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SECTION 1
INTRODUCTION

This section provides a general introduction to the Mississippi Emergency Management Agency (MEMA) District 6 Regional Hazard Mitigation Plan. It consists of the following five subsections:

- 1.1 Background
- 1.2 Purpose
- 1.3 Scope
- 1.4 Authority
- 1.5 Summary of Plan Contents

1.1 BACKGROUND

Natural hazards, such as hurricanes, floods, and tornadoes, are a part of the world around us. Their occurrence is natural and inevitable, and there is little we can do to control their force and intensity. We must consider these hazards to be legitimate and significant threats to human life, safety, and property.

The MEMA District 6 Region is located in the northeastern corner of Mississippi and includes the counties of Clarke, Jasper, Kemper, Lauderdale, Leake, Neshoba, Newton, Scott, and Smith. This area is vulnerable to a wide range of natural hazards such as floods, drought, hurricanes, severe thunderstorms, and wildfires. It is also vulnerable to human-caused hazards, including chemical releases and hazardous material spills. These hazards threaten the life and safety of residents in the MEMA District 6 Region and have the potential to damage or destroy both public and private property, disrupt the local economy, and impact the overall quality of life of individuals who live, work, and vacation in the MEMA District 6 Region.

While the threat from hazardous events may never be fully eliminated, there is much we can do to lessen their potential impact upon our community and our citizens. By minimizing the impact of hazards upon our built environment, we can prevent such events from resulting in disasters. The concept and practice of reducing risks to people and property from known hazards is generally referred to as *hazard mitigation*.

FEMA Definition of Hazard Mitigation:
"Any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards."

Hazard mitigation techniques include both structural measures (such as strengthening or protecting buildings and infrastructure from the destructive forces of potential hazards) and non-structural measures (such as the adoption of sound land use policies and the creation of public awareness programs). It is widely accepted that the most effective mitigation measures are implemented at the local government level, where decisions on the regulation and control of development are ultimately made. A comprehensive mitigation approach addresses hazard vulnerabilities that exist today and in the foreseeable future. Therefore, it is essential that projected patterns of future development are evaluated and considered in terms of how that growth will increase or decrease a community's overall hazard vulnerability.

A key component in the formulation of a comprehensive approach to hazard mitigation is to develop, adopt, and update a local hazard mitigation plan as needed. A hazard mitigation plan establishes the broad community vision and guiding principles for reducing hazard risk, and further proposes specific mitigation actions to eliminate or reduce identified vulnerabilities.

Each of the nine counties participating in the development of the MEMA District 6 Hazard Mitigation Plan has an existing hazard mitigation plan that has evolved over the years, as described in Section 2: *Planning Process*. This regional plan draws from each of the county plans and documents the region's sustained efforts to incorporate hazard mitigation principles and practices into routine government activities and functions. At its core, the Plan recommends specific actions to minimize hazard vulnerability and protect residents from losses to those hazards that pose the greatest risk. These mitigation actions go beyond simply recommending structural solutions to reduce existing vulnerability, such as elevation, retrofitting, and acquisition projects. Local policies on community growth and development, incentives for natural resource protection, and public awareness and outreach activities are examples of other actions considered to reduce the MEMA District 6 Region's vulnerability to identified hazards. The Plan remains a living document, with implementation and evaluation procedures established to help achieve meaningful objectives and successful outcomes over time.

1.1.1 The Disaster Mitigation Act and the Flood Insurance Reform Act

In an effort to reduce the Nation's mounting natural disaster losses, the U.S. Congress passed the Disaster Mitigation Act of 2000 (DMA 2000) in order to amend the Robert T. Stafford Disaster Relief and Emergency Assistance Act. Section 322 of DMA 2000 emphasizes the need for state, local, and Tribal government entities to closely coordinate on mitigation planning activities and makes the development of a hazard mitigation plan a specific eligibility requirement for any local or Tribal government applying for federal mitigation grant funds. In short, if a jurisdiction is not covered by an approved mitigation plan, it will not be eligible for mitigation grant funds. These funds include the Hazard Mitigation Grant Program (HMGP) and the Pre-Disaster Mitigation (PDM) program, both of which are administered by the Federal Emergency Management Agency (FEMA) under the Department of Homeland Security. Communities with an adopted and federally-approved hazard mitigation plan thereby become pre- positioned and more apt to receive available mitigation funds before and after the next disaster strikes.

Additionally, the Flood Insurance Reform Act of 2004 (P.L. 108-264) created two new grant programs, Severe Repetitive Loss (SRL) and Repetitive Flood Claim (RFC), and modified the existing Flood Mitigation Assistance (FMA) program. One of the requirements of this Act is that a FEMA-approved Hazard Mitigation Plan is now required if communities wish to be eligible for these FEMA mitigation programs. However, as of early 2014, these programs have been folded into a single Flood Mitigation Assistance (FMA) program.

This change was brought on by new, major federal flood insurance legislation that was passed in 2012 under the Biggert-Waters Flood Insurance Reform Act (P.L. 112-141) and the subsequent Homeowner Flood Insurance Affordability Act in 2014 which revised Biggert-Waters. These acts made several changes to the way the National Flood Insurance Program is to be run, including raises in rates to reflect true flood risk and changes in how Flood Insurance Rate Map (FIRM) updates impact policyholders. These acts further emphasize Congress' focus on mitigating vulnerable structures.

In 2018, the Disaster Recovery Reform Act (DRRA) was signed into law as part of the Federal Aviation Administration Reauthorization Act of 2018. The goal was to build the Nation's capacity for the next catastrophic event. As a result of the DRRA, FEMA developed the Building Resilient Infrastructure and

Communities (BRIC) program. The intent of BRIC is to shift the federal focus away from reactive disaster spending and toward proactive community resilience investments. A requirement of the program is to have a FEMA approved Hazard Mitigation Plan.

The MEMA District 6 Regional Hazard Mitigation Plan has been prepared in coordination with FEMA Region IV and the Mississippi Emergency Management Agency (MEMA) to ensure that the Plan meets all applicable FEMA and state requirements for hazard mitigation plans. A *Local Mitigation Plan Review Tool*, found in Appendix C, provides a summary of federal and state minimum standards and notes the location where each requirement is met within the Plan.

1.2 PURPOSE

The purpose of the MEMA District 6 Regional Hazard Mitigation Plan is to:

- Complete update of existing plans to demonstrate progress and reflect current conditions;
- Increase public awareness and education about the plan and planning process;
- Maintain grant eligibility for participating jurisdictions; and
- Maintain compliance with state and federal legislative requirements for local hazard mitigation plans.

1.3 SCOPE

The focus of the MEMA District 6 Regional Hazard Mitigation Plan is on those hazards determined to be “high” or “moderate” risks to the MEMA District 6 Region, as determined through a detailed hazard risk assessment. Other hazards that pose a “low” or “negligible” risk will also be evaluated, but they may not be fully addressed until they are determined to be of high or moderate risk. This enables the participating jurisdictions to prioritize mitigation actions based on those hazards which are understood to present the greatest risk to lives and property.

The geographic scope (i.e., the planning area) for the Plan includes 9 counties and 30 incorporated jurisdictions. **Table 1.1** lists the participating areas.

TABLE 1.1: PARTICIPATING JURISDICTIONS IN THE MEMA DISTRICT 6 REGIONAL HAZARD MITIGATION PLAN

Clarke County		Neshoba County	
Enterprise	Shubuta	Philadelphia	
Pachuta	Stonewall	**Newton County***	
Quitman		Chunky	Newton
Jasper County		Decatur	Union
Bay Springs	Louin	**Scott County**	
Heidelberg	Montrose	Forest	Morton
Kemper County		Lake	Sebastopol
De Kalb	Scooba	**Smith County**	
Lauderdale County		Mize	Sylvarena
Marion	Meridian	Polkville	Taylorsville
Leake County		Raleigh	
Carthage	Walnut Grove		
Lena			

* The Town of Hickory has decided not to participate in this planning effort.

1.4 AUTHORITY

The MEMA District 6 Regional Hazard Mitigation Plan has been developed in accordance with current state and federal rules and regulations governing local hazard mitigation plans and has been adopted by each participating county and local jurisdiction in accordance with standard local procedures. Copies of the adoption resolutions for each participating jurisdiction are provided in Appendix A. The Plan shall be routinely monitored and revised to maintain compliance with the following provisions, rules, and legislation:

- Section 322, Mitigation Planning, of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as enacted by Section 104 of the Disaster Mitigation Act of 2000 (P.L. 106-390);
- FEMA's Final Rule published in the Federal Register, at 44 CFR Part 201 (201.6 for local mitigation planning requirements and 201.7 for Tribal planning requirements); and
- Flood Insurance Reform Act of 2004 (P.L. 108-264), Biggert-Waters Flood Insurance Reform Act of 2012 (P.L. 112-141) and the Homeowner Flood Insurance Affordability Act.

1.5 SUMMARY OF PLAN CONTENTS

The contents of this Plan are designed and organized to be as reader-friendly and functional as possible. While significant background information is included on the processes used and studies completed (i.e., risk assessment, capability assessment), this information is separated from the more meaningful planning outcomes or actions (i.e., mitigation strategy, mitigation action plan).

Section 2, ***Planning Process***, provides a complete narrative description of the process used to prepare the Plan. This includes the identification of participants on the hazard mitigation council and describes how the public and other stakeholders were involved. It also includes a detailed summary for each of the key meetings held, along with any associated outcomes.

The ***Community Profile***, located in Section 3, provides a general overview of the MEMA District 6 Region, including prevalent geographic, demographic, and economic characteristics. In addition, building characteristics and land use patterns are discussed. This baseline information provides a snapshot of the planning area and helps local officials recognize those social, environmental, and economic factors that ultimately play a role in determining the region's vulnerability to hazards.

The Risk Assessment is presented in three sections: Section 4, ***Hazard Identification***; Section 5, ***Hazard Profiles***; and Section 6, ***Vulnerability Assessment***. Together, these sections serve to identify, analyze, and assess hazards that pose a threat to the MEMA District 6 Region. The risk assessment also attempts to define any hazard risks that may uniquely or exclusively affect specific areas of the MEMA District 6 Region.

The Risk Assessment begins by identifying hazards that threaten the MEMA District 6 Region. Next, detailed profiles are established for each hazard, building on available historical data from past hazard occurrences, spatial extent, and probability of future occurrence. This section culminates in a hazard risk ranking based on conclusions regarding the frequency of occurrence, spatial extent, and potential impact highlighted in each of the hazard profiles. In the vulnerability assessment, FEMA's HAZUS®MH loss estimation methodology is used to evaluate known hazard risks by their relative long-term cost in expected damages. In essence, the information generated through the risk assessment serves a critical function as the MEMA District 6 Region seeks to determine the most appropriate mitigation actions to pursue and implement—enabling it to prioritize and focus its efforts on those hazards of greatest concern and those structures or planning areas facing the greatest risk(s).

The ***Capability Assessment***, found in Section 7, provides a comprehensive examination of the MEMA District 6 Region's capacity to implement meaningful mitigation strategies and identifies opportunities to increase and enhance that capacity. Specific capabilities addressed in this section include planning and regulatory capability, staff and organizational (administrative) capability, technical capability, fiscal capability, and political capability. Information was obtained through the use of a detailed survey questionnaire and an inventory and analysis of existing plans, ordinances, and relevant documents. The purpose of this assessment is to identify any existing gaps, weaknesses, or conflicts in programs or activities that may hinder mitigation efforts and to identify those activities that should be built upon in establishing a successful and sustainable local hazard mitigation program.

The *Community Profile*, *Risk Assessment*, and *Capability Assessment* collectively serve as a basis for determining the goals for the MEMA District 6 Regional Hazard Mitigation Plan, each contributing to the development, adoption, and implementation of a meaningful and manageable *Mitigation Strategy* that is based on accurate background information.

The ***Mitigation Strategy***, found in Section 8, consists of broad goal statements as well as an analysis of hazard mitigation techniques for the jurisdictions participating in the MEMA District 6 Regional Hazard Mitigation Plan to consider in reducing hazard vulnerabilities. The strategy provides the foundation for a detailed ***Mitigation Action Plan***, found in Section 9, which links specific mitigation actions for each county and municipal department or agency to locally-assigned implementation mechanisms and target completion dates. Together, these sections are designed to make the Plan both strategic, through the identification of long-term goals, and functional, through the identification of immediate and short-term actions that will guide day-to-day decision-making and project implementation.

In addition to the identification and prioritization of possible mitigation projects, emphasis is placed on the use of program and policy alternatives to help make the MEMA District 6 Region less vulnerable to the damaging forces of hazards while improving the economic, social, and environmental health of the community. The concept of multi-objective planning was emphasized throughout the planning process, particularly in identifying ways to link, where possible, hazard mitigation policies and programs with complimentary community goals related to disaster recovery, housing, economic development, recreational opportunities, transportation improvements, environmental quality, land development, and public health and safety.

Plan Maintenance, found in Section 10, includes the measures that the jurisdictions participating in the MEMA District 6 Regional plan will take to ensure the Plan's continuous long-term implementation. The procedures also include the manner in which the Plan will be regularly evaluated and updated to remain a current and meaningful planning document.

County-specific **Annexes** have been created for each of the counties participating in this plan. Each Annex contains information relevant to the county and the participating municipal jurisdictions in the county. Information included in each county-level Annex includes Community Profile, Risk Assessment, and Capability Assessment information. The Mitigation Actions identified for that county and its municipal jurisdictions are also included in the county's Annex. This allows each county and jurisdiction to quickly locate the information contained in the plan that is most relevant for them.

SECTION 2
PLANNING PROCESS

This section describes the planning process undertaken by the Mississippi Emergency Management Agency (MEMA) District 6 counties and jurisdictions in the development of its 2021 Regional Hazard Mitigation Plan. It consists of the following eight subsections:

- 2.1 Overview of Hazard Mitigation Planning
- 2.2 History of Hazard Mitigation Planning in the MEMA District 6 Region
- 2.3 Preparing the 2021 Plan
- 2.4 The MEMA District 6 Regional Hazard Mitigation Council
- 2.5 Community Meetings and Workshops
- 2.6 Involving the Public
- 2.7 Involving the Stakeholders
- 2.8 Documentation of Plan Progress

44 CFR Requirement
44 CFR Part 201.6(c)(1): The plan shall include documentation of the planning process used to develop the plan, including how it was prepared, who was involved in the process and how the public was involved.

2.1 OVERVIEW OF HAZARD MITIGATION PLANNING

Local hazard mitigation planning is the process of organizing community resources, identifying and assessing hazard risks, and determining how to best minimize or manage those risks. This process culminates in a hazard mitigation plan that identifies specific mitigation actions, each designed to achieve both short-term planning objectives and a long-term community vision.

To ensure the functionality of a hazard mitigation plan, responsibility is assigned for each proposed mitigation action to a specific individual, department, or agency along with a schedule or target completion date for its implementation (see Section 10: *Plan Maintenance*). Plan maintenance procedures are established for the routine monitoring of implementation progress, as well as the evaluation and enhancement of the mitigation plan itself. These plan maintenance procedures ensure that the Plan remains a current, dynamic, and effective planning document over time that becomes integrated into the routine local decision-making process.

Communities that participate in hazard mitigation planning have the potential to accomplish many benefits, including:

- saving lives and property,
- saving money,
- speeding up recovery following disasters,

- reducing future vulnerability through wise development and post-disaster recovery and reconstruction,
- expediting the receipt of pre-disaster and post-disaster grant funding, and
- demonstrating a firm commitment to improving community health and safety.

Typically, communities that participate in mitigation planning are described as having the potential to produce long-term and recurring benefits by breaking the repetitive cycle of disaster loss. A core assumption of hazard mitigation is that the investments made before a hazard event will significantly reduce the demand for post-disaster assistance by lessening the need for emergency response, repair, recovery, and reconstruction. Furthermore, mitigation practices will enable local residents, businesses, and industries to re-establish themselves in the wake of a disaster, getting the community economy back on track sooner and with less interruption.

The benefits of mitigation planning go beyond solely reducing hazard vulnerability. Mitigation measures such as the acquisition or regulation of land in known hazard areas can help achieve multiple community goals, such as preserving open space, maintaining environmental health, and enhancing recreational opportunities. Thus, it is vitally important that any local mitigation planning process be integrated with other concurrent local planning efforts, and any proposed mitigation strategies must take into account other existing community goals or initiatives that will help complement or hinder their future implementation.

2.2 HISTORY OF HAZARD MITIGATION PLANNING IN MEMA DISTRICT 6 REGION

Each of the counties and jurisdictions participating in this Plan originally had a previously adopted hazard county-level mitigation plan. The FEMA approval dates for each of these plans, along with a list of the participating municipalities for each plan, are listed below:

- *Clarke County - Clarke County Mississippi Hazard Mitigation Plan* (2016)
  - Enterprise
  - Quitman
  - Pachuta
  - Shubuta
  - Stonewall
- *Jasper County - Jasper County Mississippi Hazard Mitigation Plan* (2016)
  - Bay Springs
  - Heidelberg
  - Louin
  - Montrose
- *Kemper County - Kemper County Mississippi Hazard Mitigation Plan* (2016)
  - De Kalb
  - Scooba

- *Lauderdale County - Lauderdale County Mississippi Hazard Mitigation Plan* (2016)
  - Marion
  - Meridian
- *Leake County - Leake County Mississippi Hazard Mitigation Plan* (2016)
  - Carthage
  - Lena
  - Walnut Grove
- *Neshoba County - Neshoba County Mississippi Hazard Mitigation Plan* (2016)
  - Philadelphia
  - Union (partially in Neshoba and Newton Counties)[1]
- *Newton County - Newton County Mississippi Hazard Mitigation Plan* (2016)
  - Chunky
  - Decatur
  - Newton (city)
  - Union (partially in Neshoba and Newton Counties)
- *Scott County - Scott County Mississippi Hazard Mitigation Plan* (2016)[2]
  - Forest
  - Lake
  - Morton
  - Sebastopol
- *Smith County - Smith County Mississippi Hazard Mitigation Plan* (2016)
  - Mize
  - Polkville
  - Raleigh
  - Sylvarena
  - Taylorsville

Each of these plans were developed using the multi-jurisdictional planning process recommended by the Federal Emergency Management Agency (FEMA). For this plan, the 2016 version of the mitigation plan, all of the aforementioned jurisdictions joined to form a regional plan. The 2021, hazard mitigation plan update remains structured as a regional plan, and no new jurisdictions have joined the process.

2.3 PREPARING THE 2021 PLAN

Local hazard mitigation plans are required to be updated every five years to remain eligible for federal mitigation funding.

To prepare the 2021 *MEMA District 6 Regional Hazard Mitigation Plan*, MEMA hired Witt O'Brien's as an outside consultant to provide professional mitigation planning services.

[1] The Town of Union will only be included under Newton County for this plan.

[2] Scott County did not participate during this plan update.

Per the contractual scope of work, Witt O'Brien's followed the mitigation planning process recommended by FEMA in the Local Multi-Hazard Mitigation Planning Guidance. The Local Mitigation Plan Review Tool, found in Appendix C, provides a summary of FEMA's current minimum standards of acceptability for compliance with DMA 2000 and notes the location where each requirement is met within this Plan. These standards are based upon FEMA's Final Rule as published in the Federal Register in Part 201 of the Code of Federal Regulations (CFR).

Although each participating jurisdiction had already developed a hazard mitigation plan in the past, the combination of the nine county-level plans into one regional plan still required making some plan update revisions based on FEMA's Local Multi-Hazard Mitigation Planning Guidance. Since all sections of the regional plan are technically new, plan update requirements do not apply. However, since this is the first regional plan among the jurisdictions, key elements from the previous approved plans are referenced throughout the document (e.g., existing actions) and required a discussion of changes made. For example, all of the risk assessment elements needed to be updated to include most recent information. It was also necessary to formulate a single set of goals for the region, but they were based on previously determined goals (Section 8: *Mitigation Strategy*). The Capability Assessment section includes updated information for all of the participating jurisdictions and the Mitigation Action Plan provides implementation status updates for all of the actions identified in the previous plans.

The process used to prepare this Plan included twelve major steps that were completed over the course of approximately nine months beginning in June 2015. Each of these planning steps (illustrated in **Figure 2.1**) resulted in critical work products and outcomes that collectively make up the Plan. Specific plan sections are further described in Section 1: *Introduction*.

Over the past five years, each participating jurisdiction has been actively working to implement their existing plans. This is documented in the Mitigation Action Plan through the implementation status updates for each of the Mitigation Actions. The Capability Assessment also documents changes and improvements in the capabilities of each participating jurisdiction to implement the Mitigation Strategy.

FIGURE 2.1: MITIGATION PLANNING PROCESS FOR THE MEMA DISTRICT 6 REGION

As is further detailed below, the planning process was conducted through Hazard Mitigation Council meetings comprised primarily of local government staff from each of the participating jurisdictions and advisory stakeholders.

2.4 THE MEMA DISTRICT 6 REGIONAL HAZARD MITIGATION COUNCIL

In order to guide the development of this Plan, the counties in MEMA District 6 (Clarke, Jasper, Kemper, Lauderdale, Leake, Neshoba, Newton, Scott, and Smith) and representatives from their participating municipal jurisdictions created the MEMA District 6 Regional Hazard Mitigation Council (RHMC). The RHMC represents a community-based planning team made up of representatives from various county departments and municipalities and other key stakeholders identified to serve as critical partners in the planning process.

Beginning in June 2015, the RHMC members engaged in regular discussions as well as local planning workshops to discuss and complete tasks associated with preparing the Plan. This working group coordinated on all aspects of plan preparation and provided valuable input to the process. In addition to regular meetings, committee members routinely communicated and were kept informed through an e-mail distribution list.

Specifically, the tasks assigned to the RHMC members included:

- participate in RHMC meetings and workshops
- provide best available data as required for the Risk Assessment portion of the Plan
- help review the local Capability Assessment information and provide copies of any mitigation or hazard-related documents for review and incorporation into the Plan
- support the development of the Mitigation Strategy, including the design and adoption of regional goal statements
- help design and propose appropriate mitigation actions for their department/agency for incorporation into the Mitigation Action Plan
- review and provide timely comments on all study findings and draft plan deliverables
- support the adoption of the *2016 MEMA District 6 Hazard Mitigation Plan*

Table 2.1 lists the members of the RHMC who were responsible for participating in the development of the Plan. Council members are listed in alphabetical order by last name.

Table 2.1: Members of the MEMA District 6 Regional Hazard Mitigation Council

NAME	TITLE	DEPARTMENT / AGENCY
Dudley, Ben*	Director	Kemper County EMA
Farmer, Dinah	Administrative Officer	Lauderdale County EMA
Goodman, Al	Principal	AWG Consulting
Harper, Brenda	City Clerk	Town of Decatur
Ivy, Eddie*	Director	Clarke County EMA
Jordan, Tina	District 6 Area Coordinator	MEMA
Lucas, Mike*	Director	Jasper County EMA
Malone, Tommy*	Director	Leake County EMA
Mayo, Jeff*	Director	Neshoba County EMA
McDaniel, Kandace	Intern	MEMA
McKinney, Carolyn	Planner	MEMA
Patrick, Bill	Bureau Director	MEMA
Seaney, Alvin*	Director	Scott County EMA
Seaney, Sheila	Deputy Director	Scott County EMA
Smith, Scott*	Director	Newton County EMA
Spears, Scott*	Director	Lauderdale County EMA
Thornton, Annette	Administrative Assistant	Smith County EMA
Warren, Brian*	Director	Smith County EMA

* Served as the county's main point of contact

Some of the Regional Hazard Mitigation Council Members listed above were designated to represent more than one jurisdiction. Specifically:

- Eddie Ivy represented Clarke County and the Town of Enterprise, Village of Pachuta, City of Quitman, Town of Shubuta, and Town of Stonewall
- Mike Lucas represented Jasper County and the City of Bay Springs, Town of Heidelberg, Town of Louin, and Town of Montrose.
- Ben Dudley represented Kemper County and the Town of DeKalb and Town of Scooba.
- Scott Spears represented Lauderdale County and the Town of Marion and City of Meridian.
- Tommy Malone represented Leake County and the City of Carthage, Town of Lena, and Town of Walnut Grove.
- Jeff Mayo represented Neshoba County and the City of Philadelphia.
- Scott Smith represented Newton County and the Town of Chunky, Town of Decatur, City of Newton, and Town of Union.
- Alvin Seaney represented Scott County and the City of Forest, Town of Lake, City of Morton, and Town of Sebastopol.
- Brian Warren represented Smith County and the Town of Mize, Town of Polkville, Town of Raleigh, Village of Sylvarena, and Town of Taylorsville.

This authorized representation is documented in signed letters that were provided to MEMA from each of these municipalities that designated these persons as their representatives. Copies of these letters can be obtained by contacting MEMA.

Each of the municipalities participated in the planning process through county-level meetings and calls with their respective county's emergency management agency director, who discussed the risk assessment with them and helped them update their mitigation actions accordingly.

Additional participation and input from other identified stakeholders and the general public was sought by the MEMA District 6 counties during the planning process through phone calls and the distribution of e-mails, advertisements, and public notices aimed at informing people of the development of the Hazard Mitigation Plan (public and stakeholder involvement is further discussed later in this section). It should be noted that many neighboring communities were offered the opportunity to participate in the planning process through phone conversations and in-person discussions. Among those invited to participate were representatives from Emergency Management offices in several of the counties that surround the MEMA District 6 Region including Covington, Winston, and Noxubee Counties. During these discussions, no major comments or suggestions were received concerning the plan.

2.4.1 Multi-Jurisdictional Participation

The MEMA District 6 Hazard Mitigation Plan includes nine counties and thirty incorporated municipalities. To satisfy multi-jurisdictional participation requirements, each county and its participating jurisdictions were required to perform the following tasks:

- Participate in mitigation planning workshops or designate a representative to do so;
- Identify completed/new mitigation projects, if applicable; and
- Develop and adopt (or update) their local Mitigation Action Plan.

Each jurisdiction participated in the planning process and has developed a local Mitigation Action Plan unique to their jurisdiction. Each jurisdiction will adopt their Mitigation Action Plan separately. This provides the means for jurisdictions to monitor and update their Plan on a regular basis.

2.5 COMMUNITY MEETINGS AND WORKSHOPS

The preparation of this Plan required a series of meetings and workshops for facilitating discussion, gaining consensus and initiating data collection efforts with local government staff, community officials, and other identified stakeholders. More importantly, the meetings and workshops prompted continuous input and feedback from relevant participants throughout the drafting stages of the Plan. The following is a summary of the key meetings and community workshops held during the development of the plan update.[4] In many cases, routine discussions and additional meetings were held by local staff to accomplish planning tasks specific to their department or agency, such as the approval of specific mitigation actions for their department or agency to undertake and include in the Mitigation Action Plan.

Project Kickoff Meeting
June 9, 2015
Forest, MS

June 9, 2015 MEMA District 6 RHMC Meeting

Following the contractual Notice to Proceed, Atkins staff arranged for a project kickoff meeting. The MEMA District 6 Area Coordinator helped to arrange a meeting location. An email was distributed which invited representatives from the participating counties and municipalities, external stakeholders, and other local organizations to the meeting. The regional participants are collectively known as the Regional Hazard Mitigation Council ("RHMC" or "Council"). The meeting was held at the Scott County Emergency Management Office and was attended by a range of stakeholders.

Tina Jordan, MEMA District 6 Area Coordinator, started the meeting by welcoming the representatives from each county, participating municipal jurisdictions, and other stakeholders. Ms. Jordan then introduced Ryan Wiedenman, Project Manager from the project consulting team, Atkins.

Mr. Wiedenman led the kickoff meeting and began by providing an overview of the items to be discussed at the meeting and briefly reviewed each of the handouts that were distributed in the meeting packets (agenda, project description, and presentation slides). He then provided a brief overview of mitigation and discussed the Disaster Mitigation Act of 2000 and NC Senate Bill 300.

He gave a list of the participating jurisdictions for the regional plan, noting that nearly every local government in the region is participating in an existing hazard mitigation plan. These plans expire at various times in mid to late 2016, so the planning team will plan to develop a draft to submit to FEMA by early 2016.

Mr. Wiedenman then explained the six different categories of mitigation techniques (emergency services; prevention; natural resource protection; structural projects; public education and awareness; and property protection) and gave examples of each. This explanation culminated with an Ice Breaker Exercise for the attendees.

[4] Copies of agendas, sign-in sheets, minutes, and handout materials for all meetings and workshops can be found in Appendix D.

Mr. Wiedenman instructed attendees on how to complete the exercise. Attendees were divided into small groups and given an equal amount of fictitious FEMA money and asked to spend it in the various mitigation categories. Money could be thought of as grant money that communities received towards mitigation. Attendees were asked to target their money towards areas of mitigation that are of greatest concern for their community. Ideally, the exercise helps pinpoint areas of mitigation that the community may want to focus on when developing mitigation grants. Mr. Wiedenman also presented the Ice Breaker Exercise results which were:

- Emergency Services $138
- Public Education $41
- Property Protection $35
- Natural Resource Protection $35
- Prevention $26
- Structural $18

"Icebreaker" Exercise

Mr. Wiedenman then discussed the key objectives and structure of the planning process, explaining the specific tasks to be accomplished for this project, including the planning process, risk assessment, vulnerability assessment, capability assessment, mitigation strategy and action plan, plan maintenance procedures, and documentation. The project schedule was presented along with the project staffing chart, which demonstrates the number of experienced individuals that will be working on this project.
The data collection needs and public outreach efforts were also discussed.

Mr. Wiedenman then reviewed the roles and responsibilities of Atkins, participating jurisdictions, and stakeholders. The presentation concluded with a discussion of the next steps to be taken in the project development, which included discussing data collection efforts, continuing public outreach, and the next meeting for the HMPT.

The meeting was opened for questions and comments, but nothing of note was brought up.

Mr. Wiedenman thanked everyone for attending and identified himself as the point of contact for any questions or issues. The meeting was adjourned.

Mitigation Strategy Meeting
October 8, 2015

Ms. Tina Jordan with MEMA welcomed everyone to the meeting and went over safety and administrative topics. She then passed the meeting over to Mr. Ryan Wiedenman to discuss the findings and information that Atkins pulled together.

Mr. Wiedenman initiated the meeting with a review of the meeting handouts, which included an agenda, presentation slides, proposed goals for the plan, mitigation actions from the region's existing plan, and mitigation action worksheets for collecting information for any new mitigation actions. Mr. Wiedenman reviewed the project schedule and stated that a draft of the Hazard Mitigation Plan would be presented to the Hazard Mitigation Planning team at the end of November.

He then presented the findings of the risk assessment, starting with a review of the Presidential Disaster Declarations that have impacted the region. He then explained the process for preparing Hazard Profiles and discussed how each hazard falls into one of five categories: Flood-related, Fire-related, Geologic, Wind-related, and Other. He indicated that each hazard must be evaluated and then profiled and assessed to determine a relative risk for each hazard.

Mr. Wiedenman reviewed the Hazard Profiles and the following bullets summarize the information presented:

<u>Flood-Related Hazards</u>

- FLOOD. There have been 237 flood events recorded in MEMA District 6 since 1997, resulting in $208.3 million in property damage per NCDC. There have been 263 NFIP losses since 1978 and approximately $4.2 million in claims. 40 repetitive loss properties in the region account for 101 of the recorded losses. Future occurrences are likely.

- EROSION. There have not been any instances of major erosion reported, however, some HMPT members noted that erosion has occurred to some degree as part of the land subsidence hazard.

- DAM/LEVEE FAILURE. There have been 8 recorded dam failures in the region according to the State HMP. There are 37 high hazard dams in the region. Future occurrences are possible.

- WINTER STORM. There have been 90 recorded winter weather events in the region since 1996 resulting in $12.8 million in reported property damages. Future occurrences are likely.

<u>Fire-Related Hazards</u>

- DROUGHT. There have been eleven years (out of the past fifteen, 2000-2014) where drought conditions have been reported as moderate to extreme in the region and future occurrences are likely.

- HEAT WAVE. There have been 45 recorded extreme heat events reported by the National Climatic Data Center (NCDC) since 2007. Heat extents of 106 degrees indicate that extreme heat is a hazard of concern for the region. Future occurrences are likely.

- WILDFIRE. There is an average of 3,270 fires per year reported in the region. These burn an annual average of 3,723 acres. Future occurrences are highly likely.

<u>Geologic Hazards</u>

- EARTHQUAKES. There have been 8 recorded earthquake events in MEMA District 6 since 1886. The strongest had a recorded magnitude of V MMI. Future occurrences are possible.

- LANDSLIDE. No known occurrences of landslides and USGS mapping shows a very low risk for most of the region, though there are some areas of moderate risk. Future occurrences unlikely.

- LAND SUBSIDENCE. There were no major recorded past events and in general the region has a low susceptibility. Future occurrences unlikely.

Wind-Related Hazards

- HURRICANES AND TROPICAL STORMS. NOAA data shows that 57 storm tracks have come within 75 miles of the region since 1885. Future occurrences are likely.

- THUNDERSTORM/HIGH WIND. There have been 2,110 severe thunderstorm/high wind events reported since 1955 with $53.9 million in reported property damages. Two deaths have been reported. Future occurrences are highly likely.

- HAILSTORM. There have been 1,072 recorded events since 1960. Future occurrences are highly likely.

- LIGHTNING. There have been 17 recorded lightning events reported by the National Climatic Data Center (NCDC) since 1998. Future occurrences are highly likely.

- TORNADOES. There have been 379 recorded tornado events reported in the region since 1950. $855.8 million in property damages. 35 deaths and 450 injuries have been reported. Future occurrences are likely.

Other Hazards

- HAZARDOUS MATERIALS INCIDENTS. There have been 532 reported hazardous materials events reported in the county since 1971. 45 serious events were reported with 0 deaths and 16 injuries. Future occurrences are likely.

The results of the hazard identification process were used to generate a Priority Risk Index (PRI), which categorizes and prioritizes potential hazards as high, moderate or low risk based on probability, impact, spatial extent, warning time, and duration. The highest PRI was assigned to Thunderstorm/High Wind followed by Tornado, Flood, Hurricane/Tropical Storm, and Hailstorm.

Hazard Mitigation Planning Team members recommended raising the relative risk level for Tornado to the highest priority hazard, noting that several counties had experienced higher level tornadoes than what was reported.

In concluding the review of Hazard Profiles, Mr. Wiedenman stated if anyone had additional information for the hazard profiles, or had concerns with any of the data presented, they should call or email him.

Mr. Wiedenman presented the Capability Assessment Findings. Atkins has developed a scoring system that was used to rank the participating jurisdictions in terms of capability in four major areas (Planning and Regulatory; Administrative and Technical; Fiscal; Political). Important capability indicators include National Flood Insurance Program (NFIP) participation, Building Code Effective Grading Schedule

(BCEGS) score, Community Rating System (CRS) participation, and the Local Capability Assessment Survey conducted by Atkins.

Mr. Wiedenman reviewed the Relevant Plans and Ordinances, Relevant Staff/Personnel Resources, and Relevant Fiscal Resources. All of these categories were used to rate the overall capability of the participating counties and jurisdictions. Most jurisdictions are in the limited to moderate range for Planning and Regulatory Capability and in the limited range for Fiscal Capability. There is variation between the jurisdictions for Administrative and Technical Capability, mainly with respect to availability staff skilled in GIS and planning. Based upon the scoring methodology developed by Atkins, it was determined that most of the participating jurisdictions have limited to moderate capability to implement hazard mitigation programs and activities.

Mr. Wiedenman also discussed the results of the public participation survey that was posted on several of the participating counties' and municipal websites. As of the meeting date, 9 responses had been received. Mr. Wiedenman explained that the survey would close on October 31, so the HMPT could make one final push to get the survey out to the public since responses were so low. Based on preliminary survey results, respondents felt that Severe Thunderstorm/High Wind posed the greatest threat to their neighborhood, followed by Tornado. 89 percent of the respondents were interested in making their homes more resistant to hazards. However, 44 percent don't know who to contact regarding reducing their risks to hazards.

Mr. Wiedenman gave an overview of Mitigation Strategy Development and presented the existing goals for the plan and explained that Atkins recommended keeping the goals as they are. The Hazard Mitigation Team accepted the existing goals for the plan. Mr. Wiedenman then provided an overview and examples of suggested mitigation actions tailored for MEMA District 6 counties and their municipalities. Mr. Wiedenman then asked each county and the municipalities to provide a status update for their existing mitigation actions (completed, deleted, or deferred) by October 31, 2015. Mr. Wiedenman also asked planning team members to include any new mitigation actions by October 31, 2015.

Mr. Wiedenman thanked the group for taking the time to attend and explained that if team members had any issues or questions about the planning process or their next steps, they could contact him. The meeting was adjourned.

2.6 INVOLVING THE PUBLIC

44 CFR Requirement
44 CFR Part 201.6(b)(1): The planning process shall include an opportunity for the public to comment on the plan during the drafting stage and prior to plan approval.

An important component of the mitigation planning process involves public participation. Individual citizen and community-based input provides the entire Council with a greater understanding of local concerns and increases the likelihood of successfully implementing mitigation actions by developing community "buy-in" from those directly affected by the decisions of public officials. As citizens become more involved in decisions that affect their safety, they are more likely to gain a greater appreciation of the hazards present in their community and take the steps necessary to reduce their impact. Public awareness is a key component of any community's overall mitigation strategy aimed at making a home, neighborhood, school, business or entire city safer from the potential effects of hazards.

Public involvement in the development of the *MEMA District 6 Hazard Mitigation Plan* was sought using two methods: (1) public survey instruments (hard copy and web-based) were made available, and (2) copies of draft Plan deliverables were made available for public review on county websites and at government offices. The Public was provided two opportunities to be involved in the actual plan development at two distinct periods during the planning process: (1) during the drafting stage of the Plan; and (2) upon completion of a final draft Plan, but prior to official plan approval and adoption. A public participation survey (discussed in greater detail in Section 2.6.1) was made available during the planning process at various locations throughout the MEMA District 6 Region and at various locations on the internet.

It should be noted that many local officials explained that the best way to reach members of the public in their jurisdiction was often not through the internet and that many local governments do not have official websites on which to advertise an online survey link. Therefore, Atkins provided hard copies of the survey for all local governments and these were distributed to members of the public in the way each county felt would be most conducive to receiving responses. For instance, some communities brought hard copies to local community events and encouraged citizens to fill out the survey and send it directly to Atkins or to their local Emergency Management office.

Additionally, each of the participating jurisdictions will hold public meetings before the final plan is officially adopted by the local governing bodies. These meetings will occur at different times once FEMA has granted conditional approval of the Plan. Adoption resolutions will be included in Appendix A.

2.6.1 Public Participation Survey

The MEMA District 6 Region was successful in getting citizens to provide input to the mitigation planning process through the use of the *Public Participation Survey*. The *Public Participation Survey* was designed to capture data and information from residents of the Region that might not be able to participate through other means in the mitigation planning process, such as attending a public meeting at a specific time and location.

As mentioned above, hard copies of the *Public Participation Survey* were distributed to the RHMC to be made available for residents to complete at local public offices. A link to an electronic version of the survey was also posted at various locations on the internet.

A total of 121 survey responses were received, which provided valuable input for the RHMC to consider in the development of the plan update. Selected survey results are presented below.

- Approximately 82 percent of survey respondents had been impacted by a disaster, mainly hurricanes (Katrina—2005) and tornadoes.
- Respondents ranked Tornado as the highest threat to their neighborhood (53 percent), followed by Severe Thunderstorm/High Wind (26 percent).
- Approximately 32 percent of respondents have taken actions to make their homes more resistant to hazards and 90 percent are interested in making their homes more resistant to hazards.

- 46 percent of respondents do not know what office to contact regarding reducing their risks to hazards.
- Emergency Services and Public Education and Awareness were ranked as the most important activities for communities to pursue in reducing risks.

Public survey results were presented to the RHMC at the October 8 meeting. A copy of the survey and a detailed summary of the survey results are provided in Appendix B and Appendix D, respectively

2.7 INVOLVING THE STAKEHOLDERS

44 CFR Requirement
44 CFR Part 201.6(b)(2): The planning process shall include an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other non-profit interests to be involved in the planning process.

At the beginning of the planning process for the development of this plan, the project consultant worked with MEMA mitigation staff, the MEMA District 6 Area Coordinator, and each of the nine County Emergency Management leads to initiate outreach to stakeholders to be involved in the planning process. The project consultant sent out a list of recommended stakeholders provided from FEMA Publication 386-1 titled **Getting Started: Building Support for Mitigation Planning**. The list of recommended stakeholders is found in Appendix C of that publication (Worksheet #1: Build the Planning Team) and has been included in **Appendix B** of this plan to demonstrate the wide range of stakeholders that were considered to participate in the development of this plan. Each of the nine County Emergency Management leads used that list for reference as they invited stakeholders from their counties to participate in the planning process.

Additionally, the project consultant and the County EM leads contacted Mississippi Automated Resources Information System (MARIS), Mississippi Forestry Commission, Mississippi Department of Environmental Quality, representatives from each of the county-level school districts, and relevant representatives from higher education (universities, community colleges, etc.) to ask them to participate in the planning process and provide data that was used in the development of this plan.

In addition to the efforts described above, the participating jurisdictions in the MEMA District 6 plan went above and beyond the minimum requirements for stakeholder outreach by designing and distributing the *Public Participation Survey* described earlier in this section. In addition to collecting public input for the plan, the survey was generated to allow those stakeholders that could not attend Regional Hazard Mitigation Council meetings the opportunity to provide input to the plan and the planning process. All survey results were shared with the Regional Hazard Mitigation Council and represented input from citizens, local officials, businesses, academia, and other private interests in the Region. Several of these organizations contacted the consultant directly with comments as well. A list of representatives who participated from the aforementioned groups can be found in **Table 2.2**.

TABLE 2.2: MEMBERS OF THE MEMA DISTRICT 6 REGIONAL HAZARD MITIGATION COUNCIL

NAME	TITLE	DEPARTMENT / AGENCY
Dr. Alvin Taylor	Superintendent	Meridian
Tommy Dearing	Superintendent	Neshoba County School District
J.O. Amis	Superintendent	Newton County School District
Dr. Virginia Young	Superintendent	Newton
Dr. Gwendolyn Page	Superintendent	East Jasper School District
Charles Boyles	Conservator	Scott County
Nick Hillman	Superintendent	Smith County School District
Dr. Lundy Brantley	Superintendent	Union
Jackie Pollock	Superintendent	Kemper County School District
Randy Hodges	Superintendent	Lauderdale County School District
Warren Woodrow	Superintendent	West Jasper School District
Patrick Posey	Superintendent	Leake County School District

2.8 DOCUMENTATION OF PLAN PROGRESS

Progress in hazard mitigation planning for the participating jurisdictions in the MEMA District 6 Region is documented in this plan update. Since hazard mitigation planning efforts officially began in the participating counties with the development of the initial Hazard Mitigation Plans in the late 1990's/early 2000s, many mitigation actions have been completed and implemented in the participating jurisdictions. These actions will help reduce the overall risk to natural hazards for the people and property in the Region. The actions that have been completed are documented in the Mitigation Action Plan found in Section 9.

In addition, community capability continues to improve with the implementation of new plans, policies, and programs that help to promote hazard mitigation at the local level. The current state of local capabilities for the participating jurisdictions is captured in Section 7: *Capability Assessment*. The participating jurisdictions continue to demonstrate their commitment to hazard mitigation and hazard mitigation planning and have proven this by reconvening the Hazard Mitigation Council to update the Plan and by continuing to involve the public in the hazard mitigation planning process.

SECTION 3
COMMUNITY PROFILE

This section of the Plan provides a general overview of the Mississippi Emergency Management Agency (MEMA) District 6 Region. It consists of the following four subsections:

- **3.1 Geography and the Environment**
- **3.2 Population and Demographics**
- **3.3 Housing, Infrastructure, and Land Use**
- **3.4 Employment and Industry**

The county-specific annexes provide more detailed community profile information about each county.

3.1 GEOGRAPHY AND THE ENVIRONMENT

The MEMA District 6 Region was named based on the Mississippi Emergency Management Agency districts lines and is one of nine MEMA regions throughout the state. The Region is located in the east central portion of the state. It is bounded by the Mississippi/Alabama State Line to the east. Interstate 20 runs east to west through the region, passing through Lauderdale, Newton, and Scott Counties. Interstate 59 runs north to south, passing through Clarke, Lauderdale, and Jasper Counties. The MEMA District 6 Region includes the counties of Clarke, Jasper, Kemper, Lauderdale, Leake, Neshoba, Newton, Scott, and Smith. An orientation map is provided as **Figure 3.1**.

The MEMA District 6 Region encompasses various higher learning facilities such as East Mississippi Community College, Meridian Community College, University of Southern Mississippi School of Nursing, and Mississippi State University Meridian Campus. Naval Air Station Meridian Extension is located within the MEMA District 6 Region offering a training facility for East Mississippi Community College. The Pearl River Resort is located in Neshoba County and contains two casinos, golf course, waterpark, and spa. Roosevelt State Park in Scott County is a state park along the western edge of Bienville National Forest in parts of Jasper, Newton, Scott, and Smith Counties. Many historic sites are located throughout the MEMA District 6 Region attracting historic enthusiasts from around the country.

The total area of each of the participating counties is presented in **Table 3.1**.

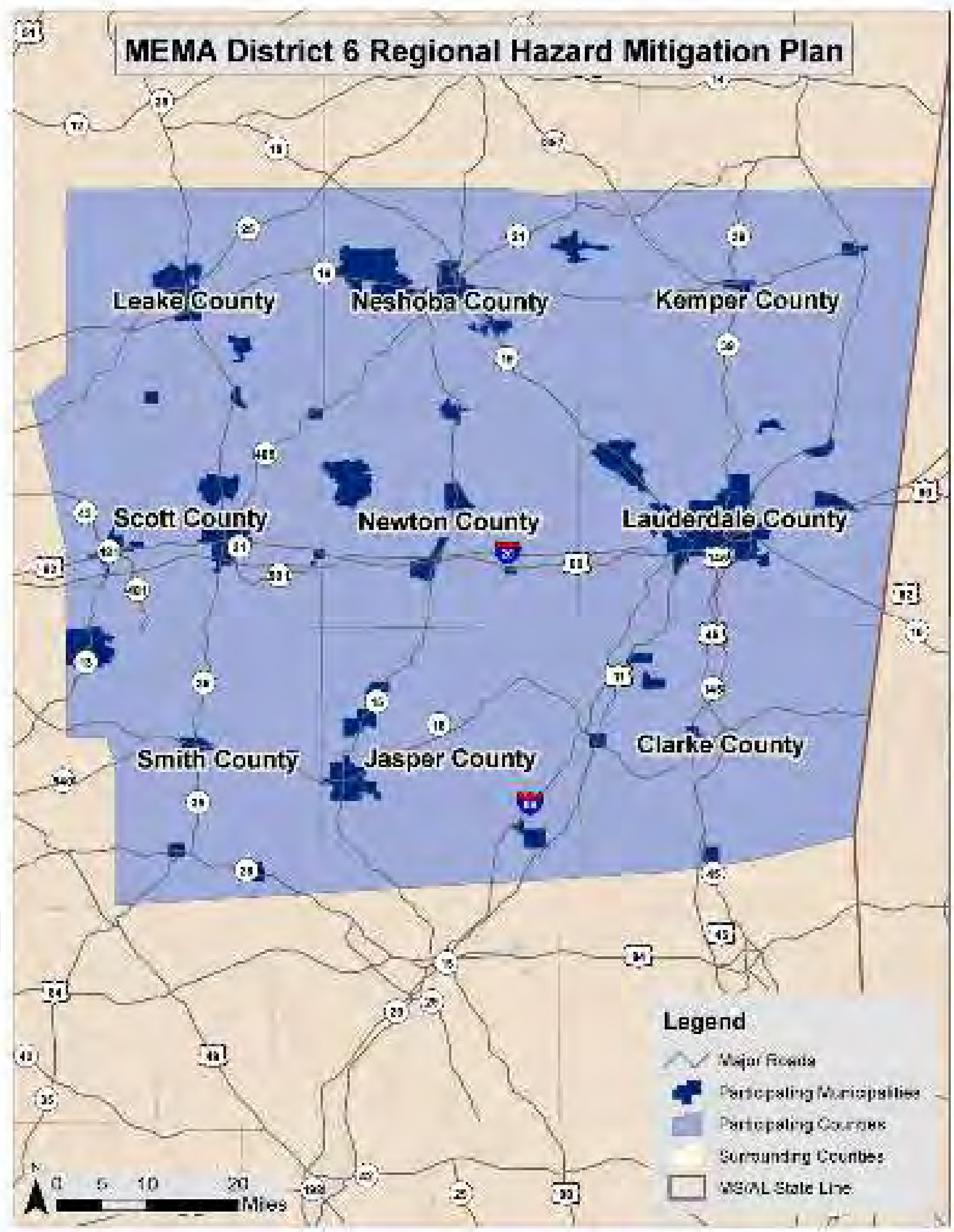
Table 3.1: TOTAL AREA OF PARTICIPATING COUNTIES

County	Land Area (sq. mi.)	Water Area (sq. mi.)	Total Area (sq. mi.)
Clarke County	692	2	694
Jasper County	676	1	677
Kemper County	766	1	767
Lauderdale County	704	11	715
Leake County	583	2	585
Neshoba County	570	2	572
Newton County	578	2	580
Scott County	609	1	610
Smith County	636	1	637

Source: United States Census Bureau

The MEMA District 6 Region enjoys four distinct seasons but the climate in the region is generally hot and humid compared to the rest of the United States given its latitude and relative proximity to the Gulf Coast. Precipitation is generally highest in winter months when the temperatures are moderately lower, but the likelihood of precipitation remains relatively constant throughout the year. Summers in the region can become fairly hot with average highs in the nineties and lows in the seventies. The region is also often susceptible to turbulent weather when warm, wet air from the Gulf of Mexico is pushed up into the region to mix with cooler air coming down from across the continent which can result in severe weather conditions. This is particularly true in the spring when seasons are changing and diverse weather patterns interact.

Figure 3.1: MEMA DISTRICT 6 REGION ORIENTATION MAP



3.2 POPULATION AND DEMOGRAPHICS

While Kemper County is the largest by area, Lauderdale County is the most populous of the participating counties within the MEMA District 6 Region. Between 2010 and 2020, all of participating counties experienced population decline. Lauderdale County had the largest population decline at -7.7 percent, with Scott County having the least decline at -0.5 percent. Population counts from the U.S. Census Bureau for 1990, 2000, and 2010 for each of the participating counties and jurisdictions are presented in **Table 3.2**.

Table 3.2: POPULATION COUNTS FOR PARTICIPATING COUNTIES

Jurisdiction	1990 Census Population	2000 Census Population	2010 Census Population	2020 Census Population	% Change 2010 to 2020
Clarke County	17,313	17,955	16,732	15,615	-6.7%
Jasper County	17,114	18,149	17,062	16,367	-4.0%
Kemper County	10,356	10,453	10,456	8,988	-14.0%
Lauderdale County	75,555	78,161	80,261	72,984	-9.0%
Leake County	18,436	20,940	23,805	21,275	-10.6%
Neshoba County	24,800	28,684	29,676	29,087	-1.9%
Newton County	20,291	21,838	21,720	21,291	-1.9%
Scott County	24,137	28,423	28,264	27,990	-0.9%
Smith County	14,798	16,182	16,491	14,209	-13.8%

Source: United States Census Bureau

Based on 2020 Census data, the median age for residents of the participating counties ranges from 33 to 42 years with a mean age of 34 years old. The racial characteristics of the participating counties are presented in **Table 3.3**. Generally, whites make up the majority of the population in the region; however, there is a substantial black population in every county, and represents the majority in the counties of Kemper and Jasper.

Table 3.3: Demographics of participating counties

Jurisdiction	White alone %	Black or African American alone %	American Indian or Alaska Native alone %	Asian alone %	Native Hawaiian or Other Pacific Islander alone %	Two or more races %	Hispanic or Latino ** %
Clarke County	63.8%	34.7%	0.5%	0.2%	Z*	0.7%	1.1%
Jasper County	45.5%	53.2%	0.3%	0.1%	Z*	0.8%	1.4%
Kemper County	34.1%	61.4%	3.5%	0.2%	0.0%	0.8%	0.9%
Lauderdale County	53.6%	44.2%	0.3%	0.8%	Z*	1.1%	2.3%
Leake County	49.4%	42.1%	6.8%	0.5%	Z*	1.1%	1.9%
Neshoba County	58.5%	21.3%	17.5%	0.4%	0.1%	1.9%	2.2%
Newton County	61.6%	31.2%	5.6%	0.5%	Z*	1.1%	2.0%
Scott County	58.2%	36.6%	0.7%	0.6%	0.4%	1.5%	11.9%
Smith County	75.3%	23.7%	0.2%	0.1%	Z*	0.7%	1.8%

**Z Value greater than zero but less than half unit of measure shown.*
*** *Hispanics may be of any race, so also are included in applicable race categories*
Source: United States Census Bureau.

3.3 HOUSING, INFRASTRUCTURE, AND LAND USE

3.3.1 Housing

According to the 2019 U.S. Census American Community Survey estimates, there are 107,777 housing units in the MEMA District 6 Region, most of which are single family homes. Housing information for the nine participating counties is presented in **Table 3.4**.

Table 3.4: HOUSING CHARACTERISTICS OF PARTICIPATING COUNTIES

Jurisdiction	Housing Units 2019	Owner-occupied housing unit rate %	Median value of owner-occupied housing unit 2015-2019
Clarke County	8,057	83.9%	$84,900
Jasper County	8,490	85%	$79,000
Kemper County	4,795	73.6%	$73,600
Lauderdale County	35,399	64.5%	$96,300
Leake County	9,622	70.8%	$83,300
Neshoba County	12.598	71.5%	$83,000
Newton County	9,567	77.2%	$85,600
Scott County	11,810	74.1%	$71,300
Smith County	7,439	83%	$102,600

Source: United States Census Bureau

3.3.2 Infrastructure

TRANSPORTATION

There are several major thoroughfares that traverse the MEMA District 6 Region. Interstate 20 runs east-west through Lauderdale, Newton, and Scott Counties connecting multiple towns in these counties to Meridian, Jackson, and into Alabama. Interstate 59 runs north to south, passing through Clarke, Lauderdale, and Jasper Counties, allowing transportation to and from the City of Meridian to multiple towns including those in southern Mississippi, such as Hattiesburg. U.S. Highway 11 runs roughly north-south through Clarke, Lauderdale, and Jasper Counties. U.S. Highway 45 is a north-south highway from the MEMA District 6 Region to the Gulf of Mexico through Clarke, Kemper, and Lauderdale Counties. Within Lauderdale, Newton, and Scott Counties, U.S. Highway 80 connects towns east-west throughout the state and into Alabama and Louisiana. Several other State Highways run through the region, connecting many of the towns to each other and municipalities outside the region. In addition, the Natchez Trace Parkway runs through Leake County. The Natchez Trace Parkway is a National Parkway that is highly regarded for its scenic views, hiking trails, picnic areas, camp sites, and exhibits.

There are several small general aviation airports within the MEMA District 6 Region, including one in nearly every county. Naval Air Station Meridian is a military airport northeast of the City of Meridian in Lauderdale County. It is one of the U.S. Navy's two jet strike pilot training facilities which supports aviation and technical training. The closest major airport used by residents located in nearby counties includes Jackson-Evers International Airport, which offers international and domestic flights to a number of locations around the world.

UTILITIES

Electric power in the MEMA District 6 Region is provided by several electricity cooperatives. East Mississippi Electric Power Association serves Clarke, Jasper, Kemper, and Lauderdale Counties, and they also provide high-speed fiber-to-the-home broadband internet through East Mississippi Connect. Mississippi Power Company provides power to Clarke, Jasper, Kemper, Lauderdale, Newton, and Smith Counties, as well as several other nearby counties. Southern Pine Electric Power provides service to many counties in the region including Jasper, Kemper, Newton, Scott, and Smith Counties, and they too are in the process of providing high-speed fiber-to-the-home broadband internet through TEC Fiber Internet. Leake, Neshoba, Scott, and Smith also receive service from Central Electric Power Association. Additionally, Entergy supplies some service to some residents in Leake County.

Water and sewer service is provided by all of the participating towns, but unincorporated areas often rely on septic systems and wells in the MEMA District 6 Region.

Internet

Currently ranked 42nd in the USA, Mississippi is among the top ten worst states in the nation when it comes to state broadband access according to Broadband Now. This is in part due to the relatively low statewide average download speed of 84.5 Mbps and the fact that over 16% percent of the population remains without access to a high-speed wired broadband connection of 25 Mbps or faster. That being said, 39.9% of Mississippians have access to fiber-optic service, which is significantly higher than the national average of 25% of consumers who have access to the same in part due to electrical utilities offering fiber-to-the-home broadband internet. In the MEMA District 6 Region Kemper County has the lowest percentage of broadband coverage at 41%, while Lauderdale County has an estimated coverage of 86.7%.

COMMUNITY FACILITIES

There are a number of public buildings and community facilities located throughout the MEMA District 6 Region. According to the data collected for the vulnerability assessment (Section 6.4.1), there are 129 fire – rescue stations, 48 police stations, 18 medical care facilities, and 111 schools located within the study area.

The largest hospital located in MEMA District 6 is the Anderson Regional Medical Center, a 260-bed regional medical and surgical hospital located in Meridian. The Rush Foundation Hospital in Meridian is another major 215-bed hospital in the region, as is the Alliance Health Center in Meridian with 154 beds. There are also several additional medical care facilities located throughout the region as outlined in the vulnerability assessment.

The MEMA District 6 Region contains numerous local, state, and national parks and recreation areas, including the Bienville National Forest and Natchez Trace Parkway. These facilities offer recreational opportunities to area residents and hundreds of thousands of visitors each year.

3.3.3 Land Use

Many areas of the MEMA District 6 Region are undeveloped or sparsely developed. As shown in Figure 3.1 above, there are many small incorporated municipalities located throughout the nine-county area, with a few larger hubs interspersed. These areas are where the region's population is generally concentrated. The incorporated areas are also where many of the businesses, commercial uses, and institutional uses are located. Land uses in the balance of the study area generally consist of rural residential development, agricultural uses, and recreational areas, although there are some notable exceptions in the larger municipalities.

Local land use and associated regulations are further discussed in Section 7: Capability Assessment.

3.4 EMPLOYMENT AND INDUSTRY

Like many other parts of Mississippi, the MEMA District 6 Region's economy has traditionally been heavily reliant on the manufacturing industries. However, the region has suffered from numerous plant closings during the 1990s and 2000s. As a result, many of the communities are now working to develop other economic categories such as wholesale/retail trade which has experienced growth within the MEMA District 6 Region. Education, educational services, and health care remain growth economies due to the prevalence of various higher learning establishments and health care facilities within the MEMA District 6 Region. Although jobs have decreased, manufacturing continues to play a major role in the local economy and provide jobs for residents throughout the region.

According to the American Community Survey (ACS), in In Clarke County, 50.6 percent of the population 16 and over were employed; 45.6 percent were not currently in the labor force. An estimated 77.4 percent of the people employed were private wage and salary workers; 17.0 percent were federal, state, or local government workers; and 5.1 percent were self-employed in their own (not incorporated) business with 31.8% employed in educational services, and health care and social assistance.

In Jasper County, 48.6 percent of the population 16 and over were employed; 48.5 percent were not currently in the labor force. An estimated 80.7 percent of the people employed were private wage and salary workers; 14.8 percent were federal, state, or local government workers; and 4.4 percent were self-employed in their own (not incorporated) business. Manufacturing jobs accounted for 25% of the jobs, while educational services, and health care and social assistance made up 24.7%.

In Kemper County, 39.2 percent of the population 16 and over were employed; 56.2 percent were not currently in the labor force. An estimated 63.4 percent of the people employed were private wage and salary workers; 30.2 percent were federal, state, or local government workers; and 6.4 percent were self-employed in their own (not incorporated) business. Educational services, and health care and social assistance jobs made up 24.9% while manufacturing accounted for 22%.

In Lauderdale County, Mississippi, 51.7 percent of the population 16 and over were employed; 43.7 percent were not currently in the labor force. An estimated 76.9 percent of the people employed were private wage and salary workers; 17.9 percent were federal, state, or local government workers; and 4.8 percent were self-employed in their own (not incorporated) business. Educational services, and health care and social assistance jobs accounted for 30.3%.

In Leake County, 48.6 percent of the population 16 and over were employed; 46.8 percent were not currently in the labor force. An estimated 75.0 percent of the people employed were private wage and salary workers; 17.4 percent were federal, state, or local government workers; and 7.5 percent were self-employed in their own (not incorporated) business. Manufacturing accounted for 20.4% while educational services, and health care and social assistance jobs made up 19.3%.

In Neshoba County, 51.4 percent of the population 16 and over were employed; 42.7 percent were not currently in the labor force. An estimated 65.8 percent of the people employed were private wage and salary workers; 28.1 percent were federal, state, or local government workers; and 5.8 percent were self-employed in their own (not incorporated) business. The largest employment sector is educational services, and health care and social assistance at 29.7%.

In Newton County, 48.5 percent of the population 16 and over were employed; 48.5 percent were not currently in the labor force. An estimated 72.6 percent of the people employed were private wage and salary workers; 21.3 percent were federal, state, or local government workers; and 5.8 percent were self-employed in their own (not incorporated) business with 29.7% employed in the educational services, and health care and social assistance industry.

In Scott County, Mississippi, 51.8 percent of the population 16 and over were employed; 44.3 percent were not currently in the labor force. An estimated 81.1 percent of the people employed were private wage and salary workers; 10.9 percent were federal, state, or local government workers; and 7.8 percent were self-employed in their own (not incorporated) business with 29.4% employed in the manufacturing industry.

In Smith County, Mississippi, 49.3 percent of the population 16 and over were employed; 48.5 percent were not currently in the labor force. An estimated 73.1 percent of the people employed were private wage and salary workers; 17.9 percent were federal, state, or local government workers; and 8.4 percent were self-employed in their own (not incorporated) business. Manufacturing accounted for 22.2% while educational services, and health care and social assistance jobs made up 22.3%

SECTION 4
HAZARD IDENTIFICATION

This section describes how the Hazard Mitigation Council identified the hazard to be included in this plan. It consists of the following five subsections:

44 CFR Requirement
44 CFR Part 201.6(c)(2)(i): The risk assessment shall include a description of the type, location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

4.1 OVERVIEW

The MEMA District 6 Region is vulnerable to a wide range of natural and human-caused hazards that threaten life and property. Current FEMA regulations and guidance under the Disaster Mitigation Act of 2000 (DMA 2000) require, at a minimum, an evaluation of a full range of natural hazards. An evaluation of human-caused (i.e., terrorism) and technological hazards (i.e., hazardous materials incident) is encouraged, though not required, for plan approval. The MEMA District 6 Region has included a comprehensive assessment of all hazards. It should be noted however, that this list may not be all-inclusive and will be revisited with each plan update.

Upon a review of the full range of natural hazards suggested under FEMA planning guidance, the participating jurisdictions in the MEMA District 6 Regional Hazard Mitigation Plan have identified a number of hazards that are to be addressed in this Regional Hazard Mitigation Plan. These hazards were identified through an extensive process that utilized input from the MEMA District 6 Region Hazard Mitigation Council members, research of past disaster declarations in the participating counties[1], and review of the Mississippi State Hazard Mitigation Plan (2018). Readily available information from reputable sources (such as federal and state agencies) was also evaluated to supplement information from these key sources.

Table 4.1 lists the full range of hazards initially identified for inclusion in the Plan and provides a brief description for each. This table includes 22 individual hazards. Some of these hazards are considered to be interrelated or cascading (one hazard event may cause another, i.e. – hurricanes cause flooding), but for preliminary hazard identification purposes these individual hazards are broken out separately.

Table 4.2 lists the disaster declarations that have impacted the MEMA District 6 Region.

[1] A complete list of disaster declarations for the MEMA District 6 Region can be found below in Section 4.3

Table 4.3 documents the evaluation process used for determining which of the initially identified hazards are considered significant enough to warrant further evaluation in the risk assessment. For each hazard considered, the table indicates whether or not the hazard was identified as a significant hazard to be further assessed, how this determination was made, and why this determination was made. The table works to summarize not only those hazards that *were* identified (and why) but also those that *were not* identified (and why not). Hazard events not identified for inclusion at this time may be addressed during future evaluations and updates of the risk assessment if deemed necessary by the MEMA District 6 RHMC during the plan update process.

Lastly, **Table 4.4** provides a summary of the hazard identification and evaluation process noting that 14 of the 22 initially identified hazards are considered significant enough for further evaluation through this Plan's risk assessment (marked with a "☑").

4.2 DESCRIPTION OF FULL RANGE OF HAZARDS

In this section, hazards are classified into groups including flood-related hazards, fire-related hazards, geologic hazards, wind-related hazards, and other hazards (a catch-all category of hazards that typically includes human-caused and technological hazards). As noted above, several sources were consulted to determine a list of hazards to be considered by MEMA District 6. These include the MEMA District 6 RHMC members, research of past disaster declarations in the participating counties[2], review of FEMA's Multi-Hazard Identification and Risk Assessment (1997) and review of the State of Mississippi Hazard Mitigation Plan (2018). Readily available information from reputable sources (such as federal and state agencies) was also evaluated to supplement information from these key sources.

Table 4.1: DESCRIPTIONS OF THE FULL RANGE OF INITIALLY IDENTIFIED HAZARDS

Hazard	Description
FLOOD-RELATED HAZARDS	
Avalanche	A rapid fall or slide of a large mass of snow down a mountainside.
Dam and Levee Failure	Dam failure is the collapse, breach, or other failure of a dam structure resulting in downstream flooding. In the event of a dam failure, the energy of the water stored behind even a small dam is capable of causing loss of life and severe property damage if development exists downstream of the dam. Dam failure can result from natural events, human-induced events, or a combination of the two. The most common cause of dam failure is prolonged rainfall that produces flooding. Failures due to other natural events such as hurricanes, earthquakes or landslides are significant because there is generally little or no advance warning.
Erosion	Erosion is the gradual breakdown and movement of land due to both physical and chemical processes of water, wind, and general meteorological conditions. Natural, or geologic, erosion has occurred since the Earth's formation and continues at a very slow and uniform rate each year.

[2] [2] A complete list of disaster declarations for the MEMA District 6 Region can be found below in Section 4.3.

Flood	The accumulation of water within a water body which results in the overflow of excess water onto adjacent lands, usually floodplains. The floodplain is the land adjoining the channel of a river, stream ocean, lake or other watercourse or water body that is susceptible to flooding. Most floods fall into the following three categories: riverine flooding, coastal flooding, or shallow flooding (where shallow flooding refers to sheet flow, ponding and urban drainage).
Storm Surge	A storm surge is a large dome of water often 50 to 100 miles wide and rising anywhere from four to five feet in a Category 1 hurricane up to more than 30 feet in a Category 5 storm. Storm surge heights and associated waves are also dependent upon the shape of the offshore continental shelf (narrow or wide) and the depth of the ocean bottom (bathymetry). A narrow shelf, or one that drops steeply from the shoreline and subsequently produces deep water close to the shoreline, tends to produce a lower surge but higher and more powerful storm waves. Storm surge arrives ahead of a storm's actual landfall and the more intense the hurricane is, the sooner the surge arrives. Storm surge can be devastating to coastal regions, causing severe beach erosion and property damage along the immediate coast. Further, water rise caused by storm surge can be very rapid, posing a serious threat to those who have not yet evacuated flood-prone areas.
Winter Storm and Freeze	Winter storms may include snow, sleet, freezing rain, or a mix of these wintry forms of precipitation. Blizzards, the most dangerous of all winter storms, combine low temperatures, heavy snowfall, and winds of at least 35 miles per hour, reducing visibility to only a few yards. Ice storms occur when moisture falls and freezes immediately upon impact on trees, power lines, communication towers, structures, roads and other hard surfaces. Winter storms and ice storms can down trees, cause widespread power outages, damage property, and cause fatalities and injuries to human life.
FIRE-RELATED HAZARDS	
Drought/Heat Wave	A prolonged period of less than normal precipitation such that the lack of water causes a serious hydrologic imbalance. Common effects of drought include crop failure, water supply shortages, and fish and wildlife mortality. High temperatures, high winds, and low humidity can worsen drought conditions and also make areas more susceptible to wildfire. Human demands and actions have the ability to hasten or mitigate drought-related impacts on local communities. A heat wave may occur when temperatures hover 10 degrees or more above the average high temperature for the region and last for several weeks. Humid or muggy conditions, which add to the discomfort of high temperatures, occur when a "dome" of high atmospheric pressure traps hazy, damp air near the ground. Excessively dry and hot conditions can provoke dust storms and low visibility. A heat wave combined with a drought can be very dangerous and have severe economic consequences on a community.
Wildfire	An uncontrolled fire burning in an area of vegetative fuels such as grasslands, brush, or woodlands. Heavier fuels with high continuity, steep slopes, high temperatures, low humidity, low rainfall, and high winds all work to increase risk for people and property located within wildfire hazard areas or along the urban/wildland interface. Wildfires are part of the natural management of forest ecosystems, but most are caused by human factors. Over 80 percent of forest fires are started by negligent human behavior such as smoking in wooded areas or improperly extinguishing campfires. The second most common cause for wildfire is lightning.

GEOLOGIC HAZARDS	
Earthquake	A sudden, rapid shaking of the Earth caused by the breaking and shifting of rock beneath the surface. This movement forces the gradual building and accumulation of energy. Eventually, strain becomes so great that the energy is abruptly released, causing the shaking at the earth's surface which we know as an earthquake. Roughly 90 percent of all earthquakes occur at the boundaries where plates meet, although it is possible for earthquakes to occur entirely within plates. Earthquakes can affect hundreds of thousands of square miles; cause damage to property measured in the tens of billions of dollars; result in loss of life and injury to hundreds of thousands of persons; and disrupt the social and economic functioning of the affected area.
Expansive Soils	Soils that will exhibit some degree of volume change with variations in moisture conditions. The most important properties affecting degree of volume change in a soil are clay mineralogy and the aqueous environment. Expansive soils will exhibit expansion caused by the intake of water and, conversely, will exhibit contraction when moisture is removed by drying. Generally speaking, they often appear sticky when wet, and are characterized by surface cracks when dry. Expansive soils become a problem when structures are built upon them without taking proper design precautions into account with regard to soil type. Cracking in walls and floors can be minor, or can be severe enough for the home to be structurally unsafe.
Landslide	The movements of a mass of rock, debris, or earth down a slope when the force of gravity pulling down the slope exceeds the strength of the earth materials that comprise to hold it in place. Slopes greater than 10 degrees are more likely to slide, as are slopes where the height from the top of the slope to its toe is greater than 40 feet. Slopes are also more likely to fail if vegetative cover is low and/or soil water content is high.
Land Subsidence	The gradual settling or sudden sinking of the Earth's surface due to the subsurface movement of earth materials. Causes of land subsidence include groundwater pumpage, aquifer system compaction, drainage of organic soils, underground mining, hydrocompaction, natural compaction, sinkholes, and thawing permafrost.
Sinkhole	Sinkholes are a natural and common geologic feature in areas with underlying limestone and other rock types that are soluble in natural water. Most limestone is porous, allowing the acidic water of rain to percolate through their strata, dissolving some limestone and carrying it away in solution. Over time, this persistent erosional process can create extensive underground voids and drainage systems in much of the carbonate rocks. Collapse of overlying sediments into the underground cavities produces sinkholes.
Tsunami	A series of waves generated by an undersea disturbance such as an earthquake. The speed of a tsunami traveling away from its source can range from up to 500 miles per hour in deep water to approximately 20 to 30 miles per hour in shallower areas near coastlines. Tsunamis differ from regular ocean waves in that their currents travel from the water surface all the way down to the sea floor. Wave amplitudes in deep water are typically less than one meter; they are often barely detectable to the human eye. However, as they approach shore, they slow in shallower water, basically causing the waves from behind to effectively "pile up", and wave heights to increase dramatically. As opposed to typical waves which crash at the shoreline, tsunamis bring with them a continuously flowing 'wall of water' with the potential to cause devastating damage in coastal areas located immediately along the shore.

Volcano	A mountain that opens downward to a reservoir of molten rock below the surface of the earth. While most mountains are created by forces pushing up the earth from below, volcanoes are different in that they are built up over time by an accumulation of their own eruptive products: lava, ash flows, and airborne ash and dust. Volcanoes erupt when pressure from gases and the molten rock beneath becomes strong enough to cause an explosion.
WIND-RELATED HAZARDS	
Hurricane and Tropical Storm	Hurricanes and tropical storms are classified as cyclones and defined as any closed circulation developing around a low-pressure center in which the winds rotate counter-clockwise in the Northern Hemisphere (or clockwise in the Southern Hemisphere) and with a diameter averaging 10 to 30 miles across. When maximum sustained winds reach or exceed 39 miles per hour, the system is designated a tropical storm, given a name, and is closely monitored by the National Hurricane Center. When sustained winds reach or exceed 74 miles per hour the storm is deemed a hurricane. The primary damaging forces associated with these storms are high-level sustained winds, heavy precipitation and tornadoes. Coastal areas are also vulnerable to the additional forces of storm surge, wind- driven waves and tidal flooding which can be more destructive than cyclone wind. The majority of hurricanes and tropical storms form in the Atlantic Ocean, Caribbean Sea and Gulf of Mexico during the official Atlantic hurricane season, which extends from June through November.
Nor'easter	Similar to hurricanes, nor'easters are ocean storms capable of causing substantial damage to coastal areas in the Eastern United States due to their associated strong winds and heavy surf. Nor'easters are named for the winds that blow in from the northeast and drive the storm up the East Coast along the Gulf Stream, a band of warm water that lies off the Atlantic coast. They are caused by the interaction of the jet stream with horizontal temperature gradients and generally occur during the fall and winter months when moisture and cold air are plentiful. Nor'easters are known for dumping heavy amounts of rain and snow, producing hurricane-force winds, and creating high surf that causes severe beach erosion and coastal flooding.
Severe Thunderstorm (wind, hail, lightning)	Thunderstorms are caused by air masses of varying temperatures meeting in the atmosphere. Rapidly rising warm moist air fuels, the formation of thunderstorms. Thunderstorms may occur singularly, in lines, or in clusters. They can move through an area very quickly or linger for several hours. Thunderstorms may result in hail, tornadoes, or straight-line winds. Windstorms pose a threat to lives, property, and vital utilities primarily due to the effects of flying debris and can down trees and power lines. A hailstorm is any storm that produces hailstones that fall to the ground; usually used when the amount or size of the hail is considered significant. Hail is formed when up2021s in thunderstorms carry raindrops into parts of the atmosphere where the temperatures are below freezing. Lightning is a discharge of electrical energy resulting from the buildup of positive and negative charges within a thunderstorm, creating a "bolt" when the buildup of charges becomes strong enough. This flash of light usually occurs within the clouds or between the clouds and the ground. A bolt of lightning can reach temperatures approaching 50,000 degrees Fahrenheit. Lightning rapidly heats the sky as it flashes, but the surrounding air cools following the bolt. This rapid heating and cooling of the surrounding air causes thunder. On average, 73 people are killed each year by lightning strikes in the United States.

Tornado	A tornado is a violently rotating column of air that has contact with the ground and is often visible as a funnel cloud. Its vortex rotates cyclonically with wind speeds ranging from as low as 40 mph to as high as 300 mph. Tornadoes are most often generated by thunderstorm activity when cool, dry air intersects and overrides a layer of warm, moist air forcing the warm air to rise rapidly. The destruction caused by tornadoes ranges from light to catastrophic depending on the intensity, size and duration of the storm.
OTHER HAZARDS	
Hazardous Materials Incident	Hazardous material (HAZMAT) incidents can apply to fixed facilities as well as mobile, transportation-related accidents in the air, by rail, on the nation's highways and on the water. HAZMAT incidents consist of solid, liquid and/or gaseous contaminants that are released from fixed or mobile containers, whether by accident or by design as with an intentional terrorist attack. A HAZMAT incident can last hours to days, while some chemicals can be corrosive or otherwise damaging over longer periods of time. In addition to the primary release, explosions and/or fires can result from a release, and contaminants can be extended beyond the initial area by persons, vehicles, water, wind and possibly wildlife as well.
Pandemic	Pandemics are infectious and contagious outbreaks typically caused by a virus that originated in animals and spreads to humans. Common sources are swine and avian. There are several definitions of pandemic depending on the severity of the outbreak. It can be defined generally as an epidemic occurring over a large geographic area. Pandemic viruses reproduce and mutate rapidly. Unlike seasonal influenza, humans have no immunity to the mutated strains, making it especially deadly in populations.
Terror Threat	Terrorism is defined by FEMA as, "the use of force or violence against persons or property in violation of the criminal laws of the United States for purposes of intimidation, coercion, or ransom." Terrorist acts may include assassinations, kidnappings, hijackings, bomb scares and bombings, cyber-attacks (computer-based), and the use of chemical, biological, nuclear and radiological weapons.

4.3 DISASTER DECLARATIONS

Disaster declarations provide overall insight into the specific hazards that may impact the MEMA District 6 Regional planning area. Since 1969, 31 presidential disaster declarations have occurred in the region. This includes 18 events related to tornadoes, 18 events related to flooding, 7 events related to high wind, 7 events related to hurricane and tropical storm, 1 event related to winter storm events, and 1 pandemic.

Table 4.2: MEMA DISTRICT 6 REGION DISASTER DECLARATIONS BY COUNTY

Year	Disaster Number	Description	Clarke	Jasper	Kemper	Lauderdale	Leake	Neshoba	Newton	Scott	Smith
1969	271	HURRICANE CAMILLE		X							X
1971	302	STORMS & TORNADOES		X							
1973	368	HEAVY RAINS, TORNADOES & FLOODING	X			X					

Year	Disaster Number	Description	Clarke	Jasper	Kemper	Lauderdale	Leake	Neshoba	Newton	Scott	Smith
1974	430	HEAVY RAINS & FLOODING	X	X	X	X	X	X	X		X
1976	499	STORMS, TORNADOES & FLOODING							X		
1979	577	STORMS, TORNADOES, FLOODS	X		X	X	X	X	X	X	
1979	599	HURRICANE FREDERIC	X	X		X					
1983	683	SEVERE STORMS, TORNADOES, AND FLOODING					X				
1990	859	STORMS, TORNADOES & FLOODING	X	X	X	X			X		X
1992	939	SEVERE STORMS & TORNADOES				X					
1992	968	SEVERE STORMS, HIGH WINDS & TORNADOES		X	X	X	X	X	X	X	X
1998	1251	HURRICANE GEORGES		X							
1999	1265	WINTER STORMS, ICE AND FREEZING RAIN			X		X	X			
2001	1360	SEVERE STORMS AND TORNADOES						X		X	
2001	1365	SEVERE STORMS AND FLOODING					X	X			
2001	1398	SEVERE STORMS, TORNADOES AND FLOODING					X			X	
2003	1459	SEVERE STORMS, TORNADOES, FLOODS	X	X	X	X	X	X	X	X	X
2004	1550	HURRICANE IVAN	X	X	X	X		X	X	X	X
2005	1594	HURRICANE DENNIS	X	X	X	X	X	X	X	X	X
2005	1604	HURRICANE KATRINA	X	X	X	X	X	X	X	X	X
2011	1972	SEVERE STORMS, TORNADOES, STRAIGHT-LINE WINDS, AND ASSOCIATED FLOODING	X	X	X			X	X	X	X
2012	4081	HURRICANE ISAAC	X	X	X	X	X	X	X	X	X
2014	4175	SEVERE STORMS, TORNADOES, AND FLOODING					X		X		
2016	4268	SEVERE STORMS AND FLOODING	X								
2017	4295	SEVERE STORMS, TORNADOES, STRAIGHT-LINE WINDS, AND FLOODING				X					
2019	4415	SEVERE STORMS, FLOODING, AND TORNADO	X	X					X		
2019	4450	SEVERE STORMS, TORNADOES, STRAIGHT-LINE WINDS, AND FLOODING	X		X						
2019	4470	SEVERE STORM, STRAIGHT-LINE WINDS, AND FLOODING		X			X	X	X	X	X
2020	4528	COVID-19 PANDEMIC	X	X	X	X	X	X	X	X	X
2020	4536	SEVERE STORMS, TORNADOES, STRAIGHT-LINE WINDS, AND FLOODING	X	X			X				X
2020	4551	SEVERE STORMS, TORNADOES, STRAIGHT-LINE WINDS, AND FLOODING									X
2021	4598	SEVERE WINTER STORMS		X	X	X	X	X	X	X	X
NUMBER OF DISASTERS			16	18	14	15	16	15	16	13	15

4.4 HAZARD EVALUATION

Table 4.3: DOCUMENTATION OF THE HAZARD EVALUATION PROCESS

Hazards Considered	Was this hazard identified as a significant hazard to be addressed in the plan at this time? (Yes or No)	How was this determination made?	Why was this determination made?
FLOOD-RELATED HAZARDS			
Avalanche	NO	• Review of FEMA's Multi-Hazard Identification and Risk Assessment • Review of State of MS Hazard Mitigation Plan • Review of previous MEMA District 6 Region hazard mitigation plans • Review of US Forest Service National Avalanche Center web site	• The United States avalanche hazard is limited to mountainous western states including Alaska, as well as some areas of low risk in New England. • Avalanche was not considered in the State of MS Hazard Mitigation Plan since it poses no threat to the state. • Avalanche is not included in any of previous MEMA District 6 Region hazard mitigation plans. • There is no risk or history of avalanche events in Mississippi.
Dam and Levee Failure	YES	• Review of FEMA's Multi-Hazard Identification and Risk Assessment • Review of State of MS Hazard Mitigation Plan • Review of previous MEMA District 6 Region hazard mitigation plans • Review of MS Department of Environmental Quality dam inventory	• The National Inventory of Dams shows dams are located in every state. • Dam/levee failure is identified in the state plan as a limited hazard. • State of MS 2018 Hazard Mitigation Plan ranks Dam and Levee Failure as High. • 48 dams in the region are classified as high-hazard (high hazard is defined where dam failure may cause loss of life or serious damage).

Hazards Considered	Was this hazard identified as a significant hazard to be addressed in the plan at this time? (Yes or No)	How was this determination made?	Why was this determination made?
Erosion	YES	• Review of State of MS Hazard Mitigation Plan • Review of previous MEMA District 6 Region hazard mitigation plans	• Coastal erosion was excluded from the State of MS Hazard Mitigation Plan as a hazard; however, it is addressed under the hurricane hazard. Riverine erosion is not addressed in the plan. • Erosion is not identified as a hazard in any of the previous MEMA District 6 Region hazard mitigation plans. • Erosion is a natural process and continuous process that impacts the region.
Flood	YES	• Review of FEMA's Multi-Hazard Identification and Risk Assessment • Review of State of MS Hazard Mitigation Plan • Review of previous MEMA District 6 Region hazard mitigation plans • Review of NOAA NCDC Storm Events Database • Review of historical disaster declarations • Review of FEMA DFIRM data • Review of FEMA's NFIP Community Status Book and Community Rating System (CRS)	• Floods occur in all 50 states and in the U.S. territories. • The flood hazard is thoroughly discussed in the state plan. Much of the state is located in the 100-year floodplain. Further, flash floods are a common occurrence during rain storms. • Each of the previous MEMA District 6 Region hazard mitigation plans address flooding. • NCDC reports that MEMA District 6 Region counties have been affected by 345 flood events since 1997. In total, these events caused 1 recorded death and an estimated $165.217 Million in property damages. • 18 out of 31 disaster declarations were flood-related and an additional 7 were hurricane or tropical storm-related which caused flooding issues. • 33 of the 40 MEMA District 6 jurisdictions participate in the NFIP and 1 municipality also participate in the CRS.

Hazards Considered	Was this hazard identified as a significant hazard to be addressed in the plan at this time? (Yes or No)	How was this determination made?	Why was this determination made?
Storm Surge	NO	• Review of FEMA's Multi-Hazard Identification and Risk Assessment • Review of State of MS Hazard Mitigation Plan • Review of previous MEMA District 6 Region hazard mitigation plans • Review of NOAA NCDC Storm Events Database	• Given the inland location of the MEMA District 6 Region, storm surge would not affect the area. • Storm surge is discussed in the state plan under the hurricane hazard and indicates that only the costal shoreline counties are subject to storm surge. • None the previous hazard mitigation plans in the MEMA District 6 Region identify storm surge as a potential hazard. • No historical events were reported by NCDC.
Winter Storm and Freeze	YES	• Review of FEMA's Multi-Hazard Identification and Risk Assessment • Review of State of MS Hazard Mitigation Plan • Review of previous MEMA District 6 Region hazard mitigation plans • Review of NOAA NCDC Storm Events Database • Review of historical presidential disaster declarations	• Winter storms affect every state in the continental U.S. and Alaska. • Extreme winter weather is identified in the state plan as a limited hazard. • Winter storm events are not considered to be a major hazard in the previous MEMA District 6 Region hazard mitigation plans. • NCDC reports that the MEMA District 6 Region counties have been affected by 111 winter weather events since 1996. These events resulted in over $11.6 million in property damages. • 1 out of 31 disaster declarations was directly related to winter storm events.

Hazards Considered	Was this hazard identified as a significant hazard to be addressed in the plan at this time? (Yes or No)	How was this determination made?	Why was this determination made?
FIRE-RELATED HAZARDS			
Drought / Heat Wave	YES	• Review of FEMA's Multi-Hazard Identification and Risk Assessment • Review of State of MS Hazard Mitigation Plan • Review of previous MEMA District 6 Region hazard mitigation plans • Review of US Drought Monitor website • Review of NOAA NCDC Storm Events Database	• Drought is a normal part of virtually all climatic regimes, including areas with high and low average rainfall. Also, many areas of the United States are susceptible to heat wave, including Mississippi. • Droughts are identified in the State of MS Hazard Mitigation Plan as a moderate hazard. • Drought and extreme heat are not considered to be major hazards in any of the previous MEMA District 6 Region hazard mitigation plans. • There are reports of the most extreme (exceptional) drought in each of the MEME District 6 Region counties according to the US Drought Monitor. • NCDC reports that the MEMA District 6 Region counties have been affected by 103 drought events since 2006 and 36 extreme heat events since 2005.

Hazards Considered	Was this hazard identified as a significant hazard to be addressed in the plan at this time? (Yes or No)	How was this determination made?	Why was this determination made?
Wildfire	YES	• Review of FEMA's Multi-Hazard Identification and Risk Assessment • Review of State of MS Hazard Mitigation Plan • Review of previous MEMA District 6 Region hazard mitigation plans • Review of Southern Wildfire Risk Assessment (SWRA) Data • Review of Mississippi Forestry Commission website	• Wildfires occur in virtually all parts of the United States. Wildfire hazard risks will increase as low-density development along the urban/wildland interface increases. • The State of MS Hazard Mitigation Plan identifies wildfire as a moderate hazard a • Each of the previous MEMA District 6 Region hazard mitigation plans address wildfire. • A review of SWRA data indicates that there are areas of concern in the MEMA District 6 Region. Wildfire hazard risks will increase as low-density development along the urban/wildland interface increases. • According to the Mississippi Forestry Commission, the MEMA District 6 Region experiences an average of 3,310 fires each year which burn a combined 3,723 acres annually.

Hazards Considered	Was this hazard identified as a significant hazard to be addressed in the plan at this time? (Yes or No)	How was this determination made?	Why was this determination made?
GEOLOGIC HAZARDS			
Earthquake	YES	• Review of FEMA's Multi-Hazard Identification and Risk Assessment • Review of State of MS Hazard Mitigation Plan • Review of previous MEMA District 6 Region hazard mitigation plans • Review of National Geophysical Data Center • USGS Earthquake Hazards Program website	• Although the zone of greatest seismic activity in the United States is along the Pacific Coast, eastern and central regions have experienced significant earthquakes. • Earthquake events are identified as a low risk in the 2018 State of MS Hazard Mitigation Plan, and all counties in MS are considered to be susceptible to the effects of earthquakes. • Earthquakes have occurred in and around the State of Mississippi in the past. The state is affected by the New Madrid (near Missouri) and White River Fault lines which have generated a magnitude 8.0 earthquake in the last 200 years. • None of the previous MEMA District 6 Region hazard mitigation plans consider earthquake to be a hazard of concern. • 8 events are known to have occurred in the region according to the National Geophysical Data Center. The greatest MMI reported was a 5.

Hazards Considered	Was this hazard identified as a significant hazard to be addressed in the plan at this time? (Yes or No)	How was this determination made?	Why was this determination made?
Expansive Soils	NO	• Review of FEMA's Multi-Hazard Identification and Risk Assessment • Review of State of MS Hazard Mitigation Plan • Review of previous MEMA District 6 Region hazard mitigation plans • Review of USGS Swelling Clays Map	• The effects of expansive soils are most prevalent in parts of the Southern, Central, and Western U.S. • Expansive soils are not identified in the state plan, and have not historically been a problem for most areas in Mississippi. • Expansive soils are not addressed in any of the previous MEMA District 6 Region hazard mitigation plans. • According to USGS, the MEMA District 6 Region is predominately located in an area that is underlain with "generally less than 50%" clay having high swelling potential. However, there is a portion of the region underlain with abundant clay having high swelling potential.

Hazards Considered	Was this hazard identified as a significant hazard to be addressed in the plan at this time? (Yes or No)	How was this determination made?	Why was this determination made?
Landslide	YES	• Review of FEMA's Multi-Hazard Identification and Risk Assessment • Review of State of MS Hazard Mitigation Plan • Review of previous MEMA District 6 Region hazard mitigation plans • Review of USGS Landslide Incidence and Susceptibility Hazard Map	• Landslides occur in every state in the U.S., and they are most common in the coastal ranges of California, the Colorado Plateau, the Rocky Mountains, and the Appalachian Mountains. • The State of MS Hazard Mitigation Plan excludes the landslide hazard because there is no extensive history of landslides in Mississippi. • None of the previous MEMA District 6 Region hazard mitigation plans consider landslide to be a likely hazard to affect the area. • USGS landslide hazard maps indicate "low incidence" (less than 1.5% of the area is involved in landsliding) across the majority of the region; however, there are areas in the southwestern portion of the region that are "moderate incidence" areas (between 1.5 and 10% of the areas is involved in landsliding). • Additionally, local conditions may become more favorable for landslides due to heavy rain, for example.
Land Subsidence	YES	• Review of FEMA's Multi-Hazard Identification and Risk Assessment • Review of State of MS Hazard Mitigation Plan • Review of previous MEMA District 6 Region hazard mitigation plans	• Land subsidence affects at least 45 states, including Mississippi. However, because of the broad range of causes and impacts, there has been limited national focus on this hazard. • The state plan addresses land subsidence in earth quake section. • The probability of future land subsidence events in the region is unlikely (less than 1 percent annual probability).

Hazards Considered	Was this hazard identified as a significant hazard to be addressed in the plan at this time? (Yes or No)	How was this determination made?	Why was this determination made?
Sinkhole	NO	• Review of FEMA's Multi-Hazard Identification and Risk Assessment • Review of State of MS Hazard Mitigation Plan • Review of previous MEMA District 6 Region hazard mitigation plans	• The states with the greatest number of active sinkholes are Alabama, Florida, Georgia, Indiana, Missouri, Pennsylvania, and Tennessee. • The state plan does not identify sinkholes as a hazard because there is no significant historical record of the hazard in the region. • Sinkholes are not addressed in any of the previous MEMA District 6 Region hazard mitigation plans.
Tsunami	NO	• Review of FEMA's Multi-Hazard Identification and Risk Assessment • Review of State of MS Hazard Mitigation Plan • Review of previous MEMA District 6 Region hazard mitigation plans • Review of USGS Regional Assessment of Tsunami potential in the Gulf of Mexico • Review of FEMA "How-to" mitigation planning guidance (Publication 386-2, "Understanding Your Risks – Identifying Hazards and Estimating Losses)	• No record exists of a catastrophic tsunami impacting the Gulf of Mexico coast. • Tsunami inundation zone maps are not available for communities located along the U.S. Gulf Coast. • The tsunami hazard is excluded from the state plan. There is no historical record of tsunamis in the Gulf of Mexico. • None of the previous MEMA District 6 Region hazard mitigation plans consider tsunami to be a problem for the area. • FEMA mitigation planning guidance suggests that locations along the U.S. Gulf Coast have a relatively low tsunami risk and need not conduct a tsunami risk assessment at this time.

Hazards Considered	Was this hazard identified as a significant hazard to be addressed in the plan at this time? (Yes or No)	How was this determination made?	Why was this determination made?
Volcano	NO	• Review of FEMA's Multi-Hazard Identification and Risk Assessment • Review of State of MS Hazard Mitigation Plan • Review of USGS Volcano Hazards Program website	• More than 65 potentially active volcanoes exist in the United States and most are located in Alaska. The Western states and Hawaii are also potentially affected by volcanic hazards. • There are no active volcanoes in Mississippi. • The volcano hazard is excluded from the state plan. There is no historical record of this hazard in the region.
WIND-RELATED HAZARDS			
Hurricane and Tropical Storm	YES	• Review of FEMA's Multi-Hazard Identification and Risk Assessment • Review of State of MS Hazard Mitigation Plan • Review of previous MEMA District 6 Region hazard mitigation plans • Analysis of NOAA historical tropical cyclone tracks and National Hurricane Center Website • Review of NOAA NCDC Storm Events Database • Review of historical presidential disaster declarations	• The Atlantic and Gulf regions are most prone to landfall by hurricanes and tropical storms. • The State Hazard Mitigation Plan profiles the hurricane hazard and identifies it as a significant hazard, noting its devastating impacts on the state. • Each of the previous MEMA District 6 Region hazard mitigation plans address hurricanes. • NOAA historical records indicate 57 hurricanes and tropical storms have come within 75 miles of the MEMA District 6 Region since 1855. • 7 out of 31 disaster declarations in the MEMA District 6 Region are directly related to hurricane and tropical storm events.

Hazards Considered	Was this hazard identified as a significant hazard to be addressed in the plan at this time? (Yes or No)	How was this determination made?	Why was this determination made?
Nor'easter	NO	• Review of State of MS Hazard Mitigation Plan • Review of previous MEMA District 6 Region hazard mitigation plans • Review of NOAA NCDC Storm Events Database	• Nor'easters are not profiled or discussed in the state plan. • Nor'easters are not identified in any of the previous MEMA District 6 Region hazard mitigation plans. • NCDC does not report any nor'easter activity for the MEMA District 6 Region counties.
Severe Thunderstorm (wind, hail, lightning)	YES	• Review of FEMA's Multi-Hazard Identification and Risk Assessment • Review of State of MS Hazard Mitigation Plan • Review of previous MEMA District 6 Region hazard mitigation plans • Review of NOAA NCDC Storm Events Database • Review of historical presidential disaster declarations	• Severe thunderstorm events were not profiled in the State Hazard Mitigation Plan because they do not typically impact the entire state, invoking a state response. However, severe thunderstorms were identified as a significant concern at the local level. • Severe weather is addressed in each of the previous MEMA District 6 Region hazard mitigation plans. • 21 of 31 disaster declarations in the MEMA District 6 Region are related to severe storm and high wind events.

Hazards Considered	Was this hazard identified as a significant hazard to be addressed in the plan at this time? (Yes or No)	How was this determination made?	Why was this determination made?
Tornado	YES	• Review of FEMA's Multi-Hazard Identification and Risk Assessment • Review of State of MS Hazard Mitigation Plan • Review of previous MEMA District 6 Region hazard mitigation plans • Review of NOAA NCDC Storm Events Database • Review of historical presidential disaster declarations	• From 1991 to 2010, Mississippi experienced 9.2 tornadoes per 10,000 miles, making it the 5th ranked "tornado state" in the U.S. • Tornado events are listed in the State of MS Hazard Mitigation Plan as a high risk and are referenced as a common disaster. • Tornadoes are addressed in all of the previous MEMA District 6 Region hazard mitigation plans. • NCDC reports 468 tornado events in MEMA District 6 Region counties since 1950. These events have resulted in 35 recorded deaths, 464 injuries, and $366.12 million in property damage with the most severe being an F5. • 18 out of 31 disaster declarations in the MEMA District 6 Region are related to tornado events.

Hazards Considered	Was this hazard identified as a significant hazard to be addressed in the plan at this time? (Yes or No)	How was this determination made?	Why was this determination made?
OTHER HAZARDS			
Hazardous Materials Incident	YES	• Review of FEMA's Multi-Hazard Identification and Risk Assessment • Review of State of MS Hazard Mitigation Plan • Review of previous MEMA District 6 Region hazard mitigation plans • Review of EPA TRI sites inventory • Review of PHMSA HAZMAT Incident Statistics database	• Cities, counties, and towns where hazardous materials fabrication, processing, and storage sites are located, and those where hazardous waste treatment, storage, or disposal facilities operate are at risk for hazardous materials events. • Hazardous materials incidents are not discussed in the state plan. • There are 48 TRI sites located in the MEMA District 6 Region. • According to the PHMSA, there have been 303 reported hazardous materials incidents in the region.
Pandemic	YES	• Ongoing COVID-19 Pandemic • Review of State of MS Hazard Mitigation Plan • Review of previous MEMA District 6 Region hazard mitigation plans	• Ongoing COVID-19 Pandemic DR-4528 declared April 5, 2020 and continuing. • Pandemic is not discussed in the state plan. • Pandemic is not included in any of the previous MEMA District 6 Region hazard mitigation plans.
Terror Threat	NO	• Review of State of MS Hazard Mitigation Plan • Review of previous MEMA District 6 Region hazard mitigation plans	• Terrorism is excluded from the state plan, but it does note that it is included in 17% of local plans. • None of the previous MEMA District 6 Region hazard mitigation plans include terrorism as a hazard.

4.5 HAZARD IDENTIFICATION RESULTS

Table 4.4: SUMMARY RESULTS OF THE HAZARD IDENTIFICATION AND EVALUATION PROCESS

FLOOD-RELATED HAZARDS	GEOLOGIC HAZARDS
☐ Avalanche	☑ Earthquake
☑ Dam and Levee Failure	☐ Expansive Soils
☑ Erosion	☑ Landslide
☑ Flood	☑ Land Subsidence
☐ Storm Surge	☐ Sinkhole
☑ Winter Storm and Freeze	☐ Tsunami
FIRE-RELATED HAZARDS	☐ Volcano
☑ Drought / Heat Wave	**WIND-RELATED HAZARDS**
☑ Wildfire	☑ Hurricane and Tropical Storm
	☐ Nor'easter
	☑ Severe Thunderstorm (Wind, Hail, Lightning)
	☑ Tornado
	OTHER HAZARDS
	☑ Hazardous Materials Incident
	☑ Pandemic
	☐ Terror Threat

☑ = Hazard considered significant enough for further evaluation in the MEMA District 6 Region hazard risk assessment.

SECTION 5
HAZARD PROFILES

This section includes detailed hazard profiles for each of the hazards identified in the previous section (*Hazard Identification*) as significant enough for further evaluation in the MEMA District 6 Regional Hazard Mitigation Plan. It contains the following subsections:

44 CFR Requirement
44 CFR Part 201.6(c)(2)(i): The risk assessment shall include a description of the type, location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events

5.1 OVERVIEW

This section includes detailed hazard profiles for each of the hazards identified in the previous section (*Hazard Identification*) as significant enough for further evaluation in the MEMA District 6 Region hazard risk assessment by creating a hazard profile. Each hazard profile includes a general description of the hazard including its location, extent (or severity), historical occurrences, probability of future occurrences. Each profile also includes specific items noted by members of the MEMA District 6 Regional Hazard Mitigation Council (RHMC) as it relates to unique historical or anecdotal hazard information for the counties in the MEMA District 6 Region or a participating municipality within them.

The following hazards were identified:

- **Flood-related Hazards**
  - Flood
  - Erosion
  - Dam and Levee Failure

    - Winter Storm and Freeze
- **Fire-related Hazards**
    - Drought / Heat Wave
    - Wildfire
- **Geologic Hazards**
    - Earthquake
    - Landslide
    - Land Subsidence
- **Wind-related Hazards**
    - Hurricane and Tropical Storm
    - Thunderstorm (including wind, hail, and lightning)
    - Tornado
- **Other Hazards**
    - Hazardous Materials Incident
    - Pandemic

5.2 STUDY AREA

The MEMA District 6 Region includes 9 counties and 30 incorporated jurisdictions. **Table 5.1** provides a summary table of the participating jurisdictions within each county. In addition, **Figure 5.1** provides a base map, for reference, of the MEMA District 6 Region.

Table 5.1: PARTICIPATING JURISDICTIONS IN THE MEMA DISTRICT 6 REGIONAL HAZARD MITIGATION PLAN

Clarke County		Neshoba County	
Enterprise	Shubuta	Philadelphia	
Pachuta	Stonewall	**Newton County**	
Quitman		Chunky	Newton
Jasper County		Decatur	Union
Bay Springs	Louin	**Scott County**	
Heidelberg	Montrose	Forest	Morton
Kemper County		Lake	Sebastopol
De Kalb	Scooba	**Smith County**	
Lauderdale County		Mize	Sylvarena
Marion	Meridian	Polkville	Taylorsville
Leake County		Raleigh	
Carthage	Walnut Grove		
Lena			

Figure 5.1: MEMA DISTRICT 6 BASE MAP

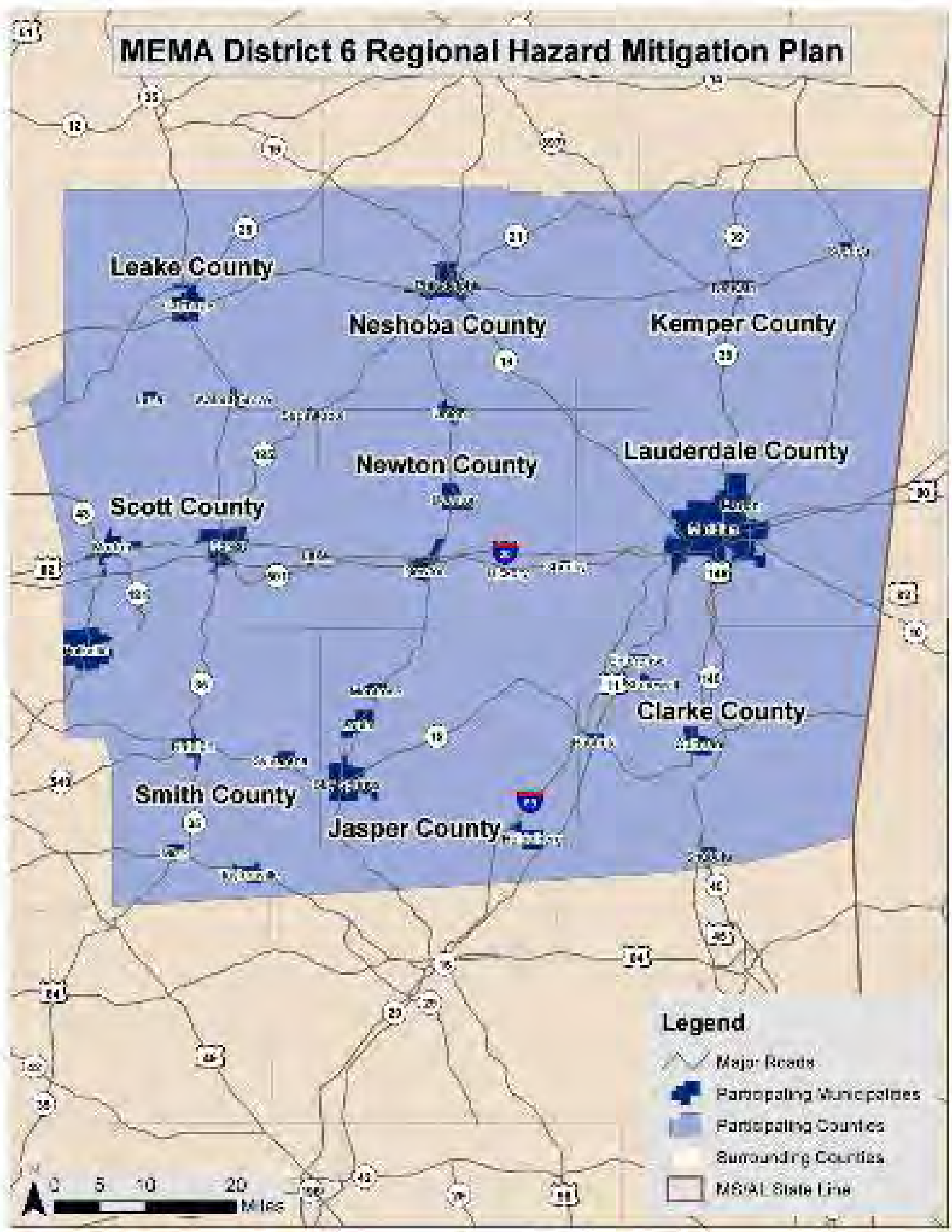


Table 5.2 lists each significant hazard for the MEMA District 6 Region and identifies whether or not it has been determined to be a specific hazard of concern for the municipal jurisdictions and the unincorporated areas of the counties. This is the based on the best available data and information from the MEMA District 6 Regional Hazard Mitigation Council. (• = hazard of concern)

Table 5.2: SUMMARY OF IDENTIFIED HAZARD EVENTS IN THE MEMA DISTRICT 6 REGION

Jurisdiction	Flood-related				Fire-related		Geologic			Wind-related			Other	
	Flood	Erosion	Dam / Levee	Winter Storm /	Drought / Heat Wave	Wildfire	Earthquake	Landslide	Land	Hurricane	Thunderstorm	Tornado	HAZMAT	Pandemic
Clarke County														
Enterprise	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Quitman	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Pachuta	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Shubuta	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Stonewall	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Unincorporated Area	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Jasper County														
Bay Springs	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Heidelberg	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Louin	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Montrose	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Unincorporated Area	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Kemper County														
De Kalb	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Scooba	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Unincorporated Area	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Lauderdale County														
Marion	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Meridian	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Unincorporated Area	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Leake County														
Carthage	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Lena	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Walnut Grove	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Unincorporated Area	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Neshoba County														
Philadelphia	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Unincorporated Area	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Newton County														
Chunky	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Decatur	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Hickory	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Newton (city)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Union	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Unincorporated Area	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Scott County														
Forest	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Morton	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Lake	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Sebastopol	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Jurisdiction	Flood-related				Fire-related		Geologic			Wind-related			Other	
	Flood	Erosion	Dam / Levee	Winter Storm /	Drought / Heat Wave	Wildfire	Earthquake	Landslide	Land	Hurricane	Thunderstorm	Tornado	HAZMAT	Pandemic
Unincorporated Area	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Smith County														
Mize	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Polkville	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Raleigh	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Sylvarena	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Taylorsville	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Unincorporated Area	•	•	•	•	•	•	•	•	•	•	•	•	•	•

FLOOD-RELATED HAZARDS

5.3 FLOOD

5.3.1 Background

Flooding is the most frequent and costly natural hazard in the United States and is a hazard that has caused more than 10,000 deaths since 1900. Nearly 90 percent of presidential disaster declarations result from natural events where flooding was a major component.

Floods generally result from excessive precipitation and can be classified under two categories: general floods, precipitation over a given river basin for a long period of time along with storm-induced wave action, and flash floods, the product of heavy localized precipitation in a short time period over a given location. The severity of a flooding event is typically determined by a combination of several major factors, including stream and river basin topography and physiography, precipitation and weather patterns, recent soil moisture conditions, and the degree of vegetative clearing and impervious surface.

General floods are usually long-term events that may last for several days. The primary types of general flooding include riverine, coastal, and urban flooding. Riverine flooding is a function of excessive precipitation levels and water runoff volumes within the watershed of a stream or river. Coastal flooding is typically a result of storm surge, wind-driven waves, and heavy rainfall produced by hurricanes, tropical storms, and other large coastal storms. Urban flooding occurs where manmade development has obstructed the natural flow of water and decreased the ability of natural groundcover to absorb and retain surface water runoff.

Flash flooding is another type of flooding that can be associated with urban flooding. It is common in urbanized areas where much of the ground is covered by impervious surfaces. Most flash flooding occurs along mountain streams and is caused by slow-moving thunderstorms in a local area or by heavy rains associated with hurricanes and tropical storms. However, flash-flooding events may also occur from a dam or levee failure within minutes or hours of heavy amounts of rainfall, or from a sudden release of water held by retention basin or other stormwater control facility.

The periodic flooding of lands adjacent to rivers, streams, and shorelines (land known as floodplain) is a natural and inevitable occurrence that can be expected to take place based upon established recurrence intervals. Floodplains are designated by the frequency of the flood that is large enough to cover them. For example, the 10-year floodplain will be covered by the 100-year flood and the 100-year floodplain by the 1,000-year flood. Flood frequencies such as the 100-year flood are determined by plotting a graph of the size of all known floods for an area and determining how often floods of a particular size occur. Another way of expressing the flood frequency is the chance of occurrence in a given year, which is the percentage of the probability of flooding each year. For example, the 100-year flood has a 1- percent annual chance of occurring in any given year, and the 500-year flood has a 0.2-percent annual chance of occurring in any given year.

5.3.2 Location and Spatial Extent

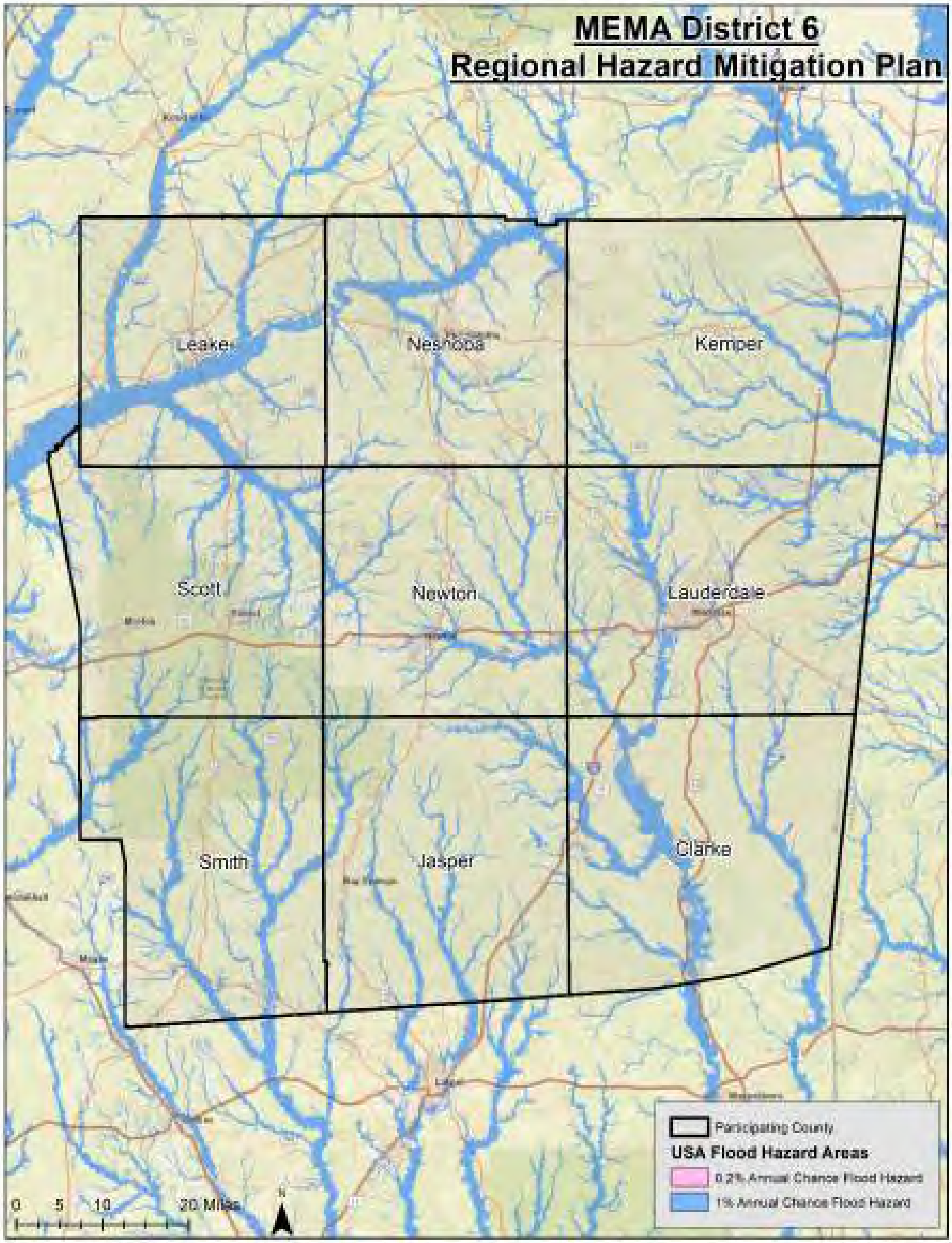
There are areas in the MEMA District 6 Region that are susceptible to flood events. Special flood hazard areas in the Region were mapped using Geographic Information System (GIS) and FEMA Digital Flood Insurance Rate Maps (DFIRM). This includes Zone A (1-percent annual chance floodplain), Zone AE (1-percent annual chance floodplain with elevations), and Zone X500 (0.2-percent annual chance floodplain). According to GIS analysis, of the 5,842 square miles that make up the MEMA District 6 Region, there are approximately 917.2 square miles of land in zones A and AE (1-percent annual chance floodplain/100-year floodplain) and 3.2 square miles of land in zone X500 (0.2-percent annual chance floodplain/500-year floodplain). The county totals are presented below in **Table 5.3**.

Table 5.3: SUMMARY OF FLOODPLAIN AREAS IN THE MEMA DISTRICT 6 REGION

Location (DFIRM date)	100-year area (square miles)	500-year area (square miles)
Clarke County (2011)	113.2	0.3
Jasper County (2011)	96.9	0.0
Kemper County (2007)	69.6	0.1
Lauderdale County (2013)	114.3	1.8
Leake County (2011)	125.5	0.0
Neshoba County (2010)	99.8	0.2
Newton County (2011)	95.3	0.3
Scott County (2010)	92.6	0.0
Smith County (2021)	110.0	0.5
MEMA DISTRICT 6 REGION TOTAL	**917.2**	**3.2**

These flood zone values account for approximately 15.8 percent of the total land area in the MEMA District 6 Region. It is important to note that while FEMA digital flood data is recognized as best available data for planning purposes, it does not always reflect the most accurate and up-to-date flood risk. Flooding and flood-related losses often do occur outside of delineated special flood hazard areas. **Figure 5.2** illustrates the location and extent of currently mapped special flood hazard areas for the Region based on best available FEMA Digital Flood Insurance Rate Map (DFIRM) data.

Figure 5.2: SPECIAL FLOOD HAZARD AREAS IN MEMA DISTRICT 6 REGION[1]



Source: Federal Emergency Management Agency

[1] Additional, more detailed county-level and jurisdiction-level maps can be found in the annexes.

5.3.3 Historical Occurrences

Floods were at least partially responsible for 18 disaster declarations in the MEMA District 6 Region between 1973 and 2021.[2] Information from the National Centers for Environmental Information was used to ascertain additional historical flood events. The National Centers for Environmental Information reported a total of 345 events throughout the MEMA District 6 Region since 1997. A summary of these events is presented in **Table 5.4**. These events accounted for $165.2 million in property damage and 1 fatality throughout the region. Specific information on flood events for each county, including date, type of flooding, and deaths and injuries, can be found in the county-specific annexes. Annualized, flooding accounts for roughly $6.9 million dollars in losses to the MEMA District 6 Region.

Table 5.4: SUMMARY OF FLOOD OCCURRENCES IN THE MEMA DISTRICT 6 REGION

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Clarke County	34	0/0	$4,668,000
Jasper County	33	0/0	$4,007,000
Kemper County	14	0/0	$1,590,000
Lauderdale County	73	0/0	$55,579,000
Leake County	28	0/0	$10,980,000
Neshoba County	39	0/0	$2,160,000
Newton County	43	0/0	$32,296,000
Scott County	48	1/0	$53,310,000
Smith County	33	0/0	$627,000
MEMA DISTRICT 6 REGIONAL TOTAL	345	1/0	$165,217,000

Source: National Centers for Environmental Information – retrieved April 2021

[2] Not all of the participating counties were declared disaster areas for these storms.

5.3.4 Historical Summary of Insured Flood Losses

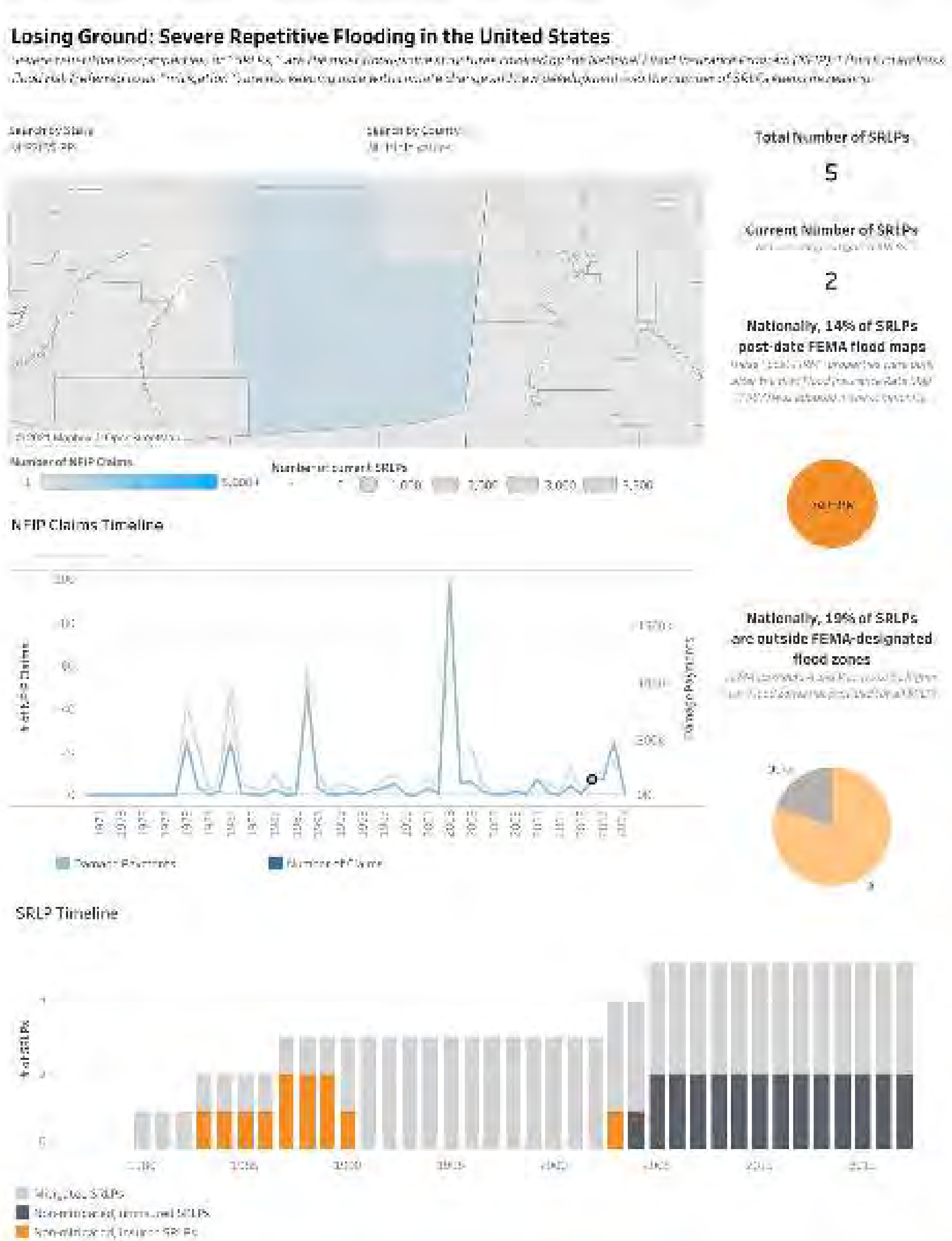
According to FEMA flood insurance policy records as of September 2019, there have been 464 flood losses reported in the MEMA District 6 Region through the National Flood Insurance Program (NFIP) since 1978, totaling over $5.53 million in claims payments. A summary of these figures for each MEMA District 6 county is provided in **Table 5.5**. It should be emphasized that these numbers include only those losses to structures that were insured through the NFIP policies, and for losses in which claims were sought and received. It is likely that many additional instances of flood loss in the MEMA District 6 Region were either uninsured, denied claims payment, or not reported.

Table 5.5: SUMMARY OF INSURED FLOOD LOSSES IN MEMA DISTRICT 6 REGION

Location	Flood Losses	Claims Payments
Clarke County	78	$1,218,834
Jasper County	13	$112,372
Kemper County*	0	$0
Lauderdale County	263	$3,201,731
Leake County	48	$388,303
Neshoba County	8	$48,062
Newton County	12	$125,229
Scott County	31	$364,905
Smith County	11	$74,475
MEMA DISTRICT 6 REGION TOTAL	464	$5,533,911

*These communities do not participate in the National Flood Insurance Program. Therefore, no values are reported.
Source: Federal Emergency Management Agency, National Flood Insurance Program, NFIP Data as of September 30, 2019 received from the Natural Resources Defense Council. NRDC received this data from FEMA via FOIA.

Figure 5.3: Overview of Severe Repetitive Loss Properties in the MEMA District 6 Region



Source: https://www.nrdc.org/resources/losing-ground-flood-visualization-tool

5.3.5 Repetitive Loss Properties

FEMA defines a repetitive loss property as any insurable building for which two or more claims of more than $1,000 were paid by the NFIP within any rolling 10-year period, since 1978. A repetitive loss property may or may not be currently insured by the NFIP. Currently there are over 140,000 repetitive loss properties nationwide.

FEMA also has a higher designated rating known as Severe Repetitive Loss (SRL) which is any NFIP-insured single -family or multi-family residential building that has incurred flood-related damage for which four or more separate claims have been made, with the amount of each claim (including building and contents payments) exceeding $5,000, and with the cumulative amount of such claims payments exceeding $20,000; or for which at least two separate claims payments (building payments only) have been made under such coverage, with the cumulative amount of such claims exceeding the market value of the building.

According to the Mississippi Emergency Management Agency, there are 40 non-mitigated repetitive loss properties located in the MEMA District 6 Region, which accounted for 101 losses and almost $2.2 million in claims payments under the NFIP. The average claim amount for these properties is $21,494. Of the 40 properties, 29 are single family and 11 are non-residential. Without mitigation, these properties will likely continue to experience flood losses. **Table 5.6** presents a summary of these figures for the MEMA District 6 Region. Detailed information on repetitive loss properties and NFIP claims and policies can be found in the county-specific annexes.

Table 5.6: SUMMARY OF REPETITIVE LOSS PROPERTIES IN THE MEMA DISTRICT 6 REGION

Location	Number of Properties	Number of Losses	Total Payments
Clarke County	**4**	**9**	**$232,608**
Enterprise	2	5	$221,482
Pachuta	0	0	$0
Quitman	0	0	$0
Shubuta	0	0	$0
Stonewall	0	0	$0
Unincorporated Area	2	4	$11,125
Jasper County	**1**	**3**	**$58,475**
Bay Springs	0	0	$0
Heidelberg	1	3	$58,475
Louin*	--	--	--
Montrose*	--	--	--
Unincorporated Area	0	0	$0
Kemper County	**0**	**0**	**$0**
De Kalb	0	0	$0
Scooba	0	0	$0
Unincorporated Area	0	0	$0
Lauderdale County	**27**	**73**	**$1,732,349**
Marion	0	0	$0

Meridian	10	34	$782,844
Unincorporated Area	17	39	$949,504
Leake County	**4**	**8**	**$56,800**
Carthage	3	6	$46,028
Lena*	--	--	--
Walnut Grove	0	0	$0
Unincorporated Area	1	2	$10,772
Neshoba County	**0**	**0**	**$0**
Philadelphia	0	0	$0
Unincorporated Area	0	0	$0
Newton County	**1**	**2**	**$24,850**
Chunky	0	0	$0
Decatur*	--	--	--
Hickory*	--	--	--
Newton (city)	1	2	$24,850
Union	0	0	$0
Unincorporated Area	0	0	$0
Scott County	**3**	**6**	**$65,840**
Forest	2	4	$62,767
Lake	0	0	$0
Morton	1	2	$3,072
Sebastopol	0	0	$0
Unincorporated Area	0	0	$0
Smith County	**0**	**0**	**$0**
Mize	0	0	$0
Polkville*	--	--	--
Raleigh	0	0	$0
Sylvarena*	--	--	--
Taylorsville	0	0	$0
Unincorporated Area	0	0	$0
MEMA DISTRICT 6 REGIONAL TOTAL	**40**	**101**	**$2,170,921**

* These communities do not participate in the National Flood Insurance Program. Therefore, no values are reported.
Source: Federal Emergency Management Agency, National Flood Insurance Program. Updated information for Repetitive Loss Properties was not available and it current as of 2015.

5.3.6 Probability of Future Occurrences

Flood events will remain a threat in the MEMA District 6 Region, and the probability of future occurrences will remain likely (between 10 and 100 percent annual probability). The probability of future flood events based on magnitude and according to best available data is illustrated in the figures above**,** which indicates those areas susceptible to the 1-percent annual chance flood (100-year floodplain) and the 0.2-percent annual chance flood (500-year floodplain).

It can be inferred from the floodplain location maps, previous occurrences, and repetitive loss properties that risk varies throughout the region. For example, the northwestern corner of the region has more floodplain and thus a higher risk of flood than the northeastern corner of the region. Flood is not the greatest hazard of concern but will continue to occur and cause damage. Therefore, mitigation actions may be warranted, particularly for repetitive loss properties.

5.4 EROSION

5.4.1 Background

Erosion is the gradual breakdown and movement of land due to both physical and chemical processes of water, wind, and general meteorological conditions. Natural, or geologic, erosion has occurred since the Earth's formation and continues at a very slow and uniform rate each year.

There are two types of soil erosion: wind erosion and water erosion. Wind erosion can cause significant soil loss. Winds blowing across sparsely vegetated or disturbed land can pick up soil particles and carry them through the air, thus displacing them. Water erosion, the hazard of topic here, can occur over land or in streams and channels. Water erosion that takes place over land may result from raindrops, shallow sheets of water flowing off the land, or shallow surface flow, which becomes concentrated in low spots. Stream channel erosion may occur as the volume and velocity of water flow increases enough to cause movement of the streambed and bank soils. Major storms, such hurricanes in coastal areas, may cause significant erosion by combining high winds with heavy surf and storm surge to significantly impact the shoreline.

An area's potential for erosion is determined by four factors: soil characteristics, vegetative cover, topography climate or rainfall, and topography. Soils composed of a large percentage of silt and fine sand are most susceptible to erosion. As the clay and organic content of these soils increases, the potential for erosion decreases. Well-drained and well-graded gravels and gravel-sand mixtures are the least likely to erode. Coarse gravel soils are highly permeable and have a good capacity for absorption, which can prevent or delay the amount of surface runoff. Vegetative cover can be very helpful in controlling erosion by shielding the soil surface from falling rain, absorbing water from the soil, and slowing the velocity of runoff. Runoff is also affected by the topography of the area including size, shape, and slope. The greater the slope length and gradient, the more potential an area has for erosion. Climate can affect the amount of runoff, especially the frequency, intensity, and duration of rainfall and storms. When rainstorms are frequent, intense, or of long duration, erosion risks are high. Seasonal changes in temperature and rainfall amounts define the period of highest erosion risk of the year.

During the past 20 years, the importance of erosion control has gained the increased attention of the public. Implementation of erosion control measures consistent with sound agricultural and construction operations is needed to minimize the adverse effects associated with harmful chemicals run-off due to wind or water events. The increase in government regulatory programs and public concern has resulted in a wide range of erosion control products, techniques, and analytical methodologies in the United States. The preferred method of erosion control in recent years has been the restoration of vegetation.

5.4.2 Location and Spatial Extent

Erosion in the MEMA District 6 Region is typically caused by flash flooding events. Unlike coastal areas, areas of concern for erosion in the MEMA District 6 Region are primarily rivers and streams. Generally, vegetation also helps to prevent erosion in the area, and it is not an extreme threat to any of the participating counties and jurisdictions.

At this time, there is no data available on localized areas of erosion so it is not possible to depict extent on a map. No areas of concern were reported by the hazard mitigation council.

5.4.3 Historical Occurrences

Several sources were vetted to identify areas of erosion in the MEMA District 6 Region. This includes searching local newspapers, interviewing local officials, and reviewing previous hazard mitigation plans. No historical erosion occurrences were found in these sources.

5.4.4 Probability of Future Occurrences

Erosion remains a natural, dynamic, and continuous process for the MEMA District 6 Region, and it will continue to occur. The annual probability level assigned for erosion is possible (between 1 and 10 percent annually). However, given the lack of historical events, location, and threat to life or property, no further analysis will be done in Section 6: *Vulnerability Assessment*.

5.5 DAM AND LEVEE FAILURE

5.5.1 Background

Worldwide interest in dam and levee safety has risen significantly in recent years. Aging infrastructure, new hydrologic information, and population growth in floodplain areas downstream from dams and near levees have resulted in an increased emphasis on safety, operation, and maintenance.

There are approximately 91,000 dams in the United States today, the majority of which are privately owned. Other owners include state and local authorities, public utilities, and federal agencies. The benefits of dams are numerous: they provide water for drinking, navigation, and agricultural irrigation. Dams also provide hydroelectric power, create lakes for fishing and recreation, and save lives by preventing or reducing floods.

Though dams have many benefits, they also can pose a risk to communities if not designed, operated, and maintained properly. In the event of a dam failure, the energy of the water stored behind even a small dam is capable of causing loss of life and extensive property damage if development exists downstream. If a levee breaks, scores of properties may become submerged in floodwaters and residents may become trapped by rapidly rising water. The failure of dams and levees has the potential to place large numbers of people and great amounts of property in harm's way

5.5.2 Location and Spatial Extent

The Mississippi Department of Environmental Quality provides information on dams including a hazard potential classification. There are three hazard classifications—high, significant, and low—that correspond to qualitative descriptions. **Table 5.7** explains these classifications.

Table 5.7: MISSISSIPPI DAM HAZARD CLASSIFICATIONS

Hazard Classification	Description
Low	Dam failure may cause damage to farm buildings (excluding residences), agricultural land, or county or minor roads.
Significant	Dam failure may cause significant damage to main roads, minor railroads, or cause interruption of use or service of relatively important public utilities.
High	Dam failure may cause loss of life, serious damage to homes, industrial or commercial buildings, important public utilities, main highways or railroads. Dams constructed in existing or proposed residential, commercial or industrial areas will be classified as high hazard dams, unless the applicant presents clear and convincing evidence to the contrary.

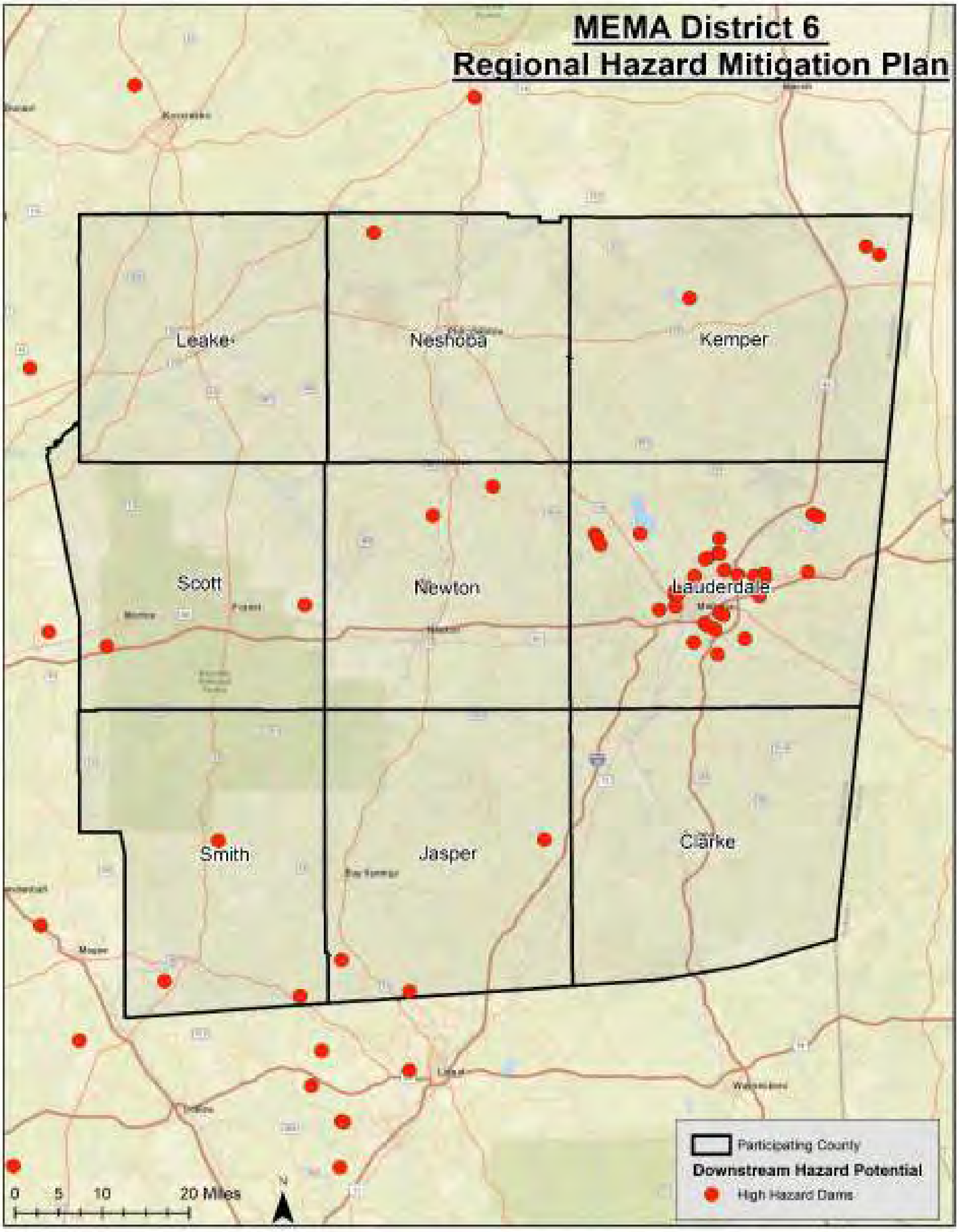
Source: U.S. Army Corps of Engineers – National Inventory of Dams

According to the U.S. Army Corps of Engineers' National Inventory of Dams, there are 48 high hazard dams in the MEMA District 6 Region. **Figure 5.4** shows the location of each of these high hazard dams and **Table 5.8** lists them by name.

[5] The list of high hazard dams obtained from the Mississippi Department of Environmental Quality was reviewed and amended

by local officials to the best of their knowledge.

Figure 5.4: MEMA DISTRICT 6 HIGH HAZARD DAM LOCATIONS



Source: U.S. Army Corps of Engineers – National Inventory of Dams

Table 5.8: MEMA DISTRICT 6 REGION HIGH HAZARD DAMS

Dam Name	Hazard Potential
Clarke County	
NONE	*N/A*
Jasper County	
HERITAGE LAKE DAM	High
LAKE EDDINS DAM	High
BIG CREEK WATERSHED STRUCTURE	High
Kemper County	
SHAMMACK CREEK WATERSHED STRUCTURE 2 DAM	High
SHAMMACK CREEK WATERSHED STRUCTURE 3 DAM	High
KEMPER COUNTY LAKE DAM	High
Lauderdale County	
OKATIBBEE DAM	High
DALEWOOD SHORES LAKE DAM	High
BRIARWOOD COUNTRY CLUB LAKE DAM	High
MEMORIAL PARK CEMETERY POND DAM	High
C W DOWNER POND DAM	High
N D BROOKSHIRE POND	High
LAKE TOM BAILEY	High
BOUNDS LAKE DAM	High
LAKEWOOD LAKE DAM	High
EAST MISSISSIPPI STATE HOSPITAL LAKE DAM	High
BONITA LAKE DAM NUMBER 1	High
LAKEMONT LAKE DAM	High
MIRROR LAKE DAM	High
FAULKNER LAKE DAM	High
LONG CREEK RESERVOIR DAM	High
CRESCENT LAKE DAM	High
LAKE DRUID DAM	High
SOWASHEE CREEK WS STR 11 DAM	High
SOWASHEE CREEK WS STR 8 DAM	High
BONITA NUMBER 2 DAM	High
SOWASHEE CREEK WS STR NO 2 DAM	High
LAKE MAILANDE	High
MAGNOLIA LAKE ESTATES DAM	High
SCHAMBERVILLE NUMBER 1 DAM	High
SCHAMBERVILLE NUMBER 2 DAM	High
RAINBOW LAKES # 1 DAM	High
RAINBOW LAKES # 4 DAM	High
RAINBOW LAKES # 5 DAM	High
MS05625 LAKE DAM	High
FAIR OAKS LAKE DAM	High
MS05765 LAKE DAM	High
MS05766 LAKE DAM	High
MS05901 LAKE DAM	High
Leake County	
NONE	*N/A*
Neshoba County	
WISH YOU ENOUGH DAM	High
Newton County	
CHUNKY RIVER WS STR 47 DAM	High

Dam Name	Hazard Potential
TURKEY CREEK WATER PARK DAM	High
CHUNKY RIVER WS NUMBER 8 DAM	High
Scott County	
HINES LAKE DAM	High
ROOSEVELT STATE PARK LAKE DAM	High
Smith County	
PRENTISS WALKER LAKE	High
UPPER LEAF RIVER STRUCTURE 9 DAM	High
BIG CREEK WATERSHED STRUCTURE	High

Source: National Inventory of Dams – U.S. Army Corps of Engineers

5.5.3 Historical Occurrences

According to the Mississippi State Hazard Mitigation Plan, there have been eleven dam failures reported in the MEMA District 6 Region, seven in Lauderdale County, two in Smith County, one in Scott County, and one in Leake County. Although no damage was reported with these events, several breach scenarios in the region could be catastrophic.

Table 5.9 below provides a brief description of the eight reported dam failures.

Table 5.9: MEMA DISTRICT 6 REGION DAM FAILURES (1982-2020)

Date	County	Structure Name	Cause of
May 1983	Leake	State Highway 35	Overtopped
March 1984	Lauderdale	Dalewood Shores	Minor Breach
May 1995	Lauderdale	Vise Lake Dam	Sand boils – problem with longevity of dam
January 2002	Lauderdale	John Kasper Lake	Excessive seepage leading to dam breach
March 2002	Lauderdale	Lake Tom Bailey	Deterioration for primary concrete spillway
August 2002	Lauderdale	State Hospital Lake	Poor overall condition
April 2003	Lauderdale	Lake Evelyn	Piping
May 2003	Lauderdale	Wild Duck Lake	Piping
April 2014	Scott	Whiteway Farms Dam	Severe seepage through dam that will eventually lead to failure
March 2016	Smith	Vowell Lake Dam	Piping
May 2017	Smith	Vowell Lake Dam	Slide occurs in the center of the crest and downstream slope

Source: Mississippi Department of Environmental Quality

5.5.4 Probability of Future Occurrence

Given the current dam inventory and historic data, a dam breach is possible (between 1 and 10 percent annual probability) in the future. However, as has been demonstrated in the past, regular monitoring is necessary to prevent these events. No further analysis will be completed in Section 6: *Vulnerability Assessment* as more sophisticated dam breach plans (typically completed by the U.S. Army Corp of Engineers) have been completed for dams of concern in the region.

5.6 WINTER STORM AND FREEZE

5.6.1 Background

A winter storm can range from a moderate snow over a period of a few hours to blizzard conditions with blinding wind-driven snow that lasts for several days. Events may include snow, sleet, freezing rain, or a mix of these wintry forms of precipitation. Some winter storms might be large enough to affect several states, while others might affect only localized areas. Occasionally, heavy snow might also cause significant property damages, such as roof collapses on older buildings.

All winter storm events have the potential to present dangerous conditions to the affected area. Larger snowfalls pose a greater risk, reducing visibility due to blowing snow and making driving conditions treacherous. A heavy snow event is defined by the National Weather Service as an accumulation of 4 of more inches in 12 hours or less. A blizzard is the most severe form of winter storm. It combines low temperatures, heavy snow, and winds of 35 miles per hour or more, which reduces visibility to a quarter mile or less for at least 3 hours. Winter storms are often accompanied by sleet, freezing rain, or an ice storm. Such freeze events are particularly hazardous as they create treacherous surfaces.

Ice storms are defined as storms with significant amounts of freezing rain and are a result of cold air damming (CAD). CAD is a shallow, surface-based layer of relatively cold, stably-stratified air entrenched against the eastern slopes of the Appalachian Mountains. With warmer air above, falling precipitation in the form of snow melts, then becomes either super-cooled (liquid below the melting point of water) or re-freezes. In the former case, super-cooled droplets can freeze on impact (freezing rain), while in the latter case, the re-frozen water particles are ice pellets (or sleet). Sleet is defined as partially frozen raindrops or refrozen snowflakes that form into small ice pellets before reaching the ground. They typically bounce when they hit the ground and do not stick to the surface. However, it does accumulate like snow, posing similar problems and has the potential to accumulate into a layer of ice on surfaces. Freezing rain, conversely, usually sticks to the ground, creating a sheet of ice on the roadways and other surfaces. All of the winter storm elements – snow, low temperatures, sleet, ice, etcetera – have the potential to cause significant hazard to a community. Even small accumulations can down power lines and tree limbs and create hazardous driving conditions. Furthermore, communication and power may be disrupted for days.

5.6.2 Location and Spatial Extent

Nearly the entire continental United States is susceptible to winter storm and freeze events. Some ice and winter storms may be large enough to affect several states, while others might affect limited, localized areas. The degree of exposure typically depends on the normal expected severity of local winter weather. The MEMA District 6 Region is not accustomed to severe winter weather conditions and rarely receives severe winter weather, even during the winter months. Events tend to be mild in nature; however, even relatively small accumulations of snow, ice, or other wintery precipitation can lead to losses and damage due to the fact that these events are not commonplace. Given the atmospheric nature of the hazard, the entire region has uniform exposure to a winter storm.

5.6.3 Historical Occurrences

Winter weather has resulted in two disaster declarations in the MEMA District 6 Region, one in 1999, and most recently in 2021. According to the National Centers for Environmental Information, there have been a total of 121 recorded winter storm events in the MEMA District 6 Region since 1996 (**Table 5.10**). These events resulted in more than $13.5 million in damages. Detailed information on the recorded winter storm events can be found in the county-specific annexes.

Table 5.10: SUMMARY OF WINTER STORM EVENTS IN THE MEMA DISTRICT 6 REGION

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Clarke County	10	0/0	$885,000
Jasper County	12	0/0	$1,305,000
Kemper County	14	0/0	$1,000,000
Lauderdale County	17	3/0	$3,006,000
Leake County	14	0/0	$1,700.000
Neshoba County	12	0/0	$1,600,000
Newton County	16	0/0	$1,490,000
Scott County	14	0/0	$1,170.000
Smith County	12	0/0	$1,400,000
MEMA DISTRICT 6 REGION TOTAL	**121**	**3/0**	**$13,556,000**

Source: National Centers for Environmental Information - retrieved April 2021

There have been several severe winter weather events in the MEMA District 6 Region. The text below describes two of the major events and associated impacts on the region. Similar impacts can be expected with severe winter weather.

December 1998
Central Mississippi was hit by a crippling ice storm. Up to 2 inches of ice accumulated on power lines and much of the region experienced long power outages, nearly seven days in some cases. The ice caused numerous power outages and brought down many trees and power lines. Christmas travel was severely hampered for several days with motorists stranded at airports, bus stations, and truck stops. Travel did not return to normal until after Christmas in some locations.

January 2008 Winter Storm
This storm produced heavy snow across the region, with an average of three to four inches of snow. Some heavier amounts, between four to five inches, also fell in isolated areas. At the height of the snow, temperatures fell to near freezing, and accumulations occurred on roadways resulting in a number of traffic accidents. Additionally, some power outages occurred in the heaviest snow band due to the weight of wet snow on limbs and lines.

December 2017 Heavy Snow
An early season winter storm brought heavy snow to much of Mississippi between the evening of the 7th and into the afternoon of the 8th. The greatest amounts fell mainly south and east of the Natchez Trace corridor. Amounts of up to 7 to 8 inches were measured in the Pine Belt. Heavier snow accumulations resulted in downed limbs and trees, power outages, and traffic accidents across the state.

February 17, 2021 Ice Storm
As an arctic air mass continued to build southward across the South on February 17th, another wave of precipitation overspread this cold air mass across much of Mississippi. The main impacts across central and southern portions of the state were from freezing rain and resulting heavy icing, but some significant accumulations of sleet and snow also occurred in areas mainly north and west of the Natchez Trace. Freezing rain continued through the evening hours, ending from west to east by the early morning of

February 18th. Ice accumulated quickly in many locations and downed numerous trees, large limbs, and power lines across the affected areas. Several trees and limbs fell onto power lines, resulting in more widespread power outages as well. Some trees fell onto homes or cars, and significant amounts of ice, sleet, and snow collapsed a few gas station awnings and roofs where accumulations were greatest. In the hardest hit areas, extensive damage to trees and power lines took several months and cost several hundred thousands of dollars to clean up.

Winter storms throughout the planning area have several negative externalities including hypothermia, cost of snow and debris cleanup, business and government service interruption, traffic accidents, and power outages. Furthermore, citizens may resort to using inappropriate heating devices that could to fire or an accumulation of toxic fumes.

5.6.4 Probability of Future Occurrences

Winter storm events will continue to occur in the MEMA District 6 Region. Based on historical information, the probability is likely (between 10 and 100 percent annual probability).

FIRE-RELATED HAZARDS

5.7 DROUGHT / HEAT WAVE

5.7.1 Background

DROUGHT

Drought is a normal part of virtually all climatic regions, including areas with high and low average rainfall. Drought is the consequence of a natural reduction in the amount of precipitation expected over an extended period of time, usually a season or more in length. High temperatures, high winds, and low humidity can exacerbate drought conditions. In addition, human actions and demands for water resources can hasten drought-related impacts. Droughts may also lead to more severe wildfires.

Droughts are typically classified into one of four types: 1) meteorological, 2) hydrologic, 3) agricultural, or 4) socioeconomic. **Table 5.11** presents definitions for these types of droughts.

Table 5.11: DROUGHT CLASSIFICATION DEFINITIONS

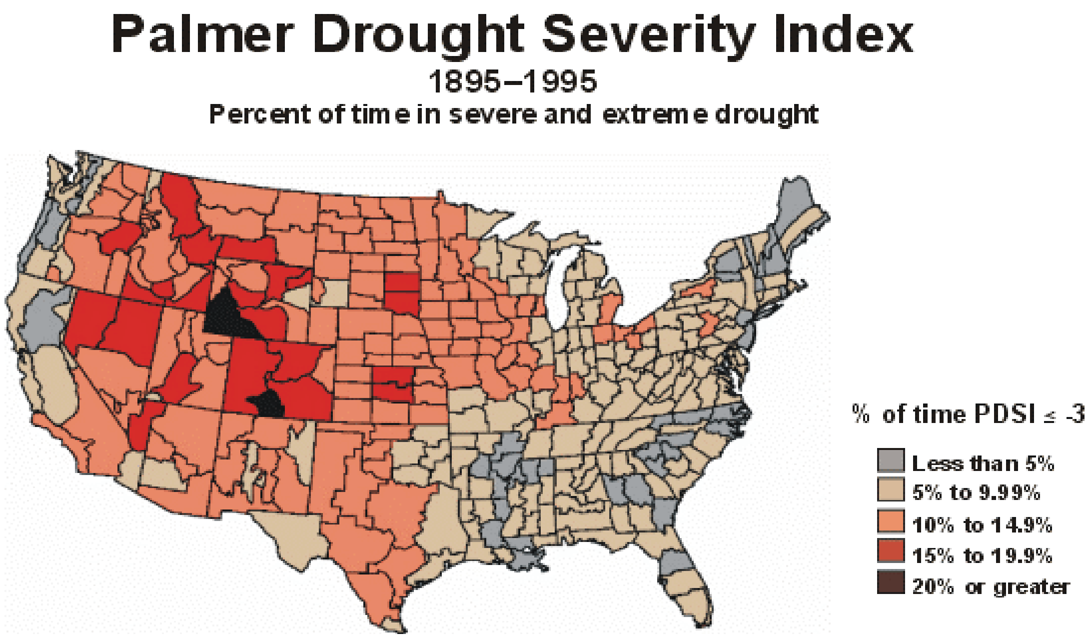
Meteorological Drought	The degree of dryness or departure of actual precipitation from an expected average or normal amount based on monthly, seasonal, or annual time scales.
Hydrologic Drought	The effects of precipitation shortfalls on stream flows and reservoir, lake, and groundwater levels.
Agricultural Drought	Soil moisture deficiencies relative to water demands of plant life, usually crops.
Socioeconomic Drought	The effect of demands for water exceeding the supply as a result of a weather-related supply shortfall.

Source: Multi-Hazard Identification and Risk Assessment: A Cornerstone of the National Mitigation Strategy, FEMA

Droughts are slow-onset hazards, but, over time, can have very damaging affects to crops, municipal water supplies, recreational uses, and wildlife. If drought conditions extend over a number of years, the direct and indirect economic impact can be significant.

The Palmer Drought Severity Index (PDSI) is based on observed drought conditions and range from -0.5 (incipient dry spell) to -4.0 (extreme drought). Evident in **Figure 5.5**, the Palmer Drought Severity Index Summary Map for the United Stated, drought affects most areas of the United States, but is less severe in the Eastern and Southeastern United States.

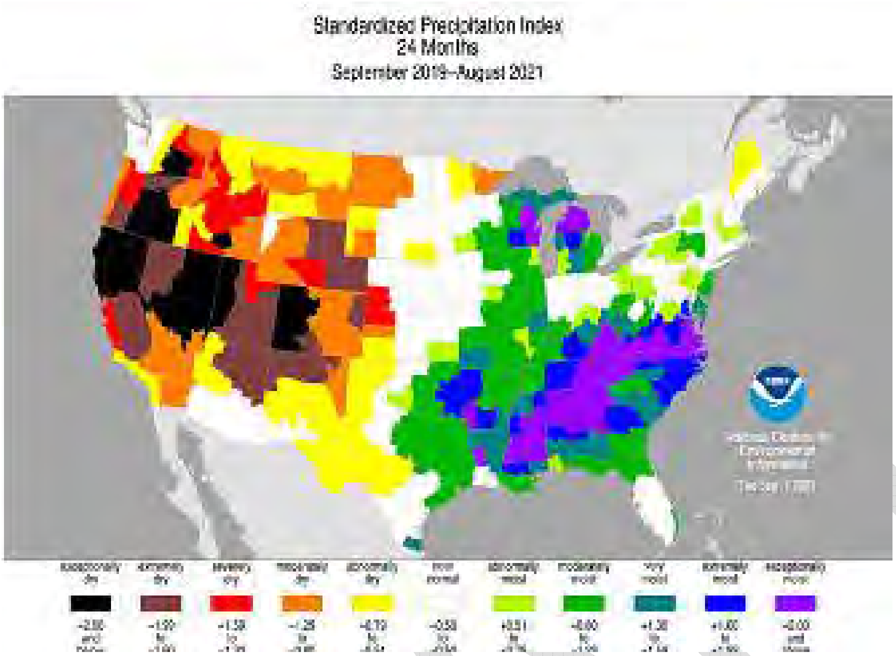
Figure 5.5: PALMER DROUGHT SEVERITY INDEX SUMMARY MAP FOR THE UNITED STATES



Source: National Drought Mitigation Center

The Standardized Precipitation Index (SPI) measures moisture supply. The SPI maps here show the spatial extent of anomalously wet and dry areas at time scales for the last 24 months.

Figure 5.6: Standardized Precipitation Index [3]



[3] National Centers for Environmental Information

The U.S. Drought Monitor also records information on historical drought occurrence. The U.S. Drought Monitor categorizes drought on a D0-D4 scale as **Table 5.12** presents definitions for these classifications.

Table 5.12:U.S. DROUGHT MONITOR

D0	Abnormally Dry	Going into drought: short-term dryness slowing planting, growth of crops or pastures. Coming out of drought: some lingering water deficits; pastures or crops not fully recovered
D1	Moderate Drought	Some damage to crops, pastures; streams, reservoirs, or wells low, some water shortages developing or imminent; voluntary water-use restrictions requested
D2	Severe Drought	Crop or pasture losses likely; water shortages common; water restrictions imposed
D3	Extreme Drought	Major crop/pasture losses; widespread water shortages or restrictions
D4	Exceptional Drought	Exceptional and widespread crop/pasture losses; shortages of water in reservoirs, streams, and wells creating water emergencies

Source: United States Drought Monitor, http://droughtmonitor.unl.edu/classify.htm

HEAT WAVE

Extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and that last for an extended period of time. A heat wave may occur when temperatures hover 10 degrees or more above the average high temperature for the region and last for a prolonged number of days or several weeks. Humid conditions may also add to the discomfort of high temperatures.

While extreme heat does not typically affect buildings, the impact to the population can have grave effects. Health risks from extreme heat include heat cramps, heat fainting, heat exhaustion and heat stroke. According to the National Weather Service (which compiles data from the National Centers for Environmental Information), heat is the leading weather-related killer in the United States. During the ten-year period between 2000 and 2009 heat events killed 162 people - more people than lightning, tornado, flood, cold, winter storm, wind and hurricane hazards. However, most deaths are attributed to prolonged heat waves in large cities that rarely experience hot weather. The elderly and the ill are most at-risk, along with those who exercise outdoors in hot, humid weather.

The National Weather Service devised the Heat Index as a mechanism to better inform the public of heat dangers. The Heat Index Chart, shown in **Figure 5.7**, uses air temperature and humidity to determine the heat index or apparent temperature. **Table 5.13** shows the dangers associated with different heat index temperatures. Some populations, such as the elderly and young, are more susceptible to heat danger than other segments of the population.

Figure 5.7: HEAT INDEX CHART

Relative Humidity (in percent)

Air Temp (in F)	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
140	125																				
135	120	128																			
130	117	122	[illegible]																		
125	111	116	123	[illegible]	[illegible]																
120	107	111	116	123	130	[illegible]	[illegible]														
115	103	107	111	115	120	127	[illegible]	[illegible]	[illegible]												
110	99	102	105	108	112	117	123	130	[illegible]	[illegible]	[illegible]										
105	95	97	100	102	105	109	113	118	123	129	[illegible]	[illegible]	[illegible]								
100	91	93	95	97	99	101	104	107	110	115	120	126	[illegible]	[illegible]	[illegible]						
95	87	88	90	91	93	94	96	98	101	104	107	110	114	119	124	[illegible]	[illegible]				
90	83	84	85	86	87	88	90	91	93	95	96	98	100	102	106	109	113	117	122		
85	78	79	80	81	82	83	84	85	86	87	88	89	90	91	93	95	97	99	102	105	108
80	73	74	75	76	77	77	78	79	79	80	81	81	82	83	85	86	86	87	88	89	91
75	69	69	70	71	72	72	73	73	74	74	75	75	76	76	77	77	78	78	79	79	80
70	64	64	65	65	66	66	67	67	68	68	69	69	70	70	70	70	71	71	71	71	72

Source: National Oceanic and Atmospheric Administration

Table 5.13: HEAT DISORDERS ASSOCIATED WITH HEAT INDEX TEMPERATURE

Heat Index Temperature (Fahrenheit)	Description of Risks
80°- 90°	Fatigue possible with prolonged exposure and/or physical activity
90°- 105°	Sunstroke, heat cramps, and heat exhaustion possible with prolonged exposure and/or physical activity
105°- 130°	Sunstroke, heat cramps, and heat exhaustion likely, and heatstroke possible with prolonged exposure and/or physical activity
130° or higher	Heatstroke or sunstroke is highly likely with continued exposure

Source: National Weather Service, National Oceanic and Atmospheric Administration

5.7.2 Location and Spatial Extent

DROUGHT

Drought typically covers a large area and cannot be confined to any geographic or political boundaries. Furthermore, it is assumed that the MEMA District 6 Region would be uniformly exposed to drought, making the spatial extent potentially widespread. It is also notable that drought conditions typically do not cause significant damage to the built environment but may exacerbate wildfire conditions.

HEAT WAVE

Heat waves typically impact a large area and cannot be confined to any geographic or political boundaries.

5.7.3 Historical Occurrences

DROUGHT

Data from the U.S. Drought Monitor and National Centers for Environmental Information (NCEI) were used to ascertain historical drought events in the MEMA District 6 Region. The U.S. Drought Monitor reports data at the county level on a weekly basis throughout the county. It classifies drought conditions on a scale of D0 to D4, as described in **Table 5.13** above.

According to the U.S. Drought Monitor, all of the counties in the MEMA District 6 Region had drought levels (including abnormally dry) in at least 19 of the last 21 years (2000-2021). According to NCEI, there have been 12 drought occurrences in the MEMA District 6 Region (**Table 5.14**). The most severe drought classification reported for each year, according to U.S. Drought Monitor classifications, is listed in the county-specific annexes. It should be noted that the U.S. Drought Monitor also estimates what percentage of the county is in each classification of drought severity. For example, the most severe classification reported may be exceptional, but a majority of the county may actually be in a less severe condition.

Table 5.14: SUMMARY OF DROUGHT OCCURRENCES IN THE MEMA DISTRICT 6 REGION

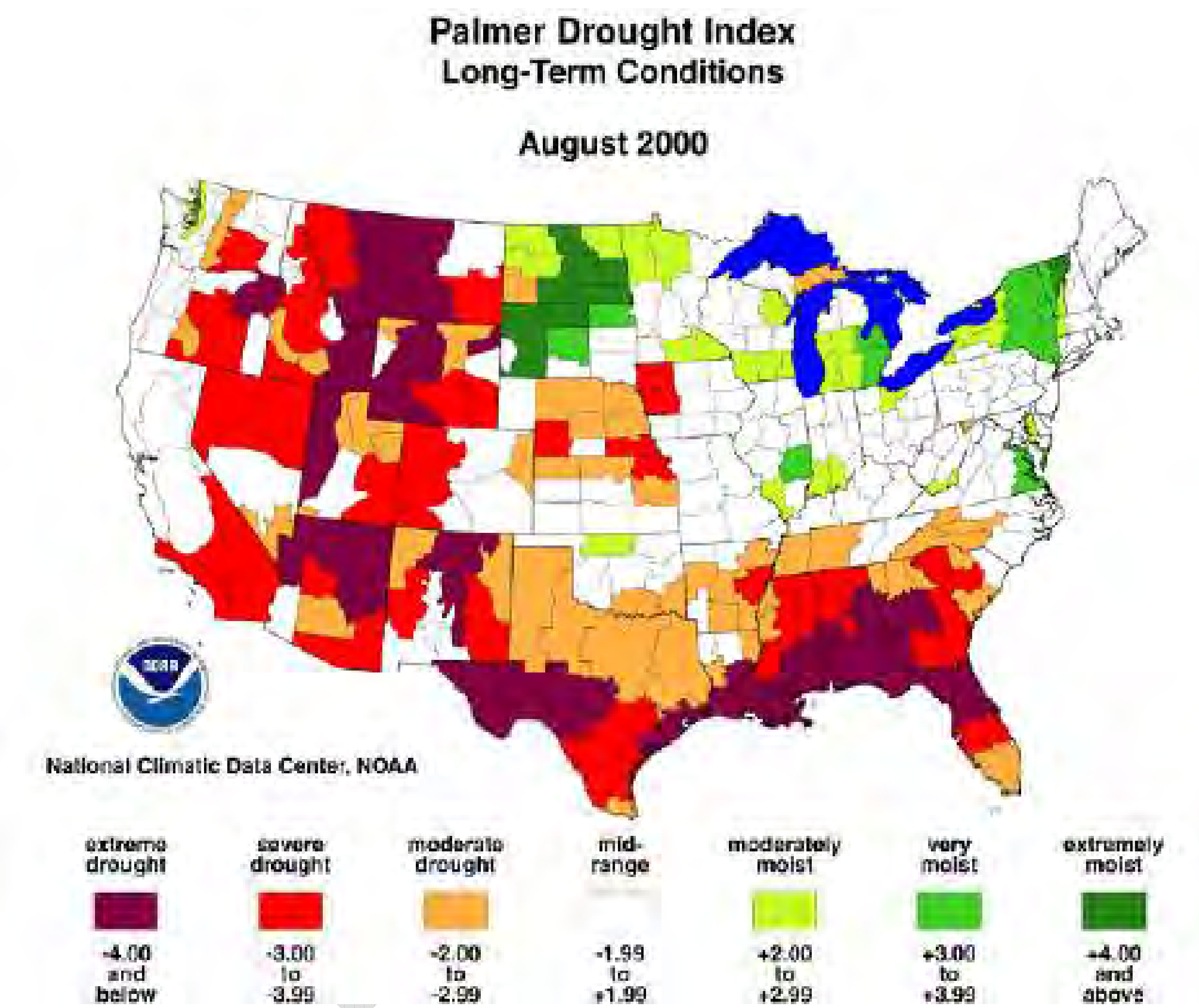
Location	Number of Drought Occurrences
Clarke County	11
Jasper County	10
Kemper County	11
Lauderdale County	11
Leake County	12
Neshoba County	12
Newton County	12
Scott County	12
Smith County	12

Source: National Centers for Environmental Information - retrieved April 2021

Some additional anecdotal information was provided from the National Centers for Environmental Information on droughts in the MEMA District 6 Region.

Summer 2000 Drought – As shown in **Figure 5.7** below, drought conditions were pronounced throughout much of the south and western areas of the nation.

Figure 5.8: PALMER DROUGHT INDEX FOR AUGUST 2000



Summer 2006 – During a four-and-a-half-month period, from June to the middle of October, abnormally dry conditions prevailed across most of Jackson, MS County Warning Area (CWA). The drought had a significant impact on the agricultural industry. Non-irrigated crops were destroyed and all other sustainable crops produced a below normal yield. Catfish ponds were drawn down to severe levels and required water to be pumped back into the fish ponds. The cattle industry suffered due to low watering ponds and lack of sufficient grasslands for grazing and hay production. Water supply problems were encountered by those cities who obtained water from local rivers for drinking purposes due to the low river flows. Fire threat was significant causing the issuance of burn bans across the CWA.

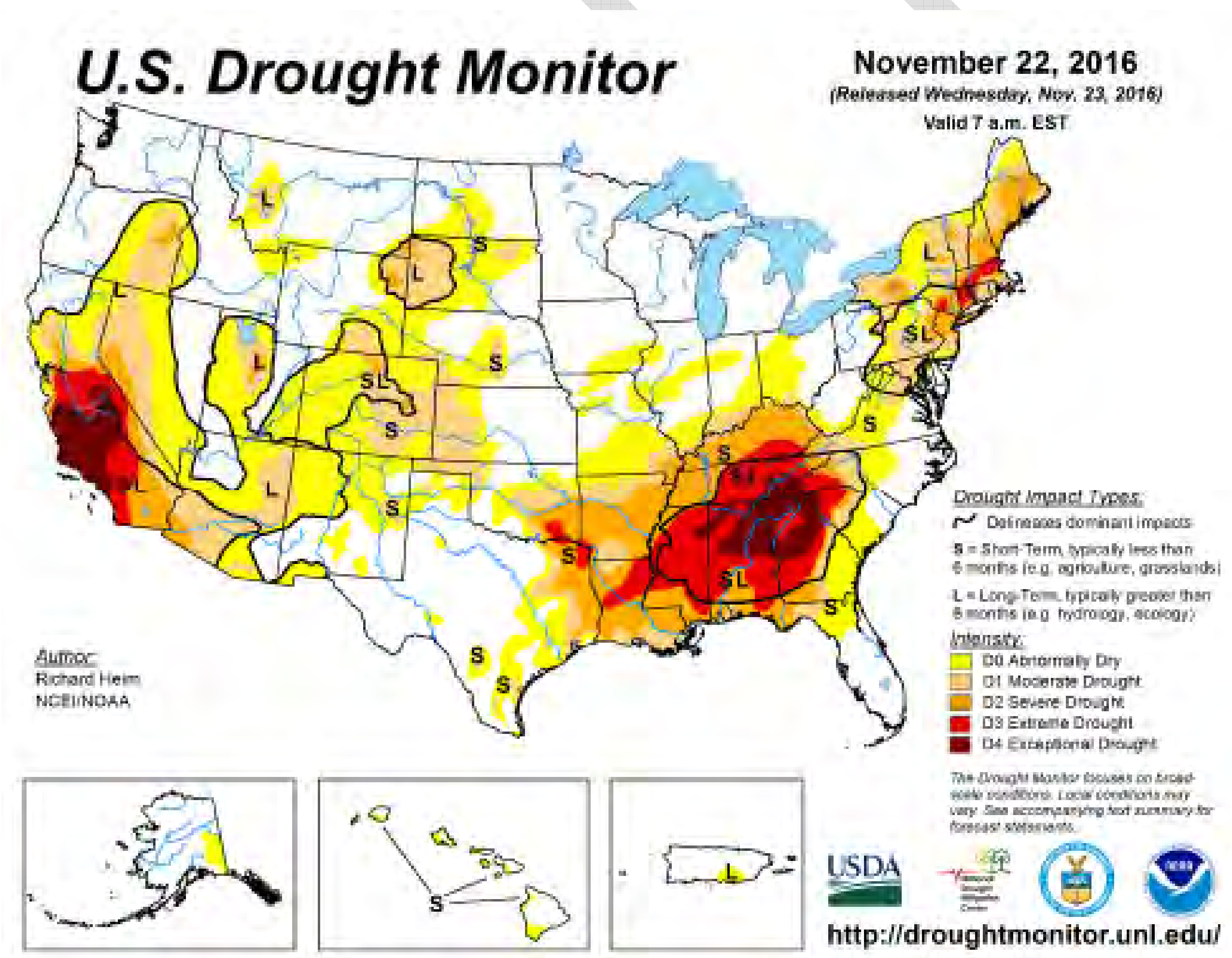
Summer 2007 – By the middle of April, drought conditions were being experienced across a large portion of Eastern and some of Central Mississippi. During the month of May, the drought worsened and expanded. In June, the drought peaked across the region. Although drought conditions continued throughout July and August, conditions were less severe than earlier in the summer. As a result of these conditions, area farmers and crop yields were affected.

October 2010 – Very dry conditions continued across central Mississippi during most of October. Crops were put under stress under the warm and dry conditions. The likely impact was less crop yields for harvest time.

November 2016

Dry conditions continued into November, which created continued stress on crops. Some locations were even classified as being in extreme drought. This drought classification expanded and covered much of the state by the end of the month shown in the figure below.

Figure 5.9: U.S. Drought Monitor November 22, 2016

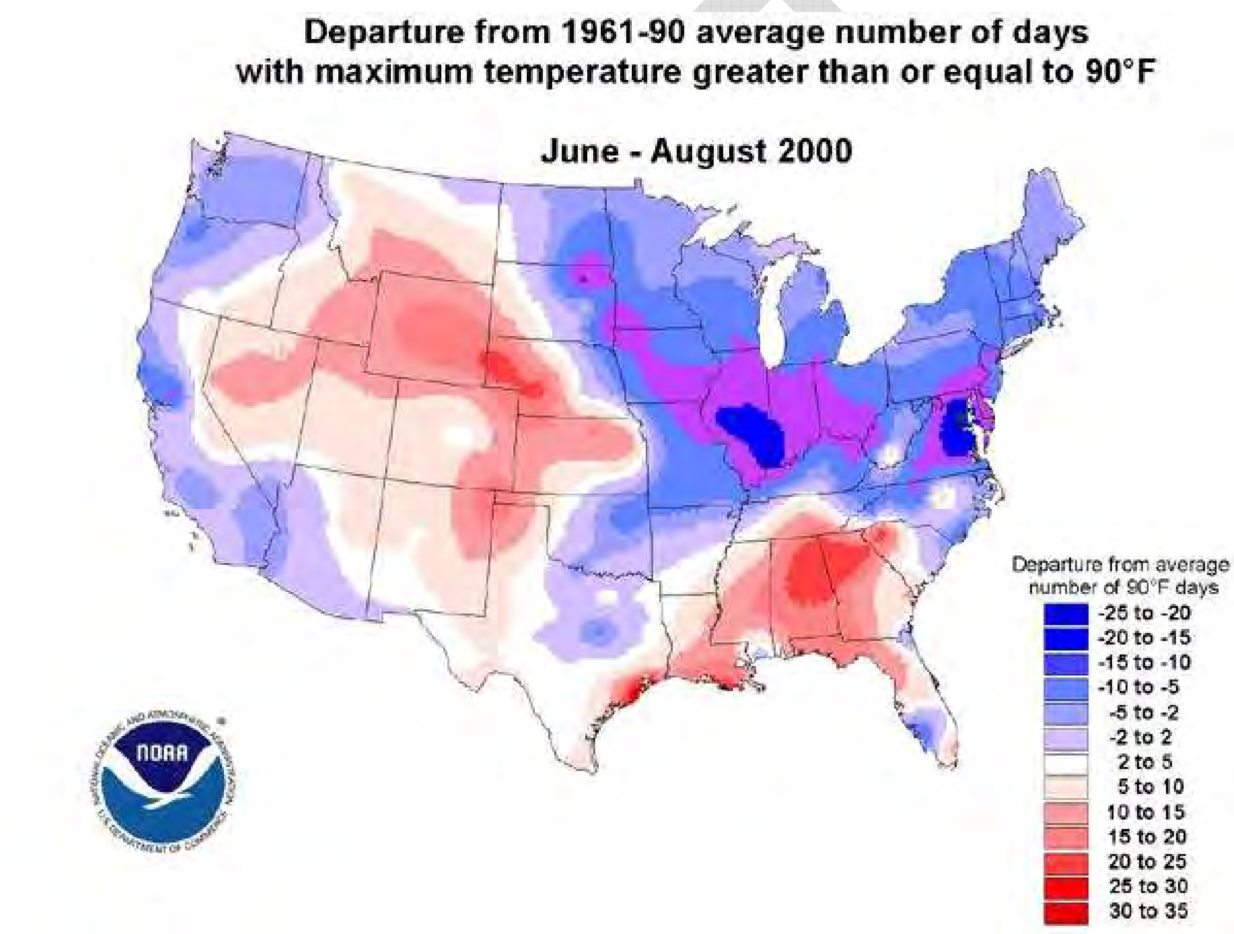


HEAT WAVE

The National Centers for Environmental Information was used to determine historical heat wave occurrences in the region.

Summer of 2000 Heat Wave – Hot temperatures persisted from July to September across the South and Plains. Known as the Summer of 2000 Heat Wave, high temperatures commonly peaked over 100 degrees. As shown in figure below, there were several days over 90 degree than the typical average. This was the fourth warmest July-August on record.

Figure 5.10: DEPARTURE FROM AVERAGE NUMBER OF 90 DEGREE DAYS



Source: http://www.NCEI.noaa.gov/sotc/drought/2000/16#Heat

July 2005 – A five-day heat wave occurred across the region. Heat index values reached near 110 degrees each day. Each day had high temperatures ranging from 95 to 99 degrees. This was the warmest stretch of weather the area experienced since July 2001.

August 2005 –A heat wave covering the south began in mid-August and lasted about 10 days. High temperatures were consistently over 95 degrees and surpassed 100 degrees or more on some days. It was the first time since August 2000 that 100-degree temperatures reached the area.

July 2006 – A short heat wave impacted most of the area temperatures in the 90s to around 100 for five straight days.

August 2007 – A heat wave gripped most of the area with the warmest temperatures since 2000. It lasted from August 5th to the 16th.

August 2010 – The combination of high humidity and above normal temperatures produced heat index readings ranged between 105 and 109 degrees during the afternoon hours in the middle part of August.

5.7.4 Probability of Future Occurrences

DROUGHT

According to the Palmer Drought Severity Index (**Figure 5.5**), MEMA District 6 has a relatively low risk for drought hazard (5 to 9.99%). However, local areas may experience much more severe and/or frequent drought events than what is represented on the Palmer Drought Severity Index map.

Based on historical occurrence information, it is assumed that all of the MEMA District 6 Region has a probability level of likely (between 10 and 100 percent annual probability) for future drought events. However, the extent (or magnitude) of drought and the amount of geographic area covered by drought, varies with each year. Historic information indicates that there is a much lower probability for extreme, long-lasting drought conditions.

HEAT WAVE

Based on historical occurrence information, it is assumed that all of the MEMA District 6 Region has a probability level of likely (between 10 and 100 percent annual probability) for future heat wave events.

5.8 WILDFIRE

5.8.1 Background

A wildfire is any outdoor fire (i.e., grassland, forest, brush land) that is not under control, supervised, or prescribed.[4] Wildfires are part of the natural management of forest ecosystems, but may also be caused

[4] Prescription burning, or "controlled burn," undertaken by land management agencies is the process of igniting fires under selected conditions, in accordance with strict parameters.

by human factors.

Nationally, over 80 percent of forest fires are started by negligent human behavior such as smoking in wooded areas or improperly extinguishing campfires. The second most common cause for wildfire is lightning. In Mississippi, a majority of fires are caused by debris burning.

There are three classes of wildland fires: surface fire, ground fire, and crown fire. A surface fire is the most common of these three classes and burns along the floor of a forest, moving slowly and killing or damaging trees. A ground fire (muck fire) is usually started by lightning or human carelessness and burns on or below the forest floor. Crown fires spread rapidly by wind and move quickly by jumping along the tops of trees. Wildfires are usually signaled by dense smoke that fills the area for miles around.

Wildfire probability depends on local weather conditions, outdoor activities such as camping, debris burning, and construction, and the degree of public cooperation with fire prevention measures. Drought conditions and other natural hazards (such as tornadoes, hurricanes, etc.) increase the probability of wildfires by producing fuel in both urban and rural settings.

Many individual homes and cabins, subdivisions, resorts, recreational areas, organizational camps, businesses, and industries are located within high wildfire hazard areas. Furthermore, the increasing demand for outdoor recreation places more people in wildlands during holidays, weekends, and vacation periods. Unfortunately, wildland residents and visitors are rarely educated or prepared for wildfire events that can sweep through the brush and timber and destroy property within minutes.

Wildfires can result in severe economic losses as well. Businesses that depend on timber, such as paper mills and lumber companies, experience losses that are often passed along to consumers through higher prices and sometimes jobs are lost. The high cost of responding to and recovering from wildfires can deplete state resources and increase insurance rates. The economic impact of wildfires can also be felt in the tourism industry if roads and tourist attractions are closed due to health and safety concerns.

State and local governments can impose fire safety regulations on home sites and developments to help curb wildfire. Land treatment measures such as fire access roads, water storage, helipads, safety zones, buffers, firebreaks, fuel breaks, and fuel management can be designed as part of an overall fire defense system to aid in fire control. Fuel management, prescribed burning, and cooperative land management planning can also be encouraged to reduce fire hazards.

5.8.2 Location and Spatial Extent

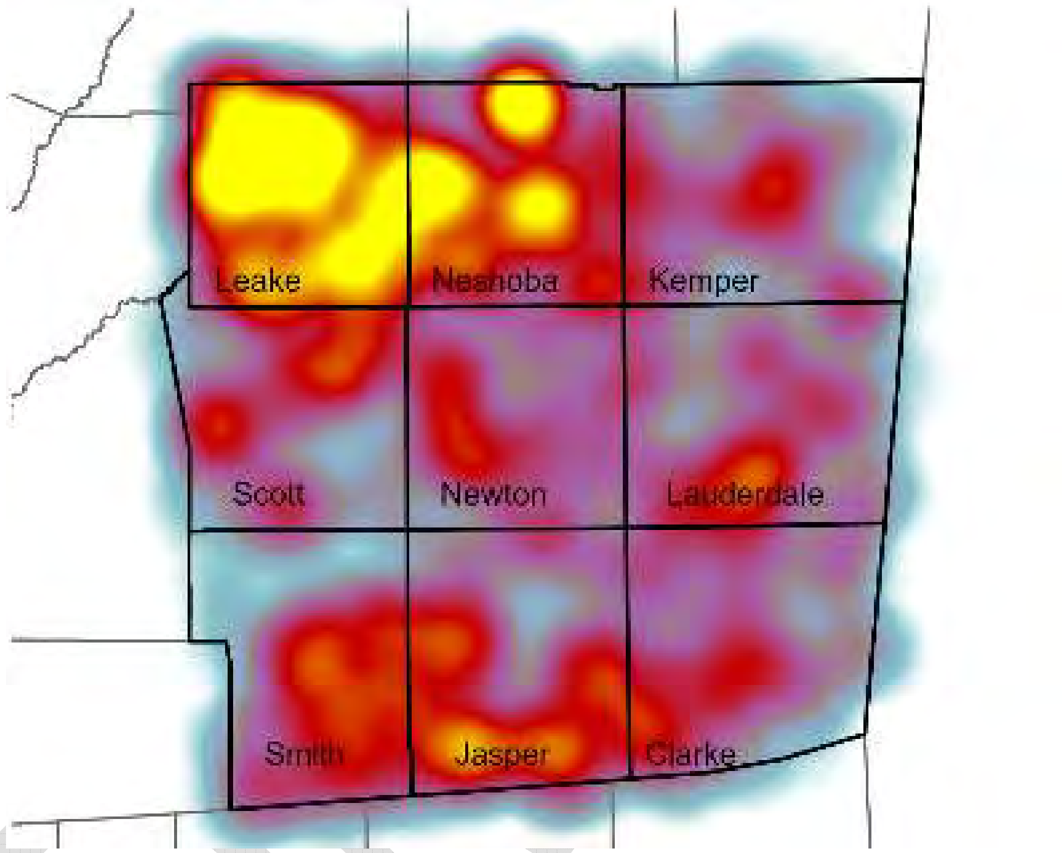
The entire region is at risk to a wildfire occurrence. However, several factors such as drought conditions or high levels of fuel on the forest floor, may make a wildfire more likely. Furthermore, areas in the urban-wildland interface are particularly susceptible to fire hazard as populations abut formerly undeveloped areas. The Wildfire Ignition Density data shown in the figure below give an indication of historic location.

5.8.3 Historical Occurrences

Figure below

shows the Wildfire Ignition Density in the MEMA District 6 Region based on data from the Southern Wildfire Risk Assessment. This data is based on historical fire ignitions and the likelihood of a wildfire igniting in an area. Occurrence is derived by modeling historic wildfire ignition locations to create an average ignition rate map. This is measured in the number of fires per year per 1,000 acres.

Figure 5.11: WILDFIRE IGNITION DENSITY IN THE MEMA DISTRICT 6 REGION January 2015 – June 2021



Source: Mississippi Forestry Commission

Based on data from the Mississippi Forestry Commission from 2005 to 2014, the MEMA District 6 Region experienced an average of 294 wildfires annually which burned a combined 3,522 acres, on average per year. The data indicates that most of these fires are small, averaging about 12 acres per fire. Recent data provided by the Mississippi Forestry Commission for the time period 2015 – 2021 shows an overall reduction in the number of fires with an average of 160 fires occurring annually and 11.5 acres burned per fire. The year 2017 saw a total average of acres burned well under the average with only 74 fires and 451 total acres having been reportedly burned in the MEMA District 6 Region. **Table 5.15** provides a summary table for wildfire occurrences in the MEMA District 6 Region. The number of reported wildfire occurrences in the participating counties between the years 2015 and 2021 is listed in the county-specific annexes to this plan.

Table 5.15: SUMMARY TABLE OF ANNUAL WILDFIRE OCCURRENCES (2015 -2021)

	Clarke County	Jasper County	Kemper County	Lauderdale County	Leake County
Average Number of Fires per year	15	18	13	14.8	34.4
Average Number of Acres Burned per year	194	144.4	305.2	134.2	422.1
Average Number of Acres Burned per fire	12.9	8.0	23.4	9.0	12.27

Source: Mississippi Forestry Commission (January 2015 – June 2021)

TABLE 5.15 (CONT.): SUMMARY TABLE OF ANNUAL WILDFIRE OCCURRENCES (2015 -2021)

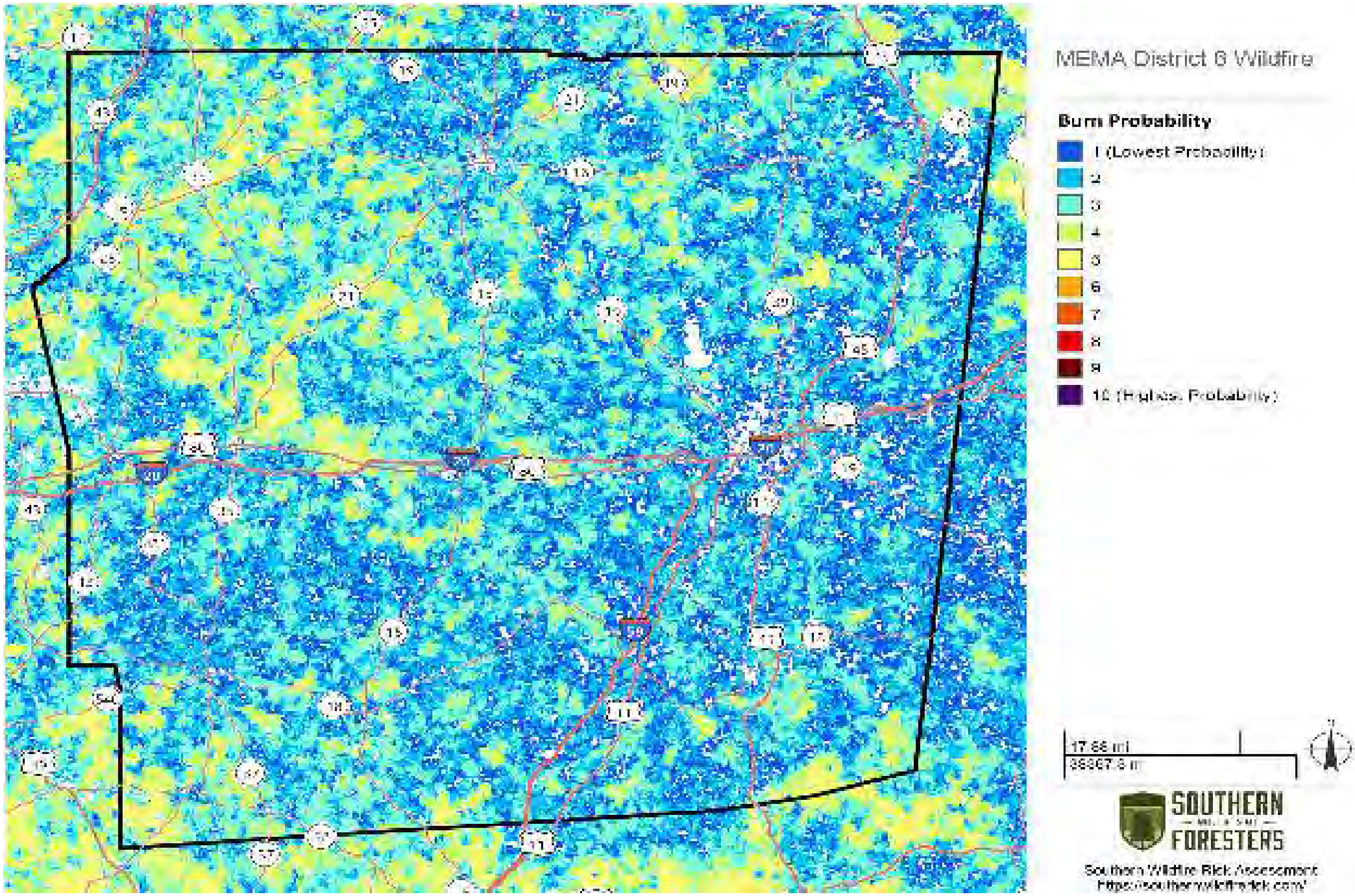
	Neshoba County	Newton County	Scott County	Smith County	MEMA D6 Region Total
Average Number of Fires per year	23.2	12.1	13.4	15.8	160.5
Average Number of Acres Burned per year	132.7	71.1	189.1	198.8	1,859.8
Average Number of Acres Burned per fire	5.7	5.8	14.1	12.5	11.5

Source: Mississippi Forestry Commission (January 2015 – June 2021)

5.8.4 Probability of Future Occurrences

Wildfire events will be an ongoing occurrence in the MEMA District 6 Region. Figure below shows that there is some probability a wildfire will occur throughout the region. However, the likelihood of wildfires increases during drought cycles and abnormally dry conditions. Fires are likely to stay small in size but could increase due to local climate and ground conditions. Dry, windy conditions with an accumulation of forest floor fuel (potentially due to ice storms or lack of fire) could create conditions for a large fire that spreads quickly. It should also be noted that some areas do vary somewhat in risk. For example, highly developed areas are less susceptible unless they are located near the urban-wildland boundary. The risk will also vary due to assets. Areas in the urban-wildland interface will have much more property at risk, resulting in increased vulnerability and need to mitigate compared to rural, mainly forested areas. The probability assigned to the MEMA District 6 Region for future wildfire events is highly likely (100 percent annual probability).

Figure 5.12: BURN PROBABILITY IN THE MEMA DISTRICT 6 REGION



Source: Southern Wildfire Risk Assessment

GEOLOGIC HAZARDS

5.9 EARTHQUAKE

5.9.1 Background

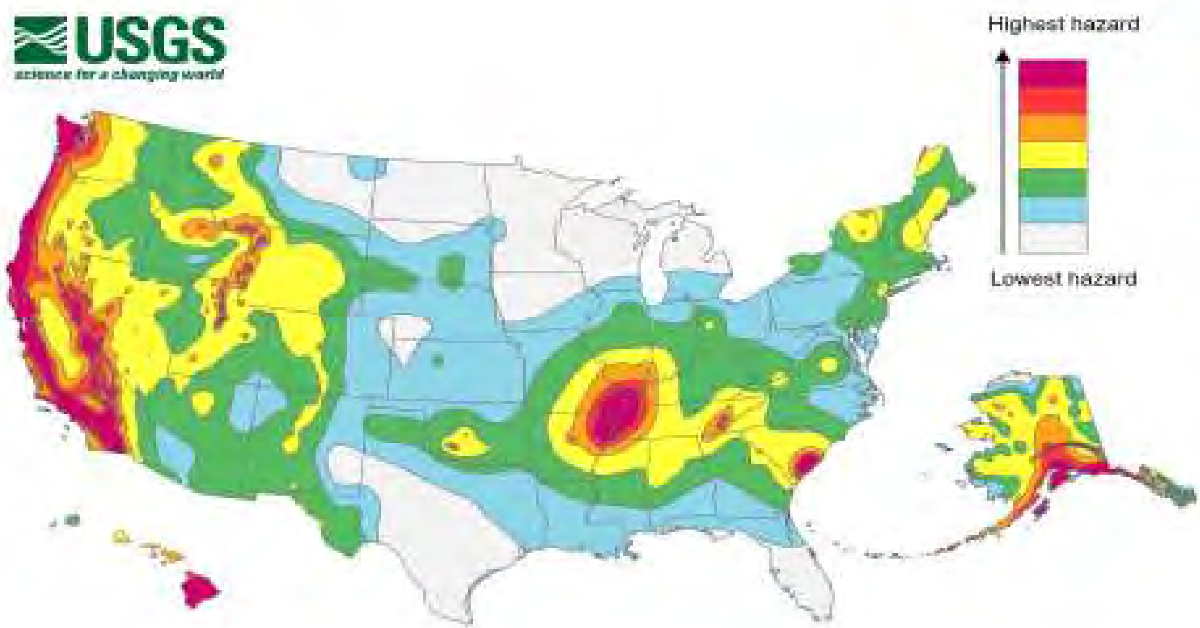
An earthquake is movement or trembling of the ground produced by sudden displacement of rock in the Earth's crust. Earthquakes result from crustal strain, volcanism, landslides, or the collapse of caverns. Earthquakes can affect hundreds of thousands of square miles, cause damage to property measured in the tens of billions of dollars, result in loss of life and injury to hundreds of thousands of persons, and disrupt the social and economic functioning of the affected area.

Most property damage and earthquake-related deaths are caused by the failure and collapse of structures due to ground shaking. The level of damage depends upon the amplitude and duration of the shaking, which are directly related to the earthquake size, distance from the fault, site, and regional geology. Other damaging earthquake effects include landslides, the down-slope movement of soil and rock (mountain regions and along hillsides), and liquefaction, in which ground soil loses the ability to resist shear and flows much like quick sand. In the case of liquefaction, anything relying on the substrata for support can shift, tilt, rupture, or collapse.

Most earthquakes are caused by the release of stresses accumulated as a result of the rupture of rocks along opposing fault planes in the Earth’s outer crust. These fault planes are typically found along borders of the Earth's 10 tectonic plates. The areas of greatest tectonic instability occur at the perimeters of the slowly moving plates, as these locations are subjected to the greatest strains from plates traveling in opposite directions and at different speeds. Deformation along plate boundaries causes strain in the rock and the consequent buildup of stored energy. When the built-up stress exceeds the rocks' strength a rupture occurs. The rock on both sides of the fracture is snapped, releasing the stored energy and producing seismic waves, generating an earthquake.

The greatest earthquake threat in the United States is along tectonic plate boundaries and seismic fault lines located in the central and western states; however, the Eastern United State does face moderate risk to less frequent, less intense earthquake events. Figure below shows relative seismic risk for the United States.

Figure 5.13: UNITED STATES EARTHQUAKE HAZARD MAP



Source: United States Geological Survey

Earthquakes are measured in terms of their magnitude and intensity. Magnitude is measured using the Richter Scale, an open-ended logarithmic scale that describes the energy release of an earthquake through a measure of shock wave amplitude (**Table 5.16**). Each unit increase in magnitude on the Richter Scale corresponds to a 10-fold increase in wave amplitude, or a 32-fold increase in energy. Intensity is most commonly measured using the Modified Mercalli Intensity (MMI) Scale based on direct and indirect measurements of seismic effects. The scale levels are typically described using roman numerals, ranging from "I" corresponding to imperceptible (instrumental) events to "XII" for catastrophic (total destruction). A detailed description of the Modified Mercalli Intensity Scale of earthquake intensity and its correspondence to the Richter Scale is given in **Table 5.17**.

Table 5.16: RICHTER SCALE

RICHTER MAGNITUDES	EARTHQUAKE EFFECTS
< 3.5	Generally not felt, but recorded.
3.5 - 5.4	Often felt, but rarely causes damage.
5.4 - 6.0	At most slight damage to well-designed buildings. Can cause major damage to poorly constructed buildings over small regions.
6.1 - 6.9	Can be destructive in areas up to about 100 kilometers across where people live.
7.0 - 7.9	Major earthquake. Can cause serious damage over larger areas.
8 or >	Great earthquake. Can cause serious damage in areas several hundred kilometers across.

Source: Federal Emergency Management Agency

Table 5.17: MODIFIED MERCALLI INTENSITY SCALE FOR EARTHQUAKES

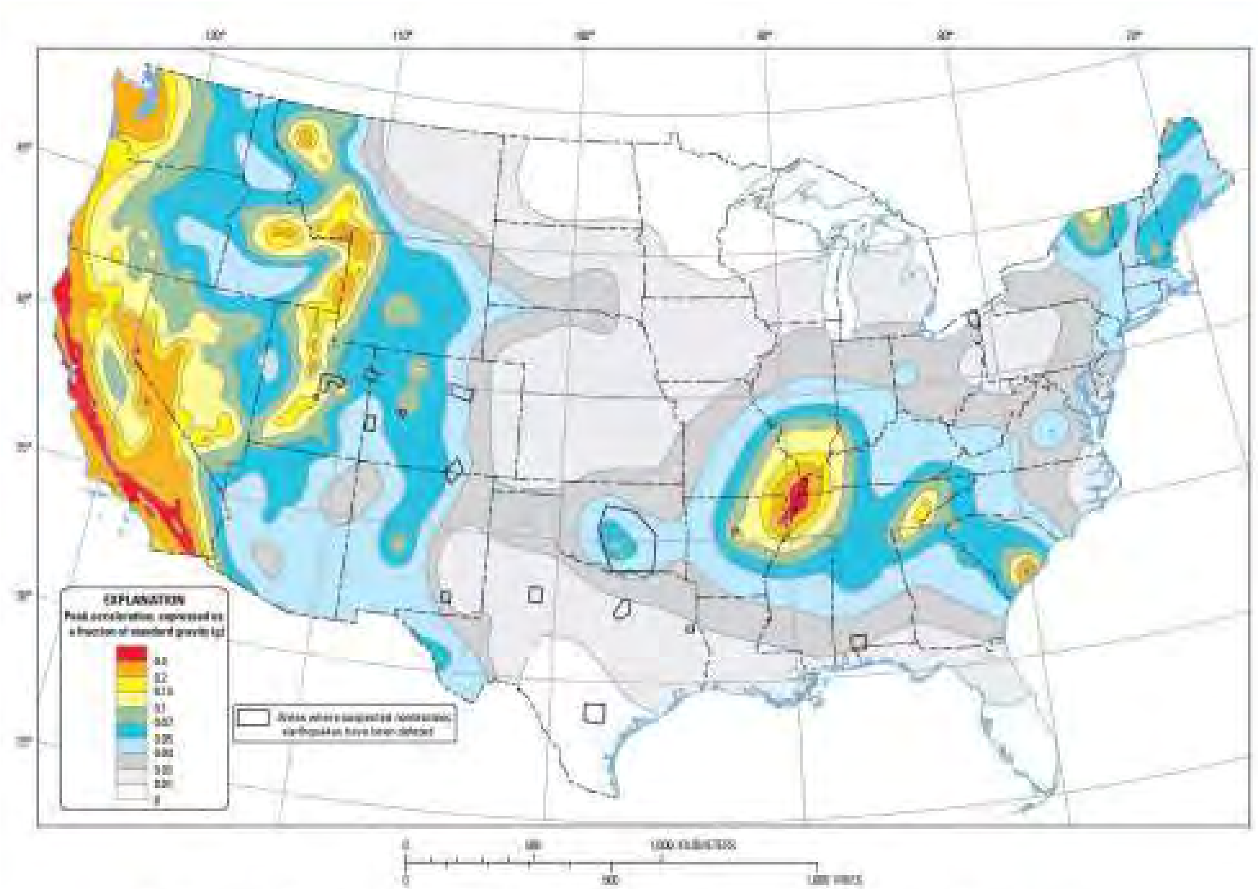
SCALE	INTENSITY	DESCRIPTION OF EFFECTS	CORRESPONDIN G RICHTER SCALE MAGNITUDE
I	INSTRUMENTAL	Detected only on seismographs.	
II	FEEBLE	Some people feel it.	< 4.2
III	SLIGHT	Felt by people resting; like a truck rumbling by.	
IV	MODERATE	Felt by people walking.	
V	SLIGHTLY STRONG	Sleepers awake; church bells ring.	< 4.8
VI	STRONG	Trees sway; suspended objects swing, objects fall off shelves.	< 5.4
VII	VERY STRONG	Mild alarm; walls crack; plaster falls.	< 6.1
VIII	DESTRUCTIVE	Moving cars uncontrollable; masonry fractures, poorly constructed buildings damaged.	
IX	RUINOUS	Some houses collapse; ground cracks; pipes break open.	< 6.9
X	DISASTROUS	Ground cracks profusely; many buildings destroyed; liquefaction and landslides widespread.	< 7.3
XI	VERY DISASTROUS	Most buildings and bridges collapse; roads, railways, pipes and cables destroyed; general triggering of other hazards.	< 8.1
XII	CATASTROPHIC	Total destruction; trees fall; ground rises and falls in waves.	> 8.1

Source: Federal Emergency Management Agency

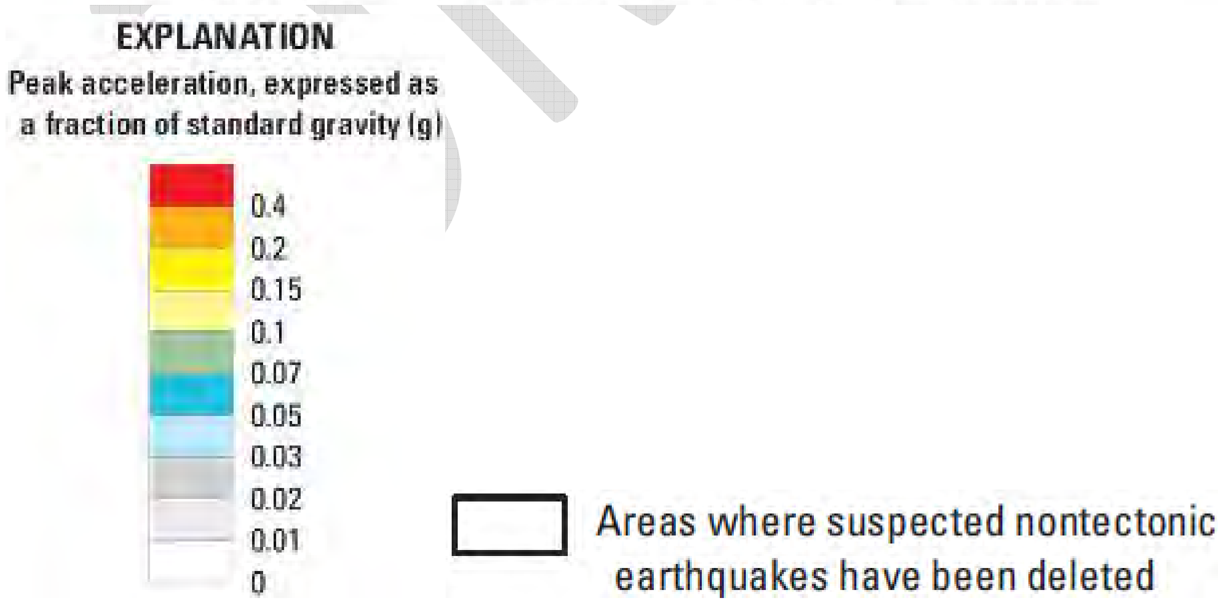
5.9.2 Location and Spatial Extent

Figure below shows the intensity level associated with the MEMA District 6 Region, based on the national USGS map of peak acceleration with 10 percent probability of exceedance in 50 years. It is the probability that ground motion will reach a certain level during an earthquake. The data show peak horizontal ground acceleration (the fastest measured change in speed, for a particle at ground level that is moving horizontally due to an earthquake) with a 10 percent probability of exceedance in 50 years. The map was compiled by the U.S. Geological Survey (USGS) Geologic Hazards Team, which conducts global investigations of earthquake, geomagnetic, and landslide hazards. According to this map, all of the MEMA District 6 Region lies within an approximate zone of level "2" to "5" ground acceleration. This indicates that the region as a whole exists within an area of moderate seismic risk.

Figure 5.14: PEAK ACCELERATION WITH 10 PERCENT PROBABILITY OF EXCEEDANCE IN 50 YEARS

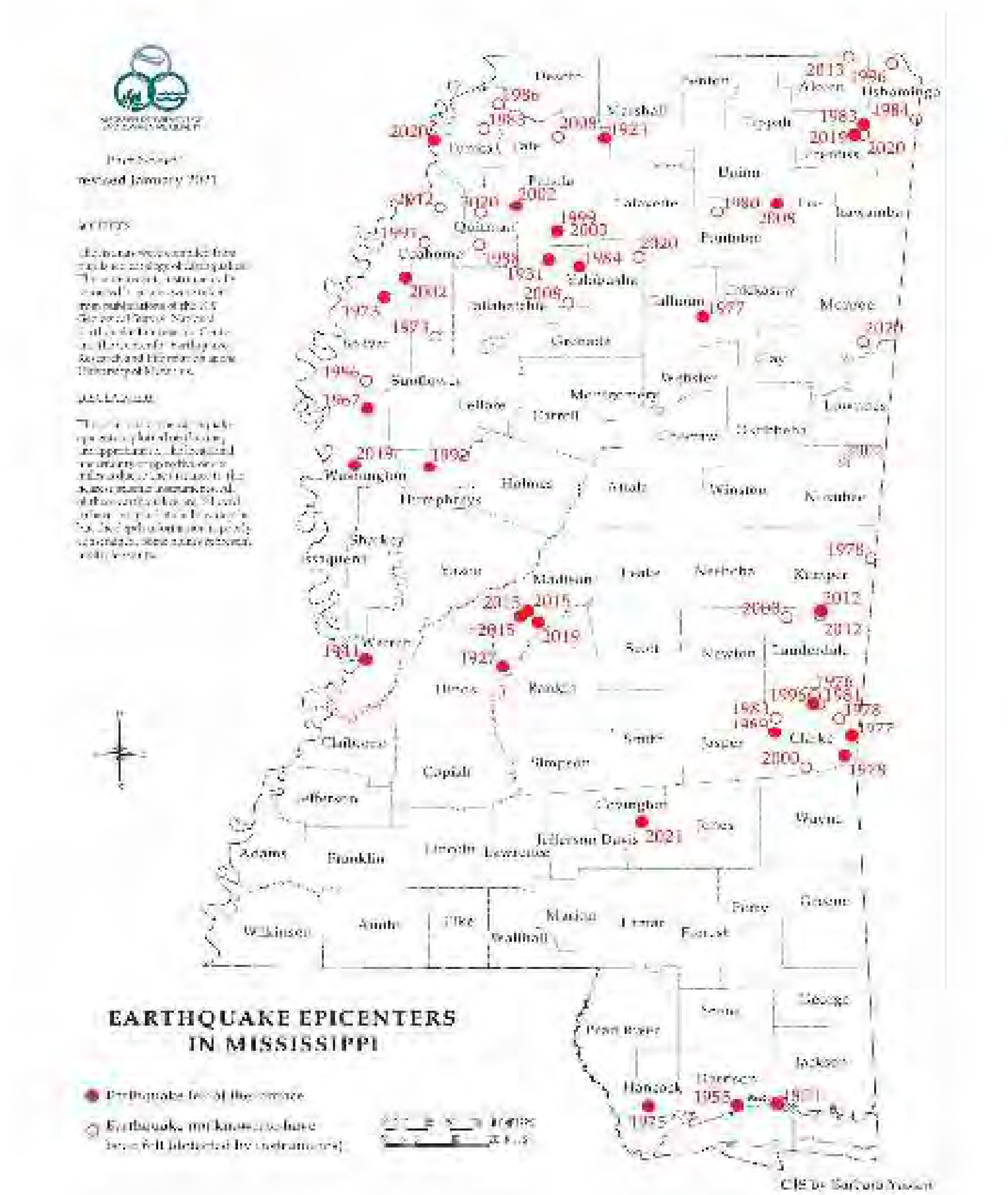


Ten-percent probability of exceedance in 50 years map of peak ground acceleration



Source: United States Geological Survey, 2014

Figure 5.15: Earthquake Epicenters in the State of Mississippi



Source: Mississippi Department of Environmental Quality

5.9.3 Historical Occurrences

At least eight earthquakes are known to have affected the MEMA District 6 Region since 1886. The strongest of these measured a V on the Modified Mercalli Intensity (MMI) scale. **Table 5.18** provides a summary of earthquake events reported by the National Geophysical Data Center between 1638 and 1985. A detailed occurrence of each event including the date, distance from the epicenter, magnitude, and Modified Mercalli Intensity (if known) can be found in the county-specific annexes. [5]

Table 5.18: SUMMARY OF SEISMIC ACTIVITY IN THE MEMA DISTRICT 6 REGION

Location	Number of Occurrences	Greatest MMI Reported	Richter Scale Equivalent
Clarke County	**1**	**II**	**< 4.2**
Enterprise	1	II	< 4.2
Pachuta	0	--	--
Quitman	0	--	--
Shubuta	0	--	--
Stonewall	0	--	--
Unincorporated Area	0	--	--
Jasper County	**1**	**III**	**< 4.8**
Bay Springs	0	--	--
Heidelberg	0	--	--
Louin	0	--	--
Montrose	0	--	--
Unincorporated Area	1	III	< 4.8
Kemper County	**1**	**III**	**< 4.8**
De Kalb	0	--	--
Scooba	0	--	--
Unincorporated Area	1	III	< 4.8
Lauderdale County	**4**	**IV**	**< 4.8**
Marion	0	--	--
Meridian	3	IV	< 4.8
Unincorporated Area	1	IV	< 4.8
Leake County	**1**	**V**	**< 4.8**
Carthage	1	V	< 4.8
Lena	0	--	--
Walnut Grove	0	--	--
Unincorporated Area	0	--	--
Neshoba County	**0**	**--**	**--**
Philadelphia	0	--	--
Unincorporated Area	0	--	--
Newton County	**0**	**--**	**--**
Chunky	0	--	--
Decatur	0	--	--
Hickory	0	--	--

[5] Due to reporting mechanisms, not all earthquake events were recorded during this time. Furthermore, some are missing data, such as the epicenter location, due to a lack of widely used technology. In these instances, a value of "unknown" is reported.

Location	Number of Occurrences	Greatest MMI Reported	Richter Scale Equivalent
Newton (city)	0	--	--
Union	0	--	--
Unincorporated Area	0	--	--
Scott County	**0**	**--**	**--**
Forest	0	--	--
Lake	0	--	--
Morton	0	--	--
Sebastopol	0	--	--
Unincorporated Area	0	--	--
Smith County	**0**	**--**	**--**
Mize	0	--	--
Polkville	0	--	--
Raleigh	0	--	--
Sylvarena	0	--	--
Taylorsville	0	--	--
Unincorporated Area	0	--	--
MEMA DISTRICT 6 REGIONAL TOTAL	**8**	**V**	**< 4.8**

Source: National Geophysical Data Center

In addition to those earthquakes specifically affecting the MEMA District 6 Region, a list of earthquakes that have affected Mississippi is presented below in **Table 5.19.**

Table 5.19: EARTHQUAKES WHICH HAVE AFFECTED MISSISSIPPI

Date	Origin	Richter Scale (Magnitude)	MMI (Intensity)	MMI in Mississippi	MEMA District 6 Counties Affected
1811-1812	New Madrid Seismic Zone	7.8-8.1	XI	Not available	Affected counties as far as the Gulf Coast
3/29/1972	New Madrid Seismic Zone	Not available	IV	I, II, III, IV	--
4/29/2003	8 miles ENE of Ft. Payne, AL	4.6	V	I, II, III, IV	Lauderdale
11/7/2004	25 miles SW of Tuscaloosa, AL	4.0	V	I, II, III, IV	Lauderdale, Leake, Newton, and Scott
2/10/2005	22 miles WSW of Blytheville, AR	4.1	V	I, II, III	--
5/1/2005	15 miles WSW of Blytheville, AR	4.1	IV	I, II, III	--
6/2/2005	10 miles NNW of Dyersburg, TN	4.0	III	I	--
9/10/2006	253 miles SSW of Apalachicola, FL	6.0	VI	I, II, III, IV	Lauderdale and Scott

Source: State of Mississippi Standard Mitigation Plan (2013 Update)

5.9.4 Probability of Future Occurrences

The probability of significant, damaging earthquake events affecting the MEMA District 6 Region is unlikely. However, it is possible that future earthquakes resulting in light to moderate perceived shaking and damages ranging from none to very light will affect the region. The annual probability level for the region is estimated to be between 1 and 10 percent (possible).

5.10 LANDSLIDE

5.10.1 Background

A landslide is the downward and outward movement of slope-forming soil, rock, and vegetation, which is driven by gravity. Landslides may be triggered by both natural and human-caused changes in the environment, including heavy rain, rapid snow melt, steepening of slopes due to construction or erosion, earthquakes, volcanic eruptions, and changes in groundwater levels.

There are several types of landslides: rock falls, rock topple, slides, and flows. Rock falls are rapid movements of bedrock, which result in bouncing or rolling. A topple is a section or block of rock that rotates or tilts before falling to the slope below. Slides are movements of soil or rock along a distinct surface of rupture, which separates the slide material from the more stable underlying material. Mudflows, sometimes referred to as mudslides, mudflows, lahars or debris avalanches, are fast-moving rivers of rock, earth, and other debris saturated with water. They develop when water rapidly accumulates in the ground, such as heavy rainfall or rapid snowmelt, changing the soil into a flowing river of mud or "slurry." Slurry can flow rapidly down slopes or through channels and can strike with little or no warning at avalanche speeds. Slurry can travel several miles from its source, growing in size as it picks up trees, cars, and other materials along the way. As the flows reach flatter ground, the mudflow spreads over a broad area where it can accumulate in thick deposits.

Landslides are typically associated with periods of heavy rainfall or rapid snow melt and tend to worsen the effects of flooding that often accompanies these events. In areas burned by forest and brush fires, a lower threshold of precipitation may initiate landslides. Some landslides move slowly and cause damage gradually, whereas others move so rapidly that they can destroy property and take lives suddenly and unexpectedly.

Among the most destructive types of debris flows are those that accompany volcanic eruptions. A spectacular example in the United States was a massive debris flow resulting from the 1980 eruptions of Mount St. Helens, Washington. Areas near the bases of many volcanoes in the Cascade Mountain Range of California, Oregon, and Washington are at risk from the same types of flows during future volcanic eruptions.

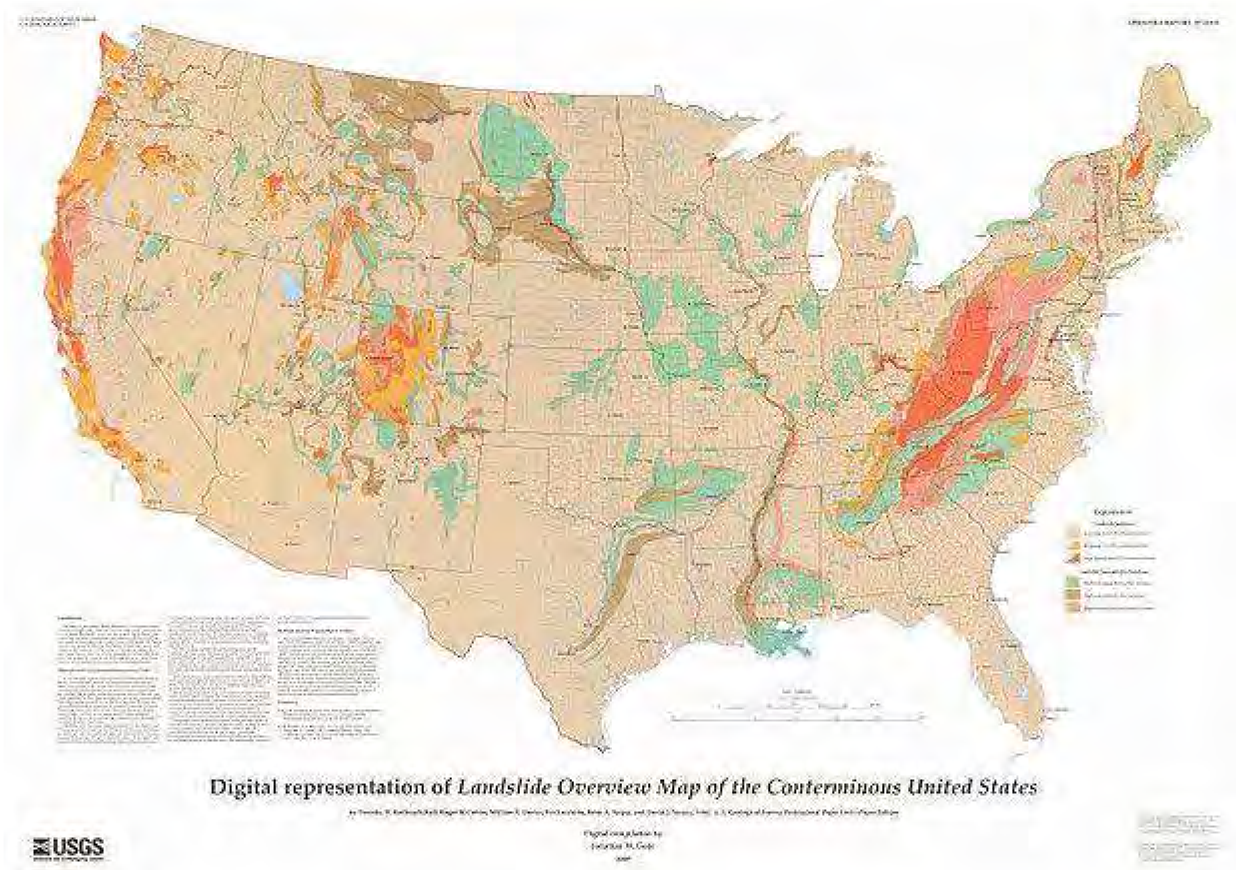
Areas that are generally prone to landslide hazards include previous landslide areas, the bases of steep slopes, the bases of drainage channels, and developed hillsides where leach-field septic systems are used. Areas that are typically considered safe from landslides include areas that have not moved in the past, relatively flat-lying areas away from sudden changes in slope, and areas at the top or along ridges set back from the tops of slopes.

According to the United States Geological Survey, each year landslides cause $5.1 billion (2009 dollars) in damage and between 25 and 50 deaths in the United States.[6] **Figure 5.14** delineates areas where large numbers of landslides have occurred and areas that are susceptible to landsliding in the conterminous United States.[7]

[6] United States Geological Survey (USGS). United States Department of the Interior. "Landslide Hazards – A National Threat." 2005.

[7] This map layer is provided in the U.S. Geological Survey Professional Paper 1183, Landslide Overview Map of the Conterminous United States, available online at: http://landslides.usgs.gov/html_files/landslides/nationalmap/national.html.

Figure 5.16: LANDSLIDE OVERVIEW MAP OF THE CONTERMINOUS UNITED STATES[8]



Landslide Incidence		Landslide Susceptibility/Incidence	
	Low Incidence (less than 1.5% of area involved)		Moderate susceptibility/low incidence
	Moderate Incidence (1.5%-15% of area involved)		High susceptibility/low incidence
	High Incidence (greater than 15% of area involved		High susceptibility/moderate incidence

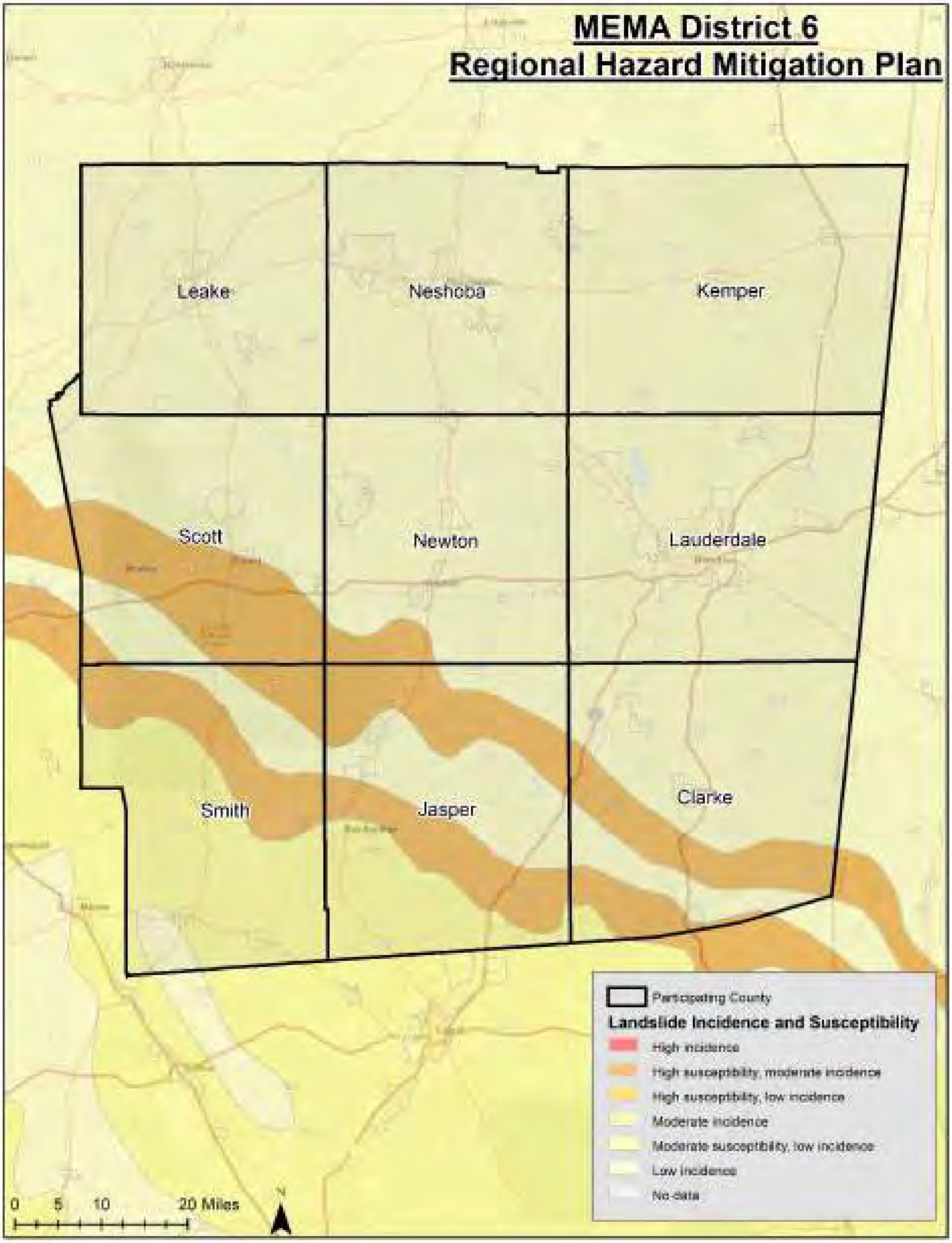
Source: United States Geological Survey

[8] Susceptibility not indicated where same or lower than incidence. Susceptibility to landsliding was defined as the probable degree of response of [the areal] rocks and soils to natural or artificial cutting or loading of slopes, or to anomalously high precipitation. High, moderate, and low susceptibility are delimited by the same percentages used in classifying the incidence of landsliding. Some generalization was necessary at this scale, and several small areas of high incidence and susceptibility were slightly exaggerated.

5.10.2 Location and Spatial Extent

Landslides occur along steep slopes when the pull of gravity can no longer be resisted (often due to heavy rain). Human development can also exacerbate risk by building on previously undevelopable steep slopes. Landslides are possible throughout the MEMA District 6 Region, though the risk is relatively low. According to figure below, the majority of the region falls under a low incidence area. This indicates that less than 1.5 percent of the area is involved in landsliding. There are also some areas in the southwestern portion of the region that are moderate incidence areas. This indicates that between 1.5 and 10 percent of the area is involved in landsliding.

Figure 5.17: LANDSLIDE SUSCEPTIBILITY MAP OF THE MEMA DISTRICT 6 REGION



Source: United States Geological Survey

5.10.3 Historical Occurrences

There is no extensive history of landslides in the MEMA District 6 Region. Landslide events typically occur in isolated areas, but no major landside events were reported.

5.10.4 Probability of Future Occurrences

Based on historical information and the USGS susceptibility index, the probability of future landslide events is unlikely (less than 1 percent annual probability). The USGS data indicates that most areas in the MEMA District 6 Region have a low incidence rate and low susceptibly to landsliding activity. There are also some areas in the southwestern corner of the region with moderate susceptibility to landsliding as well as additional areas with moderate incidence and high susceptibility. Local conditions may become more favorable for landslides due to heavy rain, for example. This would increase the likelihood of occurrence. It should also be noted that some areas in the MEMA District 6 Region have greater risk than others given factors such as steepness on slope and modification of slopes.

5.11 LAND SUBSIDENCE

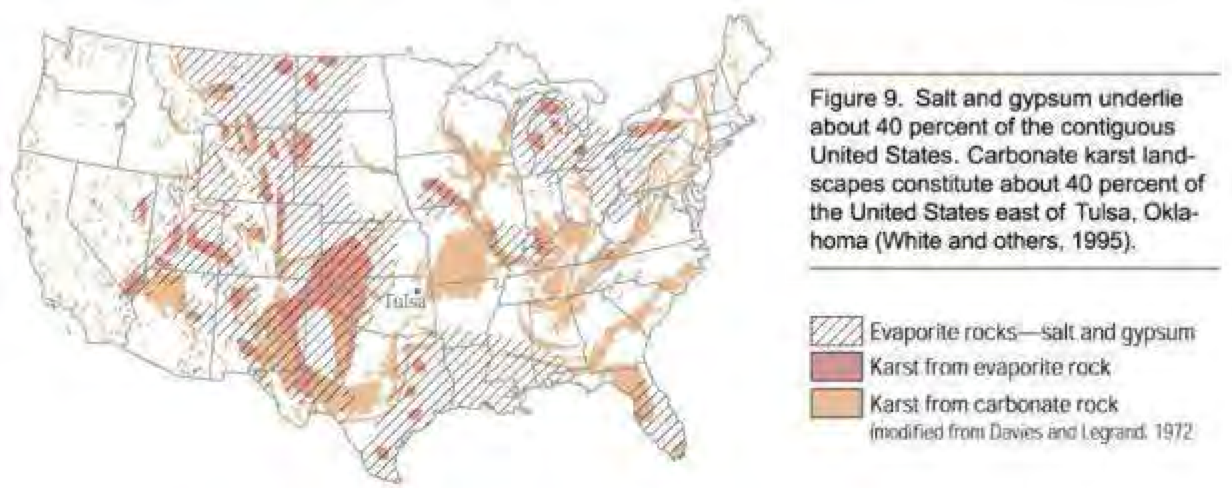
5.11.1 Background

Land subsidence is the gradual settling or sudden sinking of the Earth's surface due to the subsurface movement of earth materials. This can occur over a large area or a small spot, creating a sinkhole. Causes of land subsidence include groundwater pumpage, aquifer system compaction, drainage of organic soils, underground mining, hydrocompaction, natural compaction, sinkholes, and thawing permafrost.

The geological composition of an area impacts the potential for subsidence. Karst and evaporative rock contribute to land subsidence. Karst is distinctive topography in which the landscape is largely shaped by the dissolving action of water on carbonate bedrock (usually limestone, dolomite, or marble). As groundwater flows, voids are created from dissolving subsurface foundations. Karst topography includes land subsidence in the form of sink holes, which is brought on by sinking soils resulting from caves or cavities below the surface. Evaporative rock (salt and gypsum) are soluble in water and large cavity formations can occur. Sink holes or cavity collapses occur when these underground voids are created naturally, or artificially, and then collapse due to natural or human induced forces.

Figure below shows the location of rock types associated with subsidence in the United States.

Figure 5.18: MAP OF ROCK TYPES ASSOCIATED WITH SUBSIDENCE IN THE UNITED STATES



Source: United States Geological Survey

According to the U.S. Geological Survey (USGS), subsidence affects an estimated 17,000 square miles in 45 states. Salt and gypsum underlie about 35 to 40 percent of the United States, though in many areas they are buried at great depths.

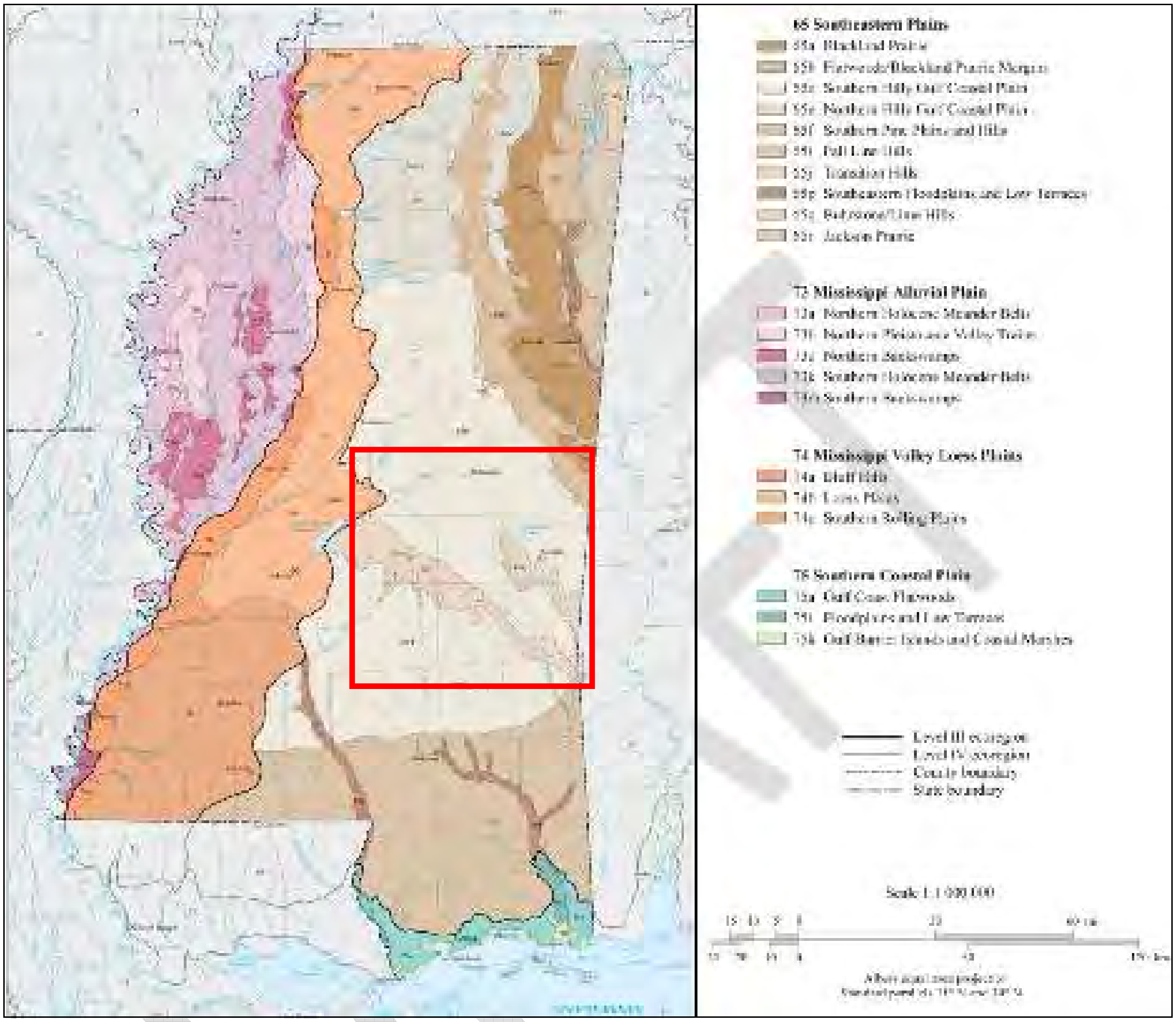
Underground mining of coal, salt, limestone, and gypsum contribute to subsidence. Most mining is accomplished by direct human action utilizing heavy machinery to remove the material; however, with salt there are cases where pressurized water is used to wash-out the deposit (solution mining). All of these mines create voids under the Earth's surface. Several key factors determining the potential for these voids to collapse include depth, mining technique used, types of rock and or soils, and development on the ground surface.

Subsidence causes regional drainage patterns to change. This can impact flooding, back up storm drains, and damage infrastructure. Subsidence can also negatively impact riverine flooding by altering the topography and rupture land surface.

5.11.2 Location and Spatial Extent

Much of the MEMA D6 region is located in an area where the soil is substantially clay, causing a shrink and swell effect depending on the current conditions. Indeed, much of the area underlain by the calcareous Yazoo clay which, when combined with sand and marl, is highly susceptible to expansion when wet and shrinking when dry. These areas are denoted below.

Figure 5.19: MAP OF MISSISSIPPI SOILS



Source: http://www.eoearth.org/view/article/152119/

5.11.3 Historical Occurrences

Although there is no significant historical record of land subsidence in the MEMA District 6 Region, anecdotal evidence of isolated incidents has been reported. Many local county officials have noted the impacts from these swings and changes in soil as roads and other infrastructure have experienced large cracks and breaks, causing stops in daily operations and significant costs to local, state, and federal budgets. Often the cost to repair this infrastructure can be in the range of millions of dollars depending on the degree of damage and necessity for quick repairs.

5.11.4 Probability of Future Occurrences

The probability of future land subsidence events in the region is unlikely (less than 1 percent annual probability). The potential for land subsidence may be impacted by local conditions such as heavy rain or extremely dry periods.

WIND-RELATED HAZARDS

5.12 HURRICANE AND TROPICAL STORM

5.12.1 Background

Hurricanes and tropical storms are classified as cyclones and defined as any closed circulation developing around a low-pressure center in which the winds rotate counter-clockwise in the Northern Hemisphere (or clockwise in the Southern Hemisphere) and whose diameter averages 10 to 30 miles across. A tropical cyclone refers to any such circulation that develops over tropical waters. Tropical cyclones act as a "safety-valve," limiting the continued build-up of heat and energy in tropical regions by maintaining the atmospheric heat and moisture balance between the tropics and the pole-ward latitudes. The primary damaging forces associated with these storms are high-level sustained winds, heavy precipitation, and tornadoes.

The key energy source for a tropical cyclone is the release of latent heat from the condensation of warm water. Their formation requires a low-pressure disturbance, warm sea surface temperature, rotational force from the spinning of the earth, and the absence of wind shear in the lowest 50,000 feet of the atmosphere. The majority of hurricanes and tropical storms form in the Atlantic Ocean, Caribbean Sea, and Gulf of Mexico during the official Atlantic hurricane season, which encompasses the months of June through November. The peak of the Atlantic hurricane season is in early to mid-September and the average number of storms that reach hurricane intensity per year in the Atlantic basin is about six.

As an incipient hurricane develops, barometric pressure (measured in millibars or inches) at its center falls and winds increase. If the atmospheric and oceanic conditions are favorable, it can intensify into a tropical depression. When maximum sustained winds reach or exceed 39 miles per hour, the system is designated a tropical storm, given a name, and is closely monitored by the National Hurricane Center in Miami, Florida. When sustained winds reach or exceed 74 miles per hour the storm is deemed a hurricane. Hurricane intensity is further classified by the Saffir-Simpson Scale (**Table 5.20**), which rates hurricane intensity on a scale of 1 to 5, with 5 being the most intense.

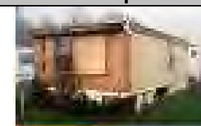
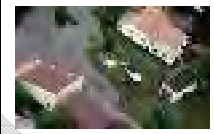
Table 5.20: SAFFIR-SIMPSON SCALE

Category	Maximum Sustained Wind Speed (MPH)
1	74–95
2	96–110
3	111–129
4	130–156
5	157 +

Source: National Hurricane Center

The Saffir-Simpson Scale categorizes hurricane intensity linearly based upon maximum sustained winds, barometric pressure and storm surge potential, which are combined to estimate potential damage. Categories 3, 4, and 5 are classified as "major" hurricanes and, while hurricanes within this range comprise only 20 percent of total tropical cyclone landfalls, they account for over 70 percent of the damage in the United States. **Table 5.21** describes the damage that could be expected for each category of hurricane. Damage during hurricanes may also result from spawned tornadoes, storm surge, and inland flooding associated with heavy rainfall that usually accompanies these storms.

Table 5.21: HURRICANE DAMAGE CLASSIFICATIONS

Storm Category	Damage Level	Description of Damages	Photo Example
1	MINIMAL	No real damage to building structures. Damage primarily to unanchored mobile homes, shrubbery, and trees. Also, some coastal flooding and minor pier damage.	
2	MODERATE	Some roofing material, door, and window damage. Considerable damage to vegetation, mobile homes, etc. Flooding damages piers and small craft in unprotected moorings may break their moorings.	
3	EXTENSIVE	Some structural damage to small residences and utility buildings, with a minor amount of curtainwall failures. Mobile homes are destroyed. Flooding near the coast destroys smaller structures, with larger structures damaged by floating debris. Terrain may be flooded well inland.	
4	EXTREME	More extensive curtainwall failures with some complete roof structure failure on small residences. Major erosion of beach areas. Terrain may be flooded well inland.	
5	CATASTROPHIC	Complete roof failure on many residences and industrial buildings. Some complete building failures with small utility buildings blown over or away. Flooding causes major damage to lower floors of all structures near the shoreline. Massive evacuation of residential areas may be required.	

Source: National Hurricane Center; Federal Emergency Management Agency

5.12.2 Location and Spatial Extent

Hurricanes and tropical storms threaten the entire Atlantic and Gulf seaboard of the United States. While coastal areas are most directly exposed to the brunt of landfalling storms, their impact is often felt hundreds of miles inland and they can affect the MEMA District 6 Region. All areas in the MEMA District 6 Region are equally susceptible to hurricane and tropical storms.

5.12.3 Historical Occurrences

According to the National Hurricane Center's historical storm track records, 57 hurricane or tropical storm/depression tracks have passed within 75 miles of the MEMA District 6 Region since 1855.[15] This includes: 1 Category 3 hurricane, 2 Category 2 hurricanes, 5 Category 1 hurricanes, 33 tropical storms, and 16 tropical depressions.

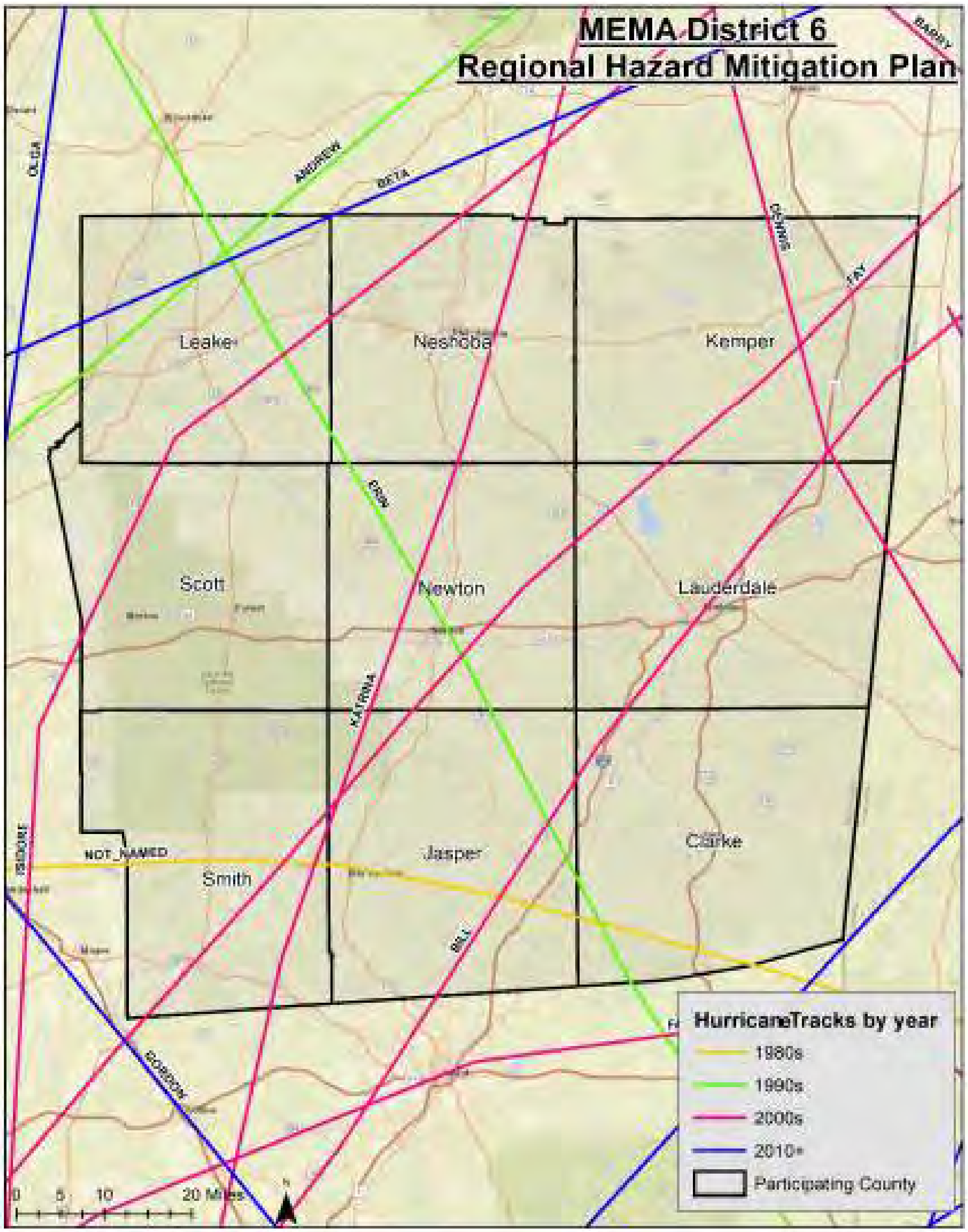
Of the recorded storm events, 35 hurricane or tropical storm/depression events traversed directly through the region as shown in the figure below. Notable storms include Hurricane Frederic (1979) and Hurricane Katrina (2005). The following table provides for each event the date of occurrence, name (if

[15] These storm track statistics include tropical depressions, tropical storms, and hurricanes. Lesser events may still cause

significant local impact in terms of rainfall and high winds.

applicable), maximum wind speed (as recorded within 75 miles of the MEMA District 6 Region) and category of the storm based on the Saffir-Simpson Scale.

Figure 5.20: HISTORICAL HURRICANE STORM TRACKS WITHIN 75 MILES OF THE MEMA DISTRICT 6 REGION



Source: National Oceanic and Atmospheric Administration, National Hurricane Center

Table 5.22: HISTORICAL STORM TRACKS WITHIN 75 MILES OF THE MEMA 6 DISTRICT REGION (1850–2020)

Date of Occurrence	Storm Name	Maximum Wind Speed (knots)	Storm Category
9/16/1855	UNNAMED	70	Category 1
9/15/1860	UNNAMED	70	Category 1
7/12/1872	UNNAMED	40	Tropical Storm
9/2/1879	UNNAMED	60	Tropical Storm
10/7/1879	UNNAMED	40	Tropical Storm
10/16/1879	UNNAMED	40	Tropical Storm
9/1/1880	UNNAMED	50	Tropical Storm
8/3/1881	UNNAMED	40	Tropical Storm
6/14/1887	UNNAMED	30	Tropical Depression
8/28/1890	UNNAMED	35	Tropical Storm
9/12/1892	UNNAMED	40	Tropical Storm
9/8/1893	UNNAMED	55	Tropical Storm
8/17/1895	UNNAMED	35	Tropical Storm
8/3/1898	UNNAMED	35	Tropical Storm
8/16/1901	UNNAMED	45	Tropical Storm
10/10/1905	UNNAMED	35	Tropical Storm
9/27/1906	UNNAMED	95	Category 2
9/22/1907	UNNAMED	35	Tropical Storm
6/13/1912	UNNAMED	50	Tropical Storm
7/17/1912	UNNAMED	25	Tropical Depression
9/14/1912	UNNAMED	50	Tropical Storm
9/30/1915	UNNAMED	60	Tropical Storm
7/6/1916	UNNAMED	80	Category 1
7/5/1919	UNNAMED	30	Tropical Depression
10/18/1923	UNNAMED	50	Tropical Storm
7/30/1926	UNNAMED	25	Tropical Depression
9/1/1932	UNNAMED	60	Tropical Storm
10/16/1932	UNNAMED	45	Tropical Storm
8/1/1936	UNNAMED	40	Tropical Storm
9/1/1937	UNNAMED	30	Tropical Depression
6/16/1939	UNNAMED	35	Tropical Storm
8/14/1939	UNNAMED	35	Tropical Storm
9/26/1939	UNNAMED	40	Tropical Storm
9/25/1940	UNNAMED	20	Tropical Depression
9/4/1948	UNNAMED	50	Tropical Storm
9/5/1949	UNNAMED	40	Tropical Storm
8/31/1950	BAKER	65	Category 1
6/1/1959	ARLENE	25	Tropical Depression
9/16/1960	ETHEL	35	Tropical Storm
9/26/1960	FLORENCE	15	Tropical Depression

Date of Occurrence	Storm Name	Maximum Wind Speed (knots)	Storm Category
8/18/1969	CAMILLE	100	Category 3
9/16/1971	EDITH	60	Tropical Storm
7/19/1977	UNNAMED	25	Tropical Depression
9/6/1977	BABE	30	Tropical Depression
7/11/1979	BOB	40	Tropical Storm
9/13/1979	FREDERIC	95	Category 2
8/12/1987	UNNAMED	25	Tropical Depression
8/27/1992	ANDREW	30	Tropical Depression
8/4/1995	ERIN	45	Tropical Storm
8/6/2001	BARRY	20	Tropical Depression
9/26/2002	ISIDORE	55	Tropical Storm
7/1/2003	BILL	45	Tropical Storm
7/11/2005	DENNIS	45	Tropical Storm
8/29/2005	KATRINA	80	Category 1
9/14/2007	HUMBERTO	20	Tropical Depression
8/24/2008	FAY	30	Tropical Depression
8/17/2009	CLAUDETTE	25	Tropical Depression
10/28/2020	Zeta	33	Tropical Depression

*It should be noted that the track of several major hurricanes that impacted the region fell outside of the 75-mile buffer. These storms were included in the table due to their significant impact. (Georges, 1988; Ivan, 2004; Issac, 2012)
Source: National Hurricane Center - retrieved April 2021

Federal records indicate that seven disaster declarations were made in 1969 (Hurricane Camille), 1979 (Hurricane Frederic), 1998 (Hurricane Georges), 2004 (Hurricane Ivan), 2005 (Hurricane Dennis and Hurricane Katrina), and 2012 (Hurricane Isaac).[16] Hurricane and tropical storm events can cause substantial damage in the area due to high winds and flooding.

Flooding and high winds from hurricanes and tropical storms can cause damage throughout the region. Anecdotes are available from NCEI for the major storms that have impacted the area as found below:

Tropical Storm Isidore – September 26, 2002
The heavy rainfall associated with Tropical Storm Isidore resulted in significant river and flash flooding across much of Mississippi. Twenty-four-hour rainfall totals between 5 and 10 inches were common over much of Mississippi, especially in the southern part of the state, where 24-hour amounts exceeded 9 inches near Hattiesburg. Gradient wind gusts between 35 and 45 miles per hour combined with the saturated ground to lead to numerous downed trees and powerlines over the state. Most of the damage was seen along and east of the Natchez Trace, near the path of the storm's diffuse center. One indirect fatality was reported just east of the Kalem community in Scott County. Here, a falling tree struck a truck driven by a 31-year-old male. Damage from Isidore was an estimated $500,000.

Tropical Storm Bill – June 30 and July 1, 2003
Heavy rainfall with Tropical Storm Bill resulted in several reports of flash flooding. Forty-eight-hour rainfall totals ranged between 3 and 7 inches, mainly across SE portions of Mississippi. Gradient wind

gusts between 30 and 40 mph combined with saturated soils to down numerous trees very close to center's track. Damage from Bill was an estimated $100,000.

Hurricane Ivan – September 16, 2004
Thousands of trees were blown down across Eastern Mississippi during Hurricane Ivan as well as hundreds of power lines. The strong wind itself did not cause much structural damage, however the fallen trees did. These downed trees accounted for several hundred homes, mobile homes and businesses to be damaged or destroyed. Most locations across Eastern Mississippi reported sustained winds between 30 and 40 mph with Tropical Storm force gusts between 48 and 54 mph. The strongest reported winds occurred in Newton, Lauderdale and Oktibbeha Counties.

Overall, rainfall totals were held in check as Ivan steadily moved north. The heaviest rains were confined to far Eastern Mississippi where 3 to 4 inches fell over a 15-hour period. Due to the duration of the rain no flooding was reported. Across Eastern Mississippi, Hurricane Ivan was responsible for one fatality. This fatality occurred in Brooksville (Noxubee County) when a tree fell on a man. Damage from Ivan was estimated at $200 million.

Tropical Storm Arlene – June 11, 2005
The western periphery of Tropical Storm Arlene affected far Eastern Mississippi during the evening and brought gusty winds and locally heavy rains to that portion of the state. Peak wind gusts were reported up to 40 mph and the combination of wet soils allowed for a few hundred trees to get blown down or uprooted. Several of the downed trees took down power lines and a small few landed on homes causing damage. Additionally, the counties across Eastern Mississippi received 3 to 5 inches of rain as Arlene lifted north.

Hurricane Dennis – July 10, 2005
Hurricane Dennis moved north-northwest across Southwest Alabama and then into East-Central Mississippi and finally across Northeast Mississippi. Wind gusts over tropical storm force were common across areas east of a line from Starkville to Newton to Hattiesburg. These winds caused several hundred trees to uproot or snap and took down numerous power lines. Additionally, a total of 21 homes or businesses sustained minor to major damage from fallen trees or gustywinds.

Heavy rainfall was not a major issue as Dennis steadily moved across the region. Rainfall totals between 2 and 5 inches fell across Eastern Mississippi over a 12-hour period. One indirect fatality occurred in Jasper County from an automobile accident due to wet roads.

Hurricane Katrina – August 29, 2005
Hurricane Katrina will likely go down as the worst and costliest natural disaster in United States history. The amount of destruction, the cost of damaged property/agriculture and the large loss of life across the affected region has been overwhelming. Catastrophic damage was widespread across a large portion of the Gulf Coast region. The devastation was not only confined to the coastal region, widespread and significant damage occurred well inland up to the Hattiesburg area and northward past Interstate 20.

Hurricane force winds were common across Central Mississippi. The region received sustained winds of 60-80 mph with gusts ranging from 80-120 mph. Wind damage to structures was widespread, with roofs blown off or partially peeled. Hundreds of signs were shredded or blown down. Many businesses sustained structural damage as windows were broken, roofs were blown off, and walls were collapsed. Millions of trees were uprooted and snapped. Power poles and lines were snapped and taken down from wind and trees. It was thousands of downed trees which caused the most significant structural damage as these trees fell onto homes and businesses. Power outages lasted from a few days to as long as four weeks. Agriculture and timber industries were severely impacted. Row crops, including cotton, rice, corn, and soybeans, took a hard hit. Other impacted industries were the catfish industry, dairy and cattle industry, and nursery businesses.

5.12.4 Probability of Future Occurrences

Given the inland location of the region, it is more likely to be affected by remnants of hurricane and tropical storm systems (as opposed to a major hurricane) which may result in flooding or high winds. The probability of being impacted is less than coastal areas, but still remains a real threat to the MEMA District 6 Region due to induced events like flooding. Based on historical evidence, the probability level of future occurrence is likely (between 10 and 100 percent annual probability). Given the regional nature of the hazard, all areas in the region are equally exposed to this hazard. However, when the region is impacted, the damage could be catastrophic, threatening lives and property throughout the planning area.

5.13 THUNDERSTORM (WIND, HAIL, LIGHTNING)

5.13.1 Background

THUNDERSTORM / HIGH WIND

Thunderstorms can produce a variety of accompanying hazards including wind (discussed here), hail, and lightning. Although thunderstorms generally affect a small area, they are very dangerous may cause substantial property damage.

Three conditions need to occur for a thunderstorm to form. First, it needs moisture to form clouds and rain. Second, it needs unstable air, such as warm air that can rise rapidly (this often referred to as the “engine” of the storm). Third, thunderstorms need lift, which comes in the form of cold or warm fronts, sea breezes, mountains, or the sun’s heat. When these conditions occur simultaneously, air masses of varying temperatures meet, and a thunderstorm is formed. These storm events can occur singularly, in lines, or in clusters. Furthermore, they can move through an area very quickly or linger for several hours.

According to the National Weather Service, more than 100,000 thunderstorms occur each year, though only about 10 percent of these storms are classified as “severe.” A severe thunderstorm occurs when the storm produces at least one of these three elements: 1) hail of three-quarters of an inch, 2) a tornado, or 3) winds of at least 58 miles per hour.

Downbursts are also possible with thunderstorm events. Such events are an excessive burst of wind in excess of 125 miles per hour. They are often confused with tornadoes. Downbursts are caused by down drafts from the base of a convective thunderstorm cloud. It occurs when rain-cooled air within the cloud becomes heavier than its surroundings. Thus, air rushes towards the ground in a destructive yet isolated manner. There are two types of downbursts. Downbursts less than 2.5 miles wide, duration less than 5 minutes, and winds up to 168 miles per hour are called “microbursts.” Larger events greater than 2.5 miles at the surface and longer than 5 minutes with winds up to 130 miles per hour are referred to as “macrobursts.”

HAILSTORM

Hailstorms are a potentially damaging outgrowth of severe thunderstorms. Early in the developmental stages of a hailstorm, ice crystals form within a low-pressure front due to the rapid rising of warm air into the upper atmosphere and the subsequent cooling of the air mass. Frozen droplets gradually accumulate on the ice crystals until they develop to a sufficient weight and fall as precipitation. Hail typically takes the form of spheres or irregularly-shaped masses greater than 0.75 inches in diameter. The size of hailstones is a direct function of the size and severity of the storm. High velocity updraft winds are required to keep hail in suspension in thunderclouds. The strength of the updraft is a function of the intensity of heating at the Earth's surface. Higher temperature gradients relative to elevation above the surface result in increased suspension time and hailstone size. **Table 5.23** shows the TORRO Hailstorm Intensity Scale which is a way of measuring hail severity.

Table 5.23: TORRO HAILSTORM INTENSITY SCALE

	Intensity Category	Typical Hail Diameter (mm)*	Probable Kinetic Energy, J-m²	mm to inch conversion (inches)	Typical Damage Impacts
H0	Hard Hail	5	0-20	0 - 0.2	No damage
H1	Potentially Damaging	5-**15**	>20	0.2 - 0.6	Slight general damage to plants, crops
H2	Significant	10-**20**	>100	0.4 - 0.8	Significant damage to fruit, crops, vegetation
H3	Severe	20-**30**	>300	0.8 - 1.2	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
H4	Severe	25-**40**	>500	1.0 - 1.6	Widespread glass damage, vehicle bodywork damage
H5	Destructive	30-**50**	>800	1.2 - 2.0	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
H6	Destructive	40-**60**		1.6 - 2.4	Bodywork of grounded aircraft dented, brick walls pitted
H7	Destructive	50-**75**		2.0 - 3.0	Severe roof damage, risk of serious injuries
H8	Destructive	60-**90**		1.6 - 3.5	(Severest recorded in the British Isles) Severe damage to aircraft bodywork
H9	Super Hailstorms	75-**100**		3.0 - 3.9	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open
H10	Super Hailstorms	>100			Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open

Source: http://www.torro.org.uk/site/hscale.php

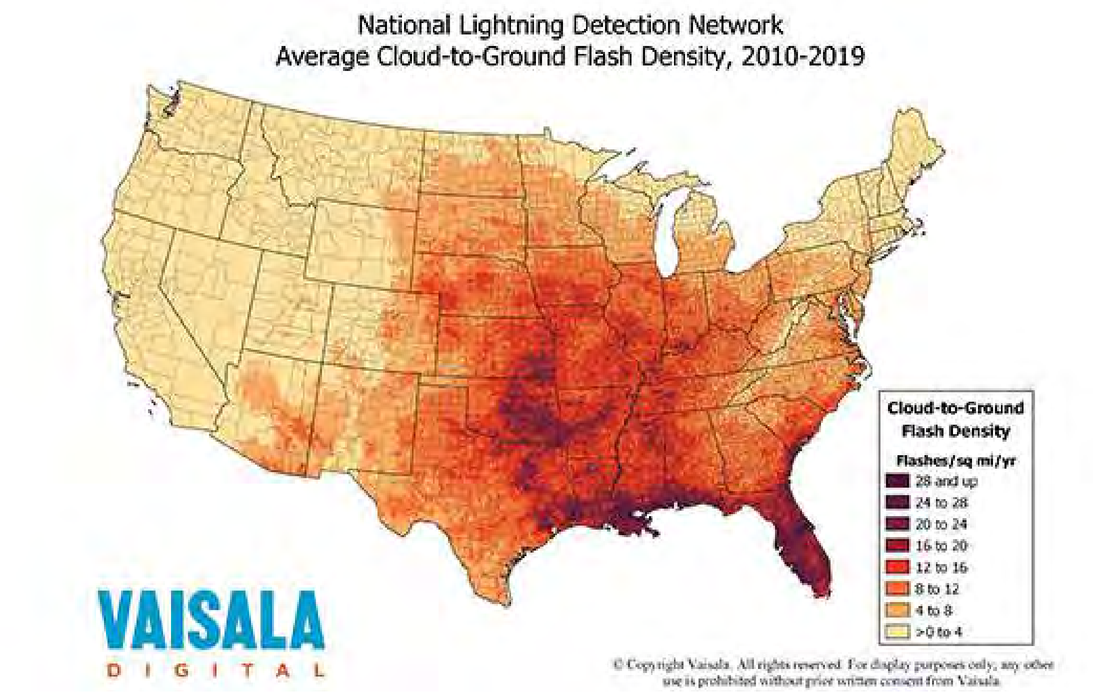
LIGHTNING

Lightning is a discharge of electrical energy resulting from the buildup of positive and negative charges within a thunderstorm, creating a "bolt" when the buildup of charges becomes strong enough. This flash of light usually occurs within the clouds or between the clouds and the ground. A bolt of lightning can reach temperatures approaching 50,000 degrees Fahrenheit. Lightning rapidly heats the sky as it flashes but the surrounding air cools following the bolt. This rapid heating and cooling of the surrounding air causes the thunder which often accompanies lightning strikes. While most often affiliated with severe thunderstorms, lightning may also strike outside of heavy rain and might occur as far as 10 miles away from any rainfall.

Lightning strikes occur in very small, localized areas. For example, they may strike a building, electrical transformer, or even a person. According to FEMA, lightning injures an average of 300 people and kills 80 people each year in the United States. Direct lightning strikes also have the ability to cause significant damage to buildings, critical facilities, and infrastructure largely by igniting a fire. Lightning is also responsible for igniting wildfires that can result in widespread damages to property.

Figure below shows the Vaisala's U.S. National Lightning Detection Network which indicates the average flash density per foot per square kilometer per year.

Figure 5.21: LIGHTNING FLASH DENSITY IN THE UNITED STATES



Source: Vaisala United States National Lightning Detection Network

5.13.2 Location and Spatial Extent

THUNDERSTORM / HIGH WIND

A thunderstorm event is an atmospheric hazard, and thus has no geographic boundaries. It is typically a widespread event that can occur in all regions of the United States. However, thunderstorms are most common in the central and southern states because atmospheric conditions in those regions are favorable for generating these powerful storms. It is assumed that the MEMA District 6 Region has uniform exposure to an event and the spatial extent of an impact could be large.

HAILSTORM

Hailstorms frequently accompany thunderstorms, so their locations and spatial extents coincide. It is assumed that the MEMA District 6 Region is uniformly exposed to severe thunderstorms; therefore, all areas of the region are equally exposed to hail which may be produced by such storms.

LIGHTNING

Lightning occurs randomly, therefore it is impossible to predict where and with what frequency it will strike. It is assumed that all of the MEMA District 6 Region is uniformly exposed to lightning.

5.13.3 Historical Occurrences

THUNDERSTORM / HIGH WIND

Severe storms were at least partially responsible for 21 disaster declarations in the MEMA District 6 Region in between 1971 and 2021. According to NCEI, there have been 2,292 reported thunderstorm and high wind events since 1955 in the MEMA District 6 Region. These events caused over $57.9 million in damages. There were also reports of 6 fatalities and 34 injuries. **Table 5.24** summarizes this information. Detailed thunderstorm and high wind event reports including date, magnitude, and associated damages for each event are presented in the county-specific annexes.

Table 5.24: SUMMARY OF THUNDERSTORM / HIGH WIND OCCURRENCES IN THE MEMA DISTRICT 6 REGION

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Clarke County	215	0/0	$3,820,000
Jasper County	222	0/1	$3,424,000
Kemper County	140	0/7	$1,862,000
Lauderdale County	309	1/4	$6,181,000
Lauderdale County	357	1/4	$6,130,000
Leake County	208	2/6	$8,727,000
Neshoba County	223	1/8	$5,081,000
Newton County	208	1/2	$5,010,000
Scott County	189	0/2	$12,100,000
Smith County	221	0/0	$5,604,000
MEMA DISTRICT 6 REGIONAL TOTAL	2,292	6/34	$57,939,000

Source: National Centers for Environmental Information - retrieved April 2021

HAILSTORM

According to the National Centers for Environmental Information, 891 recorded hailstorm events have affected the MEMA District 6 Region since 1960. **Table 5.25** is a summary of the hail events in the MEMA District 6 Region. Detailed information about each event that occurred in the region is provided in the county- specific annexes. In all, hail occurrences resulted in over $12.98 million in property damages, with significantly higher damages reported in Kemper County and Smith County. Hail ranged in diameter from 0.75 inches to 4.5 inches. It should be noted that hail is notorious for causing substantial damage to cars, roofs, and other areas of the built environment that may not be reported to the National Centers for Environmental Information. Furthermore, high losses in Kemper County and Smith County indicate that neighboring counties may also be subject to additional, unreported losses. Therefore, it is likely that damages are greater than the reported value. Additionally, a single storm event may have affected multiple counties. On an annualized basis, hail accounts for roughly $212,000 in losses to the MEMA District 6 Region.

Table 5.25: SUMMARY OF HAIL OCCURRENCES IN THE MEMA DISTRICT 6 REGION

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Clarke County	**82**	**0/0**	**$372,000**
Jasper County	**99**	**0/0**	**$548,000**
Kemper County	**78**	**0/0**	**$1,215,000**
Lauderdale County	**151**	**0/0**	**$534,000**
Leake County	**77**	**0/0**	**$433,500**
Neshoba County	**111**	**0/0**	**$1,685,000**
Newton County	**116**	**0/0**	**$475,000**
Scott County	**87**	**0/0**	**$5,509,000**
Smith County	**90**	**0/0**	**$2,209,000**
MEMA DISTRICT 6 REGIONAL TOTAL	**891**	**0/0**	**$12,980,500**

Source: National Centers for Environmental Information - retrieved April 2021

LIGHTNING

According to the National Centers for Environmental Information, there have been a total of 25 recorded lightning events in the MEMA District 6 Region since 1998. These events resulted in over $2.1 million in damages, as listed in summary **Table 5.26**. Furthermore, lightning has caused one fatality and three injuries in the MEMA District 6 Region. Detailed information on historical lightning events can be found in the county-specific annexes.

It is certain that more than 25 events have impacted the region. Many of the reported events are those that cause damage, and it should be expected that damages are likely much higher for this hazard than what is reported.

Table 5.26: SUMMARY OF LIGHTNING OCCURRENCES IN THE MEMA DISTRICT 6 REGION

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Clarke County	7	1/1	$237,000
Jasper County	2	0/0	$25,000
Kemper County	1	0/0	$250,000
Lauderdale County	1	0/2	$0
Leake County	3	0/0	$113,000
Neshoba County	6	0/3	$103,000
Newton County	1	0/0	$150,000
Scott County	2	0/0	$155,000
Smith County	2	0/0	$1,103,000
MEMA DISTRICT 6 REGIONAL TOTAL	25	1/6	$2,136,000

Source: National Centers for Environmental Information - retrieved April 2021

5.13.4 Probability of Future Occurrences

THUNDERSTORM / HIGH WIND

Given the high number of previous events, it is certain that thunderstorm events, including straight-line wind events, will occur in the future. This results in a probability level of highly likely (100 percent annual probability) for the entire planning area.

HAILSTORM

Based on historical occurrence information, it is assumed that the probability of future hail occurrences is highly likely (100 percent annual probability). Since hail is an atmospheric hazard, it is assumed that the entire MEMA District 6 Region has equal exposure to this hazard. It can be expected that future hail events will continue to cause minor damage to property and vehicles throughout the region.

LIGHTNING

Although there was not a high number of historical lightning events reported throughout the MEMA District 6 Region via NCEI data, it is a regular occurrence accompanied by thunderstorms. In fact, lightning events will assuredly happen on an annual basis, though all events will not cause damage. According to Vaisala's U.S. National Lightning Detection Network (NLDN), the MEMA District 6 Region is located in an area of the country that experienced an average of 4 to 6 cloud-to-ground lightning flashes per square kilometer per year between 2015 and 2019.[9] Therefore, the probability of future events is highly likely (100 percent annual probability). It can be expected that future lightning events will continue to threaten life and cause minor property damages throughout the region.

[9] Vaisala's Annual Lightning Report – 2020. Retrieved on 9.8.2021 from: https://www.vaisala.com/sites/default/files/documents/WEA-MET-Annual-Lightning-Report-2020-B212260EN-A.pdf

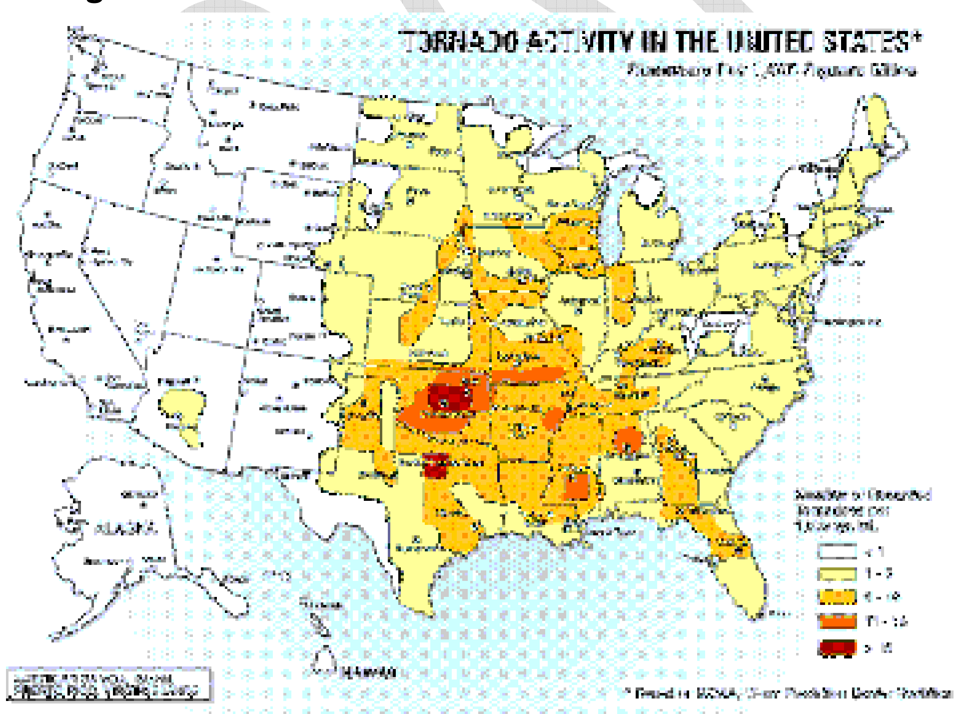
5.14 TORNADO

5.14.1 Background

A tornado is a violent windstorm characterized by a twisting, funnel-shaped cloud extending to the ground. Tornadoes are most often generated by thunderstorm activity (but sometimes result from hurricanes and other tropical storms) when cool, dry air intersects and overrides a layer of warm, moist air forcing the warm air to rise rapidly. The damage caused by a tornado is a result of the high wind velocity and wind-blown debris, also accompanied by lightning or large hail. According to the National Weather Service, tornado wind speeds normally range from 40 miles per hour to more than 300 miles per hour. The most violent tornadoes have rotating winds of 250 miles per hour or more and are capable of causing extreme destruction and turning normally harmless objects into deadly missiles.

Each year, an average of over 800 tornadoes is reported nationwide, resulting in an average of 80 deaths and 1,500 injuries.[24] According to the NOAA Storm Prediction Center (SPC), the highest concentration of tornadoes in the United States has been in Oklahoma, Texas, Kansas, and Florida respectively. Although the Great Plains region of the Central United States does favor the development of the largest and most dangerous tornadoes (earning the designation of "tornado alley"), Florida experiences the greatest number of tornadoes per square mile of all U.S. states (SPC, 2002). **Figure 5.20** shows tornado activity in the United States based on the number of recorded tornadoes per 1,000 square miles.

Figure 5.22: TORNADO ACTIVITY IN THE UNITED STATES



Source: Federal Emergency Management Agency

[24] NOAA, 2009.

Tornadoes are more likely to occur during the months of March through May and are most likely to form in the late afternoon and early evening. Most tornadoes are a few dozen yards wide and touch down briefly, but even small short-lived tornadoes can inflict tremendous damage. Highly destructive tornadoes may carve out a path over a mile wide and several miles long.

The destruction caused by tornadoes ranges from light to inconceivable depending on the intensity, size, and duration of the storm. Typically, tornadoes cause the greatest damage to structures of light construction, including residential dwellings (particularly mobile homes). Tornadic magnitude is reported according to the Fujita and Enhanced Fujita Scales. Tornado magnitudes prior to 2005 were determined using the traditional version of the Fujita Scale (**Table 5.27**). Tornado magnitudes that were determined in 2005 and later were determined using the Enhanced Fujita Scale (**Table 5.28**).

Table 5.27: THE FUJITA SCALE (EFFECTIVE PRIOR TO 2005)

F-SCALE NUMBER	INTENSITY	WINDSPEED	TYPE OF DAMAGE DONE
F0	GALE TORNADO	40–72 MPH	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages to sign boards.
F1	MODERATE TORNADO	73–112 MPH	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.
F2	SIGNIFICANT TORNADO	113–157 MPH	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
F3	SEVERE TORNADO	158–206 MPH	Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted.
F4	DEVASTATING TORNADO	207–260 MPH	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
F5	INCREDIBLE TORNADO	261–318 MPH	Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles fly through the air in excess of 100 meters; trees debarked; steel re-enforced concrete structures badly damaged.
F6	INCONCEIVABLE TORNADO	319–379 MPH	These winds are very unlikely. The small area of damage they might produce would probably not be recognizable along with the mess produced by F4 and F5 wind that would surround the F6 winds. Missiles, such as cars and refrigerators would do serious secondary damage that could not be directly identified as F6 damage. If this level is ever achieved, evidence for it might only be found in some manner of ground swirl pattern, for it may never be identifiable through engineering studies.

Source: National Weather Service

Table 5.28:THE ENHANCED FUJITA SCALE (EFFECTIVE 2005 AND LATER)

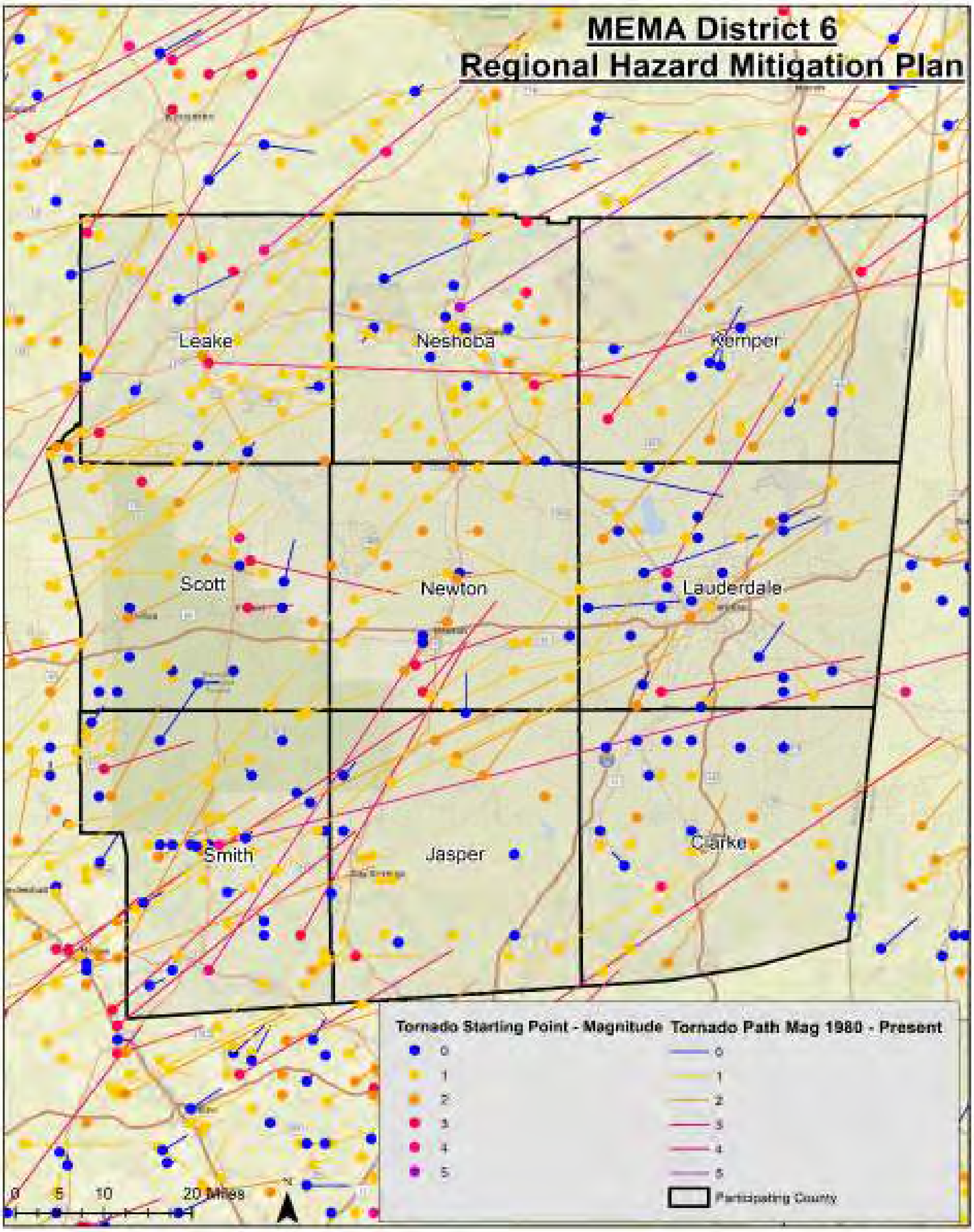
EF-SCALE NUMBER	INTENSITY PHRASE	3 SECOND GUST (MPH)	TYPE OF DAMAGE DONE
EF0	GALE	65–85	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages to sign boards.
EF1	MODERATE	86–110	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.
EF2	SIGNIFICANT	111–135	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
EF3	SEVERE	136–165	Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted.
EF4	DEVASTATING	166–200	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
EF5	INCREDIBLE	Over 200	Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles fly through the air in excess of 100 meters; trees debarked; steel re-enforced concrete structures badly damaged.

Source: National Weather Service

5.14.2 Location and Spatial Extent

Tornadoes occur throughout the state of Mississippi, and thus the MEMA District 6 Region. Tornadoes typically impact a relatively small area, but damage may be extensive. Event locations are completely random and it is not possible to predict specific areas that are more susceptible to tornado strikes over time. Therefore, it is assumed that the MEMA District 6 Region is uniformly exposed to this hazard. With that in mind, figure below shows tornado track data for many of the major tornado events that have impacted the region. While no definitive pattern emerges from this data, some areas that have been impacted in the past may be potentially more susceptible in the future.

Figure 5.23: HISTORICAL TORNADO TRACKS IN THE MEMA DISTRICT 6 REGION



Source: National Weather Service Storm Prediction Center

5.14.3 Historical Occurrences

Tornadoes were at least partially responsible for 18 disaster declarations in the MEMA District 6 Region between 1971 and 2021. According to the National Centers for Environmental Information, there have been a total of 471 recorded tornado events in the MEMA District 6 Region since 1950 (**Table 5.29**), resulting in more than $366.250 million in property damages. In addition, 35 fatalities and 464 injuries were reported. The magnitude of these tornadoes ranges from F0 to F5 in intensity. Detailed information on historical tornado events can be found in the county-specific annexes. Annualized, tornadic events account for $5.15 million dollars in losses to the MEMA District 6 Region each year.

Table 5.29: SUMMARY OF TORNADO OCCURRENCES IN THE MEMA DISTRICT 6 REGION

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Clarke County	39	4/26	$28,520,000
Jasper County	45	2/21	$50,252,000
Kemper County	34	5/36	$43,075,000
Lauderdale County	51	3/100	$19,497,000
Leake County	67	4/66	$65,986,000
Neshoba County	59	3/69	$76,934,000
Newton County	45	1/42	$19,870,000
Scott County	53	2/20	$10,048,000
Smith County	78	11/84	$52,068,000
MEMA DISTRICT 6 REGIONAL TOTAL	471	35/464	$366,250,000

Source: National Centers for Environmental Information - retrieved April 2021

There have been several significant tornado events in the MEMA District 6 Region. The text below describes one of the major events and associated impacts on the region.

From April 25 to 28, 2011, the largest tornado outbreak ever recorded affected the Southern, Midwestern, and Northeastern U.S., leaving catastrophic destruction in its wake, especially across the states of Alabama and Mississippi. On April 27, 10 tornadoes were reported in the MEMA District 6 region that ranged in magnitude from EF0 to EF5. These tornadoes resulted in 10 fatalities, 20 injuries, and $5,102,934 in property damages across the region.

5.14.4 Probability of Future Occurrences

According to historical information, tornado events pose a significant threat to the MEMA District 6 Region. The probability of future tornado occurrences affecting MEMA District 6 Region is likely (between 10 and 100 percent annual probability).

OTHER HAZARDS

5.15 HAZARDOUS MATERIALS INCIDENTS

5.15.1 Background

Hazardous materials can be found in many forms and quantities that can potentially cause death; serious injury; long-lasting health effects; and damage to buildings, homes, and other property in varying degrees. Such materials are routinely used and stored in many homes and businesses and are also shipped daily on the nation's highways, railroads, waterways, and pipelines. This subsection on the hazardous material hazard is intended to provide a general overview of the hazard, and the threshold for identifying fixed and mobile sources of hazardous materials is limited to general information on rail, highway, and fixed HAZMAT sites determined to be of greatest significance as appropriate for the purposes of this plan.

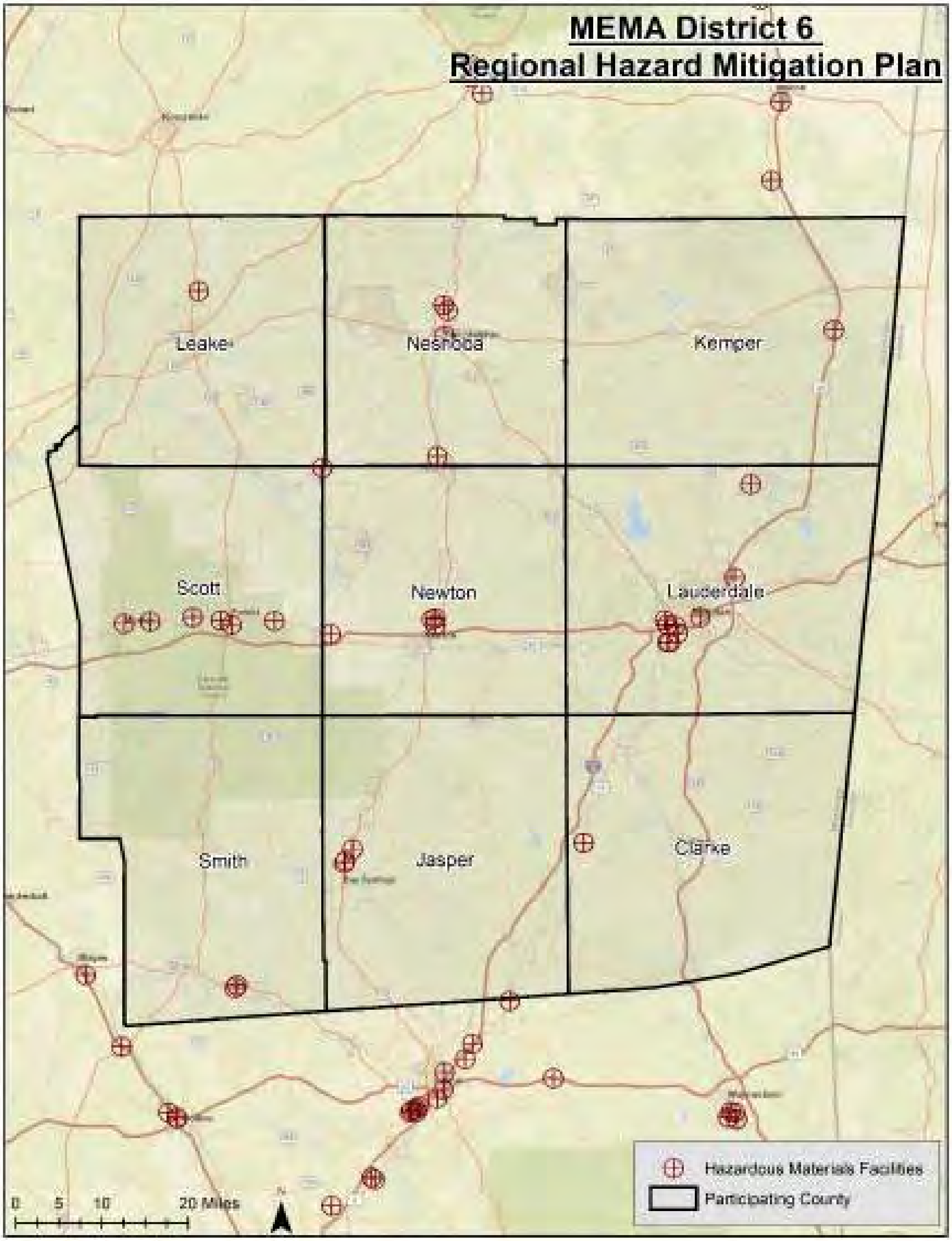
Hazardous material (HAZMAT) incidents can apply to fixed facilities as well as mobile, transportation-related accidents in the air, by rail, on the nation's highways, and on the water. Approximately 6,774 HAZMAT events occur each year, 5,517 of which are highway incidents, 991 are railroad incidents, and 266 are due to other causes. In essence, HAZMAT incidents consist of solid, liquid, and/or gaseous contaminants that are released from fixed or mobile containers, whether by accident or by design as with an intentional terrorist attack. A HAZMAT incident can last hours to days, while some chemicals can be corrosive or otherwise damaging over longer periods of time. In addition to the primary release, explosions and/or fires can result from a release, and contaminants can be extended beyond the initial area by persons, vehicles, water, wind, and possibly wildlife as well.

Hazardous material incidents can include the spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment of a hazardous material, but exclude: (1) any release which results in exposure to poisons solely within the workplace with respect to claims which such persons may assert against the employer of such persons; (2) emissions from the engine exhaust of a motor vehicle, rolling stock, aircraft, vessel or pipeline pumping station engine; (3) release of source, byproduct, or special nuclear material from a nuclear incident; and
(4) the normal application of fertilizer.

5.15.2 Location and Spatial Extent

As a result of the 1986 Emergency Planning and Community Right to Know Act (EPCRA), the Environmental Protection Agency provides public information on hazardous materials. One facet of this program is to collection information from industrial facilities on the releases and transfers of certain toxic agents. This information is then reported in the Toxic Release Inventory (TRI). TRI sites indicate where such activity is occurring. The MEMA District 6 Region has 32 TRI sites. These sites are shown below.

Figure 5.24: TOXIC RELEASE INVENTORY (TRI) SITES IN THE MEMA DISTRICT 6 REGION



Source: Environmental Protection Agency

In additional to "fixed" hazardous materials locations, hazardous materials may also impact the region via roadways and rail. Many roads in the region are subject to hazardous materials transport and all roads that permit hazardous material transport are considered potentially at risk to an incident.

5.15.3 Historical Occurrences

The U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA) lists historical occurrences throughout the nation. A "serious incident" is a hazardous materials incident that involves:

- a fatality or major injury caused by the release of a hazardous material,
- the evacuation of 25 or more persons as a result of release of a hazardous material or exposure to fire,
- a release or exposure to fire which results in the closure of a major transportation artery,
- the alteration of an aircraft flight plan or operation,
- the release of radioactive materials from Type B packaging,
- the release of over 11.9 galls or 88.2 pounds of a severe marine pollutant, or
- the release of a bulk quantity (over 199 gallons or 882 pounds) of a hazardous material.

However, prior to 2002, a hazardous materials "serious incident" was defined as follows:

- a fatality or major injury due to a hazardous material,
- closure of a major transportation artery or facility or evacuation of six or more person due to the presence of hazardous material, or
- a vehicle accident or derailment resulting in the release of a hazardous material.

There has been a total of 310 recorded HAZMAT incidents in the MEMA District 6 Region since 1971. These events resulted in almost $4.9 million in remediation costs and property damage as well as 8 injuries. **Table 5.30** summarizes the HAZMAT incidents reported in the MEMA District 6 Region. Detailed information on these events is presented in the county-specific annexes.

Table 5.30: SUMMARY OF HAZMAT INCIDENTS IN THE MEMA DISTRICT 6 REGION

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Clarke County	**4**	**0/0**	**$331,225**
Jasper County	**10**	**0/0**	**$344,778**
Kemper County	**0**	**0/0**	**$0**
Lauderdale County	**269**	**0/7**	**$2,022,646**
Leake County	**1**	**0/0**	**$0**
Neshoba County	**3**	**0/0**	**$0**
Newton County	**9**	**0/1**	**$374,544**
Scott County	**9**	**0/0**	**$1,569,600**
Smith County	**5**	**0/0**	**$250,783**
MEMA DISTRICT 6 REGIONAL TOTAL	**310**	**0/8**	**$4,893,576**

Source: United States Department of Transportation Pipeline and Hazardous Materials Safety Administration - retrieved April 2021

5.15.4 Probability of Future Occurrence

Given the location of more than thirty toxic release inventory sites in the MEMA District 6 Region and prior roadway and railway incidents, it is likely (between 10 and 100 percent annual probability) that a hazardous material incident may occur in the region. County and town officials are mindful of this possibility and take precautions to prevent such an event from occurring. Furthermore, there are detailed plans in place to respond to an occurrence.

5.16 Pandemic

5.16.1 Background

A pandemic is defined as an epidemic occurring worldwide, or over a very wide area, crossing international boundaries and usually affecting a large number of people. A pandemic result when a virus mutates from an animal to a strain that can be passed to humans. Humans have no immunity to these new strains, making them especially deadly. The strain may ultimately mutate to a form where it can be passed from human-to-human. Given the lack of immunity, the virus spreads quickly and can have devastating effects on the population. When the virus spreads globally, it is deemed a pandemic.

The World Health Organization (WHO) constantly monitors influenza cases throughout the world and has implemented a six-phase system:

- **Phase 1**: No new influenza virus has been found in people or animals.
- **Phase 2**: an animal influenza virus circulating among domesticated or wild animals is known to have caused infection in humans, and is therefore considered a potential pandemic threat.
- **Phase 3**: an animal or human-animal influenza reassortant virus has caused sporadic cases or small clusters of disease in people, but has not resulted in human-to-human transmission sufficient to sustain community-level outbreaks. Limited human-to-human transmission may occur under some circumstances, for example, when there is close contact between an infected person and an unprotected caregiver. However, limited transmission under such restricted circumstances does not indicate that the virus has gained the level of transmissibility among humans necessary to cause a pandemic.
- **Phase 4**: Is characterized by verified human-to-human transmission of an animal or human-animal influenza reassortant virus able to cause "community-level outbreaks". The ability to cause sustained disease outbreaks in a community marks a significant upwards shift in the risk of a pandemic. Any country that suspects or has verified such an event should urgently consult with WHO so that the situation can be jointly assessed and a decision made by the affected country if implementation of a rapid pandemic containment operation is warranted. Phase 4 indicates a significant increase in risk of a pandemic but does not necessarily mean that a pandemic is a forgone conclusion.
- **Phase 5**: is characterized by human-to-human spread of the virus into at least two countries in one WHO region. While most countries will not be affected at this stage, the declaration of Phase 5 is a strong signal that a pandemic is imminent and that the time to finalize the organization, communication, and implementation of the planned mitigation measures is short.
- **Phase 6**: the pandemic phase, is characterized by community level outbreaks in at least one other

country in a different WHO region in addition to the criteria defined in Phase 5. Designation of this phase will indicate that a global pandemic is under way

- **Post-Peak Period**: Levels of pandemic influenza in most countries have dropped below peak levels.
- **Possible New Wave**: Level of pandemic influenza activity in most counties rising again.
- **Post-Pandemic Period**: Levels of influenza activity have returned to levels seen for seasonal influenza.

Pandemics are also known to occur in waves. For example, initial wave of infected persons may be those first to contract the virus. These people may subsequently pass it to health officials or family members. For this reason, the duration of pandemic outbreaks tends to last weeks or even months.

5.16.2 Location & Spatial Extent

Pandemics are global in nature. However, they may start anywhere. The MEMA District 6 Region chose to analyze this hazard given the current and on-going COVID-19 Public Health Emergency.

All populations should be considered at risk to pandemic. Buildings and infrastructure while not directly impacted by the virus/pathogen could be indirectly impacted if people are not able to operate and maintain them due to illness. Many buildings could potentially be shutdown, at least temporarily, as a result. Employers may initiate work from home procedures for non-essential workers in order to help stop infection. Commerce activities, and thus the economy, may suffer greatly during this time.

5.16.3 Historical Occurrences

Several pandemics have been reported throughout history. A short history of the flu/Spanish Flu was collected from The Historical Text Archive and is described below. [38]

The first known pandemic dates back to 430 B.C. with the Plague of Athens. It reportedly killed a quarter of the population over four years due to typhoid fever. In 165-180 A.D., the Antonine Plague killed nearly 5 million people. Next, the Plague of Justinian (the first bubonic plague pandemic) occurred from 541 to 566. It killed 10,000 people a day at its peak and resulted in a 50 percent drop in Europe's population.

Since the 1500s, influenza pandemics have occurred about three times every century or roughly every 10-50 years. The Black Death devastated European populations in the 14th century. Nearly a third of the population (20-30 million) was killed over six years. From 1817 to present, seven Cholera Pandemics have impacted to the world and killed millions. Perhaps most severe, was the Third Cholera Pandemic (1852-1959) which started in China. Isolated cases can still be found in the Western U.S. today. There were three major pandemics in the 20th century (1918-1919, 1957-1958, and 1968-1969). The most infamous pandemic flu of the 20th century, however, was that of 1918-1919. Since the 1960s, there has been two pandemics, the 2009 H1N1 influenza and SARS-CoV-2 (COVID-19). The pandemics of the 20th and 21st centuries that impacted the United States are detailed below.

1918 Spanish Flu: This was the most devastating flu of the 20th century. This pandemic spread across the world in three waves between 1918 and 1919. It typically impacted areas for around twelve weeks and then would largely disappear. However, it would frequently reemerge several months later. Worldwide, approximately 50 million persons died and over a quarter of the population was infected. Nearly 675,000 people died in the United States. The illness came on suddenly and could cause death within a few hours. The virus impacted those aged 15 to 35 especially hard. The movement of troops during World War I is thought to have facilitated the spread of the virus.

In Mississippi, state officials noted that "epidemics have been reported from a number of places in the State," on October 4th, 1918. By the 18th, twenty-six localities reported 1,934 cases (the real number of cases was likely much higher). West Point, Mississippi was hit especially hard and quarantine was established. Throughout the state, African Americans were impacted at a greater rate than white populations. This is thought to be partly caused from a shortage of caretakers. It is estimated that over 6,000 people died in Mississippi, though that number may be much higher as death records were not widely recorded.

***1957 Asian Flu*:** It is estimated that the Asian Flu caused 2 million deaths worldwide. Approximately 70,000 deaths were in the U.S. However, the proportion of people impacted was substantially higher than that of the Spanish Flu. This flu was characterized as having much milder effects than the Spanish Flu and greater survivability. Similar to other pandemics, this pandemic has two waves. Elderly and infant populations were more likely to succumb to death. This flu is thought to have originated from a genetic mutation of a bird virus.

***1968 Hong Kong Flu*:** The Hong Kong Flu is thought to have caused one million deaths worldwide. It was milder than both the Asian and Spanish influenza viruses. It was similar to the Asian Flu, which may have provided some immunity to the virus. It had the most severe impact on elderly populations.

2009 H1N1 Influenza: This flu was derived from human, swine, and avian virus strains. It was initially reported in Mexico in April 2009. On April 26, the U.S. government declared H1N1 a public health emergency. A vaccine was developed and over 80 million were vaccinated which helped minimize the impacts. The virus had mild impacts on most of the population but did cause death (usually from viral pneumonia) in high-risk populations such as pregnant women, obese persons, indigenous people, and those with chronic respiratory, cardiac, neurological, or immunity conditions. Worldwide, it is estimated that 43 million to 89 million people contracted H1N1 between April 2009 and April 2010, and between 8,870 and 18,300 H1N1 cases resulted in death.

2020 SARS-CoV-2 (COVID-19): Coronavirus Disease 2019 (COVID-19) was declared as pandemic by the World Health Organization on March 11th, 2020 mainly due to the speed and scale of the transmission of the disease. Before that, it started as an epidemic in mainland China with the focus being firstly reported in the city of Wuhan, Hubei province in February 26th. The etiologic agent of COVID-19 was isolated and identified as a novel coronavirus, initially designated as 2019-nCoV. Later, the virus genome was sequenced and because it was genetically related to the coronavirus outbreak responsible for the SARS outbreak of 2003, the virus was named as severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) by the International Committee for Taxonomy of Viruses.

As of May 2021, the COVID-19 pandemic has resulted in over 156 million confirmed cases and over 3.6 million deaths globally, with 32.6 million confirmed cases and 579,000 deaths in the United States alone. It has also sparked fears of an impending economic crisis and recession. Social distancing, self-isolation and travel restrictions have led to a reduced workforce across all economic sectors and caused many jobs to be lost. Schools closed down, and the need for commodities and manufactured products had decreased. In contrast, the need for medical supplies had significantly increased. The food sector also faced increased demand due to panic-buying and stockpiling of food products. No industry or sector was left untouched by COVID-19.

- **Agriculture** - A global crash in demand from hotels and restaurants saw prices of agricultural commodities drop by 20%

- **Petroleum & Oil** - During a meeting at the Organization of the Petroleum Exporting Countries (OPEC) in Vienna on March 6th, 2020 a refusal by Russia to slash oil production triggered Saudi Arabia to retaliate with extraordinary discounts to buyers and a threat to pump more crude. Saudi, regarded as the de facto leader of OPEC, increased its provision of oil by 25% compared to February – taking production volume to an unprecedented level. This caused the steepest one-day price crash seen in nearly 30 years
- **Education** - COVID-19 has affected all levels of the education system, from pre-school to post-secondary education. Different countries introduced various policies, ranging from complete closure in Germany, Italy, and the United States to targeted closure in the United Kingdom for all but the children of workers in key industries.
- **Finance Industry** - COVID-19 has affected communities, businesses and organizations globally, inadvertently affecting the financial markets and the global economy. Uncoordinated governmental responses and lockdowns have led to a disruption in the supply chain. In China, lockdown restrictions significantly reduced the production of goods from factories, while quarantine and self-isolation policies decreased consumption, demand and utilization of products and services

5.16.4 Probability of Future Occurrences

Based on historical occurrence information, it is assumed that all of the MEMA District 6 Region has a probability level of unlikely (less than 1 percent annual probability) for future pandemic events. The massive increase in globalization and connectivity has meant that a virus can spread from one side of the world to another in mere hours. In 2020, people around the world were as used to hopping on an international flight as they were catching a bus or a train. Air travel makes it possible for someone to travel halfway across the globe in less time than it takes for many diseases to incubate, making it extremely difficult to prevent their spread. In 1990, 1 billion people travelled by air, a number that has since increased to more than 4.2 billion in 2018. While pandemics are still relatively rare, the ease of international travel, coupled with climate change, and urbanization increases the probability of more frequent pandemics.

The Mississippi State Department of Health maintains a state pandemic plan which can be found here: http://www.msdh.state.ms.us/msdhsite/index.cfm/44,1136,122,154,pdf/SNSPlan.pdf It should also be noted that several counties in the region maintain Pandemic Incident Response Plans.

5.17 CONCLUSIONS ON HAZARD RISK

The hazard profiles presented in this section were developed using best available data and result in what may be considered principally a qualitative assessment as recommended by FEMA in its "How-to" guidance document titled *Understanding Your Risks: Identifying Hazards and Estimating Losses* (FEMA Publication 386-2). It relies heavily on historical and anecdotal data, stakeholder input, and professional and experienced judgment regarding observed and/or anticipated hazard impacts. It also carefully considers the findings in other relevant plans, studies, and technical reports.

5.17.1 Hazard Extent

Table 5.31 describes the extent of each natural hazard identified for the MEMA District 6 Region. The extent of a hazard is defined as its severity or magnitude, as it relates to the planning area.

Table 5.31: EXTENT OF MEMA DISTRICT 6 REGION HAZARDS

Flood-related Hazards	
Flood	Flood extent can be measured by the amount of land and property in the floodplain as well as flood height and velocity. The amount of land in the floodplain accounts for 15.8 percent of the total land area in the MEMA District 6 Region. Flood depth and velocity are recorded via United States Geological Survey stream gages throughout the region. While a gage does not exist for each participating jurisdiction, there is one at or near many areas. The greatest peak discharge recorded for the region was near Lena in Leake County in 1979. Water reached a discharge of 122,000 cubic feet per second and the stream gage height was recorded at 32.2 feet. Additional peak discharge readings and gage heights are in the table below.

Location/ Jurisdiction	Date	Peak Discharge (cfs)	Gage Height (ft)
Clarke County			
Chickasawhay River at Enterprise	2/23/1961	61,700	37.94
Chickasawhay River near Quitman	April 1900	66,000	50.91
Souinlovie Creek near Pachuta	April 1900	27,000	59.00
Chickasawhay River at Shubuta	April 1900	90,000	47.90
Jasper County			
Tallahala Creek at Waldrup (unincorporated area)	2/6/2004	18,900	23.17

Kemper County			
Hamilton Branch near De Kalb	4/13/1974	662	7.58
Flat Scooba Creek Tributary near Scooba	4/12/1979	427	8.87
Lauderdale County			
Okatibbee Creek near Meridian	2/22/1961	27,000	26.14
Leake County			
Pearl River near Carthage	4/14/1979	102,000	28.74
Pearl River near Lena	4/17/1979	122,000	32.20
Tuscolameta Creek at Walnut Grove	4/8/2003	45,800	32.08
Neshoba County			
Pearl River at Burnside (unincorporated area)	4/13/1979	76,600	23.60
Newton County			
Potterchitto Creek at Newton	4/7/2003	8,520	18.64
Scott County			
Strong River near Morton	12/24/1974	5,600	22.00
Smith County			
Oakohay Creek at Mize	4/13/1974	28,900	17.26
Leaf River near Raleigh	4/13/1974	17,000	28.17
Leaf River near Taylorsville	4/14/1974	37,600	57.44

Erosion	The extent of erosion can be defined by the measurable rate of erosion that occurs. There are no erosion rate records located in the MEMA District 6 Region.
Dam Failure	Dam Failure extent is defined using the Mississippi Division of Environmental Quality criteria (Table 5.7). Forty-eight dams are classified as high-hazard in the MEMA District 6 Region. • Clarke County: 0 high hazard dams • Jasper County: 3 high hazard dams • Kemper County: 3 high hazard dams • Lauderdale County: 33 high hazard dams • Leake County: 0 high hazard dams • Neshoba County: 1 high hazard dam • Newton County: 3 high hazard dams • Scott County: 2 high hazard dams • Smith County: 3 high hazard dams

Winter Storm and Freeze	The extent of winter storms can be measured by the amount of snowfall received (in inches). Official long term snow records are only kept for one location in the MEMA District 6 Region. The greatest snowfall reported in Meridian (Lauderdale County) was 14.0 inches in 1963.
Fire-related Hazards	
Drought / Heat Wave	Drought extent is defined by the U.S. Drought Monitor Classifications which include Abnormally Dry, Moderate Drought, Severe Drought, Extreme Drought, and Exceptional Drought. According to the U.S. Drought Monitor Classifications, the most severe drought condition is Exceptional. All of the participating counties have received this ranking at least once over the fifteen-year reporting period. The extent of extreme heat can be measured by the record high temperature recorded. Official long term temperature records are only kept for one location in the MEMA District 6 Region. The highest recorded temperature in Meridian (Lauderdale County) was 107°F in 1980.
Wildfire	Wildfire data was provided by the Mississippi Forestry Commission and is reported annually by county from 2005-2014. The greatest number of fires in one year occurred in Jasper County and the greatest number of acres burned in year occurred in Smith County. Analyzing the data by county indicates the following wildfire hazard extent for each county. ***Clarke County*** • The greatest number of fires to occur in any year was 75 in 2006. • The great number of acres to burn in a single year occurred in 2006 when 1,057 acres were burned. ***Jasper County*** • The greatest number of fires to occur in any year was 106 in 2007. • The great number of acres to burn in a single year occurred in 2006 when 1,144 acres were burned. ***Kemper County*** • The greatest number of fires to occur in any year was 43 in 2007. • The great number of acres to burn in a single year occurred in 2007 when 533 acres were burned. ***Lauderdale County*** • The greatest number of fires to occur in any year was 53 in 2007. • The great number of acres to burn in a single year occurred in 2007 when 887 acres were burned. ***Leake County*** • The greatest number of fires to occur in any year was 102 in 2007. • The great number of acres to burn in a single year occurred in 2007 when 1,994 acres were burned. ***Neshoba County*** • The greatest number of fires to occur in any year was 47 in 2005. • The great number of acres to burn in a single year occurred in 2014

	when 356 acres were burned. ***Newton County*** • The greatest number of fires to occur in any year was 57 in 2007. • The great number of acres to burn in a single year occurred in 2006 when 509 acres were burned. ***Scott County*** • The greatest number of fires to occur in any year was 37 in 2007. • The great number of acres to burn in a single year occurred in 2006 when 503 acres were burned. ***Smith County*** • The greatest number of fires to occur in any year was 50 in 2006 and 2007. • The great number of acres to burn in a single year occurred in 2008 when 4,405 acres were burned.
Geologic Hazards	
Earthquake	Earthquake extent can be measured by the Richter Scale (Table 5.16), the Modified Mercalli Intensity (MMI) scale (Table 5.17), and the distance of the epicenter from the MEMA District 6 Region. According to data provided by the National Geophysical Data Center, the greatest earthquake to impact the region was reported in Leake County with an MMI of V (slightly strong) and a correlating Richter Scale measurement of approximately 4.9. • Clarke County: MMI of II; unknown magnitude; 829.0 km to epicenter • Jasper County: MMI of III; unknown magnitude; 240.0 km to epicenter • Kemper County: MMI of III; unknown magnitude; 229.0 km to epicenter • Lauderdale County: MMI of IV; unknown magnitude; 218.0 km to epicenter • Leake County: MMI of V; 4.9 magnitude; 461.0 km to epicenter • Neshoba County: None Reported • Newton County: None Reported • Scott County: None Reported • Smith County: None Reported
Landslide	As noted above in the landslide profile, there is no extensive history of landslides in the MEMA District 6 Region and landslide events typically occur in isolated areas. This provides a challenge when trying to determine an accurate extent for the landslide hazard. However, when using the USGS landslide susceptibility index, extent can be measured with incidence, which is low throughout most of the MEMA District 6 Region, except for some areas of moderate incidence in the southwestern portion. There is also low susceptibility throughout the majority of the region, except for some areas in the southwestern portion which have moderate and high susceptibility.
Land Subsidence	The extent of land subsidence can be defined by the measurable rate of subsidence that occurs. There are no subsidence rate records located in the MEMA District 6 Region nor is there any significant historical record of events.
Wind-related Hazards	
Hurricane and Tropical Storm	Hurricane extent is defined by the Saffir-Simpson Scale which classifies hurricanes into Category 1 through Category 5 (Table 5.20). The greatest classification of hurricane to traverse directly through the MEMA District 6 Region was Hurricane

	Frederic, which was a Category 2 hurricane when it passed through the region. • Clarke County: Hurricane Frederic, Category 2 (95 knots) • Jasper County: Hurricane Katrina, Category 1 (80 knots) • Kemper County: Hurricane Frederic, Category 1 (65 knots) • Lauderdale County: Hurricane Frederic, Category 1 (65 knots) • Leake County: Unnamed 1879 Storm, Tropical Storm (50 knots) • Neshoba County: Hurricane Katrina, Category 1 (80 knots) • Newton County: Hurricane Katrina, Category 1 (80 knots) • Scott County: Unnamed 1915 Storm, Tropical Storm (60 knots) • Smith County: Hurricane Katrina, Category 1 (80 knots)
Thunderstorm / Hail / Lightning	Thunderstorm extent is defined by the number of thunder events and wind speeds reported. According to a 65-year history from the National Centers for Environmental Information the strongest recorded wind event in the MEMA District 6 Region was reported on February 12, 2008 at 90 knots (approximately 104 mph). It should be noted that future events may exceed these historical occurrences. • Clarke County: 72 knots • Jasper County: 75 knots • Kemper County: 87 knots • Lauderdale County: 87 knots • Leake County: 80 knots • Neshoba County: 80 knots • Newton County: 83 knots • Scott County: 87 knots • Smith County: 90 knots Hail extent can be defined by the size of the hail stone. The largest hail stone reported in the MEMA District 6 Region was 4.5 inches (reported on April 15, 2011). It should be noted that future events may exceed this. • Clarke County: 4.25 inches • Jasper County: 2.5 inches • Kemper County: 4.5 inches • Lauderdale County: 2.75 inches • Leake County: 2.75 inches • Neshoba County: 2.75 inches • Newton County: 1.75 inches • Scott County: 2.0 inches • Smith County: 2.75 inches According to the Vaisala's flash density map (Figure 5.17), the MEMA District 6 Region is located in an area that experiences 6 to 8 lightning flashes per square kilometer per year. It should be noted that future lightning occurrences may exceed these figures.

Tornado	Tornado hazard extent is measured by tornado occurrences in the US provided by FEMA (Figure 5.18) as well as the Fujita/Enhanced Fujita Scale (Tables 5.27 and 5.28). The greatest magnitude reported was an F5 (reported on March 3, 1966). • Clarke County: F4 • Jasper County: F4 • Kemper County: F4 • Lauderdale County: F4 • Leake County: F5 • Neshoba County: F3 • Newton County: F4 • Scott County: F4 • Smith County: F4
Other Hazards	
Hazardous Materials Incident	According to USDOT PHMSA, the largest hazardous materials incident reported in the region was 16,000 LGA released on the railway on July 4, 1977. It should be noted that larger events are possible. • Clarke County: 2,730 LGA • Jasper County: 2,113 LGA • Kemper County: 3,287 LGA • Lauderdale County: 13,000 LGA • Leake County: 0.13368 GCF • Neshoba County: 1,937 LGA • Newton County: 16,000 LGA • Scott County: 6,133 LGA • Smith County: 4,000 LGA
Pandemic	Due to historical reporting limitations, the data from only COVID-19 has been included below. The following data is current as of 08/10/2021 and represents the deaths reported: • Clarke County: 80 • Jasper County: 48 • Kemper County: 30 • Lauderdale County: 246 • Leake County: 77 • Neshoba County: 182 • Newton County: 65 • Scott County: 77 • Smith County: 37

5.17.2 Priority Risk Index

In order to draw some meaningful planning conclusions on hazard risk for the MEMA District 6 Region, the results of the hazard profiling process were used to generate region-wide hazard classifications according to a "Priority Risk Index" (PRI). The purpose of the PRI is to categorize and prioritize all potential hazards for the MEMA District 6 Region as high, moderate, or low risk. Combined with the asset inventory and quantitative vulnerability assessment provided in the next section, the summary hazard classifications generated through the use of the PRI allows for the prioritization of those high hazard risks for mitigation planning purposes and, more specifically, the identification of hazard mitigation opportunities for the MEMA District 6 Region to consider as part of their proposed mitigation strategy.

The prioritization and categorization of identified hazards for the MEMA District 6 Region is based principally on the PRI, a tool used to measure the degree of risk for identified hazards in a particular planning area. The PRI is used to assist the MEMA District 6 Regional Hazard Mitigation Council in gaining consensus on the determination of those hazards that pose the most significant threat to the MEMA District 6 counties based on a variety of factors. The PRI is not scientifically based, but is rather meant to be utilized as an objective planning tool for classifying and prioritizing hazard risks in the MEMA District 6 Region based on standardized criteria.

The application of the PRI results in numerical values that allow identified hazards to be ranked against one another (the higher the PRI value, the greater the hazard risk). PRI values are obtained by assigning varying degrees of risk to five categories for each hazard (probability, impact, spatial extent, warning time, and duration). Each degree of risk has been assigned a value (1 to 4) and an agreed upon weighting factor, as summarized in **Table 5.32**. To calculate the PRI value for a given hazard, the assigned risk value for each category is multiplied by the weighting factor. The sum of all five categories equals the final PRI value, as demonstrated in the example equation below:

PRI VALUE = [(PROBABILITY x .30) + (IMPACT x .30) + (SPATIAL EXTENT x .20) + (WARNING TIME x .10) + (DURATION x .10)]

According to the weighting scheme and point system applied, the highest possible value for any hazard is 4.0. When the scheme is applied for the MEMA District 6 Region, the highest PRI value is 3.1 (thunderstorm wind / high wind). Prior to being finalized, PRI values for each identified hazard were reviewed and accepted by the members of the MEMA District 6 Regional Hazard Mitigation Council.

Table 5.32: PRIORITY RISK INDEX FOR THE MEMA DISTRICT 6 REGION

PRI Category	Degree of Risk			Assigned Weighting Factor
	Level	Criteria	Index Value	
Probability	Unlikely	Less than 1% annual probability	1	30%
	Possible	Between 1 and 10% annual probability	2	
	Likely	Between 10 and 100% annual probability	3	
	Highly Likely	100% annual probability	4	
Impact	Minor	Very few injuries, if any. Only minor property damage and minimal disruption on quality of life. Temporary shutdown of critical facilities.	1	30%
	Limited	Minor injuries only. More than 10% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for more than one day.	2	
	Critical	Multiple deaths/injuries possible. More than 25% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for more than one week.	3	
	Catastrophic	High number of deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for 30 days or more.	4	
Spatial Extent	Negligible	Less than 1% of area affected	1	20%
	Small	Between 1 and 10% of area affected	2	
	Moderate	Between 10 and 50% of area affected	3	
	Large	Between 50 and 100% of area affected	4	
Warning Time	More than 24 hours	Self explanatory	1	10%
	12 to 24 hours	Self explanatory	2	
	6 to 12 hours	Self explanatory	3	
	Less than 6 hours	Self explanatory	4	
Duration	Less than 6 hours	Self explanatory	1	10%
	Less than 24 hours	Self explanatory	2	
	Less than one week	Self explanatory	3	
	More than one week	Self explanatory	4	

5.17.3 Priority Risk Index Results

Table 5.33 summarizes the degree of risk assigned to each category for all initially identified hazards based on the application of the PRI. Assigned risk levels were based on the detailed hazard profiles developed for this section, as well as input from the Regional Hazard Mitigation Council. The results were then used in calculating PRI values and making final determinations for the risk assessment.

Table 5.33: SUMMARY OF PRI RESULTS FOR THE MEMA DISTRICT 6 REGION

Hazard	Category/Degree of Risk					
	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score
Flood-related Hazards						
Flood	Likely	Critical	Moderate	6 to 12 hours	Less than 24 hours	**2.9**
Erosion	Possible	Minor	Small	More than 24 hours	More than 1 week	**1.8**
Dam Failure	Possible	Critical	Small	Less than 6 hours	Less than 6 hours	**2.4**
Winter Storm and Freeze	Likely	Limited	Moderate	More than 24 hours	Less than 24 hours	**2.4**
Fire-related Hazards						
Drought / Heat Wave	Likely	Minor	Large	More than 24 hours	More than 1 week	**2.5**
Wildfire	Highly Likely	Minor	Small	Less than 6 hours	Less than 1 week	**2.6**
Geologic Hazards						
Earthquake	Possible	Minor	Moderate	Less than 6 hours	Less than 6 hours	**2.0**
Landslide	Unlikely	Minor	Small	Less than 6 hours	Less than 6 hours	**1.5**
Land Subsidence	Unlikely	Minor	Small	Less than 6 hours	Less than 6 hours	**1.5**
Wind-related Hazards						
Hurricane and Tropical Storm	Likely	Critical	Large	More than 24 hours	Less than 24 hours	**2.9**
Thunderstorm Wind / High Wind	Highly Likely	Critical	Moderate	6 to 12 hours	Less than 6 hours	**3.1**
Hailstorm	Highly Likely	Limited	Moderate	6 to 12 hours	Less than 6 hours	**2.8**
Lightning	Highly Likely	Limited	Negligible	6 to 12 hours	Less than 6 hours	**2.4**
Tornado	Likely	Catastrophic	Small	Less than 6 hours	Less than 6 hours	**3.0**
Other Hazards						
Hazardous Materials Incident	Likely	Limited	Small	Less than 6 hours	Less than 24 hours	**2.5**
Pandemic	Unlikely	Catastrophic	Large	More than 24 hours	More than 24	**2.8**

5.18 FINAL DETERMINATIONS

The conclusions drawn from the hazard profiling process for the MEMA District 6 Region, including the PRI results and input from the Regional Hazard Mitigation Council, resulted in the classification of risk for each identified hazard according to three categories: High Risk, Moderate Risk, and Low Risk (Table 5.34). For purposes of these classifications, risk is expressed in relative terms according to the estimated impact that a hazard will have on human life and property throughout all of the MEMA District 6 Region. A more quantitative analysis to estimate potential dollar losses for each hazard has been performed separately and is described in Section 6: Vulnerability Assessment. It should be noted that although some hazards are classified below as posing low risk, their occurrence of varying or unprecedented magnitudes is still possible in some cases and their assigned classification will continue to be evaluated during future plan updates.

Table 5.34: CONCLUSIONS ON HAZARD RISK FOR THE MEMA DISTRICT 6 REGION

HIGH RISK	Thunderstorm Wind / High Wind Tornado Flood Hurricane and Tropical Storm Hailstorm Pandemic
MODERATE RISK	Wildfire Drought / Heat Wave Hazardous Materials Incident Dam and Levee Failure Winter Storm and Freeze Lightning
LOW RISK	Earthquake Erosion Landslide Land Subsidence

SECTION 6
VULNERABILITY ASSESSMENT

This section identifies and quantifies the vulnerability of the MEMA District 6 Region to the significant hazards identified in the previous sections (*Hazard Identification and Profiles*). It consists of the following subsections:

- 6.1 Overview
- 6.2 Methodology
- 6.3 Explanation of Data Sources
- 6.4 Asset Inventory
- 6.5 Vulnerability Assessment Results
- 6.6 Conclusions on Hazard Vulnerability

44 CFR Requirement
44 CFR Part 201.6(c)(2)(ii): The risk assessment shall include a description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. The description shall include an overall summary of each hazard and its impact on the community. The plan should describe vulnerability in terms of: (A) The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas; (B) An estimate of the potential losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate; (C) Providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

6.1 OVERVIEW

This section builds upon the information provided in Section 4: *Hazard Identification and* Section 5*: Hazard Profiles* by identifying and characterizing an inventory of assets in the MEMA District 6 Region. In addition, the potential impact and expected amount of damages caused to these assets by each identified hazard event is assessed. The primary objective of the vulnerability assessment is to quantify exposure and the potential loss estimates for each hazard. In doing so, the MEMA District 6 counties and their participating jurisdictions may better understand their unique risks to identified hazards and be better prepared to evaluate and prioritize specific hazard mitigation actions.

This section begins with an explanation of the methodology applied to complete the vulnerability assessment, followed by a summary description of the asset inventory as compiled for the MEMA District 6 Region. The remainder of this section focuses on the results of the assessment conducted.

6.2 METHODOLOGY

This vulnerability assessment was conducted using three distinct methodologies: (1) A stochastic risk assessment; (2) a geographic information system (GIS)-based analysis; and (3) a risk modeling software analysis. Each approach provides estimates for the potential impact of hazards by using a common, systematic framework for evaluation, including historical occurrence information provided in the *Hazard*

Identification and *Analysis* sections. A brief description of the three different approaches is provided on the following pages.

6.2.1 Stochastic Risk Assessment

The stochastic risk assessment methodology was applied to analyze hazards of concern that were outside the scope of hazard risk models and the GIS-based risk assessment. This includes hazards that do not have geographically-definable boundaries and are therefore excluded from spatial analysis through GIS. A stochastic risk methodology was used for the following hazards:

- Erosion
- Dam and Levee Failure
- Winter Storm and Freeze
- Drought / Heat Wave
- Landslide
- Land Subsidence
- Thunderstorm (wind, hailstorm, lightning)
- Tornado
- Pandemic

Many of the hazards listed above are considered atmospheric and have the potential to affect all buildings and all populations. For many of these hazards listed above, no additional analysis was performed. When possible, annualized loss estimates were determined using the best available data on historical losses from sources including NOAA's National Centers for Environmental Information records, MEMA District 6 Region County hazard mitigation plans, and local knowledge. Annualized loss is the estimated long-term weighted average value of losses to property in any single year in a specified geographic area (i.e., municipal jurisdiction or county). Annualized loss estimates were generated by totaling the amount of property damage over the period of time for which records were available, and calculating the average annual loss. Given the standard weighting analysis, losses can be readily compared across hazards providing an objective approach for evaluating mitigation alternatives.

For the erosion, dam and levee failure[1], landslide, and land subsidence hazards no data with historical property damages was available. Therefore, annualized potential losses for these hazards are presumed to be negligible. Winter storm and freeze, drought / heat wave, thunderstorm (wind, hailstorm, lightning), and tornado have the potential to impact the entire MEMA District 6 Region. The results for these hazards are found near the end of this section.

6.2.2 GIS-Based Analysis

Other hazards have specified geographic boundaries that permit additional using Geographic Information Systems (GIS). These hazards include:

- Flood
- Wildfire

[1] As noted in Section 5: *Hazard Profiles*, Dam failure could be catastrophic to areas in the inundation area. Due to a lack of a data, no additional analysis was performed. Further, local MEMA District 6 officials indicate that separate dam failure plans have been completed for their counties to identify risk and response measures. There was no local knowledge of critical facilities being at risk to dam failure.

- ❖ Hazardous Material Incident

The objective of the GIS-based analysis was to determine the estimated vulnerability of critical facilities and populations for the identified hazards in the MEMA District 6 Region using best available geospatial data. Digital data was collected from local, regional, state, and national sources for hazards and buildings. Jurisdictions in the MEMA District 6 Region generally did not have readily available geospatial parcel or building footprint data. Despite this lack of data, the HMC wanted to have some estimate of potential building and dollar losses, so Census block data was extracted from Hazus MH 2.2 that included building counts and potential exposure of property in the region. Additionally, geo-referenced point locations for identified assets (critical facilities and infrastructure, special populations, etc.) were identified via Hazus MH 2.2 and used in this vulnerability analysis. ESRI® ArcGIS™ 10.2.2 was used to assess hazard vulnerability utilizing digital hazard data, as well as local building and exposure data described above.

Using these data layers, hazard vulnerability can be quantified by estimating the number and dollar value of Census blocks determined to be located in identified hazard areas. To estimate vulnerable populations in hazard areas, digital Census 2010 data by census tract was obtained. This was intersected with hazard areas to determine exposed population counts. The results of the analysis provided an estimate of the number of people and critical facilities, as well as the value of buildings determined to be potentially at risk to those hazards with delineable geographic hazard boundaries.

6.2.3 Risk Modeling Software Analysis

A risk modeling software was used for the following hazards:

- ❖ Earthquake
- ❖ Hurricane and Tropical Storm

There are several models that exist to model hazards. Hazus-MH was used in this vulnerability assessment to address the aforementioned hazards.

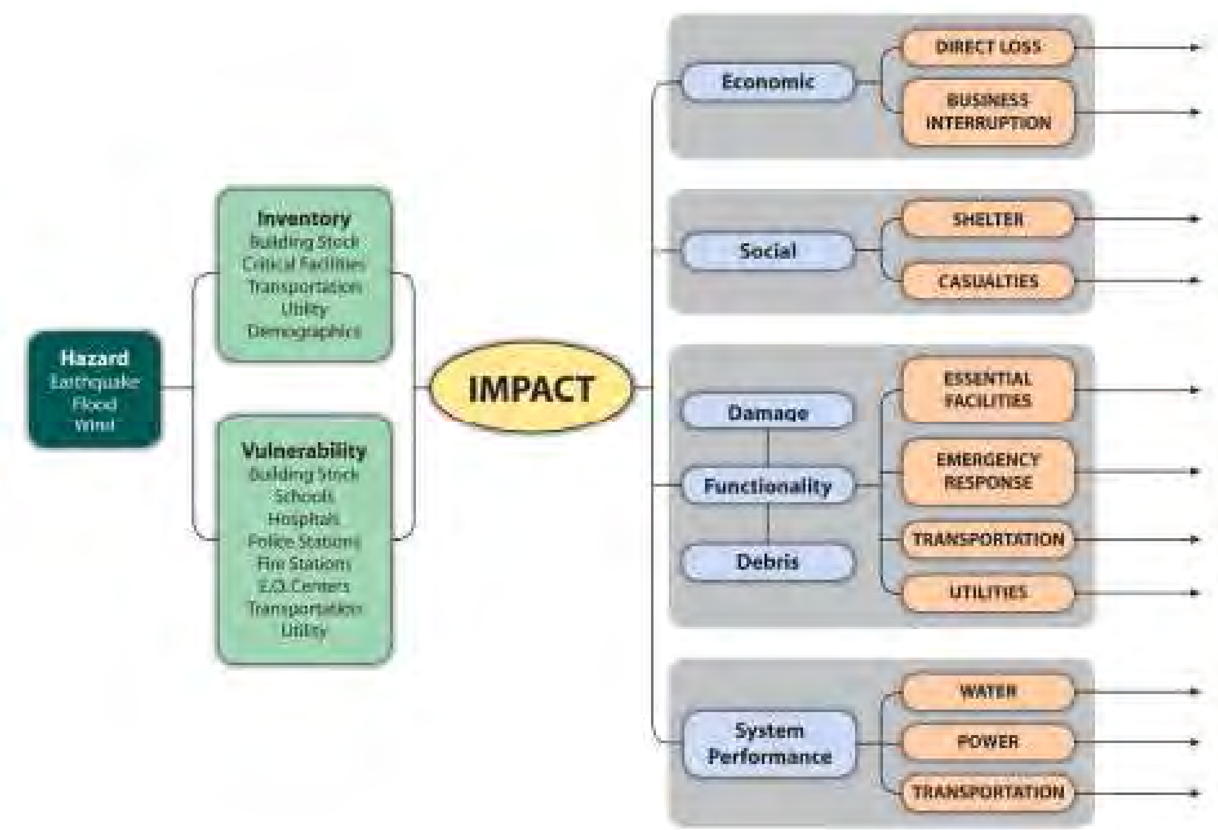
HAZUS-MH

Hazus-MH ("Hazus") is a standardized loss estimation software program developed by FEMA. It is built upon an integrated GIS platform to conduct analysis at a regional level (i.e., not on a structure-by-structure basis). The Hazus risk assessment methodology is parametric, in that distinct hazard and inventory parameters (e.g., wind speed and building types) can be modeled using the software to determine the impact (i.e., damages and losses) on the built environment.

The MEMA District 6 Regional Risk Assessment utilized Hazus-MH to produce hazard damage loss estimations for hazards for the planning area. At the time this analysis was completed, Hazus-MH 2.2 was used to estimate potential damages from hurricane winds earthquake hazards using Hazus-MH methodology. Although the program can also model losses for flood and storm surge, it was not used in this Risk Assessment.

Figure 6.1 illustrates the conceptual model of the Hazus-MH methodology.

Figure 6.1: CONCEPTUAL MODEL OF HAZUS-MH METHODOLOGY



Hazus-MH is capable of providing a variety of loss estimation results. In order to be consistent with other hazard assessments, annualized losses are presented when possible. Some additional results based on location-specific scenarios may also be presented to provide a complete picture of hazard vulnerability.

Loss estimates provided in this vulnerability assessment are based on best available data and methodologies. The results are an approximation of risk. These estimates should be used to understand relative risk from hazards and potential losses. Uncertainties are inherent in any loss estimation methodology, arising in part from incomplete scientific knowledge concerning natural hazards and their effects on the built environment. Uncertainties also result from approximations and simplifications that are necessary for a comprehensive analysis (e.g., incomplete inventories, non-specific locations, demographics, or economic parameters).

All conclusions are presented in "Conclusions on Hazard Vulnerability" at the end of this section.

6.3 EXPLANATION OF DATA SOURCES

FLOOD

FEMA Digital Flood Rate Insurance Maps (DFIRM) flood data was used to determine flood vulnerability. DFIRM data can be used in ArcGIS for mapping purposes, and they identify several features including floodplain boundaries and base flood elevations. Identified areas on the DFIRM represent some features of a Flood Insurance Rate Maps including the 100-year flood areas (1.0-percent annual chance flood), and the 500-year flood areas (0.2-percent annual chance flood). For the vulnerability assessment, local improved property data and critical facilities were overlaid on the 1.0-percent annual chance floodplains (ACF) and 0.2-percent annual chance floodplain areas for counties that had digital parcel data available. It should be noted that such an analysis does not account for building elevation.

WILDFIRE

The data used to determine vulnerability to wildfire in the MEMA District 6 Region is based on GIS data called the Southern Wildfire Risk Assessment (SWRA). This data is available on the Southern Wildfire Risk Assessment website and can be downloaded and imported into ArcGIS. A specific layer, known as "Wildland Urban Interface Risk Index" (WUIRI) was used to determine vulnerability of people and property. The WUIRI is presented on a scale of 0 to -9. It combines data on housing density with the data on the impact and likelihood of a wildfire occurring in a specific area. The primary purpose of the data is to highlight areas of concern that may be conducive to mitigation actions. Due to assumptions made, it is not true probability. However, it does provide a comparison of risk throughout the region.

EARTHQUAKE

Hazus-MH 2.2 (as described above) was used to assess earthquake vulnerability. A level 1, probabilistic scenario to estimate average annualized loss was utilized. In this scenario, several return periods (events of varying intensities) are run to determine annualized loss. Default Hazus earthquake damage functions and methodology were used to determine the probability of damage. Results are calculated at the 2010 U.S. Census tract level in Hazus and presented at the county level.

LANDSLIDE

As a result of the low susceptibility and low incidence of landslide for counties in the MEMA District 6 Region, a GIS-based vulnerability analysis was not carried out for this plan. USGS Landslide Susceptibility Index data was evaluated alongside historic occurrences and local knowledge to determine landslide vulnerability and vulnerability was determined to be consistently low throughout the region despite some areas of higher USGS vulnerability.

HURRICANE AND TROPICAL STORM WIND

Hazus-MH 2.2 (as described above) was used to assess wind vulnerability. For the hurricane wind analysis, a probabilistic scenario was created to estimate the annualized loss damage in the MEMA District 6 Region. Default Hazus wind speed data, damage functions, and methodology were used in to determine the probability of damage for 100-, 500-, and 1,000-year frequency events (also known as a return period) in the scenario. Results are calculated in Hazus at the 2010 U.S. Census tract level and presented at the region level.

HAZARDOUS MATERIALS INCIDENT

For the fixed hazardous materials incident analysis, Toxic Release Inventory (TRI) data was used. The Toxics Release Inventory is a publicly available database from the federal Environmental Protection Agency (EPA) that contains information on toxic chemical releases and other waste management activities reported annually by certain covered industry groups as well as federal facilities. This inventory was established under the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) and expanded by the Pollution Prevention Act of 1990. Each year, facilities that meet certain activity thresholds must report their releases and other waste management activities for listed toxic chemicals to EPA and to their state or tribal entity. A facility must report if it meets the following three criteria:

- The facility falls within one of the following industrial categories: manufacturing; metal mining; coal mining; electric generating facilities that combust coal and/or oil; chemical wholesale distributors; petroleum terminals and bulk storage facilities; RCRA Subtitle C treatment, storage, and disposal (TSD) facilities; and solvent recovery services;
- Has 10 or more full-time employee equivalents; and
- Manufactures or processes more than 25,000 pounds or otherwise uses more than 10,000 pounds of any listed chemical during the calendar year. Persistent, bioaccumulative, and toxic (PBT) chemicals are subject to different thresholds of 10 pounds, 100 pounds, or 0.1 grams depending on the chemical.

For the mobile hazardous materials incident analysis, transportation data including major highways and railroads were obtained from the National Atlas. This data is ArcGIS compatible, lending itself to buffer analysis to determine risk.

6.4 ASSET INVENTORY

An inventory of geo-referenced assets within the MEMA District 6 counties and jurisdictions was compiled in order to identify and characterize those properties potentially at risk to the identified hazards.[2] By understanding the type and number of assets that exist and where they are located in relation to known hazard areas, the relative risk and vulnerability for such assets can be assessed. Under this assessment, two categories of physical assets were created and then further assessed through GIS analysis. Additionally, social assets are addressed to determine population at risk to the identified hazards. These are presented below in Section 6.4.1.

6.4.1 Physical Assets

The two categories of physical assets consist of:

[2] While potentially not all-inclusive for MEMA District 6, "georeferenced" assets include those assets for which specific location data is readily available for connecting the asset to a specific geographic location for purposes of GIS analysis.

1. **Building Stock**: Unfortunately, building footprint and parcel data was not available for any of the participating areas. It should be noted that this data produced less accurate information concerning the number of buildings at risk than parcel data because the Hazus data was aggregated at a much larger geographic area, the Census Block level.

   Hazus inventory data provides an estimate of the number of buildings in the study region. The economic exposure is also presented to be referenced with any Hazus-related results.

2. **Critical Facilities**: Critical facilities vary by jurisdiction. For this Vulnerability Assessment, facilities were used from Hazus-MH which includes fire stations, police station, medical care facilities, schools, and emergency operation centers. When provided, local data was used to supplement the Hazus data. It should be noted that this listing is not all-inclusive for assets located in the region, but it is anticipated that it will be expanded during future plan updates as more geo-referenced data becomes available for use in GIS analysis.

The following tables provide a detailed listing of the geo-referenced assets that have been identified for inclusion in the vulnerability assessment for the MEMA District 6 Region.

The following table lists the estimated number of improved properties and the total value of improvements for participating areas of the MEMA District 6 Region (study area of vulnerability assessment). Because digital parcel data was not available, data obtained from Hazus-MH 2.2 inventory was utilized to complete the analysis.

Table 6.1: BUILDING STOCK VALUES OF MEMA DISTRICT 6

County	Building Value		
	Residential	Non-Residential	Total
Clarke	$936,000,000	$306,000,000	$1,243,000,000
Jasper	$989,000,000	$255,000,000	$1,245,000,000
Kemper	$556,000,000	$141,000,000	$697,000,000
Lauderdale	$5,078,000,000	$2,661,000,000	$7,740,000,000
Leake	$1,200,000,000	$432,000,000	$1,633,000,000
Neshoba	$1,658,000,000	$488,000,000	$2,147,000,000
Newton	$1,271,000,000	$450,000,000	$1,721,000,000
Scott	$1,479,000,000	$596,000,000	$2,075,000,000
Smith	$991,000,000	$195,000,000	$1,187,000,000
Total	**$14,158,000,000**	**$5,524,000,000**	**$19,688,000,000**

Source: Hazus-MH 2.2

BUILDING INVENTORY

Hazus estimates that there are more than 106,000 buildings in the region which have an aggregate total replacement value of $19,692,000,000. In terms of building construction types found in the region, wood frame construction makes up 68% of the building inventory. The remaining percentage is distributed between the other general building types.

TRANSPORTATION AND UTILITY LIFELINE INVENTORY

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications.

The total value of the lifeline inventory is over $26,019,000,000. This inventory includes over 1,317.93 miles of highways, 2,162 bridges, 30,058.82 miles of pipes.

Table 6.2: TRANSPORTATION SYSTEM LIFELINE INVENTORY

System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	2,162	2737.4453
	Segments	294	9335.2687
	Tunnels	0	0.0000
		Subtotal	**12072.7140**
Railways	Bridges	332	1328.6073
	Facilities	2	5.3260
	Segments	751	845.0312
	Tunnels	0	0.0000
		Subtotal	**2178.9645**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	1	1.2805
		Subtotal	**1.2805**
Ferry	Facilities	0	0.0000
		Subtotal	**0.0000**
Port	Facilities	0	0.0000
		Subtotal	**0.0000**
Airport	Facilities	11	50.1029
	Runways	11	691.8066
		Subtotal	**741.9095**
		Total	**14,994.90**

Table 6.3: UTILITY SYSTEM LIFELINE INVENTORY

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	587.8702
	Facilities	3	84.9150
	Pipelines	0	0.0000
		Subtotal	**672.7852**
Waste Water	Distribution Lines	NA	352.7221
	Facilities	58	6638.2343
	Pipelines	0	0.0000
		Subtotal	**6990.9564**
Natural Gas	Distribution Lines	NA	235.1481
	Facilities	8	8.4038
	Pipelines	106	735.5348
		Subtotal	**979.0867**
Oil Systems	Facilities	2	0.1700
	Pipelines	0	0.0000
		Subtotal	**0.1700**
Electrical Power	Facilities	5	2379.4876
		Subtotal	**2379.4876**
Communication	Facilities	31	2.6350
		Subtotal	**2.6350**
		Total	**11,025.10**

The following table lists the fire stations, police stations, emergency operations centers (EOCs), medical care facilities, and schools located in the MEMA District 6 Region according to Hazus-MH Version 2.2.

In addition, the table also shows the locations of critical facilities in the MEMA District 6 Region. The table at the end of this section, shows a complete list of the critical facilities by name, as well as the hazards that affect each facility. As noted previously, this list is not all-inclusive and only includes information provided through Hazus.

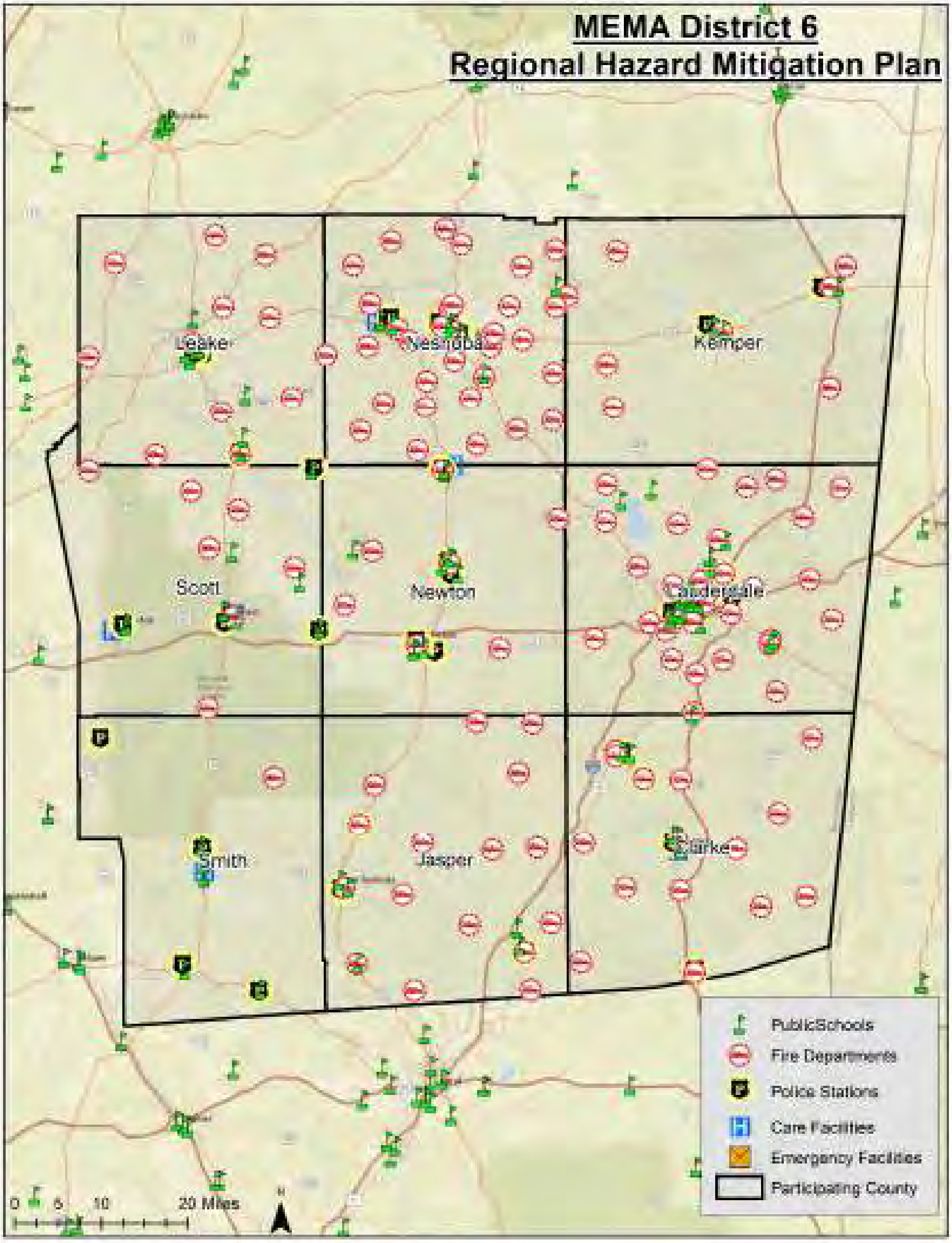
Table 6.4: CRITICAL FACILITY INVENTORY IN THE MEMA DISTRICT 6 REGION

Location	Fire Stations	Police Stations	Medical Care Facilities	EOC	Schools
Clarke County	**14**	**5**	**1**	**1**	**9**
Enterprise	2	1	0	0	3
Pachuta	2	0	0	0	0
Quitman	7	2	1	1	6
Shubuta	2	1	0	0	0
Stonewall	1	1	0	0	0
Unincorporated Area	0	0	0	0	0
Jasper County	**15**	**4**	**1**	**1**	**9**
Bay Springs	2	2	1	1	4
Heidelberg	4	1	0	0	4
Louin	3	1	0	0	0
Montrose	0	0	0	0	0
Unincorporated Area	6	0	0	0	1
Kemper County	**14**	**4**	**1**	**1**	**4**
De Kalb	1	2	1	1	3
Scooba	1	1	0	0	2
Unincorporated Area	12	1	0	0	0
Lauderdale County	**34**	**8**	**8**	**1**	**34**
Marion	1	1	0	0	0
Meridian	24	7	8	1	32
Unincorporated Area	9	0	0	0	2
Leake County	**11**	**4**	**1**	**1**	**10**
Carthage	8	2	1	1	6
Lena	1	0	0	0	0
Walnut Grove	1	1	0	0	2
Unincorporated Area	1	1	0	0	2
Neshoba County	**33**	**3**	**2**	**1**	**12**
Philadelphia	3	2	1	1	4
Unincorporated Area	30	1	1	0	8
Newton County	**10**	**6**	**1**	**1**	**9**
Chunky	1	0	0	0	0
Decatur	1	3	0	1	5
Hickory	1	1	0	0	0
Newton (city)	1	1	0	0	3
Union	1	1	1	0	1
Unincorporated Area	5	0	0	0	0
Scott County	**9**	**5**	**2**	**1**	**12**
Forest	6	2	1	1	5
Lake	1	1	0	0	3
Morton	0	2	1	0	4
Sebastopol	0	0	0	0	0

Location	Fire Stations	Police Stations	Medical Care Facilities	EOC	Schools
Unincorporated Area	6	2	1	1	5
Smith County	**6**	**5**	**0**	**1**	**6**
Mize	1	1	0	0	2
Polkville	1	1	0	0	0
Raleigh	1	2	0	1	2
Sylvarena	1	0	0	0	0
Taylorsville	1	1	0	0	2
Unincorporated Area	1	0	0	0	0
MEMA DISTRICT 6 REGION TOTAL	**146**	**44**	**17**	**9**	**105**

Source: Hazus-MH 2.2

Figure 6.2: CRITICAL FACILITY LOCATIONS IN THE MEMA DISTRICT 6 REGION



Source: Hazus-MH 2.2

6.4.2 Social Vulnerability

In addition to identifying those assets potentially at risk to identified hazards, it is important to identify and assess those particular segments of the resident population in the MEMA District 6 Region that are potentially at risk to these hazards.

The table below lists the population by jurisdiction according to U.S. Census 2020 population estimates. The total population in the MEMA District 6 Region according to Census data is 227,806 persons. Additional population estimates are presented in Section 3: *Community Profile*.

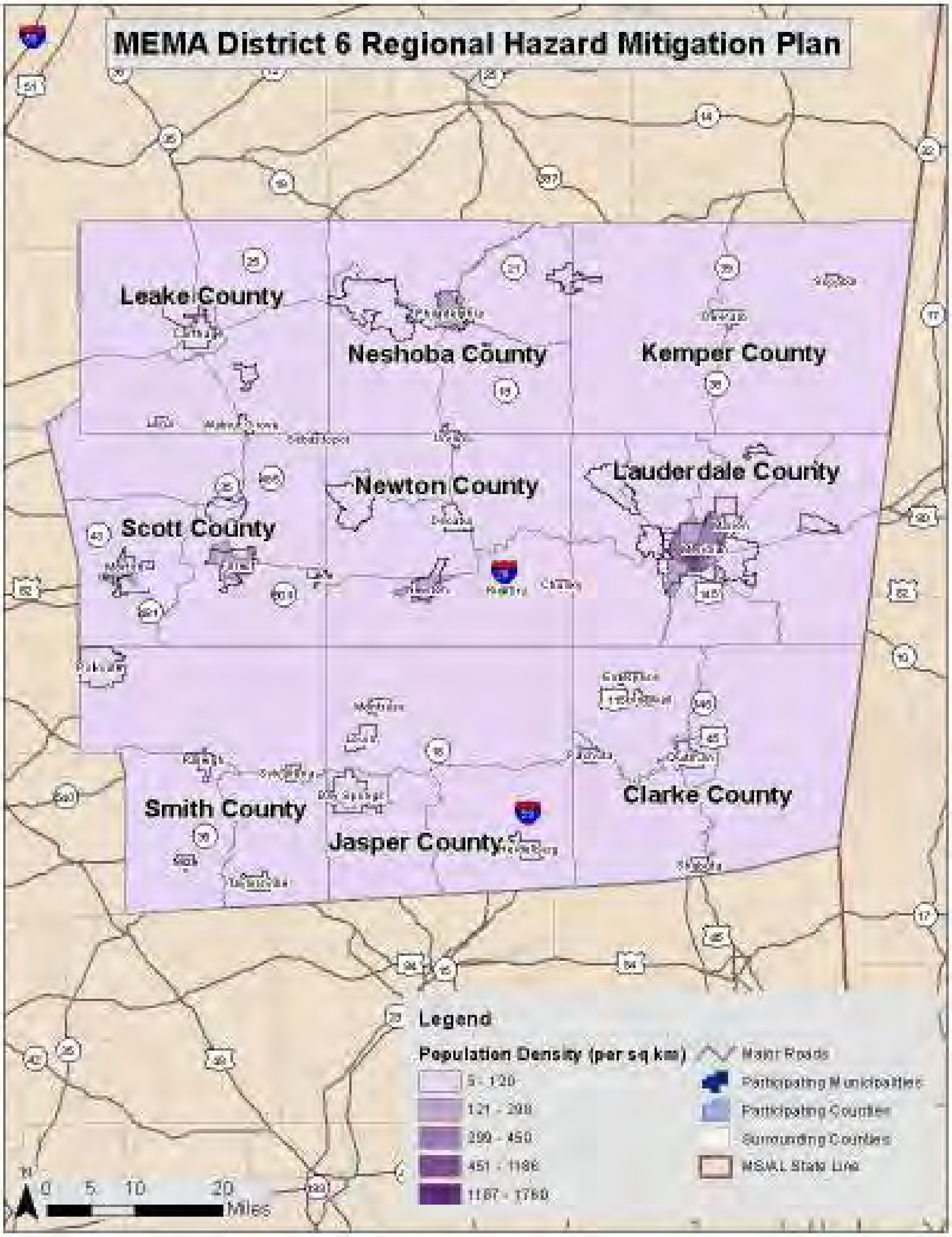
Table 6.5: TOTAL POPULATION IN THE MEMA DISTRICT 6 REGION

Location	Total 2020 Population
Clarke County	15,615
Jasper County	16,367
Kemper County	8,988
Lauderdale County	72,984
Leake County	21,275
Neshoba County	29,087
Newton County	21,291
Scott County	27,990
Smith County	14,209
MEMA DISTRICT 6 REGION TOTAL	**227,806**

Source: United States Census 2020

In addition, **Figure 6.3** illustrates the population density per square kilometer by census tract as it was reported by the U.S. Census Bureau in 2010. As can be seen in the figure the population is spread out, with concentrations in Meridian, Philadelphia, Newton, Forest, and Morton.

Figure 6.3: POPULATION DENSITY IN THE MEMA DISTRICT 6 REGION



Source: United States Census Bureau, 2010

6.4.3 Development Trends and Changes in Vulnerability

Since the previous county hazard mitigation plans were approved (in 2015), the MEMA District 6 Region has experienced limited growth and development. The table below shows the number of building units constructed since 2014 according to the U.S. Census American Community Survey 2019.

Table 6.6: BUILDING COUNTS FOR THE MEMA DISTRICT 6 REGION

Jurisdiction	Total Housing Units (2019)	Units Built 2014 or later	% Building Stock Built Post-2014
Clarke County	**8,000**	**77**	**1.0%**
Enterprise	276	0	0.0%
Pachuta	119	0	0.0%
Quitman	3,581	2	0.1%
Shubuta	205	0	0.0%
Stonewall	546	0	0.0%
Unincorporated Area	3,478	75	2.1%
Jasper County	**8,409**	**73**	**0.9%**
Bay Springs	812	0	0.0%
Heidelberg	335	0	0.0%
Louin	194	0	0.0%
Montrose	88	2	2.3%
Unincorporated Area	6,980	71	1.1%
Kemper County	**4,766**	**27**	**0.6%**
De Kalb	602	8	1.3%
Scooba	241	0	0.0%
Unincorporated Area	3,923	19	0.4%
Lauderdale County	**35,297**	**448**	**1.3%**
Marion	772	22	2.8%
Meridian	19,130	26	0.1%
Unincorporated Area	15,395	400	2.5%
Leake County	**9,567**	**126**	**1.3%**
Carthage	1,628	0	0.0%
Lena	79	1	1.3%
Walnut Grove	280	0	0.0%
Unincorporated Area	7,580	125	1.6%
Neshoba County	**12,535**	**237**	**1.9%**
Philadelphia	3,429	0	0.0%
Unincorporated Area	9,106	237	2.6%
Newton County	**9,508**	**147**	**1.5%**
Chunky	170	9	5.3%
Decatur	723	25	3.5%
Hickory	241	0	0.0%
Newton (city)	1,504	0	0.0%
Union	972	11	1.1%
Unincorporated Area	5,898	102	1.7%
Scott County	**11,716**	**222**	**1.9%**
Forest	2,378	88	3.7%
Lake	181	2	1.1%
Morton	1,212	12	1.0%
Sebastopol	134	4	3.0%
Unincorporated Area	7,811	116	1.4%

Jurisdiction	Total Housing Units (2019)	Units Built 2014 or later	% Building Stock Built Post-2014
Smith County	**7,377**	**114**	**1.5%**
Mize	113	0	0.0%
Polkville	340	0	0.0%
Raleigh	630	0	0.0%
Sylvarena	54	0	0.0%
Taylorsville	722	9	1.2%
Unincorporated Area	5,518	105	1.9%
MEMA DISTRICT 6 REGION TOTAL	**107,157**	**1,471**	**1.3%**

Source: United States Census Bureau - American Community Survey 2019

The table below shows population growth estimates for the region from 2015 to 2019 based on the U.S. Census Annual Estimates of Resident Population.

Table 6.7: POPULATION GROWTH FOR THE MEMA DISTRICT 6 REGION

Jurisdiction	Population Estimates (as of July 1)					% Change 2010-2014
	2015	2016	2017	2018	2019	
Clarke County	**16,362**	**16,203**	**16,089**	**15,928**	**15,770**	**-3.61%**
Enterprise	716	586	796	650	615	-14.10%
Pachuta	286	256	219	185	143	-50%
Quitman	2,147	1,914	1,811	2,001	1,974	-8.05%
Shubuta	342	335	397	386	337	-1.46%
Stonewall	1,315	1,250	1,014	961	933	-29%
Unincorporated Area	11,556	12,062	11,852	11,745	11,768	1.83%
Jasper County	**16,554**	**16,588**	**16,574**	**16,425**	**16,383**	**-1.03%**
Bay Springs	1,738	1,613	1,766	1,511	1,632	-6.09%
Heidelberg	702	815	735	830	716	1.99%
Louin	237	381	395	278	378	59.49%
Montrose	108	200	216	133	123	13.88%
Unincorporated Area	13,769	13,579	13,462	13,673	13,534	-1.70%
Kemper County	**10,211**	**10,128**	**10,082**	**10,107**	**9,943**	**-2.62%**
De Kalb	1,082	1,148	1,219	1,278	1,268	17.19%
Scooba	1,052	977	912	954	878	-16.53%
Unincorporated Area	8,077	8,003	7,951	7,875	7,979	-1.21%
Lauderdale County	**78,524**	**77,755**	**76,155**	**75,317**	**74,125**	**-5.60%**
Marion	1,547	1,581	1,492	1,522	1,683	8.79%
Meridian	40,507	40,094	39,213	38,602	37,848	-6.56%
Unincorporated Area	36,470	36,080	35,450	35,193	34,594	-5.14%
Leake County	**23,153**	**23,011**	**22,936**	**22,870**	**22,792**	**-1.55%**
Carthage	4,966	4,938	4,877	4,862	4,830	-2.73%
Lena	200	194	176	161	151	-24.5%
Walnut Grove	913	749	779	809	901	-1.31%
Unincorporated Area	17,074	17,130	17,104	17,038	16,910	-0.96%

Jurisdiction	Population Estimates (as of July 1)					% Change 2015-2019
	2015	2016	2017	2018	2019	
Neshoba County	**29,553**	**29,474**	**29,437**	**29,376**	**29,332**	**-0.74%**
Philadelphia	7,433	7,399	7,334	7,284	7,218	-2.89%
Unincorporated Area	22,120	22,075	22,103	22,092	22,114	-0.02%
Newton County	**21,663**	**21,652**	**21,437**	**21,524**	**21,360**	**-1.39%**
Chunky	406	440	436	415	344	-15.27%
Decatur	2,100	2,087	1,888	1,917	1,897	-9.66%
Hickory	604	589	527	654	632	4.63%
Newton (city)	3,347	3,346	3,278	3,251	3,220	-3.79%
Union	1,826	1,860	2,053	2,126	2,349	28.64%
Unincorporated Area	13,380	13,330	13,255	13,161	12,918	-3.45%
Scott County	**28,293**	**28,268**	**28,399**	**28,415**	**28,332**	**0.13%**
Forest	5,713	5,700	5,679	5,668	5,629	-1.47%
Lake	435	532	477	397	439	0.91%
Morton	3,456	3,430	3,429	3,648	3,589	3.87%
Sebastopol	314	317	383	387	359	14.33%
Unincorporated Area	18,375	18,289	18,431	18,315	18,316	-0.32%
Smith County	**16,257**	**16,137**	**16,114**	**16,063**	**16,009**	**-1.52%**
Mize	305	221	265	229	270	-11.47%
Polkville	820	784	676	633	813	-0.85%
Raleigh	1,454	1,536	1,438	1,409	1,152	20.77%
Sylvarena	101	100	116	98	147	45.54%
Taylorsville	1,348	1,534	1,667	1,998	2,080	54.30%
Unincorporated Area	12,229	11,962	11,952	11,696	11,547	-5.57%
MEMA DISTRICT 6 REGION TOTAL	**240,570**	**239,216**	**237,223**	**236,025**	**234,046**	**-2.71%**

Source: United States Census Bureau – American Community Survey

Based on the data above, there has been a relatively low rate of residential development and population growth in the region since 2014, and the majority of jurisdictions have actually experienced slight population declines. Overall, the MEMA District 6 Region experienced a population decline of 2.7%. There are 107,157 residential structures in the 9-county region, and 1.3% of the residential building stock was built 2014 or later, resulting in an increased number of structures that are vulnerable to the potential impacts of the identified hazards. Since the population has increased in this jurisdiction, there is now a greater number of people exposed to the identified hazards. Any increase in building stock is offset by an overall population decline.

It is also important to note that as development increases in the future, greater populations and more structures and infrastructure will be exposed to potential hazards if development occurs in the floodplains, moderate and high landside susceptibility areas, high wildfire risk areas, or primary and secondary TRI site buffers.

6.5 VULNERABILITY ASSESSMENT RESULTS

As noted earlier, only hazards with a specific geographic boundary, available modeling tool, or sufficient historical data allow for further analysis in this section. Those results are presented here. All other hazards are assumed to impact the entire planning region (drought / heat wave; thunderstorm—wind, hail, lightning; tornado; and winter storm and freeze) or, due to lack of data, analysis would not lead to credible results (dam and levee failure, erosion, and land subsidence). In the case of landslide, local officials determined that the USGS data may be somewhat amiss and that even the areas identified as moderate risks probably entailed an overall low risk. The total region exposure, and thus risk to these hazards, was presented in **Table 6.1**.

The hazards to be further analyzed in this section include: flood, wildfire, earthquake, hurricane and tropical storm winds, and hazardous materials incident.

The annualized loss estimate for all hazards is presented near the end of this section**.**

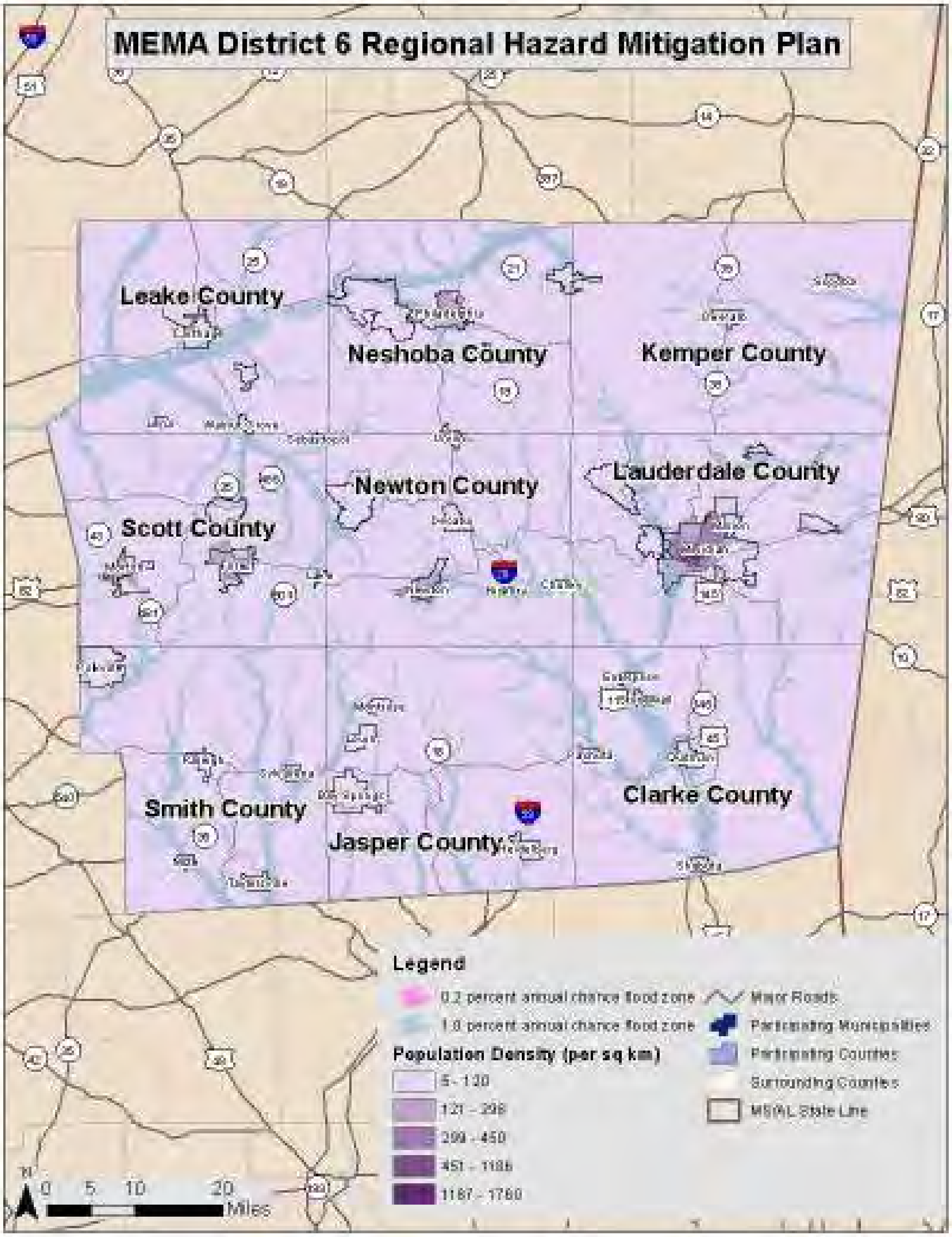
6.5.1 Flood

Historical evidence indicates that the MEMA District 6 Region is susceptible to flood events. A total of 355 flood events have been reported by the National Centers for Environmental Information resulting in $165.26 million in property damage as well as one fatality. On an annualized level, these damages amounted to $6,886,000 for the MEMA District 6 Region.

SOCIAL VULNERABILITY

The following figure is presented to gain a better understanding of at-risk population by evaluating census tract level population data against mapped floodplains. There are areas of concern in several of the municipal population centers in this region including Meridian, Carthage, and Philadelphia. Indeed, nearly every incorporated municipality is potentially at risk of being impacted by flooding in some areas of its jurisdiction. Therefore, further investigation in these areas may be warranted.

Figure 6.4: POPULATION DENSITY NEAR FLOODPLAINS



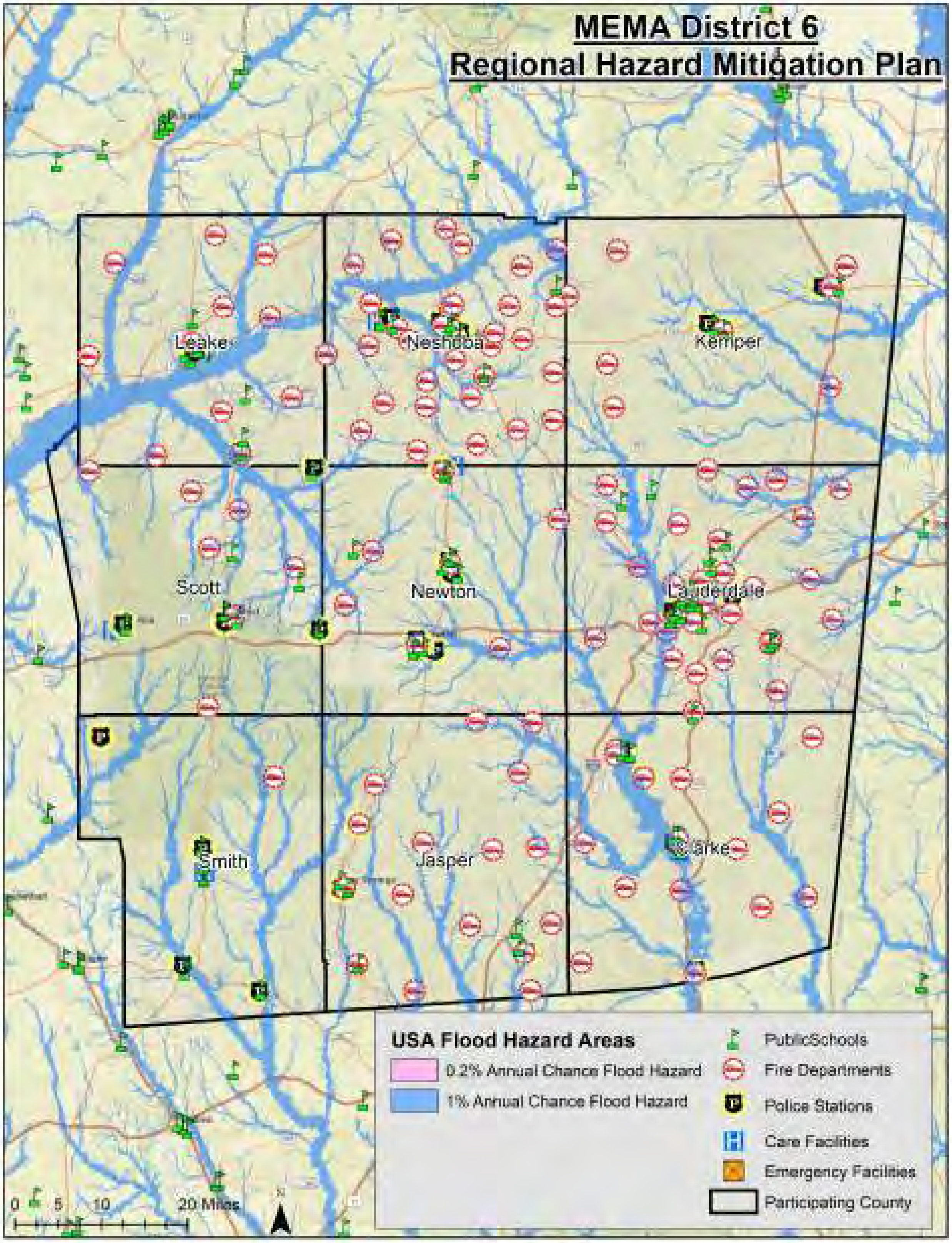
Source: Federal Emergency Management Agency DFIRM, United States Census 2010

CRITICAL FACILITIES

The following figure shows the critical facility analysis in relation to Special Flood Hazard Areas. (Please note, as previously indicated, this analysis does not consider building elevation, which may negate risk. A list of specific critical facilities and their associated risk can be found at the end of this section.

In conclusion, a flood has the potential to impact many existing and future buildings, facilities, and populations in the MEMA District 6 Region, though some areas are at a higher risk than others. All types of structures in a floodplain are at-risk, though elevated structures will have a reduced risk. Such site-specific vulnerability determinations are outside the scope of this assessment but will be considered during future plan updates. Furthermore, areas subject to repetitive flooding should be analyzed for potential mitigation actions.

Figure 6.5: CRITICAL FACILITY ANALYSIS – SFHA



Source: Federal Emergency Management Agency DFIRM, HAZUS

6.5.2 Wildfire

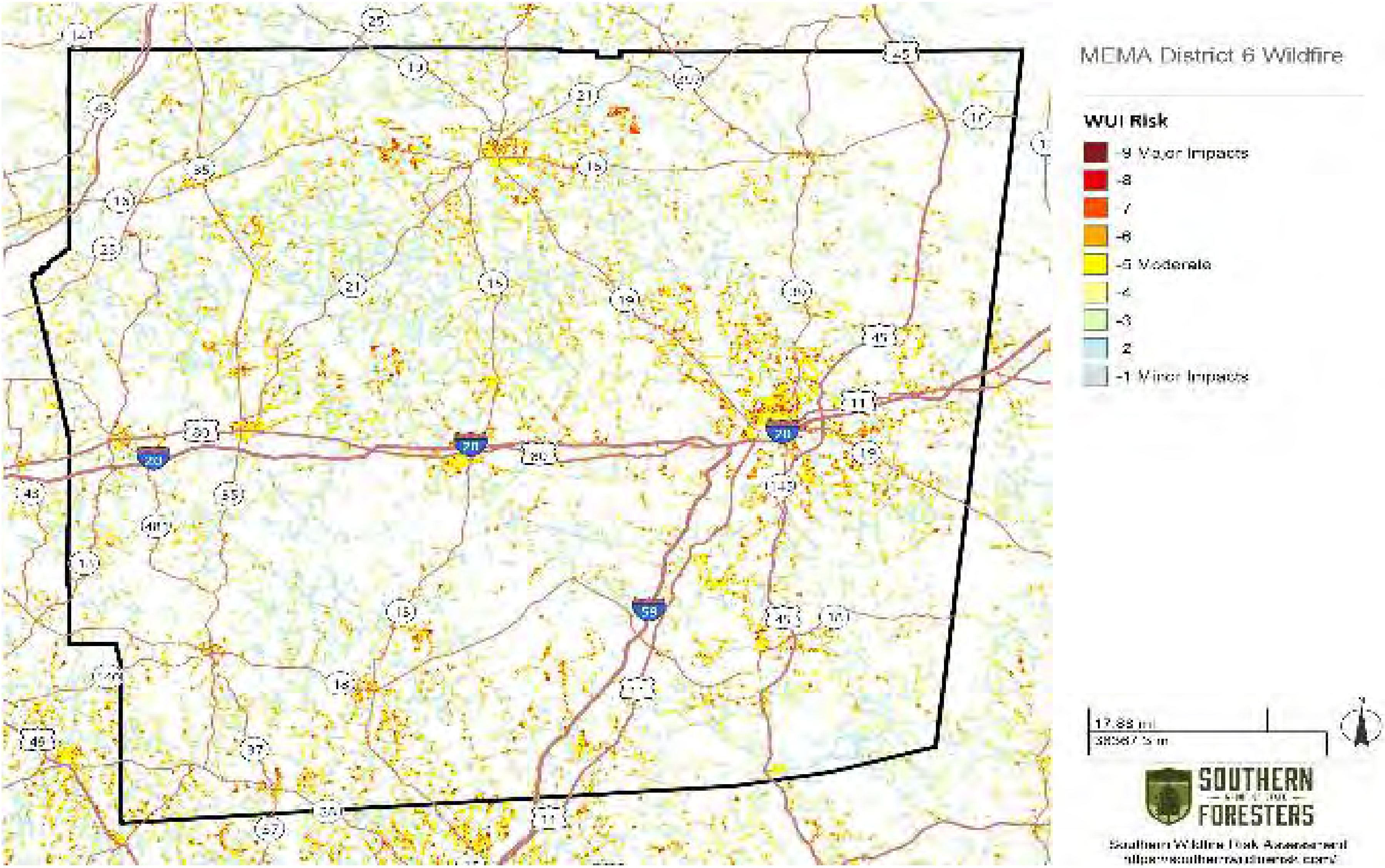
Although historical evidence indicates that the MEMA District 6 Region is susceptible to wildfire events, there are few reports which include information on historic dollar losses. Therefore, it is difficult to calculate a reliable annualized loss figure. Annualized loss is considered negligible though it should be noted that a single event could result in significant damages throughout the region.

Figure 6.6 shows the Wildland Urban Interface Risk Index (WUIRI) data, which is a data layer that shows a rating of the potential impact of a wildfire on people and their homes. The key input, Wildland Urban Interface (WUI), reflects housing density (houses per acre) consistent with Federal Register National standards. The location of people living in the WUI and rural areas is key information for defining potential wildfire impacts to people and homes. Initially provided as raster data, it was converted to a polygon to allow for analysis. The Wildland Urban Interface Risk Index data ranges from 0 to -9 with lower values being most severe (as noted previously, this is only a measure of relative risk). **Figure 6.7** shows the location of critical facilities in relation to historical burns. Data is modeled at a 30-meter cell resolution, which is consistent with other SWRA layers. The following table shows the total acres for each WUI area within the project area.

Table 6.8: MEMA District 6 WUI

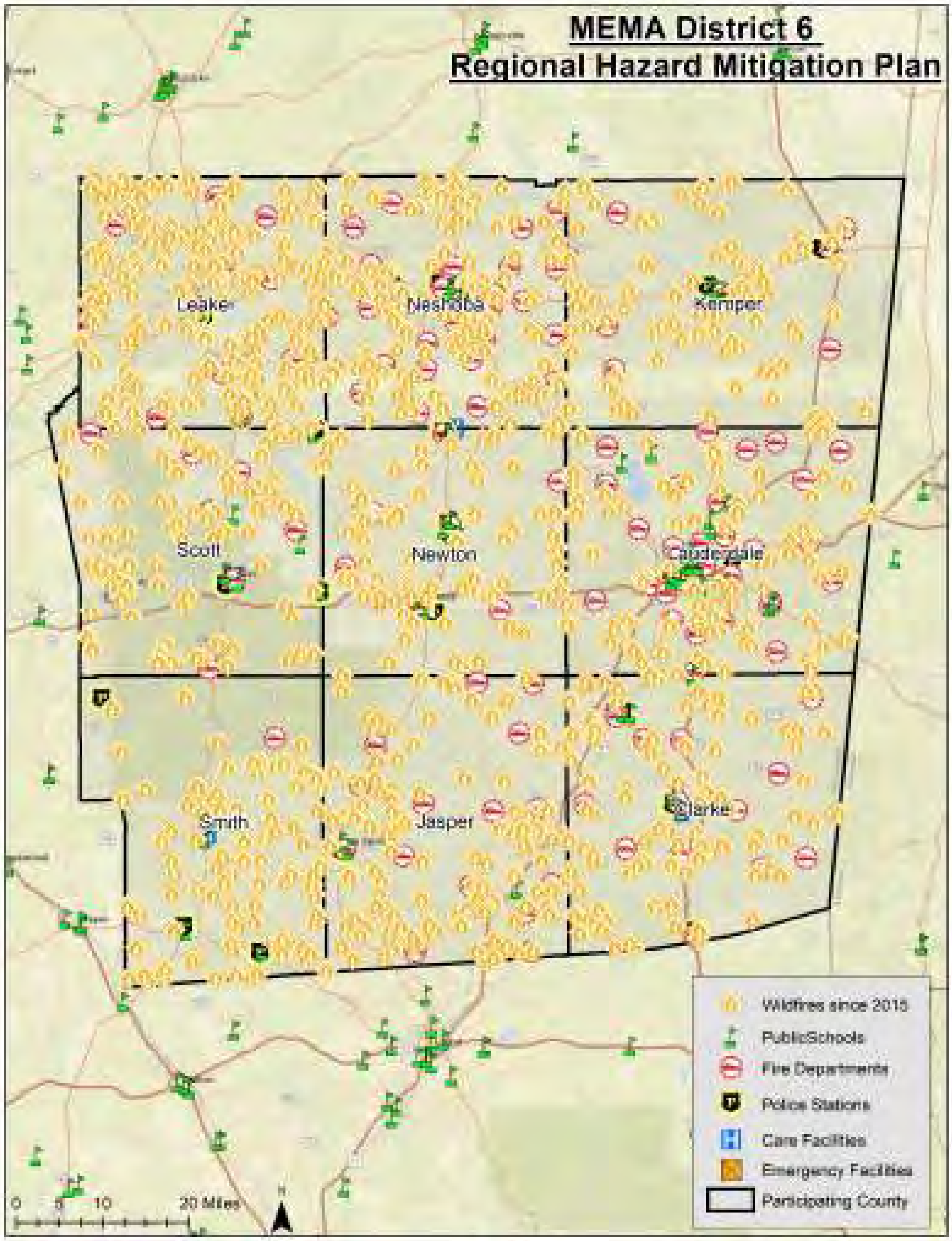
Class	Acres	Percent
-9 Major Impacts	148	0.0 %
-8	13,046	1.0 %
-7	46,442	3.5 %
-6	76,466	5.8 %
-5 Moderate	163,481	12.5 %
-4	356,792	27.2 %
-3	174,198	13.3 %
-2	359,386	27.4 %
-1 Minor Impacts	122,397	9.3 %
Total	**1,312,356**	**100.0 %**

Figure 6.6: WUI RISK INDEX AREAS IN THE MEMA DISTRICT 6 REGION



Source: Southern Wildfire Risk Assessment Data

Figure 6.7: CRITICAL FACILITY LOCATIONS - WILDFIRE



Source: Southern Wildfire Risk Assessment Data

SOCIAL VULNERABILITY

Given some level of susceptibility across the entire MEMA District 6 Region, it is assumed that the total population is at risk to the wildfire hazard. Determining the exact number of people in certain wildfire zones is difficult with existing data and could be misleading. In particular, the expansion of residential development from urban centers out into rural landscapes, increases the potential for wildland fire threat to public safety and the potential for damage to forest resources and dependent industries. This increase in population across the region will impact counties and communities that are located within the Wildland Urban Interface (WUI). The WUI is described as the area where structures and other human improvements meet and intermingle with undeveloped wildland or vegetative fuels. Population growth within the WUI substantially increases the risk from wildfire.

For the MEMA District 6 Wildfire project area, it is estimated that 229,761 people or 93.9 % percent of the total project area population (244,688) live within the WUI.[3]

CRITICAL FACILITIES

The critical facility analysis was shown in the previous figure. It should be noted, that several factors could impact the spread of a wildfire putting all facilities at risk. A list of specific critical facilities and their associated risk can be found at the end of this section.

In conclusion, a wildfire event has the potential to impact many existing and future buildings, critical facilities, and populations in the MEMA District 6 Region.

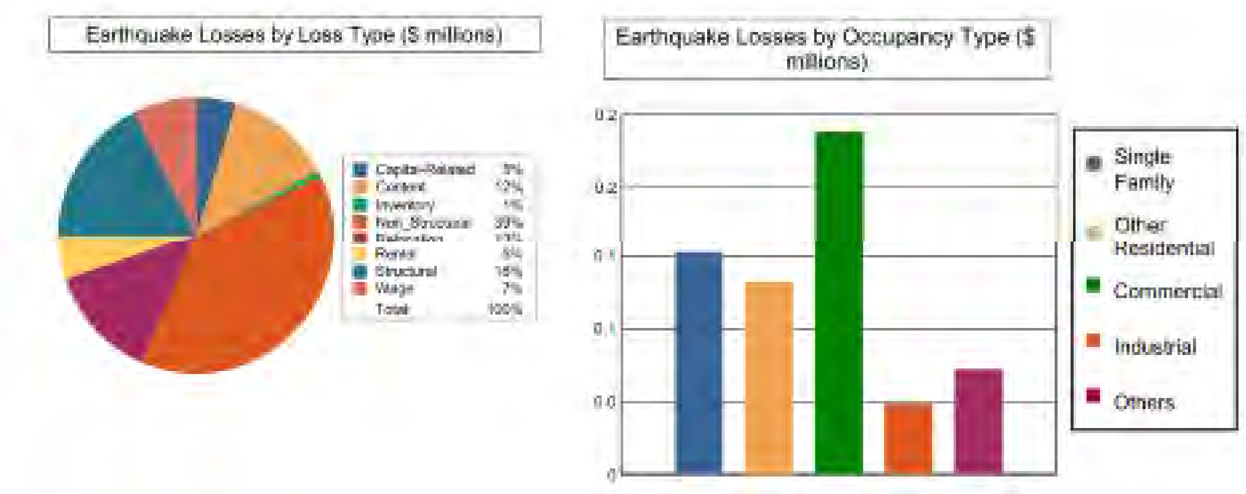
6.5.3 Earthquake

As the Hazus-MH model suggests below, and historical occurrences confirm, any earthquake activity in the area is likely to inflict minor to moderate damage to the planning area.

A probabilistic earthquake model was performed for the MEMA District 6 Region. As the Hazus-MH model suggests below, and historical occurrences confirm, any earthquake activity in the area is likely to inflict minor damage to the region. Hazus-MH 2.2 estimates the total building-related losses were $520,000; 31 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 44 % of the total loss. The figure below provides a summary of the losses associated with the building damage.

[3] Southern Wildfire Risk Assessment, August 2021. SWRA uses 2010 Census data.

Figure 6.8: MEMA D6 EARTHQUAKE LOSSES BY TYPE



For the earthquake hazard vulnerability assessment, a probabilistic scenario was created to estimate the average annualized loss for the region. The results of the analysis are generated at the Census Tract level within Hazus-MH and then aggregated to the region level. Since the scenario is annualized, no building counts are provided. Losses reported included losses due to structure failure, building loss, contents damage, and inventory loss.

Social Vulnerability

It can be assumed that all existing and future populations are at risk to the earthquake hazard. Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 39 households to be displaced due to the earthquake. Of these, 32 people (out of a total population of 244,467) will seek temporary shelter in public shelters. [4] The total economic loss estimated for the earthquake is 76.76 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory.

Critical Facilities

The Hazus-MH probabilistic analysis indicated that no critical facilities would sustain measurable damage in an earthquake event. However, all critical facilities should be considered at-risk to minor damage, should an event occur. Before the earthquake, the region had 1,241 hospital beds available for use. On the day of the earthquake, the model estimates that only 1,035 hospital beds (83.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 93.00% of the beds will be back in service. By 30 days, 99.00% will be operational.

In conclusion, an earthquake has the potential to impact all existing and future buildings, facilities, and populations in the MEMA District 6 Region. The Hazus-MH scenario indicates that minimal to moderate damage is expected from an earthquake occurrence. While the MEMA District 6 Region may not experience a large earthquake (the greatest on record is a magnitude V MMI), localized damage is possible with an occurrence. A list of specific critical facilities and their associated risk can be found at the end of this section.

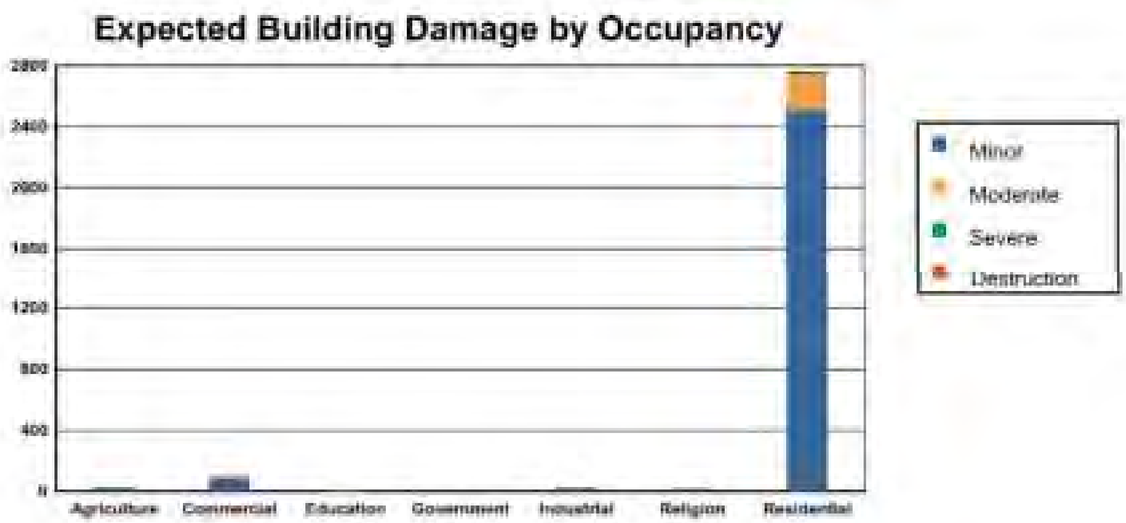
[4] HAZUS-MH utilizes 2010 Census Data

6.5.4 Hurricane and Tropical Storm

Historical evidence indicates that the MEMA District 6 Region has some significant risk to the hurricane and tropical storm hazard. There have been seven disaster declarations due to hurricanes (Hurricanes Camille, Frederic, Georges, Ivan, Dennis, Katrina, and Isaac). Several tracks have come near or traversed through the MEMA District 6 Region, as shown and discussed in Section 5: *Hazard Profiles*.

A probabilistic 100-year hurricane model was performed for the MEMA District 6. Hazus estimates that about 289 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 12 buildings that will be completely destroyed. The figure below summarizes the expected damage by general occupancy for the buildings in the region.

Figure 6.9: MEMA D6 100-YEAR HURRICANE



Hurricanes and tropical storms can cause damage through numerous additional hazards such as flooding, erosion, tornadoes, and high winds, thus it is difficult to estimate total potential losses from these cumulative effects. The current Hazus-MH hurricane model only analyzes hurricane winds and is not capable of modeling and estimating cumulative losses from all hazards associated with hurricanes; therefore, only hurricane winds are analyzed in this section. It can be assumed that all existing and future buildings and populations are at risk to the hurricane and tropical storm hazard.

Social Vulnerability

Given equal susceptibility across the county, it is assumed that the total population, both current and future, is at risk to the hurricane and tropical storm hazard. Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 34 households to be displaced due to the hurricane. Of these, 26 people (out of a total population of 244,467) will seek temporary shelter in public shelters.

CRITICAL FACILITIES

Given equal vulnerability across the MEMA District 6 Region, all critical facilities are considered to be at risk. Some buildings may perform better than others in the face of such an event due to construction and age, among factors. Determining individual building response is beyond the scope of this plan. However, this plan will consider mitigation action for especially vulnerable structures and/or critical facilities to mitigate against the effects of the hurricane hazard. A list of specific critical facilities can be found at the end of this section.

In conclusion, a hurricane event has the potential to impact many existing and future buildings, critical facilities, and populations in the MEMA District 6 Region.

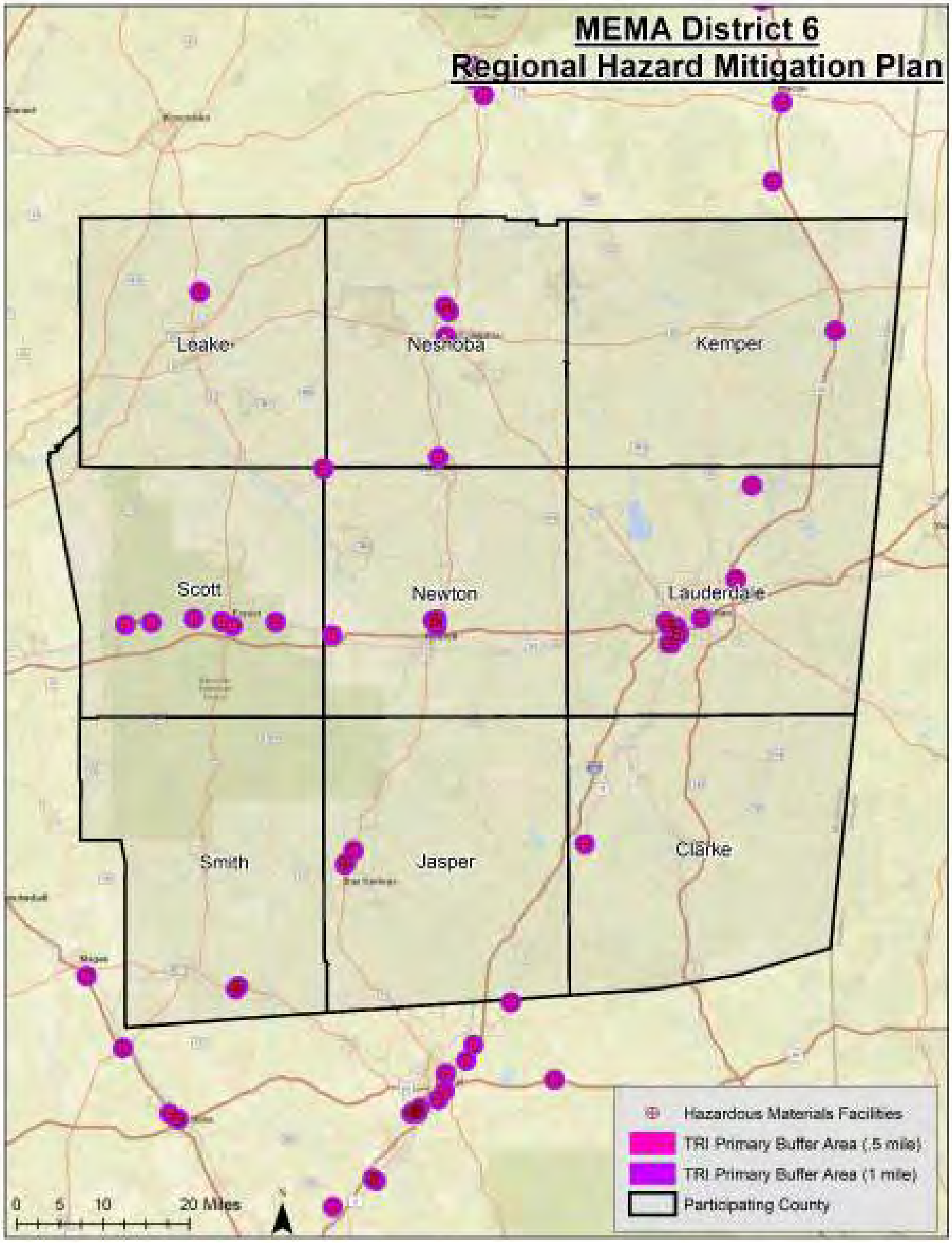
6.5.5 Hazardous Materials Incident

Historical evidence indicates that the MEMA District 6 Region is susceptible to hazardous materials events. A total of 532 HAZMAT incidents have been reported by the Pipeline and Hazardous Materials Safety Administration, resulting in $6,485,907 in property damage as well as 16 injuries. On an annualized level, these damages amount to $501,793 for the region.

Most hazardous materials incidents that occur are contained and suppressed before destroying any property or threatening lives. However, they can have a significant negative impact. Such events can cause multiple deaths, completely shut down facilities for 30 days or more, and cause more than 50 percent of affected properties to be destroyed or suffer major damage. In a hazardous materials incident, solid, liquid, and/or gaseous contaminants may be released from fixed or mobile containers. Weather conditions will directly affect how the hazard develops. Certain chemicals may travel through the air or water, affecting a much larger area than the point of the incidence itself. Non-compliance with fire and building codes, as well as failure to maintain existing fire and containment features, can substantially increase the damage from a hazardous materials release. The duration of a hazardous materials incident can range from hours to days. Warning time is minimal to none.

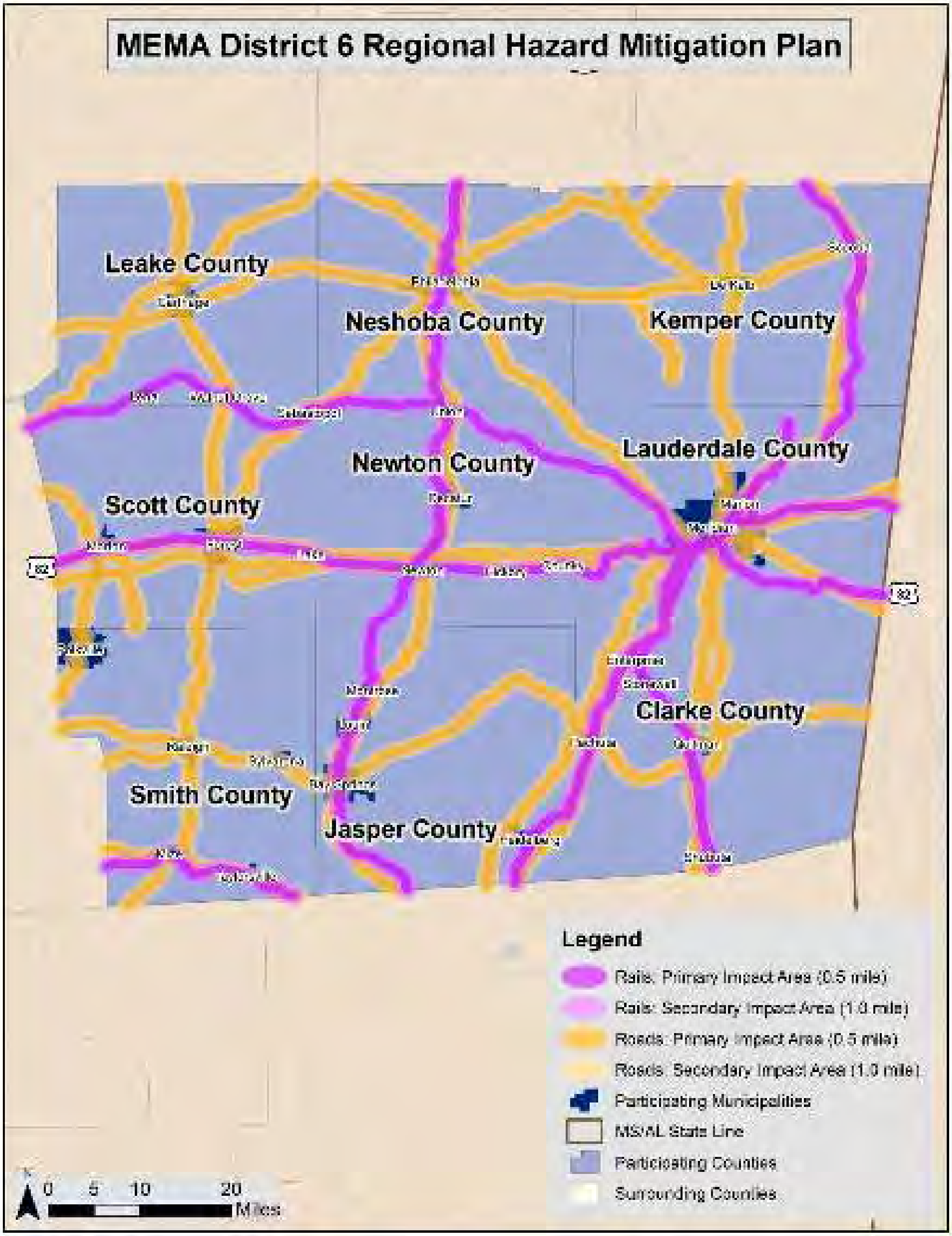
In order to conduct the vulnerability assessment for this hazard, GIS intersection analysis was used for fixed and mobile areas and building footprints/parcels. In both scenarios, two sizes of buffers—0.5- mile and 1.0-mile—were used. These areas are assumed to represent the different levels of effect: immediate (primary) and secondary. Primary and secondary impact zones were selected based on guidance from the PHMSA Emergency Response Guidebook. For the fixed site analysis, geo-referenced TRI sites in the region, along with buffers, were used for analysis as shown in **Figure 6.10.** For the mobile analysis, the major roads (Interstate highway, U.S. highway, and State highway) and railroads, where hazardous materials are primarily transported that could adversely impact people and buildings, were used for the GIS buffer analysis. **Figure 6.11** shows the areas used for mobile toxic release buffer analysis.

Figure 6.10: TRI SITES WITH BUFFERS IN THE MEMA DISTRICT 6 REGION



Source: Environmental Protection Agency

Figure 6.11: MOBILE HAZMAT BUFFERS IN THE MEMA DISTRICT 6 REGION



SOCIAL VULNERABILITY

Given high susceptibility across the entire MEMA District 6 Region, it is assumed that the total population is at risk to hazardous materials incident. It should be noted that areas of population concentration may be at an elevated risk due to a greater burden to evacuate population quickly.

CRITICAL FACILITIES

Fixed Site Analysis:
A list of specific critical facilities and their associated risk can be found at the end of this section.

Mobile Analysis:
It should be presumed that any facility located near a public roadway or rail line is susceptible to a potential HAZMAT event. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

A list of specific critical facilities and their associated risk can be found in at the end of this section.

In conclusion, a hazardous material incident has the potential to impact many existing and future buildings, critical facilities, and populations in the MEMA District 6 Region. Those areas in a primary buffer are at the highest risk, though all areas carry some vulnerability due to variations in condition that could alter the impact area (i.e., direction and speed of wind, volume of release, etc.). Further, incidents from neighboring counties could also impact the region.

6.6 CONCLUSIONS ON HAZARD VULNERABIILTY

The results of this vulnerability assessment are useful in at least three ways:

- Improving our understanding of the risk associated with the natural hazards in the MEMA District 6 Region through better understanding of the complexities and dynamics of risk, how levels of risk can be measured and compared, and the myriad of factors that influence risk. An understanding of these relationships is critical in making balanced and informed decisions on managing the risk.
- Providing a baseline for policy development and comparison of mitigation alternatives. The data used for this analysis presents a current picture of risk in the MEMA District 6 Region. Updating this risk "snapshot" with future data will enable comparison of the changes in risk with time. Baselines of this type can support the objective analysis of policy and program options for risk reduction in the region.
- Comparing the risk among the natural hazards addressed. The ability to quantify the risk to all these hazards relative to one another helps in a balanced, multi-hazard approach to risk management at each level of governing authority. This ranking provides a systematic framework to compare and prioritize the very disparate natural hazards that are present in the MEMA District 6 Region. This final step in the risk assessment provides the necessary information for local officials to craft a mitigation strategy to focus resources on only those hazards that pose the most threat to the MEMA District 6 counties.

Exposure to hazards can be an indicator of vulnerability. Economic exposure can be identified through values for improvements (buildings), and social exposure can be identified by estimating the population exposed to each hazard. This information is especially important for decision-makers to use in planning for evacuation or other public safety related needs.

The types of assets included in these analyses include all building types in the participating jurisdictions. Specific information about the types of assets that are vulnerable to the identified hazards is included in each hazard subsection (for example all building types are considered at risk to the winter storm hazard and commercial and residential are at risk to repetitive flooding, etc.).

The table presents a summary of annualized loss for each hazard in the MEMA District 6 Region. Due to the reporting of hazard damages primarily at the county level, it was difficult to determine an accurate annualized loss estimate for each municipality. Therefore, an annualized loss was determined through the damage reported through historical occurrences at the county level. These values should be used as an additional planning tool or measure risk for determining hazard mitigation strategies throughout the region.

Table 6.9: ANNUALIZED LOSS FOR THE MEMA DISTRICT 6 REGION

Hazard	Clarke County	Jasper County	Kemper County	Lauderdale County	Leake County
Flood-related Hazards					
Flood	$203,260	$167,166	$69,130	$2,316,958	$549,000
Erosion	Negligible	Negligible	Negligible	Negligible	Negligible
Dam and Levee Failure	Negligible	Negligible	Negligible	Negligible	Negligible
Winter Storm & Freeze	$5,200	$29,000	$40,000	$42,400	$65,800
Fire-related Hazards					
Drought / Heat Wave	$8,125	$8,125	$8,750	$7,500	$6,875
Wildfire	Negligible	Negligible	Negligible	Negligible	Negligible
Geologic Hazards					
Earthquake	Negligible	Negligible	Negligible	Negligible	Negligible
Landslide	Negligible	Negligible	Negligible	Negligible	Negligible
Land Subsidence	Negligible	Negligible	Negligible	Negligible	Negligible
Wind-related Hazards					
Hurricane & Tropical Storm	$576,000	$477,000	$87,000	$1,514,000	$169,000
Thunderstorm / High Wind	$78,740	$53,507	$28,378	$115,723	$20,909
Hail	$6,781	$9,881	$19,918	$9,206	$12,411
Lightning	$33,857	$1,470	$17,857	Negligible	$8,692
Tornado	$446,468	$717,885	$642,985	$275,521	$1,049,142
Other Hazards					
HAZMAT Incident	$24,335	Negligible	Negligible	$63,955	Negligible
Pandemic	Negligible	Negligible	Negligible	Negligible	Negligible

**In this table, the term "Negligible" is used to indicate that no records of dollar losses for the particular hazard were recorded. This could be the case either because there were no events that caused dollar damage or because documentation of that particular type of event is not well kept. Annualized losses were calculated based on the total number of years of reporting and damage totals.*

ANNUALIZED LOSS FOR THE MEMA DISTRICT 6 REGION (CONT.)

Hazard	Neshoba County	Newton County	Scott County	Smith County	Region Total
Flood-related Hazards					
Flood	$90,000	$1,345,666	$2,665,600	$27,478	$7,434,258
Erosion	Negligible	Negligible	Negligible	Negligible	Negligible
Dam and Levee Failure	Negligible	Negligible	Negligible	Negligible	Negligible
Winter Storm & Freeze	$61,200	$63,600	$48,800	$55,000	$411,000
Fire-related Hazards					
Drought / Heat Wave	$8,750	$6,250	$37,500	$8,125	$100,000
Wildfire	Negligible	Negligible	Negligible	Negligible	Negligible
Geologic Hazards					
Earthquake	Negligible	Negligible	Negligible	Negligible	Negligible
Landslide	Negligible	Negligible	Negligible	Negligible	Negligible
Land Subsidence	Negligible	Negligible	Negligible	Negligible	Negligible
Wind-related Hazards					
Hurricane & Tropical Storm	$308,000	$300,000	$359,000	$436,000	$436,000
Thunderstorm / High Wind	$84,766	$79,307	$209,155	$173,467	$843,952
Hail	$33,039	$8,360	$94,677	$135,221	$329,494
Lightning	$6,866	$9,375	$6,739	$241,197	$92,869
Tornado	$1,114,985	$280,070	$149,970	$2,577,687	5,161,943
Other Hazards					
HAZMAT Incident	Negligible	$10,952	$348,864	$53,687	$501,793
Pandemic					

**In this table, the term "Negligible" is used to indicate that no records of dollar losses for the particular hazard were recorded. This could be the case either because there were no events that caused dollar damage or because documentation of that particular type of event is not well kept. Annualized losses were calculated based on the total number of years of reporting and damage totals.*

As noted previously, all existing and future buildings and populations (including critical facilities) are vulnerable to atmospheric hazards including drought / heat wave, hurricane and tropical storm, thunderstorm (wind, hail, lightning), tornado, and winter storm and freeze. In addition, all buildings and populations are vulnerable to all of the man-made and technological hazards identified above. Some buildings may be more vulnerable to these hazards based on locations, construction, and building type. **Table 6.14** shows the critical facilities vulnerable to additional hazards analyzed in this section. The table lists those assets that are determined to be exposed to each of the identified hazards (marked with an "**X**").

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Table 6.10: AT-RISK CRITICAL FACILITIES IN CLARKE COUNTY

		FLOOD-RELATED					FIRE-RELATED		GEOLOGIC			WIND-RELATED			OTHER						
FACILITY NAME	FACILITY TYPE	Flood – 100 yr	Flood – 500 yr	Erosion	Dam and Levee Failure[32]	Winter Storm and Freeze	Drought / Heat Wave	Wildfire	Earthquake	Landslide	Land Subsidence	Hurricane and Tropical Storm	Thunderstorm (wind, hail,	Tornado	Fixed HAZMAT – 0.5 mile	Fixed HAZMAT – 1.0 mile	Mobile HAZMAT – 0.5 mile (road)	Mobile HAZMAT – 1.0 mile (road)	Mobile HAZMAT – 0.5 mile (rail)	Mobile HAZMAT – 1.0 mile (rail)	Pandemic
CLARKE COUNTY																					
Carmichael Volunteer Fire Department	Fire Station			X	X	X	X		X	X	X	X	X	X							X
DESOTO VOLUNTEER FIRE DEPARTMENT	Fire Station			X					X	X	X	X	X	X							X
EAST QUITMAN VOLUNTEER FIRE	Fire Station			X					X	X	X	X	X	X							X
Enterprise Volunteer Fire Department & A	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X		X	X
Enterprise Volunteer Fire Department	Fire Station			X					X	X	X	X	X	X							X
HARMONY VOLUNTEER FD	Fire Station			X					X	X	X	X	X	X							X
Hopewell Volunteer Fire Department	Fire Station			X	X	X	X		X	X	X	X	X	X							X
Pachuta Volunteer Fire Department	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
QUITMAN VOLUNTEER FD	Fire Station			X					X	X	X	X	X	X							X
ROLLING CREEK VOLUNTEER FD	Fire Station			X					X	X	X	X	X	X							X
Shubuta City Fire Dept	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
Stonewall VFD	Fire Station			X	X	X	X		X	X	X	X	X	X						X	X
THEADSVILLE VOLUNTEER FD	Fire Station			X					X	X	X	X	X	X							X
H C Watkins Memorial Hospital	Medical Care Facility			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
Clarke County Sheriff Dept	Police Station			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
Enterprise Police Dept	Police Station			X	X	X	X		X	X	X	X	X	X				X	X	X	X
Quitman City Police Dept	Police Station			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
Shubuta Police Department	Police Station			X					X	X	X	X	X	X							X
Stonewall Police Dept	Police Station			X	X	X	X		X	X	X	X	X	X						X	X

		FLOOD-RELATED					FIRE-RELATED		GEOLOGIC			WIND-RELATED			OTHER						
FACILITY NAME	FACILITY TYPE	Flood – 100 yr	Flood – 500 yr	Erosion	Dam and Levee Failure[33]	Winter Storm and Freeze	Drought / Heat Wave	Wildfire	Earthquake	Landslide	Land Subsidence	Hurricane and Tropical Storm	Thunderstorm (wind, hail,	Tornado	Fixed HAZMAT – 0.5 mile	Fixed HAZMAT – 1.0 mile	Mobile HAZMAT – 0.5 mile (road)	Mobile HAZMAT – 1.0 mile (road)	Mobile HAZMAT – 0.5 mile (rail)	Mobile HAZMAT – 1.0 mile (rail)	Pandemic
Clarkdale Attendance Center	School			X	X	X	X		X	X	X	X	X	X			X	X			X
Clarke Co Vocational Center	School			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
Enterprise Elementary	School	X		X	X	X	X	X	X	X	X	X	X	X				X	X	X	X
Enterprise High School	School			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
Enterprise Middle School	School	X		X	X	X	X		X	X	X	X	X	X				X	X	X	X
Quitman Alternative School	School			X	X	X	X		X	X	X	X	X	X			X	X		X	X
Quitman High School	School			X	X	X	X		X	X	X	X	X	X			X	X		X	X
Quitman Jr High School	School			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
Quitman Lower Elementary School	School			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
Quitman Upper Elementary School	School			X	X	X	X		X	X	X	X	X	X			X	X		X	X

As noted previously, these facilities could be at risk to dam failure if located in an inundation area. Data was not available to conduct such an analysis. There was no local knowledge of these facilities being at risk to dam failure. As additional data becomes available, more in-depth analysis will be conducted.

Table 6.11: AT-RISK CRITICAL FACILITIES IN JASPER COUNTY

		FLOOD-RELATED					FIRE-RELATED		GEOLOGIC			WIND-RELATED			OTHER						
FACILITY NAME	FACILITY TYPE	Flood – 100 yr	Flood – 500 yr	Erosion	Dam and Levee Failure	Winter Storm and Freeze	Drought / Heat Wave	Wildfire	Earthquake	Landslide	Land Subsidence	Hurricane and Tropical Storm	Thunderstorm (wind, hail,	Tornado	Fixed HAZMAT – 0.5 mile	Fixed HAZMAT – 1.0 mile	Mobile HAZMAT – 0.5 mile (road)	Mobile HAZMAT – 1.0 mile (road)	Mobile HAZMAT – 0.5 mile (rail)	Mobile HAZMAT – 1.0 mile (rail)	Pandemic
JASPER COUNTY																					
Jasper County Civil Defense	EOC			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
BAY SPRINGS VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X							X
HAL VOLUNTEER FIRE AND RESCUE	Fire Station			X	X	X	X		X	X	X	X	X	X					X	X	X
BEAVER MEADOW VOLUNTEER FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
HEIDELBERG VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
OAK BOWERY VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
MOSSVILLE VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
MONTROSE VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
LOUIN VOLUNTEER FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
CENTRAL VOLUNTEER FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
PAULDING VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
ROSE HILL VOLUNTEER FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
STRINGER VOLUNTEER FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
VOSSBURG-HEIDELBERG VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
Jasper General Hospital	Medical Care			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
Bay Springs Police Dept	Police Station			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X

As noted previously, these facilities could be at risk to dam failure if located in an inundation area. Data was not available to conduct such an analysis. There was no local knowledge of these facilities being at risk to dam failure. As additional data becomes available, more in-depth analysis will be conducted.

		FLOOD-RELATED					FIRE-RELATED		GEOLOGIC			WIND-RELATED			OTHER						
FACILITY NAME	FACILITY TYPE	Flood – 100 yr	Flood – 500 yr	Erosion	Dam and Levee Failure[32]	Winter Storm and Freeze	Drought / Heat Wave	Wildfire	Earthquake	Landslide	Land Subsidence	Hurricane and Tropical Storm	Thunderstorm (wind, hail,	Tornado	Fixed HAZMAT – 0.5 mile	Fixed HAZMAT – 1.0 mile	Mobile HAZMAT – 0.5 mile (road)	Mobile HAZMAT – 1.0 mile (road)	Mobile HAZMAT – 0.5 mile (rail)	Mobile HAZMAT – 1.0 mile (rail)	Pandemic
JASPER COUNTY																					
Heidelberg Police Dept	Police Station	X		X	X	X	X		X	X	X	X	X	X						X	X
Jasper County Sheriff's Ofc	Police Station			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
Louin Police Department	Police Station			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
Bay Springs Elem Sch	School			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
Bay Springs High School	School			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
Bay Springs Middle Sch	School			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
Heidelberg High School	School	X		X	X	X	X		X	X	X	X	X	X						X	X
Jasper Co Career Development Center	School			X	X	X	X	X	X	X	X	X	X	X							X
Stringer Attendance Center	School			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
Sylva Bay Academy Inc	School			X	X	X	X	X	X	X	X	X	X	X			X	X			X
William J Berry Elementary School	School			X	X	X	X		X	X	X	X	X	X						X	X

Table 6.12: AT-RISK CRITICAL FACILITIES IN KEMPER COUNTY

		FLOOD-RELATED					FIRE-RELATED		GEOLOGIC			WIND-RELATED			OTHER						
FACILITY NAME	FACILITY TYPE	Flood – 100 yr	Flood – 500 yr	Erosion	Dam and Levee Failure	Winter Storm and Freeze	Drought / Heat Wave	Wildfire	Earthquake	Landslide	Land Subsidence	Hurricane and Tropical Storm	Thunderstorm (wind, hail,	Tornado	Fixed HAZMAT – 0.5 mile	Fixed HAZMAT – 1.0 mile	Mobile HAZMAT – 0.5 mile (road)	Mobile HAZMAT – 1.0 mile (road)	Mobile HAZMAT – 0.5 mile (rail)	Mobile HAZMAT – 1.0 mile (rail)	Pandemic
KEMPER COUNTY																					
East Kemper Elementary	Educational			X	X	X	X		X	X	X	X	X	X			X	X		X	X
East MS Community College	Educational			X	X	X	X		X	X	X	X	X	X			X	X		X	X
East Kemper Attendance Center	Educational			X	X	X	X	X	X	X	X	X	X	X			X	X			X
KC High School	Educational			X	X	X	X		X	X	X	X	X	X			X	X			X
KC School District	Educational			X	X	X	X		X	X	X	X	X	X	X	X	X	X			X
Stennis Vocation Tech Center	Educational			X	X	X	X	X	X	X	X	X	X	X			X	X			X
West Kemper Elementary	Educational			X	X	X	X		X	X	X	X	X	X	X	X	X	X			X
3 Mile Corner	Fire Station			X	X	X	X		X	X	X	X	X	X							X
CHOCTAW FIRE DEPARTMENT STATION 3	Fire Station			X	X	X	X		X	X	X	X	X	X							X
De Kalb	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
Scooba	Fire Station			X	X	X	X		X	X	X	X	X	X							X
Damascus	Fire Station			X	X	X	X		X	X	X	X	X	X				X			X
Kemper Springs	Fire Station			X	X	X	X		X	X	X	X	X	X							X
Mt Nebo	Fire Station			X	X	X	X		X	X	X	X	X	X							X
New Hope	Fire Station	X		X	X	X	X	X	X	X	X	X	X	X						X	X
Mt. Salem	Fire Station			X	X	X	X	X	X	X	X	X	X	X			X	X			X
Porterville	Fire Station			X	X	X	X	X	X	X	X	X	X	X			X	X			X
Preston	Fire Station			X	X	X	X	X	X	X	X	X	X	X			X	X			X

* As noted previously, these facilities could be at risk to dam failure if located in an inundation area. Data was not available to conduct such an analysis. There was no local knowledge of these facilities being at risk to dam failure. As additional data becomes available, more in-depth analysis will be conducted.

		FLOOD-RELATED					FIRE-RELATED		GEOLOGIC			WIND-RELATED			OTHER						
FACILITY NAME	FACILITY TYPE	Flood – 100 yr	Flood – 500 yr	Erosion	Dam and Levee Failure	Winter Storm and Freeze	Drought / Heat Wave	Wildfire	Earthquake	Landslide	Land Subsidence	Hurricane and Tropical Storm	Thunderstorm (wind, hail,	Tornado	Fixed HAZMAT – 0.5 mile	Fixed HAZMAT – 1.0 mile	Mobile HAZMAT – 0.5 mile (road)	Mobile HAZMAT – 1.0 mile (road)	Mobile HAZMAT – 0.5 mile (rail)	Mobile HAZMAT – 1.0 mile (rail)	Pandemic
KEMPER COUNTY																					
Sinai	Fire Station			X	X	X	X	X	X	X	X	X	X	X			X	X			X
Spring Hill	Fire Station			X	X	X	X	X	X	X	X	X	X	X			X	X			X
Kemper Sheriff's Department	Police Station			X	X	X	X	X	X	X	X	X	X	X			X	X			X
Courthouse	Government			X	X	X	X		X	X	X	X	X	X	X	X	X	X			X
DeKalb Town Hall	Government			X	X	X	X		X	X	X	X	X	X	X	X	X	X			X
John C Stennis Memorial Hospital	Medical			X	X	X	X	X	X	X	X	X	X	X			X	X			X
KC Health Dept	Medical			X	X	X	X		X	X	X	X	X	X			X	X			X
Patient Care Logistics Ambulance	Medical			X	X	X	X		X	X	X	X	X	X		X	X	X			X
MS Care Center	Medical			X	X	X	X		X	X	X	X	X	X			X	X			X
Rush Health Clinic	Medical			X	X	X	X		X	X	X	X	X	X			X	X			X

Table 6.13: AT-RISK CRITICAL FACILITIES IN LAUDERDALE COUNTY

		FLOOD-RELATED					FIRE-RELATED		GEOLOGIC			WIND-RELATED			OTHER						
FACILITY NAME	FACILITY TYPE	Flood – 100 yr	Flood – 500 yr	Erosion	Dam and Levee Failure[32]	Winter Storm and Freeze	Drought / Heat Wave	Wildfire	Earthquake	Landslide	Land Subsidence	Hurricane and Tropical Storm	Thunderstorm (wind, hail,	Tornado	Fixed HAZMAT – 0.5 mile	Fixed HAZMAT – 1.0 mile	Mobile HAZMAT – 0.5 mile (road)	Mobile HAZMAT – 1.0 mile (road)	Mobile HAZMAT – 0.5 mile (rail)	Mobile HAZMAT – 1.0 mile (rail)	Pandemic
LAUDERDALE COUNTY																					
Lauderdale County EOC	EOC			X	X	X	X		X	X	X	X	X	X				X	X	X	X
BAILEY VOLUNTEER FIRE AND RESCUE	Fire Station			X	X	X	X		X	X	X	X	X	X					X	X	X
MARTIN VOLUNTEER FIRE AND RESCUE	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
COLLINSVILLE VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
EAST NESHOBA VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
SAM DALE VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
LAUDERDALE VOLUNTEER FIRE AND RESCUE	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
CENTER RIDGE VOLUNTEER FIRE AND	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
MARION VOLUNTEER FIRE AND RESCUE	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
CITY OF MERIDIAN FIRE STATION #1	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
CITY OF MERIDIAN FIRE STATION #2	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
CITY OF MERIDIAN FIRE STATION #3	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
CITY OF MERIDIAN FIRE STATION #4	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
CITY OF MERIDIAN FIRE STATION #5	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X

		FLOOD-RELATED					FIRE-RELATED		GEOLOGIC			WIND-RELATED			OTHER						
FACILITY NAME	FACILITY TYPE	Flood – 100 yr	Flood – 500 yr	Erosion	Dam and Levee Failure[32]	Winter Storm and Freeze	Drought / Heat Wave	Wildfire	Earthquake	Landslide	Land Subsidence	Hurricane and Tropical Storm	Thunderstorm (wind, hail,	Tornado	Fixed HAZMAT – 0.5 mile	Fixed HAZMAT – 1.0 mile	Mobile HAZMAT – 0.5 mile (road)	Mobile HAZMAT – 1.0 mile (road)	Mobile HAZMAT – 0.5 mile (rail)	Mobile HAZMAT – 1.0 mile (rail)	Pandemic
LAUDERDALE COUNTY																					
CITY OF MERIDIAN FIRE STATION #6	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
CITY OF MERIDIAN FIRE STATION #7	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
CITY OF MERIDIAN FIRE STATION #8	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
RUSSELL VOLUNTEER FIRE AND RESCUE	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
NAVAL AIR STATION MERIDIAN FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
NAVAL AIR STATION MERIDIAN FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
NORTHEAST VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
SUQUALENA VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
MEEHAN VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
LOST GAP VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
CLARKDALE VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
CLARKDALE VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
SOUTH VOLUNTEER FIRE AND RESCUE	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
LONG CREEK VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
WHYNOT VOLUNTEER FIRE AND RESCUE	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
CAUSEYVILLE VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
VIMVILLE VOLUNTEER FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X

FACILITY NAME	FACILITY TYPE	Flood – 100 yr	Flood – 500 yr	Erosion	Dam and Levee Failure[32]	Winter Storm and Freeze	Drought / Heat Wave	Wildfire	Earthquake	Landslide	Land Subsidence	Hurricane and Tropical Storm	Thunderstorm (wind, hail,	Tornado	Fixed HAZMAT – 0.5 mile	Fixed HAZMAT – 1.0 mile	Mobile HAZMAT – 0.5 mile (road)	Mobile HAZMAT – 1.0 mile (road)	Mobile HAZMAT – 0.5 mile (rail)	Mobile HAZMAT – 1.0 mile (rail)	Pandemic
		FLOOD-RELATED					FIRE-RELATED		GEOLOGIC			WIND-RELATED			OTHER						
LAUDERDALE COUNTY																					
186 AIR REFUELING WING FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
TOOMSUBA VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
ALAMUCHA VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
ALLIANCE HEALTH SYSTEM	Medical Care			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
ANDERSON REGIONAL MEDICAL CENTER	Medical Care			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
ANDERSON REGIONAL MEDICAL CENTER	Medical Care			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
EAST MS STATE HOSPITAL	Medical Care			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
GV (SONNY) MONTGOMERY VETERANS	Medical Care			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
REGENCY HOSPITAL OF MERIDIAN	Medical Care			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
RUSH FOUNDATION HOSPITAL	Medical Care			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
THE SPECIALTY HOSPITAL OF MERIDIAN	Medical Care			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
LAUDERDALE COUNTY SHERIFF	Police			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
MARION POLICE DEPARTMENT	Police			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
MERIDIAN COMMUNITY COLLEGE CAMPUS POLICE	Police			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
MERIDIAN POLICE DEPARTMENT	Police			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
MERIDIAN POLICE DEPARTMENT - WEST	Police			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
MISSISSIPPI HIGHWAY PATROL TROOP H	Police			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X

		FLOOD-RELATED					FIRE-RELATED		GEOLOGIC			WIND-RELATED			OTHER						
FACILITY NAME	FACILITY TYPE	Flood – 100 yr	Flood – 500 yr	Erosion	Dam and Levee Failure[32]	Winter Storm and Freeze	Drought / Heat Wave	Wildfire	Earthquake	Landslide	Land Subsidence	Hurricane and Tropical Storm	Thunderstorm (wind, hail,	Tornado	Fixed HAZMAT – 0.5 mile	Fixed HAZMAT – 1.0 mile	Mobile HAZMAT – 0.5 mile (road)	Mobile HAZMAT – 1.0 mile (road)	Mobile HAZMAT – 0.5 mile (rail)	Mobile HAZMAT – 1.0 mile (rail)	Pandemic
LAUDERDALE COUNTY																					
MISSISSIPPI HIGHWAY SAFETY PATROL	Police			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
MISSISSIPPI STATE UNIVERSITY POLICE	Police			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
CALVARY CHRISTIAN SCHOOL	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
CHILDREN'S EDUCATION CONNECTION	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
CLARKDALE ELEMENTARY SCHOOL	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
CLARKDALE HIGH SCHOOL	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
CLARKDALE MIDDLE SCHOOL	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
COMMUNITY CHRISTIAN SCHOOL	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
CRESTWOOD ELEMENTARY SCHOOL	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
GEORGE WASHINGTON CARVER MIDDLE	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
LAMAR SCHOOL	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
LAUDERDALE CO EDUCATIONAL & SKILLS	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
MAGNOLIA GROVE SCHOOL	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
MAGNOLIA MIDDLE SCHOOL	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
MARION PARK COMPLEX	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
MERIDIAN COMMUNITY COLLEGE	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
MERIDIAN HIGH SCHOOL	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
NORTHEAST LAUDERDALE ELEMENTARY	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
		FLOOD-RELATED					FIRE-RELATED		GEOLOGIC			WIND-RELATED			OTHER						

FACILITY NAME	FACILITY TYPE	Flood – 100 yr	Flood – 500 yr	Erosion	Dam and Levee Failure[32]	Winter Storm and Freeze	Drought / Heat Wave	Wildfire	Earthquake	Landslide	Land Subsidence	Hurricane and Tropical Storm	Thunderstorm (wind, hail,	Tornado	Fixed HAZMAT – 0.5 mile	Fixed HAZMAT – 1.0 mile	Mobile HAZMAT – 0.5 mile (road)	Mobile HAZMAT – 1.0 mile (road)	Mobile HAZMAT – 0.5 mile (rail)	Mobile HAZMAT – 1.0 mile (rail)	Pandemic
LAUDERDALE COUNTY																					
NORTHEAST LAUDERDALE HIGH SCHOOL	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
NORTHEAST LAUDERDALE MIDDLE	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
NORTHWEST JUNIOR HIGH SCHOOL	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
OAKLAND HEIGHTS ELEMENTARY SCHOOL	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
PARKVIEW ELEMENTARY SCHOOL	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
POPLAR SPRINGS ELEMENTARY SCHOOL	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
ROSS COLLINS VOC CENTER	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
RUSSELL CHRISTIAN ACADEMY	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
SOUTHEAST LAUDERDALE ELEMENTARY	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
SOUTHEAST LAUDERDALE HIGH SCHOOL	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
SOUTHEAST LAUDERDALE MIDDLE	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
ST PATRICK ELEMENTARY SCHOOL	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
T J HARRIS ELEMENTARY	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
THE PENTECOSTAL CHRISTIAN ACADEMY	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
WEST HILLS ELEMENTARY SCHOOL	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
WEST LAUDERDALE ELEMENTARY SCHOOL	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
WEST LAUDERDALE HIGH SCHOOL	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
WEST LAUDERDALE MIDDLE SCHOOL	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X

Table 6.14: AT-RISK CRITICAL FACILITIES IN LEAKE COUNTY

		FLOOD-RELATED					FIRE-RELATED		GEOLOGIC			WIND-RELATED			OTHER						
FACILITY NAME	FACILITY TYPE	Flood – 100 yr	Flood – 500 yr	Erosion	Dam and Levee Failure[33]	Winter Storm and Freeze	Drought / Heat Wave	Wildfire	Earthquake	Landslide	Land Subsidence	Hurricane and Tropical Storm	Thunderstorm (wind, hail,	Tornado	Fixed HAZMAT – 0.5 mile	Fixed HAZMAT – 1.0 mile	Mobile HAZMAT – 0.5 mile (road)	Mobile HAZMAT – 1.0 mile (road)	Mobile HAZMAT – 0.5 mile (rail)	Mobile HAZMAT – 1.0 mile (rail)	Pandemic
LEAKE COUNTY																					
Barnes Volunteer Fire Department	Fire Station			X	X	X	X		X	X	X	X	X	X					X	X	X
Carthage Fire Department	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
Edinburg Volunteer Fire Department	Fire Station			X	X	X	X		X	X	X	X	X	X				X			X
Lena VFD	Fire Station			X	X	X	X		X	X	X	X	X	X					X	X	X
Madden Volunteer Fire Department	Fire Station			X	X	X	X		X	X	X	X	X	X							X
Marydell Volunteer Fire Department	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
Mississippi Forestry Commission	Fire Station			X	X	X	X		X	X	X	X	X	X					X	X	X
Ofahoma Volunteer Fire Department	Fire Station			X	X	X	X		X	X	X	X	X	X					X	X	X
Reformation Volunteer Fire Department	Fire Station			X	X	X	X		X	X	X	X	X	X				X			X
Thomastown Volunteer Fire Department	Fire Station			X	X	X	X		X	X	X	X	X	X					X	X	X
Walnut Grove Volunteer Fire Department	Fire Station	X		X	X	X	X		X	X	X	X	X	X							X
Baptist Medical Center	Medical Care Facility			X	X	X	X		X	X	X	X	X	X			X	X			X
Carthage Police Dept	Police Station			X	X	X	X		X	X	X	X	X	X			X	X			X
Leake County Sheriff	Police Station			X	X	X	X		X	X	X	X	X	X			X	X			X
Walnut Grove Police	Police Station			X	X	X	X		X	X	X	X	X	X					X	X	X

		FLOOD-RELATED					FIRE-RELATED		GEOLOGIC			WIND-RELATED			OTHER						
FACILITY NAME	FACILITY TYPE	Flood – 100 yr	Flood – 500 yr	Erosion	Dam and Levee Failure[33]	Winter Storm and Freeze	Drought / Heat Wave	Wildfire	Earthquake	Landslide	Land Subsidence	Hurricane and Tropical Storm	Thunderstorm (wind, hail,	Tornado	Fixed HAZMAT – 0.5 mile	Fixed HAZMAT – 1.0 mile	Mobile HAZMAT – 0.5 mile (road)	Mobile HAZMAT – 1.0 mile (road)	Mobile HAZMAT – 0.5 mile (rail)	Mobile HAZMAT – 1.0 mile (rail)	Pandemic
LEAKE COUNTY																					
Leake County Vocational Center	School			X	X	X	X		X	X	X	X	X	X			X	X			X
LEAKE CENTRAL ELEMENTARY SCHOOL	School			X	X	X	X		X	X	X	X	X	X					X	X	X
LEAKE CENTRAL HIGH SCHOOL	School			X	X	X	X		X	X	X	X	X	X					X	X	X
LEAKE CENTRAL JUNIOR HIGH	School			X	X	X	X		X	X	X	X	X	X					X	X	X
LEAKE CO CAREER & TECHNICAL CENTER	School			X	X	X	X		X	X	X	X	X	X					X	X	X
LEAKE COUNTY ELEMENTARY SCHOOL	School			X	X	X	X		X	X	X	X	X	X					X	X	X
LEAKE COUNTY HIGH SCHOOL	School			X	X	X	X		X	X	X	X	X	X					X	X	X
Red Water Elementary School	School			X	X	X	X	X	X	X	X	X	X	X			X	X			X
Standing Pine Elementary School	School			X	X	X	X		X	X	X	X	X	X							X

Table 6.15: AT-RISK CRITICAL FACILITIES IN NESHOBA COUNTY

		FLOOD-RELATED					FIRE-RELATED		GEOLOGIC			WIND-RELATED			OTHER						
FACILITY NAME	FACILITY TYPE	Flood – 100 yr	Flood – 500 yr	Erosion	Dam and Levee Failure[32]	Winter Storm and Freeze	Drought / Heat Wave	Wildfire	Earthquake	Landslide	Land Subsidence	Hurricane and Tropical Storm	Thunderstorm (wind, hail,	Tornado	Fixed HAZMAT – 0.5 mile	Fixed HAZMAT – 1.0 mile	Mobile HAZMAT – 0.5 mile (road)	Mobile HAZMAT – 1.0 mile (road)	Mobile HAZMAT – 0.5 mile (rail)	Mobile HAZMAT – 1.0 mile (rail)	Pandemic
NESHOBA COUNTY																					
ARLINGTON VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
ARLINGTON VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
CHOCTAW FIRE DEPARTMENT STATION 1	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
CHOCTAW FIRE DEPARTMENT STATION 2	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
COUNTY LINE VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
COUNTY LINE VOLUNTEER FIRE	Fire Station																				
DIXON VOLUNTEER FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
DIXON VOLUNTEER FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
EAST NESHOBA VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
EAST NESHOBA VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
EAST NESHOBA VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
EAST NESHOBA VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
FAIRVIEW VOLUNTEER FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
HOPE VOLUNTEER FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
HOPE VOLUNTEER FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
LINWOOD VOLUNTEER FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
LINWOOD VOLUNTEER FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
LINWOOD VOLUNTEER FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
LONGINO CENTRAL VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
		FLOOD-RELATED					FIRE-RELATED		GEOLOGIC			WIND-RELATED			OTHER						

FACILITY NAME	FACILITY TYPE	Flood – 100 yr	Flood – 500 yr	Erosion	Dam and Levee Failure[32]	Winter Storm and Freeze	Drought / Heat Wave	Wildfire	Earthquake	Landslide	Land Subsidence	Hurricane and Tropical Storm	Thunderstorm (wind, hail,	Tornado	Fixed HAZMAT – 0.5 mile	Fixed HAZMAT – 1.0 mile	Mobile HAZMAT – 0.5 mile (road)	Mobile HAZMAT – 1.0 mile (road)	Mobile HAZMAT – 0.5 mile (rail)	Mobile HAZMAT – 1.0 mile (rail)	Pandemic
NESHOBA COUNTY																					
NORTH BEND VOLUNTEER FIRE 1	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
NORTH BEND VOLUNTEER FIRE 2	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
NORTH BEND VOLUNTEER FIRE 3	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
PHILADELPHIA FIRE DEPARTMENT 1	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
PHILADELPHIA FIRE DEPARTMENT 2	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
PHILADELPHIA FIRE DEPARTMENT 3	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
STALLO VOLUNTEER FIRE DEPARTMENT 1	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
STALLO VOLUNTEER FIRE DEPARTMENT 2	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
TUCKER VOLUNTEER FIRE DEPARTMENT 1	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
TUCKER VOLUNTEER FIRE DEPARTMENT 2	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
TUCKER VOLUNTEER FIRE DEPARTMENT 3	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
Choctaw Health Center	Medical Care			X	X	X	X		X	X	X	X	X	X			X	X			X
Neshoba County Gen Hospital	Medical Care	X		X	X	X	X		X	X	X	X	X	X			X	X			X
Choctaw Indian Police Dept	Police Station			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
Neshoba County Sheriff	Police Station			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
Philadelphia Police Dept	Police Station			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
Boque Chitto Elementary School	School	X		X	X	X	X		X	X	X	X	X	X				X	X	X	X
Choctaw Central High School	School			X	X	X	X		X	X	X	X	X	X							X
Choctaw Central Middle School	School			X	X	X	X		X	X	X	X	X	X							X

FACILITY NAME	FACILITY TYPE	FLOOD-RELATED					FIRE-RELATED		GEOLOGIC			WIND-RELATED			OTHER						
		Flood – 100 yr	Flood – 500 yr	Erosion	Dam and Levee Failure[32]	Winter Storm and Freeze	Drought / Heat Wave	Wildfire	Earthquake	Landslide	Land Subsidence	Hurricane and Tropical Storm	Thunderstorm (wind, hail,	Tornado	Fixed HAZMAT – 0.5 mile	Fixed HAZMAT – 1.0 mile	Mobile HAZMAT – 0.5 mile (road)	Mobile HAZMAT – 1.0 mile (road)	Mobile HAZMAT – 0.5 mile (rail)	Mobile HAZMAT – 1.0 mile (rail)	Pandemic
NESHOBA COUNTY																					
Neshoba Central Elementary School	School			X	X	X	X		X	X	X	X	X	X				X			X
Neshoba Central High School	School			X	X	X	X		X	X	X	X	X	X			X	X			X
Neshoba Central Middle School	School			X	X	X	X		X	X	X	X	X	X				X			X
Pearl River Elementary School	School			X	X	X	X		X	X	X	X	X	X			X	X			X
Philadelphia Elementary School	School			X	X	X	X		X	X	X	X	X	X			X	X		X	X
Philadelphia High School	School			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
Philadelphia Middle School	School			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
Tucker Elementary School	School	X		X	X	X	X		X	X	X	X	X	X				X	X	X	X

As noted previously, these facilities could be at risk to dam failure if located in an inundation area. Data was not available to conduct such an analysis. There was no local knowledge of these facilities being at risk to dam failure. As additional data becomes available, more in-depth analysis will be conducted.

Table 6.16: AT-RISK CRITICAL FACILITIES IN NEWTON COUNTY

		FLOOD-RELATED					FIRE-RELATED		GEOLOGIC			WIND-RELATED			OTHER						
FACILITY NAME	FACILITY TYPE	Flood – 100 yr	Flood – 500 yr	Erosion	Dam and Levee Failure[32]	Winter Storm and Freeze	Drought / Heat Wave	Wildfire	Earthquake	Landslide	Land Subsidence	Hurricane and Tropical Storm	Thunderstorm (wind, hail,	Tornado	Fixed HAZMAT – 0.5 mile	Fixed HAZMAT – 1.0 mile	Mobile HAZMAT – 0.5 mile (road)	Mobile HAZMAT – 1.0 mile (road)	Mobile HAZMAT – 0.5 mile (rail)	Mobile HAZMAT – 1.0 mile (rail)	Pandemic
NEWTON COUNTY																					
BEULAH HUBBARD VOLUNTEER FIRE	Fire Station																				
CHUNKY VOLUNTEER FIRE	Fire Station																				
CONEHATTA VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X							X
DECATUR VOLUNTEER FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X							X
DUFFEE VOLUNTEER FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X							X
GIBBSTOWN VOLUNTEER FIRE	Fire Station																				
GREENVIELD VOLUNTEER FIRE	Fire Station																				
HICKORY VOLUNTEER FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X							X
NEWTON FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X							X
UNION FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X							X
DECATUR POLICE DEPARTMENT	Police			X	X	X	X		X	X	X	X	X	X							X

		FLOOD-RELATED					FIRE-RELATED		GEOLOGIC			WIND-RELATED			OTHER						
FACILITY NAME	FACILITY TYPE	Flood – 100 yr	Flood – 500 yr	Erosion	Dam and Levee Failure[33]	Winter Storm and Freeze	Drought / Heat Wave	Wildfire	Earthquake	Landslide	Land Subsidence	Hurricane and Tropical Storm	Thunderstorm (wind, hail,	Tornado	Fixed HAZMAT – 0.5 mile	Fixed HAZMAT – 1.0 mile	Mobile HAZMAT – 0.5 mile (road)	Mobile HAZMAT – 1.0 mile (road)	Mobile HAZMAT – 0.5 mile (rail)	Mobile HAZMAT – 1.0 mile (rail)	Pandemic
EAST CENTRAL COMMUNITY COLLEGE	Police			X	X	X	X		X	X	X	X	X	X							X
HICKORY POLICE DEPARTMENT	Police			X	X	X	X		X	X	X	X	X	X							X
MISSISSIPPI DEPARTMENT OF PUBLIC	Police			X	X	X	X		X	X	X	X	X	X							X
NEWTON COUNTY SHERIFFS	Police			X	X	X	X		X	X	X	X	X	X							X
NEWTON POLICE DEPARTMENT	Police			X	X	X	X		X	X	X	X	X	X							X
UNION POLICE DEPARTMENT	Police			X	X	X	X		X	X	X	X	X	X							X
CONEHATTA ELEMENTARY SCHOOL	School			X	X	X	X		X	X	X	X	X	X							X
EAST CENTRAL ALTERNATIVE SCHOOL	School			X	X	X	X		X	X	X	X	X	X							X
EAST CENTRAL COMMUNITY COLLEGE	School			X	X	X	X		X	X	X	X	X	X							X
N H PILATE MIDDLE SCHOOL	School			X	X	X	X		X	X	X	X	X	X							X
NEWTON COUNTY ACADEMY	School			X	X	X	X		X	X	X	X	X	X							X
NEWTON COUNTY ELEMENTARY SCHOOL	School			X	X	X	X		X	X	X	X	X	X							X
NEWTON COUNTY HIGH SCHOOL	School			X	X	X	X		X	X	X	X	X	X							X
NEWTON COUNTY VOC COMPLEX	School			X	X	X	X		X	X	X	X	X	X							X
NEWTON ELEMENTARY SCHOOL	School			X	X	X	X		X	X	X	X	X	X							X
NEWTON HIGH SCHOOL	School			X	X	X	X		X	X	X	X	X	X							X
NEWTON MUNICIPAL CAREER CENTER	School			X	X	X	X		X	X	X	X	X	X							X
UNION ELEMENTARY SCHOOL	School			X	X	X	X		X	X	X	X	X	X							X
UNION HIGH SCHOOL	School			X	X	X	X		X	X	X	X	X	X							X
UNION MIDDLE SCHOOL	School			X	X	X	X		X	X	X	X	X	X							X

Table 6.17: AT-RISK CRITICAL FACILITIES IN SCOTT COUNTY

		FLOOD-RELATED					FIRE-RELATED		GEOLOGIC			WIND-RELATED			OTHER						
FACILITY NAME	FACILITY TYPE	Flood – 100 yr	Flood – 500 yr	Erosion	Dam and Levee Failure	Winter Storm and Freeze	Drought / Heat Wave	Wildfire	Earthquake	Landslide	Land Subsidence	Hurricane and Tropical Storm	Thunderstorm (wind, hail,	Tornado	Fixed HAZMAT – 0.5 mile	Fixed HAZMAT – 1.0 mile	Mobile HAZMAT – 0.5 mile (road)	Mobile HAZMAT – 1.0 mile (road)	Mobile HAZMAT – 0.5 mile (rail)	Mobile HAZMAT – 1.0 mile (rail)	Pandemic
SCOTT COUNTY																					
GIBBSTOWN-LAWRENCE VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X							X
HOMEWOOD VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X							X
LAKE VOLUNTEER FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X							X
LUDLOW VOLUNTEER FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X							X
NORTH CENTRAL SCOTT COUNTY 1	Fire Station			X	X	X	X		X	X	X	X	X	X							X
NORTH CENTRAL SCOTT COUNTY 2	Fire Station			X	X	X	X		X	X	X	X	X	X							X
NORTH CENTRAL SCOTT COUNTY 3	Fire Station			X	X	X	X		X	X	X	X	X	X							X
PINEVILLE VOLUNTEER FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X							X
THE CITY OF FOREST FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X							X
FOREST POLICE DEPARTMENT	Police			X	X	X	X		X	X	X	X	X	X							X
SCOTT COUNTY SHERIFFS DEPARTMENT /	Police			X	X	X	X		X	X	X	X	X	X							X
LAKE POLICE DEPARTMENT	Police			X	X	X	X		X	X	X	X	X	X							X
MORTON POLICE DEPARTMENT	Police			X	X	X	X		X	X	X	X	X	X							X
POLKVILLE POLICE DEPARTMENT	Police			X	X	X	X		X	X	X	X	X	X							X
SCOTT COUNTY EOC	EOC			X	X	X	X		X	X	X	X	X	X							X
ALPHA & OMEGA ACADEMY	School			X	X	X	X		X	X	X	X	X	X							X
BETTYE MAE JACK MIDDLE SCHOOL	School			X	X	X	X		X	X	X	X	X	X							X
FOREST ELEMENTARY SCHOOL	School			X	X	X	X		X	X	X	X	X	X							X
FOREST HIGH SCHOOL	School			X	X	X	X		X	X	X	X	X	X							X
FOREST SCOTT CO VOC TECH CENTER	School			X	X	X	X		X	X	X	X	X	X							X

		FLOOD-RELATED					FIRE-RELATED		GEOLOGIC			WIND-RELATED			OTHER						
FACILITY NAME	FACILITY TYPE	Flood – 100 yr	Flood – 500 yr	Erosion	Dam and Levee Failure	Winter Storm and Freeze	Drought / Heat Wave	Wildfire	Earthquake	Landslide	Land Subsidence	Hurricane and Tropical Storm	Thunderstorm (wind, hail,	Tornado	Fixed HAZMAT – 0.5 mile	Fixed HAZMAT – 1.0 mile	Mobile HAZMAT – 0.5 mile (road)	Mobile HAZMAT – 1.0 mile (road)	Mobile HAZMAT – 0.5 mile (rail)	Mobile HAZMAT – 1.0 mile (rail)	Pandemic
SCOTT COUNTY																					
HAWKINS MIDDLE SCHOOL	School			X	X	X	X		X	X	X	X	X	X							X
LAKE ELEMENTARY SCHOOL	School			X	X	X	X		X	X	X	X	X	X							X
LAKE HIGH SCHOOL	School			X	X	X	X		X	X	X	X	X	X							X
LAKE MIDDLE SCHOOL	School			X	X	X	X		X	X	X	X	X	X							X
MORTON ELEMENTARY SCHOOL	School			X	X	X	X		X	X	X	X	X	X							X
MORTON HIGH SCHOOL	School			X	X	X	X		X	X	X	X	X	X							X
SCOTT CENTRAL ATTENDANCE CENTER	School			X	X	X	X		X	X	X	X	X	X							X

Table 6.18: AT-RISK CRITICAL FACILITIES IN SMITH COUNTY

		FLOOD-RELATED					FIRE-RELATED		GEOLOGIC			WIND-RELATED			OTHER						
FACILITY NAME	FACILITY TYPE	Flood – 100 yr	Flood – 500 yr	Erosion	Dam and Levee Failure	Winter Storm and Freeze	Drought / Heat Wave	Wildfire	Earthquake	Landslide	Land Subsidence	Hurricane and Tropical Storm	Thunderstorm (wind, hail,	Tornado	Fixed HAZMAT – 0.5 mile	Fixed HAZMAT – 1.0 mile	Mobile HAZMAT – 0.5 mile (road)	Mobile HAZMAT – 1.0 mile (road)	Mobile HAZMAT – 0.5 mile (rail)	Mobile HAZMAT – 1.0 mile (rail)	Pandemic
SMITH COUNTY																					
Smith County EOC	EOC			X	X	X	X		X	X	X	X	X	X			X	X			X
Sylvarena Volunteer Fire Department	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
Polkville Volunteer Fire Department	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
Mize Volunteer Fire Department	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
Taylorsville Volunteer Fire Department	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
Raleigh Volunteer Fire Department	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
Pineville Volunteer Fire Department	Fire Station			X	X	X	X		X	X	X	X	X	X							X
Mize City Police Dept	Police Station	X		X	X	X	X		X	X	X	X	X	X				X		X	X
Polkville Police Department	Police Station																				
Raleigh Police Dept	Police Station			X	X	X	X		X	X	X	X	X	X			X	X			X
Smith County Sheriff	Police Station			X	X	X	X		X	X	X	X	X	X			X	X			X
Taylorsville Police Dept	Police Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
Community Learning Center	School			X	X	X	X		X	X	X	X	X	X			X	X			X
Mize Attendance Center	School			X	X	X	X		X	X	X	X	X	X			X	X		X	X
Raleigh Elementary School	School			X	X	X	X		X	X	X	X	X	X			X	X			X
Raleigh High School	School			X	X	X	X		X	X	X	X	X	X			X	X			X
Smith Co Voc Complex	School			X	X	X	X		X	X	X	X	X	X							X
Taylorsville Attendance Center	School			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X

SECTION 7
CAPABILITY ASSESSMENT

This section of the Plan discusses the capability of the MEMA District 6 Region to implement hazard mitigation activities. It consists of the following four subsections:

- 7.1 What is a Capability Assessment?
- 7.2 Conducting the Capability Assessment
- 7.3 Capability Assessment Findings
- 7.4 Conclusions on Local Capability

7.1 WHAT IS A CAPABILITY ASSESSMENT?

The purpose of conducting a capability assessment is to determine the ability of a local jurisdiction to implement a comprehensive mitigation strategy and to identify potential opportunities for establishing or enhancing specific mitigation policies, programs, or projects.[1] As in any planning process, it is important to try to establish which goals, objectives, and/or actions are feasible based on an understanding of the organizational capacity of those agencies or departments tasked with their implementation. A capability assessment helps to determine which mitigation actions are practical, and likely to be implemented over time, given a local government's planning and regulatory framework, level of administrative and technical support, number of fiscal resources, and current political climate.

A capability assessment has two primary components: 1) an inventory of a local jurisdiction's relevant plans, ordinances, or programs already in place and 2) an analysis of its capacity to carry them out. Careful examination of local capabilities will detect any existing gaps, shortfalls, or weaknesses with ongoing government activities that could hinder proposed mitigation activities and possibly exacerbate community hazard vulnerability. A capability assessment also highlights the positive mitigation measures already in place or being implemented at the local government level, which should continue to be supported and enhanced through future mitigation efforts.

The capability assessment completed for the MEMA District 6 Region serves as a critical planning step and an integral part of the foundation for designing an effective hazard mitigation strategy. Coupled with the Risk Assessment, the Capability Assessment helps identify and target meaningful mitigation actions for incorporation in the Mitigation Strategy portion of the Hazard Mitigation Plan. It not only helps establish the goals and objectives for the region to pursue under this Plan, but it also ensures that those goals and objectives are realistically achievable under given local conditions.

[1] While the Final Rule for implementing the Disaster Mitigation Act of 2000 does not require a local capability assessment to be completed for local hazard mitigation plans, it is a critical step in developing a mitigation strategy that meets the needs of the region while taking into account their own unique abilities. The Rule does state that a community's mitigation strategy should be "based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools" (44 CFR, Part 201.6(c)(3)).

7.2 CONDUCTING THE CAPABILITY ASSESSMENT

In order to facilitate the inventory and analysis of local government capabilities within the MEMA District 6 counties, a detailed Capability Assessment Survey was completed for each of the participating jurisdictions based on the information found in existing hazard mitigation plans and local government websites. The survey questionnaire compiled information on a variety of “capability indicators” such as existing local plans, policies, programs, or ordinances that contribute to and/or hinder the region’s ability to implement hazard mitigation actions. Other indicators included information related to the region’s fiscal, administrative, and technical capabilities, such as access to local budgetary and personnel resources for mitigation purposes. The current political climate, an important consideration for any local planning or decision-making process, was also evaluated with respect to hazard mitigation.

At a minimum, survey results provide an extensive inventory of existing local plans, ordinances, programs, and resources that are in place or under development in addition to their overall effect on hazard loss reduction. However, the survey instrument can also serve to identify gaps, weaknesses, or conflicts those counties and local jurisdictions can recast as opportunities for specific actions to be proposed as part of the hazard mitigation strategy.

The information collected in the survey questionnaire was incorporated into a database for further analysis. A general scoring methodology was then applied to quantify each jurisdiction’s overall capability.[2] According to the scoring system, each capability indicator was assigned a point value based on its relevance to hazard mitigation.

Using this scoring methodology, a total score and an overall capability rating of “high,” “moderate,” or “limited” could be determined according to the total number of points received. These classifications are designed to provide nothing more than a general assessment of local government capability. The results of this capability assessment provide critical information for developing an effective and meaningful mitigation strategy.

7.3 CAPABILITY ASSESSMENT FINDINGS

The findings of the capability assessment are summarized in this Plan to provide insight into the relevant capacity of the MEMA District 6 Region to implement hazard mitigation activities. All information is based upon the review of existing hazard mitigation plans and local government websites through the Capability Assessment Survey and input provided by local government officials during meetings of the MEMA District 6 Hazard Mitigation Council.

7.3.1 Planning and Regulatory Capability

Planning and regulatory capability is based on the implementation of plans, ordinances, and programs that demonstrate a local jurisdiction’s commitment to guiding and managing growth, development, and redevelopment in a responsible manner while maintaining the general welfare of the community. It includes emergency response and mitigation planning, comprehensive land use planning, and transportation planning; the enforcement of zoning or subdivision ordinances and building codes that regulate how land is developed and structures are built; as well as protecting environmental, historic, and cultural resources in the community. Although some conflicts can arise, these planning initiatives

[2] The scoring methodology used to quantify and rank the region’s capability can be found in Appendix B.

generally present significant opportunities to integrate hazard mitigation principles and practices into the local decision-making process.

This assessment is designed to provide a general overview of the key planning and regulatory tools and programs that are in place or under development for the MEMA District 6 Region along with their potential effect on loss reduction. This information will help identify opportunities to address existing gaps, weaknesses, or conflicts with other initiatives in addition to integrating the implementation of this Plan with existing planning mechanisms where appropriate.

Table 7.1 provides a summary of the relevant local plans, ordinances, and programs already in place or under development for the MEMA District 6 Region. A checkmark (✓) indicates that the given item is currently in place and being implemented. An asterisk (*) indicates that the given item is currently being developed for future implementation. Each of these local plans, ordinances, and programs should be considered available mechanisms for incorporating the requirements of the MEMA District 6 Regional Hazard Mitigation Plan.

Table 7.1: RELEVANT PLANS, ORDINANCES, AND PROGRAMS

Planning / Regulatory Tool	CLARKE COUNTY	Enterprise	Pachuta	Quitman	Shubuta	Stonewall	JASPER COUNTY	Bay Springs	Heidelberg	Louin	Montrose	KEMPER COUNTY	De Kalb	Scooba	LAUDERDALE COUNTY	Marion	Meridian	LEAKE COUNTY	Carthage	Lena	Walnut Grove
Hazard Mitigation Plan	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Comprehensive Land Use Plan		✓		✓		✓	✓	✓	✓							✓	✓		✓		
Floodplain Management Plan															✓						
Open Space Management Plan (or Parks & Rec/Greenway Plan)																					
Stormwater Management Plan/Ordinance																✓	✓				
Natural Resource Protection Plan																					
Flood Response Plan															✓						
Emergency Operations Plan	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Continuity of Operations Plan							✓								✓						
Evacuation Plan																					
Disaster Recovery Plan															✓						
Capital Improvements Plan																✓	✓		✓		
Economic Development Plan	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Historic Preservation Plan																					
Flood Damage Prevention Ordinance	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓		✓
Zoning Ordinance		✓		✓		✓		✓	✓						✓	✓	✓		✓		
Subdivision Ordinance															✓	✓	✓		✓		
Unified Development Ordinance																					

Planning / Regulatory Tool	CLARKE COUNTY	Enterprise	Pachuta	Quitman	Shubuta	Stonewall	JASPER COUNTY	Bay Springs	Heidelberg	Louin	Montrose	KEMPER COUNTY	De Kalb	Scooba	LAUDERDALE COUNTY	Marion	Meridian	LEAKE COUNTY	Carthage	Lena	Walnut Grove
Post-Disaster Redevelopment Ordinance																					
Building Code		✓	✓	✓		✓		✓	✓	✓	✓					✓	✓		✓		
Fire Code				✓				✓								✓	✓		✓		
National Flood Insurance Program (NFIP)	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓		✓
NFIP Community Rating System															✓		✓				

TABLE 7.1: RELEVANT PLANS, ORDINANCES, AND PROGRAMS (CONT.)

Planning / Regulatory Tool	NESHOBA COUNTY	Philadelphia	NEWTON COUNTY	Chunky	Decatur	Hickory	Newton (city)	Union	SCOTT COUNTY	Forest	Lake	Morton	Sebastopol	SMITH COUNTY	Mize	Polkville	Raleigh	Sylvarena	Taylorsville
Hazard Mitigation Plan	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Comprehensive Land Use Plan		✓			✓		✓	✓		✓		✓							✓
Floodplain Management Plan														✓	✓	✓	✓	✓	✓
Open Space Management Plan (or Parks & Rec/Greenway Plan)																			
Stormwater Management Plan/Ordinance																			
Natural Resource Protection Plan																			
Flood Response Plan																			
Emergency Operations Plan	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Continuity of Operations Plan																			
Evacuation Plan																			
Disaster Recovery Plan																			
Capital Improvements Plan							✓	✓											
Economic Development Plan	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Historic Preservation Plan																			
Flood Damage Prevention Ordinance	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓
Zoning Ordinance		✓			✓		✓	✓		✓		✓							✓
Subdivision Ordinance		✓					✓			✓									
Unified Development Ordinance																			

Planning / Regulatory Tool	NESHOBA COUNTY	Philadelphia	NEWTON COUNTY	Chunky	Decatur	Hickory	Newton (city)	Union	SCOTT COUNTY	Forest	Lake	Morton	Sebastopol	SMITH COUNTY	Mize	Polkville	Raleigh	Sylvarena	Taylorsville
Post-Disaster Redevelopment Ordinance																			
Building Code		✓					✓	✓		✓		✓					✓		✓
Fire Code		✓			✓		✓	✓		✓		✓							
National Flood Insurance Program (NFIP)	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
NFIP Community Rating System																			

A more detailed discussion on the region's planning and regulatory capability follows.

7.3.2 Emergency Management

Hazard mitigation is widely recognized as one of the four primary phases of emergency management. The three other phases include preparedness, response, and recovery. In reality, each phase is interconnected with hazard mitigation, as **Figure 7.1** suggests. Opportunities to reduce potential losses through mitigation practices are most often implemented before disaster strikes, such as the elevation of flood prone structures or the continuous enforcement of policies that prevent and regulate development that is vulnerable to hazards due to its location, design, or other characteristics. Mitigation opportunities will also be presented during immediate preparedness or response activities, such as installing storm shutters in advance of a hurricane, and certainly during the long-term recovery and redevelopment process following a hazard event.

Figure 7.1: THE FOUR PHASES OF EMERGENCY MANAGEMENT

Planning for each phase is a critical part of a comprehensive emergency management program and a key to the successful implementation of hazard mitigation actions. As a result, the Capability Assessment Survey asked several questions across a range of emergency management plans in order to assess the MEMA District 6 Region's willingness to plan and their level of technical planning proficiency.

Hazard Mitigation Plan: A hazard mitigation plan represents a community's blueprint for how it intends to reduce the impact of natural and human-caused hazards on people and the built environment. The essential elements of a hazard mitigation plan include a risk assessment, capability assessment, and mitigation strategy.

- Each of the nine counties participating in this multi-jurisdictional plan has previously adopted a hazard mitigation plan. Each participating municipality was included in its respective county's plan.

Disaster Recovery Plan: A disaster recovery plan serves to guide the physical, social, environmental, and economic recovery and reconstruction process following a disaster. In many instances, hazard mitigation principles and practices are incorporated into local disaster recovery plans with the intent of capitalizing on opportunities to break the cycle of repetitive disaster losses. Disaster recovery plans can also lead to the preparation of disaster redevelopment policies and ordinances to be enacted following a hazard event.

- None of the counties or municipalities participating in this multi-jurisdictional plan has adopted a disaster recovery plan. The counties should consider developing a plan to guide the recovery and reconstruction process following a disaster.

Emergency Operations Plan: An emergency operations plan outlines responsibilities and the means by which resources are deployed during and following an emergency or disaster.

- Each of the nine counties participating in this multi-jurisdictional plan maintains a comprehensive emergency management plan through its respective county emergency management agency. Each participating municipality is covered by its respective county's plan.
- The City of Meridian also maintains a municipal-level emergency operations plan.

Continuity of Operations Plan: A continuity of operations plan establishes a chain of command, line of succession, and plans for backup or alternate emergency facilities in case of an extreme emergency or disaster event.

- Each of the nine counties participating in this multi-jurisdictional plan maintains a Continuity of Operations Plan through its respective county emergency management agency.

Flood Response Plan: A flood response plan establishes procedures for responding to a flood emergency including coordinating and facilitating resources to minimize the impacts of flood.

- None of the counties or municipalities participating in this multi-jurisdictional plan has adopted a flood response plan.

7.3.3 General Planning

The implementation of hazard mitigation activities often involves agencies and individuals beyond the emergency management profession. Stakeholders may include local planners, public works officials, economic development specialists, and others. In many instances, concurrent local planning efforts will help to achieve or complement hazard mitigation goals, even though they are not designed as such. Therefore, the Capability Assessment Survey also asked questions regarding general planning capabilities and the degree to which hazard mitigation is integrated into other on-going planning efforts in the MEMA District 6 Region.

Comprehensive Land Use Plan: A comprehensive land use plan establishes the overall vision for what a community wants to be and serves as a guide for future governmental decision making. Typically, a comprehensive plan contains sections on demographic conditions, land use, transportation elements, and community facilities. Given the broad nature of the plan and its regulatory standing in many communities, the integration of hazard mitigation measures into the comprehensive plan can enhance the likelihood of achieving risk reduction goals, objectives, and actions.

- ❖ Jasper County has adopted a county comprehensive plan.
- ❖ Several of the municipalities participating in this multi-jurisdictional plan have also adopted municipal-level comprehensive plans, including the Town of Enterprise, City of Quitman, Town of Stonewall, City of Bay Springs, Town of Heidelberg, Town of Marion, City of Meridian, City of Carthage, City of Philadelphia, Town of Decatur, City of Newton, Town of Union, City of Forest, City of Morton, and Town of Taylorsville.

Capital Improvements Plan: A capital improvements plan guides the scheduling of spending on public improvements. A capital improvements plan can serve as an important mechanism for guiding future development away from identified hazard areas. Limiting public spending in hazardous areas is one of the most effective long-term mitigation actions available to local governments.

- ❖ None of the counties participating in this multi-jurisdictional plan has adopted a capital improvement plan.
- ❖ The Town of Marion, City of Meridian, City of Carthage, City of Newton, and Town of Union have each adopted a capital improvement plan.

Historic Preservation Plan: A historic preservation plan is intended to preserve historic structures or districts within a community. An often-overlooked aspect of the historic preservation plan is the assessment of buildings and sites located in areas subject to natural hazards and the identification of ways to reduce future damages. This may involve retrofitting or relocation techniques that account for the need to protect buildings that do not meet current building standards or are within a historic district that cannot easily be relocated out of harm’s way.

- ❖ None of the counties or municipalities participating in this multi-jurisdictional plan has a historic preservation plan.

Zoning Ordinance: Zoning represents the primary means by which land use is controlled by local governments. As part of a community’s police power, zoning is used to protect the public health, safety, and welfare of those in a given jurisdiction that maintains zoning authority. A zoning ordinance is the mechanism through which zoning is typically implemented. Since zoning regulations enable municipal governments to limit the type and density of development, a zoning ordinance can serve as a powerful tool when applied in identified hazard areas.

- Lauderdale County has adopted a zoning ordinance.
- Several of the participating municipalities have adopted zoning ordinances, including the Town of Enterprise, City of Quitman, Town of Stonewall, City of Bay Springs, Town of Heidelberg, Town of Marion, City of Meridian, City of Carthage, City of Philadelphia, Town of Decatur, City of Newton, Town of Union, City of Forest, City of Morton, and Town of Taylorsville.

Subdivision Ordinance: A subdivision ordinance is intended to regulate the development of residential, commercial, industrial, or other uses, including associated public infrastructure, as land is subdivided into buildable lots for sale or future development. Subdivision design that accounts for natural hazards can dramatically reduce the exposure of future development.

- Lauderdale County has adopted a subdivision ordinance.
- Several of the participating municipalities have adopted subdivision ordinances, including the Town of Marion, City of Meridian, City of Carthage, City of Philadelphia, City of Newton, and City of Forest.

Building Codes, Permitting, and Inspections: Building codes regulate construction standards. In many communities, permits, and inspections are required for new construction. Decisions regarding the adoption of building codes (that account for hazard risk), the type of permitting process required both before and after a disaster, and the enforcement of inspection protocols all affect the level of hazard risk faced by a community.

- Effective August 1, 2014, the State of Mississippi has adopted as a minimum any of the last three editions of the International Building Code and any additional codes as adopted by the Mississippi Building Code Council. In December 2019, the Mississippi Building Code Council adopted the 2018 editions of the IBC, IRC, IEBC, IFC, IFGC, IMC, IPC and IECC. The ISPSC is adopted by reference in the IBC and IRC. Adopting Mississippi jurisdictions must currently adopt either the 2012, 2015 or the 2018 editions. Jurisdictions had 120 days to opt out of adoptions. Additionally, all state buildings, leased or owned, must meet the requirements set forth in the 2012 International Building Code.
- None of the counties participating in this multi-jurisdictional plan has adopted a building code.
- The following participating municipalities have adopted building codes: Town of Enterprise, Town of Pachuta, City of Quitman, Town of Stonewall, City of Bay Springs, Town of Heidelberg, Town of Louin, Village of Montrose, Town of Marion, City of Meridian, City of Carthage, City of Philadelphia, City of Newton, Town of Union, City of Forest, City of Morton, Town of Raleigh, and Town of Taylorsville.

The adoption and enforcement of building codes by local jurisdictions is routinely assessed through the Building Code Effectiveness Grading Schedule (BCEGS) program developed by the Insurance Services Office, Inc. (ISO).[3] In Mississippi, the Mississippi State Rating Bureau assesses the building codes in effect in a particular community and how the community enforces its building codes *with special emphasis on mitigation of losses from natural hazards*. The results of BCEGS assessments are routinely provided to ISO's member private insurance companies, which in turn may offer ratings credits for new

[3] Participation in BCEGS is voluntary and may be declined by local governments if they do not wish to have their local building codes evaluated.

buildings constructed in communities with strong BCEGS classifications. The concept is that communities with well-enforced, up-to-date codes should experience fewer disaster-related losses and, as a result, should have lower insurance rates.

In conducting the assessment, ISO collects information related to personnel qualification and continuing education as well as the number of inspections performed per day. This type of information combined with local building codes is used to determine a grade for that jurisdiction. The grades range from 1 to 10 with a BCEGS grade of 1 representing exemplary commitment to building code enforcement and a grade of 10 indicating less than minimum recognized protection.

7.3.4 Floodplain Management

Flooding represents the greatest natural hazard facing the nation. At the same time, the tools available to reduce the impacts associated with flooding are among the most developed when compared to other hazard-specific mitigation techniques. In addition to approaches that cut across hazards such as education, outreach, and the training of local officials, the *National Flood Insurance Program* (NFIP) contains specific regulatory measures that enable government officials to determine where and how growth occurs relative to flood hazards. Participation in the NFIP is voluntary for local governments; however, program participation is strongly encouraged by FEMA as a first step for implementing and sustaining an effective hazard mitigation program. It is therefore used as part of this assessment as a key indicator for measuring local capability.

In order for a county or municipality to participate in the NFIP, they must adopt a local flood damage prevention ordinance that requires jurisdictions to follow established minimum building standards in the floodplain. These standards require that all new buildings and substantial improvements to existing buildings will be protected from damage by a 100-year flood event and that new development in the floodplain will not exacerbate existing flood problems or increase damage to other properties.

A key service provided by the NFIP is the mapping of identified flood hazard areas. Once completed, the Flood Insurance Rate Maps (FIRMs) are used to assess flood hazard risk, regulate construction practices, and set flood insurance rates. FIRMs are an important source of information to educate residents, government officials, and the private sector about the likelihood of flooding in their community.

Table 7.2 provides NFIP policy and claim information for each participating jurisdiction in the MEMA District 6 Region. Each of the jurisdictions that are participating in the development of this plan that also participate in the NFIP are committed to maintaining and enforcing their floodplain management ordinances and regulating new development in floodplains.

Table 7.2: NFIP POLICY AND CLAIM INFORMATION

Jurisdiction	Date Joined NFIP	Current Effective Map Date	NFIP Policies in Force	Insurance in Force	Closed Claims	Total Payments to Date
CLARKE COUNTY†	08/16/88	09/02/11	63	$9,406,200	23	$332,258
Enterprise	01/01/87	09/02/11	7	$873,800	6	$293,457
Pachuta	11/18/10	09/02/11(M)	0	$0	0	$0

Jurisdiction	Date Joined NFIP	Current Effective Map Date	NFIP Policies in Force	Insurance in Force	Closed Claims	Total Payments to Date
Quitman	01/01/86	09/02/11(M)	18	$4,984,000	2	$18,401
Shubuta	09/01/91	09/02/11	23	$1,886,400	3	$7,781
Stonewall	08/16/88	09/02/11	15	$1,007,500	7	$30,121
JASPER COUNTY†	12/01/03	07/04/11(M)	28	$4,693,100	2	$10,153
Bay Springs	06/17/86	07/04/11(M)	5	$2,560,000	1	$31,646
Heidelberg	01/01/87	07/04/11(M)	2	$131,300	5	$74,592
Louin*	--	--	--	--	--	--
Montrose*	--	--	--	--	--	--
KEMPER COUNTY†	10/02/07	09/05/07	4	$428,000	0	$0
De Kalb	11/14/07	09/05/07	0	$0	0	$0
Scooba	10/02/07	09/05/07	1	$59,800	0	$0
LAUDERDALE COUNTY†	09/29/89	05/16/13	234	$47,577,800	51	$1,097,407
Marion	09/29/89	02/03/10	7	$1,011,100	3	$61,963
Meridian	12/15/77	05/16/13	371	$71,498,400	106	$1,667,768
LEAKE COUNTY†	09/15/89	09/16/11	23	$2,948,600	10	$92,350
Carthage	08/19/85	09/16/11	18	$1,838,400	18	$186,046
Lena*	--	--	--	--	--	--
Walnut Grove	09/16/11	09/16/11	0	$0	0	$0
NESHOBA COUNTY†	09/15/89	05/20/10	30	$5,472,000	0	$0
Philadelphia	09/29/86	05/20/10	43	$10,520,900	4	$44,902
NEWTON COUNTY†	01/02/80	12/17/10	13	$2,358,700	1	$18,423
Chunky	08/01/86	12/17/10(M)	1	$68,800	1	$2,801
Decatur*	--	--	--	--	--	--
Hickory*	--	--	--	--	--	--
Newton (city)	04/15/80	12/17/10	3	$585,000	3	$31,232
Union	04/15/80	12/17/10	2	$335,000	0	$0
SCOTT COUNTY†	09/01/87	12/17/10(M)	23	$4,415,100	3	$118,069

Jurisdiction	Date Joined NFIP	Current Effective Map Date	NFIP Policies in Force	Insurance in Force	Closed Claims	Total Payments to Date
Forest	02/01/87	12/17/10(M)	45	$6,362,600	4	$62,767
Lake	08/05/85	12/17/10(M)	1	$20,700	0	$0
Morton	09/29/86	12/17/10(M)	18	$1,694,000	4	$4,406
Sebastopol	06/03/86	12/17/10(M)	0	$0	0	$0
SMITH COUNTY†	07/01/91	08/16/11	10	$2,717,500	0	$0
Mize	01/01/86	08/16/11	10	$1,503,600	6	$27,348
Polkville*	--	--	--	--	--	--
Raleigh	05/02/13	(NSFHA)	0	$0	0	$0
Sylvarena*	--	--	--	--	--	--
Taylorsville	06/17/86	08/16/11	3	$1,113,600	0	$0

†Includes unincorporated areas of county only
*Community does not participate in the NFIP
(M) – No Elevation Determined, All Zone A, C and X
(NSFHA) – No Special Flood Hazard Area – All Zone C
Source: NFIP Community Status information as of 9/2/2015; NFIP claims and policy information as of 6/30/2015, NFIP data post 2015 was not made available for this plan update.

All jurisdictions listed above that are participants in the NFIP will continue to comply with all required provisions of the program and will work to adequately comply in the future utilizing a number of strategies. For example, the jurisdictions will coordinate with NCEM and FEMA to develop maps and regulations related to special flood hazard areas within their jurisdictional boundaries and, through a consistent monitoring process, will design and improve their floodplain management program in a way that reduces the risk of flooding to people and property.

As noted above, several jurisdictions are not participants in the NFIP. Montrose, Lena, Decatur, and Sylvarena do not participate because they have very small or negligible land areas classified as floodplain, so most residents would be unlikely to purchase flood insurance. Meanwhile, Louin, Hickory, and Polkville are small communities and generally do not have the capacity or resources to properly administer and maintain the program.

Community Rating System: An additional indicator of floodplain management capability is the active participation of local jurisdictions in the Community Rating System (CRS). The CRS is an incentive-based program that encourages counties and municipalities to undertake defined flood mitigation activities that go beyond the minimum requirements of the NFIP by adding extra local measures to provide protection from flooding. All of the 18 creditable CRS mitigation activities are assigned a range of point values. As points are accumulated and reach identified thresholds, communities can apply for an improved CRS class rating. Class ratings, which range from 10 to 1, are tied to flood insurance premium reductions as shown in **Table 7.3**. As class rating improves (the lower the number the better), the percent reduction in flood insurance premiums for NFIP policyholders in that community increases.

Table 7.3: CRS PREMIUM DISCOUNTS, BY CLASS

CRS Class	Premium Reduction
1	45%
2	40%
3	35%
4	30%
5	25%
6	20%
7	15%
8	10%
9	5%
10	0

Source: *FEMA*

Community participation in the CRS is voluntary. Any community that is in full compliance with the rules and regulations of the NFIP may apply to FEMA for a CRS classification better than class 10. The CRS application process has been greatly simplified over the past several years based on community comments. Changes were made with the intent to make the CRS more user-friendly and make extensive technical assistance available for communities who request it.

- The City of Meridian participates in the CRS and has a Class 9 rating, as does the County of Lauderdale with a rating of 8. Participation in the CRS program should be considered as a mitigation action by the other counties and municipalities.

Flood Damage Prevention Ordinance: A flood damage prevention ordinance establishes minimum building standards in the floodplain with the intent to minimize public and private losses due to flood conditions.

- All communities participating in the NFIP are required to adopt a local flood damage prevention ordinance. All counties and municipalities participating in this hazard mitigation plan, with the exception of the Town of Louin, the Village of Montrose, Town of Lena, Town of Decatur, Town of Hickory, Town of Polkville, and Village of Sylvarena, also participate in the NFIP and they all have adopted flood damage prevention regulations.

Floodplain Management Plan: A floodplain management plan (or a flood mitigation plan) provides a framework for action regarding corrective and preventative measures to reduce flood-related impacts.

- None of the participating counties or municipalities has adopted a floodplain management plan to help prevent damages associated with flooding and flood loss.

Open Space Management Plan*:* An open space management plan is designed to preserve, protect, and restore largely undeveloped lands in their natural state and to expand or connect areas in the public domain such as parks, greenways, and other outdoor recreation areas. In many instances, open space management practices are consistent with the goals of reducing hazard losses, such as the preservation of wetlands or other flood-prone areas in their natural state in perpetuity.

- None of the participating counties or municipalities has an open space management plan.

Stormwater Management Plan: A stormwater management plan is designed to address flooding associated with stormwater runoff. The stormwater management plan is typically focused on design and construction measures that are intended to reduce the impact of more frequently occurring minor urban flooding.

- None of the participating counties or municipalities has adopted a stormwater management plan or stormwater management ordinance.
- The City of Meridian includes some stormwater regulations in its local subdivision ordinance.

7.3.6 Administrative and Technical Capability

The ability of a local government to develop and implement mitigation projects, policies, and programs is directly tied to its ability to direct staff time and resources for that purpose. Administrative capability can be evaluated by determining how mitigation-related activities are assigned to local departments and if there are adequate personnel resources to complete these activities. The degree of intergovernmental coordination among departments will also affect administrative capability for the implementation and success of proposed mitigation activities.

Technical capability can generally be evaluated by assessing the level of knowledge and technical expertise of local government employees, such as personnel skilled in using Geographic Information Systems (GIS) to analyze and assess community hazard vulnerability. The Capability Assessment Survey was used to capture information on administrative and technical capability through the identification of available staff and personnel resources.

Table 7.4 provides a summary of the Capability Assessment Survey results for the MEMA District 6 Region with regard to relevant staff and personnel resources. A checkmark (✓) indicates the presence of a staff member(s) in that jurisdiction with the specified knowledge or skill.

Table 7.4: RELEVANT STAFF / PERSONNEL RESOURCES

Staff / Personnel Resource	CLARKE COUNTY	Enterprise	Pachuta	Quitman	Shubuta	Stonewall	JASPER COUNTY	Bay Springs	Heidelberg	Louin	Montrose	KEMPER COUNTY	De Kalb	Scooba	LAUDERDALE COUNTY	Marion	Meridian	LEAKE COUNTY	Carthage	Lena	Walnut Grove
Planners with knowledge of land development / land management practices															✓		✓				
Engineers or professionals trained in construction practices related to buildings and/or infrastructure				✓											✓	✓	✓		✓		
Planners or engineers with an understanding of natural and/or human-caused hazards															✓		✓				
Emergency Manager	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Staff / Personnel Resource	CLARKE COUNTY	Enterprise	Pachuta	Quitman	Shubuta	Stonewall	JASPER COUNTY	Bay Springs	Heidelberg	Louin	Montrose	KEMPER COUNTY	De Kalb	Scooba	LAUDERDALE COUNTY	Marion	Meridian	LEAKE COUNTY	Carthage	Lena	Walnut Grove
Floodplain Manager	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓		✓
Land Surveyors															✓						
Scientists familiar with the hazards of the community	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Staff with education or expertise to assess the community's vulnerability to hazards	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Personnel skilled in GIS and/or HAZUS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓	✓	✓				
Resource development staff or grant writers															✓						✓

TABLE 7.4: RELEVANT STAFF / PERSONNEL RESOURCES (CONT.)

Staff / Personnel Resource	NESHOBA COUNTY	Philadelphia	NEWTON COUNTY	Chunky	Decatur	Hickory	Newton (city)	Union	SCOTT COUNTY	Forest	Lake	Morton	Sebastopol	SMITH COUNTY	Mize	Polkville	Raleigh	Sylvarena	Taylorsville
Planners with knowledge of land development / land management practices																			
Engineers or professionals trained in construction practices related to buildings and/or infrastructure		✓								✓									✓
Planners or engineers with an understanding of natural and/or human-caused hazards																			
Emergency Manager	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Floodplain Manager	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓
Land Surveyors																			
Scientists familiar with the hazards of the community	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Staff with education or expertise to assess the community's vulnerability to hazards	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Personnel skilled in GIS and/or HAZUS	✓	✓							✓	✓	✓	✓	✓						
Resource development staff or grant writers																			

Credit for having a floodplain manager was given to those jurisdictions that have a flood damage prevention ordinance, and therefore an appointed floodplain administrator, regardless of whether the appointee was dedicated solely to floodplain management. Credit was given for having a scientist familiar with the hazards of the community if a jurisdiction has a Cooperative Extension Service or Soil and Water Conservation Department. Credit was also given for having staff with education or expertise to assess the community's vulnerability to hazards if a staff member from the jurisdiction was a participant on the existing hazard mitigation plan's planning committee.

7.3.7 Fiscal Capability

The ability of a local government to take action is often closely associated with the amount of money available to implement policies and projects. This may take the form of outside grant funding awards or locally-based revenue and financing. The costs associated with mitigation policy and project implementation vary widely. In some cases, policies are tied primarily to staff time or administrative costs associated with the creation and monitoring of a given program. In other cases, direct expenses are linked to an actual project, such as the acquisition of flood-prone homes, which can require a substantial commitment from local, state, and federal funding sources.

The Capability Assessment Survey was used to capture information on the region's fiscal capability through the identification of locally available financial resources.

Table 7.5 provides a summary of the results for the MEMA District 6 Region with regard to relevant fiscal resources. A checkmark (✓) indicates that the given fiscal resource is locally available for hazard mitigation purposes (including match funds for state and federal mitigation grant funds) according to the previous hazard mitigation plans.

Table 7.5: RELEVANT FISCAL RESOURCES

Fiscal Tool / Resource	CLARKE COUNTY	Enterprise	Pachuta	Quitman	Shubuta	Stonewall	JASPER COUNTY	Bay Springs	Heidelberg	Louin	Montrose	KEMPER COUNTY	De Kalb	Scooba	LAUDERDALE COUNTY	Marion	Meridian	LEAKE COUNTY	Carthage	Lena	Walnut Grove
Capital Improvement Programming	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Community Development Block Grants (CDBG)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special Purpose Taxes (or taxing districts)															✓						
Gas / Electric Utility Fees							✓								✓						
Water / Sewer Fees							✓								✓						
Stormwater Utility Fees																					
Development Impact Fees															✓						
General Obligation, Revenue, and/or Special Tax Bonds															✓						

Fiscal Tool / Resource	CLARKE COUNTY	Enterprise	Pachuta	Quitman	Shubuta	Stonewall	JASPER COUNTY	Bay Springs	Heidelberg	Louin	Montrose	KEMPER COUNTY	De Kalb	Scooba	LAUDERDALE COUNTY	Marion	Meridian	LEAKE COUNTY	Carthage	Lena	Walnut Grove
Partnering Arrangements or Intergovernmental Agreements												✓	✓		✓						
Other: other state and Federal funding sources	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

TABLE 7.5: RELEVANT FISCAL RESOURCES (CONT.)

Fiscal Tool / Resource	NESHOBA COUNTY	Philadelphia	NEWTON COUNTY	Chunky	Decatur	Hickory	Newton (city)	Union	SCOTT COUNTY	Forest	Lake	Morton	Sebastopol	SMITH COUNTY	Mize	Polkville	Raleigh	Sylvarena	Taylorsville
Capital Improvement Programming	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Community Development Block Grants (CDBG)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special Purpose Taxes (or taxing districts)																			
Gas / Electric Utility Fees																			
Water / Sewer Fees																			
Stormwater Utility Fees																			
Development Impact Fees																			
General Obligation, Revenue, and/or Special Tax Bonds																			
Partnering Arrangements or Intergovernmental Agreements	✓																		
Other: other state and Federal funding sources	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

7.3.8 Political Capability

One of the most difficult capabilities to evaluate involves the political will of a jurisdiction to enact meaningful policies and projects designed to reduce the impact of future hazard events. Hazard mitigation may not be a local priority or may conflict with or be seen as an impediment to other goals of the community, such as growth and economic development. Therefore, the local political climate must be considered in designing mitigation strategies as it could be the most difficult hurdle to overcome in accomplishing their adoption and implementation.

The Capability Assessment Survey was used to capture information on political capability of the MEMA District 6 Region. Previous hazard mitigation plans were reviewed for general examples of local political capability, such as guiding development away from identified hazard areas, restricting public investments or capital improvements within hazard areas, or enforcing local development standards that go beyond minimum state or federal requirements (i.e., building codes, floodplain management, etc.).

- The previous hazard mitigation plans identified existing ordinances that address natural hazards or are related to hazard mitigation, such as emergency management, zoning, subdivision regulations, comprehensive land use plans, and flood damage prevention ordinances.
- During the months immediately following a disaster, local public opinion in the region is more likely to shift in support of hazard mitigation efforts.

7.4 CONCLUSIONS ON LOCAL CAPABILITY

In order to form meaningful conclusions on the assessment of local capability, a quantitative scoring methodology was designed and applied to results of the Capability Assessment Survey. This methodology, further described in Appendix B, attempts to assess the overall level of capability of the MEMA District 6 Region to implement hazard mitigation actions.

The overall capability to implement hazard mitigation actions varies among the participating jurisdictions. For planning and regulatory capability, the jurisdictions are in the limited or moderate range. The administrative and technical capabilities vary widely among the jurisdictions with larger jurisdictions generally having greater staff and technical resources. The majority of jurisdictions are in the limited range for fiscal capability.

Table 7.6 shows the results of the capability assessment using the designed scoring methodology. The capability score is based solely on the information found in existing hazard mitigation plans and readily available on the jurisdictions' government websites. According to the assessment, the average local capability score for all responding jurisdictions is 19.4, which falls into the limited capability ranking.

Table 7.6: CAPABILITY ASSESSMENT RESULTS

Jurisdiction	Overall Capability Score	Overall Capability Rating
CLARKE COUNTY	23	Moderate
Enterprise	22	Moderate
Pachuta	18	Limited
Quitman	25	Moderate
Shubuta	17	Limited
Stonewall	22	Moderate
JASPER COUNTY	26	Moderate
Bay Springs	23	Moderate
Heidelberg	22	Moderate

Jurisdiction	Overall Capability Score	Overall Capability Rating
Louin	11	Limited
Montrose	11	Limited
KEMPER COUNTY	22	Moderate
De Kalb	16	Limited
Scooba	15	Limited
LAUDERDALE COUNTY	26	Moderate
Marion	27	Moderate
Meridian	38	Moderate
LEAKE COUNTY	22	Moderate
Carthage	26	Moderate
Lena	9	Limited
Walnut Grove	17	Limited
NESHOBA COUNTY	24	Moderate
Philadelphia	26	Moderate
NEWTON COUNTY	22	Moderate
Chunky	16	Limited
Decatur	14	Limited
Hickory	9	Limited
Newton (city)	24	Moderate
Union	23	Moderate
SCOTT COUNTY	23	Moderate
Forest	26	Moderate
Lake	17	Limited
Morton	23	Moderate
Sebastopol	17	Limited
SMITH COUNTY	22	Moderate
Mize	15	Limited

Jurisdiction	Overall Capability Score	Overall Capability Rating
Polkville	9	Limited
Raleigh	17	Limited
Sylvarena	9	Limited
Taylorsville	23	Moderate

As previously discussed, one of the reasons for conducting a Capability Assessment is to examine local capabilities to detect any existing gaps or weaknesses within ongoing government activities that could hinder proposed mitigation activities and possibly exacerbate community hazard vulnerability. These gaps or weaknesses have been identified for each jurisdiction in the tables found throughout this section. The participating jurisdictions used the Capability Assessment as part of the basis for the Mitigation Actions that are identified in Section 9; therefore, each jurisdiction addresses their ability to expand on and improve their existing capabilities through the identification of their Mitigation Actions.

7.4.1 Linking the Capability Assessment with the Risk Assessment and the Mitigation Strategy

The conclusions of the Risk Assessment and Capability Assessment serve as the foundation for the development of a meaningful hazard mitigation strategy. During the process of identifying specific mitigation actions to pursue, the RHMC considered not only each jurisdiction's level of hazard risk, but also their existing capability to minimize or eliminate that risk.

SECTION 8
MITIGATION STRATEGY

This section of the Plan provides the blueprint for the participating jurisdictions in the MEMA District 6 Region to follow in order to become less vulnerable to its identified hazards. It is based on general consensus of the Regional Hazard Mitigation Council (RHMC) and the findings and conclusions of the *Capability Assessment* and *Risk Assessment*. It consists of the following five subsections:

- 8.1 Introduction
- 8.2 Mitigation Goals
- 8.3 Identification and Analysis of Mitigation Techniques
- 8.4 Selection of Mitigation Techniques for the MEMA District 6 Region
- 8.5 Plan Update Requirement

8.1 INTRODUCTION

The intent of the Mitigation Strategy is to provide the communities in the MEMA District 6 Region with the goals that will serve as guiding principles for future mitigation policy and project administration, along with an analysis of mitigation techniques deemed available to meet those goals and reduce the impact of identified hazards. It is designed to be comprehensive, strategic, and functional in nature:

- In being *comprehensive*, the development of the strategy includes a thorough review of all hazards and identifies extensive mitigation measures intended to not only reduce the future impacts of high-risk hazards, but also to help the region achieve compatible economic, environmental, and social goals.
- In being *strategic*, the development of the strategy ensures that all policies and projects proposed for implementation are consistent with pre-identified, long-term planning goals.
- In being *functional,* each proposed mitigation action is linked to established priorities and assigned to specific departments or individuals responsible for their implementation with target completion deadlines. When necessary, funding sources are identified that can be used to assist in project implementation.

The first step in designing the Mitigation Strategy includes the identification of mitigation goals. Mitigation goals represent broad statements that are achieved through the implementation of more specific mitigation actions. These actions include both hazard mitigation policies (such as the regulation of land in known hazard areas through a local ordinance) and hazard mitigation projects that seek to address specifically targeted hazard risks (such as the acquisition and relocation of a repetitive loss structure).

The second step involves the identification, consideration, and analysis of available mitigation measures to help achieve the identified mitigation goals. This is a long-term, continuous process sustained through the development and maintenance of this Plan. Alternative mitigation measures will continue to be considered as future mitigation opportunities are identified, as data and technology improve, as mitigation funding becomes available, and as this Plan is maintained over time.

The third and last step in designing the Mitigation Strategy is the selection and prioritization of specific mitigation actions for the communities in the MEMA District 6 Region (provided separately in Section 9: *Mitigation Action Plan*). Each county and participating jurisdiction has its own Mitigation Action Plan (MAP) that reflects the needs and concerns of that jurisdiction. The MAP represents an unambiguous and functional plan for action and is considered to be the most essential outcome of the mitigation planning process.

The MAP includes a prioritized listing of proposed hazard mitigation actions (policies and projects) for the MEMA District 6 counties and jurisdictions to complete. Each action has accompanying information, such as those departments or individuals assigned responsibility for implementation, potential funding sources, and an estimated target date for completion. The MAP provides those departments or individuals responsible for implementing mitigation actions with a clear roadmap that also serves as an important tool for monitoring success or progress over time. The cohesive collection of actions listed in the MAP can also serve as an easily understood menu of mitigation policies and projects for those local decision makers who want to quickly review the recommendations and proposed actions of the Regional Hazard Mitigation Plan.

In preparing each Mitigation Action Plan for the MEMA District 6 Region, officials considered the overall hazard risk and capability to mitigate the effects of hazards as recorded through the risk and capability assessment process, in addition to meeting the adopted mitigation goals and unique needs of the community.

8.1.1 Mitigation Action Prioritization

Prioritization of the proposed mitigation actions was based on the following six factors:

- Effect on overall risk to life and property
- Ease of implementation
- Political and community support
- A general economic cost/benefit review[1]
- Funding availability
- Continued compliance with the NFIP

[1] Only a general economic cost/benefit review was considered by the Regional Hazard Mitigation Council through the process of selecting and prioritizing mitigation actions. Mitigation actions with "high" priority were determined to be the most cost effective and most compatible with the participating jurisdictions' unique needs. Actions with a "moderate" priority were determined to be cost-effective and compatible with jurisdictional needs, but may be more challenging to complete administratively or fiscally than "high" priority actions. Actions with a "low" priority were determined to be important community needs, but the community likely identified several potential challenges in terms of implementation (e.g. lack of funding, technical obstacles). A more detailed cost/benefit analysis will be applied to particular projects prior to the application for or obligation of funding, as appropriate.

The point of contact for each county helped coordinate the prioritization process by reviewing each action and working with the lead agency/department responsible to determine a priority for each action using the six factors listed above.

Using these criteria, actions were classified as high, moderate, or low priority by the participating jurisdiction officials.

8.2 MITIGATION GOALS

44 CFR Requirement
44 CFR Part 201.6(c)(3)(i): The mitigation strategy shall include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

The primary goal of all local governments is to promote the public health, safety, and welfare of its citizens. In keeping with this standard, the MEMA District 6 counties and the participating municipalities have developed ten goal statements for local hazard mitigation planning in the region. In developing these goals, the previous county hazard mitigation plans were reviewed to determine areas of consistency. The project consultant reviewed the goals from each of the existing plans that were combined to form this regional plan. All of the goals were similar and, therefore, regional goals were formulated based on commonalities found between the goals in each plan. **Table 8.1** provides a listing of all of the existing mitigation goals from the plans that are being combined.

As a result of reviewing the existing goals, 10 proposed regional goals were presented to the Hazard Mitigation Council for their consideration. The proposed goals were reviewed, voted on, and accepted by the RHMC at their second meeting. This process of combining goals from the previous plans served to highlight the planning process that had occurred in each county prior to joining this regional planning effort. Each goal, purposefully broad in nature, serves to establish parameters that were used in developing more mitigation actions. The MEMA District 6 Regional Mitigation Goals are presented in **Table 8.2**. Consistent implementation of actions over time will ensure that community goals are achieved.

Table 8.1: EXISTING MITIGATION GOALS

	Former Plan Reference								
Proposed Goal	Clarke Co.	Jasper Co.	Kemper Co.	Lauderdale Co.	Leake Co.	Neshoba Co.	Newton Co.	Scott Co.	Smith Co.
Local government will have the capacity to develop, implement, and maintain **effective mitigation programs**.	Goal 1	Goal 1	Goal 1	Goal 1	Goal 1	Goal 1	Goal 1	Goal 1	Goal 1
All sectors of the community will work together to create a **disaster-resistant community** by the year 2020.	Goal 2	Goal 2	Goal 2	Goal 2	Goal 2	Goal 2	Goal 2	Goal 2	Goal 2
The community will have the capability to initiate and sustain **emergency response operations during and after a disaster**.	Goal 3	Goal 3	Goal 3	Goal 3	Goal 3	Goal 3	Goal 3	Goal 3	Goal 3

	Former Plan Reference								
Proposed Goal	**Clarke Co.**	**Jasper Co.**	**Kemper Co.**	**Lauderdale Co.**	**Leake Co.**	**Neshoba Co.**	**Newton Co.**	**Scott Co.**	**Smith Co.**
The **continuity of local government operations** will not be significantly disrupted by disasters.	Goal 4	Goal 4	Goal 4	Goal 4	Goal 4	Goal 4	Goal 4	Goal 4	Goal 4
The **health, safety, and welfare of the community's residents and visitors** will not be threatened by disasters.	Goal 5	Goal 5	Goal 5	Goal 5	Goal 5	Goal 5	Goal 5	Goal 5	Goal 5
The **policies and regulations of local government will support effective hazard mitigation programming** throughout the community.	Goal 6	Goal 6	Goal 6	Goal 6	Goal 6	Goal 6	Goal 6	Goal 6	Goal 6
Residents of the community will have **homes, institutions, and places of employment that are not vulnerable to disaster**.	Goal 7	Goal 7	Goal 7	Goal 7	Goal 7	Goal 7	Goal 7	Goal 7	Goal 7
The **economic vitality** of the community will not be threatened by a disaster.	Goal 8	Goal 8	Goal 8	Goal 8	Goal 8	Goal 8	Goal 8	Goal 8	Goal 8
The availability and functioning of the community's **infrastructure will not be significantly disrupted by a disaster**.	Goal 9	Goal 9	Goal 9	Goal 9	Goal 9	Goal 9	Goal 9	Goal 9	Goal 9
All **members of the community will understand the hazards threatening local areas and the techniques to minimize vulnerability** to those hazards.	Goal 10	Goal 10	Goal 10	Goal 10	Goal 10	Goal 10	Goal 10	Goal 10	Goal 10

Table 8.2: MEMA DISTRICT 6 REGIONAL MITIGATION GOALS

	Goal
Goal #1	Local government will have the capacity to develop, implement, and maintain **effective mitigation programs**.
Goal #2	All sectors of the community will work together to create a **disaster-resistant community** by the year 2020.
Goal #3	The community will have the capability to initiate and sustain **emergency response operations during and after a disaster**.
Goal #4	The **continuity of local government operations** will not be significantly disrupted by disasters.
Goal #5	The **health, safety, and welfare of the community's residents and visitors** will not be threatened by disasters.
Goal #6	The **policies and regulations of local government will support effective hazard mitigation programming** throughout the community.
Goal #7	Residents of the community will have **homes, institutions, and places of employment that are not vulnerable to disaster**.
Goal #8	The **economic vitality** of the community will not be threatened by a disaster.
Goal #9	The availability and functioning of the community's **infrastructure will not be significantly disrupted by a disaster**.
Goal #10	All **members of the community will understand the hazards threatening local areas and the techniques to minimize vulnerability** to those hazards.

8.3 IDENTIFICATION AND ANALYSIS OF MITIGATION TECHNIQUES

44 CFR Requirement
44 CFR Part 201.6(c)(3)(ii): The mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effect of each hazard, with particular emphasis on new and existing buildings and infrastructure.

In formulating the Mitigation Strategy for the MEMA District 6 Region, a wide range of activities were considered in order to help achieve the established mitigation goals, in addition to addressing any specific hazard concerns. These activities were discussed during the MEMA District 6 Regional Hazard Mitigation Planning meetings. In general, all activities considered by the RHMC can be classified under one of the following six (6) broad categories of mitigation techniques: Prevention, Property Protection, Natural Resource Protection, Structural Projects, Emergency Services, and Public Awareness and Education. These are discussed in detail below.

8.3.1 Prevention

Preventative activities are intended to keep hazard problems from getting worse, and are typically administered through government programs or regulatory actions that influence the way land is developed and buildings are built. They are particularly effective in reducing a community's future vulnerability, especially in areas where development has not occurred or capital improvements have not been substantial. Examples of preventative activities include:

- Planning and zoning
- Building codes
- Open space preservation
- Floodplain regulations
- Stormwater management regulations
- Drainage system maintenance
- Capital improvements programming
- Riverine / fault zone setbacks

8.3.2 Property Protection

Property protection measures involve the modification of existing buildings and structures to help them better withstand the forces of a hazard, or removal of the structures from hazardous locations. Examples include:

- Acquisition
- Relocation
- Building elevation
- Critical facilities protection
- Retrofitting (e.g., windproofing, floodproofing, seismic design techniques, etc.)

- Safe rooms, shutters, shatter-resistant glass
- Insurance

8.3.3 Natural Resource Protection

Natural resource protection activities reduce the impact of natural hazards by preserving or restoring natural areas and their protective functions. Such areas include floodplains, wetlands, steep slopes, and sand dunes. Parks, recreation, or conservation agencies and organizations often implement these protective measures. Examples include:

- Floodplain protection
- Watershed management
- Riparian buffers
- Forest and vegetation management (e.g., fire resistant landscaping, fuel breaks, etc.)
- Erosion and sediment control
- Wetland preservation and restoration
- Habitat preservation
- Slope stabilization

8.3.4 Structural Projects

Structural mitigation projects are intended to lessen the impact of a hazard by modifying the environmental natural progression of the hazard event through construction. They are usually designed by engineers and managed or maintained by public works staff. Examples include:

- Reservoirs
- Dams / levees / dikes / floodwalls
- Diversions / detention / retention
- Channel modification
- Storm sewers

8.3.5 Emergency Services

Although not typically considered a “mitigation” technique, emergency service measures do minimize the impact of a hazard event on people and property. These commonly are actions taken immediately prior to, during, or in response to a hazard event. Examples include:

- Warning systems
- Evacuation planning and management
- Emergency response training and exercises
- Sandbagging for flood protection
- Installing temporary shutters for wind protection

8.3.6 Public Education and Awareness

Public education and awareness activities are used to advise residents, elected officials, business owners, potential property buyers, and visitors about hazards, hazardous areas, and mitigation techniques they can use to protect themselves and their property. Examples of measures to educate and inform the public include:

- Outreach projects
- Speaker series / demonstration events
- Hazard map information
- Real estate disclosure
- Library materials
- School children's educational programs
- Hazard expositions

8.4 SELECTION OF MITIGATION TECHNIQUES FOR THE MEMA DISTRICT 6 REGION

In order to determine the most appropriate mitigation techniques for the communities in the MEMA District 6 Region, the RHMC members thoroughly reviewed and considered the findings of the *Capability Assessment* and *Risk Assessment* to determine the best activities for their respective communities. Other considerations included the effect of each mitigation action on overall risk to life and property, its ease of implementation, its degree of political and community support, its general cost-effectiveness, and funding availability (if necessary).

8.5 PLAN UPDATE REQUIREMENT

In keeping with FEMA requirements for plan updates, the Mitigation Actions identified in the previous MEMA District 6 county hazard mitigation plans were evaluated to determine their 2021 implementation status. Updates on the implementation status of each action are provided. The mitigation actions provided in Section 9*: Mitigation Action Plan* include the mitigation actions from the previous plans as well as any new mitigation actions proposed through the 2021 planning process.

SECTION 9
MITIGATION ACTION PLAN

This section includes the listing of the mitigation actions proposed by the participating jurisdictions in MEMA District 6. It consists of the following two subsections:

- 9.1 Overview
- 9.2 Mitigation Action Plans

44 CFR Requirement
44 CFR Part 201.6(c)(3)(iii): The mitigation strategy shall include an action plan describing how the actions identified in paragraph (c)(2)(ii) of this section will be prioritized, implemented, and administered by the local jurisdiction.

9.1 OVERVIEW

As described in the previous section, the Mitigation Action Plan, or MAP, provides a functional plan of action for each jurisdiction. It is designed to achieve the mitigation goals established in Section 8: *Mitigation Strategy* and will be maintained on a regular basis according to the plan maintenance procedures established in Section 10: *Plan Maintenance*.

Each proposed mitigation action has been identified as an effective measure (policy or project) to reduce hazard risk for the communities in the MEMA District 6 Region. Each action is listed in the MAP in conjunction with background information such as hazard(s) addressed and relative priority. Other information provided in the MAP includes potential funding sources to implement the action should funding be required (not all proposed actions are contingent upon funding). Most importantly, implementation mechanisms are provided for each action, including the designation of a lead agency or department responsible for carrying the action out as well as a timeframe for its completion. These implementation mechanisms ensure that the MEMA District 6 Regional Hazard Mitigation Plan remains a functional document that can be monitored for progress over time. The proposed actions are not listed in priority order, though each has been assigned a priority level of “high,” “moderate,” or “low” as described below and in Section 8 (page 8.2).

The Mitigation Action Plan is organized by mitigation strategy category (Prevention, Property Protection, Natural Resource Protection, Structural Projects, Emergency Services, or Public Education and Awareness). The following are the key elements described in the Mitigation Action Plan:

- Hazard(s) Addressed—Hazard which the action addresses.
- Relative Priority—High, moderate, or low priority as assigned by the jurisdiction.
- Lead Agency/Department—Department responsible for undertaking the action.
- Potential Funding Sources—Local, State, or Federal sources of funds are noted here, where applicable.

- Implementation Schedule—Date by which the action the action should be completed. More information is provided when possible.
- Implementation Status (2021)—Indication of completion, progress, deferment, or no change since the previous plan. If the action is new, that will be noted here.

9.2 MITIGATION ACTION PLANS

The mitigation actions proposed by each of the participating jurisdictions are listed in 40 individual MAPs on the following pages. **Table 9.1** shows the location of each jurisdiction's MAP within this section as well as the number of mitigation actions proposed by each jurisdiction.

TABLE 9.1: INDIVIDUAL MAP LOCATIONS

Location	Page
Clarke County	9:4
Jasper County	9:26
Kemper County	9:39
Lauderdale County	9:48
Leake County	9:57
Neshoba County	9:74
Newton County	9:80
Scott County	9:99
Smith County	9:119

Clarke County Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-2	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2025	Deferred. The International Building Code has not been adopted. The county will review this code and consider adoption, so this action will remain in the
P-3	Purchase smoke alarms to be distributed to elderly residents.	Wildfire	Low	County Fire Service	FEMA/MEMA, AFGP, Local funds	2025	Ongoing. Although some effort has been made to purchase and distribute smoke alarms to elderly residents, there are likely still large numbers of residents who lack this service. The county will continue to seek funding the implement this action.
P-4	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	County Emergency Management	FEMA/MEMA, Homeland Security	2025	Ongoing. Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
P-5	Collect additional data on the number of buildings located in flood-prone areas near the Chickasawhay River and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	County Emergency Management	FEMA/MEMA, Local funds	2025	Ongoing. Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1							
Emergency Services							
ES-1	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strike.	Hurricane	High	County Emergency Management	FEMA/MEMA, Local funds	2025	Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan.
ES-2	Installation of a public warning system in the unincorporated areas of the County.	All	High	Board of Supervisors, County Emergency Management	FEMA/MEMA, Homeland Security, Local funds	2025	Some have been installed, but more are needed. The county will continue to look at the feasibility of this action going forward.
ES-3	Purchase generators for the County Fire Service.	All	Moderate	County Fire Service	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	Some generators have been purchased for the fire service, but there is still as strong need for additional generators. The county will continue to look for funding sources for these.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
ES-4	Purchase generators for the rural water associations to provide adequate backup power during emergencies.	All	Low	Rural Water Associations	FEMA/MEMA, Homeland Security, Local funds	2025	Generators for the rural water associations have not been purchased due to lack of funding. The county is looking at possible alternative funding sources.
ES-5	County is in the process of signing up with HyperReach for mass notifications. This system is opt-in, and will require an extensive campaign to get residents to sign up for emergency alerts.	All	High	County EMA	Local	2022	New Action. County recently signed the contract with HyperReach, but will need to conduct extensive outreach to get residents to opt-in.
Public Education and Awareness							
PEA-1	Education of local citizens on the danger of driving across flooded roads.	Flood	High	County Emergency Management	FEMA/MEMA, JAG, Local funds	2025	The county has worked hard to inform citizens of the dangers of driving across flooded roads, but this action needs to be continued going forward.
PEA-2	Purchase materials to educate the public on being prepared for hazards, including tornadoes, flooding, severe weather, etc.	All	Low	County Emergency Management	FEMA/MEMA, Homeland Security, Local funds	2025	The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.
PEA-3	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2025	Some residents have built safe rooms, and are then issued an address so that those nearby know there is a shelter. This campaign is ongoing.

Town of Enterprise Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
			Prevention				
P-1	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-2	Passage of an ordinance requiring property owners to clean out ditches that cause flooding of local streets. The ordinance would also get the Town legal recourse to go onto such property and do the work if the owner did not comply.	Flood	Low	Board of Aldermen	Local budget	2025	The town has not passed an ordinance to require property owners to clean out ditches, but it will continue to evaluate the political feasibility of this alternative and will keep this action in place.
P-3	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
P-4	Collect additional data on the number of buildings located in flood-prone areas near the Chickasawhay River and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.
			Property Protection				
PP-1							
			Natural Resource Protection				
NRP-1							

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Structural Projects							
SP-1							
Emergency Services							
ES-1	Purchase backup generator to provide adequate backup power for the water system.	Tornado, High Wind	High	Public Works	FEMA/MEMA, Homeland Security, Local funds	2025	The town has not purchased a backup generator for the water system. It will look into trying to find funding for this going forward.
ES-2	Purchase of portable generators to provide adequate backup power to operate sewer lift stations.	Tornado, High Wind	High	Public Works	FEMA/MEMA, Homeland Security, Local funds	2025	The town has not purchased portable generators for lift stations. It will look into trying to find funding for this going forward.
ES-3	Purchase portable generators for public works department to use during emergencies.	All	High	Public Works	FEMA/MEMA, Homeland Security, Local funds	2025	The town has not purchased portable generators for public works. It will look into trying to find funding for this going forward.
ES-4	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Fire Department , Police Department	FEMA/MEMA, Local funds	2025	Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan.
ES-5	Purchase a generator to provide adequate backup power for the Enterprise Volunteer Fire Department.	Tornado, High Wind	Moderate	Volunteer Fire Department	FEMA/MEMA, Homeland Security, Local funds	2025	The town has not purchased a backup generator for the fire department. It will look into trying to find funding for this going forward.
ES-6	Installation of a public warning system for the Town.	Tornado, High Wind	Moderate	Board of Aldermen	FEMA/MEMA, Homeland Security, Local funds	2025	The town has not installed a public warning system, but it would like to continue to look at funding options for this system

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Public Education and Awareness							
PEA-1	Education of local citizens on dangers of driving across flooded roads.	Flood	High	Fire Department , Police Department	FEMA/MEMA, JAG, Local funds	2025	The county has worked hard to inform citizens of the dangers of driving across flooded roads, but this action needs to be continued going forward.
PEA-2	Purchase materials to educate the public on being prepared for all hazards, including tornadoes, flooding, severe weather, fire, etc.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, AFGP, Local funds	2025	The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.
PEA-3	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2025	Some residents have built safe rooms, and are then issued an address so that those nearby know there is a shelter. This campaign is ongoing.

Town of Pachuta Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Alderman	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-2	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1							
Emergency Services							
ES-1	Installation of an emergency warning system for the Town.	Tornado, High Wind	High	Board of Alderman	FEMA/MEMA, Homeland Security, Local funds	2025	A public warning system has not been installed in the town due to lack of funding. The town will continue to look at the feasibility of this action going forward.
ES-2	Purchase of a generator to provide adequate backup power for the water system.	Tornado, High Wind	High	Public Works	FEMA/MEMA, Homeland Security, Local funds	2025	The town has not purchased a backup generator for the water system. It will look into trying to find funding for this going forward.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
ES-3	Purchase of a generator to provide adequate backup power for the volunteer fire department.	Tornado, High Wind	High	Volunteer Fire Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	The town has not purchased a backup generator for the fire department. It will look into trying to find funding for this going forward.
ES-4	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan.
ES-5	Purchase of additional turnout suits, radios, and nozzles for the volunteer fire department.	Wildfire	Moderate	Volunteer Fire Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2020	Completed
Public Education and Awareness							
PEA-1	Education of local citizens on the dangers of driving across flooded roads.	Flood	High	Volunteer Fire Department, Police Department	FEMA/MEMA, JAG, Local funds	2025	The county has worked hard to inform citizens of the dangers of driving across flooded roads, but this action needs to be continued going forward.
PEA-2	Purchase materials to educate the public on being prepared for all hazards, including tornadoes, flooding, severe weather, etc.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
PEA-2	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2025	New action

City of Quitman Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Rehabilitation of the storm drain system, including the cleaning out of the drains and lining them with plastic coating.	Flood	High	Public Works	FEMA/MEMA, CDBG, Local funds	2025	The storm drain system has been cleaned out in the past, but a large-scale project to fix the inherent problems has not been undertaken. The city will continue to work on improving the drain system going forward.
P-2	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
P-4	Collect additional data on the number of buildings located in flood-prone areas near the Chickasawhay River and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.
P-5	Hydrology Study for City of Quitman	Flood	Very High	Clarke County EMA	FEMA/MEMA, Local	2022	New Item

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-6	Flash Flooding is our number one threat as the north entrance to the city is 20' to 30' higher than all areas below to the city limits in the south.	Flood	High	Public Works / Street Department	FEMA/MEMA, CDBG, Local	2022	New Action. Each area or storm basin has been analyzed, with one hydrology study completed.
P-7	Culverts at the end of W. Franklin going under the Street and Railroad are Undersized and the risk is flooding the entire business center of downtown.	Flood	Very High	Public Works / Street Departme nt	FEMA/MEMA, CDBG, Local	2022	New Action. Culverts under Railroad Ave. Need to be enlarged to handle storm water. Once done the culverts under the railroad need to be enlarged.
P-8	Bailey Avenue has flooded twice in the last five years. Hydrology study indicates size of 30" culvert should be replaced with two 36"x 42" culverts.	Flood	High	Public Works / Street Department	FEMA/MEMA, CDBG, Local	2022	New Action. Several Homes have flooded with one home experiencing a loss of $67,000. Have increased the flow away from Bailey to culverts under N. Jackson to reduce pressure on Bailey.
P-9	Water volume and pressure on the east side of Archusa Lake is a serious problem. Fire protection is suspect and sewer service is not complete to most homes.		High	Contractor Engineer	Corps of Engineers 592 Funds	2022	New Action. First phase ($1.9) million will start in 2021 with an additional $4. million In other stages. In ground pressure tank will be built.
P-10	Pine View Circle has had flood losses in four of the last 10 yrs. Junior High School has raw sewage flooding twice in 4 yrs.	Flood	High	Public Works / Engineer	FEMA/MEMA, CDBG, Local	2022	New Action. Sewer lines north of Pine View Circle and the Jr. High have been lined to reduce the infiltration of storm waters.
P-11	Culverts at end of Sycamore and Railroad Avenue can't handle the storm water surge and need to be increased in size. Three Homes have flooded in last 5 yrs.	Flood	High	Public Works / Engineer	FEMA/MEMA, CDBG, Local	2023	New Action

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-12	Homes on the lower end of Lorretta Drive suffer flooding from storm waters going down their driveways and getting into their homes.	Flood	High	Public Works / Engineer	FEMA/MEMA, CDBG, Local	2024	New Action
P-13	Warning systems to alarm when weather or other threats develop Currently have two new sirens that have voice command ability	All	High	Fire	HMGP, FEMA, MEMA, CDBG	2021	New Action
P-14	Standby Emergency generator for City Hall and Economic Dev. Center.	All	High	Public Works	HMGP, FEMA, MEMA, CDBG	2021	New Action
P-15	Infiltration of storm waters in the lines from Grecimar to Pecan Circle and Dogwood have caused homes to be unable to flush their toilets	Flood	High	Water Department	HMGP, FEMA, MEMA, Local, CDBG	2022	New Action
P-16	Security aroung water wells and Lift Stations is needed. Currently, only a fence is around all of them. Needed is better security, cameras, and SCATA systems to alert us.	Security	High	Water Department	FEMA, MEMA, CDBG, Local	2021	New Action
P-11	Keeping gutters cleaned is currently being done by a 30 year old street sweeper, and other equipment is needed Back-hoe and Tractor to pull leaf machine are essential	All	Moderate	Street Department	Volkswagen Funds & Local	2021	New Action
P-12	Collect additional data on the number of buildings located in storm surge flooding. Determine their assessed value to determine potential losses	Flood	Moderate	Zoning	Local	2021	New Action

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-13	City has numerous old brick Man-holes that are subject to collapse. We have replaced several but have many others	All	Moderate	Engineer, Water Department	HMGP, FEMA, MEMA	2023	New Action
P-14	City has cast iron water pipes and one street uses an Asbestos pipe for water. Some water lines need to be Increased, especially to the other side of the lake.	Health & Safety	Moderate	Engineer, Water Departme nt	HMGP, FEMA, MEMA, CDBG, Local	2022	New Action

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Property Protection							
PP-1	Repair of roof at the Quitman Fire Department.	High Wind	High	Fire Department	FEMA/MEMA, Homeland Security, Local funds	2017	COMPLETED
PP-2	Installation of a pitched roof on City Hall to replace the current flat roof.	Flood	High	Board of Aldermen	FEMA/MEMA, Homeland Security, Local funds	2017	COMPLETED
PP-3	Depot	Flood & High Wind	High	Board of Alderman	Local, MDAH	2021	New Action
Natural Resource Protection							
NRP-1	Chickasawhay River Natural Asset	Debris	Moderate	City and Army Corps of Engineers	Local	2023	New Action
Structural Projects							
SP-1	Installation of larger culverts on Railroad Avenue.	Flood	High	Public Works	FEMA/MEMA, CDBG, Local funds	2023	Larger culverts have not been installed on Railroad Avenue. The city will continue to look into potential funding sources for this project.
SP-2	Installation of a cement drainage ditch behind Pineview Circle.	Flood	High	Public Works	FEMA/MEMA, CDBG, Local funds	2023	A cement drainage ditch has not been installed behind Pineview Circle. The city will continue to look into potential funding sources for this project.
SP-3	Installation of approximately 400’ of culverts on Anderson Street.	Flood	High	Public Works	FEMA/MEMA, CDBG, Local funds	2023	Culverts have not been installed on Anderson Street. The city will continue to look into potential funding sources for this project.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
SP-4	Installation of additional pumps at the sewer to handle excess water due to heavy rainfall.	Flood	High	Public Works	FEMA/MEMA, CDBG, Local funds	2025	Additional pumps have not been installed to the sewer system. The city will continue to look into potential funding sources for this project.
SP-5	Sewer Lines draining into Brock Street Lift Station are incurring excessive Infiltration	Flood	High	Water Sewer	HMGP, CDBG, Local	2022	New Action
SP-6	Combine the small lagoon with the larger lagoon after cleaning smaller one	Health & Safety	Moderate	Water Sewer	HMGP, CDBG, Local	2024	New Action
SP-7	Bringing Sewer to other side of lake and increase water volume and pressure	Health & Safety	High	Water Sewer	CDBG, Local	2022	New Action
SP-8	Above Ground 150,000 gal. Water Tank for other side of Lake	Health & Safety	Moderate	Water Sewer	CDBG, Local	2024	New Action
SP-9	Retainage Ponds at Lumber Mill Property to lessen the effect of storm waters	Flood	High	Engineer, Water Sewer	CDBG, Local	2024	New Action
Emergency Services							
ES-1	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane.	Hurricane	High	Fire Department , Police Department	FEMA/MEMA, Local funds	2022	Have implemented ISIS Communication System and have place two warning sirens of the three needed plan is ongoing.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
ES-2	Installation of an emergency warning system for the city.	All	High	Board of Aldermen	FEMA/MEMA, Homeland Security, Local funds	2020	We now have three of the warning sirens of the four needed. One more to go.
ES-3	Purchase generators to provide adequate backup power for critical facilities.	Tornado, High Wind	Moderate	Board of Aldermen	FEMA/MEMA, Homeland Security, AFGP, Local funds	2022	We have no back-up for City Hall or the two water wells. Need two 100K's and two 50K generators
ES-4	Purchase wildland firefighting gear for the volunteer fire department.	Wildfire	Moderate	Volunteer Fire Department	FEMA/MEMA, Homeland Security, DFGP, Local funds	2022	Wildfire fighting gear has not been purchased but is needed. One more to go.
ES-5	Purchase Equipment for Police Officers to respond to civil unrest and protection of Officers	Safety	Moderate	Police Department	FEMA, MEMA, Homeland Security	2022	New Action
Public Education and Awareness							
PEA-1	Education of local citizens on the dangers of driving across flooded roads.	Flood	High	Fire Department, Police Department	FEMA/MEMA, JAG, Local funds	2022	Considerable improvement in this program, but it will remain an ongoing effort
PEA-2	Purchase of materials to educate the public on being prepared for all hazards, including tornadoes, flooding, severe weather, etc.	All	Low	Fire Department , Police Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.
PEA-3	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2020	New action
PEA-4	Using the Iris System to notify citizens by area of boil water notices	Health & Safety	High	Public Works	FEMA, MEMA, Local	2021	New Action

Town of Shubuta Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Clean out three drainage ditches that lead to the Chickasawhay River.	Flood	High	Public Works	FEMA/MEMA, CDBG, Local funds	2025	These drainage ditches have been cleaned up fairly regularly, but the town would like to continue carrying out this task and evaluate the effectiveness of keeping them cleared.
P-2	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	The International Building Code has been adopted. The county will need to review this code over the next 5 years, so this action will remain in the plan.
P-3	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-4	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-5	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Volunteer Fire Department, Police Department	FEMAMEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
P-6	Collect additional data on the number of buildings located in flood-prone areas near the Chickasawhay River and determine the value in order to determine the potential losses due to a flood event.	Flood	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1							
Emergency Services							
ES-1	Purchase of a generator to provide adequate backup power for the water system.	Tornado, High Wind	High	Public Works	FEMA/MEMA, Homeland Security, Local funds	2025	The town has not purchased a backup generator for the water system. It will look into trying to find funding for this going forward.
ES-2	Develop a plan to notify and educate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strike.	Hurricane	High	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan.
ES-3	Installation of an emergency warning system for the Town.	Tornado, High wind	High	Board of Aldermen	FEMA/MEMA, Homeland Security, Local funds	2025	The town has not installed an emergency warning system, but it would like to continue to look at funding options for this system
ES-4	Purchase of a generator to provide adequate backup power for the volunteer fire department.	Tornado, High Wind	Moderate	Volunteer Fire Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	The town has not purchased a backup generator for the fire department. It will look into trying to find funding for this going forward.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
ES-5	Purchase wildland firefighting gear for the volunteer fire department.	Wildfire	Moderate	Volunteer Fire Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	This equipment has not been purchased for volunteer fire departments due to lack of funding. The town will continue to look for ways to fund this going forward.
Public Education and Awareness							
PEA-1	Education of local citizens on the dangers of driving across flooded roads.	Flood	High	Volunteer Fire Department, Police Department	FEMA/MEA, JAG, Local funds	2025	The county has worked hard to inform citizens of the dangers of driving across flooded roads, but this action needs to be continued going forward.
PEA-2	Purchase materials to educate the public on being prepared for all hazards, including tornadoes, flooding, severe weather, fire, etc.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.
PEA-3	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2025	Ongoing

Town of Stonewall Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
				Prevention			
P-1	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-2	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
P-4	Collect additional data on the number of buildings located in flood-prone areas near the Chickasawhay River and determine the assessed value in order to determine the potential losses due to a flood event.	Flood	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.
				Property Protection			
PP-1							
				Natural Resource Protection			
NRP-1							

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Structural Projects							
SP-1	Replacement of the bridge on Highway 513.	Flood	High	Public Works	FEMA/MEMA, CDBG, LSBP, Local funds	2025	This bridge has not been replaced yet, but the town still sees it as a priority, so it will look at determining how to get the project funded going forward.
Emergency Services							
ES-1	Installation of an emergency warning system for the Town.	Tornado, High Wind	High	Board of Aldermen	FEMA/MEMA, Homeland Security, Local funds	2025	The town has not installed an early warning system, but it would like to continue to look at funding options for this system
ES-2	Purchase of generators to provide adequate backup power for the water and sewer systems.	Tornado, High Wind	High	Public Works	FEMA/MEMA, Homeland Security, Local funds	2025	The town has not purchased a backup generator for the water system. It will look into trying to find funding for this going forward.
ES-3	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan.
ES-4	Purchase a generator to provide adequate backup power for the Stonewall Volunteer Fire Department.	Tornado, High Wind	Moderate	Volunteer Fire Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	The town has not purchased a backup generator for the fire department. It will look into trying to find funding for this going forward.
ES-5	Purchase wildland firefighting gear for the volunteer fire department.	Wildfire	Moderate	Volunteer Fire Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	This equipment has not been purchased for volunteer fire departments due to lack of funding. The town will continue to look for ways to fund this going forward.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Public Education and Awareness							
PEA-1	Education of local citizens on the dangers of driving across flooded roads.	Flood	High	Volunteer Fire Department, Police Department	FEMA/MEMA, JAG, Local funds	2025	The county has worked hard to inform citizens of the dangers of driving across flooded roads, but this action needs to be continued going forward.
PEA-2	Purchase of materials to educate the public on being prepared for all hazards, including tornadoes, flooding, severe weather, etc.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.
PEA-3	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2025	Ongoing

Jasper County Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-2	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2020	Completed
P-4	Collect additional data to define hazards, risks areas, and vulnerabilities to be used in future updates of the plan.	All	Low	County EMA	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Structural Projects							
SP-1	Install three cement culverts on CR 299, clean out ditches, and repair road.	Flood	High	Board of Supervisors	FEMA/MEMA, CDBG, Local funds	2025	Deferred. Culverts have not been installed. The county will continue to look for potential funding sources for these
SP-2	Clean out ditches and install rip rap on CR 1822.	Flood	High	Board of Supervisors	FEMA/MEMA, CDBG, Local funds	2025	Deferred. The county has worked on cleaning out ditches, but it has not installed rip rap at this location. Going forward, the county will continue to try to secure funding for
SP-3	Clean out ditches and install rip rap on CR 31.	Flood	High	Board of Supervisors	FEMA/MEMA, CDBG, Local funds	2025	Deferred. The county has worked on cleaning out ditches, but it has not installed rip rap at this location. Going forward, the county will continue to try to secure funding for
SP-4	Install two 24”x30’ culverts, clean out ditches, and install rip rap on CR 3919.	Flood	High	Board of Supervisors	FEMA/MEMA, CDBG, Local funds	2025	Deferred. Culverts have not been installed. The county will continue to look for potential funding sources for these
Emergency Services							
ES-1	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	County EMA	FEMA/MEMA, Local Funds	2017 Code Red Purchased	Completed

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
ES-2	Installation of outdoor warning system for the Stringer community.	Tornado, High Wind	Moderate	County EMA	FEMA/MEMA, Homeland Security, Local funds	2025	Ongoing. An outdoor warning system has not been installed in the Stringer community due to lack of funding. The county will continue to look at the feasibility of this action going forward.
ES-3	Currently have 3 tornado sirens, would like to obtain 12 more.	Tornado, High Wind	Moderate	County EMA	FEMA/MEMA, Homeland Security, Local funds	2025	
Public Education and Awareness							
PEA-1	Purchase of materials to educate the public on being prepared for hazards, including, severe weather, flooding, fire, etc.	All	Low	County EMA	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	Ongoing. The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.

City of Bay Springs Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-2	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2025 ongoing	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1							
Emergency Services							
ES-1	Purchase of generators to provide backup power for sewer lift stations.	Tornado, High Wind, Hurricane	High	Public Works	FEMA/MEMA, Homeland Security, Local funds	2025	The town has bought some, purchased a backup generator for the water system. It will look into trying to find additional funding for this going forward.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
ES-2	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2017 Code Red	Completed
Public Education and Awareness							
PEA-1	Purchase of materials to educate the public on being prepared for hazards, including tornadoes, severe weather, flooding, fire, etc.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.
PEA-2	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2025	Deferred.

Town of Heidelberg Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Cleaning out of Beaver Creek to alleviate flooding on East Main Street.	Flood	High	Public Works	FEMA/MEMA, CDBG, Local funds	2025	The town has cleaned out Beaver Creek on many occasions, but it will need to continue to implement this action to reduce flooding risk. Therefore this action will remain in the plan.
P-2	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	The International Building Code has been adopted. The county will need to review this code over the next 5 years, so this action will remain in the plan.
P-4	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
P-5	Collect additional data on the number of buildings located in flood-prone areas and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1	Installation of a larger culvert on North Pine Avenue and cleaning out of ditch.	Flood	Moderate	Public Works	FEMA/MEMA, CDBG, Local funds	2025	Deferred. A larger culvert has not been installed at North Pine Avenue, although some cleaning has taken place. This project will be carried forward to the next plan.
Emergency Services							
ES-1	Installation of an Emergency Warning System for the Town.	Tornado, High Wind	High	Board of Aldermen, Volunteer Fire Department	FEMA/MEMA, Homeland Security, Local funds	2025	An emergency warning system has not been installed in town, but the town will continue to look for funding sources.
ES-2	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2017 Code Red	Completed

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Public Education and Awareness							
PEA-1	Purchase of materials to educate the public on being prepared for hazards, including tornadoes, severe weather, flooding, fire, etc.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025 On going	The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.
PEA-2	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2024	Ongoing, engineer meetings.

Town of Louin Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-2	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Ongoing. The International Building Code has been adopted. The county will need to review this code over the next 5 years, so this action will remain in the plan.
P-4	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1							

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Emergency Services							
ES-1	Installation of outdoor warning system.	Tornado, High Wind	High	Board of Aldermen	FEMA/MEMA, Homeland Security, Local funds	2017	Completed
ES-2	Installation of a new water well to serve as backup for the water system.	Tornado, High Wind	High	Board of Aldermen	FEMA/MEMA, CDBG, Rural Development, Local funds	2025	Deferred. A new water well has not been installed in the town. The town would like to try to secure funding for this and will keep this as an action going forward.
ES-3	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2017 Code Red	Completed
ES-4	Purchase of weather radios for public meeting places.	Tornado, High Wind	Moderate	Board of Aldermen, Volunteer Fire Department	FEMA/MEMA, Homeland Security, Local funds	2020	Completed
Public Education and Awareness							
PEA-1	Purchase of materials to educate the public on being prepared for hazards, including tornadoes, severe weather, flooding, fire, etc.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
PEA-2	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2025	Ongoing process.

Town of Montrose Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-2	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2020	Completed
P-4	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1							

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Emergency Services							
ES-1	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2017 Code Red	Completed
ES-2	Purchase of weather radios for public meeting places.	Tornado, High Wind	Moderate	Board of Aldermen, Volunteer Fire Department	FEMA/MEMA, Homeland Security, Local funds	2025	Weather radios have not been purchased, but the town would still like to plan to do this going forward so it will remain an action. New mayor, ongoing
ES-3	Purchase of a brush/quick attack truck for the fire department to help them fight grass and woods fires, especially in the national forest and game reserve.	Wildfire	Moderate	Volunteer Fire Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	The town has not purchased a truck for the fire department to help them fight fires. This action will remain in the plan going forward. Applied for grant, will try again.
Public Education and Awareness							
PEA-1	Purchase of materials to educate the public on being prepared for hazards, including tornadoes, severe weather, flooding, fire, etc.	All	Love	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.
PEA-2	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2025	Ongoing process.

Kemper County Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate new/existing construction and infrastructure in heavily wooded areas.	Wildfire	Moderate	Board of Supervisors	FEMA, MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-2	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Board of Supervisors	FEMA, MEMA, Local funds	2025	Ongoing. The International Building Code has not been adopted. The county will review this code and consider adoption, so this action will remain in the
P-3	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	County Emergency Management	FEMA, MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
P-4	Collect additional data on the number of buildings located in flood-prone areas and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	County Emergency Management	FEMA, MEMA, Local funds	2025	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Structural Projects							
SP-1							
Emergency Services							
ES-1	Installation of a NOAA weather repeater in Kemper County. Lack of coverage, NOAA will not install repeater.	Tornado, High Wind	High	Board of Supervisors, County Emergency Management	FEMA, MEMA, Homeland Security, Local funds	2025	A NOAA weather repeater has not been installed in the county. The county is still interested in pursuing this project, so it will remain in the plan.
ES-2	Purchase of generator trailers to operate the water systems in the Town of Scooba and the Town of De Kalb during emergency situations. De Kalb has generator at treatment plant now, trying to obtain more.	Tornado, High Wind	High	County Emergency Management	FEMA, MEMA, Homeland Security, Local funds	2025	Generator trailers have not been purchased, but the county would like to purchase these trailers so it will remain an action. Deferred
ES-3	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes. NIXLE	Hurricane	High	County Emergency Management	FEMA, MEMA, Local funds	2018	Completed
ES-4	Upgrade E-911 system to Phase II wireless compliance. **Contracted to Neshoba County**	All	High	County Emergency Management	FEMA, MEMA, Homeland Security, AFGP, Local funds	2014	Completed
ES-5	Purchase 3 sets of "Jaws of Life" extraction equipment for VFD's and Emergency Response Units. **Now have 7 sets.**	All	High	County Emergency Management	FEMA, MEMA, Homeland Security, AFGP, Local funds	2019	Completed
ES-6	Purchase a generator to provide adequate backup power for the wastewater lift station serving the regional correctional facility. Currently looking for funding sources, remains a priority.	All	High	Board of Supervisors, Sheriff's Department	FEMA, MEMA, Local funds	2025	The county has not purchased backup generators for the lift station, but this is still a priority so it will remain an action going forward.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
ES-7	Purchase of generators for the County's volunteer fire departments.	Tornado, High Wind	Moderate	County Fire Service	FEMA, MEMA, Homeland Security, AFGP,	2020	Completed
ES-8	Construction of two additional fire stations for the rural volunteer fire departments. **One station completed, decided against second.**	Wildfire	Moderate	County Emergency Management, Volunteer Fire	FEMA, MEMA, CDBG, Local funds	2020	Completed
ES-9	Upgrade county radio system from VHF analog to State's 800mhz digital trunked system.	All	High	County Emergency Management	Local	2022	New Action. Waiting on procurement ok Wireless Communications Commission.
Public Education and Awareness							
PEA-1	Purchase of materials to educate the public on being prepared for hazards, including tornadoes, severe weather, flooding, fire, etc. NIXLE is ongoing.	All	Low	County Emergency Management	FEMA, MEMA, Homeland Security, AFGP, Local funds	2025	Ongoing. The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.
PEA-2	Encourage the construction of safe rooms and tornado shelters. Continues as a mitigation effort.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2025	Ongoing. Safe room construction has been encouraged throughout the county, especially with new construction, but the county will continue to seek funding to install additional safe rooms and shelters.
PEA-3	Install commercial grade weather station	All weather related hazards	High	County Emergency Management	Local, MEMA, FEMA	2025	Ongoing. Still seeking funding sources.
PEA-4	County Sheriff recently contracted with NIXLE for alerts, EMA would like to encourage more users to opt-in.	All	High	County Emergency Management		2025	New project. County currently has 2,000 users who have signed up, would like to increase.

Town of De Kalb Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate new/existing construction and infrastructure in heavily wooded areas.	Wildfire	Moderate	Volunteer Fire Department, Police Department	FEMA, MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-2	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Volunteer Fire Department, Police Department	FEMA, MEMA, Local funds	2025	The International Building Code has been adopted. The county will need to review this code over the next 5 years, so this action will remain in the plan.
P-3	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Volunteer Fire Department, Police Department	FEMA, MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1	Dredging of approximately 1.2 miles of Snoody Creek and the installation of rip rap to alleviate flooding near local preschool.	Flood	High	Public Works	FEMA, MEMA, CDBG, Local funds	2025	Dredging of Snoody Creek has not taken place and rip rap has not been installed. This action still needs to be implemented going forward.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
SP-2	Improvements to the storm drain system.	Flood	High	Public Works	FEMA, MEMA, CDBG, Local funds	2025	Ongoing. The town has made some improvements to the storm drain, but additional modifications are necessary. Therefore the town will continue to pursue this as an action.
Emergency Services							
ES-1	Purchase of generators to provide adequate backup power for the Town's wastewater facilities.	Tornado, High Wind	Low	Public Works	FEMA, MEMA, Homeland Security, Local funds	1-2 years	The town has not purchased generators to backup the wastewater facilities, but this is a need and the town will continue to seek funding going forward.
ES-2	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes. **NIXLE**	Hurricane	High	Volunteer Fire Department, Police Department	FEMA, MEMA, Local funds	2017	Completed
ES-3	Installing of fire hydrants.	Wildfire	High	Public Works, Volunteer Fire Department	FEMA, MEMA, CDBG, Local funds	2024	The town has installed some fire hydrants, but more in rural areas would be useful so this action will remain in place. Hydrants have been installed, they need mapped.
Public Education and Awareness							
PEA-1	Purchase of materials to educate the public on being prepared for hazards, including tornadoes, severe weather, flooding, fire, etc.	All	Low	Volunteer Fire Department, Police Department	FEMA, MEMA, Homeland Security, AFGP, Local funds	2025	The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
PEA-2	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2020	Ongoing. Safe room has been encouraged throughout the county, especially with new construction, but the county will continue to seek funding to install additional safe rooms and shelters.

Town of Scooba Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Clearing of Little Scooba Creek for approximately 2 miles.	Flood	High	Public Works	FEMA/MEMA, CDBG, Local funds	2025	Clearing of the Little Scooba Creek has taken place to some degree, but the town needs to continue to address this issue to reduce flooding going forward.
P-2	Work with ECPDD to develop a model ordinance to regulate new/existing construction and infrastructure in heavily wooded areas.	Wildfire	Moderate	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	The International Building Code has been adopted. The county will need to review this code over the next 5 years, so this action will remain in the plan.
P-4	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
P-5	Collect additional data on the number of buildings located in flood-prone areas and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1	Improvements to storm drain system.	Flood	High	Public Works	FEMA/MEMA, CDBG, Local funds	2025	Ongoing. The town has made some improvements to the storm drain, but additional modifications are necessary. Therefore, the town will continue to pursue this as an action.
Emergency Services							
ES-1	Purchase of generators to provide adequate backup power for the Town's water and wastewater facilities.	Tornado, High Wind	High	Public Works	FEMA/MEMA, Homeland Security, Local funds	2025	Ongoing. The town has not purchased generators to backup the wastewater facilities, but this is a need and the town will continue to seek funding going forward.
ES-2	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes. **NIXLE**	Hurricane	High	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2018	Completed
ES-3	Installing of fire hydrants.	Wildfire	High	Public Works, Volunteer Fire Department	FEMA/MEMA, CDBG, Local funds	2025	The town has installed some fire hydrants, but more in rural areas would be useful so this action will remain in place. While some hydrants are functional, many need repaired.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Public Education and Awareness							
PEA-1	Purchase of materials to educate the public on being prepared for hazards, including tornadoes, severe weather, flooding, fire, etc.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.
PEA-2	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Safe room construction has been encouraged throughout the county, especially with new construction, but the county will continue to seek funding to install additional safe rooms and shelters.

Lauderdale County Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-2	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	County Fire Service	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2025	The International Building Code has not been adopted. The county will review this code and consider adoption, so this action will remain in the plan. Cities have adopted 2018.
P-4	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	County Emergency Management	FEMA/MEMA, Homeland Security, Local funds	2020	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
P-5	Collect additional data on the number of buildings located in flood-prone areas and determine their assess value in order to determine potential losses due to a flood event.	Flood	Low	County Emergency Management	FEMA/MEMA, Local funds	2020	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.
Property Protection							
PP-1	Renovate EOC to include lights, HVAC, and install 8 security cameras.	All	High	Board of Supervisors, County Emergency Management	FEMA, Local funds	2017	Completed
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1	Install a larger culvert on Morgan Road.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, CDBG, Local funds	2021	Completed
SP-2	Replace bridge on Arkadelphia Road.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, CDBG, LSBP, Local funds	2025	The bridge on Arkadelphia Road has not been replaced as funding has not been provided. The county would like to leave this action in place and seek funding in the future.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Emergency Services							
ES-1	Purchase generators for the County Fire Service.	All	Moderate	County Fire Service	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	Some generators have been purchased for the fire service, but there is still as strong need for additional generators. The county will continue to look for funding sources for these.
Public Education and Awareness							
PEA-1	Education of local citizens on the danger of driving across flooded roads.	Flood	High	County Emergency Management	FEMA/MEMA, JAG, Local funds	2025	The county has worked hard to inform citizens of the dangers of driving across flooded roads, but this action needs to be continued going forward. Turn around, don't drown.
PEA-2	Purchase materials to educate public on being prepared for hazards, including tornadoes, flooding, severe weather, etc.	All	Low	County Emergency Management	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.
PEA-2	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2025	New action, no program officially, but will continually encourage safe rooms.

Town of Marion Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-2	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Board of Aldermen, Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
P-4	Collect additional data on the number of buildings located in flood-prone areas and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	Board of Aldermen, Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Structural Projects							
SP-1							
Emergency Services							
ES-1	Purchase a generator to provide backup power for the Town Hall, which also houses the police department.	All	High	Board of Aldermen, Public Works	FEMA/MEMA, Homeland Security, Local funds	2025	A generator for backup power to town hall has not been purchased. The town is still interested in pursuing this project, but needs to find a funding source.
ES-2	Purchase a mobile generator to provide backup power for the Town's sewer lift stations.	All	High	Board of Aldermen, Public Works	FEMA/MEMA, Local funds	2025	Some generators have been purchased and are available, but there is still as strong need for additional generators for lift stations. The county will continue to look for funding sources for these.
Public Education and Awareness							
PEA-1	Education of local citizens on the danger of driving across flooded roads.	Flood	High	County Emergency Management	FEMA/MEMA, JAG, Local funds	2025	The county has worked hard to inform citizens of the dangers of driving across flooded roads, but this action needs to be continued going forward.
PEA-2	Purchase materials to educate the public on being prepared for hazards, including tornadoes, flooding, severe weather, etc.	All	Low	Board of Aldermen, Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.
PEA-3	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2025	Ongoing campaign.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Previously Completed Actions							
	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Board of Aldermen	FEMA/MEMA, Local funds	1-2 years	Completed

City of Meridian Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Repair and improve drainage at locations that experience localized flooding.	Flood	High	Public Works	FEMA/MEMA, Homeland Security, CDBG, Local funds	2025	The city has not repaired and improved all drainage areas, all though some projects have been implemented. The city will continue to identify areas of localized flooding and potential projects to implement
P-2	Work with ECPDD to develop a model ordinance to regulate new/existing construction and infrastructure in heavily wooded areas.	Wildfire	Moderate	City Council	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	The City will continue participation in the NFIP and will continue to update building requirements to ensure compliance with recommendations to prevent flood damage.	Flood	Moderate	City Council	FEMA/MEMA	2025	The city has been an active participant in the NFIP and plans to continue to try to improve its overall floodplain management program in accordance with the NFIP. Therefore this action will remain in place.
P-4	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	City Emergency Management	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
P-5	Collect additional data on the number of buildings located in flood-prone areas and determine their assess value in order to determine potential losses due to a flood event.	Flood	Low	City Emergency Management	FEMA/MEMA, Homeland Security, Local funds	2025	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.
Property Protection							
PP-1	Incorporate backup power into specifications for replacement of critical sewer lift stations.	All	Moderate	Public Works	FEMA/MEMA, CDBG, Local funds	2025	Backup power for lift stations have not been implemented. This is still an important action and will remain in the plan for the city.
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1	Repair Long Creek Lake Dam by rebuilding of the earthen dam.	Dam Failure	High	Public Works	FEMA/MEMA, Local funds	2025	Ongoing. This dam has not been repaired and the city stills sees this as a potential issue, so the action will be carried forward in the plan.
Emergency Services							
ES-1	Participate in countywide Emergency Notification System.	All	High	City Emergency Management, Fire Department	FEMA/MEMA, Homeland Security, Local funds	2025	The town has participated in the Emergency Notification System to some degree, but would like to expand its participation going forward so this will remain an action.
ES-2	Purchase generators for backup power for the city's water system.	All	High	Public Works	FEMA/MEMA, Homeland Security, CDBG, Local funds	2025	Generators for the city's water system have not been purchased. The city would like to purchase these generators and will seek funding to do so.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
ES-3	Increase recruitment, retention, and training for emergency personnel.	All	High	DHS	FEMA/MEMA, Homeland Security, AFG, Local funds	2025	The city has worked hard to try to recruit and train the best personnel possible, but this is a continual effort that will need to be pursued going forward so this action will remain in the plan.
ES-4	Purchase generators for Frank Cochran Center and Pool House (Emergency Shelter and Pet Shelter).	All	High	DHS, Parks and Recreation	FEMA/MEMA, Homeland Security, Local funds	2025	A generator has not been purchased for the either of these shelter facilities, but this is still a need for the city. Therefore, the city will continue to pursue this action.
ES-5	Purchase generators to provide backup power to the wastewater treatment plant.	All	High	Public Works	FEMA/MEMA, Homeland Security, CDBG, Local funds	2025	The city has not purchased a backup generator for the wastewater treatment plant. It will look into trying to find funding for this going forward.
Public Education and Awareness							
PEA-1	Public education program to provide educational programs on being prepared for all types of hazards to schools and citizen groups.	All	Low	City Emergency Management, Fire Department	FEMA/MEMA, Local funds	2025	The county has done a good job of sending out information on preparedness and weather updates to schools and citizen groups. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.
PEA-2	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2025	Ongoing campaign.

Leake County Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Waterway maintenance of flood-prone waterways, including: clearing and removal of debris; dredging of waterways; and erosion prevention measures, such as rip rap and planting of vegetation.	Flood	High	Board of Supervisors	FEMA/MEMA, CDBG, US Army Corps of Engineers, Local funds	2025	Ongoing. This action has been partially completed as there is a plan in place for clearing and debris removal. However, the county is seeking funding for erosion prevention measures and dredging.
P-2	Development of a permit system for the County.	Flood	High	Board of Supervisors	FEMA/MEMA, CDBG, Local funds	2017	Completed
P-3	Work with Leake County Schools to identify which roads their buses have trouble crossing during heavy rains because of flooding.	Flood	High	County Emergency Management, County School System	FEMA/MEMA, CDBG, State DOE, Local funds	2025	The county has been in contact with the school system concerning this issue, but a comprehensive plan to address these issues is not in place as there was a lack of funding. Seeking funding.
P-4	Establish and publish base flood elevations throughout the County.	Flood	High	Board of Supervisors, County Emergency Management	FEMA/MEMA, Homeland Security, US Army Corps of Engineers, Local funds	2025	The county has not published base flood elevations throughout the county. This is a goal the county is still working towards so it will remain in the plan.
P-5	Work with ECPDD to develop a model ordinance to regulate new/existing construction and infrastructure in flood-prone areas.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
P-6	Work with ECPDD to develop a model ordinance to regulate new/existing construction and infrastructure in heavily wooded areas.	Wildfire	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-7	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2025	The International Building Code has not been adopted. The county will review this code and consider adoption, so this action will remain in the plan.
P-8	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	County Emergency Management	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
P-9	Collect additional data on the number of buildings located in flood-prone areas near the Pearl River and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	County Emergency Management	FEMA/MEMA, Local funds	2025	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Structural Projects							
SP-1	Build a new EOC.	All	High	County EMA / Sheriff	FEMA, MEMA, Local	2022	New Action
Emergency Services							
ES-1	Installation of texting/paging system for the County.	All	High	County Emergency Management	FEMA/MEMA, Homeland Security, Local funds	2017	Completed
ES-2	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	County Emergency Management	FEMA/MEMA, Local funds	2017	Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan.
ES-3	Install radios on all Leake County Schools buses for emergency contact during flooding.	Flood	Moderate	County Emergency Management, County School System	FEMA/MEMA, State DOE, Local funds	2020	Completed
ES-4	Installation of a camera atop Leake County Communications Office to monitor weather conditions from E-911 Center.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2020	Completed

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
ES-5	Installation of emergency warning systems at all 10 fire stations in the County.	Tornado, High Wind	Moderate	County Fire Service	FEMA/MEMA, Homeland Security, Local funds	2025	Ongoing. Emergency warning systems have not been installed at fire stations. The county will continue seeking
ES-6	Purchase of generators for the County's seven rural fire departments.	Tornado, High Wind	Moderate	County Fire Service	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	Ongoing. Generators have not been purchased for all of the rural fire departments, so this action will remain in the
ES-7	Increasing specialized training of local emergency responders in order to improve response.	All	Moderate	County Emergency Management	FEMA/MEMA, AFGP, Homeland Security, Local funds	2025	Ongoing. Although some training of local responders has taken place, there is a continual need to train new responders and keep current responders up to date, so this action will remain in place.
ES-8	Conducting mock emergency exercises to improve local response capabilities.	All	Moderate	County Emergency Management	FEMA/MEMA, AFGP, Homeland Security, Local funds	2025	The county has conducted mock emergency exercises, but these will still need to be carried out going forward. The county will continue to carry these out in the future.
ES-9	County maps will be provided to all emergency responders to improve overall emergency response.	All	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2017	Completed
ES-10	Purchase of a tower for emergency communications repeater station.	All	Moderate	County Emergency Management	FEMA/MEMA, Homeland Security, Local funds	2020	Completed

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
ES-11	Digitize mapping and upgrades to current E-911 system to make it Phase II compatible with mapping and data information for emergency response, situation tracking, identification of hazard areas, and other information that may be implemented in Hazard Mitigation Planning and response.	All	High	County Emergency Management	FEMA/MEMA, Homeland Security, Local funds	2016	Completed
Public Education and Awareness							
PEA-1	Education of local citizens on the dangers of driving across flooded roads.	Flood	High	County Emergency Management	FEMA/MEMA, LLEBG, Local funds	2025	The county has worked hard to inform citizens of the dangers of driving across flooded roads, but this action needs to be continued going forward.
PEA-2	Education of local residents on being prepared for all hazards including tornadoes, high winds, and severe weather.	All	High	County Emergency Management	FEMA/MEMA, Local funds	2025	The county has implemented education activities mostly through local radio and print ads The county will continue to work on better public information techniques and improve public communication.
PEA-3	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2025	Safe room construction has been encouraged throughout the county, especially with new construction, but the county will continue to seek funding to install additional safe rooms and shelters.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
PEA-4	Improve the County's library of hazard response reference materials.	All	Moderate	County Emergency Management	FEMA/MEMA, AFGP, Homeland Security, Local funds	2020	Completed
PEA-5	Development of a Leake County website with links to all County Offices, emergency plans, etc.	All	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2020	Completed
Previously Completed Actions							

City of Carthage Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate new/existing construction and infrastructure in flood-prone areas.	Flood	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-2	Work with ECPDD to develop a model ordinance to regulate new/existing construction and infrastructure in heavily wooded areas.	Wildfire	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Fire Department , Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
P-4	Collect additional data on the number of buildings located in flood-prone areas near the Pearl River and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	Fire Department , Police Department	FEMA/MEMA, Local funds	2025	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.
Property Protection							
PP-1	Acquire large capacity Sump/Water Pump to assist with flooding of prone areas in city of Carthage	Flood	High	Board of Aldermen	FEMA/MEMA, Local Funds	2020	Complete (pumps are leased)

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1	Drainage improvements along Allenwood Drive, Terry Lane, and South Valley Street. Existing drainage system is not capable of handling runoffs from heavy rains.	Flood	High	Public Works	FEMA/MEMA, Local funds	2025	Improvements have not been implemented in these areas, but the city will continue seeking funding.
SP-2	Upgrade levee system on Town Creek south side of Carthage.	Flood	High	Public Works	Local, FEMA, MEMA	2025	New Action
Emergency Services							
ES-1	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Fire Department , Police Department	FEMA/MEMA, Local funds	2025	Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan.
Public Education and Awareness							
PEA-1	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Low	Fire Department , Police Department	FEMA/MEMA, Local funds	2025	Safe room construction has been encouraged throughout the county, especially with new construction, but the county will continue to seek funding to install additional safe rooms and shelters.
PEA-2	Education of local residents on being prepared for all hazards including tornadoes, high winds, and severe weather.	All	Low	Fire Department , Police Department	FEMA/MEMA, Local funds	2025	The county has implemented education activities mostly through local radio and print ads The county will continue to work on better public information techniques and improve public communication.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
PEA-3	Education of local citizens on the dangers of driving across flooded roads.	Flood	Low	Fire Department , Police Department	FEMA/MEMA, Local funds	2025	The county has worked hard to inform citizens of the dangers of driving across flooded roads, but this action needs to be continued going forward.
Previously Completed Actions							

Town of Lena Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate new/existing construction and infrastructure in flood-prone areas.	Flood	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-2	Work with ECPDD to develop a model ordinance to regulate new/existing construction and infrastructure in heavily wooded areas.	Wildfire	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	The International Building Code has been adopted. The county will need to review this code over the next 5 years, so this action will remain in the plan.
P-4	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
P-5	Collect additional data on the number of buildings located in flood-prone areas near the Pearl River and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1							
Emergency Services							
ES-1	Purchase of a generator to provide adequate standby power for the Town of Lena's water system.	Tornado, High Wind	High	Public Works	FEMA/MEMA, Homeland Security, Local funds	2017	Completed
ES-2	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan.
ES-3	Purchase of a generator to provide adequate standby power for the Lena Volunteer Fire Department.	Tornado, High Wind	Moderate	Volunteer Fire Department	FEMA/MEMA, AFGP, Homeland Security, Local funds	2025	A generator for the fire department has not been purchased due to lack of funding. The town will continue to try to find a funding source for this project.
ES-4	Renovate existing emergency warning system so that it can be remotely activated by the E-911 Center during emergencies.	Tornado, High Wind	Moderate	Board of Aldermen	FEMA/MEMA, Homeland Security, Local funds	2025	The existing emergency warning system has not been renovated to have remote activation capabilities. The county will continue to seek funding to implement this action.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Public Education and Awareness							
PEA-1	Education of local citizens on the dangers of driving across flooded roads.	Flood	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, LLEBG, AAA (free booklets?), Local funds	2025	The county has worked hard to inform citizens of the dangers of driving across flooded roads, but this action needs to be continued going forward.
PEA-2	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Safe room construction has been encouraged throughout the county, especially with new construction, but the county will continue to seek funding to install additional safe rooms and shelters.
PEA-3	Education of local residents on being prepared for all hazards including tornadoes, high winds, and severe weather.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	The county has implemented education activities mostly through local radio and print ads The county will continue to work on better public information techniques and improve public communication.
Previously Completed Actions							

Town of Walnut Grove Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Clean out debris and enlarge the main drainage ditch that runs through the Town of Walnut Grove to Tusculometa Creek.	Flood	High	Public Works	FEMA/MEMA, CDBG, Local funds	2017	Completed
P-2	Waterway maintenance of flood-prone waterways, including: clearing and removal of debris; dredging of waterways; and erosion prevention measures, such as rip rap and planting of vegetation.	Flood	Moderate	Public Works	FEMA/MEMA, CDBG, US Army Corps of Engineers, Local funds	2025	This action has been partially completed as there is a plan in place for clearing and debris removal. However, the county is seeking funding for erosion prevention measures and dredging.
P-3	Work with ECPDD to develop a model ordinance to regulate new/existing construction and infrastructure in flood-prone areas.	Flood	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-4	Work with ECPDD to develop a model ordinance to regulate new/existing construction and infrastructure in heavily wooded areas.	Wildfire	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-5	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	The International Building Code has been adopted. The county will need to review this code over the next 5 years, so this action will remain in the plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
P-6	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
P-7	Collect additional data on the number of buildings located in flood-prone areas near the Pearl River and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.
P-8	Work to become compliant with National Flood Insurance Program (NFIP) guidelines.	Flood	Low	Board of Aldermen	FEMA/MEMA, Local funds	2025	The town has worked hard to become compliant with the NFIP. This is an action that still requires some work, so the town will leave it in place in the plan.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1	Installation of a larger culvert on Main Street at Walnut Grove Town Hall to alleviate flooding in the downtown area.	Flood	High	Public Works	FEMA/MEMA, CDBG, Local funds	2025	A larger culvert has not been installed on Main Street due to lack of funding. The town will continue to seek funding to implement this project.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
SP-2	Installation of a larger culvert on the north side of Spruce Street near South Leake High School.	Flood	Moderate	Public Works	FEMA/MEMA, CDBG, Local funds	2020	Completed
Emergency Services							
ES-1	Purchase of a generator to provide adequate standby power for the Town of Walnut Grove water system.	Tornado, High Wind	High	Public Works	FEMA/MEMA, Homeland Security, Local funds	2017	Completed
ES-2	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan.
ES-3	Renovate existing emergency warning system so that it can be remotely activated by the E-911 Center during emergencies.	Tornado, High wind	Moderate	Board of Aldermen	FEMA/MEMA, Homeland Security, Local funds	2020	Partially completed.The existing emergency warning system has not been renovated to have remote activation capabilities. The county will continue to seek funding to implement this action.
ES-4	Construction of a new fire station for so the Walnut Grove Volunteer Fire Department can most effectively respond to emergencies and to serve as the emergency response post during such emergencies.	Tornado, High Wind	Moderate	Volunteer Fire Department	FEMA/MEMA, CDBG, Local funds	2020	Completed

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
ES-5	Increasing specialized training of local emergency responders in order to improve response capabilities.	All	Moderate	Volunteer Fire Department	FEMA/MEMA, AFGP, Homeland Security, Local funds	2025	Although some training of local responders has taken place, there is a continual need to train new responders and keep current responders up to date, so this action will remain in place.
ES-6	Conducting mock emergency exercise to improve local response capabilities.	All	Moderate	Volunteer Fire Department	FEMA/MEMA, AFGP, Homeland Security, Local funds	2025	The county has conducted mock emergency exercises, but these will still need to be carried out going forward. The county will continue to carry these out in the future.
Public Education and Awareness							
PEA-1	Education of local citizens on the dangers of driving across flooded roads.	Flood	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, LLEBG, AAA, Local funds	2025	The county has worked hard to inform citizens of the dangers of driving across flooded roads, but this action needs to be continued going forward.
PEA-2	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Safe room construction has been encouraged throughout the county, especially with new construction, but the county will continue to seek funding to install additional safe rooms and shelters.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
PEA-3	Education of local residents on being prepared for all hazards including tornadoes, high winds, and severe weather.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	The county has implemented education activities mostly through local radio and print ads The county will continue to work on better public information techniques and improve public communication.
Previously Completed Actions							

Neshoba County Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration by Board.
P-2	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration by Board.
P-3	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2025	The International Building Code has not been adopted. The county will review this code and consider adoption, so this action will remain in the plan.
P-4	Performance of annual maintenance on drainage systems (ditches) to ensure that debris is removed.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2025	An annual maintenance process for the drainage systems is in place, but this process will need to be evaluated going forward. The county will review this in the next 5 years and continue to perform maintenance.
P-5	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	County EMA	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
P-6	Collect additional data on the number of buildings located in flood-prone areas near the Pearl River and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	County EMA	FEMA/MEMA, Local funds	2025	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1	Installation of rip-rap at the end of all new culverts.	Flood	High	Board of Supervisors	FEMA/MEMA, Local funds	2025	Rip-rap has been added to the end of a number of culverts, but as new culverts are added to areas in the county, this action will need to be continually implemented. In process.
Emergency Services							
ES-1	Purchase of generators to provide adequate backup power for all volunteer fire departments.	Tornado, High Wind	High	County Fire Service	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	2 generators have been acquired but the county needs additional.
ES-2	Purchase of generators to provide emergency power to all critical facilities including a full capacity generator at the Neshoba County Courthouse, Courthouse Annex (Old Jail) and Philadelphia-Neshoba County Public Library.	Tornado, High Wind, Hurricane	High	Board of Supervisors	FEMA/MEMA, Homeland Security, Local Funds	2017	Completed
ES-3	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	County EMA	FEMA/MEMA, Local funds	2025	Discussions continue, county is considering the purchase of CodeRed.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
ES-4	Add amenities – specifically showers and a concourse to arena floor elevator - to Coliseum to make it compliant with necessary shelter requirements.	All	High	Board of Supervisors, County EMA	FEMA/MEMA, Homeland Security, Local funds	2018	Completed
ES-5	Protect Critical Facilities and Infrastructure from lighting damage	Tornado, Thunderstorms	High	Board of Supervisors, County EMA	FEMA/MEMA, Local Funds	2025	New action, Seeking Funding to implement protection measures.
ES-6	Map Community Risk through development of a coordinated GIS Department.	All	High	Board of Supervisors, County EMA	FEMA/MEMA, Local Funds	2025	Still Seeking Funding.
Public Education and Awareness							
PEA-1	Education of the public on all natural hazards, including flooding, tornadoes, severe thunderstorms, winter weather, and hurricanes.	All	Low	County EMA	FEMA/MEMA, Local funds	2025	The county has done a good job of posting preparedness information and weather updates to County Website and providing information to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.
PEA-2	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2025	Still in active discussions.

City of Philadelphia Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration by Board.
P-2	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration by Board.
P-3	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Fire Department , Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
P-4	Collect additional data on the number of buildings located in flood-prone areas near the Pearl River and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	Fire Department , Police Department	FEMA/MEMA, Local funds	2025	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.
Property Protection							
PP-1	Installation of a new 1000 GPM water well and related lines, with a standby generator, to supply the water treatment plant.	All	High	Public Works	FEMA/MEMA, CDBG, Local funds	2025	The city has not installed a water well with generator due to lack of funding, but it would still like to implement this action, so it will continue seeking funding.
Natural Resource Protection							
NRP-1							

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Structural Projects							
SP-1	Enlarge bridge on Williamsville Drive and on bypass. This stream also needs to be cleaned out in the area that falls outside the City limits.	Flood	High	Public Works	FEMA/MEMA, CDBG, Local funds	2025	The bridge has not been enlarged, but the city is seeking funding. The city also plans to work with the county on keeping the area outside city limits clear of debris.
SP-2	Cleaning out and widening of the ditch that runs adjacent to Main Street which causes flooding at Woffords Nursery and Landscape on Main, Byars Furniture Storage Warehouse on Gum Street, and three structures on Hopson Street.	Flood	Moderate	Public Works	FEMA/MEMA, CDBG, Local funds	2025	There has been some effort to clear out the ditch, but there has not been much effort to fully address the issue. The city is currently seeking funding to implement a full-scale project to address the issue.
SP-3	Clean out and deepen ditch at Chestnut Street near stream/creek between North Lewis and Martin Luther King.	Flood	Moderate	Public Works	FEMA/MEMA, CDBG, Local funds	2025	There has been some effort to clear out the ditch, but there has not been much effort to fully address the issue. The city is currently seeking funding to implement a full-scale project to address the issue.
Emergency Services							
ES-1	Purchase of generators to provide adequate backup power for the wastewater facilities after a disaster.	All	High	Public Works	FEMA/MEMA, CDBG, Local funds	2025	2 generators have been acquired but the county needs 10 additional.
ES-2	Purchase of a generator to provide adequate backup power allowing the Senior Citizens Center to be used as a shelter.	All	High	Public Works	FEMA/MEMA, CDBG, Local funds	2025	New action. Seeking Funding.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
ES-3	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	EMA, Fire Department , Police Department	FEMA/MEMA, Local funds	2025	Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan.
ES-4	Purchase of a satellite telephone for the Philadelphia Electric Department so communication can be maintained with TVA following a disaster.	All	High	Public Works	FEMA/MEMA, Homeland Security, Local funds	2025	A satellite telephone for the Electric Department has not been purchased. The city is still looking for funding to implement this action.
Public Education and Awareness							
PEA-1	Purchase of materials to educate the public on being prepared for hazards, including tornadoes, severe weather, flooding, fire, etc.	All	Low	Fire Department , Police Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	The city has done a good job of posting preparedness information and weather updates to County Website and providing information to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.
PEA-2	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2025	New action

Newton County Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-2	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2025	The International Building Code has not been adopted. The county will review this code and consider adoption, so this action will remain in the plan.
P-3	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	County Emergency Management	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
P-4	Collect additional data on the number of buildings located in flood-prone areas near the Chunky River and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	County Emergency Management	FEMA/MEMA, Local funds	2025	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Structural Projects							
SP-1	Replace the 48” culvert with a 5’ culvert on Dalmas Vance Road and raise road bed to 1’ or higher.	Flood	High	Board of Supervisors	FEMA/MEMA, CDBG, LSBP, Local funds	2017	COMPLETED
SP-2	Replace two 36” culverts on Hugh Huddnall Road with a 5’ arch culvert and raise road bed 2’ or more.	Flood	High	Board of Supervisors	FEMA/MEMA, CDBG, LSBP, Local funds	2017	COMPLETED
SP-3	Install a 8’ rail car on Griffis Fountain Road.	Flood	High	Board of Supervisors	FEMA/MEMA, CDBG, LSBP, Local funds	2025	Ongoing. A rail car has not been installed on this road. The county will continue to seek funding for this project and it will remain in the plan.
SP-4	Replace two 20” culverts on Strebeck Road with two 36” culverts and install rip rap.	Flood	High	Board of Supervisors	FEMA/MEMA, CDBG, LSBP, Local funds	DELETED	DELETED
SP-5	Install two 40’ x 30” culverts and one 30’ x 24” culvert on Risher Creek Road.	Flood	High	Board of Supervisors	FEMA/MEMA, CDBG, Local funds	2017	COMPLETED
SP-6	Install two 30’ x 24” plastic culverts on Landfill Road.	Flood	High	Board of Supervisors	FEMA/MEMA, CDBG, Local funds	2017	COMPLETED
SP-7	Install 35” x 24” x 40’ polymer-coated arc culvert on Mapp Road.	Flood	High	Board of Supervisors	FEMA/MEMA, CDBG, Local funds	2017	COMPLETED

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
SP-8	Replace the culvert on Blackwell Road with a bridge.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, CDBG, LSBP, Local funds	2025	This culvert has not been replaced. The county will continue to seek funding for this project and it will remain in the plan.
SP-9	Replace 5' culvert with tank car and 4' culvert with 5' culvert and install fill material and rip rap on Ridge Roade.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, CDBG, LSBP, Local funds	2025	These culverts have not been replaced. The county will continue to seek funding for this project and it will remain in the plan.
SP-10	Replace two 30" culverts on Peavey Road with 48" culverts.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, CDBG, LSBP, Local funds	2020	COMPLETED
SP-11	Replace 20" culvert on Johnson Road with a 36" culvert.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, CDBG, LSBP, Local funds	2025	These culverts have not been replaced. The county will continue to seek funding for this project and it will remain in the plan.
SP-12	Build up Potterchitto Road and install rip rap.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, CDBG, LSBP, Local funds	2025	This road has not been elevated and rip rap has not been installed. The county will continue to seek funding for this project and it will remain in the plan.
SP-13	Install two 20' x 30" and one 30' x 30" plastic culverts on Sandspring Church Road.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, CDBG, Local funds	2025	These culverts have not been replaced. The county will continue to seek funding for this project and it will remain in the plan.
SP-14	Install two 30' x 24" plastic culverts on Ledlow Road.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, CDBG, Local funds	2020	COMPLETED

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
SP-15	Install two 20' x 24" plastic culverts on Savell Road.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, CDBG, Local funds	2025	These culverts have not been replaced. The county will continue to seek funding for this project and it will remain in the plan.
SP-16	Replacement of the bridge on Roberts County-Line Road.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, CDBG, Local funds	2025	This bridge has not been replaced. The county will continue to seek funding for this project and it will remain in the plan.
SP-17	Replace bridge on Greenfield Rd. near Greenfield Fire Station, it's a critical road.	All	Moderate	Board of Supervisors	FEMA/MEMA, CDBG, Local funds	2025	New Action
Emergency Services							
ES-1	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	County Emergency Management	MEMA, FEMA, Local funds	2025	Ongoing. Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding
ES-2	Purchase of generators to provide adequate backup power for County volunteer fire department.	Tornado, High Wind	Moderate	County Fire Service	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	Generators have been installed at Decatur and Union. Still working to procure additional generators for the remaining locations.
Public Education and Awareness							
PEA-1	Purchase of materials to educate the public on being prepared for hazards, including tornadoes, severe weather, flooding, fire, etc.	All	Low	County Emergency Management	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
PEA-2	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2025	County EMA continually promotes tornado shelters to the public.
Previously Completed Actions							

Town of Chunky Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	The International Building Code has been adopted. The county will need to review this code over the next 5 years, so this action will remain in the plan.
P-2	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-4	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
P-5	Collect additional data on the number of buildings located in flood-prone areas near the Chunky River and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1							
Emergency Services							
ES-1	Purchase a generator to provide adequate backup power for City Hall.	Tornado, High Wind	High	Public Works, Volunteer Fire Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	A generator to provide backup power for City Hall has not been purchased. The town would like to continue to search for a funding source for this project so it will remain in the plan.
ES-2	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan.
ES-3	Purchase of a wood chipper so the Town can remove debris following storms.	Tornado, High Wind	Moderate	Public Works	FEMA/MEMA, DEQ, Local funds	2025	The town has not purchased a wood chipper. The town will continue to seek funding for this project.
ES-4	Purchase of a water filtration device for the water system to ensure safe drinking water even after loss of service.	Tornado, High Wind	Moderate	Public Works	FEMA/MEMA, Homeland Security, Local funds	2025	A water filtration device has not been purchased to provide drinking water after loss of service. The town will continue to seek funding for this project.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
ES-5	Purchase of an emergency warning system for the Town.	Tornado, High Wind	Moderate	Board of Aldermen, Volunteer Fire Department	FEMA/MEMA, Homeland Security, Local funds	2025	An emergency warning system has not been installed due to lack of funding. The town will continue to look at the feasibility of this action going forward.
Public Education and Awareness							
PEA-1	Purchase of materials to educate the public on being prepared for hazards, including tornadoes, severe weather, flooding, fire, etc.	All	Low	Volunteer Fire Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.
PEA-2	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2025	Ongoing campaign.
Previously Completed Actions							

Town of Decatur Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	The International Building Code has been adopted. The county will need to review this code over the next 5 years, so this action will remain in the plan.
P-2	Clear/clear all ditches/drains to prevent flooding during heavy rains.	Flood	Moderate	Board of Aldermen	FEMA/MEMA, CDBG, Local funds	2025	Ditches/drains have been cleared on several occasions, but a long-term plan to address this issue needs to be developed, so the town will continue to work on this action.
P-3	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-4	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-5	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
P-6	Collect additional data on the number of buildings located in flood-prone areas and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1	Replacement of two small culverts under South Fifth Street with one large culvert.	Flood	Moderate	Public Works	FEMA/MEMA, CDBG, Local funds	2025	These culverts have not been replaced. The county will continue to seek funding for this project and it will remain in the plan.
Emergency Services							
ES-1	Purchase of a generator to provide adequate backup power for the Town's water/sewer system.	Tornado, High Wind	High	Public Works	FEMA/MEMA, Homeland Security, Local funds	2025	A backup generator to the town's water system has not been purchased. The town would like to focus on implementing this action going forward, so it will seek funding.
ES-2	Purchase of a minim pumper for the fire department.	Wildfire	High	Board of Aldermen, Volunteer Fire Department	FEMA/MEMA, CDBG, AFGP, Local funds	2017	COMPLETED
ES-3	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
ES-4	Purchase of weather radios for Town's public buildings and schools.	Tornado, High Wind	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Weather radios have not been purchased for public buildings/schools due to lack of funding. The town would still like to implement this if funding can be identified.
Public Education and Awareness							
PEA-1	Purchase of materials to educate the public on being prepared for hazards, including tornadoes, severe weather, flooding, fire. Etc.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.
PEA-2	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2025	Ongoing campaign.
Previously Completed Actions							

Town of Hickory Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Cleaning out of ditches within the Town and rerouting them to nearest creek to alleviate flooding in low-lying areas.	Flood	Moderate	Public Works	FEMA/MEMA, CDBG, Local funds	2025	Ditches have been cleared on several occasions, but a long-term solution to address this issue needs to be developed, so the town will continue to work on this action and seek funding to identify and implement a project.
P-2	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	The International Building Code has been adopted. The county will need to review this code over the next 5 years, so this action will remain in the plan.
P-3	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-4	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
P-5	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
P-6	Collect additional data on the number of buildings located in flood-prone areas near the Chunky River and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1							
Emergency Services							
ES-1	Installation of an emergency warning system.	Tornado, High Wind	High	Board of Aldermen, Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2017	COMPLETED

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
ES-3	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan.
Public Education and Awareness							
PEA-1	Purchase of materials to educate the public on being prepared for hazards, including tornadoes, severe weather, flooding, fire, etc.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.
PEA-2	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2025	Ongoing campaign.

City of Newton Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-2	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Fire Department , Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
P-4	Collect additional data on the number of buildings located in flood-prone areas and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	Fire Department , Police Department	FEMA/MEMA, Local funds	2025	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Structural Projects							
SP-1	Rehabilitation of the storm drain system to alleviate localized flooding in the downtown area.	Flood	High	Public Works	FEMA/MEMA, CDBG, Local funds	2025	The storm drain system has not been rehabilitated to sufficiently alleviate all localized flooding downtown. The town will continue to try to address these localized flooding issues with stormwater projects when funding is available.
Emergency Services							
ES-1	Installation of an emergency warning system for the city.	Tornado, High Wind	High	Fire Department , Police Department	FEMA/MEMA, Homeland Security, Local funds	2017	COMPLETED
ES-2	Purchase of a generator to provide adequate backup power for the sewer system.	Tornado, High Wind	High	Public Works	FEMA/MEMA, Homeland Security, Local funds	2025	A generator to provide backup power for the sewer system has not been purchased. The town would like to continue to search for a funding source for this project so it will remain in the plan.
ES-3	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Fire Department , Police Department	FEMA/MEMA, Local funds	2025	Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
ES-4	Purchase a generator to provide adequate backup power for Newton Fire Department.	All	High	Board of Aldermen, Public Works	FEMA/MEMA, Homeland Security, Local funds	2025	A generator to provide backup power for the fire department has not been purchased. The town would like to continue to search for a funding source for this project so it will remain in the plan.
ES-5	Purchase adequate backup power systems for City Hall and Fire Department.	All	High	Board of Aldermen, Public Works	FEMA/MEMA, Homeland Security, Local funds	2025	A generator to provide backup power for City Hall has not been purchased. The town would like to continue to search for a funding source for this project so it will remain in the plan.
Public Education and Awareness							
PEA-1	Purchase of materials to educate the public on being prepared for all hazards, including tornadoes, severe weather, flooding, fire, etc.	All	Low	Fire Department , Police Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.
PEA-2	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2025	Ongoing campaign.
Previously Completed Actions							

Town of Union Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-2	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1	Replacement of two culverts with one larger culvert under Walnut Street.	Flood	Moderate	Public Works	FEMA/MEMA, CDBG, Local funds	2025	These culverts have not been replaced. The county will continue to seek funding for this project and it will remain in the plan.
Emergency Services							
ES-1	Replace the emergency warning system.	All	High	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2017	COMPLETED

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
ES-2	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan.
Public Education and Awareness							
PEA-1	Public Education programs in the local school system on the dangers of severe weather.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	There are a number of resources from the county that reach out to the local school system, but this is an effort that needs to continue going forward, so this action will remain in place.
PEA-2	Purchase of materials to educate the public on being prepared for hazards, including tornadoes, severe weather, flooding, fire, etc.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.
PEA-3	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2025	Ongoing campaign.

Scott County Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with Forest Municipal Schools and Scott County Schools to identify which roads their buses have trouble crossing during heavy rains because of flooding.	Flood	Low	County EMA, County School System, Forest Municipal School System	FEMA/MEMA, CDBG, State DOE, Local funds	2017	Data has been collected for this analysis, but specific roads have not been identified and there has not been action undertaken to address these issues. This will remain in the plan going forward as the county seeks to complete the action.
P-2	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2020	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2020	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-4	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2020	The International Building Code has not been adopted. The county will review this code and consider adoption, so this action will remain in the plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
P-5	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	County EMA	FEMA/MEMA, Homeland Security, Local funds	2020	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
P-6	Collect additional data on the number of buildings located in flood-prone areas and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	County EMA	FEMA/MEMA, Local funds	2020	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1	Replacement of three 72" culverts with one 31' bridge on Rocky Creek Road to alleviate flooding at the intersection of this road and Morton-Rankin County Line Road.	Flood	High	Board of Supervisors	FEMA/MEMA, CDBG, State Aid, Bridge Replacement Program, Local funds	2017	These culverts have not been replaced. The county will continue to seek funding for this project and it will remain in the plan.
SP-2	Elevation of Rocky Creek Road, including building the road up to 24" for 0.2 miles and 12" for 0.2 miles and the installation of two 48" culverts and one 36" culvert.	Flood	High	Board of Supervisors	FEMA/MEMA, CDBG, Local funds	2020	This road has not been elevated and culverts have not been installed. The county will continue to seek funding for this project and it will remain in the plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
SP-3	Replacement of bridge on Old Jackson Road.	Flood	High	Board of Supervisors	FEMA/MEMA, Local funds	2020	This bridge has not been replaced. The county will continue to seek funding for this project and it will remain in the plan.
SP-4	Elevation of Doc Webb Road by 12" and the replacement of two 36" culverts with two 48" culverts.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, US Army Corps of Engineers, CDBG, Local funds	2020	This road has not been elevated and culverts have not been installed. The county will continue to seek funding for this project and it will remain in the plan.
SP-5	Elevation of Steve Lee Drive by 12" and the installation of an additional 9' culvert.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, CDBG, Local funds	2020	This road has not been elevated and culvert has not been installed. The county will continue to seek funding for this project and it will remain in the plan.
SP-6	Replacement of the bridge, replacement of two (2) 48" culverts, and elevation of approximately 0.5 miles of Hillsboro-Ludlow Road.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2020	This bridge has not been replaced and culverts have not been installed. The county will continue to seek funding for this project and it will remain in the plan.
Emergency Services							
ES-1	Work to secure adequate backup power or alternate shelter for the residents of Magnolia Manor Personal Care Home in Forest.	Flood	High	County EMA, Magnolia Manor	FEMA/MEMA, Private funds, Local funds	2017	Backup power for residents of care home has not been added. The county will seek funding to implement this project in the future.
ES-2	Purchase of additional tankers for the rural volunteer fire departments.	Wildfire	High	County EMA, Volunteer Fire Departments	FEMA/MEMA, AFGP, CDBG, Local funds	2017	Some tankers have been purchased, but there is still a need for additional tankers so this project will be deferred and remain in the plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
ES-3	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	County EMA	FEMA/MEMA, Local funds	2017	Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan.
ES-4	Increase the number of emergency warning systems throughout the County, especially inside the municipalities. Also, increase the size and number of existing warning systems.	Tornado, High Wind	Moderate	County EMA	FEMA/MEMA, Homeland Security, Local funds	2020	The county would still like to increase the number of early warning systems it has in place and will work on seeking additional grant funding to implement these systems.
ES-5	Conducting mock emergency exercises to improve local response capabilities.	All	Moderate	County EMA	FEMA/MEMA, AFGP, Homeland Security, Local funds	2020	The county has conducted mock exercises in the past to improve local response capabilities, but these exercises need to be carried out in the future as well, so this action will remain in place.
ES-6	Installation of generator quick connect/transfer switches at all County schools.	All	Moderate	County EMA	FEMA/MEMA, Local funds	2020	There have been some quick connects added to county schools, but there is a definitive need for additional transfer switches. This action will be carried forward.
Public Education and Awareness							
PEA-1	Education of local citizens on the dangers of driving across flooded roads.	Flood	High	County EMA	FEMA/MEMA, LLEBG, AAA (free booklets?), Local funds	2020	The county has undertaken numerous public education campaigns to make citizens aware of the dangers of driving across flooded roads, but this is still a top priority for the county and will remain as an action going forward.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
PEA-2	Education of local residents on being prepared for severe weather and hazards.	All	High	County EMA	FEMA/MEMA, Local funds	2020	The county works with local media and does many outreach events to inform residents about preparing for hazards. However, there is still significant outreach that needs to take place going forward so this action will remain in place.
Previously Completed Actions							
	Replacement of the bridge on Horseshoe Road that washed out in a past flood.	Flood	High	Board of Supervisors	FEMA/MEMA, CDBG, Local funds	1-2 years	Completed.
	Purchase of weather radios for public meeting places – i.e., schools, community centers, senior citizen centers.	Tornado, High Wind	High	County EMA	FEMA/MEMA, Local funds	1-2 years	Completed.
	Contact local cable systems in Sebastopol and Lake to see if they have the capability to allow emergency alerts to be broadcast over local television channels.	Tornado, High Wind	High	County EMA	Public Service	1-2 years	Completed. Done except for the Town of Lake.
	Work with administration at S.E. Lackey Critical Access Hospital/Convalescent Home to provide extra manpower to help move patients into hallways during severe weather warnings.	Tornado, High Wind	High	County EMA, Lackey Hospital	Public Service	1-2 years	Completed. Part of Hospital Emergency Plan.
	Installation of a texting/paging system for the County.	All	High	County EMA, Board of Supervisors	FEMA/MEMA, Homeland Security, AFGP, Local funds	1-2 years	Completed.
	Purchase of a paging system for Scott County Schools.	All	Moderate	County School System	FEMA/MEMA, DOE, Local funds	2-5 years	Completed. Texting system in place.
	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Low	County EMA	FEMA/MEMA, Local funds	Ongoing	Completed.

City of Forest Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with Forest Municipal Schools to identity which roads their buses have trouble crossing during heavy rains because of flooding.	Flood	High	Fire Department, Police Department, Forest Municipal Schools	FEMA, MEMA, CDBG, State DOE, Local funds	2017	Data has been collected for this analysis, but specific roads have not been identified and there has not been action undertaken to address these issues. This will remain in the plan going forward as the county seeks to complete the action.
P-2	Passage and enforcement of wind codes on new construction.	Tornado, High Wind	Moderate	Board of Aldermen	Local funds	2020	The city has wind codes in place to govern new construction, but these codes will likely need further evaluation and amendment in the future, so this action will remain in place.
P-3	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Aldermen	FEMA, MEMA, Local funds	2020	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-4	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Board of Aldermen	FEMA, MEMA, Local funds	2020	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
P-5	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Fire Department, Police Department	FEMA, MEMA, Homeland Security, Local funds	2020	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
P-6	Collect additional data on the number of buildings located in flood-prone areas and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	Fire Department, Police Department	FEMA, MEMA, Local funds	2020	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.
Property Protection							
PP-1	Retrofitting of existing buildings to conform to wind codes.	Tornado, High Wind	Moderate	Public Works	FEMA, MEMA, Local funds	2020	The city has retrofit some of its buildings to conform with wind codes, but there are still some buildings that are not up to code, so the city will continue to pursue this action as funding is available.
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1	Installation of larger culverts and clean out of debris in channel at Hillsboro Street at West Banks Street.	Flood	High	Public Works	FEMA, MEMA, CDBG, Local funds	2017	These culverts have not been replaced. The county will continue to seek funding for this project and it will remain in the plan.
SP-2	Installation of larger culverts and clean out of debris in channel at Highway 35 and Highway 80.	Flood	Low	Public Works	FEMA, MEMA, MDOT, Local funds	2020	These culverts have not been replaced. The county will continue to seek funding for this project and it will remain in the plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Emergency Services							
ES-1	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Fire Department , Police Department	FEMA, MEMA, Local funds	2017	Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan.
ES-2	Construction of a new fire station south of I-20.	All	High	Board of Aldermen, Fire Department	FEMA, MEMA, Homeland Security, CDBG, Local funds	2017	A new fire station has not been constructed due to lack of available funding. The city will continue to look into options to build this station.
ES-3	Purchase of generators to provide adequate backup power for all water and wastewater facilities.	All	High	Public Works	FEMA, MEMA, CDBG, Local funds	2017	Generators have not been purchased for all water and wastewater facilities. The city has not had funds for these projects, but will continue to try to find funding streams for these going forward.
ES-4	Expand warning siren network to notify residents of dangers.	All	High	Public Works	FEMA, MEMA, Local funds	2017	The warning siren network has been expanded to some degree, but there are still many improvements that could be made and the city would like to continue to look into potential options for improving the system.
ES-5	Purchase of a radio system for Forest Municipal School District that is compatible with the City's system.	All	Moderate	Fire Department, Police Department, School District	FEMA, MEMA, DOE, Local funds	2020	Radio system for the school district has not been purchased. The city wants to keep this as an action and continue to pursue it going forward.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Public Education and Awareness							
PEA-1	Education of local citizens on the dangers of driving across flooded roads.	Flood	High	Fire Department , Police Department	FEMA, MEMA, LLEBG, Local funds	2020	The county has undertaken numerous public education campaigns to make citizens aware of the dangers of driving across flooded roads, but this is still a top priority for the county and will remain as an action going forward.
PEA-2	Education of local citizens on how to prevent stoppage of culverts from debris on private property.	Flood	Moderate	Public Works	FEMA, MEMA, Local funds	2020	Some outreach efforts have taken place to educate citizens on preventing culvert stoppage, but this effort needs to continue so it will remain an action.
PEA-3	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	Fire Department , Police Department	FEMA, MEMA, Local funds	2020	Citizens are encouraged to construct safe rooms and identify shelters, but this action will need to remain in place as additional outreach efforts are needed in the future.
PEA-4	Education of local residents on being prepared for severe weather and hazards.	All	High	County EMA	FEMA/MEMA, Local funds	2020	New action. The county works with local media and does many outreach events to inform residents about preparing for hazards. However, there is still significant outreach that needs to take place going forward so this action will remain in place.
Previously Completed Actions							
	Installation of larger culverts and clean out of debris in channel on Martin Luther King Jr. Drive.	Flood	High	Public Works	FEMA, MEMA, CDBG, Local funds	1-2 years	Completed.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
	Installation of larger culverts and clean out of debris in channel at Front Street at Wade Street.	Flood	High	Public Works	FEMA, MEMA, CDBG, Local funds	1-2 years	Completed.
	Installation of larger culverts and clean out of debris in channel at Jones Street at Old Fairground.	Flood	High	Public Works	FEMA, MEMA, CDBG, Local funds	1-2 years	Completed.
	Installation of larger culverts and clean out of debris in channel at Highway 80 at Eastwood.	Flood	Low	Public Works	FEMA, MEMA, MDOT, Local funds	3-5 years	Completed.
	Establishing a regular maintenance schedule of existing culverts to prevent debris buildup.	Flood	Low	Public Works	Local funds	3-5 years	Completed.

Town of Lake Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Clearing and removal of debris from Warrior Creek to alleviate flooding south of Town.	Flood	Moderate	Public Works	FEMA, MEMA, CDBG, Local funds	2020	Efforts have been made in the past to clear the creek, but further steps need to be taken to alleviate the flooding on the south side of town, so this action will remain in place.
P-2	Work with ECPDD to develop a model ordinance to regulate construction in flood prone areas.	Flood	Moderate	Board of Aldermen	FEMA, MEMA, Local funds	2020	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Board of Aldermen	FEMA, MEMA, Local funds	2020	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-4	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Board of Aldermen	FEMA, MEMA, Local funds	2020	The International Building Code has been adopted. The county will need to review this code over the next 5 years, so this action will remain in the plan.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Structural Projects							
SP-1	Elevation of Steve Lee Drive by 12" and the installation of an additional 9' culvert.	Flood	High	Scott County Board of Supervisors, Board of Aldermen	FEMA, MEMA, CDBG, Local funds	2020	This road has not been elevated and culvert has not been installed. The town will continue to seek funding for this project and it will remain in the plan.
Emergency Services							
ES-1	Purchase a generator to provide reliable standby power for the Lake Volunteer Fire Department.	Tornado, High Wind	High	Fire Department	FEMA, MEMA, AFGP, Local funds	2017	Generators have not been purchased for fire department. The town has not had funds for these projects, but will continue to try to find funding streams for these going forward.
ES-2	Installation of an emergency warning system for the Town.	Tornado, High Wind	High	Board of Aldermen, Volunteer Fire Department, Police	FEMA, MEMA, Local funds	2017	A warning siren network has not been installed and the town would like to continue to look into potential options for funding the system.
ES-3	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Volunteer Fire Department, Police Department	FEMA, MEMA, Local funds	2017	Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan.
ES-4	Contact local cable system to see if they have the capability to allow emergency alerts to be broadcast over local television channels.	Tornado, High Wind	Moderate	Board of Aldermen	FEMA, MEMA, Local funds	Deleted	Deleted. Not feasible, most residents have satellite.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Public Education and Awareness							
PEA-1	Education of local citizens on the dangers of driving across flooded roads.	Flood	Low	Volunteer Fire Department, Police Department	FEMA, MEMA, LLEBG, AAA (free booklets?), Local funds	2020	The county has undertaken numerous public education campaigns to make citizens aware of the dangers of driving across flooded roads, but this is still a top priority for the county and will remain as an action going forward.
PEA-2	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Low	Volunteer Fire Department, Police Department	FEMA, MEMA, Local funds	2020	Citizens are encouraged to construct safe rooms and identify shelters, but this action will need to remain in place as additional outreach efforts are needed in the future.
PEA-3	Education of local residents on being prepared for sever weather and hazards.	All	Low	Volunteer Fire Department, Police Department	FEMA, MEMA, Local funds	2020	The county works with local media and does many outreach events to inform residents about preparing for hazards. However, there is still significant outreach that needs to take place going forward so this action will remain in place.
Previously Completed Actions							
	Purchase of weather radios for public meeting places – i.e., schools, community centers, and senior citizen centers.	Tornado, High Wind	High	Board of Aldermen, Fire Department, Police	FEMA, MEMA, Local funds	1-2 years	Completed.

City of Morton Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Board of Aldermen	FEMA, MEMA, Local funds	2020	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-2	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Fire Department, Police Department	FEMA, MEMA, Homeland Security, Local funds	2020	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
P-3	Collect additional data on the number of buildings located in flood-prone areas and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	Fire Department, Police Department	FEMA, MEMA, Local funds	2020	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1	Work with US Army Corps of Engineers to identify projects to alleviate flooding in flood-prone areas.	Flood	High	Board of Aldermen	FEMA, MEMA, US Army Corps of Engineers, CDBG, Local funds	2017	The town has not worked with the USACE to identify projects, so this action will need to be carried forward and implemented before future structural projects can be installed.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Emergency Services							
ES-1	Purchase of weather radios for public meeting places – i.e., schools, community centers, senior citizen centers.	Tornado, High Wind	High	Board of Aldermen	FEMA, MEMA, Local funds	2020	Weather radios for the schools, community centers, etc have not been purchased. The town wants to keep this as an action and continue to pursue it going forward.
ES-2	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Fire Department , Police Department	FEMA, MEMA, Local funds	2017	Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan.
ES-3	Expand warning siren network to notify residents of dangers.	All	High	Public Works	FEMA, MEMA, Local funds	2017	The warning siren network has been expanded to some degree, but there are still many improvements that could be made and the city would like to continue to look into potential options for improving the system.
ES-4	Work to secure more satellite telephones for emergency personnel so they can communicate with Scott Regional Hospital.	Tornado, High Wind	Moderate	Fire Department, Police Department, Scott Regional	FEMA, MEMA, Local funds	2020	Satellite telephones for emergency personnel have not been purchased, but this is a need, so the town will continue to look into funding options.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Public Education and Awareness							
PEA-1	Education of local citizens on the dangers of driving across flooded roads.	Flood	Low	Fire Department , Police Department	FEMA, MEMA, LLEBG, AAA (free booklets?), Local funds	2020	The county has undertaken numerous public education campaigns to make citizens aware of the dangers of driving across flooded roads, but this is still a top priority for the county and will remain as an action going forward.
PEA-2	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Low	Fire Department , Police Department	FEMA, MEMA, Local funds	2020	Citizens are encouraged to construct safe rooms and identify shelters, but this action will need to remain in place as additional outreach efforts are needed in the future.
PEA-3	Education of local residents on being prepared for severe weather and hazards.	All	Low	Fire Department , Police Department	FEMA, MEMA, Local funds	2020	The county works with local media and does many outreach events to inform residents about preparing for hazards. However, there is still significant outreach that needs to take place going forward so this action will remain in place.
Previously Completed Actions							
	Purchase of a generator to provide standby power for the water system.	Tornado, High Wind	High	Public Works	FEMA, MEMA, Homeland Security, Local funds	1-2 years	Completed.
	Work to secure transportation for non-critical patients at Scott Regional Hospital during emergencies.	Tornado, High Wind	High	Fire Department, Police Department, Scott	FEMA, MEMA, Local funds	1-2 years	Completed. Part of Hospital Emergency Plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Aldermen	FEMA, MEMA, Local funds	2-5 years	Completed.

Town of Sebastopol Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Aldermen	FEMA, MEMA, Local funds	2020	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-2	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Board of Aldermen	FEMA, MEMA, Local funds	2020	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Board of Aldermen	FEMA, MEMA, Local funds	2020	The International Building Code has been adopted. The county will need to review this code over the next 5 years, so this action will remain in the plan.
P-4	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Volunteer Fire Department, Police Department	FEMA, MEMA, Homeland Security, Local funds	2020	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
P-5	Collet additional data on the number of buildings located in flood-prone areas and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	Volunteer Fire Department, Police Department	FEMA, MEMA, Local funds	2020	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1							
Emergency Services							
ES-1	Installation of an emergency warning system for the Town.	Tornado, High Wind	High	Board of Aldermen	FEMA, MEMA, Local funds	2017	A warning siren network has not been installed and the town would like to continue to look into potential options for funding the system.
ES-2	Purchase of a generator to provide standby power for Sebastopol Fire Department.	Tornado, High Wind	High	Volunteer Fire Department	FEMA, MEMA, AFGP, Homeland Security, Local funds	2017	A generator has not been purchased for fire department. The town has not had funds for these projects, but will continue to try to find funding streams for these going forward.
ES-3	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Volunteer Fire Department, Police Department	FEMA, MEMA, Local funds	2017	Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan.
ES-4	Contact local cable system to see if they have the capability to allow emergency alerts to be broadcast over local television channels.	Tornado, High Wind	Moderate	Board of Aldermen	Public Service	Deleted	Deleted. Not feasible, most residents have satellite.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Public Education and Awareness							
PEA-1	Education of local citizens on the dangers of driving across flooded roads.	Flood	Low	Volunteer Fire Department, Police Department	FEMA, MEMA, LLEBG, AAA (free booklets?), Local funds	2020	The county has undertaken numerous public education campaigns to make citizens aware of the dangers of driving across flooded roads, but this is still a top priority for the county and will remain as an action going forward.
PEA-2	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Low	Volunteer Fire Department, Police Department	FEMA, MEMA, Local funds	2020	Citizens are encouraged to construct safe rooms and identify shelters, but this action will need to remain in place as additional outreach efforts are needed in the future.
PEA-3	Education of local residents on being prepared for sever weather and hazards.	All	Low	Volunteer Fire Department, Police Department	FEMA, MEMA, Local funds	2020	The county works with local media and does many outreach events to inform residents about preparing for hazards. However, there is still significant outreach that needs to take place going forward so this action will remain in place.
Previously Completed Actions							
	Purchase of weather radios for public meeting places – i.e., schools, community centers, senior citizen centers.	Tornado, High Wind	Moderate	Board of Aldermen	FEMA, MEMA, Local funds	2-5 years	Completed.

Smith County Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2020	COMPLETED
P-2	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2020	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	DELETED	DELETED
P-4	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	County EMA	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
P-5	Conduct an H&H Study in Taylorsville and Mize.	Flooding	High	County EMA	FEMA/MEMA, Local	2025	New Action

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Property Protection							
PP-1	Elevation of County Road 131.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, CDBG, Local funds	2020	COMPLETED
PP-2	Elevation of County Road 503-S.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, CDBG, Local funds	2025	This road has not been elevated, but the county is still interested in pursuing the project going forward if funding becomes available. This action will remain in the plan.
PP-3	Elevation of County Road 48.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, CDBG, Local funds	2025	This road has not been elevated, but the county is still interested in pursuing the project going forward if funding becomes available. This action will remain in the plan.
PP-4	Elevation of County Road 563.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, CDBG, Local funds	2025	This road has not been elevated, but the county is still interested in pursuing the project going forward if funding becomes available. This action will remain in the plan.
Natural Resource Protection							
NRP-1							

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Structural Projects							
SP-1	Cleaning out Cohay Creek in Mize to alleviate flooding in the downtown area. Another possible solution is to install a dyke to retain water.	Flood	Moderate	Board of Supervisors, Town of Mize Board of Aldermen	FEMA/MEMA, CDBG, Local funds	2025	Ongoing. A dyke has not been installed in this area and although it has been cleaned out on several occasions, a long-term solution to this flooding issue is required, so this action will remain in the plan
Emergency Services							
ES-1	Increase the number of emergency warning systems throughout the County, especially inside the municipalities. Also, increase the size and number of existing warning systems.	Tornado, High Wind	High	County EMA	FEMA/MEMA, Local funds	2017	COMPLETED
ES-2	Purchase of weather radios for public meeting places – i.e., community centers and senior citizen centers.	Tornado, High Wind	High	County EMA	FEMA/MEMA, Local funds	2017	COMPLETED
ES-3	Seek ways to bring local hospital care back into Smith County.	Tornado, High Wind	High	Board of Supervisors		2025	The county has not been able to bring local hospital care back into the county. This is something that local officials would like to continue to pursue, so it will remain in the plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
ES-4	Purchase and installation of the "Alert Now" text messaging system, which would allow Smith County Schools to quickly notify teachers, parents, and students of disasters.	All	High	County Schools	FEMA/MEMA, DOE, Local funds	2017	COMPLETED
ES-5	Establishment of at least three (3) new fire districts and stations in the rural areas of the County to help improve overall emergency response.	All	Moderate	Board of Supervisors, County EMA	FEMA/MEMA, AFGP, CDBG, Rural Development, Local funds	2020	COMPLETED
ES-6	Installation of a generator with quick connect/transfer switches at all Smith County Schools campuses.	All	Moderate	County Schools	FEMA/MEMA, DOE, Local funds	2025	Some generators have been purchased for the county, but there is still a strong need for generators at schools. The county will continue to look for funding sources for these.
ES-7	Seek funds to help pay overtime costs for Smith County Schools when they have to provide personnel if school buildings are used as shelters during emergencies.	Tornado, High Wind	Low	Board of Supervisors, County School System	FEMA/MEMA, DOE, Local funds	2025	The county does not have a separate fund for paying overtime costs when schools have to be used for sheltering during storm events. This is something the county will look at establishing in the future and will remain an action in the plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Public Education and Awareness							
PEA-1	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Low	County EMA	FEMA/MEMA, Local funds	2025	Ongoing. The county has encouraged the construction of safe rooms and tornado shelters, however, this is an effort that requires continual attention so the county will leave it as an action and continue to pursue it going forward.
PEA-2	Education of local residents on being prepared for severe weather and other hazards.	All	Low	County EMA	FEMA/MEMA, Local funds	2025	Ongoing. The county has worked hard to inform citizens of how to be prepared for severe weather and other hazards, but this action needs to be continued
Previously Completed Actions							

Town of Mize Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2020	COMPLETED
P-2	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Ongoing. The International Building Code has been adopted. The county will need to review this code over the next 5 years, so this action
P-4	Conduct a base flood elevation study for the Town.	Flood	Low	Board of Aldermen	FEMA/MEMA, US Army Corps of Engineers, Pat Harrison Waterway District, Local funds	2025	Ongoing. A base flood elevation study has not been conducted for the town, but this is something that the town would like to continue to pursue because of the information that would be gained for possible mitigation. This will remain in the plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
P-5	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
P-6	Collect additional data on the number of buildings located in flood-prone areas near the Oakahay River and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	The town has not collected data on the number of buildings located in flood prone areas, but there have been some loss estimations carried out through this planning process. Nevertheless, town officials would like to continue to evaluate and assess the potential damages to determine what projects could be implemented.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1	Cleaning out of Cohay Creek in Mize to alleviate flooding in the downtown area. Another possible solution is to install a dyke to retain water.	Flood	Moderate	Public Works	FEMA/MEMA, CDBG, Local funds	2022	A dyke has not been installed in this area and although it has been cleaned out on several occasions, a long-term solution to this flooding issue is required, so this action will remain in the plan in the future.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Emergency Services							
ES-1	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2017	Completed
ES-2	Purchase of generators to provide adequate backup power for all water and wastewater facilities to prevent interruption of service during and after a disaster.	All	High	Board of Aldermen	FEMA/MEMA, Local funds	2020	Completed
Public Education and Awareness							
PEA-1	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	The county has encouraged the construction of safe rooms and tornado shelters, however, this is an effort that requires continual attention so the county will leave it as an action and continue to pursue it going forward.
PEA-2	Education of local residents on being prepared for severe weather and other hazards.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	The county has worked hard to inform citizens of how to be prepared for severe weather and other hazards, but this action needs to be continued going forward.
Previously Completed Actions							

Town of Polkville Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2020	Completed
P-2	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Consider adoption of the International Code Council's International Building Code.	All	Moderate		FEMA/MEMA, Local funds	2025	The International Building Code has been adopted. The county will need to review this code over the next 5 years, so this action will remain in the plan.
P-4	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1							

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Emergency Services							
ES-1	Installation of an emergency warning system for the Town.	Tornado, High Wind	High	Board of Aldermen	FEMA/MEMA, Homeland Security, Local funds	2017	COMPLETED
ES-2	Purchase of 10 sets of turnout gear and four (4) SCBAs for the Polkville Volunteer Fire Department.	All	High	Volunteer Fire Department	FEMA/MEMA, AFGP, Homeland Security, Local funds	2017	COMPLETED
ES-3	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2017	COMPLETED
ES-4	Purchase a new tanker for the Polkville Volunteer Fire Department.	All	High	Board of Aldermen, Volunteer Fire Department	FEMA/MEMA, AFGP, Rural Development, CDBG, Local funds	2017	COMPLETED
ES-5	Purchase of weather radios for public meeting places – i.e., schools, community centers, senior citizen centers.	Tornado, High Wind	Moderate	Board of Aldermen, Volunteer Fire Department	FEMA/MEMA, Local funds	2025	Weather radios have not been purchased for public meeting places due to cost constraints. The county would still like to implement this action, pending finding funding.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Public Education and Awareness							
PEA-1	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Low	Volunteer Fire Department	FEMA/MEMA, Local funds	2025	The county has encouraged the construction of safe rooms and tornado shelters, however, this is an effort that requires continual attention so the county will leave it as an action and continue to pursue it going forward.
PEA-2	Education of local residents on being prepared for severe weather and other hazards.	All	Low	Volunteer Fire Department	FEMA/MEMA, Local funds	2025	The county has worked hard to inform citizens of how to be prepared for severe weather and other hazards, but this action needs to be continued going forward.
Previously Completed Actions							

Town of Raleigh Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2020	COMPLETED
P-2	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2020	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2020	The International Building Code has been adopted. The county will need to review this code over the next 5 years, so this action will remain in the plan.
P-4	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Property Protection							
PP-1	Rehabilitation of wastewater pumping stations to install submersible pumps that will not fail during heavy rainfall.	Flood	High	Board of Aldermen	FEMA/MEMA, CDBG, Rural Development, SRF, Local funds	2017	COMPLETED
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1	Drainage improvements to help control storm water during periods of heavy and/or prolonged rain, including the replacement of culverts, clearing and dredging of debris from ditches and creeks, and erosion control measures.	Flood	Moderate	Board of Aldermen	FEMA/MEMA, CDBG, US Army Corps of Engineers, Pat Harrison Waterway District, Local funds	2025	The town has installed some drainage improvements to reduce localized flooding from stormwater, however, there are still many drainage projects that could be implemented and the town would like to continue to pursue funding for these.
Emergency Services							
ES-1	Increase the number of emergency warning systems throughout the Town.	Tornado, High Wind	High	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2017	COMPLETED

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
ES-2	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2017	COMPLETED
ES-3	Purchase of generators to provide adequate backup power to all water and wastewater facilities to prevent interruption of service during and after a disaster.	All	High	Board of Aldermen	FEMA/MEMA, Local funds	2020	COMPLETED
ES-4	Purchase of a generators for the Senior Citizens Center, which will be used as a shelter during and after disasters.	All	High	Board of Aldermen	FEMA/MEMA, Local funds	2025	Generators for the Senior Center have not been purchased due to lack of funding. The county is looking at possible alternative funding sources.
ES-5	Installation of a new water well to serve the Town.	All	High	Board of Aldermen	FEMA/MEMA, CDBG, Rural Development, SRF, Local funds	2025	A new water well has not been installed to serve the town, but this action will remain in place as it is still a need for the town.
ES-6	Purchase of a generator for Raleigh Police Department.	Tornado, High Wind	Moderate	Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	A generator for the police department has not been purchased due to lack of funding. The county is looking at possible alternative funding sources.
ES-7	Purchase of weather radios for public meetings places – i.e., schools, community centers, and senior citizen centers.	Tornado, High Wind	Low	Volunteer Fire Department, County EMA	FEMA/MEMA, Local funds	2017	COMPLETED

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Public Education and Awareness							
PEA-1	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Low	Volunteer Fire Department, County EMA	FEMA/MEMA, Local funds	2025	The county has encouraged the construction of safe rooms and tornado shelters, however, this is an effort that requires continual attention so the county will leave it as an action and continue to pursue it going forward.
PEA-2	Education of local residents on being prepared for severe weather and other hazards.	All	Low	Volunteer Fire Department, County EMA	FEMA/MEMA, Local funds	2025	The county has worked hard to inform citizens of how to be prepared for severe weather and other hazards, but this action needs to be continued going forward.
Previously Completed Actions							

Village of Sylvarena Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-2	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Consider adoption of the International Code Council's International Building Code.	All	Moderate		FEMA/MEMA, Local funds	2025	The International Building Code has been adopted. The county will need to review this code over the next 5 years, so this action will remain in the plan.
P-4	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1							

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Emergency Services							
ES-1	Installation of an emergency warning system for the Town.	Tornado, High Wind	High	Board of Aldermen	FEMA/MEMA, Homeland Security, Local funds	2025	A warning system for the town has not been purchased. The county has an emergency warning system in place, and there is interest in expanding this system and giving it a broader range of coverage. The county will continue to pursue this action, but needs funding to do so.
ES-2	Construction of a new fire station so the Sylvarena VFD can most effectively respond to emergencies and serve as the emergency response post during emergencies.	Tornado, High Wind	High	Volunteer Fire Department	FEMA/MEMA, CDBG, Local funds	2017	COMPLETED
ES-3	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan.
ES-4	Purchase of weather radios for public meetings places – i.e., schools, community centers, senior citizen centers.	Tornado, High Wind	Moderate	Board of Aldermen, Volunteer Fire Department	FEMA/MEMA, Local funds	2025	Weather radios have not been purchased for public meeting places due to cost constraints. The county would still like to implement this action, pending finding funding.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Public Education and Awareness							
PEA-1	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Low	Volunteer Fire Department	FEMA/MEMA, Local funds	2025	The county has encouraged the construction of safe rooms and tornado shelters, however, this is an effort that requires continual attention so the county will leave it as an action and continue to pursue it going forward.
PEA-2	Education of local residents on being prepared for severe weather and other hazards.	All	Low	Volunteer Fire Department	FEMA/MEMA, Local funds	2025	The county has worked hard to inform citizens of how to be prepared for severe weather and other hazards, but this action needs to be continued going forward.
Previously Completed Actions							

Town of Taylorsville Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Volunteer Fire Department, Police Department	FEMA, MEMA, Local funds	2020	COMPLETED
P-2	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Volunteer Fire Department, Police Department	FEMA, MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Consider adoption of the International Code Council's International Building Code.	All	Moderate		FEMA, MEMA, Local funds	2025	The International Building Code has been adopted. The county will need to review this code over the next 5 years, so this action will remain in the plan.
P-4	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Volunteer Fire Department, Police Department	FEMA, MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Property Protection							
PP-1	Elevation or acquisition/relocation of flood-prone structures.	Flood	Moderate	Board of Aldermen	FEMA, MEMA, Local funds	2025	Ongoing. Although the town has not had any major acquisition or elevation projects in the past several years, this is still something the town is interested in pursuing if citizens located in flood-prone areas voluntarily determine that an acquisition/elevation
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1	Installation of a larger culvert at Moore and Gamble Streets.	Flood	High	Public Works	FEMA, MEMA, CDBG, Local funds	2017	COMPLETED
SP-2	Installation of larger culvert on Mayhall Street.	Flood	High	Public Works	FEMA, MEMA, CDBG, Local funds	2025	The town has not installed a larger culvert, so this action will remain in the plan as it is still a project the town would like to pursue.
SP-3	Replacement of the old clay culvert on Eaton Street.	Flood	High	Public Works	FEMA, MEMA, CDBG, Local funds	2017	COMPLETED
SP-4	Installation of a larger culvert at Dallas Street and Highway 37.	Flood	Moderate	Public Works	FEMA, MEMA, CDBG, Local funds	2025	The town has not installed a larger culvert, so this action will remain in the plan as it is still a project the town would like to pursue.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Emergency Services							
ES-1	Increasing the number of emergency warning systems throughout the Town.	Tornado, High Wind	High	Volunteer Fire Department, Police Department	FEMA, MEMA, Local funds	2017	COMPLETED
ES-2	Update Town's 911 equipment, including making it compatible with enhanced 911.	Tornado, High Wind	High	Board of Aldermen, Volunteer Fire Department, Police Department	FEMA, MEMA, Local funds	2017	COMPLETED
ES-3	Installation of reverse 911 system.	Tornado, High Wind	High	Board of Aldermen, Volunteer Fire Department, Police Department	FEMA, MEMA, Local funds	2017	COMPLETED
ES-4	Purchase of generators to provide adequate backup power for all water and wastewater facilities to prevent interruption of service during and after a disaster.	All	High	Board of Aldermen	FEMA, MEMA, Local funds	2020	COMPLETED

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
ES-5	Purchase additional equipment for local emergency responders to improve their response capabilities.	All	High	Volunteer Fire Department, Police Department	FEMA, MEMA, AFGP, Local funds	2025	Some equipment has been purchased to improve emergency responder capabilities, but there is still a need for additional equipment, so this action will remain in place going forward.
ES-6	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Volunteer Fire Department, Police Department	FEMA, MEMA, Local funds	2025	Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan.
ES-7	Continue training of more emergency personnel to improve the Town's response capabilities.	All	Low	Volunteer Fire Department, Police Department	FEMA, MEMA, AFGP, Local funds	2025	Although the town has done a great deal of training to improve capabilities of local employees, there is still a continuing need to maintain this capacity, so the town will continue to pursue this action.
Public Education and Awareness							
PEA-1	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Low	Volunteer Fire Department	FEMA, MEMA, Local funds	2025	The county has encouraged the construction of safe rooms and tornado shelters, however, this is an effort that requires continual attention so the county will leave it as an action and continue to pursue it going forward.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
PEA-2	Education of local residents on being prepared for severe weather and other hazards.	All	Low	Volunteer Fire Department	FEMA, MEMA, Local funds	2025	The county has worked hard to inform citizens of how to be prepared for severe weather and other hazards, but this action needs to be continued going forward.

SECTION 10
PLAN MAINTENANCE

This section discusses how the MEMA District 6 Mitigation Strategy and Mitigation Action Plan will be implemented and how the Regional Hazard Mitigation Plan will be evaluated and enhanced over time. This section also discusses how the public will continue to be involved in a sustained hazard mitigation planning process. It consists of the following four subsections:

- 10.1 Monitoring and Evaluating the Previous Plan
- 10.2 Implementation and Integration
- 10.3 Monitoring, Evaluation, and Enhancement
- 10.4 Continued Public Involvement

44 CFR Requirement
44 CFR Part201.6(c)(4)(i): The plan shall include a plan maintenance process that includes a section describing the method and schedule of monitoring, evaluating and updating the mitigation plan within a five-year cycle. ***44 CFR Part 201.6(c)(4)(ii):*** The plan maintenance process shall include a process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate

10.1 MONITORING AND EVALUATING THE PREVIOUS PLAN

Since the previous 10 plans were adopted (Jasper and Neshoba Counties in 2011 and Clarke, Kemper, Lauderdale, Leake, Newton, Scott, and Smith Counties in 2012), each county has worked to ensure that mitigation was integrated into local activities and that the mitigation plan was appropriately implemented. Each of the counties outlined a process in their previous county-level mitigation plans for monitoring and evaluating the plan throughout the interim period between plan updates.

Each county was ultimately successful in implementing the monitoring and evaluation processes that were outlined in previous plans as all 10 counties held annual meetings to discuss the mitigation plan and the priorities that were outlined in it. Each county's specific process is outlined below with an explanation of how the monitoring and evaluating process was carried out as well as any changes that were identified by the county or its jurisdictions that would be useful to implement during the next update.

Clarke County

The Clarke County Hazard Mitigation Plan (2012) included an annual review process and progress report on the plan. This review process was carried out by the Clarke County Hazard Mitigation Committee every year since the previous plan was approved. During this annual review process, the County Hazard Mitigation Committee developed an end-of-year report on the plan to detail mitigation activities undertaken over the course of the year as well as any mitigation projects that have been completed.

The report also evaluated the plan goals and objectives to ensure they address current and expected conditions; determined if the nature or magnitude of risk has changed; evaluated whether current resources are adequate for implementing the plan; documented any implementation problems such as technical, political, legal, or coordination with other agencies; discussed whether the outcomes have occurred as expected; documented agency and other partner participation; and documented public participation opportunities.

Copies of the annual evaluation report were made available to the local units of governments, citizens, MEMA, and FEMA. To maintain public involvement during the plan monitoring and evaluation process, the public was invited to attend the Clarke County Hazard Mitigation Committee meetings and provided the opportunity to comment on the implementation and evaluation of the plan. The public was notified of the meetings through notices in *The Clarke County Tribune*.

Although there were some minor revisions made to the plan during the interim update period, there were few major revisions identified during these annual reviews and the Hazard Mitigation Committee generally agreed that the plan was on course and that the monitoring and evaluating process itself was sufficient to ensure implementation of the plan.

Jasper County

The Jasper County Hazard Mitigation Plan (2011) included an annual review process and progress report on the plan. This review process was carried out by the Jasper County Hazard Mitigation Committee every year since the previous plan was approved. During this annual review process, the County Hazard Mitigation Committee developed an end-of-year report on the plan to detail mitigation activities undertaken over the course of the year as well as any mitigation projects that have been completed. The report also evaluated the plan goals and objectives to ensure they address current and expected conditions; determined if the nature or magnitude of risk has changed; evaluated whether current resources are adequate for implementing the plan; documented any implementation problems such as technical, political, legal, or coordination with other agencies; discussed whether the outcomes have occurred as expected; documented agency and other partner participation; and documented public participation opportunities.

Copies of the annual evaluation report were made available to the local units of governments, citizens, MEMA, and FEMA. To maintain public involvement during the plan monitoring and evaluation process, the public was invited to attend the Jasper County Hazard Mitigation Committee meetings and provided the opportunity to comment on the implementation and evaluation of the plan. The public was notified of the meetings through notices in the Jasper County Newspaper.

Although there were some minor revisions made to the plan during the interim update period, there were few major revisions identified during these annual reviews and the Hazard Mitigation Committee generally agreed that the plan was on course and that the monitoring and evaluating process itself was sufficient to ensure implementation of the plan.

Kemper County

The Kemper County Hazard Mitigation Plan (2012) included an annual review process and progress report on the plan. This review process was carried out by the Kemper County Hazard Mitigation Committee every year since the previous plan was approved. During this annual review process, the County Hazard Mitigation Committee developed an end-of-year report on the plan to detail mitigation activities undertaken over the course of the year as well as any mitigation projects that have been completed. The report also evaluated the plan goals and objectives to ensure they address current and expected conditions; determined if the nature or magnitude of risk has changed; evaluated whether current resources are adequate for implementing the plan; documented any implementation problems such as technical, political, legal, or coordination with other agencies; discussed whether the outcomes have occurred as expected; documented agency and other partner participation; and documented public participation opportunities.

Copies of the annual evaluation report were made available to the local units of governments, citizens, MEMA, and FEMA. To maintain public involvement during the plan monitoring and evaluation process, the public was invited to attend the Kemper County Hazard Mitigation Committee meetings and provided the opportunity to comment on the implementation and evaluation of the plan. The public was notified of the meetings through notices in *The Kemper County Messenger*.

Although there were some minor revisions made to the plan during the interim update period, there were few major revisions identified during these annual reviews and the Hazard Mitigation Committee generally agreed that the plan was on course and that the monitoring and evaluating process itself was sufficient to ensure implementation of the plan.

Lauderdale County

The Lauderdale County Hazard Mitigation Plan (2012) included an annual review process and progress report on the plan. This review process was carried out by the Lauderdale County Hazard Mitigation Committee every year since the previous plan was approved. During this annual review process, the County Hazard Mitigation Committee developed an end-of-year report on the plan to detail mitigation activities undertaken over the course of the year as well as any mitigation projects that have been completed. The report also evaluated the plan goals and objectives to ensure they address current and expected conditions; determined if the nature or magnitude of risk has changed; evaluated whether current resources are adequate for implementing the plan; documented any implementation problems such as technical, political, legal, or coordination with other agencies; discussed whether the outcomes have occurred as expected; documented agency and other partner participation; and documented public participation opportunities.

Copies of the annual evaluation report were made available to the local units of governments, citizens, MEMA, and FEMA. To maintain public involvement during the plan monitoring and evaluation process, the public was invited to attend the Lauderdale County Hazard Mitigation Committee meetings and provided the opportunity to comment on the implementation and evaluation of the plan. The public was notified of the meetings through notices in *The Meridian Star*.

Although there were some minor revisions made to the plan during the interim update period, there were few major revisions identified during these annual reviews and the Hazard Mitigation Committee generally agreed that the plan was on course and that the monitoring and evaluating process itself was sufficient to ensure implementation of the plan.

Leake County

The Leake County Hazard Mitigation Plan (2012) included an annual review process and progress report on the plan. This review process was carried out by the Leake County Hazard Mitigation Committee every year since the previous plan was approved. During this annual review process, the County Hazard Mitigation Committee developed an end-of-year report on the plan to detail mitigation activities undertaken over the course of the year as well as any mitigation projects that have been completed.

The report also evaluated the plan goals and objectives to ensure they address current and expected conditions; determined if the nature or magnitude of risk has changed; evaluated whether current resources are adequate for implementing the plan; documented any implementation problems such as technical, political, legal, or coordination with other agencies; discussed whether the outcomes have occurred as expected; documented agency and other partner participation; and documented public participation opportunities.

Copies of the annual evaluation report were made available to the local units of governments, citizens, MEMA, and FEMA. To maintain public involvement during the plan monitoring and evaluation process, the public was invited to attend the Leake County Hazard Mitigation Committee meetings and provided the opportunity to comment on the implementation and evaluation of the plan. The public was notified of the meetings through notices in *The Carthaginian*.

Although there were some minor revisions made to the plan during the interim update period, there were few major revisions identified during these annual reviews and the Hazard Mitigation Committee generally agreed that the plan was on course and that the monitoring and evaluating process itself was sufficient to ensure implementation of the plan.

Neshoba County

The Neshoba County Hazard Mitigation Plan (2011) included an annual review process and progress report on the plan. This review process was carried out by the Neshoba County Hazard Mitigation Committee every year since the previous plan was approved. During this annual review process, the County Hazard Mitigation Committee developed an end-of-year report on the plan to detail mitigation activities undertaken over the course of the year as well as any mitigation projects that have been completed. The report also evaluated the plan goals and objectives to ensure they address current and expected conditions; determined if the nature or magnitude of risk has changed; evaluated whether current resources are adequate for implementing the plan; documented any implementation problems such as technical, political, legal, or coordination with other agencies; discussed whether the outcomes have occurred as expected; documented agency and other partner participation; and documented public participation opportunities.

Copies of the annual evaluation report were made available to the local units of governments, citizens, MEMA, and FEMA. To maintain public involvement during the plan monitoring and evaluation process, the public was invited to attend the Neshoba County Hazard Mitigation Committee meetings and provided the opportunity to comment on the implementation and evaluation of the plan. The public was notified of the meetings through notices in *The Neshoba Democrat*.

Although there were some minor revisions made to the plan during the interim update period, there were few major revisions identified during these annual reviews and the Hazard Mitigation Committee generally agreed that the plan was on course and that the monitoring and evaluating process itself was sufficient to ensure implementation of the plan.

Newton County

The Newton County Hazard Mitigation Plan (2012) included an annual review process and progress report on the plan. This review process was carried out by the Newton County Hazard Mitigation Committee every year since the previous plan was approved. During this annual review process, the County Hazard Mitigation Committee developed an end-of-year report on the plan to detail mitigation activities undertaken over the course of the year as well as any mitigation projects that have been completed. The report also evaluated the plan goals and objectives to ensure they address current and expected conditions; determined if the nature or magnitude of risk has changed; evaluated whether current resources are adequate for implementing the plan; documented any implementation problems such as technical, political, legal, or coordination with other agencies; discussed whether the outcomes have occurred as expected; documented agency and other partner participation; and documented public participation opportunities.

Copies of the annual evaluation report were made available to the local units of governments, citizens, MEMA, and FEMA. To maintain public involvement during the plan monitoring and evaluation process, the public was invited to attend the Newton County Hazard Mitigation Committee meetings and provided the opportunity to comment on the implementation and evaluation of the plan. The public was notified of the meetings through notices in *The Newton Record* and *The Union Appeal*.

Although there were some minor revisions made to the plan during the interim update period, there were few major revisions identified during these annual reviews and the Hazard Mitigation Committee generally agreed that the plan was on course and that the monitoring and evaluating process itself was sufficient to ensure implementation of the plan.

Scott County

The Scott County Hazard Mitigation Plan (2012) included an annual review process and progress report on the plan. This review process was carried out by the Scott County Hazard Mitigation Committee every year since the previous plan was approved. During this annual review process, the County Hazard Mitigation Committee developed an end-of-year report on the plan to detail mitigation activities undertaken over the course of the year as well as any mitigation projects that have been completed. The report also evaluated the plan goals and objectives to ensure they address current and expected conditions; determined if the nature or magnitude of risk has changed; evaluated whether current resources are adequate for implementing the plan; documented any implementation problems such as technical, political, legal, or coordination with other agencies; discussed whether the outcomes have occurred as expected; documented agency and other partner participation; and documented public participation opportunities.

Copies of the annual evaluation report were made available to the local units of governments, citizens, MEMA, and FEMA. To maintain public involvement during the plan monitoring and evaluation process, the public was invited to attend the Scott County Hazard Mitigation Committee meetings and provided the opportunity to comment on the implementation and evaluation of the plan. The public was notified of the meetings through notices in *The Scott County Times*.

Although there were some minor revisions made to the plan during the interim update period, there were few major revisions identified during these annual reviews and the Hazard Mitigation Committee generally agreed that the plan was on course and that the monitoring and evaluating process itself was sufficient to ensure implementation of the plan.

Smith County

The Smith County Hazard Mitigation Plan (2012) included an annual review process and progress report on the plan. This review process was carried out by the Smith County Hazard Mitigation Committee every year since the previous plan was approved. During this annual review process, the County Hazard Mitigation Committee developed an end-of-year report on the plan to detail mitigation activities undertaken over the course of the year as well as any mitigation projects that have been completed.

The report also evaluated the plan goals and objectives to ensure they address current and expected conditions; determined if the nature or magnitude of risk has changed; evaluated whether current resources are adequate for implementing the plan; documented any implementation problems such as technical, political, legal, or coordination with other agencies; discussed whether the outcomes have occurred as expected; documented agency and other partner participation; and documented public participation opportunities.

Copies of the annual evaluation report were made available to the local units of governments, citizens, MEMA, and FEMA. To maintain public involvement during the plan monitoring and evaluation process, the public was invited to attend the Smith County Hazard Mitigation Committee meetings and provided the opportunity to comment on the implementation and evaluation of the plan. The public was notified of the meetings through notices in *The Smith County Reformer*.

Although there were some minor revisions made to the plan during the interim update period, there were few major revisions identified during these annual reviews and the Hazard Mitigation Committee generally agreed that the plan was on course and that the monitoring and evaluating process itself was sufficient to ensure implementation of the plan.

10.2 IMPLEMENTATION AND INTEGRATION

Each agency, department, or other partner participating under the MEMA District 6 Regional Hazard Mitigation Plan is responsible for implementing specific mitigation actions as prescribed in the Mitigation Action Plan. Every proposed action listed in the Mitigation Action Plan is assigned to a specific "lead" agency or department in order to assign responsibility and accountability and increase the likelihood of subsequent implementation.

In addition to the assignment of a local lead department or agency, an implementation time period or a specific implementation date has been assigned in order to assess whether actions are being implemented in a timely fashion. The counties in the MEMA District 6 Region will seek outside funding sources to implement mitigation projects in both the pre-disaster and post-disaster environments. When applicable, potential funding sources have been identified for proposed actions listed in the Mitigation Action Plan.

The participating jurisdictions will integrate this Hazard Mitigation Plan into relevant city and county government decision-making processes or mechanisms, where feasible. This includes integrating the requirements of the Hazard Mitigation Plan into other local planning documents, processes, or mechanisms, such as comprehensive or capital improvement plans, when appropriate. The members of the MEMA District 6 Regional Hazard Mitigation Council (RHMC) will remain charged with ensuring that the goals and mitigation actions of new and updated local planning documents for their agencies or departments are consistent, or do not conflict with, the goals and actions of the Hazard Mitigation Plan, and will not contribute to increased hazard vulnerability in the MEMA District 6 Region.

Since the previous regional-level plans were adopted, each county and participating jurisdiction has worked to integrate the hazard mitigation plan into other planning mechanisms where applicable/feasible. Examples of how this integration has occurred have been documented in the Implementation Status discussion provided for each of the mitigation actions found in Section 9. Specific examples of how integration has occurred include:

- Integrating the mitigation plan into reviews and updates of floodplain management ordinances;
- Integrating the mitigation plan into reviews and updates of County emergency operations plans;
- Integrating the mitigation plan into review and updates of building codes; and
- Integrating the mitigation plan into the capital improvements plan through identification of mitigation actions that require local funding

Opportunities to further integrate the requirements of this Plan into other local planning mechanisms shall continue to be identified through future meetings of the RHMC, individual county meetings, and the annual review process described herein. Although it is recognized that there are many possible benefits to integrating components of this Plan into other local planning mechanisms, the development and maintenance of this stand-alone Regional Hazard Mitigation Plan is deemed by the MEMA District 6 RHMC to be the most effective and appropriate method to implement local hazard mitigation actions at this time.

10.3 MONITORING, EVALUATION, AND ENHANCEMENT

Periodic revisions and updates of the Hazard Mitigation Plan are required to ensure that the goals of the Plan are kept current, taking into account potential changes in hazard vulnerability and mitigation priorities. In addition, revisions may be necessary to ensure that the Plan is in full compliance with applicable federal and state regulations. Periodic evaluation of the Plan will also ensure that specific mitigation actions are being reviewed and carried out according to the Mitigation Action Plan.

The MEMA District 6 RHMC shall meet every year to evaluate the progress attained and to revise, where needed, the activities set forth in the Plan. The findings and recommendations of the RHMC shall be shared with interested municipal and County Council members. The RHMC will also meet following any disaster events warranting a reexamination of the mitigation actions being implemented or proposed for future implementation. This will ensure that the Plan is continuously updated to reflect changing conditions and needs within the region. MEMA will be responsible for reconvening the RHMC for these reviews.[1]

FIVE YEAR PLAN REVIEW

The Plan will be thoroughly reviewed by the RHMC every five years to determine whether there have been any significant changes in the region that may, in turn, necessitate changes in the types of mitigation actions proposed. New development in identified hazard areas, an increased exposure to hazards, an increase or decrease in capability to address hazards, and changes to federal or state legislation are examples of factors that may affect the necessary content of the Plan.

The plan review provides MEMA District 6 county officials with an opportunity to evaluate those actions that have been successful and to explore the possibility of documenting potential losses avoided due to the implementation of specific mitigation measures. The plan review also provides the opportunity to

[1] A sample Mitigation Action Progress Form and Plan Update Evaluation Worksheet (from FEMA's *Local Mitigation Planning Handbook*) are included in Appendix B. These documents can be used to guide the evaluation of mitigation actions and future plan updates.

address mitigation actions that may not have been successfully implemented as assigned. MEMA will be responsible for reconvening the RHMC and helping conduct the five-year review.

During the five-year plan review process, the following questions will be considered as criteria for assessing the effectiveness and appropriateness of the Plan:

- Do the goals address current and expected conditions?
- Has the nature or magnitude of risks changed?
- Are the current resources appropriate for implementing the Plan?
- Are there implementation problems, such as technical, political, legal or coordination issues with other agencies?
- Have the outcomes occurred as expected?
- Did County departments participate in the plan implementation process as assigned?

Following the five-year review, any revisions deemed necessary will be summarized and implemented according to the reporting procedures and plan amendment process outlined herein. Upon completion of the review and update/amendment process, the MEMA District 6 Regional Hazard Mitigation Plan will be submitted to the State Hazard Mitigation Officer at MEMA for final review and approval in coordination with the Federal Emergency Management Agency (FEMA).

Because the plan update process can take several months to complete, and because Federal funding may be needed to update the plan, it is recommended that the five-year review process begin at the beginning of the third year after the plan was last approved. This will allow the participants in the MEMA District 6 Regional Hazard Mitigation Plan to organize in order to seek Federal funding if necessary and complete required plan update documentation before the plan expires at the end of the fifth year.

DISASTER DECLARATION

Following a disaster declaration, the MEMA District 6 Regional Hazard Mitigation Plan will be revised as necessary to reflect lessons learned, or to address specific issues and circumstances arising from the event. It will be the responsibility of MEMA to reconvene the RHMC and ensure the appropriate stakeholders are invited to participate in the plan revision and update process following declared disaster events.

REPORTING PROCEDURES

The results of the five-year review will be summarized by the RHMC in the plan update and will include an evaluation of the effectiveness of the Plan and any required or recommended changes or amendments. The results will also include an evaluation of implementation progress for each of the proposed mitigation actions, identifying reasons for delays or obstacles to their completion along with recommendations as to whether and how to continue to pursue the action.

PLAN AMENDMENT PROCESS

In general, the RHMC agreed that any minor amendments suggested by a county or participating municipality would be automatically accepted into the plan as long as the amendment only impacted that jurisdiction. However, if the amendment proposed a large-scale change to the structure of the plan or impacted other jurisdictions, the following amendment process would need to be followed.

Upon the initiation of the amendment process, the MEMA District 6 counties will forward information on the proposed change(s) to all interested parties including, but not limited to, all directly affected County departments, residents, and businesses. Information will also be forwarded to MEMA. This information will be disseminated in order to seek input on the proposed amendment(s) for no less than a 45-day review and comment period.

At the end of the 45-day review and comment period, the proposed amendment(s) and all comments will be forwarded to the RHMC for final consideration. The RHMC will review the proposed amendment along with the comments received from other parties, and if acceptable, the committee will submit a recommendation for the approval and adoption of changes to the Plan.

In determining whether to recommend approval or denial of a Plan amendment request, the following factors will be considered by the RHMC:

- There are errors, inaccuracies, or omissions made in the identification of issues or needs in the Plan.
- New issues or needs have been identified which are not adequately addressed in the Plan.
- There has been a change in information, data, or assumptions from those on which the Plan is based.

Upon receiving the recommendation from the RHMC, and prior to adoption of the Plan Amendment, the participating jurisdictions will hold a public hearing, if deemed necessary. The governing bodies of each participating jurisdiction will review the recommendation from the RHMC (including the factors listed above) and any oral or written comments received at the public hearing. Following that review, the governing bodies will take one of the following actions:

- Adopt the proposed amendments as presented;
- Adopt the proposed amendments with modifications;
- Refer the amendments request back to the RHMC for further revision; or
- Defer the amendment request back to the RHMC for further consideration and/or additional hearings.

10.4 CONTINUED PUBLIC INVOLVEMENT

44 CFR Requirement
44 CFR Part 201.6(c)(4)(iii): The plan maintenance process shall include a discussion on how the community will continue public participation in the plan maintenance process

Public participation is an integral component to the mitigation planning process and will continue to be essential as this Plan evolves over time. As described above, significant changes or amendments to the Plan shall require a public hearing prior to any adoption procedures.

Other efforts to involve the public in the maintenance, evaluation, and revision process will be made as necessary. These efforts may include:

- Advertising meetings of the RHMC in local newspapers, public bulletin boards and/or County office buildings;
- Designating willing and voluntary citizens and private sector representatives as official members of the RHMC;
- Utilizing local media to update the public on any maintenance and/or periodic review activities taking place;
- Utilizing the MEMA District 6 county websites to advertise any maintenance and/or periodic review activities taking place; and
- Keeping copies of the Plan in public libraries.

Overall, the RHMC and participating counties will continue to provide outreach concerning mitigation through TV and other media as well as through outreach events such as local fairs or public events. In this way, the public will have continual interaction with the mitigation process and the efforts taken by local officials to implement mitigation.

ANNEX A
CLARKE COUNTY

This annex includes jurisdiction-specific information for Clarke County and its participating municipalities. It consists of the following five subsections:

- ❖ A.1 Clarke County Community Profile
- ❖ A.2 Clarke County Risk Assessment
- ❖ A.3 Clarke County Vulnerability Assessment
- ❖ A.4 Clarke County Capability Assessment
- ❖ A.5 Clarke County Mitigation Strategy

A.1 CLARKE COUNTY COMMUNITY PROFILE

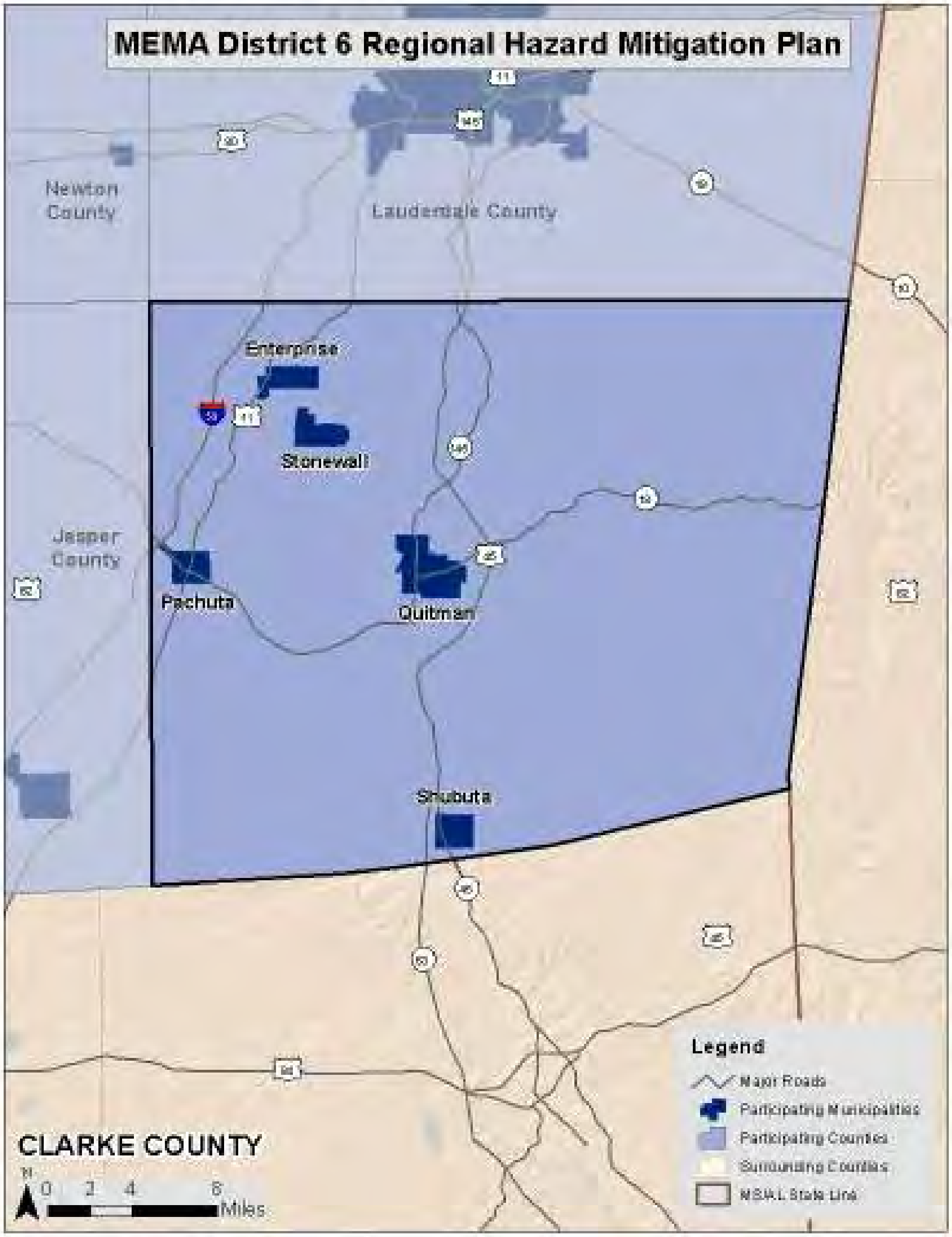
A.1.1 Geography and the Environment

Clarke County is located in eastern Mississippi. It comprises four towns and one city, Town of Enterprise, Town of Pachuta, City of Quitman, Town of Shubuta, and Town of Stonewall, as well as many small unincorporated communities. An orientation map is provided as **Figure A.1**.

The county provides many outdoor recreational activities due to its close proximity to the Chickasawhay River along with cultural opportunities at the historic Mississippi State University Riley Center for Education and Performing Arts. The total area of the county is 694 square miles, 2 square miles of which is water area.

Summer temperatures in the county range from highs of about 90 degrees Fahrenheit (˚F) to lows in the upper 60s. Winter temperatures range from highs in the mid-50s to lows around 30˚F. Average annual rainfall is approximately 56 inches, with the wettest months being November, December, and May.

Figure A.1: CLARKE COUNTY ORIENTATION MAP



A.1.2 Population and Demographics

According to the 2019 American Community Survey data provided by U.S. Census, Clarke County has a population of 15,770 people. The county has seen a decrease in population between 2010 and 2020, however two municipalities have experienced growth. The population density is 24 people per square mile. Population counts from the US Census Bureau for 2000, 2010, and 2019 for the county and participating jurisdictions are presented in **Table A.1**.

Table A.1: POPULATION COUNTS FOR CLARKE COUNTY

Jurisdiction	2000 Census Population	2010 Census Population	2019 Census Population	% Change 2010-2019
Clarke County	17,955	16,732	15,770	-5.74%
Enterprise	474	526	615	16.92%
Pachuta	245	261	143	-45.21%
Quitman	2,463	2,323	1,974	-15%
Shubuta	651	441	337	-23%
Stonewall	1,149	1,088	933	-14.24%

Source: United States Census Bureau

Based on the 2019 American Community Survey, the median age of residents of Clarke County is 42.2 years. The racial characteristics of the county are presented in **Table A.2**. Whites make up the majority of the population in the county, accounting for 63.6 percent of the population.

Table A.2: DEMOGRAPHICS OF CLARKE COUNTY

Jurisdiction	White, Percent (2019)	Black or African American, Percent (2019)	American Indian or Alaska Native, Percent (2019)	Asian, Percent (2019)	Native Hawaiian or Other Pacific Islander, Percent (2019)	Other Race, Percent (2019)	Two or More Races, percent (2019)	Persons of Hispanic Origin, Percent (2019)*
Clarke County	**63.6%**	**35.5%**	**0.1%**	**0.0%**	**0.0%**	**0.3%**	**0.6%**	**0.68%**
Enterprise	86.7%	13.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Pachuta	62.2%	37.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Quitman	54.4%	42.3%	0.5%	0.0%	0.0%	0.95%	0.3%	1.5%
Shubuta	19.3%	80.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0%
Stonewall	80.0%	20.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%

*Hispanics may be of any race, so also are included in applicable race categories
Source: United States Census Bureau, American Community Survey

A.1.3 Housing

According to the 2019 American Community Survey, there are 8,000 housing units in Clarke County, the majority of which are single family homes or mobile homes. Housing information for the county and five municipalities is presented in **Table A.3**.

Table A.3: HOUSING CHARACTERISTICS OF CLARKE COUNTY

Jurisdiction	Housing Units (2010)	Housing Units (2019)	Median Home Value (2019)
Clarke County	**7,876**	**8000**	**$84,900**
Enterprise	250	276	$110,600
Pachuta	134	134	$86,900
Quitman	1,065	1,065	$94,000
Shubuta	217	217	$54,100
Stonewall	559	559	$55,200

Source: United States Census Bureau. American Community Survey

A.1.4 Infrastructure

TRANSPORTATION

In Clarke County, Interstate 59 runs north to south allowing transportation in the north western part of the county. U.S. Highway 11 runs roughly north-south through Clarke County. U.S. Highway 45 is a north-south highway from the Gulf of Mexico through Clarke County.

The Clarke County Airport provides limited local service within the county. The closest international airport is Jackson-Evers International Airport, which offers international and domestic flights to a number of locations around the world.

UTILITIES

Electrical power in Clarke County is provided by East Mississippi Electric Power Association and Mississippi Power Company and several local distributors, including Dixie EPA and Southern Pine EPA.

Water and sewer service is provided to residents by the Towns of Enterprise, Pachuta, Shubuta, Stonewall, as well as the City of Quitman. Wautubee Water Association also serves some of the county residents.

COMMUNITY FACILITIES

There are a number of buildings and community facilities located throughout Clarke County. According to the data collected for the vulnerability assessment (Section 6.4.1), there are 7 fire stations, 6 police stations, and 10 public schools located within the county.

There is one hospital located in Clarke County. H.C. Watkins Memorial Hospital is a 25-bed acute medical-surgical hospital located in the City of Quitman.

Recreational opportunities in Clarke County include great hunting, fishing, and golfing as well as local entertainment. Clarko State Park offers camping, cabin rentals and water sports and contains a Lake that allows boat launch, fishing, and water skiing. Archusa Creek Water Park provides fishing opportunities along with camping, boating, swimming, water skiing, and picnicking.

A.1.5 Land Use

Many areas of Clarke County are undeveloped or sparsely developed. There are several small incorporated municipalities located throughout the county, with a few larger hubs interspersed. These areas are where the county's population is generally concentrated. The incorporated areas are also where many of the businesses, commercial uses, and institutional uses are located. Land uses in the balance of the study area generally consist of rural residential development, agricultural uses, and recreational areas, although there are some notable exceptions in the larger municipalities. Local land use and associated regulations are further discussed in *Section 7: Capability Assessment.*

East Central Planning and Development District assists with Clarke County with planning and development to promote economic growth and job opportunities.

A.1.6 Employment and Industry

According to the 2019 American Community Survey (ACS), in In Clarke County, 50.6 percent of the population 16 and over were employed; 45.6 percent were not currently in the labor force. An estimated 77.4 percent of the people employed were private wage and salary workers; 17.0 percent were federal, state, or local government workers; and 5.1 percent were self-employed in their own (not incorporated) business with 31.8% employed in educational services, and health care and social assistance. The median household income for Clarke County in 2019 was $43,207, while the state's median household income for the same period was $45,081

A.2 CLARKE COUNTY RISK ASSESSMENT

This subsection includes hazard profiles for each of the significant hazards identified in Section 4: *Hazard Identification* as they pertain to Clarke County. Each hazard profile includes a description of the hazard's location and extent, notable historical occurrences, and the probability of future occurrences. Additional information can be found in Section 5: *Hazard Profiles*.

A.2.1 Flood

LOCATION AND SPATIAL EXTENT

There are areas in Clarke County that are susceptible to flood events. Special flood hazard areas in the county were mapped using Geographic Information System (GIS) and FEMA Digital Flood Insurance Rate Maps (DFIRM).[1]This includes Zone A (1-percent annual chance floodplain), Zone AE (1-percent annual chance floodplain with elevation), and Zone X500 (0.2-percent annual chance floodplain). According to GIS analysis, of the 697 square miles that make up Clarke County, there are 113.2 square miles of land in zones A and AE (1-percent annual chance floodplain/100-year floodplain) and 0.3 square miles of land in zone X500 (0.2-percent annual chance floodplain/500-year floodplain).

These flood zone values account for 16.3 percent of the total land area in Clarke County. It is important to note that while FEMA digital flood data is recognized as best available data for planning purposes, it does not always reflect the most accurate and up-to-date flood risk. Flooding and flood-related losses often do occur outside of delineated special flood hazard areas. **Figure A.2** illustrates the location and extent of currently mapped special flood hazard areas for Clarke County based on best available FEMA Digital Flood Insurance Rate Map (DFIRM) data. Flooding problems in Clarke County are due primarily to overflow of the Chickasawhay River and its major tributaries.[2]

[1] The county-level DFIRM data used for Clarke County were updated in 2010.

[2] FEMA. Flood Insurance Study. September 2011

Figure A.2: SPECIAL FLOOD HAZARD AREAS IN CLARKE COUNTY

Source: Federal Emergency Management Agency

HISTORICAL OCCURRENCES

Floods were at least partially responsible for six disaster declarations in Clarke County in 1973, 1974, 1979, 1990, 2003, and 2011, 2016, 2019, and 2020.[3] Information from the National Centers for Environmental Information was used to ascertain additional historical flood events. The National Centers for Environmental Information reported a total of 18 events in Clarke

[3] A complete listing of historical disaster declarations can be found in Section 4: *Hazard Identification*.

County since 1998. A summary of these events is presented in **Table A.4**. These events accounted for almost $4.7 million in property damage in the county. Specific information on flood events, including date, type of flooding, and deaths and injuries, can be found in **Table A.5**.

Table A.4: SUMMARY OF FLOOD OCCURRENCES IN CLARKE COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Enterprise	2	0/0	$3,002,000
Pachuta	1	0/0	$5,000
Quitman	8	0/0	$648,000
Shubuta	1	0/0	$5,000
Stonewall	5	0/0	$362,000
Unincorporated Area	19	0/0	$653,000
CLARKE COUNTY TOTAL	**18**	**0/0**	**$4,675,000**

Source: National Centers for Environmental Information

Table A.5: HISTORICAL FLOOD EVENTS IN CLARKE COUNTY

According to the National Centers for Environmental Information, there have been a total of 18 reported flood events in Clarke County with over $4.675 Million in property damage. These are the most significant flood events reported:

January 8th, 1998 - An emergency spillway on a small dam at the Archusa Water Park failed and sent flood waters down the Chickasawhay river resulting in over $500,000 in property damage. Water got up around fifty homes, but only twenty five homes were flooded.
March 31st, 2005 - Heavy rains, between 4 and 6 inches, fell across portions of Clarke county during the early morning hours of March 31st. Nearly a dozen county roads were flooded with several being washed out. Reported property damage was $170,000.
March 9th, 2011 - Significant and widespread heavy rainfall occurred across nearly all of Clarke County. Rainfall totals ranged from 6 to 8 inches. Dozens of roads were flooded with many washed out. Extensive flooding occurred around Quitman with 15 homes and businesses flooded. Water rescues occurred at nearly a dozen homes with people trapped by the flood waters. Across the county, 10 additional homes were flooded. The resulting property damage was in excess of $3 Million.
March 22nd, 2012 - Shubuta Creek was well out of its banks. Numerous county roads were washed out. Water was over County Road 270. A culvert was washed out and County Road 120 was closed. Property damage was reported to be $300,000.
March 10th, 2016 - Numerous roads were flooded across Clarke County. Water entered three homes and three inches of water entered the Clarke County EOC. Several roads washed out with other roads impassable between Quitman and Enterprise. Multiple roads were flooded in Quitman. Flooding occurred on County Road 320 and 120 resulting in over $200,000 in property damage.

HISTORICAL SUMMARY OF INSURED FLOOD LOSSES

According to FEMA flood insurance policy records as of June 2015, there have been 41 flood losses reported in Clarke County through the National Flood Insurance Program (NFIP) since 1978, totaling over $682,000 in claims payments. A summary of these figures for the county is provided in **Table A.6**. It should be emphasized that these numbers include only those losses to structures that were insured through the NFIP policies, and for losses in which claims were sought and received. It is likely that many additional instances of flood loss in Clarke County were either uninsured, denied claims payment, or not reported. Available data from the Natural Resources Defense Council (NRDC) reveal that as of September 30, 2019 there were 78 reported NFIP claims totaling $1,218,834 in Clarke County.

Table A.6: SUMMARY OF INSURED FLOOD LOSSES IN CLARKE COUNTY (2015)

Location	Flood Losses	Claims Payments
Enterprise	6	$293,457
Pachuta	0	$0
Quitman	2	$18,401
Shubuta	3	$7,781
Stonewall	7	$30,121
Unincorporated Area	23	$332,258
CLARKE COUNTY TOTAL	**41**	**$682,018**

Source: Federal Emergency Management Agency, National Flood Insurance Program (2015). As of this update, access to more current NFIP data isn't available. The data from 2019 was obtained through a FOIA request by the Natural Resources Defense Council.

REPETITIVE LOSS PROPERTIES

According to the Mississippi Emergency Management Agency, there are four non-mitigated repetitive loss properties located in Clarke County, which accounted for nine losses and almost $233,000 in claims payments under the NFIP. The average claim amount for these properties is $25,845. Of the four properties, three are single family and one is non-residential. Without mitigation, these properties will likely continue to experience flood losses. **Table A.7** presents detailed information on repetitive loss properties and NFIP claims and policies for Clarke County.

Table A.7: REPETITIVE LOSS PROPERTIES IN CLARKE COUNTY (2015)

Location	Number of Properties	Types of Properties	Number of Losses	Building Payments	Content Payments	Total Payments	Average Payment
Enterprise	2	1 single family; 1 non-residential	5	$188,107	$33,376	$221,482	$44,296
Pachuta	0	--	0	$0	$0	$0	$0
Quitman	0	--	0	$0	$0	$0	$0
Shubuta	0	--	0	$0	$0	$0	$0

Location	Number of Properties	Types of Properties	Number of Losses	Building Payments	Content Payments	Total Payments	Average Payment
Stonewall	0	--	0	$0	$0	$0	$0
Unincorporated Area	2	2 single family	4	$11,125	$0	$11,125	$2,781
CLARKE COUNTY TOTAL	**4**		**9**	**$199,232**	**$33,376**	**$232,608**	**$25,845**

Source: National Flood Insurance Program

PROBABILITY OF FUTURE OCCURRENCES

Flood events will remain a threat in Clarke County, and the probability of future occurrences will remain likely (between 10 and 100 percent annual probability). The participating jurisdictions and unincorporated areas have risk to flooding, though not all areas will experience flood. The probability of future flood events based on magnitude and according to best available data is illustrated in the figures above**,** which indicates those areas susceptible to the 1-percent annual chance flood (100-year floodplain) and the 0.2-percent annual chance flood (500-year floodplain).

It can be inferred from the floodplain location maps, previous occurrences, and repetitive loss properties that risk varies throughout the county. For example, the Town of Shubuta has more floodplain and thus a higher risk of flood than the other municipalities. Flood is not the greatest hazard of concern but will continue to occur and cause damage. Therefore, mitigation actions may be warranted, particularly for repetitive loss properties.

A.2.2 Erosion

LOCATION AND SPATIAL EXTENT

Erosion in Clarke County is typically caused by flash flooding events. Unlike coastal areas, areas of concern for erosion in Clarke County are primarily rivers and streams. Generally, vegetation helps to prevent erosion in the area, and it is not an extreme threat to the county. No areas of concern were reported by the hazard mitigation council.

HISTORICAL OCCURRENCES

Several sources were vetted to identify areas of erosion in Clarke County. This includes searching local newspapers, interviewing local officials, and reviewing previous hazard mitigation plans. No historical erosion occurrences were found in these sources.

PROBABILITY OF FUTURE OCCURRENCES

Erosion remains a natural, dynamic, and continuous process for Clarke County, and it will continue to occur. The annual probability level assigned for erosion is possible (between 1 and 10 percent annually).

A.2.3 Dam and Levee Failure

LOCATION AND SPATIAL EXTENT

According to the U.S. Army Corps of Engineers' National Inventory of Dams, there are no high hazard dams in Clarke County (**Table A.8**). **Figure A.3** shows the location of other nearby high hazard dams.

Figure A.3: CLARKE COUNTY HIGH HAZARD DAM LOCATIONS

Source: U.S. Army Corps of Engineers – National Inventory of Dams (NID)

Table A.8: CLARKE COUNTY HIGH HAZARD DAMS

Dam Name	Hazard Potential
Clarke County	
NONE	*N/A*

Source: Mississippi Department of Environmental Quality

HISTORICAL OCCURRENCES

There is no record of dam breaches in Clarke County.

PROBABILITY OF FUTURE OCCURRENCES

Given the current dam inventory and historic data, a dam breach is possible (between 1 and 10 percent annual probability) in the future. However, as has been demonstrated in the past, regular monitoring is necessary to prevent these events.

A.2.4 Winter Storm and Freeze

LOCATION AND SPATIAL EXTENT

Nearly the entire continental United States is susceptible to winter storm and freeze events. Some ice and winter storms may be large enough to affect several states, while others might affect limited, localized areas. The degree of exposure typically depends on the normal expected severity of local winter weather. Clarke County is not accustomed to severe winter weather conditions and rarely receives severe winter weather, even during the winter months. Events tend to be mild in nature; however, even relatively small accumulations of snow, ice, or other wintery precipitation can lead to losses and damage due to the fact that these events are not commonplace. Given the atmospheric nature of the hazard, the entire county has uniform exposure to a winter storm.

HISTORICAL OCCURRENCES

According to the National Centers for Environmental Information, there have been a total of six recorded winter storm events in Clarke County since 1996 (**Table A.9**). These events resulted in over $727,000 in damages. Detailed information on the recorded winter storm events can be found in **Table A.10**.

Table A.9: SUMMARY OF WINTER STORM EVENTS IN CLARKE COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Clarke County	10	0/0	$885,000

Source: National Centers for Environmental Information

Table A.10: HISTORICAL WINTER STORM IMPACTS IN CLARKE COUNTY

Location	Date	Type	Deaths / Injuries	Property Damage*
Enterprise				
None Reported	--	--	--	--
Pachuta				
None Reported	--	--	--	--

Location	Date	Type	Deaths /	Property Damage*
Quitman				
None Reported	--	--	--	--
Shubuta				
None Reported	--	--	--	--
Stonewall				
None Reported	--	--	--	--
Unincorporated Area				
CLARKE (ZONE)	2/1/1996	Ice Storm	0/0	$152,096
CLARKE (ZONE)	1/1/2002	Heavy Snow	0/0	$6,633
CLARKE (ZONE)	1/19/2008	Heavy Snow	0/0	$0
CLARKE (ZONE)	1/1/2010	Cold / Wind Chill	0/0	$200,000
CLARKE (ZONE)	2/11/2010	Heavy Snow	0/0	$547,194
CLARKE (ZONE)	1/9/2011	Ice Storm	0/0	$21,218
CLARKE (ZONE)	1/28/2014	Heavy Snow	0/0	$0
CLARKE (ZONE)	1/6/2017	Winter Weather	0/0	$10,000
CLARKE (ZONE)	12/7/2017	Heavy Snow	0/0	$50,000
CLARKE (ZONE)	1/16/2018	Winter Weather	0/0	$0

*All damage may not have been reported.
Source: National Centers for Environmental Information

There have been several severe winter weather events in Clarke County. The text below describes one of the major events and associated impacts on the county. Similar impacts can be expected with severe winter weather.

January 2008 Winter Storm -
This storm produced heavy snow across the region, with an average of three to four inches of snow. Some heavier amounts, between four to five inches, also fell in isolated areas. At the height of the snow, temperatures fell to near freezing, and accumulations occurred on roadways resulting in a number of traffic accidents. Additionally, some power outages occurred in the heaviest snow band due to the weight of wet snow on limbs and lines.

Winter storms throughout the planning area have several negative externalities including hypothermia, cost of snow and debris cleanup, business and government service interruption, traffic accidents, and power outages. Furthermore, citizens may resort to using inappropriate heating devices that could to fire or an accumulation of toxic fumes.

February 2010 Heavy Snow –
At the National Weather Service office, a total of 4.7 inches of snow fell during the event. This is the 2nd largest February snowfall event and the 10th overall largest snowfall event on record. This heavy snow event was not just a local event. Heavy snow spanned a large portion of the South with a substantial swath of 3 to 6 inches which fell from north-central Texas through north and central Louisiana, central and southern Mississippi, Alabama and Georgia.

February 2021 Ice Storm
As an arctic air mass continued to build southward across the South on February 17th, another wave of precipitation overspread this cold air mass across much of Mississippi. The main impacts across central and southern portions of the state were from freezing rain and resulting heavy icing, but some significant

accumulations of sleet and snow also occurred in areas mainly north and west of the Natchez Trace. Freezing rain continued through the evening hours, ending from west to east by the early morning of February 18th. Ice accumulated quickly in many locations and downed numerous trees, large limbs, and power lines across the affected areas. Several trees and limbs fell onto power lines, resulting in more widespread power outages as well. Some trees fell onto homes or cars, and significant amounts of ice, sleet, and snow collapsed a few gas station awnings and roofs where accumulations were greatest. In the hardest hit areas, extensive damage to trees and power lines took several months and cost several hundred thousands of dollars to clean up.

PROBABILITY OF FUTURE OCCURRENCES

Winter storm events will continue to occur in Clarke County. According to historical information, the annual probability is likely (between 10 and 100 percent).

FIRE-RELATED HAZARDS

A.2.5 Drought / Heat Wave

Drought

Drought typically covers a large area and cannot be confined to any geographic or political boundaries. Furthermore, it is assumed that Clarke County would be uniformly exposed to drought, making the spatial extent potentially widespread. It is also notable that drought conditions typically do not cause significant damage to the built environment but may exacerbate wildfire conditions.

Heat Wave

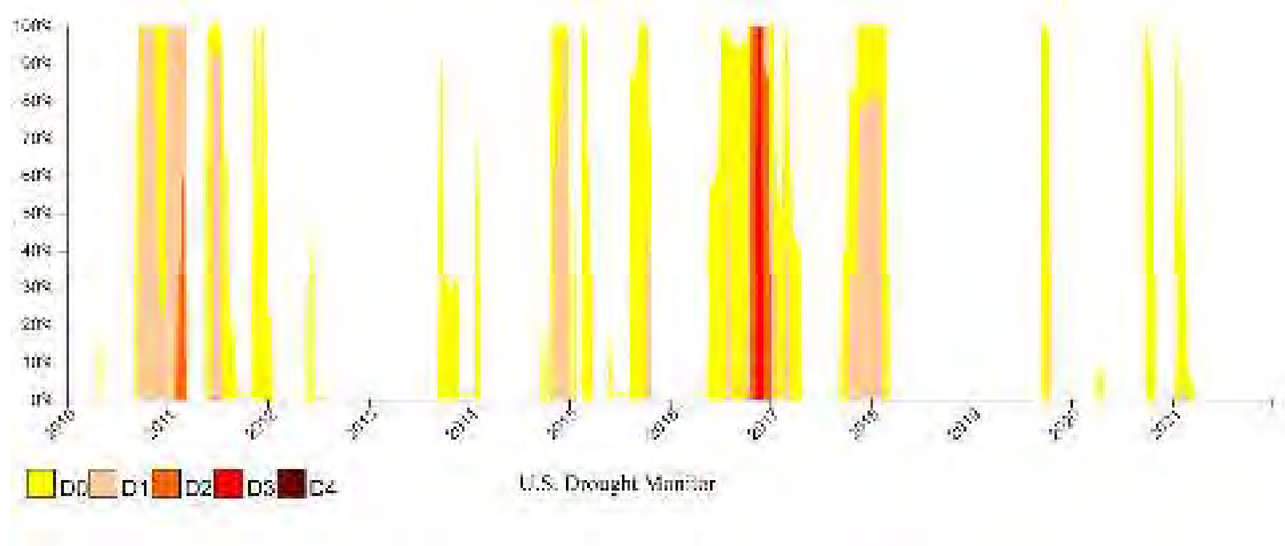
Heat waves typically impact a large area and cannot be confined to any geographic or political boundaries.

HISTORICAL OCCURRENCES

Drought

Table A.11 shows the most severe drought classification for each year, according to U.S. Drought Monitor classifications. It should be noted that the U.S. Drought Monitor also estimates what percentage of the county is in each classification of drought severity. For example, the most severe classification reported may be exceptional but a majority of the county may actually be in a less severe condition.

Table A.11: HISTORICAL DROUGHT OCCURRENCES IN CLARKE COUNTY



Source: United States Drought Monitor

Some additional anecdotal information was provided from the National Centers for Environmental Information on droughts in Clarke County.

Summer 2006 – During a four-and-a-half-month period, from June to the middle of October, abnormally dry conditions prevailed across most of Jackson, MS County Warning Area (CWA). The drought had a significant impact on the agricultural industry. Non-irrigated crops were destroyed and all other sustainable crops produced a below normal yield. Catfish ponds were drawn down to severe levels and required water to be pumped back into the fish ponds. The cattle industry suffered due to low watering ponds and lack of sufficient grasslands for grazing and hay production. Water supply problems were encountered by those cities who obtained water from local rivers for drinking purposes due to the low river flows. Fire threat was significant causing the issuance of burn bans across the CWA.

Summer 2007 – By the middle of April, drought conditions were being experienced across a large portion of Eastern and some of Central Mississippi. During the month of May, the drought worsened and expanded. In June, the drought peaked across the region. Although drought conditions continued throughout July and August, conditions were less severe than earlier in the summer. As a result of these conditions, area farmers and crop yields were affected.

October 2010 – Very dry conditions continued across central Mississippi during most of October. Crops were put under stress under the warm and dry conditions. The likely impact was less crop yields for harvest time.

Heat Wave

The National Centers for Environmental Information was used to determine historical heat wave occurrences in the county.

July 2005 – A five-day heat wave occurred across the region. Heat index values reached near 110 degrees each day. Each day had high temperatures ranging from 95 to 99 degrees. This was the warmest stretch of weather the area experienced since July 2001.

August 2005 –A heat wave covering the south began in mid-August and lasted about 10 days. High temperatures were consistently over 95 degrees and surpassed 100 degrees or more on some days. It was the first time since August 2000 that 100-degree temperatures reached the area.

July 2006 – A short heat wave impacted most of the area temperatures in the 90s to around 100 for five straight days.

August 2007 – A heat wave gripped most of the area with the warmest temperatures since 2000. It lasted from August 5th to the 16th.

August 2010 – The combination of high humidity and above normal temperatures produced heat index readings ranged between 105 and 109 degrees during the afternoon hours in the middle part of August.

PROBABILITY OF FUTURE OCCURRENCES

Drought

Based on historical occurrence information, it is assumed that Clarke County has a probability level of likely (between 10 and 100 percent annual probability) for future drought events. However, the extent (or magnitude) of drought and the amount of geographic area covered by drought, varies with each year. Historic information indicates that there is a much lower probability for extreme, long-lasting drought conditions.

Heat Wave

Based on historical occurrence information, it is assumed that all of Clarke County has a probability level of likely (between 10 and 100 percent annual probability) for future heat wave events.

A.2.6 Wildfire

LOCATION AND SPATIAL EXTENT

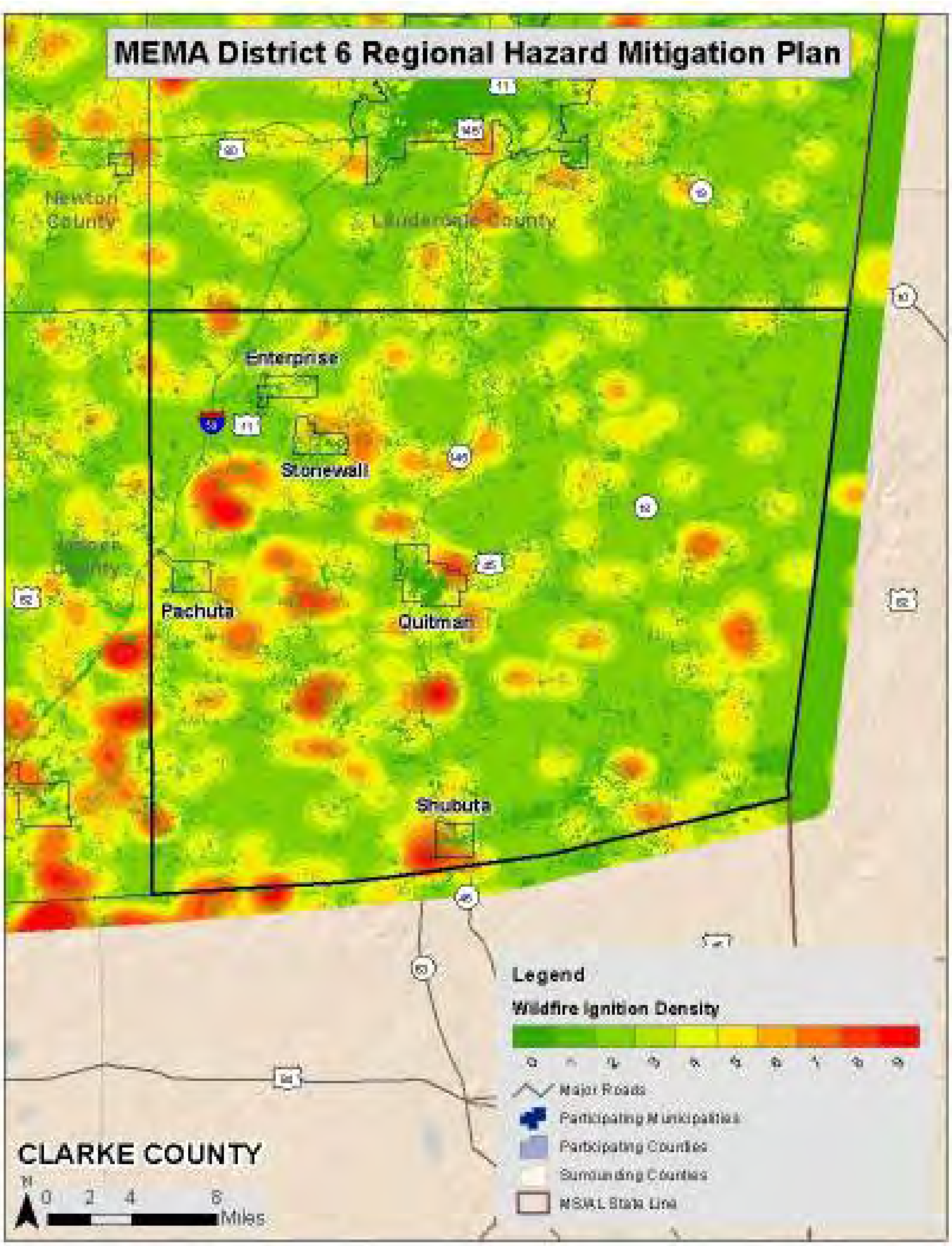
The entire county is at risk to a wildfire occurrence. However, several factors such as drought conditions or high levels of fuel on the forest floor, may make a wildfire more likely. Furthermore, areas in the urban-wildland interface are particularly susceptible to fire hazard as populations abut formerly undeveloped areas. The Wildfire Ignition Density data shown in the figure below give an indication of historic location.

HISTORICAL OCCURRENCES

Figure A.4 shows the Wildfire Ignition Density in Clarke County based on data from the Southern Wildfire Risk Assessment. This data is based on historical fire ignitions and the likelihood of a wildfire igniting in an area. Occurrence is derived by modeling historic wildfire ignition locations to create an average ignition rate map. This is measured in the number of fires per year per 1,000 acres.[4]

[4] Southern Wildfire Risk Assessment, 2021.

Figure A.4: WILDFIRE IGNITION DENSITY IN CLARKE COUNTY



Source: Southern Wildfire Risk Assessment

Based on data from the Mississippi Forestry Commission from 2005 to 2014, Clarke County experiences an average of 36 wildfires annually which burn an average of 394 acres per year. The data indicates that most of these fires are small, averaging 11 acres per fire. **Table A.12** provides a summary of wildfire occurrences in Clarke County and **Table A.13** lists the number of reported wildfire occurrences in the county between the years 2011 and 2020.

Table A.12: SUMMARY TABLE OF ANNUAL WILDFIRE OCCURRENCES (2015-2021)*

	Clarke County
Average Number of Fires per year	15
Average Number of Acres Burned per year	194
Average Number of Acres Burned per fire	12.9

*These values reflect averages over a 5-year period.
Source: Mississippi Forestry Commission

Table A.13: HISTORICAL WILDFIRE OCCURRENCES IN CLARKE COUNTY

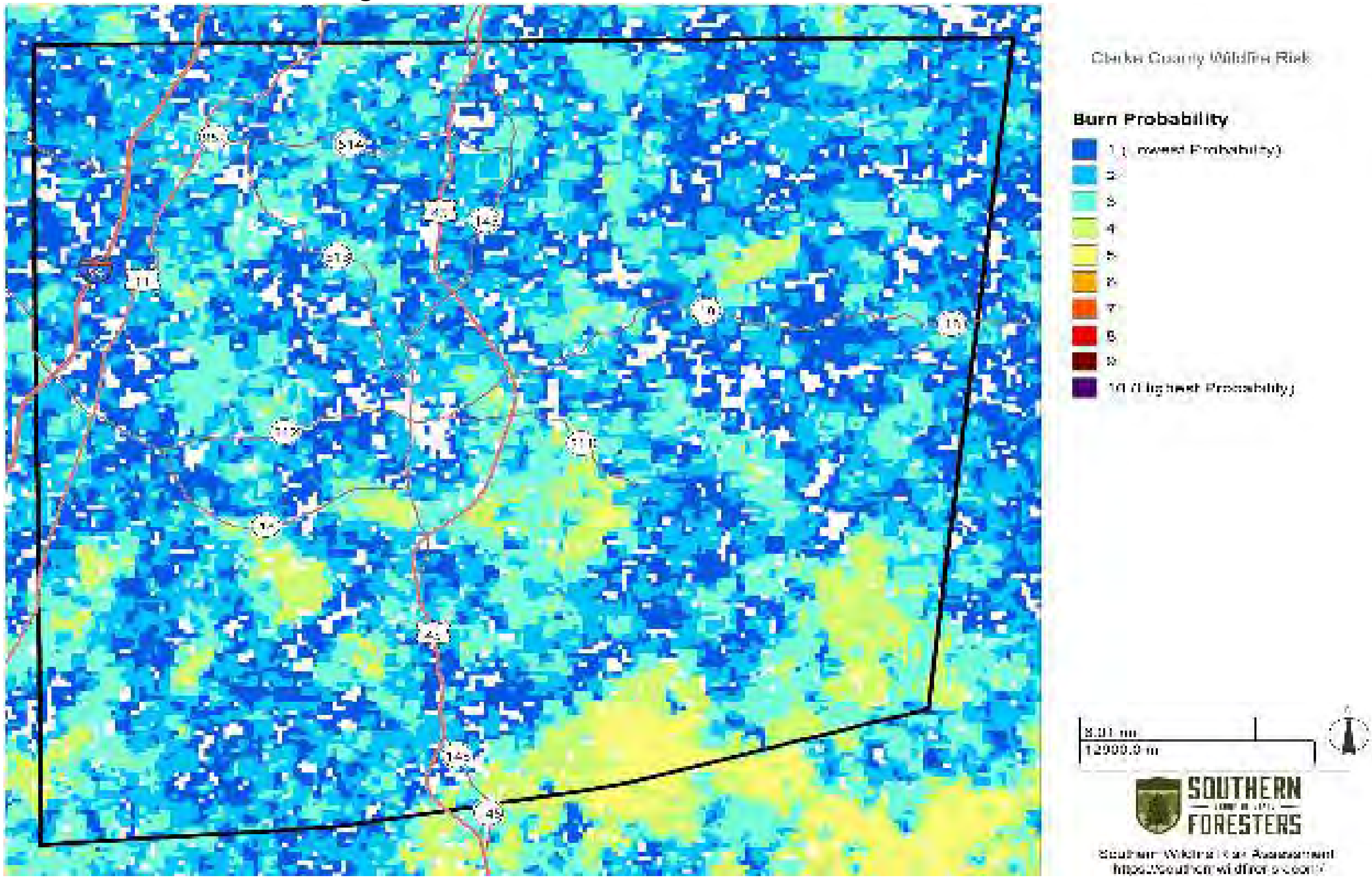
Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
CLARK										
Number of Fires	42	10	12	20	24	29	9	5	19	8
Number of Acres Burned	368	77	172	193	249	268	163	64	332	49

Source: Mississippi Forestry Commission

PROBABILITY OF FUTURE OCCURRENCES

Wildfire events will be an ongoing occurrence in Clarke County. **Figure A.5** shows that there is some probability a wildfire will occur throughout the county. However, the likelihood of wildfires increases during drought cycles and abnormally dry conditions. Fires are likely to stay small in size but could increase due to local climate and ground conditions. Dry, windy conditions with an accumulation of forest floor fuel (potentially due to ice storms or lack of fire) could create conditions for a large fire that spreads quickly. It should also be noted that some areas do vary somewhat in risk. For example, highly developed areas are less susceptible unless they are located near the urban-wildland boundary. The risk will also vary due to assets. Areas in the urban-wildland interface will have much more property at risk, resulting in increased vulnerability and need to mitigate compared to rural, mainly forested areas. The probability assigned to Clarke County for future wildfire events is highly likely (100 percent annual probability).

Figure A.5: BURN PROBABILITY IN CLARKE COUNTY



Source: Southern Wildfire Risk Assessment

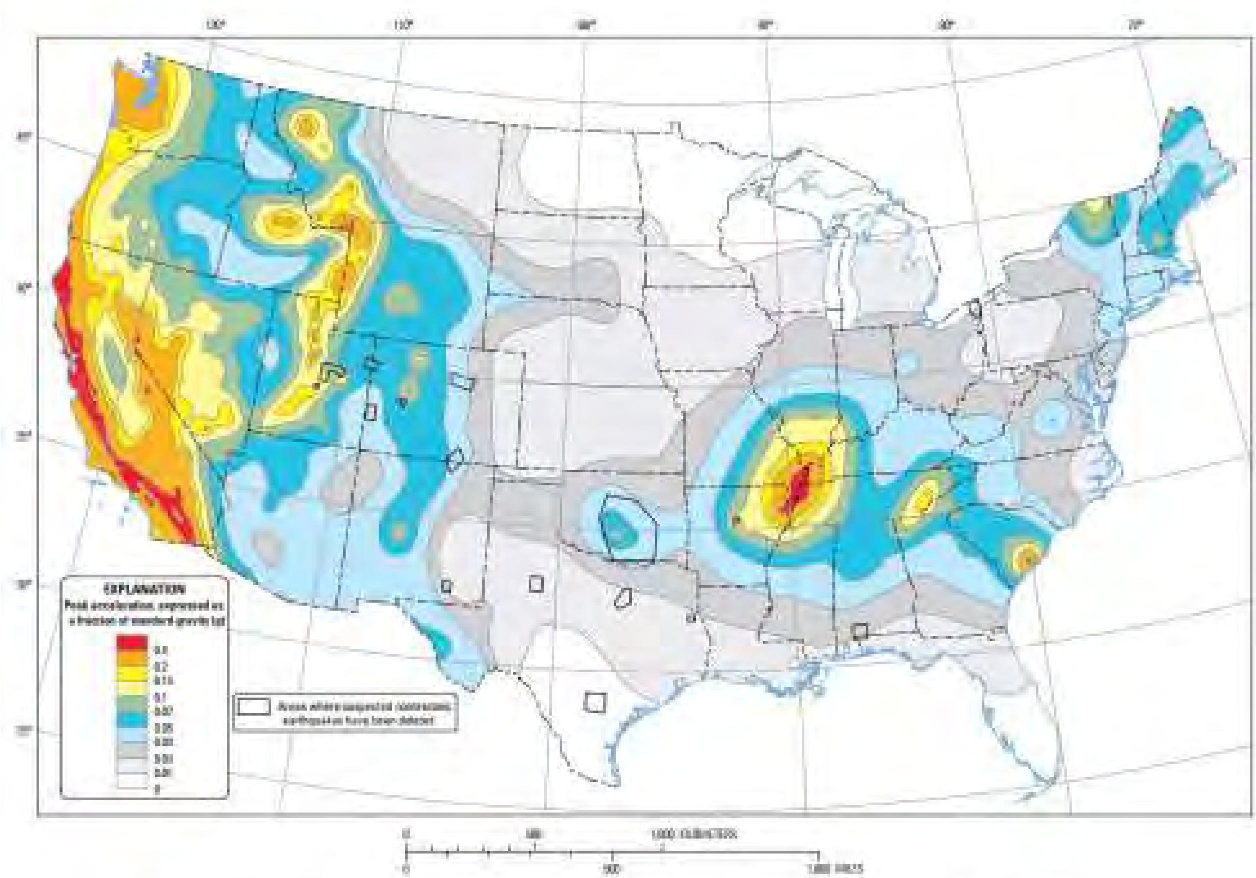
GEOLOGIC HAZARDS

A.2.7 Earthquake

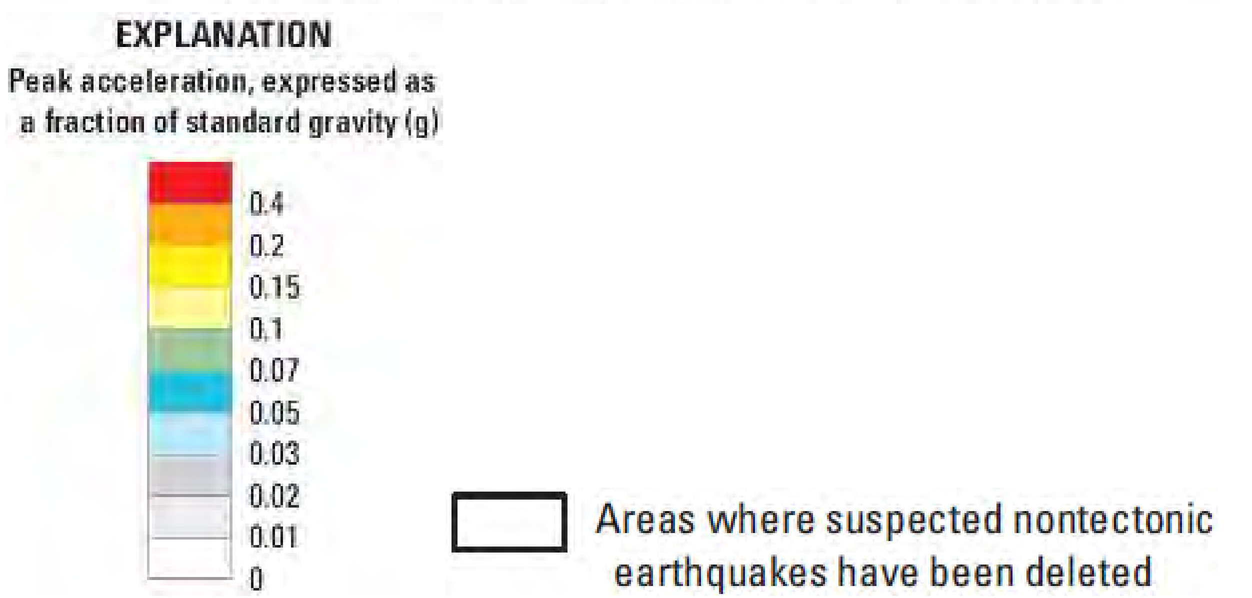
LOCATION AND SPATIAL EXTENT

Figure A.6 shows the intensity level associated with Clarke County, based on the national USGS map of peak acceleration with 10 percent probability of exceedance in 50 years. It is the probability that ground motion will reach a certain level during an earthquake. The data show peak horizontal ground acceleration (the fastest measured change in speed, for a particle at ground level that is moving horizontally due to an earthquake) with a 10 percent probability of exceedance in 50 years. The map was compiled by the U.S. Geological Survey (USGS) Geologic Hazards Team, which conducts global investigations of earthquake, geomagnetic, and landslide hazards. According to this map, Clarke County lies within an approximate zone of level “2” to “3” ground acceleration. This indicates that the county exists within an area of moderate seismic risk.

Figure A.6: PEAK ACCELERATION WITH 10 PERCENT PROBABILITY OF EXCEEDANCE IN 50 YEARS



Ten-percent probability of exceedance in 50 years map of peak ground acceleration



Source: United States Geological Survey, 2014

HISTORICAL OCCURRENCES

At least one earthquake is known to have affected Clarke County since 1886. This measured a II on the Modified Mercalli Intensity (MMI) scale. **Table A.14** provides a summary of earthquake events reported by the National Geophysical Data Center between 1638 and 1985. **Table A.15** presents a detailed occurrence of each event including the date, distance for the epicenter, magnitude and Modified Mercalli Intensity (if known).[5]

Table A.14: SUMMARY OF SEISMIC ACTIVITY IN CLARKE COUNTY

Location	Number of Occurrences	Greatest MMI Reported	Richter Scale Equivalent
Enterprise	1	II	< 4.2
Pachuta	0	--	--
Quitman	0	--	--
Shubuta	0	--	--
Stonewall	0	--	--
Unincorporated Area	0	--	--
CLARKE COUNTY TOTAL	**1**	**II (feeble)**	**< 4.2**

Source: National Geophysical Data Center

Table A.15: SIGNIFICANT SEISMIC EVENTS IN CLARKE COUNTY (1638 -1985)

Location	Date	Epicentral Distance	Magnitude	MMI
Enterprise				
Enterprise	9/1/1886	829.0 km	*Unknown*	II
Pachuta				
None Reported	--	--	--	--
Quitman				
None Reported	--	--	--	--
Shubuta				
None Reported	--	--	--	--
Stonewall				
None Reported	--	--	--	--
Unincorporated Area				
None Reported	--	--	--	--

Source: National Geophysical Data Center

PROBABILITY OF FUTURE OCCURRENCES

The probability of significant, damaging earthquake events affecting Clarke County is unlikely. However, it is possible that future earthquakes resulting in light to moderate perceived shaking and damages ranging from none to very light will affect the county. The annual probability level for the

[5] Due to reporting mechanisms, not all earthquake events were recorded during this time. Furthermore, some are missing data, such as the epicenter location, due to a lack of widely used technology. In these instances, a value of "unknown" is reported.

county is estimated to be between 1 and 10 percent (possible).

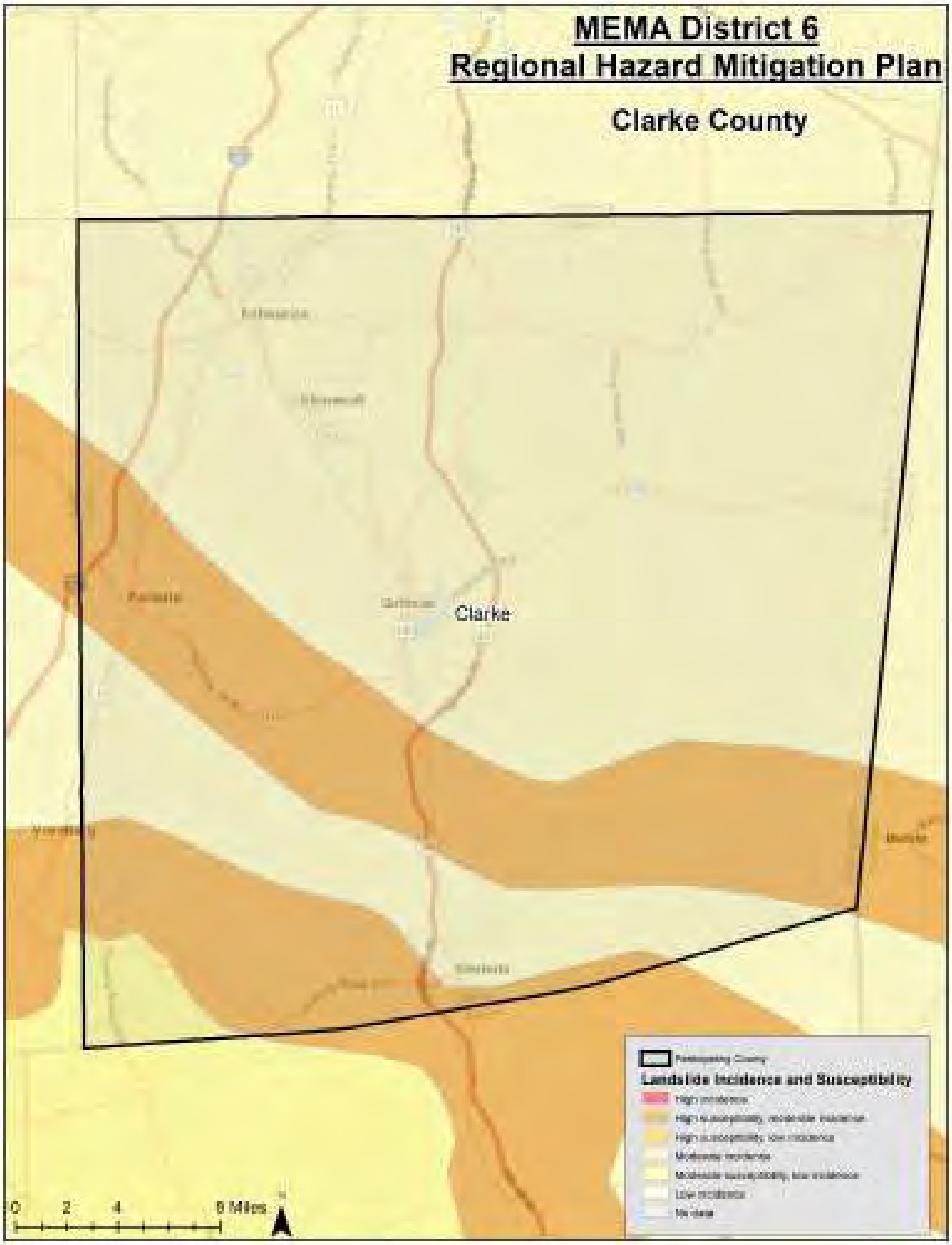
A.2.8 Landslide

LOCATION AND SPATIAL EXTENT

Landslides occur along steep slopes when the pull of gravity can no longer be resisted (often due to heavy rain). Human development can also exacerbate risk by building on previously undevelopable steep slopes. Landslides are possible throughout Clarke County, though the risk is relatively low.

According to **Figure A.7** below, the majority of the county falls under a low incidence area. This indicates that less than 1.5 percent of the area is involved in landsliding. There are also some areas in the southwestern half of the county that are moderate incidence areas. This indicates that between 1.5 and 10 percent of the area is involved in landsliding.

Figure A.7: LANDSLIDE SUSCEPTIBILITY AND INCIDENCE MAP OF CLARKE COUNTY



Source: United States Geological Survey

HISTORICAL OCCURRENCES

There is no extensive history of landslides in Clarke County. Landslide events typically occur in isolated areas. Reviews of the USGS Landslide Inventory show no historical occurrences of landslides.

PROBABILITY OF FUTURE OCCURRENCES

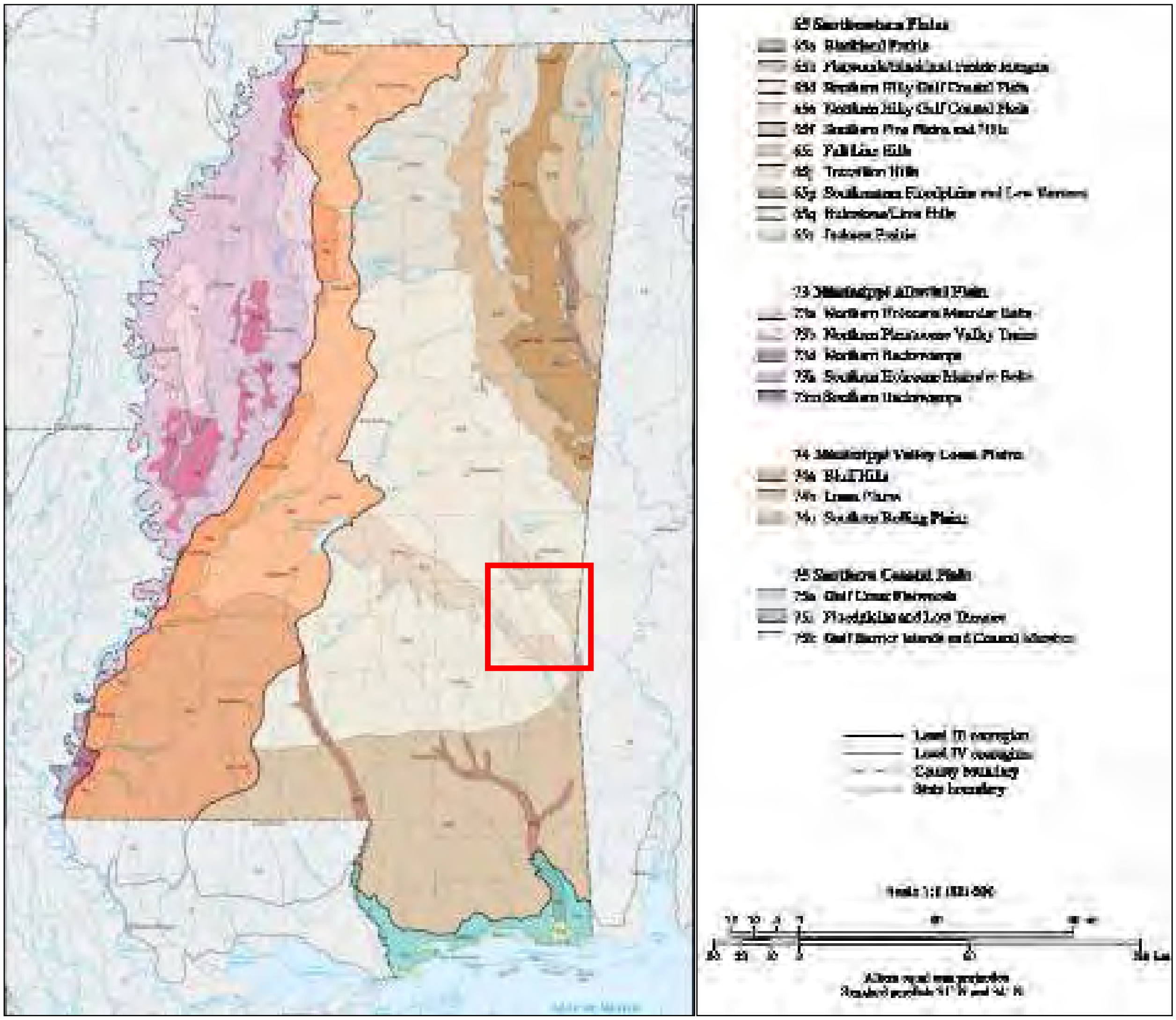
Based on historical information and the USGS susceptibility index, the probability of future landslide events is unlikely (less than 1 percent probability). The USGS data indicates that most areas in Clarke County have a low incidence rate and low susceptibly to landsliding activity. There are also some areas in the southwestern half of the county with moderate susceptibility to landsliding as well as additional areas with moderate incidence and high susceptibility. Local conditions may become more favorable for landslides due to heavy rain, for example. This would increase the likelihood of occurrence. It should also be noted that some areas in Clarke County have greater risk than others given factors such as steepness on slope and modification of slopes.

A.2.9 Land Subsidence

LOCATION AND SPATIAL EXTENT

Much of Clarke County is located in an area where the soil is substantially clay, causing a shrink and swell effect depending on the current conditions. Indeed, much of the area underlain by the calcareous Yazoo clay which, when combined with sand and marl, is highly susceptible to expansion when wet and shrinking when dry. These areas are denoted below in **Figure A.8**.

Figure A.8: MAP OF MISSISSIPPI SOILS



Source: http://www.eoearth.org/view/article/152119/

HISTORICAL OCCURRENCES

There is no significant historical record of land subsidence in Clarke County. However, local county officials have noted the impacts from these swings and changes in soil as roads and other infrastructure have experienced large cracks and breaks, causing stops in daily operations and significant costs to local, state, and federal budgets. Often the cost to repair this infrastructure can be in the range of millions of dollars depending on the degree of damage and necessity for quick repairs.

PROBABILITY OF FUTURE OCCURRENCES

The probability of future land subsidence events in the county is unlikely (less than 1 percent annual probability).

WIND-RELATED HAZARDS

A.2.10 Hurricane and Tropical Storm

LOCATION AND SPATIAL EXTENT

Hurricanes and tropical storms threaten the entire Atlantic and Gulf seaboard of the United States. While coastal areas are most directly exposed to the brunt of landfalling storms, their impact is often felt hundreds of miles inland and they can affect Clarke County. All areas in Clarke County are equally susceptible to hurricane and tropical storms.

HISTORICAL OCCURRENCES

According to the National Hurricane Center's historical storm track records, 57 hurricane or tropical storm/depression tracks have passed within 75 miles of the MEMA District 6 Region since 1855.[10] This includes: 1 Category 3 hurricane, 2 Category 2 hurricanes, 5 Category 1 hurricanes, 33 tropical storms, and 16 tropical depressions.

Of the recorded storm events, 35 hurricane or tropical storm/depression events traversed directly through the region as shown in **Figure A.9**. Notable storms include Hurricane Frederic (1979) and Hurricane Katrina (2005). **Table A.16** provides for each event the date of occurrence, name (if applicable), maximum wind speed (as recorded within 75 miles of the MEMA District 6 Region) and category of the storm based on the Saffir-Simpson Scale.

[10] These storm track statistics include tropical depressions, tropical storms, and hurricanes. Lesser events may still cause

significant local impact in terms of rainfall and high winds.

Figure A.9: HISTORICAL HURRICANE STORM TRACKS 1980 - 2021

Source: National Oceanic and Atmospheric Administration, National Hurricane Center

Table A.16: HISTORICAL STORM TRACKS WITHIN 75 MILES OF THE MEMA 6 DISTRICT REGION (1850–2020)

Date of Occurrence	Storm Name	Maximum Wind Speed (knots)	Storm Category
9/16/1855	UNNAMED	70	Category 1
9/15/1860	UNNAMED	70	Category 1
7/12/1872	UNNAMED	40	Tropical Storm
9/2/1879	UNNAMED	60	Tropical Storm
10/7/1879	UNNAMED	40	Tropical Storm
10/16/1879	UNNAMED	40	Tropical Storm
9/1/1880	UNNAMED	50	Tropical Storm
8/3/1881	UNNAMED	40	Tropical Storm
6/14/1887	UNNAMED	30	Tropical Depression
8/28/1890	UNNAMED	35	Tropical Storm
9/12/1892	UNNAMED	40	Tropical Storm
9/8/1893	UNNAMED	55	Tropical Storm
8/17/1895	UNNAMED	35	Tropical Storm
8/3/1898	UNNAMED	35	Tropical Storm
8/16/1901	UNNAMED	45	Tropical Storm
10/10/1905	UNNAMED	35	Tropical Storm
9/27/1906	UNNAMED	95	Category 2
9/22/1907	UNNAMED	35	Tropical Storm
6/13/1912	UNNAMED	50	Tropical Storm
7/17/1912	UNNAMED	25	Tropical Depression
9/14/1912	UNNAMED	50	Tropical Storm
9/30/1915	UNNAMED	60	Tropical Storm
7/6/1916	UNNAMED	80	Category 1
7/5/1919	UNNAMED	30	Tropical Depression
10/18/1923	UNNAMED	50	Tropical Storm
7/30/1926	UNNAMED	25	Tropical Depression
9/1/1932	UNNAMED	60	Tropical Storm
10/16/1932	UNNAMED	45	Tropical Storm
8/1/1936	UNNAMED	40	Tropical Storm
9/1/1937	UNNAMED	30	Tropical Depression
6/16/1939	UNNAMED	35	Tropical Storm
8/14/1939	UNNAMED	35	Tropical Storm
9/26/1939	UNNAMED	40	Tropical Storm
9/25/1940	UNNAMED	20	Tropical Depression
9/4/1948	UNNAMED	50	Tropical Storm
9/5/1949	UNNAMED	40	Tropical Storm
8/31/1950	BAKER	65	Category 1
6/1/1959	ARLENE	25	Tropical Depression
9/16/1960	ETHEL	35	Tropical Storm
9/26/1960	FLORENCE	15	Tropical Depression

Date of Occurrence	Storm Name	Maximum Wind Speed (knots)	Storm Category
8/18/1969	CAMILLE	100	Category 3
9/16/1971	EDITH	60	Tropical Storm
7/19/1977	UNNAMED	25	Tropical Depression
9/6/1977	BABE	30	Tropical Depression
7/11/1979	BOB	40	Tropical Storm
9/13/1979	FREDERIC	95	Category 2
8/12/1987	UNNAMED	25	Tropical Depression
8/27/1992	ANDREW	30	Tropical Depression
8/4/1995	ERIN	45	Tropical Storm
8/6/2001	BARRY	20	Tropical Depression
9/26/2002	ISIDORE	55	Tropical Storm
7/1/2003	BILL	45	Tropical Storm
7/11/2005	DENNIS	45	Tropical Storm
8/29/2005	KATRINA	80	Category 1
9/14/2007	HUMBERTO	20	Tropical Depression
8/24/2008	FAY	30	Tropical Depression
8/17/2009	CLAUDETTE	25	Tropical Depression
10/28/2020	Zeta	33	Tropical Depression

*It should be noted that the track of several major hurricanes that impacted the region fell outside of the 75-mile buffer. These storms were included in the table due to their significant impact. (Georges, 1988; Ivan, 2004; Issac, 2012)
Source: National Hurricane Center

Federal records indicate that disaster declarations were made in 1979 (Hurricane Frederic), 2004 (Hurricane Ivan), 2005 (Hurricane Dennis and Hurricane Katrina), and 2012 (Hurricane Issac). Hurricane and tropical storm events can cause substantial damage in the area due to high winds and flooding.

Flooding and high winds from hurricanes and tropical storms can cause damage throughout the county. Anecdotes are available from NCEI for the major storms that have impacted the county as found below:

Tropical Storm Isidore – September 26, 2002
The heavy rainfall associated with Tropical Storm Isidore resulted in significant river and flash flooding across much of Mississippi. Twenty-four-hour rainfall totals between 5 and 10 inches were common over much of Mississippi, especially in the southern part of the state, where 24-hour amounts exceeded 9 inches near Hattiesburg. Gradient wind gusts between 35 and 45 miles per hour combined with the saturated ground to lead to numerous downed trees and powerlines over the state. Most of the damage was seen along and east of the Natchez Trace, near the path of the storm's diffuse center. One indirect fatality was reported just east of the Kalem community in Scott County. Here, a falling tree struck a truck driven by a 31-year-old male. Damage from Isidore was an estimated $500,000.

Tropical Storm Bill – June 30 and July 1, 2003
Heavy rainfall with Tropical Storm Bill resulted in several reports of flash flooding. Forty-eight-hour rainfall totals ranged between 3 and 7 inches, mainly across SE portions of Mississippi. Gradient wind gusts between 30 and 40 mph combined with saturated soils to down numerous trees very close to center's track. Damage from Bill was an estimated $100,000.

Hurricane Ivan – September 16, 2004
Thousands of trees were blown down across Eastern Mississippi during Hurricane Ivan as well as hundreds of power lines. The strong wind itself did not cause much structural damage, however the fallen trees did. These downed trees accounted for several hundred homes, mobile homes and businesses to be damaged or destroyed. Most locations across Eastern Mississippi reported sustained winds between 30 and 40 mph with Tropical Storm force gusts between 48 and 54 mph. The strongest reported winds occurred in Newton, Lauderdale and Oktibbeha Counties.

Overall, rainfall totals were held in check as Ivan steadily moved north. The heaviest rains were confined to far Eastern Mississippi where 3 to 4 inches fell over a 15-hour period. Due to the duration of the rain no flooding was reported. Across Eastern Mississippi, Hurricane Ivan was responsible for one fatality. This fatality occurred in Brooksville (Noxubee County) when a tree fell on a man. Damage from Ivan was estimated at $200 million.

Tropical Storm Arlene – June 11, 2005
The western periphery of Tropical Storm Arlene affected far Eastern Mississippi during the evening and brought gusty winds and locally heavy rains to that portion of the state. Peak wind gusts were reported up to 40 mph and the combination of wet soils allowed for a few hundred trees to get blown down or uprooted. Several of the downed trees took down power lines and a small few landed on homes causing damage. Additionally, the counties across Eastern Mississippi received 3 to 5 inches of rain as Arlene lifted north.

Hurricane Dennis – July 10, 2005
Hurricane Dennis moved north-northwest across Southwest Alabama and then into East-Central Mississippi and finally across Northeast Mississippi. Wind gusts over tropical storm force were common across areas east of a line from Starkville to Newton to Hattiesburg. These winds caused several hundred trees to uproot or snap and took down numerous power lines. Additionally, a total of 21 homes or businesses sustained minor to major damage from fallen trees or gusty winds.

Heavy rainfall was not a major issue as Dennis steadily moved across the region. Rainfall totals between 2 and 5 inches fell across Eastern Mississippi over a
12-hour period. One indirect fatality occurred in Jasper County from an automobile accident due to wet roads.

Hurricane Katrina – August 29, 2005
Hurricane Katrina will likely go down as the worst and costliest natural disaster in United States history. The amount of destruction, the cost of damaged property/agriculture and the large loss of life across the affected region has been overwhelming. Catastrophic damage was widespread across a large portion of the Gulf Coast region. The devastation was not only confined to the coastal region, widespread and significant damage occurred well inland up to the Hattiesburg area and northward past Interstate 20.

Hurricane force winds were common across Central Mississippi. The region received sustained winds of 60-80 mph with gusts ranging from 80-120 mph. Wind damage to structures was widespread, with roofs blown off or partially peeled. Hundreds of signs were shredded or blown down. Many businesses sustained structural damage as windows were broken, roofs were blown off, and walls were collapsed. Millions of trees were uprooted and snapped. Power poles and lines were snapped and taken down from wind and trees. It was thousands of downed trees which caused the most significant structural damage as these trees fell onto homes and businesses. Power outages lasted from a few days to as long as four weeks. Agriculture and timber industries were severely impacted. Row crops, including cotton, rice, corn, and soybeans, took a hard hit. Other impacted industries were the catfish industry, dairy and cattle industry, and nursery businesses.

PROBABILITY OF FUTURE OCCURRENCES

Given the inland location of the county, it is more likely to be affected by remnants of hurricane and tropical storm systems (as opposed to a major hurricane) which may result in flooding or high winds. The probability of being impacted is less than coastal areas, but still remains a real threat to Clarke County due to induced events like flooding. Based on historical evidence, the probability level of future occurrence is likely (annual probability between 10 and 100 percent). Given the regional nature of the hazard, all areas in the county are equally exposed to this hazard. However, when the county is impacted, the damage could be catastrophic, threatening lives and property throughout the planning area.

A.2.11 Thunderstorm (wind, hail, lightning)

LOCATION AND SPATIAL EXTENT

Thunderstorm / High Wind

A thunderstorm event is an atmospheric hazard, and thus has no geographic boundaries. It is typically a widespread event that can occur in all regions of the United States. However, thunderstorms are most common in the central and southern states because atmospheric conditions in those regions are favorable for generating these powerful storms. It is assumed that Clarke County has uniform exposure to an event and the spatial extent of an impact could be large.

Hailstorm

Hailstorms frequently accompany thunderstorms, so their locations and spatial extents coincide. It is assumed that Clarke County is uniformly exposed to severe thunderstorms; therefore, all areas of the county are equally exposed to hail which may be produced by such storms.

Lightning

Lightning occurs randomly, therefore it is impossible to predict where and with what frequency it will strike. It is assumed that all of Clarke County is uniformly exposed to lightning.

HISTORICAL OCCURRENCES

Thunderstorm / High Wind

Severe storms were at least partially responsible for eight disaster declarations in Clarke County in 1979, 1990, 2003, 2011, 2016, 2019, and 2020. According to NCEI, there have been 289 reported thunderstorm and high wind events since 1971 in Clarke County. These events caused over $3.82 million in damages.

Table A.17 summarizes this information. **A.18** presents top thunderstorm and high wind event reports including date, magnitude, and associated damages for each event.

Table A.17: SUMMARY OF THUNDERSTORM / HIGH WIND OCCURRENCES IN CLARKE COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
CLARKE COUNTY TOTAL	**289**	**0/0**	**$3,823,000**

Source: National Centers for Environmental Information

Table A.18: HISTORICAL THUNDERSTORM / HIGH WIND OCCURRENCES IN CLARKE COUNTY

The following thunderstorm and high wind occurrences represent the top events in terms of property damage:

May 29th, 2005 –

A swath of wind damage occurred across portions of Clarke County from Pachuta to Quitman to Stonewall. Within this area several dozen trees were blown down with many blocking area roads. In Pachuta 1 tree damaged a vehicle and in Quitman one tree caused major damage to a house. Property damage was reported to be in excess of $400,000.

May 9th, 2006 –

A supercell thunderstorm developed just northwest of Newton, in Newton County, and tracked east and then east-southeast across southern Lauderdale and northern Clarke Counties. This long-lived supercell storm produced a swath of quarter to golf ball sized hail all along its path. Additionally, in northern Clarke County, near Highway 45, the rear flank downdraft of this storm downed several trees and blew a carport off a house. A few of the downed trees fell on a home causing significant damage. The storm held its intensity as it moved into Choctaw County Alabama with a reported $150,000 in property damage occurring in Clarke County.

May 3rd, 2009 –

Early on the 3rd, clusters of severe storms evolved into a line which produced scattered wind damage as it pushed east along and just north of I-20. An outflow boundary pushed out of this line and provided the focus for the second powerful and significant severe event.

Between 8 am and 1 pm, a Derecho evolved and raced east across the southern half of the forecast area at 60 to 70 mph. A Derecho is defined as a long-lived windstorm, usually a large bow echo, which has a width of 40 to 250 miles and covers a long distance, typically one to three states. This large bowing squall line brought intense straight-line winds and widespread damage across its swath. Some of the wind speeds within this Derecho ranged between 80 and 95 mph. There were numerous reports of trees down as well as downed power lines, which caused widespread power outages in many locations. Many structures were damaged by either fallen trees or just the wind itself. Scattered reports of hail and a few tornadoes also occurred. Property damage in Clarke County was in excess of $640,000.

April 4th, 2011 –

A powerful storm system took shape across the central United States and clashed with a warm and unstable airmass. An extensive and intense squall line resulted which quickly pushed eastward across the eastern half of the country. Overall, this system produced a large severe weather outbreak and brought widespread wind damage to multiple states across the south, mid-south, and southeast United States. Nearly 1500 reports of severe weather were reported, across 15 states, with the vast majority being damaging winds. Wind damage was not the only severe weather event type, large hail and tornadoes were also part of the

mix. In terms of total events (severe weather reports), this outbreak is one of the largest in the United States.
Across the National Weather Service Jackson forecast area, numerous reports of down trees and power lines were reported along with multiple reports of damaged structures. These structures were damaged by either fallen trees or intense winds. Survey teams found 5 tornadoes across the area, two of which were rated EF2. The first strong tornado moved into northwest Catahoula Parish from LaSalle Parish. The other strong tornado occurred across Tensas Parish and tracked to the MS River, crossed the river and dissipated in far northwest Claiborne County. The other three tornadoes were rated EF1. One of these occurred just north of Utica, in Hinds County, another tracked across northern Simpson County near Braxton, and the other across southeast Lincoln and southern Lawrence Counties. Property damage in Clarke County was reported to be over $200,000.

Hailstorm
According to the National Centers for Environmental Information, 108 recorded hailstorm events have affected Clarke County since 1966. **Table A.19** is a summary of the hail events in Clarke County. **A.20** provides detailed information about top events that occurred in the county. In all, hail occurrences resulted in approximately $450,000 in property damages. Hail ranged in diameter from 0.75 inches to 4.25 inches. It should be noted that hail is notorious for causing substantial damage to cars, roofs, and other areas of the built environment that may not be reported to the National Centers for Environmental Information. Therefore, it is likely that damages are greater than the reported value.

Table A.19: SUMMARY OF HAIL OCCURRENCES IN CLARKE COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
CLARKE COUNTY TOTAL	**108**	**0/0**	**$398,000**

Source: National Centers for Environmental Information

Table A.20: HISTORICAL HAIL OCCURRENCES IN CLARKE COUNTY

March 5th, 1998 –
The largest diameter hail reported for this event was 1.75 in. and caused a reported $100,000 in damages to roofs and automobiles.
May 9th, 2006 –
A supercell thunderstorm developed just northwest of Newton, in Newton County, and tracked east and then east-southeast across southern Lauderdale and northern Clarke Counties. This long-lived supercell storm produced a swath of quarter to golf ball sized hail all along its path. Additionally, in northern Clarke County, near Highway 45, the rear flank downdraft of this storm downed several trees and blew a carport off a house. A few of the downed trees fell on a home causing significant damage. The storm held its intensity as it moved into Choctaw County Alabama. Property damage was reported to be $50,000.
April 15th, 2011 –
A significant severe weather event and tornado outbreak affected portions of central Mississippi, southeastern Arkansas, and northeastern Louisiana on April 15th. This event evolved slowly and brought multiple rounds of severe storms to the region between 3 am and 9 pm. A total of 15 tornadoes occurred during this event with 3 being of the strong variety (EF2 or EF3). In addition, numerous reports of damaging straight-line winds occurred as well as instances of large hail. Some of the strongest storms produced hail from golf ball to baseball size. There were two reports of softball sized hail as well, one in Clarke County and the other in Kemper County. In addition to the severe storms, significant flash flooding occurred over northern portions of central Mississippi. A swath of golf ball to softball sized hail fell across west central Clarke County causing $125,000 in property damage. The largest diameter hail was reported to be 4.25 in.

Lightning

According to the National Centers for Environmental Information, there has been seven recorded lightning events in Clarke County since 2014. This event did not result in any reported damages, as listed in summary **Table A.21**. However, lightning has caused one fatality in the county. Detailed information on historical lightning events can be found in **Table A.22**.

It is certain that more than one event has impacted the county. Many of the reported events are those that cause damage, and it should be expected that damages are likely much higher for this hazard than what is reported.

Table A.21: SUMMARY OF LIGHTNING OCCURRENCES IN CLARKE COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Enterprise	0	0/0	$0
Pachuta	0	0/0	$0
Quitman	0	0/0	$0
Shubuta	0	0/0	$0
Stonewall	0	0/0	$0
Unincorporated Area	7	1/0	$237,000
CLARKE COUNTY TOTAL	**7**	**1/1**	**$237,000**

Source: National Centers for Environmental Information

Table A.22: HISTORICAL LIGHTNING OCCURRENCES IN CLARKE COUNTY

Location	Date	Deaths / Injuries	Property Damage	Details
Enterprise				
None Reported	--	--	--	--
Pachuta				
None Reported	--	--	--	--
Quitman				
None Reported	--	--	--	--
Shubuta				
None Reported	--	--	--	--
Stonewall				
None Reported	--	--	--	--
Unincorporated Area				
DE SOTO	7/11/2014	1/0	$0	A 23-year-old female was struck and killed by a lightning strike while riding a horse.
QUITMAN CLARK	8/8/2015	0/0	$100,000	
SABLE	8/10/2018	0/1	$0	An adult male was struck by lightning while driving south on Highway 45.
DE SOTO	8/18/2018	0/0	$2,000	
SYKES	12/27/2018	0/0	$100,000	
PINE RIDGE	8/14/2019	0/0	$15,000	
SABLE	8/11/2020	0/0	$20,000	

PROBABILITY OF FUTURE OCCURRENCES

Thunderstorm / High Wind
Given the high number of previous events, it is certain that thunderstorm events, including straight-line wind events, will occur in the future. This results in a probability level of highly likely (100 percent annual probability) for the entire county.

Hailstorm
Based on historical occurrence information, it is assumed that the probability of future hail occurrences is highly likely (100 percent annual probability). Since hail is an atmospheric hazard, it is assumed that Clarke County has equal exposure to this hazard. It can be expected that future hail events will continue to cause minor damage to property and vehicles throughout the county.

Lightning
Although there was not a high number of historical lightning events reported in Clarke County via NCEI data, it is a regular occurrence accompanied by thunderstorms. In fact, lightning events will assuredly happen on an annual basis, though not all events will cause damage. According to Vaisala's U.S. National Lightning Detection Network (NLDN), Clarke County is located in an area of the country that experienced an average of 4 to 6 cloud-to-ground lightning flashes per square kilometer per year between 2015 and 2019.[6] Therefore, the probability of future events is highly likely (100 percent annual probability). It can be expected that future lightning events will continue to threaten life and cause minor property damages throughout the county.

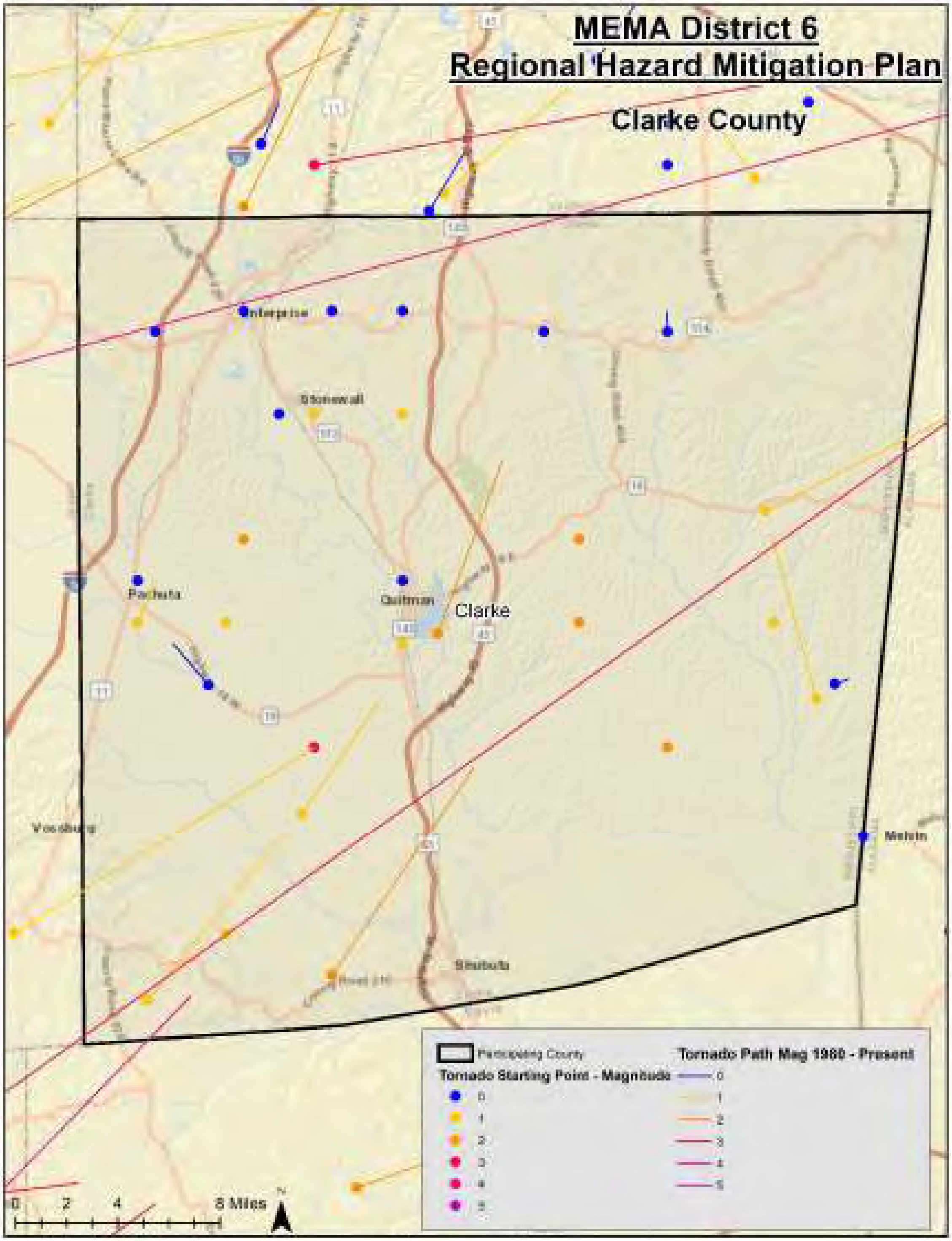
A.2.12 Tornado

LOCATION AND SPATIAL EXTENT

Tornadoes occur throughout the state of Mississippi, and thus in Clarke County. Tornadoes typically impact a relatively small area, but damage may be extensive. Event locations are completely random and it is not possible to predict specific areas that are more susceptible to tornado strikes over time. Therefore, it is assumed that Clarke County is uniformly exposed to this hazard. With that in mind, **Figure A.10** shows tornado track data for many of the major tornado events that have impacted the county. While no definitive pattern emerges from this data, some areas that have been impacted in the past may be potentially more susceptible in the future.

[6] Vaisala's Annual Lightning Report – 2020. Retrieved on 9.8.2021 from:
https://www.vaisala.com/sites/default/files/documents/WEA-MET-Annual-Lightning-Report-2020-B212260EN-A.pdf

Figure A.10: HISTORICAL TORNADO TRACKS IN CLARKE COUNTY



Source: National Weather Service Storm Prediction Center

HISTORICAL OCCURRENCES

Tornadoes were at least partially responsible for five disaster declarations in Clarke County in 1973, 1979, 1990, 2003, 2011, 2019, and 2020. According to the National Centers for Environmental Information, there have been a total of 39 recorded tornado events in Clarke County since 1957 (**Table A.23**), resulting in over $28.524 million in property damages. In addition, 4 fatalities and 26 injuries were reported. The magnitude of these tornadoes ranges from F0 to F4 and EF0 to EF4 in intensity, although an EF5 event is possible. Detailed information on historic tornado events can be found in **Table A.24**.

Table A.23: SUMMARY OF TORNADO OCCURRENCES IN CLARKE COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
CLARKE COUNTY TOTAL	**39**	**4/26**	**$28,524,000**

Source: National Centers for Environmental Information

Table A.24: HISTORICAL TORNADO IMPACTS IN CLARKE COUNTY

February 28th, 1987 –
An F4 tornado touched down near Moselle, Mississippi and grew to a width of 2 miles as it passed near Laurel. The tornado traveled a distance of 40 miles killing six people, injuring 350 others, and causing $25 million in damages. The tornado ended in Clarke County.

April 27th, 2011 –
A historic outbreak of tornadoes across the Ark-La-Miss began late on Tuesday, April 26th continuing into the early morning hours of Wednesday, April 27th. The event ramped up again during the early afternoon of April 27th continuing into the early evening. The activity on April 26th began as supercell thunderstorms producing large hail and tornadoes across northeast Texas and portions of Arkansas before evolving into a squall line as it moved east. Through the rest of the afternoon multiple tornadoes developed, stemming from multiple supercell storms. Nearly all of the storms produced tornadoes, with many of them long track and significant. The other violent tornado to impact the Jackson, MS forecast area occurred across Smith, Jasper, and Clarke Counties. This tornado continued into Alabama and had a total path length of 124 miles across both states. Loss of life during this historic event was staggering. Unfortunately, 321 people lost their lives making this the second deadliest tornado outbreak in U.S. history. Over $900,000 in property damage occurred in Clarke County.

February 5th, 2020 –
This long track tornado affected the counties of Jasper, Clarke and Lauderdale. This tornado began in Jasper County south of Bay Springs along County Road 9, where it snapped several softwood trees and some minor peeling of the tin roof of a home also occurred. It progressed northeast and crossed MS Highway 15 where it snapped a few softwood trees. The snapping and uprooting of softwood trees continued as it crossed US Highway 18, and then moved into Clarke County resulting in multiple snapped and uprooted trees, severely damaging a carport and causing damage to portions of a one-story home along US Highway 513. As the tornado neared Enterprise, it continued to snap and uproot numerous softwood trees thus causing them to fall onto cars and take down several power poles along County Road 360 and US Highway 11. Along US Highway 11 North, as the tornado neared Lauderdale County, it took off a large section of a one-story home. This tornado caused $500,000 in damages.

PROBABILITY OF FUTURE OCCURRENCES

According to historical information, tornado events pose a significant threat to Clarke County. The probability of future tornado occurrences affecting Clarke County is likely (between 10 and 100 percent annual probability).

A.2.13 Hazardous Materials Incidents

LOCATION AND SPATIAL EXTENT

Clarke County has one TRI site. This site is shown in **Figure A.11.**

Figure A.11: TOXIC RELEASE INVENTORY (TRI) SITES IN CLARKE COUNTY

Source: Environmental Protection Agency

In additional to “fixed” hazardous materials locations, hazardous materials may also impact the county via roadways and rail. Many roads in the county are subject to hazardous materials transport and all roads that permit hazardous material transport are considered potentially at risk to an incident.

HISTORICAL OCCURRENCES

There has been a total of eight recorded HAZMAT incidents in Clarke County since 1977 (**Table A.25**). These events resulted in more than $404,000 in property damage. **Table A.26** presents detailed information on historic HAZMAT incidents in Clarke County as reported by the U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA).

Table A.25: SUMMARY OF HAZMAT INCIDENTS IN CLARKE COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Enterprise	1	0/0	$70,353
Pachuta	5	0/0	$333,836
Quitman	2	0/0	$73
Shubuta	0	0/0	$0
Stonewall	0	0/0	$0
Unincorporated Area	0	0/0	$0
CLARKE COUNTY TOTAL	**8**	**0/0**	**$404,262**

Source: United States Department of Transportation Pipeline and Hazardous Materials Safety Administration

Table A.26: HAZMAT INCIDENTS IN CLARKE COUNTY

Report Number	Date	City	Mode	Serious Incident?	Fatalities/ Injuries	Damages ($)*	Quantity Released
Enterprise							
I-1993060965	6/3/1993	ENTERPRISE	Highway	No	0/0	$70,353	100 LGA
Pachuta							
I-1980090269	8/18/1980	PACHUTA	Highway	No	0/0	$0	1 LGA
I-1987050207	4/28/1987	PACHUTA	Highway	No	0/0	$0	3 LGA
I-1988070398	7/4/1988	PACHUTA	Highway	No	0/0	$0	65 LGA
E-2013120282	12/2/2013	PACHUTA	Highway	No	0/0	$0	2 LGA
E-2014100659	9/17/2014	PACHUTA	Highway	Yes	0/0	$333,836	2,730 LGA
Quitman							
I-1977081726	8/10/1977	QUITMAN	Highway	No	0/0	$0	15 LGA
I-1998061053	4/7/1998	QUITMAN	Highway	No	0/0	$73	2 LGA
Shubuta							
None Reported	--	--	--	--	--	--	--
Stonewall							
None Reported	--	--	--	--	--	--	--
Unincorporated Area							
None Reported	--	--	--	--	--	--	--

Source: United States Department of Transportation Pipeline and Hazardous Materials Safety Administration

PROBABILITY OF FUTURE OCCURRENCES

Given the location of one toxic release inventory site in Clarke County and prior roadway incidents, it is likely (between 10 and 100 percent annual probability) that a hazardous material incident may occur in the county. County and town officials are mindful of this possibility and take precautions to prevent such an event from occurring. Furthermore, there are detailed plans in place to respond to an occurrence.

A.2.14 Pandemic

LOCATION AND SPATIAL EXTENT

Pandemics are global in nature. However, they may start anywhere. Clarke County chose to analyze this hazard given the agriculture in the area and potential for this kind of event to occur in any location at any time.

All populations should be considered at risk to pandemic. Buildings and infrastructure are not directly impacted by the virus/pathogen but could be indirectly impacted if people are not able to operate and maintain them due to illness. Many buildings may be shutdown, at least temporarily, as a result. Employers may initiate work from home procedures for non-essential workers in order to help stop infection. Commerce activities, and thus the economy, may suffer greatly during this time.

HISTORICAL OCCURRENCES

Several pandemics have been reported throughout history. A short history of the flu/Spanish Flu was collected from The Historical Text Archive and is described below.

The first known pandemic dates back to 430 B.C. with the Plague of Athens. It reportedly killed a quarter of the population over four years due to typhoid fever. In 165-180 A.D., the Antonine Plague killed nearly 5 million people. Next, the Plague of Justinian (the first bubonic plague pandemic) occurred from 541 to 566. It killed 10,000 people a day at its peak and resulted in a 50 percent drop in Europe's population. Since the 1500s, influenza pandemics have occurred about three times every century or roughly every 10 to 50 years. The Black Death devastated European populations in the 14th century. Nearly a third of the population (20-30 million) was killed over six years. From 1817 to present, seven Cholera Pandemics have impacted to the world and killed millions. Perhaps most severe, was the Third Cholera Pandemic (1852-1959) which started in China. Isolated cases can still be found in the Western U.S. today. There were three major pandemics in the 20th century (1918-1919, 1957-1958, and 1968-1969). The most infamous pandemic flu of the 20th century, however, was that of 1918-1919. Since the 1960s, there has only been one pandemic, the 2009 H1N1 influenza. The pandemics of the 20th and 21st centuries that impacted the United States are detailed below.

1918 Spanish Flu: This was the most devastating flu of the 20th century. This pandemic spread across the world in three waves between 1918 and 1919. It typically impacted areas for around twelve weeks and then would largely disappear. However, it would frequently reemerge several months later. Worldwide, approximately 50 million persons died and over a quarter of the population was infected. Nearly 675,000 people died in the United States. The illness came on suddenly and could cause death within a few hours. The virus impacted those aged 15 to 35 especially hard. The movement of troops during World War I is thought to have facilitated the spread of the virus.

In Mississippi, state officials noted that "epidemics have been reported from a number of places in the State," on October 4th, 1918. By the 18th, twenty-six localities reported 1,934 cases (the real number of cases was likely much higher). West Point, Mississippi was hit especially hard and quarantine was established. Throughout the state, African Americans were impacted at a greater rate than white populations. This is thought to be partly caused from a shortage of caretakers. It is estimated that over 6,000 people died in Mississippi, though that number may be much higher as death records were not widely recorded.

1957 Asian Flu: It is estimated that the Asian Flu caused 2 million deaths worldwide. Approximately 70,000 deaths were in the U.S. However, the proportion of people impacted was substantially higher than that of the Spanish Flu. This flu was characterized as having much milder effects than the Spanish Flu and greater survivability. Similar to other pandemics, this pandemic has two waves. Elderly and infant populations were more likely to succumb to death. This flu is thought to have originated from a genetic mutation of a bird virus.

1968 Hong Kong Flu: The Hong Kong Flu is thought to have caused one million deaths worldwide. It was milder than both the Asian and Spanish influenza viruses. It was similar to the Asian Flu, which may have provided some immunity to the virus. It had the most severe impact on elderly populations.

2009 H1N1 Influenza: This flu was derived from human, swine, and avian virus strains. It was initially reported in Mexico in April 2009. On April 26, the U.S. government declared H1N1 a public health emergency. A vaccine was developed and over 80 million were vaccinated which helped minimize the impacts. The virus had mild impacts on most of the population but did cause death (usually from viral pneumonia) in high-risk populations such as pregnant women, obese persons, indigenous people, and those with chronic respiratory, cardiac, neurological, or immunity conditions. Worldwide, it is estimated that 43 million to 89 million people contracted H1N1 between April 2009 and April 2010, and between 8,870 and 18,300 H1N1 cases resulted in death.

2020 SARS-CoV-2 (COVID-19): Coronavirus Disease 2019 (COVID-19) was declared as pandemic by the World Health Organization on March 11th, 2020 mainly due to the speed and scale of the transmission of the disease. Prior to that, it started as an epidemic in mainland China with the focus being firstly reported in the city of Wuhan, Hubei province on February 26th, 2020. The etiologic agent of COVID-19 was isolated and identified as a novel coronavirus, initially designated as 2019-nCoV. Later, the virus genome was sequenced and because it was genetically related to the coronavirus outbreak responsible for the SARS outbreak of 2003, the virus was named as severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) by the International Committee for Taxonomy of Viruses.

There is a considerable amount of data on the extent of COVID-19 throughout the State of Mississippi and Clarke County. The number of reported cases and deaths across the State of Mississippi and Clarke County are shown in the figure below.

Figure 12: COVID-19 Cases as of 08/01/2021[7]

	Cases	Deaths
Mississippi	348,496	7,556
Clarke County	1,881	80

[7] Mississippi State Department of Health. *COVID-19 Dashboard*. Retrieved from: https://msdh.ms.gov/msdhsite/_static/14,0,420.html

In addition to the pandemics above, there have been several cases of pandemic threats, some of which reached epidemic levels. They were contained before spreading globally. Examples include Smallpox, Polio, Tuberculosis, Malaria, AIDS, SARS and Yellow Fever. Advances in medicine and technology have been instrumental in containing the spread of viruses in recent history.

In addition to the pandemics above, there have been several cases of pandemic threats, some of which reached epidemic levels. They were contained before spreading globally. Examples include Smallpox, Polio, Tuberculosis, Malaria, AIDS, SARS and Yellow Fever. Advances in medicine and technology have been instrumental in containing the spread of viruses in recent history.
It is notable that no birds have been infected with Avian Flu in North and South America.

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that all of Clarke County has a probability level of unlikely (less than 1 percent annual probability) for future pandemics events. While pandemic can have devastating impacts, they are relatively rare.
The Mississippi State Department of Health maintains a state pandemic plan which can be found here: http://www.msdh.state.ms.us/msdhsite/index.cfm/44,1136,122,154,pdf/SNSPlan.pdf

A.2.15 Conclusions on Hazard Risk

The hazard profiles presented in this section were developed using best available data and result in what may be considered principally a qualitative assessment as recommended by FEMA in its "How-to" guidance document titled *Understanding Your Risks: Identifying Hazards and Estimating Losses* (FEMA Publication 386-2). It relies heavily on historical and anecdotal data, stakeholder input, and professional and experienced judgment regarding observed and/or anticipated hazard impacts. It also carefully considers the findings in other relevant plans, studies, and technical reports.

HAZARD EXTENT

Table A.27 describes the extent of each natural hazard identified for Clarke County. The extent of a hazard is defined as its severity or magnitude, as it relates to the planning area.

Table A.27: EXTENT OF CLARKE COUNTY HAZARDS

Flood-related Hazards	
Flood	Flood extent can be measured by the amount of land and property in the floodplain as well as flood height and velocity. The amount of land in the floodplain accounts for 16.3 percent of the total land area in Clarke County. Flood depth and velocity are recorded via United States Geological Survey stream gages throughout the region. While a gage does not exist for each participating jurisdiction, there is one at or near many areas. The greatest peak discharge recorded for the county was at the Chickasawhay River at Shubuta in April 1900. Water reached a discharge of 90,000 cubic feet per second and the stream gage height was recorded at 47.90 feet.
Erosion	The extent of erosion can be defined by the measurable rate of erosion that occurs. There are no erosion rate records located in Clarke County.
Dam Failure	Dam Failure extent is defined using the Mississippi Department of Environmental Quality criteria (Table 5.7). No dams are classified as high-hazard in Clarke County.
Winter Storm and Freeze	The extent of winter storms can be measured by the amount of snowfall received (in inches). Official long term snow records are not kept for any areas in Clarke County. However, the greatest snowfall reported in Meridian (north of the county) was 14.0 inches in 1963.

Fire-related Hazards	
Drought / Heat Wave	Drought extent is defined by the U.S. Drought Monitor Classifications which include Abnormally Dry, Moderate Drought, Severe Drought, Extreme Drought, and Exceptional Drought. According to the U.S. Drought Monitor Classifications, the most severe drought condition is Exceptional. Clarke County has received this ranking twice over the 15-year reporting period. The extent of extreme heat can be measured by the record high temperature recorded. Official long term temperature records are not kept for any areas in Clarke County. However, the highest recorded temperature in Meridian (north of the county) was 107°F in 1980.
Wildfire	Wildfire data was provided by the Mississippi Forestry Commission and is reported annually by county from 2005-2014. The greatest number of fires to occur in Clarke County in any year 75 in 2006. The greatest number of acres to burn in the county in a single year occurred in 2006 when 1,057 acres were burned. Although this data lists the extent that has occurred, larger and more frequent wildfires are possible throughout the county.
Geologic Hazards	
Earthquake	Earthquake extent can be measured by the Richter Scale (Table 5.16), the Modified Mercalli Intensity (MMI) scale (Table 5.17), and the distance of the epicenter from Clarke County. According to data provided by the National Geophysical Data Center, the greatest earthquake to impact the county was reported in Enterprise with a MMI of II (feeble), an unknown magnitude, and 829 km away from the epicenter.
Landslide	As noted above in the landslide profile, there is no extensive history of landslides in Clarke County and landslide events typically occur in isolated areas. This provides a challenge when trying to determine an accurate extent for the landslide hazard. However, when using the USGS landslide susceptibility index, extent can be measured with incidence, which is low throughout the majority of the county, except for some areas of moderate incidence in the southwestern half. There is also low susceptibility throughout most of the county, except for some areas in the southwestern portion which have moderate and high susceptibility.
Land Subsidence	The extent of land subsidence can be defined by the measurable rate of subsidence that occurs. There are no subsidence rate records located in Clarke County nor is there any significant historical record of events.
Wind-related Hazards	
Hurricane and Tropical Storm	Hurricane extent is defined by the Saffir-Simpson Scale which classifies hurricanes into Category 1 through Category 5 (Table 5.20). The greatest classification of hurricane to traverse directly through Clarke County was Hurricane Frederic, a Category 2 storm which carried tropical force winds of 95 knots upon arrival in the county.

Thunderstorm / Hail / Lightning	Thunderstorm extent is defined by the number of thunder events and wind speeds reported. According to a 65-year history from the National Centers for Environmental Information, the strongest recorded wind event in Clarke County was last reported on May 3, 2009 at 72 knots (approximately 83 mph). It should be noted that future events may exceed these historical occurrences. Hail extent can be defined by the size of the hail stone. The largest hail stone reported in Clarke County was 4.25 inches (reported on April 15, 2011). It should be noted that future events may exceed this. According to the Vaisala's flash density map (Figure 5.17), Clarke County is located in an area that experiences 6 to 8 lightning flashes per square kilometer per year. It should be noted that future lightning occurrences may exceed these figures.
Tornado	Tornado hazard extent is measured by tornado occurrences in the US provided by FEMA (Figure 5.18) as well as the Fujita/Enhanced Fujita Scale (Tables 5.27 and 5.28). The greatest magnitude reported in Clarke County was an F4 (reported on February 28, 1987).
Other Hazards	
Hazardous Materials Incident	According to USDOT PHMSA, the largest hazardous materials incident reported in Clarke County was 2,730 LGA released on the highway (reported on September 17, 2014). It should be noted that larger events are possible.
Pandemic	While pandemics remain to be rare occurrences overall, it cannot be ignored that as of the drafting of this plan the world continues to be engulfed by the COVID-19 Pandemic.

PRIORITY RISK INDEX RESULTS

In order to draw some meaningful planning conclusions on hazard risk for Clarke County, the results of the hazard profiling process were used to generate countywide hazard classifications according to a "Priority Risk Index" (PRI). More information on the PRI and how it was calculated can be found in Section 5.16.2.

Table A.28 summarizes the degree of risk assigned to each category for all initially identified hazards based on the application of the PRI. Assigned risk levels were based on the detailed hazard profiles developed for this section, as well as input from the Regional Hazard Mitigation Council. The results were then used in calculating PRI values and making final determinations for the risk assessment.

Table A.28: SUMMARY OF PRI RESULTS FOR CLARKE COUNTY

Hazard	Category/Degree of Risk					
	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score
Flood-related Hazards						
Flood	Likely	Critical	Moderate	6 to 12 hours	Less than 24 hours	**2.9**
Erosion	Possible	Minor	Small	More than 24 hours	More than 1 week	**1.8**
Dam Failure	Possible	Critical	Small	Less than 6 hours	Less than 6 hours	**2.4**
Winter Storm and Freeze	Likely	Limited	Moderate	More than 24 hours	Less than 24 hours	**2.4**
Fire-related Hazards						
Drought / Heat Wave	Likely	Minor	Large	More than 24 hours	More than 1 week	**2.5**
Wildfire	Highly Likely	Minor	Small	Less than 6 hours	Less than 1 week	**2.6**
Geologic Hazards						
Earthquake	Possible	Minor	Moderate	Less than 6 hours	Less than 6 hours	**2.0**
Landslide	Unlikely	Minor	Small	Less than 6 hours	Less than 6 hours	**1.5**
Land Subsidence	Unlikely	Minor	Small	Less than 6 hours	Less than 6 hours	**1.5**
Wind-related Hazards						
Hurricane and Tropical Storm	Likely	Critical	Large	More than 24 hours	Less than 24 hours	**2.9**
Thunderstorm Wind / High Wind	Highly Likely	Critical	Moderate	6 to 12 hours	Less than 6 hours	**3.1**
Hailstorm	Highly Likely	Limited	Moderate	6 to 12 hours	Less than 6 hours	**2.8**
Lightning	Highly Likely	Limited	Negligible	6 to 12 hours	Less than 6 hours	**2.4**
Tornado	Likely	Catastrophic	Small	Less than 6 hours	Less than 6 hours	**3.0**
Other Hazards						
Hazardous Materials Incident	Likely	Limited	Small	Less than 6 hours	Less than 24 hours	**2.5**
Pandemic	Unlikely	Catastrophic	Large	More than 24 hours	More than 24hrs	**2.8**

A.2.16 Final Determinations on Hazard Risk

The conclusions drawn from the hazard profiling process for Clarke County, including the PRI results and input from the Regional Hazard Mitigation Council, resulted in the classification of risk for each identified hazard according to three categories: High Risk, Moderate Risk, and Low Risk (**Table A.29**). For purposes of these classifications, risk is expressed in relative terms according to the estimated impact that a hazard will have on human life and property throughout all of Clarke County. A more quantitative analysis to estimate potential dollar losses for each hazard has been performed separately, and is described in Section 6: *Vulnerability Assessment* and below in Section A.3. It should be noted that although some hazards are classified below as posing low risk, their occurrence of varying or unprecedented magnitudes is still possible in some cases and their assigned classification will continue to be evaluated during future plan updates.

Table 29: CONCLUSIONS ON HAZARD RISK FOR CLARKE COUNTY

HIGH RISK	Thunderstorm Wind / High Wind Tornado Flood Hurricane and Tropical Storm Hailstorm Pandemic
MODERATE RISK	Wildfire Drought / Heat Wave Hazardous Materials Incident Dam and Levee Failure Winter Storm and Freeze Lightning
LOW RISK	Earthquake Erosion Landslide Land Subsidence

A.3 CLARKE COUNTY VULNERABILITY ASSESSMENT

This subsection identifies and quantifies the vulnerability of Clarke County to the significant hazards previously identified. This includes identifying and characterizing an inventory of assets in the county and assessing the potential impact and expected amount of damages caused to these assets by each identified hazard event. More information on the methodology and data sources used to conduct this assessment can be found in Section 6: *Vulnerability Assessment*.

A.3.1 Asset Inventory

The following table lists the fire stations, police stations, emergency operations centers (EOCs), medical care facilities, and schools located in Clarke County according to Hazus-MH Version 2.2.

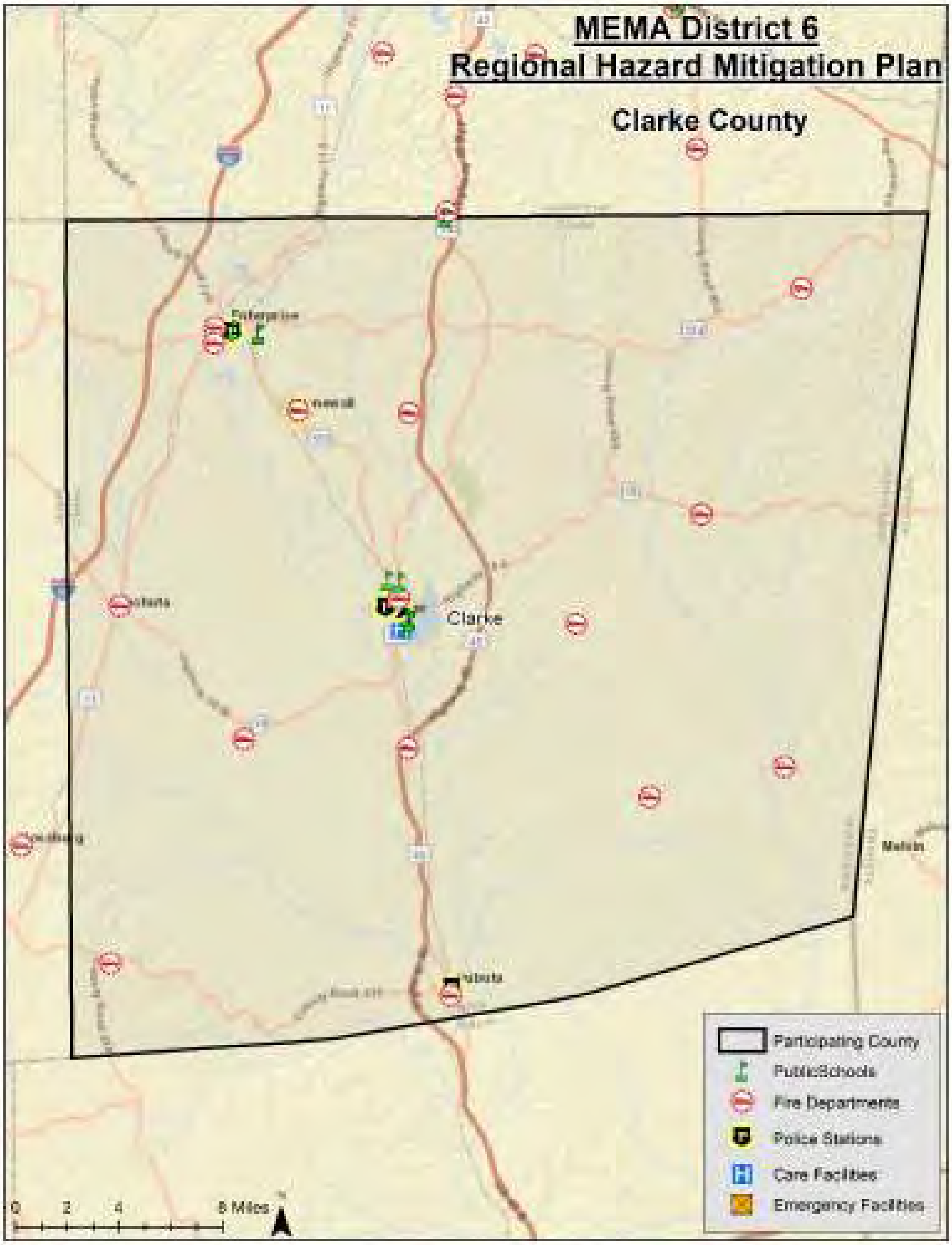
In addition, the figure below shows the locations of critical facilities in Clarke County. At the end of this subsection, shows a complete list of the critical facilities by name, as well as the hazards that affect each facility. As noted previously, this list is not all-inclusive and only includes information provided through Hazus.

Table A.30: CRITICAL FACILITY INVENTORY IN CLARKE COUNTY

Location	Fire Stations	Police Stations	Medical Care Facilities	EOC	Schools
Enterprise	2	1	1	0	3
Pachuta	2	0	0	0	0
Quitman	7	2	1	1	6
Shubuta	2	1	1	0	0
Stonewall	1	1	0	0	0
Unincorporated Area	0	0	0	0	0
ASSET VALUATION	**$32,048,232**	**$11,465,772**	**N/A**	**$2,293,154**	**$58,718,113**
CLARKE COUNTY TOTAL	**14**	**5**	**3**	**1**	**9**

Source: Hazus-MH 2.2

Figure A.13: CRITICAL FACILITY LOCATIONS IN CLARKE COUNTY



Source: Hazus-MH 2.2

A.3.2 Social Vulnerability

In addition to identifying those assets potentially at risk to identified hazards, it is important to identify and assess those particular segments of the resident population in Clarke County that are potentially at risk to these hazards.

Table A.32 lists the population by jurisdiction according to U.S. Census 2010 population estimates. The total population in Clarke County according to Census data is 16,732 persons. Additional population estimates are presented above in Section A.1.

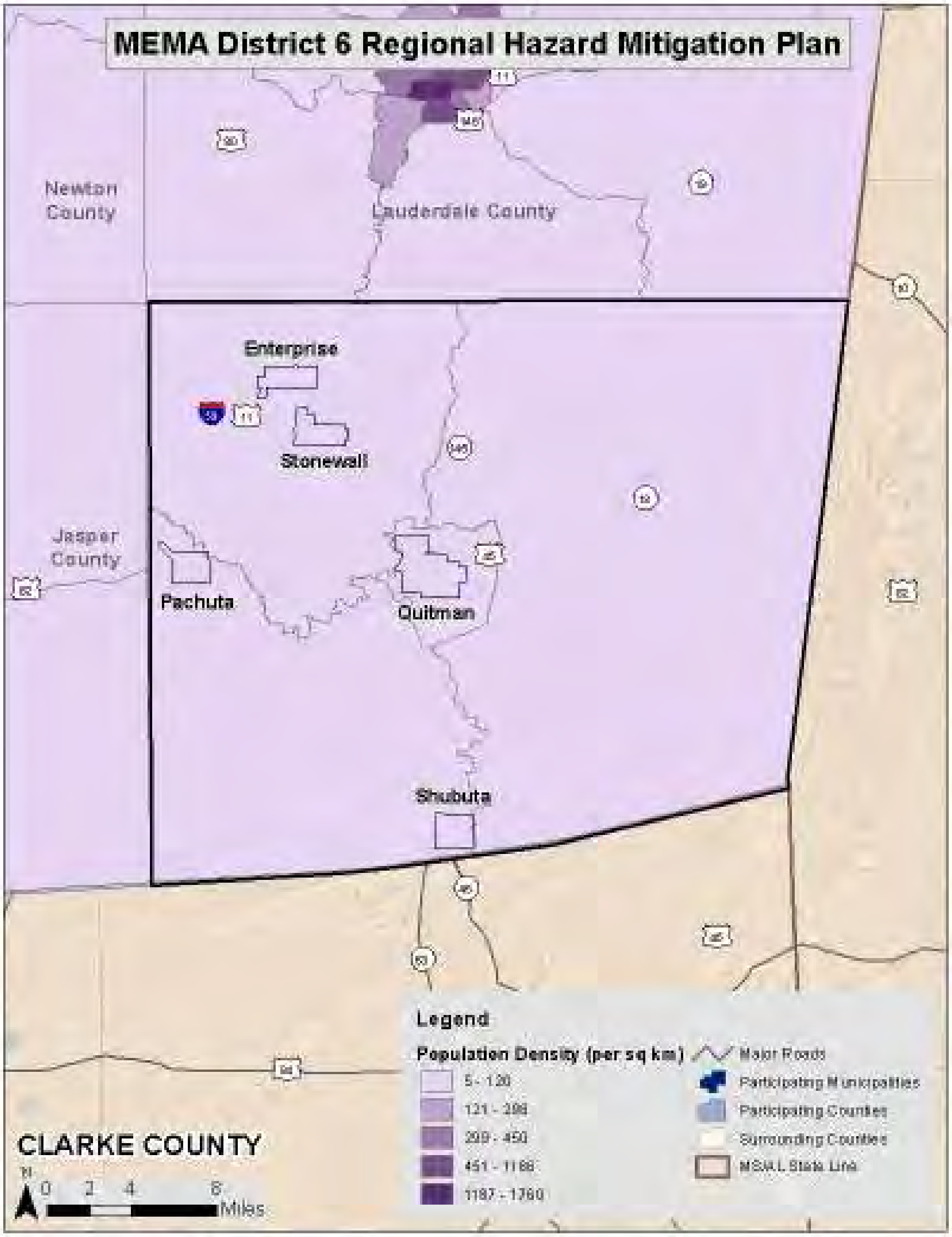
Table A.31: TOTAL POPULATION IN CLARKE COUNTY

Location	Total 2019 Population
Enterprise	615
Pachuta	143
Quitman	1,974
Shubuta	337
Stonewall	933
Unincorporated Area	11,768
CLARKE COUNTY TOTAL	**15,770**

Source: United States Census – American Community Survey 2019

In addition, the following figure illustrates the population density per square kilometer by census tract as it was reported by the U.S. Census Bureau American Community Survey 2019.

Figure A.14: POPULATION DENSITY IN CLARKE COUNTY



Source: United States Census – American Community Survey 2019

A.3.3 Development Trends and Changes in Vulnerability

Since the previous county hazard mitigation plan was approved (in 2015), Clarke County has experienced limited growth and development. **Table A.33** shows the number of building units constructed since 2010 according to the U.S. Census American Community Survey.

Table A.32: BUILDING COUNTS FOR CLARKE COUNTY

Jurisdiction	Total Housing Units (2019)	Units Built 2014 or later	% Building Stock Built Post-2014
Enterprise	276	0	0.0%
Pachuta	119	0	0.0%
Quitman	3,581	2	0.1%
Shubuta	205	0	0.0%
Stonewall	546	0	0.0%
Unincorporated Area	3,478	75	2.1%
CLARKE COUNTY TOTAL	**8,000**	**77**	**1.0%**

Source: United States Census Bureau

Table A.34 shows population growth estimates for the county from 2010 to 2014 based on the U.S. Census Annual Estimates of Resident Population.

Table A.33: POPULATION GROWTH FOR CLARKE COUNTY

Jurisdiction	Population Estimates (as of July 1)					% Change 2015-2019
	2015	2016	2017	2018	2019	
Enterprise	716	586	796	650	615	-14.10%
Pachuta	286	256	219	185	143	-50%
Quitman	2,147	1,914	1,811	2,001	1,974	-8.05%
Shubuta	342	335	397	386	337	-1.46%
Stonewall	1,315	1,250	1,014	961	933	-29%
Unincorporated Area	11,556	12,062	11,852	11,745	11,768	1.83%
CLARKE COUNTY TOTAL	**16,362**	**16,203**	**16,089**	**15,928**	**15,770**	**-3.61%**

Source: United States Census Bureau – American Community Survey

Based on the data above, there has been a low rate of residential development and population growth in the county since 2015, and the county has actually experienced a slight population decline. However, the unincorporated areas of the county have experienced a slightly higher rate of development compared to the rest of the county, resulting in an increased number of structures that are vulnerable to the potential impacts of the identified hazards. Conversely, since the population has decreased throughout the county, there are now fewer numbers of people exposed to the identified hazards. Therefore, development and population growth have impacted the county's vulnerability since the previous local hazard mitigation plan was approved but there has been no change in the overall vulnerability since the changes offset one another.

It is also important to note that as development increases in the future, greater populations and more structures and infrastructure will be exposed to potential hazards if development occurs in the floodplains, moderate and high landside susceptibility areas, high wildfire risk areas, or primary and secondary TRI site buffers.

A.3.4 Vulnerability Assessment Results

As noted in Section 6: *Vulnerability Assessment*, only hazards with a specific geographic boundary, available modeling tool, or sufficient historical data allow for further analysis. Those results, specific to

Clarke County, are presented here. All other hazards are assumed to impact the entire planning region (drought / heat wave; thunderstorm—wind, hail, lightning; tornado; and winter storm and freeze) or, due to lack of data, analysis would not lead to credible results (dam and levee failure, erosion, and land subsidence). In the case of landslide, local officials determined that the USGS data may be somewhat amiss and that even the areas identified as moderate risks probably entailed an overall low risk.

The hazards to be further analyzed in this subsection include: flood, wildfire, earthquake, hurricane and tropical storm winds, and hazardous materials incident.

The annualized loss estimate for all hazards is presented near the end of this subsection.

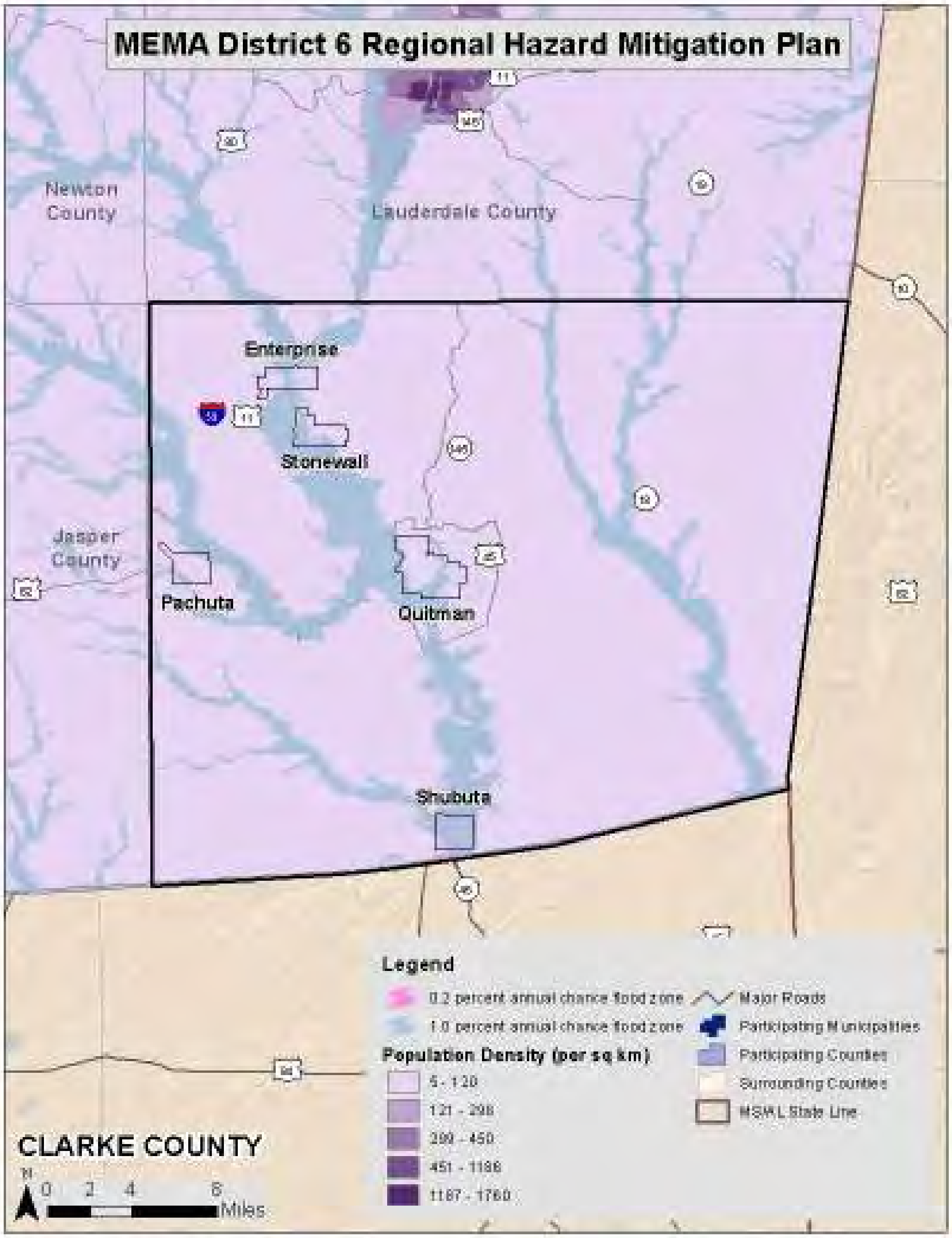
FLOOD

Historical evidence indicates that Clarke County is susceptible to flood events. A total of 18 flood events have been reported by the National Centers for Environmental Information resulting in $4.7 million in property damage. On an annualized level, these damages amounted to $341,967 for Clarke County.

Social Vulnerability

The figure below is presented to gain a better understanding of at-risk population by evaluating census tract level population data against mapped floodplains. There are areas of concern in several areas of the county. Indeed, nearly every incorporated municipality is potentially at risk of being impacted by flooding in some areas of its jurisdiction. Therefore, further investigation in these areas may be warranted. Population density data remains unchanged since last update.

Figure A.15: POPULATION DENSITY NEAR FLOODPLAINS

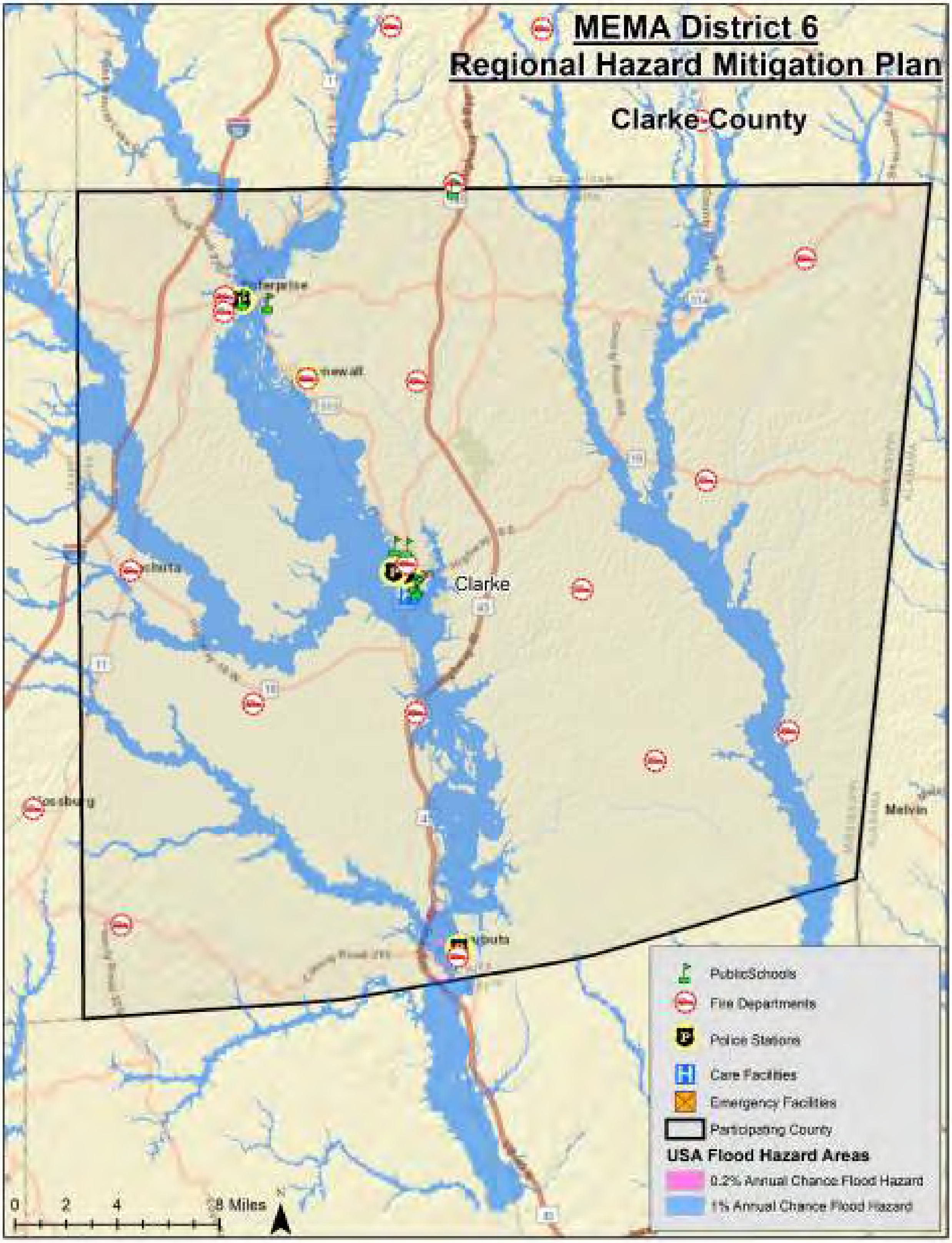


Source: Federal Emergency Management Agency DFIRM, United States Census 2019

Critical Facilities

The following figure shows critical facility locations in relation to Special Flood Hazard Areas. (Please note, as previously indicated, this analysis does not consider building elevation, which may negate risk.) Both facilities are schools located in the 1.0 percent annual chance flood zone. A list of specific critical facilities and their associated risk can be found at the end of this section.

Figure A.16: CRITICAL FACILITY LOCATION ANALYSIS – SFHA



In conclusion, a flood has the potential to impact many existing and future buildings, facilities, and populations in Clarke County, though some areas are at a higher risk than others. All types of structures in a floodplain are at-risk, though elevated structures will have a reduced risk. Such site-specific vulnerability determinations are outside the scope of this assessment but will be considered during future plan updates. Furthermore, areas subject to repetitive flooding should be analyzed for potential mitigation actions.

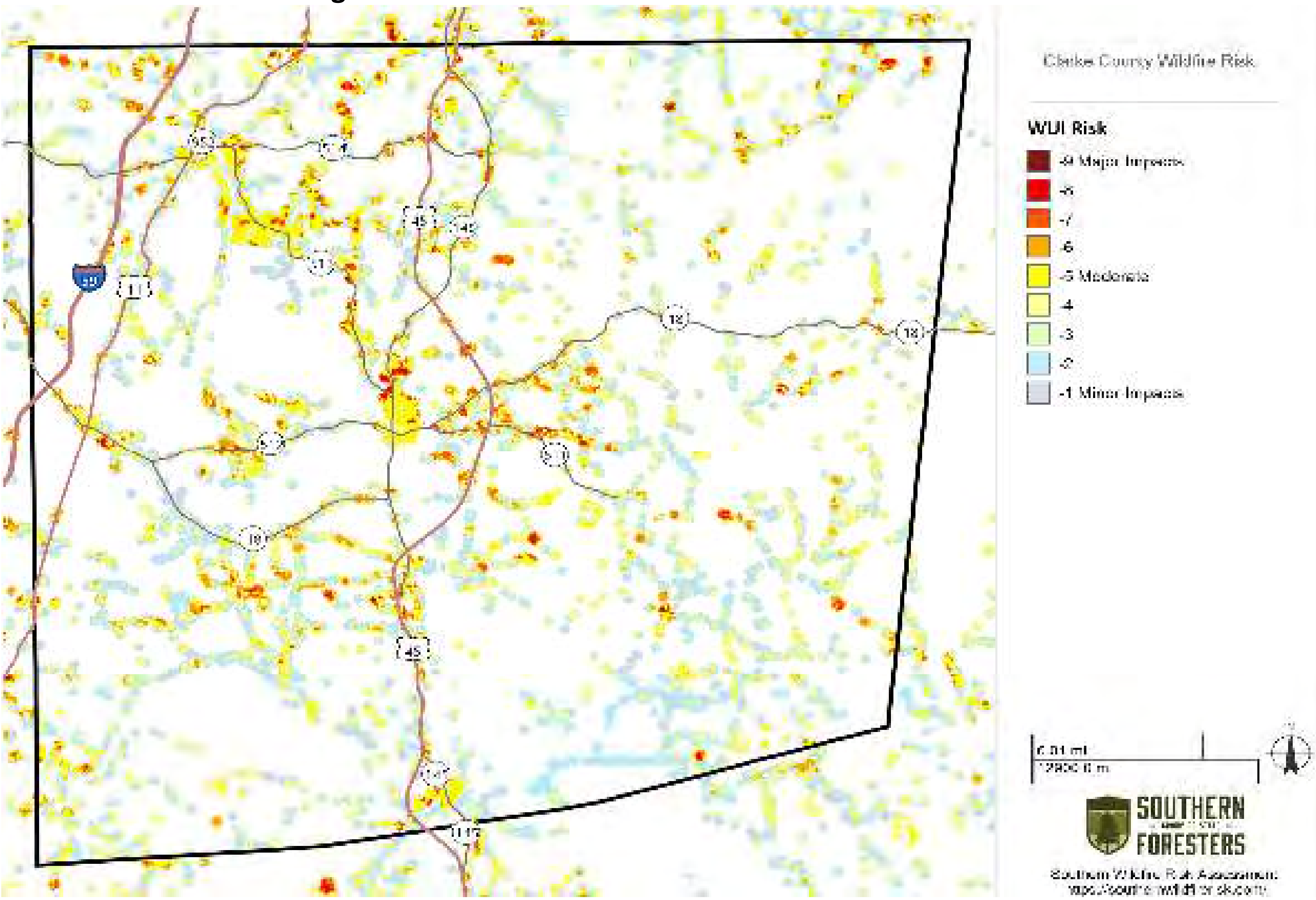
WILDFIRE

Although historical evidence indicates that Clarke County is susceptible to wildfire events, there are few reports of damage. Therefore, it is difficult to calculate a reliable annualized loss figure. Annualized loss is considered negligible though it should be noted that a single event could result in significant damages throughout the county.

To estimate exposure to wildfire, building data was obtained from Hazus-MH 2.2 which includes information that has been aggregated at the Census block level and which has been deemed useful for analyzing wildfire vulnerability. However, it should be noted that the accuracy of Hazus data is somewhat lower than that of parcel data. For the critical facility analysis, areas of concern were intersected with critical facility locations.

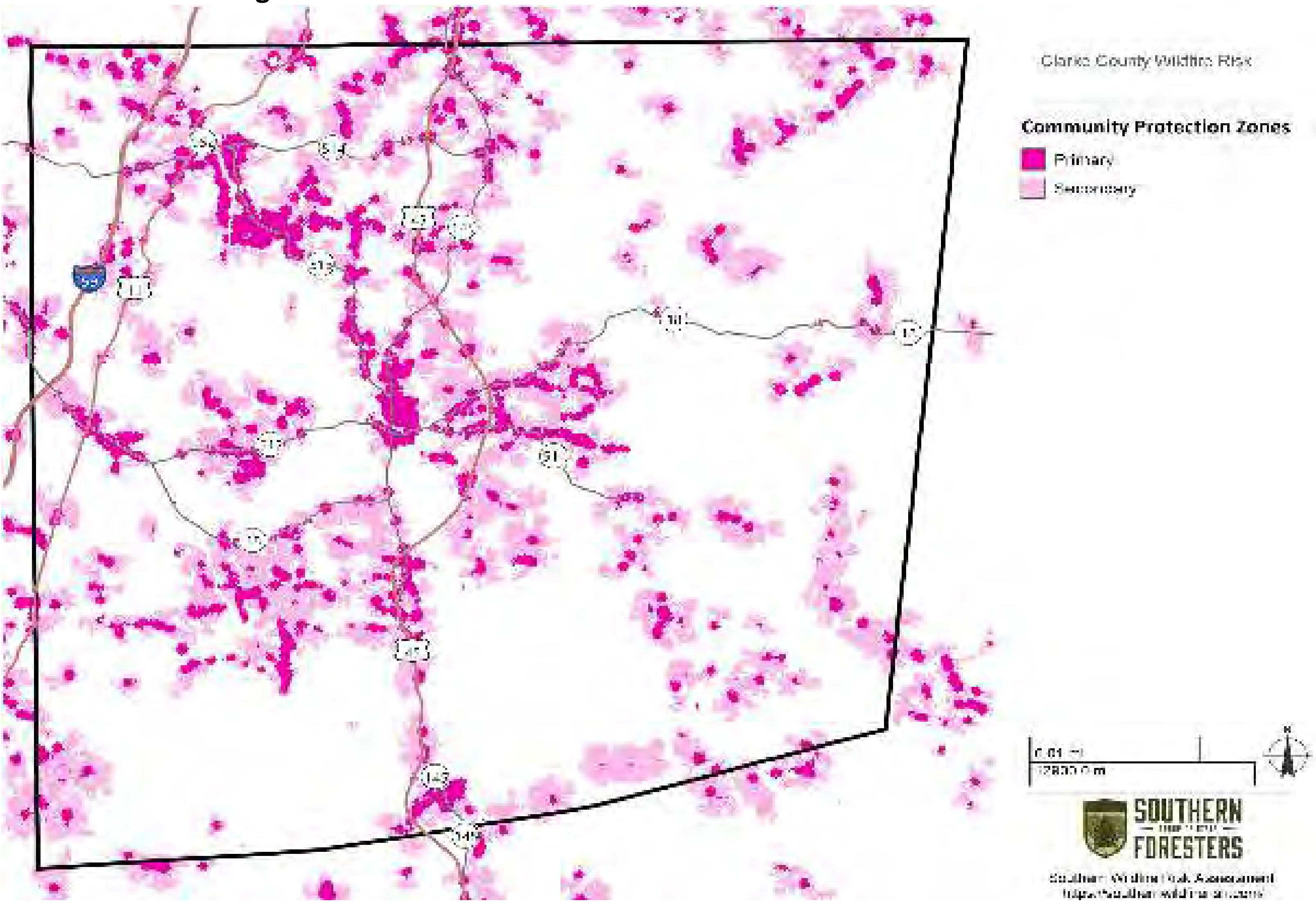
Figure A.17 shows the Wildland Urban Interface Risk Index (WUIRI) data, which is a data layer that shows a rating of the potential impact of a wildfire on people and their homes. The key input, Wildland Urban Interface (WUI), reflects housing density (houses per acre) consistent with Federal Register National standards. The location of people living in the WUI and rural areas is key information for defining potential wildfire impacts to people and homes. Initially provided as raster data, it was converted to a polygon to allow for analysis. The Wildland Urban Interface Risk Index data ranges from 0 to -9 with lower values being most severe (as noted previously, this is only a measure of relative risk). **Figure A.18** Community Protection Zones (CPZ) represent those areas considered highest priority for mitigation planning activities**.** CPZs are based on an analysis of the *Where People Live* housing density data and surrounding fire behavior potential. Rate of Spread data is used to determine the areas of concern around populated areas that are within a 2-hour fire spread distance. This is referred to as the Secondary CPZ. **Figure A.19** shows critical facility locations in relation to historical wildfire burns.

Figure A.17: WUI RISK INDEX AREAS IN CLARKE COUNTY



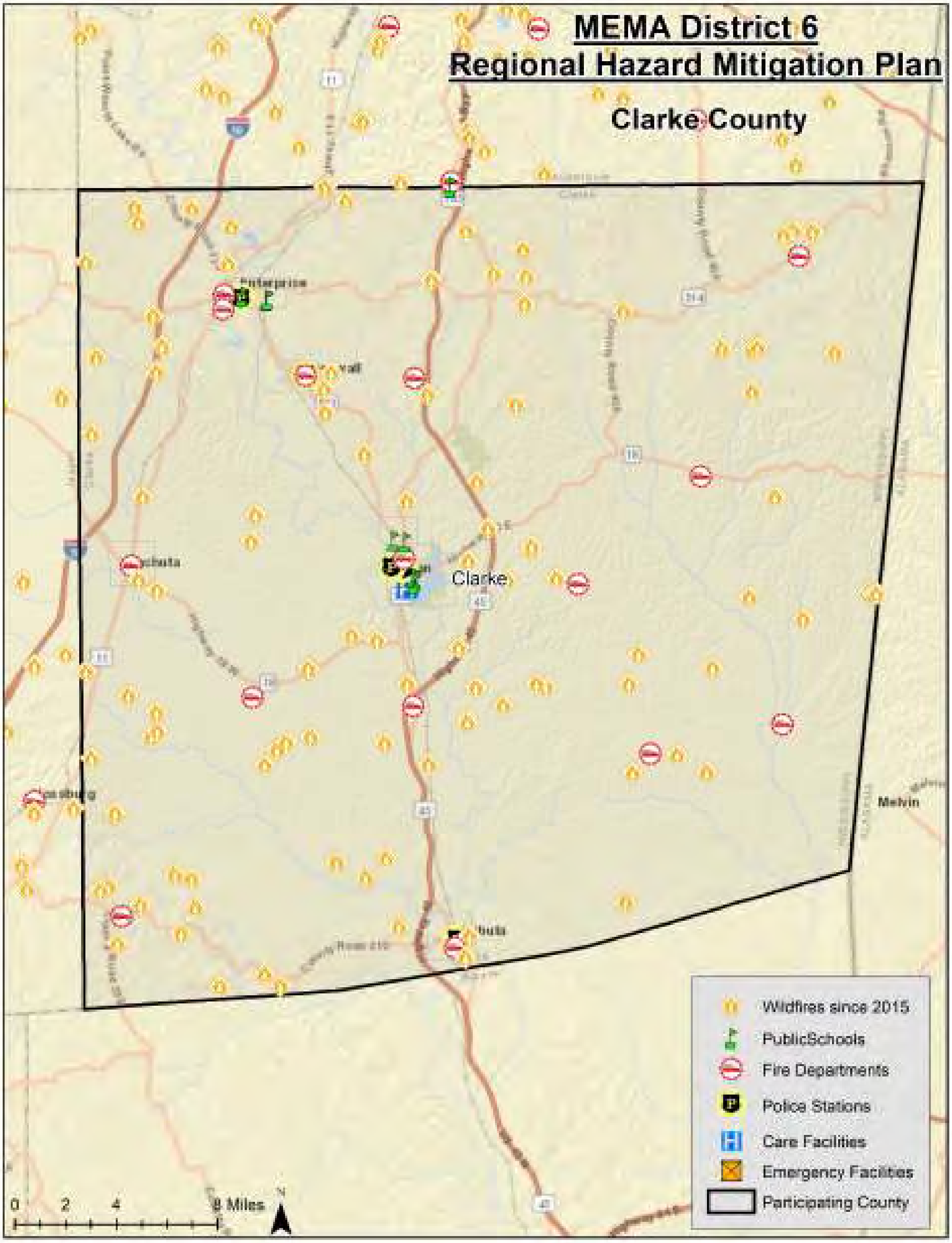
Source: Southern Wildfire Risk Assessment Data

Figure A.18: COMMUNITY PROTECTION ZONES IN CLARKE COUNTY



Source: Southern Wildfire Risk Assessment Data

Figure A.19: CRITICAL FACILITY ANALYSIS - WILDFIRE



Source: Southern Wildfire Risk Assessment Data

Social Vulnerability

Given some level of susceptibility across the entire county, it is assumed that the total population is at risk to the wildfire hazard. Determining the exact number of people in certain wildfire zones is difficult with existing data and could be misleading. In particular, the expansion of residential development from urban centers out into rural landscapes, increases the potential for wildland fire threat to public safety and the potential for damage to forest resources and dependent industries. This increase in population across the region will impact counties and communities that are located within the Wildland Urban Interface (WUI). The WUI is described as the area where structures and other human improvements meet and intermingle with undeveloped wildland or vegetative fuels. Population growth within the WUI substantially increases the risk from wildfire. For the Clarke County Wildfire Risk project area, it is estimated that 16,515 people or 98.6 % percent of the total project area population (16,751) live within the WUI.[8]

Critical Facilities

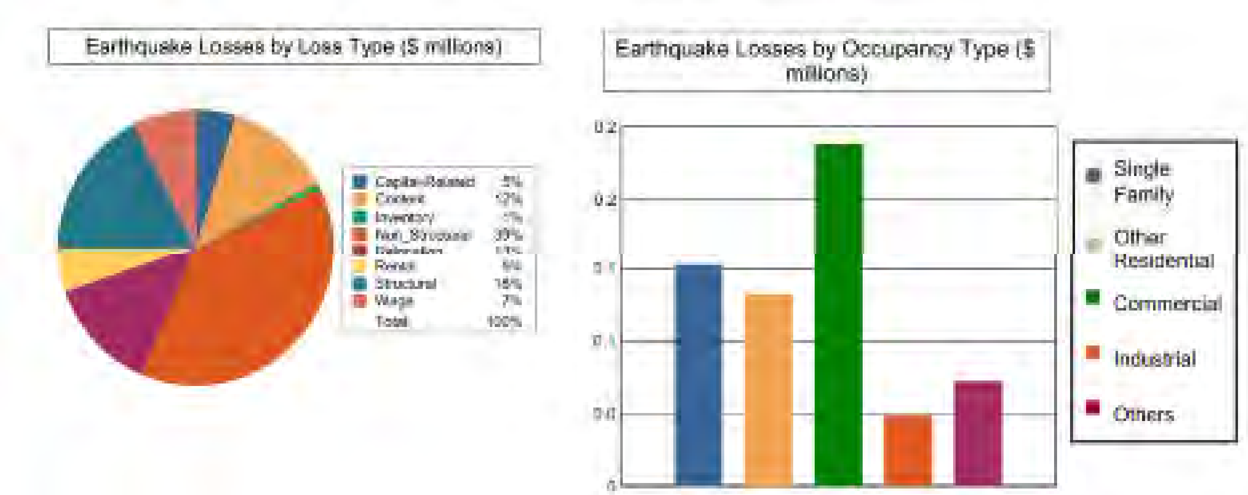
The critical facility analysis revealed that there are two critical facilities located in wildfire areas of concern, including one police station and one school. It should be noted, that several factors could impact the spread of a wildfire putting all facilities at risk. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

In conclusion, a wildfire event has the potential to impact many existing and future buildings, critical facilities, and populations in Clarke County.

EARTHQUAKE

A probabilistic earthquake model was performed for the MEMA District 6 Region. As the Hazus-MH model suggests below, and historical occurrences confirm, any earthquake activity in the area is likely to inflict minor damage to the county. Hazus-MH 2.2 estimates the total building-related losses were $520,000; 31 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 44 % of the total loss. The figure below provides a summary of the losses associated with the building damage.

Figure A.20: MEMA D6 EARTHQUAKE LOSSES BY TYPE



For the earthquake hazard vulnerability assessment, a probabilistic scenario was created to estimate the average annualized loss for the region. The results of the analysis are generated at the Census Tract level

[8] Southern Wildfire Risk Assessment 2021

within Hazus-MH and then aggregated to the region level. Since the scenario is annualized, no building counts are provided. Losses reported included losses due to structure failure, building loss, contents damage, and inventory loss.

Social Vulnerability

It can be assumed that all existing and future populations are at risk to the earthquake hazard. Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 39 households to be displaced due to the earthquake. Of these, 32 people (out of a total population of 244,467) will seek temporary shelter in public shelters. [9] The total economic loss estimated for the earthquake is 76.76 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory.

Critical Facilities

The Hazus-MH probabilistic analysis indicated that no critical facilities would sustain measurable damage in an earthquake event. However, all critical facilities should be considered at-risk to minor damage, should an event occur. Before the earthquake, the region had 1,241 hospital beds available for use. On the day of the earthquake, the model estimates that only 1,035 hospital beds (83.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 93.00% of the beds will be back in service. By 30 days, 99.00% will be operational.

In conclusion, an earthquake has the potential to impact all existing and future buildings, facilities, and populations in Clarke County. The Hazus-MH scenario indicates that minimal to moderate damage is expected from an earthquake occurrence. While Clarke County may not experience a large earthquake (the greatest on record is a magnitude II MMI), localized damage is possible with an occurrence. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

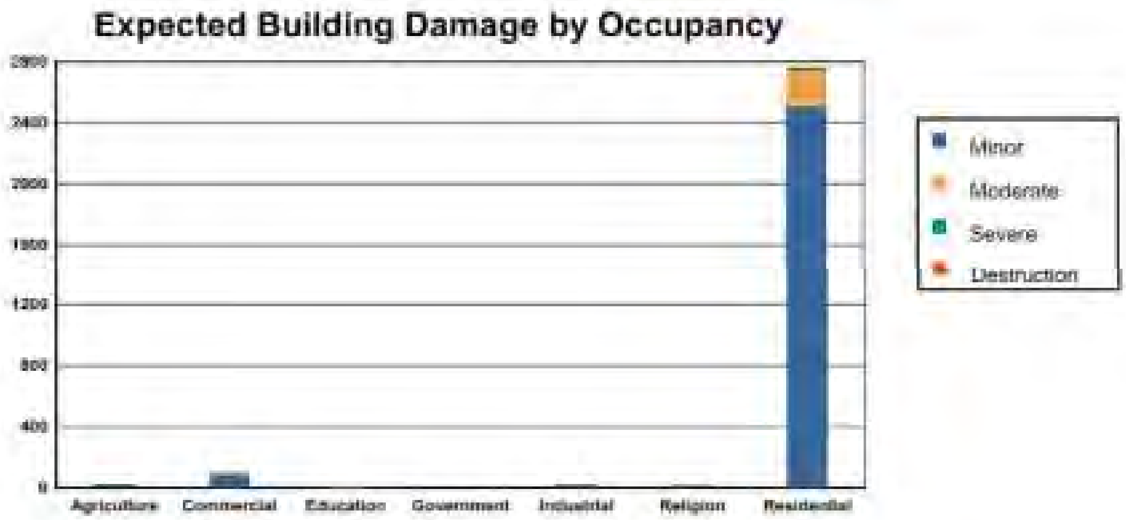
HURRICANE AND TROPICAL STORM

Historical evidence indicates that Clarke County has some risk to the hurricane and tropical storm hazard. There have been five disaster declarations due to hurricanes (Hurricanes Frederic, Ivan, Dennis, Katrina, and Isaac). Several tracks have come near or traversed through the county, as shown and discussed in Section A.2.10.

A probabilistic 100-year hurricane model was performed for the MEMA District 6. Hazus estimates that about 289 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 12 buildings that will be completely destroyed. The figure below summarizes the expected damage by general occupancy for the buildings in the region.

[9] HAZUS-MH utilizes 2010 Census Data

Figure A.21: MEMA D6 100-YEAR HURRICANE



Hurricanes and tropical storms can cause damage through numerous additional hazards such as flooding, erosion, tornadoes, and high winds, thus it is difficult to estimate total potential losses from these cumulative effects. The current Hazus-MH hurricane model only analyzes hurricane winds and is not capable of modeling and estimating cumulative losses from all hazards associated with hurricanes; therefore, only hurricane winds are analyzed in this section. It can be assumed that all existing and future buildings and populations are at risk to the hurricane and tropical storm hazard.

Social Vulnerability

Given equal susceptibility across the county, it is assumed that the total population, both current and future, is at risk to the hurricane and tropical storm hazard. Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 34 households to be displaced due to the hurricane. Of these, 26 people (out of a total population of 244,467) will seek temporary shelter in public shelters.

Critical Facilities

Given equal vulnerability across Clarke County, all critical facilities are considered to be at risk. Some buildings may perform better than others in the face of such an event due to construction and age, among other factors. Determining individual building response is beyond the scope of this plan. However, this plan will consider mitigation action for especially vulnerable structures and/or critical facilities to mitigate against the effects of the hurricane hazard. A list of specific critical facilities can be found at the end of this subsection.

In conclusion, a hurricane event has the potential to impact many existing and future buildings, critical facilities, and populations in Clarke County.

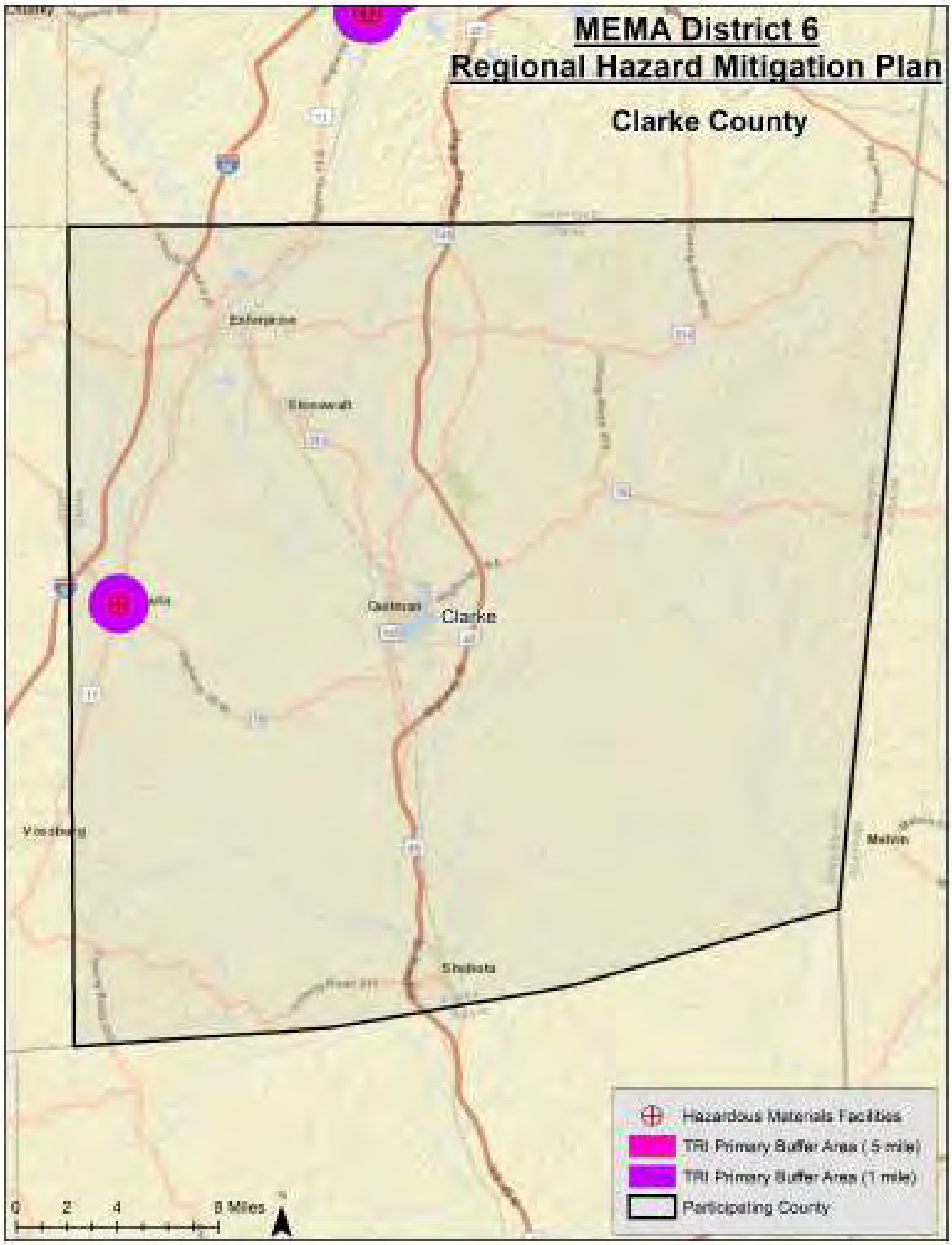
HAZARDOUS MATERIALS INCIDENT

Historical evidence indicates that Clarke County is susceptible to hazardous materials events. A total of eight HAZMAT incidents have been reported by the Pipeline and Hazardous Materials Safety Administration, resulting in $404,262 in property damage. On an annualized level, these damages amount to $12,738 for the county.

Most hazardous materials incidents that occur are contained and suppressed before destroying any property or threatening lives. However, they can have a significant negative impact. Such events can cause multiple deaths, completely shut down facilities for 30 days or more, and cause more than 50 percent of affected properties to be destroyed or suffer major damage. In a hazardous materials incident, solid, liquid, and/or gaseous contaminants may be released from fixed or mobile containers. Weather conditions will directly affect how the hazard develops. Certain chemicals may travel through the air or water, affecting a much larger area than the point of the incidence itself. Non-compliance with fire and building codes, as well as failure to maintain existing fire and containment features, can substantially increase the damage from a hazardous materials release. The duration of a hazardous materials incident can range from hours to days. Warning time is minimal to none.

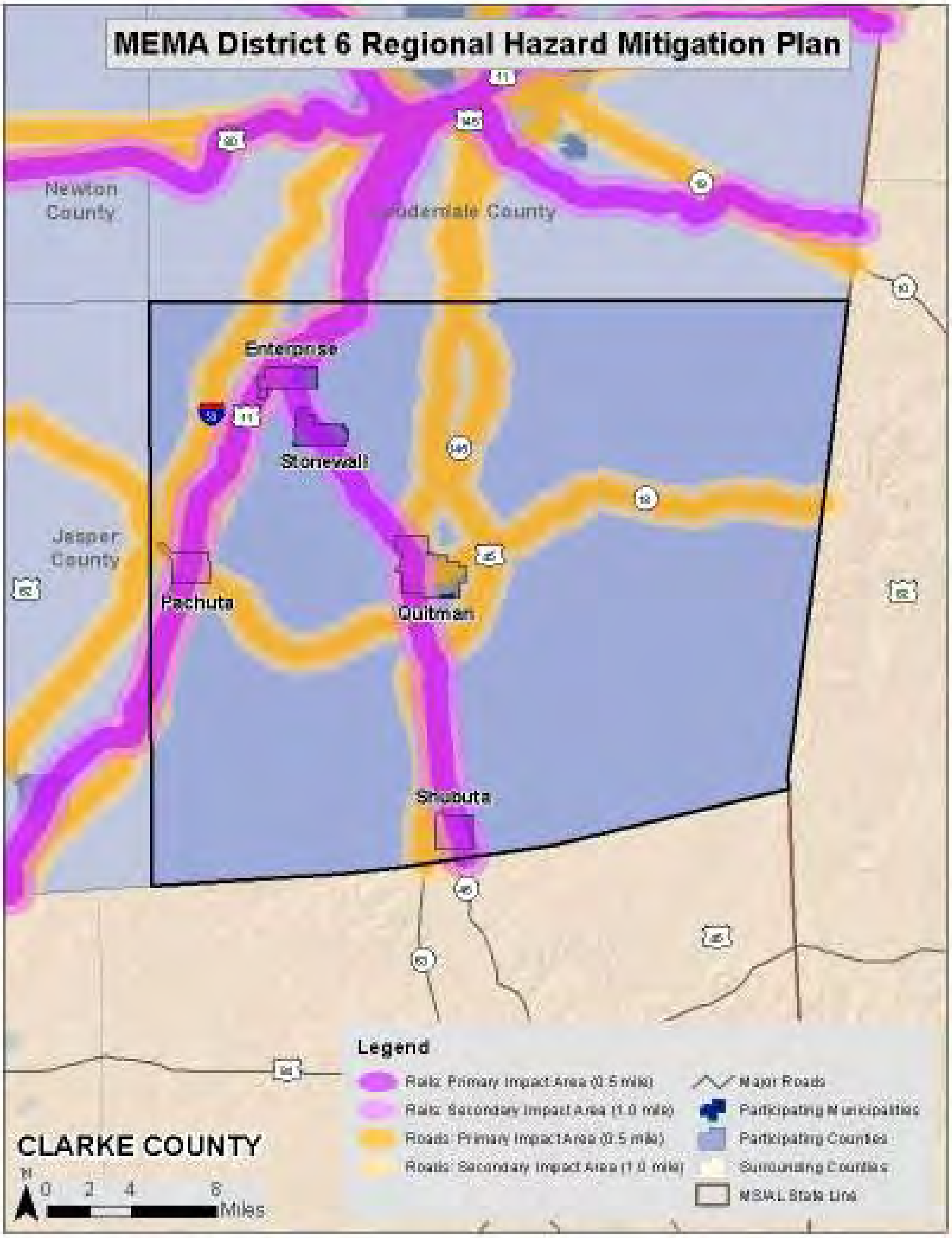
In order to conduct the vulnerability assessment for this hazard, GIS intersection analysis was used for fixed and mobile areas and building footprints/parcels. In both scenarios, two sizes of buffers—0.5-mile and 1.0-mile—were used. These areas are assumed to represent the different levels of effect: immediate (primary) and secondary. Primary and secondary impact zones were selected based on guidance from the PHMSA Emergency Response Guidebook. For the fixed site analysis, geo-referenced TRI sites in the region, along with buffers, were used for analysis as shown in **Figure A.22.** For the mobile analysis, the major roads (Interstate highway, U.S. highway, and State highway) and railroads, where hazardous materials are primarily transported that could adversely impact people and buildings, were used for the GIS buffer analysis. **Figure A.23** shows the areas used for mobile toxic release buffer analysis.

Figure A.22: TRI SITES WITH BUFFERS IN CLARKE COUNTY



Source: Environmental Protection Agency

Figure A.23: MOBILE HAZMAT BUFFERS IN CLARKE COUNTY



Social Vulnerability

Given high susceptibility across the entire county, it is assumed that the total population is at risk to a hazardous materials incident. It should be noted that areas of population concentration may be at an elevated risk due to a greater burden to evacuate population quickly.

Critical Facilities

Fixed Site Analysis:

The critical facility analysis for fixed TRI sites revealed that there are no facilities located in a HAZMAT risk zone. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

Mobile Analysis:

It should be presumed that any facility located near a public roadway or rail line is susceptible to a potential HAZMAT event. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

A list of specific critical facilities and their associated risk can be found at the end of this subsection.

In conclusion, a hazardous material incident has the potential to impact many existing and future buildings, critical facilities, and populations in Clarke County. Those areas in a primary buffer are at the highest risk, though all areas carry some vulnerability due to variations in conditions that could alter the impact area (i.e., direction and speed of wind, volume of release, etc.). Further, incidents from neighboring counties could also impact the county and participating jurisdictions.

CONCLUSIONS ON HAZARD VULNERABILITY

The following table presents a summary of annualized loss for each hazard in Clarke County. Due to the reporting of hazard damages primarily at the county level, it was difficult to determine an accurate annualized loss estimate for each municipality. Therefore, an annualized loss was determined through the damage reported through historical occurrences at the county level. These values should be used as an additional planning tool or measure risk for determining hazard mitigation strategies throughout the county.

Table A.34: ANNUALIZED LOSS FOR CLARKE COUNTY

Event	Clarke County
Flood-related Hazards	
Flood	$203,260
Erosion	Negligible
Dam and Levee Failure	Negligible
Winter Storm & Freeze	$5,200
Fire-related Hazards	
Drought / Heat Wave	$8,125
Wildfire	Negligible
Geologic Hazards	
Earthquake	Negligible
Landslide	Negligible
Land Subsidence	Negligible
Wind-related Hazards	
Hurricane & Tropical Storm	$576,000
Thunderstorm / High Wind	$78,740
Hail	$6,781
Lightning	$33,857
Tornado	$446,468
Other Hazards	
HAZMAT Incident	$24,335
Pandemic	Negligible

**In this table, the term "Negligible" is used to indicate that no records of dollar losses for the particular hazard were recorded. This could be the case either because there were no events that caused dollar damage or because documentation of that particular type of event is not well kept. Annualized losses were calculated based on the total number of years of reporting and damage totals.*

As noted previously, all existing and future buildings and populations (including critical facilities) are vulnerable to atmospheric hazards including drought / heat wave, hurricane and tropical storm, thunderstorm (wind, hail, lightning), tornado, and winter storm and freeze. In addition, all buildings and populations are vulnerable to all of the man-made and technological hazards identified above. Some buildings may be more vulnerable to these hazards based on locations, construction, and building type. The following table shows the critical facilities vulnerable to additional hazards analyzed in this subsection. The table lists those assets that are determined to be exposed to each of the identified hazards (marked with an "**X**").

Table A.35: AT-RISK CRITICAL FACILITIES IN CLARKE COUNTY

		FLOOD-RELATED					FIRE-RELATED		GEOLOGIC			WIND-RELATED			OTHER						
FACILITY NAME	FACILITY TYPE	Flood – 100 yr	Flood – 500 yr	Erosion	Dam and Levee Failure[32]	Winter Storm and Freeze	Drought / Heat Wave	Wildfire	Earthquake	Landslide	Land Subsidence	Hurricane and Tropical Storm	Thunderstorm (wind, hail,	Tornado	Fixed HAZMAT – 0.5 mile	Fixed HAZMAT – 1.0 mile	Mobile HAZMAT – 0.5 mile (road)	Mobile HAZMAT – 1.0 mile (road)	Mobile HAZMAT – 0.5 mile (rail)	Mobile HAZMAT – 1.0 mile (rail)	Pandemic
CLARKE COUNTY																					
Carmichael Volunteer Fire Department	Fire Station			X	X	X	X		X	X	X	X	X	X							X
DESOTO VOLUNTEER FIRE DEPARTMENT	Fire Station			X					X	X	X	X	X	X							X
EAST QUITMAN VOLUNTEER FIRE	Fire Station			X					X	X	X	X	X	X							X
Enterprise Volunteer Fire Department & A	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X		X	X
Enterprise Volunteer Fire Department	Fire Station			X					X	X	X	X	X	X							X
HARMONY VOLUNTEER FD	Fire Station			X					X	X	X	X	X	X							X
Hopewell Volunteer Fire Department	Fire Station			X	X	X	X		X	X	X	X	X	X							X
Pachuta Volunteer Fire Department	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
QUITMAN VOLUNTEER FD	Fire Station			X					X	X	X	X	X	X							X
ROLLING CREEK VOLUNTEER FD	Fire Station			X					X	X	X	X	X	X							X
Shubuta City Fire Dept	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
Stonewall VFD	Fire Station			X	X	X	X		X	X	X	X	X	X						X	X
THEADSVILLE VOLUNTEER FD	Fire Station			X					X	X	X	X	X	X							X
H C Watkins Memorial Hospital	Medical Care Facility			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
Clarke County Sheriff Dept	Police Station			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
Enterprise Police Dept	Police Station			X	X	X	X		X	X	X	X	X	X				X	X	X	X
Quitman City Police Dept	Police Station			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
Shubuta Police Department	Police Station			X					X	X	X	X	X	X							X
Stonewall Police Dept	Police Station			X	X	X	X		X	X	X	X	X	X						X	X

		FLOOD-RELATED					FIRE-RELATED		GEOLOGIC			WIND-RELATED			OTHER						
FACILITY NAME	FACILITY TYPE	Flood – 100 yr	Flood – 500 yr	Erosion	Dam and Levee Failure[33]	Winter Storm and Freeze	Drought / Heat Wave	Wildfire	Earthquake	Landslide	Land Subsidence	Hurricane and Tropical Storm	Thunderstorm (wind, hail,	Tornado	Fixed HAZMAT – 0.5 mile	Fixed HAZMAT – 1.0 mile	Mobile HAZMAT – 0.5 mile (road)	Mobile HAZMAT – 1.0 mile (road)	Mobile HAZMAT – 0.5 mile (rail)	Mobile HAZMAT – 1.0 mile (rail)	Pandemic
Clarkdale Attendance Center	School			X	X	X	X		X	X	X	X	X	X			X	X			X
Clarke Co Vocational Center	School			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
Enterprise Elementary	School	X		X	X	X	X	X	X	X	X	X	X	X				X	X	X	X
Enterprise High School	School			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
Enterprise Middle School	School	X		X	X	X	X		X	X	X	X	X	X				X	X	X	X
Quitman Alternative School	School			X	X	X	X		X	X	X	X	X	X			X	X		X	X
Quitman High School	School			X	X	X	X		X	X	X	X	X	X			X	X		X	X
Quitman Jr High School	School			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
Quitman Lower Elementary School	School			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
Quitman Upper Elementary School	School			X	X	X	X		X	X	X	X	X	X			X	X		X	X

As noted previously, these facilities could be at risk to dam failure if located in an inundation area. Data was not available to conduct such an analysis. There was no local knowledge of these facilities being at risk to dam failure. As additional data becomes available, more in-depth analysis will be conducted.

A.4 CLARKE COUNTY CAPABILITY ASSESSMENT

This subsection discusses the capability of Clarke County to implement hazard mitigation activities. More information on the purpose and methodology used to conduct the assessment can be found in Section 7: *Capability Assessment*.

A.4.1 Planning and Regulatory Capability

The table below provides a summary of the relevant local plans, ordinances, and programs already in place or under development for Clarke County. A checkmark (✓) indicates that the given item is currently in place and being implemented. An asterisk (*) indicates that the given item is currently being developed for
future implementation. Each of these local plans, ordinances, and programs should be considered available mechanisms for incorporating the requirements of the MEMA District 6 Regional Hazard Mitigation Plan.

Table A.36: RELEVANT PLANS, ORDINANCES, AND PROGRAMS

Planning Tool/Regulatory Tool	Hazard Mitigation Plan	Comprehensive Land Use Plan	Floodplain Management Plan	Open Space Management Plan (Parks & Rec/Greenway Plan	Stormwater Management Plan/Ordinance	Natural Resource Protection Plan	Flood Response Plan	Emergency Operations Plan	Continuity of Operations Plan	Evacuation Plan	Disaster Recovery Plan	Capital Improvements Plan	Economic Development Plan	Historic Preservation Plan	Flood Damage Prevention Ordinance	Zoning Ordinance	Subdivision Ordinance	Unified Development Ordinance	Post-Disaster Redevelopment Ordinance	Building Code	Fire Code	National Flood Insurance Program (NFIP)	NFIP Community Rating System
CLARKE COUNTY	✓							✓					✓		✓							✓	
Enterprise	✓	✓						✓					✓		✓	✓				✓		✓	
Pachuta	✓							✓					✓		✓					✓		✓	
Quitman	✓	✓						✓					✓		✓	✓				✓	✓	✓	
Shubuta	✓							✓					✓		✓							✓	
Stonewall	✓	✓						✓					✓		✓	✓				✓		✓	

A more detailed discussion on the county's planning and regulatory capabilities follows.

EMERGENCY MANAGEMENT

Hazard Mitigation Plan
Clarke County has previously adopted a hazard mitigation plan. The Town of Enterprise, Town of Pachuta, City of Quitman, Town of Shubuta, and Town of Stonewall were also included in this plan.

Emergency Operations Plan
Clarke County maintains an Emergency Operations Plan through its Emergency Management Agency. The Town of Enterprise, Town of Pachuta, City of Quitman, Town of Shubuta, and Town of Stonewall are each covered by this plan.

GENERAL PLANNING

Comprehensive Land Use Plan
Clarke County has not adopted a county comprehensive land use plan. However, the Town of Enterprise, City of Quitman, and Town of Stonewall each have adopted a municipal comprehensive plan.

Zoning Ordinance
Clarke County does not have a zoning ordinance in place. However, the Town of Enterprise, City of Quitman, and Town of Stonewall have adopted zoning ordinances.

Building Codes, Permitting, and Inspections
The Town of Enterprise, Town of Pachuta, City of Quitman, and Town of Stonewall have adopted a building code.

FLOODPLAIN MANAGEMENT

The following table provides NFIP policy and claim information for each participating jurisdiction in Clarke County.

Table A.37: NFIP POLICY AND CLAIM INFORMATION

Jurisdiction	Date Joined NFIP	Current Effective Map Date	NFIP Policies in Force	Insurance in Force	Closed Claims	Total Payments to Date
CLARKE COUNTY†	08/16/88	09/02/11	63	$9,406,200	23	$332,258
Enterprise	01/01/87	09/02/11	7	$873,800	6	$293,457
Pachuta	11/18/10	09/02/11(M)	0	$0	0	$0
Quitman	01/01/86	09/02/11(M)	18	$4,984,000	2	$18,401
Shubuta	09/01/91	09/02/11	23	$1,886,400	3	$7,781
Stonewall	08/16/88	09/02/11	15	$1,007,500	7	$30,121

†Includes unincorporated areas of county only
(M) – No Elevation Determined, All Zone A, C and X
Source: NFIP Community Status information as of 9/2/2015; NFIP claims and policy information as of 6/30/2015

Flood Damage Prevention Ordinance
All communities participating in the NFIP are required to adopt a local flood damage prevention ordinance. Clarke County, the Town of Enterprise, the Town of Pachuta, the City of Quitman, the Town of Shubuta, and the Town of Stonewall all participate in the NFIP and have adopted flood damage prevention ordinances.

A.4.2 Administrative and Technical Capability

The table below provides a summary of the capability assessment results for Clarke County with regard to relevant staff and personnel resources. A checkmark (✓) indicates the presence of a staff member(s) in that jurisdiction with the specified knowledge or skill.

Table A.38: RELEVANT STAFF / PERSONNEL RESOURCES

Staff / Personnel Resource	Planners with knowledge of land development/land management practices	Engineers or professionals trained in construction practices related to buildings and/or infrastructure	Planners or engineers with an understanding of natural and/or human-caused hazards	Emergency Manager	Floodplain Manager	Land Surveyors	Scientists familiar with the hazards of the community	Staff with education or expertise to assess the community' s vulnerability to hazards	Personnel skilled in GIS and/or Hazus	Resource development staff or grant writers
CLARKE COUNTY				✓	✓		✓	✓	✓	
Enterprise				✓	✓		✓	✓	✓	
Pachuta				✓	✓		✓	✓	✓	
Quitman		✓		✓	✓		✓	✓	✓	
Shubuta				✓	✓		✓	✓	✓	
Stonewall				✓	✓		✓	✓	✓	

Credit for having a floodplain manager was given to those jurisdictions that have a flood damage prevention ordinance, and therefore an appointed floodplain administrator, regardless of whether the appointee was dedicated solely to floodplain management. Credit was given for having a scientist familiar with the hazards of the community if a jurisdiction has a Cooperative Extension Service or Soil and Water Conservation Department. Credit was also given for having staff with education or expertise to assess the community's vulnerability to hazards if a staff member from the jurisdiction was a participant on the existing hazard mitigation plan's planning committee.

A.4.3 Fiscal Capability

The following table provides a summary of the results for Clarke County with regard to relevant fiscal resources. A checkmark (✓) indicates that the given fiscal resource is locally available for hazard mitigation purposes (including match funds for state and federal mitigation grant funds) according to the previous county hazard mitigation plan.

Table A.39: RELEVANT FISCAL RESOURCES

Fiscal Tool / Resource	Capital Improvement Programming	Community Development Block Grants (CDBG)	Special Purpose Taxes (or taxing districts)	Gas/Electric Utility Fees	Water/Sewer Fees	Stormwater Utility Fees	Development Impact Fees	General Obligation, Revenue, and/or Special Tax Bonds	Partnering Arrangements or Intergovernmental Agreements	Other: other state and Federal funding sources
CLARKE COUNTY	✓	✓								✓
Enterprise	✓	✓								✓
Pachuta	✓	✓								✓
Quitman	✓	✓								✓
Shubuta	✓	✓								✓
Stonewall	✓	✓								✓

A.4.4 Political Capability

During the months immediately following a disaster, local public opinion in Clarke County is more likely to shift in support of hazard mitigation efforts.

A.4.5 Conclusions on Local Capability

The table below shows the results of the capability assessment using the designed scoring methodology described in Section 7: *Capability Assessment*. The capability score is based solely on the information found in existing hazard mitigation plans and readily available on the jurisdictions' government websites. According to the assessment, the average local capability score for the county and its jurisdictions is 20.8, which falls into the moderate capability ranking.

Table A.40: CAPABILITY ASSESSMENT RESULTS

Jurisdiction	Overall Capability Score	Overall Capability Rating
CLARKE COUNTY	21	Moderate
Enterprise	22	Moderate
Pachuta	18	Limited
Quitman	25	Moderate
Shubuta	17	Limited
Stonewall	22	Moderate

A.5 CLARKE COUNTY MITIGATION STRATEGY

This subsection provides the blueprint for Clarke County to follow in order to become less vulnerable to its identified hazards. It is based on general consensus of the Regional Hazard Mitigation Council and the findings and conclusions of the capability assessment and risk assessment. Additional Information can be found in Section 8: *Mitigation Strategy* and Section 9: *Mitigation Action Plan*.

A.5.1 Mitigation Goals

Clarke County developed 10 mitigation goals in coordination with the other participating MEMA District 6 Region jurisdictions. The regional mitigation goals are presented in below.

Table A.41: MEMA DISTRICT 6 REGIONAL MITIGATION GOALS

Goal #		Goals & Objectives	Action #
#1	**Goal**	Local government will be able to maintain **effective mitigation programs**.	PEA-1
	Objective	***County attends regular meetings to discuss emergency preparedness and mitigation efforts.***	
#2	**Goal**	The community will work together to create a **disaster-resistant community**.	PEA-2
	Objective	***County maintains relationship with private sector entities such as RedCross.***	
#3	**Goal**	The community will be able to initiate and sustain **emergency response operations.**	PEA-2
	Objective	***County has created mutual aid agreements with neighboring jurisdictions for support during disasters.***	
#4	**Goal**	**Government operations** will not be significantly disrupted by disasters.	
	Objective	***County has a COOP and was recently updated.***	
#5	**Goal**	The **health, safety, and welfare of the community's residents and visitors** will be protected.	ES-5
	Objective	***County just signed with HyperReach, and will actively work to get residents and visitors to opt-in to receive important alerts to the community.***	
#6	**Goal**	**Local government will support effective hazard mitigation programming** in the community.	
	Objective	***County encourages ordinances such as mandatory reporting of spills.***	
#7	**Goal**	Residents of the community will have **homes, institutions, and work places that are safer**.	PEA-3
	Objective	***County encourages saferooms, and residents can register them and receive an address for their shelter so that they may be used for those that are nearby.***	
#8	**Goal**	The **local economy** of the community will be prepared for a disaster.	
	Objective	***County works with RedCross and local religious organizations to ensure necessary resources are available in times of disaster.***	
#9	**Goal**	**Local infrastructure will not be significantly disrupted by a disaster**.	ES-4
	Objective	***Some emergency standby generators have been installed, and they are looking to purchase more.***	
#10	**Goal**	All **members of the community will understand the hazards threatening their community.**	PEA-1
	Objective	***County makes use of social media and news to get information out, and in the near future, HyperReach will be in service.***	

To attain the listed mitigation goals, the county has also identified objectives that will assist them in the mitigation action process. Objectives are broader than specific actions, but are measurable, unlike goals. Objectives connect goals with the actual mitigation actions. The action plan describes how the mitigation actions will be implemented, including how those actions will be prioritized, administered and incorporated into the community's existing planning mechanisms.

A.5.2 Mitigation Action Plan

The mitigation actions proposed by Clarke County, Enterprise, Pachuta, Quitman, Shubuta, and Stonewall are listed in the following individual Mitigation Action Plans.

Clarke County Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-2	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2025	Deferred. The International Building Code has not been adopted. The county will review this code and consider adoption, so this action will remain in the
P-3	Purchase smoke alarms to be distributed to elderly residents.	Wildfire	Low	County Fire Service	FEMA/MEMA, AFGP, Local funds	2025	Ongoing. Although some effort has been made to purchase and distribute smoke alarms to elderly residents, there are likely still large numbers of residents who lack this service. The county will continue to seek funding the implement this action.
P-4	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	County Emergency Management	FEMA/MEMA, Homeland Security	2025	Ongoing. Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
P-5	Collect additional data on the number of buildings located in flood-prone areas near the Chickasawhay River and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	County Emergency Management	FEMA/MEMA, Local funds	2025	Ongoing. Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1							
Emergency Services							
ES-1	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strike.	Hurricane	High	County Emergency Management	FEMA/MEMA, Local funds	2025	Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan.
ES-2	Installation of a public warning system in the unincorporated areas of the County.	All	High	Board of Supervisors, County Emergency Management	FEMA/MEMA, Homeland Security, Local funds	2025	Some have been installed, but more are needed. The county will continue to look at the feasibility of this action going forward.
ES-3	Purchase generators for the County Fire Service.	All	Moderate	County Fire Service	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	Some generators have been purchased for the fire service, but there is still as strong need for additional generators. The county will continue to look for funding sources for these.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
ES-4	Purchase generators for the rural water associations to provide adequate backup power during emergencies.	All	Low	Rural Water Associations	FEMA/MEMA, Homeland Security, Local funds	2025	Generators for the rural water associations have not been purchased due to lack of funding. The county is looking at possible alternative funding sources.
ES-5	County is in the process of signing up with HyperReach for mass notifications. This system is opt-in, and will require an extensive campaign to get residents to sign up for emergency alerts.	All	High	County EMA	Local	2022	New Action. County recently signed the contract with HyperReach, but will need to conduct extensive outreach to get residents to opt-in.
Public Education and Awareness							
PEA-1	Education of local citizens on the danger of driving across flooded roads.	Flood	High	County Emergency Management	FEMA/MEMA, JAG, Local funds	2025	The county has worked hard to inform citizens of the dangers of driving across flooded roads, but this action needs to be continued going forward.
PEA-2	Purchase materials to educate the public on being prepared for hazards, including tornadoes, flooding, severe weather, etc.	All	Low	County Emergency Management	FEMA/MEMA, Homeland Security, Local funds	2025	The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.
PEA-3	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2025	Some residents have built safe rooms, and are then issued an address so that those nearby know there is a shelter. This campaign is ongoing.

Town of Enterprise Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-2	Passage of an ordinance requiring property owners to clean out ditches that cause flooding of local streets. The ordinance would also get the Town legal recourse to go onto such property and do the work if the owner did not comply.	Flood	Low	Board of Aldermen	Local budget	2025	The town has not passed an ordinance to require property owners to clean out ditches, but it will continue to evaluate the political feasibility of this alternative and will keep this action in place.
P-3	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
P-4	Collect additional data on the number of buildings located in flood-prone areas near the Chickasawhay River and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Structural Projects							
SP-1							
Emergency Services							
ES-1	Purchase backup generator to provide adequate backup power for the water system.	Tornado, High Wind	High	Public Works	FEMA/MEMA, Homeland Security, Local funds	2025	The town has not purchased a backup generator for the water system. It will look into trying to find funding for this going forward.
ES-2	Purchase of portable generators to provide adequate backup power to operate sewer lift stations.	Tornado, High Wind	High	Public Works	FEMA/MEMA, Homeland Security, Local funds	2025	The town has not purchased portable generators for lift stations. It will look into trying to find funding for this going forward.
ES-3	Purchase portable generators for public works department to use during emergencies.	All	High	Public Works	FEMA/MEMA, Homeland Security, Local funds	2025	The town has not purchased portable generators for public works. It will look into trying to find funding for this going forward.
ES-4	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Fire Department , Police Department	FEMA/MEMA, Local funds	2025	Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan.
ES-5	Purchase a generator to provide adequate backup power for the Enterprise Volunteer Fire Department.	Tornado, High Wind	Moderate	Volunteer Fire Department	FEMA/MEMA, Homeland Security, Local funds	2025	The town has not purchased a backup generator for the fire department. It will look into trying to find funding for this going forward.
ES-6	Installation of a public warning system for the Town.	Tornado, High Wind	Moderate	Board of Aldermen	FEMA/MEMA, Homeland Security, Local funds	2025	The town has not installed a public warning system, but it would like to continue to look at funding options for this system

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Public Education and Awareness							
PEA-1	Education of local citizens on dangers of driving across flooded roads.	Flood	High	Fire Department , Police Department	FEMA/MEMA, JAG, Local funds	2025	The county has worked hard to inform citizens of the dangers of driving across flooded roads, but this action needs to be continued going forward.
PEA-2	Purchase materials to educate the public on being prepared for all hazards, including tornadoes, flooding, severe weather, fire, etc.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, AFGP, Local funds	2025	The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.
PEA-3	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2025	Some residents have built safe rooms, and are then issued an address so that those nearby know there is a shelter. This campaign is ongoing.

Town of Pachuta Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Alderman	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-2	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1							
Emergency Services							
ES-1	Installation of an emergency warning system for the Town.	Tornado, High Wind	High	Board of Alderman	FEMA/MEMA, Homeland Security, Local funds	2025	A public warning system has not been installed in the town due to lack of funding. The town will continue to look at the feasibility of this action going forward.
ES-2	Purchase of a generator to provide adequate backup power for the water system.	Tornado, High Wind	High	Public Works	FEMA/MEMA, Homeland Security, Local funds	2025	The town has not purchased a backup generator for the water system. It will look into trying to find funding for this going forward.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
ES-3	Purchase of a generator to provide adequate backup power for the volunteer fire department.	Tornado, High Wind	High	Volunteer Fire Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	The town has not purchased a backup generator for the fire department. It will look into trying to find funding for this going forward.
ES-4	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan.
ES-5	Purchase of additional turnout suits, radios, and nozzles for the volunteer fire department.	Wildfire	Moderate	Volunteer Fire Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2020	Completed
Public Education and Awareness							
PEA-1	Education of local citizens on the dangers of driving across flooded roads.	Flood	High	Volunteer Fire Department, Police Department	FEMA/MEMA, JAG, Local funds	2025	The county has worked hard to inform citizens of the dangers of driving across flooded roads, but this action needs to be continued going forward.
PEA-2	Purchase materials to educate the public on being prepared for all hazards, including tornadoes, flooding, severe weather, etc.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
PEA-2	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2025	New action

City of Quitman Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Rehabilitation of the storm drain system, including the cleaning out of the drains and lining them with plastic coating.	Flood	High	Public Works	FEMA/MEMA, CDBG, Local funds	2025	The storm drain system has been cleaned out in the past, but a large-scale project to fix the inherent problems has not been undertaken. The city will continue to work on improving the drain system going forward.
P-2	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Fire Department , Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
P-4	Collect additional data on the number of buildings located in flood-prone areas near the Chickasawhay River and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	Fire Department , Police Department	FEMA/MEMA, Local funds	2025	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.
P-5	Hydrology Study for City of Quitman	Flood	Very High	Clarke County EMA	FEMA/MEMA, Local	2022	New Item

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
			Prevention				
P-6	Flash Flooding is our number one threat as the north entrance to the city is 20' to 30' higher than all areas below to the city limits in the south.	Flood	High	Public Works / Street Department	FEMA/MEMA, CDBG, Local	2022	New Action. Each area or storm basin has been analyzed, with one hydrology study completed.
P-7	Culverts at the end of W. Franklin going under the Street and Railroad are Undersized and the risk is flooding the entire business center of downtown.	Flood	Very High	Public Works / Street Departme nt	FEMA/MEMA, CDBG, Local	2022	New Action. Culverts under Railroad Ave. Need to be enlarged to handle storm water. Once done the culverts under the railroad need to be enlarged.
P-8	Bailey Avenue has flooded twice in the last five years. Hydrology study indicates size of 30" culvert should be replaced with two 36"x 42" culverts.	Flood	High	Public Works / Street Department	FEMA/MEMA, CDBG, Local	2022	New Action. Several Homes have flooded with one home experiencing a loss of $67,000. Have increased the flow away from Bailey to culverts under N. Jackson to reduce pressure on Bailey.
P-9	Water volume and pressure on the east side of Archusa Lake is a serious problem. Fire protection is suspect and sewer service is not complete to most homes.		High	Contractor Engineer	Corps of Engineers 592 Funds	2022	New Action. First phase ($1.9) million will start in 2021 with an additional $4. million In other stages. In ground pressure tank will be built.
P-10	Pine View Circle has had flood losses in four of the last 10 yrs. Junior High School has raw sewage flooding twice in 4 yrs.	Flood	High	Public Works / Engineer	FEMA/MEMA, CDBG, Local	2022	New Action. Sewer lines north of Pine View Circle and the Jr. High have been lined to reduce the infiltration of storm waters.
P-11	Culverts at end of Sycamore and Railroad Avenue can't handle the storm water surge and need to be increased in size. Three Homes have flooded in last 5 yrs.	Flood	High	Public Works / Engineer	FEMA/MEMA, CDBG, Local	2023	New Action

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-12	Homes on the lower end of Lorretta Drive suffer flooding from storm waters going down their driveways and getting into their homes.	Flood	High	Public Works / Engineer	FEMA/MEMA, CDBG, Local	2024	New Action
P-13	Warning systems to alarm when weather or other threats develop Currently have two new sirens that have voice command ability	All	High	Fire	HMGP, FEMA, MEMA, CDBG	2021	New Action
P-14	Standby Emergency generator for City Hall and Economic Dev. Center.	All	High	Public Works	HMGP, FEMA, MEMA, CDBG	2021	New Action
P-15	Infiltration of storm waters in the lines from Grecimar to Pecan Circle and Dogwood have caused homes to be unable to flush their toilets	Flood	High	Water Department	HMGP, FEMA, MEMA, Local, CDBG	2022	New Action
P-16	Security aroung water wells and Lift Stations is needed. Currently, only a fence is around all of them. Needed is better security, cameras, and SCATA systems to alert us.	Security	High	Water Department	FEMA, MEMA, CDBG, Local	2021	New Action
P-11	Keeping gutters cleaned is currently being done by a 30 year old street sweeper, and other equipment is needed Back-hoe and Tractor to pull leaf machine are essential	All	Moderate	Street Department	Volkswagen Funds & Local	2021	New Action
P-12	Collect additional data on the number of buildings located in storm surge flooding. Determine their assessed value to determine potential losses	Flood	Moderate	Zoning	Local	2021	New Action

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-13	City has numerous old brick Man-holes that are subject to collapse. We have replaced several but have many others	All	Moderate	Engineer, Water Department	HMGP, FEMA, MEMA	2023	New Action
P-14	City has cast iron water pipes and one street uses an Asbestos pipe for water. Some water lines need to be Increased, especially to the other side of the lake.	Health & Safety	Moderate	Engineer, Water Departme nt	HMGP, FEMA, MEMA, CDBG, Local	2022	New Action

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Property Protection							
PP-1	Repair of roof at the Quitman Fire Department.	High Wind	High	Fire Department	FEMA/MEMA, Homeland Security, Local funds	2017	COMPLETED
PP-2	Installation of a pitched roof on City Hall to replace the current flat roof.	Flood	High	Board of Aldermen	FEMA/MEMA, Homeland Security, Local funds	2017	COMPLETED
PP-3	Depot	Flood & High Wind	High	Board of Alderman	Local, MDAH	2021	New Action
Natural Resource Protection							
NRP-1	Chickasawhay River Natural Asset	Debris	Moderate	City and Army Corps of Engineers	Local	2023	New Action
Structural Projects							
SP-1	Installation of larger culverts on Railroad Avenue.	Flood	High	Public Works	FEMA/MEMA, CDBG, Local funds	2023	Larger culverts have not been installed on Railroad Avenue. The city will continue to look into potential funding sources for this project.
SP-2	Installation of a cement drainage ditch behind Pineview Circle.	Flood	High	Public Works	FEMA/MEMA, CDBG, Local funds	2023	A cement drainage ditch has not been installed behind Pineview Circle. The city will continue to look into potential funding sources for this project.
SP-3	Installation of approximately 400’ of culverts on Anderson Street.	Flood	High	Public Works	FEMA/MEMA, CDBG, Local funds	2023	Culverts have not been installed on Anderson Street. The city will continue to look into potential funding sources for this project.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
SP-4	Installation of additional pumps at the sewer to handle excess water due to heavy rainfall.	Flood	High	Public Works	FEMA/MEMA, CDBG, Local funds	2025	Additional pumps have not been installed to the sewer system. The city will continue to look into potential funding sources for this project.
SP-5	Sewer Lines draining into Brock Street Lift Station are incurring excessive Infiltration	Flood	High	Water Sewer	HMGP, CDBG, Local	2022	New Action
SP-6	Combine the small lagoon with the larger lagoon after cleaning smaller one	Health & Safety	Moderate	Water Sewer	HMGP, CDBG, Local	2024	New Action
SP-7	Bringing Sewer to other side of lake and increase water volume and pressure	Health & Safety	High	Water Sewer	CDBG, Local	2022	New Action
SP-8	Above Ground 150,000 gal. Water Tank for other side of Lake	Health & Safety	Moderate	Water Sewer	CDBG, Local	2024	New Action
SP-9	Retainage Ponds at Lumber Mill Property to lessen the effect of storm waters	Flood	High	Engineer, Water Sewer	CDBG, Local	2024	New Action
Emergency Services							
ES-1	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane.	Hurricane	High	Fire Department , Police Department	FEMA/MEMA, Local funds	2022	Have implemented ISIS Communication System and have place two warning sirens of the three needed plan is ongoing.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
ES-2	Installation of an emergency warning system for the city.	All	High	Board of Aldermen	FEMA/MEMA, Homeland Security, Local funds	2020	We now have three of the warning sirens of the four needed. One more to go.
ES-3	Purchase generators to provide adequate backup power for critical facilities.	Tornado, High Wind	Moderate	Board of Aldermen	FEMA/MEMA, Homeland Security, AFGP, Local funds	2022	We have no back-up for City Hall or the two water wells. Need two 100K's and two 50K generators
ES-4	Purchase wildland firefighting gear for the volunteer fire department.	Wildfire	Moderate	Volunteer Fire Department	FEMA/MEMA, Homeland Security, DFGP, Local funds	2022	Wildfire fighting gear has not been purchased but is needed. One more to go.
ES-5	Purchase Equipment for Police Officers to respond to civil unrest and protection of Officers	Safety	Moderate	Police Department	FEMA, MEMA, Homeland Security	2022	New Action
Public Education and Awareness							
PEA-1	Education of local citizens on the dangers of driving across flooded roads.	Flood	High	Fire Department, Police Department	FEMA/MEMA, JAG, Local funds	2022	Considerable improvement in this program, but it will remain an ongoing effort
PEA-2	Purchase of materials to educate the public on being prepared for all hazards, including tornadoes, flooding, severe weather, etc.	All	Low	Fire Department , Police Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.
PEA-3	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2020	New action
PEA-4	Using the Iris System to notify citizens by area of boil water notices	Health & Safety	High	Public Works	FEMA, MEMA, Local	2021	New Action

Town of Shubuta Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Clean out three drainage ditches that lead to the Chickasawhay River.	Flood	High	Public Works	FEMA/MEMA, CDBG, Local funds	2025	These drainage ditches have been cleaned up fairly regularly, but the town would like to continue carrying out this task and evaluate the effectiveness of keeping them cleared.
P-2	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	The International Building Code has been adopted. The county will need to review this code over the next 5 years, so this action will remain in the plan.
P-3	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-4	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-5	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Volunteer Fire Department, Police Department	FEMAMEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
P-6	Collect additional data on the number of buildings located in flood-prone areas near the Chickasawhay River and determine the value in order to determine the potential losses due to a flood event.	Flood	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1							
Emergency Services							
ES-1	Purchase of a generator to provide adequate backup power for the water system.	Tornado, High Wind	High	Public Works	FEMA/MEMA, Homeland Security, Local funds	2025	The town has not purchased a backup generator for the water system. It will look into trying to find funding for this going forward.
ES-2	Develop a plan to notify and educate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strike.	Hurricane	High	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan.
ES-3	Installation of an emergency warning system for the Town.	Tornado, High wind	High	Board of Aldermen	FEMA/MEMA, Homeland Security, Local funds	2025	The town has not installed an emergency warning system, but it would like to continue to look at funding options for this system
ES-4	Purchase of a generator to provide adequate backup power for the volunteer fire department.	Tornado, High Wind	Moderate	Volunteer Fire Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	The town has not purchased a backup generator for the fire department. It will look into trying to find funding for this going forward.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
ES-5	Purchase wildland firefighting gear for the volunteer fire department.	Wildfire	Moderate	Volunteer Fire Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	This equipment has not been purchased for volunteer fire departments due to lack of funding. The town will continue to look for ways to fund this going forward.
Public Education and Awareness							
PEA-1	Education of local citizens on the dangers of driving across flooded roads.	Flood	High	Volunteer Fire Department, Police Department	FEMA/MEA, JAG, Local funds	2025	The county has worked hard to inform citizens of the dangers of driving across flooded roads, but this action needs to be continued going forward.
PEA-2	Purchase materials to educate the public on being prepared for all hazards, including tornadoes, flooding, severe weather, fire, etc.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.
PEA-3	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2025	Ongoing

Town of Stonewall Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-2	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
P-4	Collect additional data on the number of buildings located in flood-prone areas near the Chickasawhay River and determine the assessed value in order to determine the potential losses due to a flood event.	Flood	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
	Structural Projects						
SP-1	Replacement of the bridge on Highway 513.	Flood	High	Public Works	FEMA/MEMA, CDBG, LSBP, Local funds	2025	This bridge has not been replaced yet, but the town still sees it as a priority, so it will look at determining how to get the project funded going forward.
	Emergency Services						
ES-1	Installation of an emergency warning system for the Town.	Tornado, High Wind	High	Board of Aldermen	FEMA/MEMA, Homeland Security, Local funds	2025	The town has not installed an early warning system, but it would like to continue to look at funding options for this system
ES-2	Purchase of generators to provide adequate backup power for the water and sewer systems.	Tornado, High Wind	High	Public Works	FEMA/MEMA, Homeland Security, Local funds	2025	The town has not purchased a backup generator for the water system. It will look into trying to find funding for this going forward.
ES-3	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan.
ES-4	Purchase a generator to provide adequate backup power for the Stonewall Volunteer Fire Department.	Tornado, High Wind	Moderate	Volunteer Fire Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	The town has not purchased a backup generator for the fire department. It will look into trying to find funding for this going forward.
ES-5	Purchase wildland firefighting gear for the volunteer fire department.	Wildfire	Moderate	Volunteer Fire Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	This equipment has not been purchased for volunteer fire departments due to lack of funding. The town will continue to look for ways to fund this going forward.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Public Education and Awareness							
PEA-1	Education of local citizens on the dangers of driving across flooded roads.	Flood	High	Volunteer Fire Department, Police Department	FEMA/MEMA, JAG, Local funds	2025	The county has worked hard to inform citizens of the dangers of driving across flooded roads, but this action needs to be continued going forward.
PEA-2	Purchase of materials to educate the public on being prepared for all hazards, including tornadoes, flooding, severe weather, etc.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.
PEA-3	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2025	Ongoing

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ANNEX B
JASPER COUNTY

This annex includes jurisdiction-specific information for Jasper County and its participating municipalities. It consists of the following five subsections:

- B.1 Jasper County Community Profile
- B.2 Jasper County Risk Assessment
- B.3 Jasper County Vulnerability Assessment
- B.4 Jasper County Capability Assessment
- B.5 Jasper County Mitigation Strategy

B.1 JASPER COUNTY COMMUNITY PROFILE

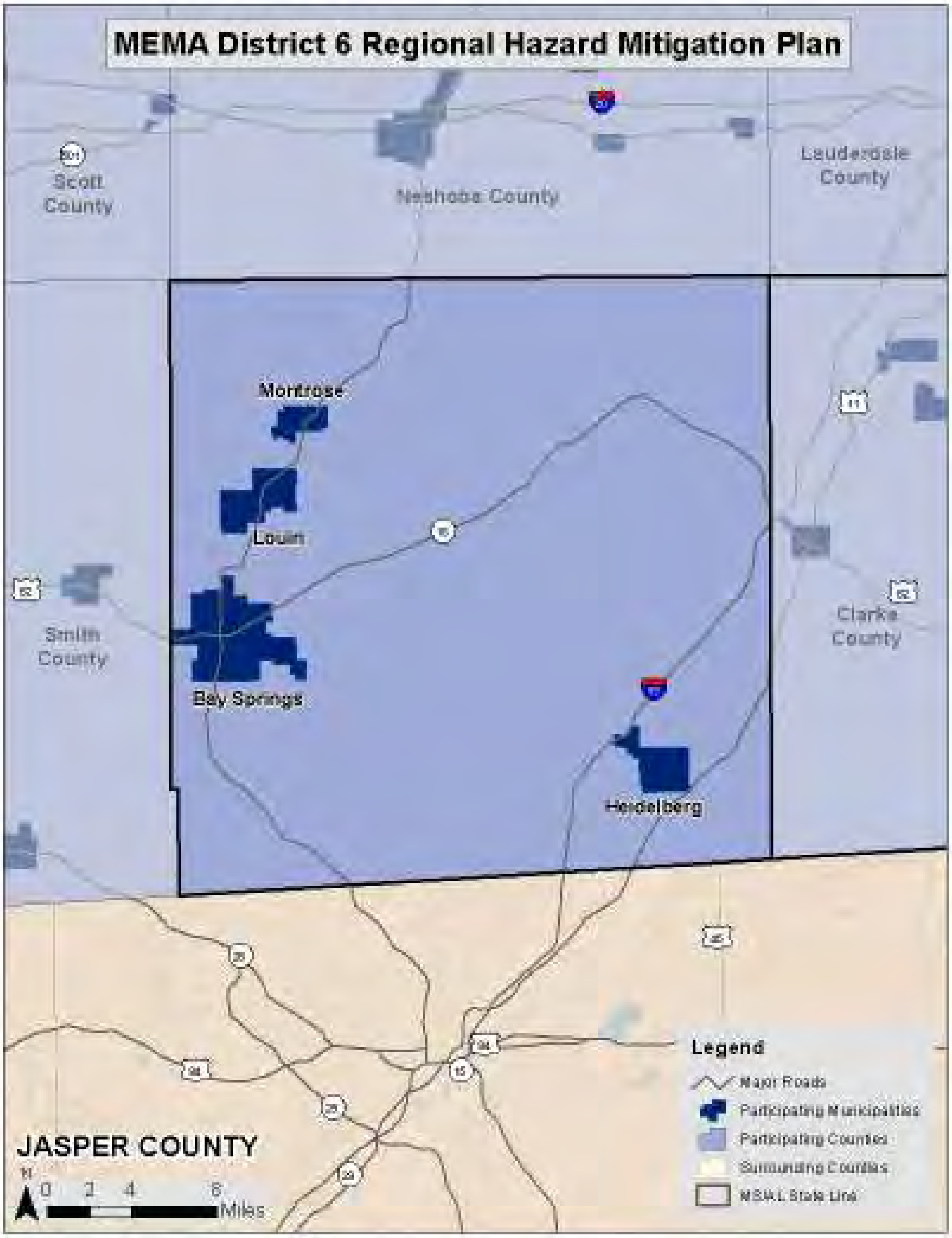
B.1.1 Geography and the Environment

Jasper County is located in eastern Mississippi. It comprises three towns and one city, City of Bay Springs, Town of Heidelberg, Town of Louin, and Town of Montrose, as well as many small unincorporated communities. An orientation map is provided as **Figure B.1**.

The county is the top gas and oil producing county in Mississippi with both business development opportunities and multiple outdoor recreational opportunities. The total area of the county is 677 square miles, 1 square mile of which is water area.

Summer temperatures in the county range from highs of about 90 degrees Fahrenheit (˚F) to lows in the upper 60s. Winter temperatures range from highs in the mid-50s to lows around 30˚F. Average annual rainfall is approximately 56 inches, with the wettest months being November, December, and May.

Figure B.1: JASPER COUNTY ORIENTATION MAP



B.1.2 Population and Demographics

According to the 2019 Census estimate, Jasper County has a population of 16,383 people. The county has seen a decrease in population between 2000 and 2010, however Louin did experience a substantial rate of growth. The population density is 27 people per square mile. Population counts from the US Census Bureau for 2000, 2010, and 2019 for the county and participating jurisdictions are presented in **Table B.1**.

Table B.1: Population Counts for Jasper County

Jurisdiction	2000 Census Population	2010 Census Population	2019 Census Estimate	% Change 2010-2019
Jasper County	**18,149**	**17,062**	**16,383**	**-3.9%**
Bay Springs	2,097	1,786	1,632	-8.6%
Heidelberg	840	718	716	-0.2%
Louin	339	277	378	36.4%
Montrose	127	140	123	-12.4%

Source: United States Census Bureau – American Community Survey

Based on the 2019 American Community Survey, the median age of residents of Jasper County is 41 years. The racial characteristics of the county are presented in **Table B.2**. Black or African American make up the majority of the population in the county, accounting for 54.3 percent of the population.

Table B.2: Demographics of Jasper County

Jurisdiction	White, Percent (2019)	Black or African American, Percent (2019)	American Indian or Alaska Native, Percent (2019)	Asian, Percent (2019)	Native Hawaiian or Other Pacific Islander, Percent (2019)	Other Race, Percent (2019)	Two or More Races, percent (2019)	Persons of Hispanic Origin, Percent (2019)*
Jasper County	**44.7%**	**54.3%**	**0.0%**	**0.0%**	**0.0%**	**0.4%**	**0.5%**	**0.5%**
Bay Springs	36.9%	61.1%	0.1%	0.0%	0.0%	0.0%	2.0%	0%
Heidelberg	15.1%	84.8%	0.0%	0.0%	0.0%	0.0%	0.1%	0%
Louin	55%	44.4%	0.0%	0.0%	0.0%	0.0%	0.5%	0 %
Montrose	70.7%	12.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

*Hispanics may be of any race, so also are included in applicable race categories
Source: United States Census Bureau

B.1.3 Housing

According to the 2019 American Community Survey, there are 8,409 housing units in Jasper County, the majority of which are single family homes or mobile homes. Housing information for the county and four municipalities is presented in **Table B.3**.

Table B.3: Housing Characteristics of Jasper County

Jurisdiction	Housing Units (2010)	Housing Units (2019)	Median Home Value (2019 ACS)
Jasper County	**8,212**	**8,409**	**$79,000**
Bay Springs	855	812	$78,900
Heidelberg	346	335	$81,900
Louin	168	194	$88,800
Montrose	80	88	$65,600

Source: United States Census Bureau

B.1.4 Infrastructure

TRANSPORTATION

In Jasper County, U.S. Highway 11 runs roughly north-south. Interstate 59 runs north to south, passing through the county, allowing transportation to and from the City of Meridian to multiple towns including those in southern Mississippi.

The Thigpen Field Airport provides limited local service and regional air travel. The closest international airport includes Jackson-Evers International Airport, which offers international and domestic flights to a number of locations around the world.

Freight rail service to the area is provided by Watco Rail Transportation Services and Norfolk Southern Railroad, with assistance to distribution by five major truck lines.

UTILITIES

Electrical power in Jasper County is provided by the Electric Power Association of Mississippi and Southern Pine Electric Power Association and several local distributors, where applicable.

Water and sewer service is provided to residents by the multiple local utility companies such as Beaver Meadow Waterworks Association, Matthews Moss Water Association, Rose Hill Water Association, Tallahala Water Association, and Tri-County Water Association, along with various other locally based companies.

COMMUNITY FACILITIES

There are a number of buildings and community facilities located throughout Jasper County. According to the data collected for the vulnerability assessment (Section 6.4.1), there are 15 fire stations, 4 police stations, and 9 public schools located within the county.

There is one hospital located in Jasper County. Jasper General Hospital is a 20-bed medical hospital located in the City of Bay Springs.

Claude Bennett State Park, located near Bay Springs, is a 71 acres lake that is open year-round providing boating, skiing, fishing, swimming, and hunting. Lake Eddins is a 700-acre fishing lake that is available for boating and water based recreational activities. Tallahala Wildlife Management Areas is a 28,120-acre area used for hunting and managing wildlife. Golf opportunities are located within the county. Various festivals occurred within the county. Beinville National Forest is partially located in the county and consists of 178,541 acres used for hiking, fishing, boating, and hunting.

B.1.5 Land Use

Many areas of Jasper County are undeveloped or sparsely developed. There are several small incorporated municipalities located throughout the county, with a few larger hubs interspersed. These areas are where the county's population is generally concentrated. The incorporated areas are also where many of the businesses, commercial uses, and institutional uses are located. Land uses in the balance of the study area generally consist of rural residential development, agricultural uses, and recreational areas, although there are some notable exceptions in the larger municipalities. Local land use and associated regulations are further discussed in *Section 7: Capability Assessment.*

East Central Planning and Development District assists with Jasper County with planning and development to promote economic growth and job opportunities. Jasper County does have an Economic Development District that services the county's economic development needs through collaboration with other local, state, and national agencies.

B.1.6 Employment and Industry

According to U.S. Census Bureau's American Community Survey (ACS), in 2019, Jasper County had an average annual employment of 6,762 workers and an average unemployment rate of 7.3 percent as of May 2021[1]. In 2019, the manufacturing industry employed the most people, with 25 percent of the workforce, followed by educational services, health care, and social assistance (24.7%); Agriculture, Forestry, Fishing, and Hunting (5.4%); and Construction (10.8%). The median household income in Jasper County was $35,872 compared to $45,081 in the state of Mississippi.

B.2 JASPER COUNTY RISK ASSESSMENT

This subsection includes hazard profiles for each of the significant hazards identified in Section 4: *Hazard Identification* as they pertain to Jasper County. Each hazard profile includes a description of the hazard's location and extent, notable historical occurrences, and the probability of future occurrences. Additional information can be found in Section 5: *Hazard Profiles*.

B.2.1 Flood

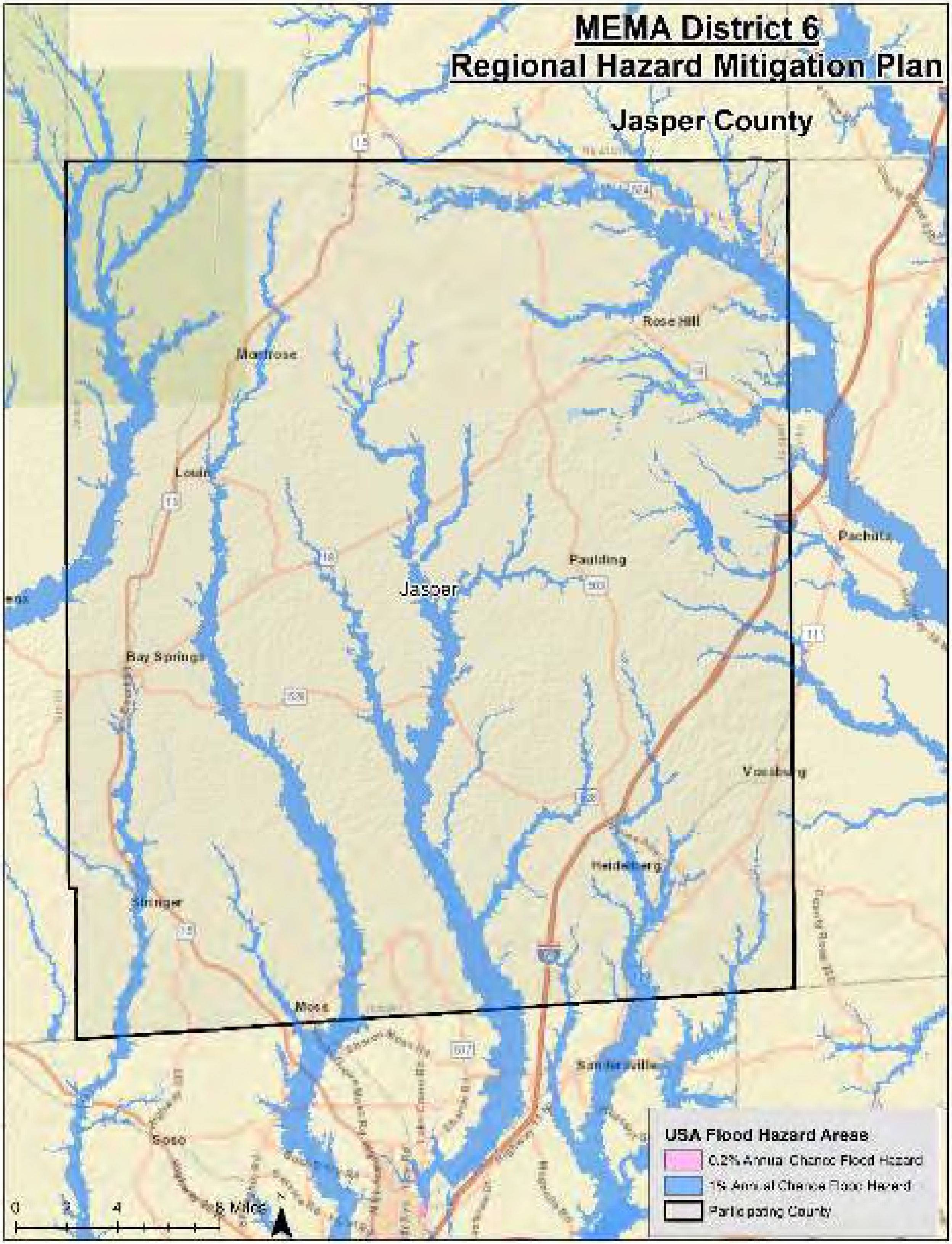
LOCATION AND SPATIAL EXTENT

There are areas in Jasper County that are susceptible to flood events. Special flood hazard areas in the county were mapped using Geographic Information System (GIS) and FEMA Digital Flood Insurance Rate Maps (DFIRM).[2] This includes Zone A (1-percent annual chance floodplain), Zone AE (1-percent annual chance floodplain with elevation), and Zone X500 (0.2-percent annual chance floodplain). According to GIS analysis, of the 686 square miles that make up Jasper County, there are 96.9 square miles of land in zones A and AE (1-percent annual chance floodplain/100-year floodplain) and 0.0 square miles of land in zone X500 (0.2-percent annual chance floodplain/500-year floodplain).

These flood zone values account for 14.1 percent of the total land area in Jasper County. It is important to note that while FEMA digital flood data is recognized as best available data for planning purposes, it does not always reflect the most accurate and up-to-date flood risk. Flooding and flood-related losses often do occur outside of delineated special flood hazard areas. **Figure B.2** illustrates the location and extent of currently mapped special flood hazard areas for Jasper County based on best available FEMA Digital Flood Insurance Rate Map (DFIRM) data. The principal flood problems are primarily due to the flooding of streams providing the major drainage for Jasper County.[3]

[1] Mississippi Department of Employment Security https://www.mdes.ms.gov/media/8651/uratesmap.pdf
[2] The county-level DFIRM data used for Jasper County were updated in 2010.
[3] FEMA. Flood Insurance Study. July 2011

Figure B.2: Special Flood Hazard Areas in Jasper County



Source: Federal Emergency Management Agency

HISTORICAL OCCURRENCES

Floods were at least partially responsible for seven disaster declarations in Jasper County in 1974, 1990, 2003, 2011, 2019, and 2020.[4] Information from the National Centers for Environmental Informationwas used to ascertain additional historical flood events. The National Centers for Environmental Information reported a total of 34 events in Jasper County since 1997. A summary of these events is presented in **Table B.4**. These events accounted for over $4 million in property damage in the county. Specific information on flood events, including date, type of flooding, and deaths and injuries, can be found in **Table B.5**.

Table B.4: Summary of Flood Occurrences in Jasper County

Location	Number of Occurrences	Deaths / Injuries
Bay Springs	6	0/0
Heidelberg	8	0/0
Louin	0	0/0
Montrose	0	0/0
Unincorporated Area	20	0/0
JASPER COUNTY TOTAL	**34**	**0/0**

Source: National Centers for Environmental information

Table B.5: Top Historical Flood Events in Jasper County[5]

Location	Date	Type	Deaths / Injuries	Property Damage
Stafford Springs	**03/09/2011**	**Flash Flood**	**0/0**	**$2,000,000**
Moss	**09/02/2008**	**Flash Flood**	**0/0**	**$500,000**
Vossburg	**12/28/2018**	**Flash Flood**	**0/0**	**$500,000**
West Portion	**08/29/2005**	**Flash Flood**	**0/0**	**$400,000**
Heidelberg	**08/29/2005**	**Flash Flood**	**0/0**	**$150,000**

Source: National Centers for Environmental Information

HISTORICAL SUMMARY OF INSURED FLOOD LOSSES

Current NFIP and Repetitive Loss Properties data was not available during this plan update. Information is current as of 2015. According to FEMA flood insurance policy records as of September 2019, there have been thirteen flood losses reported in Jasper County through the National Flood Insurance Program (NFIP) since 1978, totaling over $112,000 in claims payments. It should be emphasized that these numbers include only those losses to structures that were insured through the NFIP policies, and for losses in which claims were sought and received. It is likely that many additional instances of flood loss in Jasper County were either uninsured, denied claims payment, or not reported. Precise NFIP data was not provided or available at the time of this update. Data was sourced from the Natural Resources Defense Council obtained through a Freedom of Information Act request.

REPETITIVE LOSS PROPERTIES

[4] A complete listing of historical disaster declarations can be found in Section 4: *Hazard Identification*.

[5] Based on reported property damage.

According to the Mississippi Emergency Management Agency, there is one non-mitigated repetitive loss properties located in Jasper County, which accounted for three losses and more than $58,000 in claims payments under the NFIP. The average claim amount for these properties is $19,492. The property is non-residential. Without mitigation, this property will likely continue to experience flood losses. **TableB.6** presents detailed information on repetitive loss properties and NFIP claims and policies for Jasper County. [6]

Table B.6: REPETITIVE LOSS PROPERTIES IN JASPER COUNTY

Location	Number of Properties	Types of Properties	Number of Losses	Building Payments	Content Payments	Total Payments	Average Payment
Bay Springs	1	1 non-residential	3	$25,709	$32,766	$58,475	$19,492
Heidelberg	0	--	0	$0	$0	$0	$0
Louin*	--	--	--	--	--	--	--
Montrose*	--	--	--	--	--	--	--
Unincorporated Area	0	--	0	$0	$0	$0	$0
JASPER COUNTY TOTAL	**1**		**3**	**$25,709**	**$32,766**	**$58,475**	**$19,492**

*These communities do not participate in the National Flood Insurance Program. Therefore, no values are reported.
Source: National Flood Insurance Program. Current NFIP or Repetitive Loss Property data was not made available and is current as of 2015.

PROBABILITY OF FUTURE OCCURRENCES

Flood events will remain a threat in Jasper County, and the probability of future occurrences will remain likely (between 10 and 100 percent annual probability). The participating jurisdictions and unincorporated areas have risk to flooding, though not all areas will experience flood. The probability of future flood events based on magnitude and according to best available data is illustrated in the figures above**,** which indicates those areas susceptible to the 1-percent annual chance flood (100-year floodplain) and the 0.2-percent annual chance flood (500-year floodplain).

It can be inferred from the floodplain location maps, previous occurrences, and repetitive loss properties that risk varies throughout the county. For example, the Town of Heidelberg has more floodplain and thus a higher risk of flood than the other municipalities. Flood is not the greatest hazard of concern but will continue to occur and cause damage. Therefore, mitigation actions may be warranted, particularly for repetitive loss properties.

B.2.2 Erosion

LOCATION AND SPATIAL EXTENT

Erosion in Jasper County is typically caused by flash flooding events. Unlike coastal areas, areas of concern for erosion in Jasper County are primarily rivers and streams. Generally, vegetation helps to prevent erosion in the area, and it is not an extreme threat to the county. No areas of concern were reported by the hazard mitigation council.

HISTORICAL OCCURRENCES

[6] Repetitive Loss Property data was not provided or made available for this plan update.

Several sources were vetted to identify areas of erosion in Jasper County. This includes searching local newspapers, interviewing local officials, and reviewing previous hazard mitigation plans. No historical erosion occurrences were found in these sources.

PROBABILITY OF FUTURE OCCURRENCES

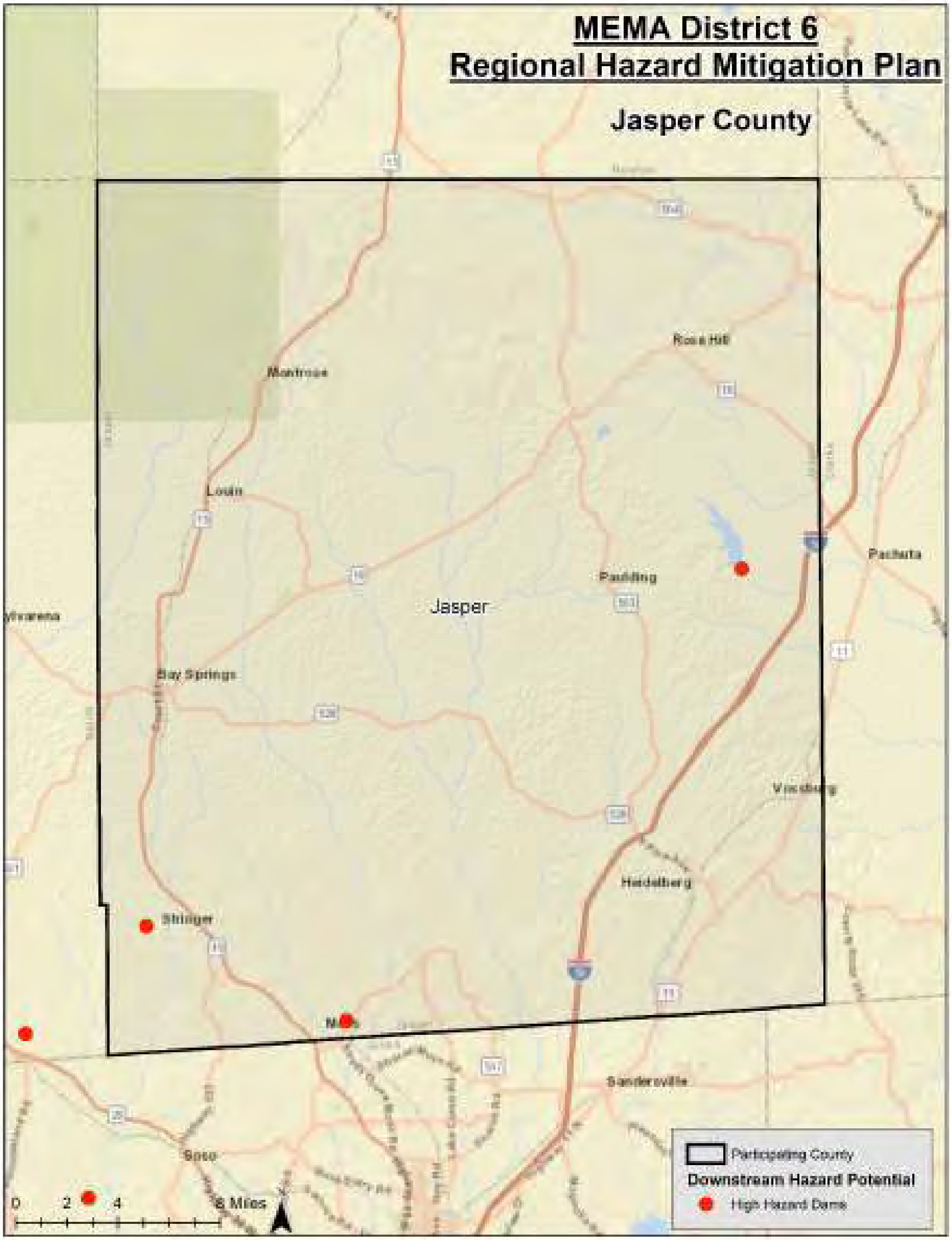
Erosion remains a natural, dynamic, and continuous process for Jasper County, and it will continue to occur. The annual probability level assigned for erosion is possible (between 1 and 10 percent annually).

B.2.3 Dam and Levee Failure

LOCATION AND SPATIAL EXTENT

According to the Mississippi Department of Environmental Quality, there are three high hazard dams in Jasper County. **Figure B.3** shows the location of each of these high hazard dams and **Table B.7** lists them by name.

Figure B.3: Jasper County High Hazard Dam Locations



Source: U.S. Army Corps of Engineers – National Inventory of Dams

Table B.7: JASPER COUNTY HIGH HAZARD DAMS

Dam Name	Hazard Potential
Jasper County	
HERITAGE LAKE DAM	High
LAKE EDDINS DAM	High
BIG CREEK WATERSHED STRUCTURE	High

Source: U.S. Army Corps. Of Engineers – National Inventory of Dams

HISTORICAL OCCURRENCES

There is no record of dam breaches in Jasper County.

PROBABILITY OF FUTURE OCCURRENCES

Given the current dam inventory and historic data, a dam breach is possible (between 1 and 10 percent annual probability) in the future. However, as has been demonstrated in the past, regular monitoring is necessary to prevent these events.

B.2.4 Winter Storm and Freeze

LOCATION AND SPATIAL EXTENT

Nearly the entire continental United States is susceptible to winter storm and freeze events. Some ice and winter storms may be large enough to affect several states, while others might affect limited, localized areas. The degree of exposure typically depends on the normal expected severity of local winter weather. Jasper County is not accustomed to severe winter weather conditions and rarely receives severe winter weather, even during the winter months. Events tend to be mild in nature; however, even relatively small accumulations of snow, ice, or other wintery precipitation can lead to losses and damage due to the fact that these events are not commonplace. Given the atmospheric nature of the hazard, the entire county has uniform exposure to a winter storm.

HISTORICAL OCCURRENCES

According to the National Climatic Data Center, there have been a total of thirteen recorded winter storm events in Jasper County since 1996 (**Table B.8**). These events resulted in over $1.2 million in damages. Detailed information on the recorded winter storm events can be found in **Table B.9**.

Table B.8: Summary of Winter Storm Events in Jasper County

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Jasper County	13	0/0	$1,330,000

Source: National Centers for Environmental Information

Table B.9: HISTORICAL WINTER STORM IMPACTS IN JASPER COUNTY

Location	Date	Type	Deaths / Injuries	Property Damage*
Bay Springs				
None Reported	--	--	--	--
Heidelberg				
None Reported	--	--	--	--
Louin				
None Reported	--	--	--	--
Montrose				
None Reported	--	--	--	--
Unincorporated Area				
JASPER	2/1/1996	Ice Storm	0/0	$152,096
JASPER	1/1/2002	Heavy Snow	0/0	$6,633
JASPER	1/19/2008	Heavy Snow	0/0	$0
JASPER	12/11/2008	Heavy Snow	0/0	$0
JASPER	01/01/2010	Cold/Wind Chill	0/0	$150,000
JASPER	2/11/2010	Heavy Snow	0/0	$437,755
JASPER	1/9/2011	Ice Storm	0/0	$0
JASPER	2/3/2011	Ice Storm	0/0	$636,541
JASPER	1/28/2014	Heavy Snow	0/0	$0
JASPER	12/08/2017	Heavy Snow	0/0	$50,000
JASPER	12/31/2017	Winter Weather	0/0	$0
JASPER	01/16/2018	Winter Weather	0/0	$0
JASPER	02/17/2021	Ice Storm	0/0	$25,000

Source: National Centers for Environmental Information

There have been several severe winter weather events in Jasper County. The text below describes one of the major events and associated impacts on the county. Similar impacts can be expected with severe winter weather.

January 2008 Winter Storm

This storm produced heavy snow across the region, with an average of three to four inches of snow. Some heavier amounts, between four to five inches, also fell in isolated areas. At the height of the snow, temperatures fell to near freezing, and accumulations occurred on roadways resulting in a number of traffic accidents. Additionally, some power outages occurred in the heaviest snow band due to the weight of wet snow on limbs and lines.

Winter storms throughout the planning area have several negative externalities including hypothermia, cost of snow and debris cleanup, business and government service interruption, traffic accidents, and power outages. Furthermore, citizens may resort to using inappropriate heating devices that could to fire or an accumulation of toxic fumes.

PROBABILITY OF FUTURE OCCURRENCES

Winter storm events will continue to occur in Jasper County. According to historical information, the annual probability is likely (between 10 and 100 percent).

FIRE-RELATED HAZARDS

B.2.5 Drought / Heat Wave

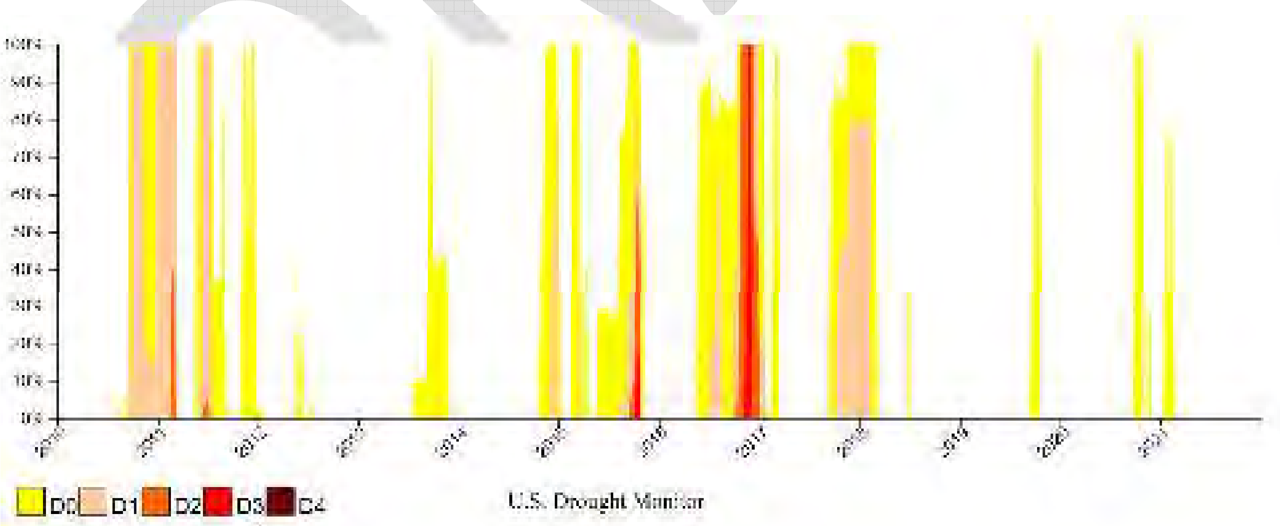
Drought
Drought typically covers a large area and cannot be confined to any geographic or political boundaries. Furthermore, it is assumed that Jasper County would be uniformly exposed to drought, making the spatial extent potentially widespread. It is also notable that drought conditions typically do not cause significant damage to the built environment but may exacerbate wildfire conditions.

Heat Wave
Heat waves typically impact a large area and cannot be confined to any geographic or political boundaries.

HISTORICAL OCCURRENCES

Drought
According to the U.S. Drought Monitor, Jasper County had drought levels (including abnormally dry) in each of the last 15 years (2010-2021). **Figure B.4** shows the most severe drought classification for each year, according to U.S. Drought Monitor classifications. It should be noted that the U.S. Drought Monitor also estimates what percentage of the county is in each classification of drought severity. For example, the most severe classification reported may be exceptional but a majority of the county may actually be in a less severe condition.

Figure B.4: Historical Drought Occurrences in Jasper County



Source: United States Drought Monitor

Some additional anecdotal information was provided from the National Centers for Environmental Information on droughts in Jasper County.

Summer 2006 – During a four-and-a-half-month period, from June to the middle of October, abnormally dry conditions prevailed across most of Jackson, MS County Warning Area (CWA). The drought had a significant impact on the agricultural industry. Non-irrigated crops were destroyed and all other sustainable crops produced a below normal yield. Catfish ponds were drawn down to severe levels and required water to be pumped back into the fish ponds. The cattle industry suffered due to low watering ponds and lack of sufficient grasslands for grazing and hay production. Water supply problems were encountered by those cities who obtained water from local rivers for drinking purposes due to the low river flows. Fire threat was significant causing the issuance of burn bans across the CWA.

Summer 2007 – By the middle of April, drought conditions were being experienced across a large portion of Eastern and some of Central Mississippi. During the month of May, the drought worsened and expanded. In June, the drought peaked across the region. Although drought conditions continued throughout July and August, conditions were less severe than earlier in the summer. As a result of these conditions, area farmers and crop yields were affected.

November 2016 - Very dry conditions continued into November, which resulted in an area of severe drought (D2). This eventually turned into extreme (D3) drought across Jasper County by the end of the month. Crops were put under more stress from the dry and hot conditions.

Heat Wave
The National Centers for Environmental Information was used to determine historical heat wave occurrences in the county.

July 2005 – A five-day heat wave occurred across the region. Heat index values reached near 110 degrees each day. Each day had high temperatures ranging from 95 to 99 degrees. This was the warmest stretch of weather the area experienced since July 2001.

August 2005 –A heat wave covering the south began in mid-August and lasted about 10 days. High temperatures were consistently over 95 degrees and surpassed 100 degrees or more on some days. It was the first time since August 2000 that 100-degree temperatures reached the area.

July 2006 – A short heat wave impacted most of the area temperatures in the 90s to around 100 for five straight days.

August 2007 – A heat wave gripped most of the area with the warmest temperatures since 2000. It lasted from August 5th to the 16th.

August 2010 – The combination of high humidity and above normal temperatures produced heat index readings ranged between 105 and 109 degrees during the afternoon hours in the middle part of August.

PROBABILITY OF FUTURE OCCURRENCES

Drought
Based on historical occurrence information, it is assumed that Jasper County has a probability level of

likely (between 10 and 100 percent annual probability) for future drought events. However, the extent (or magnitude) of drought and the amount of geographic area covered by drought, varies with each year. Historic information indicates that there is a much lower probability for extreme, long-lasting drought conditions.

Heat Wave

Based on historical occurrence information, it is assumed that all of Jasper County has a probability level of likely (between 10 and 100 percent annual probability) for future heat wave events.

B.2.6 Wildfire

LOCATION AND SPATIAL EXTENT

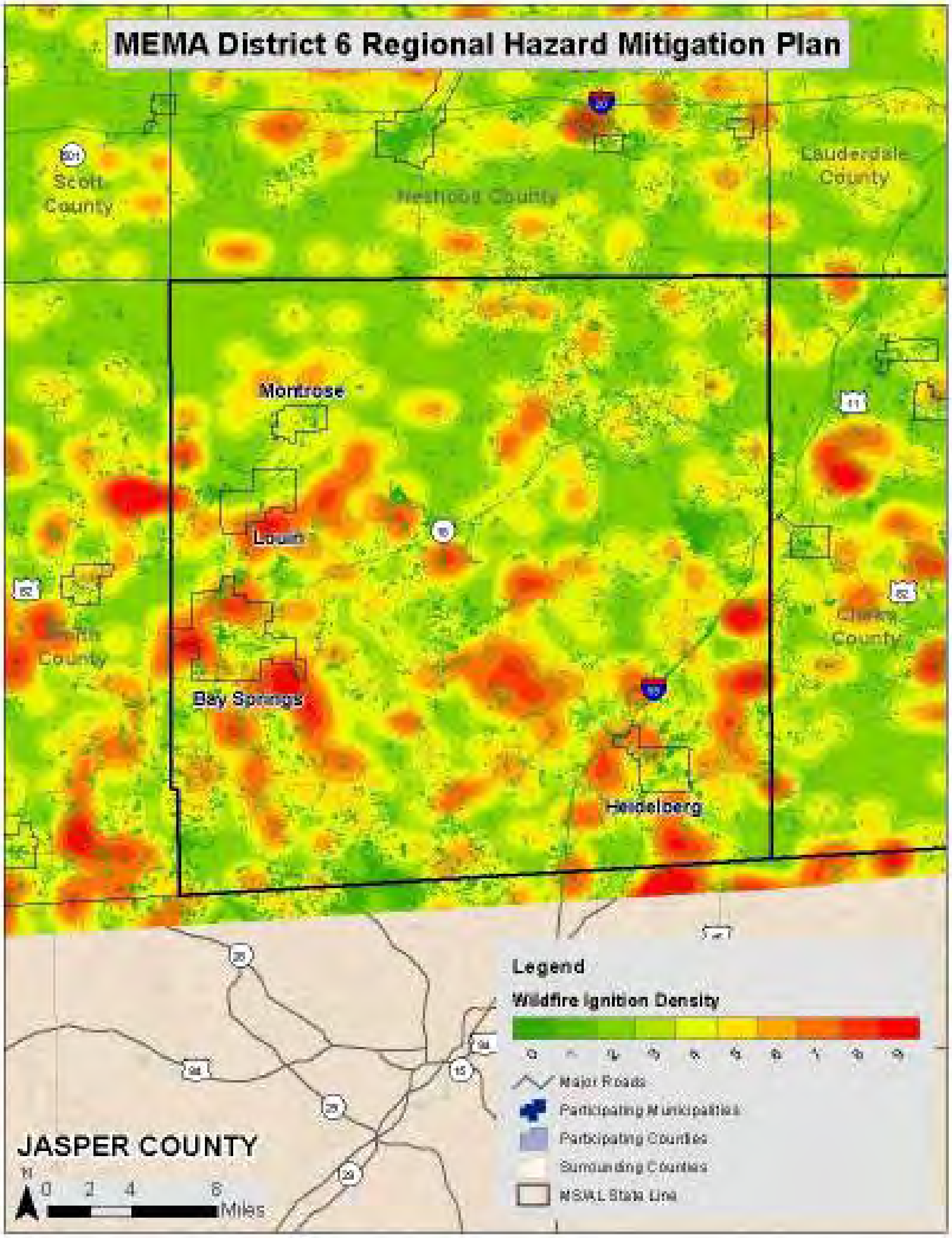
The entire county is at risk to a wildfire occurrence. However, several factors such as drought conditions or high levels of fuel on the forest floor, may make a wildfire more likely. Furthermore, areas in the urban-wildland interface are particularly susceptible to fire hazard as populations abut formerly undeveloped areas. The Wildfire Ignition Density data shown in the figure below give an indication of historic location.

HISTORICAL OCCURRENCES

Figure B.5 shows the Wildfire Ignition Density in Jasper County based on data from the Southern Wildfire Risk Assessment. This data is based on historical fire ignitions and the likelihood of a wildfire igniting in an area. Occurrence is derived by modeling historic wildfire ignition locations to create an average ignition rate map. This is measured in the number of fires per year per 1,000 acres.[7]

[7] Southern Wildfire Risk Assessment, 2014.

Figure B.5: Wildfire Ignition Density in Jasper County



Source: Southern Wildfire Risk Assessment

Based on data from the Mississippi Forestry Commission from 2015 to 2020, Jasper County experiences an average of 20 wildfires annually which burn an average of 221 acres per year. The data indicates that most of these fires are small, averaging 11 acres per fire. **Table B.10** provides a summary of wildfire occurrences in Jasper County and **Table B.11** lists the number of reported wildfire occurrences in the county between the years 2011 and 2020.

Table B.10: Summary of Annual Wildfire Occurrences (2015-2020)

	Jasper County
Average Number of Fires per year	20
Average Number of Acres Burned per year	221
Average Number of Acres Burned per fire	11

*These values reflect averages over a 6-year period.

Source: Mississippi Forestry Commission

Table B.11: Historical Wildfire Occurrences in Jasper County

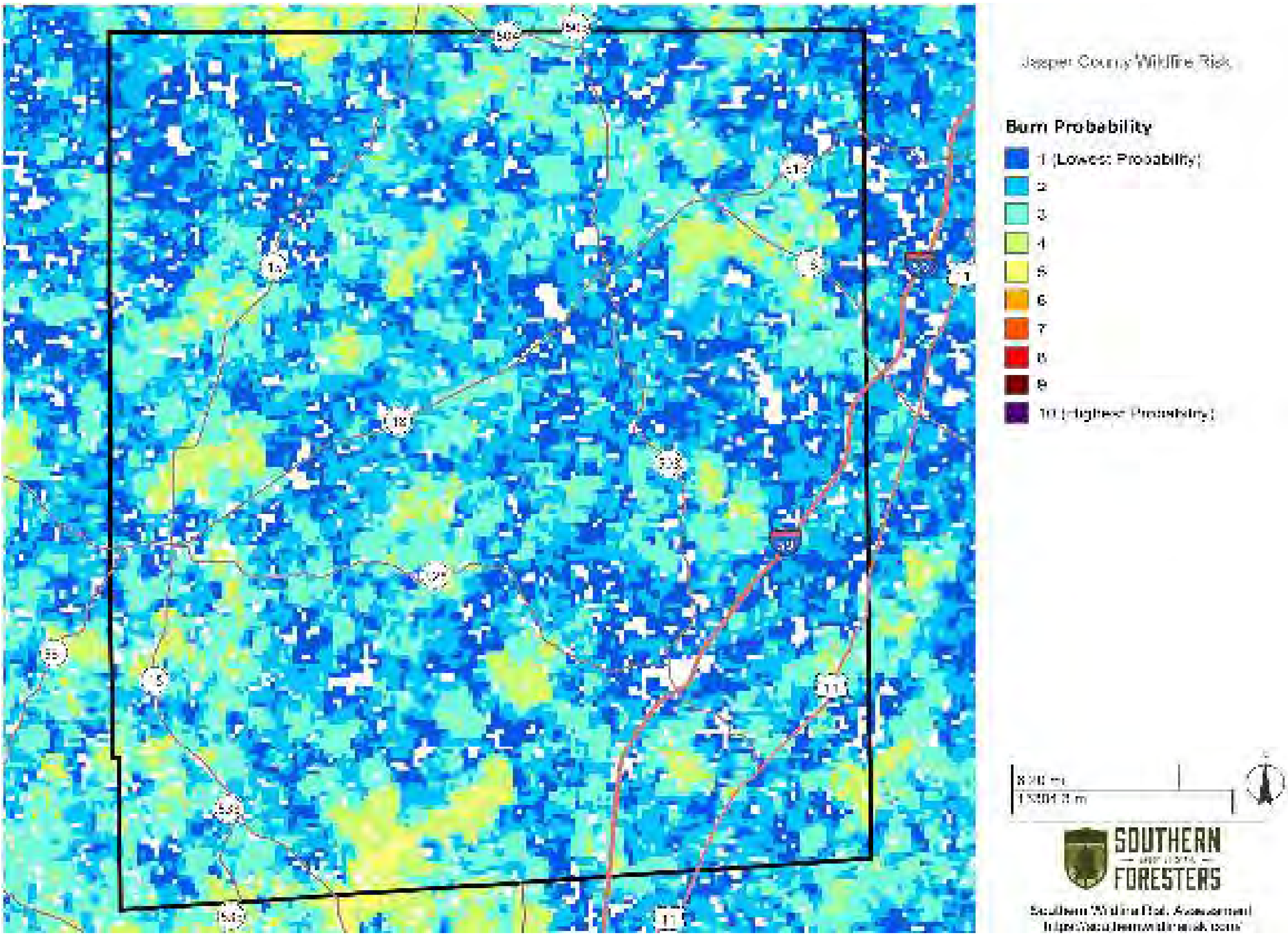
Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Jasper County										
Number of Fires	70	18	10	20	37	39	21	7	8	9
Number of Acres Burned	834	88	195	318	489	313	337	56	24	107

Source: Mississippi Forestry Commission

PROBABILITY OF FUTURE OCCURRENCES

Wildfire events will be an ongoing occurrence in Jasper County. **Figure B.6** shows that there is some probability a wildfire will occur throughout the county. However, the likelihood of wildfires increases during drought cycles and abnormally dry conditions. Fires are likely to stay small in size but could increase due to local climate and ground conditions. Dry, windy conditions with an accumulation of forest floor fuel (potentially due to ice storms or lack of fire) could create conditions for a large fire that spreads quickly. It should also be noted that some areas do vary somewhat in risk. For example, highly developed areas are less susceptible unless they are located near the urban-wildland boundary. The risk will also vary due to assets. Areas in the urban-wildland interface will have much more property at risk, resulting in increased vulnerability and need to mitigate compared to rural, mainly forested areas. The probability assigned to Jasper County for future wildfire events is highly likely (100 percent annual probability).

Figure B.6: Burn Probability in Jasper County



Source: Southern Wildfire Risk Assessment

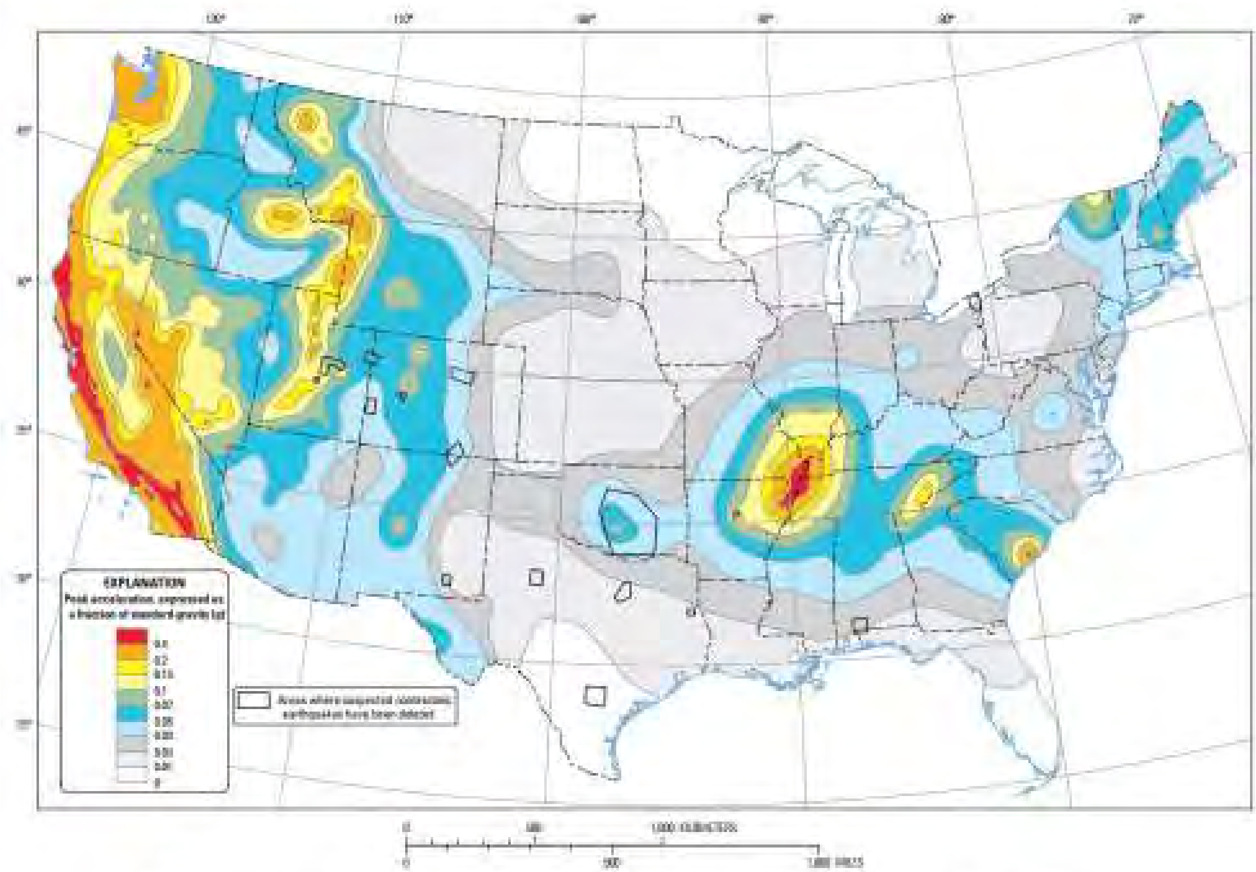
GEOLOGIC HAZARDS

B.2.7 Earthquake

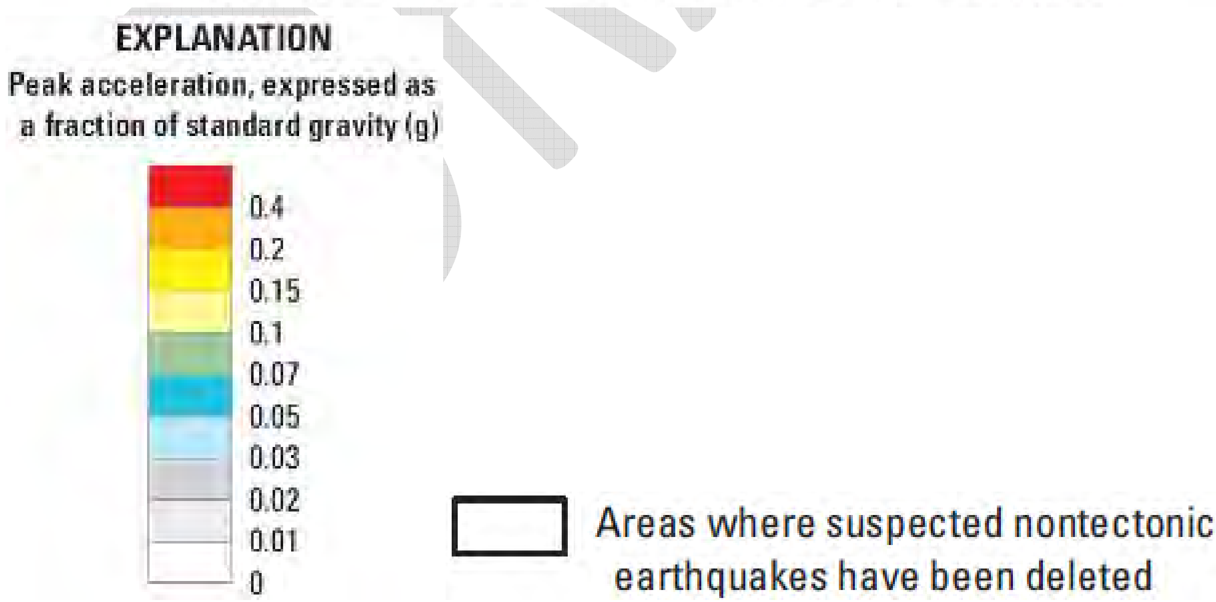
LOCATION AND SPATIAL EXTENT

Figure B.7 shows the intensity level associated with Jasper County, based on the national USGS map of peak acceleration with 10 percent probability of exceedance in 50 years. It is the probability that ground motion will reach a certain level during an earthquake. The data show peak horizontal ground acceleration (the fastest measured change in speed, for a particle at ground level that is moving horizontally due to an earthquake) with a 10 percent probability of exceedance in 50 years. The map was compiled by the U.S. Geological Survey (USGS) Geologic Hazards Team, which conducts global investigations of earthquake, geomagnetic, and landslide hazards. According to this map, Jasper County lies within an approximate zone of level “2” to “3” ground acceleration. This indicates that the county exists within an area of moderate seismic risk.

Figure B.7: Peak Acceleration with 10 Percent Probability of Exceedance in 50 Years



Ten-percent probability of exceedance in 50 years map of peak ground acceleration



Source: United States Geological Survey, 2014

HISTORICAL OCCURRENCES

At least one earthquake is known to have affected Jasper County since 1931. This measured a III on the Modified Mercalli Intensity (MMI) scale. **Table B.12** provides a summary of earthquake events reported by the National Geophysical Data Center between 1638 and 1985. **Table B.13** presents a detailed occurrence of each event including the date, distance for the epicenter, magnitude and Modified Mercalli Intensity (if known).[8]

Table B.12: Summary of Seismic Activity in Jasper County

Location	Number of Occurrences	Greatest MMI Reported	Richter Scale Equivalent
Bay Springs	0	--	--
Heidelberg	0	--	--
Louin	0	--	--
Montrose	0	--	--
Unincorporated Area	1	III	< 4.8
JASPER COUNTY TOTAL	**1**	**III (slight)**	**< 4.8**

Source: National Geophysical Data Center

Table B.13: Significant Seismic Events in Jasper County (1638 -1985)

Location	Date	Epicentral Distance	Magnitude	MMI
Bay Springs				
None Reported	--	--	--	--
Heidelberg				
None Reported	--	--	--	--
Louin				
None Reported	--	--	--	--
Montrose				
None Reported	--	--	--	--
Unincorporated Area				
Paulding	12/17/1931	240.0 km	*Unknown*	III

Source: National Geophysical Data Center

PROBABILITY OF FUTURE OCCURRENCES

The probability of significant, damaging earthquake events affecting Jasper County is unlikely. However, it is possible that future earthquakes resulting in light to moderate perceived shaking and damages ranging from none to very light will affect the county. The annual probability level for the county is estimated to be between 1 and 10 percent (possible).

[8] Due to reporting mechanisms, not all earthquake events were recorded during this time. Furthermore, some are missing data, such as the epicenter location, due to a lack of widely used technology. In these instances, a value of "unknown" is reported.

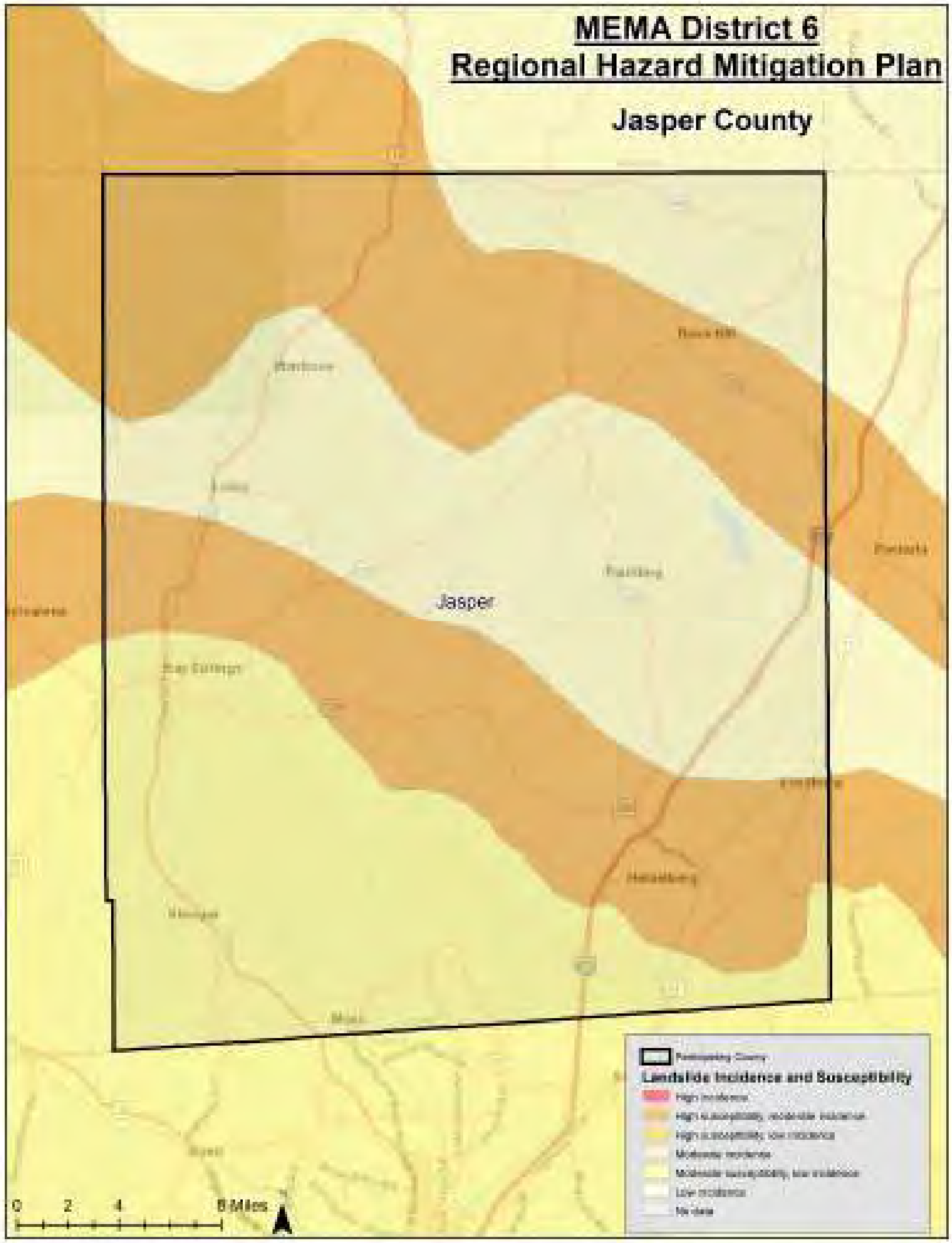
B.2.8 Landslide

LOCATION AND SPATIAL EXTENT

Landslides occur along steep slopes when the pull of gravity can no longer be resisted (often due to heavy rain). Human development can also exacerbate risk by building on previously undevelopable steep slopes. Landslides are possible throughout Jasper County, though the risk is relatively low.

According to **Figure B.8** below, the majority of the county falls under a low incidence area. This indicates that less than 1.5 percent of the area is involved in landsliding. There are also some areas throughout the county that are moderate incidence areas. This indicates that between 1.5 and 10 percent of the area is involved in landsliding.

Figure B.8: Landslide Susceptibility and Incidence Map of Jasper County



Source: United States Geological Survey

HISTORICAL OCCURRENCES

There is no extensive history of landslides in Jasper County. Landslide events typically occur in isolated areas. Reviews of the USGS Landslide Inventory show no historical occurrences of landslides.

PROBABILITY OF FUTURE OCCURRENCES

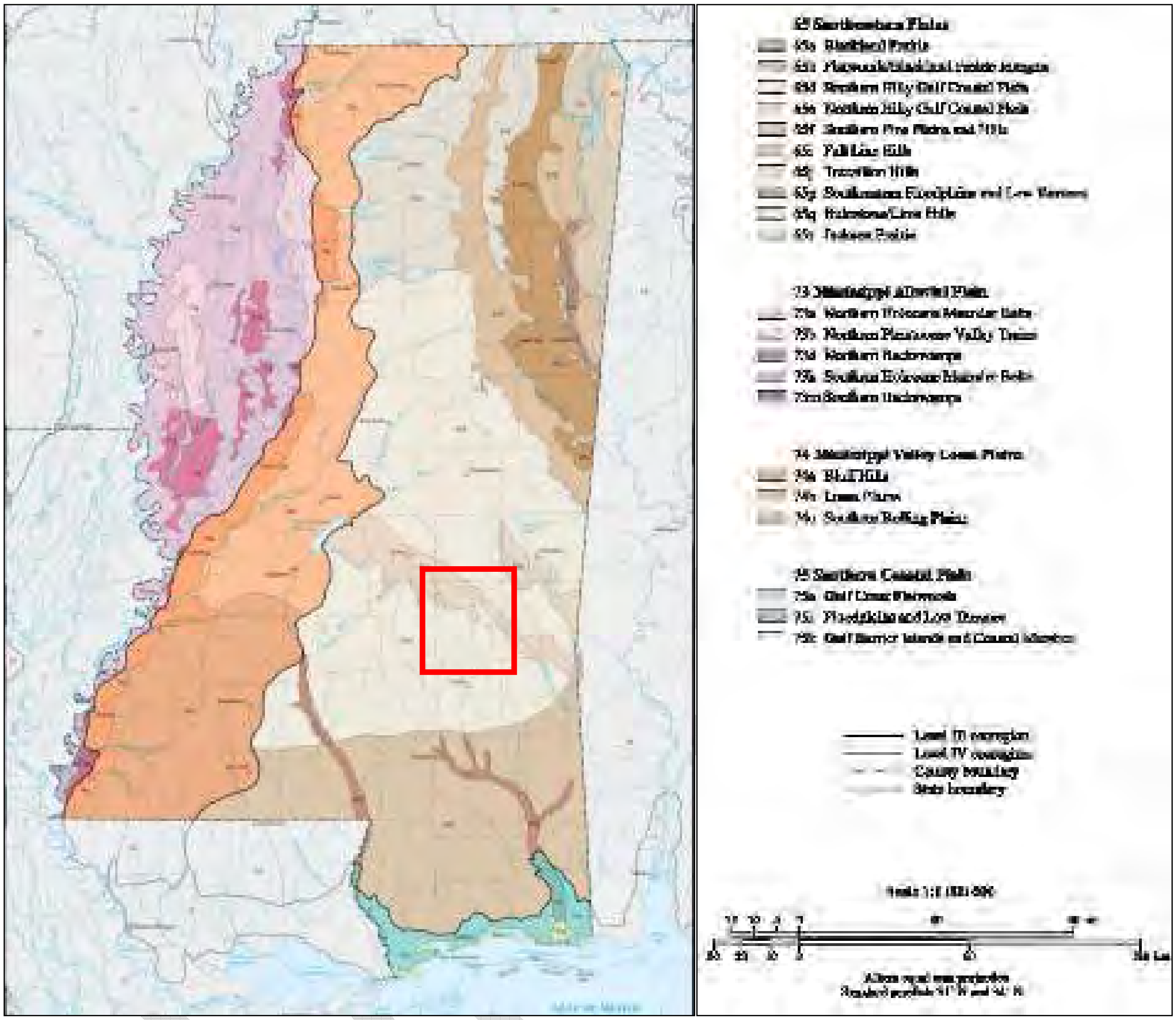
Based on historical information and the USGS susceptibility index, the probability of future landslide events is unlikely (less than 1 percent probability). The USGS data indicates that most areas in Jasper County have a low incidence rate and low susceptibly to landsliding activity. There are also some areas in the southwestern half of the county with moderate susceptibility to landsliding as well as additional areas with moderate incidence and high susceptibility. Local conditions may become more favorable for landslides due to heavy rain, for example. This would increase the likelihood of occurrence. It should also be noted that some areas in Jasper County have greater risk than others given factors such as steepness on slope and modification of slopes.

B.2.9 Land Subsidence

LOCATION AND SPATIAL EXTENT

Much of Jasper County is located in an area where the soil is substantially clay, causing a shrink and swell effect depending on the current conditions. Indeed, much of the area underlain by the calcareous Yazoo clay which, when combined with sand and marl, is highly susceptible to expansion when wet and shrinking when dry. These areas are denoted below in **Figure B.9**.

Figure B.9: Map of Mississippi Soils



Source: http://www.eoearth.org/view/article/152119/

HISTORICAL OCCURRENCES

There is no significant historical record of land subsidence in Jasper County. However, local county officials have noted the impacts from these swings and changes in soil as roads and other infrastructure have experienced large cracks and breaks, causing stops in daily operations and significant costs to local, state, and federal budgets. Often the cost to repair this infrastructure can be in the range of millions of dollars depending on the degree of damage and necessity for quick repairs.

PROBABILITY OF FUTURE OCCURRENCES

The probability of future land subsidence events in the county is unlikely (less than 1 percent annual probability).

WIND-RELATED HAZARDS

B.2.10 Hurricane and Tropical Storm

LOCATION AND SPATIAL EXTENT

Hurricanes and tropical storms threaten the entire Atlantic and Gulf seaboard of the United States. While coastal areas are most directly exposed to the brunt of landfalling storms, their impact is often felt hundreds of miles inland and they can affect Jasper County. All areas in Jasper County are equally susceptible to hurricane and tropical storms.

HISTORICAL OCCURRENCES

According to the National Hurricane Center's historical storm track records, 58 hurricane or tropical storm/depression tracks have passed within 75 miles of the MEMA District 6 Region since 1855.[9] This includes: 1 Category 3 hurricane, 2 Category 2 hurricanes, 5 Category 1 hurricanes, 33 tropical storms, and 16 tropical depressions.

Of the recorded storm events, 35 hurricane or tropical storm/depression events traversed directly through the region as shown in **Figure B.10**. Notable storms include Hurricane Frederic (1979) and Hurricane Katrina (2005). **Table B.14** provides for each event the date of occurrence, name (if applicable), maximum wind speed (as recorded within 75 miles of the MEMA District 6 Region) and category of the storm based on the Saffir-Simpson Scale.

[9] These storm track statistics include tropical depressions, tropical storms, and hurricanes. Lesser events may still cause significant local impact in terms of rainfall and high winds.

Figure B.10: Historical Hurricane Storm Tracks 1980 - 2020

Source: National Oceanic and Atmospheric Administration, National Hurricane Center

Table B.14: Historical Storm Tracks Within 75 Miles of MEMA District 6 Region (1850–2020)

Date of Occurrence	Storm Name	Maximum Wind Speed (knots)	Storm Category
9/16/1855	UNNAMED	70	Category 1
9/15/1860	UNNAMED	70	Category 1
7/12/1872	UNNAMED	40	Tropical Storm
9/2/1879	UNNAMED	60	Tropical Storm
10/7/1879	UNNAMED	40	Tropical Storm
10/16/1879	UNNAMED	40	Tropical Storm
9/1/1880	UNNAMED	50	Tropical Storm
8/3/1881	UNNAMED	40	Tropical Storm
6/14/1887	UNNAMED	30	Tropical Depression
8/28/1890	UNNAMED	35	Tropical Storm
9/12/1892	UNNAMED	40	Tropical Storm
9/8/1893	UNNAMED	55	Tropical Storm
8/17/1895	UNNAMED	35	Tropical Storm
8/3/1898	UNNAMED	35	Tropical Storm
8/16/1901	UNNAMED	45	Tropical Storm
10/10/1905	UNNAMED	35	Tropical Storm
9/27/1906	UNNAMED	95	Category 2
9/22/1907	UNNAMED	35	Tropical Storm
6/13/1912	UNNAMED	50	Tropical Storm
7/17/1912	UNNAMED	25	Tropical Depression
9/14/1912	UNNAMED	50	Tropical Storm
9/30/1915	UNNAMED	60	Tropical Storm
7/6/1916	UNNAMED	80	Category 1
7/5/1919	UNNAMED	30	Tropical Depression
10/18/1923	UNNAMED	50	Tropical Storm
7/30/1926	UNNAMED	25	Tropical Depression
9/1/1932	UNNAMED	60	Tropical Storm
10/16/1932	UNNAMED	45	Tropical Storm
8/1/1936	UNNAMED	40	Tropical Storm
9/1/1937	UNNAMED	30	Tropical Depression
6/16/1939	UNNAMED	35	Tropical Storm
8/14/1939	UNNAMED	35	Tropical Storm
9/26/1939	UNNAMED	40	Tropical Storm
9/25/1940	UNNAMED	20	Tropical Depression
9/4/1948	UNNAMED	50	Tropical Storm
9/5/1949	UNNAMED	40	Tropical Storm
8/31/1950	BAKER	65	Category 1
6/1/1959	ARLENE	25	Tropical Depression
9/16/1960	ETHEL	35	Tropical Storm
9/26/1960	FLORENCE	15	Tropical Depression

Date of Occurrence	Storm Name	Maximum Wind Speed (knots)	Storm Category
8/18/1969	CAMILLE	100	Category 3
9/16/1971	EDITH	60	Tropical Storm
7/19/1977	UNNAMED	25	Tropical Depression
9/6/1977	BABE	30	Tropical Depression
7/11/1979	BOB	40	Tropical Storm
9/13/1979	FREDERIC	95	Category 2
8/12/1987	UNNAMED	25	Tropical Depression
8/27/1992	ANDREW	30	Tropical Depression
8/4/1995	ERIN	45	Tropical Storm
8/6/2001	BARRY	20	Tropical Depression
9/26/2002	ISIDORE	55	Tropical Storm
7/1/2003	BILL	45	Tropical Storm
7/11/2005	DENNIS	45	Tropical Storm
8/29/2005	KATRINA	80	Category 1
9/14/2007	HUMBERTO	20	Tropical Depression
8/24/2008	FAY	30	Tropical Depression
8/17/2009	CLAUDETTE	25	Tropical Depression
10/28/2020	Zeta	33	Tropical Depression

*It should be noted that the track of several major hurricanes that impacted the region fell outside of the 75-mile buffer. These storms were included in the table due to their significant impact. (Georges, 1988; Ivan, 2004; Issac, 2012)
Source: National Hurricane Center

Federal records indicate that disaster declarations were made in 1969 (Hurricane Camille), 1979 (Hurricane Frederic), 1998 (Hurricane Georges), 2004 (Hurricane Ivan), 2005 (Hurricane Dennis and Hurricane Katrina), and 2012 (Hurricane Issac). Hurricane and tropical storm events can cause substantial damage in the area due to high winds and flooding. A complete listing of historical disaster declarations can be found in Section 4: Hazard Identification.

Flooding and high winds from hurricanes and tropical storms can cause damage throughout the county. Anecdotes are available from NCDC for the major storms that have impacted the county as found below:

Tropical Storm Isidore – September 26, 2002
The heavy rainfall associated with Tropical Storm Isidore resulted in significant river and flash flooding across much of Mississippi. Twenty-four-hour rainfall totals between 5 and 10 inches were common over much of Mississippi, especially in the southern part of the state, where 24-hour amounts exceeded 9 inches near Hattiesburg. Gradient wind gusts between 35 and 45 miles per hour combined with the saturated ground to lead to numerous downed trees and powerlines over the state. Most of the damage was seen along and east of the Natchez Trace, near the path of the storm's diffuse center. One indirect fatality was reported just east of the Kalem community in Scott County. Here, a falling tree struck a truck driven by a 31-year-old male. Damage from Isidore was an estimated $500,000.

Tropical Storm Bill – June 30 and July 1, 2003
Heavy rainfall with Tropical Storm Bill resulted in several reports of flash flooding. Forty-eight hour rainfall totals ranged between 3 and 7 inches, mainly across SE portions of Mississippi. Gradient wind gusts

between 30 and 40 mph combined with saturated soils to down numerous trees very close to center's track. Damage from Bill was an estimated $100,000.

Hurricane Ivan – September 16, 2004
Thousands of trees were blown down across Eastern Mississippi during Hurricane Ivan as well as hundreds of power lines. The strong wind itself did not cause much structural damage, however the fallen trees did. These downed trees accounted for several hundred homes, mobile homes and businesses to be damaged or destroyed. Most locations across Eastern Mississippi reported sustained winds between 30 and 40 mph with Tropical Storm force gusts between 48 and 54 mph. The strongest reported winds occurred in Newton, Lauderdale and Oktibbeha Counties.

Overall, rainfall totals were held in check as Ivan steadily moved north. The heaviest rains were confined to far Eastern Mississippi where 3 to 4 inches fell over a 15-hour period. Due to the duration of the rain no flooding was reported. Across Eastern Mississippi, Hurricane Ivan was responsible for one fatality. This fatality occurred in Brooksville (Noxubee County) when a tree fell on a man. Damage from Ivan was estimated at $200 million.

Hurricane Dennis – July 10, 2005
Hurricane Dennis moved north-northwest across Southwest Alabama and then into East-Central Mississippi and finally across Northeast Mississippi. Wind gusts over tropical storm force were common across areas east of a line from Starkville to Newton to Hattiesburg. These winds caused several hundred trees to uproot or snap and took down numerous power lines. Additionally, a total of 21 homes or businesses sustained minor to major damage from fallen trees or gusty winds.

Heavy rainfall was not a major issue as Dennis steadily moved across the region. Rainfall totals between 2 and 5 inches fell across Eastern Mississippi over a 12 hour period. One indirect fatality occurred in Jasper County from an automobile accident due to wet roads.

Hurricane Katrina – August 29, 2005
Hurricane Katrina will likely go down as the worst and costliest natural disaster in United States history. The amount of destruction, the cost of damaged property/agriculture and the large loss of life across the affected region has been overwhelming. Catastrophic damage was widespread across a large portion of the Gulf Coast region. The devastation was not only confined to the coastal region, widespread and significant damage occurred well inland up to the Hattiesburg area and northward past Interstate 20.

Hurricane force winds were common across Central Mississippi. The region received sustained winds of 60-80 mph with gusts ranging from 80-120 mph. Wind damage to structures was widespread, with roofs blown off or partially peeled. Hundreds of signs were shredded or blown down. Many businesses sustained structural damage as windows were broken, roofs were blown off, and walls were collapsed. Millions of trees were uprooted and snapped. Power poles and lines were snapped and taken down from wind and trees. It was thousands of downed trees which caused the most significant structural damage as these trees fell onto homes and businesses. Power outages lasted from a few days to as long as four weeks. Agriculture and timber industries were severely impacted. Row crops, including cotton, rice, corn, and soybeans, took a hard hit. Other impacted industries were the catfish industry, dairy and cattle industry, and nursery businesses.

PROBABILITY OF FUTURE OCCURRENCES

Given the inland location of the county, it is more likely to be affected by remnants of hurricane and tropical storm systems (as opposed to a major hurricane) which may result in flooding or high winds. The probability of being impacted is less than coastal areas, but still remains a real threat to Jasper County due to induced events like flooding. Based on historical evidence, the probability level of future occurrence is likely (annual probability between 10 and 100 percent). Given the regional nature of the hazard, all areas in the county are equally exposed to this hazard. However, when the county is impacted, the damage could be catastrophic, threatening lives and property throughout the planning area.

B.2.11 Thunderstorm (wind, hail, lightning)

LOCATION AND SPATIAL EXTENT

Thunderstorm / High Wind
A thunderstorm event is an atmospheric hazard, and thus has no geographic boundaries. It is typically a widespread event that can occur in all regions of the United States. However, thunderstorms are most common in the central and southern states because atmospheric conditions in those regions are favorable for generating these powerful storms. It is assumed that Jasper County has uniform exposure to an event and the spatial extent of an impact could be large.

Hailstorm
Hailstorms frequently accompany thunderstorms, so their locations and spatial extents coincide. It is assumed that Jasper County is uniformly exposed to severe thunderstorms; therefore, all areas of the county are equally exposed to hail which may be produced by such storms.

Lightning
Lightning occurs randomly, therefore it is impossible to predict where and with what frequency it will strike. It is assumed that all of Jasper County is uniformly exposed to lightning.

HISTORICAL OCCURRENCES

Thunderstorm / High Wind
Severe storms were at least partially responsible for eight disaster declarations in Jasper County in 1971, 1990, 1992, 2003, 2011, 2019, and 2020.[10] According to NCEI, there have been 281 reported thunderstorm and high wind events since 1956 in Jasper County. These events caused over $3.4 million in damages. There were also reports of one injury. **Table B.15** summarizes this information.

[10] A complete listing of historical disaster declarations can be found in Section 4: *Hazard Identification*.

Table B.15: Summary of Thunderstorm / High Wind Occurrences in Jasper County

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Bay Springs	46	0/0	$1,008,000
Heidelberg	34	0/0	$728,000
Louin	21	0/0	$212,000
Montrose	3	0/0	$13,000
Unincorporated Area	177	0/1	$1,415,000
JASPER COUNTY TOTAL	**281**	**0/1**	**$3,420,000**

Source: National Centers for Environmental Information

Hailstorm

According to the National Centers for Environmental Information, 135 recorded hailstorm events have affected Jasper County since 1962. **Table B.16** is a summary of the hail events in Jasper County. **Table B.20** provides detailed information about each event that occurred in the county. In all, hail occurrences resulted in approximately $548,000 in property damages. Hail ranged in diameter from 0.75 inches to 2.5 inches. It should be noted that hail is notorious for causing substantial damage to cars, roofs, and other areas of the built environment that may not be reported to the National Centers for Environmental Information. Therefore, it is likely that damages are greater than the reported value.

Table B.16: Summary of Hail Occurrences in Jasper County

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Bay Springs	27	0/0	$391,000
Heidelberg	11	0/0	$27,000
Louin	14	0/0	$4,000
Montrose	2	0/0	$15,000
Unincorporated Area	81	0/0	$113,406
JASPER COUNTY TOTAL	**135**	**0/0**	**$548,000**

Source: National Climatic Data Center

Lightning

According to the National Climatic Data Center, there has been two recorded lightning events in Jasper County since 2004. These events resulted in over $25,000 damages, as listed in summary **Table B.17**. Detailed information on historical lightning events can be found in **Table B.18**.

It is certain that more than two events have impacted the county. Many of the reported events are those that cause damage, and it should be expected that damages are likely much higher for this hazard than what is reported.

Table B.17: Summary of Lightning Occurrences in Jasper County

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Bay Springs	0	0/0	$0
Heidelberg	0	0/0	$0
Louin	0	0/0	$0
Montrose	0	0/0	$0
Unincorporated Area	1	0/0	$6,317
JASPER COUNTY TOTAL	**1**	**0/0**	**$6,317**

Source: National Centers for Environmental Information

Table B.18: Historical Lightning Occurrences in Jasper County

Location	Date	Deaths / Injuries	Property Damage*	Details
Bay Springs				
Bay Springs	4/13/2019	0/0	$20,000	Lightning struck a house on County Road 1515.
Heidelberg				
None Reported	--	--	--	--
Louin				
None Reported	--	--	--	--
Montrose				
None Reported	--	--	--	--
Unincorporated Area				
STRINGER	7/16/2004	0/0	$5,000	A home was struck by lightning.

Source: National Centers for Environmental Information

PROBABILITY OF FUTURE OCCURRENCES

Thunderstorm / High Wind

Given the high number of previous events, it is certain that thunderstorm events, including straight-line wind events, will occur in the future. This results in a probability level of highly likely (100 percent annual probability) for the entire county.

Hailstorm

Based on historical occurrence information, it is assumed that the probability of future hail occurrences is highly likely (100 percent annual probability). Since hail is an atmospheric hazard, it is assumed that Jasper County has equal exposure to this hazard. It can be expected that future hail events will continue to cause minor damage to property and vehicles throughout the county.

Lightning

Although there was not a high number of historical lightning events reported in Jasper County via NCDC data, it is a regular occurrence accompanied by thunderstorms. In fact, lightning events will assuredly happen on an annual basis, though not all events will cause damage. According to Vaisala's U.S. National Lightning Detection Network (NLDN), Jasper County is located in an area of the country that experienced an average of 4 to 6 cloud-to-ground lightning flashes per square kilometer per year between 2015 and 2019.[11] Therefore, the probability of future events is highly likely (100 percent annual probability). It can be expected that future lightning events will continue to threaten life and cause minor property damages throughout the county.

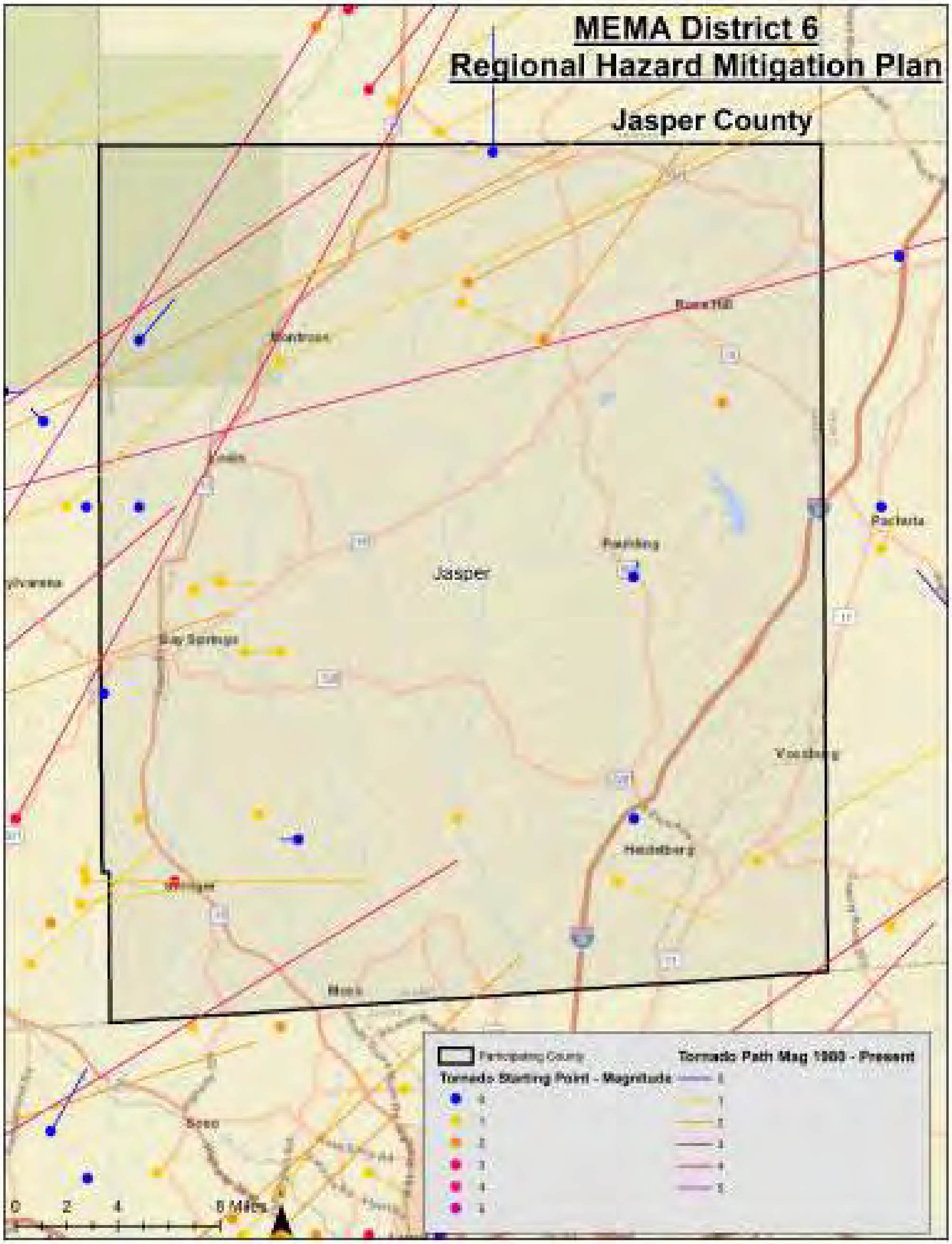
B.2.12 Tornado

LOCATION AND SPATIAL EXTENT

Tornadoes occur throughout the state of Mississippi, and thus in Jasper County. Tornadoes typically impact a relatively small area, but damage may be extensive. Event locations are completely random and it is not possible to predict specific areas that are more susceptible to tornado strikes over time. Therefore, it is assumed that Jasper County is uniformly exposed to this hazard. With that in mind, **Figure B.11** shows tornado track data for many of the major tornado events that have impacted the county. While no definitive pattern emerges from this data, some areas that have been impacted in the past may be potentially more susceptible in the future.

[11] Vaisala's Annual Lightning Report – 2020. Retrieved on 9.8.2021 from: https://www.vaisala.com/sites/default/files/documents/WEA-MET-Annual-Lightning-Report-2020-B212260EN-A.pdf

Figure B.11: Historical Tornado Tracks in Jasper County



Source: National Weather Service Storm Prediction Center

HISTORICAL OCCURRENCES

Tornadoes were at least partially responsible for seven disaster declarations in Jasper County in 1971, 1990, 1992, 2003, 2011, 2019, and 2020.[12] According to the National Centers for Environmental Information, there have been a total of 45 recorded tornado events in Jasper County since 1951 (**Table B.19**), resulting

[12] A complete listing of historical disaster declarations can be found in Section 4: *Hazard Identification*.

in over $50.2 million in property damages. In addition, 2 fatalities and 21 injuries were reported. The magnitude of these tornadoes ranges from F0 to F4 and EF0 to EF4 in intensity, although an EF5 event is possible. Detailed information on historic tornado events can be found in **Table B.20**.

Table B.19: Summary of Tornado Occurrences in Jasper County

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Bay Springs	5	0/0	$2,424,000
Heidelberg	1	0/0	$20,000
Louin	1	0/0	$1,000
Montrose	3	0/3	$5,000,000
Unincorporated Area	28	2/18	$42,806,530
JASPER COUNTY TOTAL	**38**	**2/21**	**$50,251,530**

Source: National Centers for Environmental Information

From April 25 to 28, 2011, the largest tornado outbreak ever recorded affected the Southern, Midwestern, and Northeastern U.S., leaving catastrophic destruction in its wake, especially across the states of Alabama and Mississippi. During this outbreak, one EF4 tornado was reported in Jasper County on April 27, 2011. This tornado resulted in two fatalities and almost $955,000 in property damages.

The following tornado occurrences are the three largest on record in terms of reported property damage:

November 22nd, 1992 - This large and violent tornado produced a path 1 mi (1.6 km) wide through the Bienville National Forest and sparsely-populated areas. Most of the damage was in Smith County, near Sylvarena. There, a large church was leveled and 90 homes were destroyed. The tornado then moved into Jasper County, where three houses and four mobile homes were destroyed. In the area, 21 houses and two mobile homes were damaged. In Newton County, six homes were damaged, one mobile home was destroyed, and one commercial building was destroyed. Timber loss was well into the millions of dollars, mainly through the Bienville National Forest, where substantial tree damage occurred over a wide, long swath. Property damage was reported to be over $25 million.

April 12th, 2020 - This violent, deadly tornado traveled 68 miles through parts of five counties including southeastern Jefferson Davis, central Covington, northwestern Jones, southeastern Jasper, and western Clarke counties. Locations impacted by this tornado include Bassfield, the areas between Collins and Seminary, Soso, Moss, Heidelberg, and Pachuta. This tornado is preliminarily rated EF4 with an estimated peak wind of 190 MPH east of Bassfield in southwestern Jefferson Davis County. Additional EF4 damage was noted near Soso in Jones County and at Moss in Jasper County. The maximum path width was 2.25 miles in the vicinity of Hughes Road west of Seminary in western Covington County. At this width, the tornado ranks 3rd widest in the official NOAA United States tornado database behind the El Reno, OK tornado of 2013 (2.6 mi) and the Hallam, NE tornado of 2004 (2.5 mi). This tornado now ranks as the widest on record in the state of Mississippi, surpassing the Yazoo City, MS tornado of 2010 (1.75 mi). Eight lives were lost in this tornado, and there was an undetermined number of additional injuries. Total property damage was reported to be $5.8 million.

November 24th, 2004 - This tornado moved into Jasper County from Smith County 5.5 miles southwest of Montrose and tracked northeast for 20 miles before moving into Newton County 6 miles east of Garlandville. As this strong tornado tracked across Jasper County a few thousand trees were uprooted and snapped. Seven residential homes sustained major damage along with eleven sustaining minor damage. Eight chicken houses were destroyed with five more sustaining major damage. The total path length of this tornado was 38 miles across Smith, Jasper and Newton counties. An estimated $3 million in property damage occurred.

PROBABILITY OF FUTURE OCCURRENCES

According to historical information, tornado events pose a significant threat to Jasper County. The probability of future tornado occurrences affecting Jasper County is likely (between 10 and 100 percent annual probability).

B.2.13 Hazardous Materials Incidents

LOCATION AND SPATIAL EXTENT

Jasper County has three TRI sites. This site is shown in **Figure B.12.**

Figure B.12: Toxic Release Inventory Sites (TRI) in Jasper County

Source: Environmental Protection Agency

In additional to "fixed" hazardous materials locations, hazardous materials may also impact the county via roadways and rail. Many roads in the county are subject to hazardous materials transport and all roads that permit hazardous material transport are considered potentially at risk to an incident.

HISTORICAL OCCURRENCES

There has been a total of 12 recorded HAZMAT incidents in Jasper County since 1977 (**Table B.20**). These events resulted in almost $453,000 in property damage. **Table B.21** presents detailed information on historic HAZMAT incidents in Jasper County as reported by the U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA).

Table B.20: Summary of HazMat Incidents in Jasper County

Location	Number of Occurrences	Deaths / Injuries	Property Damage (2015)
Bay Springs	6	0/0	$99,177
Heidelberg	6	0/0	$353,672
Louin	0	0/0	$0
Montrose	0	0/0	$0
Unincorporated Area	0	0/0	$0
JASPER COUNTY TOTAL	**12**	**0/0**	**$452,849**

Source: United States Department of Transportation Pipeline and Hazardous Materials Safety Administration

Table B.21: HazMat Incidents in Jasper County

Report Number	Date	City	Mode	Serious Incident?	Fatalities/ Injuries	Damages ($)*	Quantity Released
Bay Springs							
I-1979050164	4/20/1979	BAY SPRINGS	Highway	No	0/0	$0	100 LGA
I-1990030439	2/2/1990	BAY SPRINGS	Highway	No	0/0	$1,165	15 LGA
I-1994081201	6/17/1994	BAY SPRINGS	Highway	No	0/0	$84,538	60 LGA
I-1996060330	5/29/1996	BAY SPRINGS	Highway	No	0/0	$0	1 LGA
I-2001061064	1/29/2001	BAY SPRINGS	Highway	No	0/0	$13,475	0
I-2008090499	9/9/2008	BAY SPRINGS	Highway	No	0/0	$0	0.039062 LGA
Heidelberg							
I-1975110640	11/15/1975	HEIDELBERG	Highway	No	0/0		0
I-1978011104	1/4/1978	HEIDELBERG	Highway	Yes	0/0		500 LGA
I-1978030148	2/23/1978	HEIDLEBURG	Highway	Yes	0/0		1,806 LGA
I-1989100159	9/16/1989	HEIDELBERG	Highway	No	0/0		0.125 LGA
E-2005060170	5/24/2005	HEIDELBERG	Highway	No	0/0	$41,545	0.0625 LGA
I-2008080095	4/1/2008	HEIDELBURG	Highway	Yes	0/0	$312,127	2,113 LGA
Louin							
None Reported	--	--	--	--	--	--	--
Montrose							
None Reported	--	--	--	--	--	--	--
Unincorporated Area							
None Reported	--	--	--	--	--	--	--

PROBABILITY OF FUTURE OCCURRENCES

Given the location of one toxic release inventory site in Jasper County and prior roadway incidents, it is likely (between 10 and 100 percent annual probability) that a hazardous material incident may occur in the county. County and town officials are mindful of this possibility and take precautions to prevent such an event from occurring. Furthermore, there are detailed plans in place to respond to an occurrence.

B.2.14 Pandemic

LOCATION AND SPATIAL EXTENT

Pandemics are global in nature. However, they may start anywhere. Jasper County chose to analyze this hazard given the agriculture in the area and potential for this kind of event to occur in any location at any time.

All populations should be considered at risk to pandemic. Buildings and infrastructure are not directly impacted by the virus/pathogen but could be indirectly impacted if people are not able to operate and maintain them due to illness. Many buildings may be shutdown, at least temporarily, as a result. Employers may initiate work from home procedures for non-essential workers in order to help stop infection. Commerce activities, and thus the economy, may suffer greatly during this time.

HISTORICAL OCCURRENCES

Several pandemics have been reported throughout history. A short history of the flu/Spanish Flu was collected from The Historical Text Archive and is described below.

The first known pandemic dates back to 430 B.C. with the Plague of Athens. It reportedly killed a quarter of the population over four years due to typhoid fever. In 165-180 A.D., the Antonine Plague killed nearly 5 million people. Next, the Plague of Justinian (the first bubonic plague pandemic) occurred from 541 to 566. It killed 10,000 people a day at its peak and resulted in a 50 percent drop in Europe's population. Since the 1500s, influenza pandemics have occurred about three times every century or roughly every 10 to 50 years. The Black Death devastated European populations in the 14th century. Nearly a third of the population (20-30 million) was killed over six years. From 1817 to present, seven Cholera Pandemics have impacted to the world and killed millions. Perhaps most severe, was the Third Cholera Pandemic (1852-1959) which started in China. Isolated cases can still be found in the Western U.S. today. There were three major pandemics in the 20th century (1918-1919, 1957-1958, and 1968-1969). The most infamous pandemic flu of the 20th century, however, was that of 1918-1919. Since the 1960s, there has only been one pandemic, the 2009 H1N1 influenza. The pandemics of the 20th and 21st centuries that impacted the United States are detailed below.

1918 Spanish Flu: This was the most devastating flu of the 20th century. This pandemic spread across the world in three waves between 1918 and 1919. It typically impacted areas for around twelve weeks and then would largely disappear. However, it would frequently reemerge several months later. Worldwide, approximately 50 million persons died and over a quarter of the population was infected. Nearly 675,000 people died in the United States. The illness came on suddenly and could cause death within a few hours. The virus impacted those aged 15 to 35 especially hard. The movement of troops during World War I is thought to have facilitated the spread of the virus.

In Mississippi, state officials noted that "epidemics have been reported from a number of places in the

State," on October 4th, 1918. By the 18th, twenty-six localities reported 1,934 cases (the real number of cases was likely much higher). West Point, Mississippi was hit especially hard and quarantine was established. Throughout the state, African Americans were impacted at a greater rate than white populations. This is thought to be partly caused from a shortage of caretakers. It is estimated that over 6,000 people died in Mississippi, though that number may be much higher as death records were not widely recorded.

1957 Asian Flu: It is estimated that the Asian Flu caused 2 million deaths worldwide. Approximately 70,000 deaths were in the U.S. However, the proportion of people impacted was substantially higher than that of the Spanish Flu. This flu was characterized as having much milder effects than the Spanish Flu and greater survivability. Similar to other pandemics, this pandemic has two waves. Elderly and infant populations were more likely to succumb to death. This flu is thought to have originated from a genetic mutation of a bird virus.

1968 Hong Kong Flu: The Hong Kong Flu is thought to have caused one million deaths worldwide. It was milder than both the Asian and Spanish influenza viruses. It was similar to the Asian Flu, which may have provided some immunity to the virus. It had the most severe impact on elderly populations.

2009 H1N1 Influenza: This flu was derived from human, swine, and avian virus strains. It was initially reported in Mexico in April 2009. On April 26, the U.S. government declared H1N1 a public health emergency. A vaccine was developed and over 80 million were vaccinated which helped minimize the impacts. The virus had mild impacts on most of the population but did cause death (usually from viral pneumonia) in high-risk populations such as pregnant women, obese persons, indigenous people, and those with chronic respiratory, cardiac, neurological, or immunity conditions. Worldwide, it is estimated that 43 million to 89 million people contracted H1N1 between April 2009 and April 2010, and between 8,870 and 18,300 H1N1 cases resulted in death.

2020 SARS-CoV-2 (COVID-19): Coronavirus Disease 2019 (COVID-19) was declared as pandemic by the World Health Organization on March 11th, 2020 mainly due to the speed and scale of the transmission of the disease. Prior to that, it started as an epidemic in mainland China with the focus being firstly reported in the city of Wuhan, Hubei province on February 26th, 2020. The etiologic agent of COVID-19 was isolated and identified as a novel coronavirus, initially designated as 2019-nCoV. Later, the virus genome was sequenced and because it was genetically related to the coronavirus outbreak responsible for the SARS outbreak of 2003, the virus was named as severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) by the International Committee for Taxonomy of Viruses.

There is a considerable amount of data on the extent of COVID-19 throughout the State of Mississippi and Jasper County. The number of reported cases and deaths across the State of Mississippi and Jasper County are shown in the figure below.

Figure B.13: COVID-19 Cases as of 08/01/2021[13]

	Cases	Deaths
Mississippi	348,496	7,556
Jasper County	2,331	48

In addition to the pandemics above, there have been several cases of pandemic threats, some of which reached epidemic levels. They were contained before spreading globally. Examples include Smallpox,

[13] Mississippi State Department of Health. *COVID-19 Dashboard*. Retrieved from: https://msdh.ms.gov/msdhsite/_static/14,0,420.html

Polio, Tuberculosis, Malaria, AIDS, SARS and Yellow Fever. Advances in medicine and technology have been instrumental in containing the spread of viruses in recent history.

In addition to the pandemics above, there have been several cases of pandemic threats, some of which reached epidemic levels. They were contained before spreading globally. Examples include Smallpox, Polio, Tuberculosis, Malaria, AIDS, SARS and Yellow Fever. Advances in medicine and technology have been instrumental in containing the spread of viruses in recent history.
It is notable that no birds have been infected with Avian Flu in North and South America.

PROBABILITY OF FUTURE OCCURRENCES
Based on historical occurrence information, it is assumed that all of Jasper County has a probability level of unlikely (less than 1 percent annual probability) for future pandemics events. While pandemic can have devastating impacts, they are relatively rare.
The Mississippi State Department of Health maintains a state pandemic plan which can be found here: http://www.msdh.state.ms.us/msdhsite/index.cfm/44,1136,122,154,pdf/SNSPlan.pdf

B.2.15 Conclusions on Hazard Risk

The hazard profiles presented in this section were developed using best available data and result in what may be considered principally a qualitative assessment as recommended by FEMA in its "How-to" guidance document titled *Understanding Your Risks: Identifying Hazards and Estimating Losses* (FEMA Publication 386-2). It relies heavily on historical and anecdotal data, stakeholder input, and professional and experienced judgment regarding observed and/or anticipated hazard impacts. It also carefully considers the findings in other relevant plans, studies, and technical reports.

HAZARD EXTENT

Table B.22 describes the extent of each natural hazard identified for Jasper County. The extent of a hazard is defined as its severity or magnitude, as it relates to the planning area.

Table B.22: Extent of Jasper County Hazard

Flood-related Hazards	
Flood	Flood extent can be measured by the amount of land and property in the floodplain as well as flood height and velocity. The amount of land in the floodplain accounts for 14.1 percent of the total land area in Jasper County. Flood depth and velocity are recorded via United States Geological Survey stream gages throughout the region. While a gage does not exist for each participating jurisdiction, there is one at or near many areas. The greatest peak discharge recorded for the county was at the Tallahala Creek at Waldrup on February 6, 2004. Water reached a discharge of 18,900 cubic feet per second and the stream gage height was recorded at 23.17 feet.
Erosion	The extent of erosion can be defined by the measurable rate of erosion that occurs. There are no erosion rate records located in Jasper County.
Dam Failure	Dam Failure extent is defined using the Mississippi Department of Environmental Quality criteria. Three dams are classified as high-hazard in Jasper County.

Winter Storm and Freeze	The extent of winter storms can be measured by the amount of snowfall received (in inches). Official long term snow records are not kept for any areas in Jasper County. However, the greatest snowfall reported in Meridian (northeast of the county) was 14.0 inches in 1963.
Fire-related Hazards	
Drought / Heat Wave	Drought extent is defined by the U.S. Drought Monitor Classifications which include Abnormally Dry, Moderate Drought, Severe Drought, Extreme Drought, and Exceptional Drought. According to the U.S. Drought Monitor Classifications, the most severe drought condition is Exceptional. Jasper County has received this ranking twice over the 15-year reporting period. The extent of extreme heat can be measured by the record high temperature recorded. Official long term temperature records are not kept for any areas in Jasper County. However, the highest recorded temperature in Meridian (northeast of the county) was 107°F in 1980.
Wildfire	Wildfire data was provided by the Mississippi Forestry Commission and is reported annually by county from 2015-2019. The greatest number of fires to occur in Jasper County in any year 106 in 2007. The greatest number of acres to burn in the county in a single year occurred in 2006 when 1,144 acres were burned. Although this data lists the extent that has occurred, larger and more frequent wildfires are possible throughout the county.
Geologic Hazards	
Earthquake	Earthquake extent can be measured by the Richter Scale, the Modified Mercalli Intensity (MMI) scale, and the distance of the epicenter from Jasper County. According to data provided by the National Geophysical Data Center, the greatest earthquake to impact the county was reported in Paulding with a MMI of III (slight), an unknown magnitude, and 240 km away from the epicenter.
Landslide	As noted above in the landslide profile, there is no extensive history of landslides in Jasper County and landslide events typically occur in isolated areas. This provides a challenge when trying to determine an accurate extent for the landslide hazard. However, when using the USGS landslide susceptibility index, extent can be measured with incidence, which is low across the majority of the county, except for some areas of moderate incidence located throughout. There is also low susceptibility across most of the county, except for some areas which have moderate and high susceptibility.
Land Subsidence	The extent of land subsidence can be defined by the measurable rate of subsidence that occurs. There are no subsidence rate records located in Jasper County nor is there any significant historical record of events.
Wind-related Hazards	
Hurricane and Tropical Storm	Hurricane extent is defined by the Saffir-Simpson Scale which classifies hurricanes into Category 1 through Category 5. The greatest classification of hurricane to traverse directly through Jasper County was Hurricane Katrina, a Category 1 storm which carried tropical force winds of 80 knots upon arrival in the county.

Thunderstorm / Hail / Lightning	Thunderstorm extent is defined by the number of thunder events and wind speeds reported. According to a 65-year history from the National Climatic Data Center, the strongest recorded wind event in Jasper County was last reported on February 12, 2008 at 75 knots (approximately 86 mph). It should be noted that future events may exceed these historical occurrences. Hail extent can be defined by the size of the hail stone. The largest hail stone reported in Jasper County was 2.5 inches (reported June 20, 1998). It should be noted that future events may exceed this. According to the Vaisala's flash density map, Jasper County is located in an area that experiences 6 to 8 lightning flashes per square kilometer per year. It should be noted that future lightning occurrences may exceed these figures.
Tornado	Tornado hazard extent is measured by tornado occurrences in the US provided by FEMA as well as the Fujita/Enhanced Fujita Scale. The greatest magnitude reported in Jasper County was an F4 (reported on November 22, 1992).
Other Hazards	
Hazardous Materials Incident	According to USDOT PHMSA, the largest hazardous materials incident reported in Jasper County was 2,113 LGA released on the highway (reported on April 1, 2008). It should be noted that larger events are possible.
Pandemic	While pandemics remain to be rare occurrences overall, it cannot be ignored that as of the drafting of this plan the world continues to be engulfed by the COVID-19 Pandemic.

PRIORITY RISK INDEX RESULTS

In order to draw some meaningful planning conclusions on hazard risk for Jasper County, the results of the hazard profiling process were used to generate countywide hazard classifications according to a "Priority Risk Index" (PRI). More information on the PRI and how it was calculated can be found in Section 5.16.2.

Table B.23 summarizes the degree of risk assigned to each category for all initially identified hazards based on the application of the PRI. Assigned risk levels were based on the detailed hazard profiles developed for this section, as well as input from the Regional Hazard Mitigation Council. The results were then used in calculating PRI values and making final determinations for the risk assessment.

Table B.23: Summary of PRI Results for Jasper County

Hazard	Category/Degree of Risk					
	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score
Flood-related Hazards						
Flood	Likely	Critical	Moderate	6 to 12 hours	Less than 24 hours	**2.9**
Erosion	Possible	Minor	Small	More than 24 hours	More than 1 week	**1.8**
Dam Failure	Possible	Critical	Small	Less than 6 hours	Less than 6 hours	**2.4**
Winter Storm and Freeze	Likely	Limited	Moderate	More than 24 hours	Less than 24 hours	**2.4**
Fire-related Hazards						
Drought / Heat Wave	Likely	Minor	Large	More than 24 hours	More than 1 week	**2.5**
Wildfire	Highly Likely	Minor	Small	Less than 6 hours	Less than 1 week	**2.6**
Geologic Hazards						
Earthquake	Possible	Minor	Moderate	Less than 6 hours	Less than 6 hours	**2.0**
Landslide	Unlikely	Minor	Small	Less than 6 hours	Less than 6 hours	**1.5**
Land Subsidence	Unlikely	Minor	Small	Less than 6 hours	Less than 6 hours	**1.5**
Wind-related Hazards						
Hurricane and Tropical Storm	Likely	Critical	Large	More than 24 hours	Less than 24 hours	**2.9**
Thunderstorm Wind / High Wind	Highly Likely	Critical	Moderate	6 to 12 hours	Less than 6 hours	**3.1**
Hailstorm	Highly Likely	Limited	Moderate	6 to 12 hours	Less than 6 hours	**2.8**
Lightning	Highly Likely	Limited	Negligible	6 to 12 hours	Less than 6 hours	**2.4**
Tornado	Likely	Catastrophic	Small	Less than 6 hours	Less than 6 hours	**3.0**
Other Hazards						
Hazardous Materials Incident	Likely	Limited	Small	Less than 6 hours	Less than 24 hours	**2.5**
Pandemic	Unlikely	Catastrophic	Large	More than 24 hours	More than 24hrs	**2.8**

B.2.16 Final Determinations on Hazard Risk

The conclusions drawn from the hazard profiling process for Jasper County, including the PRI results and input from the Regional Hazard Mitigation Council, resulted in the classification of risk for each identified hazard according to three categories: High Risk, Moderate Risk, and Low Risk (**Table B.24**). For purposes of these classifications, risk is expressed in relative terms according to the estimated impact that a hazard will have on human life and property throughout all of Jasper County. A more quantitative analysis to estimate potential dollar losses for each hazard has been performed separately, and is described in Section 6: *Vulnerability Assessment* and below in Section B.3. It should be noted that although some hazards are classified below as posing low risk, their occurrence of varying or unprecedented magnitudes is still possible in some cases and their assigned classification will continue to be evaluated during future plan updates.

Table B.24: Conclusions on Hazard Risk for Jasper County

HIGH RISK	Thunderstorm Wind / High Wind Tornado Flood Hurricane and Tropical Storm Hailstorm Pandemic
MODERATE RISK	Wildfire Drought / Heat Wave Hazardous Materials Incident Dam and Levee Failure Winter Storm and Freeze Lightning
LOW RISK	Earthquake Erosion Landslide Land Subsidence

B.3 JASPER COUNTY VULNERABILITY ASSESSMENT

This subsection identifies and quantifies the vulnerability of Jasper County to the significant hazards previously identified. This includes identifying and characterizing an inventory of assets in the county and assessing the potential impact and expected amount of damages caused to these assets by each identified hazard event. More information on the methodology and data sources used to conduct this assessment can be found in Section 6: *Vulnerability Assessment*.

B.3.1 Asset Inventory

Following table lists the fire stations, police stations, emergency operations centers (EOCs), medical care facilities, and schools located in Jasper County according to Hazus-MH Version 2.2.

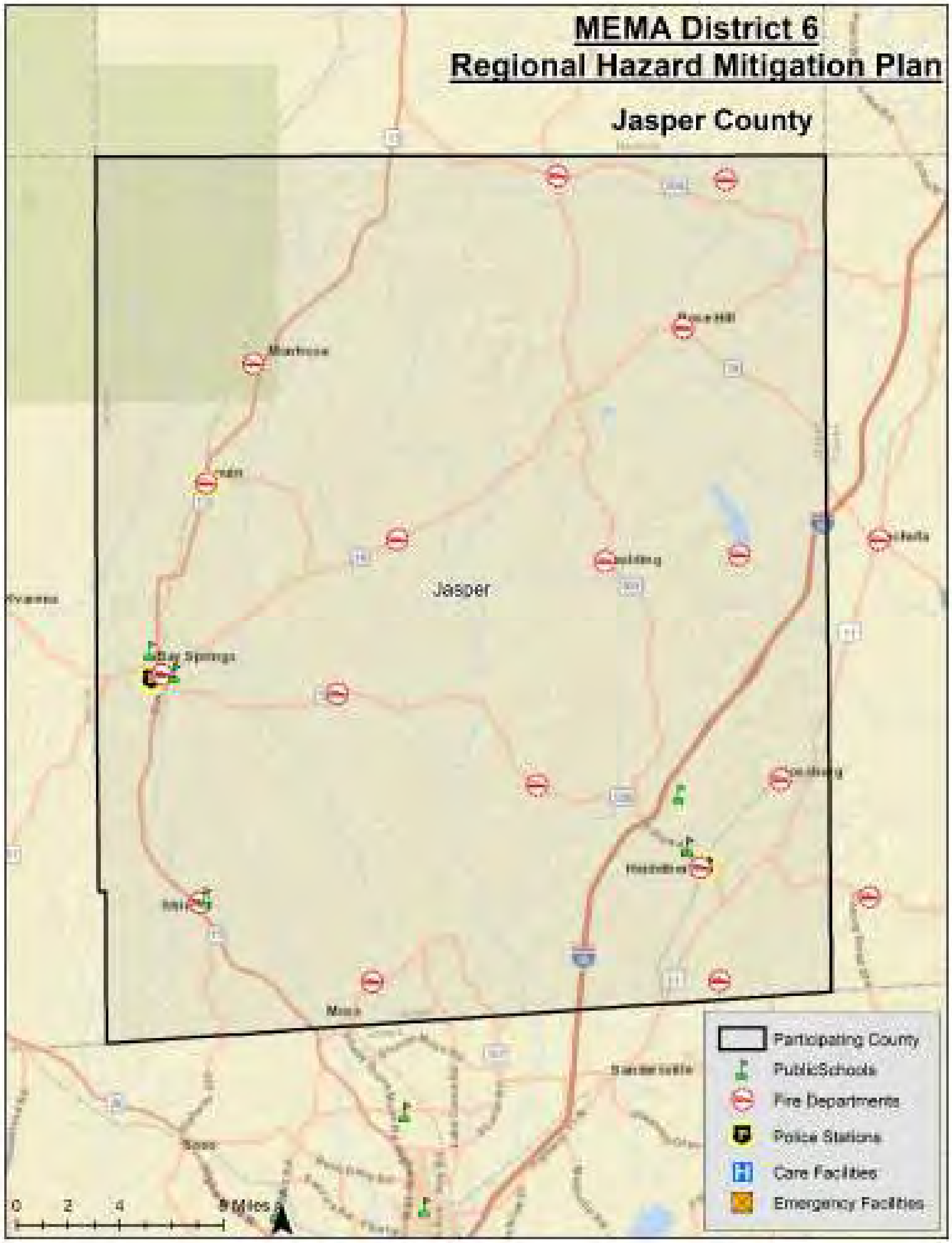
In addition, **Figure B.13** shows the locations of critical facilities in Jasper County. The table at the end of this subsection, shows a complete list of the critical facilities by name, as well as the hazards that affect each facility. As noted previously, this list is not all-inclusive and only includes information provided through Hazus.

Table B.25: Critical Facility Inventory for Jasper County

Location	Fire Stations	Police Stations	Medical Care Facilities	EOC	Schools
Bay Springs	2	2	1	1	4
Heidelberg	4	1	0	0	4
Louin	3	1	0	0	0
Montrose	0	0	0	0	0
Unincorporated Area	6	0	0	0	1
ASSET VALUATION	**$31.377.067**	**$8,948,896**	**$1,741,536**	**$2,237,224**	**$34,426,883**
JASPER COUNTY TOTAL	**15**	**4**	**1**	**1**	**9**

Source: Hazus-MH 2.2

Figure B.14: Critical Facility Locations in Jasper County



Source: Hazus-MH 2.2

B.3.2 Social Vulnerability

In addition to identifying those assets potentially at risk to identified hazards, it is important to identify and assess those particular segments of the resident population in Jasper County that are potentially at risk to these hazards.

Following table lists the population by jurisdiction according to American Community Survey 2019 population estimates. The total population in Jasper County according to ACS data is 16,383 persons. Additional population estimates are presented above in Section B.1.

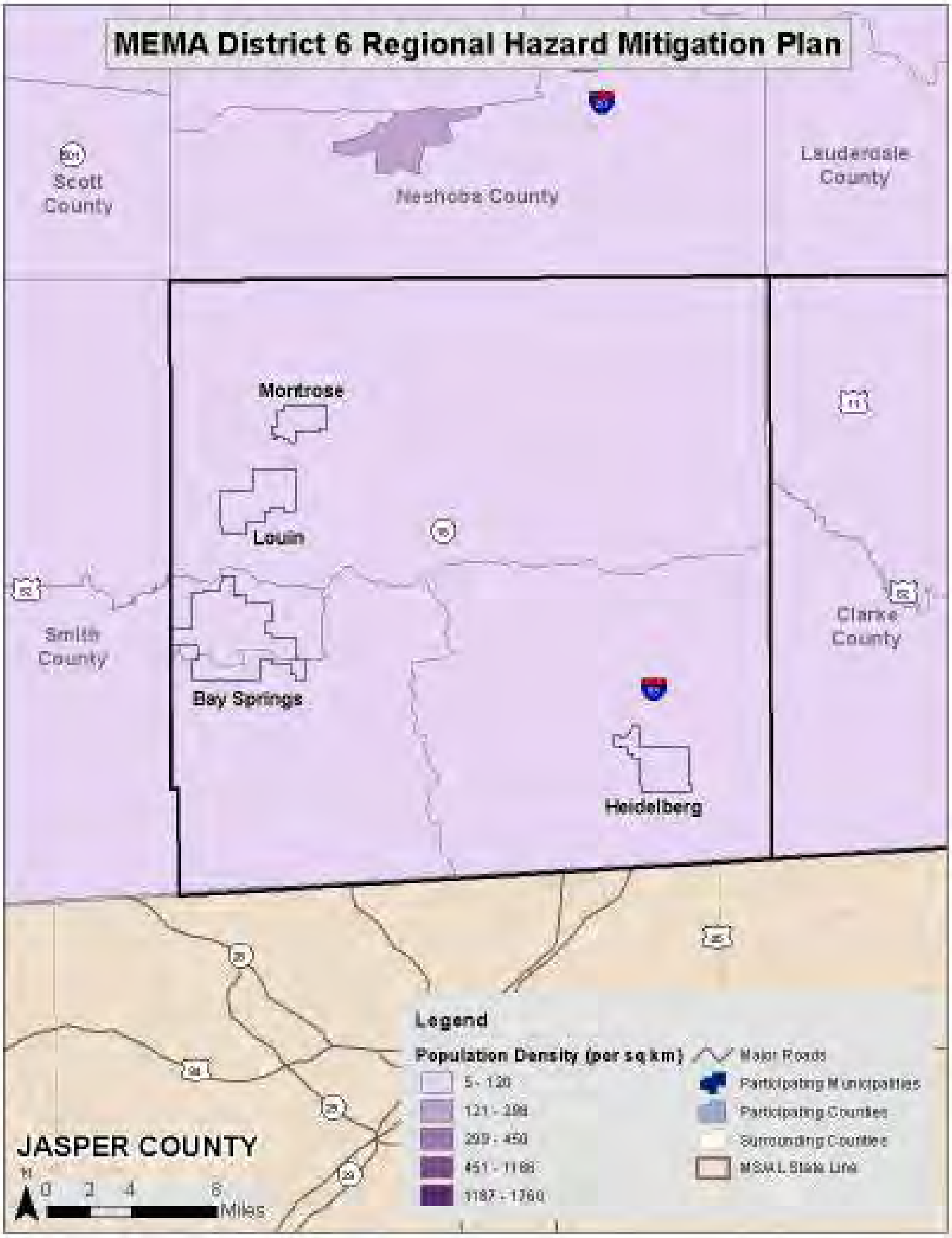
Table B.26: Total Population in Jasper County

Location	Total 2019 Population
Bay Springs	1,632
Heidelberg	716
Louin	378
Montrose	123
Unincorporated Area	13,534
JASPER COUNTY TOTAL	**16,383**

Source: United States Census - American Community Survey - 2019

In addition, the figure below illustrates the population density per square kilometer by census tract as it was reported by the U.S. Census Bureau in 2019.

Figure B.15: Population Density in Jasper County



Source: United States Census Bureau, 2019

B.3.3 Development Trends and Changes in Vulnerability

Since the previous county hazard mitigation plan was approved (in 2015), Jasper County has experienced limited growth and development. The table below shows the number of building units constructed since 2014 according to the U.S. Census American Community Survey.

Table B.27: Building Counts for Jasper County

Jurisdiction	Total Housing Units (2019)	Units Built 2014 or later	% Building Stock Built Post-2014
Bay Springs	812	0	0.0%
Heidelberg	335	0	0.0%
Louin	194	0	0.0%
Montrose	88	2	2.3%
Unincorporated Area	6,980	71	1.1%
JASPER COUNTY TOTAL	**8,409**	**73**	**0.9%**

Source: United States Census Bureau – American Community Survey

The following table shows population growth estimates for the county from 2015 to 2019 based on the U.S. Census Annual Estimates of Resident Population.

Table B.28: Population Growth for Jasper County

Jurisdiction	Population Estimates (as of July 1)					% Change 2015-2019
	2015	2016	2017	2018	2019	
Bay Springs	1,738	1,613	1,766	1,511	1,632	-6.09%
Heidelberg	702	815	735	830	716	1.99%
Louin	237	381	395	278	378	59.49%
Montrose	108	200	216	133	123	13.88%
Unincorporated Area	13,769	13,579	13,462	13,673	13,534	-1.70%
JASPER COUNTY TOTAL	**16,554**	**16,588**	**16,574**	**16,425**	**16,383**	**-1.03%**

Source: United States Census Bureau - American Community Survey

Based on the data above, there has been a low rate of residential development and population growth in the county since 2014, and the county has actually experienced a slight population decline. However, the unincorporated areas of the county have experienced a slightly higher rate of development compared to the rest of the county, resulting in an increased number of structures that are vulnerable to the potential impacts of the identified hazards. Conversely, since the population has decreased throughout the county, there are now fewer numbers of people exposed to the identified hazards. Therefore, development and population growth have impacted the county's vulnerability since the previous local hazard mitigation plan was approved but there has been no change in the overall vulnerability since the changes offset one another.

It is also important to note that as development increases in the future, greater populations and more structures and infrastructure will be exposed to potential hazards if development occurs in the floodplains, moderate and high landside susceptibility areas, high wildfire risk areas, or primary and secondary TRI site buffers.

B.3.4 Vulnerability Assessment Results

As noted in Section 6: *Vulnerability Assessment*, only hazards with a specific geographic boundary, available modeling tool, or sufficient historical data allow for further analysis. Those results, specific to Jasper County, are presented here. All other hazards are assumed to impact the entire planning region (drought / heat wave; thunderstorm—wind, hail, lightning; tornado; and winter storm and freeze) or, due to lack of data, analysis would not lead to credible results (dam and levee failure, erosion, and land subsidence). In the case of landslide, local officials determined that the USGS data may be somewhat amiss and that even the areas identified as moderate risks probably entailed an overall low risk.

The hazards to be further analyzed in this subsection include: flood, wildfire, earthquake, hurricane and tropical storm winds, and hazardous materials incident.

The annualized loss estimate for all hazards is presented near the end of this subsection**.**

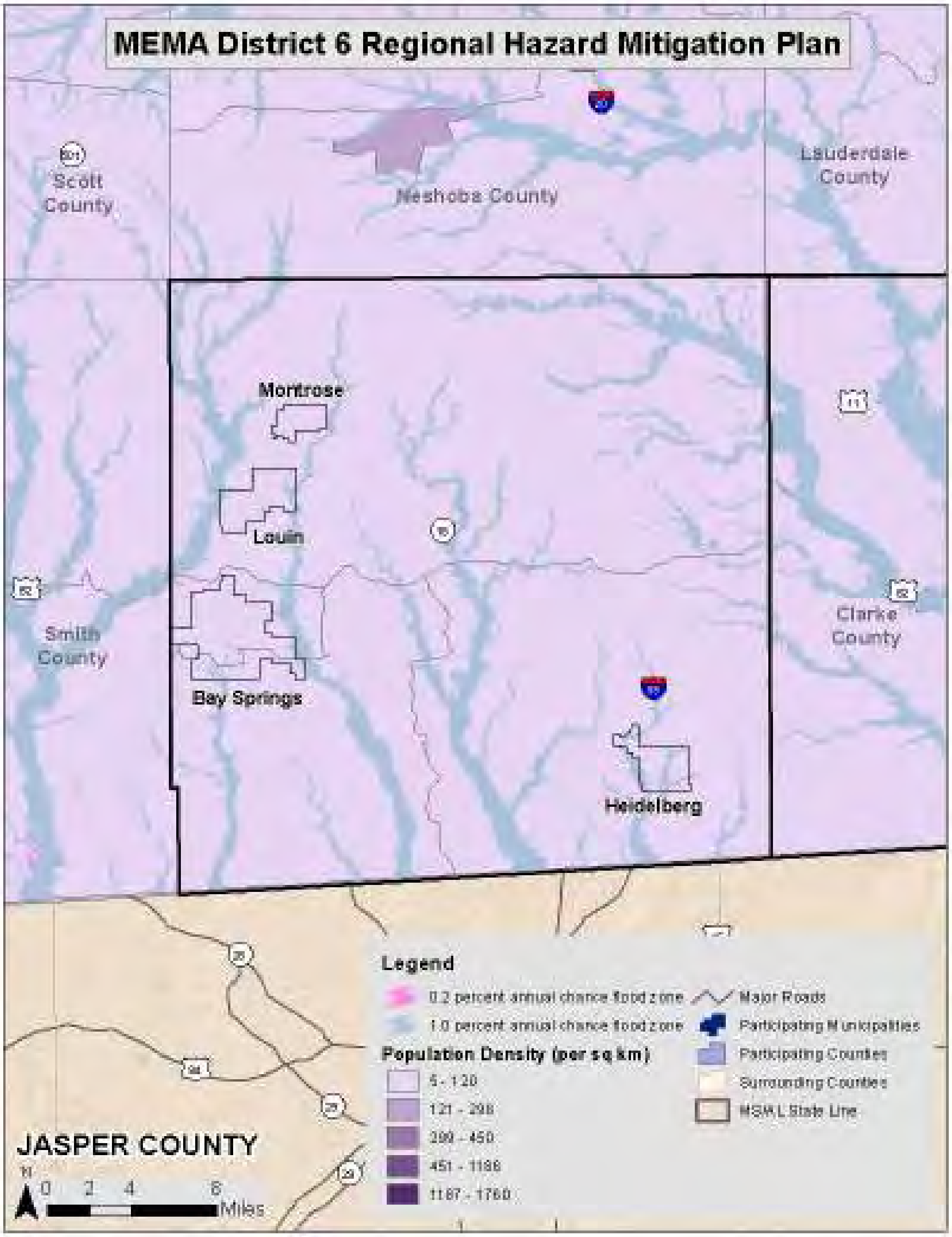
FLOOD

Historical evidence indicates that Jasper County is susceptible to flood events. A total of 35 flood events have been reported by the National Centers for Environmental Information resulting in $4.012 million in property damage. On an annualized level, these damages amounted to $167,166 for Jasper County.

Social Vulnerability

The following figure is presented to gain a better understanding of at-risk population by evaluating census tract level population data against mapped floodplains. There are areas of concern in several areas of the county. Indeed, nearly every incorporated municipality is potentially at risk of being impacted by flooding in some areas of its jurisdiction. Therefore, further investigation in these areas may be warranted. Population density data remains unchanged.

Figure B.16: Population Density Near Floodplains

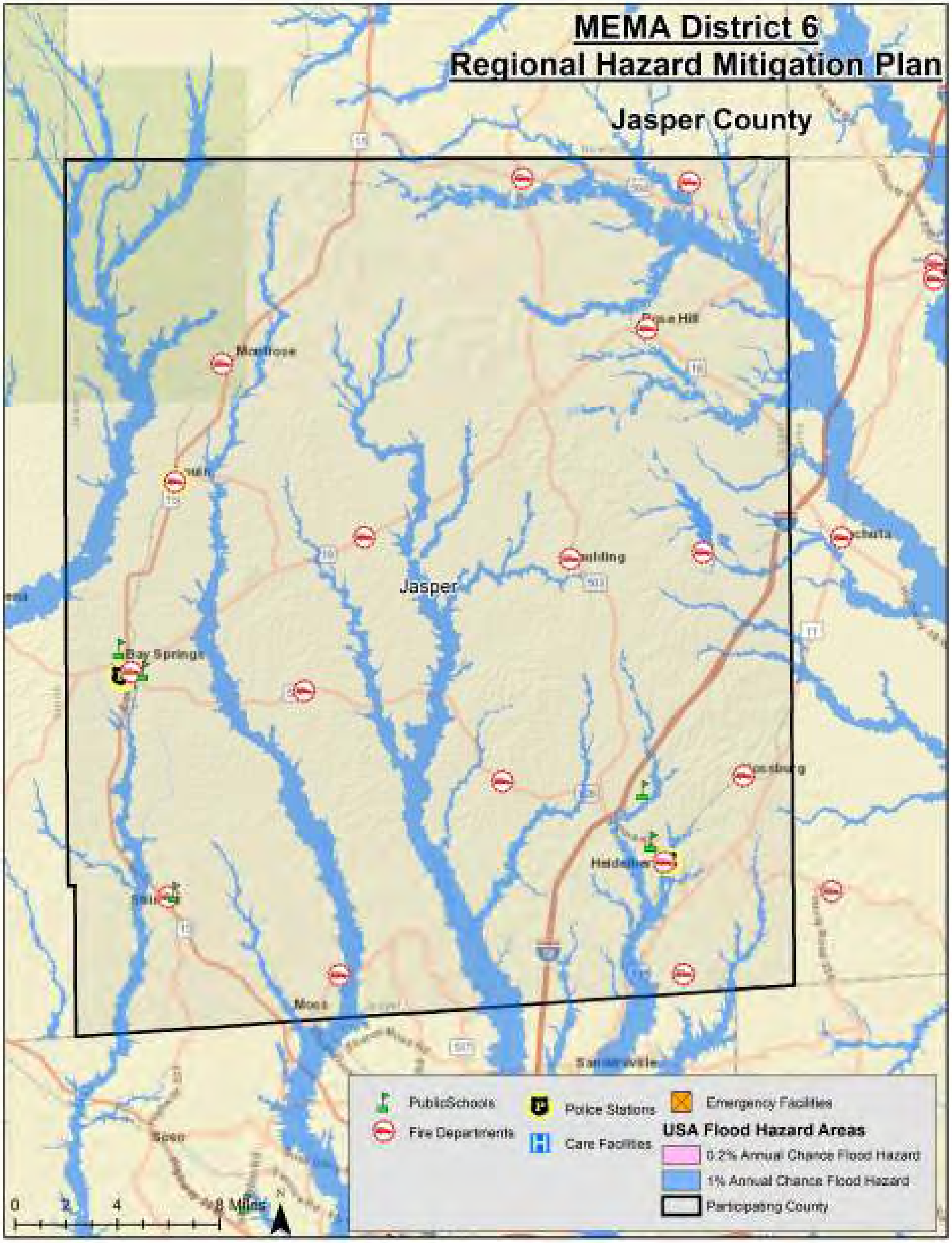


Source: Federal Emergency Management Agency DFIRM, United States Census 2010

Critical Facilities

The following figure shows critical facilities in relation to Special Flood Hazard Areas. (Please note, as previously indicated, this analysis does not consider building elevation, which may negate risk.) Both facilities are located in the 1.0 percent annual chance flood zone, and they include one police station and one school. A list of specific critical facilities and their associated risk can be found at the end of this section.

Figure B.17: CRITICAL FACILITY ANALYSIS – SFHA



In conclusion, a flood has the potential to impact many existing and future buildings, facilities, and populations in Jasper County, though some areas are at a higher risk than others. All types of structures in a floodplain are at-risk, though elevated structures will have a reduced risk. Such site-specific vulnerability determinations are outside the scope of this assessment but will be considered during future plan updates. Furthermore, areas subject to repetitive flooding should be analyzed for potential mitigation actions.

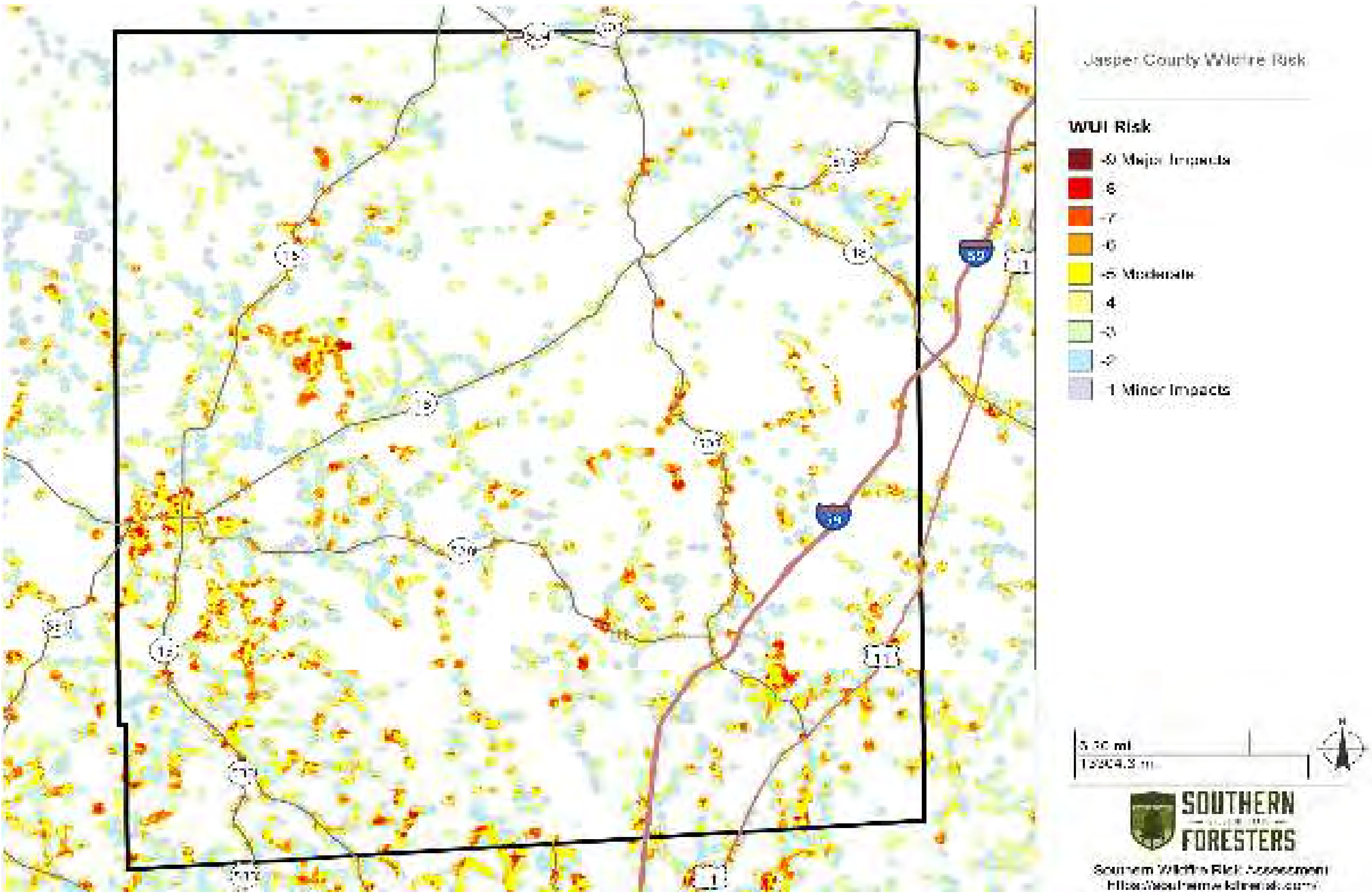
WILDFIRE

Although historical evidence indicates that Jasper County is susceptible to wildfire events, there are few reports of damage. Therefore, it is difficult to calculate a reliable annualized loss figure. Annualized loss is considered negligible though it should be noted that a single event could result in significant damages throughout the county.

To estimate exposure to wildfire, building data was obtained from Hazus-MH 2.2 which includes information that has been aggregated at the Census block level and which has been deemed useful for analyzing wildfire vulnerability. However, it should be noted that the accuracy of Hazus data is somewhat lower than that of parcel data. For the critical facility analysis, areas of concern were intersected with critical facility locations.

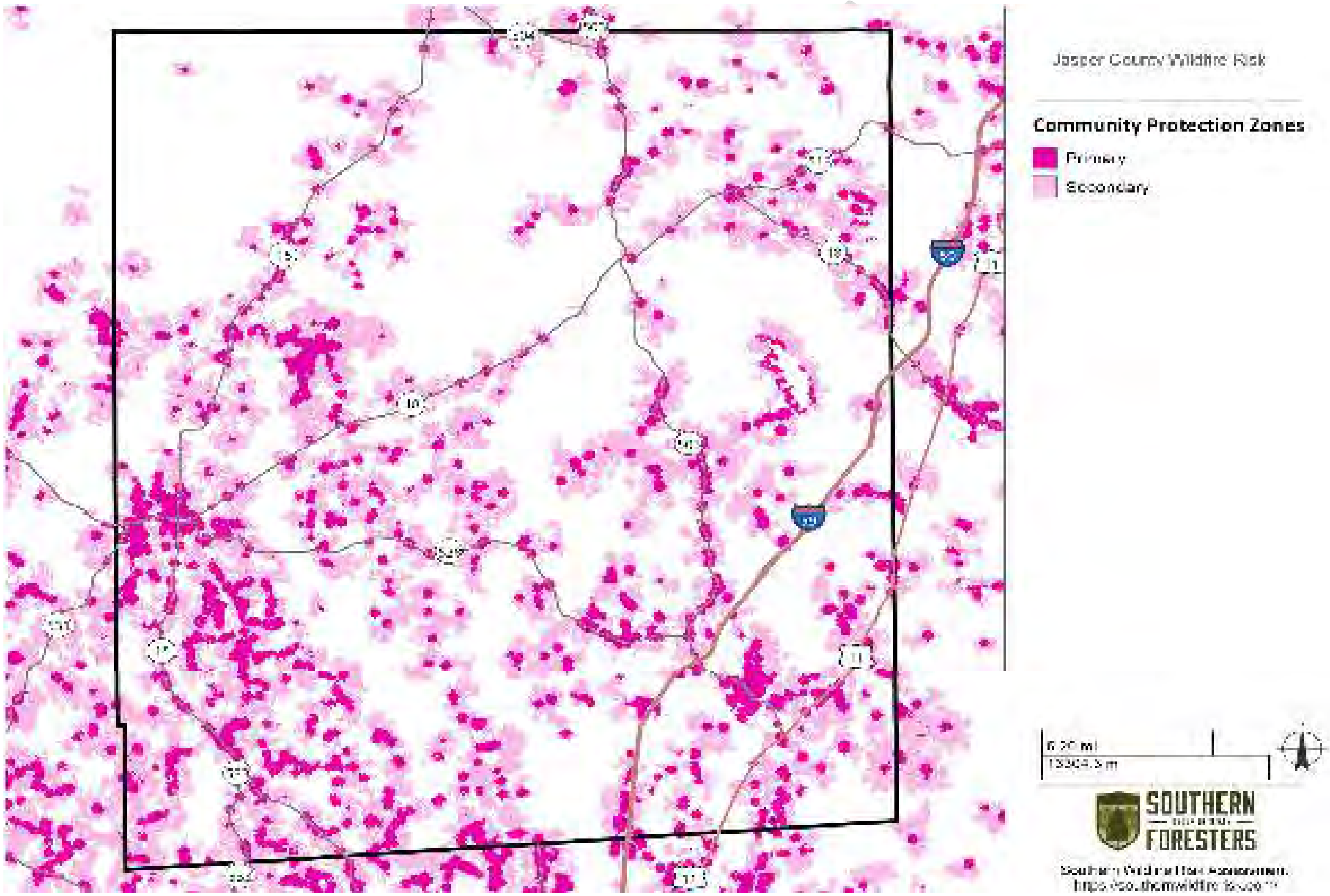
Figure B.18 shows the Wildland Urban Interface Risk Index (WUIRI) data, which is a data layer that shows a rating of the potential impact of a wildfire on people and their homes. The key input, Wildland Urban Interface (WUI), reflects housing density (houses per acre) consistent with Federal Register National standards. The location of people living in the WUI and rural areas is key information for defining potential wildfire impacts to people and homes. Initially provided as raster data, it was converted to a polygon to allow for analysis. The Wildland Urban Interface Risk Index data ranges from 0 to -9 with lower values being most severe (as noted previously, this is only a measure of relative risk). **Figure B.19** Community Protection Zones (CPZ) represent those areas considered highest priority for mitigation planning activities**.** CPZs are based on an analysis of the *Where People Live* housing density data and surrounding fire behavior potential. Rate of Spread data is used to determine the areas of concern around populated areas that are within a 2-hour fire spread distance. This is referred to as the Secondary CPZ. **Figure B.20** shows critical facility locations in relation to historical wildfire burns.

Figure B.18: WUI RISK INDEX AREAS IN JASPER COUNTY



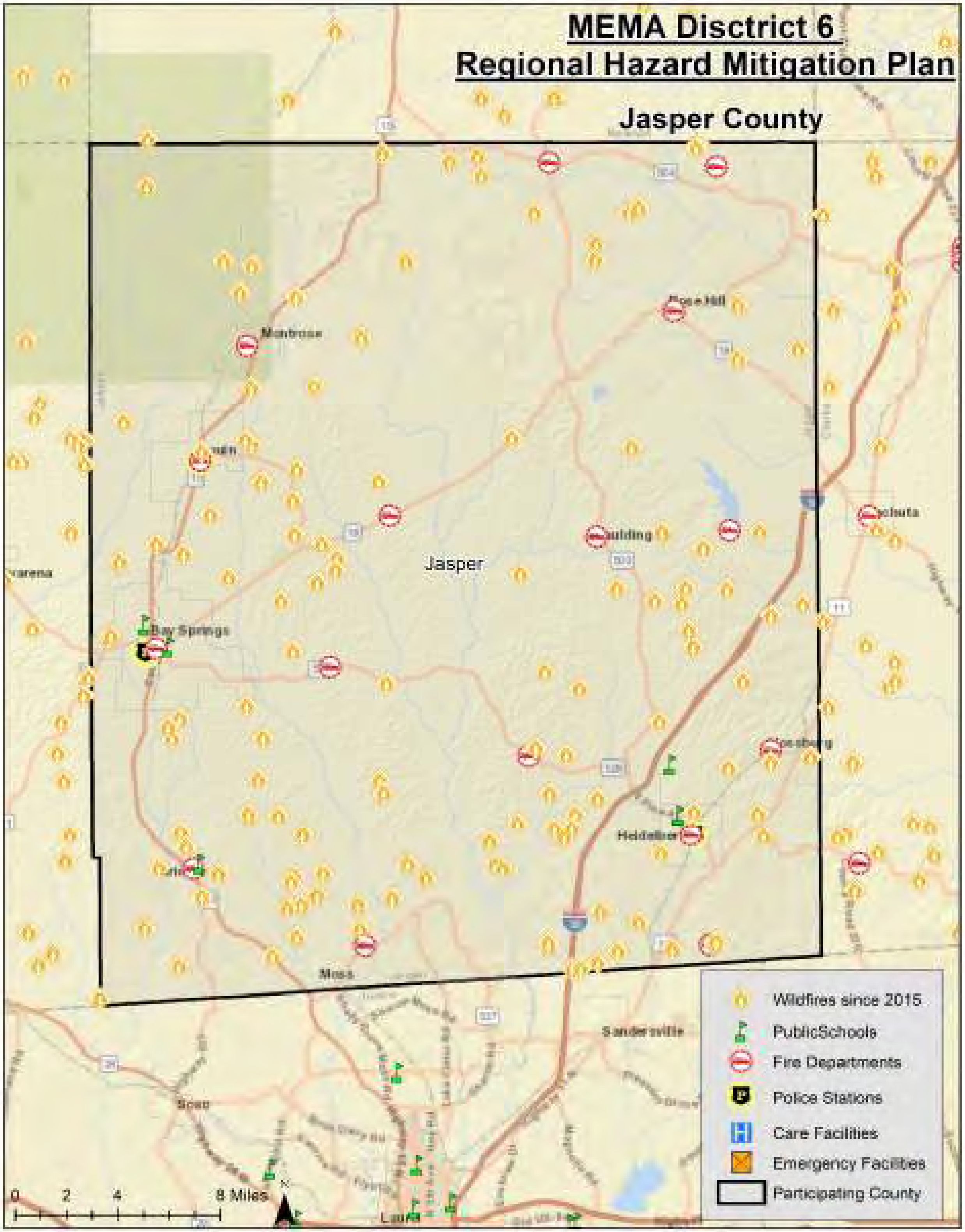
Source: Southern Wildfire Risk Assessment Data

Figure B.19: COMMUNITY PROTECTION ZONES IN JASPER COUNTY



Source: Southern Wildfire Risk Assessment Data

Figure B.20: CRITICAL FACILITY ANALYSIS – WILDFIRE



Source: Southern Wildfire Risk Assessment Data

Social Vulnerability
Given some level of susceptibility across the entire county, it is assumed that the total population is at risk to the wildfire hazard. Determining the exact number of people in certain wildfire zones is difficult with existing data and could be misleading. In particular, the expansion of residential development from urban centers out into rural landscapes, increases the potential for wildland fire threat to public safety and the potential for damage to forest resources and dependent industries. This increase in population across the region will impact counties and communities that are located within the Wildland Urban Interface (WUI). The WUI is described as the area where structures and other human improvements meet and intermingle with undeveloped wildland or vegetative fuels. Population growth within the WUI substantially increases the risk from wildfire.

For the Jasper County Wildfire Risk project area, it is estimated that 16,872 people or 98.9 % percent of the total project area population (17,058) live within the WUI.

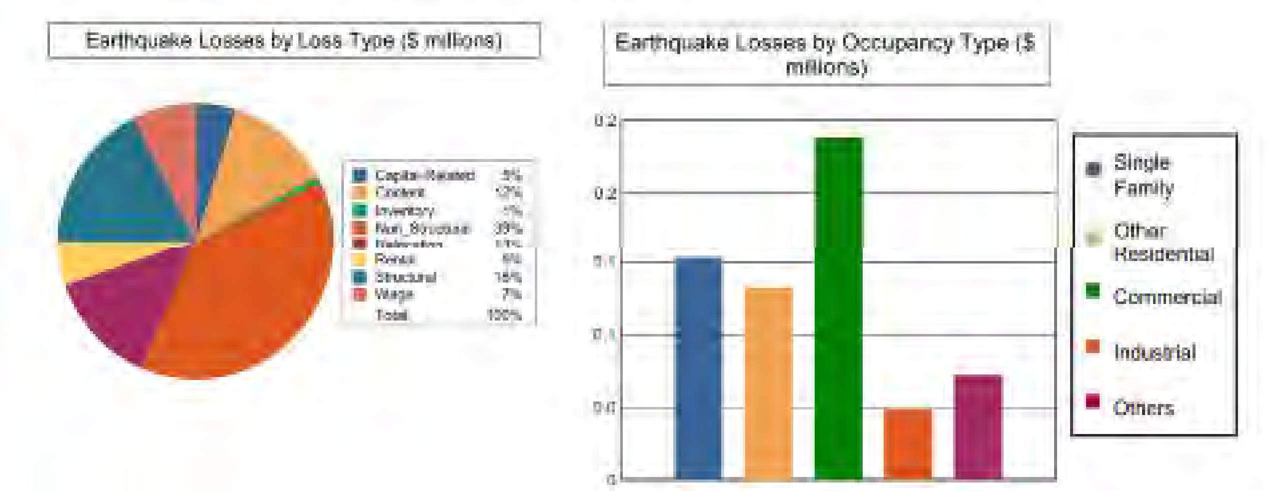
Critical Facilities
The critical facility analysis revealed that there are two critical facilities located in wildfire areas of concern, including two schools. It should be noted, that several factors could impact the spread of a wildfire putting all facilities at risk. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

In conclusion, a wildfire event has the potential to impact many existing and future buildings, critical facilities, and populations in Jasper County.

EARTHQUAKE

A probabilistic earthquake model was performed for the MEMA District 6 Region. As the Hazus-MH model suggests below, and historical occurrences confirm, any earthquake activity in the area is likely to inflict minor damage to the county. Hazus-MH 2.2 estimates the total building-related losses were $520,000; 31 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 44 % of the total loss. The figure below provides a summary of the losses associated with the building damage.

Figure B.21: MEMA D6 EARTHQUAKE LOSSES BY TYPE



For the earthquake hazard vulnerability assessment, a probabilistic scenario was created to estimate the average annualized loss for the region. The results of the analysis are generated at the Census Tract level within Hazus-MH and then aggregated to the region level. Since the scenario is annualized, no building counts are provided. Losses reported included losses due to structure failure, building loss, contents damage, and inventory loss.

Social Vulnerability

It can be assumed that all existing and future populations are at risk to the earthquake hazard. Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 39 households to be displaced due to the earthquake. Of these, 32 people (out of a total population of 244,467) will seek temporary shelter in public shelters. [14] The total economic loss estimated for the earthquake is 76.76 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory.

Critical Facilities

The Hazus-MH probabilistic analysis indicated that no critical facilities would sustain measurable damage in an earthquake event. However, all critical facilities should be considered at-risk to minor damage, should an event occur. Before the earthquake, the region had 1,241 hospital beds available for use. On the day of the earthquake, the model estimates that only 1,035 hospital beds (83.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 93.00% of the beds will be back in service. By 30 days, 99.00% will be operational.

In conclusion, an earthquake has the potential to impact all existing and future buildings, facilities, and populations in Jasper County. The Hazus-MH scenario indicates that minimal to moderate damage is expected from an earthquake occurrence. While Jasper County may not experience a large earthquake (the greatest on record is a magnitude III MMI), localized damage is possible with an occurrence. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

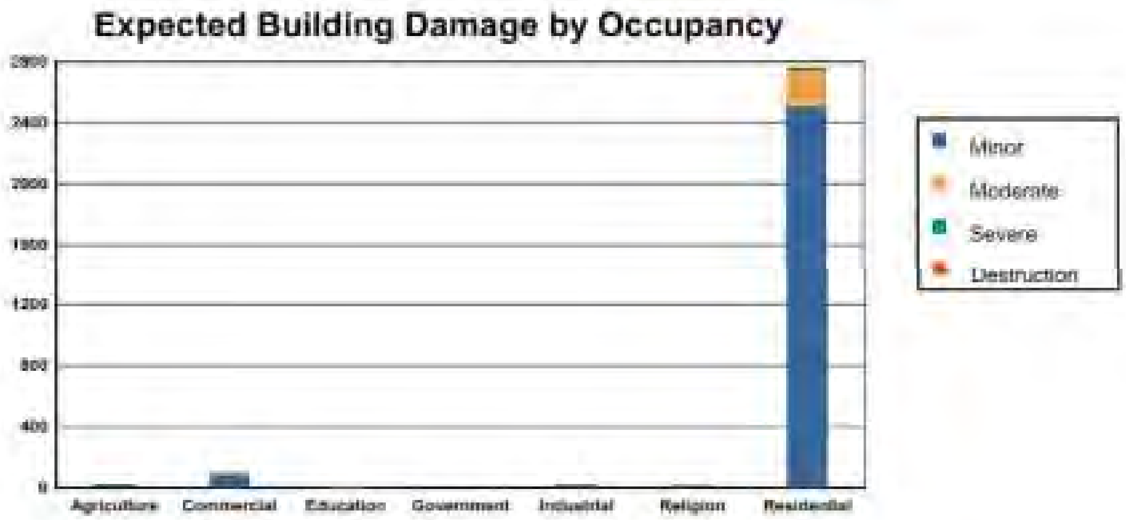
HURRICANE AND TROPICAL STORM

Historical evidence indicates that Jasper County has some risk to the hurricane and tropical storm hazard. There have been seven disaster declarations due to hurricanes (Hurricanes Camille, Frederic, Georges, Ivan, Dennis, Katrina, and Isaac). Several tracks have come near or traversed through the county, as shown and discussed in Section B.2.10.

A probabilistic 100-year hurricane model was performed for the MEMA District 6. Hazus estimates that about 289 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 12 buildings that will be completely destroyed. The figure below summarizes the expected damage by general occupancy for the buildings in the region.

[14] HAZUS-MH utilizes 2010 Census Data

Figure A.22: MEMA D6 100-YEAR HURRICANE



Hurricanes and tropical storms can cause damage through numerous additional hazards such as flooding, erosion, tornadoes, and high winds, thus it is difficult to estimate total potential losses from these cumulative effects. The current Hazus-MH hurricane model only analyzes hurricane winds and is not capable of modeling and estimating cumulative losses from all hazards associated with hurricanes; therefore, only hurricane winds are analyzed in this section. It can be assumed that all existing and future buildings and populations are at risk to the hurricane and tropical storm hazard.

Social Vulnerability

Given equal susceptibility across the county, it is assumed that the total population, both current and future, is at risk to the hurricane and tropical storm hazard. Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 34 households to be displaced due to the hurricane. Of these, 26 people (out of a total population of 244,467) will seek temporary shelter in public shelters.

Critical Facilities

Given equal vulnerability across Jasper County, all critical facilities are considered to be at risk. Some buildings may perform better than others in the face of such an event due to construction and age, among other factors. Determining individual building response is beyond the scope of this plan. However, this plan will consider mitigation action for especially vulnerable structures and/or critical facilities to mitigate against the effects of the hurricane hazard. A list of specific critical facilities can be found in **Table B.43** at the end of this subsection.

In conclusion, a hurricane event has the potential to impact many existing and future buildings, critical facilities, and populations in Jasper County.

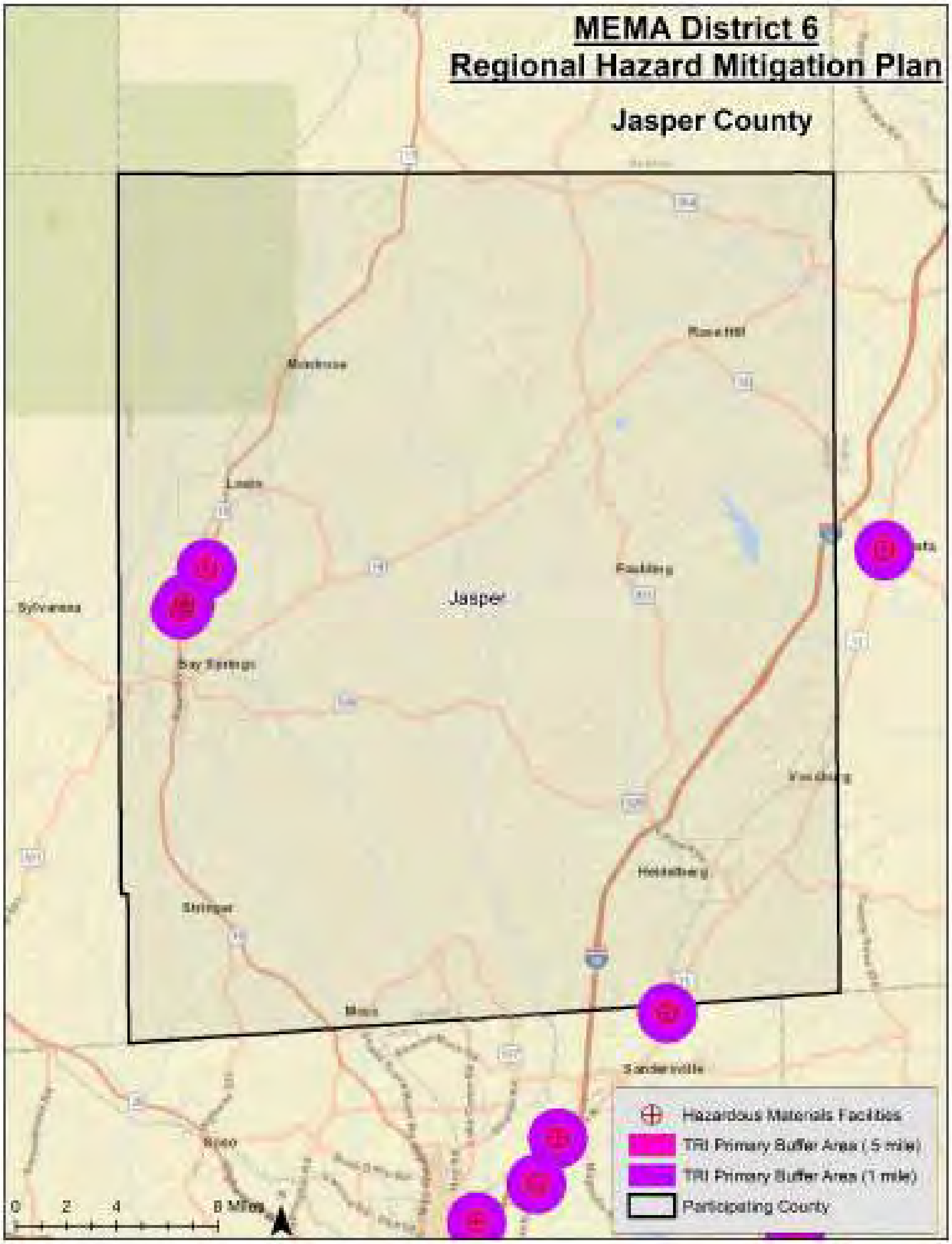
HAZARDOUS MATERIALS INCIDENT

Historical evidence indicates that Jasper County is susceptible to hazardous materials events. A total of 12 HAZMAT incidents have been reported by the Pipeline and Hazardous Materials Safety Administration, resulting in $452,849 in property damage. On an annualized level, these damages amount to $11,597 for the county.

Most hazardous materials incidents that occur are contained and suppressed before destroying any property or threatening lives. However, they can have a significant negative impact. Such events can cause multiple deaths, completely shut down facilities for 30 days or more, and cause more than 50 percent of affected properties to be destroyed or suffer major damage. In a hazardous materials incident, solid, liquid, and/or gaseous contaminants may be released from fixed or mobile containers. Weather conditions will directly affect how the hazard develops. Certain chemicals may travel through the air or water, affecting a much larger area than the point of the incidence itself. Non-compliance with fire and building codes, as well as failure to maintain existing fire and containment features, can substantially increase the damage from a hazardous materials release. The duration of a hazardous materials incident can range from hours to days. Warning time is minimal to none.

In order to conduct the vulnerability assessment for this hazard, GIS intersection analysis was used for fixed and mobile areas and building footprints/parcels. In both scenarios, two sizes of buffers—0.5-mile and 1.0-mile—were used. These areas are assumed to represent the different levels of effect: immediate (primary) and secondary. Primary and secondary impact zones were selected based on guidance from the PHMSA Emergency Response Guidebook. For the fixed site analysis, geo-referenced TRI sites in the region, along with buffers, were used for analysis as shown in **Figure B.23.** For the mobile analysis, the major roads (Interstate highway, U.S. highway, and State highway) and railroads, where hazardous materials are primarily transported that could adversely impact people and buildings, were used for the GIS buffer analysis. **Figure B.24** shows the areas used for mobile toxic release buffer analysis.

Figure B.23: TRI SITES WITH BUFFERS IN JASPER COUNTY



Source: Environmental Protection Agency

Figure B.24: MOBILE HAZMAT BUFFERS IN JASPER COUNTY

Social Vulnerability

Given high susceptibility across the entire county, it is assumed that the total population is at risk to a hazardous materials incident. It should be noted that areas of population concentration may be at an elevated risk due to a greater burden to evacuate population quickly.

Critical Facilities

Fixed Site Analysis:

The critical facility analysis for fixed TRI sites revealed that there are no facilities located in a HAZMAT risk zone. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

Mobile Analysis:

It should be presumed that any facility located near a public roadway or rail line is susceptible to a potential HAZMAT event. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

A list of specific critical facilities and their associated risk can be found at the end of this subsection.

In conclusion, a hazardous material incident has the potential to impact many existing and future buildings, critical facilities, and populations in Jasper County. Those areas in a primary buffer are at the highest risk, though all areas carry some vulnerability due to variations in conditions that could alter the impact area (i.e., direction and speed of wind, volume of release, etc.). Further, incidents from neighboring counties could also impact the county and participating jurisdictions.

CONCLUSIONS ON HAZARD VULNERABILITY

The following table presents a summary of annualized loss for each hazard in Jasper County. Due to the reporting of hazard damages primarily at the county level, it was difficult to determine an accurate annualized loss estimate for each municipality. Therefore, an annualized loss was determined through the damage reported through historical occurrences at the county level. These values should be used as an additional planning tool or measure risk for determining hazard mitigation strategies throughout the county.

Table B.29: ANNUALIZED LOSS FOR JASPER COUNTY

Event	Jasper County
Flood-related Hazards	
Flood	$167,166
Erosion	Negligible
Dam and Levee Failure	Negligible
Winter Storm & Freeze	$29,000
Fire-related Hazards	
Drought / Heat Wave	$8,125
Wildfire	Negligible
Geologic Hazards	
Earthquake	Negligible
Landslide	Negligible
Land Subsidence	Negligible
Wind-related Hazards	
Hurricane & Tropical Storm	$477,000
Thunderstorm / High Wind	$53,507
Hail	$9,881
Lightning	$1,470
Tornado	$717,885
Other Hazards	
HAZMAT Incident	Negligible
Pandemic	Negligible

**In this table, the term "Negligible" is used to indicate that no records of dollar losses for the particular hazard were recorded. This could be the case either because there were no events that caused dollar damage or because documentation of that particular type of event is not well kept. Annualized losses were calculated based on the total number of years of reporting and damage totals.*

As noted previously, all existing and future buildings and populations (including critical facilities) are vulnerable to atmospheric hazards including drought / heat wave, hurricane and tropical storm, thunderstorm (wind, hail, lightning), tornado, and winter storm and freeze. In addition, all buildings and populations are vulnerable to all of the man-made and technological hazards identified above. Some buildings may be more vulnerable to these hazards based on locations, construction, and building type. The following table shows the critical facilities vulnerable to additional hazards analyzed in this subsection. The table lists those assets that are determined to be exposed to each of the identified hazards (marked with an "**X**").

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Table B.30: AT-RISK CRITICAL FACILITIES IN JASPER COUNTY

		FLOOD-RELATED					FIRE-RELATED		GEOLOGIC			WIND-RELATED			OTHER						
FACILITY NAME	FACILITY TYPE	Flood – 100 yr	Flood – 500 yr	Erosion	Dam and Levee Failure	Winter Storm and Freeze	Drought / Heat Wave	Wildfire	Earthquake	Landslide	Land Subsidence	Hurricane and Tropical Storm	Thunderstorm (wind, hail,	Tornado	Fixed HAZMAT – 0.5 mile	Fixed HAZMAT – 1.0 mile	Mobile HAZMAT – 0.5 mile (road)	Mobile HAZMAT – 1.0 mile (road)	Mobile HAZMAT – 0.5 mile (rail)	Mobile HAZMAT – 1.0 mile (rail)	Pandemic
JASPER COUNTY																					
Jasper County Civil Defense	EOC			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
BAY SPRINGS VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X							X
HAL VOLUNTEER FIRE AND RESCUE	Fire Station			X	X	X	X		X	X	X	X	X	X					X	X	X
BEAVER MEADOW VOLUNTEER FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
HEIDELBERG VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
OAK BOWERY VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
MOSSVILLE VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
MONTROSE VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
LOUIN VOLUNTEER FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
CENTRAL VOLUNTEER FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
PAULDING VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
ROSE HILL VOLUNTEER FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
STRINGER VOLUNTEER FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
VOSSBURG-HEIDELBERG VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
Jasper General Hospital	Medical Care			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
Bay Springs Police Dept	Police Station			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X

As noted previously, these facilities could be at risk to dam failure if located in an inundation area. Data was not available to conduct such an analysis. There was no local knowledge of these facilities being at risk to dam failure. As additional data becomes available, more in-depth analysis will be conducted.

FACILITY NAME	FACILITY TYPE	FLOOD-RELATED					FIRE-RELATED		GEOLOGIC			WIND-RELATED			OTHER						Pandemic
		Flood – 100 yr	Flood – 500 yr	Erosion	Dam and Levee Failure[32]	Winter Storm and Freeze	Drought / Heat Wave	Wildfire	Earthquake	Landslide	Land Subsidence	Hurricane and Tropical Storm	Thunderstorm (wind, hail,	Tornado	Fixed HAZMAT – 0.5 mile	Fixed HAZMAT – 1.0 mile	Mobile HAZMAT – 0.5 mile (road)	Mobile HAZMAT – 1.0 mile (road)	Mobile HAZMAT – 0.5 mile (rail)	Mobile HAZMAT – 1.0 mile (rail)	
JASPER COUNTY																					
Heidelberg Police Dept	Police Station	X		X	X	X	X		X	X	X	X	X	X						X	X
Jasper County Sheriff's Ofc	Police Station			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
Louin Police Department	Police Station			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
Bay Springs Elem Sch	School			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
Bay Springs High School	School			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
Bay Springs Middle Sch	School			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
Heidelberg High School	School	X		X	X	X	X		X	X	X	X	X	X						X	X
Jasper Co Career Development Center	School			X	X	X	X	X	X	X	X	X	X	X							X
Stringer Attendance Center	School			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
Sylva Bay Academy Inc	School			X	X	X	X	X	X	X	X	X	X	X			X	X			X
William J Berry Elementary School	School			X	X	X	X		X	X	X	X	X	X						X	X

B.4 JASPER COUNTY CAPABILITY ASSESSMENT

This subsection discusses the capability of Jasper County to implement hazard mitigation activities. More information on the purpose and methodology used to conduct the assessment can be found in Section 7: *Capability Assessment*.

B.4.1 Planning and Regulatory Capability

The table below provides a summary of the relevant local plans, ordinances, and programs already in place or under development for Jasper County. A checkmark (✓) indicates that the given item is currently in place and being implemented. An asterisk (*) indicates that the given item is currently being developed for future implementation. Each of these local plans, ordinances, and programs should be considered available mechanisms for incorporating the requirements of the MEMA District 6 Regional Hazard Mitigation Plan.

Table B.31: RELEVANT PLANS, ORDINANCES, AND PROGRAMS

Planning Tool/Regulatory Tool	Hazard Mitigation Plan	Comprehensive Land Use Plan	Floodplain Management Plan	Open Space Management Plan (Parks & Rec/Greenway Plan	Stormwater Management Plan/Ordinance	Natural Resource Protection Plan	Flood Response Plan	Emergency Operations Plan	Continuity of Operations Plan	Evacuation Plan	Disaster Recovery Plan	Capital Improvements Plan	Economic Development Plan	Historic Preservation Plan	Flood Damage Prevention Ordinance	Zoning Ordinance	Subdivision Ordinance	Unified Development Ordinance	Post-Disaster Redevelopment Ordinance	Building Code	Fire Code	National Flood Insurance Program (NFIP)	NFIP Community Rating System
JASPER COUNTY	✓	✓						✓					✓		✓							✓	
Bay Springs	✓	✓						✓					✓		✓	✓				✓	✓	✓	
Heidelberg	✓	✓						✓					✓		✓	✓				✓		✓	
Louin	✓							✓					✓							✓			
Montrose	✓							✓					✓							✓			

A more detailed discussion on the county's planning and regulatory capabilities follows.

EMERGENCY MANAGEMENT

Hazard Mitigation Plan

Jasper County has previously adopted a hazard mitigation plan. The City of Bay Springs, Town of Heidelberg, Town of Louin, and Town of Montrose were also included in this plan.

Emergency Operations Plan
Jasper County maintains an Emergency Operations Plan through its Emergency Management Agency. The City of Bay Springs, Town of Heidelberg, Town of Louin, and Town of Montrose are each covered by this plan.

GENERAL PLANNING

Comprehensive Land Use Plan
Jasper County has adopted a county comprehensive plan. The City of Bay Springs and Town of Heidelberg have also each adopted a municipal comprehensive plan.

Zoning Ordinance
Jasper County does not have a zoning ordinance in place. However, the City of Bay Springs and Town of Heidelberg have adopted zoning ordinances.

Building Codes, Permitting, and Inspections
The City of Bay Springs, Town of Heidelberg, Town of Louin, and Village of Montrose have adopted a building code.

FLOODPLAIN MANAGEMENT

The table below provides NFIP policy and claim information for each participating jurisdiction in Jasper County.

Table B.32: NFIP POLICY AND CLAIM INFORMATION

Jurisdiction	Date Joined NFIP	Current Effective Map Date	NFIP Policies in Force	Insurance in Force	Closed Claims	Total Payments to Date
JASPER COUNTY†	12/01/03	07/04/11(M)	28	$4,693,100	2	$10,153
Bay Springs	06/17/86	07/04/11(M)	5	$2,560,000	1	$31,646
Heidelberg	01/01/87	07/04/11(M)	2	$131,300	5	$74,592
Louin*	--	--	--	--	--	--
Montrose*	--	--	--	--	--	--

†Includes unincorporated areas of county only
*Community does not participate in the NFIP
(M) – No Elevation Determined, All Zone A, C and X
Source: NFIP Community Status information as of 9/2/2015; NFIP claims and policy information as of 6/30/2015

Flood Damage Prevention Ordinance
All communities participating in the NFIP are required to adopt a local flood damage prevention ordinance. Jasper County, the City of Bay Springs, and the Town of Heidelberg all participate in the NFIP and have adopted flood damage prevention ordinances.

B.4.2 Administrative and Technical Capability

The table below provides a summary of the capability assessment results for Jasper County with regard to relevant staff and personnel resources. A checkmark (✓) indicates the presence of a staff member(s) in that jurisdiction with the specified knowledge or skill.

Table B.33: RELEVANT STAFF / PERSONNEL RESOURCES

Staff / Personnel Resource	Planners with knowledge of land development/land management practices	Engineers or professionals trained in construction practices related to buildings and/or infrastructure	Planners or engineers with an understanding of natural and/or human-caused hazards	Emergency Manager	Floodplain Manager	Land Surveyors	Scientists familiar with the hazards of the community	Staff with education or expertise to assess the community's vulnerability to hazards	Personnel skilled in GIS and/or Hazus	Resource development staff or grant writers
JASPER COUNTY				✓	✓		✓	✓	✓	
Bay Springs				✓	✓		✓	✓	✓	
Heidelberg				✓	✓		✓	✓	✓	
Louin				✓			✓	✓	✓	
Montrose				✓			✓	✓	✓	

Credit for having a floodplain manager was given to those jurisdictions that have a flood damage prevention ordinance, and therefore an appointed floodplain administrator, regardless of whether the appointee was dedicated solely to floodplain management. Credit was given for having a scientist familiar with the hazards of the community if a jurisdiction has a Cooperative Extension Service or Soil and Water Conservation Department. Credit was also given for having staff with education or expertise to assess the community's vulnerability to hazards if a staff member from the jurisdiction was a participant on the existing hazard mitigation plan's planning committee.

B.4.3 Fiscal Capability

The table below provides a summary of the results for Jasper County with regard to relevant fiscal resources. A checkmark (✓) indicates that the given fiscal resource is locally available for hazard mitigation purposes (including match funds for state and federal mitigation grant funds) according to the previous county hazard mitigation plan.

Table B.34: RELEVANT FISCAL RESOURCES

Fiscal Tool / Resource	Capital Improvement Programming	Community Development Block Grants (CDBG)	Special Purpose Taxes (or taxing districts)	Gas/Electric Utility Fees	Water/Sewer Fees	Stormwater Utility Fees	Development Impact Fees	General Obligation, Revenue, and/or Special Tax Bonds	Partnering Arrangements or Intergovernmental Agreements	Other: other state and Federal funding sources
JASPER COUNTY	✓	✓								✓
Bay Springs	✓	✓								✓
Heidelberg	✓	✓								✓
Louin	✓	✓								✓
Montrose	✓	✓								✓

B.4.4 Political Capability

During the months immediately following a disaster, local public opinion in Jasper County is more likely to shift in support of hazard mitigation efforts.

B.4.5 Conclusions on Local Capability

The table below shows the results of the capability assessment using the designed scoring methodology described in Section 7: *Capability Assessment*. The capability score is based solely on the information found in existing hazard mitigation plans and readily available on the jurisdictions' government websites. According to the assessment, the average local capability score for the county and its jurisdictions is 18.2, which falls into the limited capability ranking.

Table B.35: CAPABILITY ASSESSMENT RESULTS

Jurisdiction	Overall Capability Score	Overall Capability Rating
JASPER COUNTY	24	Moderate
Bay Springs	23	Moderate
Heidelberg	22	Moderate

Jurisdiction	Overall Capability Score	Overall Capability Rating
Louin	11	Limited
Montrose	11	Limited

B.5 JASPER COUNTY MITIGATION STRATEGY

This subsection provides the blueprint for Jasper County to follow in order to become less vulnerable to its identified hazards. It is based on general consensus of the Regional Hazard Mitigation Council and the findings and conclusions of the capability assessment and risk assessment. Additional Information can be found in Section 8: *Mitigation Strategy* and Section 9: *Mitigation Action Plan*.

B.5.1 Mitigation Goals

Jasper County developed 10 mitigation goals in coordination with the other participating MEMA District 6 Region jurisdictions. The regional mitigation goals are presented in below.

Table B.36: MEMA DISTRICT 6 REGIONAL MITIGATION GOALS

Goal #		Goals & Objectives	Action #
#1	Goal	Local government will be able to maintain **effective mitigation programs**.	PEA-1
	Objective	***More community outreach, publish information online.***	
#2	Goal	The community will work together to create a **disaster-resistant community**.	PEA-2
	Objective	***Before pandemic EMA wasn't known, more in the news now. Cities are working to be better prepared. Post pandemic.***	
#3	Goal	The community will be able to initiate and sustain **emergency response operations.**	PEA-2
	Objective	***EOC will be stood up, coordinate communications. EMA puts out public info, statements.***	
#4	Goal	**Government operations** will not be significantly disrupted by disasters.	
	Objective	***Set up Amateur Radio station at office. Strengthen communications capabilities.***	
#5	Goal	The **health, safety, and welfare of the community's residents and visitors** will be protected.	ES-5
	Objective	***Purchased Code Red warning system, adding SafeRoom in Heidelberg. Wants more tornado sirens, applied for grant for 5 sirens.***	
#6	Goal	**Local government will support effective hazard mitigation programming** in the community.	
	Objective	***New building codes have been adopted by municipalities.***	
#7	Goal	Residents of the community will have **homes, institutions, and work places that are safer**.	PEA-3
	Objective	***Power loss is a problem. Encourage critical facilities to have backup generators.***	
#8	Goal	The **local economy** of the community will be prepared for a disaster.	
	Objective	***Work closely with RedCross to secure more resources during and post disaster.***	
#9	Goal	**Local infrastructure will not be significantly disrupted by a disaster**.	ES-4
	Objective	***Backup power sources. Storm water management.***	
#10	Goal	All **members of the community will understand the hazards threatening their community.**	PEA-1
	Objective	***More public outreach. Restart meetings with healthcare facilities.***	

To attain the listed mitigation goals, the county has also identified objectives that will assist them in the mitigation action process. Objectives are broader than specific actions, but are measurable, unlike goals. Objectives connect goals with the actual mitigation actions. The action plan describes how the mitigation actions will be implemented, including how those actions will be prioritized, administered and incorporated into the community's existing planning mechanisms.

B.5.2 Mitigation Action Plan

The mitigation actions proposed by Jasper County, Bay Springs, Heidelberg, Louin, and Montrose are listed in the following individual Mitigation Action Plans.

Jasper County Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-2	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2020	Completed
P-4	Collect additional data to define hazards, risks areas, and vulnerabilities to be used in future updates of the plan.	All	Low	County EMA	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Structural Projects							
SP-1	Install three cement culverts on CR 299, clean out ditches, and repair road.	Flood	High	Board of Supervisors	FEMA/MEMA, CDBG, Local funds	2025	Deferred. Culverts have not been installed. The county will continue to look for potential funding sources for these
SP-2	Clean out ditches and install rip rap on CR 1822.	Flood	High	Board of Supervisors	FEMA/MEMA, CDBG, Local funds	2025	Deferred. The county has worked on cleaning out ditches, but it has not installed rip rap at this location. Going forward, the county will continue to try to secure funding for
SP-3	Clean out ditches and install rip rap on CR 31.	Flood	High	Board of Supervisors	FEMA/MEMA, CDBG, Local funds	2025	Deferred. The county has worked on cleaning out ditches, but it has not installed rip rap at this location. Going forward, the county will continue to try to secure funding for
SP-4	Install two 24”x30’ culverts, clean out ditches, and install rip rap on CR 3919.	Flood	High	Board of Supervisors	FEMA/MEMA, CDBG, Local funds	2025	Deferred. Culverts have not been installed. The county will continue to look for potential funding sources for these
Emergency Services							
ES-1	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	County EMA	FEMA/MEMA, Local Funds	2017 Code Red Purchased	Completed

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
ES-2	Installation of outdoor warning system for the Stringer community.	Tornado, High Wind	Moderate	County EMA	FEMA/MEMA, Homeland Security, Local funds	2025	Ongoing. An outdoor warning system has not been installed in the Stringer community due to lack of funding. The county will continue to look at the feasibility of this action going forward.
ES-3	Currently have 3 tornado sirens, would like to obtain 12 more.	Tornado, High Wind	Moderate	County EMA	FEMA/MEMA, Homeland Security, Local funds	2025	
Public Education and Awareness							
PEA-1	Purchase of materials to educate the public on being prepared for hazards, including, severe weather, flooding, fire, etc.	All	Low	County EMA	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	Ongoing. The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.

City of Bay Springs Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-2	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2025 ongoing	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1							
Emergency Services							
ES-1	Purchase of generators to provide backup power for sewer lift stations.	Tornado, High Wind, Hurricane	High	Public Works	FEMA/MEMA, Homeland Security, Local funds	2025	The town has bought some, purchased a backup generator for the water system. It will look into trying to find additional funding for this going forward.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
ES-2	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2017 Code Red	Completed
Public Education and Awareness							
PEA-1	Purchase of materials to educate the public on being prepared for hazards, including tornadoes, severe weather, flooding, fire, etc.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.
PEA-2	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2025	Deferred.

Town of Heidelberg Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Cleaning out of Beaver Creek to alleviate flooding on East Main Street.	Flood	High	Public Works	FEMA/MEMA, CDBG, Local funds	2025	The town has cleaned out Beaver Creek on many occasions, but it will need to continue to implement this action to reduce flooding risk. Therefore this action will remain in the plan.
P-2	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	The International Building Code has been adopted. The county will need to review this code over the next 5 years, so this action will remain in the plan.
P-4	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
P-5	Collect additional data on the number of buildings located in flood-prone areas and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1	Installation of a larger culvert on North Pine Avenue and cleaning out of ditch.	Flood	Moderate	Public Works	FEMA/MEMA, CDBG, Local funds	2025	Deferred. A larger culvert has not been installed at North Pine Avenue, although some cleaning has taken place. This project will be carried forward to the next plan.
Emergency Services							
ES-1	Installation of an Emergency Warning System for the Town.	Tornado, High Wind	High	Board of Aldermen, Volunteer Fire Department	FEMA/MEMA, Homeland Security, Local funds	2025	An emergency warning system has not been installed in town, but the town will continue to look for funding sources.
ES-2	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2017 Code Red	Completed

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Public Education and Awareness							
PEA-1	Purchase of materials to educate the public on being prepared for hazards, including tornadoes, severe weather, flooding, fire, etc.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025 On going	The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.
PEA-2	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2024	Ongoing, engineer meetings.

Town of Louin Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-2	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Ongoing. The International Building Code has been adopted. The county will need to review this code over the next 5 years, so this action will remain in the plan.
P-4	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1							

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Emergency Services							
ES-1	Installation of outdoor warning system.	Tornado, High Wind	High	Board of Aldermen	FEMA/MEMA, Homeland Security, Local funds	2017	Completed
ES-2	Installation of a new water well to serve as backup for the water system.	Tornado, High Wind	High	Board of Aldermen	FEMA/MEMA, CDBG, Rural Development, Local funds	2025	Deferred. A new water well has not been installed in the town. The town would like to try to secure funding for this and will keep this as an action going forward.
ES-3	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2017 Code Red	Completed
ES-4	Purchase of weather radios for public meeting places.	Tornado, High Wind	Moderate	Board of Aldermen, Volunteer Fire Department	FEMA/MEMA, Homeland Security, Local funds	2020	Completed
Public Education and Awareness							
PEA-1	Purchase of materials to educate the public on being prepared for hazards, including tornadoes, severe weather, flooding, fire, etc.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
PEA-2	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2025	Ongoing process.

Town of Montrose Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-2	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2020	Completed
P-4	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1							

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Emergency Services							
ES-1	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2017 Code Red	Completed
ES-2	Purchase of weather radios for public meeting places.	Tornado, High Wind	Moderate	Board of Aldermen, Volunteer Fire Department	FEMA/MEMA, Homeland Security, Local funds	2025	Weather radios have not been purchased, but the town would still like to plan to do this going forward so it will remain an action. New mayor, ongoing
ES-3	Purchase of a brush/quick attack truck for the fire department to help them fight grass and woods fires, especially in the national forest and game reserve.	Wildfire	Moderate	Volunteer Fire Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	The town has not purchased a truck for the fire department to help them fight fires. This action will remain in the plan going forward. Applied for grant, will try again.
Public Education and Awareness							
PEA-1	Purchase of materials to educate the public on being prepared for hazards, including tornadoes, severe weather, flooding, fire, etc.	All	Love	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.
PEA-2	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2025	Ongoing process.

ANNEX C
KEMPER COUNTY

This annex includes jurisdiction-specific information for Kemper County and its participating municipalities. It consists of the following five subsections:

- C.1 Kemper County Community Profile
- C.2 Kemper County Risk Assessment
- C.3 Kemper County Vulnerability Assessment
- C.4 Kemper County Capability Assessment
- C.5 Kemper County Mitigation Strategy

C.1 KEMPER COUNTY COMMUNITY PROFILE

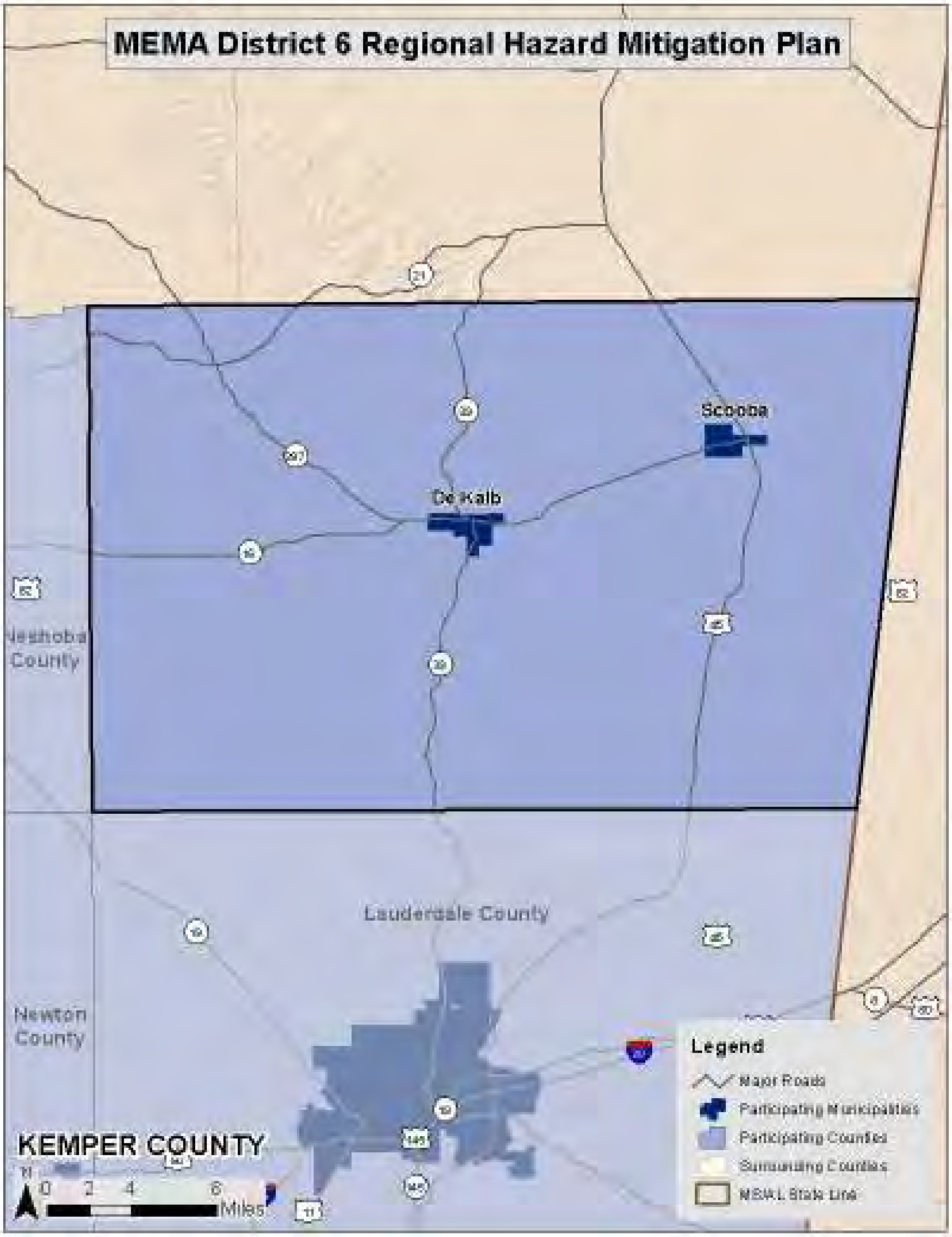
C.1.1 Geography and the Environment

Kemper County is located in eastern Mississippi. It comprises of two towns, Town of De Kalb and Town of Scooba, as well as many small unincorporated communities. An orientation map is provided as **Figure C.1**.

The county offers multiple outdoor recreational opportunities, historic sites to explore, and access to highways and railroads for easy access to major market. The total area of the county is 767 square miles, 1 square mile of which is water area.

Summer temperatures in the county range from highs of about 90 degrees Fahrenheit (˚F) to lows in the upper 60s. Winter temperatures range from highs in the mid-50s to lows around 30˚F. Average annual rainfall is approximately 56 inches, with the wettest months being November, December, and May.

Figure C.1: KEMPER COUNTY ORIENTATION MAP



C.1.2 Population and Demographics

According to the 2020 Census, Kemper County has a population of 8,988 people. The county experienced a 14% decline in population, (10,456, 2010 census vs 8,988, 2020) DeKalb showed a 25% reduction (1,164 vs 877) and Scooba an almost 4% increase (717 vs 744). The population density is 11.7 people per square mile. Population counts from the US Census Bureau for 2000, 2010, and 2020 for the county and participating jurisdictions are presented in **Table C.1**.

Table C.1: POPULATION COUNTS FOR KEMPER COUNTY

Jurisdiction	2000 Census Population	2010 Census Population	2020 Census Population	% Change 2010-2020
Kemper County	**10,453**	**10,456**	**8,988**	**-14%**
De Kalb	972	1,164	877	-25%
Scooba	632	732	744	3.7%

Source: United States Census Bureau

Based on the 2019 American Community Survey, the median age of residents of Kemper County is 41.4 years. The racial characteristics of the county are presented in **Table C.2**. Black or African Americans make up the majority of the population in the county, accounting for 61.7 percent of the population.

Table C.2: DEMOGRAPHICS OF KEMPER COUNTY

Jurisdiction	White, Percent (2019)	Black or African American, Percent (2019)	American Indian or Alaska Native, Percent (2019)	Asian, Percent (2019)	Native Hawaiian or Other Pacific Islander, Percent (2019)	Other Race, Percent (2019)	Two or More Races, percent (2019)	Persons of Hispanic Origin, Percent (2019)*
Kemper County	**34.5%**	**61.7%**	**3.7%**	**0.1%**	**0.0%**	**0.0%**	**0.1%**	**0.6%**
De Kalb	24.0%	75.6%	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%
Scooba	29.0%	70.2%	0.0	0.8%	0.0%	0.0%	0.0%	0.0%

*Hispanics may be of any race, so also are included in applicable race categories
Source: United States Census Bureau

C.1.3 Housing

According to the 2019 American Community Survey, there are 4,766 housing units in Kemper County, the majority of which are single family homes or mobile homes. Housing information for the county and two municipalities is presented in **Table C.3**.

Table C.3: HOUSING CHARACTERISTICS OF KEMPER COUNTY

Jurisdiction	Housing Units (2000)	Housing Units (2010)	Housing Units (2019)	Median Home Value (2019)
Kemper County	**4,533**	**4,722**	**4,766**	**$73,600**
De Kalb	444	521	602	$65,700
Scooba	244	228	241	$60,000

Source: United States Census Bureau - American Community Survey

C.1.4 Infrastructure

TRANSPORTATION

In Kemper County, U.S. Highway 45 provides access to the north and south from the Gulf of Mexico into Tennessee. State Highway 16, which crosses east and west, travels through the town of De Kalb. State Highway 21 provides access east-west and State Highway 39 provides access north-south.

The Naval Outlying Landing Field Joe William Airfield is a naval airstrip within Kemper County. The closest international airport includes Jackson-Evers International Airport, which offers international and domestic flights to a number of locations around the world.

UTILITIES

Electrical power in Kemper County is provided by the East MS Electric Power Association. The County is homes to two energy facilities that produce electricity for MS Power and TVA (Tennessee Valley Authority).

Water and sewer service is provided to residents by the Central Water Association, Kipling Water Association, Northwest Kemper Water Association, Porterville Water Association, Townsend Community Water Association, the Town of DeKalb public works, and the Town of Scooba Public Works.

COMMUNITY FACILITIES

There are a number of buildings and community facilities located throughout Kemper County. According to the data collected for the vulnerability assessment (Section 6.4.1), there are 14 fire stations, 4 law enforcement offices, and 4 schools.

There is one hospital located in Kemper County. John C. Stennis Memorial Hospital is a 25-bed acute-care hospital located in the Town of DeKalb.

Recreational opportunities in Kemper County include great hunting, and fishing, as well as local entertainment. Kemper County Lake provides opportunities for boating, camping, fishing, and hiking.

C.1.5 Land Use

Many areas of Kemper County are undeveloped or sparsely developed. There are two small incorporated municipalities located in the county. These areas are where the county's population is generally concentrated. The incorporated areas are also where many of the businesses, commercial uses, and institutional uses are located. Land uses in the balance of the study area generally consist of rural residential development, agricultural uses, and recreational areas. Local land use and associated regulations are further discussed in Section 7: Capability Assessment.

East Central Planning and Development District assists Kemper County with planning and development to promote economic growth and job opportunities.

C.1.6 Employment and Industry

According to U.S. Census Bureau's American Community Survey (ACS), in 2013, Kemper County had an average annual employment of 3,311 workers and an average unemployment rate of 8.1 percent in May 2021 according to Mississippi Department of Employment Security. In 2019, the Educational Services, Health Care, and Social Assistance industry employed 24.9 percent of the workforce followed by Construction (8.4%) and Manufacturing (22%). The median household income in Kemper County was $31,103 compared to $45,081 in the state of Mississippi.

C.2 KEMPER COUNTY RISK ASSESSMENT

This subsection includes hazard profiles for each of the significant hazards identified in Section 4: *Hazard Identification* as they pertain to Kemper County. Each hazard profile includes a description of the hazard's location and extent, notable historical occurrences, and the probability of future occurrences. Additional information can be found in Section 5: *Hazard Profiles*.

C.2.1 Flood

LOCATION AND SPATIAL EXTENT

There are areas in Kemper County that are susceptible to flood events. Special flood hazard areas in the county were mapped using Geographic Information System (GIS) and FEMA Digital Flood Insurance Rate Maps (DFIRM). This includes Zone A (1-percent annual chance floodplain), Zone AE (1-percent annual chance floodplain with elevation), and Zone X500 (0.2-percent annual chance floodplain). According to GIS analysis, of the 767 square miles that make up Kemper County, there are 69.6 square miles of land in zones A and AE (1-percent annual chance floodplain/100-year floodplain) and 0.1 square miles of land in zone X500 (0.2-percent annual chance floodplain/500-year floodplain).

These flood zone values account for 9.1 percent of the total land area in Kemper County. It is important to note that while FEMA digital flood data is recognized as best available data for planning purposes, it does not always reflect the most accurate and up-to-date flood risk. Flooding and flood-related losses often do occur outside of delineated special flood hazard areas. **Figure C.2** illustrates the location and extent of currently mapped special flood hazard areas for Kemper County based on best available FEMA Digital Flood Insurance Rate Map (DFIRM) data.[1] The section of Little Scooba Creek evaluated in the original Flood Insurance Study for the Town of Scooba flows easterly and southerly through the Town of Scooba. During periods of intense rainfall, the runoff exceeds the capacity of the channel and inundates adjacent low-lying areas. No recent channelization or realignment of Little Scooba Creek has occurred. The stream was apparently diverted either intentionally or accidentally in the past to a ditch providing drainage along the Illinois Central Railroad. This diversion did not exacerbate flooding problems as the ditch roughly parallels the old channel. The Town of Dekalb currently experiences flooding from Snoody Creek on the southwest side of town.[2]

[1] DFIRM data last updated in 2007.
[2] FMEA. Flood Insurance Study. September 2007

Figure C.2: SPECIAL FLOOD HAZARD AREAS IN KEMPER COUNTY

Source: Federal Emergency Management Agency

HISTORICAL OCCURRENCES

Floods were at least partially responsible for six disaster declarations in Kemper County in 1974, 1979, 1990, 2003, 2011, and 2019. A complete listing of historical disaster declarations can be found in Section 4: *Hazard Identification*. Information from the National Centers for Environmental Information was used to ascertain additional historical flood events. The National Centers for Environmental Information reported a total of 14 events in

Kemper County since 1998. A summary of these events is presented in **Table C.4**. These events accounted for just over $2.0 million in property damage in the county. Specific information on flood events, including date, type of flooding, and deaths and injuries, can be found in **Table C.5**.

Table C.4: SUMMARY OF FLOOD OCCURRENCES IN KEMPER COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
De Kalb	2	0/0	$27,629
Scooba	2	0/0	$0
Unincorporated Area	9	0/0	$1,977,754
KEMPER COUNTY TOTAL	**14**	**0/0**	**$2,005,383**

Source: National Centers for Environmental Information

Table C.5: HISTORICAL FLOOD EVENTS IN KEMPER COUNTY

Location	Date	Type	Deaths / Injuries	Property Damage
De Kalb				
DE KALB	9/21/2009	Flash Flood	0/0	$16,685
DE KALB	3/10/2010	Flash Flood	0/0	$10,944
Scooba				
SCOOBA	1/7/1998	Flash Flood	0/0	$0
SCOOBA	4/7/2014	Flash Flood	0/0	$0
Unincorporated Area				
SOUTH PORTION	4/7/2003	Flash Flood	0/0	$1,296,946
COUNTYWIDE	4/24/2003	Flash Flood	0/0	$129,695
COUNTYWIDE	2/5/2004	Flash Flood	0/0	$126,330
WEST PORTION	8/29/2005	Flash Flood	0/0	$244,381
KELLIS STORE	9/18/2009	Flash Flood	0/0	$55,617
KELLIS STORE	9/23/2009	Flash Flood	0/0	$66,740
KEYSVILLE	1/1/2011	Flash Flood	0/0	$21,218
KELLIS STORE	1/1/2011	Flash Flood	0/0	$21,218
RUSHTON	3/9/2011	Flash Flood	0/0	$10,609
KELLIS STORE	02/10/2020	Flash Flood	0/0	$5,000

Source: National Centers for Environmental Information

HISTORICAL SUMMARY OF INSURED FLOOD LOSSES

NFIP and Repetitive Loss Properties data was not available for this plan update. The following data is current as of 2015. According to FEMA flood insurance policy records as of June 2015, there have been no flood losses reported in Kemper County through the National Flood Insurance Program (NFIP) since 1978. A summary of these figures for the county is provided in **Table C.6**. It should be emphasized that these numbers include only those losses to structures that were insured through the NFIP policies, and for losses in which claims were sought and received. It is likely that many additional instances of flood loss in Kemper County were either uninsured, denied claims payment, or not reported. NFIP and Repetitive Loss Properties data was not available for this plan update.

Table C.6: SUMMARY OF INSURED FLOOD LOSSES IN KEMPER COUNTY

Location	Flood Losses	Claims Payments
De Kalb	0	$0
Scooba	0	$0
Unincorporated Area	0	$0
KEMPER COUNTY TOTAL	**0**	**$0**

Source: Federal Emergency Management Agency, National Flood Insurance Program

REPETITIVE LOSS PROPERTIES

According to the Mississippi Emergency Management Agency, there are no non-mitigated repetitive loss properties located in Kemper County. **Table C.7** presents detailed information on repetitive loss properties and NFIP claims and policies for Kemper County.

Table C.7: REPETITIVE LOSS PROPERTIES IN KEMPER COUNTY

Location	Number of Properties	Types of Properties	Number of Losses	Building Payments	Content Payments	Total Payments	Average Payment
De Kalb	0	--	0	$0	$0	$0	$0
Scooba	0	--	0	$0	$0	$0	$0
Unincorporated Area	0	--	0	$0	$0	$0	$0
KEMPER COUNTY TOTAL	**0**		**0**	**$0**	**$0**	**$0**	**$0**

Source: National Flood Insurance Program

PROBABILITY OF FUTURE OCCURRENCES

Flood events will remain a threat in Kemper County, and the probability of future occurrences will remain likely (between 10 and 100 percent annual probability). The participating jurisdictions and unincorporated areas have risk to flooding, though not all areas will experience flood. The probability of future flood events based on magnitude and according to best available data is illustrated in the figures above**,** which indicates those areas susceptible to the 1-percent annual chance flood (100-year floodplain) and the 0.2-percent annual chance flood (500-year floodplain).

It can be inferred from the floodplain location maps, previous occurrences, and repetitive loss properties that risk varies throughout the county. For example, the Town of Scooba has more floodplain and thus a higher risk of flood than the Town of De Kalb. Flood is not the greatest hazard of concern but will continue to occur and cause damage. Therefore, mitigation actions may be warranted, particularly for repetitive loss properties.

C.2.2 Erosion

LOCATION AND SPATIAL EXTENT

Erosion in Kemper County is typically caused by flash flooding events. Unlike coastal areas, areas of concern for erosion in Kemper County are primarily rivers and streams. Generally, vegetation helps to prevent erosion in the area, and it is not an extreme threat to the county. No areas of concern were reported by the hazard mitigation council.

HISTORICAL OCCURRENCES

Several sources were vetted to identify areas of erosion in Kemper County. This includes searching local newspapers, interviewing local officials, and reviewing previous hazard mitigation plans. No historical erosion occurrences were found in these sources.

PROBABILITY OF FUTURE OCCURRENCES

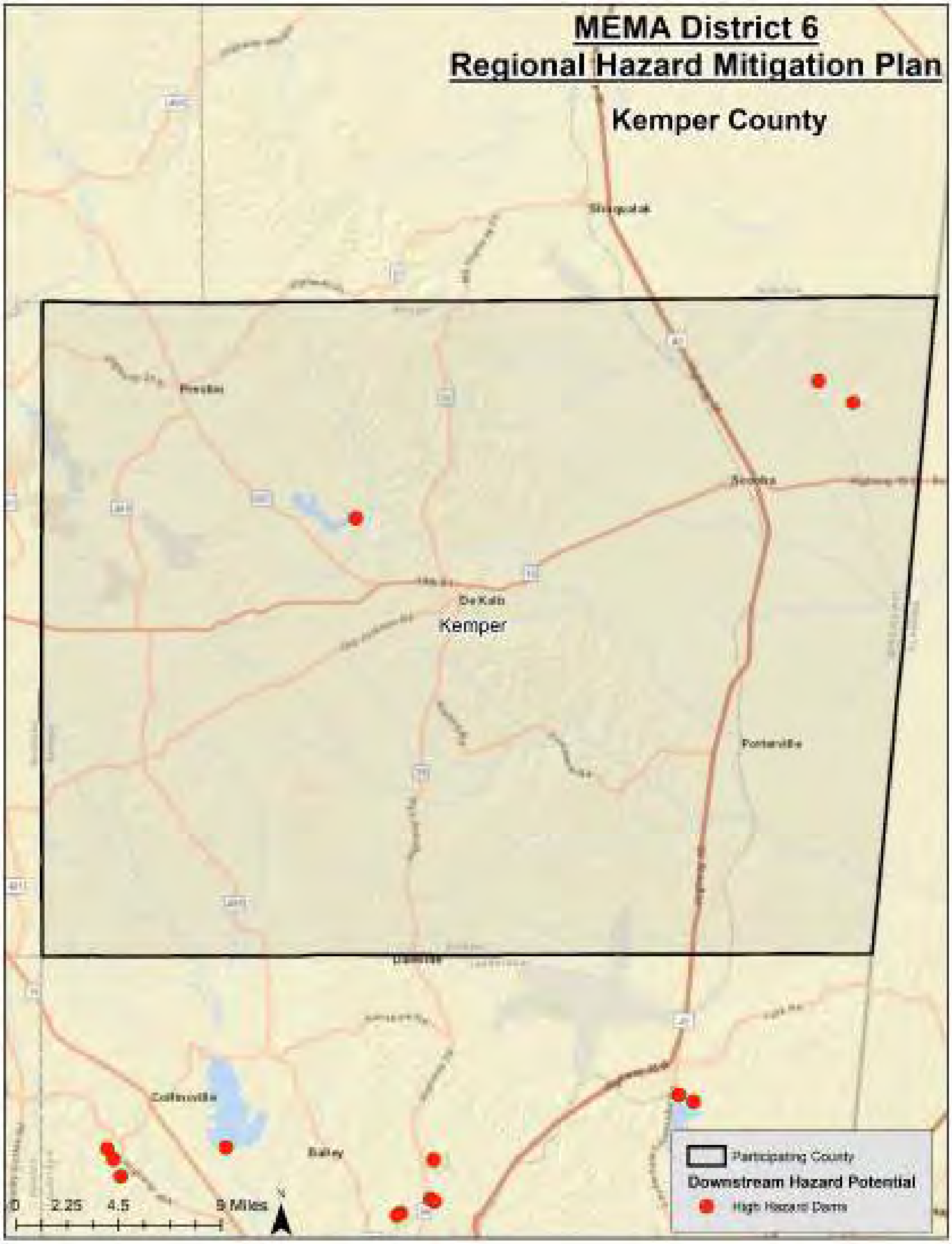
Erosion remains a natural, dynamic, and continuous process for Kemper County, and it will continue to occur. The annual probability level assigned for erosion is possible (between 1 and 10 percent annually).

C.2.3 Dam and Levee Failure

LOCATION AND SPATIAL EXTENT

According to the U.S. Army Corps of Engineers, there are three high hazard dams in Kemper County. **Figure C.3** shows the location of each of these high hazard dams and **Table C.8** lists them by name.

Figure C.3: KEMPER COUNTY HIGH HAZARD DAM LOCATIONS



Source: Mississippi Department of Environmental Quality

Table C.8: KEMPER COUNTY HIGH HAZARD DAMS

Dam Name	Hazard Potential
Kemper County	
SHAMMACK CREEK WATERSHED STRUCTURE 2 DAM	High
SHAMMACK CREEK WATERSHED STRUCTURE 3 DAM	High
KEMPER COUNTY LAKE DAM	High

Source: U.S. Army Corps of Engineers – National inventory of Dams

HISTORICAL OCCURRENCES

There is no record of dam breaches in Kemper County.

PROBABILITY OF FUTURE OCCURRENCES

Given the current dam inventory and historic data, a dam breach is possible (between 1 and 10 percent annual probability) in the future. However, as has been demonstrated in the past, regular monitoring is necessary to prevent these events.

C.2.4 Winter Storm and Freeze

LOCATION AND SPATIAL EXTENT

Nearly the entire continental United States is susceptible to winter storm and freeze events. Some ice and winter storms may be large enough to affect several states, while others might affect limited, localized areas. The degree of exposure typically depends on the normal expected severity of local winter weather. Kemper County is not accustomed to severe winter weather conditions andrarely receives severe winter weather, even during the winter months. Events tend to be mild in nature; however, even relatively small accumulations of snow, ice, or other wintery precipitation can lead to losses and damage due to the fact that these events are not commonplace. Given the atmospheric nature of the hazard, the entire county has uniform exposure to a winter storm.

HISTORICAL OCCURRENCES

Winter weather has resulted in two disaster declarations in Kemper County, in 1999, and 2021. According to the National Centers for Environmental Information, there have been a total of 15 recorded winter storm events in Kemper County since 1996 (**Table C.9**). These events resulted in over $1.0 million in damages. Detailed information on the recorded winter storm events can be found in **Table C.10**.

Table C.9: SUMMARY OF WINTER STORM EVENTS IN KEMPER COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Kemper County	15	0/0	$1,000,000

Source: National Centers for Environmental Information

Table C.10: HISTORICAL WINTER STORM IMPACTS IN KEMPER COUNTY

Location	Date	Type	Deaths / Injuries	Property Damage*
De Kalb				
None Reported	--	--	--	--
Scooba				
None Reported	--	--	--	--
Unincorporated Area				
KEMPER (ZONE)	2/1/1996	Ice Storm	0/0	$152,096
KEMPER (ZONE)	12/14/1997	Heavy Snow	0/0	$0
KEMPER (ZONE)	12/23/1998	Ice Storm	0/0	$117,123
KEMPER (ZONE)	1/27/2000	Ice Storm	0/0	$41,575
KEMPER (ZONE)	1/19/2008	Heavy Snow	0/0	$0
KEMPER (ZONE)	3/1/2009	Heavy Snow	0/0	$0
KEMPER (ZONE)	2/11/2010	Heavy Snow	0/0	$109,439
KEMPER (ZONE)	1/9/2011	Ice Storm	0/0	$42,436
KEMPER (ZONE)	2/3/2011	Ice Storm	0/0	$318,270
KEMPER (ZONE)	2/9/2011	Heavy Snow	0/0	$212,180
KEMPER (ZONE)	1/16/2013	Heavy Snow	0/0	$51,219
KEMPER (ZONE)	12/08/2017	Heavy Snow	0/0	$0
KEMPER (ZONE)	01/16/2018	Winter Weather	0/0	$0
KEMPER (ZONE)	01/10/2021	Heavy Snow	0/0	$0
KEMPER (ZONE)	02/17/2021	Ice Storm	0/0	$100,000

Source: National Centers for Environmental Information

There have been several severe winter weather events in Kemper County. The text below describes two of the major events and associated impacts on the county. Similar impacts can be expected with severe winter weather.

December 1998
Central Mississippi was hit by a crippling ice storm. Up to 2 inches of ice accumulated on power lines and much of the region experienced long power outages, nearly seven days in some cases. The ice caused numerous power outages and brought down many trees and power lines. Christmas travel was severely hampered for several days with motorists stranded at airports, bus stations, and truck stops. Travel did not return to normal until after Christmas in some locations.

January 2008 Winter Storm

This storm produced heavy snow across the region, with an average of three to four inches of snow. Some heavier amounts, between four to five inches, also fell in isolated areas. At the height of the snow, temperatures fell to near freezing, and accumulations occurred on roadways resulting in a number of traffic accidents. Additionally, some power outages occurred in the heaviest snow band due to the weight of wet snow on limbs and lines.

Winter storms throughout the planning area have several negative externalities including hypothermia, cost of snow and debris cleanup, business and government service interruption, traffic accidents, and power outages. Furthermore, citizens may resort to using inappropriate heating devices that could to fire or an accumulation of toxic fumes.

February 2021 Winter Storm

DR4598 disaster declaration for the February 2021 ice storm. PA declaration for Kemper, $170,000 debris cleanup cost. Widespread power loss across the county.

PROBABILITY OF FUTURE OCCURRENCES

Winter storm events will continue to occur in Kemper County. According to historical information, the annual probability is likely (between 10 and 100 percent).

FIRE-RELATED HAZARDS

C.2.5 Drought / Heat Wave

Drought

Drought typically covers a large area and cannot be confined to any geographic or political boundaries. Furthermore, it is assumed that Kemper County would be uniformly exposed to drought, making the spatial extent potentially widespread. It is also notable that drought conditions typically do not cause significant damage to the built environment but may exacerbate wildfire conditions.

Heat Wave

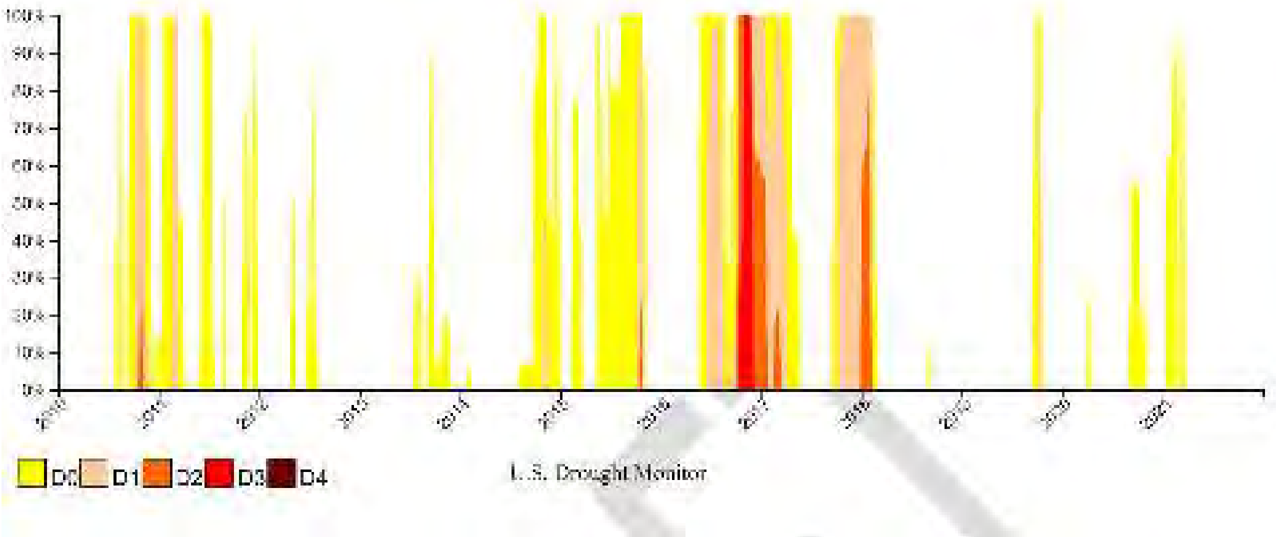
Heat waves typically impact a large area and cannot be confined to any geographic or political boundaries.

HISTORICAL OCCURRENCES

Drought

Table C.11 shows the most severe drought classification for each year, according to U.S. Drought Monitor classifications. It should be noted that the U.S. Drought Monitor also estimates what percentage of the county is in each classification of drought severity. For example, the most severe classification reported may be exceptional but a majority of the county may actually be in a less severe condition.

Table C.11: HISTORICAL DROUGHT OCCURRENCES IN KEMPER COUNTY



Some additional anecdotal information was provided from the National Centers for Environmental Information on droughts in Kemper County.

Summer 2006 – During a four-and-a-half-month period, from June to the middle of October, abnormally dry conditions prevailed across most of Jackson, MS County Warning Area (CWA). The drought had a significant impact on the agricultural industry. Non-irrigated crops were destroyed and all other sustainable crops produced a below normal yield. Catfish ponds were drawn down to severe levels and required water to be pumped back into the fish ponds. The cattle industry suffered due to low watering ponds and lack of sufficient grasslands for grazing and hay production. Water supply problems were encountered by those cities who obtained water from local rivers for drinking purposes due to the low river flows. Fire threat was significant causing the issuance of burn bans across the CWA.

Summer 2007 – By the middle of April, drought conditions were being experienced across a large portion of Eastern and some of Central Mississippi. During the month of May, the drought worsened and expanded. In June, the drought peaked across the region. Although drought conditions continued throughout July and August, conditions were less severe than earlier in the summer. As a result of these conditions, area farmers and crop yields were affected.

October 2010 – Very dry conditions continued across central Mississippi during most of October. Crops were put under stress under the warm and dry conditions. The likely impact was less crop yields for harvest time.

Heat Wave

The National Centers for Environmental Information was used to determine historical heat wave occurrences in the county.

July 2005 – A five-day heat wave occurred across the region. Heat index values reached near 110 degrees each day. Each day had high temperatures ranging from 95 to 99 degrees. This was the warmest stretch of weather the area experienced since July 2001.

August 2005 –A heat wave covering the south began in mid-August and lasted about 10 days. High temperatures were consistently over 95 degrees and surpassed 100 degrees or more on some days. It was the first time since August 2000 that 100-degree temperatures reached the area.

July 2006 – A short heat wave impacted most of the area temperatures in the 90s to around 100 for five straight days.

August 2007 – A heat wave gripped most of the area with the warmest temperatures since 2000. It lasted from August 5th to the 16th.

August 2010 – The combination of high humidity and above normal temperatures produced heat index readings ranged between 105 and 109 degrees during the afternoon hours in the middle part of August.

PROBABILITY OF FUTURE OCCURRENCES

Drought
Based on historical occurrence information, it is assumed that Kemper County has a probability level of likely (between 10 and 100 percent annual probability) for future drought events. However, the extent (or magnitude) of drought and the amount of geographic area covered by drought, varies with each year. Historic information indicates that there is a much lower probability for extreme, long-lasting drought conditions.

Heat Wave
Based on historical occurrence information, it is assumed that all of Kemper County has a probability level of likely (between 10 and 100 percent annual probability) for future heat wave events.

C.2.6 Wildfire

LOCATION AND SPATIAL EXTENT

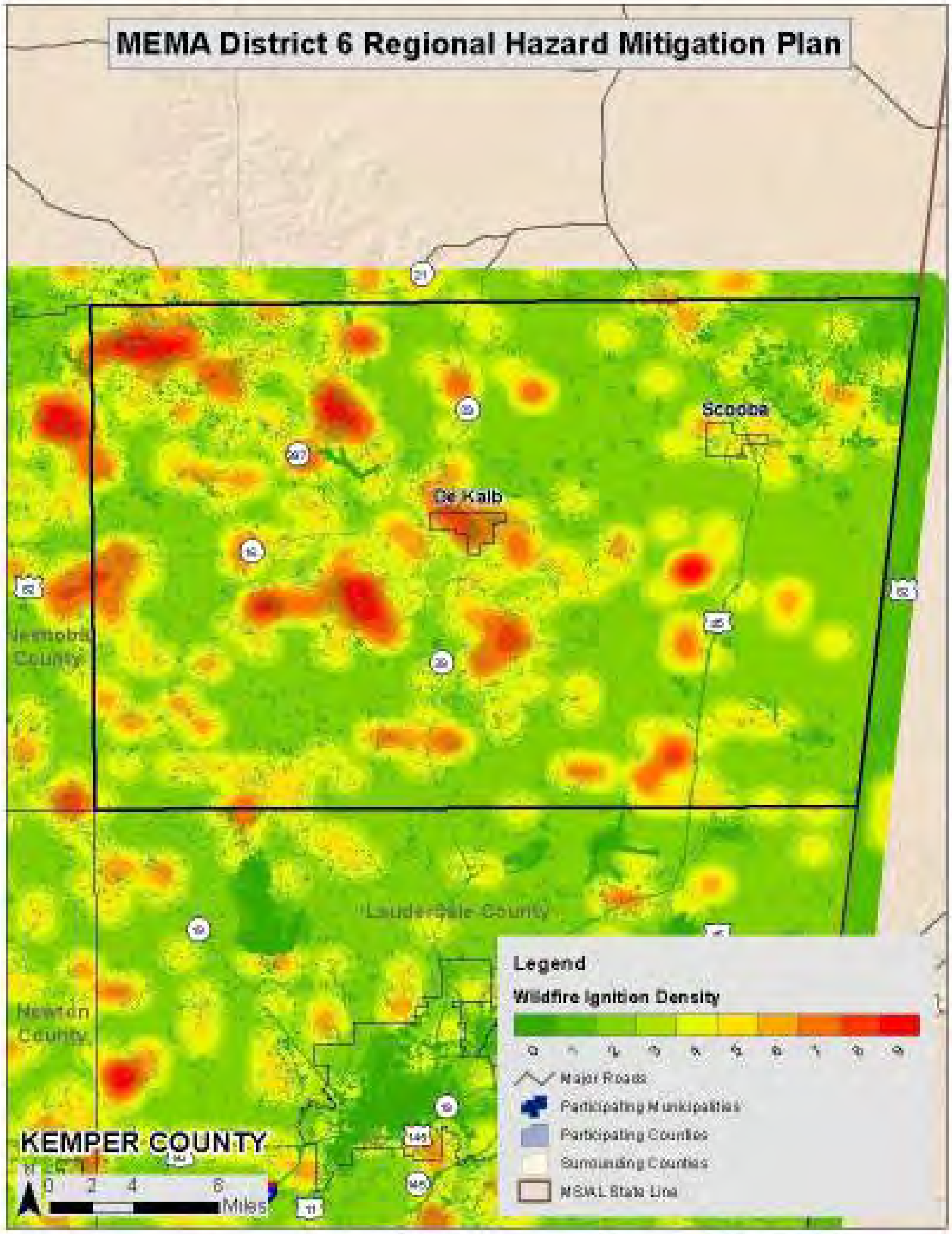
The entire county is at risk to a wildfire occurrence. However, several factors such as drought conditions or high levels of fuel on the forest floor, may make a wildfire more likely. Furthermore, areas in the urban-wildland interface are particularly susceptible to fire hazard as populations abut formerly undeveloped areas. The Wildfire Ignition Density data shown in the figure below give an indication of historic location.

HISTORICAL OCCURRENCES

Figure C.4 shows the Wildfire Ignition Density in Kemper County based on data from the Southern Wildfire Risk Assessment. This data is based on historical fire ignitions and the likelihood of a wildfire igniting in an area. Occurrence is derived by modeling historic wildfire ignition locations to create an average ignition rate map. This is measured in the number of fires per year per 1,000 acres.[3]

[3] Southern Wildfire Risk Assessment, 2014

Figure C.4: WILDFIRE IGNITION DENSITY IN KEMPER COUNTY



Source: Southern Wildfire Risk Assessment

Based on data from the Mississippi Forestry Commission from 2015 to 2020, Kemper County experiences an average of 13 wildfires annually which burn an average of 305.2 acres per year. The data indicates that most of these fires are small, averaging 11 acres per fire. **Table C.12** provides a summary of wildfire occurrences in Kemper County and **Table C.13** lists the number of reported wildfire occurrences in the county between the years 2011 and 2020.

Table C.12: SUMMARY TABLE OF ANNUAL WILDFIRE OCCURRENCES (2015-2020) *

	Kemper County
Average Number of Fires per year	13
Average Number of Acres Burned per year	305.2
Average Number of Acres Burned per fire	23.4

*These values reflect averages over a 5-year period.
Source: Mississippi Forestry Commission

Table C.13: HISTORICAL WILDFIRE OCCURRENCES IN KEMPER COUNTY

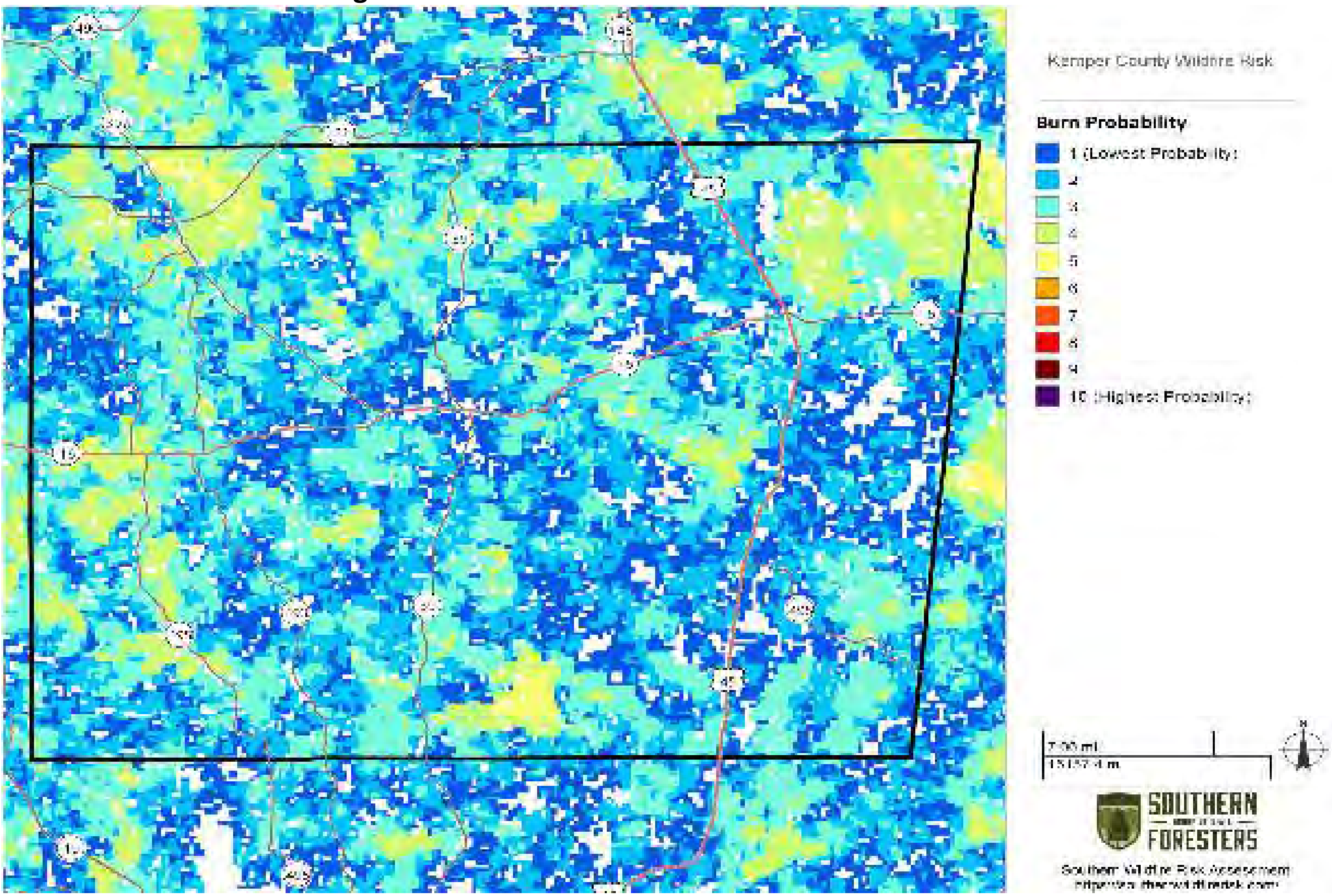
Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Kemper County										
Number of Fires	30	21	4	35	15	37	12	4	10	3
Number of Acres Burned	464	198	28	323	924	663	151	17	257	15

Source: Mississippi Forestry Commission

PROBABILITY OF FUTURE OCCURRENCES

Wildfire events will be an ongoing occurrence in Kemper County. **Figure C.5** shows that there is some probability a wildfire will occur throughout the county. However, the likelihood of wildfires increases during drought cycles and abnormally dry conditions. Fires are likely to stay small in size but could increase due to local climate and ground conditions. Dry, windy conditions with an accumulation of forest floor fuel (potentially due to ice storms or lack of fire) could create conditions for a large fire that spreads quickly. It should also be noted that some areas do vary somewhat in risk. For example, highly developed areas are less susceptible unless they are located near the urban-wildland boundary. The risk will also vary due to assets. Areas in the urban-wildland interface will have much more property at risk, resulting in increased vulnerability and need to mitigate compared to rural, mainly forested areas. The probability assigned to Kemper County for future wildfire events is highly likely (100 percent annual probability).

Figure C.5: BURN PROBABILITY IN KEMPER COUNTY



Source: Southern Wildfire Risk Assessment

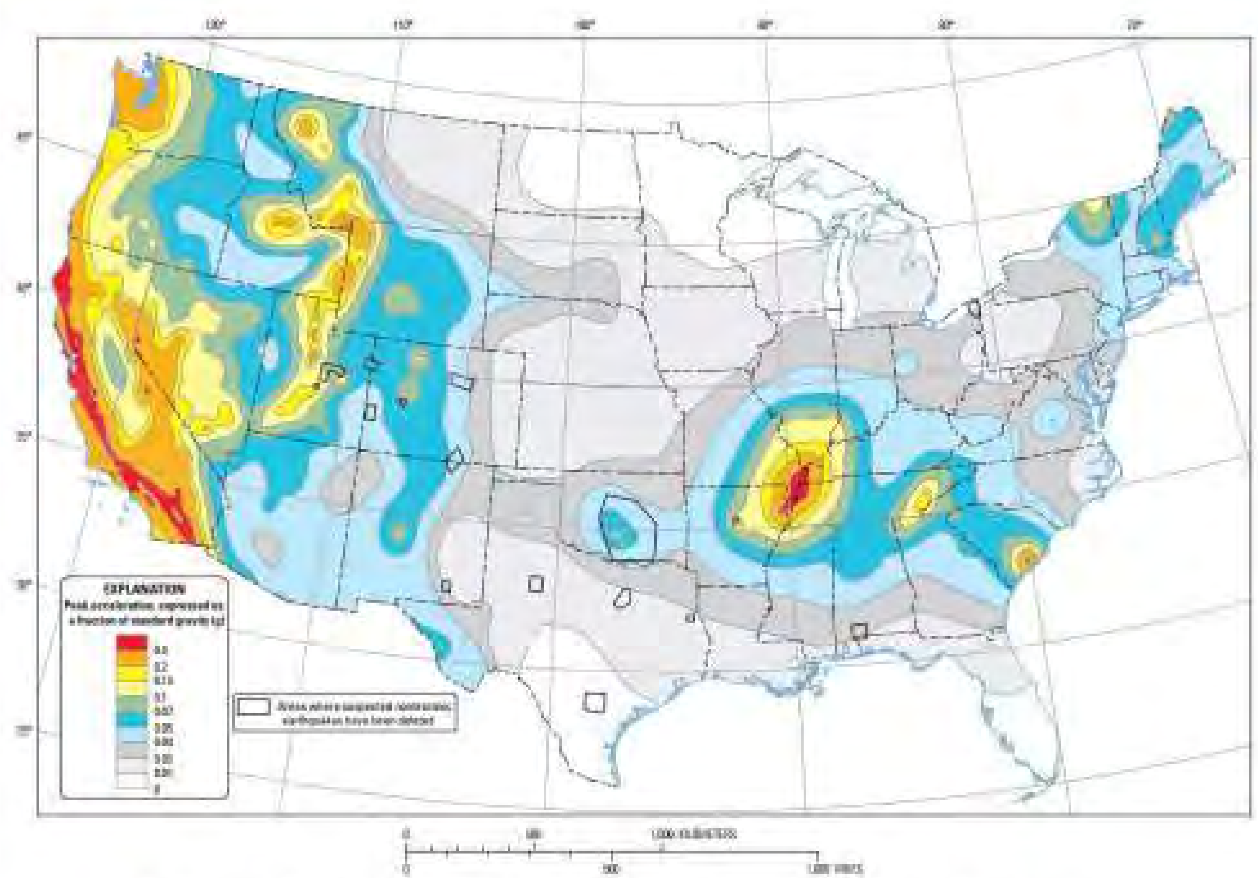
GEOLOGIC HAZARDS

C.2.7 Earthquake

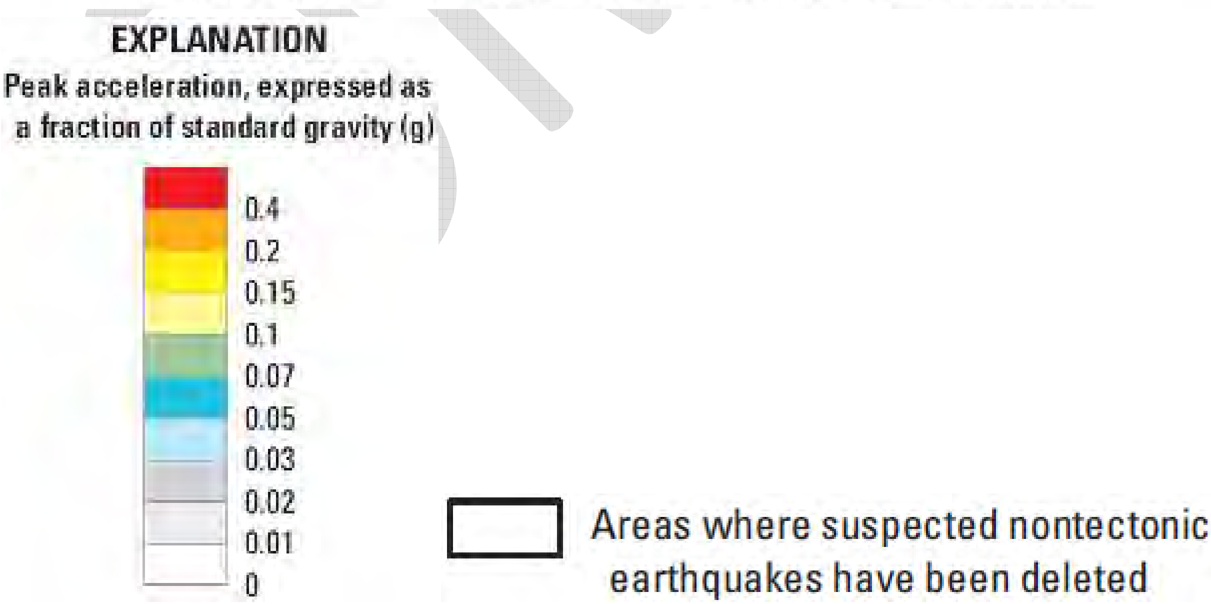
LOCATION AND SPATIAL EXTENT

Figure C.6 shows the intensity level associated with Kemper County, based on the national USGS map of peak acceleration with 10 percent probability of exceedance in 50 years. It is the probability that ground motion will reach a certain level during an earthquake. The data show peak horizontal ground acceleration (the fastest measured change in speed, for a particle at ground level that is moving horizontally due to an earthquake) with a 10 percent probability of exceedance in 50 years. The map was compiled by the U.S. Geological Survey (USGS) Geologic Hazards Team, which conducts global investigations of earthquake, geomagnetic, and landslide hazards. According to this map, Kemper County lies within an approximate zone of level “3” to “5” ground acceleration. This indicates that the county exists within an area of moderate seismic risk.

Figure C.6: PEAK ACCELERATION WITH 10 PERCENT PROBABILITY OF EXCEEDANCE IN 50 YEARS



Ten-percent probability of exceedance in 50 years map of peak ground acceleration



Source: United States Geological Survey, 2014

HISTORICAL OCCURRENCES

At least one earthquake is known to have affected Kemper County since 1916. This measured a III on the Modified Mercalli Intensity (MMI) scale. **Table C.14** provides a summary of earthquake events reported by the National Geophysical Data Center between 1638 and 1985. **Table C.15** presents a detailed occurrence of each event including the date, distance for the epicenter, magnitude and Modified Mercalli Intensity (if known).[4]

Table C.14: SUMMARY OF SEISMIC ACTIVITY IN KEMPER COUNTY

Location	Number of Occurrences	Greatest MMI Reported	Richter Scale Equivalent
De Kalb	0	--	--
Scooba	0	--	--
Unincorporated Area	1	III	< 4.8
KEMPER COUNTY TOTAL	**1**	**III (slight)**	**< 4.8**

Source: National Geophysical Data Center

Table C.15: SIGNIFICANT SEISMIC EVENTS IN KEMPER COUNTY (1638 -1985)

Location	Date	Epicentral Distance	Magnitude	MMI
De Kalb				
None Reported	--	--	--	--
Scooba				
None Reported	--	--	--	--
Unincorporated Area				
Porterville	10/18/1916	229.0 km	*Unknown*	III

Source: National Geophysical Data Center

PROBABILITY OF FUTURE OCCURRENCES

The probability of significant, damaging earthquake events affecting Kemper County is unlikely. However, it is possible that future earthquakes resulting in light to moderate perceived shaking and damages ranging from none to very light will affect the county. The annual probability level for the county is estimated to be between 1 and 10 percent (possible).

C.2.8 Landslide

LOCATION AND SPATIAL EXTENT

Landslides occur along steep slopes when the pull of gravity can no longer be resisted (often due to heavy rain). Human development can also exacerbate risk by building on previously undevelopable steep slopes. Landslides are possible throughout Kemper County, though the risk is relatively low.

[4] Due to reporting mechanisms, not all earthquake events were recorded during this time. Furthermore, some are missing data, such as the epicenter location, due to a lack of widely used technology. In these instances, a value of "unknown" is reported.

According to **Figure C.7** below, the entire county falls under a low incidence area. This indicates that less than 1.5 percent of the area is involved in landsliding.

Figure C.7: LANDSLIDE SUSCEPTIBILITY AND INCIDENCE MAP OF KEMPER COUNTY

Source: United States Geological Survey

HISTORICAL OCCURRENCES

There is no extensive history of landslides in Kemper County. Landslide events typically occur in isolated areas. Reviews of the USGS Landslide Inventory show no historical occurrences of landslides.

PROBABILITY OF FUTURE OCCURRENCES

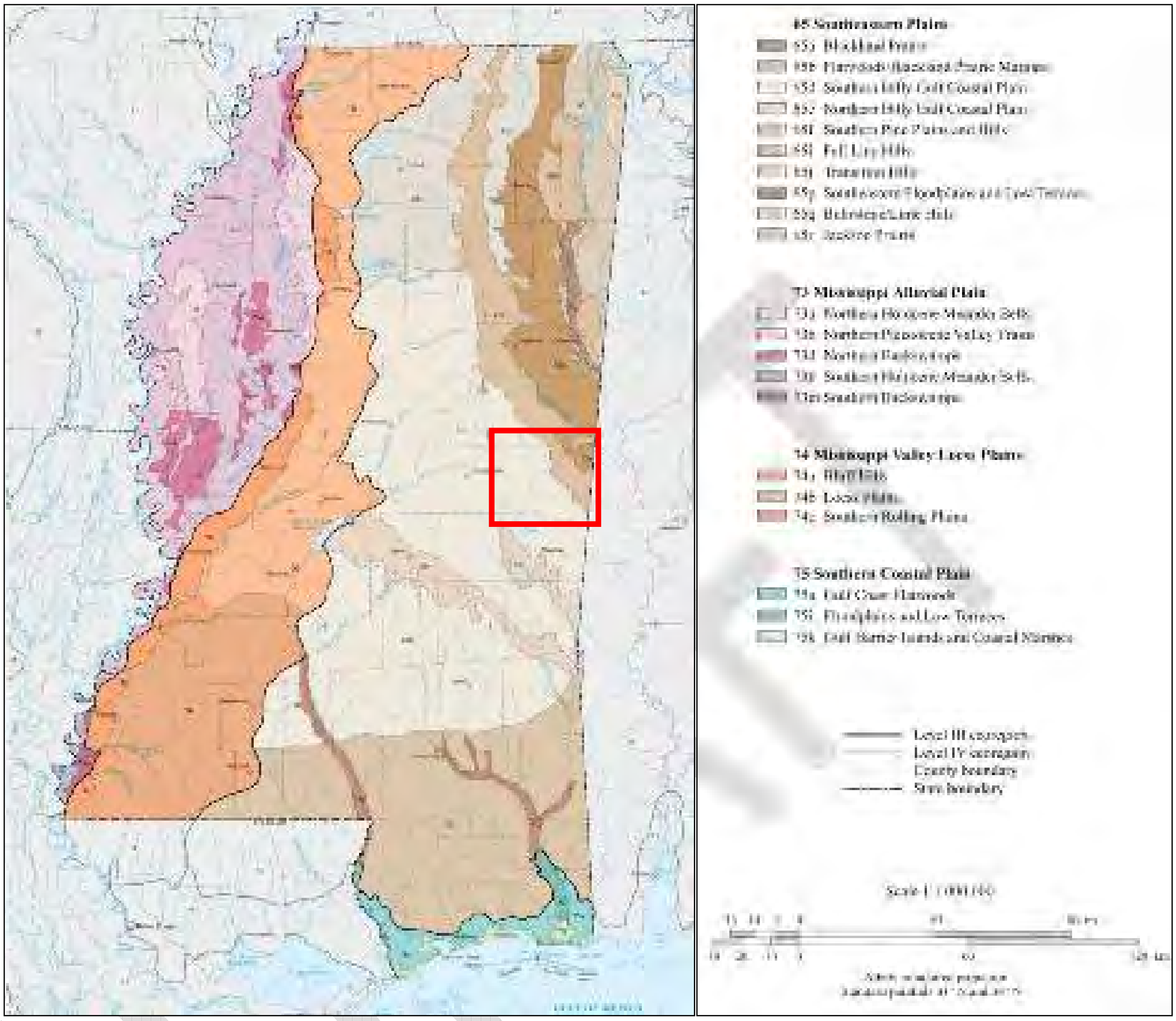
Based on historical information and the USGS susceptibility index, the probability of future landslide events is unlikely (less than 1 percent probability). The USGS data indicates that all areas in Kemper County have a low incidence rate and low susceptibly to landsliding activity. However, local conditions may become more favorable for landslides due to heavy rain, for example. This would increase the likelihood of occurrence. It should also be noted that some areas in Kemper County have greater risk than others given factors such as steepness on slope and modification of slopes.

C.2.9 Land Subsidence

LOCATION AND SPATIAL EXTENT

Much of Kemper County is located in an area where the soil is substantially clay, causing a shrink and swell effect depending on the current conditions. Indeed, much of the area underlain by the calcareous Yazoo clay which, when combined with sand and marl, is highly susceptible to expansion when wet and shrinking when dry. These areas are denoted below in **Figure C.8**.

Figure C.8: MAP OF MISSISSIPPI SOILS



Source: http://www.eoearth.org/view/article/152119/

HISTORICAL OCCURRENCES

There is no significant historical record of land subsidence in Kemper County. However, local county officials have noted the impacts from these swings and changes in soil as roads and other infrastructure have experienced large cracks and breaks, causing stops in daily operations and significant costs to local, state, and federal budgets. Often the cost to repair this infrastructure can be in the range of millions of dollars depending on the degree of damage and necessity for quick repairs.

PROBABILITY OF FUTURE OCCURRENCES

The probability of future land subsidence events in the county is unlikely (less than 1 percent annual probability).

WIND-RELATED HAZARDS

C.2.10 Hurricane and Tropical Storm

LOCATION AND SPATIAL EXTENT

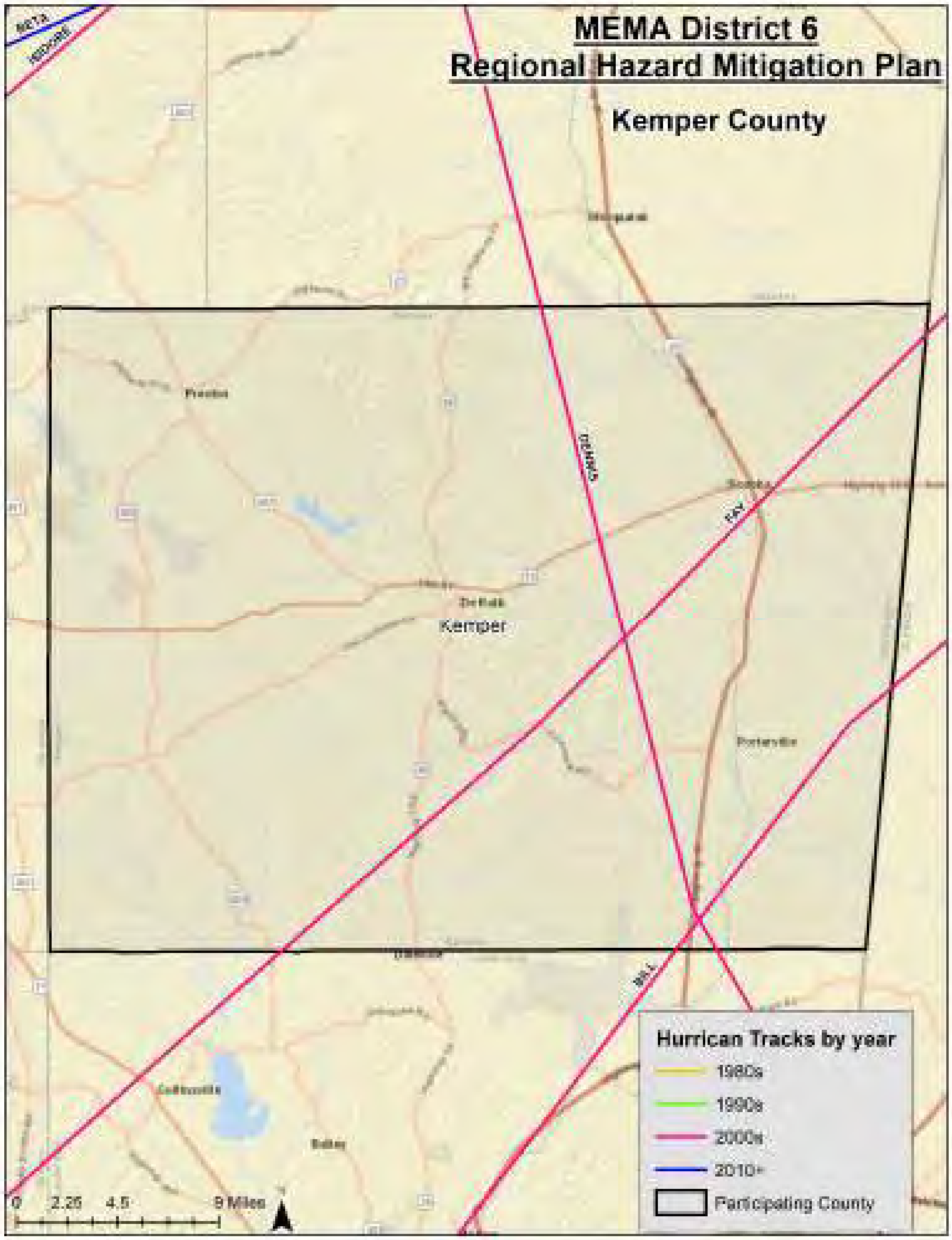
Hurricanes and tropical storms threaten the entire Atlantic and Gulf seaboard of the United States. While coastal areas are most directly exposed to the brunt of landfalling storms, their impact is often felt hundreds of miles inland and they can affect Kemper County. All areas in Kemper County are equally susceptible to hurricane and tropical storms.

HISTORICAL OCCURRENCES

According to the National Hurricane Center's historical storm track records, 58 hurricane or tropical storm/depression tracks have passed within 75 miles of the MEMA District 6 Region since 1855.[11] This includes: 1 Category 3 hurricane, 2 Category 2 hurricanes, 5 Category 1 hurricanes, 33 tropical storms, and 16 tropical depressions.

Of the recorded storm events, 35 hurricane or tropical storm/depression events traversed directly through the region as shown in **Figure C.9**. Notable storms include Hurricane Frederic (1979) and Hurricane Katrina (2005). **Table C.16** provides for each event the date of occurrence, name (if applicable), maximum wind speed (as recorded within 75 miles of the MEMA District 6 Region) and category of the storm based on the Saffir-Simpson Scale.

Figure C.9: HISTORICAL HURRICANE STORM TRACKS 1980 - 2020



Source: National Oceanic and Atmospheric Administration, National Hurricane Center

Table C.16: HISTORICAL STORM TRACKS WITHIN 75 MILES OF THE MEMA 6 DISTRICT REGION (1850–2020)

Date of Occurrence	Storm Name	Maximum Wind Speed (knots)	Storm Category
9/16/1855	UNNAMED	70	Category 1
9/15/1860	UNNAMED	70	Category 1
7/12/1872	UNNAMED	40	Tropical Storm
9/2/1879	UNNAMED	60	Tropical Storm
10/7/1879	UNNAMED	40	Tropical Storm
10/16/1879	UNNAMED	40	Tropical Storm
9/1/1880	UNNAMED	50	Tropical Storm
8/3/1881	UNNAMED	40	Tropical Storm
6/14/1887	UNNAMED	30	Tropical Depression
8/28/1890	UNNAMED	35	Tropical Storm
9/12/1892	UNNAMED	40	Tropical Storm
9/8/1893	UNNAMED	55	Tropical Storm
8/17/1895	UNNAMED	35	Tropical Storm
8/3/1898	UNNAMED	35	Tropical Storm
8/16/1901	UNNAMED	45	Tropical Storm
10/10/1905	UNNAMED	35	Tropical Storm
9/27/1906	UNNAMED	95	Category 2
9/22/1907	UNNAMED	35	Tropical Storm
6/13/1912	UNNAMED	50	Tropical Storm
7/17/1912	UNNAMED	25	Tropical Depression
9/14/1912	UNNAMED	50	Tropical Storm
9/30/1915	UNNAMED	60	Tropical Storm
7/6/1916	UNNAMED	80	Category 1
7/5/1919	UNNAMED	30	Tropical Depression
10/18/1923	UNNAMED	50	Tropical Storm
7/30/1926	UNNAMED	25	Tropical Depression
9/1/1932	UNNAMED	60	Tropical Storm
10/16/1932	UNNAMED	45	Tropical Storm
8/1/1936	UNNAMED	40	Tropical Storm
9/1/1937	UNNAMED	30	Tropical Depression
6/16/1939	UNNAMED	35	Tropical Storm
8/14/1939	UNNAMED	35	Tropical Storm
9/26/1939	UNNAMED	40	Tropical Storm
9/25/1940	UNNAMED	20	Tropical Depression
9/4/1948	UNNAMED	50	Tropical Storm
9/5/1949	UNNAMED	40	Tropical Storm
8/31/1950	BAKER	65	Category 1
6/1/1959	ARLENE	25	Tropical Depression
9/16/1960	ETHEL	35	Tropical Storm
9/26/1960	FLORENCE	15	Tropical Depression

Date of Occurrence	Storm Name	Maximum Wind Speed (knots)	Storm Category
8/18/1969	CAMILLE	100	Category 3
9/16/1971	EDITH	60	Tropical Storm
7/19/1977	UNNAMED	25	Tropical Depression
9/6/1977	BABE	30	Tropical Depression
7/11/1979	BOB	40	Tropical Storm
9/13/1979	FREDERIC	95	Category 2
8/12/1987	UNNAMED	25	Tropical Depression
8/27/1992	ANDREW	30	Tropical Depression
8/4/1995	ERIN	45	Tropical Storm
8/6/2001	BARRY	20	Tropical Depression
9/26/2002	ISIDORE	55	Tropical Storm
7/1/2003	BILL	45	Tropical Storm
7/11/2005	DENNIS	45	Tropical Storm
8/29/2005	KATRINA	80	Category 1
9/14/2007	HUMBERTO	20	Tropical Depression
8/24/2008	FAY	30	Tropical Depression
8/17/2009	CLAUDETTE	25	Tropical Depression
10/28/2020	Zeta	33	Tropical Depression

*It should be noted that the track of several major hurricanes that impacted the region fell outside of the 75-mile buffer. These storms were included in the table due to their significant impact. (Georges, 1988; Ivan, 2004; Issac, 2012)
Source: National Hurricane Center

Federal records indicate that disaster declarations were made in 2004 (Hurricane Ivan), 2005 (Hurricane Dennis and Hurricane Katrina), and 2012 (Hurricane Issac). A complete listing of historical disaster declarations can be found in Section 4: Hazard Identification. Hurricane and tropical storm events can cause substantial damage in the area due to high winds and flooding.

Flooding and high winds from hurricanes and tropical storms can cause damage throughout the county. Anecdotes are available from NCDC for the major storms that have impacted the county as found below:

Tropical Storm Bill – June 30 and July 1, 2003
Heavy rainfall with Tropical Storm Bill resulted in several reports of flash flooding. Forty-eight hour rainfall totals ranged between 3 and 7 inches, mainly across SE portions of Mississippi. Gradient wind gusts between 30 and 40 mph combined with saturated soils to down numerous trees very close to center's track. Damage from Bill was an estimated $100,000.

Hurricane Ivan – September 16, 2004
Thousands of trees were blown down across Eastern Mississippi during Hurricane Ivan as well as hundreds of power lines. The strong wind itself did not cause much structural damage, however the fallen trees did. These downed trees accounted for several hundred homes, mobile homes and businesses to be damaged or destroyed. Most locations across Eastern Mississippi reported sustained winds between 30 and 40 mph with Tropical Storm force gusts between 48 and 54 mph. The strongest reported winds occurred in Newton, Lauderdale and Oktibbeha Counties.

Overall, rainfall totals were held in check as Ivan steadily moved north. The heaviest rains were confined to far Eastern Mississippi where 3 to 4 inches fell over a 15-hour period. Due to the duration of the rain no flooding was reported. Across Eastern Mississippi, Hurricane Ivan was responsible for one fatality. This fatality occurred in Brooksville (Noxubee County) when a tree fell on a man. Damage from Ivan was estimated at $200 million.

Tropical Storm Arlene – June 11, 2005
The western periphery of Tropical Storm Arlene affected far Eastern Mississippi during the evening and brought gusty winds and locally heavy rains to that portion of the state. Peak wind gusts were reported up to 40 mph and the combination of wet soils allowed for a few hundred trees to get blown down or uprooted. Several of the downed trees took down power lines and a small few landed on homes causing damage. Additionally, the counties across Eastern Mississippi received 3 to 5 inches of rain as Arlene lifted north.

Hurricane Dennis – July 10, 2005
Hurricane Dennis moved north-northwest across Southwest Alabama and then into East-Central Mississippi and finally across Northeast Mississippi. Wind gusts over tropical storm force were common across areas east of a line from Starkville to Newton to Hattiesburg. These winds caused several hundred trees to uproot or snap and took down numerous power lines. Additionally, a total of 21 homes or businesses sustained minor to major damage from fallen trees or gusty winds.

Heavy rainfall was not a major issue as Dennis steadily moved across the region. Rainfall totals between 2 and 5 inches fell across Eastern Mississippi over a 12 hour period. One indirect fatality occurred in Jasper County from an automobile accident due to wet roads.

Hurricane Katrina – August 29, 2005
Hurricane Katrina will likely go down as the worst and costliest natural disaster in United States history. The amount of destruction, the cost of damaged property/agriculture and the large loss of life across the affected region has been overwhelming. Catastrophic damage was widespread across a large portion of the Gulf Coast region. The devastation was not only confined to the coastal region, widespread and significant damage occurred well inland up to the Hattiesburg area and northward past Interstate 20.

Hurricane force winds were common across Central Mississippi. The region received sustained winds of 60-80 mph with gusts ranging from 80-120 mph. Wind damage to structures was widespread, with roofs blown off or partially peeled. Hundreds of signs were shredded or blown down. Many businesses sustained structural damage as windows were broken, roofs were blown off, and walls were collapsed. Millions of trees were uprooted and snapped. Power poles and lines were snapped and taken down from wind and trees. It was thousands of downed trees which caused the most significant structural damage as these trees fell onto homes and businesses. Power outages lasted from a few days to as long as four weeks. Agriculture and timber industries were severely impacted. Row crops, including cotton, rice, corn, and soybeans, took a hard hit. Other impacted industries were the catfish industry, dairy and cattle industry, and nursery businesses.

PROBABILITY OF FUTURE OCCURRENCES

Given the inland location of the county, it is more likely to be affected by remnants of hurricane and tropical storm systems (as opposed to a major hurricane) which may result in flooding or high winds. The probability of being impacted is less than coastal areas, but still remains a real threat to Kemper County due to induced events like flooding. Based on historical evidence, the probability level of future occurrence is likely (annual probability between 10 and 100 percent). Given the regional nature of the hazard, all areas in the county are equally exposed to this hazard. However, when the county is impacted, the damage could be catastrophic, threatening lives and property throughout the planning area.

C.2.11 Thunderstorm (wind, hail, lightning)

LOCATION AND SPATIAL EXTENT

Thunderstorm / High Wind

A thunderstorm event is an atmospheric hazard, and thus has no geographic boundaries. It is typically a widespread event that can occur in all regions of the United States. However, thunderstorms are most common in the central and southern states because atmospheric conditions in those regions are favorable for generating these powerful storms. It is assumed that Kemper County has uniform exposure to an event and the spatial extent of an impact could be large.

Hailstorm

Hailstorms frequently accompany thunderstorms, so their locations and spatial extents coincide. It is assumed that Kemper County is uniformly exposed to severe thunderstorms; therefore, all areas of the county are equally exposed to hail which may be produced by such storms.

Lightning

Lightning occurs randomly, therefore it is impossible to predict where and with what frequency it will strike. It is assumed that all of Kemper County is uniformly exposed to lightning.

HISTORICAL OCCURRENCES

Thunderstorm / High Wind

Severe storms were at least partially responsible for five disaster declarations in Kemper County in 1979, 1990, 1992, 2003, 2011, and 2019. According to NCEI, there have been 172 reported thunderstorm and high wind events since 1955 in Kemper County. These events caused almost $1.86 million in damages. There were also reports of seven injuries. **Table C.17** summarizes this information.

Table C.17: SUMMARY OF THUNDERSTORM / HIGH WIND OCCURRENCES IN KEMPER COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
De Kalb	35	0/3	$544,000
Scooba	23	0/0	$192,500
Unincorporated Area	114	0/4	$1,125,500
KEMPER COUNTY TOTAL	**172**	**0/7**	**$1,862,000**

Source: National Centers for Environmental Information

Hailstorm

According to the National Centers for Environmental Information, 92 recorded hailstorm events have affected Kemper County since 1960. **Table C.18** is a summary of the hail events in Kemper County. In all, hail occurrences resulted in approximately $1.215 million in property damages. Hail ranged in diameter from 0.75 inches to 4.5 inches. It should be noted that hail is notorious for causing substantial damage to cars, roofs, and other areas of the built environment that may not be reported to the National Centers for Environmental Information. Therefore, it is likely that damages are greater than the reported value.

Table C.18: SUMMARY OF HAIL OCCURRENCES IN KEMPER COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
De Kalb	18	0/0	$16,000
Scooba	7	0/0	$0
Unincorporated Area	67	0/0	$1,199,000
KEMPER COUNTY TOTAL	**92**	**0/0**	**$1,215,000**

Source: National Centers for Environmental Information

Lightning

According to the National Centers for Environmental Information, there has been one recorded lightning event in Kemper County since 2007. This event resulted in almost $250,000 in damages, as listed in summary **Table C.19**. Detailed information on historical lightning events can be found in **Table C.20**.

It is certain that more than one event has impacted the county. Many of the reported events are those that cause damage, and it should be expected that damages are likely much higher for this hazard than what is reported.

Table C.19: SUMMARY OF LIGHTNING OCCURRENCES IN KEMPER COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
De Kalb	0	0/0	$0
Scooba	0	0/0	$0
Unincorporated Area	1	0/0	$287,735
KEMPER COUNTY TOTAL	**1**	**0/0**	**$287,735**

Source: National Centers for Environmental Information

Table C.20: HISTORICAL LIGHTNING OCCURRENCES IN KEMPER COUNTY

Location	Date	Deaths / Injuries	Property Damage*	Details
De Kalb				
None Reported	--	--	--	--
Scooba				
None Reported	--	--	--	--
Unincorporated Area				
PRESTON	6/19/2007	0/0	$50,000	During the morning hours of June 19th, a complex of storms moved a cross East Central Mississippi. A lightning strike from a thunderstorm hit a house and caused a fire. The home was heavily damaged and determined a total loss.

Source: National Centers for Environmental Information

PROBABILITY OF FUTURE OCCURRENCES

Thunderstorm / High Wind

Given the high number of previous events, it is certain that thunderstorm events, including straight-line wind events, will occur in the future. This results in a probability level of highly likely (100 percent annual probability) for the entire county.

Hailstorm
Based on historical occurrence information, it is assumed that the probability of future hail occurrences is highly likely (100 percent annual probability). Since hail is an atmospheric hazard, it is assumed that Kemper County has equal exposure to this hazard. It can be expected that future hail events will continue to cause minor damage to property and vehicles throughout the county.

Lightning
Although there was not a high number of historical lightning events reported in Kemper County via NCDC data, it is a regular occurrence accompanied by thunderstorms. In fact, lightning events will assuredly happen on an annual basis, though not all events will cause damage. According to Vaisala's U.S. National Lightning Detection Network (NLDN), Kemper County is located in an area of the country that experienced an average of 4 to 6 cloud-to-ground lightning flashes per square kilometer per year between 2015 and 2019.[5] Therefore, the probability of future events is highly likely (100 percent annual probability). It can be expected that future lightning events will continue to threaten life and cause minor property damages throughout the county.

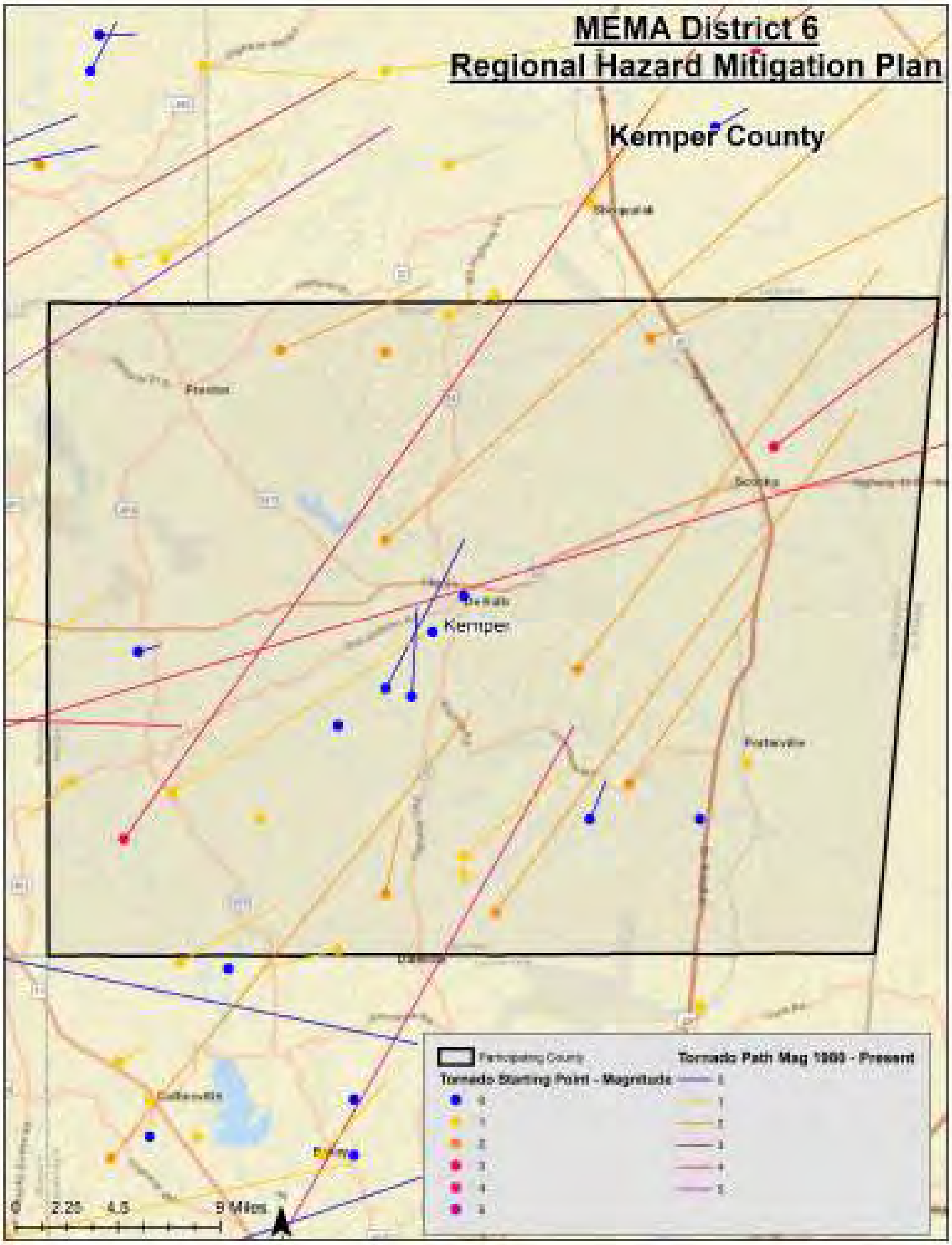
C.2.12 Tornado

LOCATION AND SPATIAL EXTENT

Tornadoes occur throughout the state of Mississippi, and thus in Kemper County. Tornadoes typically impact a relatively small area, but damage may be extensive. Event locations are completely random and it is not possible to predict specific areas that are more susceptible to tornado strikes over time. Therefore, it is assumed that Kemper County is uniformly exposed to this hazard. With that in mind, **Figure C.10** shows tornado track data for many of the major tornado events that have impacted the county. While no definitive pattern emerges from this data, some areas that have been impacted in the past may be potentially more susceptible in the future.

[5] Vaisala's Annual Lightning Report – 2020. Retrieved on 9.8.2021 from: https://www.vaisala.com/sites/default/files/documents/WEA-MET-Annual-Lightning-Report-2020-B212260EN-A.pdf

Figure C.10: HISTORICAL TORNADO TRACKS IN KEMPER COUNTY



Source: National Weather Service Storm Prediction Center

HISTORICAL OCCURRENCES

Tornadoes were at least partially responsible for six disaster declarations in Kemper County in 1979, 1990, 1992, 2003, 2011, and 2019. According to the National Centers for Environmental Information, there have been a total of 35 recorded tornado events in Kemper County since 1954 (**Table C.21**), resulting in over $43 million in property damages. In addition, 5 fatalities and 36 injuries were reported. The magnitude of these tornadoes ranges from F0 to F4 and EF0 to EF5 in intensity.

Table C.21: SUMMARY OF TORNADO OCCURRENCES IN KEMPER COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
De Kalb	3	0/0	$80,000
Scooba	1	0/0	$500,000
Unincorporated Area	31	5/36	$42,500,000
KEMPER COUNTY TOTAL	**35**	**5/36**	**$43,080,000**

Source: National Centers for Environmental Information

A significant severe weather event and tornado outbreak affected portions of central Mississippi, southeastern Arkansas, and northeastern Louisiana on April 15th, 2011. This event evolved slowly and brought multiple rounds of severe storms to the region between 3 am and 9 pm. A total of 15 tornadoes occurred during this event with 3 being of the strong variety (EF2 or EF3). In addition, numerous reports of damaging straight-line winds occurred as well as instances of large hail. Some of the strongest storms produced hail from golf ball to baseball size. There were two reports of softball sized hail as well, one in Clarke County and the other in Kemper County. In addition to the severe storms, significant flash flooding occurred over northern portions of central Mississippi.

From April 25 to 28, 2011, the largest tornado outbreak ever recorded affected the Southern, Midwestern, and Northeastern U.S., leaving catastrophic destruction in its wake, especially across the states of Alabama and Mississippi. During this outbreak, three tornados that ranged in magnitude from EF1 to EF5 were reported in Kemper County on April 27, 2011. These tornadoes resulted in three fatalities, six injuries, and over $647,000 in property damages.

PROBABILITY OF FUTURE OCCURRENCES

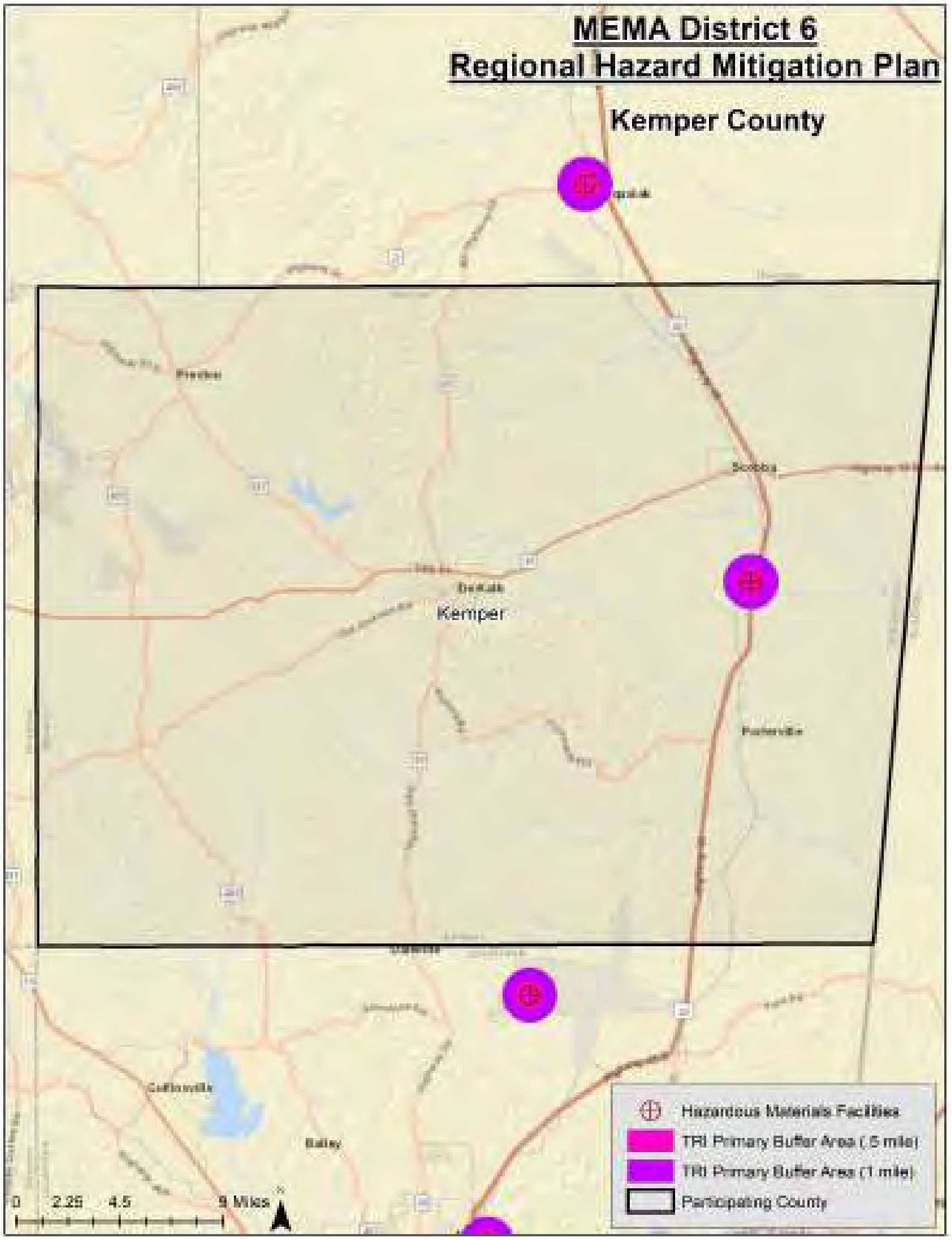
According to historical information, tornado events pose a significant threat to Kemper County. The probability of future tornado occurrences affecting Kemper County is likely (between 10 and 100 percent annual probability).

C.2.13 Hazardous Materials Incidents

LOCATION AND SPATIAL EXTENT

Kemper County has one TRI site. This site is shown in **Figure C.11.**

Figure C.11: TRI SITES IN KEMPER COUNTY



Source: Environmental Protection Agency

In additional to "fixed" hazardous materials locations, hazardous materials may also impact the county via roadways and rail. Many roads in the county are subject to hazardous materials transport and all roads that permit hazardous material transport are considered potentially at risk to an incident.

HISTORICAL OCCURRENCES

There have been a total of one recorded HAZMAT incidents in Kemper County since 1977 (**Table C.22**). This event did not result in any property damage. **Table C.23** presents detailed information on historic HAZMAT incidents in Kemper County as reported by the U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA).

Table C.22: SUMMARY OF HAZMAT INCIDENTS IN KEMPER COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
De Kalb	1	0/0	$0
Scooba	0	0/0	$0
Unincorporated Area	0	0/0	$0
KEMPER COUNTY TOTAL	**1**	**0/0**	**$0**

Source: United States Department of Transportation Pipeline and Hazardous Materials Safety Administration

Table C.23: HAZMAT INCIDENTS IN KEMPER COUNTY

Report Number	Date	City	Mode	Serious Incident?	Fatalities/ Injuries	Damages ($)*	Quantity Released
De Kalb							
I-1977110442	11/1/1977	DE KALB	Highway	Yes	0/0	$0	3,287 LGA
Scooba							
None Reported	--	--	--	--	--	--	--
Unincorporated Area							
None Reported	--	--	--	--	--	--	--

Source: United States Department of Transportation Pipeline and Hazardous Materials Safety Administration

PROBABILITY OF FUTURE OCCURRENCES

Given the location of one toxic release inventory site in Kemper County and a prior roadway incident, it is likely (between 10 and 100 percent annual probability) that a hazardous material incident may occur in the county. County and town officials are mindful of this possibility and take precautions to prevent such an event from occurring. Furthermore, there are detailed plans in place to respond to an occurrence.

C.2.14 Pandemic

LOCATION AND SPATIAL EXTENT

Pandemics are global in nature. However, they may start anywhere. Kemper County chose to analyze this hazard given the agriculture in the area and potential for this kind of event to occur in any location at any time.

All populations should be considered at risk to pandemic. Buildings and infrastructure are not directly impacted by the virus/pathogen but could be indirectly impacted if people are not able to operate and maintain them due to illness. Many buildings may be shutdown, at least temporarily, as a result. Employers may initiate work from home procedures for non-essential workers in order to help stop infection. Commerce activities, and thus the economy, may suffer greatly during this time.

HISTORICAL OCCURRENCES

Several pandemics have been reported throughout history. A short history of the flu/Spanish Flu was collected from The Historical Text Archive and is described below.

The first known pandemic dates back to 430 B.C. with the Plague of Athens. It reportedly killed a quarter of the population over four years due to typhoid fever. In 165-180 A.D., the Antonine Plague killed nearly 5 million people. Next, the Plague of Justinian (the first bubonic plague pandemic) occurred from 541 to 566. It killed 10,000 people a day at its peak and resulted in a 50 percent drop in Europe's population. Since the 1500s, influenza pandemics have occurred about three times every century or roughly every 10 to 50 years. The Black Death devastated European populations in the 14th century. Nearly a third of the population (20-30 million) was killed over six years. From 1817 to present, seven Cholera Pandemics have impacted to the world and killed millions. Perhaps most severe, was the Third Cholera Pandemic (1852-1959) which started in China. Isolated cases can still be found in the Western U.S. today. There were three major pandemics in the 20th century (1918-1919, 1957-1958, and 1968-1969). The most infamous pandemic flu of the 20th century, however, was that of 1918-1919. The pandemics of the 20th and 21st centuries that impacted the United States are detailed below.

1918 Spanish Flu: This was the most devastating flu of the 20th century. This pandemic spread across the world in three waves between 1918 and 1919. It typically impacted areas for around twelve weeks and then would largely disappear. However, it would frequently reemerge several months later. Worldwide, approximately 50 million persons died and over a quarter of the population was infected. Nearly 675,000 people died in the United States. The illness came on suddenly and could cause death within a few hours. The virus impacted those aged 15 to 35 especially hard. The movement of troops during World War I is thought to have facilitated the spread of the virus.

In Mississippi, state officials noted that "epidemics have been reported from a number of places in the State," on October 4th, 1918. By the 18th, twenty-six localities reported 1,934 cases (the real number of cases was likely much higher). West Point, Mississippi was hit especially hard and quarantine was established. Throughout the state, African Americans were impacted at a greater rate than white populations. This is thought to be partly caused from a shortage of caretakers. It is estimated that over 6,000 people died in Mississippi, though that number may be much higher as death records were not widely recorded.

1957 Asian Flu: It is estimated that the Asian Flu caused 2 million deaths worldwide. Approximately 70,000 deaths were in the U.S. However, the proportion of people impacted was substantially higher than that of the Spanish Flu. This flu was characterized as having much milder effects than the Spanish Flu and greater survivability. Similar to other pandemics, this pandemic has two waves. Elderly and infant populations were more likely to succumb to death. This flu is thought to have originated from a genetic mutation of a bird virus.

1968 Hong Kong Flu: The Hong Kong Flu is thought to have caused one million deaths worldwide. It was milder than both the Asian and Spanish influenza viruses. It was similar to the Asian Flu, which may have provided some immunity to the virus. It had the most severe impact on elderly populations.

2009 H1N1 Influenza: This flu was derived from human, swine, and avian virus strains. It was initially reported in Mexico in April 2009. On April 26, the U.S. government declared H1N1 a public health emergency. A vaccine was developed and over 80 million were vaccinated which helped minimize the impacts. The virus had mild impacts on most of the population but did cause death (usually from viral pneumonia) in high-risk populations such as pregnant women, obese persons, indigenous people, and those with chronic respiratory, cardiac, neurological, or immunity conditions. Worldwide, it is estimated that 43 million to 89 million people contracted H1N1 between April 2009 and April 2010, and between 8,870 and 18,300 H1N1 cases resulted in death.

2020 SARS-CoV-2 (COVID-19): Coronavirus Disease 2019 (COVID-19) was declared as pandemic by the World Health Organization on March 11th, 2020 mainly due to the speed and scale of the transmission of the disease. Prior to that, it started as an epidemic in mainland China with the focus being firstly reported in the city of Wuhan, Hubei province on February 26th, 2020. The etiologic agent of COVID-19 was isolated and identified as a novel coronavirus, initially designated as 2019-nCoV. Later, the virus genome was sequenced and because it was genetically related to the coronavirus outbreak responsible for the SARS outbreak of 2003, the virus was named as severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) by the International Committee for Taxonomy of Viruses.

There is a considerable amount of data on the extent of COVID-19 throughout the State of Mississippi and Kemper County. The number of reported cases and deaths across the State of Mississippi and Kemper County are shown in the figure below.

Figure 12: COVID-19 Cases as of 08/01/2021[6]

	Cases	Deaths
Mississippi	348,496	7,556
Kemper County	1,035	29

In addition to the pandemics above, there have been several cases of pandemic threats, some of which reached epidemic levels. They were contained before spreading globally. Examples include Smallpox, Polio, Tuberculosis, Malaria, AIDS, SARS and Yellow Fever. Advances in medicine and technology have been instrumental in containing the spread of viruses in recent history.

In addition to the pandemics above, there have been several cases of pandemic threats, some of which reached epidemic levels. They were contained before spreading globally. Examples include Smallpox, Polio, Tuberculosis, Malaria, AIDS, SARS and Yellow Fever. Advances in medicine and technology have been instrumental in containing the spread of viruses in recent history.
It is notable that no birds have been infected with Avian Flu in North and South America.

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that all of Kemper County has a probability level of unlikely (less than 1 percent annual probability) for future pandemics events. While pandemic can have devastating impacts, they are relatively rare.
The Mississippi State Department of Health maintains a state pandemic plan which can be found here: http://www.msdh.state.ms.us/msdhsite/index.cfm/44,1136,122,154,pdf/SNSPlan.pdf

[6] Mississippi State Department of Health. *COVID-19 Dashboard*. Retrieved from: https://msdh.ms.gov/msdhsite/_static/14,0,420.html

C.2.15 Conclusions on Hazard Risk

The hazard profiles presented in this section were developed using best available data and result in what may be considered principally a qualitative assessment as recommended by FEMA in its “How-to” guidance document titled *Understanding Your Risks: Identifying Hazards and Estimating Losses* (FEMA Publication 386-2). It relies heavily on historical and anecdotal data, stakeholder input, and professional and experienced judgment regarding observed and/or anticipated hazard impacts. It also carefully considers the findings in other relevant plans, studies, and technical reports.

HAZARD EXTENT

Table C.24 describes the extent of each natural hazard identified for Kemper County. The extent of a hazard is defined as its severity or magnitude, as it relates to the planning area.

Table C.24: EXTENT OF KEMPER COUNTY HAZARDS

Flood-related Hazards	
Flood	Flood extent can be measured by the amount of land and property in the floodplain as well as flood height and velocity. The amount of land in the floodplain accounts for 9.1 percent of the total land area in Kemper County. Flood depth and velocity are recorded via United States Geological Survey stream gages throughout the region. While a gage does not exist for each participating jurisdiction, there is one at or near many areas. The greatest peak discharge recorded for the county was at the Hamilton Branch near De Kalb on April 13, 1974. Water reached a discharge of 662 cubic feet per second and the stream gage height was recorded at 7.58 feet.
Erosion	The extent of erosion can be defined by the measurable rate of erosion that occurs. There are no erosion rate records located in Kemper County.
Dam Failure	Dam Failure extent is defined using the Mississippi Department of Environmental Quality criteria. Three dams are classified as high-hazard in Kemper County.
Winter Storm and Freeze	The extent of winter storms can be measured by the amount of snowfall received (in inches). Official long term snow records are not kept for any areas in Kemper County. However, the greatest snowfall reported in Meridian (south of the county) was 14.0 inches in 1963.
Fire-related Hazards	
Drought / Heat Wave	Drought extent is defined by the U.S. Drought Monitor Classifications which include Abnormally Dry, Moderate Drought, Severe Drought, Extreme Drought, and Exceptional Drought. According to the U.S. Drought Monitor Classifications, the most severe drought condition is Exceptional. Kemper County has received this ranking twice over the 15-year reporting period. The extent of extreme heat can be measured by the record high temperature recorded. Official long term temperature records are not kept for any areas in Kemper County. However, the highest recorded temperature in Meridian (south of the county) was 107°F in 1980.
Wildfire	Wildfire data was provided by the Mississippi Forestry Commission and is reported annually by county from 2015-2020. The greatest number of fires to occur in Kemper County in any year 43 in 2007. The greatest number of acres to burn in the county in a single year occurred in 2015 when 924 acres were burned. Although this data lists the extent that has occurred, larger and more frequent wildfires are possible throughout the county.

Geologic Hazards	
Earthquake	Earthquake extent can be measured by the Richter Scale (Table 5.16), the Modified Mercalli Intensity (MMI) scale (Table 5.17), and the distance of the epicenter from Kemper County. According to data provided by the National Geophysical Data Center, the greatest earthquake to impact the county was reported in Porterville with a MMI of III (slight), an unknown magnitude, and 229 km away from the epicenter.
Landslide	As noted above in the landslide profile, there is no extensive history of landslides in Kemper County and landslide events typically occur in isolated areas. This provides a challenge when trying to determine an accurate extent for the landslide hazard. However, when using the USGS landslide susceptibility index, extent can be measured with incidence, which is low throughout the entire county. There is also low susceptibility throughout the county.
Land Subsidence	The extent of land subsidence can be defined by the measurable rate of subsidence that occurs. There are no subsidence rate records located in Kemper County nor is there any significant historical record of events.
Wind-related Hazards	
Hurricane and Tropical Storm	Hurricane extent is defined by the Saffir-Simpson Scale which classifies hurricanes into Category 1 through Category 5. The greatest classification of hurricane to traverse directly through Kemper County was Hurricane Frederic, a Category 1 storm which carried tropical force winds of 65 knots upon arrival in the county.
Thunderstorm / Hail / Lightning	Thunderstorm extent is defined by the number of thunder events and wind speeds reported. According to a 65-year history from the National Centers for Environmental Information, the strongest recorded wind event in Kemper County was reported on April 4, 2008 at 87 knots (approximately 100 mph). It should be noted that future events may exceed these historical occurrences. Hail extent can be defined by the size of the hail stone. The largest hail stone reported in Kemper County was 4.5 inches (reported on April 15, 2011). It should be noted that future events may exceed this. According to the Vaisala's flash density map, Kemper County is located in an area that experiences 6 to 8 lightning flashes per square kilometer per year. It should be noted that future lightning occurrences may exceed these figures.
Tornado	Tornado hazard extent is measured by tornado occurrences in the US provided by FEMA as well as the Fujita/Enhanced Fujita Scale. The greatest magnitude reported in Kemper County was an F4 (reported on March 12, 1986).
Other Hazards	
Hazardous Materials Incident	According to USDOT PHMSA, the largest hazardous materials incident reported in the Kemper County was 3,287 LGA released on the highway (reported on November 1, 1977). It should be noted that larger events are possible.
Pandemic	While pandemics remain to be rare occurrences overall, it cannot be ignored that as of the drafting of this plan the world continues to be engulfed by the COVID-19 Pandemic.

PRIORITY RISK INDEX RESULTS

In order to draw some meaningful planning conclusions on hazard risk for Kemper County, the results of the hazard profiling process were used to generate countywide hazard classifications according to a "Priority Risk Index" (PRI). More information on the PRI and how it was calculated can be found in Section 5.

Table C.25 summarizes the degree of risk assigned to each category for all initially identified hazards based on the application of the PRI. Assigned risk levels were based on the detailed hazard profiles developed for this section, as well as input from the Regional Hazard Mitigation Council. The results were then used in calculating PRI values and making final determinations for the risk assessment.

Table C.25: SUMMARY OF PRI RESULTS FOR KEMPER COUNTY

Hazard	Category/Degree of Risk					
	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score
Flood-related Hazards						
Flood	Likely	Critical	Moderate	6 to 12 hours	Less than 24 hours	**2.9**
Erosion	Possible	Minor	Small	More than 24 hours	More than 1 week	**1.8**
Dam Failure	Possible	Critical	Small	Less than 6 hours	Less than 6 hours	**2.4**
Winter Storm and Freeze	Likely	Limited	Moderate	More than 24 hours	Less than 24 hours	**2.4**
Fire-related Hazards						
Drought / Heat Wave	Likely	Minor	Large	More than 24 hours	More than 1 week	**2.5**
Wildfire	Highly Likely	Minor	Small	Less than 6 hours	Less than 1 week	**2.6**
Geologic Hazards						
Earthquake	Possible	Minor	Moderate	Less than 6 hours	Less than 6 hours	**2.0**
Landslide	Unlikely	Minor	Small	Less than 6 hours	Less than 6 hours	**1.5**
Land Subsidence	Unlikely	Minor	Small	Less than 6 hours	Less than 6 hours	**1.5**
Wind-related Hazards						
Hurricane and Tropical Storm	Likely	Critical	Large	More than 24 hours	Less than 24 hours	**2.9**
Thunderstorm Wind / High Wind	Highly Likely	Critical	Moderate	6 to 12 hours	Less than 6 hours	**3.1**
Hailstorm	Highly Likely	Limited	Moderate	6 to 12 hours	Less than 6 hours	**2.8**
Lightning	Highly Likely	Limited	Negligible	6 to 12 hours	Less than 6 hours	**2.4**
Tornado	Likely	Catastrophic	Small	Less than 6 hours	Less than 6 hours	**3.0**
Other Hazards						
Hazardous Materials Incident	Likely	Limited	Small	Less than 6 hours	Less than 24 hours	**2.5**
Pandemic	Unlikely	Catastrophic	Large	More than 24 hours	More than 24hrs	**2.8**

C.2.16 Final Determinations on Hazard Risk

The conclusions drawn from the hazard profiling process for Kemper County, including the PRI results and input from the Regional Hazard Mitigation Council, resulted in the classification of risk for each identified hazard according to three categories: High Risk, Moderate Risk, and Low Risk (**Table C.26**). For purposes of these classifications, risk is expressed in relative terms according to the estimated impact that a hazard will have on human life and property throughout all of Kemper County. A more quantitative analysis to estimate potential dollar losses for each hazard has been performed separately, and is described in

Section 6: *Vulnerability Assessment* and below in Section C.3. It should be noted that although some hazards are classified below as posing low risk, their occurrence of varying or unprecedented magnitudes is still possible in some cases and their assigned classification will continue to be evaluated during future plan updates.

Table C.26: CONCLUSIONS ON HAZARD RISK FOR KEMPER COUNTY

HIGH RISK	Thunderstorm Wind / High Wind Tornado Flood Hurricane and Tropical Storm Hailstorm Pandemic
MODERATE RISK	Wildfire Drought / Heat Wave Hazardous Materials Incident Dam and Levee Failure Winter Storm and Freeze Lightning
LOW RISK	Earthquake Erosion Landslide Land Subsidence

C.3 KEMPER COUNTY VULNERABILITY ASSESSMENT

This subsection identifies and quantifies the vulnerability of Kemper County to the significant hazards previously identified. This includes identifying and characterizing an inventory of assets in the county and assessing the potential impact and expected amount of damages caused to these assets by each identified hazard event. More information on the methodology and data sources used to conduct this assessment can be found in Section 6: *Vulnerability Assessment*.

C.3.1 Asset Inventory

The following table lists the fire stations, public safety buildings, government facilities, medical facilities, and educational buildings located in Kemper County according to Hazus-MH Version 2.2.

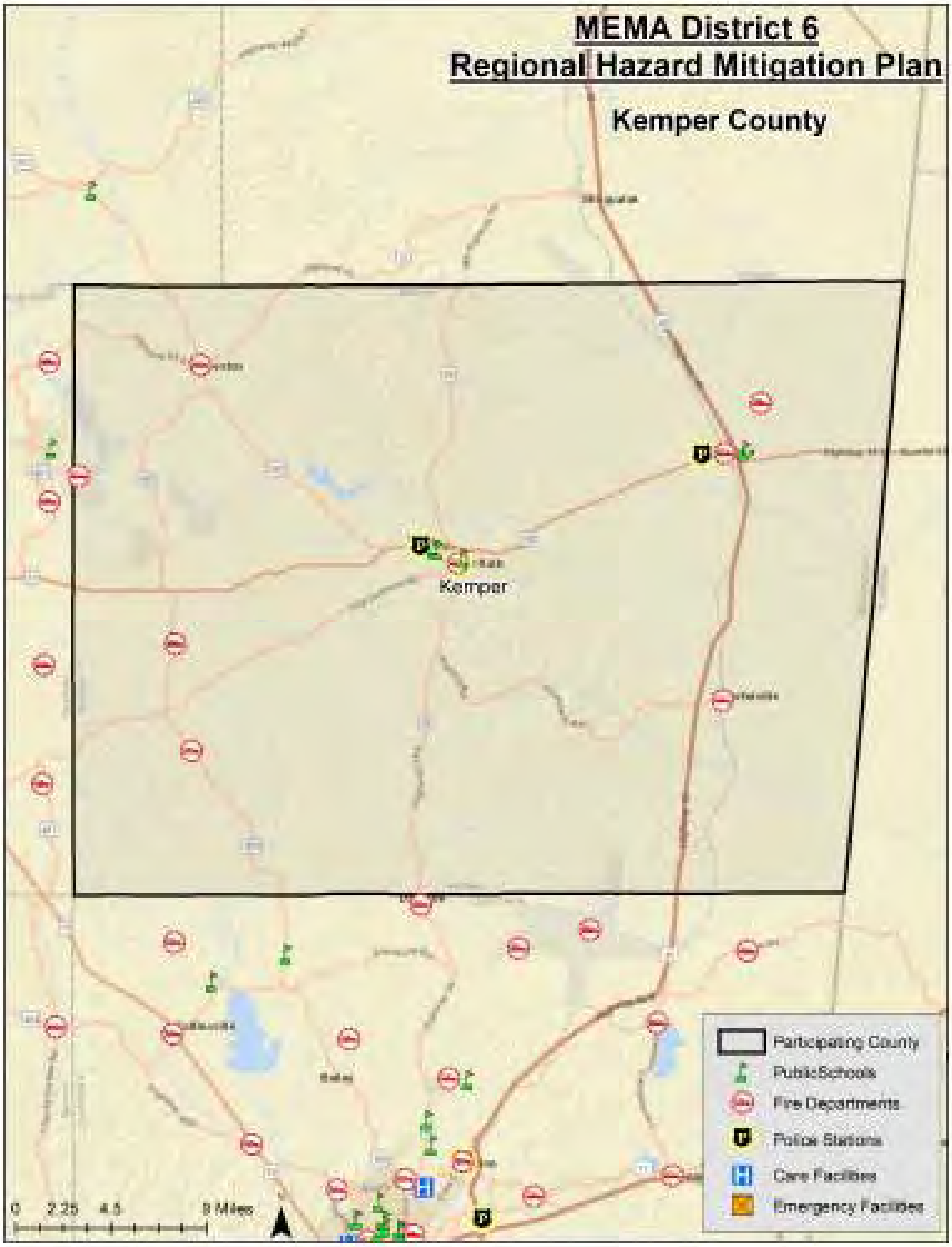
In addition, **Figure C.13** shows the locations of critical facilities in Kemper County. At the end of this subsection, shows a complete list of the critical facilities by name, as well as the hazards that affect each facility. As noted previously, this list is not all-inclusive and only includes information provided through Hazus and by local officials.

Table C.27: CRITICAL FACILITY INVENTORY IN KEMPER COUNTY

Location	Fire Stations	Police Stations	Medical Facilities	EOC	Public Schools
De Kalb	1	2	1	1	3
Scooba	1	1	0	0	2
Unincorporated Area	12	1	0	0	0
ASSET VALUATION	$18,345,236	$6,879,463	$2,789,178	$2,237,154	$66,195,760
KEMPER COUNTY TOTAL	14	4	1	1	4

Source: Hazus-MH 2.2

Figure C.13: CRITICAL FACILITY LOCATIONS IN KEMPER COUNTY



Source: Hazus-MH 2.2

C.3.2 Social Vulnerability

In addition to identifying those assets potentially at risk to identified hazards, it is important to identify and assess those particular segments of the resident population in Kemper County that are potentially at risk to these hazards.

The following table lists the population by jurisdiction according to U.S. Census 2020 population estimates. The total population in Kemper County according to Census data is 8,988 persons. Additional population estimates are presented above in Section C.1.

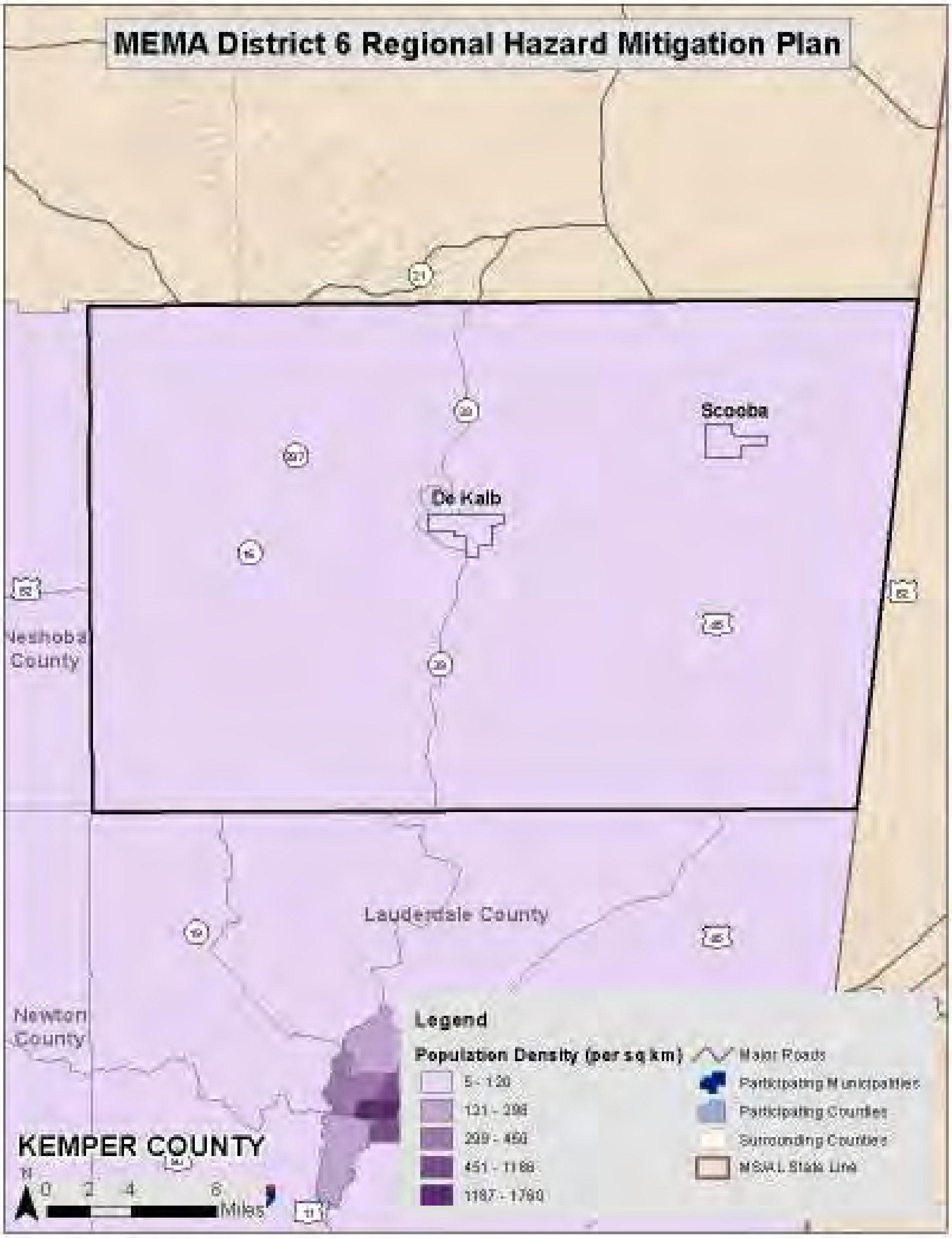
Table 28: TOTAL POPULATION IN KEMPER COUNTY

Location	Total 2020 Population
De Kalb	877
Scooba	744
Unincorporated Area	7367
KEMPER COUNTY TOTAL	**8,988**

Source: United States Census

In addition, **Figure C.14** illustrates the population density per square kilometer by census tract as it was reported by the U.S. Census Bureau 2010. This data remains unchanged since last update.

Figure C.14: POPULATION DENSITY IN KEMPER COUNTY



Source: United States Census Bureau, 2010

C.3.3 Development Trends and Changes in Vulnerability

Since the previous county hazard mitigation plan was approved (in 2015), Kemper County has experienced limited growth and development. **Table C.29** shows the number of building units constructed since 2010 according to the U.S. Census American Community Survey.

Table C.29: BUILDING COUNTS FOR KEMPER COUNTY

Jurisdiction	Total Housing Units (2019)	Units Built 2014 or later	% Building Stock Built Post-
De Kalb	602	8	1.3%
Scooba	241	0	0.0%
Unincorporated Area	3,923	19	0.4%
KEMPER COUNTY TOTAL	**4,766**	**27**	**0.6%**

Source: United States Census Bureau – American Community Survey

Table C.34 shows population growth estimates for the county from 2010 to 2014 based on the U.S. Census Annual Estimates of Resident Population.

Table C.30: POPULATION GROWTH FOR KEMPER COUNTY

Jurisdiction	Population Estimates (as of July 1)					% Change 2015-2019
	2015	2016	2017	2018	2019	
De Kalb	1,082	1,148	1,219	1,278	1,268	17.19%
Scooba	1,052	977	912	954	878	-16.53%
Unincorporated Area	8,077	8,003	7,951	7,875	7,979	-1.21%
KEMPER COUNTY TOTAL	**10,211**	**10,128**	**10,082**	**10,107**	**9,943**	**-2.62%**

Source: United States Census Bureau

Based on the data above, De Kalb, along with the unincorporated areas of the county saw a minimal increase in housing units built after 2014. Kemper County overall saw a decrease of 2.62% of its population since 2015. Therefore, development and population growth have not impacted the county's vulnerability since the previous local hazard mitigation plan was approved and there has been no change in the overall vulnerability.

It is also important to note that as development increases in the future, greater populations and more structures and infrastructure will be exposed to potential hazards if development occurs in the floodplains, moderate and high landside susceptibility areas, high wildfire risk areas, or primary and secondary TRI site buffers.

C.3.4 Vulnerability Assessment Results

As noted in Section 6: *Vulnerability Assessment*, only hazards with a specific geographic boundary, available modeling tool, or sufficient historical data allow for further analysis. Those results, specific to Kemper County, are presented here. All other hazards are assumed to impact the entire planning region (drought / heat wave; thunderstorm—wind, hail, lightning; tornado; and winter storm and freeze) or, due to lack of data, analysis would not lead to credible results (dam and levee failure, erosion, and land subsidence). In the case of landslide, local officials determined that the USGS data may be somewhat amiss and that even the areas identified as moderate risks probably entailed an overall low risk.

The hazards to be further analyzed in this subsection include: flood, wildfire, earthquake, hurricane and tropical storm winds, and hazardous materials incident.

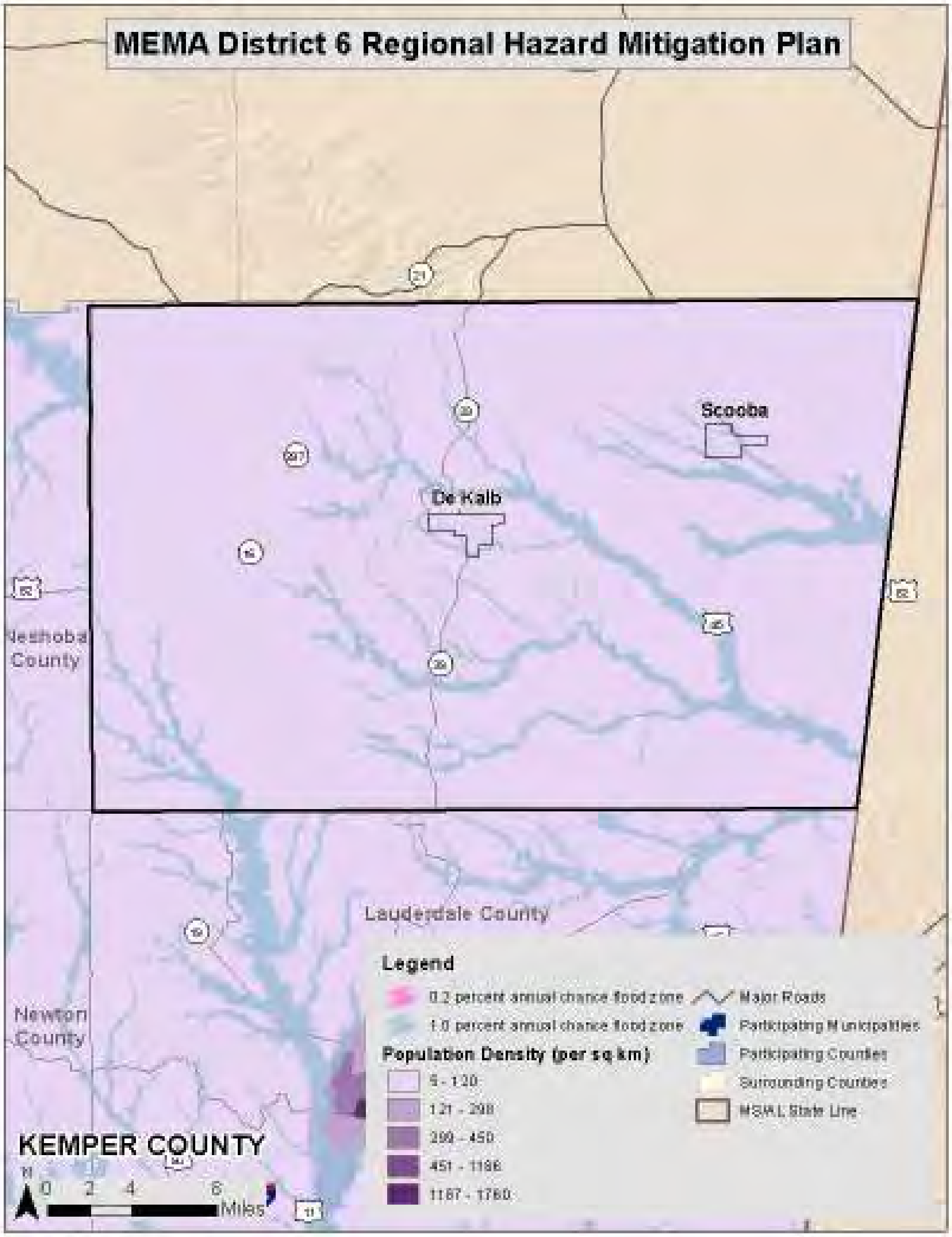
The annualized loss estimate for all hazards is presented near the end of this subsection**.**

FLOOD

Historical evidence indicates that Kemper County is susceptible to flood events. A total of 14 flood events have been reported by the National Centers for Environmental Information resulting in $1.59 Million in property damage. On an annualized level, these damages amounted to $69,130 for Kemper County.

Social Vulnerability
Figure C.15 is presented to gain a better understanding of at-risk population by evaluating census tract level population data against mapped floodplains. There are areas of concern in several areas of the county. Indeed, nearly every incorporated municipality is potentially at risk of being impacted by flooding in some areas of its jurisdiction. Therefore, further investigation in these areas may be warranted. This data remains unchanged since last update.

Figure C.15: POPULATION DENSITY NEAR FLOODPLAINS



Source: Federal Emergency Management Agency DFIRM, United States Census 2010

Critical Facilities
The following figure shows critical facilities in relation to Special Flood Hazard Areas. A list of specific critical facilities and their associated risk can be found at the end of this section.

In conclusion, a flood has the potential to impact many existing and future buildings, facilities, and populations in Kemper County, though some areas are at a higher risk than others. All types of structures in a floodplain are at-risk, though elevated structures will have a reduced risk. Such site-specific vulnerability determinations are outside the scope of this assessment but will be considered during future plan updates. Furthermore, areas subject to repetitive flooding should be analyzed for potential mitigation actions.

Figure C16: CRITICAL FACILITY ANALYSIS - SFHA

Source: Federal Emergency Management Agency DFIRM

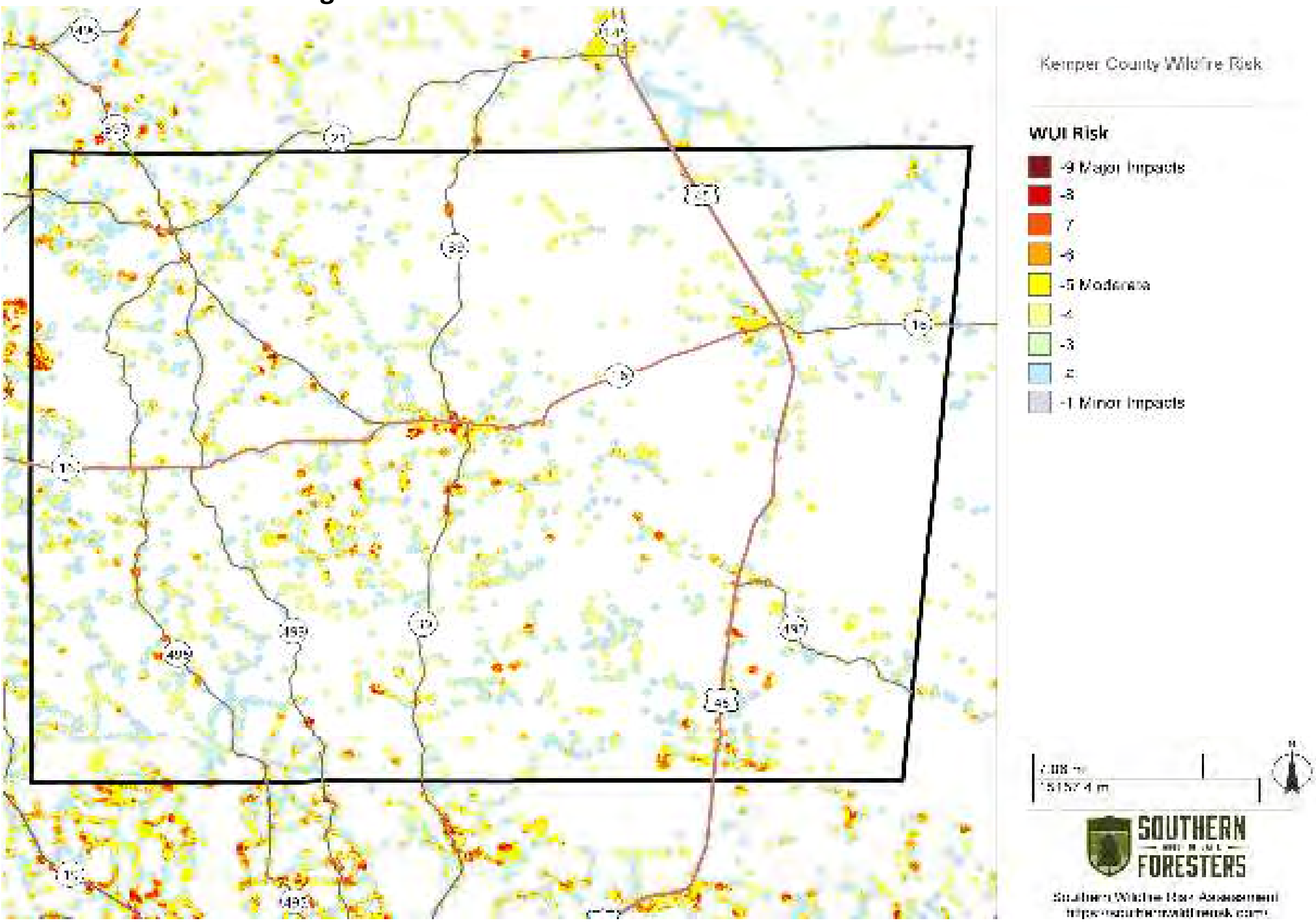
WILDFIRE

Although historical evidence indicates that Kemper County is susceptible to wildfire events, there are few reports of damage. Therefore, it is difficult to calculate a reliable annualized loss figure. Annualized loss is considered negligible though it should be noted that a single event could result in significant damages throughout the county.

To estimate exposure to wildfire, building data was obtained from Hazus-MH 2.2 which includes information that has been aggregated at the Census block level and which has been deemed useful for analyzing wildfire vulnerability. However, it should be noted that the accuracy of Hazus data is somewhat lower than that of parcel data. For the critical facility analysis, areas of concern were intersected with critical facility locations.

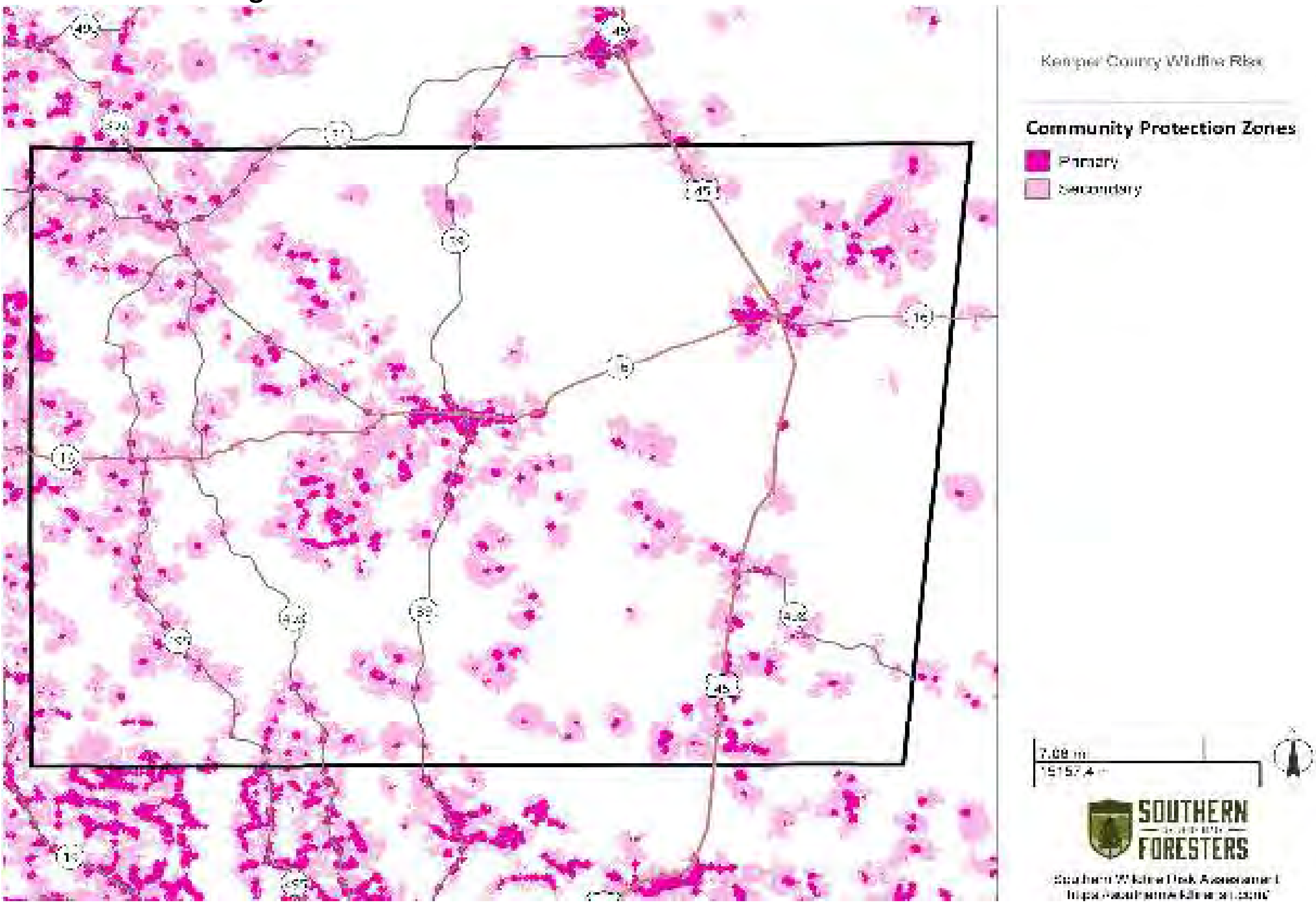
Figure C.17 shows the Wildland Urban Interface Risk Index (WUIRI) data, which is a data layer that shows a rating of the potential impact of a wildfire on people and their homes. The key input, Wildland Urban Interface (WUI), reflects housing density (houses per acre) consistent with Federal Register National standards. The location of people living in the WUI and rural areas is key information for defining potential wildfire impacts to people and homes. Initially provided as raster data, it was converted to a polygon to allow for analysis. The Wildland Urban Interface Risk Index data ranges from 0 to -9 with lower values being most severe (as noted previously, this is only a measure of relative risk). **Figure C.18** Community Protection Zones (CPZ) represent those areas considered highest priority for mitigation planning activities**.** CPZs are based on an analysis of the *Where People Live* housing density data and surrounding fire behavior potential. Rate of Spread data is used to determine the areas of concern around populated areas that are within a 2-hour fire spread distance. This is referred to as the Secondary CPZ. **Figure C.19** shows critical facility locations in relation to historical wildfire burns.

Figure C.17: WUI RISK INDEX AREAS IN KEMPER COUNTY



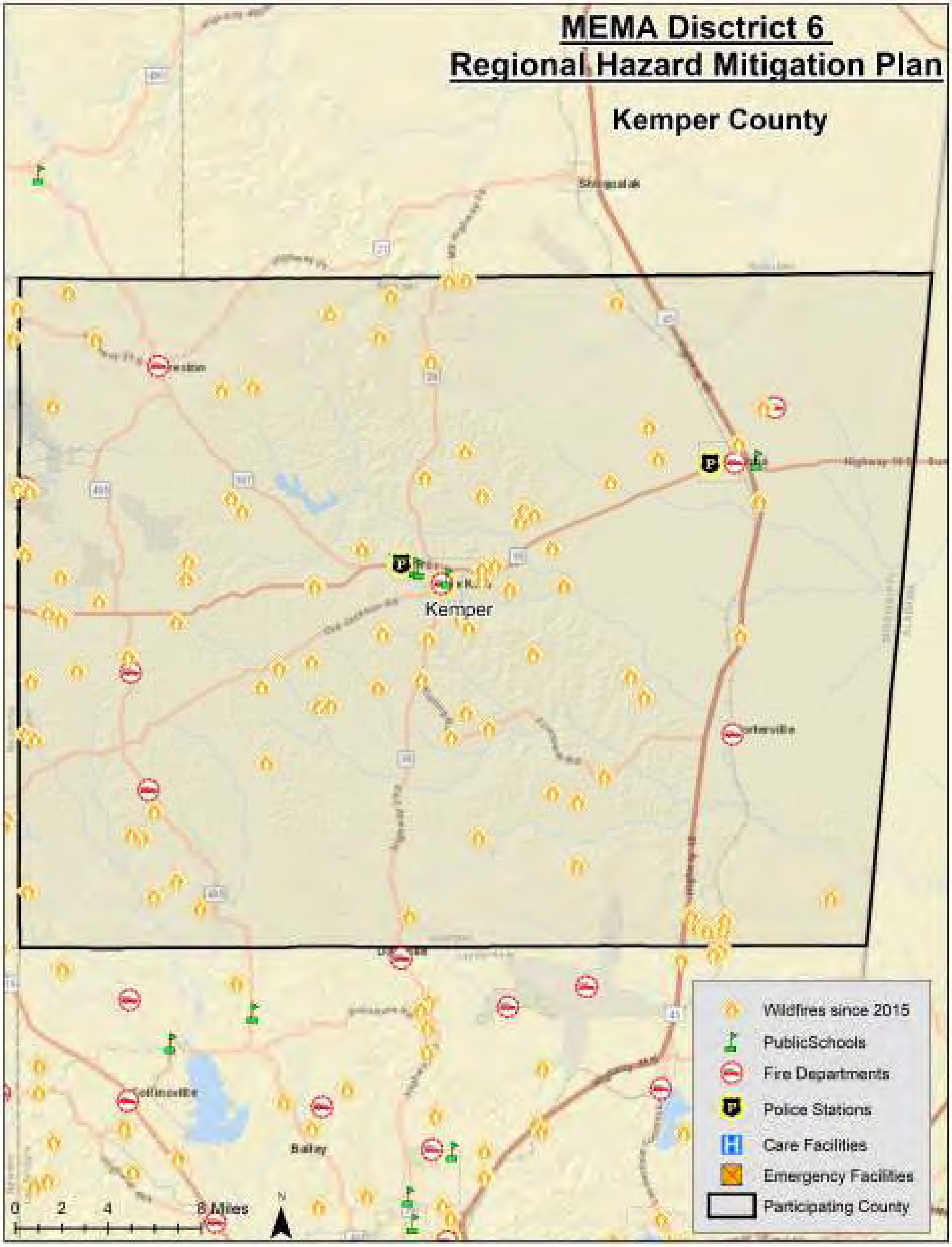
Source: Southern Wildfire Risk Assessment Data

Figure C.18: COMMUNITY PROTECTION ZONES IN KEMPER COUNTY



Source: Southern Wildfire Risk Assessment Data

Figure C.19: CRITICAL FACILITY ANALYSIS – WILDFIRE



Source: Southern Wildfire Risk Assessment Data

Social Vulnerability

Given some level of susceptibility across the entire county, it is assumed that the total population is at risk to the wildfire hazard. Determining the exact number of people in certain wildfire zones is difficult with existing data and could be misleading. In particular, the expansion of residential development from urban centers out into rural landscapes, increases the potential for wildland fire threat to public safety and the potential for damage to forest resources and dependent industries. This increase in population across the region will impact counties and communities that are located within the Wildland Urban Interface (WUI). The WUI is described as the area where structures and other human improvements meet and intermingle with undeveloped wildland or vegetative fuels. Population growth within the WUI substantially increases the risk from wildfire.

For the Kemper County Wildfire Risk project area, it is estimated that 10,374 people or 98.6 % percent of the total project area population (10,520) live within the WUI.

Critical Facilities

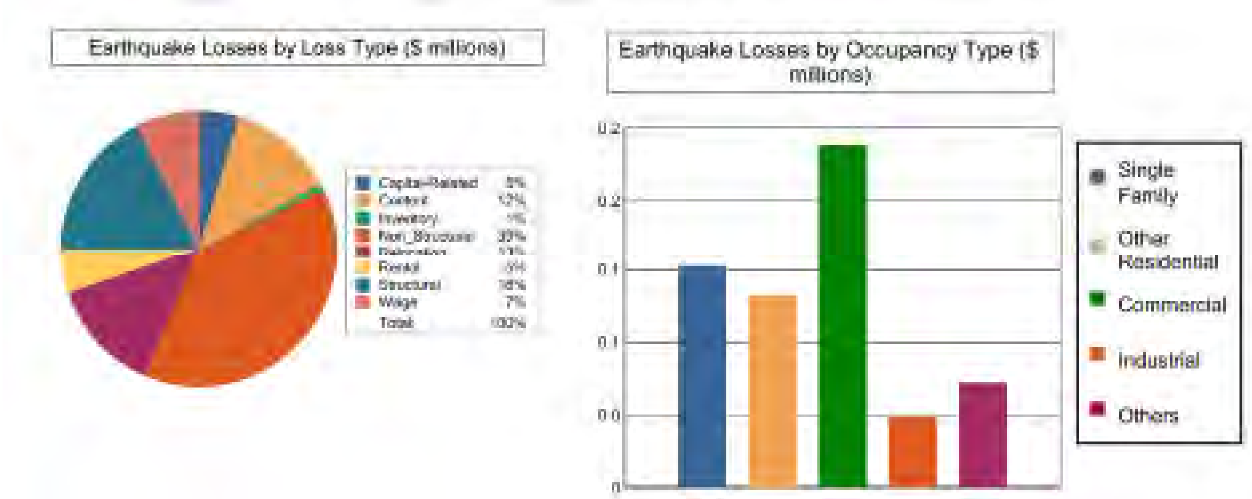
The critical facility analysis revealed that there are 9 facilities located in wildfire areas of concern. It should be noted, that several factors could impact the spread of a wildfire putting all facilities at risk. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

In conclusion, a wildfire event has the potential to impact many existing and future buildings, critical facilities, and populations in Kemper County.

EARTHQUAKE

A probabilistic earthquake model was performed for the MEMA District 6 Region. As the Hazus-MH model suggests below, and historical occurrences confirm, any earthquake activity in the area is likely to inflict minor damage to the county. Hazus-MH 2.2 estimates the total building-related losses were $520,000; 31 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 44 % of the total loss. The figure below provides a summary of the losses associated with the building damage.

Figure C.20: MEMA D6 EARTHQUAKE LOSSES BY TYPE



For the earthquake hazard vulnerability assessment, a probabilistic scenario was created to estimate the average annualized loss for the region. The results of the analysis are generated at the Census Tract level within Hazus-MH and then aggregated to the region level. Since the scenario is annualized, no building counts are provided. Losses reported included losses due to structure failure, building loss, contents damage, and inventory loss.

Social Vulnerability

It can be assumed that all existing and future populations are at risk to the earthquake hazard. Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 39 households to be displaced due to the earthquake. Of these, 32 people (out of a total population of 244,467) will seek temporary shelter in public shelters. [7] The total economic loss estimated for the earthquake is 76.76 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory.

Critical Facilities

The Hazus-MH probabilistic analysis indicated that no critical facilities would sustain measurable damage in an earthquake event. However, all critical facilities should be considered at-risk to minor damage, should an event occur. Before the earthquake, the region had 1,241 hospital beds available for use. On the day of the earthquake, the model estimates that only 1,035 hospital beds (83.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 93.00% of the beds will be back in service. By 30 days, 99.00% will be operational.

In conclusion, an earthquake has the potential to impact all existing and future buildings, facilities, and populations in Kemper County. The Hazus-MH scenario indicates that minimal to moderate damage is expected from an earthquake occurrence. While Kemper County may not experience a large earthquake (the greatest on record is a magnitude III MMI), localized damage is possible with an occurrence. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

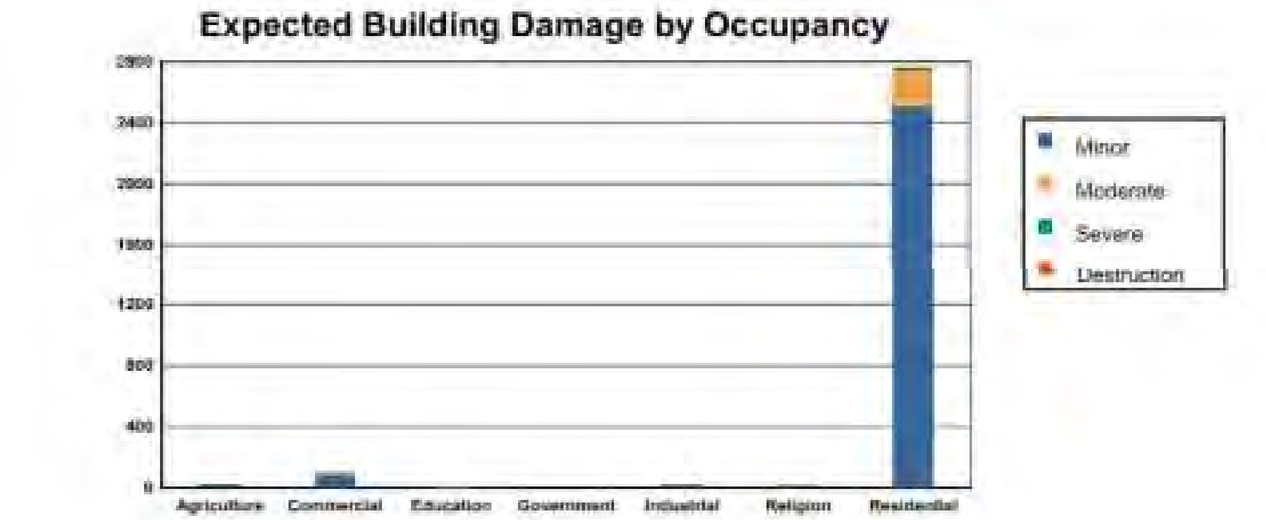
HURRICANE AND TROPICAL STORM

Historical evidence indicates that Kemper County has some risk to the hurricane and tropical storm hazard. There have been four disaster declarations due to hurricanes (Hurricanes Ivan, Dennis, Katrina, and Isaac). Several tracks have come near or traversed through the county, as shown and discussed in Section C.2.10.

A probabilistic 100-year hurricane model was performed for the MEMA District 6. Hazus estimates that about 289 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 12 buildings that will be completely destroyed. The figure below summarizes the expected damage by general occupancy for the buildings in the region.

[7] HAZUS-MH utilizes 2010 Census Data

Figure C.21: MEMA D6 100-YEAR HURRICANE



Hurricanes and tropical storms can cause damage through numerous additional hazards such as flooding, erosion, tornadoes, and high winds, thus it is difficult to estimate total potential losses from these cumulative effects. The current Hazus-MH hurricane model only analyzes hurricane winds and is not capable of modeling and estimating cumulative losses from all hazards associated with hurricanes; therefore, only hurricane winds are analyzed in this section. It can be assumed that all existing and future buildings and populations are at risk to the hurricane and tropical storm hazard.

Social Vulnerability

Given equal susceptibility across the county, it is assumed that the total population, both current and future, is at risk to the hurricane and tropical storm hazard. Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 34 households to be displaced due to the hurricane. Of these, 26 people (out of a total population of 244,467) will seek temporary shelter in public shelters.

Critical Facilities

Given equal vulnerability across Kemper County, all critical facilities are considered to be at risk. Some buildings may perform better than others in the face of such an event due to construction and age, among other factors. Determining individual building response is beyond the scope of this plan. However, this plan will consider mitigation action for especially vulnerable structures and/or critical facilities to mitigate against the effects of the hurricane hazard. A list of specific critical facilities canbe found at the end of this subsection.

In conclusion, a hurricane event has the potential to impact many existing and future buildings, critical facilities, and populations in Kemper County.

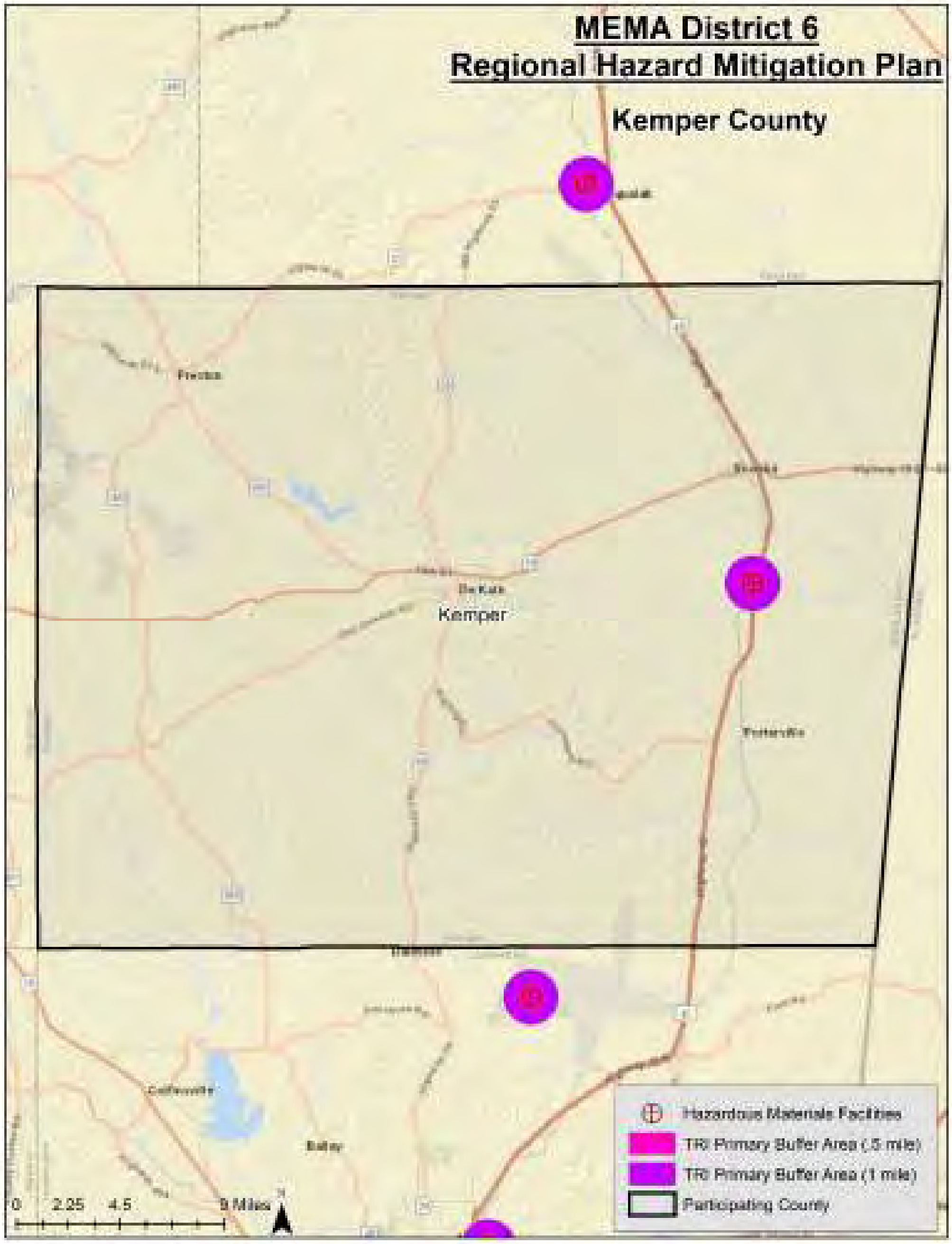
HAZARDOUS MATERIALS INCIDENT

Although historical evidence indicates that Kemper County is susceptible to hazardous materials events, there are no reports of damage. Therefore, it is difficult to calculate a reliable annualized loss figure. It is assumed that while major event could result in significant losses, annualizing structural losses over a long period of time would most likely yield a negligible annualized loss estimate for Kemper County.

Most hazardous materials incidents that occur are contained and suppressed before destroying any property or threatening lives. However, they can have a significant negative impact. Such events can cause multiple deaths, completely shut down facilities for 30 days or more, and cause more than 50 percent of affected properties to be destroyed or suffer major damage. In a hazardous materials incident, solid, liquid, and/or gaseous contaminants may be released from fixed or mobile containers. Weather conditions will directly affect how the hazard develops. Certain chemicals may travel through the air or water, affecting a much larger area than the point of the incidence itself. Non-compliance with fire and building codes, as well as failure to maintain existing fire and containment features, can substantially increase the damage from a hazardous materials release. The duration of a hazardous materials incident can range from hours to days. Warning time is minimal to none.

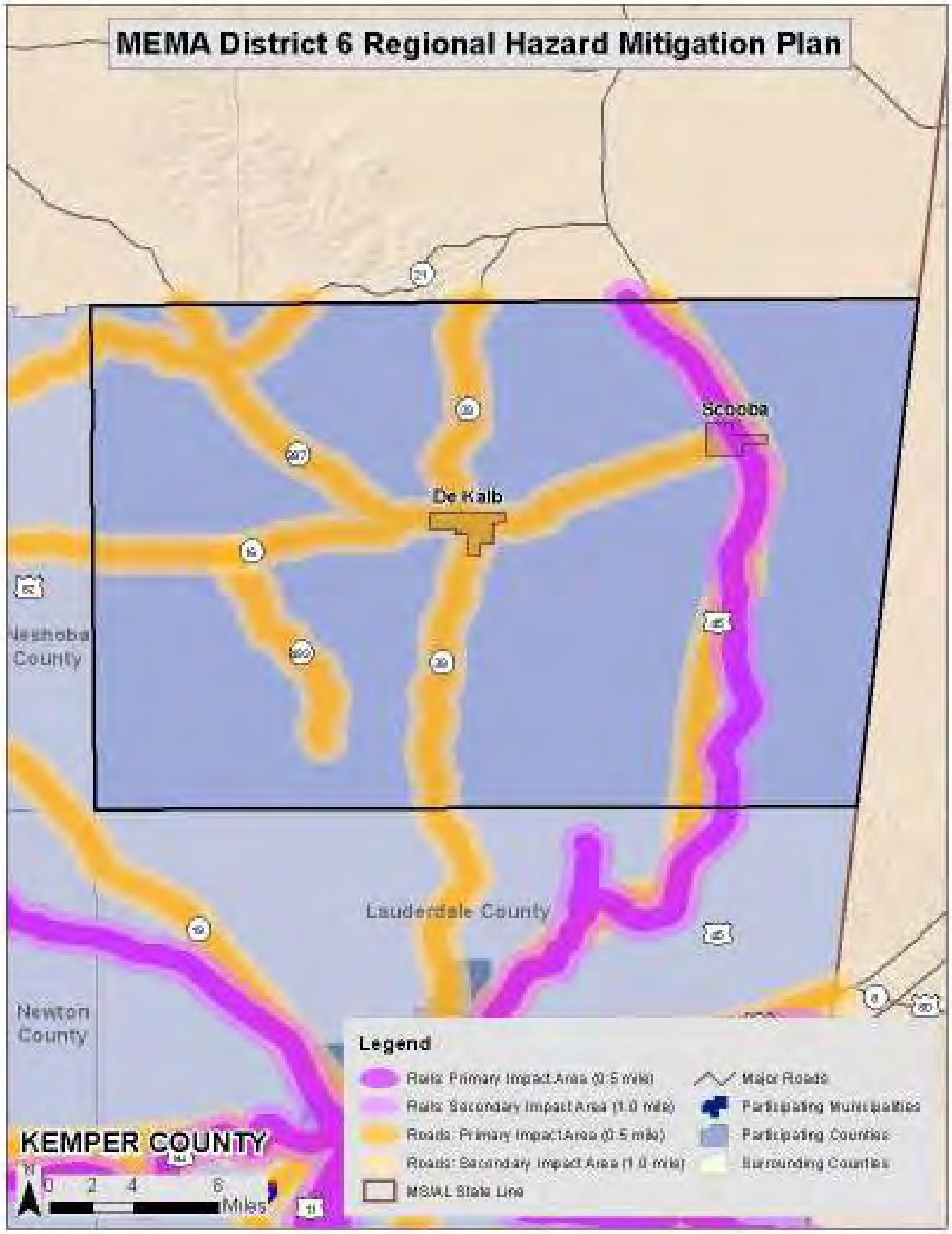
In order to conduct the vulnerability assessment for this hazard, GIS intersection analysis was used for fixed and mobile areas and building footprints/parcels. This type of analysis will likely yield inflated results (generally higher than what is actually reported after an actual event). In both scenarios, two sizes of buffers—0.5-mile and 1.0-mile—were used. These areas are assumed to represent the different levels of effect: immediate (primary) and secondary. Primary and secondary impact zones were selected based on guidance from the PHMSA Emergency Response Guidebook. For the fixed site analysis, geo-referenced Tier II sites in the region, along with buffers, were used for analysis as shown in **Figure C.22.** For the mobile analysis, the major roads (Interstate highway, U.S. highway, and State highway) and railroads, where hazardous materials are primarily transported that could adversely impact people and buildings, were used for the GIS buffer analysis. **Figure C.23** shows the areas used for mobile toxic release buffer analysis.

Figure C.22: TRI SITES WITH BUFFERS IN KEMPER COUNTY



Source: Environmental Protection Agency

Figure C.23: MOBILE HAZMAT BUFFERS IN KEMPER COUNTY



Social Vulnerability

Given high susceptibility across the entire county, it is assumed that the total population is at risk to a hazardous materials incident. It should be noted that areas of population concentration may be at an elevated risk due to a greater burden to evacuate population quickly.

Critical Facilities

Fixed Site Analysis:

The critical facility analysis for fixed TRI sites revealed that there are six facilities located in a HAZMAT risk zone. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

Mobile Analysis:

It should be presumed that any facility located near a public roadway or rail line is susceptible to a potential HAZMAT event. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

A list of specific critical facilities and their associated risk can be found at the end of this subsection.

In conclusion, a hazardous material incident has the potential to impact many existing and future buildings, critical facilities, and populations in Kemper County. Those areas in a primary buffer are at the highest risk, though all areas carry some vulnerability due to variations in conditions that could alter the impact area (i.e., direction and speed of wind, volume of release, etc.). Further, incidents from neighboring counties could also impact the county and participating jurisdictions.

CONCLUSIONS ON HAZARD VULNERABILITY

The following table presents a summary of annualized loss for each hazard in Kemper County. Due to the reporting of hazard damages primarily at the county level, it was difficult to determine an accurate annualized loss estimate for each municipality. Therefore, an annualized loss was determined through the damage reported through historical occurrences at the county level. These values should be used as an additional planning tool or measure risk for determining hazard mitigation strategies throughout the county.

Table C.31: ANNUALIZED LOSS FOR KEMPER COUNTY

Event	Kemper County
Flood-related Hazards	
Flood	$69,130
Erosion	Negligible
Dam and Levee Failure	Negligible
Winter Storm & Freeze	$40,000
Fire-related Hazards	
Drought / Heat Wave	$8,750
Wildfire	Negligible
Geologic Hazards	
Earthquake	Negligible
Landslide	Negligible
Land Subsidence	Negligible
Wind-related Hazards	
Hurricane & Tropical Storm	$87,000
Thunderstorm / High Wind	$28,378
Hail	$19,918
Lightning	$17,857
Tornado	$642,985
Other Hazards	
HAZMAT Incident	Negligible
Pandemic	Negligible

**In this table, the term "Negligible" is used to indicate that no records of dollar losses for the particular hazard were recorded. This could be the case either because there were no events that caused dollar damage or because documentation of that particular type of event is not well kept. Annualized losses were calculated based on the total number of years of reporting and damage totals.*

As noted previously, all existing and future buildings and populations (including critical facilities) are vulnerable to atmospheric hazards including drought / heat wave, hurricane and tropical storm, thunderstorm (wind, hail, lightning), tornado, and winter storm and freeze. In addition, all buildings and populations are vulnerable to all of the man-made and technological hazards identified above. Some buildings may be more vulnerable to these hazards based on locations, construction, and building type. The following table shows the critical facilities vulnerable to additional hazards analyzed in this subsection. The table lists those assets that are determined to be exposed to each of the identified hazards (marked with an "**X**").

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Table 32: AT-RISK CRITICAL FACILITIES IN KEMPER COUNTY

		FLOOD-RELATED					FIRE-RELATED		GEOLOGIC			WIND-RELATED			OTHER						
FACILITY NAME	FACILITY TYPE	Flood – 100 yr	Flood – 500 yr	Erosion	Dam and Levee Failure	Winter Storm and Freeze	Drought / Heat Wave	Wildfire	Earthquake	Landslide	Land Subsidence	Hurricane and Tropical Storm	Thunderstorm (wind, hail,	Tornado	Fixed HAZMAT – 0.5 mile	Fixed HAZMAT – 1.0 mile	Mobile HAZMAT – 0.5 mile (road)	Mobile HAZMAT – 1.0 mile (road)	Mobile HAZMAT – 0.5 mile (rail)	Mobile HAZMAT – 1.0 mile (rail)	Pandemic
KEMPER COUNTY																					
East Kemper Elementary	Educational			X	X	X	X		X	X	X	X	X	X			X	X		X	X
East MS Community College	Educational			X	X	X	X		X	X	X	X	X	X			X	X		X	X
East Kemper Attendance Center	Educational			X	X	X	X	X	X	X	X	X	X	X			X	X			X
KC High School	Educational			X	X	X	X		X	X	X	X	X	X			X	X			X
KC School District	Educational			X	X	X	X		X	X	X	X	X	X	X	X	X	X			X
Stennis Vocation Tech Center	Educational			X	X	X	X	X	X	X	X	X	X	X			X	X			X
West Kemper Elementary	Educational			X	X	X	X		X	X	X	X	X	X	X	X	X	X			X
3 Mile Corner	Fire Station			X	X	X	X		X	X	X	X	X	X							X
CHOCTAW FIRE DEPARTMENT STATION 3	Fire Station			X	X	X	X		X	X	X	X	X	X							X
De Kalb	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
Scooba	Fire Station			X	X	X	X		X	X	X	X	X	X							X
Damascus	Fire Station			X	X	X	X		X	X	X	X	X	X				X			X
Kemper Springs	Fire Station			X	X	X	X		X	X	X	X	X	X							X
Mt Nebo	Fire Station			X	X	X	X		X	X	X	X	X	X							X
New Hope	Fire Station	X		X	X	X	X	X	X	X	X	X	X	X						X	X
Mt. Salem	Fire Station																				
Porterville	Fire Station																				
Preston	Fire Station																				

* As noted previously, these facilities could be at risk to dam failure if located in an inundation area. Data was not available to conduct such an analysis. There was no local knowledge of these facilities being at risk to dam failure. As additional data becomes available, more in-depth analysis will be conducted.

		FLOOD-RELATED					FIRE-RELATED		GEOLOGIC			WIND-RELATED			OTHER						
FACILITY NAME	FACILITY TYPE	Flood – 100 yr	Flood – 500 yr	Erosion	Dam and Levee Failure	Winter Storm and Freeze	Drought / Heat Wave	Wildfire	Earthquake	Landslide	Land Subsidence	Hurricane and Tropical Storm	Thunderstorm (wind, hail,	Tornado	Fixed HAZMAT – 0.5 mile	Fixed HAZMAT – 1.0 mile	Mobile HAZMAT – 0.5 mile (road)	Mobile HAZMAT – 1.0 mile (road)	Mobile HAZMAT – 0.5 mile (rail)	Mobile HAZMAT – 1.0 mile (rail)	Pandemic
KEMPER COUNTY																					
Sinai	Fire Station																				
Spring Hill	Fire Station																				
Kemper Sheriff's Department	Police Station			X	X	X	X	X	X	X	X	X	X	X			X	X			X
Courthouse	Government			X	X	X	X		X	X	X	X	X	X	X	X	X	X			X
DeKalb Town Hall	Government			X	X	X	X		X	X	X	X	X	X	X	X	X	X			X
John C Stennis Memorial Hospital	Medical			X	X	X	X	X	X	X	X	X	X	X			X	X			X
KC Health Dept	Medical			X	X	X	X		X	X	X	X	X	X			X	X			X
Patient Care Logistics Ambulance	Medical			X	X	X	X		X	X	X	X	X	X		X	X	X			X
MS Care Center	Medical			X	X	X	X		X	X	X	X	X	X			X	X			X
Rush Health Clinic	Medical			X	X	X	X		X	X	X	X	X	X			X	X			X

C.4 KEMPER COUNTY CAPABILITY ASSESSMENT

This subsection discusses the capability of Kemper County to implement hazard mitigation activities. More information on the purpose and methodology used to conduct the assessment can be found in Section 7: *Capability Assessment*.

C.4.1 Planning and Regulatory Capability

The following table provides a summary of the relevant local plans, ordinances, and programs already in place or under development for Kemper County. A checkmark (✓) indicates that the given item is currently in place and being implemented. An asterisk (*) indicates that the given item is currently being developed for future implementation. Each of these local plans, ordinances, and programs should be considered available mechanisms for incorporating the requirements of the MEMA District 6 Regional Hazard Mitigation Plan.

Table C.33: RELEVANT PLANS, ORDINANCES, AND PROGRAMS

Planning Tool/Regulatory Tool	Hazard Mitigation Plan	Comprehensive Land Use Plan	Floodplain Management Plan	Open Space Management Plan (Parks & Rec/Greenway Plan	Stormwater Management Plan/Ordinance	Natural Resource Protection Plan	Flood Response Plan	Emergency Operations Plan	Continuity of Operations Plan	Evacuation Plan	Disaster Recovery Plan	Capital Improvements Plan	Economic Development Plan	Historic Preservation Plan	Flood Damage Prevention Ordinance	Zoning Ordinance	Subdivision Ordinance	Unified Development Ordinance	Post-Disaster Redevelopment Ordinance	Building Code	Fire Code	National Flood Insurance Program (NFIP)	NFIP Community Rating System
KEMPER COUNTY	✓							✓					✓		✓							✓	
De Kalb	✓							✓					✓		✓							✓	
Scooba	✓							✓					✓		✓							✓	

A more detailed discussion on the county's planning and regulatory capabilities follows.

EMERGENCY MANAGEMENT

Hazard Mitigation Plan
Kemper County has previously adopted a hazard mitigation plan. The Town of De Kalb and Town of Scooba were also included in this plan.

Emergency Operations Plan
Kemper County maintains an Emergency Operations Plan through its Emergency Management Agency. The Town of De Kalb and Town of Scooba are each covered by this plan.

GENERAL PLANNING

Neither Kemper County, the Town of De Kalb, nor the Town of Scooba have any general planning tools in place.

FLOODPLAIN MANAGEMENT

The following table provides NFIP policy and claim information for each participating jurisdiction in Kemper County.

Table C.34: NFIP POLICY AND CLAIM INFORMATION

Jurisdiction	Date Joined NFIP	Current Effective Map Date	NFIP Policies in Force	Insurance in Force	Closed Claims	Total Payments to Date
KEMPER COUNTY†	10/02/07	09/05/07	4	$428,000	0	$0
De Kalb	11/14/07	09/05/07	0	$0	0	$0
Scooba	10/02/07	09/05/07	1	$59,800	0	$0

†Includes unincorporated areas of county only
Source: NFIP Community Status information as of 9/2/2015; NFIP claims and policy information as of 6/30/2015

Flood Damage Prevention Ordinance
All communities participating in the NFIP are required to adopt a local flood damage prevention ordinance. Kemper County, the Town of De Kalb, and the Town of Scooba all participate in the NFIP and have adopted flood damage prevention ordinances.

C.4.2 Administrative and Technical Capability

The following table provides a summary of the capability assessment results for Kemper County with regard to relevant staff and personnel resources. A checkmark (✓) indicates the presence of a staff member(s) in that jurisdiction with the specified knowledge or skill.

Table C.35: RELEVANT STAFF / PERSONNEL RESOURCES

Staff / Personnel Resource	Planners with knowledge of land development/land management practices	Engineers or professionals trained in construction practices related to buildings and/or infrastructure	Planners or engineers with an understanding of natural and/or human-caused hazards	Emergency Manager	Floodplain Manager	Land Surveyors	Scientists familiar with the hazards of the community	Staff with education or expertise to assess the community's vulnerability to hazards	Personnel skilled in GIS and/or Hazus	Resource development staff or grant writers
KEMPER COUNTY	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
De Kalb				✓	✓		✓	✓		
Scooba				✓	✓		✓	✓		

Credit for having a floodplain manager was given to those jurisdictions that have a flood damage prevention ordinance, and therefore an appointed floodplain administrator, regardless of whether the appointee was dedicated solely to floodplain management. Credit was given for having a scientist familiar with the hazards of the community if a jurisdiction has a Cooperative Extension Service or Soil and Water Conservation Department. Credit was also given for having staff with education or expertise to assess the community's vulnerability to hazards if a staff member from the jurisdiction was a participant on the existing hazard mitigation plan's planning committee.

C.4.3 Fiscal Capability

The following table provides a summary of the results for Kemper County with regard to relevant fiscal resources. A checkmark (✓) indicates that the given fiscal resource is locally available for hazard mitigation purposes (including match funds for state and federal mitigation grant funds) according to the previous county hazard mitigation plan.

Table C.36: RELEVANT FISCAL RESOURCES

Fiscal Tool / Resource	Capital Improvement Programming	Community Development Block Grants (CDBG)	Special Purpose Taxes (or taxing districts)	Gas/Electric Utility Fees	Water/Sewer Fees	Stormwater Utility Fees	Development Impact Fees	General Obligation, Revenue, and/or Special Tax Bonds	Partnering Arrangements or Intergovernmental Agreements	Other: other state and Federal funding sources
KEMPER COUNTY		✓	✓					✓	✓	✓
De Kalb	✓	✓							✓	✓
Scooba	✓	✓								✓

C.4.4 Political Capability

During the months immediately following a disaster, local public opinion in Kemper County is more likely to shift in support of hazard mitigation efforts.

C.4.5 Conclusions on Local Capability

The following table shows the results of the capability assessment using the designed scoring methodology described in Section 7: *Capability Assessment*. The capability score is based solely on the information found in existing hazard mitigation plans and readily available on the jurisdictions' government websites. According to the assessment, the average local capability score for the county and its jurisdictions is 17.3, which falls into the limited capability ranking.

Table C.37: CAPABILITY ASSESSMENT RESULTS

Jurisdiction	Overall Capability Score	Overall Capability Rating
KEMPER COUNTY	21	Moderate
De Kalb	16	Limited
Scooba	15	Limited

C.5 KEMPER COUNTY MITIGATION STRATEGY

This subsection provides the blueprint for Kemper County to follow in order to become less vulnerable to its identified hazards. It is based on general consensus of the Regional Hazard Mitigation Council and the findings and conclusions of the capability assessment and risk assessment. Additional Information can be found in Section 8: *Mitigation Strategy* and Section 9: *Mitigation Action Plan*.

C.5.1 Mitigation Goals

Kemper County developed 10 mitigation goals in coordination with the other participating MEMA District 6 Region jurisdictions. The regional mitigation goals are presented in the following table.

Table C.38: MEMA DISTRICT 6 REGIONAL MITIGATION GOALS

Goal #		Goals & Objectives	Action #
#1	**Goal**	Local government will be able to maintain **effective mitigation programs**.	PEA-1
	Objective	***Implement, monitor, and assess the effectiveness of the mitigation strategy and promote successes.***	
#2	**Goal**	The community will work together to create a **disaster-resistant community**.	PEA-2
	Objective	***Increase coordination through routine collaboration and meetings/exercises.***	
#3	**Goal**	The community will be able to initiate and sustain **emergency response operations.**	PEA-2
	Objective	***County has a contract with NIXLE for alerts and public information, but the system is opt-in. Continue with efforts to get more users signed up for alerts.***	
#4	**Goal**	**Government operations** will not be significantly disrupted by disasters.	
	Objective	**Kemper will pursue a COOP and continue the discussion.**	
#5	**Goal**	The **health, safety, and welfare of the community's residents and visitors** will be protected.	ES-5
	Objective	***Continued public outreach encouraging residents and visitors to sign up for NIXLE.***	
#6	**Goal**	**Local government will support effective hazard mitigation programming** in the community.	
	Objective	***Collaborate with necessary officials on the adoption and understanding of HMP.***	
#7	**Goal**	Residents of the community will have **homes, institutions, and work places that are safer**.	PEA-3
	Objective	***While vulnerabilities will not be eliminated, however diligently warning residents ahead of a disaster (tornado) is critical. County EMA will continue to encourage residents to signup.***	
#8	**Goal**	The **local economy** of the community will be prepared for a disaster.	
	Objective		
#9	**Goal**	**Local infrastructure will not be significantly disrupted by a disaster**.	ES-4
	Objective	***Work to strengthen water utilities collaboration and ability to function through a disaster.***	
#10	**Goal**	All **members of the community will understand the hazards threatening their community.**	PEA-1
	Objective	***Storm Spotter training.***	

To attain the listed mitigation goals, the county has also identified objectives that will assist them in the mitigation action process. Objectives are broader than specific actions, but are measurable, unlike goals. Objectives connect goals with the actual mitigation actions. The action plan describes how the mitigation actions will be implemented, including how those actions will be prioritized, administered and incorporated into the community's existing planning mechanisms.

C.5.2 Mitigation Action Plan

The mitigation actions proposed by Kemper County, De Kalb, and Scooba are listed in the following individual Mitigation Action Plans.

Kemper County Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate new/existing construction and infrastructure in heavily wooded areas.	Wildfire	Moderate	Board of Supervisors	FEMA, MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-2	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Board of Supervisors	FEMA, MEMA, Local funds	2025	Ongoing. The International Building Code has not been adopted. The county will review this code and consider adoption, so this action will remain in the
P-3	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	County Emergency Management	FEMA, MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
P-4	Collect additional data on the number of buildings located in flood-prone areas and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	County Emergency Management	FEMA, MEMA, Local funds	2025	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Structural Projects							
SP-1							
Emergency Services							
ES-1	Installation of a NOAA weather repeater in Kemper County. Lack of coverage, NOAA will not install repeater.	Tornado, High Wind	High	Board of Supervisors, County Emergency Management	FEMA, MEMA, Homeland Security, Local funds	2025	A NOAA weather repeater has not been installed in the county. The county is still interested in pursuing this project, so it will remain in the plan.
ES-2	Purchase of generator trailers to operate the water systems in the Town of Scooba and the Town of De Kalb during emergency situations. De Kalb has generator at treatment plant now, trying to obtain more.	Tornado, High Wind	High	County Emergency Management	FEMA, MEMA, Homeland Security, Local funds	2025	Generator trailers have not been purchased, but the county would like to purchase these trailers so it will remain an action. Deferred
ES-3	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes. NIXLE	Hurricane	High	County Emergency Management	FEMA, MEMA, Local funds	2018	Completed
ES-4	Upgrade E-911 system to Phase II wireless compliance. **Contracted to Neshoba County**	All	High	County Emergency Management	FEMA, MEMA, Homeland Security, AFGP, Local funds	2014	Completed
ES-5	Purchase 3 sets of "Jaws of Life" extraction equipment for VFD's and Emergency Response Units. **Now have 7 sets.**	All	High	County Emergency Management	FEMA, MEMA, Homeland Security, AFGP, Local funds	2019	Completed
ES-6	Purchase a generator to provide adequate backup power for the wastewater lift station serving the regional correctional facility. Currently looking for funding sources, remains a priority.	All	High	Board of Supervisors, Sheriff's Department	FEMA, MEMA, Local funds	2025	The county has not purchased backup generators for the lift station, but this is still a priority so it will remain an action going forward.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
ES-7	Purchase of generators for the County's volunteer fire departments.	Tornado, High Wind	Moderate	County Fire Service	FEMA, MEMA, Homeland Security, AFGP, Local funds	2020	Completed
ES-8	Construction of two additional fire stations for the rural volunteer fire departments. **One station completed, decided against second.**	Wildfire	Moderate	County Emergency Management, Volunteer Fire	FEMA, MEMA, CDBG, Local funds	2020	Completed
ES-9	Upgrade county radio system from VHF analog to State's 800mhz digital trunked system.	All	High	County Emergency Management	Local	2022	New Action. Waiting on procurement ok Wireless Communications Commission.
Public Education and Awareness							
PEA-1	Purchase of materials to educate the public on being prepared for hazards, including tornadoes, severe weather, flooding, fire, etc. NIXLE is ongoing.	All	Low	County Emergency Management	FEMA, MEMA, Homeland Security, AFGP, Local funds	2025	Ongoing. The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.
PEA-2	Encourage the construction of safe rooms and tornado shelters. Continues as a mitigation effort.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2025	Ongoing. Safe room construction has been encouraged throughout the county, especially with new construction, but the county will continue to seek funding to install additional safe rooms and shelters.
PEA-3	Install commercial grade weather station	All weather related hazards	High	County Emergency Management	Local, MEMA, FEMA	2025	Ongoing. Still seeking funding sources.

PEA-4	County Sheriff recently contracted with NIXLE for alerts, EMA would like to encourage more users to opt-in.	All	High	County Emergency Management		2025	New project. County currently has 2,000 users who have signed up, would like to increase.

Town of De Kalb Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate new/existing construction and infrastructure in heavily wooded areas.	Wildfire	Moderate	Volunteer Fire Department, Police Department	FEMA, MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-2	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Volunteer Fire Department, Police Department	FEMA, MEMA, Local funds	2025	The International Building Code has been adopted. The county will need to review this code over the next 5 years, so this action will remain in the plan.
P-3	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Volunteer Fire Department, Police Department	FEMA, MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1	Dredging of approximately 1.2 miles of Snoody Creek and the installation of rip rap to alleviate flooding near local preschool.	Flood	High	Public Works	FEMA, MEMA, CDBG, Local funds	2025	Dredging of Snoody Creek has not taken place and rip rap has not been installed. This action still needs to be implemented going forward.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
SP-2	Improvements to the storm drain system.	Flood	High	Public Works	FEMA, MEMA, CDBG, Local funds	2025	Ongoing. The town has made some improvements to the storm drain, but additional modifications are necessary. Therefore the town will continue to pursue this as an action.
Emergency Services							
ES-1	Purchase of generators to provide adequate backup power for the Town's wastewater facilities.	Tornado, High Wind	Low	Public Works	FEMA, MEMA, Homeland Security, Local funds	1-2 years	The town has not purchased generators to backup the wastewater facilities, but this is a need and the town will continue to seek funding going forward.
ES-2	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes. **NIXLE**	Hurricane	High	Volunteer Fire Department, Police Department	FEMA, MEMA, Local funds	2017	Completed
ES-3	Installing of fire hydrants.	Wildfire	High	Public Works, Volunteer Fire Department	FEMA, MEMA, CDBG, Local funds	2024	The town has installed some fire hydrants, but more in rural areas would be useful so this action will remain in place. Hydrants have been installed, they need mapped.
Public Education and Awareness							

PEA-1	Purchase of materials to educate the public on being prepared for hazards, including tornadoes, severe weather, flooding, fire, etc.	All	Low	Volunteer Fire Department, Police Department	FEMA, MEMA, Homeland Security, AFGP, Local funds	2025	The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
PEA-2	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2020	Ongoing. Safe room has been encouraged throughout the county, especially with new construction, but the county will continue to seek funding to install additional safe rooms and shelters.

Town of Scooba Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Clearing of Little Scooba Creek for approximately 2 miles.	Flood	High	Public Works	FEMA/MEMA, CDBG, Local funds	2025	Clearing of the Little Scooba Creek has taken place to some degree, but the town needs to continue to address this issue to reduce flooding going forward.
P-2	Work with ECPDD to develop a model ordinance to regulate new/existing construction and infrastructure in heavily wooded areas.	Wildfire	Moderate	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	The International Building Code has been adopted. The county will need to review this code over the next 5 years, so this action will remain in the plan.
P-4	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
P-5	Collect additional data on the number of buildings located in flood-prone areas and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1	Improvements to storm drain system.	Flood	High	Public Works	FEMA/MEMA, CDBG, Local funds	2025	Ongoing. The town has made some improvements to the storm drain, but additional modifications are necessary. Therefore, the town will continue to pursue this as an action.
Emergency Services							
ES-1	Purchase of generators to provide adequate backup power for the Town's water and wastewater facilities.	Tornado, High Wind	High	Public Works	FEMA/MEMA, Homeland Security, Local funds	2025	Ongoing. The town has not purchased generators to backup the wastewater facilities, but this is a need and the town will continue to seek funding going forward.
ES-2	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes. **NIXLE**	Hurricane	High	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2018	Completed
ES-3	Installing of fire hydrants.	Wildfire	High	Public Works, Volunteer Fire Department	FEMA/MEMA, CDBG, Local funds	2025	The town has installed some fire hydrants, but more in rural areas would be useful so this action will remain in place. While some hydrants are functional, many need repaired.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Public Education and Awareness							
PEA-1	Purchase of materials to educate the public on being prepared for hazards, including tornadoes, severe weather, flooding, fire, etc.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.
PEA-2	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Safe room construction has been encouraged throughout the county, especially with new construction, but the county will continue to seek funding to install additional safe rooms and shelters.

ANNEX D
LAUDERDALE COUNTY

This annex includes jurisdiction-specific information for Lauderdale County and its participating municipalities. It consists of the following five subsections:

D.1 LAUDERDALE COUNTY COMMUNITY PROFILE

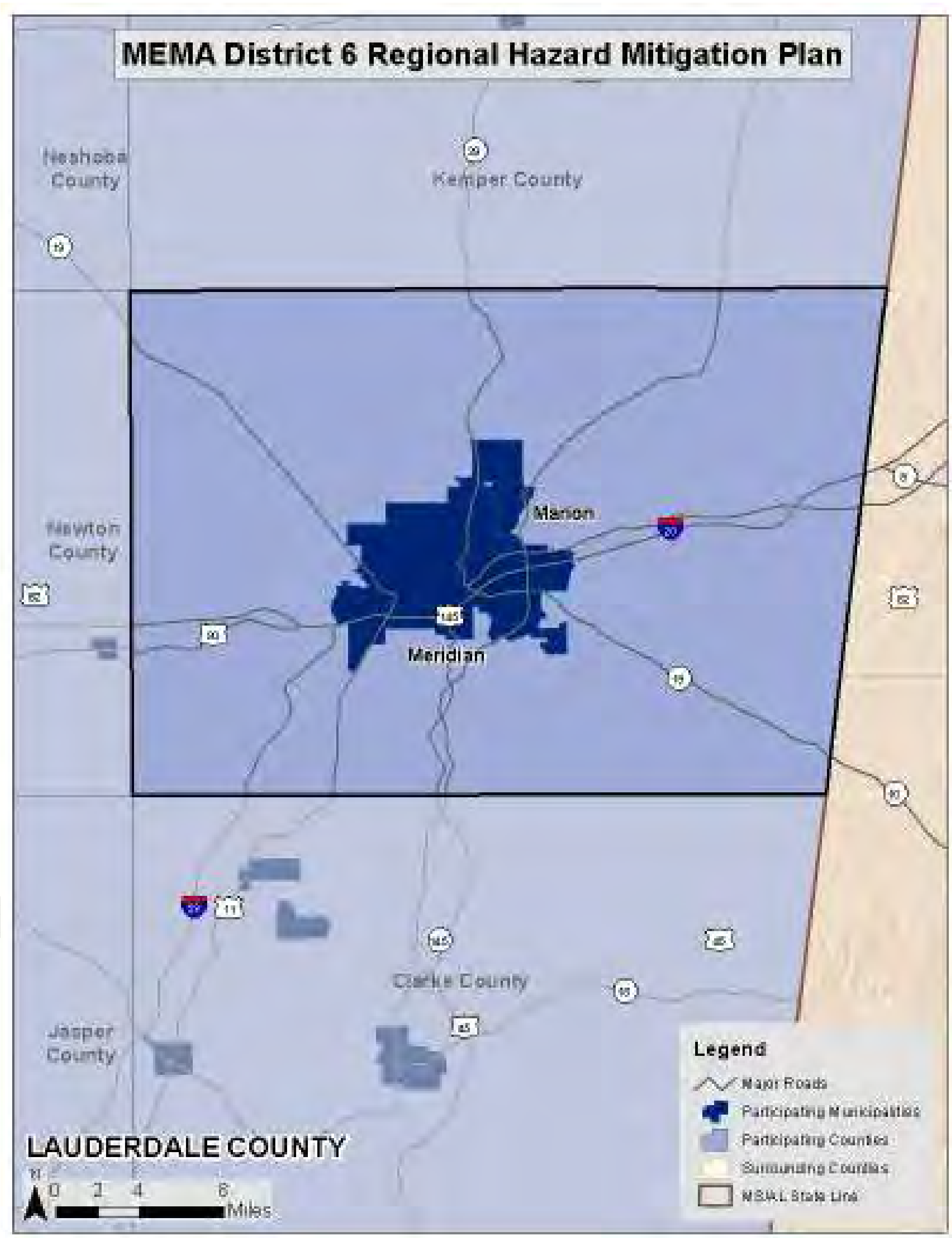
D.1.1 Geography and the Environment

Lauderdale County is located in eastern Mississippi. It comprises one town and one city, Town of Marion and City of Meridian, as well as many small unincorporated communities. An orientation map is provided as **Figure D.1**.

The county provides cultural and historic attractions along with outdoor, art, music, and recreational opportunities. The total area of the county is 715 square miles, 11 square miles of which is water area.

Summer temperatures in the county range from highs of about 90 degrees Fahrenheit (˚F) to lows in the upper 60s. Winter temperatures range from highs in the mid-50s to lows around 30˚F. Average annual rainfall is approximately 56 inches, with the wettest months being November, December, and May.

Figure D.1: LAUDERDALE COUNTY ORIENTATION MAP



D.1.2 Population and Demographics

According to the 2019 American Community Survey, Lauderdale County has a population of 74,125 people. The county has seen a slight decrease in population between 2000 and 2019, however Marion has experienced a substantial rate of growth. The population density is 111 people per square mile. Population counts from the US Census Bureau for 2000, 2010, and 2019 for the county and participating jurisdictions are presented in **Table D.1**.

Table D.1: POPULATION COUNTS FOR LAUDERDALE COUNTY

Jurisdiction	2000 Census Population	2010 Census Population	2019 Census Population	% Change 2000-2010
Lauderdale County	**78,161**	**80,261**	**74,125**	**-5.16%**
Marion	1,305	1,479	1,683	28.96%
Meridian	39,968	41,148	37,848	-5.30%

Source: United States Census Bureau – American Community Survey

Based on the 2019 American Community Survey, the median age of residents of Lauderdale County is 37.5 years. The racial characteristics of the county are presented in **Table D.2**. Whites make up the majority of the population in the county, accounting for 54.5 percent of the population.

Table D.2: DEMOGRAPHICS OF LAUDERDALE COUNTY

Jurisdiction	White, Percent (2019)	Black or African American, Percent (2019)	American Indian or Alaska Native, Percent (2019)	Asian, Percent (2019)	Native Hawaiian or Other Pacific Islander, Percent (2019)	Other Race, Percent (2019)	Two or More Races, percent (2019)	Persons of Hispanic Origin, Percent (2019)*
Lauderdale County	**54.5%**	**42.5%**	**0.2%**	**0.8%**	**0.0%**	**0.7%**	**1.3%**	**2.1%**
Marion	41.4%	56.2%	0.0%	0.0%	0.0%	1.6%	0.7%	1.7%
Meridian	35.0%	62.9%	0.1%	0.8%	0.0%	0.6%	0.7%	2.4%

*Hispanics may be of any race, so also are included in applicable race categories
Source: United States Census Bureau – American Community Survey 2019

D.1.3 Housing

According to the 2019 American Community Survey, there are 35,297 housing units in Lauderdale County, the majority of which are single family homes or mobile homes. Housing information for the county and two municipalities is presented in **Table D.3**. As shown in the table, both municipalities have small percentages of seasonal housing units compared to the unincorporated county.

Table D.3: HOUSING CHARACTERISTICS OF LAUDERDALE COUNTY

Jurisdiction	Housing Units (2010)	Housing Units (2019)	Median Home Value (2019)
Lauderdale County	**34,698**	**35,297**	**$96,300**
Marion	700	772	$161,800
Meridian	18,591	19,130	$83,300

Source: United States Census Bureau - American Community Survey

D.1.4 Infrastructure

TRANSPORTATION

In Lauderdale County, contains multiple major transportation routes providing access both north-south and east-west. Interstate 20 runs east-west through Lauderdale County connecting multiple towns to and from Meridian, Jackson, and into Alabama. Interstate 59 runs north to south, passing through Lauderdale County, allowing transportation to and from the City of Meridian to multiple towns including those in southern Mississippi, such as Hattiesburg. U.S. Highway 11 runs roughly north-south through the county. U.S. Highway 45 is a north-south highway from the Gulf of Mexico through Lauderdale County. U.S. Highway 80 connects towns east-west throughout the county and into Alabama.

Naval Air Station Meridian is a military airport northeast of the City of Meridian in Lauderdale County. It is one of the U.S. Navy's two jet strike pilot training facilities which supports aviation and technical training. The closest major airport used by residents located in nearby counties includes Jackson-Evers International Airport, which offers international and domestic flights to a number of locations around the world.

Multiple rail lines converge within Lauderdale County, including Norfolk Southern, Meridian & Bigbee Railroad, and Amtrak commercial rail line.

UTILITIES

Electrical power in Lauderdale County is provided by the East Mississippi Electric Power Association and Mississippi Power southern Company.

Water and sewer service is provided to residents by the various local agencies such as the City of Meridian, Collinsville Water Association, Long Creek Water Association, Northwest Kemper Water Association, Russell Utilities, Tallahalla Water Association, Toomsuba Water System, along with various others.

COMMUNITY FACILITIES

There are a number of buildings and community facilities located throughout Lauderdale County. According to the data collected for the vulnerability assessment (Section 6.4.1), there are 34 fire stations, 8 police stations, and 34 public schools located within the county.

Multiple hospital facilities are located within Lauderdale County. Anderson Regional Medical Center is a 400-bed facility with services including long tern acute care, wound care, inpatient rehabilitation, pain management, and obstetric services. Alliance Health Center 154-bed acute car psychiatric and substance abuse treatments hospital. East Mississippi State Hospital has facilities catering to rehabilitation requirements and nursing home needs. Rush Foundation Hospital in City of Meridian is a 215-bed community based acute care medical center.

Recreational opportunities in Lauderdale County include outdoor activities such as hunting, fishing, and golfing as well as local and regional entertainment. The county contains hunting and fishing opportunities, multiple local golf courses, two theaters, multiple museums, and various sport complexes. Bonita Lake and Dunn's Falls showcase the natural features within the county.

D.1.5 Land Use

Many areas of Lauderdale County are undeveloped or sparsely developed. There are several small incorporated municipalities located throughout the county, with a few larger hubs interspersed. These areas are where the county's population is generally concentrated. The incorporated areas are also where many of the businesses, commercial uses, and institutional uses are located. Land uses in the balance of the study area generally consist of rural residential development, agricultural uses, and recreational areas, although there are some notable exceptions in the larger municipalities. Local land use and associated regulations are further discussed in *Section 7: Capability Assessment.*

East Central Planning and Development District assists with Lauderdale County with planning and development to promote economic growth and job opportunities. The City of Meridian has a Community Development Department Planning Division involved in immediate and long-range planning issues along with assisting downtown, historic, and tree commission initiatives.

D.1.6 Employment and Industry

According to U.S. Census Bureau's American Community Survey (ACS), in 2019, Lauderdale County had an average annual employment of 33,858 workers, and according to Mississippi Department of Employment Security as of May 2021 had an unemployment rate of 5.9 percent. In 2019, the Educational Services, Health Care, and Social Assistance industry employed 30.3 percent of the workforce. Retail trade was the second largest industry, employing 11.5 percent of workers, and Manufacturing followed closely behind (9.2%). The median household income in Lauderdale County was $61,186 compared to $45,081 in the state of Mississippi.

D.2 LAUDERDALE COUNTY RISK ASSESSMENT

This subsection includes hazard profiles for each of the significant hazards identified in Section 4: *Hazard Identification* as they pertain to Lauderdale County. Each hazard profile includes a description of the hazard's location and extent, notable historical occurrences, and the probability of future occurrences. Additional information can be found in Section 5: *Hazard Profiles*.

D.2.1 Flood

LOCATION AND SPATIAL EXTENT

There are areas in Lauderdale County that are susceptible to flood events. Special flood hazard areas in the county were mapped using Geographic Information System (GIS) and FEMA Digital Flood Insurance Rate Maps (DFIRM). This includes Zone A (1-percent annual chance floodplain), Zone AE (1-percent annual chance floodplain with elevation), and Zone X500 (0.2-percent annual chance floodplain). According to GIS analysis, of the 710 square miles that make up Lauderdale County, there are 114.3 square miles of land in zones A and AE (1-percent annual chance floodplain/100-year floodplain) and 1.8 square miles of land in zone X500 (0.2-percent annual chance floodplain/500-year floodplain).[1]

[1] The county-level DFIRM data used for Lauderdale County were updated in 2013.

These flood zone values account for 16.4 percent of the total land area in Lauderdale County. It is important to note that while FEMA digital flood data is recognized as best available data for planning purposes, it does not always reflect the most accurate and up-to-date flood risk. Flooding and flood-related losses often do occur outside of delineated special flood hazard areas. **Figure D.2** illustrates the location and extent of currently mapped special flood hazard areas for Lauderdale County based on best available FEMA Digital Flood Insurance Rate Map (DFIRM) data.

Significant flooding occurs in the low-lying areas along Okatibbee Creek and its tributaries and along Sowashee Creek and its tributaries. Parts of the Sowashee Creek floodplain have been filled in and developed in recent years, leading to increased flooding potential along some parts of the stream. Floods can occur in the City of Meridian any time during the year, but the most frequent flooding occurs during late summer or early fall caused by brief intense storms.[2]

[2] FEMA. Flood Insurance Study. May 2013

Figure D.2: SPECIAL FLOOD HAZARD AREAS IN LAUDERDALE COUNTY

Source: Federal Emergency Management Agency

HISTORICAL OCCURRENCES

Floods were at least partially responsible for six disaster declarations in Lauderdale County in 1973, 1974, 1979, 1990, 2003, and 2017. Information from the National Centers for Environmental Information was used to ascertain additional historical flood events. The National Centers for Environmental Information reported a total of 74 events in Lauderdale County since 1997. A summary of these events is presented in **Table D.4**. These events accounted for almost $55.6 million in property damage in the county. Specific information on flood events, including date, type of flooding, and deaths and injuries, can be found in **Table D.5**.

Table D.4: SUMMARY OF FLOOD OCCURRENCES IN LAUDERDALE COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Marion	2	0/0	$12,000
Meridian	38	0/0	$53,862,000
Unincorporated Area	34	0/0	$1,730,000
LAUDERDALE COUNTY TOTAL	**74**	**0/0**	**$55,604,000**

Source: National Centers for Environmental Information

Table D.5: HISTORICAL FLOOD EVENTS IN LAUDERDALE COUNTY

April 7, 2003 - Several rounds of thunderstorms dumped 5 to 10 inches of rain across most of Lauderdale County. Widespread street flooding occurred with numerous county roads flooded and even washed out. To put the entire event into perspective, areas just to the N of Interstate 20 and extending W to E across the entire state, experienced a 125-year rainfall event. Rainfall totals ranged from 7 to 12 inches which all fell in about 18 hours. Due to the large amounts of rain, river flooding quickly became a major problem. The Pelahatchie Creek experienced a 100-year flood. The Chunky River, at Chunky, set a new record. This river actually flooded a portion of Interstate 20 which had to be closed for a few hours. The Chickasawhay River at Enterprise also set a record. In addition to all the flash flooding, the river flooding caused major damage to homes and flooded numerous roads. More than $50 Million in damages were reported from this single flood event alone.

HISTORICAL SUMMARY OF INSURED FLOOD LOSSES

According to FEMA flood insurance policy records as of June 2015, there have been 160 flood losses reported in Lauderdale County through the National Flood Insurance Program (NFIP) since 1978, totaling over $2.8 million in claims payments. A summary of these figures for the county is provided in **Table D.6**. It should be emphasized that these numbers include only those losses to structures that were insured through the NFIP policies, and for losses in which claims were sought and received. It is likely that many additional instances of flood loss in Lauderdale County were either uninsured, denied claims payment, or not reported.

Table D.6: SUMMARY OF INSURED FLOOD LOSSES IN LAUDERDALE COUNTY

Location	Flood Losses	Claims Payments
Marion	3	$61,963
Meridian	106	$1,667,768
Unincorporated Area	51	$1,097,407
LAUDERDALE COUNTY TOTAL	**160**	**$2,827,138**

Source: Federal Emergency Management Agency, National Flood Insurance Program. NFIP data was not made available for this plan update, information listed above is current as of 2015.

REPETITIVE LOSS PROPERTIES

According to the Mississippi Emergency Management Agency, there are 27 non-mitigated repetitive loss properties located in Lauderdale County, which accounted for 73 losses and more than $1.7 million in claims payments under the NFIP. The average claim amount for these properties is $23,731. Of the 27 properties, 20 are single family and 7 are non-residential. Without mitigation, these properties will likely continue to experience flood losses. **Table D.7** presents detailed information on repetitive loss properties and NFIP claims and policies for Lauderdale County. Repetitive Loss Properties data was not made available during this update, the following information is current as of 2015.

Table D.7: REPETITIVE LOSS PROPERTIES IN LAUDERDALE COUNTY

Location	Number of Properties	Types of Properties	Number of Losses	Building Payments	Content Payments	Total Payments	Average Payment
Marion	0	--	0	$0	$0	$0	$0
Meridian	10	5 single family; 5 non-residential	34	$587,284	$195,561	$782,844	$23,025
Unincorporated Area	17	15 single family; 2 non-residential	39	$677,990	$271,514	$949,504	$24,346
LAUDERDALE COUNTY TOTAL	**27**		**73**	**$1,265,274**	**$467,075**	**$1,732,349**	**$23,731**

Source: National Flood Insurance Program

PROBABILITY OF FUTURE OCCURRENCES

Flood events will remain a threat in Lauderdale County, and the probability of future occurrences will remain likely (between 10 and 100 percent annual probability). The participating jurisdictions and unincorporated areas have risk to flooding, though not all areas will experience flood. The probability of future flood events based on magnitude and according to best available data is illustrated in the figures above**,** which indicates those areas susceptible to the 1-percent annual chance flood (100-year floodplain) and the 0.2-percent annual chance flood (500-year floodplain).

It can be inferred from the floodplain location maps, previous occurrences, and repetitive loss properties that risk varies throughout the county. For example, the City of Meridian has more floodplain and thus a higher risk of flood than the Town of Marion. Flood is not the greatest hazard of concern but will continue to occur and cause damage. Therefore, mitigation actions may be warranted, particularly for repetitive loss properties.

D.2.2 Erosion

LOCATION AND SPATIAL EXTENT

Erosion in Lauderdale County is typically caused by flash flooding events. Unlike coastal areas, areas of concern for erosion in Lauderdale County are primarily rivers and streams. Generally, vegetation helps to prevent erosion in the area, and it is not an extreme threat to the county. No areas of concern were reported by the hazard mitigation council.

HISTORICAL OCCURRENCES

Several sources were vetted to identify areas of erosion in Lauderdale County. This includes searching local newspapers, interviewing local officials, and reviewing previous hazard mitigation plans. No historical erosion occurrences were found in these sources.

PROBABILITY OF FUTURE OCCURRENCES

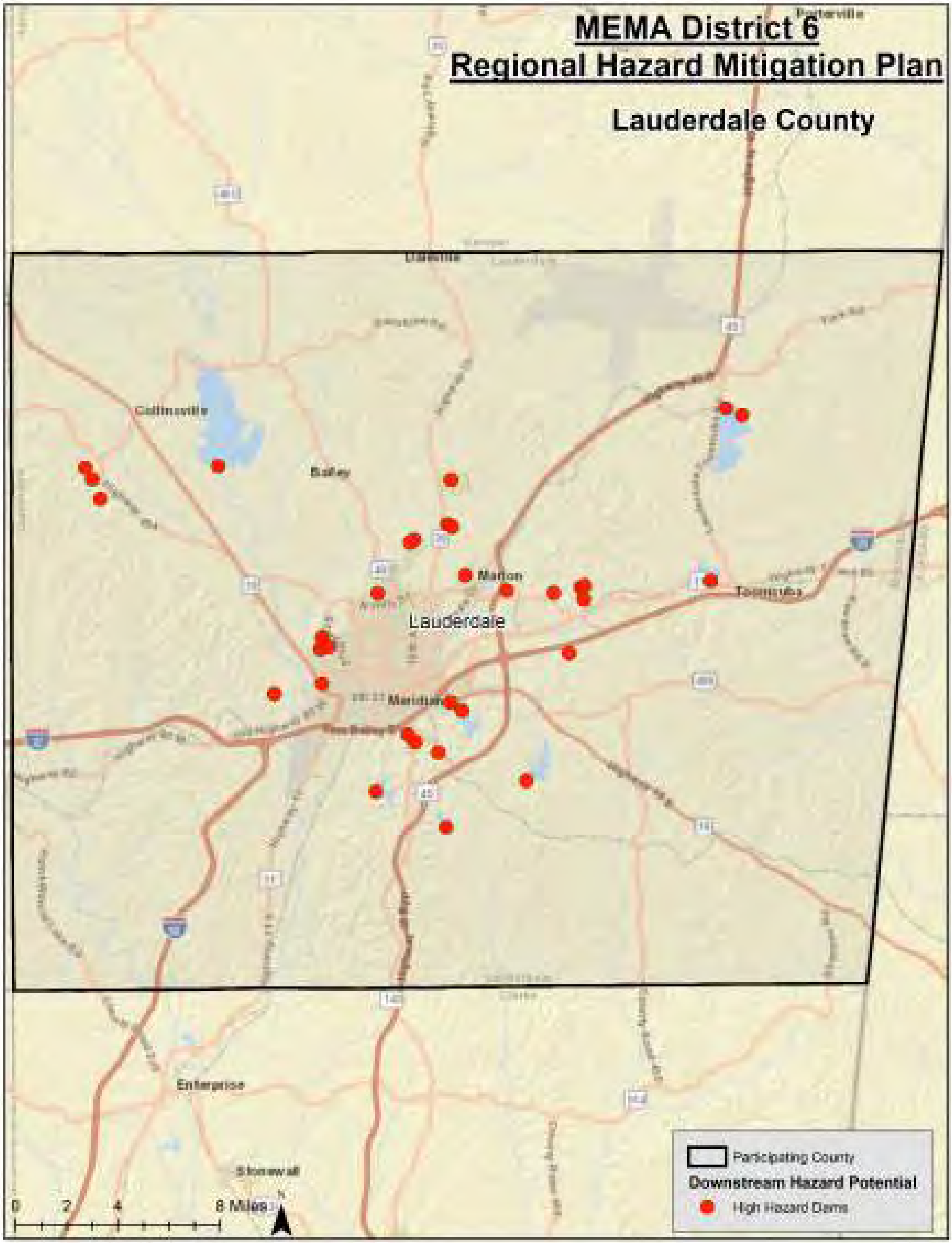
Erosion remains a natural, dynamic, and continuous process for Lauderdale County, and it will continue to occur. The annual probability level assigned for erosion is possible (between 1 and 10 percent annually).

D.2.3 Dam and Levee Failure

LOCATION AND SPATIAL EXTENT

According to the U.S. Army Corps of Engineers National Inventory of Dams, there are 33 high hazard dams in Lauderdale County. **Figure D.3** shows the location of each of these high hazard dams and **Table D.8** lists them by name.

Figure D.3: LAUDERDALE COUNTY HIGH HAZARD DAM LOCATIONS



Source: U.S. Army Corps of Engineers – National Inventory of Dams

Table D.8: LAUDERDALE COUNTY HIGH HAZARD DAMS

Dam Name	Hazard Potential
Lauderdale County	
BONITA LAKE DAM NUMBER 1	High
BONITA NUMBER 2 DAM	High
BOUNDS LAKE DAM	High
BRIARWOOD COUNTRY CLUB LAKE DAM	High
C W DOWNER POND DAM	High
CRESCENT LAKE DAM	High
DALEWOOD SHORES LAKE DAM	High
EAST MISSISSIPPI STATE HOSPITAL LAKE DAM	High
FAIR OAKS LAKE DAM	High
FAULKNER LAKE DAM	High
LAKE DRUID DAM	High
LAKE MAILANDE	High
LAKE TOM BAILEY	High
LAKEMONT LAKE DAM	High
LAKEWOOD LAKE DAM	High
LONG CREEK RESERVOIR DAM	High
MAGNOLIA LAKE ESTATES DAM	High
MEMORIAL PARK CEMETERY POND DAM	High
MIRROR LAKE DAM	High
MS05625 LAKE DAM	High
MS05765 LAKE DAM	High
MS05766 LAKE DAM	High
MS05901 LAKE DAM	High
N D BROOKSHIRE POND	High
OKATIBBEE DAM	High
RAINBOW LAKES # 1 DAM	High
RAINBOW LAKES # 4 DAM	High
RAINBOW LAKES # 5 DAM	High
SCHAMBERVILLE NUMBER 1 DAM	High
SCHAMBERVILLE NUMBER 2 DAM	High
SOWASHEE CREEK WS STR 11 DAM	High
SOWASHEE CREEK WS STR 8 DAM	High

Source: U.S. Army Corps of Engineers – National Inventory of Dams

HISTORICAL OCCURRENCES

According to the Mississippi State Hazard Mitigation Plan, there have been seven dam failures reported in Lauderdale County. Although no damage was reported with these events, several breach scenarios in the county could be catastrophic.

Table D.9 below provides a brief description of the seven reported dam failures.

Table D.9: LAUDERDALE COUNTY DAM FAILURES (1982-2021)

Date	County	Structure Name	Cause of Failure
March 1984	Lauderdale	Dalewood Shores	Minor Breach
May 1995	Lauderdale	Vise Lake Dam	Sand boils – problem with longevity of dam
January 2002	Lauderdale	John Kasper Lake	Excessive seepage leading to dam breach
March 2002	Lauderdale	Lake Tom Bailey	Deterioration for primary concrete spillway
August 2002	Lauderdale	State Hospital Lake	Poor overall condition
April 2003	Lauderdale	Lake Evelyn	Piping
May 2003	Lauderdale	Wild Duck Lake	Piping
March 2021	Lauderdale	Bonita Lake Dam #2	40' breach in the dam causing flooding along Highway 19

Source: Mississippi Department of Environmental Quality

PROBABILITY OF FUTURE OCCURRENCES

Given the current dam inventory and historic data, a dam breach is possible (between 1 and 10 percent annual probability) in the future. However, as has been demonstrated in the past, regular monitoring is necessary to prevent these events.

D.2.4 Winter Storm and Freeze

LOCATION AND SPATIAL EXTENT

Nearly the entire continental United States is susceptible to winter storm and freeze events. Some ice and winter storms may be large enough to affect several states, while others might affect limited, localized areas. The degree of exposure typically depends on the normal expected severity of local winter weather. Lauderdale County is not accustomed to severe winter weather conditions and rarely receives severe winter weather, even during the winter months. Events tend to be mild in nature; however, even relatively small accumulations of snow, ice, or other wintery precipitation can lead to losses and damage due to the fact that these events are not commonplace. Given the atmospheric nature of the hazard, the entire county has uniform exposure to a winter storm.

HISTORICAL OCCURRENCES

According to the National Centers for Environmental Information, there have been a total of 13 recorded winter storm events in Lauderdale County since 1996 (**Table D.10**). These events resulted in almost $2.4 million in damages. Detailed information on the recorded winter storm events can be found in **Table D.11**.

Table D.10: SUMMARY OF WINTER STORM EVENTS IN LAUDERDALE COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Lauderdale County	15	0/0	$2,472,521

Source: National Centers for Environmental Information

Table D.11: HISTORICAL WINTER STORM IMPACTS IN LAUDERDALE COUNTY

Location	Date	Type	Deaths / Injuries	Property Damage*
Marion				
None Reported	--	--	--	--
Meridian				
None Reported	--	--	--	--
Unincorporated Area				
LAUDERDALE (ZONE)	2/1/1996	Ice Storm	0/0	$152,096
LAUDERDALE (ZONE)	12/14/1997	Heavy Snow	0/0	$0
LAUDERDALE (ZONE)	12/23/1998	Ice Storm	0/0	$21,961
LAUDERDALE (ZONE)	1/27/2000	Ice Storm	0/0	$20,787
LAUDERDALE (ZONE)	1/19/2008	Heavy Snow	0/0	$0
LAUDERDALE (ZONE)	3/1/2009	Winter Weather	0/0	$0
LAUDERDALE (ZONE)	1/7/2010	Winter Weather	0/0	$0
LAUDERDALE (ZONE)	2/11/2010	Heavy Snow	0/0	$984,950
LAUDERDALE (ZONE)	1/9/2011	Ice Storm	0/0	$31,827
LAUDERDALE (ZONE)	2/3/2011	Ice Storm	0/0	$848,721
LAUDERDALE (ZONE)	2/9/2011	Heavy Snow	0/0	$212,180
LAUDERDALE (ZONE)	1/16/2013	Heavy Snow	0/0	$0
LAUDERDALE (ZONE)	1/28/2014	Heavy Snow	0/0	$0
LAUDERDALE (ZONE)	12/07/2017	Heavy Snow	0/0	$100,000
LAUDERDALE (ZONE)	02/17/2021	Ice Storm	0/0	$100,000

Source: National Centers for Environmental Information

There have been several severe winter weather events in Lauderdale County. The text below describes two of the major events and associated impacts on the county. Similar impacts can be expected with severe winter weather.

December 1998

Central Mississippi was hit by a crippling ice storm. Up to 2 inches of ice accumulated on power lines and much of the region experienced long power outages, nearly seven days in some cases. The ice caused numerous power outages and brought down many trees and power lines. Christmas travel was severely hampered for several days with motorists stranded at airports, bus stations, and truck stops. Travel did not return to normal until after Christmas in some locations.

January 2008 Winter Storm

This storm produced heavy snow across the region, with an average of three to four inches of snow. Some heavier amounts, between four to five inches, also fell in isolated areas. At the height of the snow, temperatures fell to near freezing, and accumulations occurred on roadways resulting in a number of traffic accidents. Additionally, some power outages occurred in the heaviest snow band due to the weight of wet snow on limbs and lines.

Winter storms throughout the planning area have several negative externalities including hypothermia, cost of snow and debris cleanup, business and government service interruption, traffic accidents, and power outages. Furthermore, citizens may resort to using inappropriate heating devices that could to fire or an accumulation of toxic fumes.

PROBABILITY OF FUTURE OCCURRENCES

Winter storm events will continue to occur in Lauderdale County. According to historical information, the annual probability is likely (between 10 and 100 percent).

FIRE-RELATED HAZARDS

D.2.5 Drought / Heat Wave

Drought

Drought typically covers a large area and cannot be confined to any geographic or political boundaries. Furthermore, it is assumed that Lauderdale County would be uniformly exposed to drought, making the spatial extent potentially widespread. It is also notable that drought conditions typically do not cause significant damage to the built environment but may exacerbate wildfire conditions.

Heat Wave

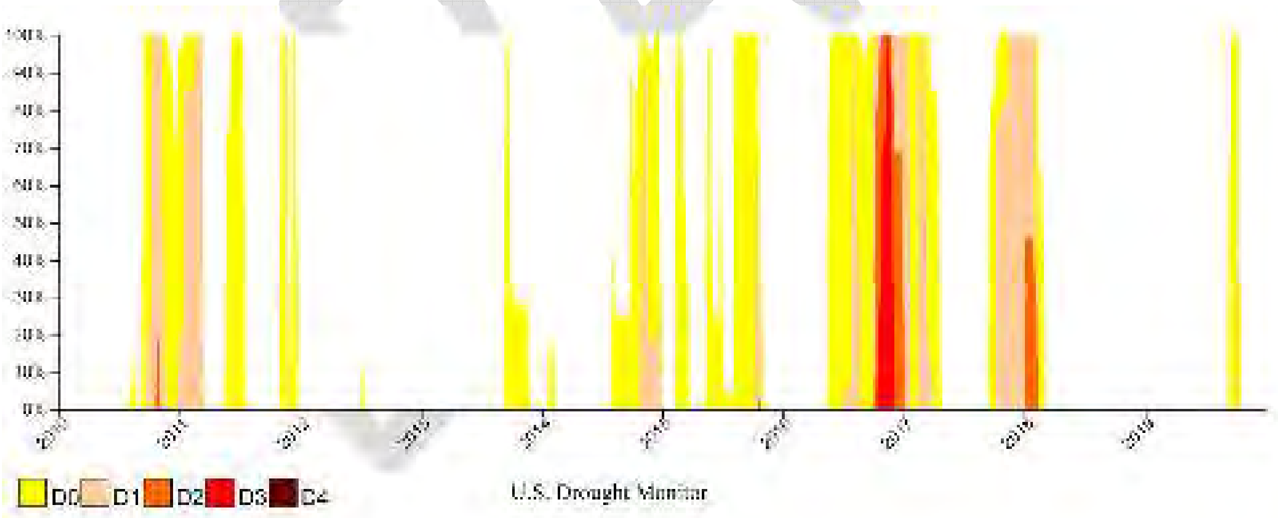
Heat waves typically impact a large area and cannot be confined to any geographic or political boundaries.

HISTORICAL OCCURRENCES

Drought

Table D.12 shows the most severe drought classification for each year, according to U.S. Drought Monitor classifications. It should be noted that the U.S. Drought Monitor also estimates what percentage of the county is in each classification of drought severity. For example, the most severe classification reported may be exceptional but a majority of the county may actually be in a less severe condition.

Table D.12: HISTORICAL DROUGHT OCCURRENCES IN LAUDERDALE COUNTY



Source: United States Drought Monitor

Some additional anecdotal information was provided from the National Centers for Environmental Information on droughts in Lauderdale County.

Summer 2006 – During a four-and-a-half-month period, from June to the middle of October, abnormally dry conditions prevailed across most of Jackson, MS County Warning Area (CWA). The drought had a significant impact on the agricultural industry. Non-irrigated crops were destroyed and all other sustainable crops produced a below normal yield. Catfish ponds were drawn down to severe levels and required water to be pumped back into the fish ponds. The cattle industry suffered due to low watering ponds and lack of sufficient grasslands for grazing and hay production. Water supply problems were encountered by those cities who obtained water from local rivers for drinking purposes due to the low river flows. Fire threat was significant causing the issuance of burn bans across the CWA.

Summer 2007 – By the middle of April, drought conditions were being experienced across a large portion of Eastern and some of Central Mississippi. During the month of May, the drought worsened and expanded. In June, the drought peaked across the region. Although drought conditions continued throughout July and August, conditions were less severe than earlier in the summer. As a result of these conditions, area farmers and crop yields were affected.

October 2010 – Very dry conditions continued across central Mississippi during most of October. Crops were put under stress under the warm and dry conditions. The likely impact was less crop yields for harvest time.

November 2016 - Dry conditions continued into November, which created continued stress on crops. Some locations were even classified as being in extreme drought. This drought classification expanded and covered much of the state by the end of the month. Very dry conditions continued into November, which resulted in an area of extreme (D3) drought remaining across Lauderdale County. Crops were put under more stress from the dry and hot conditions.

Heat Wave

The National Centers for Environmental Information was used to determine historical heat wave occurrences in the county.

July 2005 – A five-day heat wave occurred across the region. Heat index values reached near 110 degrees each day. Each day had high temperatures ranging from 95 to 99 degrees. This was the warmest stretch of weather the area experienced since July 2001.

August 2005 –A heat wave covering the south began in mid-August and lasted about 10 days. High temperatures were consistently over 95 degrees and surpassed 100 degrees or more on some days. It was the first time since August 2000 that 100-degree temperatures reached the area.

July 2006 – A short heat wave impacted most of the area temperatures in the 90s to around 100 for five straight days.

August 2007 – A heat wave gripped most of the area with the warmest temperatures since 2000. It lasted from August 5^{th} to the 16^{th}.

August 2010 – The combination of high humidity and above normal temperatures produced heat index readings ranged between 105 and 109 degrees during the afternoon hours in the middle part of August.

PROBABILITY OF FUTURE OCCURRENCES

Drought
Based on historical occurrence information, it is assumed that Lauderdale County has a probability level of likely (between 10 and 100 percent annual probability) for future drought events. However, the extent (or magnitude) of drought and the amount of geographic area covered by drought, varies with each year.

Historic information indicates that there is a much lower probability for extreme, long-lasting drought conditions.

Heat Wave
Based on historical occurrence information, it is assumed that all of Lauderdale County has a probability level of likely (between 10 and 100 percent annual probability) for future heat wave events.

D.2.6 Wildfire

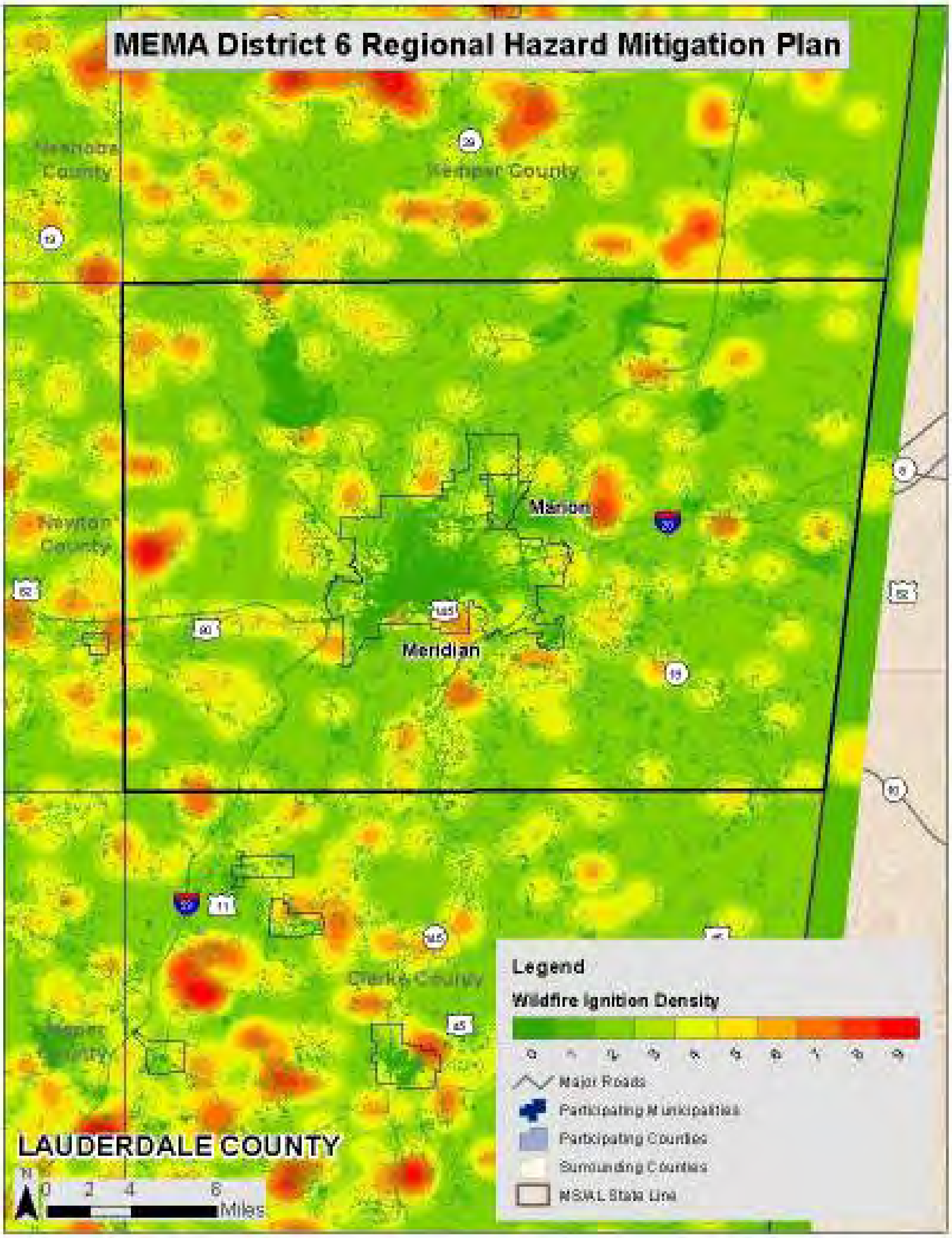
LOCATION AND SPATIAL EXTENT

The entire county is at risk to a wildfire occurrence. However, several factors such as drought conditions or high levels of fuel on the forest floor, may make a wildfire more likely. Furthermore, areas in the urban-wildland interface are particularly susceptible to fire hazard as populations abut formerly undeveloped areas. The Wildfire Ignition Density data shown in the figure below give an indication of historic location.

HISTORICAL OCCURRENCES

Figure D.4 shows the Wildfire Ignition Density in Lauderdale County based on data from the Southern Wildfire Risk Assessment. This data is based on historical fire ignitions and the likelihood of a wildfire igniting in an area. Occurrence is derived by modeling historic wildfire ignition locations to create an average ignition rate map. This is measured in the number of fires per year per 1,000 acres.

Figure D.4: WILDFIRE IGNITION DENSITY IN LAUDERDALE COUNTY



Source: Southern Wildfire Risk Assessment

Based on data from the Mississippi Forestry Commission from 2015 to 2019, Lauderdale County experiences an average of 18 wildfires annually which burn an average of 155.8 acres per year. The data indicates that most of these fires are small, averaging 8.6 acres per fire. **Table D.13** provides a summary of wildfire occurrences in Lauderdale County and **Table D.14** lists the number of reported wildfire occurrences in the county between the years 2010 and 2019.

Table D.13: SUMMARY TABLE OF ANNUAL WILDFIRE OCCURRENCES (2015-2019)

	Lauderdale County
Average Number of Fires per year	18
Average Number of Acres Burned per year	155.8
Average Number of Acres Burned per fire	8.6

*These values reflect averages over a 5-year period.
Source: Mississippi Forestry Commission

Table D.14: HISTORICAL WILDFIRE OCCURRENCES IN LAUDERDALE COUNTY

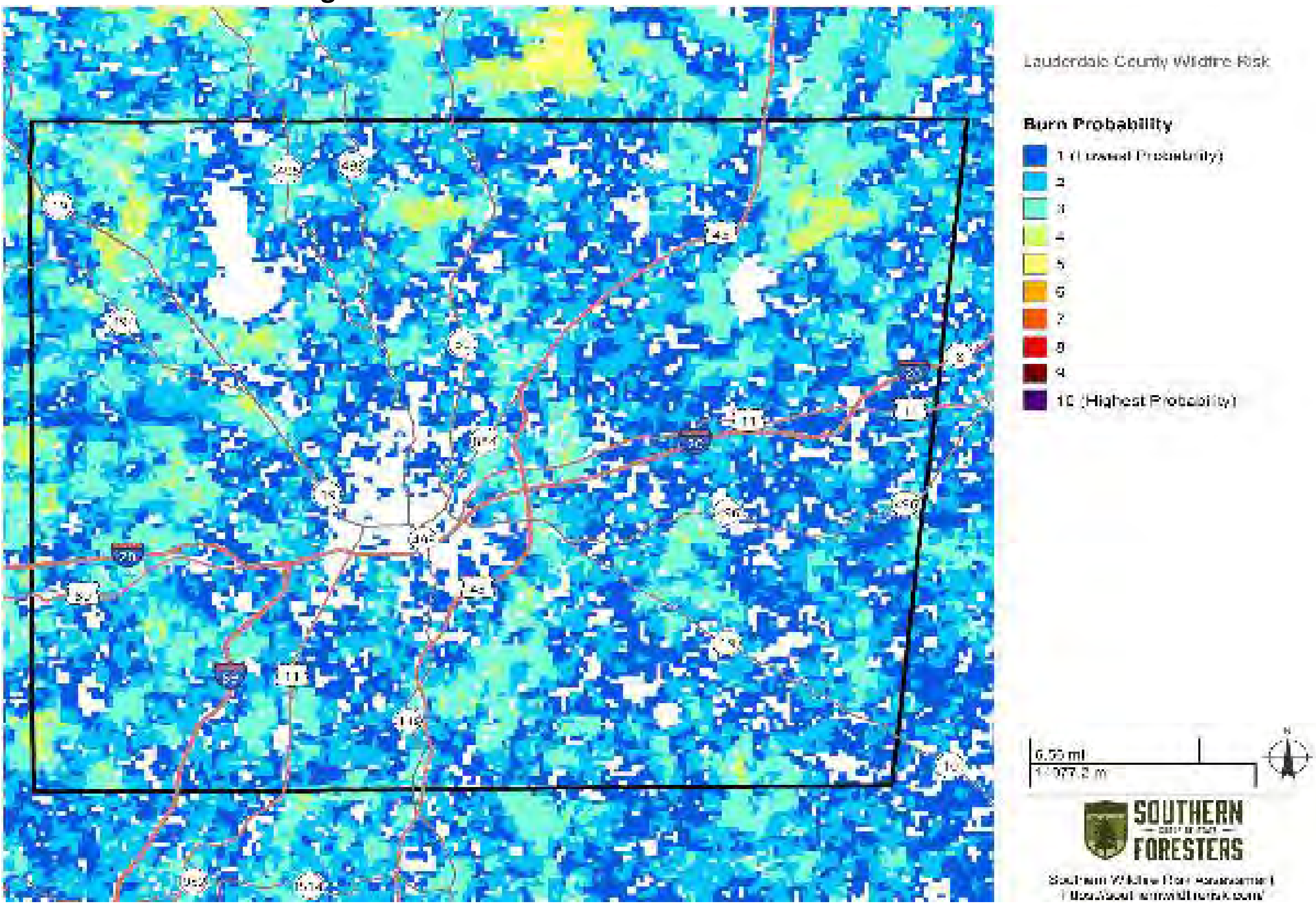
Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Lauderdale County										
Number of Fires	11	20	14	11	23	21	36	15	7	11
Number of Acres Burned	37	167	126	72	149	159	283	118	34	185

Source: Mississippi Forestry Commission

PROBABILITY OF FUTURE OCCURRENCES

Wildfire events will be an ongoing occurrence in Lauderdale County. **Figure D.5** shows that there is some probability a wildfire will occur throughout the county. However, the likelihood of wildfires increases during drought cycles and abnormally dry conditions. Fires are likely to stay small in size but could increase due to local climate and ground conditions. Dry, windy conditions with an accumulation of forest floor fuel (potentially due to ice storms or lack of fire) could create conditions for a large fire that spreads quickly. It should also be noted that some areas do vary somewhat in risk. For example, highly developed areas are less susceptible unless they are located near the urban-wildland boundary. The risk will also vary due to assets. Areas in the urban-wildland interface will have much more property at risk, resulting in increased vulnerability and need to mitigate compared to rural, mainly forested areas. The probability assigned to Lauderdale County for future wildfire events is highly likely (100 percent annual probability).

Figure D.5: BURN PROBABILITY IN LAUDERDALE COUNTY



Source: Southern Wildfire Risk Assessment

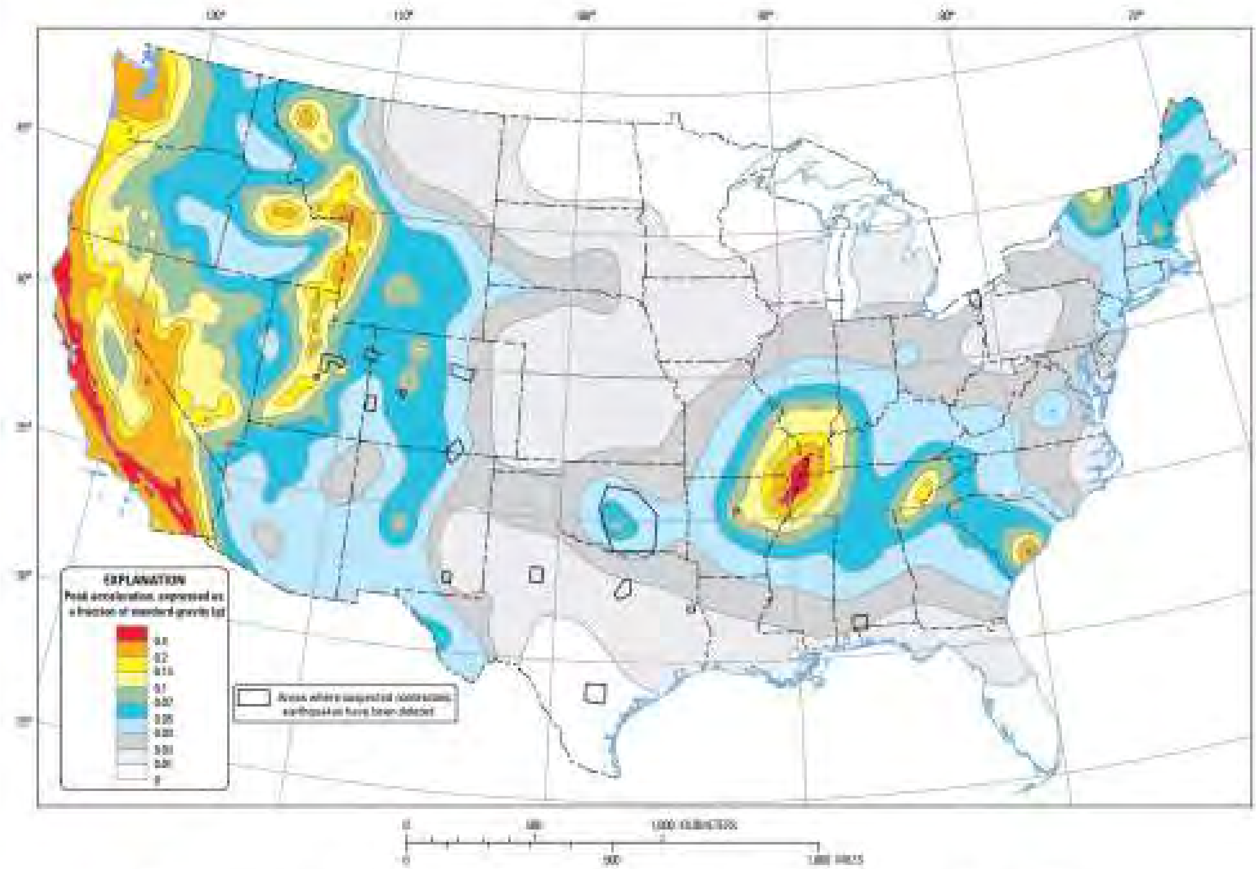
GEOLOGIC HAZARDS

D.2.7 Earthquake

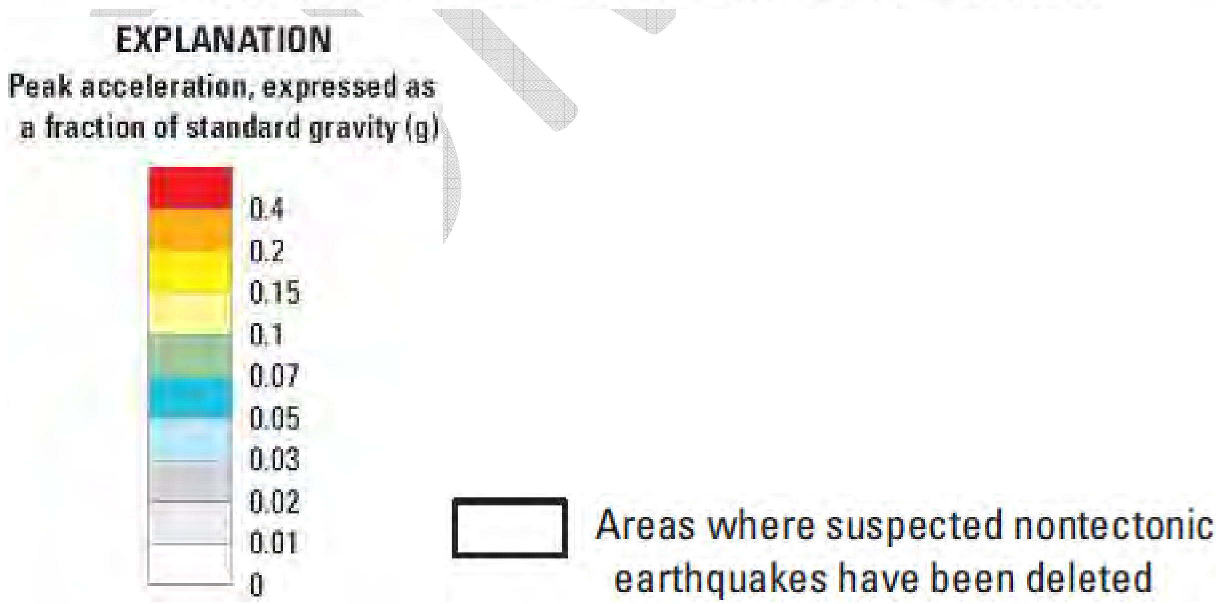
LOCATION AND SPATIAL EXTENT

Figure D.6 shows the intensity level associated with Lauderdale County, based on the national USGS map of peak acceleration with 10 percent probability of exceedance in 50 years. It is the probability that ground motion will reach a certain level during an earthquake. The data show peak horizontal ground acceleration (the fastest measured change in speed, for a particle at ground level that is moving horizontally due to an earthquake) with a 10 percent probability of exceedance in 50 years. The map was compiled by the U.S. Geological Survey (USGS) Geologic Hazards Team, which conducts global investigations of earthquake, geomagnetic, and landslide hazards. According to this map, Lauderdale County lies within an approximate zone of level “2” to “5” ground acceleration. This indicates that the county exists within an area of moderate seismic risk.

Figure D.6: PEAK ACCELERATION WITH 10 PERCENT PROBABILITY OF EXCEEDANCE IN 50 YEARS



Ten-percent probability of exceedance in 50 years map of peak ground acceleration



Source: United States Geological Survey, 2014

HISTORICAL OCCURRENCES

At least four earthquakes are known to have affected Lauderdale County since 1886. The strongest of these measured IV on the Modified Mercalli Intensity (MMI) scale. **Table D.15** provides a summary of earthquake events reported by the National Geophysical Data Center between 1638 and 1985. **Table D.16** presents a detailed occurrence of each event including the date, distance for the epicenter, magnitude and Modified Mercalli Intensity (if known).[3]

Table D.15: SUMMARY OF SEISMIC ACTIVITY IN LAUDERDALE COUNTY

Location	Number of Occurrences	Greatest MMI Reported	Richter Scale Equivalent
Marion	0	--	--
Meridian	3	IV	< 4.8
Unincorporated Area	1	IV	< 4.8
LAUDERDALE COUNTY TOTAL	**4**	**IV (moderate)**	**< 4.8**

Source: National Geophysical Data Center

Table D.16: SIGNIFICANT SEISMIC EVENTS IN LAUDERDALE COUNTY (1638 -1985)

Location	Date	Epicentral Distance	Magnitude	MMI
Marion				
None Reported	--	--	--	--
Meridian				
Meridian	9/1/1886	816.0 km	*Unknown*	II
Meridian	11/13/1927	--	*Unknown*	IV
Meridian	12/17/1931	218.0 km	*Unknown*	IV
Unincorporated Area				
Toomsuba	10/18/1916	246.0 km	*Unknown*	IV

Source: National Geophysical Data Center

PROBABILITY OF FUTURE OCCURRENCES

The probability of significant, damaging earthquake events affecting Lauderdale County is unlikely. However, it is possible that future earthquakes resulting in light to moderate perceived shaking and damages ranging from none to very light will affect the county. The annual probability level for the county is estimated to be between 1 and 10 percent (possible).

D.2.8 Landslide

LOCATION AND SPATIAL EXTENT

Landslides occur along steep slopes when the pull of gravity can no longer be resisted (often due to heavy rain). Human development can also exacerbate risk by building on previously undevelopable

[3] Due to reporting mechanisms, not all earthquake events were recorded during this time. Furthermore, some are missing data, such as the epicenter location, due to a lack of widely used technology. In these instances, a value of "unknown" is reported.

steep slopes. Landslides are possible throughout Lauderdale County, though the risk is relatively low.

According to **Figure D.7** below, the entire county falls under a low incidence area. This indicates that less than 1.5 percent of the area is involved in landsliding.

Figure D.7: LANDSLIDE SUSCEPTIBILITY AND INCIDENCE MAP OF LAUDERDALE COUNTY

Source: United States Geological Survey

HISTORICAL OCCURRENCES

There is no extensive history of landslides in Lauderdale County. Landslide events typically occur in isolated areas. Reviews of the USGS Landslide Inventory show no historical occurrences of landslides.

PROBABILITY OF FUTURE OCCURRENCES

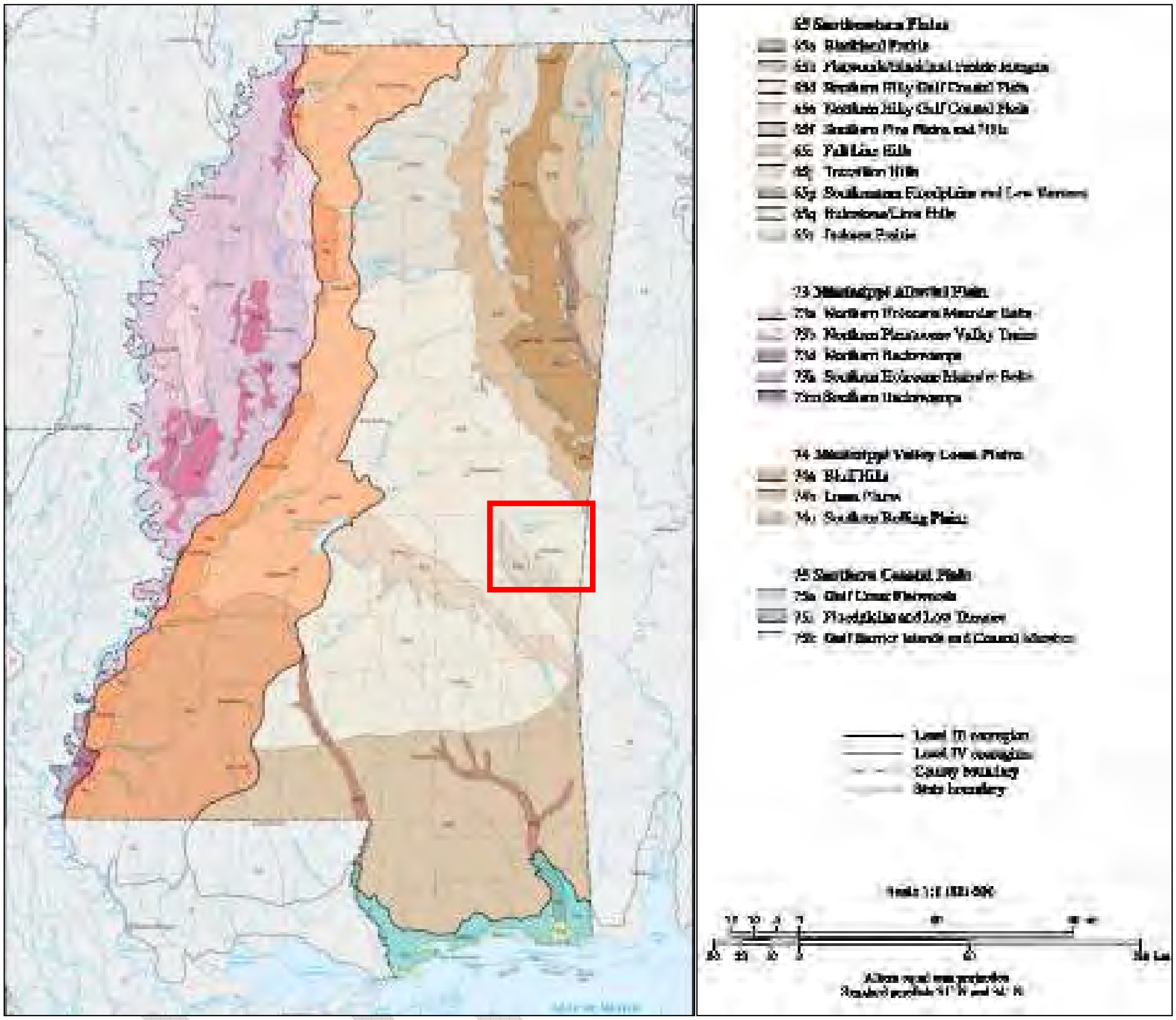
Based on historical information and the USGS susceptibility index, the probability of future landslide events is unlikely (less than 1 percent probability). The USGS data indicates that all areas in Lauderdale County have a low incidence rate and low susceptibly to landsliding activity. However, local conditions may become more favorable for landslides due to heavy rain, for example. This would increase the likelihood of occurrence. It should also be noted that some areas in Lauderdale County have greater risk than others given factors such as steepness on slope and modification of slopes.

D.2.9 Land Subsidence

LOCATION AND SPATIAL EXTENT

Much of Lauderdale County is located in an area where the soil is substantially clay, causing a shrink and swell effect depending on the current conditions. Indeed, much of the area underlain by the calcareous Yazoo clay which, when combined with sand and marl, is highly susceptible to expansion when wet and shrinking when dry. These areas are denoted below in **Figure D.8**.

Figure D.8: MAP OF MISSISSIPPI SOILS



Source: http://www.eoearth.org/view/article/152119/

HISTORICAL OCCURRENCES

According to Lauderdale County Emergency Management, there is record of one sinkhole event in Lauderdale County. Local county officials have noted the impacts from these swings and changes in soil as roads and other infrastructure have experienced large cracks and breaks, causing stops in daily operations and significant costs to local, state, and federal budgets. Often the cost to repair this infrastructure can be in the range of millions of dollars depending on the degree of damage and necessity for quick repairs.

November 7th, 2015
A massive sinkhole opened in the parking lot of the new IHOP restaurant on Frontage Road in Meridian at about 7:15PM, swallowing more than ten vehicles. Witnesses reported hearing a loud boom, then seeing the ground sink. No injuries were reported in the incident, officials said. Multiple agencies responded, including the Meridian Police Department, Lauderdale County Emergency Management, Meridian Fire

Department and Lauderdale County Fire Service.[4]

PROBABILITY OF FUTURE OCCURRENCES

The probability of future land subsidence events in the county is unlikely (less than 1 percent annual probability).

WIND-RELATED HAZARDS

D.2.10 Hurricane and Tropical Storm

LOCATION AND SPATIAL EXTENT

Hurricanes and tropical storms threaten the entire Atlantic and Gulf seaboard of the United States. While coastal areas are most directly exposed to the brunt of landfalling storms, their impact is often felt hundreds of miles inland and they can affect Lauderdale County. All areas in Lauderdale County are equally susceptible to hurricane and tropical storms.

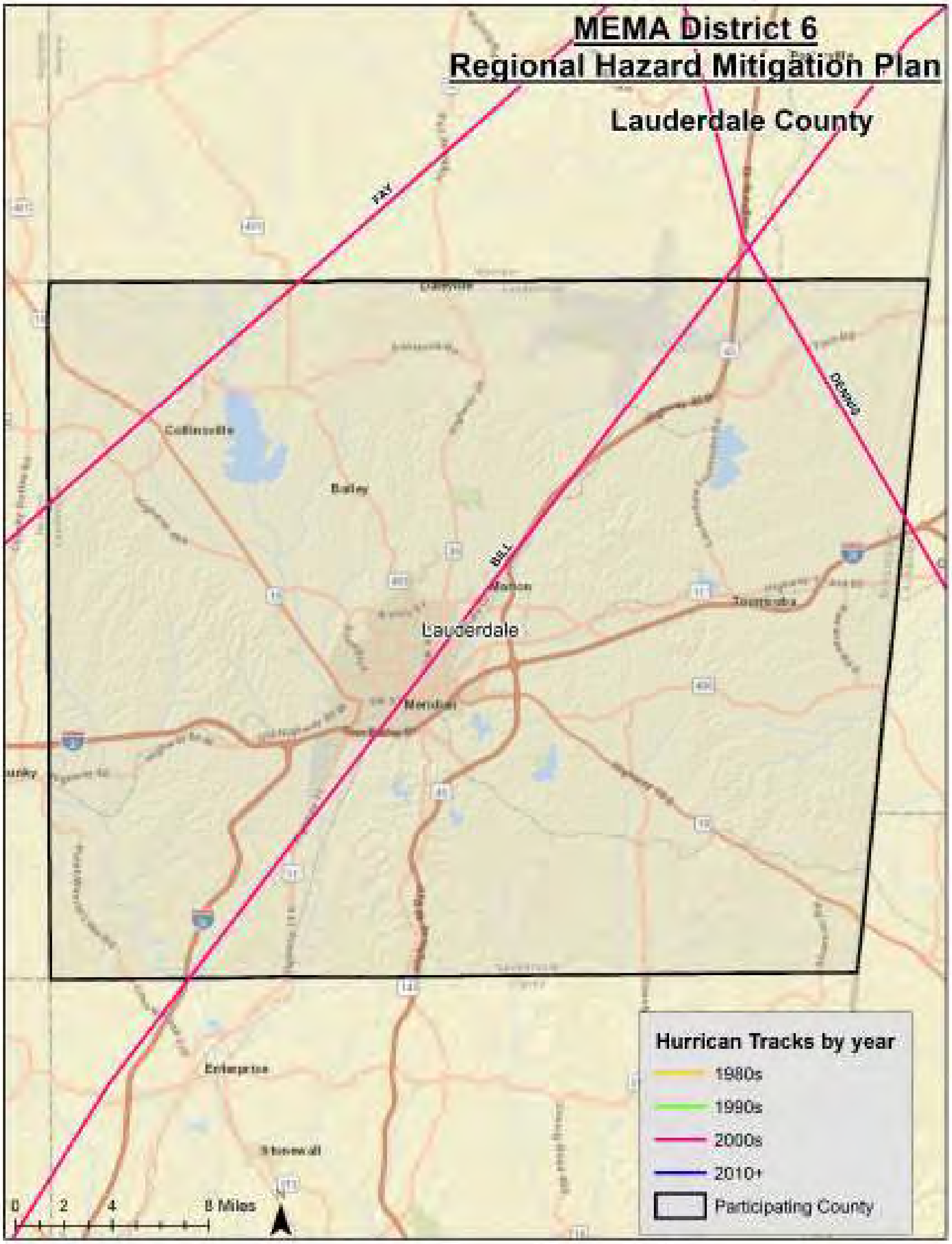
HISTORICAL OCCURRENCES

According to the National Hurricane Center's historical storm track records, 58 hurricane or tropical storm/depression tracks have passed within 75 miles of the MEMA District 6 Region since 1855. This includes: 1 Category 3 hurricane, 2 Category 2 hurricanes, 5 Category 1 hurricanes, 33 tropical storms, and 16 tropical depressions.

Of the recorded storm events, 35 hurricane or tropical storm/depression events traversed directly through the region as shown in **Figure D.9**. Notable storms include Hurricane Frederic (1979) and Hurricane Katrina (2005). **Table D.17** provides for each event the date of occurrence, name (if applicable), maximum wind speed (as recorded within 75 miles of the MEMA District 6 Region) and category of the storm based on the Saffir-Simpson Scale.

[4] https://www.meridianstar.com/news/sinkhole-opens-in-ihop-parking-lot/article_609a6aa4-85d4-11e5-97f4-d75d73089942.html

Figure D.9: HISTORICAL HURRICANE STORM TRACKS 1980 - 2020



Source: National Oceanic and Atmospheric Administration, National Hurricane Center

Table D.17: HISTORICAL STORM TRACKS WITHIN 75 MILES OF THE MEMA 6 DISTRICT REGION (1850–2020)

Date of Occurrence	Storm Name	Maximum Wind Speed (knots)	Storm Category
9/16/1855	UNNAMED	70	Category 1
9/15/1860	UNNAMED	70	Category 1
7/12/1872	UNNAMED	40	Tropical Storm
9/2/1879	UNNAMED	60	Tropical Storm
10/7/1879	UNNAMED	40	Tropical Storm
10/16/1879	UNNAMED	40	Tropical Storm
9/1/1880	UNNAMED	50	Tropical Storm
8/3/1881	UNNAMED	40	Tropical Storm
6/14/1887	UNNAMED	30	Tropical Depression
8/28/1890	UNNAMED	35	Tropical Storm
9/12/1892	UNNAMED	40	Tropical Storm
9/8/1893	UNNAMED	55	Tropical Storm
8/17/1895	UNNAMED	35	Tropical Storm
8/3/1898	UNNAMED	35	Tropical Storm
8/16/1901	UNNAMED	45	Tropical Storm
10/10/1905	UNNAMED	35	Tropical Storm
9/27/1906	UNNAMED	95	Category 2
9/22/1907	UNNAMED	35	Tropical Storm
6/13/1912	UNNAMED	50	Tropical Storm
7/17/1912	UNNAMED	25	Tropical Depression
9/14/1912	UNNAMED	50	Tropical Storm
9/30/1915	UNNAMED	60	Tropical Storm
7/6/1916	UNNAMED	80	Category 1
7/5/1919	UNNAMED	30	Tropical Depression
10/18/1923	UNNAMED	50	Tropical Storm
7/30/1926	UNNAMED	25	Tropical Depression
9/1/1932	UNNAMED	60	Tropical Storm
10/16/1932	UNNAMED	45	Tropical Storm
8/1/1936	UNNAMED	40	Tropical Storm
9/1/1937	UNNAMED	30	Tropical Depression
6/16/1939	UNNAMED	35	Tropical Storm
8/14/1939	UNNAMED	35	Tropical Storm
9/26/1939	UNNAMED	40	Tropical Storm
9/25/1940	UNNAMED	20	Tropical Depression
9/4/1948	UNNAMED	50	Tropical Storm
9/5/1949	UNNAMED	40	Tropical Storm
8/31/1950	BAKER	65	Category 1
6/1/1959	ARLENE	25	Tropical Depression
9/16/1960	ETHEL	35	Tropical Storm
9/26/1960	FLORENCE	15	Tropical Depression

Date of Occurrence	Storm Name	Maximum Wind Speed (knots)	Storm Category
8/18/1969	CAMILLE	100	Category 3
9/16/1971	EDITH	60	Tropical Storm
7/19/1977	UNNAMED	25	Tropical Depression
9/6/1977	BABE	30	Tropical Depression
7/11/1979	BOB	40	Tropical Storm
9/13/1979	FREDERIC	95	Category 2
8/12/1987	UNNAMED	25	Tropical Depression
8/27/1992	ANDREW	30	Tropical Depression
8/4/1995	ERIN	45	Tropical Storm
8/6/2001	BARRY	20	Tropical Depression
9/26/2002	ISIDORE	55	Tropical Storm
7/1/2003	BILL	45	Tropical Storm
7/11/2005	DENNIS	45	Tropical Storm
8/29/2005	KATRINA	80	Category 1
9/14/2007	HUMBERTO	20	Tropical Depression
8/24/2008	FAY	30	Tropical Depression
8/17/2009	CLAUDETTE	25	Tropical Depression
10/28/2020	Zeta	33	Tropical Depression

*It should be noted that the track of several major hurricanes that impacted the region fell outside of the 75-mile buffer. These storms were included in the table due to their significant impact. (Georges, 1988; Ivan, 2004; Issac, 2012)
Source: National Hurricane Center

Federal records indicate that disaster declarations were made in 1979 (Hurricane Frederic), 2004 (Hurricane Ivan), 2005 (Hurricane Dennis and Hurricane Katrina), and 2012 (Hurricane Issac). Hurricane and tropical storm events can cause substantial damage in the area due to high winds and flooding.

Flooding and high winds from hurricanes and tropical storms can cause damage throughout the county. Anecdotes are available from NCEI for the major storms that have impacted the county as found below:

Tropical Storm Isidore – September 26, 2002
The heavy rainfall associated with Tropical Storm Isidore resulted in significant river and flash flooding across much of Mississippi. Twenty-four-hour rainfall totals between 5 and 10 inches were common over much of Mississippi, especially in the southern part of the state, where 24-hour amounts exceeded 9 inches near Hattiesburg. Gradient wind gusts between 35 and 45 miles per hour combined with the saturated ground to lead to numerous downed trees and powerlines over the state. Most of the damage was seen along and east of the Natchez Trace, near the path of the storm's diffuse center. One indirect fatality was reported just east of the Kalem community in Scott County. Here, a falling tree struck a truck driven by a 31-year-old male. Damage from Isidore was an estimated $500,000.

Tropical Storm Bill – June 30 and July 1, 2003
Heavy rainfall with Tropical Storm Bill resulted in several reports of flash flooding. Forty-eight-hour rainfall totals ranged between 3 and 7 inches, mainly across SE portions of Mississippi. Gradient wind gusts between 30 and 40 mph combined with saturated soils to down numerous trees very close to center's track. Damage from Bill was an estimated $100,000.

Hurricane Ivan – September 16, 2004
Thousands of trees were blown down across Eastern Mississippi during Hurricane Ivan as well as hundreds of power lines. The strong wind itself did not cause much structural damage, however the fallen trees did. These downed trees accounted for several hundred homes, mobile homes and businesses to be damaged or destroyed. Most locations across Eastern Mississippi reported sustained winds between 30 and 40 mph with Tropical Storm force gusts between 48 and 54 mph. The strongest reported winds occurred in Newton, Lauderdale and Oktibbeha Counties.

Overall, rainfall totals were held in check as Ivan steadily moved north. The heaviest rains were confined to far Eastern Mississippi where 3 to 4 inches fell over a 15 hour period. Due to the duration of the rain no flooding was reported. Across Eastern Mississippi, Hurricane Ivan was responsible for one fatality. This fatality occurred in Brooksville (Noxubee County) when a tree fell on a man. Damage from Ivan was estimated at $200 million.

Tropical Storm Arlene – June 11, 2005
The western periphery of Tropical Storm Arlene affected far Eastern Mississippi during the evening and brought gusty winds and locally heavy rains to that portion of the state. Peak wind gusts were reported up to 40 mph and the combination of wet soils allowed for a few hundred trees to get blown down or uprooted. Several of the downed trees took down power lines and a small few landed on homes causing damage. Additionally, the counties across Eastern Mississippi received 3 to 5 inches of rain as Arlene lifted north.

Hurricane Dennis – July 10, 2005
Hurricane Dennis moved north-northwest across Southwest Alabama and then into East-Central Mississippi and finally across Northeast Mississippi. Wind gusts over tropical storm force were common across areas east of a line from Starkville to Newton to Hattiesburg. These winds caused several hundred trees to uproot or snap and took down numerous power lines. Additionally, a total of 21 homes or businesses sustained minor to major damage from fallen trees or gusty winds.

Heavy rainfall was not a major issue as Dennis steadily moved across the region. Rainfall totals between 2 and 5 inches fell across Eastern Mississippi over a 12 hour period. One indirect fatality occurred in Jasper County from an automobile accident due to wet roads.

Hurricane Katrina – August 29, 2005
Hurricane Katrina will likely go down as the worst and costliest natural disaster in United States history. The amount of destruction, the cost of damaged property/agriculture and the large loss of life across the affected region has been overwhelming. Catastrophic damage was widespread across a large portion of the Gulf Coast region. The devastation was not only confined to the coastal region, widespread and significant damage occurred well inland up to the Hattiesburg area and northward past Interstate 20.

Hurricane force winds were common across Central Mississippi. The region received sustained winds of 60-80 mph with gusts ranging from 80-120 mph. Wind damage to structures was widespread, with roofs blown off or partially peeled. Hundreds of signs were shredded or blown down. Many businesses sustained structural damage as windows were broken, roofs were blown off, and walls were collapsed. Millions of trees were uprooted and snapped. Power poles and lines were snapped and taken down from wind and trees. It was thousands of downed trees which caused the most significant structural damage as these trees fell onto homes and businesses. Power outages lasted from a few days to as long as four weeks. Agriculture and timber industries were severely impacted. Row crops, including cotton, rice, corn, and soybeans, took a hard hit. Other impacted industries were the catfish industry, dairy and cattle industry, and nursery businesses.

PROBABILITY OF FUTURE OCCURRENCES

Given the inland location of the county, it is more likely to be affected by remnants of hurricane and tropical storm systems (as opposed to a major hurricane) which may result in flooding or high winds. The probability of being impacted is less than coastal areas, but still remains a real threat to Lauderdale County due to induced events like flooding. Based on historical evidence, the probability level of future occurrence is likely (annual probability between 10 and 100 percent). Given the regional nature of the hazard, all areas in the county are equally exposed to this hazard. However, when the county is impacted, the damage could be catastrophic, threatening lives and property throughout the planning area.

D.2.11 Thunderstorm (wind, hail, lightning)

LOCATION AND SPATIAL EXTENT

Thunderstorm / High Wind
A thunderstorm event is an atmospheric hazard, and thus has no geographic boundaries. It is typically a widespread event that can occur in all regions of the United States. However, thunderstorms are most common in the central and southern states because atmospheric conditions in those regions are favorable for generating these powerful storms. It is assumed that Lauderdale County has uniform exposure to an event and the spatial extent of an impact could be large.

Hailstorm
Hailstorms frequently accompany thunderstorms, so their locations and spatial extents coincide. It is assumed that Lauderdale County is uniformly exposed to severe thunderstorms; therefore, all areas of the county are equally exposed to hail which may be produced by such storms.

Lightning
Lightning occurs randomly, therefore it is impossible to predict where and with what frequency it will strike. It is assumed that all of Lauderdale County is uniformly exposed to lightning.

HISTORICAL OCCURRENCES

Thunderstorm / High Wind
Severe storms were at least partially responsible for six disaster declarations in Lauderdale County in 1979, 1990, twice in 1992, 2003, and 2017. According to NCEI, there have been 437 reported thunderstorm and high wind events since 1956 in Lauderdale County. These events caused almost $6.13 million in damages. There were also reports of one fatality and four injuries. **Table D.18** summarizes

this information. **Table D.19** presents detailed thunderstorm and high wind event reports including date, magnitude, and associated damages for each event.

Table D.18: SUMMARY OF THUNDERSTORM / HIGH WIND OCCURRENCES IN LAUDERDALE COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Marion	6	0/0	$25,500
Meridian	96	0/2	$1,675,750
Unincorporated Area	335	1/2	$4,428,260
LAUDERDALE COUNTY TOTAL	**437**	**1/4**	**$6,129,510**

Source: National Centers for Environmental Information

Hailstorm

According to the National Centers for Environmental Information, 223 recorded hailstorm events have affected Lauderdale County since 1963. **Table D.19** is a summary of the hail events in Lauderdale County. In all, hail occurrences resulted in approximately $534,000 in property damages. Hail ranged in diameter from 0.75 inches to 2.75 inches. It should be noted that hail is notorious for causing substantial damage to cars, roofs, and other areas of the built environment that may not be reported to the National Centers for Environmental Information. Therefore, it is likely that damages are greater than the reported value.

Table D.19: SUMMARY OF HAIL OCCURRENCES IN LAUDERDALE COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Marion	8	0/0	$28,000
Meridian	62	0/0	$134,000
Unincorporated Area	153	0/0	$372,000
LAUDERDALE COUNTY TOTAL	**223**	**0/0**	**$534,000**

Source: National Centers for Environmental Information

Lightning

According to the National Centers for Environmental Information, there has been one recorded lightning event in Lauderdale County since 1996 (**Table D.20**). Detailed information on historical lightning events can be found in **Table D.21**.

It is certain that more lightning events have impacted the county. Many of the reported events are those that cause damage, and it should be expected that damages are likely much higher for this hazard than what is reported.

Table D.20: SUMMARY OF LIGHTNING OCCURRENCES IN LAUDERDALE COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Marion	0	0/0	$0
Meridian	0	0/0	$0
Unincorporated Area	1	0/4	$0
LAUDERDALE COUNTY TOTAL	**1**	**0/4**	**$0**

Source: National Centers for Environmental Information

Table 21: HISTORICAL LIGHTNING OCCURRENCES IN LAUDERDALE COUNTY

Location	Date	Deaths / Injuries	Property Damage*	Details
Marion				
None Reported	--	--	--	--
Meridian				
None Reported	--	--	--	--
Unincorporated Area				
Meehan	8/10/2018	0/4	$0	Showers and thunderstorms developed in a warm and humid air mass. Some of these storms produced damaging wind gusts. There were also four injuries from lightning. One adult and one child were injured when the tree they were walking under was struck by lightning.

Source: National Centers for Environmental Information

PROBABILITY OF FUTURE OCCURRENCES

Thunderstorm / High Wind

Given the high number of previous events, it is certain that thunderstorm events, including straight-line wind events, will occur in the future. This results in a probability level of highly likely (100 percent annual probability) for the entire county.

Hailstorm

Based on historical occurrence information, it is assumed that the probability of future hail occurrences is highly likely (100 percent annual probability). Since hail is an atmospheric hazard, it is assumed that Lauderdale County has equal exposure to this hazard. It can be expected that future hail events will continue to cause minor damage to property and vehicles throughout the county.

Lightning

Although there were no historical lightning events reported in Lauderdale County via NCEI data, it is a regular occurrence accompanied by thunderstorms. In fact, lightning events will assuredly happen on an annual basis, though not all events will cause damage. According to Vaisala's U.S. National Lightning Detection Network (NLDN), Lauderdale County is located in an area of the country that experienced an average of 4 to 6 cloud-to-ground lightning flashes per square kilometer per year between 2015 and 2019.[5] Therefore, the probability of future events is highly likely (100 percent annual probability). It can be expected that future lightning events will continue to threaten life and cause minor property damages throughout the county.

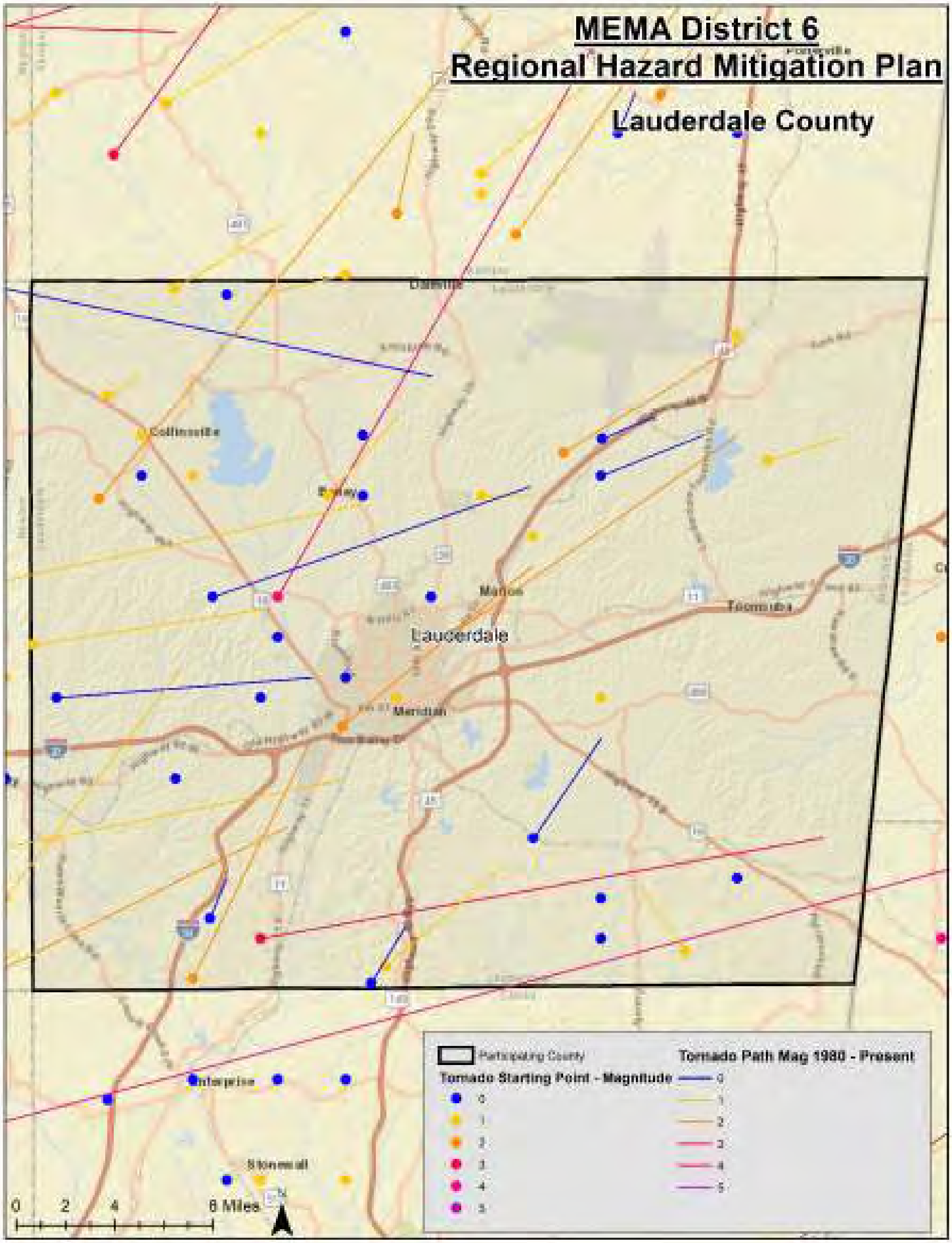
D.2.12 Tornado

LOCATION AND SPATIAL EXTENT

Tornadoes occur throughout the state of Mississippi, and thus in Lauderdale County. Tornadoes typically impact a relatively small area, but damage may be extensive. Event locations are completely random and it is not possible to predict specific areas that are more susceptible to tornado strikes over time. Therefore, it is assumed that Lauderdale County is uniformly exposed to this hazard. With that in mind, **Figure D.10** shows tornado track data for many of the major tornado events that have impacted the county. While no definitive pattern emerges from this data, some areas that have been impacted in the past may be potentially more susceptible in the future.

[5] Vaisala's Annual Lightning Report – 2020. Retrieved on 9.8.2021 from: https://www.vaisala.com/sites/default/files/documents/WEA-MET-Annual-Lightning-Report-2020-B212260EN-A.pdf

Figure D.10: HISTORICAL TORNADO TRACKS IN LAUDERDALE COUNTY



Source: National Weather Service Storm Prediction Center

HISTORICAL OCCURRENCES

Tornadoes were at least partially responsible for seven disaster declarations in Lauderdale County in 1973, 1979, 1990, twice in 1992, 2003, and 2017. According to the National Centers for Environmental Information, there have been a total of 51 recorded tornado events in Lauderdale County since 1950 (**Table D.22**), resulting in over $19.497 million in property damages. In addition, 3 fatalities and 100 injuries were reported. The magnitude of these tornadoes ranges from F0 to F4 and EF0 to EF2 in intensity, although an EF5 event is possible. Detailed information on historic tornado events can be found in **Table D.25**.

Table D.22: SUMMARY OF TORNADO OCCURRENCES IN LAUDERDALE COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Marion	1	0/0	$250,000
Meridian	4	0/19	$2,628,000
Unincorporated Area	40	3/81	$16,619,250
LAUDERDALE COUNTY TOTAL	**45**	**3/100**	**$19,497,250**

Source: National Centers for Environmental Information

From April 25 to 28, 2011, the largest tornado outbreak ever recorded affected the Southern, Midwestern, and Northeastern U.S., leaving catastrophic destruction in its wake, especially across the states of Alabama and Mississippi. During this outbreak, one EF0 tornado was reported in Lauderdale County on April 27, 2011. This tornado resulted in just over $106,000 in property damages.

PROBABILITY OF FUTURE OCCURRENCES

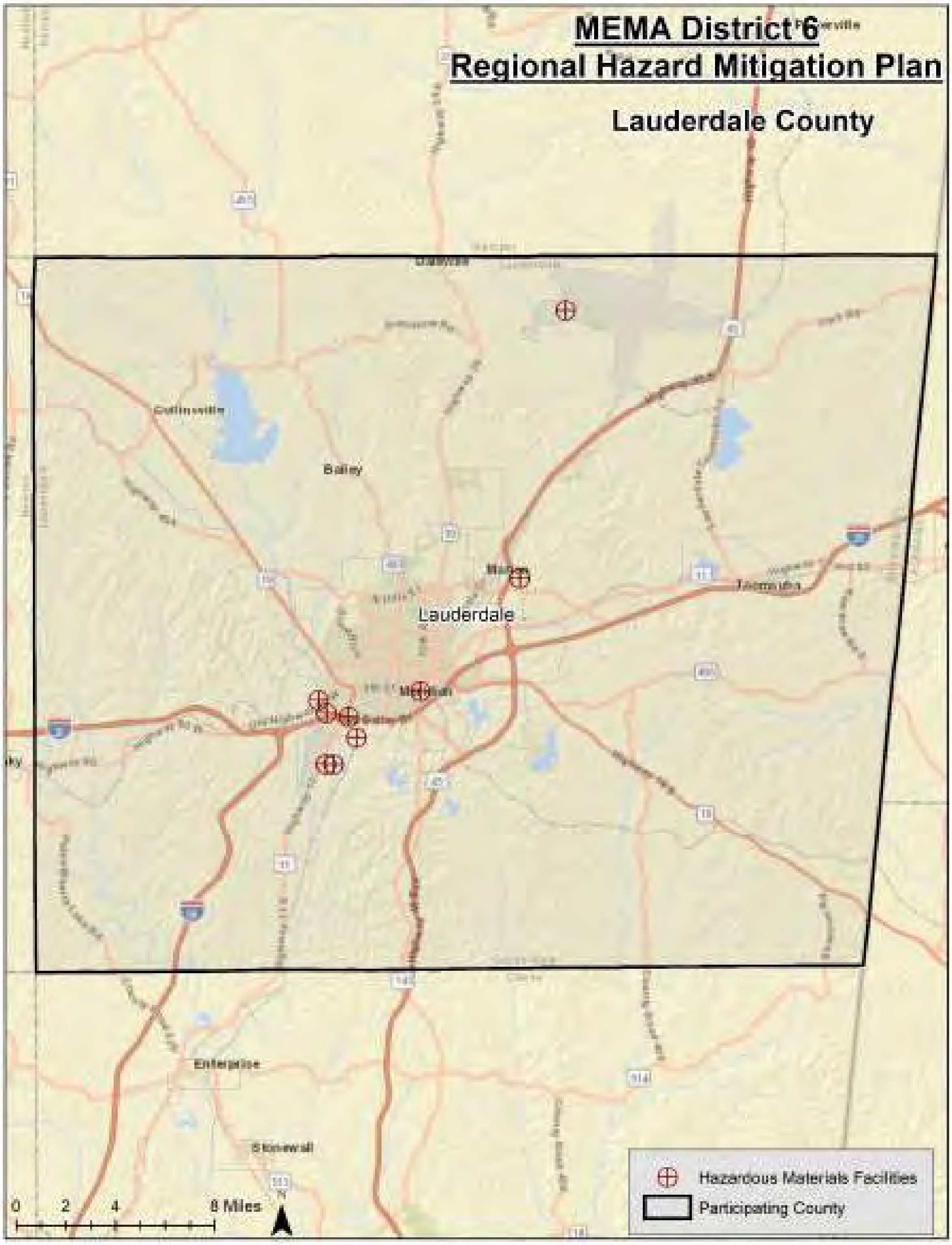
According to historical information, tornado events pose a significant threat to Lauderdale County. The probability of future tornado occurrences affecting Lauderdale County is likely (between 10 and 100 percent annual probability).

D.2.13 Hazardous Materials Incidents

LOCATION AND SPATIAL EXTENT

Lauderdale County has nine TRI sites. These sites are shown in **Figure D.11.**

Figure D.11: TOXIC RELEASE INVENTORY (TRI) SITES IN LAUDERDALE COUNTY



Source: Environmental Protection Agency

In additional to "fixed" hazardous materials locations, hazardous materials may also impact the county via roadways and rail. Many roads in the county are subject to hazardous materials transport and all roads that permit hazardous material transport are considered potentially at risk to an incident.

HISTORICAL OCCURRENCES

There have been a total of 276 recorded HAZMAT incidents in Lauderdale County since 1971 (**Table D.23**). These events resulted in over $2 million in property damage as well as seven injuries.

Table D.23: SUMMARY OF HAZMAT INCIDENTS IN LAUDERDALE COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Marion	0	0/0	$0
Meridian	243	0/7	$1,541,761
Unincorporated Area	33	0/0	$480,885
LAUDERDALE COUNTY TOTAL	**276**	**0/7**	**$2,022,646**

Source: United States Department of Transportation Pipeline and Hazardous Materials Safety Administration

PROBABILITY OF FUTURE OCCURRENCES

Given the location of eight toxic release inventory site in Lauderdale County and prior roadway and railway incidents, it is likely (between 10 and 100 percent annual probability) that a hazardous material incident may occur in the county. County and town officials are mindful of this possibility and take precautions to prevent such an event from occurring. Furthermore, there are detailed plans in place to respond to an occurrence.

D.2.14 Pandemic

LOCATION AND SPATIAL EXTENT

Pandemics are global in nature. However, they may start anywhere. Lauderdale County chose to analyze this hazard given the agriculture in the area and potential for this kind of event to occur in any location at any time.

All populations should be considered at risk to pandemic. Buildings and infrastructure are not directly impacted by the virus/pathogen but could be indirectly impacted if people are not able to operate and maintain them due to illness. Many buildings may be shutdown, at least temporarily, as a result. Employers may initiate work from home procedures for non-essential workers in order to help stop infection. Commerce activities, and thus the economy, may suffer greatly during this time.

HISTORICAL OCCURRENCES

Several pandemics have been reported throughout history. A short history of the flu/Spanish Flu was collected from The Historical Text Archive and is described below.

The first known pandemic dates back to 430 B.C. with the Plague of Athens. It reportedly killed a quarter of the population over four years due to typhoid fever. In 165-180 A.D., the Antonine Plague killed nearly 5 million people. Next, the Plague of Justinian (the first bubonic plague pandemic) occurred from 541 to

566. It killed 10,000 people a day at its peak and resulted in a 50 percent drop in Europe's population. Since the 1500s, influenza pandemics have occurred about three times every century or roughly every 10 to 50 years. The Black Death devastated European populations in the 14th century. Nearly a third of the population (20-30 million) was killed over six years. From 1817 to present, seven Cholera Pandemics have impacted to the world and killed millions. Perhaps most severe, was the Third Cholera Pandemic (1852-1959) which started in China. Isolated cases can still be found in the Western U.S. today. There were three major pandemics in the 20th century (1918-1919, 1957-1958, and 1968-1969). The most infamous pandemic flu of the 20th century, however, was that of 1918-1919. Since the 1960s, there has only been one pandemic, the 2009 H1N1 influenza. The pandemics of the 20th and 21st centuries that impacted the United States are detailed below.

1918 Spanish Flu: This was the most devastating flu of the 20th century. This pandemic spread across the world in three waves between 1918 and 1919. It typically impacted areas for around twelve weeks and then would largely disappear. However, it would frequently reemerge several months later. Worldwide, approximately 50 million persons died and over a quarter of the population was infected. Nearly 675,000 people died in the United States. The illness came on suddenly and could cause death within a few hours. The virus impacted those aged 15 to 35 especially hard. The movement of troops during World War I is thought to have facilitated the spread of the virus.

In Mississippi, state officials noted that "epidemics have been reported from a number of places in the State," on October 4th, 1918. By the 18th, twenty-six localities reported 1,934 cases (the real number of cases was likely much higher). West Point, Mississippi was hit especially hard and quarantine was established. Throughout the state, African Americans were impacted at a greater rate than white populations. This is thought to be partly caused from a shortage of caretakers. It is estimated that over 6,000 people died in Mississippi, though that number may be much higher as death records were not widely recorded.

1957 Asian Flu: It is estimated that the Asian Flu caused 2 million deaths worldwide. Approximately 70,000 deaths were in the U.S. However, the proportion of people impacted was substantially higher than that of the Spanish Flu. This flu was characterized as having much milder effects than the Spanish Flu and greater survivability. Similar to other pandemics, this pandemic has two waves. Elderly and infant populations were more likely to succumb to death. This flu is thought to have originated from a genetic mutation of a bird virus.

1968 Hong Kong Flu: The Hong Kong Flu is thought to have caused one million deaths worldwide. It was milder than both the Asian and Spanish influenza viruses. It was similar to the Asian Flu, which may have provided some immunity to the virus. It had the most severe impact on elderly populations.

2009 H1N1 Influenza: This flu was derived from human, swine, and avian virus strains. It was initially reported in Mexico in April 2009. On April 26, the U.S. government declared H1N1 a public health emergency. A vaccine was developed and over 80 million were vaccinated which helped minimize the impacts. The virus had mild impacts on most of the population but did cause death (usually from viral pneumonia) in high-risk populations such as pregnant women, obese persons, indigenous people, and those with chronic respiratory, cardiac, neurological, or immunity conditions. Worldwide, it is estimated that 43 million to 89 million people contracted H1N1 between April 2009 and April 2010, and between 8,870 and 18,300 H1N1 cases resulted in death.

2020 SARS-CoV-2 (COVID-19): Coronavirus Disease 2019 (COVID-19) was declared as pandemic by the

World Health Organization on March 11th, 2020 mainly due to the speed and scale of the transmission of the disease. Prior to that, it started as an epidemic in mainland China with the focus being firstly reported in the city of Wuhan, Hubei province on February 26th, 2020. The etiologic agent of COVID-19 was isolated and identified as a novel coronavirus, initially designated as 2019-nCoV. Later, the virus genome was sequenced and because it was genetically related to the coronavirus outbreak responsible for the SARS outbreak of 2003, the virus was named as severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) by the International Committee for Taxonomy of Viruses.

There is a considerable amount of data on the extent of COVID-19 throughout the State of Mississippi and Lauderdale County. The number of reported cases and deaths across the State of Mississippi and Lauderdale County are shown in the figure below.

Figure 12: COVID-19 Cases as of 08/01/2021[6]

	Cases	Deaths
Mississippi	348,496	7,556
Lauderdale County	8,008	244

In addition to the pandemics above, there have been several cases of pandemic threats, some of which reached epidemic levels. They were contained before spreading globally. Examples include Smallpox, Polio, Tuberculosis, Malaria, AIDS, SARS and Yellow Fever. Advances in medicine and technology have been instrumental in containing the spread of viruses in recent history.

In addition to the pandemics above, there have been several cases of pandemic threats, some of which reached epidemic levels. They were contained before spreading globally. Examples include Smallpox, Polio, Tuberculosis, Malaria, AIDS, SARS and Yellow Fever. Advances in medicine and technology have been instrumental in containing the spread of viruses in recent history.
It is notable that no birds have been infected with Avian Flu in North and South America.

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that all of Lauderdale County has a probability level of unlikely (less than 1 percent annual probability) for future pandemics events. While pandemic can have devastating impacts, they are relatively rare.
The Mississippi State Department of Health maintains a state pandemic plan which can be found here: http://www.msdh.state.ms.us/msdhsite/index.cfm/44,1136,122,154,pdf/SNSPlan.pdf

[6] Mississippi State Department of Health. *COVID-19 Dashboard*. Retrieved from: https://msdh.ms.gov/msdhsite/_static/14,0,420.html

D.2.15 Conclusions on Hazard Risk

The hazard profiles presented in this section were developed using best available data and result in what may be considered principally a qualitative assessment as recommended by FEMA in its "How-to" guidance document titled *Understanding Your Risks: Identifying Hazards and Estimating Losses* (FEMA Publication 386-2). It relies heavily on historical and anecdotal data, stakeholder input, and professional and experienced judgment regarding observed and/or anticipated hazard impacts. It also carefully considers the findings in other relevant plans, studies, and technical reports.

HAZARD EXTENT

Table D.24 describes the extent of each natural hazard identified for Lauderdale County. The extent of a hazard is defined as its severity or magnitude, as it relates to the planning area.

Table D.24: EXTENT OF LAUDERDALE COUNTY HAZARDS

Flood-related Hazards	
Flood	Flood extent can be measured by the amount of land and property in the floodplain as well as flood height and velocity. The amount of land in the floodplain accounts for 16.4 percent of the total land area in Lauderdale County. Flood depth and velocity are recorded via United States Geological Survey stream gages throughout the region. While a gage does not exist for each participating jurisdiction, there is one at or near many areas. The greatest peak discharge recorded for the county was at the Okatibbee Creek near Meridian on February 22, 1961. Water reached a discharge of 27,000 cubic feet per second and the stream gage height was recorded at 26.14 feet.
Erosion	The extent of erosion can be defined by the measurable rate of erosion that occurs. There are no erosion rate records located in Lauderdale County.
Dam Failure	Dam Failure extent is defined using the Mississippi Department of Environmental Quality criteria. Thirty-three dams are classified as high-hazard in Lauderdale County.
Winter Storm and Freeze	The extent of winter storms can be measured by the amount of snowfall received (in inches). The greatest snowfall reported in Meridian was 14.0 inches in 1963.
Fire-related Hazards	
Drought / Heat Wave	Drought extent is defined by the U.S. Drought Monitor Classifications which include Abnormally Dry, Moderate Drought, Severe Drought, Extreme Drought, and Exceptional Drought. According to the U.S. Drought Monitor Classifications, the most severe drought condition is Exceptional. Lauderdale County has received this ranking twice over the 15-year reporting period. The extent of extreme heat can be measured by the record high temperature recorded. The highest recorded temperature in Meridian was 107°F in 1980.
Wildfire	Wildfire data was provided by the Mississippi Forestry Commission and is reported annually by county from 2015-2019. The greatest number of fires to occur in Lauderdale County in any year 53 in 2007. The greatest number of acres to burn in the county in a single year occurred in 2007 when 887 acres were burned. Although this data lists the extent that has occurred, larger and more frequent wildfires are possible throughout the county.
Geologic Hazards	
Earthquake	Earthquake extent can be measured by the Richter Scale, the Modified Mercalli Intensity (MMI) scale, and the distance of the epicenter from Lauderdale County. According to data provided by the National Geophysical Data Center, the greatest earthquake to impact the county was reported in Enterprise with a MMI of IV (slight), an unknown magnitude, and 218 km away from the epicenter.
Landslide	As noted above in the landslide profile, there is no extensive history of landslides in Lauderdale County and landslide events typically occur in isolated areas. This provides a challenge when trying to determine an accurate extent for the landslide hazard. However, when using the USGS landslide susceptibility index, extent can be measured with incidence, which is low throughout the entire county. There is also low susceptibility across the county.
Land Subsidence	The extent of land subsidence can be defined by the measurable rate of subsidence that occurs. There are no subsidence rate records located in Lauderdale County nor is there any significant historical record of events.

Wind-related Hazards	
Hurricane and Tropical Storm	Hurricane extent is defined by the Saffir-Simpson Scale which classifies hurricanes into Category 1 through Category 5. The greatest classification of hurricane to traverse directly through Lauderdale County was Hurricane Frederic, a Category 1 storm which carried tropical force winds of 65 knots upon arrival in the county.
Thunderstorm / Hail / Lightning	Thunderstorm extent is defined by the number of thunder events and wind speeds reported. According to a 65-year history from the National Centers for Environmental Information, the strongest recorded wind event in Lauderdale County was reported on April 4, 2008 at 87 knots (approximately 100 mph). It should be noted that future events may exceed these historical occurrences. Hail extent can be defined by the size of the hail stone. The largest hail stone reported in Lauderdale County was 2.75 inches (reported on April 15, 2011). It should be noted that future events may exceed this. According to the Vaisala's flash density map (Figure 5.17), Lauderdale County is located in an area that experiences 6 to 8 lightning flashes per square kilometer per year. It should be noted that future lightning occurrences may exceed these figures.
Tornado	Tornado hazard extent is measured by tornado occurrences in the US provided by FEMA (Figure 5.18) as well as the Fujita/Enhanced Fujita Scale (Tables 5.27 and 5.28). The greatest magnitude reported in Lauderdale County was an F4 (last reported on March 12, 1986).
Other Hazards	
Hazardous Materials Incident	According to USDOT PHMSA, the largest hazardous materials incident reported in the Lauderdale County was 13,000 LGA released on the railway (reported on May 29, 1982). It should be noted that larger events are possible.
Pandemic	While pandemics remain to be rare occurrences overall, it cannot be ignored that as of the drafting of this plan the world continues to be engulfed by the COVID-19 Pandemic.

PRIORITY RISK INDEX RESULTS

In order to draw some meaningful planning conclusions on hazard risk for Lauderdale County, the results of the hazard profiling process were used to generate countywide hazard classifications according to a "Priority Risk Index" (PRI). More information on the PRI and how it was calculated can be found in Section 5.16.2.

The table below summarizes the degree of risk assigned to each category for all initially identified hazards based on the application of the PRI. Assigned risk levels were based on the detailed hazard profiles developed for this section, as well as input from the Regional Hazard Mitigation Council. The results were then used in calculating PRI values and making final determinations for the risk assessment.

Table D.25: SUMMARY OF PRI RESULTS FOR LAUDERDALE COUNTY

Hazard	Category/Degree of Risk					
	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score
Flood-related Hazards						
Flood	Likely	Critical	Moderate	6 to 12 hours	Less than 24 hours	**2.9**
Erosion	Possible	Minor	Small	More than 24 hours	More than 1 week	**1.8**
Dam Failure	Possible	Critical	Small	Less than 6 hours	Less than 6 hours	**2.4**
Winter Storm and Freeze	Likely	Limited	Moderate	More than 24 hours	Less than 24 hours	**2.4**
Fire-related Hazards						
Drought / Heat Wave	Likely	Minor	Large	More than 24 hours	More than 1 week	**2.5**
Wildfire	Highly Likely	Minor	Small	Less than 6 hours	Less than 1 week	**2.6**
Geologic Hazards						
Earthquake	Possible	Minor	Moderate	Less than 6 hours	Less than 6 hours	**2.0**
Landslide	Unlikely	Minor	Small	Less than 6 hours	Less than 6 hours	**1.5**
Land Subsidence	Unlikely	Minor	Small	Less than 6 hours	Less than 6 hours	**1.5**
Wind-related Hazards						
Hurricane and Tropical Storm	Likely	Critical	Large	More than 24 hours	Less than 24 hours	**2.9**
Thunderstorm Wind / High Wind	Highly Likely	Critical	Moderate	6 to 12 hours	Less than 6 hours	**3.1**
Hailstorm	Highly Likely	Limited	Moderate	6 to 12 hours	Less than 6 hours	**2.8**
Lightning	Highly Likely	Limited	Negligible	6 to 12 hours	Less than 6 hours	**2.4**
Tornado	Likely	Catastrophic	Small	Less than 6 hours	Less than 6 hours	**3.0**
Other Hazards						
Hazardous Materials Incident	Likely	Limited	Small	Less than 6 hours	Less than 24 hours	**2.5**
Pandemic	Unlikely	Catastrophic	Large	More than 24 hours	More than 24hrs	**2.8**

D.2.16 Final Determinations on Hazard Risk

The conclusions drawn from the hazard profiling process for Lauderdale County, including the PRI results and input from the Regional Hazard Mitigation Council, resulted in the classification of risk for each identified hazard according to three categories: High Risk, Moderate Risk, and Low Risk (**below**). For purposes of these classifications, risk is expressed in relative terms according to the estimated impact that a hazard will have on human life and property throughout all of Lauderdale County. A more quantitative analysis to estimate potential dollar losses for each hazard has been performed separately, and is described in Section 6: *Vulnerability Assessment* and below in Section D.3. It should be noted that although some hazards are classified below as posing low risk, their occurrence of varying or unprecedented magnitudes is still possible in some cases and their assigned classification will continue to be evaluated during future plan updates.

Table D.26: CONCLUSIONS ON HAZARD RISK FOR LAUDERDALE COUNTY

HIGH RISK	Thunderstorm Wind / High Wind Tornado Flood Hurricane and Tropical Storm Hailstorm Pandemic
MODERATE RISK	Wildfire Drought / Heat Wave Hazardous Materials Incident Dam and Levee Failure Winter Storm and Freeze Lightning
LOW RISK	Earthquake Erosion Landslide Land Subsidence

D.3 LAUDERDALE COUNTY VULNERABILITY ASSESSMENT

This subsection identifies and quantifies the vulnerability of Lauderdale County to the significant hazards previously identified. This includes identifying and characterizing an inventory of assets in the county and assessing the potential impact and expected amount of damages caused to these assets by each identified hazard event. More information on the methodology and data sources used to conduct this assessment can be found in Section 6: *Vulnerability Assessment*.

D.3.1 Asset Inventory

The following table lists the fire stations, police stations, emergency operations centers (EOCs), medical care facilities, and schools located in Lauderdale County according to Hazus-MH Version 2.2.

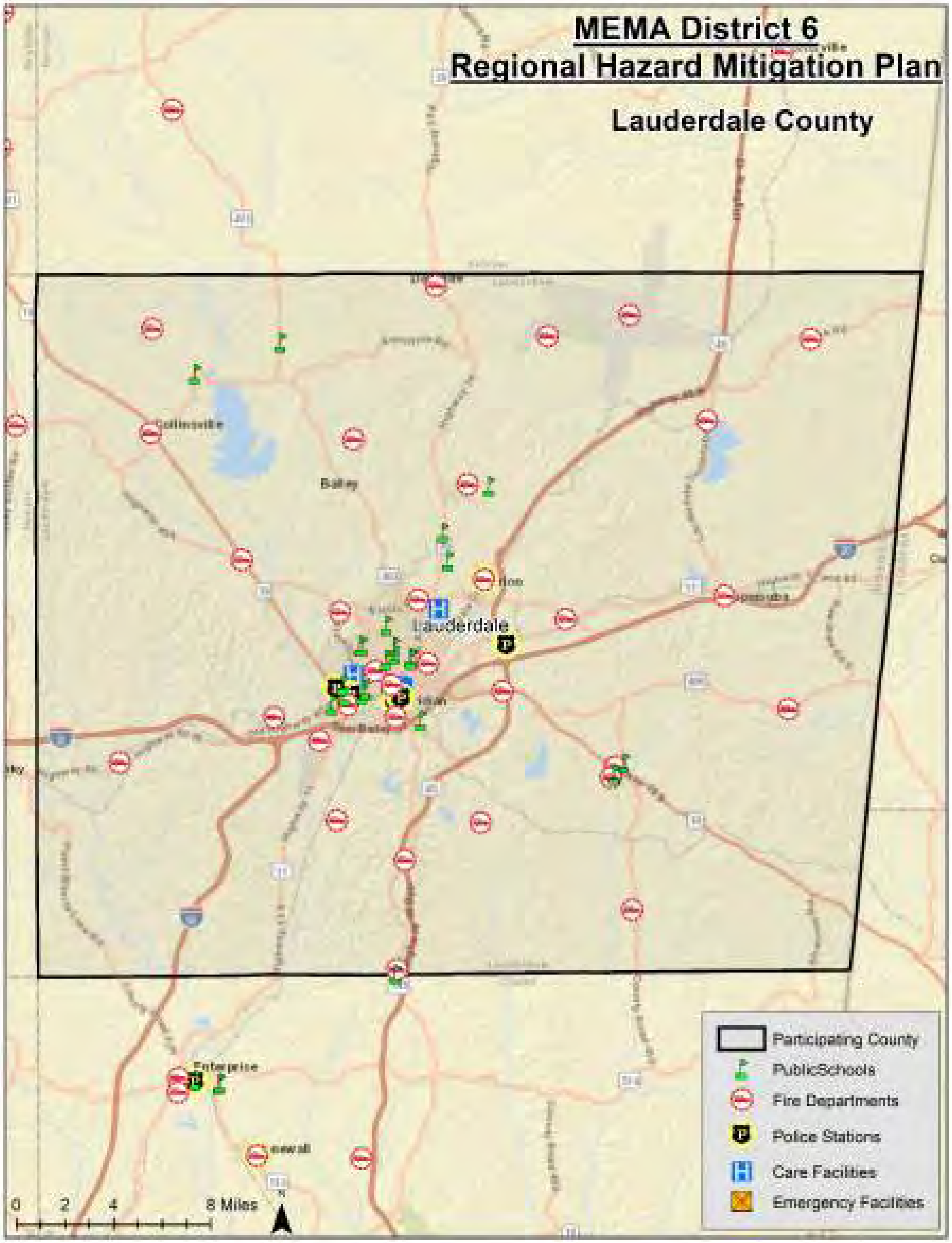
In addition, **Figure D.13** shows the locations of critical facilities in Lauderdale County. At the end of this subsection, a complete list of the critical facilities by name, as well as the hazards that affect each facility can be found. As noted previously, this list is not all-inclusive and only includes information provided through Hazus.

Table D.27: CRITICAL FACILITY INVENTORY IN LAUDERDALE COUNTY

Location	Fire Stations	Police Stations	Medical Care Facilities	EOC	Schools
Marion	1	1	0	0	0
Meridian	24	7	8	1	32
Unincorporated Area	9	0	0	0	2
ASSET VALUATION	**$77,967,253**	**$18,345,236**	**$123,864,333**	**$2,293,154**	**$217,184,164**
LAUDERDALE COUNTY TOTAL	**34**	**8**	**8**	**1**	**34**

Source: Hazus-MH 2.2

Figure D.13: CRITICAL FACILITY LOCATIONS IN LAUDERDALE COUNTY



Source: Hazus-MH 2.2

D.3.2 Social Vulnerability

In addition to identifying those assets potentially at risk to identified hazards, it is important to identify and assess those particular segments of the resident population in Lauderdale County that are potentially at risk to these hazards.

The following table lists the population by jurisdiction according to U.S. Census American Community Survey 2019 population estimates. The total population in Lauderdale County according to Census data is 80,261 persons. Additional population estimates are presented above in Section D.1.

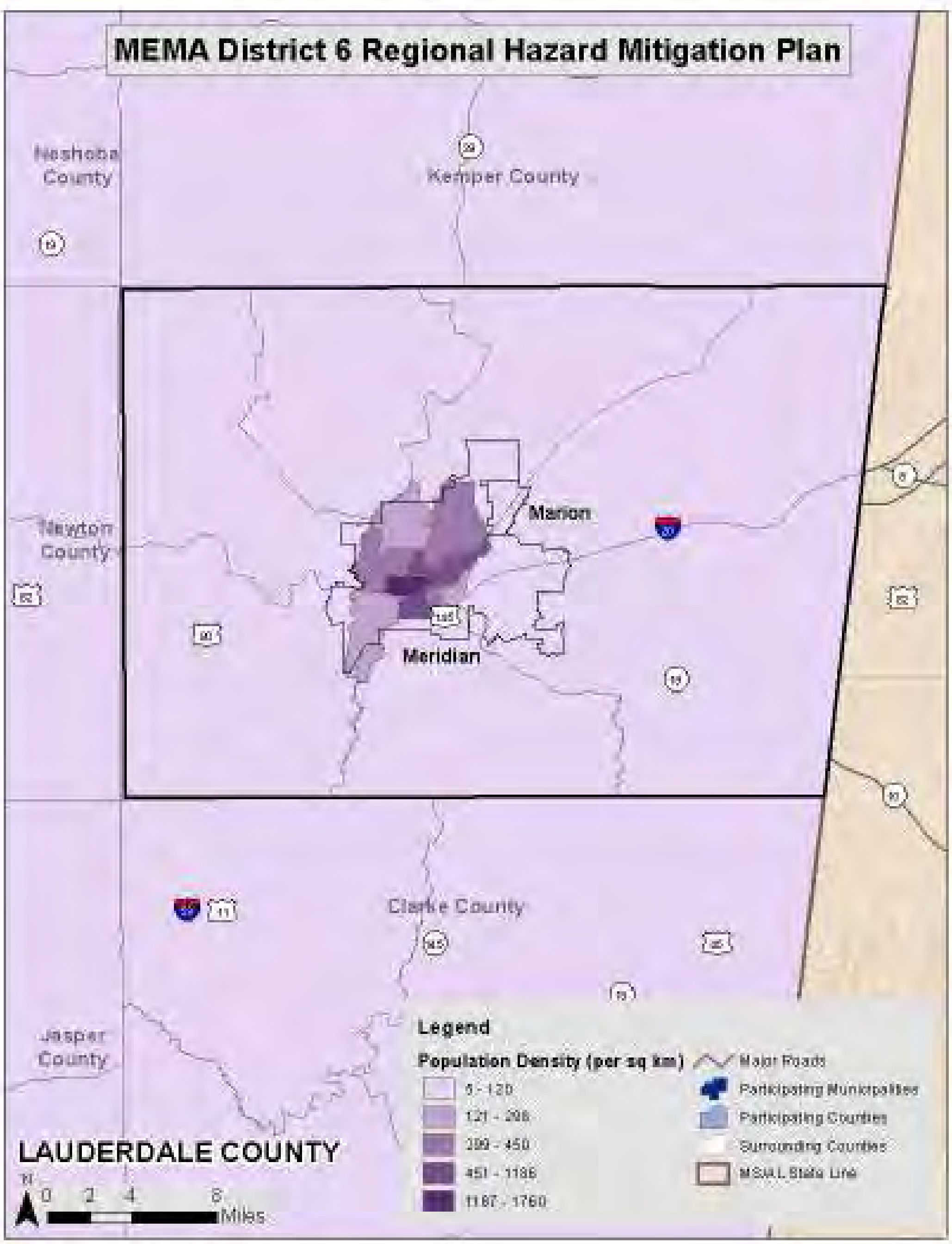
Table D.28: TOTAL POPULATION IN LAUDERDALE COUNTY

Location	Total 2019 Population
Marion	1,547
Meridian	40,507
Unincorporated Area	37,778
LAUDERDALE COUNTY TOTAL	**79,832**

Source: United States Census – American Community Survey

In addition, **Figure D.14** illustrates the population density per square kilometer by census tract as it was reported by the U.S. Census Bureau in 2010. This data remains unchanged since last plan update.

Figure D.14: POPULATION DENSITY IN LAUDERDALE COUNTY



Source: United States Census Bureau, 2010

D.3.3 Development Trends and Changes in Vulnerability

Since the previous county hazard mitigation plan was approved (in 2015), Lauderdale County has experienced limited growth and development. The following table shows the number of building units constructed since 2014 according to the U.S. Census American Community Survey.

Table D.29: BUILDING COUNTS FOR LAUDERDALE COUNTY

Jurisdiction	Total Housing Units (2019)	Units Built 2014 or later	% Building Stock Built Post-2014
Marion	772	22	2.8%
Meridian	19,130	26	0.1%
Unincorporated Area	15,395	400	2.5%
LAUDERDALE COUNTY TOTAL	**35,297**	**448**	**1.3%**

Source: United States Census Bureau American Community Survey

The following table shows population growth estimates for the county from 2015 to 2019 based on the U.S. Census Annual Estimates of Resident Population.

Table D.30: POPULATION GROWTH FOR LAUDERDALE COUNTY

Jurisdiction	Population Estimates (as of July 1)					% Change 2015-2019
	2015	2016	2017	2018	2019	
Marion	1,547	1,581	1,492	1,522	1,683	8.79%
Meridian	40,507	40,094	39,213	38,602	37,848	-6.56%
Unincorporated Area	36,470	36,080	35,450	35,193	34,594	-5.14%
LAUDERDALE COUNTY TOTAL	**78,524**	**77,755**	**76,155**	**75,317**	**74,125**	**-5.60%**

Source: United States Census Bureau – American Community Survey

Based on the data above, there has been a low rate of residential development along with slight population decline in the county since 2015. However, the Town of Marion and has experienced a slightly higher rate of development compared to the rest of the county, resulting in an increased number of structures that are vulnerable to the potential impacts of the identified hazards. Additionally, there was a higher rate of population growth in the Town of Marion. Since the population has increased in this jurisdiction, there are now greater numbers of people exposed to the identified hazards. Therefore, development and population growth have impacted the county's vulnerability since the previous local hazard mitigation plan was approved and there has been a slight increase in the overall vulnerability.

It is also important to note that as development increases in the future, greater populations and more structures and infrastructure will be exposed to potential hazards if development occurs in the floodplains, moderate and high landside susceptibility areas, high wildfire risk areas, or primary and secondary TRI site buffers.

D.3.4 Vulnerability Assessment Results

As noted in Section 6: *Vulnerability Assessment*, only hazards with a specific geographic boundary, available modeling tool, or sufficient historical data allow for further analysis. Those results, specific to Lauderdale County, are presented here. All other hazards are assumed to impact the entire planning region (drought / heat wave; thunderstorm—wind, hail, lightning; tornado; and winter storm and freeze) or, due to lack of data, analysis would not lead to credible results (dam and levee failure, erosion, and land subsidence). In the case of landslide, local officials determined that the USGS data may be somewhat amiss and that even the areas identified as moderate risks probably entailed an overall low risk.

The hazards to be further analyzed in this subsection include: flood, wildfire, earthquake, hurricane and tropical storm winds, and hazardous materials incident.

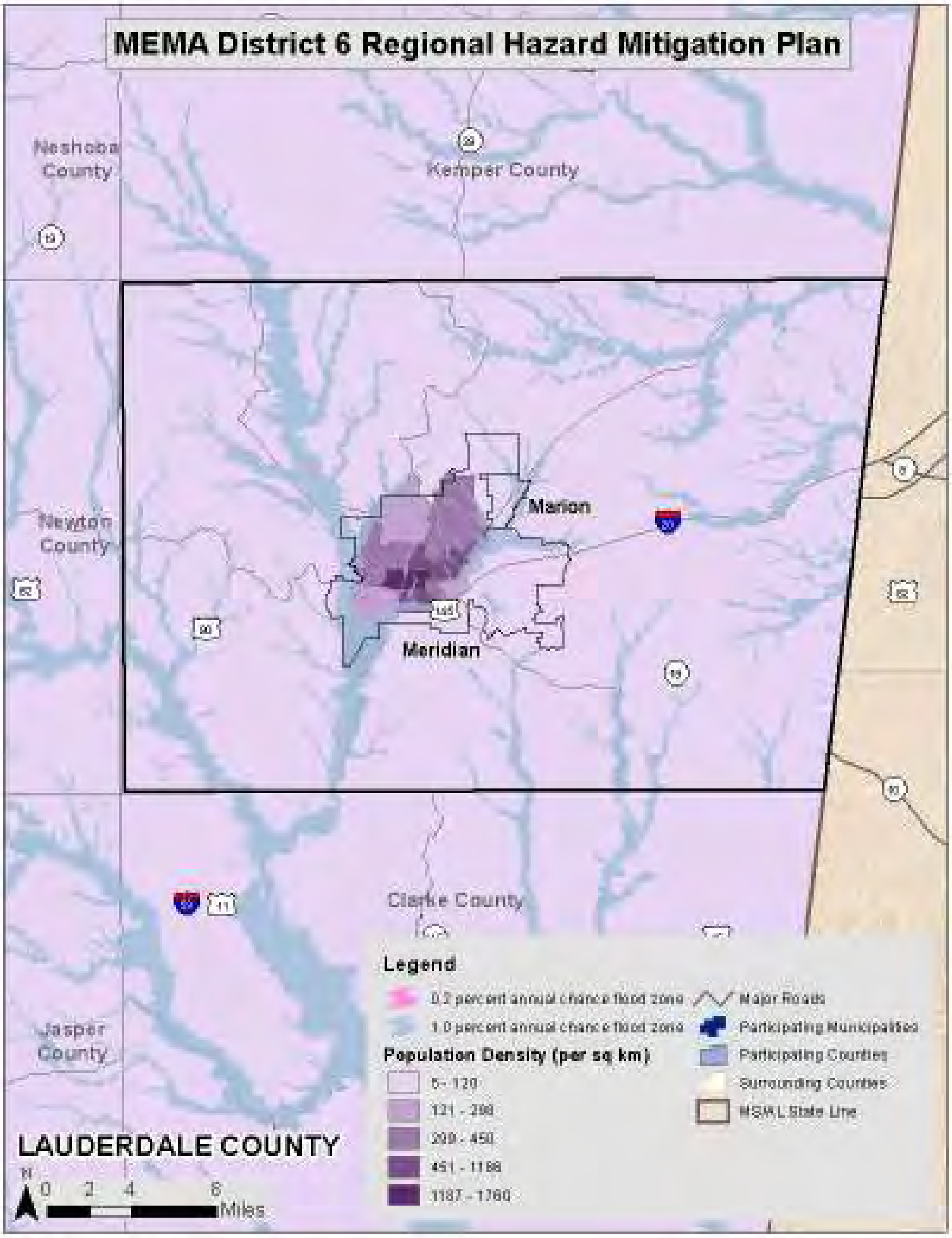
The annualized loss estimate for all hazards is presented near the end of this subsection**.**

FLOOD

Historical evidence indicates that Lauderdale County is susceptible to flood events. A total of 74 flood events have been reported by the National Centers for Environmental Information resulting in $55.6 million in property damage. On an annualized level, these damages amounted to $2.31 million for Lauderdale County.

Social Vulnerability
Figure D.15 is presented to gain a better understanding of at-risk population by evaluating census tract level population data against mapped floodplains. There are areas of concern in several areas of the county. Indeed, nearly every incorporated municipality is potentially at risk of being impacted by flooding in some areas of its jurisdiction. Therefore, further investigation in these areas may be warranted. Population density remains unchanged since the last plan update.

Figure D.15: POPULATION DENSITY NEAR FLOODPLAINS



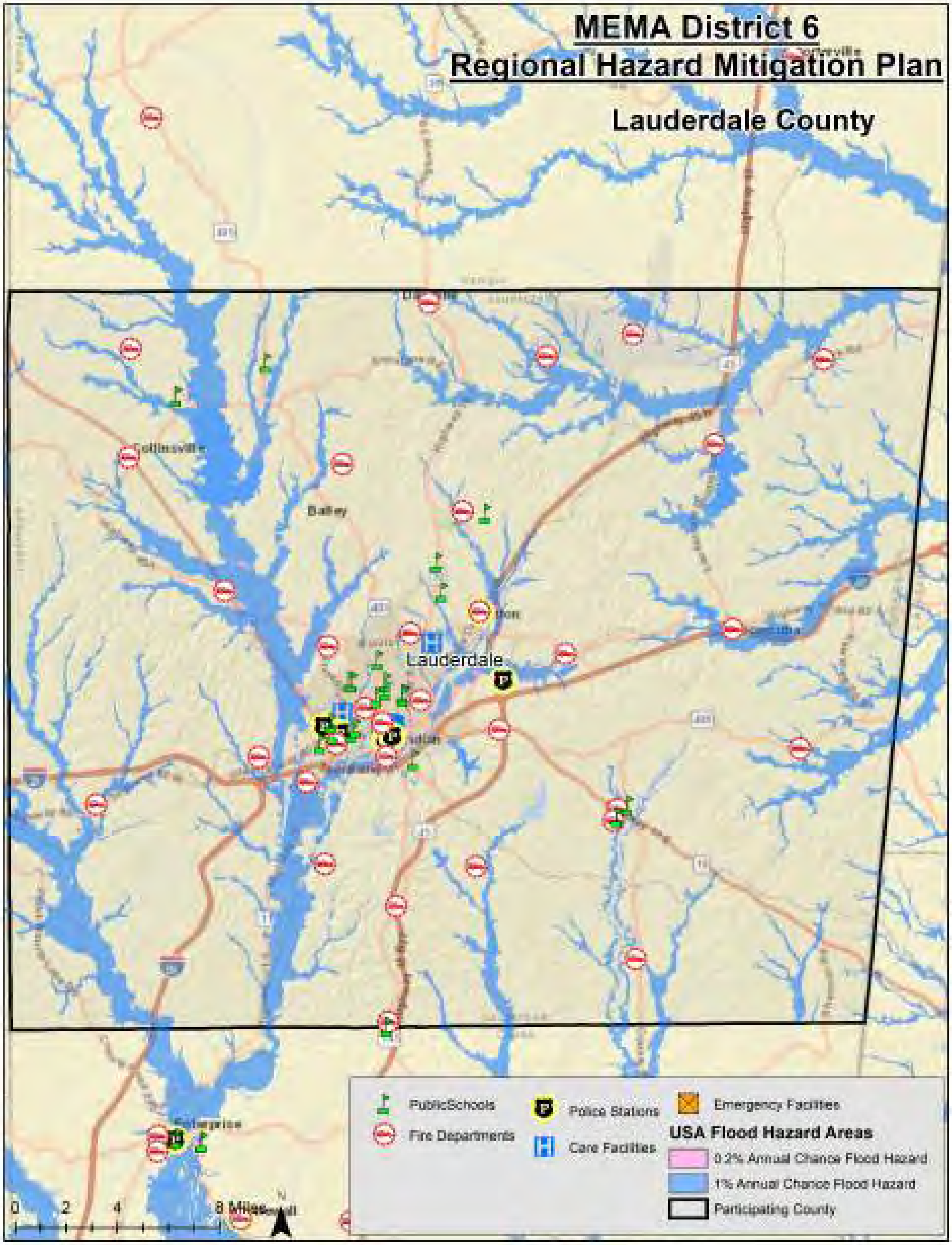
Source: Federal Emergency Management Agency DFIRM, United States Census 2010

Critical Facilities

The following figure shows critical facilities in relation to Special Flood Hazard Areas. (Please note, as previously indicated, this analysis does not consider building elevation, which may negate risk.) This facility is a school located in the 1.0 percent annual chance flood zone. A list of specific critical facilities and their associated risk can be found at the end of this section.

In conclusion, a flood has the potential to impact many existing and future buildings, facilities, and populations in Lauderdale County, though some areas are at a higher risk than others. All types of structures in a floodplain are at-risk, though elevated structures will have a reduced risk. Such site-specific vulnerability determinations are outside the scope of this assessment but will be considered during future plan updates. Furthermore, areas subject to repetitive flooding should be analyzed for potential mitigation actions.

Figure D.16: CRITICAL FACILITY ANALYSIS - SFHA



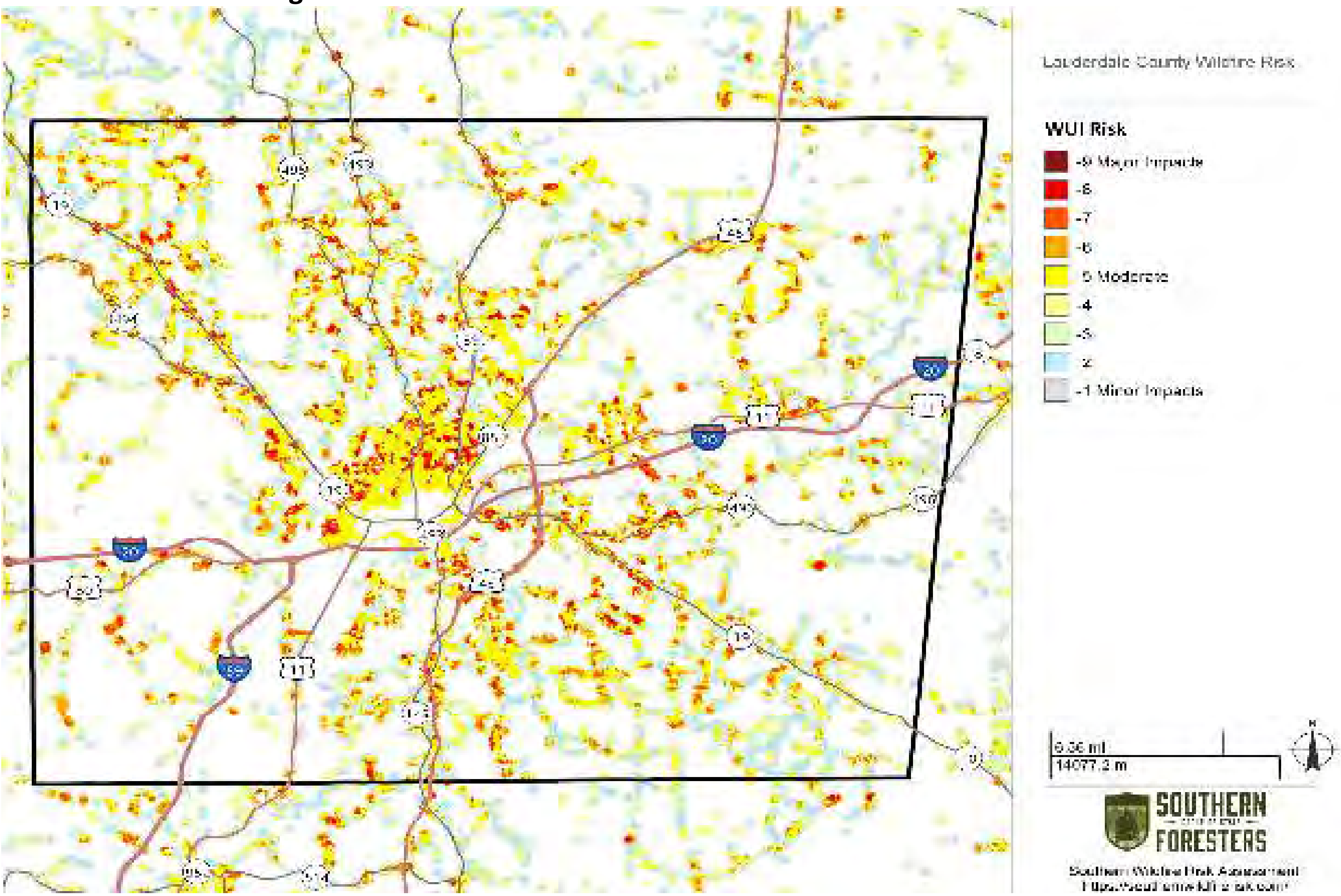
WILDFIRE

Although historical evidence indicates that Lauderdale County is susceptible to wildfire events, there are few reports of damage. Therefore, it is difficult to calculate a reliable annualized loss figure. Annualized loss is considered negligible though it should be noted that a single event could result in significant damages throughout the county.

To estimate exposure to wildfire, building data was obtained from Hazus-MH 2.2 which includes information that has been aggregated at the Census block level and which has been deemed useful for analyzing wildfire vulnerability. However, it should be noted that the accuracy of Hazus data is somewhat lower than that of parcel data. For the critical facility analysis, areas of concern were intersected with critical facility locations.

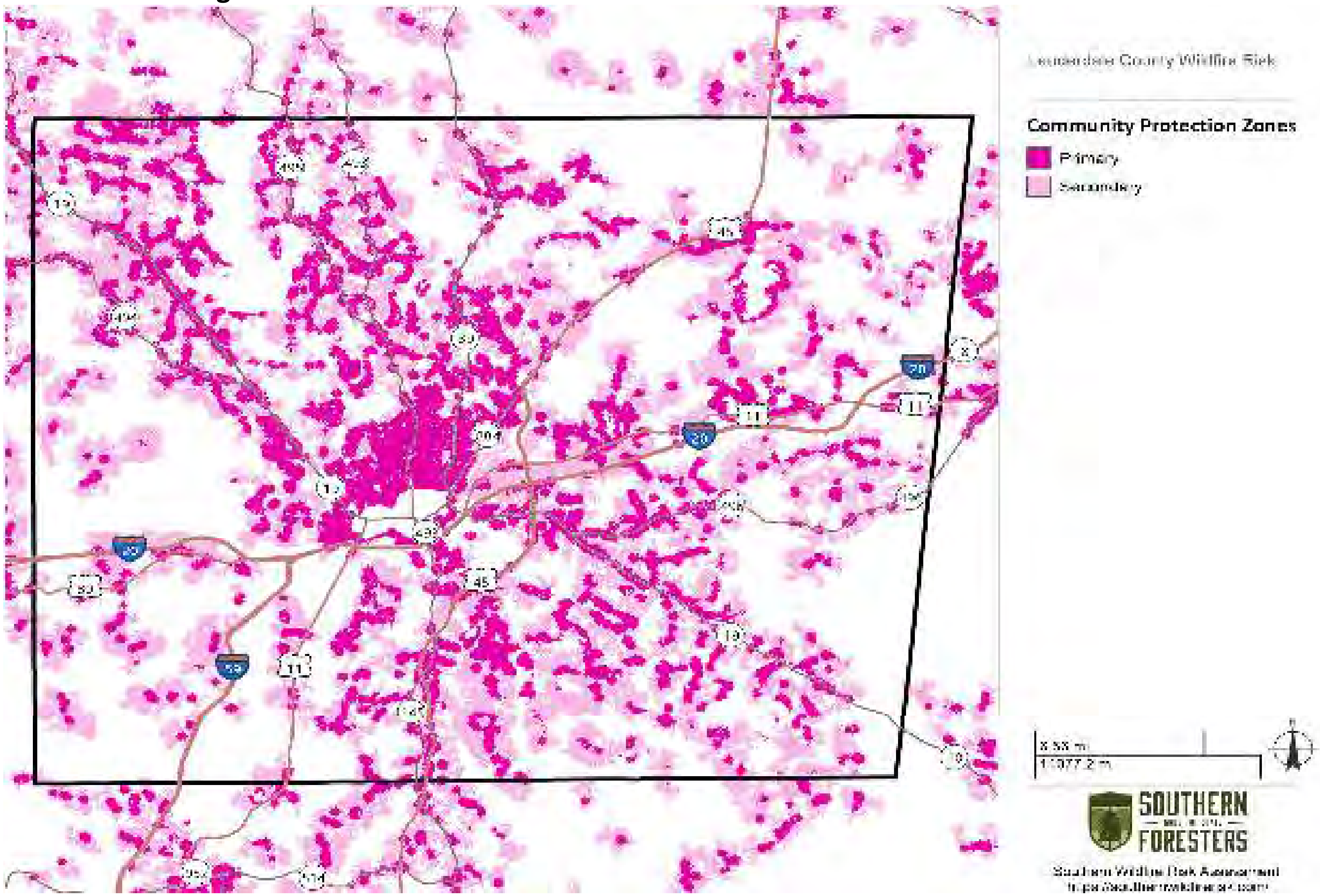
Figure D.17 shows the Wildland Urban Interface Risk Index (WUIRI) data, which is a data layer that shows a rating of the potential impact of a wildfire on people and their homes. The key input, Wildland Urban Interface (WUI), reflects housing density (houses per acre) consistent with Federal Register National standards. The location of people living in the WUI and rural areas is key information for defining potential wildfire impacts to people and homes. Initially provided as raster data, it was converted to a polygon to allow for analysis. The Wildland Urban Interface Risk Index data ranges from 0 to -9 with lower values being most severe (as noted previously, this is only a measure of relative risk). **Figure D.18** Community Protection Zones (CPZ) represent those areas considered highest priority for mitigation planning activities**.** CPZs are based on an analysis of the *Where People Live* housing density data and surrounding fire behavior potential. Rate of Spread data is used to determine the areas of concern around populated areas that are within a 2-hour fire spread distance. This is referred to as the Secondary CPZ. **Figure D.19** shows critical facilities in relation to historical wildfire burns.

Figure D.17: WUI RISK INDEX AREAS IN LAUDERDALE COUNTY



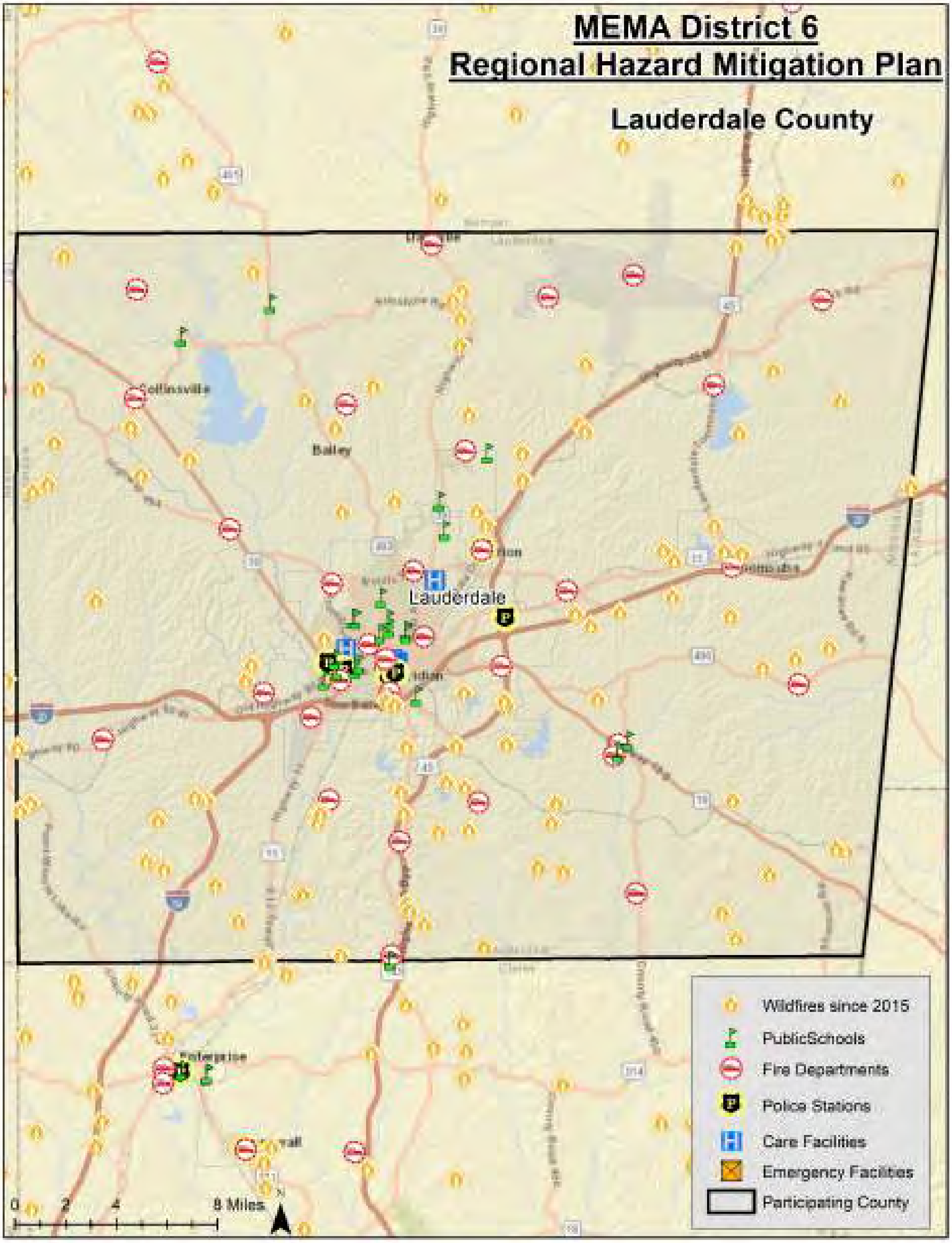
Source: Southern Wildfire Risk Assessment Data

Figure D.18: COMMUNITY PROTECTION ZONES IN LAUDERDALE COUNTY



Source: Southern Wildfire Risk Assessment Data

Figure D.19: CRITICAL FACILITY ANALYSIS – WILDFIRE



Source: Southern Wildfire Risk Assessment Data

Social Vulnerability

Given some level of susceptibility across the entire county, it is assumed that the total population is at risk to the wildfire hazard. Determining the exact number of people in certain wildfire zones is difficult with existing data and could be misleading. In particular, the expansion of residential development from urban centers out into rural landscapes, increases the potential for wildland fire threat to public safety and the potential for damage to forest resources and dependent industries. This increase in population across the region will impact counties and communities that are located within the Wildland Urban Interface (WUI). The WUI is described as the area where structures and other human improvements meet and intermingle with undeveloped wildland or vegetative fuels. Population growth within the WUI substantially increases the risk from wildfire.

For the Lauderdale County Wildfire Risk project area, it is estimated that 67,879 people or 84.7 % percent of the total project area population (80,187) live within the WUI.

Critical Facilities

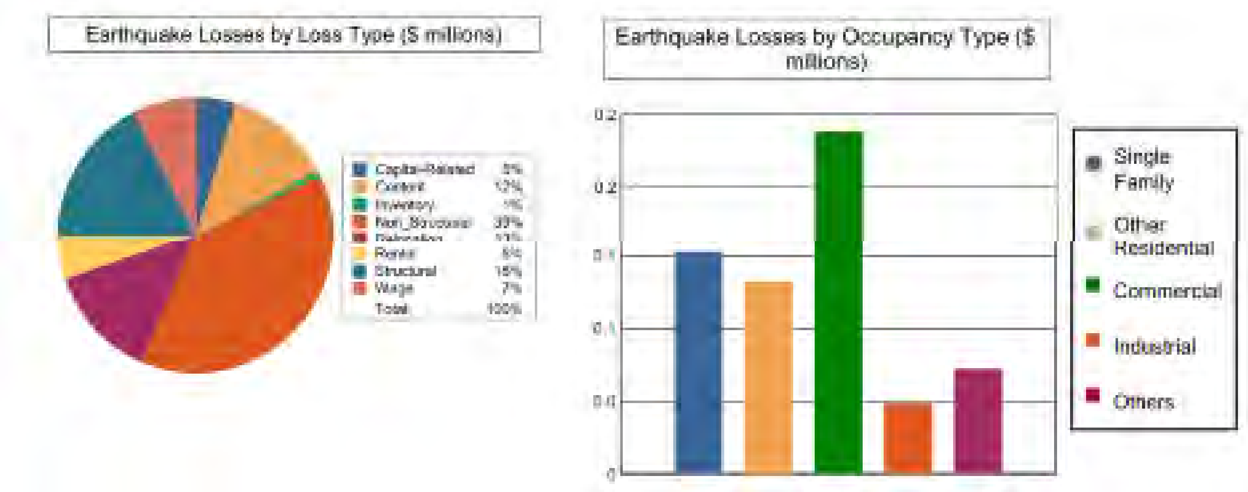
The critical facility analysis revealed that there are two critical facilities located in wildfire areas of concern, including one police station and one school. It should be noted, that several factors could impact the spread of a wildfire putting all facilities at risk. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

In conclusion, a wildfire event has the potential to impact many existing and future buildings, critical facilities, and populations in Lauderdale County.

EARTHQUAKE

A probabilistic earthquake model was performed for the MEMA District 6 Region. As the Hazus-MH model suggests below, and historical occurrences confirm, any earthquake activity in the area is likely to inflict minor damage to the county. Hazus-MH 2.2 estimates the total building-related losses were $520,000; 31 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 44 % of the total loss. The figure below provides a summary of the losses associated with the building damage.

Figure D.20: MEMA D6 EARTHQUAKE LOSSES BY TYPE



For the earthquake hazard vulnerability assessment, a probabilistic scenario was created to estimate the average annualized loss for the region. The results of the analysis are generated at the Census Tract level within Hazus-MH and then aggregated to the region level. Since the scenario is annualized, no building counts are provided. Losses reported included losses due to structure failure, building loss, contents damage, and inventory loss.

Social Vulnerability

It can be assumed that all existing and future populations are at risk to the earthquake hazard. Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 39 households to be displaced due to the earthquake. Of these, 32 people (out of a total population of 244,467) will seek temporary shelter in public shelters. [7] The total economic loss estimated for the earthquake is 76.76 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory.

Critical Facilities

The Hazus-MH probabilistic analysis indicated that no critical facilities would sustain measurable damage in an earthquake event. However, all critical facilities should be considered at-risk to minor damage, should an event occur. Before the earthquake, the region had 1,241 hospital beds available for use. On the day of the earthquake, the model estimates that only 1,035 hospital beds (83.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 93.00% of the beds will be back in service. By 30 days, 99.00% will be operational.

In conclusion, an earthquake has the potential to impact all existing and future buildings, facilities, and populations in Lauderdale County. The Hazus-MH scenario indicates that minimal to moderate damage is expected from an earthquake occurrence. While Lauderdale County may not experience a large earthquake (the greatest on record is a magnitude IV MMI), localized damage is possible with an occurrence. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

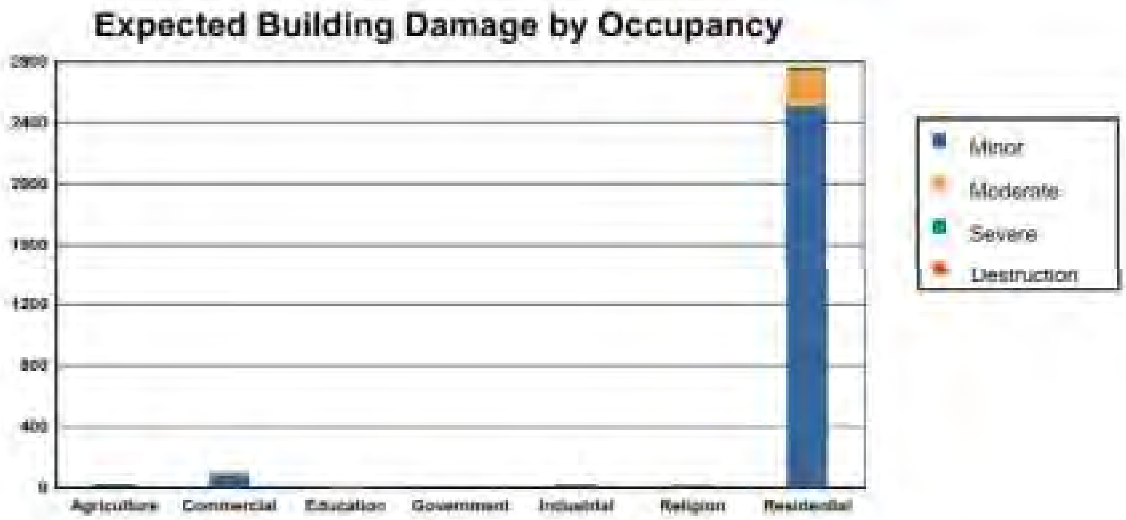
HURRICANE AND TROPICAL STORM

[7] HAZUS-MH utilizes 2010 Census Data

Historical evidence indicates that Lauderdale County has some risk to the hurricane and tropical storm hazard. There have been five disaster declarations due to hurricanes (Hurricanes Frederic, Ivan, Dennis, Katrina, and Isaac). Several tracks have come near or traversed through the county, as shown and discussed in Section D.2.10.

A probabilistic 100-year hurricane model was performed for the MEMA District 6. Hazus estimates that about 289 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 12 buildings that will be completely destroyed. The figure below summarizes the expected damage by general occupancy for the buildings in the region.

Figure D.21: MEMA D6 100-YEAR HURRICANE



Hurricanes and tropical storms can cause damage through numerous additional hazards such as flooding, erosion, tornadoes, and high winds, thus it is difficult to estimate total potential losses from these cumulative effects. The current Hazus-MH hurricane model only analyzes hurricane winds and is not capable of modeling and estimating cumulative losses from all hazards associated with hurricanes; therefore, only hurricane winds are analyzed in this section. It can be assumed that all existing and future buildings and populations are at risk to the hurricane and tropical storm hazard.

Social Vulnerability

Given equal susceptibility across the county, it is assumed that the total population, both current and future, is at risk to the hurricane and tropical storm hazard. Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 34 households to be displaced due to the hurricane. Of these, 26 people (out of a total population of 244,467) will seek temporary shelter in public shelters.

Critical Facilities

Given equal vulnerability across Lauderdale County, all critical facilities are considered to be at risk. Some buildings may perform better than others in the face of such an event due to construction and age, among other factors. Determining individual building response is beyond the scope of this plan. However, this plan will consider mitigation action for especially vulnerable structures and/or critical facilities to mitigate against the effects of the hurricane hazard. A list of specific critical facilities can be found at the end of this subsection.

In conclusion, a hurricane event has the potential to impact many existing and future buildings, critical facilities, and populations in Lauderdale County.

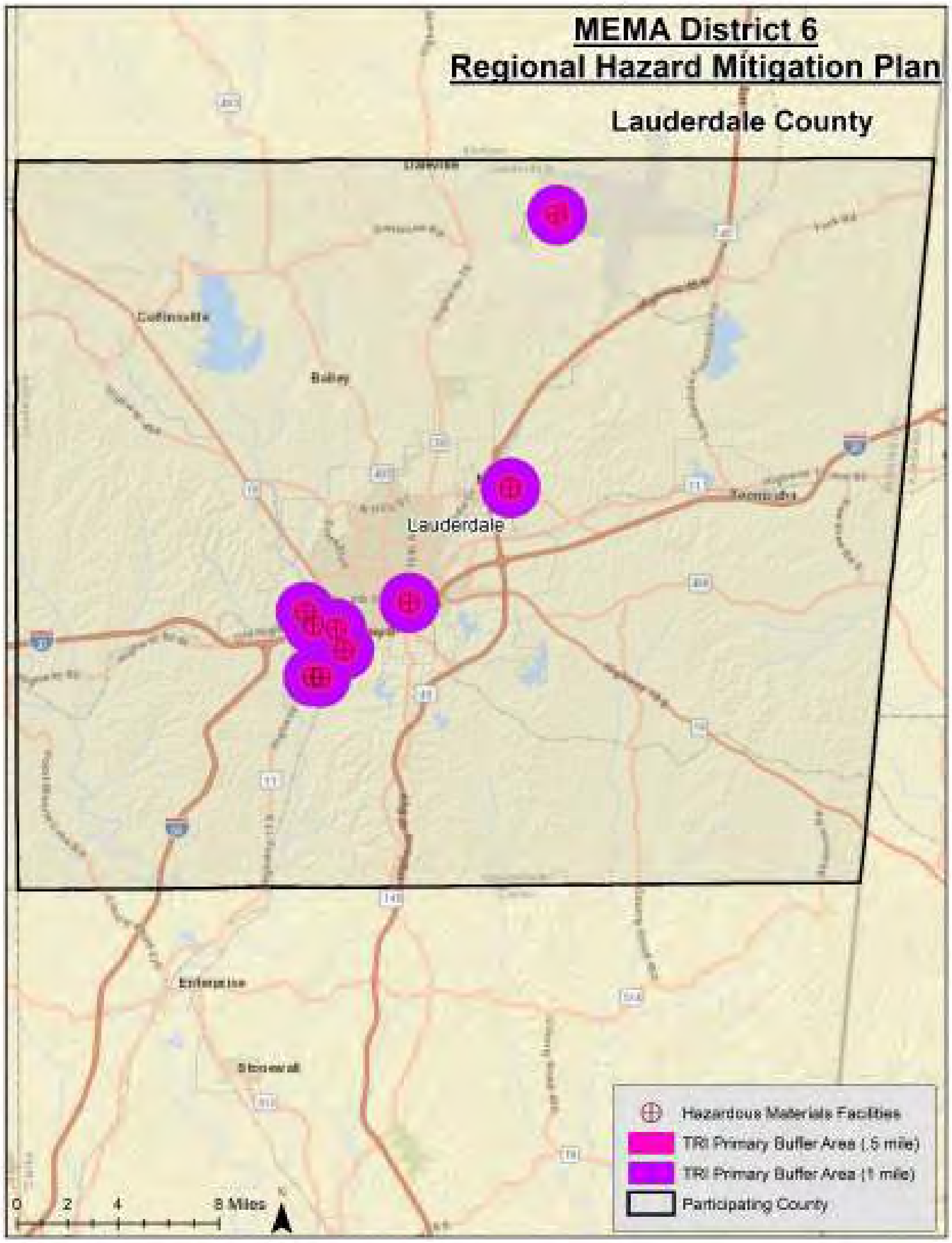
HAZARDOUS MATERIALS INCIDENT

Historical evidence indicates that Lauderdale County is susceptible to hazardous materials events. A total of 276 HAZMAT incidents have been reported by the Pipeline and Hazardous Materials Safety Administration, resulting in over $2 million in property damage as well as 7 injuries. On an annualized level, these damages amount to $63,955 for the county.

Most hazardous materials incidents that occur are contained and suppressed before destroying any property or threatening lives. However, they can have a significant negative impact. Such events can cause multiple deaths, completely shut down facilities for 30 days or more, and cause more than 50 percent of affected properties to be destroyed or suffer major damage. In a hazardous materials incident, solid, liquid, and/or gaseous contaminants may be released from fixed or mobile containers. Weather conditions will directly affect how the hazard develops. Certain chemicals may travel through the air or water, affecting a much larger area than the point of the incidence itself. Non-compliance with fire and building codes, as well as failure to maintain existing fire and containment features, can substantially increase the damage from a hazardous materials release. The duration of a hazardous materials incident can range from hours to days. Warning time is minimal to none.

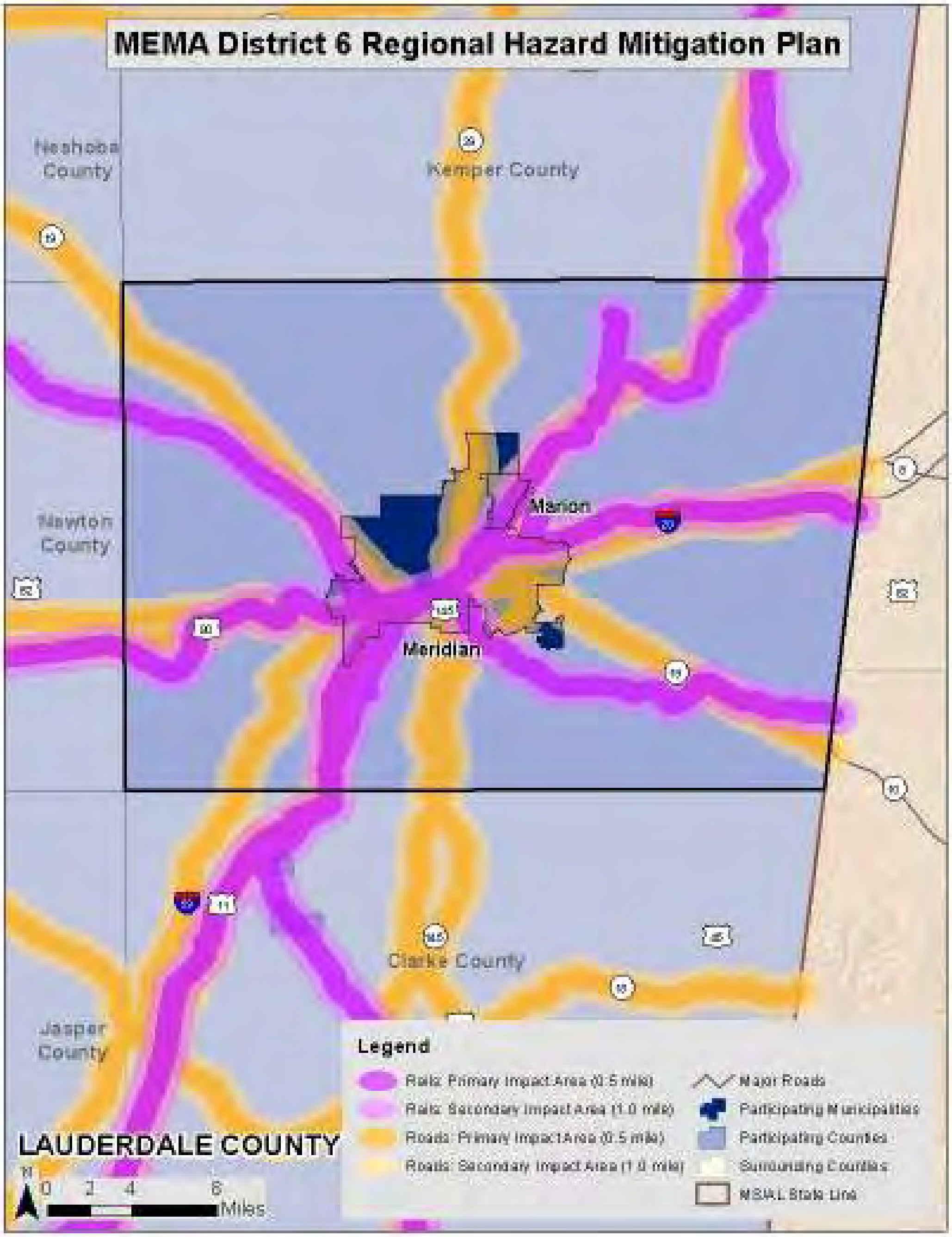
In order to conduct the vulnerability assessment for this hazard, GIS intersection analysis was used for fixed and mobile areas and building footprints/parcels. In both scenarios, two sizes of buffers—0.5-mile and 1.0-mile—were used. These areas are assumed to represent the different levels of effect: immediate (primary) and secondary. Primary and secondary impact zones were selected based on guidance from the PHMSA Emergency Response Guidebook. For the fixed site analysis, geo-referenced TRI sites in the region, along with buffers, were used for analysis as shown in **Figure D.22.** For the mobile analysis, the major roads (Interstate highway, U.S. highway, and State highway) and railroads, where hazardous materials are primarily transported that could adversely impact people and buildings, were used for the GIS buffer analysis. **Figure D.23** shows the areas used for mobile toxic release buffer analysis.

Figure D.22: TRI SITES WITH BUFFERS IN LAUDERDALE COUNTY



Source: Environmental Protection Agency

Figure D.23: MOBILE HAZMAT BUFFERS IN LAUDERDALE COUNTY



Social Vulnerability
Given high susceptibility across the entire county, it is assumed that the total population is at risk to a hazardous materials incident. It should be noted that areas of population concentration may be at an elevated risk due to a greater burden to evacuate population quickly.

Critical Facilities
Fixed Site Analysis:
The critical facility analysis for fixed TRI sites revealed that there are four facilities located in a HAZMAT risk zone. This includes one fire station and three schools. Only one facility is located within the primary impact zone. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

Mobile Analysis:
It should be presumed that any facility located near a public roadway or rail line is susceptible to a potential HAZMAT event. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

A list of specific critical facilities and their associated risk can be found at the end of this subsection.

In conclusion, a hazardous material incident has the potential to impact many existing and future buildings, critical facilities, and populations in Lauderdale County. Those areas in a primary buffer are at the highest risk, though all areas carry some vulnerability due to variations in conditions that could alter the impact area (i.e., direction and speed of wind, volume of release, etc.). Further, incidents from neighboring counties could also impact the county and participating jurisdictions.

CONCLUSIONS ON HAZARD VULNERABILITY

The following table presents a summary of annualized loss for each hazard in Lauderdale County. Due to the reporting of hazard damages primarily at the county level, it was difficult to determine an accurate annualized loss estimate for each municipality. Therefore, an annualized loss was determined through the damage reported through historical occurrences at the county level. These values should be used as an additional planning tool or measure risk for determining hazard mitigation strategies throughout the county.

Table D.31: ANNUALIZED LOSS FOR LAUDERDALE COUNTY

Event	Lauderdale County
Flood-related Hazards	
Flood	$2,316,958
Erosion	Negligible
Dam and Levee Failure	Negligible
Winter Storm & Freeze	$42,400
Fire-related Hazards	
Drought / Heat Wave	$7,500
Wildfire	Negligible
Geologic Hazards	
Earthquake	Negligible
Landslide	Negligible
Land Subsidence	Negligible
Wind-related Hazards	
Hurricane & Tropical Storm	$1,514,000
Thunderstorm / High Wind	$115,723
Hail	$9,206
Lightning	Negligible
Tornado	$275,521
Other Hazards	
HAZMAT Incident	$63,955
Pandemic	Negligible

**In this table, the term "Negligible" is used to indicate that no records of dollar losses for the particular hazard were recorded. This could be the case either because there were no events that caused dollar damage or because documentation of that particular type of event is not well kept. Annualized losses were calculated based on the total number of years of reporting and damage totals.*

As noted previously, all existing and future buildings and populations (including critical facilities) are vulnerable to atmospheric hazards including drought / heat wave, hurricane and tropical storm, thunderstorm (wind, hail, lightning), tornado, and winter storm and freeze. In addition, all buildings and populations are vulnerable to all of the man-made and technological hazards identified above. Some buildings may be more vulnerable to these hazards based on locations, construction, and building type. The following table shows the critical facilities vulnerable to additional hazards analyzed in this subsection. The table lists those assets that are determined to be exposed to each of the identified hazards (marked with an "**X**").

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Table D.32: AT-RISK CRITICAL FACILITIES IN LAUDERDALE COUNTY

		FLOOD-RELATED					FIRE-RELATED		GEOLOGIC			WIND-RELATED			OTHER						
FACILITY NAME	FACILITY TYPE	Flood – 100 yr	Flood – 500 yr	Erosion	Dam and Levee Failure[32]	Winter Storm and Freeze	Drought / Heat Wave	Wildfire	Earthquake	Landslide	Land Subsidence	Hurricane and Tropical Storm	Thunderstorm (wind, hail,	Tornado	Fixed HAZMAT – 0.5 mile	Fixed HAZMAT – 1.0 mile	Mobile HAZMAT – 0.5 mile (road)	Mobile HAZMAT – 1.0 mile (road)	Mobile HAZMAT – 0.5 mile (rail)	Mobile HAZMAT – 1.0 mile (rail)	Pandemic
LAUDERDALE COUNTY																					
Lauderdale County EOC	EOC			X	X	X	X		X	X	X	X	X	X				X	X	X	X
BAILEY VOLUNTEER FIRE AND RESCUE	Fire Station			X	X	X	X		X	X	X	X	X	X					X	X	X
MARTIN VOLUNTEER FIRE AND RESCUE	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
COLLINSVILLE VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
EAST NESHOBA VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
SAM DALE VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
LAUDERDALE VOLUNTEER FIRE AND RESCUE	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
CENTER RIDGE VOLUNTEER FIRE AND	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
MARION VOLUNTEER FIRE AND RESCUE	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
CITY OF MERIDIAN FIRE STATION #1	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
CITY OF MERIDIAN FIRE STATION #2	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
CITY OF MERIDIAN FIRE STATION #3	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
CITY OF MERIDIAN FIRE STATION #4	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
CITY OF MERIDIAN FIRE STATION #5	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X

		FLOOD-RELATED					FIRE-RELATED		GEOLOGIC			WIND-RELATED			OTHER						
FACILITY NAME	FACILITY TYPE	Flood – 100 yr	Flood – 500 yr	Erosion	Dam and Levee Failure[32]	Winter Storm and Freeze	Drought / Heat Wave	Wildfire	Earthquake	Landslide	Land Subsidence	Hurricane and Tropical Storm	Thunderstorm (wind, hail,	Tornado	Fixed HAZMAT – 0.5 mile	Fixed HAZMAT – 1.0 mile	Mobile HAZMAT – 0.5 mile (road)	Mobile HAZMAT – 1.0 mile (road)	Mobile HAZMAT – 0.5 mile (rail)	Mobile HAZMAT – 1.0 mile (rail)	Pandemic
LAUDERDALE COUNTY																					
CITY OF MERIDIAN FIRE STATION #6	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
CITY OF MERIDIAN FIRE STATION #7	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
CITY OF MERIDIAN FIRE STATION #8	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
RUSSELL VOLUNTEER FIRE AND RESCUE	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
NAVAL AIR STATION MERIDIAN FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
NAVAL AIR STATION MERIDIAN FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
NORTHEAST VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
SUQUALENA VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
MEEHAN VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
LOST GAP VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
CLARKDALE VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
CLARKDALE VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
SOUTH VOLUNTEER FIRE AND RESCUE	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
LONG CREEK VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
WHYNOT VOLUNTEER FIRE AND RESCUE	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
CAUSEYVILLE VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
VIMVILLE VOLUNTEER FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X

FACILITY NAME	FACILITY TYPE	FLOOD-RELATED: Flood – 100 yr	Flood – 500 yr	Erosion	Dam and Levee Failure[32]	Winter Storm and Freeze	FIRE-RELATED: Drought / Heat Wave	Wildfire	GEOLOGIC: Earthquake	Landslide	Land Subsidence	WIND-RELATED: Hurricane and Tropical Storm	Thunderstorm (wind, hail,	Tornado	OTHER: Fixed HAZMAT – 0.5 mile	Fixed HAZMAT – 1.0 mile	Mobile HAZMAT – 0.5 mile (road)	Mobile HAZMAT – 1.0 mile (road)	Mobile HAZMAT – 0.5 mile (rail)	Mobile HAZMAT – 1.0 mile (rail)	Pandemic
LAUDERDALE COUNTY																					
186 AIR REFUELING WING FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
TOOMSUBA VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
ALAMUCHA VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
ALLIANCE HEALTH SYSTEM	Medical Care			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
ANDERSON REGIONAL MEDICAL CENTER	Medical Care			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
ANDERSON REGIONAL MEDICAL CENTER	Medical Care			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
EAST MS STATE HOSPITAL	Medical Care			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
GV (SONNY) MONTGOMERY VETERANS	Medical Care			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
REGENCY HOSPITAL OF MERIDIAN	Medical Care			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
RUSH FOUNDATION HOSPITAL	Medical Care			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
THE SPECIALTY HOSPITAL OF MERIDIAN	Medical Care			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
LAUDERDALE COUNTY SHERIFF	Police			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
MARION POLICE DEPARTMENT	Police			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
MERIDIAN COMMUNITY COLLEGE CAMPUS POLICE	Police			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
MERIDIAN POLICE DEPARTMENT	Police			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
MERIDIAN POLICE DEPARTMENT - WEST	Police			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
MISSISSIPPI HIGHWAY PATROL TROOP H	Police			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X

		FLOOD-RELATED					FIRE-RELATED		GEOLOGIC			WIND-RELATED			OTHER						
FACILITY NAME	FACILITY TYPE	Flood – 100 yr	Flood – 500 yr	Erosion	Dam and Levee Failure[32]	Winter Storm and Freeze	Drought / Heat Wave	Wildfire	Earthquake	Landslide	Land Subsidence	Hurricane and Tropical Storm	Thunderstorm (wind, hail,	Tornado	Fixed HAZMAT – 0.5 mile	Fixed HAZMAT – 1.0 mile	Mobile HAZMAT – 0.5 mile (road)	Mobile HAZMAT – 1.0 mile (road)	Mobile HAZMAT – 0.5 mile (rail)	Mobile HAZMAT – 1.0 mile (rail)	Pandemic
LAUDERDALE COUNTY																					
MISSISSIPPI HIGHWAY SAFETY PATROL	Police			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
MISSISSIPPI STATE UNIVERSITY POLICE	Police			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
CALVARY CHRISTIAN SCHOOL	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
CHILDREN'S EDUCATION CONNECTION	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
CLARKDALE ELEMENTARY SCHOOL	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
CLARKDALE HIGH SCHOOL	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
CLARKDALE MIDDLE SCHOOL	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
COMMUNITY CHRISTIAN SCHOOL	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
CRESTWOOD ELEMENTARY SCHOOL	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
GEORGE WASHINGTON CARVER MIDDLE	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
LAMAR SCHOOL	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
LAUDERDALE CO EDUCATIONAL & SKILLS	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
MAGNOLIA GROVE SCHOOL	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
MAGNOLIA MIDDLE SCHOOL	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
MARION PARK COMPLEX	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
MERIDIAN COMMUNITY COLLEGE	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
MERIDIAN HIGH SCHOOL	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
NORTHEAST LAUDERDALE ELEMENTARY	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X

FACILITY NAME	FACILITY TYPE	FLOOD-RELATED Flood – 100 yr	FLOOD-RELATED Flood – 500 yr	FLOOD-RELATED Erosion	FLOOD-RELATED Dam and Levee Failure[32]	FLOOD-RELATED Winter Storm and Freeze	FIRE-RELATED Drought / Heat Wave	FIRE-RELATED Wildfire	GEOLOGIC Earthquake	GEOLOGIC Landslide	GEOLOGIC Land Subsidence	WIND-RELATED Hurricane and Tropical Storm	WIND-RELATED Thunderstorm (wind, hail,	WIND-RELATED Tornado	OTHER Fixed HAZMAT – 0.5 mile	OTHER Fixed HAZMAT – 1.0 mile	OTHER Mobile HAZMAT – 0.5 mile (road)	OTHER Mobile HAZMAT – 1.0 mile (road)	OTHER Mobile HAZMAT – 0.5 mile (rail)	OTHER Mobile HAZMAT – 1.0 mile (rail)	Pandemic
LAUDERDALE COUNTY																					
NORTHEAST LAUDERDALE HIGH SCHOOL	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
NORTHEAST LAUDERDALE MIDDLE	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
NORTHWEST JUNIOR HIGH SCHOOL	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
OAKLAND HEIGHTS ELEMENTARY SCHOOL	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
PARKVIEW ELEMENTARY SCHOOL	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
POPLAR SPRINGS ELEMENTARY SCHOOL	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
ROSS COLLINS VOC CENTER	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
RUSSELL CHRISTIAN ACADEMY	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
SOUTHEAST LAUDERDALE ELEMENTARY	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
SOUTHEAST LAUDERDALE HIGH SCHOOL	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
SOUTHEAST LAUDERDALE MIDDLE	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
ST PATRICK ELEMENTARY SCHOOL	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
T J HARRIS ELEMENTARY	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
THE PENTECOSTAL CHRISTIAN ACADEMY	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
WEST HILLS ELEMENTARY SCHOOL	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
WEST LAUDERDALE ELEMENTARY SCHOOL	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
WEST LAUDERDALE HIGH SCHOOL	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
WEST LAUDERDALE MIDDLE SCHOOL	School			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X

D.4 LAUDERDALE COUNTY CAPABILITY ASSESSMENT

This subsection discusses the capability of Lauderdale County to implement hazard mitigation activities. More information on the purpose and methodology used to conduct the assessment can be found in Section 7: *Capability Assessment*.

D.4.1 Planning and Regulatory Capability

The following table provides a summary of the relevant local plans, ordinances, and programs already in place or under development for Lauderdale County. A checkmark (✓) indicates that the given item is currently in place and being implemented. An asterisk (*) indicates that the given item is currently being developed for future implementation. Each of these local plans, ordinances, and programs should be considered available mechanisms for incorporating the requirements of the MEMA District 6 Regional Hazard Mitigation Plan.

Table D.33: RELEVANT PLANS, ORDINANCES, AND PROGRAMS

Planning Tool/Regulatory Tool	Hazard Mitigation Plan	Comprehensive Land Use Plan	Floodplain Management Plan	Open Space Management Plan (Parks & Rec/Greenway Plan	Stormwater Management Plan/Ordinance	Natural Resource Protection Plan	Flood Response Plan	Emergency Operations Plan	Continuity of Operations Plan	Evacuation Plan	Disaster Recovery Plan	Capital Improvements Plan	Economic Development Plan	Historic Preservation Plan	Flood Damage Prevention Ordinance	Zoning Ordinance	Subdivision Ordinance	Unified Development Ordinance	Post-Disaster Redevelopment Ordinance	Building Code	Fire Code	National Flood Insurance Program (NFIP)	NFIP Community Rating System
LAUDERDALE COUNTY	✓		✓					✓					✓		✓							✓	
Marion	✓	✓						✓				✓	✓		✓	✓	✓			✓	✓	✓	
Meridian	✓	✓						✓				✓	✓		✓	✓	✓			✓	✓	✓	✓

A more detailed discussion on the county's planning and regulatory capabilities follows.

EMERGENCY MANAGEMENT

Hazard Mitigation Plan
Lauderdale County has previously adopted a hazard mitigation plan. The Town of Marion and City of Meridian were also included in this plan.

Emergency Operations Plan
Lauderdale County maintains an Emergency Operations Plan through its Emergency Management Agency. The Town of Marion and City of Meridian are each covered by this plan. The City of Meridian also maintains a municipal-level emergency operations plan.

GENERAL PLANNING

Comprehensive Land Use Plan
Lauderdale County has not adopted a county comprehensive land use plan. However, the Town of Marion and City of Meridian have each adopted a municipal comprehensive plan.

Capital Improvements Plan
Lauderdale County has not adopted a county capital improvement plan. However, the Town of Marion and City of Meridian have each adopted a municipal capital improvement plan.

Zoning Ordinance
Lauderdale County does not have a zoning ordinance in place. However, the Town of Marion and City of Meridian have adopted zoning ordinances.

Subdivision Ordinance
Lauderdale County does not have a subdivision ordinance in place. However, the Town of Marion and City of Meridian have adopted subdivision ordinances.

Building Codes, Permitting, and Inspections
The Town of Marion and City of Meridian have adopted 2018 building code.

FLOODPLAIN MANAGEMENT

The following table provides NFIP policy and claim information for each participating jurisdiction in Lauderdale County.

Table D.34: NFIP POLICY AND CLAIM INFORMATION

Jurisdiction	Date Joined NFIP	Current Effective Map Date	NFIP Policies in Force	Insurance in Force	Closed Claims	Total Payments to Date
LAUDERDALE COUNTY†	09/29/89	05/16/13	234	$47,577,800	51	$1,097,407
Marion	09/29/89	02/03/10	7	$1,011,100	3	$61,963
Meridian	12/15/77	05/16/13	371	$71,498,400	106	$1,667,768

†Includes unincorporated areas of county only
Source: NFIP Community Status information as of 9/2/2015; NFIP claims and policy information as of 6/30/2015

Community Rating System
The City of Meridian participates in the Community Rating System (CRS) and has a Class 8 rating.

Flood Damage Prevention Ordinance

All communities participating in the NFIP are required to adopt a local flood damage prevention ordinance. Lauderdale County, the Town of Marion, and the City of Meridian all participate in the NFIP and have adopted flood damage prevention ordinances.

Stormwater Management Plan

Although none of the jurisdictions in Lauderdale County has adopted a stormwater management plan, the City of Meridian includes some stormwater regulations in its local subdivision ordinance.

D.4.2 Administrative and Technical Capability

The following table provides a summary of the capability assessment results for Lauderdale County with regard to relevant staff and personnel resources. A checkmark (✓) indicates the presence of a staff member(s) in that jurisdiction with the specified knowledge or skill.

Table D.35: RELEVANT STAFF / PERSONNEL RESOURCES

Staff / Personnel Resource	Planners with knowledge of land development/land management practices	Engineers or professionals trained in construction practices related to buildings and/or infrastructure	Planners or engineers with an understanding of natural and/or human-caused hazards	Emergency Manager	Floodplain Manager	Land Surveyors	Scientists familiar with the hazards of the community	Staff with education or expertise to assess the community's vulnerability to hazards	Personnel skilled in GIS and/or Hazus	Resource development staff or grant writers
LAUDERDALE COUNTY				✓	✓		✓	✓	✓	
Marion		✓		✓	✓		✓	✓	✓	
Meridian	✓	✓	✓	✓	✓		✓	✓	✓	

Credit for having a floodplain manager was given to those jurisdictions that have a flood damage prevention ordinance, and therefore an appointed floodplain administrator, regardless of whether the appointee was dedicated solely to floodplain management. Credit was given for having a scientist familiar with the hazards of the community if a jurisdiction has a Cooperative Extension Service or Soil and Water Conservation Department. Credit was also given for having staff with education or expertise to assess the community's vulnerability to hazards if a staff member from the jurisdiction was a participant on the existing hazard mitigation plan's planning committee.

D.4.3 Fiscal Capability

The following table provides a summary of the results for Lauderdale County with regard to relevant fiscal resources. A checkmark (✓) indicates that the given fiscal resource is locally available for hazard mitigation purposes (including match funds for state and federal mitigation grant funds) according to the previous county hazard mitigation plan.

Table D.36: RELEVANT FISCAL RESOURCES

Fiscal Tool / Resource	Capital Improvement Programming	Community Development Block Grants (CDBG)	Special Purpose Taxes (or taxing districts)	Gas/Electric Utility Fees	Water/Sewer Fees	Stormwater Utility Fees	Development Impact Fees	General Obligation, Revenue, and/or Special Tax Bonds	Partnering Arrangements or Intergovernmental Agreements	Other: other state and Federal funding sources
LAUDERDALE COUNTY	✓	✓								✓
Marion	✓	✓								✓
Meridian	✓	✓								✓

D.4.4 Political Capability

During the months immediately following a disaster, local public opinion in Lauderdale County is more likely to shift in support of hazard mitigation efforts.

D.4.5 Conclusions on Local Capability

The following table shows the results of the capability assessment using the designed scoring methodology described in Section 7: *Capability Assessment*. The capability score is based solely on the information found in existing hazard mitigation plans and readily available on the jurisdictions' government websites. According to the assessment, the average local capability score for the county and its jurisdictions is 28.7, which falls into the moderate capability ranking.

Table D.37: CAPABILITY ASSESSMENT RESULTS

Jurisdiction	Overall Capability Score	Overall Capability Rating
LAUDERDALE COUNTY	21	Moderate

Jurisdiction	Overall Capability Score	Overall Capability Rating
Marion	27	Moderate
Meridian	38	Moderate

D.5 LAUDERDALE COUNTY MITIGATION STRATEGY

This subsection provides the blueprint for Lauderdale County to follow in order to become less vulnerable to its identified hazards. It is based on general consensus of the Regional Hazard Mitigation Council and the findings and conclusions of the capability assessment and risk assessment. Additional Information can be found in Section 8: *Mitigation Strategy* and Section 9: *Mitigation Action Plan*.

D.5.1 Mitigation Goals

Lauderdale County developed 10 mitigation goals in coordination with the other participating MEMA District 6 Region jurisdictions. The regional mitigation goals are presented in the following table.

Table D.38: MEMA DISTRICT 6 REGIONAL MITIGATION GOALS

Goal #		Goals & Objectives	Action #
#1	**Goal**	Local government will be able to maintain **effective mitigation programs**.	PEA-1
	Objective	***Extensive use of public outreach.***	
#2	**Goal**	The community will work together to create a **disaster-resistant community**.	
	Objective	***Media and public outreach. Volunteer HUB that meets quarterly.***	
#3	**Goal**	The community will be able to initiate and sustain **emergency response operations.**	
	Objective	***With limited employees, volunteers are critical. Works with RedCross, Salvation Army.***	
#4	**Goal**	**Government operations** will not be significantly disrupted by disasters.	
	Objective	***County has a COOP, and updates once per year.***	
#5	**Goal**	The **health, safety, and welfare of the community's residents and visitors** will be protected.	PEA-1
	Objective	***Weekly radio show hosted by EMA.***	
#6	**Goal**	**Local government will support effective hazard mitigation programming** in the community.	P-3
	Objective	***County does not have building codes adopted, but city and town does.***	
#7	**Goal**	Residents of the community will have **homes, institutions, and work places that are safer**.	P-4
	Objective	***Advice on community development to avoid hazard prone areas.***	
#8	**Goal**	The **local economy** of the community will be prepared for a disaster.	
	Objective	***Fiscal resources are always a top priority for those impacted by disaster. High percentage rely on government assistance. Public awareness programs of what government will and will not pay for***	
#9	**Goal**	**Local infrastructure will not be significantly disrupted by a disaster**.	
	Objective	***Ensuring power, generators, and good communications. Equipment readiness.***	
#10	**Goal**	All **members of the community will understand the hazards threatening their community.**	PEA-1
	Objective	***Turn Around Don't Drown campaign, weekly radio shows hosted by EMA***	

To attain the listed mitigation goals, the county has also identified objectives that will assist them in the mitigation action process. Objectives are broader than specific actions, but are measurable, unlike goals. Objectives connect goals with the actual mitigation actions. The action plan describes how the mitigation actions will be implemented, including how those actions will be prioritized, administered and incorporated into the community's existing planning mechanisms.

D.5.2 Mitigation Action Plan

The mitigation actions proposed by Lauderdale County, Marion, and Meridian are listed in the following individual Mitigation Action Plans.

Lauderdale County Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-2	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	County Fire Service	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2025	The International Building Code has not been adopted. The county will review this code and consider adoption, so this action will remain in the plan. Cities have adopted 2018.
P-4	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	County Emergency Management	FEMA/MEMA, Homeland Security, Local funds	2020	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
P-5	Collect additional data on the number of buildings located in flood-prone areas and determine their assess value in order to determine potential losses due to a flood event.	Flood	Low	County Emergency Management	FEMA/MEMA, Local funds	2020	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.
Property Protection							
PP-1	Renovate EOC to include lights, HVAC, and install 8 security cameras.	All	High	Board of Supervisors, County Emergency Management	FEMA, Local funds	2017	Completed
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1	Install a larger culvert on Morgan Road.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, CDBG, Local funds	2021	Completed
SP-2	Replace bridge on Arkadelphia Road.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, CDBG, LSBP, Local funds	2025	The bridge on Arkadelphia Road has not been replaced as funding has not been provided. The county would like to leave this action in place and seek funding in the future.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Emergency Services							
ES-1	Purchase generators for the County Fire Service.	All	Moderate	County Fire Service	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	Some generators have been purchased for the fire service, but there is still as strong need for additional generators. The county will continue to look for funding sources for these.
Public Education and Awareness							
PEA-1	Education of local citizens on the danger of driving across flooded roads.	Flood	High	County Emergency Management	FEMA/MEMA, JAG, Local funds	2025	The county has worked hard to inform citizens of the dangers of driving across flooded roads, but this action needs to be continued going forward. Turn around, don't drown.
PEA-2	Purchase materials to educate public on being prepared for hazards, including tornadoes, flooding, severe weather, etc.	All	Low	County Emergency Management	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.
PEA-2	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2025	New action, no program officially, but will continually encourage safe rooms.

Town of Marion Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-2	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Board of Aldermen, Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
P-4	Collect additional data on the number of buildings located in flood-prone areas and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	Board of Aldermen, Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Structural Projects							
SP-1							
Emergency Services							
ES-1	Purchase a generator to provide backup power for the Town Hall, which also houses the police department.	All	High	Board of Aldermen, Public Works	FEMA/MEMA, Homeland Security, Local funds	2025	A generator for backup power to town hall has not been purchased. The town is still interested in pursuing this project, but needs to find a funding source.
ES-2	Purchase a mobile generator to provide backup power for the Town's sewer lift stations.	All	High	Board of Aldermen, Public Works	FEMA/MEMA, Local funds	2025	Some generators have been purchased and are available, but there is still as strong need for additional generators for lift stations. The county will continue to look for funding sources for these.
Public Education and Awareness							
PEA-1	Education of local citizens on the danger of driving across flooded roads.	Flood	High	County Emergency Management	FEMA/MEMA, JAG, Local funds	2025	The county has worked hard to inform citizens of the dangers of driving across flooded roads, but this action needs to be continued going forward.
PEA-2	Purchase materials to educate the public on being prepared for hazards, including tornadoes, flooding, severe weather, etc.	All	Low	Board of Aldermen, Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.
PEA-3	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2025	Ongoing campaign.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Previously Completed Actions							
	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Board of Aldermen	FEMA/MEMA, Local funds	1-2 years	Completed

City of Meridian Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Repair and improve drainage at locations that experience localized flooding.	Flood	High	Public Works	FEMA/MEMA, Homeland Security, CDBG, Local funds	2025	The city has not repaired and improved all drainage areas, all though some projects have been implemented. The city will continue to identify areas of localized flooding and potential projects to implement
P-2	Work with ECPDD to develop a model ordinance to regulate new/existing construction and infrastructure in heavily wooded areas.	Wildfire	Moderate	City Council	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	The City will continue participation in the NFIP and will continue to update building requirements to ensure compliance with recommendations to prevent flood damage.	Flood	Moderate	City Council	FEMA/MEMA	2025	The city has been an active participant in the NFIP and plans to continue to try to improve its overall floodplain management program in accordance with the NFIP. Therefore this action will remain in place.
P-4	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	City Emergency Management	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
P-5	Collect additional data on the number of buildings located in flood-prone areas and determine their assess value in order to determine potential losses due to a flood event.	Flood	Low	City Emergency Management	FEMA/MEMA, Homeland Security, Local funds	2025	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.
Property Protection							
PP-1	Incorporate backup power into specifications for replacement of critical sewer lift stations.	All	Moderate	Public Works	FEMA/MEMA, CDBG, Local funds	2025	Backup power for lift stations have not been implemented. This is still an important action and will remain in the plan for the city.
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1	Repair Long Creek Lake Dam by rebuilding of the earthen dam.	Dam Failure	High	Public Works	FEMA/MEMA, Local funds	2025	Ongoing. This dam has not been repaired and the city stills sees this as a potential issue, so the action will be carried forward in the plan.
Emergency Services							
ES-1	Participate in countywide Emergency Notification System.	All	High	City Emergency Management, Fire Department	FEMA/MEMA, Homeland Security, Local funds	2025	The town has participated in the Emergency Notification System to some degree, but would like to expand its participation going forward so this will remain an action.
ES-2	Purchase generators for backup power for the city's water system.	All	High	Public Works	FEMA/MEMA, Homeland Security, CDBG, Local funds	2025	Generators for the city's water system have not been purchased. The city would like to purchase these generators and will seek funding to do so.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
ES-3	Increase recruitment, retention, and training for emergency personnel.	All	High	DHS	FEMA/MEMA, Homeland Security, AFG, Local funds	2025	The city has worked hard to try to recruit and train the best personnel possible, but this is a continual effort that will need to be pursued going forward so this action will remain in the plan.
ES-4	Purchase generators for Frank Cochran Center and Pool House (Emergency Shelter and Pet Shelter).	All	High	DHS, Parks and Recreation	FEMA/MEMA, Homeland Security, Local funds	2025	A generator has not been purchased for the either of these shelter facilities, but this is still a need for the city. Therefore, the city will continue to pursue this action.
ES-5	Purchase generators to provide backup power to the wastewater treatment plant.	All	High	Public Works	FEMA/MEMA, Homeland Security, CDBG, Local funds	2025	The city has not purchased a backup generator for the wastewater treatment plant. It will look into trying to find funding for this going forward.
Public Education and Awareness							
PEA-1	Public education program to provide educational programs on being prepared for all types of hazards to schools and citizen groups.	All	Low	City Emergency Management, Fire Department	FEMA/MEMA, Local funds	2025	The county has done a good job of sending out information on preparedness and weather updates to schools and citizen groups. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.
PEA-2	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2025	Ongoing campaign.

ANNEX E
LEAKE COUNTY

This annex includes jurisdiction-specific information for Leake County and its participating municipalities. It consists of the following five subsections:

- E.1 Leake County Community Profile
- E.2 Leake County Risk Assessment
- E.3 Leake County Vulnerability Assessment
- E.4 Leake County Capability Assessment
- E.5 Leake County Mitigation Strategy

E.1 LEAKE COUNTY COMMUNITY PROFILE

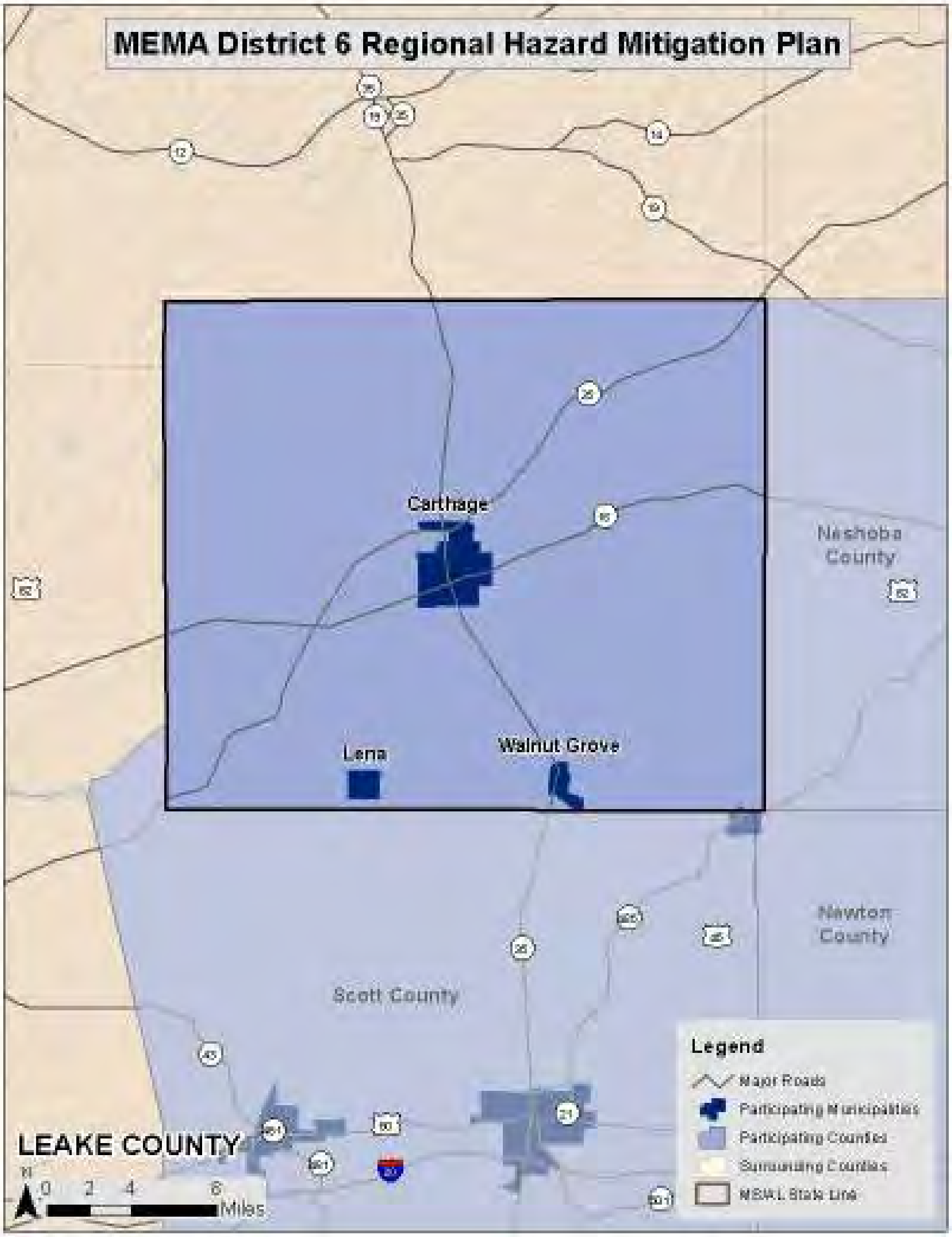
E.1.1 Geography and the Environment

Leake County is located in eastern Mississippi. It comprises two towns and one city, City of Carthage, Town of Lena, and Town of Walnut Grove, as well as many small unincorporated communities. An orientation map is provided as **Figure E.1**.

The county provides commercial and industrial opportunities along with a large recreational based economy while still keeping a strong historic and rural presence throughout. The total area of the county is 585 square miles, 2 square miles of which is water area.

Summer temperatures in the county range from highs of about 90 degrees Fahrenheit (˚F) to lows in the upper 60s. Winter temperatures range from highs in the mid-50s to lows around 30˚F. Average annual rainfall is approximately 56 inches, with the wettest months being November, December, and May.

Figure E.1: LEAKE COUNTY ORIENTATION MAP



E.1.2 Population and Demographics

According to the 2019 American Community Survey, Leake County has a population of 22,792 people. The county overall has seen a slight increase in population between 2010 and 2019. Population density is 36 people per square mile. Population counts from the US Census Bureau for 2000, 2010, and 2019 for the county and participating jurisdictions are presented in **Table E.1**.

Table E.1: POPULATION COUNTS FOR LEAKE COUNTY

Jurisdiction	2000 Census Population	2010 Census Population	2019 ACS Estimates	% Change 2000-2019
Leake County	**20,940**	**23,805**	**22,792**	**8.84%**
Carthage	4,637	5,075	4,830	4.16%
Lena	167	148	151	-9.58%
Walnut Grove	488	1,911	901	84.63%

Source: United States Census Bureau

Based on the 2019 Census, the median age of residents of Leake County is 36.9 years. The racial characteristics of the county are presented in **Table E.2**. Whites make up the majority of the population in the county, accounting for almost 51.2 percent of the population.

Table E.2: DEMOGRAPHICS OF LEAKE COUNTY

Jurisdiction	White, Percent (2019)	Black or African American, Percent (2019)	American Indian or Alaska Native, Percent (2019)	Asian, Percent (2019)	Native Hawaiian or Other Pacific Islander, Percent (2019)	Other Race, Percent (2010)	Two or More Races, percent (2019)	Persons of Hispanic Origin, Percent (2019)*
Leake County	**51.2%**	**41.9%**	**5.7%**	**0.5%**	**0.0%**	**0.2%**	**0.5%**	**4.6%**
Carthage	49.8%	46.8%	1.5%	1.6%	0.0%	0.4%	0.0%	15.5%
Lena	94.0%	6.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Walnut Grove	24.2%	75.8%	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%

*Hispanics may be of any race, so also are included in applicable race categories
Source: United States Census Bureau

E.1.3 Housing

According to the 2019 American Community Survey, there are 9,567 housing units in Leake County, the majority of which are single family homes or mobile homes. Housing information for the county and three municipalities is presented in **Table E.3**.

Table E.3: HOUSING CHARACTERISTICS OF LEAKE COUNTY

Jurisdiction	Housing Units (2010)	Housing Units (2019)	Median Home Value (2019)
Leake County	**9,415**	**9,567**	**$83,300**
Carthage	1,799	1,628	$123,300
Lena	91	79	$72,500
Walnut Grove	258	280	$66,700

Source: United States Census Bureau – American Community Survey

E.1.4 Infrastructure

TRANSPORTATION

In Leake County, State Highway 25 provides access to the north and south. State Highway 35, which crosses north and south, travels through the north western portion of the county, along with State Highway 16 that travels east and west. The Natchez Trace Parkway is a National Parkway that is highly regarded for its scenic views, hiking trails, picnic areas, camp sites, and exhibits which travels through Leake County.

The Carthage-Leake County Airport provides limited local service within Leake County. The closest major airport used by residents located in nearby counties includes Jackson-Evers International Airport, which offers international and domestic flights to a number of locations around the world.

UTILITIES

Electrical power in Leake County is provided by the Central Electric Power Association, an electric cooperative that is part of the Tennessee Valley Authority. The Mississippi Power Company a Southern Company division and Energy Mississippi also provide electrical service within the county.

Water and sewer service is provided to residents by the City of Carthage, Town of Walnut Grove, Lena Water Works and other Rural Waster Associations.

COMMUNITY FACILITIES

There are a number of buildings and community facilities located throughout Leake County. According to the data collected for the vulnerability assessment (Section 6.4.1), there are 10 fire stations, 3 police stations, and 8s public schools located within the county.

There is one hospital located in Leake County. Baptist Medical Center is a 25-bed critical access hospital offering inpatient, outpatient, and diagnostic services.

Recreational opportunities in Leake County include outdoor recreation such as golf, hunting, fishing, boating, and hiking. There are multiple outdoor recreational areas including Carthage Coliseum, Low Head Dam Park, Ross Barnett Reservoir, Coal Bluff Park, Golden Memorial State Park, and Natchez Trace Parkway. Various sporting events are held at Trustmark Park amphitheater for residents and visitors.

E.1.5 Land Use

Many areas of Leake County are undeveloped or sparsely developed. There are several small incorporated municipalities located throughout the county, with a few larger hubs interspersed. These areas are where the county's population is generally concentrated. The incorporated areas are also where many of the businesses, commercial uses, and institutional uses are located. Land uses in the balance of the study area generally consist of rural residential development, agricultural uses, and recreational areas, although there are some notable exceptions in the larger municipalities. Local land use and associated regulations are further discussed in *Section 7: Capability Assessment.*

East Central Planning and Development District assists with Leake County with planning and development to promote economic growth and job opportunities.

E.1.6 Employment and Industry

According to U.S. Census Bureau's American Community Survey (ACS), in 2019, Leake County had an average annual employment of 9,304 workers and according to Mississippi Department of Employment Security as of May 2021 an unemployment rate of 6.0 percent. In 2019, the Manufacturing industry employed 20.4 percent of the workforce followed by educational services, and health care and social assistance (19.3%) and Retail Trade (11.8%). The median household income in Leake County was $37,096 compared to $45,081 in the state of Mississippi.

E.2 LEAKE COUNTY RISK ASSESSMENT

This subsection includes hazard profiles for each of the significant hazards identified in Section 4: *Hazard Identification* as they pertain to Leake County. Each hazard profile includes a description of the hazard's location and extent, notable historical occurrences, and the probability of future occurrences. Additional information can be found in Section 5: *Hazard Profiles*.

E.2.1 Flood

LOCATION AND SPATIAL EXTENT

There are areas in Leake County that are susceptible to flood events. Special flood hazard areas in the county were mapped using Geographic Information System (GIS) and FEMA Digital Flood Insurance Rate Maps (DFIRM). This includes Zone A (1-percent annual chance floodplain), Zone AE (1-percent annual chance floodplain with elevation), and Zone X500 (0.2-percent annual chance floodplain). According to GIS analysis, of the 580 square miles that make up Leake County, there are 125.5 square miles of land in zones A and AE (1-percent annual chance floodplain/100-year floodplain) and 0.0 square miles of land in zone X500 (0.2-percent annual chance floodplain/500-year floodplain).

These flood zone values account for 21.6 percent of the total land area in Leake County. It is important to note that while FEMA digital flood data is recognized as best available data for planning purposes, it does not always reflect the most accurate and up-to-date flood risk. Flooding and flood-related losses often do occur outside of delineated special flood hazard areas. **Figure E.2** illustrates the location and extent of currently mapped special flood hazard areas for Leake County based on best available FEMA Digital Flood Insurance Rate Map (DFIRM) data.[1]

[1] DFIRM panels last updated 2011.

Figure E.2: SPECIAL FLOOD HAZARD AREAS IN LEAKE COUNTY

Source: Federal Emergency Management Agency

HISTORICAL OCCURRENCES

Floods were at least partially responsible for nine disaster declarations in Leake County in 1974, 1979, 1983, twice in 2001, 2003, 2014, 2019, and 2020. Information from the National Centers for Environmental Information was used to ascertain additional historical flood events. A complete listing of historical disaster declarations can be found in Section 4: Hazard Identification. The National Centers for Environmental Information reported a total of 28 events in Leake County since 2001. A summary of these events is presented in **Table E.4**. These events accounted for almost $10.9 million in property damage in the county.

Table E.4: SUMMARY OF FLOOD OCCURRENCES IN LEAKE COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Carthage	1	0/0	$25,000
Lena	1	0/0	$40,000
Walnut Grove	6	0/0	$83,000
Unincorporated Area	20	0/0	$10,832,000
LEAKE COUNTY TOTAL	**28**	**0/0**	**$10,980,000**

Source: National Centers for Environmental Information

HISTORICAL SUMMARY OF INSURED FLOOD LOSSES

Current NFIP and Repetitive Loss Properties data was not made available during this plan update, as such, the most current information is provided below. According to FEMA flood insurance policy records as of June 2015, there have been 28 flood losses reported in Leake County through the National Flood Insurance Program (NFIP) since 1978, totaling over $278,000 in claims payments. A summary of these figures for the county is provided in **Table E.5**. It should be emphasized that these numbers include only those losses to structures that were insured through the NFIP policies, and for losses in which claims were sought and received. It is likely that many additional instances of flood loss in Leake County were either uninsured, denied claims payment, or not reported.

Table E.5: SUMMARY OF INSURED FLOOD LOSSES IN LEAKE COUNTY

Location	Flood Losses	Claims Payments
Carthage	18	$186,046
Lena*	--	--
Walnut Grove	0	$0
Unincorporated Area	10	$92,350
LEAKE COUNTY TOTAL	**28**	**$278,396**

*This community does not participate in the National Flood Insurance Program. Therefore, no values are reported.
Source: Federal Emergency Management Agency, National Flood Insurance Program

REPETITIVE LOSS PROPERTIES

According to the Mississippi Emergency Management Agency, there are four non-mitigated repetitive loss properties located in Leake County, which accounted for eight losses and almost $57,000 in claims payments under the NFIP. The average claim amount for these properties is $7,100. All four properties are single family. Without mitigation, these properties will likely continue to experience flood losses.

Table E.6 presents detailed information on repetitive loss properties and NFIP claims and policies for Leake County.

Table E.6: REPETITIVE LOSS PROPERTIES IN LEAKE COUNTY

Location	Number of Properties	Types of Properties	Number of Losses	Building Payments	Content Payments	Total Payments	Average Payment
Carthage	3	3 single family	6	$40,000	$6,028	$46,028	$7,671
Lena*	--	--	--	--	--	--	--
Walnut Grove	0	--	0	$0	$0	$0	$0
Unincorporated Area	1	1 single family	2	$9,931	$840	$10,772	$5,386
LEAKE COUNTY TOTAL	**4**		**8**	**$49,932**	**$6,868**	**$56,800**	**$7,100**

*This community does not participate in the National Flood Insurance Program. Therefore, no values are reported.
Source: National Flood Insurance Program

PROBABILITY OF FUTURE OCCURRENCES

Flood events will remain a threat in Leake County, and the probability of future occurrences will remain likely (between 10 and 100 percent annual probability). The participating jurisdictions and unincorporated areas have risk to flooding, though not all areas will experience flood. The probability of future flood events based on magnitude and according to best available data is illustrated in the figures above**,** which indicates those areas susceptible to the 1-percent annual chance flood (100-year floodplain) and the 0.2-percent annual chance flood (500-year floodplain).

It can be inferred from the floodplain location maps, previous occurrences, and repetitive loss properties that risk varies throughout the county. For example, the Town of Lena has less floodplain and thus a lower risk of flood than the other municipalities. Flood is not the greatest hazard of concern but will continue to occur and cause damage. Therefore, mitigation actions may be warranted, particularly for repetitive loss properties.

E.2.2 Erosion

LOCATION AND SPATIAL EXTENT

Erosion in Leake County is typically caused by flash flooding events. Unlike coastal areas, areas of concern for erosion in Leake County are primarily rivers and streams. Generally, vegetation helps to prevent erosion in the area, and it is not an extreme threat to the county. No areas of concern were reported by the hazard mitigation council.

HISTORICAL OCCURRENCES

Several sources were vetted to identify areas of erosion in Leake County. This includes searching local newspapers, interviewing local officials, and reviewing previous hazard mitigation plans. No historical erosion occurrences were found in these sources.

PROBABILITY OF FUTURE OCCURRENCES

Erosion remains a natural, dynamic, and continuous process for Leake County, and it will continue to occur. The annual probability level assigned for erosion is possible (between 1 and 10 percent annually).

E.2.3 Dam and Levee Failure

LOCATION AND SPATIAL EXTENT

According to the U.S. Army Corps of Engineers' National Inventory of Dams, there are no high hazard dams in Leake County (**Table E.7**). **Figure E.3** shows the location of other nearby high hazard dams.

Figure E.3: LEAKE COUNTY HIGH HAZARD DAM LOCATIONS

Source: U.S. Army Corps of Engineers – National Inventory of Dams

Table E.7: LEAKE COUNTY HIGH HAZARD DAMS

Dam Name	Hazard Potential
Leake County	
NONE	*N/A*

Source: U.S. Army Corps of Engineers – National Inventory of Dams

HISTORICAL OCCURRENCES

According to the Mississippi State Hazard Mitigation Plan, there has been one dam failure reported in Leake County. This incident occurred in May 1983 when the State Highway 35 structure was overtopped. Although no damage was reported with this event, several breach scenarios in the county could be catastrophic.

PROBABILITY OF FUTURE OCCURRENCES

Given the current dam inventory and historic data, a dam breach is possible (between 1 and 10 percent annual probability) in the future. However, as has been demonstrated in the past, regular monitoring is necessary to prevent these events.

E.2.4 Winter Storm and Freeze

LOCATION AND SPATIAL EXTENT

Nearly the entire continental United States is susceptible to winter storm and freeze events. Some ice and winter storms may be large enough to affect several states, while others might affect limited, localized areas. The degree of exposure typically depends on the normal expected severity of local winter weather. Leake County is not accustomed to severe winter weather conditions and rarely receives severe winter weather, even during the winter months. Events tend to be mild in nature; however, even relatively small accumulations of snow, ice, or other wintery precipitation can lead to losses and damage due to the fact that these events are not commonplace. Given the atmospheric nature of the hazard, the entire county has uniform exposure to a winter storm.

HISTORICAL OCCURRENCES

Winter weather has resulted in one disaster declaration in Leake County in 1999. According to the National Centers for Environmental Information, there have been a total of 14 recorded winter storm events in Leake County since 1996 (**Table E.9**). These events resulted in almost $1.645 million in damages. Detailed information on the recorded winter storm events can be found in **Table E.10**.

TABLE E.9: SUMMARY OF WINTER STORM EVENTS IN LEAKE COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Leake County	14	0/0	$1,645,000

Source: National Centers for Environmental Information

TABLE E.10: HISTORICAL WINTER STORM IMPACTS IN LEAKE COUNTY

Location	Date	Type	Deaths / Injuries	Property Damage*
Carthage				
None Reported	--	--	--	--
Lena				
None Reported	--	--	--	--
Walnut Grove				
None Reported	--	--	--	--
Unincorporated Area				
LEAKE (ZONE)	2/1/1996	Ice Storm	0/0	$152,096
LEAKE (ZONE)	12/14/1997	Heavy Snow	0/0	$0
LEAKE (ZONE)	12/22/1998	Ice Storm	0/0	$183,005
LEAKE (ZONE)	1/27/2000	Ice Storm	0/0	$41,575
LEAKE (ZONE)	2/20/2006	Ice Storm	0/0	$142,046
LEAKE (ZONE)	12/11/2008	Heavy Snow	0/0	$0
LEAKE (ZONE)	2/11/2010	Heavy Snow	0/0	$383,036
LEAKE (ZONE)	1/9/2011	Ice Storm	0/0	$21,218
LEAKE (ZONE)	2/3/2011	Ice Storm	0/0	$424,360
LEAKE (ZONE)	2/9/2011	Heavy Snow	0/0	$318,270
LEAKE (ZONE)	1/16/2013	Heavy Snow	0/0	$0
LEAKE (ZONE)	12/08/2017	Heavy Snow	0/0	$0
LEAKE (ZONE)	1/10/2021	Heavy Snow	0/0	$0
LEAKE (ZONE)	2/17/2021	Winter Storm	0/0	$200,000

Source: National Centers for Environmental Information

There have been several severe winter weather events in Leake County. The text below describes one of the major events and associated impacts on the county. Similar impacts can be expected with severe winter weather.

December 1998

Central Mississippi was hit by a crippling ice storm. Up to 2 inches of ice accumulated on power lines and much of the region experienced long power outages, nearly seven days in some cases. The ice caused numerous power outages and brought down many trees and power lines. Christmas travel was severely hampered for several days with motorists stranded at airports, bus stations, and truck stops. Travel did not return to normal until after Christmas in some locations.

Winter storms throughout the planning area have several negative externalities including hypothermia, cost of snow and debris cleanup, business and government service interruption, traffic accidents, and power outages. Furthermore, citizens may resort to using inappropriate heating devices that could to fire or an accumulation of toxic fumes.

PROBABILITY OF FUTURE OCCURRENCES

Winter storm events will continue to occur in Leake County. According to historical information, the annual probability is likely (between 10 and 100 percent).

FIRE-RELATED HAZARDS

E.2.5 Drought / Heat Wave

Drought

Drought typically covers a large area and cannot be confined to any geographic or political boundaries. Furthermore, it is assumed that Leake County would be uniformly exposed to drought, making the spatial extent potentially widespread. It is also notable that drought conditions typically do not cause significant damage to the built environment but may exacerbate wildfire conditions.

Heat Wave

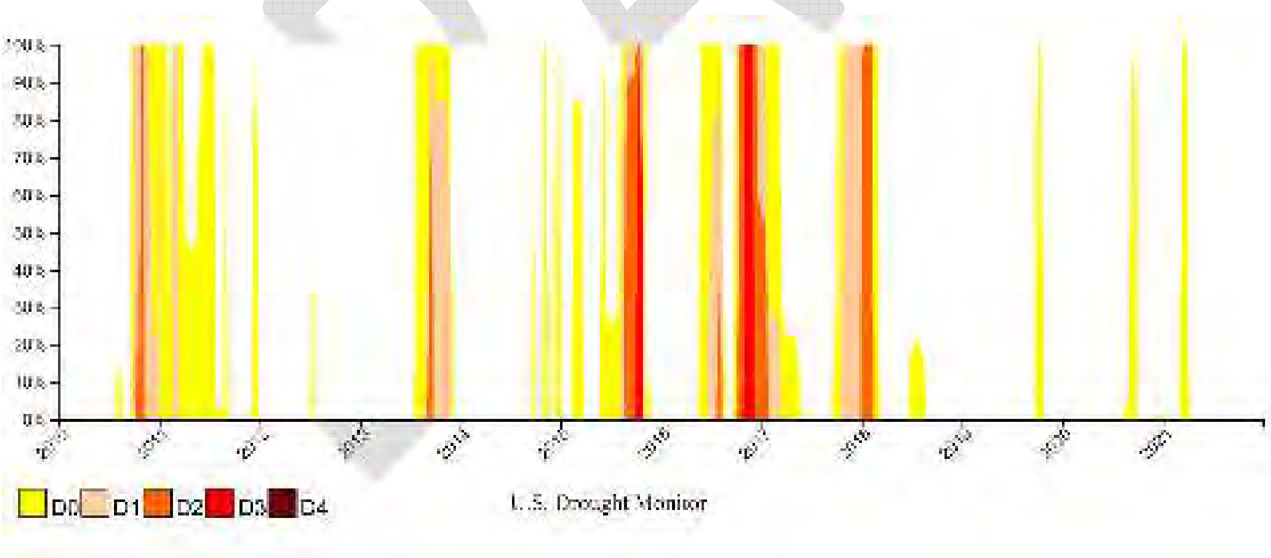
Heat waves typically impact a large area and cannot be confined to any geographic or political boundaries.

HISTORICAL OCCURRENCES

Drought

According to the U.S. Drought Monitor, Leake County had drought levels (including abnormally dry) in each of the last 10 years (2010-2020). **Table E.11** shows the most severe drought classification for each year, according to U.S. Drought Monitor classifications. It should be noted that the U.S. Drought Monitor also estimates what percentage of the county is in each classification of drought severity. For example, the most severe classification reported may be exceptional but a majority of the county may actually be in a less severe condition.

Figure E.4: HISTORICAL DROUGHT OCCURRENCES IN LEAKE COUNTY



Source: United States Drought Monitor

Some additional anecdotal information was provided from the National Centers for Environmental Information on droughts in Leake County.

Summer 2006 – During a four-and-a-half-month period, from June to the middle of October, abnormally dry conditions prevailed across most of Jackson, MS County Warning Area (CWA). The drought had a significant impact on the agricultural industry. Non-irrigated crops were destroyed and all other sustainable crops produced a below normal yield. Catfish ponds were drawn down to severe levels and required water to be pumped back into the fish ponds. The cattle industry suffered due to low watering ponds and lack of sufficient grasslands for grazing and hay production. Water supply problems were encountered by those cities who obtained water from local rivers for drinking purposes due to the low river flows. Fire threat was significant causing the issuance of burn bans across the CWA.

Summer 2007 – By the middle of April, drought conditions were being experienced across a large portion of Eastern and some of Central Mississippi. During the month of May, the drought worsened and expanded. In June, the drought peaked across the region. Although drought conditions continued throughout July and August, conditions were less severe than earlier in the summer. As a result of these conditions, area farmers and crop yields were affected.

October 2010 – Very dry conditions continued across central Mississippi during most of October. Crops were put under stress under the warm and dry conditions. The likely impact was less crop yields for harvest time.

Heat Wave

The National Centers for Environmental Information was used to determine historical heat wave occurrences in the county.

July 2005 – A five-day heat wave occurred across the region. Heat index values reached near 110 degrees each day. Each day had high temperatures ranging from 95 to 99 degrees. This was the warmest stretch of weather the area experienced since July 2001.

August 2005 –A heat wave covering the south began in mid-August and lasted about 10 days. High temperatures were consistently over 95 degrees and surpassed 100 degrees or more on some days. It was the first time since August 2000 that 100 degree temperatures reached the area.

July 2006 – A short heat wave impacted most of the area temperatures in the 90s to around 100 for five straight days.

August 2007 – A heat wave gripped most of the area with the warmest temperatures since 2000. It lasted from August 5th to the 16th.

August 2010 – The combination of high humidity and above normal temperatures produced heat index readings ranged between 105 and 109 degrees during the afternoon hours in the middle part of August.

PROBABILITY OF FUTURE OCCURRENCES

Drought

Based on historical occurrence information, it is assumed that Leake County has a probability level of likely (between 10 and 100 percent annual probability) for future drought events. However, the extent (or magnitude) of drought and the amount of geographic area covered by drought, varies with each year.

Historic information indicates that there is a much lower probability for extreme, long-lasting drought conditions.

Heat Wave
Based on historical occurrence information, it is assumed that all of Leake County has a probability level of likely (between 10 and 100 percent annual probability) for future heat wave events.

E.2.6 Wildfire

LOCATION AND SPATIAL EXTENT

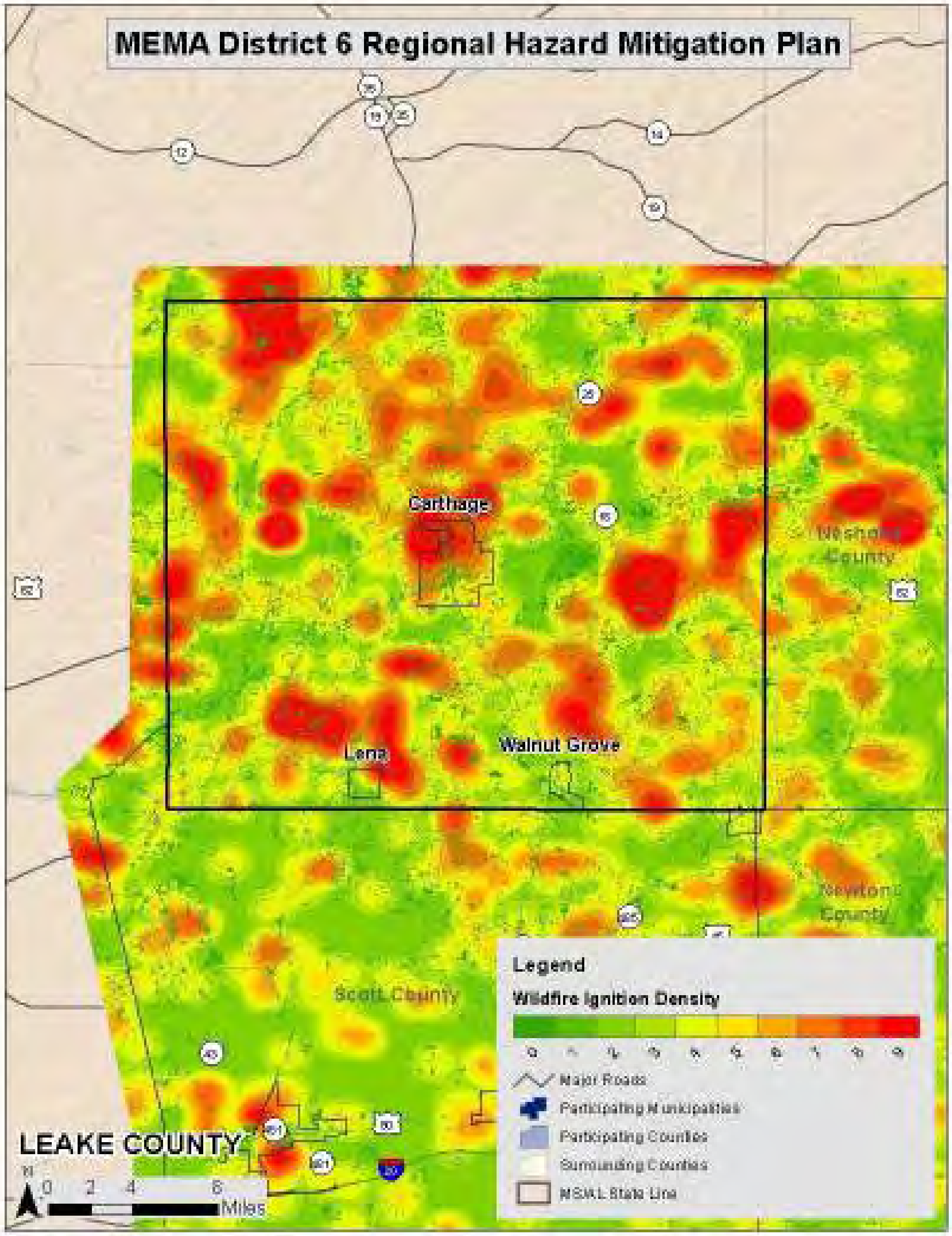
The entire county is at risk to a wildfire occurrence. However, several factors such as drought conditions or high levels of fuel on the forest floor, may make a wildfire more likely. Furthermore, areas in the urban-wildland interface are particularly susceptible to fire hazard as populations abut formerly undeveloped areas. The Wildfire Ignition Density data shown in the figure below give an indication of historic location.

HISTORICAL OCCURRENCES

Figure E.5 shows the Wildfire Ignition Density in Leake County based on data from the Southern Wildfire Risk Assessment. This data is based on historical fire ignitions and the likelihood of a wildfire igniting in an area. Occurrence is derived by modeling historic wildfire ignition locations to create an average ignition rate map. This is measured in the number of fires per year per 1,000 acres.[2]

[2] Southern Wildfire Risk Assessment, 2014.

Figure E.5: WILDFIRE IGNITION DENSITY IN LEAKE COUNTY



Source: Southern Wildfire Risk Assessment

Based on data from the Mississippi Forestry Commission from 2015 to 2019, Leake County experiences an average of 41 wildfires annually which burn an average of 426.8 acres per year. The data indicates that most of these fires are small, averaging 10.4 acres per fire. **Table E.8** provides a summary of wildfire occurrences in Leake County and **Table E.9** lists the number of reported wildfire occurrences in the county between the years 2010 and 2019.

Table E.8: SUMMARY TABLE OF ANNUAL WILDFIRE OCCURRENCES (2015-2019)

	Leake County
Average Number of Fires per year	41
Average Number of Acres Burned per year	426.8
Average Number of Acres Burned per fire	10.4

*These values reflect averages over a 5-year period.
Source: Mississippi Forestry Commission

Table E.9: HISTORICAL WILDFIRE OCCURRENCES IN LEAKE COUNTY

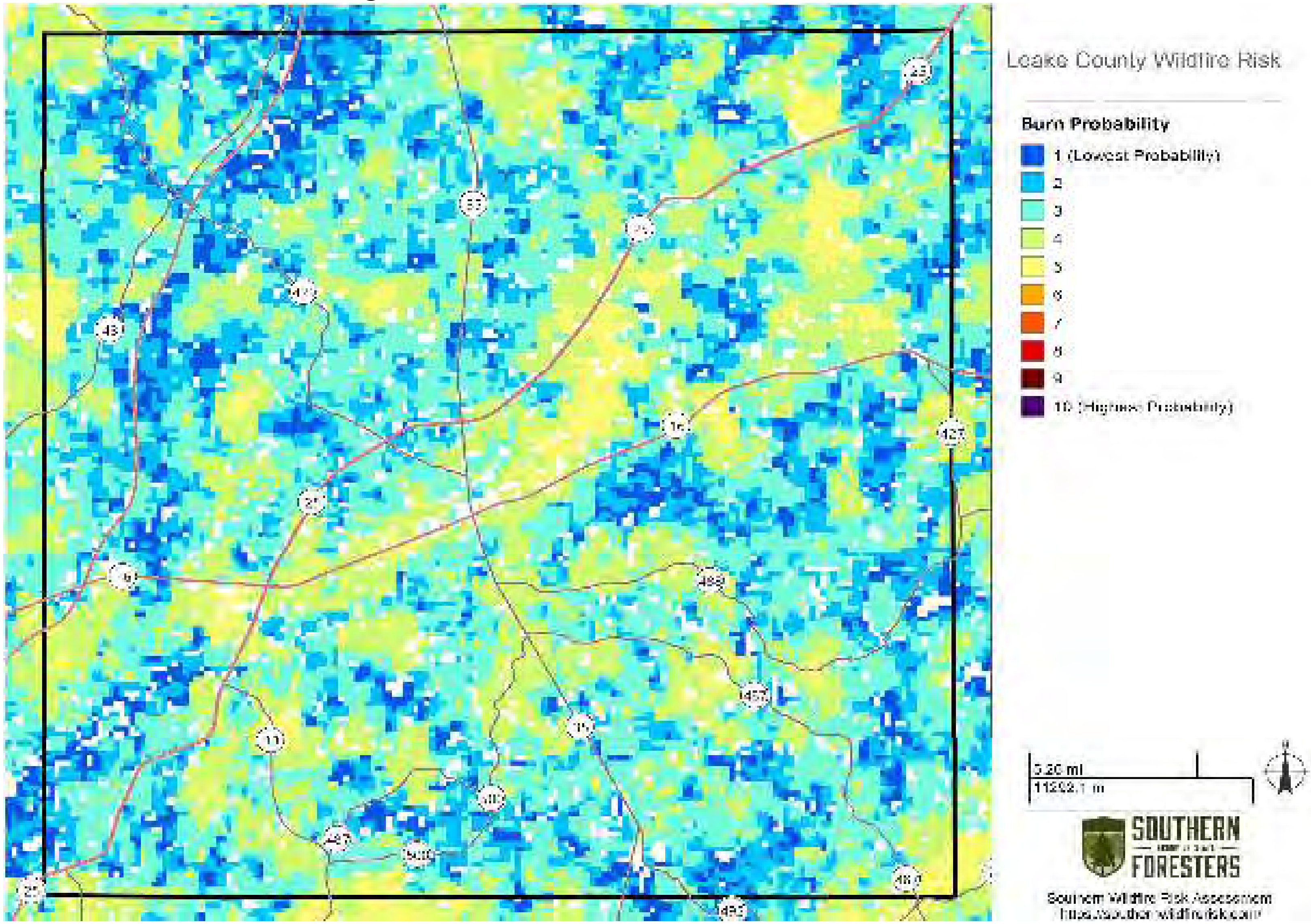
Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Leake County										
Number of Fires	43	65	41	60	50	71	54	37	19	26
Number of Acres Burned	242	1,245	683	501	469	449	790	566	96	233

Source: Mississippi Forestry Commission

PROBABILITY OF FUTURE OCCURRENCES

Wildfire events will be an ongoing occurrence in Leake County. **Figure E.6** shows that there is some probability a wildfire will occur throughout the county. However, the likelihood of wildfires increases during drought cycles and abnormally dry conditions. Fires are likely to stay small in size but could increase due to local climate and ground conditions. Dry, windy conditions with an accumulation of forest floor fuel (potentially due to ice storms or lack of fire) could create conditions for a large fire that spreads quickly. It should also be noted that some areas do vary somewhat in risk. For example, highly developed areas are less susceptible unless they are located near the urban-wildland boundary. The risk will also vary due to assets. Areas in the urban-wildland interface will have much more property at risk, resulting in increased vulnerability and need to mitigate compared to rural, mainly forested areas. The probability assigned to Leake County for future wildfire events is highly likely (100 percent annual probability).

Figure E.6: BURN PROBABILITY IN LEAKE COUNTY



Source: Southern Wildfire Risk Assessment

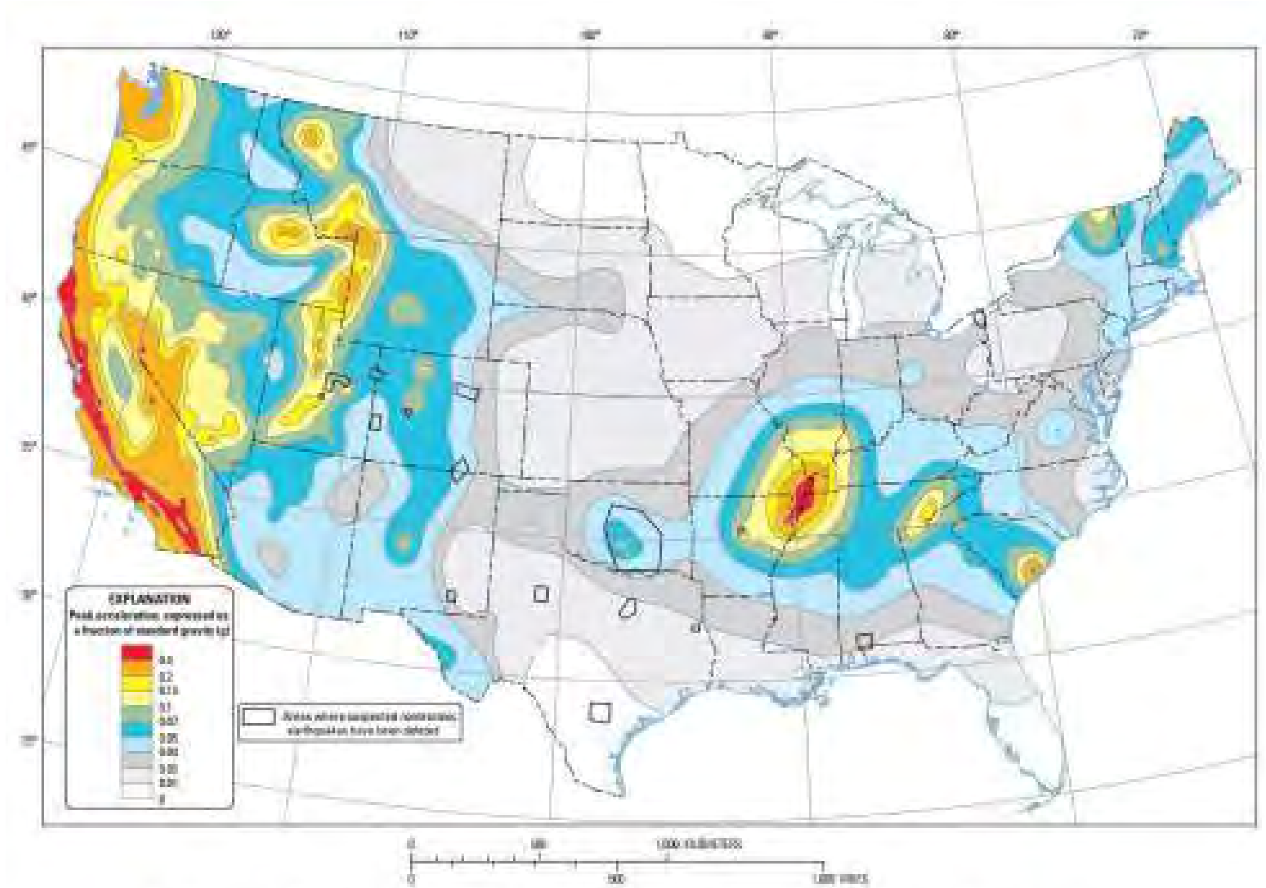
GEOLOGIC HAZARDS

E.2.7 Earthquake

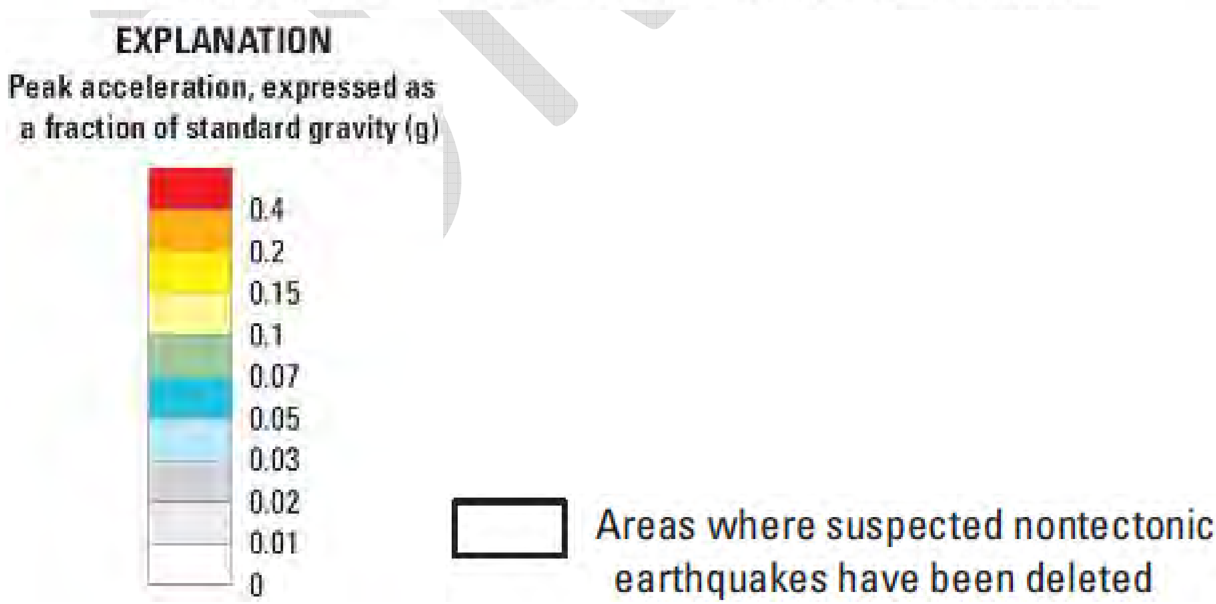
LOCATION AND SPATIAL EXTENT

Figure E.7 shows the intensity level associated with Leake County, based on the national USGS map of peak acceleration with 10 percent probability of exceedance in 50 years. It is the probability that ground motion will reach a certain level during an earthquake. The data show peak horizontal ground acceleration (the fastest measured change in speed, for a particle at ground level that is moving horizontally due to an earthquake) with a 10 percent probability of exceedance in 50 years. The map was compiled by the U.S. Geological Survey (USGS) Geologic Hazards Team, which conducts global investigations of earthquake, geomagnetic, and landslide hazards. According to this map, Leake County lies within an approximate zone of level “3” to “5” ground acceleration. This indicates that the county exists within an area of moderate seismic risk.

Figure E.7: PEAK ACCELERATION WITH 10 PERCENT PROBABILITY OF EXCEEDANCE IN 50 YEARS



Ten-percent probability of exceedance in 50 years map of peak ground acceleration



Source: United States Geological Survey, 2014

HISTORICAL OCCURRENCES

At least one earthquake is known to have affected Leake County since 1976. This measured a V on the Modified Mercalli Intensity (MMI) scale. **Table E.10** provides a summary of earthquake events reported by the National Geophysical Data Center between 1638 and 1985. **Table E.11** presents a detailed occurrence of each event including the date, distance for the epicenter, magnitude and Modified Mercalli Intensity (if known).[3]

Table E.10: SUMMARY OF SEISMIC ACTIVITY IN LEAKE COUNTY

Location	Number of Occurrences	Greatest MMI Reported	Richter Scale Equivalent
Carthage	1	V	< 4.8
Lena	0	--	--
Walnut Grove	0	--	--
Unincorporated Area	0	--	--
LEAKE COUNTY TOTAL	**1**	**V (slightly strong)**	**< 4.8**

Source: National Geophysical Data Center

Table E.11: SIGNIFICANT SEISMIC EVENTS IN LEAKE COUNTY (1638 -1985)

Location	Date	Epicentral Distance	Magnitude	MMI
Carthage				
Carthage	3/25/1976	461.0 km	4.9	V
Lena				
None Reported	--	--	--	--
Walnut Grove				
None Reported	--	--	--	--
Unincorporated Area				
None Reported	--	--	--	--

Source: National Geophysical Data Center

PROBABILITY OF FUTURE OCCURRENCES

The probability of significant, damaging earthquake events affecting Leake County is unlikely. However, it is possible that future earthquakes resulting in light to moderate perceived shaking and damages ranging from none to very light will affect the county. The annual probability level for the county is estimated to be between 1 and 10 percent (possible).

[3] Due to reporting mechanisms, not all earthquake events were recorded during this time. Furthermore, some are missing data, such as the epicenter location, due to a lack of widely used technology. In these instances, a value of "unknown" is reported.

E.2.8 Landslide

LOCATION AND SPATIAL EXTENT

Landslides occur along steep slopes when the pull of gravity can no longer be resisted (often due to heavy rain). Human development can also exacerbate risk by building on previously undevelopable steep slopes. Landslides are possible throughout Leake County, though the risk is relatively low.

According to **Figure E.8** below, the entire county falls under a low incidence area. This indicates that less than 1.5 percent of the area is involved in landsliding.

Figure E.8: LANDSLIDE SUSCEPTIBILITY AND INCIDENCE MAP OF LEAKE COUNTY

Source: United States Geological Survey

HISTORICAL OCCURRENCES

There is no extensive history of landslides in Leake County. Landslide events typically occur in isolated areas. Reviews of the USGS Landslide Inventory show no historical occurrences of landslides.

PROBABILITY OF FUTURE OCCURRENCES

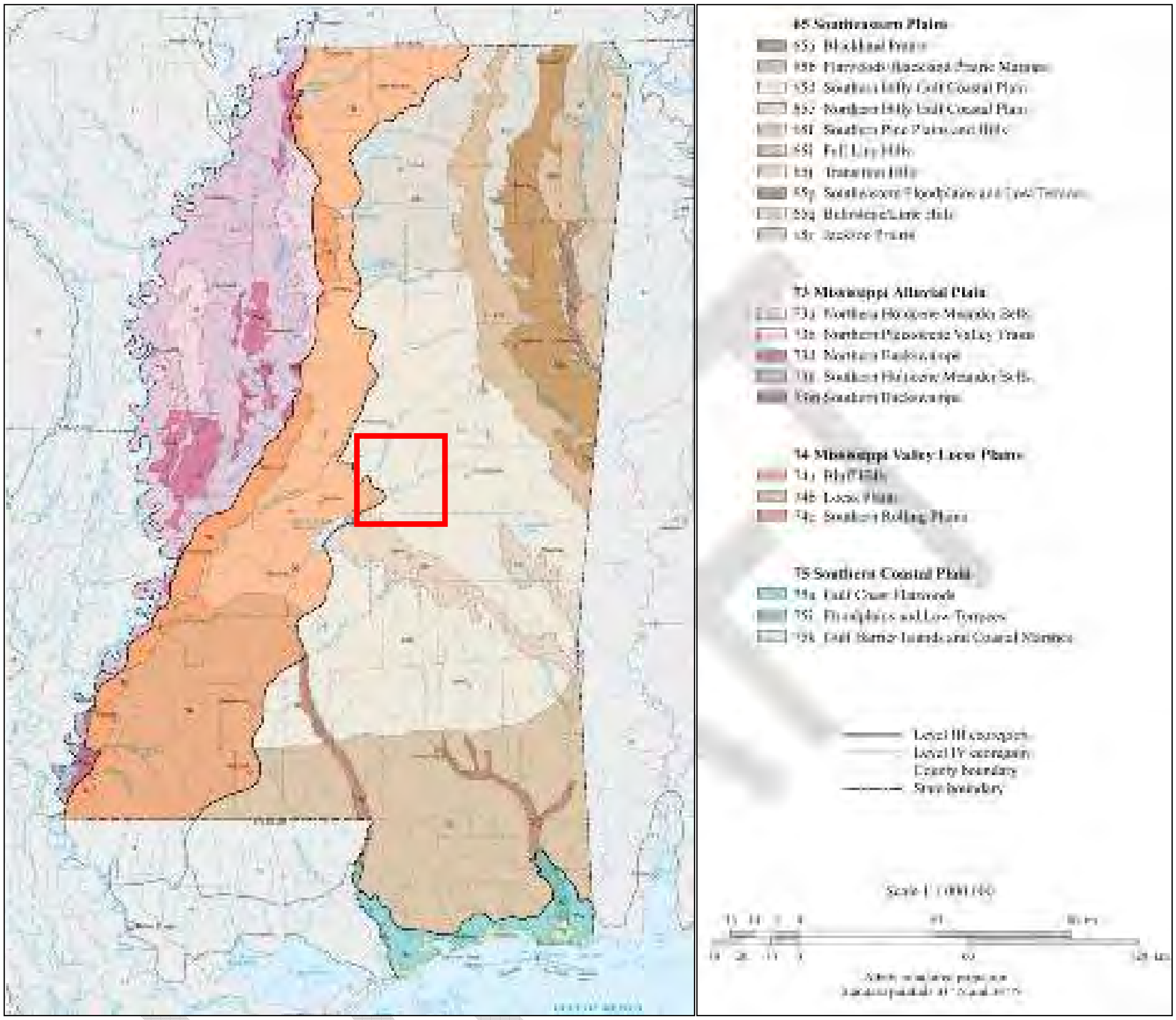
Based on historical information and the USGS susceptibility index, the probability of future landslide events is unlikely (less than 1 percent probability). The USGS data indicates that all areas in Leake County have a low incidence rate and low susceptibly to landsliding activity. However, local conditions may become more favorable for landslides due to heavy rain, for example. This would increase the likelihood of occurrence. It should also be noted that some areas in Leake County have greater risk than others given factors such as steepness on slope and modification of slopes.

E.2.9 Land Subsidence

LOCATION AND SPATIAL EXTENT

Much of Leake County is located in an area where the soil is substantially clay, causing a shrink and swell effect depending on the current conditions. Indeed, much of the area underlain by the calcareous Yazoo clay which, when combined with sand and marl, is highly susceptible to expansion when wet and shrinking when dry. These areas are denoted below in **Figure E.9**.

Figure E.9: MAP OF MISSISSIPPI SOILS



Source: http://www.eoearth.org/view/article/152119/

HISTORICAL OCCURRENCES

There is no significant historical record of land subsidence in Leake County. However, local county officials have noted the impacts from these swings and changes in soil as roads and other infrastructure have experienced large cracks and breaks, causing stops in daily operations and significant costs to local, state, and federal budgets. Often the cost to repair this infrastructure can be in the range of millions of dollars depending on the degree of damage and necessity for quick repairs.

PROBABILITY OF FUTURE OCCURRENCES

The probability of future land subsidence events in the county is unlikely (less than 1 percent annual probability).

WIND-RELATED HAZARDS

E.2.10 Hurricane and Tropical Storm

LOCATION AND SPATIAL EXTENT

Hurricanes and tropical storms threaten the entire Atlantic and Gulf seaboard of the United States. While coastal areas are most directly exposed to the brunt of landfalling storms, their impact is often felt hundreds of miles inland and they can affect Leake County. All areas in Leake County are equally susceptible to hurricane and tropical storms.

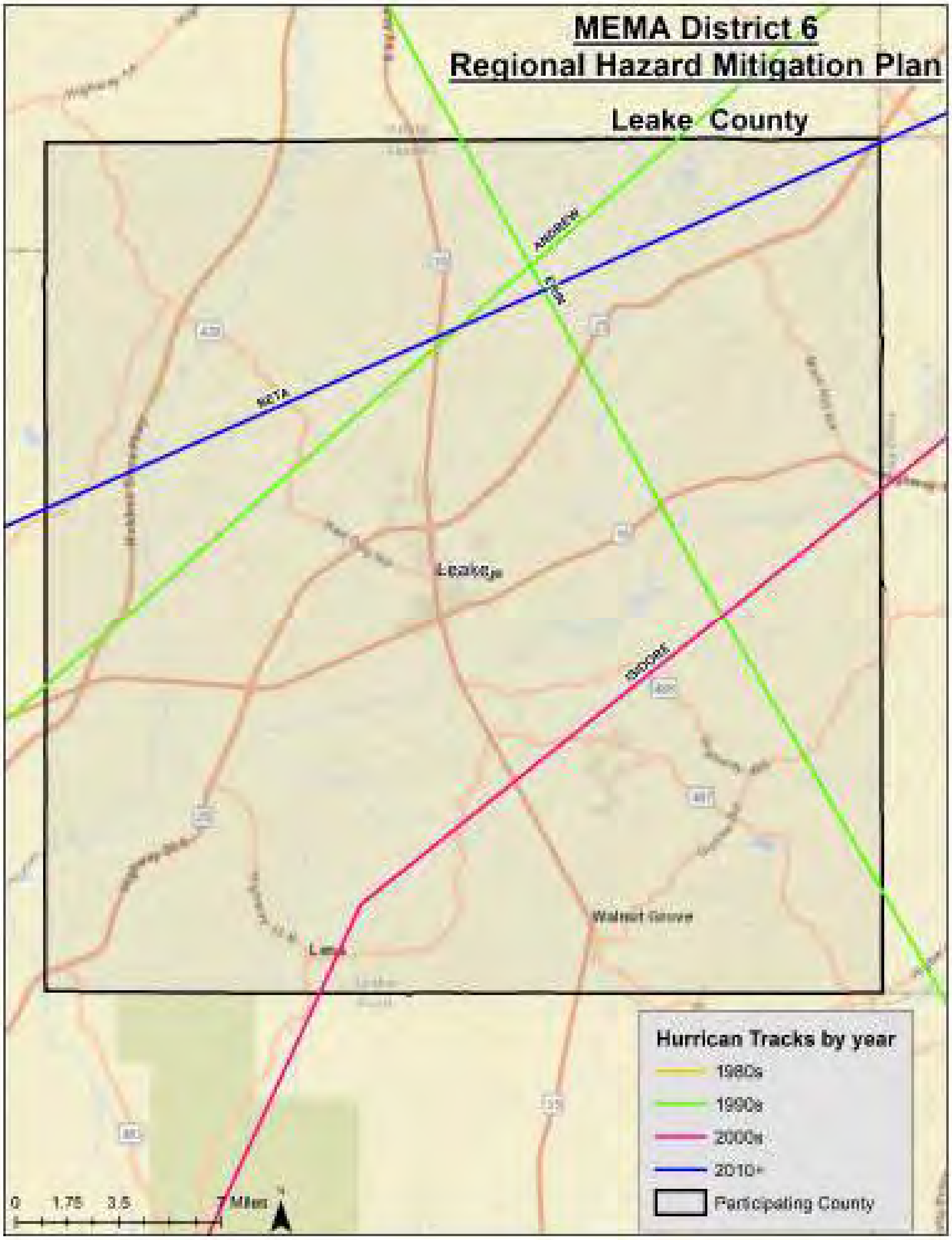
HISTORICAL OCCURRENCES

According to the National Hurricane Center's historical storm track records, 58 hurricane or tropical storm/depression tracks have passed within 75 miles of the MEMA District 6 Region since 1855. This includes: 1 Category 3 hurricane, 2 Category 2 hurricanes, 5 Category 1 hurricanes, 34 tropical storms, and 16 tropical depressions.

Of the recorded storm events, 35 hurricane or tropical storm/depression events traversed directly through the region as shown in **Figure E.10**. Notable storms include Hurricane Frederic (1979) and Hurricane Katrina (2005). **Table E.12** provides for each event the date of occurrence, name (if applicable), maximum wind speed (as recorded within 75 miles of the MEMA District 6 Region) and category of the storm based on the Saffir-Simpson Scale.[4]

[4] These storm track statistics include tropical depressions, tropical storms, and hurricanes. Lesser events may still cause significant local impact in terms of rainfall and high winds.

Figure E.10: HISTORICAL HURRICANE STORM TRACKS 1980 - 2020



Source: National Oceanic and Atmospheric Administration, National Hurricane Center

Table E.12: HISTORICAL STORM TRACKS WITHIN 75 MILES OF THE MEMA 6 DISTRICT REGION (1850–2020)

Date of Occurrence	Storm Name	Maximum Wind Speed (knots)	Storm Category
9/16/1855	UNNAMED	70	Category 1
9/15/1860	UNNAMED	70	Category 1
7/12/1872	UNNAMED	40	Tropical Storm
9/2/1879	UNNAMED	60	Tropical Storm
10/7/1879	UNNAMED	40	Tropical Storm
10/16/1879	UNNAMED	40	Tropical Storm
9/1/1880	UNNAMED	50	Tropical Storm
8/3/1881	UNNAMED	40	Tropical Storm
6/14/1887	UNNAMED	30	Tropical Depression
8/28/1890	UNNAMED	35	Tropical Storm
9/12/1892	UNNAMED	40	Tropical Storm
9/8/1893	UNNAMED	55	Tropical Storm
8/17/1895	UNNAMED	35	Tropical Storm
8/3/1898	UNNAMED	35	Tropical Storm
8/16/1901	UNNAMED	45	Tropical Storm
10/10/1905	UNNAMED	35	Tropical Storm
9/27/1906	UNNAMED	95	Category 2
9/22/1907	UNNAMED	35	Tropical Storm
6/13/1912	UNNAMED	50	Tropical Storm
7/17/1912	UNNAMED	25	Tropical Depression
9/14/1912	UNNAMED	50	Tropical Storm
9/30/1915	UNNAMED	60	Tropical Storm
7/6/1916	UNNAMED	80	Category 1
7/5/1919	UNNAMED	30	Tropical Depression
10/18/1923	UNNAMED	50	Tropical Storm
7/30/1926	UNNAMED	25	Tropical Depression
9/1/1932	UNNAMED	60	Tropical Storm
10/16/1932	UNNAMED	45	Tropical Storm
8/1/1936	UNNAMED	40	Tropical Storm
9/1/1937	UNNAMED	30	Tropical Depression
6/16/1939	UNNAMED	35	Tropical Storm
8/14/1939	UNNAMED	35	Tropical Storm
9/26/1939	UNNAMED	40	Tropical Storm
9/25/1940	UNNAMED	20	Tropical Depression
9/4/1948	UNNAMED	50	Tropical Storm
9/5/1949	UNNAMED	40	Tropical Storm
8/31/1950	BAKER	65	Category 1
6/1/1959	ARLENE	25	Tropical Depression
9/16/1960	ETHEL	35	Tropical Storm
9/26/1960	FLORENCE	15	Tropical Depression

Date of Occurrence	Storm Name	Maximum Wind Speed (knots)	Storm Category
8/18/1969	CAMILLE	100	Category 3
9/16/1971	EDITH	60	Tropical Storm
7/19/1977	UNNAMED	25	Tropical Depression
9/6/1977	BABE	30	Tropical Depression
7/11/1979	BOB	40	Tropical Storm
9/13/1979	FREDERIC	95	Category 2
8/12/1987	UNNAMED	25	Tropical Depression
8/27/1992	ANDREW	30	Tropical Depression
8/4/1995	ERIN	45	Tropical Storm
8/6/2001	BARRY	20	Tropical Depression
9/26/2002	ISIDORE	55	Tropical Storm
7/1/2003	BILL	45	Tropical Storm
7/11/2005	DENNIS	45	Tropical Storm
8/29/2005	KATRINA	80	Category 1
9/14/2007	HUMBERTO	20	Tropical Depression
8/24/2008	FAY	30	Tropical Depression
8/17/2009	CLAUDETTE	25	Tropical Depression
10/28/2020	Zeta	33	Tropical Depression

*It should be noted that the track of several major hurricanes that impacted the region fell outside of the 75-mile buffer. These storms were included in the table due to their significant impact. (Georges, 1988; Ivan, 2004; Issac, 2012)
Source: National Hurricane Center

Federal records indicate that disaster declarations were made in 2005 (Hurricane Dennis and Hurricane Katrina) and 2012 (Hurricane Issac). Hurricane and tropical storm events can cause substantial damage in the area due to high winds and flooding.

Flooding and high winds from hurricanes and tropical storms can cause damage throughout the county. Anecdotes are available from NCEI for the major storms that have impacted the county as found below:

Tropical Storm Isidore – September 26, 2002
The heavy rainfall associated with Tropical Storm Isidore resulted in significant river and flash flooding across much of Mississippi. Twenty-four-hour rainfall totals between 5 and 10 inches were common over much of Mississippi, especially in the southern part of the state, where 24-hour amounts exceeded 9 inches near Hattiesburg. Gradient wind gusts between 35 and 45 miles per hour combined with the saturated ground to lead to numerous downed trees and powerlines over the state. Most of the damage was seen along and east of the Natchez Trace, near the path of the storm's diffuse center. One indirect fatality was reported just east of the Kalem community in Scott County. Here, a falling tree struck a truck driven by a 31-year-old male. Damage from Isidore was an estimated $500,000.

Hurricane Katrina – August 29, 2005
Hurricane Katrina will likely go down as the worst and costliest natural disaster in United States history. The amount of destruction, the cost of damaged property/agriculture and the large loss of life across the affected region has been overwhelming. Catastrophic damage was widespread across a large portion of

the Gulf Coast region. The devastation was not only confined to the coastal region, widespread and significant damage occurred well inland up to the Hattiesburg area and northward past Interstate 20.

Hurricane force winds were common across Central Mississippi. The region received sustained winds of 60-80 mph with gusts ranging from 80-120 mph. Wind damage to structures was widespread, with roofs blown off or partially peeled. Hundreds of signs were shredded or blown down. Many businesses sustained structural damage as windows were broken, roofs were blown off, and walls were collapsed. Millions of trees were uprooted and snapped. Power poles and lines were snapped and taken down from wind and trees. It was thousands of downed trees which caused the most significant structural damage as these trees fell onto homes and businesses. Power outages lasted from a few days to as long as four weeks. Agriculture and timber industries were severely impacted. Row crops, including cotton, rice, corn, and soybeans, took a hard hit. Other impacted industries were the catfish industry, dairy and cattle industry, and nursery businesses.

PROBABILITY OF FUTURE OCCURRENCES

Given the inland location of the county, it is more likely to be affected by remnants of hurricane and tropical storm systems (as opposed to a major hurricane) which may result in flooding or high winds. The probability of being impacted is less than coastal areas, but still remains a real threat to Leake County due to induced events like flooding. Based on historical evidence, the probability level of future occurrence is likely (annual probability between 10 and 100 percent). Given the regional nature of the hazard, all areas in the county are equally exposed to this hazard. However, when the county is impacted, the damage could be catastrophic, threatening lives and property throughout the planning area.

E.2.11 Thunderstorm (wind, hail, lightning)

LOCATION AND SPATIAL EXTENT

Thunderstorm / High Wind

A thunderstorm event is an atmospheric hazard, and thus has no geographic boundaries. It is typically a widespread event that can occur in all regions of the United States. However, thunderstorms are most common in the central and southern states because atmospheric conditions in those regions are favorable for generating these powerful storms. It is assumed that Leake County has uniform exposure to an event and the spatial extent of an impact could be large.

Hailstorm

Hailstorms frequently accompany thunderstorms, so their locations and spatial extents coincide. It is assumed that Leake County is uniformly exposed to severe thunderstorms; therefore, all areas of the county are equally exposed to hail which may be produced by such storms.

Lightning

Lightning occurs randomly, therefore it is impossible to predict where and with what frequency it will strike. It is assumed that all of Leake County is uniformly exposed to lightning.

HISTORICAL OCCURRENCES

Thunderstorm / High Wind

Severe storms were at least partially responsible for nine disaster declarations in Leake County in 1979, 1983, 1992, twice in 2001, 2003, 2014, 2019 and 2020. According to NCEI, there have been 273 reported thunderstorm and high wind events since 1966 in Leake County. These events caused almost $8.28 million in damages. There were also reports of one fatality and six injuries. **Table E.13** summarizes this information.

Table E.13: SUMMARY OF THUNDERSTORM / HIGH WIND OCCURRENCES IN LEAKE COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Carthage	40	0/1	$1,281,000
Lena	15	0/0	$3,137,000
Walnut Grove	20	0/0	$198,000
Unincorporated Area	198	1/5	$3,672,000
LEAKE COUNTY TOTAL	**273**	**1/6**	**$8,288,000**

Source: National Centers for Environmental Information

Hailstorm

According to the National Centers for Environmental Information, 94 recorded hailstorm events have affected Leake County since 1976. **Table E.14** is a summary of the hail events in Leake County. **Table E.20** provides detailed information about each event that occurred in the county. In all, hail occurrences resulted in approximately $533,500 in property damages. Hail ranged in diameter from 0.75 inches to 2.75 inches. It should be noted that hail is notorious for causing substantial damage to cars, roofs, and other areas of the built environment that may not be reported to the National Centers for Environmental Information. Therefore, it is likely that damages are greater than the reported value.

Table E.14: SUMMARY OF HAIL OCCURRENCES IN LEAKE COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Carthage	12	0/0	$46,000
Lena	7	0/0	$52,000
Walnut Grove	6	0/0	$158,000
Unincorporated Area	55	0/0	$277,500
LEAKE COUNTY TOTAL	**94**	**0/0**	**$533,500**

Source: National Centers for Environmental Information

Lightning

According to the National Centers for Environmental Information, there have been three recorded lightning events in Leake County since 2008. These events resulted in more than $125,000 in damages, as listed in summary **Table E.15**. Detailed information on historical lightning events can be found in **Table E.16**.

It is certain that more than three events have impacted the county. Many of the reported events are those that cause damage, and it should be expected that damages are likely much higher for this hazard than what is reported.

Table E.15: SUMMARY OF LIGHTNING OCCURRENCES IN LEAKE COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Carthage	1	0/0	$8,899
Lena	0	0/0	$0
Walnut Grove	0	0/0	$0
Unincorporated Area	2	0/0	$116,143
LEAKE COUNTY TOTAL	**3**	**0/0**	**$125,042**

Source: National Centers for Environmental Information

Table E.16: HISTORICAL LIGHTNING OCCURRENCES IN LEAKE COUNTY

Location	Date	Deaths / Injuries	Property Damage*	Details
Carthage				
CARTHAGE	7/30/2009	0/0	$8,899	The 911 Dispatch Center Building in Carthage was struck by lightning.
Lena				
None Reported	--	--	--	--
Walnut Grove				
None Reported	--	--	--	--
Unincorporated Area				
THOMASTOWN	5/24/2008	0/0	$110,838	Lighting struck a church on Beamon Road and caused a fire.
EDINBURG	3/29/2011	0/0	$5,305	Lightning struck a tree next to the Edinburg Attendance Center. Debris from the tree damaged the building breaking a few windows.

Source: National Centers for Environmental Information

PROBABILITY OF FUTURE OCCURRENCES

Thunderstorm / High Wind
Given the high number of previous events, it is certain that thunderstorm events, including straight-line wind events, will occur in the future. This results in a probability level of highly likely (100 percent annual probability) for the entire county.

Hailstorm
Based on historical occurrence information, it is assumed that the probability of future hail occurrences is highly likely (100 percent annual probability). Since hail is an atmospheric hazard, it is assumed that Leake County has equal exposure to this hazard. It can be expected that future hail events will continue to cause minor damage to property and vehicles throughout the county.

Lightning
Although there was not a high number of historical lightning events reported in Leake County via NCEI data, it is a regular occurrence accompanied by thunderstorms. In fact, lightning events will assuredly happen on an annual basis, though not all events will cause damage. According to Vaisala's U.S. National Lightning Detection Network (NLDN), Leake County is located in an area of the country that experienced an average of 4 to 6 cloud-to-ground lightning flashes per square kilometer per year between 2015 and 2019.[5] Therefore, the probability of future events is highly likely (100 percent annual probability). It can be expected that future lightning events will continue to threaten life and cause minor property damages throughout the county.

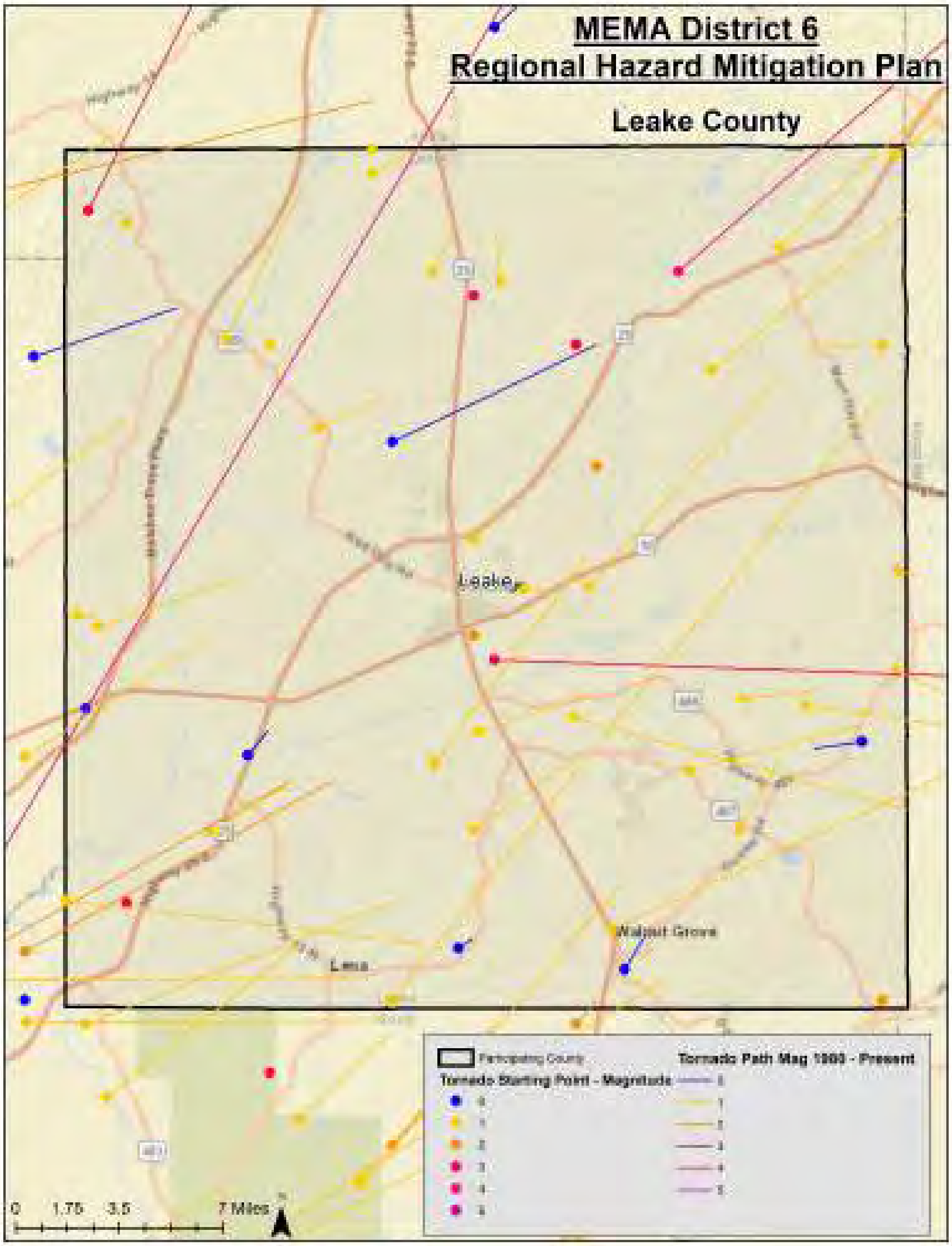
E.2.12 Tornado

LOCATION AND SPATIAL EXTENT

Tornadoes occur throughout the state of Mississippi, and thus in Leake County. Tornadoes typically impact a relatively small area, but damage may be extensive. Event locations are completely random and it is not possible to predict specific areas that are more susceptible to tornado strikes over time. Therefore, it is assumed that Leake County is uniformly exposed to this hazard. With that in mind, **Figure E.10** shows tornado track data for many of the major tornado events that have impacted the county. While no definitive pattern emerges from this data, some areas that have been impacted in the past may be potentially more susceptible in the future.

[5] Vaisala's Annual Lightning Report – 2020. Retrieved on 9.8.2021 from: https://www.vaisala.com/sites/default/files/documents/WEA-MET-Annual-Lightning-Report-2020-B212260EN-A.pdf

Figure E.11: HISTORICAL TORNADO TRACKS IN LEAKE COUNTY



Source: National Weather Service Storm Prediction Center

HISTORICAL OCCURRENCES

Tornadoes were at least partially responsible for seven disaster declarations in Leake County in 1979, 1983, 1992, 2001, 2003, 2014, and 2020. According to the National Centers for Environmental Information, there have been a total of 67 recorded tornado events in Leake County since 1958 (**Table E.17**), resulting in almost $293.2 million in property damages. In addition, 4 fatalities and 66 injuries were reported. The magnitude of these tornadoes ranges from F0 to F5 and EF0 to EF2 in intensity, although an EF5 event is possible.

Table E.17: SUMMARY OF TORNADO OCCURRENCES IN LEAKE COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Carthage	2	0/0	$220,000
Lena	2	0/0	$15,000
Walnut Grove	5	0/0	$2,361,000
Unincorporated Area	58	4/66	$63,389,500
LEAKE COUNTY TOTAL	**67**	**4/66**	**$65,985,500**

Source: National Centers for Environmental Information

PROBABILITY OF FUTURE OCCURRENCES

According to historical information, tornado events pose a significant threat to Leake County. The probability of future tornado occurrences affecting Leake County is likely (between 10 and 100 percent annual probability).

E.2.13 Hazardous Materials Incidents

LOCATION AND SPATIAL EXTENT

Leake County has one TRI site. This site is shown in **Figure E.12.**

Figure E.12: TOXIC RELEASE INVENTORY (TRI) SITES IN LEAKE COUNTY

Source: Environmental Protection Agency

In additional to "fixed" hazardous materials locations, hazardous materials may also impact the county via roadways and rail. Many roads in the county are subject to hazardous materials transport and all roads that permit hazardous material transport are considered potentially at risk to an incident.

HISTORICAL OCCURRENCES

There has been a total of four recorded HAZMAT incidents in Leake County since 1972 (**Table E.18**). These events did not result in any property damage; however, one injury was reported. **Table E.19** presents detailed information on historic HAZMAT incidents in Leake County as reported by the U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA).

Table E.18: SUMMARY OF HAZMAT INCIDENTS IN LEAKE COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Carthage	1	0/1	$0
Lena	1	0/0	$0
Walnut Grove	2	0/0	$0
Unincorporated Area	0	0/0	$0
LEAKE COUNTY TOTAL	**4**	**0/1**	**$0**

Source: United States Department of Transportation Pipeline and Hazardous Materials Safety Administration

Table E.19: HAZMAT INCIDENTS IN LEAKE COUNTY

Report Number	Date	City	Mode	Serious Incident?	Fatalities/ Injuries	Damages ($)*	Quantity Released
Carthage							
I-1973010062	12/27/1972	CARTHAGE	Highway	No	0/1	$0	0
Lena							
I-1972090006	4/20/1972	LENA	Highway	No	0/0	$0	0
Walnut Grove							
I-1973010405	1/17/1973	WALNUT GROVE	Highway	No	0/0	$0	0
E-2014050322	11/13/2013	WALNUT GROVE	Highway	No	0/0	$0	0.13368 GCF
Unincorporated Area							
None Reported	--	--	--	--	--	--	--

Source: United States Department of Transportation Pipeline and Hazardous Materials Safety Administration

PROBABILITY OF FUTURE OCCURRENCES

Given the location of one toxic release inventory site in Leake County and prior roadway incidents, it is likely (between 10 and 100 percent annual probability) that a hazardous material incident may occur in the county. County and town officials are mindful of this possibility and take precautions to prevent such an event from occurring. Furthermore, there are detailed plans in place to respond to an occurrence.

[23] Adjusted dollar values were calculated based on the average Consumer Price Index for a given calendar year. This index value has been calculated every year since 1913. For 2015, the June 2015 monthly index was used.

E.2.14 Pandemic

LOCATION AND SPATIAL EXTENT

Pandemics are global in nature. However, they may start anywhere. Leake County chose to analyze this hazard given the agriculture in the area and potential for this kind of event to occur in any location at any time.

All populations should be considered at risk to pandemic. Buildings and infrastructure are not directly impacted by the virus/pathogen but could be indirectly impacted if people are not able to operate and maintain them due to illness. Many buildings may be shutdown, at least temporarily, as a result. Employers may initiate work from home procedures for non-essential workers in order to help stop infection. Commerce activities, and thus the economy, may suffer greatly during this time.

HISTORICAL OCCURRENCES

Several pandemics have been reported throughout history. A short history of the flu/Spanish Flu was collected from The Historical Text Archive and is described below.

The first known pandemic dates back to 430 B.C. with the Plague of Athens. It reportedly killed a quarter of the population over four years due to typhoid fever. In 165-180 A.D., the Antonine Plague killed nearly 5 million people. Next, the Plague of Justinian (the first bubonic plague pandemic) occurred from 541 to 566. It killed 10,000 people a day at its peak and resulted in a 50 percent drop in Europe's population. Since the 1500s, influenza pandemics have occurred about three times every century or roughly every 10 to 50 years. The Black Death devastated European populations in the 14th century. Nearly a third of the population (20-30 million) was killed over six years. From 1817 to present, seven Cholera Pandemics have impacted to the world and killed millions. Perhaps most severe, was the Third Cholera Pandemic (1852-1959) which started in China. Isolated cases can still be found in the Western U.S. today. There were three major pandemics in the 20th century (1918-1919, 1957-1958, and 1968-1969). The most infamous pandemic flu of the 20th century, however, was that of 1918-1919. Since the 1960s, there has only been one pandemic, the 2009 H1N1 influenza. The pandemics of the 20th and 21st centuries that impacted the United States are detailed below.

1918 Spanish Flu: This was the most devastating flu of the 20th century. This pandemic spread across the world in three waves between 1918 and 1919. It typically impacted areas for around twelve weeks and then would largely disappear. However, it would frequently reemerge several months later. Worldwide, approximately 50 million persons died and over a quarter of the population was infected. Nearly 675,000 people died in the United States. The illness came on suddenly and could cause death within a few hours. The virus impacted those aged 15 to 35 especially hard. The movement of troops during World War I is thought to have facilitated the spread of the virus.

In Mississippi, state officials noted that "epidemics have been reported from a number of places in the State," on October 4th, 1918. By the 18th, twenty-six localities reported 1,934 cases (the real number of cases was likely much higher). West Point, Mississippi was hit especially hard and quarantine was established. Throughout the state, African Americans were impacted at a greater rate than white populations. This is thought to be partly caused from a shortage of caretakers. It is estimated that over 6,000 people died in Mississippi, though that number may be much higher as death records were not widely recorded.

1957 Asian Flu: It is estimated that the Asian Flu caused 2 million deaths worldwide. Approximately 70,000 deaths were in the U.S. However, the proportion of people impacted was substantially higher than that of the Spanish Flu. This flu was characterized as having much milder effects than the Spanish Flu and greater survivability. Similar to other pandemics, this pandemic has two waves. Elderly and infant populations were more likely to succumb to death. This flu is thought to have originated from a genetic mutation of a bird virus.

1968 Hong Kong Flu: The Hong Kong Flu is thought to have caused one million deaths worldwide. It was milder than both the Asian and Spanish influenza viruses. It was similar to the Asian Flu, which may have provided some immunity to the virus. It had the most severe impact on elderly populations.

2009 H1N1 Influenza: This flu was derived from human, swine, and avian virus strains. It was initially reported in Mexico in April 2009. On April 26, the U.S. government declared H1N1 a public health emergency. A vaccine was developed and over 80 million were vaccinated which helped minimize the impacts. The virus had mild impacts on most of the population but did cause death (usually from viral pneumonia) in high-risk populations such as pregnant women, obese persons, indigenous people, and those with chronic respiratory, cardiac, neurological, or immunity conditions. Worldwide, it is estimated that 43 million to 89 million people contracted H1N1 between April 2009 and April 2010, and between 8,870 and 18,300 H1N1 cases resulted in death.

2020 SARS-CoV-2 (COVID-19): Coronavirus Disease 2019 (COVID-19) was declared as pandemic by the World Health Organization on March 11th, 2020 mainly due to the speed and scale of the transmission of the disease. Prior to that, it started as an epidemic in mainland China with the focus being firstly reported in the city of Wuhan, Hubei province on February 26th, 2020. The etiologic agent of COVID-19 was isolated and identified as a novel coronavirus, initially designated as 2019-nCoV. Later, the virus genome was sequenced and because it was genetically related to the coronavirus outbreak responsible for the SARS outbreak of 2003, the virus was named as severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) by the International Committee for Taxonomy of Viruses.

There is a considerable amount of data on the extent of COVID-19 throughout the State of Mississippi and Leake County. The number of reported cases and deaths across the State of Mississippi and Neshoba County are shown in the figure below.

Figure E.13: COVID-19 Cases as of 08/01/2021[6]

	Cases	Deaths
Mississippi	348,496	7,556
Leake County	2,878	75

In addition to the pandemics above, there have been several cases of pandemic threats, some of which reached epidemic levels. They were contained before spreading globally. Examples include Smallpox, Polio, Tuberculosis, Malaria, AIDS, SARS and Yellow Fever. Advances in medicine and technology have been instrumental in containing the spread of viruses in recent history.

In addition to the pandemics above, there have been several cases of pandemic threats, some of which reached epidemic levels. They were contained before spreading globally. Examples include Smallpox, Polio, Tuberculosis, Malaria, AIDS, SARS and Yellow Fever. Advances in medicine and technology have been instrumental in containing the spread of viruses in recent history.

[6] Mississippi State Department of Health. *COVID-19 Dashboard*. Retrieved from: https://msdh.ms.gov/msdhsite/_static/14,0,420.html

It is notable that no birds have been infected with Avian Flu in North and South America.

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that all of Leake County has a probability level of unlikely (less than 1 percent annual probability) for future pandemics events. While pandemic can have devastating impacts, they are relatively rare.

The Mississippi State Department of Health maintains a state pandemic plan which can be found here: http://www.msdh.state.ms.us/msdhsite/index.cfm/44,1136,122,154,pdf/SNSPlan.pdf

E.2.15 Conclusions on Hazard Risk

The hazard profiles presented in this section were developed using best available data and result in what may be considered principally a qualitative assessment as recommended by FEMA in its "How-to" guidance document titled *Understanding Your Risks: Identifying Hazards and Estimating Losses* (FEMA Publication 386-2). It relies heavily on historical and anecdotal data, stakeholder input, and professional and experienced judgment regarding observed and/or anticipated hazard impacts. It also carefully considers the findings in other relevant plans, studies, and technical reports.

HAZARD EXTENT

Table E.20 describes the extent of each natural hazard identified for Leake County. The extent of a hazard is defined as its severity or magnitude, as it relates to the planning area.

Table E.20: EXTENT OF LEAKE COUNTY HAZARDS

Flood-related Hazards	
Flood	Flood extent can be measured by the amount of land and property in the floodplain as well as flood 21.6 percent of the total land area in Leake County. Flood depth and velocity are recorded via United States Geological Survey stream gages throughout the region. While a gage does not exist for each participating jurisdiction, there is one at or near many areas. The greatest peak discharge recorded for the county was at the Pearl River near Lena on April 17, 1979. Water reached a discharge of 122,000 cubic feet per second and the stream gage height was recorded at 32.20 feet.
Erosion	The extent of erosion can be defined by the measurable rate of erosion that occurs. There are no erosion rate records located in Leake County.
Dam Failure	Dam Failure extent is defined using the Mississippi Department of Environmental Quality criteria (Table 5.7). No dams are classified as high-hazard in Leake County.
Winter Storm and Freeze	The extent of winter storms can be measured by the amount of snowfall received (in inches). Official long term snow records are not kept for any areas in Leake County. However, the greatest snowfall reported in Meridian (southeast of the county) was 14.0 inches in 1963.
Fire-related Hazards	
Drought / Heat Wave	Drought extent is defined by the U.S. Drought Monitor Classifications which include Abnormally Dry, Moderate Drought, Severe Drought, Extreme Drought, and Exceptional Drought. According to the U.S. Drought Monitor Classifications, the most severe drought condition is Exceptional. Leake County has received this ranking once over the 10-year reporting period. The extent of extreme heat can be measured by the record high temperature recorded. Official long term temperature records are not kept for any areas in Leake County. However, the highest recorded temperature in Meridian (southeast of the county) was 107°F in 1980.

Wildfire	Wildfire data was provided by the Mississippi Forestry Commission and is reported annually by county from 2015-2019. The greatest number of fires to occur in Leake County in any year 102 in 2007. The greatest number of acres to burn in the county in a single year occurred in 2007 when 1,994 acres were burned. Although this data lists the extent that has occurred, larger and more frequent wildfires are possible throughout the county.
Geologic Hazards	
Earthquake	Earthquake extent can be measured by the Richter Scale (Table 5.16), the Modified Mercalli Intensity (MMI) scale (Table 5.17), and the distance of the epicenter from Leake County. According to data provided by the National Geophysical Data Center, the greatest earthquake to impact the county was reported in Carthage with a MMI of V (slightly strong), 4.9 magnitude, and 461 km away from the epicenter.
Landslide	As noted above in the landslide profile, there is no extensive history of landslides in Leake County and landslide events typically occur in isolated areas. This provides a challenge when trying to determine an accurate extent for the landslide hazard. However, when using the USGS landslide susceptibility index, extent can be measured with incidence, which is low throughout the entire county. There is also low susceptibility across the county.
Land Subsidence	The extent of land subsidence can be defined by the measurable rate of subsidence that occurs. There are no subsidence rate records located in Leake County nor is there any significant historical record of events.
Wind-related Hazards	
Hurricane and Tropical Storm	Hurricane extent is defined by the Saffir-Simpson Scale which classifies hurricanes into Category 1 through Category 5. The greatest classification of hurricane to traverse directly through Leake County was Unnamed 1879 Storm, a tropical storm which carried tropical force winds of 50 knots upon arrival in the county.
Thunderstorm / Hail / Lightning	Thunderstorm extent is defined by the number of thunder events and wind speeds reported. According to a 70-year history from the National Centers for Environmental Information, the strongest recorded wind event in Leake County was reported on January 13, 2005 at 80 knots (approximately 92 mph). It should be noted that future events may exceed these historical occurrences. Hail extent can be defined by the size of the hail stone. The largest hail stone reported in Leake County was 2.75 inches (reported on May 2, 2010). It should be noted that future events may exceed this. According to the Vaisala's flash density map, Leake County is located in an area that experiences 6 to 8 lightning flashes per square kilometer per year. It should be noted that future lightning occurrences may exceed these figures.
Tornado	Tornado hazard extent is measured by tornado occurrences in the US provided by FEMA as well as the Fujita/Enhanced Fujita Scale. The greatest magnitude reported in Leake County was an F5 (reported on March 3, 1966).
Other Hazards	
Hazardous Materials Incident	According to USDOT PHMSA, the largest hazardous materials incident reported in the Leake County was 0.13368 GCF released on the highway (reported on November 13, 2013). It should be noted that larger events are possible.

Pandemic	While pandemics remain to be rare occurrences overall, it cannot be ignored that as of the drafting of this plan the world continues to be engulfed by the COVID-19 Pandemic.

PRIORITY RISK INDEX RESULTS

In order to draw some meaningful planning conclusions on hazard risk for Leake County, the results of the hazard profiling process were used to generate countywide hazard classifications according to a "Priority Risk Index" (PRI). More information on the PRI and how it was calculated can be found in Section 5.16.2.

Table E.21 summarizes the degree of risk assigned to each category for all initially identified hazards based on the application of the PRI. Assigned risk levels were based on the detailed hazard profiles developed for this section, as well as input from the Regional Hazard Mitigation Council. The results were then used in calculating PRI values and making final determinations for the risk assessment.

Table E.21: SUMMARY OF PRI RESULTS FOR LEAKE COUNTY

Hazard	Category/Degree of Risk					
	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score
Flood-related Hazards						
Flood	Likely	Critical	Moderate	6 to 12 hours	Less than 24 hours	**2.9**
Erosion	Possible	Minor	Small	More than 24 hours	More than 1 week	**1.8**
Dam Failure	Possible	Critical	Small	Less than 6 hours	Less than 6 hours	**2.4**
Winter Storm and Freeze	Likely	Limited	Moderate	More than 24 hours	Less than 24 hours	**2.4**
Fire-related Hazards						
Drought / Heat Wave	Likely	Minor	Large	More than 24 hours	More than 1 week	**2.5**
Wildfire	Highly Likely	Minor	Small	Less than 6 hours	Less than 1 week	**2.6**
Geologic Hazards						
Earthquake	Possible	Minor	Moderate	Less than 6 hours	Less than 6 hours	**2.0**
Landslide	Unlikely	Minor	Small	Less than 6 hours	Less than 6 hours	**1.5**
Land Subsidence	Unlikely	Minor	Small	Less than 6 hours	Less than 6 hours	**1.5**
Wind-related Hazards						
Hurricane and Tropical Storm	Likely	Critical	Large	More than 24 hours	Less than 24 hours	**2.9**
Thunderstorm Wind / High Wind	Highly Likely	Critical	Moderate	6 to 12 hours	Less than 6 hours	**3.1**
Hailstorm	Highly Likely	Limited	Moderate	6 to 12 hours	Less than 6 hours	**2.8**
Lightning	Highly Likely	Limited	Negligible	6 to 12 hours	Less than 6 hours	**2.4**
Tornado	Likely	Catastrophic	Small	Less than 6 hours	Less than 6 hours	**3.0**
Other Hazards						
Hazardous Materials Incident	Likely	Limited	Small	Less than 6 hours	Less than 24 hours	**2.5**
Pandemic	Unlikely	Catastrophic	Large	More than 24 hours	More than 24hrs	**2.8**

E.2.16 Final Determinations on Hazard Risk

The conclusions drawn from the hazard profiling process for Leake County, including the PRI results and input from the Regional Hazard Mitigation Council, resulted in the classification of risk for each identified hazard according to three categories: High Risk, Moderate Risk, and Low Risk (**Table E.22**). For purposes of these classifications, risk is expressed in relative terms according to the estimated impact that a hazard will have on human life and property throughout all of Leake County. A more quantitative analysis to estimate potential dollar losses for each hazard has been performed separately, and is described in Section 6: *Vulnerability Assessment* and below in Section E.3. It should be noted that although some hazards are classified below as posing low risk, their occurrence of varying or unprecedented magnitudes is still possible in some cases and their assigned classification will continue to be evaluated during future plan updates.

Table E.22: CONCLUSIONS ON HAZARD RISK FOR LEAKE COUNTY

HIGH RISK	Thunderstorm Wind / High Wind Tornado Flood Hurricane and Tropical Storm Hailstorm Pandemic
MODERATE RISK	Wildfire Drought / Heat Wave Hazardous Materials Incident Dam and Levee Failure Winter Storm and Freeze Lightning
LOW RISK	Earthquake Erosion Landslide Land Subsidence

E.3 LEAKE COUNTY VULNERABILITY ASSESSMENT

This subsection identifies and quantifies the vulnerability of Leake County to the significant hazards previously identified. This includes identifying and characterizing an inventory of assets in the county and assessing the potential impact and expected amount of damages caused to these assets by each identified hazard event. More information on the methodology and data sources used to conduct this assessment can be found in Section 6: *Vulnerability Assessment*.

E.3.1 Asset Inventory

Table E.24 lists the fire stations, police stations, emergency operations centers (EOCs), medical care facilities, and schools located in Leake County according to Hazus-MH Version 2.2.

In addition, **Figure E.12** shows the locations of critical facilities in Leake County. At the end of this subsection, shows a complete list of the critical facilities by name, as well as the hazards that affect each facility. As noted previously, this list is not all-inclusive and only includes information provided through Hazus.

Table E.23: CRITICAL FACILITY INVENTORY IN LEAKE COUNTY

Location	Fire Stations	Police Stations	Medical Care Facilities	EOC	Schools
Carthage	8	2	1	1	6
Lena	1	0	0	0	0
Walnut Grove	1	1	0	0	2
Unincorporated Area	1	1	0	0	2
ASSET VALUATION	**$25,532,315**	**$11,605,598**	**$2,823,193**	**$2,321,119**	**$95,785,627**
LEAKE COUNTY TOTAL	**11**	**4**	**1**	**1**	**10**

Source: Hazus-MH 2.2

Figure E.14: CRITICAL FACILITY LOCATIONS IN LEAKE COUNTY

Source: Hazus-MH 2.2

E.3.2 Social Vulnerability

In addition to identifying those assets potentially at risk to identified hazards, it is important to identify and assess those particular segments of the resident population in Leake County that are potentially at risk to these hazards.

Table E.32 lists the population by jurisdiction according to U.S. Census American Community Survey 2019 population estimates. The total population in Leake County according to Census data is 22,792 persons. Additional population estimates are presented above in Section E.1.

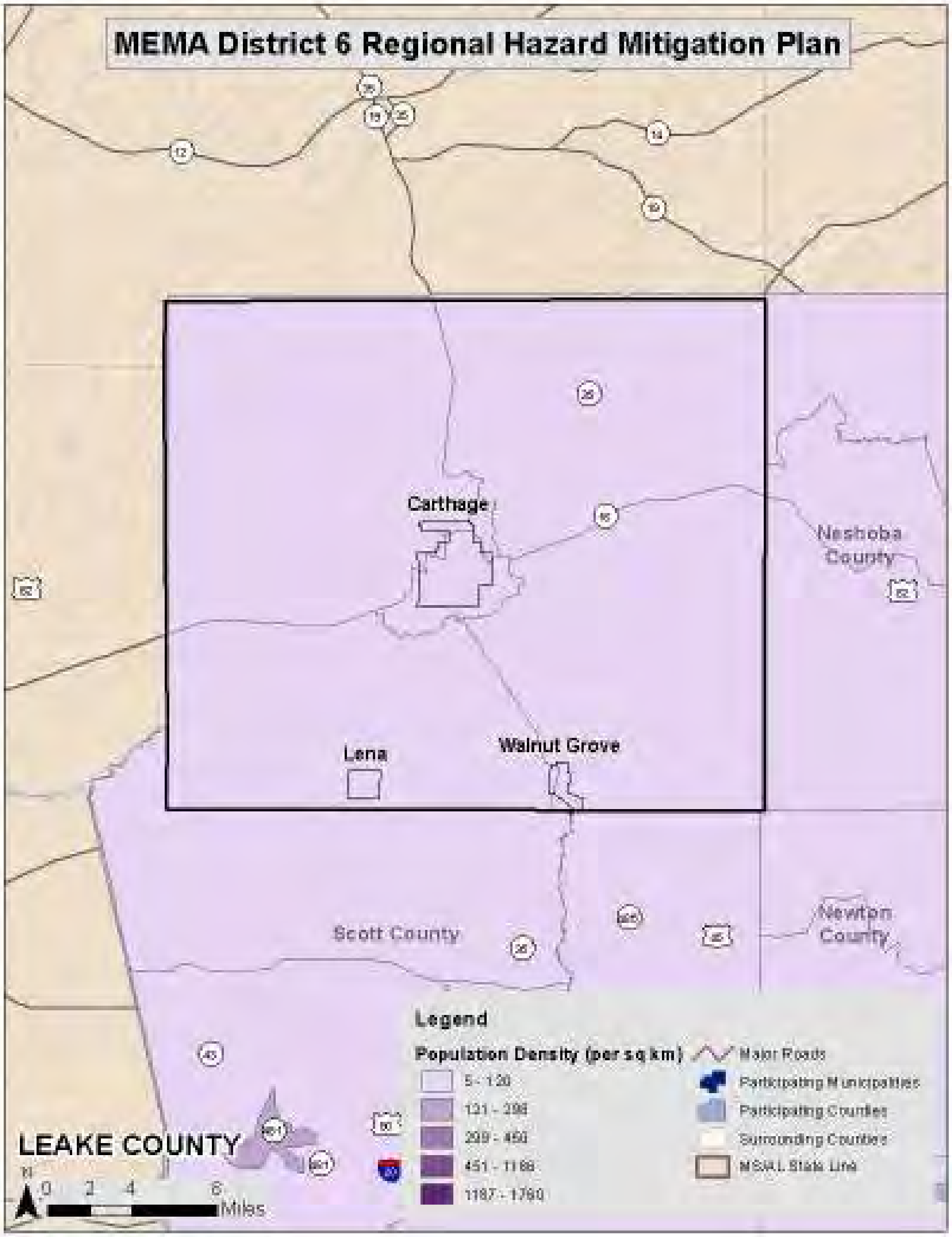
Table E.24: TOTAL POPULATION IN LEAKE COUNTY

Location	Total 2019 Population
Carthage	4,830
Lena	151
Walnut Grove	901
Unincorporated Area	16,910
LEAKE COUNTY TOTAL	**22,792**

Source: United States Census American Community Survey 2019

In addition, **Figure E.15** illustrates the population density per square kilometer by census tract as it was reported by the U.S. Census Bureau in 2010. This remains unchanged since last plan update.

Figure E.15: POPULATION DENSITY IN LEAKE COUNTY



Source: United States Census Bureau, 2010

E.3.3 Development Trends and Changes in Vulnerability

Since the previous county hazard mitigation plan was approved (in 2015), Leake County has experienced limited growth and development. **Table E.26** shows the number of building units constructed since 2014 according to the U.S. Census American Community Survey.

Table E.25: BUILDING COUNTS FOR LEAKE COUNTY

Jurisdiction	Total Housing Units (2019)	Units Built 2014 or later	% Building Stock Built Post-2014
Carthage	1,628	0	0.0%
Lena	79	1	1.3%
Walnut Grove	280	0	0.0%
Unincorporated Area	7,580	125	1.6%
LEAKE COUNTY TOTAL	9,567	126	1.3%

Source: United States Census Bureau American Community Survey

Table E.27 shows population growth estimates for the county from 2015 to 2019 based on the U.S. Census Annual Estimates of Resident Population.

Table E.26: POPULATION GROWTH FOR LEAKE COUNTY

Jurisdiction	Population Estimates (as of July 1)					% Change 2015-2019
	2015	2016	2017	2018	2019	
Carthage	4,966	4,938	4,877	4,862	4,830	-2.73%
Lena	200	194	176	161	151	-24.5%
Walnut Grove	913	749	779	809	901	-1.31%
Unincorporated Area	17,074	17,130	17,104	17,038	16,910	-0.96%
LEAKE COUNTY TOTAL	23,153	23,011	22,936	22,870	22,792	-1.55%

Source: United States Census Bureau – American Community Survey

Based on the data above, there has been a low rate of residential development and population growth in the county since 2015, and the county has actually experienced a slight population decline. However, the unincorporated areas of the county experienced a slightly higher rate of development compared to the rest of the county, resulting in an increased number of structures that are vulnerable to the potential impacts of the identified hazards. However, with Leake County experiencing slight population decline of -1.55% while seeing a slight increase in new structures being built at 1.3%, the two values offset eachother resulting in no changes since the last plan update.

It is also important to note that as development increases in the future, greater populations and more structures and infrastructure will be exposed to potential hazards if development occurs in the floodplains, moderate and high landside susceptibility areas, high wildfire risk areas, or primary and secondary TRI site buffers.

E.3.4 Vulnerability Assessment Results

As noted in Section 6: *Vulnerability Assessment*, only hazards with a specific geographic boundary, available modeling tool, or sufficient historical data allow for further analysis. Those results, specific to Leake County, are presented here. All other hazards are assumed to impact the entire planning region (drought / heat wave; thunderstorm—wind, hail, lightning; tornado; and winter storm and freeze) or, due to lack of data, analysis would not lead to credible results (dam and levee failure, erosion, and land subsidence). In the case of landslide, local officials determined that the USGS data may be somewhat amiss and that even the areas identified as moderate risks probably entailed an overall low risk. The total county exposure, and thus risk, was presented in **Table E.28**.

The hazards to be further analyzed in this subsection include: flood, wildfire, earthquake, hurricane and tropical storm winds, and hazardous materials incident.

The annualized loss estimate for all hazards is presented near the end of this subsection**.**

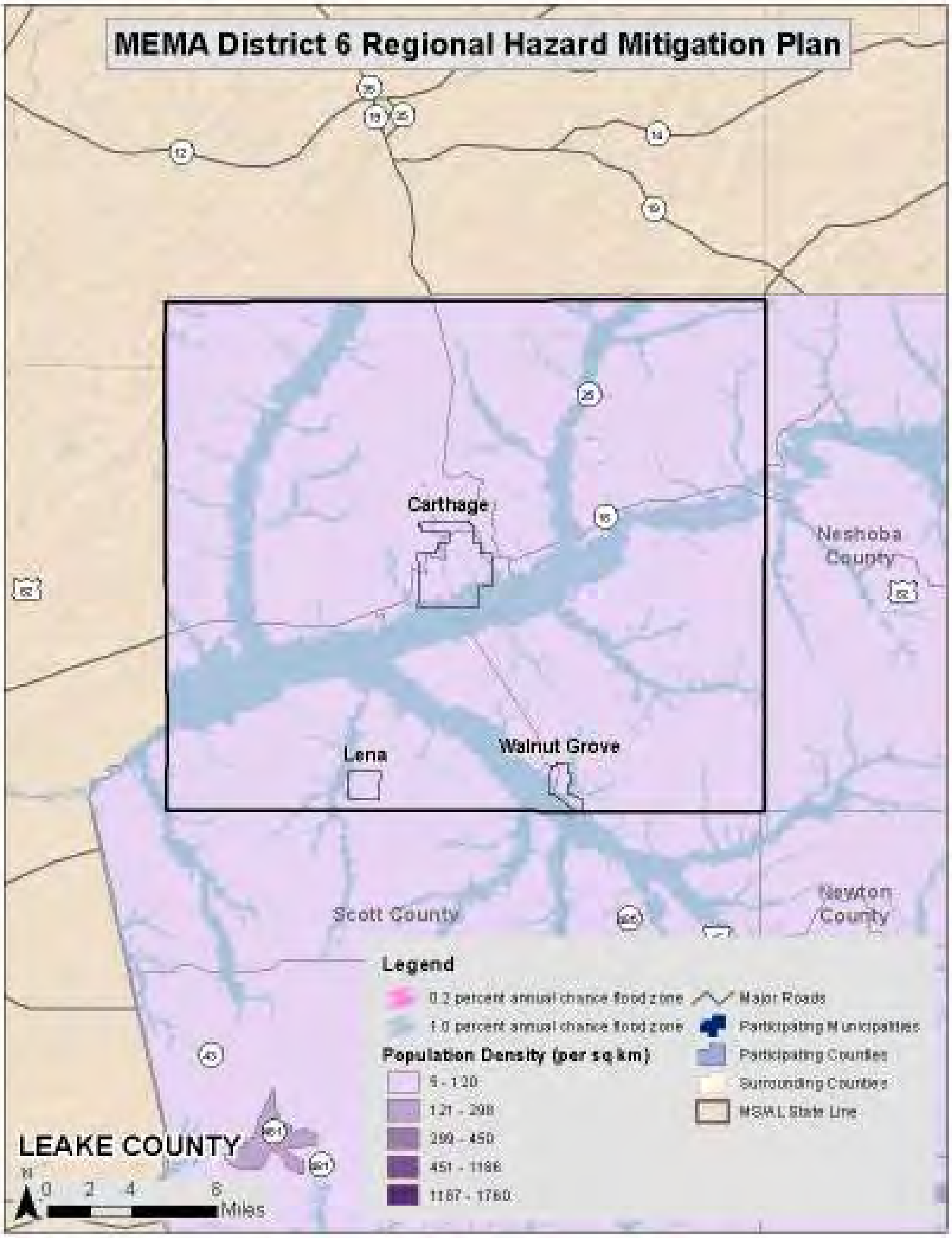
FLOOD

Historical evidence indicates that Leake County is susceptible to flood events. A total of 18 flood events have been reported by the National Centers for Environmental Information resulting in $14.1 million (2015 dollars) in property damage. On an annualized level, these damages amounted to $1.0 million for Leake County.

Social Vulnerability

Figure E.16 is presented to gain a better understanding of at-risk population by evaluating census tract level population data against mapped floodplains. There are areas of concern in several areas of the county. Indeed, nearly every incorporated municipality is potentially at risk of being impacted by flooding in some areas of its jurisdiction. Therefore, further investigation in these areas may be warranted.

Figure E.16: POPULATION DENSITY NEAR FLOODPLAINS



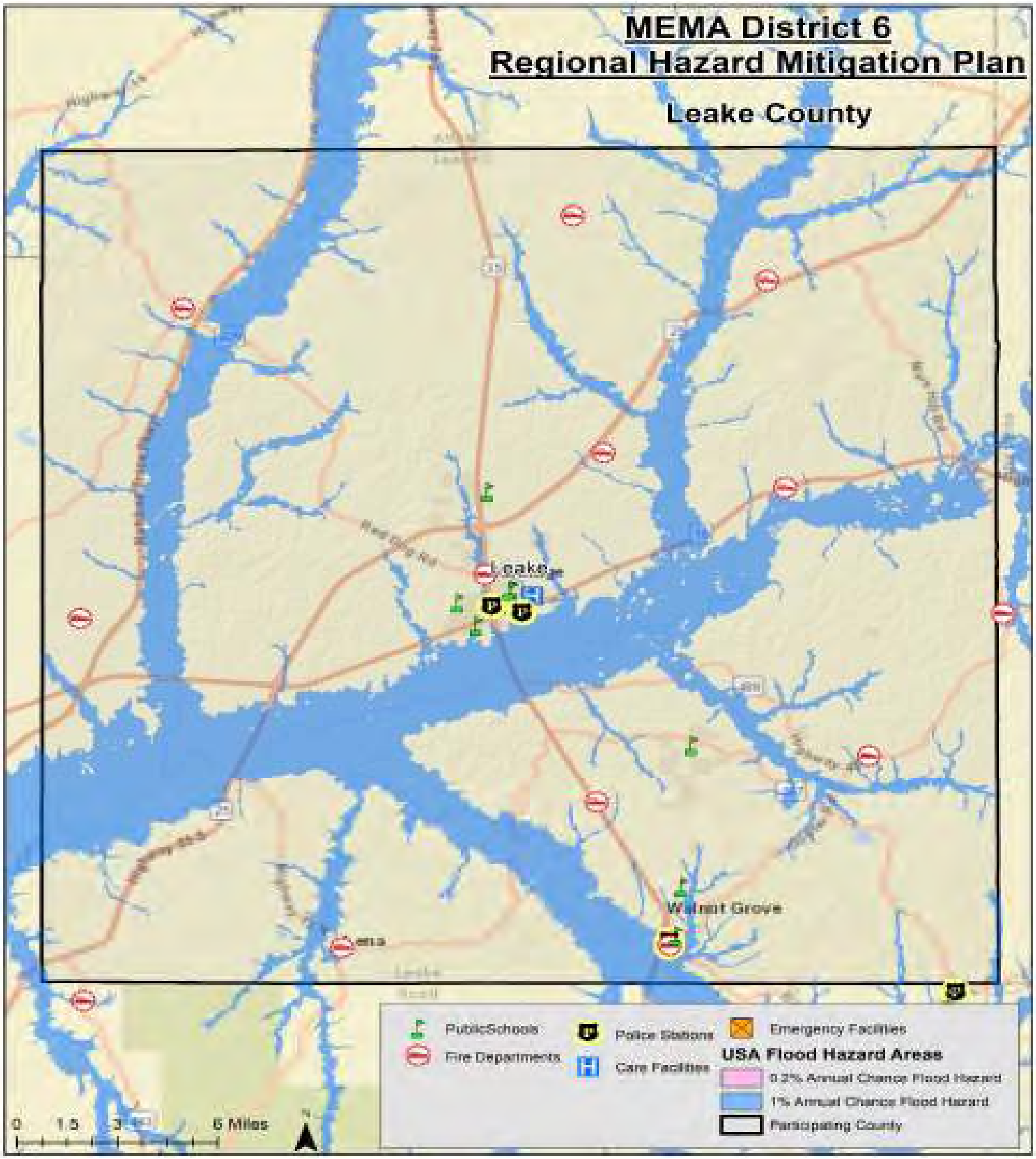
Source: Federal Emergency Management Agency DFIRM, United States Census 2010

Critical Facilities

The following figure shows critical facilities in relation to Special Flood Hazard Areas. (Please note, as previously indicated, this analysis does not consider building elevation, which may negate risk.) Both facilities are located in the 1.0 percent annual chance flood zone, and they include one fire station and one school. A list of specific critical facilities and their associated risk can be found at the end of this section.

In conclusion, a flood has the potential to impact many existing and future buildings, facilities, and populations in Leake County, though some areas are at a higher risk than others. All types of structures in a floodplain are at-risk, though elevated structures will have a reduced risk. Such site-specific vulnerability determinations are outside the scope of this assessment but will be considered during future plan updates. Furthermore, areas subject to repetitive flooding should be analyzed for potential mitigation actions.

Figure E.17: CRITICAL FACILITY ANALYSIS - SFHA



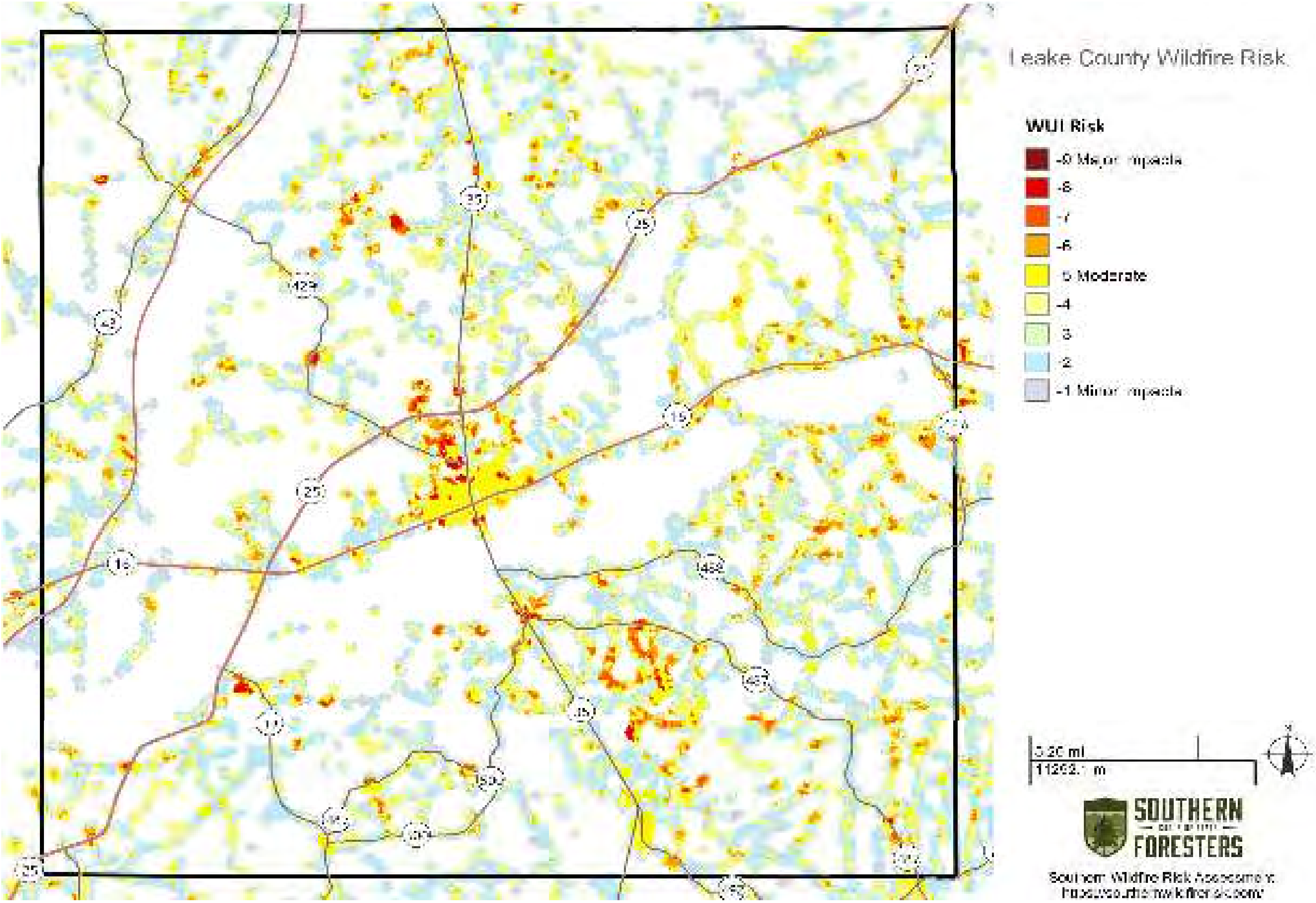
WILDFIRE

Although historical evidence indicates that Leake County is susceptible to wildfire events, there are few reports of damage. Therefore, it is difficult to calculate a reliable annualized loss figure. Annualized loss is considered negligible though it should be noted that a single event could result in significant damages throughout the county.

To estimate exposure to wildfire, building data was obtained from Hazus-MH 2.2 which includes information that has been aggregated at the Census block level and which has been deemed useful for analyzing wildfire vulnerability. However, it should be noted that the accuracy of Hazus data is somewhat lower than that of parcel data. For the critical facility analysis, areas of concern were intersected with critical facility locations.

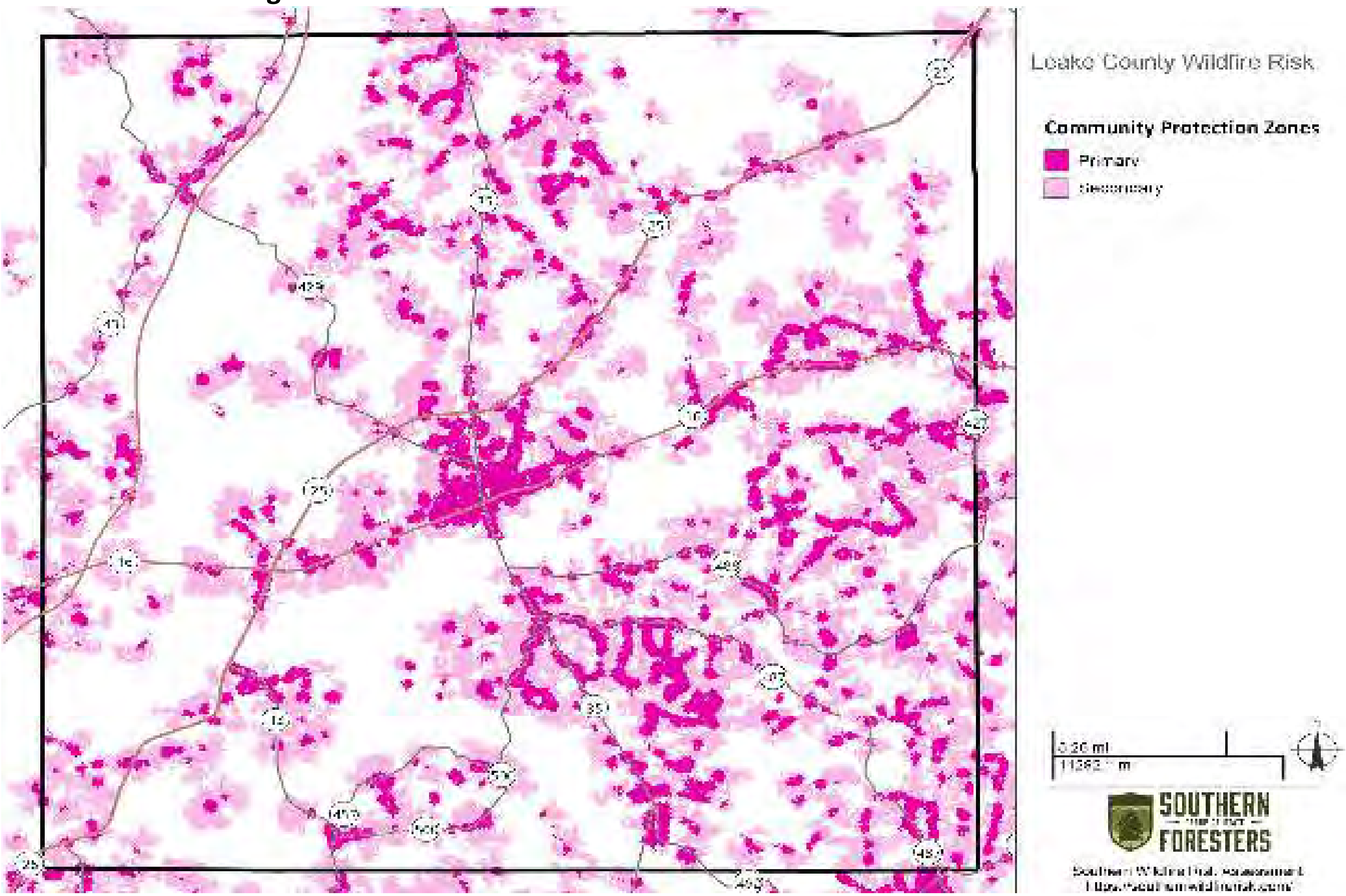
Figure E.18 shows the Wildland Urban Interface Risk Index (WUIRI) data, which is a data layer that shows a rating of the potential impact of a wildfire on people and their homes. The key input, Wildland Urban Interface (WUI), reflects housing density (houses per acre) consistent with Federal Register National standards. The location of people living in the WUI and rural areas is key information for defining potential wildfire impacts to people and homes. Initially provided as raster data, it was converted to a polygon to allow for analysis. The Wildland Urban Interface Risk Index data ranges from 0 to -9 with lower values being most severe (as noted previously, this is only a measure of relative risk). **Figure E.19** Community Protection Zones (CPZ) represent those areas considered highest priority for mitigation planning activities**.** CPZs are based on an analysis of the *Where People Live* housing density data and surrounding fire behavior potential. Rate of Spread data is used to determine the areas of concern around populated areas that are within a 2-hour fire spread distance. This is referred to as the Secondary CPZ. **Figure E.20** shows critical facility locations in relation to historical wildfire burns.

Figure E.18: WUI RISK INDEX AREAS IN LEAKE COUNTY



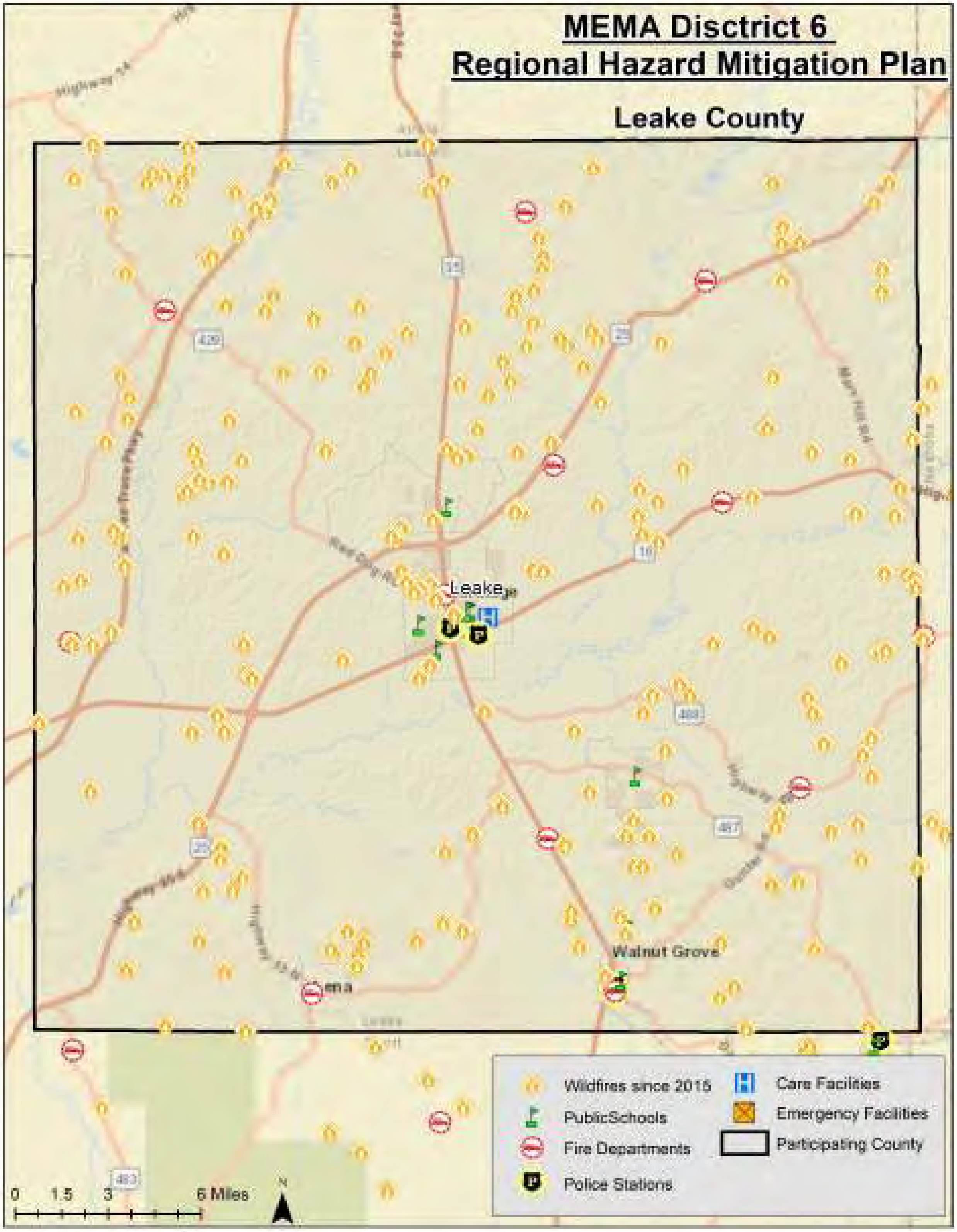
Source: Southern Wildfire Risk Assessment Data

Figure E.19: COMMUNITY PROTECTION ZONES IN LEAKE COUNTY



Source: Southern Wildfire Risk Assessment Data

Figure E.20: CRITICAL FACILITY ANALYSIS – WILDFIRE



Source: Southern Wildfire Risk Assessment Data

Social Vulnerability
Given some level of susceptibility across the entire county, it is assumed that the total population is at risk to the wildfire hazard. Determining the exact number of people in certain wildfire zones is difficult with existing data and could be misleading. In particular, the expansion of residential development from urban centers out into rural landscapes, increases the potential for wildland fire threat to public safety and the potential for damage to forest resources and dependent industries. This increase in population across the region will impact counties and communities that are located within the Wildland Urban Interface (WUI). The WUI is described as the area where structures and other human improvements meet and intermingle with undeveloped wildland or vegetative fuels. Population growth within the WUI substantially increases the risk from wildfire.

For the Leake County Wildfire Risk project area, it is estimated that 23,654 people or 98.5 % percent of the total project area population (24,019) live within the WUI.

Critical Facilities
The critical facility analysis revealed that there are two critical facilities located in wildfire areas of concern, including two schools. It should be noted, that several factors could impact the spread of a wildfire putting all facilities at risk. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

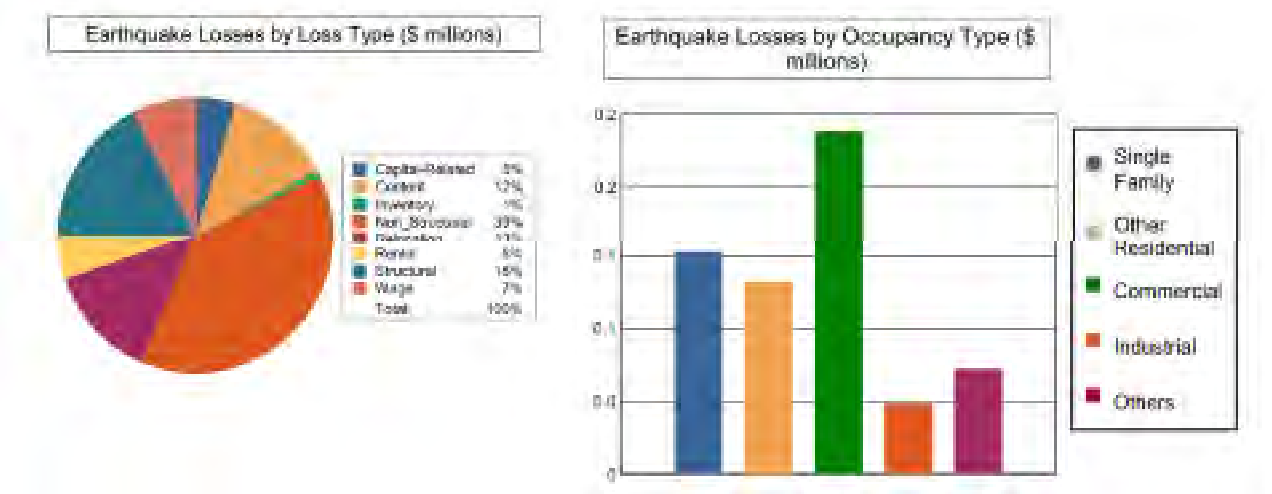
In conclusion, a wildfire event has the potential to impact many existing and future buildings, critical facilities, and populations in Leake County.

EARTHQUAKE

As the Hazus-MH model suggests below, and historical occurrences confirm, any earthquake activity in the area is likely to inflict minor damage to the county.

A probabilistic earthquake model was performed for the MEMA District 6 Region. As the Hazus-MH model suggests below, and historical occurrences confirm, any earthquake activity in the area is likely to inflict minor damage to the county. Hazus-MH 2.2 estimates the total building-related losses were $520,000; 31 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 44 % of the total loss. The figure below provides a summary of the losses associated with the building damage.

Figure E.21: MEMA D6 EARTHQUAKE LOSSES BY TYPE



For the earthquake hazard vulnerability assessment, a probabilistic scenario was created to estimate the average annualized loss for the region. The results of the analysis are generated at the Census Tract level within Hazus-MH and then aggregated to the region level. Since the scenario is annualized, no building counts are provided. Losses reported included losses due to structure failure, building loss, contents damage, and inventory loss.

Social Vulnerability

It can be assumed that all existing and future populations are at risk to the earthquake hazard. Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 39 households to be displaced due to the earthquake. Of these, 32 people (out of a total population of 244,467) will seek temporary shelter in public shelters. [7] The total economic loss estimated for the earthquake is 76.76 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory.

Critical Facilities

The Hazus-MH probabilistic analysis indicated that no critical facilities would sustain measurable damage in an earthquake event. However, all critical facilities should be considered at-risk to minor damage, should an event occur. Before the earthquake, the region had 1,241 hospital beds available for use. On the day of the earthquake, the model estimates that only 1,035 hospital beds (83.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 93.00% of the beds will be back in service. By 30 days, 99.00% will be operational.

In conclusion, an earthquake has the potential to impact all existing and future buildings, facilities, and populations in Leake County. The Hazus-MH scenario indicates that minimal to moderate damage is expected from an earthquake occurrence. While Leake County may not experience a large earthquake (the greatest on record is a magnitude V MMI), localized damage is possible with an occurrence. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

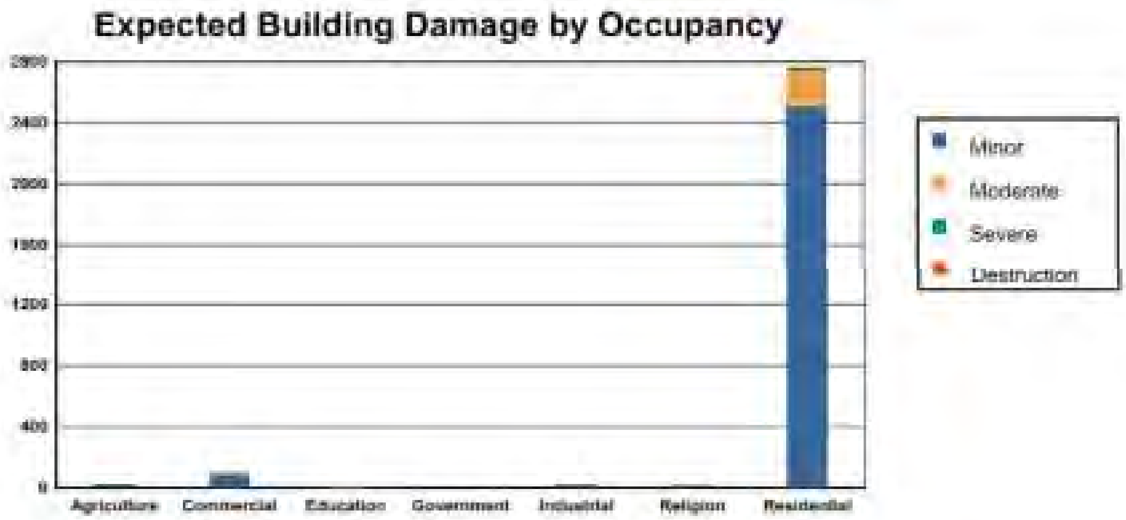
HURRICANE AND TROPICAL STORM

[7] HAZUS-MH utilizes 2010 Census Data

Historical evidence indicates that Leake County has some risk to the hurricane and tropical storm hazard. There have been three disaster declarations due to hurricanes (Hurricanes Dennis, Katrina, and Isaac). Several tracks have come near or traversed through the county, as shown and discussed in Section E.2.10.

A probabilistic 100-year hurricane model was performed for the MEMA District 6. Hazus estimates that about 289 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 12 buildings that will be completely destroyed. The figure below summarizes the expected damage by general occupancy for the buildings in the region.

Figure E.22: MEMA D6 100-YEAR HURRICANE



Hurricanes and tropical storms can cause damage through numerous additional hazards such as flooding, erosion, tornadoes, and high winds, thus it is difficult to estimate total potential losses from these cumulative effects. The current Hazus-MH hurricane model only analyzes hurricane winds and is not capable of modeling and estimating cumulative losses from all hazards associated with hurricanes; therefore, only hurricane winds are analyzed in this section. It can be assumed that all existing and future buildings and populations are at risk to the hurricane and tropical storm hazard.

Social Vulnerability

Given equal susceptibility across the county, it is assumed that the total population, both current and future, is at risk to the hurricane and tropical storm hazard. Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 34 households to be displaced due to the hurricane. Of these, 26 people (out of a total population of 244,467) will seek temporary shelter in public shelters.

Critical Facilities

Given equal vulnerability across Leake County, all critical facilities are considered to be at risk. Some buildings may perform better than others in the face of such an event due to construction and age, among other factors. Determining individual building response is beyond the scope of this plan. However, this plan will consider mitigation action for especially vulnerable structures and/or critical facilities to mitigate against the effects of the hurricane hazard. A list of specific critical facilities can be found at the end of this subsection.

In conclusion, a hurricane event has the potential to impact many existing and future buildings, critical facilities, and populations in Leake County.

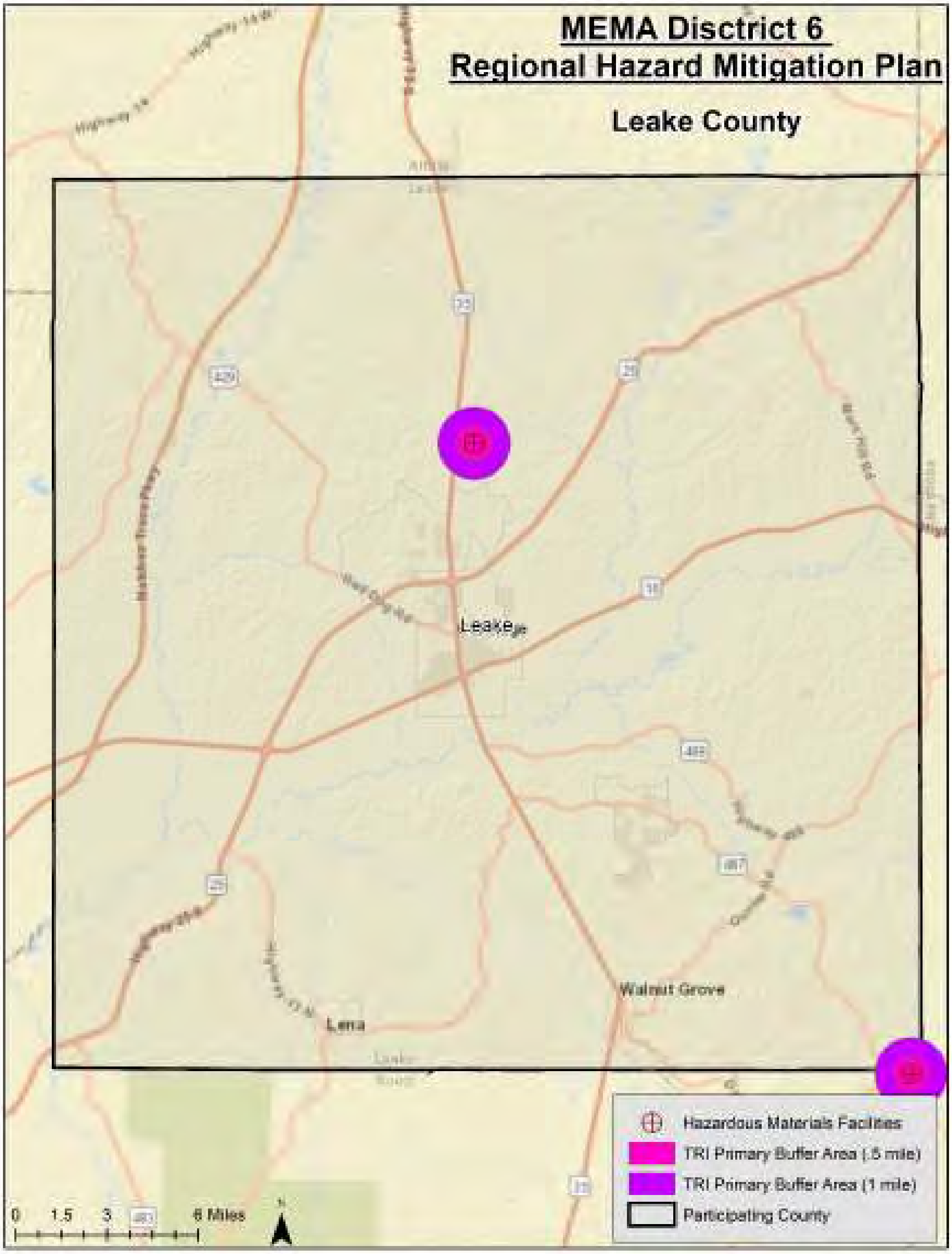
HAZARDOUS MATERIALS INCIDENT

Although historical evidence indicates that Leake County is susceptible to hazardous materials events, there are no reports of damage. Therefore, it is difficult to calculate a reliable annualized loss figure. It is assumed that while one major event could result in significant losses, annualizing structural losses over a long period of time would most likely yield a negligible annualized loss estimate for Leake County.

Most hazardous materials incidents that occur are contained and suppressed before destroying any property or threatening lives. However, they can have a significant negative impact. Such events can cause multiple deaths, completely shut down facilities for 30 days or more, and cause more than 50 percent of affected properties to be destroyed or suffer major damage. In a hazardous materials incident, solid, liquid, and/or gaseous contaminants may be released from fixed or mobile containers. Weather conditions will directly affect how the hazard develops. Certain chemicals may travel through the air or water, affecting a much larger area than the point of the incidence itself. Non-compliance with fire and building codes, as well as failure to maintain existing fire and containment features, can substantially increase the damage from a hazardous materials release. The duration of a hazardous materials incident can range from hours to days. Warning time is minimal to none.

In order to conduct the vulnerability assessment for this hazard, GIS intersection analysis was used for fixed and mobile areas and building footprints/parcels. In both scenarios, two sizes of buffers—0.5-mile and 1.0-mile—were used. These areas are assumed to represent the different levels of effect: immediate (primary) and secondary. Primary and secondary impact zones were selected based on guidance from the PHMSA Emergency Response Guidebook. For the fixed site analysis, geo-referenced TRI sites in the region, along with buffers, were used for analysis as shown in **Figure E.23.** For the mobile analysis, the major roads (Interstate highway, U.S. highway, and State highway) and railroads, where hazardous materials are primarily transported that could adversely impact people and buildings, were used for the GIS buffer analysis. **Figure E.24** shows the areas used for mobile toxic release buffer analysis.

Figure E.23: TRI SITES WITH BUFFERS IN LEAKE COUNTY



Source: Environmental Protection Agency

Figure E.24: MOBILE HAZMAT BUFFERS IN LEAKE COUNTY

Social Vulnerability

Given high susceptibility across the entire county, it is assumed that the total population is at risk to a hazardous materials incident. It should be noted that areas of population concentration may be at an elevated risk due to a greater burden to evacuate population quickly.

Critical Facilities

Fixed Site Analysis:

The critical facility analysis for fixed TRI sites revealed that there are no facilities located in a HAZMAT risk zone. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

Mobile Analysis:

It should be presumed that any facility located near a public roadway or rail line is susceptible to a potential HAZMAT event. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

A list of specific critical facilities and their associated risk can be found at the end of this subsection.

In conclusion, a hazardous material incident has the potential to impact many existing and future buildings, critical facilities, and populations in Leake County. Those areas in a primary buffer are at the highest risk, though all areas carry some vulnerability due to variations in conditions that could alter the impact area (i.e., direction and speed of wind, volume of release, etc.). Further, incidents from neighboring counties could also impact the county and participating jurisdictions.

CONCLUSIONS ON HAZARD VULNERABILITY

The following table presents a summary of annualized loss for each hazard in Leake County. Due to the reporting of hazard damages primarily at the county level, it was difficult to determine an accurate annualized loss estimate for each municipality. Therefore, an annualized loss was determined through the damage reported through historical occurrences at the county level. These values should be used as an additional planning tool or measure risk for determining hazard mitigation strategies throughout the county.

Table E.27: ANNUALIZED LOSS FOR LEAKE COUNTY

Event	Leake County
Flood-related Hazards	
Flood	$549,000
Erosion	Negligible
Dam and Levee Failure	Negligible
Winter Storm & Freeze	$65,800
Fire-related Hazards	
Drought / Heat Wave	$6,875
Wildfire	Negligible
Geologic Hazards	
Earthquake	Negligible
Landslide	Negligible
Land Subsidence	Negligible
Wind-related Hazards	
Hurricane & Tropical Storm	$169,000
Thunderstorm / High Wind	$20,909
Hail	$12,411
Lightning	$8,692
Tornado	$1,049,142
Other Hazards	
HAZMAT Incident	Negligible
Pandemic	Negligible

**In this table, the term "Negligible" is used to indicate that no records of dollar losses for the particular hazard were recorded. This could be the case either because there were no events that caused dollar damage or because documentation of that particular type of event is not well kept. Annualized losses were calculated based on the total number of years of reporting and damage totals.*

As noted previously, all existing and future buildings and populations (including critical facilities) are vulnerable to atmospheric hazards including drought / heat wave, hurricane and tropical storm, thunderstorm (wind, hail, lightning), tornado, and winter storm and freeze. In addition, all buildings and populations are vulnerable to all of the man-made and technological hazards identified above. Some buildings may be more vulnerable to these hazards based on locations, construction, and building type. The following table shows the critical facilities vulnerable to additional hazards analyzed in this subsection. The table lists those assets that are determined to be exposed to each of the identified hazards (marked with an "**X**").

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Table E.28: AT-RISK CRITICAL FACILITIES IN LEAKE COUNTY

		FLOOD-RELATED				FIRE-RELATED		GEOLOGIC			WIND-RELATED			OTHER						
FACILITY NAME	FACILITY TYPE	Flood – 100 yr	Flood – 500 yr	Erosion	Dam and Levee Failure[33]	Winter Storm and Freeze	Drought / Heat Wave	Wildfire	Earthquake	Landslide	Land Subsidence	Hurricane and Tropical Storm	Thunderstorm (wind, hail,	Tornado	Fixed HAZMAT – 0.5 mile	Fixed HAZMAT – 1.0 mile	Mobile HAZMAT – 0.5 mile (road)	Mobile HAZMAT – 1.0 mile (road)	Mobile HAZMAT – 0.5 mile (rail)	Mobile HAZMAT – 1.0 mile (rail)	Pandemic
LEAKE COUNTY																					
Barnes Volunteer Fire Department	Fire Station			X	X	X	X		X	X	X	X	X	X					X	X	X
Carthage Fire Department	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
Edinburg Volunteer Fire Department	Fire Station			X	X	X	X		X	X	X	X	X	X				X			X
Lena VFD	Fire Station			X	X	X	X		X	X	X	X	X	X					X	X	X
Madden Volunteer Fire Department	Fire Station			X	X	X	X		X	X	X	X	X	X							X
Marydell Volunteer Fire Department	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
Mississippi Forestry Commission	Fire Station			X	X	X	X		X	X	X	X	X	X					X	X	X
Ofahoma Volunteer Fire Department	Fire Station			X	X	X	X		X	X	X	X	X	X					X	X	X
Reformation Volunteer Fire Department	Fire Station			X	X	X	X		X	X	X	X	X	X				X			X
Thomastown Volunteer Fire Department	Fire Station			X	X	X	X		X	X	X	X	X	X					X	X	X
Walnut Grove Volunteer Fire Department	Fire Station	X		X	X	X	X		X	X	X	X	X	X							X
Baptist Medical Center	Medical Care Facility			X	X	X	X		X	X	X	X	X	X			X	X			X
Carthage Police Dept	Police Station			X	X	X	X		X	X	X	X	X	X			X	X			X
Leake County Sheriff	Police Station			X	X	X	X		X	X	X	X	X	X			X	X			X
Walnut Grove Police	Police Station			X	X	X	X		X	X	X	X	X	X					X	X	X

		FLOOD-RELATED					FIRE-RELATED		GEOLOGIC			WIND-RELATED			OTHER						
FACILITY NAME	FACILITY TYPE	Flood – 100 yr	Flood – 500 yr	Erosion	Dam and Levee Failure[33]	Winter Storm and Freeze	Drought / Heat Wave	Wildfire	Earthquake	Landslide	Land Subsidence	Hurricane and Tropical Storm	Thunderstorm (wind, hail,	Tornado	Fixed HAZMAT – 0.5 mile	Fixed HAZMAT – 1.0 mile	Mobile HAZMAT – 0.5 mile (road)	Mobile HAZMAT – 1.0 mile (road)	Mobile HAZMAT – 0.5 mile (rail)	Mobile HAZMAT – 1.0 mile (rail)	Pandemic
LEAKE COUNTY																					
Leake County Vocational Center	School			X	X	X	X		X	X	X	X	X	X			X	X			X
LEAKE CENTRAL ELEMENTARY SCHOOL	School			X	X	X	X		X	X	X	X	X	X					X	X	X
LEAKE CENTRAL HIGH SCHOOL	School			X	X	X	X		X	X	X	X	X	X					X	X	X
LEAKE CENTRAL JUNIOR HIGH	School			X	X	X	X		X	X	X	X	X	X					X	X	X
LEAKE CO CAREER & TECHNICAL CENTER	School			X	X	X	X		X	X	X	X	X	X					X	X	X
LEAKE COUNTY ELEMENTARY SCHOOL	School			X	X	X	X		X	X	X	X	X	X					X	X	X
LEAKE COUNTY HIGH SCHOOL	School			X	X	X	X		X	X	X	X	X	X					X	X	X
Red Water Elementary School	School			X	X	X	X	X	X	X	X	X	X	X			X	X			X
Standing Pine Elementary School	School			X	X	X	X		X	X	X	X	X	X							X

* As noted previously, these facilities could be at risk to dam failure if located in an inundation area. Data was not available to conduct such an analysis. There was no local knowledge of these facilities being at risk to dam failure.

E.4 LEAKE COUNTY CAPABILITY ASSESSMENT

This subsection discusses the capability of Leake County to implement hazard mitigation activities. More information on the purpose and methodology used to conduct the assessment can be found in Section 7: *Capability Assessment*.

E.4.1 Planning and Regulatory Capability

The table below provides a summary of the relevant local plans, ordinances, and programs already in place or under development for Leake County. A checkmark (✓) indicates that the given item is currently in place and being implemented. An asterisk (*) indicates that the given item is currently being developed for future implementation. Each of these local plans, ordinances, and programs should be considered available mechanisms for incorporating the requirements of the MEMA District 6 Regional Hazard Mitigation Plan.

Table E.29: RELEVANT PLANS, ORDINANCES, AND PROGRAMS

Planning Tool/Regulatory Tool	Hazard Mitigation Plan	Comprehensive Land Use Plan	Floodplain Management Plan	Open Space Management Plan (Parks & Rec/Greenway Plan	Stormwater Management Plan/Ordinance	Natural Resource Protection Plan	Flood Response Plan	Emergency Operations Plan	Continuity of Operations Plan	Evacuation Plan	Disaster Recovery Plan	Capital Improvements Plan	Economic Development Plan	Historic Preservation Plan	Flood Damage Prevention Ordinance	Zoning Ordinance	Subdivision Ordinance	Unified Development Ordinance	Post-Disaster Redevelopment Ordinance	Building Code	Fire Code	National Flood Insurance Program (NFIP)	NFIP Community Rating System
LEAKE COUNTY	✓		✓					✓					✓		✓							✓	
Carthage	✓	✓						✓				✓	✓		✓	✓	✓			✓	✓	✓	
Lena	✓							✓					✓										
Walnut Grove	✓							✓					✓		✓							✓	

A more detailed discussion on the county's planning and regulatory capabilities follows.

EMERGENCY MANAGEMENT

Hazard Mitigation Plan
Leake County has previously adopted a hazard mitigation plan. The City of Carthage, Town of Lena, and Town of Walnut Grove were also included in this plan.

Emergency Operations Plan
Leake County maintains an Emergency Operations Plan through its Emergency Management Agency. The City of Carthage, Town of Lena, and Town of Walnut Grove are each covered by this plan.

GENERAL PLANNING

Comprehensive Land Use Plan
Leake County has not adopted a county comprehensive land use plan. However, the City of Carthage has adopted a municipal comprehensive plan.

Capital Improvements Plan
Leake County has not adopted a county capital improvement plan. However, the City of Carthage has adopted a municipal capital improvement plan.

Zoning Ordinance
Leake County does not have a zoning ordinance in place. However, the City of Carthage has adopted a zoning ordinance.

Subdivision Ordinance
Leake County does not have a subdivision ordinance in place. However, the City of Carthage has adopted a subdivision ordinance.

Building Codes, Permitting, and Inspections
The City of Carthage has adopted a building code.

FLOODPLAIN MANAGEMENT

The table below provides NFIP policy and claim information for each participating jurisdiction in Leake County.

Table E.30: NFIP POLICY AND CLAIM INFORMATION

Jurisdiction	Date Joined NFIP	Current Effective Map Date	NFIP Policies in Force	Insurance in Force	Closed Claims	Total Payments to Date
LEAKE COUNTY†	09/15/89	09/16/11	23	$2,948,600	10	$92,350
Carthage	08/19/85	09/16/11	18	$1,838,400	18	$186,046
Lena*	--	--	--	--	--	--
Walnut Grove	09/16/11	09/16/11	0	$0	0	$0

†Includes unincorporated areas of county only
*Community does not participate in the NFIP
Source: NFIP Community Status information as of 9/2/2015; NFIP claims and policy information as of 6/30/2015

Flood Damage Prevention Ordinance

All communities participating in the NFIP are required to adopt a local flood damage prevention ordinance. Leake County, the City of Carthage, and the Town of Walnut Grove all participate in the NFIP and have adopted flood damage prevention ordinances.

E.4.2 Administrative and Technical Capability

The table below provides a summary of the capability assessment results for Leake County with regard to relevant staff and personnel resources. A checkmark (✓) indicates the presence of a staff member(s) in that jurisdiction with the specified knowledge or skill.

Table E.31: RELEVANT STAFF / PERSONNEL RESOURCES

Staff / Personnel Resource	Planners with knowledge of land development/land management practices	Engineers or professionals trained in construction practices related to buildings and/or infrastructure	Planners or engineers with an understanding of natural and/or human-caused hazards	Emergency Manager	Floodplain Manager	Land Surveyors	Scientists familiar with the hazards of the community	Staff with education or expertise to assess the community's vulnerability to hazards	Personnel skilled in GIS and/or Hazus	Resource development staff or grant writers
LEAKE COUNTY				✓	✓		✓	✓		
Carthage		✓		✓	✓		✓	✓		
Lena				✓			✓	✓		
Walnut Grove				✓	✓		✓	✓		✓

Credit for having a floodplain manager was given to those jurisdictions that have a flood damage prevention ordinance, and therefore an appointed floodplain administrator, regardless of whether the appointee was dedicated solely to floodplain management. Credit was given for having a scientist familiar with the hazards of the community if a jurisdiction has a Cooperative Extension Service or Soil and Water Conservation Department. Credit was also given for having staff with education or expertise to assess the community's vulnerability to hazards if a staff member from the jurisdiction was a participant on the existing hazard mitigation plan's planning committee.

E.4.3 Fiscal Capability

The table below provides a summary of the results for Leake County with regard to relevant fiscal resources. A checkmark (✓) indicates that the given fiscal resource is locally available for hazard mitigation purposes (including match funds for state and federal mitigation grant funds) according to the previous county hazard mitigation plan.

Table E.32: RELEVANT FISCAL RESOURCES

Fiscal Tool / Resource	Capital Improvement Programming	Community Development Block Grants (CDBG)	Special Purpose Taxes (or taxing districts)	Gas/Electric Utility Fees	Water/Sewer Fees	Stormwater Utility Fees	Development Impact Fees	General Obligation, Revenue, and/or Special Tax Bonds	Partnering Arrangements or Intergovernmental Agreements	Other: other state and Federal funding sources
LEAKE COUNTY	✓	✓								✓
Carthage	✓	✓			✓					✓
Lena	✓	✓								✓
Walnut Grove	✓	✓			✓					✓

E.4.4 Political Capability

During the months immediately following a disaster, local public opinion in Leake County is more likely to shift in support of hazard mitigation efforts.

E.4.5 Conclusions on Local Capability

The table below shows the results of the capability assessment using the designed scoring methodology described in Section 7: *Capability Assessment*. The capability score is based solely on the information found in existing hazard mitigation plans and readily available on the jurisdictions' government websites. According to the assessment, the average local capability score for the county and its jurisdictions is 18.0, which falls into the limited capability ranking.

Table E.33: CAPABILITY ASSESSMENT RESULTS

Jurisdiction	Overall Capability Score	Overall Capability Rating
LEAKE COUNTY	20	Moderate
Carthage	26	Moderate

Jurisdiction	Overall Capability Score	Overall Capability Rating
Lena	9	Limited
Walnut Grove	17	Limited

E.5 LEAKE COUNTY MITIGATION STRATEGY

This subsection provides the blueprint for Leake County to follow in order to become less vulnerable to its identified hazards. It is based on general consensus of the Regional Hazard Mitigation Council and the findings and conclusions of the capability assessment and risk assessment. Additional Information can be found in Section 8: *Mitigation Strategy* and Section 9: *Mitigation Action Plan*.

E.5.1 Mitigation Goals

Leake County developed 10 mitigation goals in coordination with the other participating MEMA District 6 Region jurisdictions. The regional mitigation goals are presented below.

Table E.34: MEMA DISTRICT 6 REGIONAL MITIGATION GOALS

Goal #		Goals & Objectives	Action #
#1	**Goal**	Local government will be able to maintain **effective mitigation programs**.	PEA-1
	Objective	***County works to get buy in on the importance of mitigation projects from key leadership.***	
#2	**Goal**	The community will work together to create a **disaster-resistant community**.	PEA-2
	Objective	***County works with RedCross and Department of Human Services for strong partnerships.***	
#3	**Goal**	The community will be able to initiate and sustain **emergency response operations.**	PEA-2
	Objective	***County is currently pursuing a new EOC / Sheriff's Office location to be able to host other departments and entities during times of emergency as the current location doesn't support that.***	
#4	**Goal**	**Government operations** will not be significantly disrupted by disasters.	
	Objective	**County maintains a COOP that is updated.**	
#5	**Goal**	The **health, safety, and welfare of the community's residents and visitors** will be protected.	ES-5
	Objective	***County subscribes to NIXLE for emergency alerts to their community and actively works to get residents to sign up.***	
#6	**Goal**	**Local government will support effective hazard mitigation programming** in the community.	
	Objective	***County has pushed NFIP and flood plain ordinances.***	
#7	**Goal**	Residents of the community will have **homes, institutions, and work places that are safer**.	PEA-3
	Objective	***Continually encourages residents to install saferooms and are seeking additional community shelters***	
#8	**Goal**	The **local economy** of the community will be prepared for a disaster.	
	Objective	***County strongly encourages insurance to cover potential hazards.***	
#9	**Goal**	**Local infrastructure will not be significantly disrupted by a disaster**.	ES-4
	Objective	***County maintains redundant communications systems and are seeking to build a new EOC.***	
#10	**Goal**	All **members of the community will understand the hazards threatening their community.**	PEA-1
	Objective	***Public information campaigns and outreach so residents are aware of the hazards they face. This has significantly increased during the COVID pandemic.***	

To attain the listed mitigation goals, the county has also identified objectives that will assist them in the mitigation action process. Objectives are broader than specific actions, but are measurable, unlike goals. Objectives connect goals with the actual mitigation actions. The action plan describes how the mitigation actions will be implemented, including how those actions will be prioritized, administered and incorporated into the community's existing planning mechanisms.

E.5.2 Mitigation Action Plan

The mitigation actions proposed by Leake County, Carthage, Lena, and Walnut Grove are listed in the following individual Mitigation Action Plans.

Leake County Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Waterway maintenance of flood-prone waterways, including: clearing and removal of debris; dredging of waterways; and erosion prevention measures, such as rip rap and planting of vegetation.	Flood	High	Board of Supervisors	FEMA/MEMA, CDBG, US Army Corps of Engineers, Local funds	2025	Ongoing. This action has been partially completed as there is a plan in place for clearing and debris removal. However, the county is seeking funding for erosion prevention measures and dredging.
P-2	Development of a permit system for the County.	Flood	High	Board of Supervisors	FEMA/MEMA, CDBG, Local funds	2017	Completed
P-3	Work with Leake County Schools to identify which roads their buses have trouble crossing during heavy rains because of flooding.	Flood	High	County Emergency Management, County School System	FEMA/MEMA, CDBG, State DOE, Local funds	2025	The county has been in contact with the school system concerning this issue, but a comprehensive plan to address these issues is not in place as there was a lack of funding. Seeking funding.
P-4	Establish and publish base flood elevations throughout the County.	Flood	High	Board of Supervisors, County Emergency Management	FEMA/MEMA, Homeland Security, US Army Corps of Engineers, Local funds	2025	The county has not published base flood elevations throughout the county. This is a goal the county is still working towards so it will remain in the plan.
P-5	Work with ECPDD to develop a model ordinance to regulate new/existing construction and infrastructure in flood-prone areas.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
P-6	Work with ECPDD to develop a model ordinance to regulate new/existing construction and infrastructure in heavily wooded areas.	Wildfire	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-7	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2025	The International Building Code has not been adopted. The county will review this code and consider adoption, so this action will remain in the plan.
P-8	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	County Emergency Management	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
P-9	Collect additional data on the number of buildings located in flood-prone areas near the Pearl River and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	County Emergency Management	FEMA/MEMA, Local funds	2025	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Structural Projects							
SP-1	Build a new EOC.	All	High	County EMA / Sheriff	FEMA, MEMA, Local	2022	New Action
Emergency Services							
ES-1	Installation of texting/paging system for the County.	All	High	County Emergency Management	FEMA/MEMA, Homeland Security, Local funds	2017	Completed
ES-2	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	County Emergency Management	FEMA/MEMA, Local funds	2017	Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan.
ES-3	Install radios on all Leake County Schools buses for emergency contact during flooding.	Flood	Moderate	County Emergency Management, County School System	FEMA/MEMA, State DOE, Local funds	2020	Completed
ES-4	Installation of a camera atop Leake County Communications Office to monitor weather conditions from E-911 Center.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2020	Completed

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
ES-5	Installation of emergency warning systems at all 10 fire stations in the County.	Tornado, High Wind	Moderate	County Fire Service	FEMA/MEMA, Homeland Security, Local funds	2025	Ongoing. Emergency warning systems have not been installed at fire stations. The county will continue seeking
ES-6	Purchase of generators for the County's seven rural fire departments.	Tornado, High Wind	Moderate	County Fire Service	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	Ongoing. Generators have not been purchased for all of the rural fire departments, so this action will remain in the
ES-7	Increasing specialized training of local emergency responders in order to improve response.	All	Moderate	County Emergency Management	FEMA/MEMA, AFGP, Homeland Security, Local funds	2025	Ongoing. Although some training of local responders has taken place, there is a continual need to train new responders and keep current responders up to date, so this action will remain in place.
ES-8	Conducting mock emergency exercises to improve local response capabilities.	All	Moderate	County Emergency Management	FEMA/MEMA, AFGP, Homeland Security, Local funds	2025	The county has conducted mock emergency exercises, but these will still need to be carried out going forward. The county will continue to carry these out in the future.
ES-9	County maps will be provided to all emergency responders to improve overall emergency response.	All	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2017	Completed
ES-10	Purchase of a tower for emergency communications repeater station.	All	Moderate	County Emergency Management	FEMA/MEMA, Homeland Security, Local funds	2020	Completed

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
ES-11	Digitize mapping and upgrades to current E-911 system to make it Phase II compatible with mapping and data information for emergency response, situation tracking, identification of hazard areas, and other information that may be implemented in Hazard Mitigation Planning and response.	All	High	County Emergency Management	FEMA/MEMA, Homeland Security, Local funds	2016	Completed
Public Education and Awareness							
PEA-1	Education of local citizens on the dangers of driving across flooded roads.	Flood	High	County Emergency Management	FEMA/MEMA, LLEBG, Local funds	2025	The county has worked hard to inform citizens of the dangers of driving across flooded roads, but this action needs to be continued going forward.
PEA-2	Education of local residents on being prepared for all hazards including tornadoes, high winds, and severe weather.	All	High	County Emergency Management	FEMA/MEMA, Local funds	2025	The county has implemented education activities mostly through local radio and print ads The county will continue to work on better public information techniques and improve public communication.
PEA-3	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2025	Safe room construction has been encouraged throughout the county, especially with new construction, but the county will continue to seek funding to install additional safe rooms and shelters.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
PEA-4	Improve the County's library of hazard response reference materials.	All	Moderate	County Emergency Management	FEMA/MEMA, AFGP, Homeland Security, Local funds	2020	Completed
PEA-5	Development of a Leake County website with links to all County Offices, emergency plans, etc.	All	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2020	Completed
Previously Completed Actions							

City of Carthage Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate new/existing construction and infrastructure in flood-prone areas.	Flood	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-2	Work with ECPDD to develop a model ordinance to regulate new/existing construction and infrastructure in heavily wooded areas.	Wildfire	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Fire Department , Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
P-4	Collect additional data on the number of buildings located in flood-prone areas near the Pearl River and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	Fire Department , Police Department	FEMA/MEMA, Local funds	2025	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.
Property Protection							
PP-1	Acquire large capacity Sump/Water Pump to assist with flooding of prone areas in city of Carthage	Flood	High	Board of Aldermen	FEMA/MEMA, Local Funds	2020	Complete (pumps are leased)

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1	Drainage improvements along Allenwood Drive, Terry Lane, and South Valley Street. Existing drainage system is not capable of handling runoffs from heavy rains.	Flood	High	Public Works	FEMA/MEMA, Local funds	2025	Improvements have not been implemented in these areas, but the city will continue seeking funding.
SP-2	Upgrade levee system on Town Creek south side of Carthage.	Flood	High	Public Works	Local, FEMA, MEMA	2025	New Action
Emergency Services							
ES-1	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Fire Department , Police Department	FEMA/MEMA, Local funds	2025	Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan.
Public Education and Awareness							
PEA-1	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Low	Fire Department , Police Department	FEMA/MEMA, Local funds	2025	Safe room construction has been encouraged throughout the county, especially with new construction, but the county will continue to seek funding to install additional safe rooms and shelters.
PEA-2	Education of local residents on being prepared for all hazards including tornadoes, high winds, and severe weather.	All	Low	Fire Department , Police Department	FEMA/MEMA, Local funds	2025	The county has implemented education activities mostly through local radio and print ads The county will continue to work on better public information techniques and improve public communication.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
PEA-3	Education of local citizens on the dangers of driving across flooded roads.	Flood	Low	Fire Department , Police Department	FEMA/MEMA, Local funds	2025	The county has worked hard to inform citizens of the dangers of driving across flooded roads, but this action needs to be continued going forward.
Previously Completed Actions							

Town of Lena Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate new/existing construction and infrastructure in flood-prone areas.	Flood	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-2	Work with ECPDD to develop a model ordinance to regulate new/existing construction and infrastructure in heavily wooded areas.	Wildfire	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	The International Building Code has been adopted. The county will need to review this code over the next 5 years, so this action will remain in the plan.
P-4	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
P-5	Collect additional data on the number of buildings located in flood-prone areas near the Pearl River and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1							
Emergency Services							
ES-1	Purchase of a generator to provide adequate standby power for the Town of Lena's water system.	Tornado, High Wind	High	Public Works	FEMA/MEMA, Homeland Security, Local funds	2017	Completed
ES-2	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan.
ES-3	Purchase of a generator to provide adequate standby power for the Lena Volunteer Fire Department.	Tornado, High Wind	Moderate	Volunteer Fire Department	FEMA/MEMA, AFGP, Homeland Security, Local funds	2025	A generator for the fire department has not been purchased due to lack of funding. The town will continue to try to find a funding source for this project.
ES-4	Renovate existing emergency warning system so that it can be remotely activated by the E-911 Center during emergencies.	Tornado, High Wind	Moderate	Board of Aldermen	FEMA/MEMA, Homeland Security, Local funds	2025	The existing emergency warning system has not been renovated to have remote activation capabilities. The county will continue to seek funding to implement this action.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Public Education and Awareness							
PEA-1	Education of local citizens on the dangers of driving across flooded roads.	Flood	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, LLEBG, AAA (free booklets?), Local funds	2025	The county has worked hard to inform citizens of the dangers of driving across flooded roads, but this action needs to be continued going forward.
PEA-2	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Safe room construction has been encouraged throughout the county, especially with new construction, but the county will continue to seek funding to install additional safe rooms and shelters.
PEA-3	Education of local residents on being prepared for all hazards including tornadoes, high winds, and severe weather.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	The county has implemented education activities mostly through local radio and print ads The county will continue to work on better public information techniques and improve public communication.
Previously Completed Actions							

Town of Walnut Grove Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Clean out debris and enlarge the main drainage ditch that runs through the Town of Walnut Grove to Tusculometa Creek.	Flood	High	Public Works	FEMA/MEMA, CDBG, Local funds	2017	Completed
P-2	Waterway maintenance of flood-prone waterways, including: clearing and removal of debris; dredging of waterways; and erosion prevention measures, such as rip rap and planting of vegetation.	Flood	Moderate	Public Works	FEMA/MEMA, CDBG, US Army Corps of Engineers, Local funds	2025	This action has been partially completed as there is a plan in place for clearing and debris removal. However, the county is seeking funding for erosion prevention measures and dredging.
P-3	Work with ECPDD to develop a model ordinance to regulate new/existing construction and infrastructure in flood-prone areas.	Flood	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-4	Work with ECPDD to develop a model ordinance to regulate new/existing construction and infrastructure in heavily wooded areas.	Wildfire	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-5	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	The International Building Code has been adopted. The county will need to review this code over the next 5 years, so this action will remain in the plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
P-6	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
P-7	Collect additional data on the number of buildings located in flood-prone areas near the Pearl River and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.
P-8	Work to become compliant with National Flood Insurance Program (NFIP) guidelines.	Flood	Low	Board of Aldermen	FEMA/MEMA, Local funds	2025	The town has worked hard to become compliant with the NFIP. This is an action that still requires some work, so the town will leave it in place in the plan.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1	Installation of a larger culvert on Main Street at Walnut Grove Town Hall to alleviate flooding in the downtown area.	Flood	High	Public Works	FEMA/MEMA, CDBG, Local funds	2025	A larger culvert has not been installed on Main Street due to lack of funding. The town will continue to seek funding to implement this project.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
SP-2	Installation of a larger culvert on the north side of Spruce Street near South Leake High School.	Flood	Moderate	Public Works	FEMA/MEMA, CDBG, Local funds	2020	Completed
Emergency Services							
ES-1	Purchase of a generator to provide adequate standby power for the Town of Walnut Grove water system.	Tornado, High Wind	High	Public Works	FEMA/MEMA, Homeland Security, Local funds	2017	Completed
ES-2	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan.
ES-3	Renovate existing emergency warning system so that it can be remotely activated by the E-911 Center during emergencies.	Tornado, High wind	Moderate	Board of Aldermen	FEMA/MEMA, Homeland Security, Local funds	2020	Partially completed.The existing emergency warning system has not been renovated to have remote activation capabilities. The county will continue to seek funding to implement this action.
ES-4	Construction of a new fire station for so the Walnut Grove Volunteer Fire Department can most effectively respond to emergencies and to serve as the emergency response post during such emergencies.	Tornado, High Wind	Moderate	Volunteer Fire Department	FEMA/MEMA, CDBG, Local funds	2020	Completed

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
ES-5	Increasing specialized training of local emergency responders in order to improve response capabilities.	All	Moderate	Volunteer Fire Department	FEMA/MEMA, AFGP, Homeland Security, Local funds	2025	Although some training of local responders has taken place, there is a continual need to train new responders and keep current responders up to date, so this action will remain in place.
ES-6	Conducting mock emergency exercise to improve local response capabilities.	All	Moderate	Volunteer Fire Department	FEMA/MEMA, AFGP, Homeland Security, Local funds	2025	The county has conducted mock emergency exercises, but these will still need to be carried out going forward. The county will continue to carry these out in the future.
Public Education and Awareness							
PEA-1	Education of local citizens on the dangers of driving across flooded roads.	Flood	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, LLEBG, AAA, Local funds	2025	The county has worked hard to inform citizens of the dangers of driving across flooded roads, but this action needs to be continued going forward.
PEA-2	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Safe room construction has been encouraged throughout the county, especially with new construction, but the county will continue to seek funding to install additional safe rooms and shelters.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
PEA-3	Education of local residents on being prepared for all hazards including tornadoes, high winds, and severe weather.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	The county has implemented education activities mostly through local radio and print ads The county will continue to work on better public information techniques and improve public communication.
Previously Completed Actions							

ANNEX F
NESHOBA COUNTY

This annex includes jurisdiction-specific information for Neshoba County and its participating municipalities. It consists of the following five subsections:

- F.1 Neshoba County Community Profile
- F.2 Neshoba County Risk Assessment
- F.3 Neshoba County Vulnerability Assessment
- F.4 Neshoba County Capability Assessment
- F.5 Neshoba County Mitigation Strategy

F.1 NESHOBA COUNTY COMMUNITY PROFILE

F.1.1 Geography and the Environment

Neshoba County is located in eastern Mississippi. It comprises one city, City of Philadelphia, as well as many small unincorporated communities. An orientation map is provided as **Figure F.1**.

The county contains multiple industries, companies, and recreation facilitates that support the local economy by providing employment for numerous residents and encouraging tourism. The total area of the county is 572 square miles, 2 square miles of which is water area.

Summer temperatures in the county range from highs of about 90 degrees Fahrenheit (˚F) to lows in the upper 60s. Winter temperatures range from highs in the mid-50s to lows around 30˚F. Average annual rainfall is approximately 56 inches, with the wettest months being November, December, and May.

Figure F.1: NESHOBA COUNTY ORIENTATION MAP

F.1.2 Population and Demographics

According to the 2019 American Community Survey, Neshoba County has a population of 29,332 people. The county has seen a slight decrease in population between 2010 and 2019, and the population density is 50 people per square mile. Population counts from the US Census Bureau for 2000, 2010, and 2019 for the county and participating jurisdiction are presented in **Table F.1**.

Table F.1: POPULATION COUNTS FOR NESHOBA COUNTY

Jurisdiction	2000 Census Population	2010 Census Population	2019 ACS Estimate	% Change 2010-2019
Neshoba County	**28,684**	**29,676**	**29,332**	**2.25%**
Philadelphia	7,303	7,477	7,218	-1.16%

Source: United States Census Bureau

Based on the 2019 Census American Community Survey, the median age of residents of Neshoba County is 37.3 years. The racial characteristics of the county are presented in **Table F.2**. Whites make up the majority of the population in the county, accounting for 60 percent of the population.

Table F.2: DEMOGRAPHICS OF NESHOBA COUNTY

Jurisdiction	White, Percent (2019)	Black or African American, Percent (2019)	American Indian or Alaska Native, Percent (2019)	Asian, Percent (2019)	Native Hawaiian or Other Pacific Islander, Percent (2019)	Other Race, Percent (2010)	Two or More Races, percent (2019)	Persons of Hispanic Origin, Percent (2019)*
Neshoba County	**60.0%**	**20.9%**	**16.7%**	**0.5%**	**0.0%**	**0.2%**	**1.6%**	**2.1%**
Philadelphia	47.5%	47.5%	1.2%	0.6%	0.0%	0.8%	2.4%	5.9%

*Hispanics may be of any race, so also are included in applicable race categories
Source: United States Census Bureau – American Community Survey

F.1.3 Housing

According to the 2019 American Community Survey, there are 12,535 housing units in Neshoba County, the majority of which are single family homes or mobile homes. Housing information for the county and one municipality is presented in **Table F.3**.

Table F.3: HOUSING CHARACTERISTICS OF NESHOBA COUNTY

Jurisdiction	Housing Units (2010)	Housing Units (2019)	Median Home Value (2019)
Neshoba County	**12,357**	**12,535**	**$83,000**
Philadelphia	3,389	3,429	$80,600

Source: United States Census Bureau – American Community Survey

F.1.4 Infrastructure

TRANSPORTATION

In Neshoba County, State Highway 15 provides access to the north and south. State Highway 16, which crosses east and west, travels through Philadelphia and through the county. State Highways 19 and 21 provides access to north and south.

The Philadelphia Municipal Airport provides limited local service. The closest major airport used by residents located in nearby counties includes Jackson-Evers International Airport, which offers international and domestic flights to a number of locations around the world.

UTILITIES

Electrical power in Neshoba County is provided by the Central Electric Power Association, CenterPoint Energy, and several local distributors.

Water and sewer service is provided to residents by the Central Water Association, Beulah Hubbard Water Association, Union Water Association, Edinburg Domestic Water System, Sebastopol Water Association, Zama Water Association, and various other local utilities.

COMMUNITY FACILITIES

There are a number of buildings and community facilities located throughout Neshoba County. According to the data collected for the vulnerability assessment (Section 6.4.1), there are 26 fire stations, 6 police stations, and 11 public schools located within the county.

There is one hospital located in Neshoba County. Neshoba County General Hospital is a 208-bed medical facility located in the City of Philadelphia.

Recreational opportunities in Neshoba County include outdoor recreation such as golf, hunting, boating, and hiking. The Pearl River Resort offers two casinos, two hotels, and multiple restaurants. Two golf courses and a large water park are available through the resort. The Mississippi Band of Choctaw Indians has a museum available to residents and visitors.

F.1.5 Land Use

Many areas of Neshoba County are undeveloped or sparsely developed. There are several small incorporated municipalities located throughout the county, with a few larger hubs interspersed. These areas are where the county's population is generally concentrated. The incorporated areas are also where many of the businesses, commercial uses, and institutional uses are located. Land uses in the balance of the study area generally consist of rural residential development, agricultural uses, and recreational areas, although there are some notable exceptions in the larger municipalities. Local land use and associated regulations are further discussed in *Section 7: Capability Assessment.*

Community Development Partnership of Philadelphia assist with preserving the area's natural beauty and promotion of development. East Central Planning and Development District assists with Neshoba County with planning and development to promote economic growth and job opportunities.

F.1.6 Employment and Industry

According to U.S. Census Bureau's American Community Survey (ACS), in 2019, Neshoba County had an average annual employment of 12,786 workers and according to Mississippi Department of Employment Security an unemployment rate of 5.8 as of May 2021. In 2019, the Educational Services, Health Care, and Social Assistance industry employed the most people, with 29.7 percent of the workforce, followed by

Arts, Entertainment, Recreation, Accommodation, and Food Services (16.5%) and Retail Trade (11.6%). The median household income in Neshoba County was $37,987 compared to $45,081 in the state of Mississippi.

F.2 NESHOBA COUNTY RISK ASSESSMENT

This subsection includes hazard profiles for each of the significant hazards identified in Section 4: *Hazard Identification* as they pertain to Neshoba County. Each hazard profile includes a description of the hazard's location and extent, notable historical occurrences, and the probability of future occurrences. Additional information can be found in Section 5: *Hazard Profiles*.

F.2.1 Flood

LOCATION AND SPATIAL EXTENT

There are areas in Neshoba County that are susceptible to flood events. Special flood hazard areas in the county were mapped using Geographic Information System (GIS) and FEMA Digital Flood Insurance Rate Maps (DFIRM). This includes Zone A (1-percent annual chance floodplain), Zone AE (1-percent annual chance floodplain with elevation), and Zone X500 (0.2-percent annual chance floodplain). According to GIS analysis, of the 569 square miles that make up Neshoba County, there are 99.8 square miles of land in zones A and AE (1-percent annual chance floodplain/100-year floodplain) and 0.2 square miles of land in zone X500 (0.2-percent annual chance floodplain/500-year floodplain).

These flood zone values account for 17.6 percent of the total land area in Neshoba County. It is important to note that while FEMA digital flood data is recognized as best available data for planning purposes, it does not always reflect the most accurate and up-to-date flood risk. Flooding and flood-related losses often do occur outside of delineated special flood hazard areas. **Figure F.2** illustrates the location and extent of currently mapped special flood hazard areas for Neshoba County based on best available FEMA Digital Flood Insurance Rate Map (DFIRM) data.[1] The principal flood problems in Neshoba County result from the overflow of Pearl River and its tributaries, including Kentawka Canal, onto the relatively flat overbanks. Flooding periodically occurs during intense seasonal rains and occasional tropical storms or hurricanes.[2]

[1] DFIRM Panels last updated 2010.
[2] FEMA. Flood Insurance Study. May 2010

Figure F.2: SPECIAL FLOOD HAZARD AREAS IN NESHOBA COUNTY

Source: Federal Emergency Management Agency

HISTORICAL OCCURRENCES

Floods were at least partially responsible for six disaster declarations in Neshoba County in 1974, 1979, 2001, 2003, 2011, and 2019. Information from the National Centers for Environmental Information was used to ascertain additional historical flood events. The National Centers for Environmental Information reported a total of 39 events in

Neshoba County since 1997. A summary of these events is presented in **Table F.4**. These events accounted for almost $2.16 million in property damage in the county.

Table F.4: SUMMARY OF FLOOD OCCURRENCES IN NESHOBA COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Philadelphia	7	0/0	$236,000
Unincorporated Area	32	0/0	$1,924,000
NESHOBA COUNTY TOTAL	**39**	**0/0**	**$2,160,000**

Source: National Centers for Environmental Information

HISTORICAL SUMMARY OF INSURED FLOOD LOSSES

NFIP and Repetitive Loss Properties data was not made available during this plan update. The following information is current as of 2015. According to FEMA flood insurance policy records as of June 2015, there have been four flood losses reported in Neshoba County through the National Flood Insurance Program (NFIP) since 1978, totaling nearly $45,000 in claims payments. A summary of these figures for the county is provided in **Table F.5**. It should be emphasized that these numbers include only those losses to structures that were insured through the NFIP policies, and for losses in which claims were sought and received. It is likely that many additional instances of flood loss in Neshoba County were either uninsured, denied claims payment, or not reported.

Table F.5: SUMMARY OF INSURED FLOOD LOSSES IN NESHOBA COUNTY

Location	Flood Losses	Claims Payments
Philadelphia	4	$44,902
Unincorporated Area	0	$0
NESHOBA COUNTY TOTAL	**4**	**$44,902**

Source: Federal Emergency Management Agency, National Flood Insurance Program

REPETITIVE LOSS PROPERTIES

According to the Mississippi Emergency Management Agency, there are no non-mitigated repetitive loss properties located in Neshoba County. **Table F.6** presents detailed information on repetitive loss properties and NFIP claims and policies for Neshoba County.

Table F.6: REPETITIVE LOSS PROPERTIES IN NESHOBA COUNTY

Location	Number of Properties	Types of Properties	Number of Losses	Building Payments	Content Payments	Total Payments	Average Payment
Philadelphia	0	--	0	$0	$0	$0	$0
Unincorporated Area	0	--	0	$0	$0	$0	$0
NESHOBA COUNTY TOTAL	**0**		**0**	**$0**	**$0**	**$0**	**$0**

Source: National Flood Insurance Program

PROBABILITY OF FUTURE OCCURRENCES

Flood events will remain a threat in Neshoba County, and the probability of future occurrences will remain likely (between 10 and 100 percent annual probability). The participating jurisdictions and unincorporated areas have risk to flooding, though not all areas will experience flood. The probability of future flood events based on magnitude and according to best available data is illustrated in the figures above**,** which indicates those areas susceptible to the 1-percent annual chance flood (100-year floodplain) and the 0.2-percent annual chance flood (500-year floodplain).

It can be inferred from the floodplain location maps, previous occurrences, and repetitive loss properties that risk varies throughout the county. For example, the northern half of the county has more floodplain and thus a higher risk of flood than the southern half of the county. Flood is not the greatest hazard of concern but will continue to occur and cause damage. Therefore, mitigation actions may be warranted, particularly for repetitive loss properties.

F.2.2 Erosion

LOCATION AND SPATIAL EXTENT

Erosion in Neshoba County is typically caused by flash flooding events. Unlike coastal areas, areas of concern for erosion in Neshoba County are primarily rivers and streams. Generally, vegetation helps to prevent erosion in the area, and it is not an extreme threat to the county. No areas of concern were reported by the hazard mitigation council.

HISTORICAL OCCURRENCES

Several sources were vetted to identify areas of erosion in Neshoba County. This includes searching local newspapers, interviewing local officials, and reviewing previous hazard mitigation plans. No historical erosion occurrences were found in these sources.

PROBABILITY OF FUTURE OCCURRENCES

Erosion remains a natural, dynamic, and continuous process for Neshoba County, and it will continue to occur. The annual probability level assigned for erosion is possible (between 1 and 10 percent annually).

F.2.3 Dam and Levee Failure

LOCATION AND SPATIAL EXTENT

According to the Mississippi Department of Environmental Quality, there is one high hazard dam in Neshoba County. **Figure F.3** shows the location of this dam and **Table F.7** lists it by name.

Figure F.3: NESHOBA COUNTY HIGH HAZARD DAM LOCATIONS

Source: U.S. Army Corps of Engineers – National Inventory of Dams

Table F.7: NESHOBA COUNTY HIGH HAZARD DAMS

Dam Name	Hazard Potential
Neshoba County	
Joyce Caracci Lake Dam	High

Source: U.S. Army Corps of Engineers – National Inventory of Dams

HISTORICAL OCCURRENCES

There is no record of dam breaches in Neshoba County.

PROBABILITY OF FUTURE OCCURRENCES

Given the current dam inventory and historic data, a dam breach is possible (between 1 and 10 percent annual probability) in the future. However, as has been demonstrated in the past, regular monitoring is necessary to prevent these events.

F.2.4 Winter Storm and Freeze

LOCATION AND SPATIAL EXTENT

Nearly the entire continental United States is susceptible to winter storm and freeze events. Some ice and winter storms may be large enough to affect several states, while others might affect limited, localized areas. The degree of exposure typically depends on the normal expected severity of local winter weather. Neshoba County is not accustomed to severe winter weather conditions and rarely receives severe winter weather, even during the winter months. Events tend to be mild in nature; however, even relatively small accumulations of snow, ice, or other wintery precipitation can lead to losses and damage due to the fact that these events are not commonplace. Given the atmospheric nature of the hazard, the entire county has uniform exposure to a winter storm.

HISTORICAL OCCURRENCES

Winter weather has resulted in two disaster declarations in Neshoba County in 1999, and 2021. According to the National Centers for Environmental Information, there have been a total of nine recorded winter storm events in Neshoba County since 1996 (**Table F.8**). These events resulted in almost $1.530 million in damages. Detailed information on the recorded winter storm events can be found in **Table F.9**.

Table F.8: SUMMARY OF WINTER STORM EVENTS IN NESHOBA COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Neshoba County	12	0/0	$1,530,000

Source: National Centers for Environmental Information

Table F.9: HISTORICAL WINTER STORM IMPACTS IN NESHOBA COUNTY

Location	Date	Type	Deaths / Injuries	Property Damage*
Philadelphia				
None Reported	--	--	--	--

Location	Date	Type	Deaths / Injuries	Property Damage*
Unincorporated Area				
NESHOBA (ZONE)	2/1/1996	Ice Storm	0/0	$152,096
NESHOBA (ZONE)	12/14/1997	Heavy Snow	0/0	$0
NESHOBA (ZONE)	12/23/1998	Ice Storm	0/0	$146,404
NESHOBA (ZONE)	1/27/2000	Ice Storm	0/0	$41,575
NESHOBA (ZONE)	2/11/2010	Heavy Snow	0/0	$328,317
NESHOBA (ZONE)	1/9/2011	Heavy Snow	0/0	$53,045
NESHOBA (ZONE)	2/3/2011	Ice Storm	0/0	$424,360
NESHOBA (ZONE)	2/9/2011	Heavy Snow	0/0	$424,360
NESHOBA (ZONE)	1/16/2013	Heavy Snow	0/0	$0
NESHOBA (ZONE)	12/08/2017	Heavy Snow	0/0	$0
NESHOBA (ZONE)	01/10/2021	Heavy Snow	0/0	$0
NESHOBA (ZONE)	02/17/2021	Ice Storm	0/0	$150,000

Source: National Centers for Environmental Information

There have been several severe winter weather events in Neshoba County. The text below describes one of the major events and associated impacts on the county. Similar impacts can be expected with severe winter weather.

December 1998
Central Mississippi was hit by a crippling ice storm. Up to 2 inches of ice accumulated on power lines and much of the region experienced long power outages, nearly seven days in some cases. The ice caused numerous power outages and brought down many trees and power lines. Christmas travel was severely hampered for several days with motorists stranded at airports, bus stations, and truck stops. Travel did not return to normal until after Christmas in some locations.

Winter storms throughout the planning area have several negative externalities including hypothermia, cost of snow and debris cleanup, business and government service interruption, traffic accidents, and power outages. Furthermore, citizens may resort to using inappropriate heating devices that could to fire or an accumulation of toxic fumes.

February 2021
A strong winter storm…..

PROBABILITY OF FUTURE OCCURRENCES

Winter storm events will continue to occur in Neshoba County. According to historical information, the annual probability is likely (between 10 and 100 percent).

FIRE-RELATED HAZARDS

F.2.5 Drought / Heat Wave

Drought
Drought typically covers a large area and cannot be confined to any geographic or political boundaries. Furthermore, it is assumed that Neshoba County would be uniformly exposed to drought, making the spatial extent potentially widespread. It is also notable that drought conditions typically do not cause

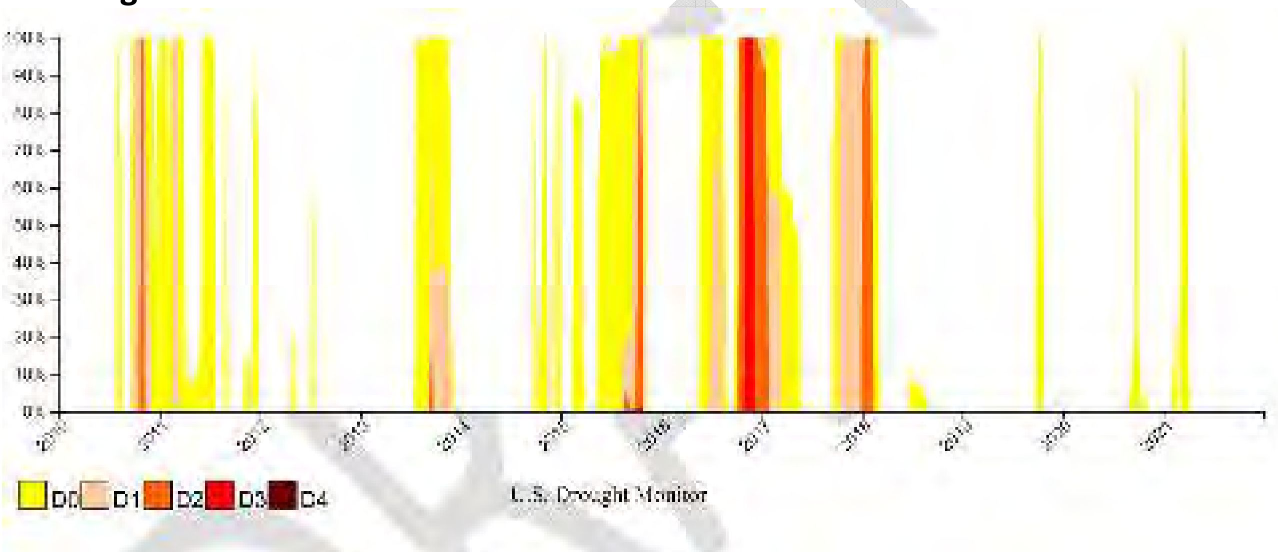
significant damage to the built environment but may exacerbate wildfire conditions.

Heat Wave
Heat waves typically impact a large area and cannot be confined to any geographic or political boundaries.

HISTORICAL OCCURRENCES

Drought
Figure F.4 shows the most severe drought classification for each year, according to U.S. Drought Monitor classifications. It should be noted that the U.S. Drought Monitor also estimates what percentage of the county is in each classification of drought severity. For example, the most severe classification reported may be exceptional but a majority of the county may actually be in a less severe condition.

Figure F.4: HISTORICAL DROUGHT OCCURRENCES IN NESHOBA COUNTY



Source: United States Drought Monitor

Some additional anecdotal information was provided from the National Centers for Environmental Information on droughts in Neshoba County.

Summer 2006 – During a four-and-a-half-month period, from June to the middle of October, abnormally dry conditions prevailed across most of Jackson, MS County Warning Area (CWA). The drought had a significant impact on the agricultural industry. Non-irrigated crops were destroyed and all other sustainable crops produced a below normal yield. Catfish ponds were drawn down to severe levels and required water to be pumped back into the fish ponds. The cattle industry suffered due to low watering ponds and lack of sufficient grasslands for grazing and hay production. Water supply problems were encountered by those cities who obtained water from local rivers for drinking purposes due to the low river flows. Fire threat was significant causing the issuance of burn bans across the CWA.

Summer 2007 – By the middle of April, drought conditions were being experienced across a large portion of Eastern and some of Central Mississippi. During the month of May, the drought worsened and expanded. In June, the drought peaked across the region. Although drought conditions continued throughout July and August, conditions were less severe than earlier in the summer. As a result of these conditions, area farmers and crop yields were affected.

October 2010 – Very dry conditions continued across central Mississippi during most of October. Crops were put under stress under the warm and dry conditions. The likely impact was less crop yields for harvest time.

Heat Wave
The National Centers for Environmental Information was used to determine historical heat wave occurrences in the county.

July 2005 – A five-day heat wave occurred across the region. Heat index values reached near 110 degrees each day. Each day had high temperatures ranging from 95 to 99 degrees. This was the warmest stretch of weather the area experienced since July 2001.

August 2005 –A heat wave covering the south began in mid-August and lasted about 10 days. High temperatures were consistently over 95 degrees and surpassed 100 degrees or more on some days. It was the first time since August 2000 that 100-degree temperatures reached the area.

July 2006 – A short heat wave impacted most of the area temperatures in the 90s to around 100 for five straight days.

August 2007 – A heat wave gripped most of the area with the warmest temperatures since 2000. It lasted from August 5th to the 16th.

August 2010 – The combination of high humidity and above normal temperatures produced heat index readings ranged between 105 and 109 degrees during the afternoon hours in the middle part of August.

PROBABILITY OF FUTURE OCCURRENCES

Drought
Based on historical occurrence information, it is assumed that Neshoba County has a probability level of likely (between 10 and 100 percent annual probability) for future drought events. However, the extent (or magnitude) of drought and the amount of geographic area covered by drought, varies with each year. Historic information indicates that there is a much lower probability for extreme, long-lasting drought conditions.

Heat Wave
Based on historical occurrence information, it is assumed that all of Neshoba County has a probability level of likely (between 10 and 100 percent annual probability) for future heat wave events.

F.2.6 Wildfire

LOCATION AND SPATIAL EXTENT

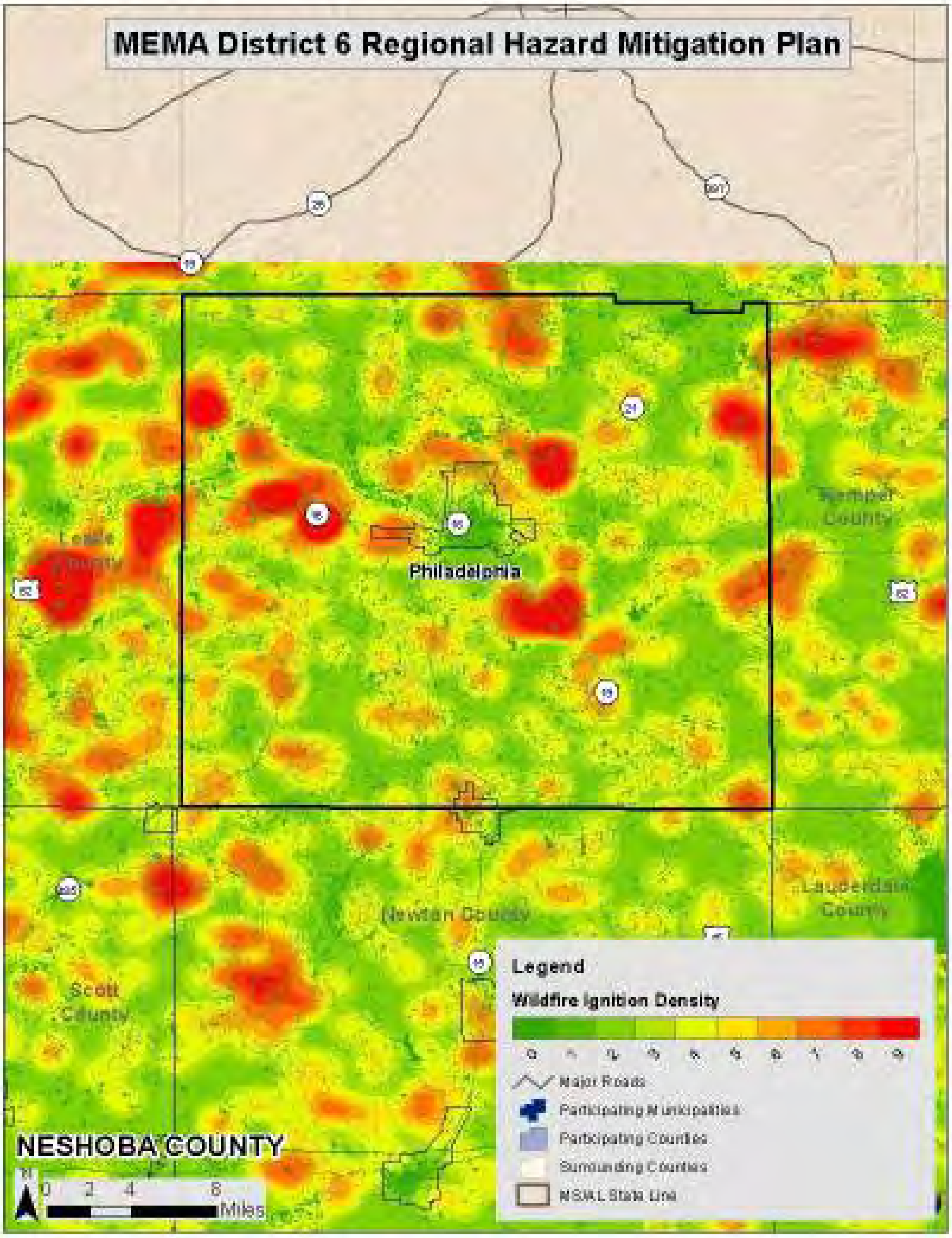
The entire county is at risk to a wildfire occurrence. However, several factors such as drought conditions or high levels of fuel on the forest floor, may make a wildfire more likely. Furthermore, areas in the urban-wildland interface are particularly susceptible to fire hazard as populations abut formerly undeveloped areas. The Wildfire Ignition Density data shown in the figure below give an indication of historic location.

HISTORICAL OCCURRENCES

Figure F.5 shows the Wildfire Ignition Density in Neshoba County based on data from the Southern Wildfire Risk Assessment. This data is based on historical fire ignitions and the likelihood of a wildfire igniting in an area. Occurrence is derived by modeling historic wildfire ignition locations to create an average ignition rate map. This is measured in the number of fires per year per 1,000 acres.[8]

[8] Southern Wildfire Risk Assessment, 2014.

Figure F.5: WILDFIRE IGNITION DENSITY IN NESHOBA COUNTY



Source: Southern Wildfire Risk Assessment

Based on data from the Mississippi Forestry Commission from 2015 to 2020, Neshoba County experiences an average of 25 wildfires annually which burn an average of 146 acres per year. The data indicates that most of these fires are small, averaging about 6 acres per fire. **Table F.10** provides a summary of wildfire occurrences in Neshoba County and **Table F.11** lists the number of reported wildfire occurrences in the county between the years 2011 and 2020.

Table F.10: SUMMARY TABLE OF ANNUAL WILDFIRE OCCURRENCES (2015-2020)*

	Neshoba County
Average Number of Fires per year	25
Average Number of Acres Burned per year	146
Average Number of Acres Burned per fire	6

*These values reflect averages over a 6-year period.
Source: Mississippi Forestry Commission

Table F.11: HISTORICAL WILDFIRE OCCURRENCES IN NESHOBA COUNTY

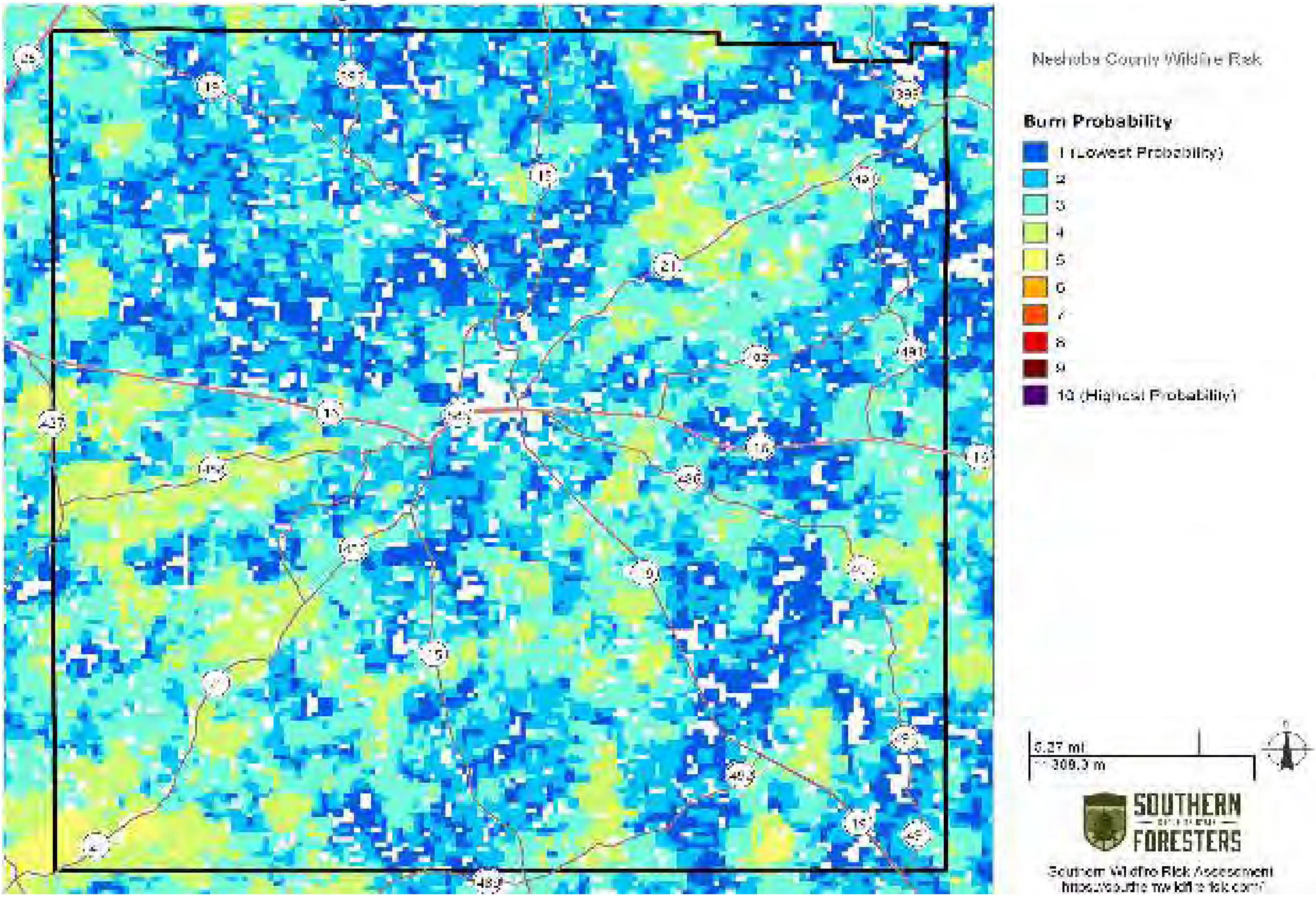
Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Neshoba County										
Number of Fires	18	16	11	21	44	48	26	10	16	11
Number of Acres Burned	117	114	86	356	219	226	181	57	78	116

Source: Mississippi Forestry Commission

PROBABILITY OF FUTURE OCCURRENCES

Wildfire events will be an ongoing occurrence in Neshoba County. **Figure F.6** shows that there is some probability a wildfire will occur throughout the county. However, the likelihood of wildfires increases during drought cycles and abnormally dry conditions. Fires are likely to stay small in size but could increase due to local climate and ground conditions. Dry, windy conditions with an accumulation of forest floor fuel (potentially due to ice storms or lack of fire) could create conditions for a large fire that spreads quickly. It should also be noted that some areas do vary somewhat in risk. For example, highly developed areas are less susceptible unless they are located near the urban-wildland boundary. The risk will also vary due to assets. Areas in the urban-wildland interface will have much more property at risk, resulting in increased vulnerability and need to mitigate compared to rural, mainly forested areas. The probability assigned to Neshoba County for future wildfire events is highly likely (100 percent annual probability).

Figure F.6: BURN PROBABILITY IN NESHOBA COUNTY



Source: Southern Wildfire Risk Assessment

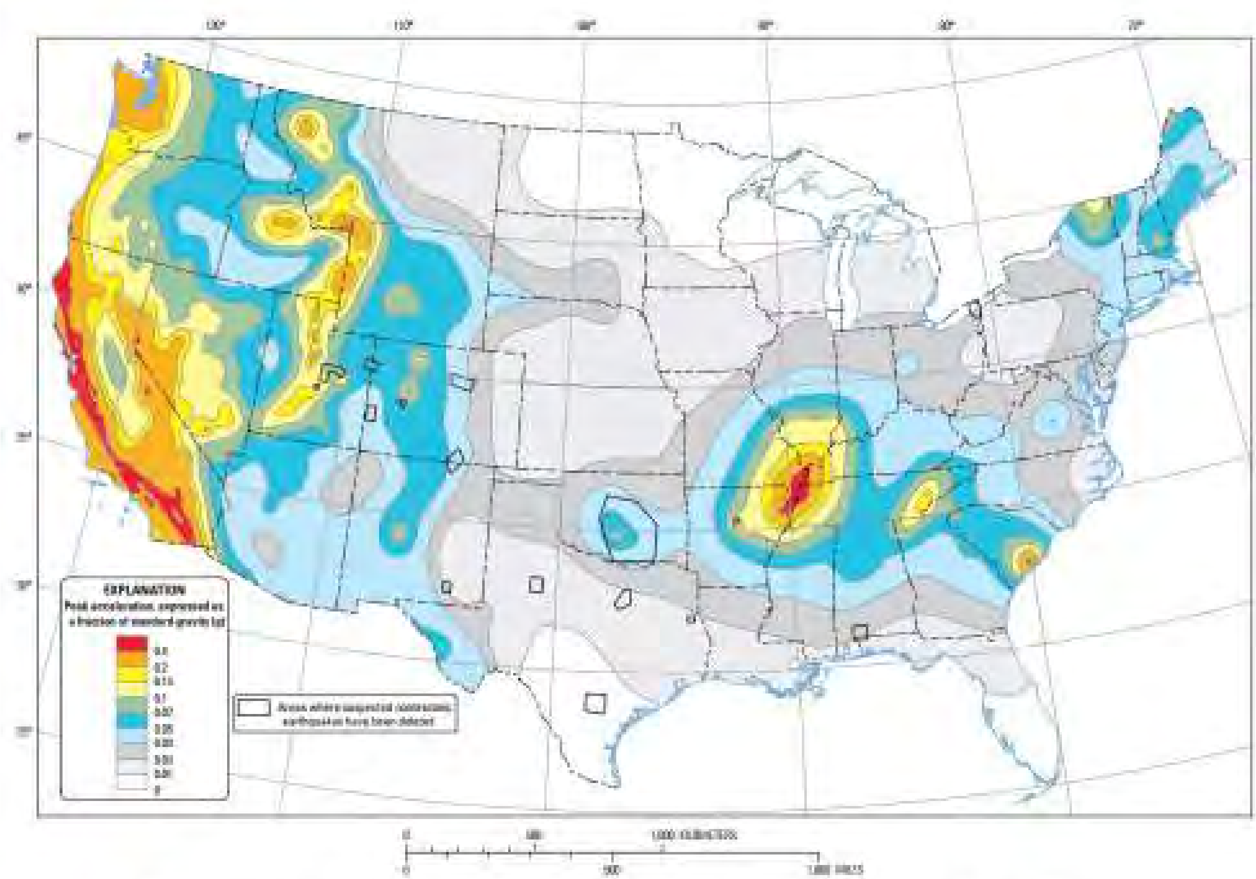
GEOLOGIC HAZARDS

F.2.7 Earthquake

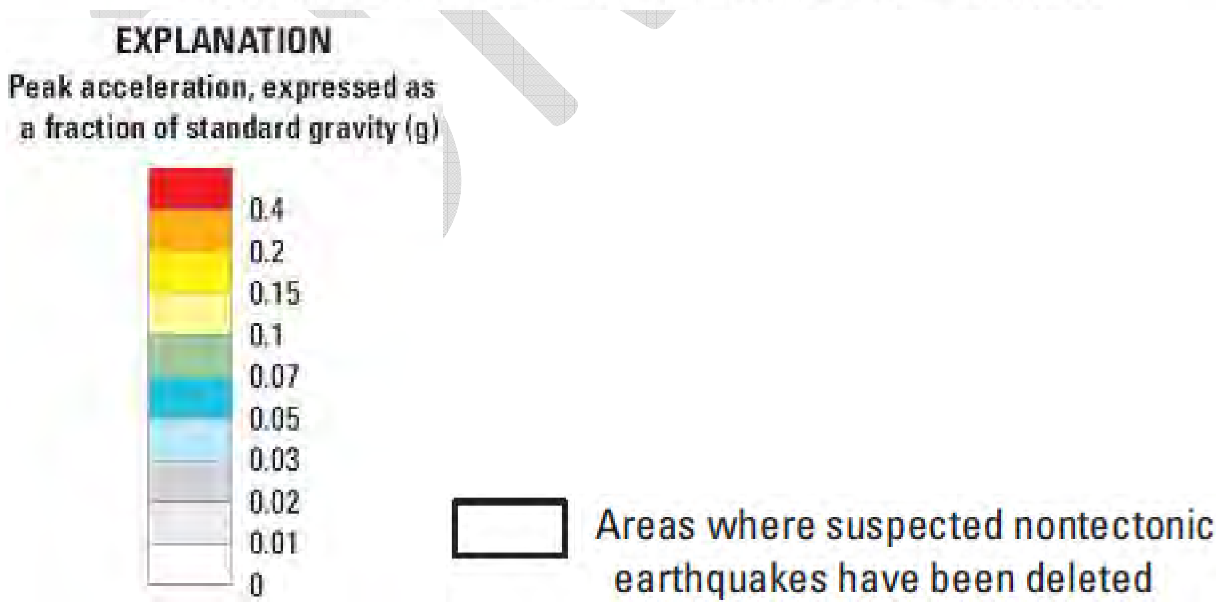
LOCATION AND SPATIAL EXTENT

Figure F.7 shows the intensity level associated with Neshoba County, based on the national USGS map of peak acceleration with 10 percent probability of exceedance in 50 years. It is the probability that ground motion will reach a certain level during an earthquake. The data show peak horizontal ground acceleration (the fastest measured change in speed, for a particle at ground level that is moving horizontally due to an earthquake) with a 10 percent probability of exceedance in 50 years. The map was compiled by the U.S. Geological Survey (USGS) Geologic Hazards Team, which conducts global investigations of earthquake, geomagnetic, and landslide hazards. According to this map, Neshoba County lies within an approximate zone of level "3" to "5" ground acceleration. This indicates that the county exists within an area of moderate seismic risk.

Figure F.7: PEAK ACCELERATION WITH 10 PERCENT PROBABILITY OF EXCEEDANCE IN 50 YEARS



Ten-percent probability of exceedance in 50 years map of peak ground acceleration



Source: United States Geological Survey, 2014

HISTORICAL OCCURRENCES

No earthquakes are known to have affected Neshoba County since 1638. **Table F.12** provides a summary of earthquake events reported by the National Geophysical Data Center between 1638 and 1985. **Table F.13** presents a detailed occurrence of each event including the date, distance for the epicenter, magnitude and Modified Mercalli Intensity (if known). [3]

Table F.12: SUMMARY OF SEISMIC ACTIVITY IN NESHOBA COUNTY

Location	Number of Occurrences	Greatest MMI Reported	Richter Scale Equivalent
Philadelphia	0	--	--
Unincorporated Area	0	--	--
NESHOBA COUNTY TOTAL	**0**	**--**	**--**

Source: National Geophysical Data Center

Table F.13: SIGNIFICANT SEISMIC EVENTS IN NESHOBA COUNTY (1638 -1985)

Location	Date	Epicentral Distance	Magnitude	MMI
Philadelphia				
None Reported	--	--	--	--
Unincorporated Area				
None Reported	--	--	--	--

Source: National Geophysical Data Center

PROBABILITY OF FUTURE OCCURRENCES

The probability of significant, damaging earthquake events affecting Neshoba County is unlikely. However, it is possible that future earthquakes resulting in light to moderate perceived shaking and damages ranging from none to very light will affect the county. The annual probability level for the county is estimated to be between 1 and 10 percent (possible).

F.2.8 Landslide

LOCATION AND SPATIAL EXTENT

Landslides occur along steep slopes when the pull of gravity can no longer be resisted (often due to heavy rain). Human development can also exacerbate risk by building on previously undevelopable steep slopes. Landslides are possible throughout Neshoba County, though the risk is relatively low.

According to **Figure F.8** below, the entire county falls under a low incidence area. This indicates that less than 1.5 percent of the area is involved in landsliding.

[3] Due to reporting mechanisms, not all earthquake events were recorded during this time. Furthermore, some are missing data, such as the epicenter location, due to a lack of widely used technology. In these instances, a value of "unknown" is reported.

Figure F.8: LANDSLIDE SUSCEPTIBILITY AND INCIDENCE MAP OF NESHOBA COUNTY

Source: United States Geological Survey

HISTORICAL OCCURRENCES

There is no extensive history of landslides in Neshoba County. Landslide events typically occur in isolated areas. Reviews of the USGS Landslide Inventory show no historical occurrences of landslides.

PROBABILITY OF FUTURE OCCURRENCES

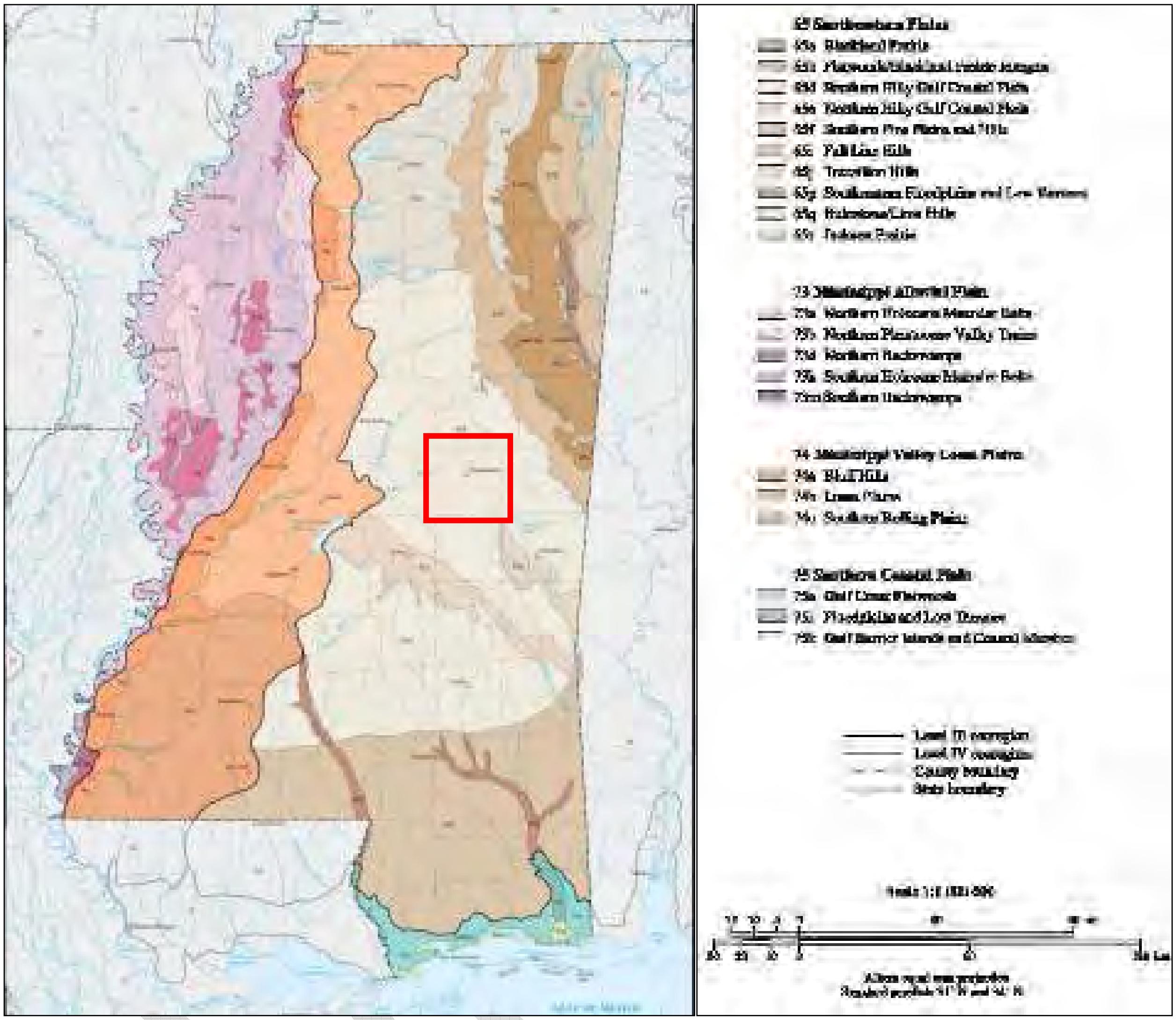
Based on historical information and the USGS susceptibility index, the probability of future landslide events is unlikely (less than 1 percent probability). The USGS data indicates that all areas in Neshoba County have a low incidence rate and low susceptibly to landsliding activity. However, local conditions may become more favorable for landslides due to heavy rain, for example. This would increase the likelihood of occurrence. It should also be noted that some areas in Neshoba County have greater risk than others given factors such as steepness on slope and modification of slopes.

F.2.9 Land Subsidence

LOCATION AND SPATIAL EXTENT

Much of Neshoba County is located in an area where the soil is substantially clay, causing a shrink and swell effect depending on the current conditions. Indeed, much of the area underlain by the calcareous Yazoo clay which, when combined with sand and marl, is highly susceptible to expansion when wet and shrinking when dry. These areas are denoted below in **Figure F.9**.

Figure F.9: MAP OF MISSISSIPPI SOILS



Source: http://www.eoearth.org/view/article/152119/

HISTORICAL OCCURRENCES

There is no significant historical record of land subsidence in Neshoba County. However, local county officials have noted the impacts from these swings and changes in soil as roads and other infrastructure have experienced large cracks and breaks, causing stops in daily operations and significant costs to local, state, and federal budgets. Often the cost to repair this infrastructure can be in the range of millions of dollars depending on the degree of damage and necessity for quick repairs.

PROBABILITY OF FUTURE OCCURRENCES

The probability of future land subsidence events in the county is unlikely (less than 1 percent annual probability).

WIND-RELATED HAZARDS

F.2.10 Hurricane and Tropical Storm

LOCATION AND SPATIAL EXTENT

Hurricanes and tropical storms threaten the entire Atlantic and Gulf seaboard of the United States. While coastal areas are most directly exposed to the brunt of landfalling storms, their impact is often felt hundreds of miles inland and they can affect Neshoba County. All areas in Neshoba County are equally susceptible to hurricane and tropical storms.

HISTORICAL OCCURRENCES

According to the National Hurricane Center's historical storm track records, 58 hurricane or tropical storm/depression tracks have passed within 75 miles of the MEMA District 6 Region since 1855. This includes: 1 Category 3 hurricane, 2 Category 2 hurricanes, 5 Category 1 hurricanes, 33 tropical storms, and 16 tropical depressions.

Of the recorded storm events, 36 hurricane or tropical storm/depression events traversed directly through the region as shown in **Figure F.10**. Notable storms include Hurricane Frederic (1979) and Hurricane Katrina (2005). **Table F.14** provides for each event the date of occurrence, name (if applicable), maximum wind speed (as recorded within 75 miles of the MEMA District 6 Region) and category of the storm based on the Saffir-Simpson Scale.

Figure F.10: HISTORICAL HURRICANE STORM TRACKS 1980 - 2020

Source: National Oceanic and Atmospheric Administration, National Hurricane Center

Table F.14: HISTORICAL STORM TRACKS WITHIN 75 MILES OF THE MEMA 6 DISTRICT REGION (1850–2020)

Date of Occurrence	Storm Name	Maximum Wind Speed (knots)	Storm Category
9/16/1855	UNNAMED	70	Category 1
9/15/1860	UNNAMED	70	Category 1
7/12/1872	UNNAMED	40	Tropical Storm
9/2/1879	UNNAMED	60	Tropical Storm
10/7/1879	UNNAMED	40	Tropical Storm
10/16/1879	UNNAMED	40	Tropical Storm
9/1/1880	UNNAMED	50	Tropical Storm
8/3/1881	UNNAMED	40	Tropical Storm
6/14/1887	UNNAMED	30	Tropical Depression
8/28/1890	UNNAMED	35	Tropical Storm
9/12/1892	UNNAMED	40	Tropical Storm
9/8/1893	UNNAMED	55	Tropical Storm
8/17/1895	UNNAMED	35	Tropical Storm
8/3/1898	UNNAMED	35	Tropical Storm
8/16/1901	UNNAMED	45	Tropical Storm
10/10/1905	UNNAMED	35	Tropical Storm
9/27/1906	UNNAMED	95	Category 2
9/22/1907	UNNAMED	35	Tropical Storm
6/13/1912	UNNAMED	50	Tropical Storm
7/17/1912	UNNAMED	25	Tropical Depression
9/14/1912	UNNAMED	50	Tropical Storm
9/30/1915	UNNAMED	60	Tropical Storm
7/6/1916	UNNAMED	80	Category 1
7/5/1919	UNNAMED	30	Tropical Depression
10/18/1923	UNNAMED	50	Tropical Storm
7/30/1926	UNNAMED	25	Tropical Depression
9/1/1932	UNNAMED	60	Tropical Storm
10/16/1932	UNNAMED	45	Tropical Storm
8/1/1936	UNNAMED	40	Tropical Storm
9/1/1937	UNNAMED	30	Tropical Depression
6/16/1939	UNNAMED	35	Tropical Storm
8/14/1939	UNNAMED	35	Tropical Storm
9/26/1939	UNNAMED	40	Tropical Storm
9/25/1940	UNNAMED	20	Tropical Depression
9/4/1948	UNNAMED	50	Tropical Storm
9/5/1949	UNNAMED	40	Tropical Storm
8/31/1950	BAKER	65	Category 1
6/1/1959	ARLENE	25	Tropical Depression
9/16/1960	ETHEL	35	Tropical Storm
9/26/1960	FLORENCE	15	Tropical Depression

Date of Occurrence	Storm Name	Maximum Wind Speed (knots)	Storm Category
8/18/1969	CAMILLE	100	Category 3
9/16/1971	EDITH	60	Tropical Storm
7/19/1977	UNNAMED	25	Tropical Depression
9/6/1977	BABE	30	Tropical Depression
7/11/1979	BOB	40	Tropical Storm
9/13/1979	FREDERIC	95	Category 2
8/12/1987	UNNAMED	25	Tropical Depression
8/27/1992	ANDREW	30	Tropical Depression
8/4/1995	ERIN	45	Tropical Storm
8/6/2001	BARRY	20	Tropical Depression
9/26/2002	ISIDORE	55	Tropical Storm
7/1/2003	BILL	45	Tropical Storm
7/11/2005	DENNIS	45	Tropical Storm
8/29/2005	KATRINA	80	Category 1
9/14/2007	HUMBERTO	20	Tropical Depression
8/24/2008	FAY	30	Tropical Depression
8/17/2009	CLAUDETTE	25	Tropical Depression
10/28/2020	Zeta	33	Tropical Depression

*It should be noted that the track of several major hurricanes that impacted the region fell outside of the 75-mile buffer. These storms were included in the table due to their significant impact. (Georges, 1988; Ivan, 2004; Issac, 2012)
Source: National Hurricane Center

Federal records indicate that disaster declarations were made in 2004 (Hurricane Ivan), 2005 (Hurricane Dennis and Hurricane Katrina), and 2012 (Hurricane Issac). Hurricane and tropical storm events can cause substantial damage in the area due to high winds and flooding.

Flooding and high winds from hurricanes and tropical storms can cause damage throughout the county. Anecdotes are available from NCEI for the major storms that have impacted the county as found below:

Tropical Storm Isidore – September 26, 2002
The heavy rainfall associated with Tropical Storm Isidore resulted in significant river and flash flooding across much of Mississippi. Twenty-four-hour rainfall totals between 5 and 10 inches were common over much of Mississippi, especially in the southern part of the state, where 24-hour amounts exceeded 9 inches near Hattiesburg. Gradient wind gusts between 35 and 45 miles per hour combined with the saturated ground to lead to numerous downed trees and powerlines over the state. Most of the damage was seen along and east of the Natchez Trace, near the path of the storm's diffuse center. One indirect fatality was reported just east of the Kalem community in Scott County. Here, a falling tree struck a truck driven by a 31-year-old male. Damage from Isidore was an estimated $500,000.

Hurricane Ivan – September 16, 2004
Thousands of trees were blown down across Eastern Mississippi during Hurricane Ivan as well as hundreds of power lines. The strong wind itself did not cause much structural damage, however the fallen trees did. These downed trees accounted for several hundred homes, mobile homes and businesses to be damaged or destroyed. Most locations across Eastern Mississippi reported sustained winds between 30

and 40 mph with Tropical Storm force gusts between 48 and 54 mph. The strongest reported winds occurred in Newton, Lauderdale and Oktibbeha Counties.

Overall, rainfall totals were held in check as Ivan steadily moved north. The heaviest rains were confined to far Eastern Mississippi where 3 to 4 inches fell over a 15-hour period. Due to the duration of the rain no flooding was reported. Across Eastern Mississippi, Hurricane Ivan was responsible for one fatality. This fatality occurred in Brooksville (Noxubee County) when a tree fell on a man. Damage from Ivan was estimated at $200 million.

Hurricane Dennis – July 10, 2005
Hurricane Dennis moved north-northwest across Southwest Alabama and then into East-Central Mississippi and finally across Northeast Mississippi. Wind gusts over tropical storm force were common across areas east of a line from Starkville to Newton to Hattiesburg. These winds caused several hundred trees to uproot or snap and took down numerous power lines. Additionally, a total of 21 homes or businesses sustained minor to major damage from fallen trees or gusty winds.

Heavy rainfall was not a major issue as Dennis steadily moved across the region. Rainfall totals between 2 and 5 inches fell across Eastern Mississippi over a 12-hour period. One indirect fatality occurred in Jasper County from an automobile accident due to wet roads.

Hurricane Katrina – August 29, 2005
Hurricane Katrina will likely go down as the worst and costliest natural disaster in United States history. The amount of destruction, the cost of damaged property/agriculture and the large loss of life across the affected region has been overwhelming. Catastrophic damage was widespread across a large portion of the Gulf Coast region. The devastation was not only confined to the coastal region, widespread and significant damage occurred well inland up to the Hattiesburg area and northward past Interstate 20.

Hurricane force winds were common across Central Mississippi. The region received sustained winds of 60-80 mph with gusts ranging from 80-120 mph. Wind damage to structures was widespread, with roofs blown off or partially peeled. Hundreds of signs were shredded or blown down. Many businesses sustained structural damage as windows were broken, roofs were blown off, and walls were collapsed. Millions of trees were uprooted and snapped. Power poles and lines were snapped and taken down from wind and trees. It was thousands of downed trees which caused the most significant structural damage as these trees fell onto homes and businesses. Power outages lasted from a few days to as long as four weeks. Agriculture and timber industries were severely impacted. Row crops, including cotton, rice, corn, and soybeans, took a hard hit. Other impacted industries were the catfish industry, dairy and cattle industry, and nursery businesses.

PROBABILITY OF FUTURE OCCURRENCES

Given the inland location of the county, it is more likely to be affected by remnants of hurricane and tropical storm systems (as opposed to a major hurricane) which may result in flooding or high winds. The probability of being impacted is less than coastal areas, but still remains a real threat to Neshoba County due to induced events like flooding. Based on historical evidence, the probability level of future occurrence is likely (annual probability between 10 and 100 percent). Given the regional nature of the hazard, all areas in the county are equally exposed to this hazard. However, when the county is impacted, the damage could be catastrophic, threatening lives and property throughout the planning area.

F.2.11 Thunderstorm (wind, hail, lightning)

LOCATION AND SPATIAL EXTENT

Thunderstorm / High Wind

A thunderstorm event is an atmospheric hazard, and thus has no geographic boundaries. It is typically a widespread event that can occur in all regions of the United States. However, thunderstorms are most common in the central and southern states because atmospheric conditions in those regions are favorable for generating these powerful storms. It is assumed that Neshoba County has uniform exposure to an event and the spatial extent of an impact could be large.

Hailstorm

Hailstorms frequently accompany thunderstorms, so their locations and spatial extents coincide. It is assumed that Neshoba County is uniformly exposed to severe thunderstorms; therefore, all areas of the county are equally exposed to hail which may be produced by such storms.

Lightning

Lightning occurs randomly, therefore it is impossible to predict where and with what frequency it will strike. It is assumed that all of Neshoba County is uniformly exposed to lightning.

HISTORICAL OCCURRENCES

Thunderstorm / High Wind

Severe storms were at least partially responsible for seven disaster declarations in Neshoba County in 1979, 1992, twice in 2001, 2003, 2011, and 2019. According to NCEI, there have been 295 reported thunderstorm and high wind events since 1961 in Neshoba County. These events caused almost $4.95 million in damages. There were also reports of one death and eight injuries. **Table F.15** summarizes this information.

Table F.15: SUMMARY OF THUNDERSTORM / HIGH WIND OCCURRENCES IN NESHOBA COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Philadelphia	76	0/0	$450,000
Unincorporated Area	219	0/8	$4,500,000
NESHOBA COUNTY TOTAL	**295**	**1/8**	**$4,950,000**

Source: National Centers for Environmental Information

Hailstorm

According to the National Centers for Environmental Information, 152 recorded hailstorm events have affected Neshoba County since 1970. **Table F.16** is a summary of the hail events in Neshoba County. In all, hail occurrences resulted in approximately $1.685 million in property damages. Hail ranged in diameter from 0.75 inches to 2.75 inches. It should be noted that hail is notorious for causing substantial damage to cars, roofs, and other areas of the built environment that may not be reported to the National Centers for Environmental Information. Therefore, it is likely that damages are greater than the reported value.

Table F.16: SUMMARY OF HAIL OCCURRENCES IN NESHOBA COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Philadelphia	51	0/0	$381,000
Unincorporated Area	101	0/0	$1,304,000
NESHOBA COUNTY TOTAL	**152**	**0/0**	**$1,685,000**

Source: National Centers for Environmental Information

Lightning

According to the National Centers for Environmental Information, there have been six recorded lightning events in Neshoba County since 2006. These events resulted in almost $114,000 in damages, as listed in summary **Table F.17**. Furthermore, lightning has caused three injuries in the county. Detailed information on historical lightning events can be found in **Table F.18**.

It is certain that more than six events have impacted the county. Many of the reported events are those that cause damage, and it should be expected that damages are likely much higher for this hazard than what is reported.

Table F.17: SUMMARY OF LIGHTNING OCCURRENCES IN NESHOBA COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Philadelphia	4	0/3	$66,019
Unincorporated Area	2	0/0	$47,741
NESHOBA COUNTY TOTAL	**6**	**0/3**	**$113,760**

Source: National Centers for Environmental Information

Table F.18: HISTORICAL LIGHTNING OCCURRENCES IN NESHOBA COUNTY

Location	Date	Deaths / Injuries	Property Damage*	Details
Philadelphia				
PHILADELPHIA	7/22/2006	0/3	$0	Lightning struck near the Pearl River Resort water park and injured 3 people.
PHILADELPHIA	12/28/2007	0/0	$51,792	A home sustained heavy damage after being struck by lightning.
PHILADELPHIA	8/7/2010	0/0	$10,944	A tree and a vehicle were struck by lightning and caught on fire at a residence in Philadelphia.
PHILADELPHIA	8/15/2010	0/0	$3,283	Lightning struck a home and caused minor damage.
Unincorporated Area				
STALLO	4/21/2011	0/0	$21,218	A home was struck by lightning and damage occurred to the water lines and cement in front of the fireplace.
ARLINGTON	9/27/2011	0/0	$26,523	Lightning struck a residence on Route 187 near the Winston County line. The structure was wood with a metal roof and caught fire near the strike location. The fire was quickly contained.

Source: National Centers for Environmental Information

PROBABILITY OF FUTURE OCCURRENCES

Thunderstorm / High Wind

Given the high number of previous events, it is certain that thunderstorm events, including straight-line wind events, will occur in the future. This results in a probability level of highly likely (100 percent annual probability) for the entire county.

Hailstorm

Based on historical occurrence information, it is assumed that the probability of future hail occurrences is highly likely (100 percent annual probability). Since hail is an atmospheric hazard, it is assumed that Neshoba County has equal exposure to this hazard. It can be expected that future hail events will continue to cause minor damage to property and vehicles throughout the county.

Lightning

Although there was not a high number of historical lightning events reported in Neshoba County via NCEI data, it is a regular occurrence accompanied by thunderstorms. In fact, lightning events will assuredly happen on an annual basis, though not all events will cause damage. According to Vaisala's U.S. National Lightning Detection Network (NLDN), Neshoba County is located in an area of the country that experienced an average of 4 to 6 cloud-to-ground lightning flashes per square kilometer per year between 2015 and 2019.[4] Therefore, the probability of future events is highly likely (100 percent annual probability). It can be expected that future lightning events will continue to threaten life and cause minor property damages throughout the county.

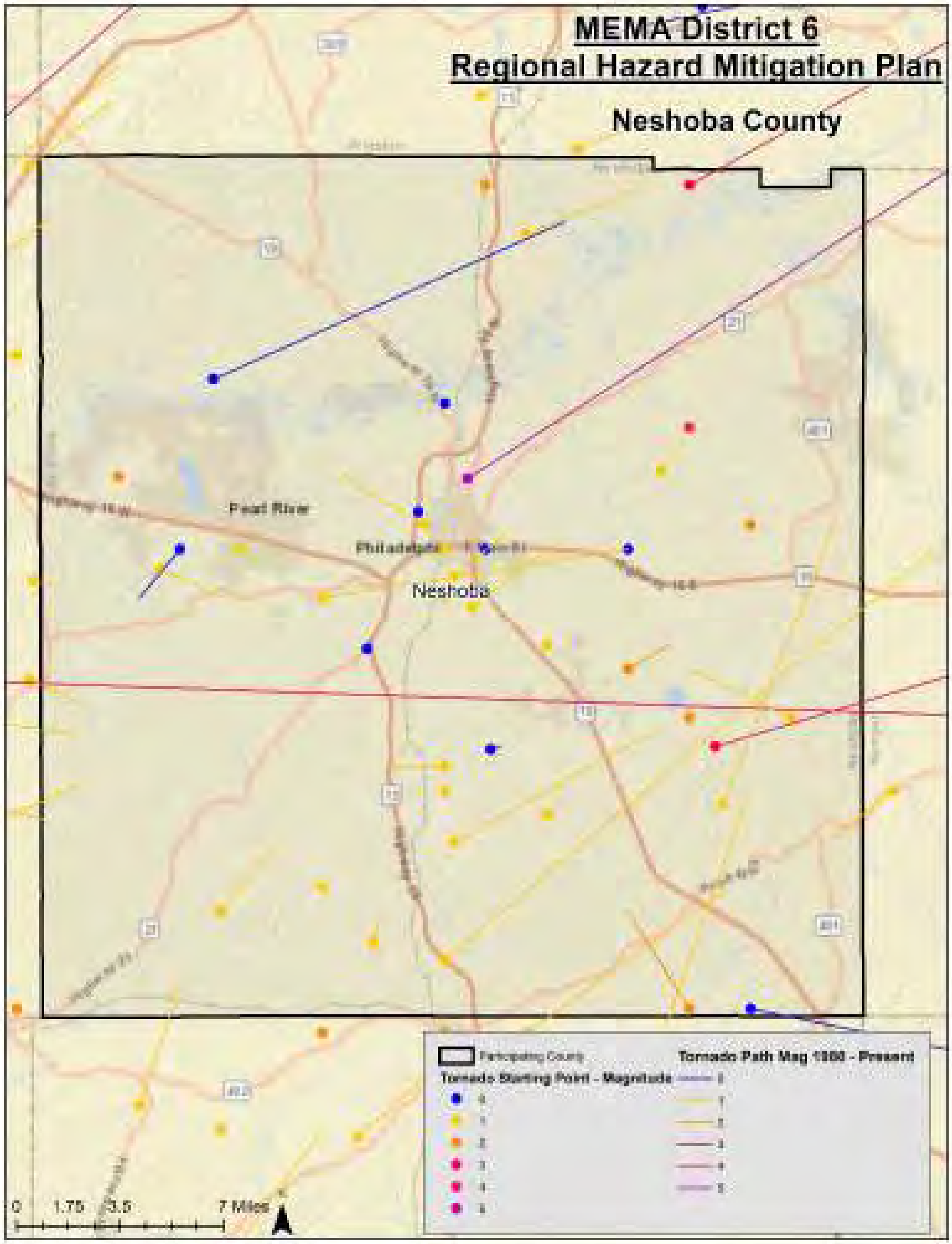
F.2.12 Tornado

LOCATION AND SPATIAL EXTENT

Tornadoes occur throughout the state of Mississippi, and thus in Neshoba County. Tornadoes typically impact a relatively small area, but damage may be extensive. Event locations are completely random and it is not possible to predict specific areas that are more susceptible to tornado strikes over time. Therefore, it is assumed that Neshoba County is uniformly exposed to this hazard. With that in mind, **Figure F.10** shows tornado track data for many of the major tornado events that have impacted the county. While no definitive pattern emerges from this data, some areas that have been impacted in the past may be potentially more susceptible in the future.

[4] Vaisala's Annual Lightning Report – 2020. Retrieved on 9.8.2021 from: https://www.vaisala.com/sites/default/files/documents/WEA-MET-Annual-Lightning-Report-2020-B212260EN-A.pdf

Figure F.11: HISTORICAL TORNADO TRACKS IN NESHOBA COUNTY



Source: National Weather Service Storm Prediction Center

HISTORICAL OCCURRENCES

Tornadoes were at least partially responsible for five disaster declarations in Neshoba County in 1979, 1992, 2001, 2003, and 2011. According to the National Centers for Environmental Information, there have been a total of 59 recorded tornado events in Neshoba County since 1952 (**Table F.19**), resulting in over $76.9 million in property damages. In addition, 3 fatalities and 69 injuries were reported. The magnitude of these tornadoes ranges from F0 to F3 and EF0 to EF5 in intensity.

Table F.19: SUMMARY OF TORNADO OCCURRENCES IN NESHOBA COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Philadelphia	3	0/0	$2,020,000
Unincorporated Area	56	3/69	$74,914,000
NESHOBA COUNTY TOTAL	**59**	**3/69**	**$76,934,000**

Source: National Centers for Environmental Information

From April 25 to 28, 2011, the largest tornado outbreak ever recorded affected the Southern, Midwestern, and Northeastern U.S., leaving catastrophic destruction in its wake, especially across the states of Alabama and Mississippi. During this outbreak, one EF5 tornado was reported in Neshoba County on April 27, 2011. This tornado resulted in over $530,000 in property damages.

PROBABILITY OF FUTURE OCCURRENCES

According to historical information, tornado events pose a significant threat to Neshoba County. The probability of future tornado occurrences affecting Neshoba County is likely (between 10 and 100 percent annual probability).

F.2.13 Hazardous Materials Incidents

LOCATION AND SPATIAL EXTENT

Neshoba County has four TRI sites. These sites are shown in **Figure F.12.**

Figure 12: TOXIC RELEASE INVENTORY (TRI) SITES IN NESHOBA COUNTY

Source: Environmental Protection Agency

In additional to "fixed" hazardous materials locations, hazardous materials may also impact the county via roadways and rail. Many roads in the county are subject to hazardous materials transport and all roads that permit hazardous material transport are considered potentially at risk to an incident.

HISTORICAL OCCURRENCES

There have been a total of six recorded HAZMAT incidents in Neshoba County since 1974 (**Table F.20**). These events did not result in any property damage, however, five injuries were reported. **Table F.21** presents detailed information on historic HAZMAT incidents in Neshoba County as reported by the U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA).

Table F.20: SUMMARY OF HAZMAT INCIDENTS IN NESHOBA COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Philadelphia	2	0/0	$0
Unincorporated Area	4	0/5	$0
NESHOBA COUNTY TOTAL	**6**	**0/5**	**$0**

Source: United States Department of Transportation Pipeline and Hazardous Materials Safety Administration

Table F.21: HAZMAT INCIDENTS IN NESHOBA COUNTY

Report Number	Date	City	Mode	Serious Incident?	Fatalities/ Injuries	Damages ($)*	Quantity Released
Philadelphia							
I-1974040145	3/27/1974	PHILADELPHIA	Highway	No	0/0	$0	0
I-1998061239	5/9/1998	PHILADELPHIA	Highway	No	0/0	$0	2 LGA
Unincorporated Area							
I-1977070236	6/20/1977	STALLO	Highway	Yes	0/0	$0	1,937 LGA
I-1993010231	11/30/1992	PEARL RIVER	Highway	No	0/4	$0	36.3 LGA
I-1994070308	6/22/1994	BOGUE CHITTO	Rail	No	0/1	$0	50 LGA
E-2006110077	10/16/2006	CHOCTAW	Rail	No	0/0	$0	61 LGA

Source: United States Department of Transportation Pipeline and Hazardous Materials Safety Administration

PROBABILITY OF FUTURE OCCURRENCES

Given the location of one toxic release inventory site in Neshoba County and prior roadway and railway incidents, it is likely (between 10 and 100 percent annual probability) that a hazardous material incident may occur in the county. County and town officials are mindful of this possibility and take precautions to prevent such an event from occurring. Furthermore, there are detailed plans in place to respond to an occurrence.

F.2.14 Pandemic

LOCATION AND SPATIAL EXTENT

Pandemics are global in nature. However, they may start anywhere. Neshoba County chose to analyze this hazard given the agriculture in the area and potential for this kind of event to occur in any location at any time.

All populations should be considered at risk to pandemic. Buildings and infrastructure are not directly impacted by the virus/pathogen but could be indirectly impacted if people are not able to operate and maintain them due to illness. Many buildings may be shutdown, at least temporarily, as a result. Employers may initiate work from home procedures for non-essential workers in order to help stop infection. Commerce activities, and thus the economy, may suffer greatly during this time.

HISTORICAL OCCURRENCES
Several pandemics have been reported throughout history. A short history of the flu/Spanish Flu was collected from The Historical Text Archive and is described below.

The first known pandemic dates back to 430 B.C. with the Plague of Athens. It reportedly killed a quarter of the population over four years due to typhoid fever. In 165-180 A.D., the Antonine Plague killed nearly 5 million people. Next, the Plague of Justinian (the first bubonic plague pandemic) occurred from 541 to 566. It killed 10,000 people a day at its peak and resulted in a 50 percent drop in Europe's population. Since the 1500s, influenza pandemics have occurred about three times every century or roughly every 10 to 50 years. The Black Death devastated European populations in the 14th century. Nearly a third of the population (20-30 million) was killed over six years. From 1817 to present, seven Cholera Pandemics have impacted to the world and killed millions. Perhaps most severe, was the Third Cholera Pandemic (1852-1959) which started in China. Isolated cases can still be found in the Western U.S. today. There were three major pandemics in the 20th century (1918-1919, 1957-1958, and 1968-1969). The most infamous pandemic flu of the 20th century, however, was that of 1918-1919. Since the 1960s, there has only been one pandemic, the 2009 H1N1 influenza. The pandemics of the 20th and 21st centuries that impacted the United States are detailed below.

1918 Spanish Flu: This was the most devastating flu of the 20th century. This pandemic spread across the world in three waves between 1918 and 1919. It typically impacted areas for around twelve weeks and then would largely disappear. However, it would frequently reemerge several months later. Worldwide, approximately 50 million persons died and over a quarter of the population was infected. Nearly 675,000 people died in the United States. The illness came on suddenly and could cause death within a few hours. The virus impacted those aged 15 to 35 especially hard. The movement of troops during World War I is thought to have facilitated the spread of the virus.

In Mississippi, state officials noted that "epidemics have been reported from a number of places in the State," on October 4th, 1918. By the 18th, twenty-six localities reported 1,934 cases (the real number of cases was likely much higher). West Point, Mississippi was hit especially hard and quarantine was established. Throughout the state, African Americans were impacted at a greater rate than white populations. This is thought to be partly caused from a shortage of caretakers. It is estimated that over 6,000 people died in Mississippi, though that number may be much higher as death records were not widely recorded.

1957 Asian Flu: It is estimated that the Asian Flu caused 2 million deaths worldwide. Approximately 70,000 deaths were in the U.S. However, the proportion of people impacted was substantially higher than that of the Spanish Flu. This flu was characterized as having much milder effects than the Spanish Flu and greater survivability. Similar to other pandemics, this pandemic has two waves. Elderly and infant populations were more likely to succumb to death. This flu is thought to have originated from a genetic mutation of a bird virus.

1968 Hong Kong Flu: The Hong Kong Flu is thought to have caused one million deaths worldwide. It was milder than both the Asian and Spanish influenza viruses. It was similar to the Asian Flu, which may have provided some immunity to the virus. It had the most severe impact on elderly populations.

2009 H1N1 Influenza: This flu was derived from human, swine, and avian virus strains. It was initially reported in Mexico in April 2009. On April 26, the U.S. government declared H1N1 a public health emergency. A vaccine was developed and over 80 million were vaccinated which helped minimize the impacts. The virus had mild impacts on most of the population but did cause death (usually from viral pneumonia) in high-risk populations such as pregnant women, obese persons, indigenous people, and those with chronic respiratory, cardiac, neurological, or immunity conditions. Worldwide, it is estimated that 43 million to 89 million people contracted H1N1 between April 2009 and April 2010, and between 8,870 and 18,300 H1N1 cases resulted in death.

2020 SARS-CoV-2 (COVID-19): Coronavirus Disease 2019 (COVID-19) was declared as pandemic by the World Health Organization on March 11th, 2020 mainly due to the speed and scale of the transmission of the disease. Prior to that, it started as an epidemic in mainland China with the focus being firstly reported in the city of Wuhan, Hubei province on February 26th, 2020. The etiologic agent of COVID-19 was isolated and identified as a novel coronavirus, initially designated as 2019-nCoV. Later, the virus genome was sequenced and because it was genetically related to the coronavirus outbreak responsible for the SARS outbreak of 2003, the virus was named as severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) by the International Committee for Taxonomy of Viruses.

There is a considerable amount of data on the extent of COVID-19 throughout the State of Mississippi and Neshoba County. The number of reported cases and deaths across the State of Mississippi and Neshoba County are shown in the figure below.

Figure F.13: COVID-19 Cases as of 08/01/2021[5]

	Cases	Deaths
Mississippi	348,496	7,556
Neshoba County	4,351	181

In addition to the pandemics above, there have been several cases of pandemic threats, some of which reached epidemic levels. They were contained before spreading globally. Examples include Smallpox, Polio, Tuberculosis, Malaria, AIDS, SARS and Yellow Fever. Advances in medicine and technology have been instrumental in containing the spread of viruses in recent history.

In addition to the pandemics above, there have been several cases of pandemic threats, some of which reached epidemic levels. They were contained before spreading globally. Examples include Smallpox, Polio, Tuberculosis, Malaria, AIDS, SARS and Yellow Fever. Advances in medicine and technology have been instrumental in containing the spread of viruses in recent history.
It is notable that no birds have been infected with Avian Flu in North and South America.

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that all of Neshoba County has a probability level of unlikely (less than 1 percent annual probability) for future pandemics events. While pandemic can have devastating impacts, they are relatively rare.
The Mississippi State Department of Health maintains a state pandemic plan which can be found here: http://www.msdh.state.ms.us/msdhsite/index.cfm/44,1136,122,154,pdf/SNSPlan.pdf

[5] Mississippi State Department of Health. *COVID-19 Dashboard*. Retrieved from: https://msdh.ms.gov/msdhsite/_static/14,0,420.html

F.2.15 Conclusions on Hazard Risk

The hazard profiles presented in this section were developed using best available data and result in what may be considered principally a qualitative assessment as recommended by FEMA in its "How-to" guidance document titled *Understanding Your Risks: Identifying Hazards and Estimating Losses* (FEMA Publication 386-2). It relies heavily on historical and anecdotal data, stakeholder input, and professional and experienced judgment regarding observed and/or anticipated hazard impacts. It also carefully considers the findings in other relevant plans, studies, and technical reports.

HAZARD EXTENT

Table F.27 describes the extent of each natural hazard identified for Neshoba County. The extent of a hazard is defined as its severity or magnitude, as it relates to the planning area.

Table F.22: EXTENT OF NESHOBA COUNTY HAZARDS

Flood-related Hazards	
Flood	Flood extent can be measured by the amount of land and property in the floodplain as well as flood height and velocity. The amount of land in the floodplain accounts for 17.6 percent of the total land area in Neshoba County. Flood depth and velocity are recorded via United States Geological Survey stream gages throughout the region. While a gage does not exist for each participating jurisdiction, there is one at or near many areas. The greatest peak discharge recorded for the county was at the Pearl River at Burnside on April 13, 1979. Water reached a discharge of 76,600 cubic feet per second and the stream gage height was recorded at 23.60 feet.
Erosion	The extent of erosion can be defined by the measurable rate of erosion that occurs. There are no erosion rate records located in Neshoba County.
Dam Failure	Dam Failure extent is defined using the Mississippi Department of Environmental Quality criteria. One dam is classified as high-hazard in Neshoba County.
Winter Storm and Freeze	The extent of winter storms can be measured by the amount of snowfall received (in inches). Official long term snow records are not kept for any areas in Neshoba County. However, the greatest snowfall reported in Meridian (southeast of the county) was 14.0 inches in 1963.
Fire-related Hazards	
Drought / Heat Wave	Drought extent is defined by the U.S. Drought Monitor Classifications which include Abnormally Dry, Moderate Drought, Severe Drought, Extreme Drought, and Exceptional Drought. According to the U.S. Drought Monitor Classifications, the most severe drought condition is Exceptional. Neshoba County has received this ranking twice over the 15-year reporting period. The extent of extreme heat can be measured by the record high temperature recorded. Official long term temperature records are not kept for any areas in Neshoba County. However, the highest recorded temperature in Meridian (southeast of the county) was 107°F in 1980.

Wildfire	Wildfire data was provided by the Mississippi Forestry Commission and is reported annually by county from 2005-2014. The greatest number of fires to occur in Neshoba County in any year 47 in 2005. The greatest number of acres to burn in the county in a single year occurred in 2014 when 356 acres were burned. Although this data lists the extent that has occurred, larger and more frequent wildfires are possible throughout the county.

Geologic Hazards	
Earthquake	Earthquake extent can be measured by the Richter Scale (Table 5.16), the Modified Mercalli Intensity (MMI) scale, and the distance of the epicenter from Neshoba County. According to data provided by the National Geophysical Data Center, no earthquakes have impacted the county.
Landslide	As noted above in the landslide profile, there is no extensive history of landslides in Neshoba County and landslide events typically occur in isolated areas. This provides a challenge when trying to determine an accurate extent for the landslide hazard. However, when using the USGS landslide susceptibility index, extent can be measured with incidence, which is low throughout the entire county. There is also low susceptibility across the county.
Land Subsidence	The extent of land subsidence can be defined by the measurable rate of subsidence that occurs. There are no subsidence rate records located in Neshoba County nor is there any significant historical record of events.
Wind-related Hazards	
Hurricane and Tropical Storm	Hurricane extent is defined by the Saffir-Simpson Scale which classifies hurricanes into Category 1 through Category 5. The greatest classification of hurricane to traverse directly through Neshoba County was Hurricane Katrina, a Category 1 storm which carried tropical force winds of 80 knots upon arrival in the county.
Thunderstorm / Hail / Lightning	Thunderstorm extent is defined by the number of thunder events and wind speeds reported. According to a 65-year history from the National Centers for Environmental Information, the strongest recorded wind event in Neshoba County was reported on April 6, 2005 at 80 knots (approximately 92 mph). It should be noted that future events may exceed these historical occurrences. Hail extent can be defined by the size of the hail stone. The largest hail stone reported in Neshoba County was 2.75 inches (reported on October 27, 1995). It should be noted that future events may exceed this. According to the Vaisala's flash density map, Neshoba County is located in an area that experiences 6 to 8 lightning flashes per square kilometer per year. It should be noted that future lightning occurrences may exceed these figures.
Tornado	Tornado hazard extent is measured by tornado occurrences in the US provided by FEMA as well as the Fujita/Enhanced Fujita Scale. The greatest magnitude reported in Neshoba County was an F3 (last reported on April 3, 1982).
Other Hazards	
Hazardous Materials Incident	According to USDOT PHMSA, the largest hazardous materials incident reported in the Neshoba County was 1,937 LGA released on the highway (reported on June 20, 1977). It should be noted that larger events are possible.
Pandemic	While pandemics remain to be rare occurrences overall, it cannot be ignored that as of the drafting of this plan the world continues to be engulfed by the COVID-19 Pandemic.

PRIORITY RISK INDEX RESULTS

In order to draw some meaningful planning conclusions on hazard risk for Neshoba County, the results of the hazard profiling process were used to generate countywide hazard classifications according to a "Priority Risk Index" (PRI).

Table F.23 summarizes the degree of risk assigned to each category for all initially identified hazards based on the application of the PRI. Assigned risk levels were based on the detailed hazard profiles developed for this section, as well as input from the Regional Hazard Mitigation Council. The results were then used in calculating PRI values and making final determinations for the risk assessment.

Table F.23: SUMMARY OF PRI RESULTS FOR NESHOBA COUNTY

Hazard	Category/Degree of Risk					
	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score
Flood-related Hazards						
Flood	Likely	Critical	Moderate	6 to 12 hours	Less than 24 hours	**2.9**
Erosion	Possible	Minor	Small	More than 24 hours	More than 1 week	**1.8**
Dam Failure	Possible	Critical	Small	Less than 6 hours	Less than 6 hours	**2.4**
Winter Storm and Freeze	Likely	Limited	Moderate	More than 24 hours	Less than 24 hours	**2.4**
Fire-related Hazards						
Drought / Heat Wave	Likely	Minor	Large	More than 24 hours	More than 1 week	**2.5**
Wildfire	Highly Likely	Minor	Small	Less than 6 hours	Less than 1 week	**2.6**
Geologic Hazards						
Earthquake	Possible	Minor	Moderate	Less than 6 hours	Less than 6 hours	**2.0**
Landslide	Unlikely	Minor	Small	Less than 6 hours	Less than 6 hours	**1.5**
Land Subsidence	Unlikely	Minor	Small	Less than 6 hours	Less than 6 hours	**1.5**
Wind-related Hazards						
Hurricane and Tropical Storm	Likely	Critical	Large	More than 24 hours	Less than 24 hours	**2.9**
Thunderstorm Wind / High Wind	Highly Likely	Critical	Moderate	6 to 12 hours	Less than 6 hours	**3.1**
Hailstorm	Highly Likely	Limited	Moderate	6 to 12 hours	Less than 6 hours	**2.8**
Lightning	Highly Likely	Limited	Negligible	6 to 12 hours	Less than 6 hours	**2.4**
Tornado	Likely	Catastrophic	Small	Less than 6 hours	Less than 6 hours	**3.0**
Other Hazards						
Hazardous Materials Incident	Likely	Limited	Small	Less than 6 hours	Less than 24 hours	**2.5**
Pandemic	Unlikely	Catastrophic	Large	More than 24 hours	More than 24hrs	**2.8**

F.2.16 Final Determinations on Hazard Risk

The conclusions drawn from the hazard profiling process for Neshoba County, including the PRI results and input from the Regional Hazard Mitigation Council, resulted in the classification of risk for each identified hazard according to three categories: High Risk, Moderate Risk, and Low Risk (**Table F.24**). For purposes of these classifications, risk is expressed in relative terms according to the estimated impact that a hazard will have on human life and property throughout all of Neshoba County. A more quantitative analysis to estimate potential dollar losses for each hazard has been performed separately, and is described in Section 6: *Vulnerability Assessment* and below in Section F.3. It should be noted that although some hazards are classified below as posing low risk, their occurrence of varying or unprecedented magnitudes is still possible in some cases and their assigned classification will continue to be evaluated during future plan updates.

Table F.24: CONCLUSIONS ON HAZARD RISK FOR NESHOBA COUNTY

HIGH RISK	Thunderstorm Wind / High Wind Tornado Flood Hurricane and Tropical Storm Hailstorm Pandemic
MODERATE RISK	Wildfire Drought / Heat Wave Hazardous Materials Incident Dam and Levee Failure Winter Storm and Freeze Lightning
LOW RISK	Earthquake Erosion Landslide Land Subsidence

F.3 NESHOBA COUNTY VULNERABILITY ASSESSMENT

This subsection identifies and quantifies the vulnerability of Neshoba County to the significant hazards previously identified. This includes identifying and characterizing an inventory of assets in the county and assessing the potential impact and expected amount of damages caused to these assets by each identified hazard event. More information on the methodology and data sources used to conduct this assessment can be found in Section 6: *Vulnerability Assessment*.

F.3.1 Asset Inventory

The following table lists the fire stations, police stations, emergency operations centers (EOCs), medical care facilities, and schools located in Neshoba County according to Hazus-MH Version 2.2.

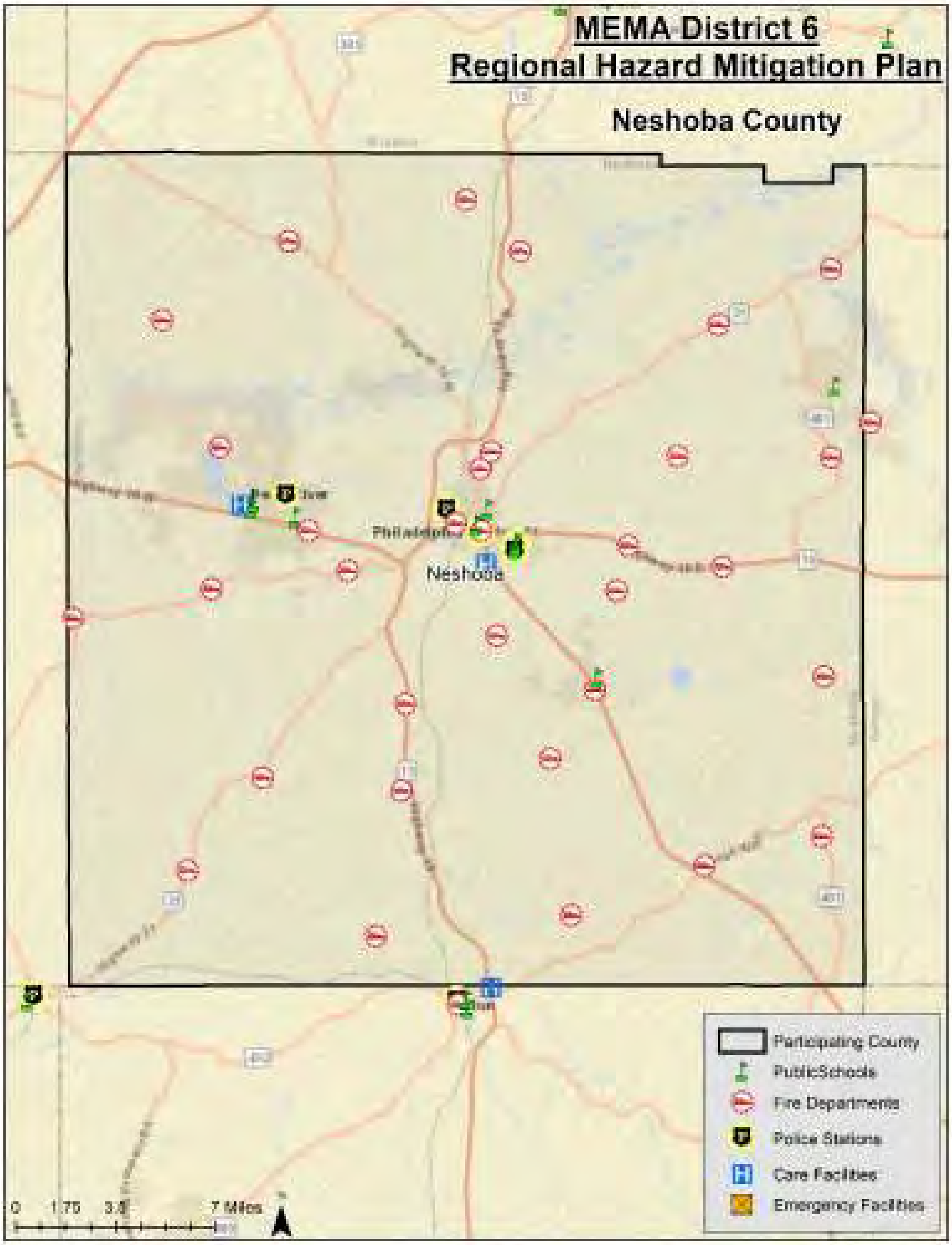
In addition, **Figure F.14** shows the locations of critical facilities in Neshoba County. At the end of this subsection, shows a complete list of the critical facilities by name, as well as the hazards that affect each facility. As noted previously, this list is not all-inclusive and only includes information provided through Hazus.

Table F.25: CRITICAL FACILITY INVENTORY IN NESHOBA COUNTY

Location	Fire Stations	Police Stations	Medical Care Facilities	EOC	Schools
Philadelphia	3	2	1	1	4
Unincorporated Area	30	1	1	0	8
ASSET VALUATION	$59,622,017	$16,052,081	$21,780,387	$2,293,154	$164,427,24
NESHOBA COUNTY TOTAL	33	3	2	1	12

Source: Hazus-MH 2.2

Figure F.14: CRITICAL FACILITY LOCATIONS IN NESHOBA COUNTY



Source: Hazus-MH 2.2

F.3.2 Social Vulnerability

In addition to identifying those assets potentially at risk to identified hazards, it is important to identify and assess those particular segments of the resident population in Neshoba County that are potentially at risk to these hazards.

The following table lists the population by jurisdiction according to U.S. Census 2019 American Community Survey population estimates. The total population in Neshoba County according to Census data is 29,332 persons. Additional population estimates are presented above in Section F.1.

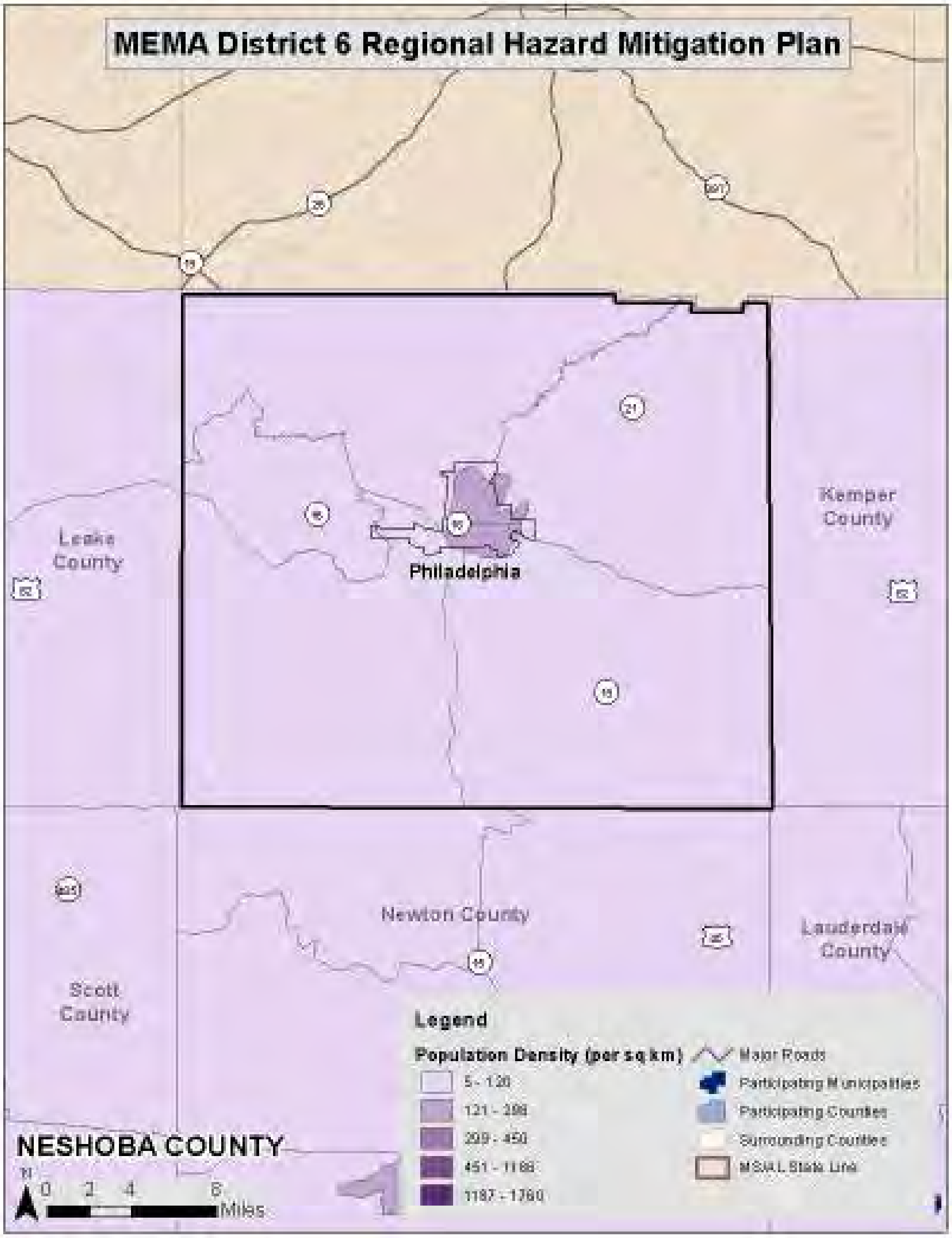
Table F.26: TOTAL POPULATION IN NESHOBA COUNTY

Location	Total 2019 Population
Philadelphia	7,218
Unincorporated Area	22,114
NESHOBA COUNTY TOTAL	**29,332**

Source: United States Census – 2019 American Community Survey

In addition, **Figure F.15** illustrates the population density per square kilometer by census tract as it was reported by the U.S. Census Bureau 2010. This data remains unchanged since the last plan update.

Figure F.15: POPULATION DENSITY IN NESHOBA COUNTY



Source: United States Census Bureau, 2010

F.3.3 Development Trends and Changes in Vulnerability

Since the previous county hazard mitigation plan was approved (in 2015), Neshoba County has experienced limited growth and development. The following table shows the number of building units constructed since 2010 according to the U.S. Census American Community Survey.

Table F.27: BUILDING COUNTS FOR NESHOBA COUNTY

Jurisdiction	Total Housing Units (2019)	Units Built 2014 or later	% Building Stock Built Post-2014
Philadelphia	3,429	0	0.0%
Unincorporated Area	9,106	237	2.6%
NESHOBA COUNTY TOTAL	12,535	237	1.9%

Source: United States Census Bureau

The following table shows population growth estimates for the county from 2015 to 2019 based on the U.S. Census Annual Estimates of Resident Population.

Table F.28: POPULATION GROWTH FOR NESHOBA COUNTY

Jurisdiction	Population Estimates (as of July 1)					% Change 2015-2019
	2015	2016	2017	2018	2019	
Philadelphia	7,433	7,399	7,334	7,284	7,218	-2.89%
Unincorporated Area	22,120	22,075	22,103	22,092	22,114	-0.02%
NESHOBA COUNTY TOTAL	29,553	29,474	29,437	29,376	29,332	-0.74%

Source: United States Census Bureau – American Community Survey

Based on the data above, there has been a low rate of residential development and population growth in the county since 2015, and the county has actually experienced a slight population decline. However, the unincorporated area of the county has experienced a slightly higher rate of development compared to the rest of the county, resulting in an increased number of structures that are vulnerable to the potential impacts of the identified hazards. Conversely, since the population has decreased throughout the county, there are now fewer numbers of people exposed to the identified hazards. Therefore, development and population growth have impacted the county's vulnerability since the previous local hazard mitigation plan was approved but there has been no change in the overall vulnerability since the changes offset one another.

It is also important to note that as development increases in the future, greater populations and more structures and infrastructure will be exposed to potential hazards if development occurs in the floodplains, moderate and high landside susceptibility areas, high wildfire risk areas, or primary and secondary TRI site buffers.

F.3.4 Vulnerability Assessment Results

As noted in Section 6: *Vulnerability Assessment*, only hazards with a specific geographic boundary, available modeling tool, or sufficient historical data allow for further analysis. Those results, specific to Neshoba County, are presented here. All other hazards are assumed to impact the entire planning region (drought / heat wave; thunderstorm—wind, hail, lightning; tornado; and winter storm and freeze) or, due to lack of data, analysis would not lead to credible results (dam and levee failure, erosion, and land subsidence). In the case of landslide, local officials determined that the USGS data may be somewhat amiss and that even the areas identified as moderate risks probably entailed an overall low risk.

The hazards to be further analyzed in this subsection include: flood, wildfire, earthquake, hurricane and tropical storm winds, and hazardous materials incident.

The annualized loss estimate for all hazards is presented near the end of this subsection**.**

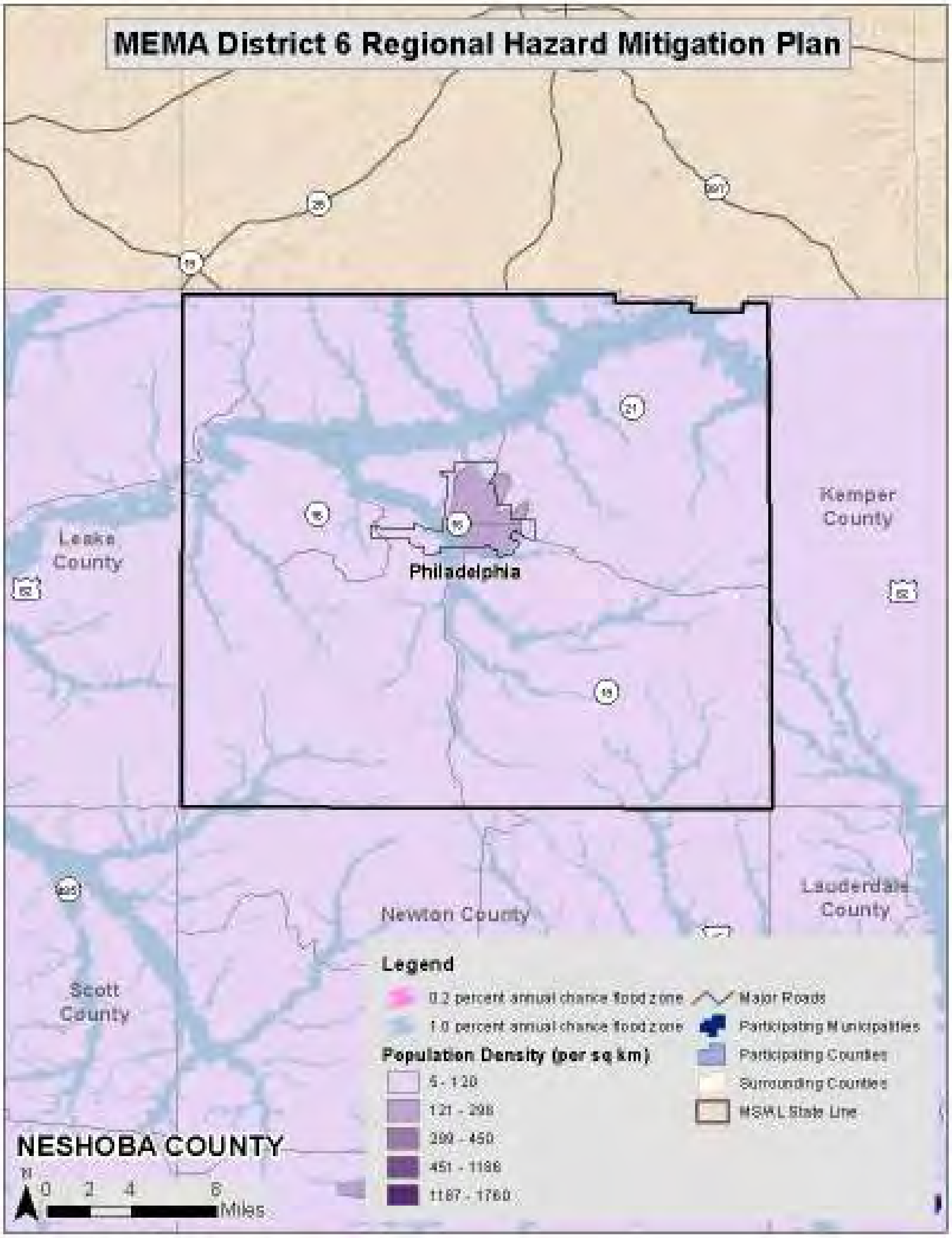
FLOOD

Historical evidence indicates that Neshoba County is susceptible to flood events. A total of 39 flood events have been reported by the National Centers for Environmental Information resulting in $2.16 in property damage. On an annualized level, these damages amounted to $90,000 for Neshoba County.

Social Vulnerability

Figure F.16 is presented to gain a better understanding of at-risk population by evaluating census tract level population data against mapped floodplains. There are areas of concern in several areas of the county. Indeed, the incorporated municipality is potentially at risk of being impacted by flooding in some areas of its jurisdiction. Therefore, further investigation in these areas may be warranted.

Figure F.16: POPULATION DENSITY NEAR FLOODPLAINS



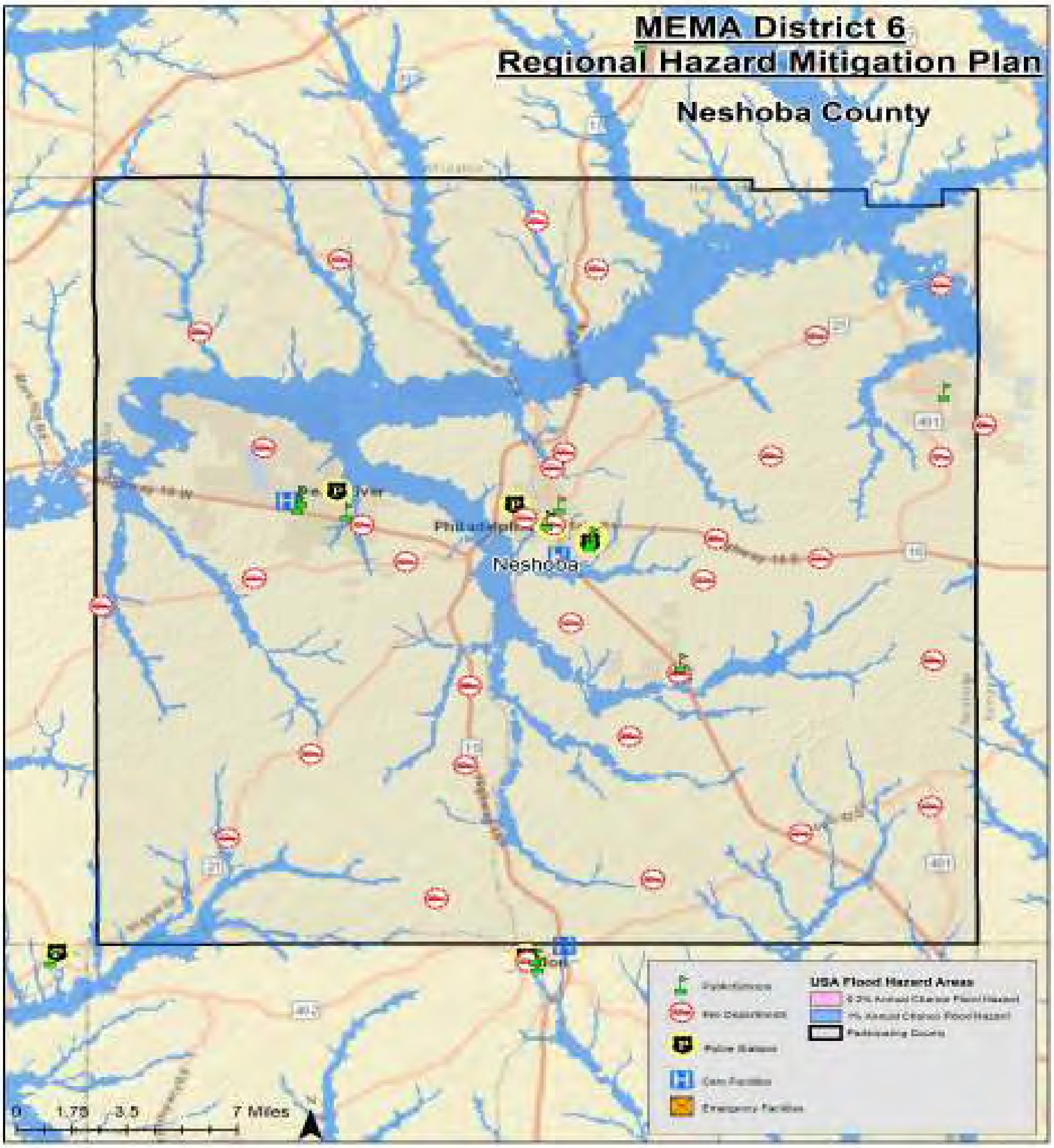
Source: Federal Emergency Management Agency DFIRM, United States Census 2010

Critical Facilities

The following figure is an analysis of critical facilities in relation to Special Flood Hazard Areas. (Please note, as previously indicated, this analysis does not consider building elevation, which may negate risk.) All four facilities are located in the 1.0 percent annual chance flood zone, and they include one medical care facility and three schools. A list of specific critical facilities and their associated risk canbe found at the end of this section.

In conclusion, a flood has the potential to impact many existing and future buildings, facilities, and populations in Neshoba County, though some areas are at a higher risk than others. All types of structures in a floodplain are at-risk, though elevated structures will have a reduced risk. Such site-specific vulnerability determinations are outside the scope of this assessment but will be considered during future plan updates. Furthermore, areas subject to repetitive flooding should be analyzed for potential mitigation actions.

Figure F.17: CRITICAL FACILITY ANALYSIS – SFHA



Source: Federal Emergency Management Agency

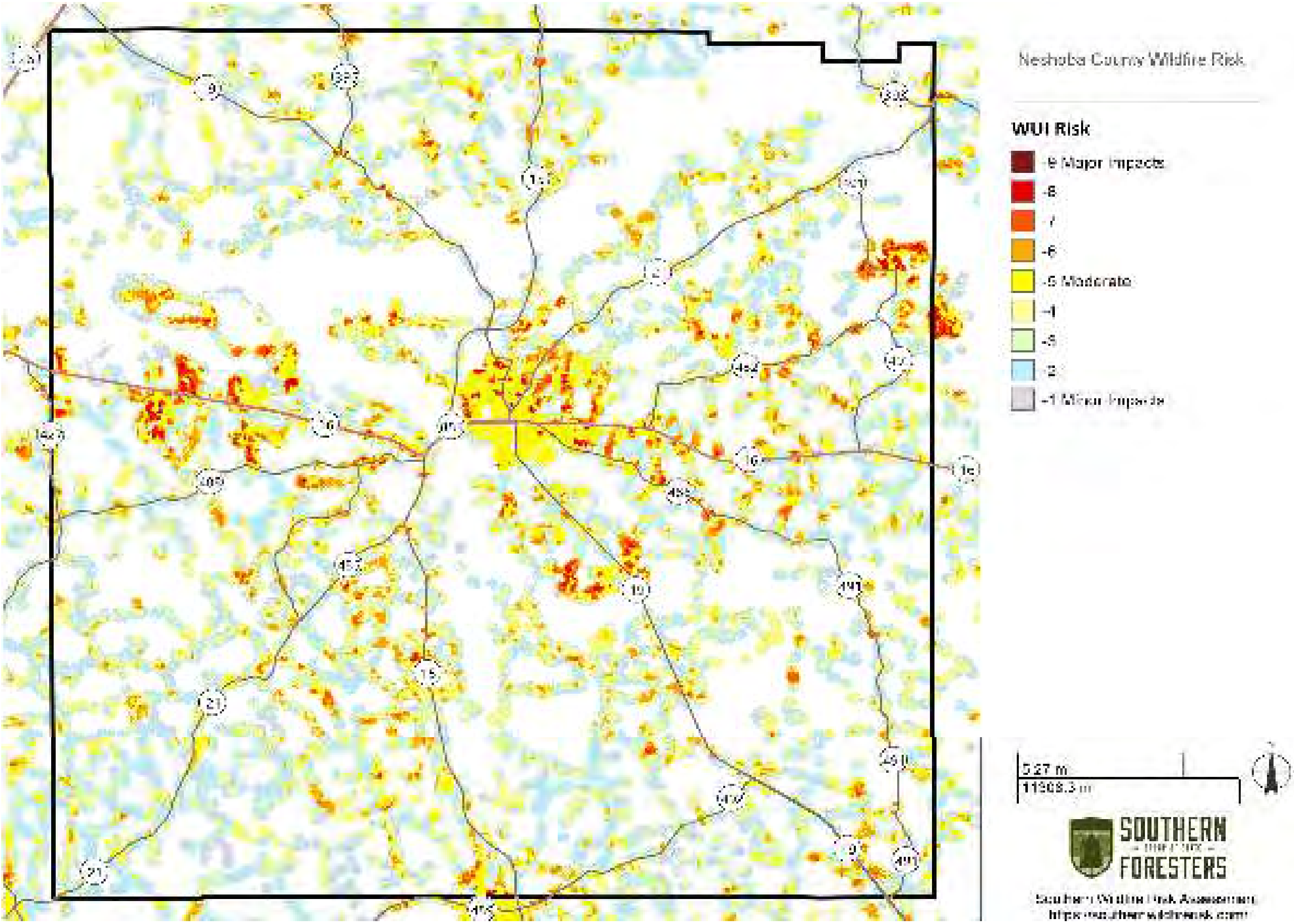
WILDFIRE

Although historical evidence indicates that Neshoba County is susceptible to wildfire events, there are few reports of damage. Therefore, it is difficult to calculate a reliable annualized loss figure. Annualized loss is considered negligible though it should be noted that a single event could result in significant damages throughout the county.

To estimate exposure to wildfire, building data was obtained from Hazus-MH 2.2 which includes information that has been aggregated at the Census block level and which has been deemed useful for analyzing wildfire vulnerability. However, it should be noted that the accuracy of Hazus data is somewhat lower than that of parcel data. For the critical facility analysis, areas of concern were intersected with critical facility locations.

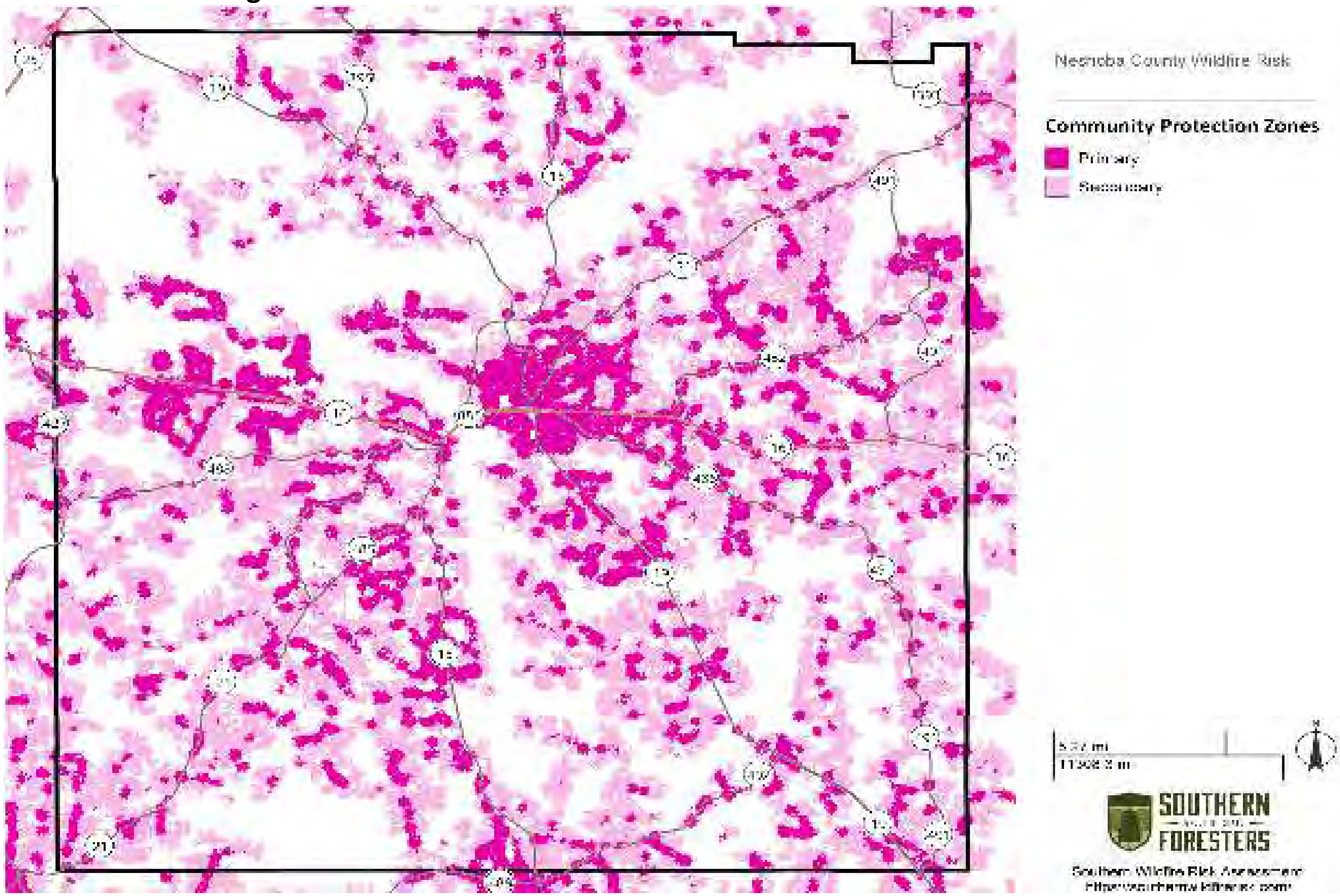
Figure F.18 shows the Wildland Urban Interface Risk Index (WUIRI) data, which is a data layer that shows a rating of the potential impact of a wildfire on people and their homes. The key input, Wildland Urban Interface (WUI), reflects housing density (houses per acre) consistent with Federal Register National standards. The location of people living in the WUI and rural areas is key information for defining potential wildfire impacts to people and homes. Initially provided as raster data, it was converted to a polygon to allow for analysis. The Wildland Urban Interface Risk Index data ranges from 0 to -9 with lower values being most severe (as noted previously, this is only a measure of relative risk). **Figure F.19** Community Protection Zones (CPZ) represent those areas considered highest priority for mitigation planning activities**.** CPZs are based on an analysis of the *Where People Live* housing density data and surrounding fire behavior potential. Rate of Spread data is used to determine the areas of concern around populated areas that are within a 2-hour fire spread distance. This is referred to as the Secondary CPZ. **Figure F.20** shows critical facility locations in relation to historical wildfire burns.

Figure F.18: WUI RISK INDEX AREAS IN NESHOBA COUNTY



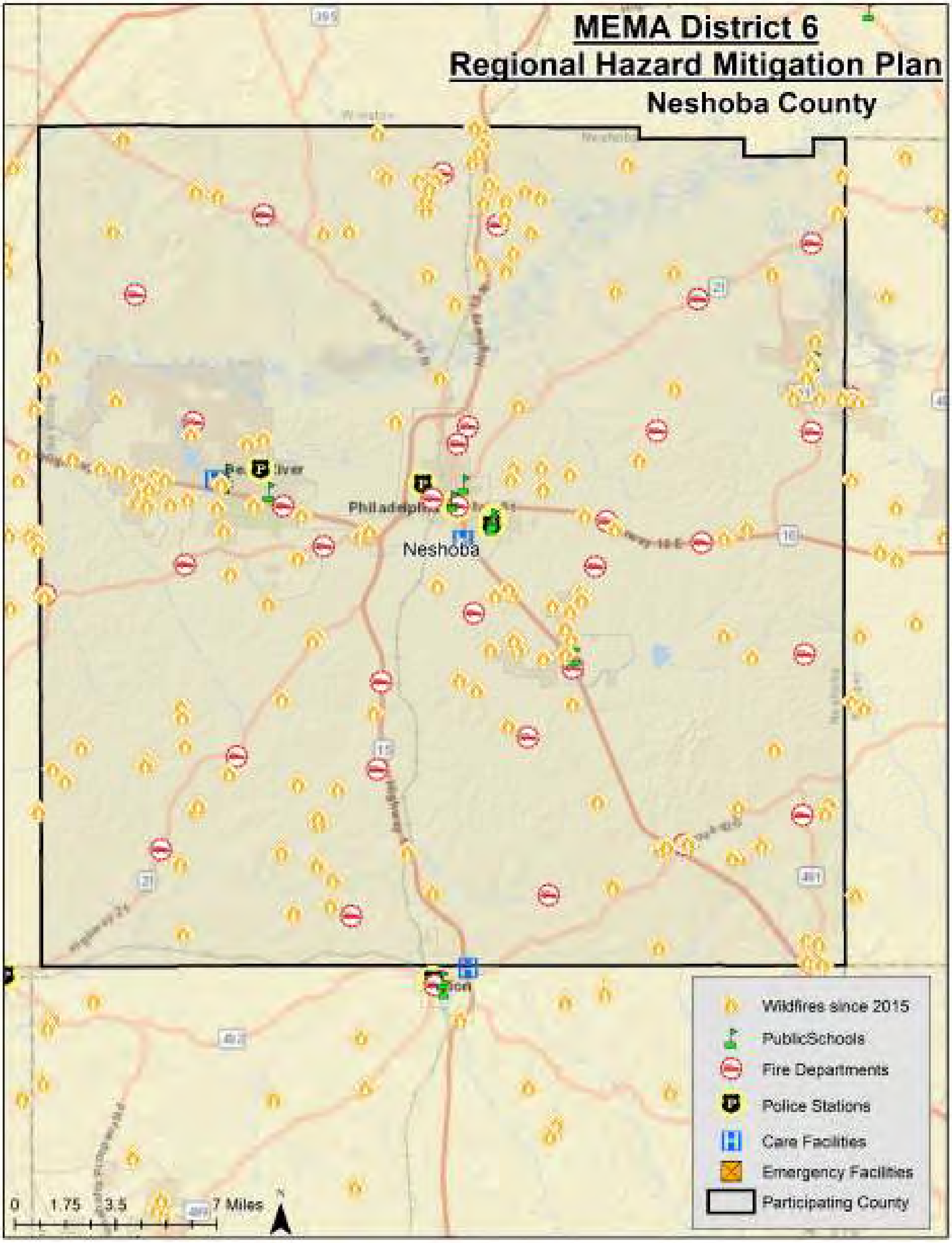
Source: Southern Wildfire Risk Assessment Data

Figure F.19: COMMUNITY PROTECTION ZONES IN NESHOBA COUNTY



Source: Southern Wildfire Risk Assessment Data

Figure F.20: CRITICAL FACILITY ANALYSIS – WILDFIRE



Source: Southern Wildfire Risk Assessment Data

Social Vulnerability
Given some level of susceptibility across the entire county, it is assumed that the total population is at risk to the wildfire hazard. Determining the exact number of people in certain wildfire zones is difficult with existing data and could be misleading. In particular, the expansion of residential development from urban centers out into rural landscapes, increases the potential for wildland fire threat to public safety and the potential for damage to forest resources and dependent industries. This increase in population across the region will impact counties and communities that are located within the Wildland Urban Interface (WUI). The WUI is described as the area where structures and other human improvements meet and intermingle with undeveloped wildland or vegetative fuels. Population growth within the WUI substantially increases the risk from wildfire.

For the Neshoba County Wildfire Risk project area, it is estimated that 28,733 people or 96.9 % percent of the total project area population (29,658) live within the WUI.

Critical Facilities
The critical facility analysis revealed that there are no critical facilities located in wildfire areas of concern. It should be noted, that several factors could impact the spread of a wildfire putting all facilities at risk. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

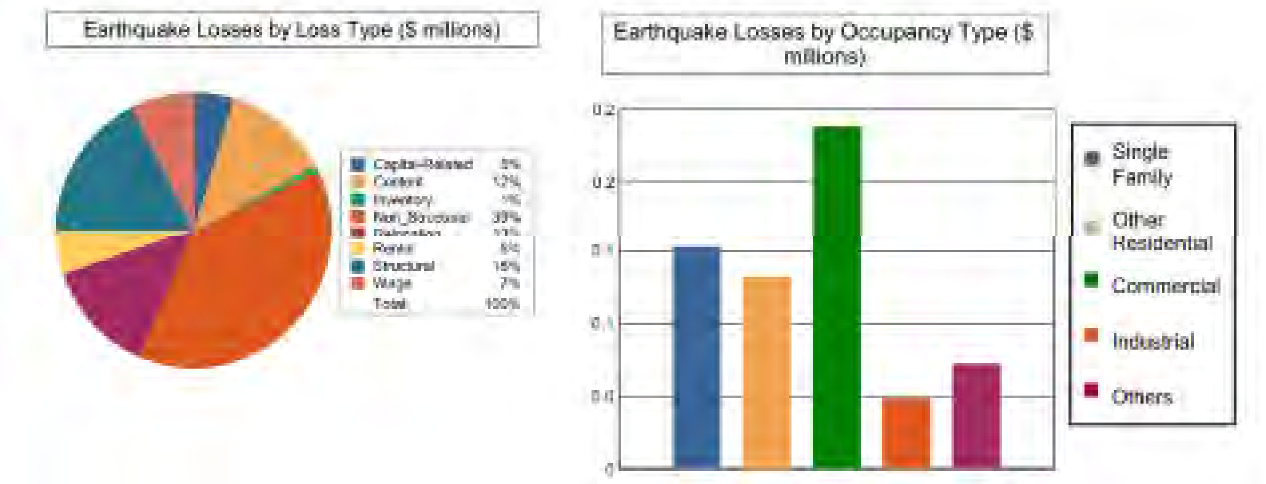
In conclusion, a wildfire event has the potential to impact many existing and future buildings, critical facilities, and populations in Neshoba County.

EARTHQUAKE

As the Hazus-MH model suggests below, and historical occurrences confirm, any earthquake activity in the area is likely to inflict minor damage to the county.

A probabilistic earthquake model was performed for the MEMA District 6 Region. As the Hazus-MH model suggests below, and historical occurrences confirm, any earthquake activity in the area is likely to inflict minor damage to the county. Hazus-MH 2.2 estimates the total building-related losses were $520,000; 31 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 44 % of the total loss. The figure below provides a summary of the losses associated with the building damage.

Figure F.21: MEMA D6 EARTHQUAKE LOSSES BY TYPE



For the earthquake hazard vulnerability assessment, a probabilistic scenario was created to estimate the average annualized loss for the region. The results of the analysis are generated at the Census Tract level within Hazus-MH and then aggregated to the region level. Since the scenario is annualized, no building counts are provided. Losses reported included losses due to structure failure, building loss, contents damage, and inventory loss.

Social Vulnerability

It can be assumed that all existing and future populations are at risk to the earthquake hazard. Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 39 households to be displaced due to the earthquake. Of these, 32 people (out of a total population of 244,467) will seek temporary shelter in public shelters. [6] The total economic loss estimated for the earthquake is 76.76 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory.

Critical Facilities

The Hazus-MH probabilistic analysis indicated that no critical facilities would sustain measurable damage in an earthquake event. However, all critical facilities should be considered at-risk to minor damage, should an event occur. Before the earthquake, the region had 1,241 hospital beds available for use. On the day of the earthquake, the model estimates that only 1,035 hospital beds (83.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 93.00% of the beds will be back in service. By 30 days, 99.00% will be operational.

In conclusion, an earthquake has the potential to impact all existing and future buildings, facilities, and populations in Neshoba County. The Hazus-MH scenario indicates that minimal to moderate damage is expected from an earthquake occurrence. While Neshoba County may not experience a large earthquake, localized damage is possible with an occurrence. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

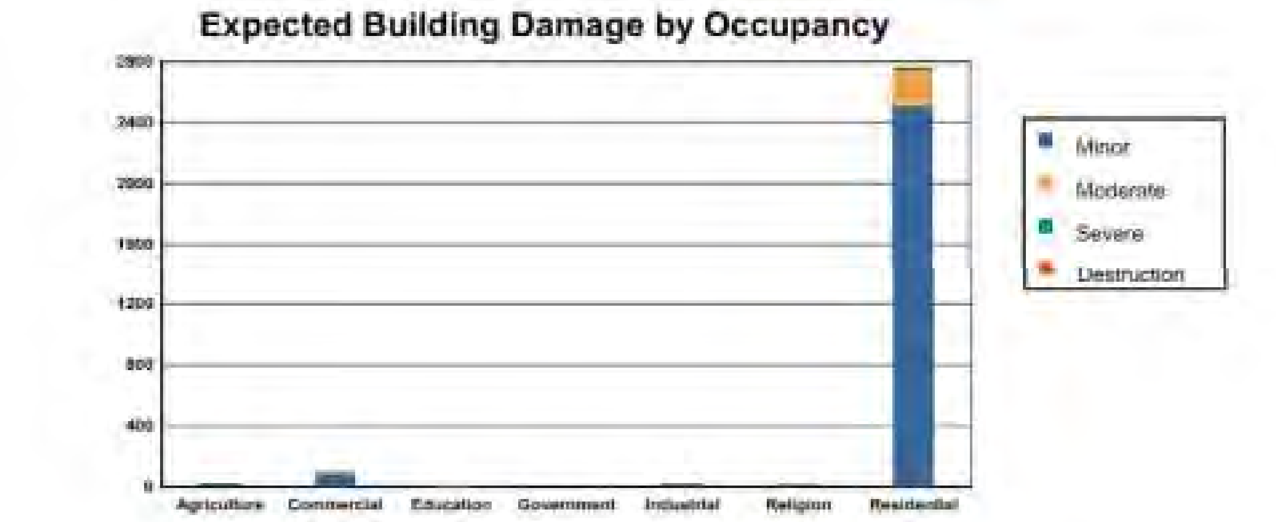
HURRICANE AND TROPICAL STORM

[6] HAZUS-MH utilizes 2010 Census Data

Historical evidence indicates that Neshoba County has some risk to the hurricane and tropical storm hazard. There have been four disaster declarations due to hurricanes (Hurricanes Ivan, Dennis, Katrina, and Isaac). Several tracks have come near or traversed through the county, as shown and discussed in Section F.2.10.

A probabilistic 100-year hurricane model was performed for the MEMA District 6. Hazus estimates that about 289 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 12 buildings that will be completely destroyed. The figure below summarizes the expected damage by general occupancy for the buildings in the region.

Figure F.22: MEMA D6 100-YEAR HURRICANE



Hurricanes and tropical storms can cause damage through numerous additional hazards such as flooding, erosion, tornadoes, and high winds, thus it is difficult to estimate total potential losses from these cumulative effects. The current Hazus-MH hurricane model only analyzes hurricane winds and is not capable of modeling and estimating cumulative losses from all hazards associated with hurricanes; therefore, only hurricane winds are analyzed in this section. It can be assumed that all existing and future buildings and populations are at risk to the hurricane and tropical storm hazard.

Social Vulnerability

Given equal susceptibility across the county, it is assumed that the total population, both current and future, is at risk to the hurricane and tropical storm hazard. Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 34 households to be displaced due to the hurricane. Of these, 26 people (out of a total population of 244,467) will seek temporary shelter in public shelters.

Critical Facilities

Given equal vulnerability across Neshoba County, all critical facilities are considered to be at risk. Some buildings may perform better than others in the face of such an event due to construction and age, among other factors. Determining individual building response is beyond the scope of this plan. However, this plan will consider mitigation action for especially vulnerable structures and/or critical facilities to mitigate against the effects of the hurricane hazard. A list of specific critical facilities can be found at the end of this subsection.

In conclusion, a hurricane event has the potential to impact many existing and future buildings, critical facilities, and populations in Neshoba County.

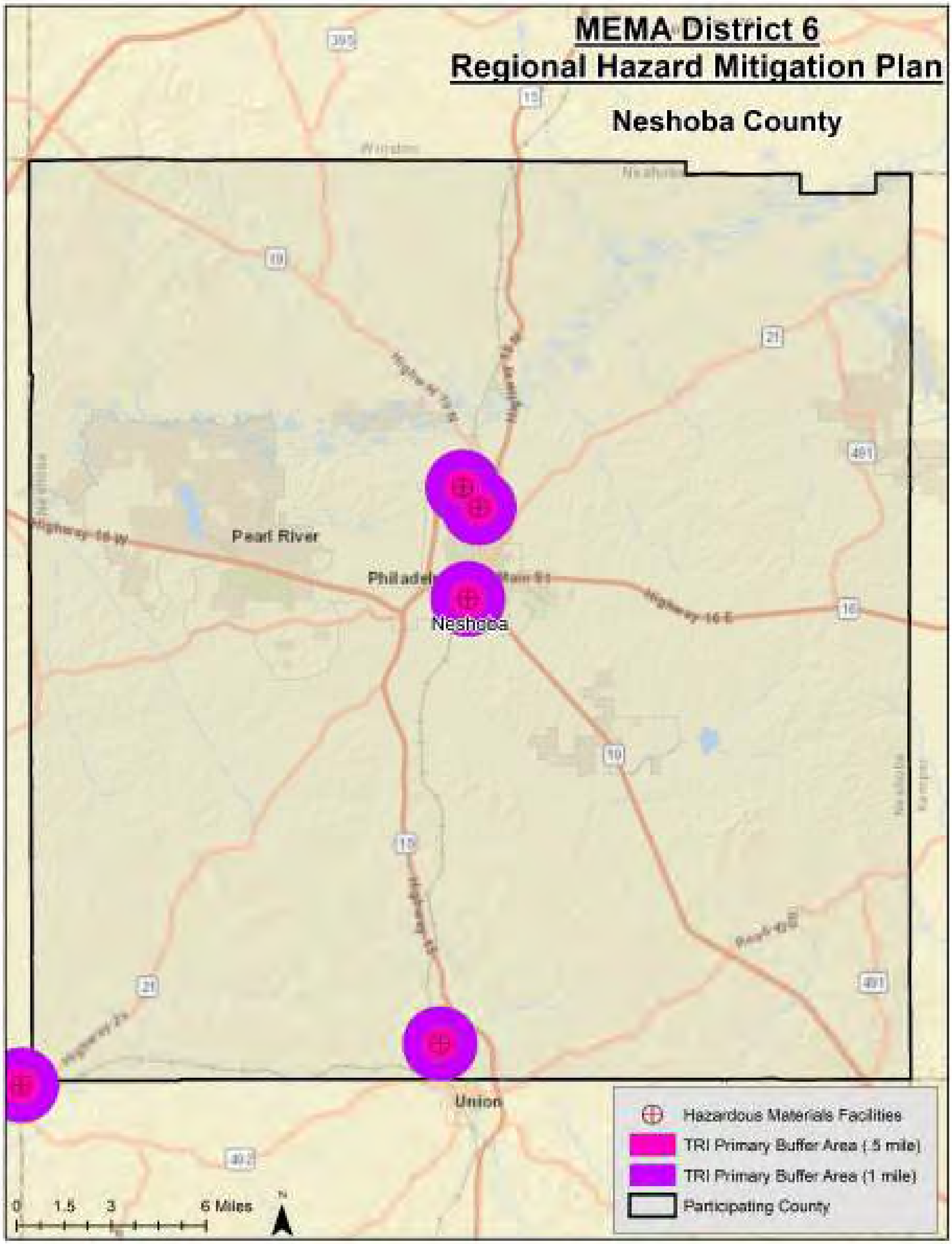
HAZARDOUS MATERIALS INCIDENT

Although historical evidence indicates that Neshoba County is susceptible to hazardous materials events, there are no reports of damage. Therefore, it is difficult to calculate a reliable annualized loss figure. It is assumed that while one major event could result in significant losses, annualizing structural losses over a long period of time would most likely yield a negligible annualized loss estimate for Neshoba County.

Most hazardous materials incidents that occur are contained and suppressed before destroying any property or threatening lives. However, they can have a significant negative impact. Such events can cause multiple deaths, completely shut down facilities for 30 days or more, and cause more than 50 percent of affected properties to be destroyed or suffer major damage. In a hazardous materials incident, solid, liquid, and/or gaseous contaminants may be released from fixed or mobile containers. Weather conditions will directly affect how the hazard develops. Certain chemicals may travel through the air or water, affecting a much larger area than the point of the incidence itself. Non-compliance with fire and building codes, as well as failure to maintain existing fire and containment features, can substantially increase the damage from a hazardous materials release. The duration of a hazardous materials incident can range from hours to days. Warning time is minimal to none.

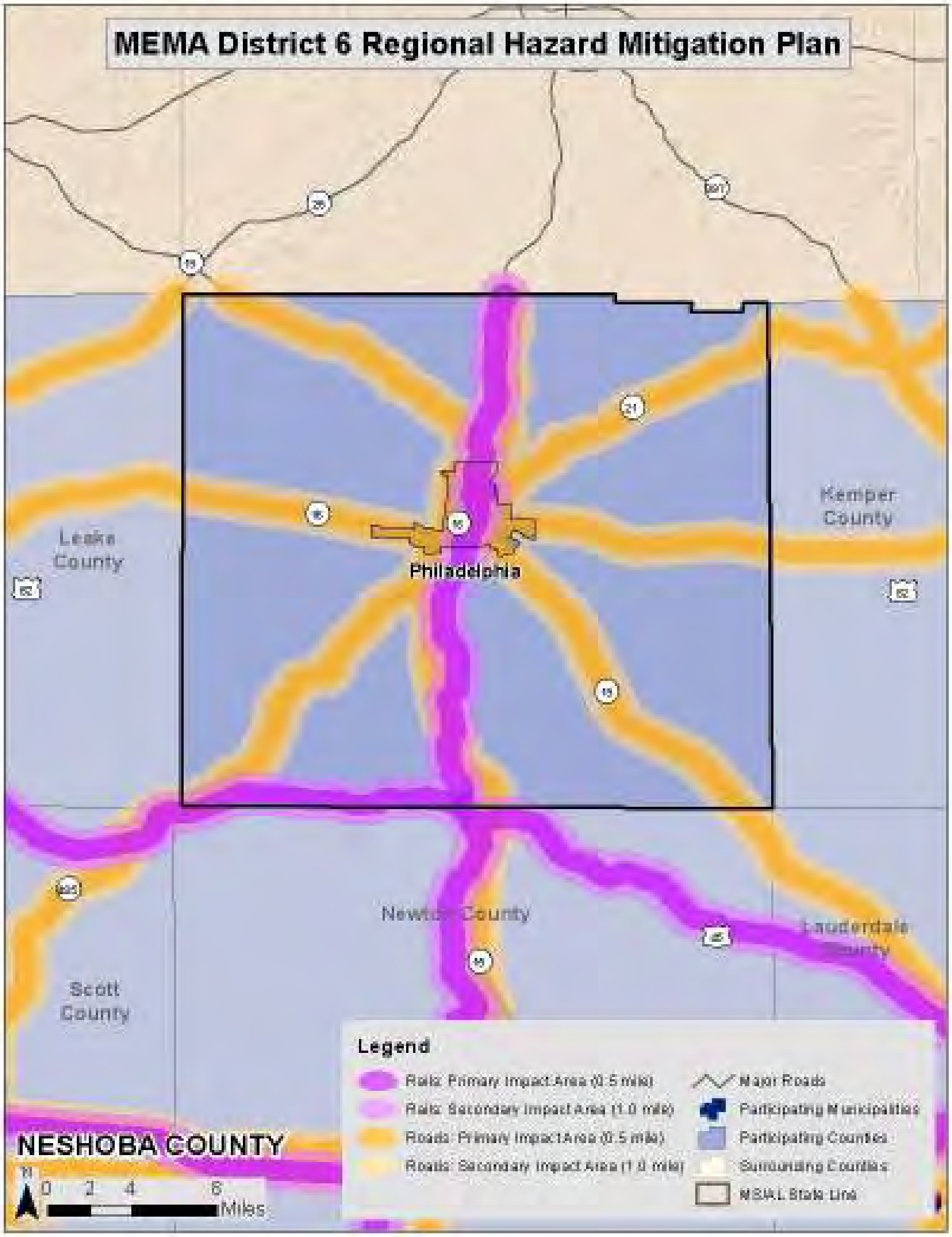
In order to conduct the vulnerability assessment for this hazard, GIS intersection analysis was used for fixed and mobile areas and building footprints/parcels. In both scenarios, two sizes of buffers—0.5-mile and 1.0-mile—were used. These areas are assumed to represent the different levels of effect: immediate (primary) and secondary. Primary and secondary impact zones were selected based on guidance from the PHMSA Emergency Response Guidebook. For the fixed site analysis, geo-referenced TRI sites in the region, along with buffers, were used for analysis as shown in **Figure F.23.** For the mobile analysis, the major roads (Interstate highway, U.S. highway, and State highway) and railroads, where hazardous materials are primarily transported that could adversely impact people and buildings, were used for the GIS buffer analysis. **Figure F.24** shows the areas used for mobile toxic release buffer analysis.

Figure F.23: TRI SITES WITH BUFFERS IN NESHOBA COUNTY



Source: Environmental Protection Agency

Figure F.24: MOBILE HAZMAT BUFFERS IN NESHOBA COUNTY



Social Vulnerability

Given high susceptibility across the entire county, it is assumed that the total population is at risk to a hazardous materials incident. It should be noted that areas of population concentration may be at an elevated risk due to a greater burden to evacuate population quickly.

Critical Facilities

Fixed Site Analysis:

The critical facility analysis for fixed TRI sites revealed that there are no facilities located in a HAZMAT risk zone. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

Mobile Analysis:

It should be presumed that any facility located near a public roadway or rail line is susceptible to a potential HAZMAT event. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

A list of specific critical facilities and their associated risk can be found at the end of this subsection.

In conclusion, a hazardous material incident has the potential to impact many existing and future buildings, critical facilities, and populations in Neshoba County. Those areas in a primary buffer are at the highest risk, though all areas carry some vulnerability due to variations in conditions that could alter the impact area (i.e., direction and speed of wind, volume of release, etc.). Further, incidents from neighboring counties could also impact the county and participating jurisdictions.

CONCLUSIONS ON HAZARD VULNERABILITY

The following table presents a summary of annualized loss for each hazard in Neshoba County. Due to the reporting of hazard damages primarily at the county level, it was difficult to determine an accurate annualized loss estimate for each municipality. Therefore, an annualized loss was determined through the damage reported through historical occurrences at the county level. These values should be used as an additional planning tool or measure risk for determining hazard mitigation strategies throughout the county.

Table F.29: ANNUALIZED LOSS FOR NESHOBA COUNTY

Event	Neshoba County
Flood-related Hazards	
Flood	$90,000
Erosion	Negligible
Dam and Levee Failure	Negligible
Winter Storm & Freeze	$61,200
Fire-related Hazards	
Drought / Heat Wave	$8,750
Wildfire	Negligible
Geologic Hazards	
Earthquake	Negligible
Landslide	Negligible
Land Subsidence	Negligible
Wind-related Hazards	
Hurricane & Tropical Storm	$308,000
Thunderstorm / High Wind	$84,766
Hail	$33,039
Lightning	$6,866
Tornado	$1,114,985
Other Hazards	
HAZMAT Incident	Negligible
Pandemic	Negligible

**In this table, the term "Negligible" is used to indicate that no records of dollar losses for the particular hazard were recorded. This could be the case either because there were no events that caused dollar damage or because documentation of that particular type of event is not well kept. Annualized losses were calculated based on the total number of years of reporting and damage totals.*

As noted previously, all existing and future buildings and populations (including critical facilities) are vulnerable to atmospheric hazards including drought / heat wave, hurricane and tropical storm, thunderstorm (wind, hail, lightning), tornado, and winter storm and freeze. In addition, all buildings and populations are vulnerable to all of the man-made and technological hazards identified above. Some buildings may be more vulnerable to these hazards based on locations, construction, and building type. The following table shows the critical facilities vulnerable to additional hazards analyzed in this subsection. The table lists those assets that are determined to be exposed to each of the identified hazards (marked with an "**X**").

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Table F.30: AT-RISK CRITICAL FACILITIES IN NESHOBA COUNTY

		FLOOD-RELATED				FIRE-RELATED		GEOLOGIC			WIND-RELATED			OTHER						
FACILITY NAME	FACILITY TYPE	Flood – 100 yr	Flood – 500 yr	Erosion	Dam and Levee Failure[32]	Winter Storm and Freeze	Drought / Heat Wave	Wildfire	Earthquake	Landslide	Land Subsidence	Hurricane and Tropical Storm	Thunderstorm (wind, hail,	Tornado	Fixed HAZMAT – 0.5 mile	Fixed HAZMAT – 1.0 mile	Mobile HAZMAT – 0.5 mile (road)	Mobile HAZMAT – 1.0 mile (road)	Mobile HAZMAT – 0.5 mile (rail)	Mobile HAZMAT – 1.0 mile (rail)	Pandemic
NESHOBA COUNTY																					
ARLINGTON VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
ARLINGTON VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
CHOCTAW FIRE DEPARTMENT STATION 1	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
CHOCTAW FIRE DEPARTMENT STATION 2	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
COUNTY LINE VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
COUNTY LINE VOLUNTEER FIRE	Fire Station																				
DIXON VOLUNTEER FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
DIXON VOLUNTEER FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
EAST NESHOBA VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
EAST NESHOBA VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
EAST NESHOBA VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
EAST NESHOBA VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
FAIRVIEW VOLUNTEER FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
HOPE VOLUNTEER FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
HOPE VOLUNTEER FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
LINWOOD VOLUNTEER FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
LINWOOD VOLUNTEER FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
LINWOOD VOLUNTEER FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
LONGINO CENTRAL VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X

		FLOOD-RELATED				FIRE-RELATED		GEOLOGIC			WIND-RELATED			OTHER						
FACILITY NAME	FACILITY TYPE	Flood – 100 yr	Flood – 500 yr	Erosion	Dam and Levee Failure[32]	Winter Storm and Freeze	Drought / Heat Wave	Wildfire	Earthquake	Landslide	Land Subsidence	Hurricane and Tropical Storm	Thunderstorm (wind, hail,	Tornado	Fixed HAZMAT – 0.5 mile	Fixed HAZMAT – 1.0 mile	Mobile HAZMAT – 0.5 mile (road)	Mobile HAZMAT – 1.0 mile (road)	Mobile HAZMAT – 0.5 mile (rail)	Mobile HAZMAT – 1.0 mile (rail)	Pandemic
NESHOBA COUNTY																					
NORTH BEND VOLUNTEER FIRE 1	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
NORTH BEND VOLUNTEER FIRE 2	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
NORTH BEND VOLUNTEER FIRE 3	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
PHILADELPHIA FIRE DEPARTMENT 1	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
PHILADELPHIA FIRE DEPARTMENT 2	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
PHILADELPHIA FIRE DEPARTMENT 3	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
STALLO VOLUNTEER FIRE DEPARTMENT 1	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
STALLO VOLUNTEER FIRE DEPARTMENT 2	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
TUCKER VOLUNTEER FIRE DEPARTMENT 1	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
TUCKER VOLUNTEER FIRE DEPARTMENT 2	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
TUCKER VOLUNTEER FIRE DEPARTMENT 3	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
Choctaw Health Center	Medical Care			X	X	X	X		X	X	X	X	X	X			X	X			X
Neshoba County Gen Hospital	Medical Care	X		X	X	X	X		X	X	X	X	X	X			X	X			X
Choctaw Indian Police Dept	Police Station			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
Neshoba County Sheriff	Police Station			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
Philadelphia Police Dept	Police Station			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
Boque Chitto Elementary School	School	X		X	X	X	X		X	X	X	X	X	X				X	X	X	X
Choctaw Central High School	School			X	X	X	X		X	X	X	X	X	X							X
Choctaw Central Middle School	School			X	X	X	X		X	X	X	X	X	X							X

		FLOOD-RELATED					FIRE-RELATED		GEOLOGIC			WIND-RELATED			OTHER						
FACILITY NAME	FACILITY TYPE	Flood – 100 yr	Flood – 500 yr	Erosion	Dam and Levee Failure[32]	Winter Storm and Freeze	Drought / Heat Wave	Wildfire	Earthquake	Landslide	Land Subsidence	Hurricane and Tropical Storm	Thunderstorm (wind, hail,	Tornado	Fixed HAZMAT – 0.5 mile	Fixed HAZMAT – 1.0 mile	Mobile HAZMAT – 0.5 mile (road)	Mobile HAZMAT – 1.0 mile (road)	Mobile HAZMAT – 0.5 mile (rail)	Mobile HAZMAT – 1.0 mile (rail)	Pandemic
NESHOBA COUNTY																					
Neshoba Central Elementary School	School			X	X	X	X		X	X	X	X	X	X				X			X
Neshoba Central High School	School			X	X	X	X		X	X	X	X	X	X			X	X			X
Neshoba Central Middle School	School			X	X	X	X		X	X	X	X	X	X				X			X
Pearl River Elementary School	School			X	X	X	X		X	X	X	X	X	X			X	X			X
Philadelphia Elementary School	School			X	X	X	X		X	X	X	X	X	X			X	X		X	X
Philadelphia High School	School			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
Philadelphia Middle School	School			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X
Tucker Elementary School	School	X		X	X	X	X		X	X	X	X	X	X				X	X	X	X

As noted previously, these facilities could be at risk to dam failure if located in an inundation area. Data was not available to conduct such an analysis. There was no local knowledge of these facilities being at risk to dam failure. As additional data becomes available, more in-depth analysis will be conducted.

F.4 NESHOBA COUNTY CAPABILITY ASSESSMENT

This subsection discusses the capability of Neshoba County to implement hazard mitigation activities. More information on the purpose and methodology used to conduct the assessment can be found in Section 7: *Capability Assessment*.

F.4.1 Planning and Regulatory Capability

The following table provides a summary of the relevant local plans, ordinances, and programs already in place or under development for Neshoba County. A checkmark (✓) indicates that the given item is currently in place and being implemented. An asterisk (*) indicates that the given item is currently being developed
for future implementation. Each of these local plans, ordinances, and programs should be considered available mechanisms for incorporating the requirements of the MEMA District 6 Regional Hazard Mitigation Plan.

Table F.31: RELEVANT PLANS, ORDINANCES, AND PROGRAMS

Planning Tool/Regulatory Tool	Hazard Mitigation Plan	Comprehensive Land Use Plan	Floodplain Management Plan	Open Space Management Plan (Parks & Rec/Greenway Plan	Stormwater Management Plan/Ordinance	Natural Resource Protection Plan	Flood Response Plan	Emergency Operations Plan	Continuity of Operations Plan	Evacuation Plan	Disaster Recovery Plan	Capital Improvements Plan	Economic Development Plan	Historic Preservation Plan	Flood Damage Prevention Ordinance	Zoning Ordinance	Subdivision Ordinance	Unified Development Ordinance	Post-Disaster Redevelopment Ordinance	Building Code	Fire Code	National Flood Insurance Program (NFIP)	NFIP Community Rating System
NESHOBA COUNTY	✓							✓	✓				✓		✓							✓	
Philadelphia	✓	✓						✓					✓		✓	✓	✓			✓	✓	✓	

A more detailed discussion on the county's planning and regulatory capabilities follows.

EMERGENCY MANAGEMENT

Hazard Mitigation Plan
Neshoba County has previously adopted a hazard mitigation plan. The City of Philadelphia was also included in this plan.

Emergency Operations Plan
Neshoba County maintains an Emergency Operations Plan through its Emergency Management Agency. The City of Philadelphia is covered by this plan.

GENERAL PLANNING

Comprehensive Land Use Plan
Neshoba County has not adopted a county comprehensive land use plan. However, the City of Philadelphia has adopted a municipal comprehensive plan.

Zoning Ordinance
Neshoba County does not have a zoning ordinance in place. However, the City of Philadelphia has adopted a zoning ordinance.

Subdivision Ordinance
Neshoba County does not have a subdivision ordinance in place. However, the City of Philadelphia has adopted a subdivision ordinance.

Building Codes, Permitting, and Inspections
The City of Philadelphia has adopted a building code.

FLOODPLAIN MANAGEMENT

The following table provides NFIP policy and claim information for each participating jurisdiction in Neshoba County.

Table F.32: NFIP POLICY AND CLAIM INFORMATION

Jurisdiction	Date Joined NFIP	Current Effective Map Date	NFIP Policies in Force	Insurance in Force	Closed Claims	Total Payments to Date
NESHOBA COUNTY†	09/15/89	05/20/10	30	$5,472,000	0	$0
Philadelphia	09/29/86	05/20/10	43	$10,520,900	4	$44,902

†Includes unincorporated areas of county only
Source: NFIP Community Status information as of 9/2/2015; NFIP claims and policy information as of 6/30/2015

Flood Damage Prevention Ordinance
All communities participating in the NFIP are required to adopt a local flood damage prevention ordinance. Neshoba County and the City of Philadelphia both participate in the NFIP and have adopted flood damage prevention ordinances.

F.4.2 Administrative and Technical Capability

The following table provides a summary of the capability assessment results for Neshoba County with regard to relevant staff and personnel resources. A checkmark (✓) indicates the presence of a staff member(s) in that jurisdiction with the specified knowledge or skill.

Table F.33: RELEVANT STAFF / PERSONNEL RESOURCES

Staff / Personnel Resource	Planners with knowledge of land development/land management practices	Engineers or professionals trained in construction practices related to buildings and/or infrastructure	Planners or engineers with an understanding of natural and/or human-caused hazards	Emergency Manager	Floodplain Manager	Land Surveyors	Scientists familiar with the hazards of the community	Staff with education or expertise to assess the community' s vulnerability to hazards	Personnel skilled in GIS and/or Hazus	Resource development staff or grant writers
NESHOBA COUNTY		✓		✓	✓			✓	✓	
Philadelphia		✓		✓	✓		✓	✓	✓	

Credit for having a floodplain manager was given to those jurisdictions that have a flood damage prevention ordinance, and therefore an appointed floodplain administrator, regardless of whether the appointee was dedicated solely to floodplain management. Credit was given for having a scientist familiar with the hazards of the community if a jurisdiction has a Cooperative Extension Service or Soil and Water Conservation Department. Credit was also given for having staff with education or expertise to assess the community's vulnerability to hazards if a staff member from the jurisdiction was a participant on the existing hazard mitigation plan's planning committee.

F.4.3 Fiscal Capability

The following table provides a summary of the results for Neshoba County with regard to relevant fiscal resources. A checkmark (✓) indicates that the given fiscal resource is locally available for hazard mitigation purposes (including match funds for state and federal mitigation grant funds) according to the previous county hazard mitigation plan.

Table F.34: RELEVANT FISCAL RESOURCES

Fiscal Tool / Resource	Capital Improvement Programming	Community Development Block Grants (CDBG)	Special Purpose Taxes (or taxing districts)	Gas/Electric Utility Fees	Water/Sewer Fees	Stormwater Utility Fees	Development Impact Fees	General Obligation, Revenue, and/or Special Tax Bonds	Partnering Arrangements or Intergovernmental Agreements	Other: other state and Federal funding sources
NESHOBA COUNTY	✓	✓	✓					✓	✓	✓
Philadelphia	✓	✓								✓

F.4.4 Political Capability

During the months immediately following a disaster, local public opinion in Neshoba County is more likely to shift in support of hazard mitigation efforts.

F.4.5 Conclusions on Local Capability

The following table shows the results of the capability assessment using the designed scoring methodology described in Section 7: *Capability Assessment*. The capability score is based solely on the information found in existing hazard mitigation plans and readily available on the jurisdictions' government websites. According to the assessment, the average local capability score for the county and its jurisdictions is 24.0, which falls into the moderate capability ranking.

Table F.35: CAPABILITY ASSESSMENT RESULTS

Jurisdiction	Overall Capability Score	Overall Capability Rating
NESHOBA COUNTY	22	Moderate
Philadelphia	26	Moderate

F.5 NESHOBA COUNTY MITIGATION STRATEGY

This subsection provides the blueprint for Neshoba County to follow in order to become less vulnerable to its identified hazards. It is based on general consensus of the Regional Hazard Mitigation Council and the findings and conclusions of the capability assessment and risk assessment. Additional Information can be found in Section 8: *Mitigation Strategy* and Section 9: *Mitigation Action Plan*.

F.5.1 Mitigation Goals

Neshoba County developed 10 mitigation goals in coordination with the other participating MEMA District 6 Region jurisdictions. The regional mitigation goals are presented below.

Table F.36: MEMA DISTRICT 6 REGIONAL MITIGATION GOALS

Goal #		Goals & Objectives	Action #
#1	Goal	Local government will be able to maintain **effective mitigation programs**.	PEA-1
	Objective	***Continually gathers information for HMP process.***	
#2	Goal	The community will work together to create a **disaster-resistant community**.	PEA-2
	Objective	***County is discussing applications such as CodeRed/NIXLE to further enhance alerting the public. Possibly restarting healthcare coalition meetings.***	
#3	Goal	The community will be able to initiate and sustain **emergency response operations.**	PEA-2
	Objective	***Collaborates with RedCross and Salvation Army for disaster response resources. Very helpful during February 2021 winter storm.***	
#4	Goal	**Government operations** will not be significantly disrupted by disasters.	
	Objective	***County maintains and regularly updates COOP.***	
#5	Goal	The **health, safety, and welfare of the community's residents and visitors** will be protected.	ES-5
	Objective	***Working on a community saferoom. Maintains working relationship with Choctaw community.***	
#6	Goal	**Local government will support effective hazard mitigation programming** in the community.	
	Objective	***Limits building in floodplain.***	
#7	Goal	Residents of the community will have **homes, institutions, and work places that are safer**.	PEA-3
	Objective	***Continuing discussions for a community saferoom. Had generators installed at critical locations, and installed an elevator at the coliseum that can be used as a shelter.***	
#8	Goal	The **local economy** of the community will be prepared for a disaster.	
	Objective	***More tornado sirens and warning systems.***	
#9	Goal	**Local infrastructure will not be significantly disrupted by a disaster**.	ES-4
	Objective	***County has installed several backup generators and will continue seeking funding for additional generators for critical locations.***	
#10	Goal	All **members of the community will understand the hazards threatening their community.**	PEA-1
	Objective	***County uses Turn Around, Don't Drown; also host spotter training. Good working relationship with their Amateur Radio community.***	

To attain the listed mitigation goals, the county has also identified objectives that will assist them in the mitigation action process. Objectives are broader than specific actions, but are measurable, unlike goals. Objectives connect goals with the actual mitigation actions. The action plan describes how the mitigation actions will be implemented, including how those actions will be prioritized, administered and incorporated into the community's existing planning mechanisms.

F.5.2 Mitigation Action Plan

The mitigation actions proposed by Neshoba County and Philadelphia are listed in the following individual Mitigation Action Plans.

Neshoba County Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration by Board.
P-2	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration by Board.
P-3	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2025	The International Building Code has not been adopted. The county will review this code and consider adoption, so this action will remain in the plan.
P-4	Performance of annual maintenance on drainage systems (ditches) to ensure that debris is removed.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2025	An annual maintenance process for the drainage systems is in place, but this process will need to be evaluated going forward. The county will review this in the next 5 years and continue to perform maintenance.
P-5	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	County EMA	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
P-6	Collect additional data on the number of buildings located in flood-prone areas near the Pearl River and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	County EMA	FEMA/MEMA, Local funds	2025	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1	Installation of rip-rap at the end of all new culverts.	Flood	High	Board of Supervisors	FEMA/MEMA, Local funds	2025	Rip-rap has been added to the end of a number of culverts, but as new culverts are added to areas in the county, this action will need to be continually implemented. In process.
Emergency Services							
ES-1	Purchase of generators to provide adequate backup power for all volunteer fire departments.	Tornado, High Wind	High	County Fire Service	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	2 generators have been acquired but the county needs additional.
ES-2	Purchase of generators to provide emergency power to all critical facilities including a full capacity generator at the Neshoba County Courthouse, Courthouse Annex (Old Jail) and Philadelphia-Neshoba County Public Library.	Tornado, High Wind, Hurricane	High	Board of Supervisors	FEMA/MEMA, Homeland Security, Local Funds	2017	Completed
ES-3	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	County EMA	FEMA/MEMA, Local funds	2025	Discussions continue, county is considering the purchase of CodeRed.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
ES-4	Add amenities – specifically showers and a concourse to arena floor elevator - to Coliseum to make it compliant with necessary shelter requirements.	All	High	Board of Supervisors, County EMA	FEMA/MEMA, Homeland Security, Local funds	2018	Completed
ES-5	Protect Critical Facilities and Infrastructure from lighting damage	Tornado, Thunderstorms	High	Board of Supervisors, County EMA	FEMA/MEMA, Local Funds	2025	New action, Seeking Funding to implement protection measures.
ES-6	Map Community Risk through development of a coordinated GIS Department.	All	High	Board of Supervisors, County EMA	FEMA/MEMA, Local Funds	2025	Still Seeking Funding.
Public Education and Awareness							
PEA-1	Education of the public on all natural hazards, including flooding, tornadoes, severe thunderstorms, winter weather, and hurricanes.	All	Low	County EMA	FEMA/MEMA, Local funds	2025	The county has done a good job of posting preparedness information and weather updates to County Website and providing information to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.
PEA-2	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2025	Still in active discussions.

City of Philadelphia Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration by Board.
P-2	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration by Board.
P-3	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
P-4	Collect additional data on the number of buildings located in flood-prone areas near the Pearl River and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.
Property Protection							
PP-1	Installation of a new 1000 GPM water well and related lines, with a standby generator, to supply the water treatment plant.	All	High	Public Works	FEMA/MEMA, CDBG, Local funds	2025	The city has not installed a water well with generator due to lack of funding, but it would still like to implement this action, so it will continue seeking funding.
Natural Resource Protection							
NRP-1							

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Structural Projects							
SP-1	Enlarge bridge on Williamsville Drive and on bypass. This stream also needs to be cleaned out in the area that falls outside the City limits.	Flood	High	Public Works	FEMA/MEMA, CDBG, Local funds	2025	The bridge has not been enlarged, but the city is seeking funding. The city also plans to work with the county on keeping the area outside city limits clear of debris.
SP-2	Cleaning out and widening of the ditch that runs adjacent to Main Street which causes flooding at Woffords Nursery and Landscape on Main, Byars Furniture Storage Warehouse on Gum Street, and three structures on Hopson Street.	Flood	Moderate	Public Works	FEMA/MEMA, CDBG, Local funds	2025	There has been some effort to clear out the ditch, but there has not been much effort to fully address the issue. The city is currently seeking funding to implement a full-scale project to address the issue.
SP-3	Clean out and deepen ditch at Chestnut Street near stream/creek between North Lewis and Martin Luther King.	Flood	Moderate	Public Works	FEMA/MEMA, CDBG, Local funds	2025	There has been some effort to clear out the ditch, but there has not been much effort to fully address the issue. The city is currently seeking funding to implement a full-scale project to address the issue.
Emergency Services							
ES-1	Purchase of generators to provide adequate backup power for the wastewater facilities after a disaster.	All	High	Public Works	FEMA/MEMA, CDBG, Local funds	2025	2 generators have been acquired but the county needs 10 additional.
ES-2	Purchase of a generator to provide adequate backup power allowing the Senior Citizens Center to be used as a shelter.	All	High	Public Works	FEMA/MEMA, CDBG, Local funds	2025	New action. Seeking Funding.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
ES-3	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	EMA, Fire Department , Police Department	FEMA/MEMA, Local funds	2025	Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan.
ES-4	Purchase of a satellite telephone for the Philadelphia Electric Department so communication can be maintained with TVA following a disaster.	All	High	Public Works	FEMA/MEMA, Homeland Security, Local funds	2025	A satellite telephone for the Electric Department has not been purchased. The city is still looking for funding to implement this action.
Public Education and Awareness							
PEA-1	Purchase of materials to educate the public on being prepared for hazards, including tornadoes, severe weather, flooding, fire, etc.	All	Low	Fire Department , Police Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	The city has done a good job of posting preparedness information and weather updates to County Website and providing information to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.
PEA-2	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2025	New action

ANNEX G
NEWTON COUNTY

This annex includes jurisdiction-specific information for Newton County and its participating municipalities. It consists of the following five subsections:

- G.1 Newton County Community Profile
- G.2 Newton County Risk Assessment
- G.3 Newton County Vulnerability Assessment
- G.4 Newton County Capability Assessment
- G.5 Newton County Mitigation Strategy

G.1 NEWTON COUNTY COMMUNITY PROFILE

G.1.1 Geography and the Environment

Newton County is located in eastern Mississippi. It comprises four towns and one city, Town of Chunky, Town of Decatur, Town of Hickory, City of Newton, and Town of Union, as well as many small unincorporated communities. An orientation map is provided as **Figure G.1**.

The county provides recreational and economic opportunities for residents and visitors. The total area of the county is 580 square miles, 2 square miles of which is water area.

Summer temperatures in the county range from highs of about 90 degrees Fahrenheit (˚F) to lows in the upper 60s. Winter temperatures range from highs in the mid-50s to lows around 30˚F. Average annual rainfall is approximately 56 inches, with the wettest months being November, December, and May.

Figure G.1: NEWTON COUNTY ORIENTATION MAP

G.1.2 Population and Demographics

According to the 2019 American Community Survey, Newton County has a population of 21,360 people. The county has seen a very slight decrease in population between 2000 and 2010, however Decatur and Hickory have experienced substantial rates of growth. The population density is 38 people per square mile. Population counts from the US Census Bureau for 2000, 2010, and 2019 for the county and participating jurisdictions are presented in **Table G.1**.

Table G.1: POPULATION COUNTS FOR NEWTON COUNTY

Jurisdiction	2000 Census Population	2010 Census Population	2019 Census Population	% Change 2000-2019
Newton County	**21,838**	**21,720**	**21,360**	**-2.18%**
Chunky	344	326	344	0.0%
Decatur	1,426	1,841	1,897	33.02%
Hickory	499	530	632	26.65%
Newton	3,699	3,373	3,220	-12.94%
Union	2,021	1,988	2,349	16.22%

Source: United States Census Bureau – American Community Survey

Based on the 2019 American Community Survey, the median age of residents of Newton County is 37 years. The racial characteristics of the county are presented in **Table G.2**. Whites make up the majority of the population in the county, accounting for 61.4 percent of the population.

Table G.2: DEMOGRAPHICS OF NEWTON COUNTY

Jurisdiction	White, Percent (2019)	Black or African American, Percent (2019)	American Indian or Alaska Native, Percent (2019)	Asian, Percent (2019)	Native Hawaiian or Other Pacific Islander, Percent (2019)	Other Race, Percent (2019)	Two or More Races, percent (2019)	Persons of Hispanic Origin, Percent (2019)*
Newton County	**61.4%**	**30.5%**	**5.3%**	**0.5%**	**0.0%**	**1.0%**	**1.2%**	**1.9%**
Chunky	86.6%	0.9%	0.0%	0.0%	0.0%	8.4%	4.1%	11.0%
Decatur	50.3%	47.6%	1.4%	0.0%	0.0%	0.0%	0.6%	2.6%
Hickory	34.3%	64.9%	0.0%	0.2%	0.0%	0.0%	0.6%	0.2%
Newton	25.7%	73.5%	0.0%	0.2%	0.0%	0.0%	0.6%	2.5%
Union	49.9%	49.0%	0.2%	0.1%	0.0%	0.0%	0.9%	0.0%

*Hispanics may be of any race, so also are included in applicable race categories
Source: United States Census Bureau – American Community Survey

G.1.3 Housing

According to the 2019 US Census American Community Survey, there are 9,508 housing units in Newton County, the majority of which are single family homes or mobile homes. Housing information for the county and five municipalities is presented in **Table G.3**.

Table G.3: HOUSING CHARACTERISTICS OF NEWTON COUNTY

Jurisdiction	Housing Units (2010)	Housing Units (2019)	Median Home Value (2019)
Newton County	**9,373**	**9,508**	**$85,600**
Chunky	144	170	$60,900

Jurisdiction	Housing Units (2010)	Housing Units (2019)	Median Home Value (2019)
Decatur	610	723	$106,300
Hickory	221	241	$65,000
Newton	1,520	1,504	$74,500
Union	887	972	$80,900

Source: United States Census Bureau – American Community Survey

G.1.4 Infrastructure

TRANSPORTATION

In Newton County, Interstate 20 runs east-west connecting multiple counties and towns. Within Newton County, U.S. Highway 80 connects towns east-west throughout the state and into Alabama and Louisiana. State Highway 15 provides access north and south throughout Mississippi.

The James H. Eason Field and Rose Field Airport in Newton County provide limited local service. The closest international airport includes Jackson-Evers International Airport, which offers international and domestic flights to a number of locations around the world.

UTILITIES

Electrical power in Newton County is provided by Central Electric Power Association, Mississippi Power, and Southern Pine Electric Power and several local distributors.

Water and sewer service is provided to residents by the Beulah Hubbard Water, Duffee Water Association, North Decatur Water Association, Tallahalla Water Association, and multiple other local service providers.

COMMUNITY FACILITIES

There are a number of buildings and community facilities located throughout Newton County. According to the data collected for the vulnerability assessment (Section 6), there are 13 fire stations, 7 police stations, and 15 public schools located within the county.

There is one hospital, Laird, in operation within Newton County.

Recreational opportunities are available within Newton County in the form of Turkey Creek Water Park, Tallahala Wildlife Management, and various local parks. Beinville National Forest is partially located in the county and consists of 178,541 acres used for hiking, fishing, boating, and hunting.

G.1.5 Land Use

Many areas of Newton County are undeveloped or sparsely developed. There are several small incorporated municipalities located throughout the county, with a few larger hubs interspersed. These areas are where the county's population is generally concentrated. The incorporated areas are also where many of the businesses, commercial uses, and institutional uses are located. Land uses in the balance of the study area generally consist of rural residential development, agricultural uses, and recreational areas, although there are some notable exceptions in the larger municipalities. Local land use and associated regulations are further discussed in *Section 7: Capability Assessment.*

East Central Planning and Development District assists with Newton County with planning and development to promote economic growth and job opportunities.

G.1.6 Employment and Industry

According to U.S. Census Bureau's American Community Survey (ACS), in 2019, Newton County had an average annual employment of 8,547 workers and according to Mississippi Department of Employment Security as of May 2021 an average unemployment rate of 6.1 percent. In 2019, according to the ACS, the Educational Services, Health Care, and Social Assistance industry employed 27.6 percent of the workforce. Manufacturing was the second largest industry, employing 18.5 percent of workers, and Retail Trade followed behind (11.9%). The median household income in Newton County was $35,958 compared to $45,081 in the state of Mississippi.

G.2 NEWTON COUNTY RISK ASSESSMENT

This subsection includes hazard profiles for each of the significant hazards identified in Section 4: *Hazard Identification* as they pertain to Newton County. Each hazard profile includes a description of the hazard's location and extent, notable historical occurrences, and the probability of future occurrences. Additional information can be found in Section 5: *Hazard Profiles*.

G.2.1 Flood

LOCATION AND SPATIAL EXTENT

There are areas in Newton County that are susceptible to flood events. Special flood hazard areas in the county were mapped using Geographic Information System (GIS) and FEMA Digital Flood Insurance Rate Maps (DFIRM). This includes Zone A (1-percent annual chance floodplain), Zone AE (1-percent annual chance floodplain with elevation), and Zone X500 (0.2-percent annual chance floodplain). According to GIS analysis, of the 584 square miles that make up Newton County, there are 95.3 square miles of land in zones A and AE (1-percent annual chance floodplain/100-year floodplain) and 0.3 square miles of land in zone X500 (0.2-percent annual chance floodplain/500-year floodplain).

These flood zone values account for 16.4 percent of the total land area in Newton County. It is important to note that while FEMA digital flood data is recognized as best available data for planning purposes, it does not always reflect the most accurate and up-to-date flood risk. Flooding and flood-related losses often do occur outside of delineated special flood hazard areas. **Figure G.2** illustrates the location and extent of currently mapped special flood hazard areas for Newton County based on best available FEMA Digital Flood Insurance Rate Map (DFIRM) data.[1] Intense seasonal rains and occasional tropical storms or hurricanes are the cause of periodic flooding in Newton County. The principal flood problems in Newton County arise from overflow into the relatively flat, developed overbanks along some streams in the town.[2]

[1] DFIRM Updated 2010
[2] FEMA. Flood Insurance Study, December 2010

Figure G.2: SPECIAL FLOOD HAZARD AREAS IN NEWTON COUNTY

Source: Federal Emergency Management Agency

HISTORICAL OCCURRENCES

Floods were at least partially responsible for nine disaster declarations in Newton County in 1974, 1976, 1979, 1990, 2003, 2011, 2014, and twice in 2019. Information from the National Centers for Environmental

Information was used to ascertain additional historical flood events. The National Centers for Environmental Information reported a total of 43 events in Newton County since 1997. A summary of these events is presented in **Table G.4**. These events accounted for more than $32.29 million in property damage in the county.

Table G.4: SUMMARY OF FLOOD OCCURRENCES IN NEWTON COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Chunky	6	0/0	$573,000
Decatur	3	0/0	$204,000
Hickory	3	0/0	$85,000
Newton (city)	6	0/0	$38,000
Union	5	0/0	$13,000
Unincorporated Area	20	0/0	$31,377,000
NEWTON COUNTY TOTAL	**43**	**0/0**	**$32,296,000**

Source: National Centers for Environmental Information

HISTORICAL SUMMARY OF INSURED FLOOD LOSSES

Updated NFIP and Repetitive Loss Properties data were not made available for this plan update. According to FEMA flood insurance policy records as of June 2015, there have been five flood losses reported in Newton County through the National Flood Insurance Program (NFIP) since 1978, totaling over $52,000 in claims payments. A summary of these figures for the county is provided in **Table G.6**. It should be emphasized that these numbers include only those losses to structures that were insured through the NFIP policies, and for losses in which claims were sought and received. It is likely that many additional instances of flood loss in Newton County were either uninsured, denied claims payment, or not reported.

Table G.5: SUMMARY OF INSURED FLOOD LOSSES IN NEWTON COUNTY

Location	Flood Losses	Claims Payments
Chunky	1	$2,801
Decatur*	--	--
Hickory*	--	--
Newton (city)	3	$31,232
Union	0	$0
Unincorporated Area	1	$18,423
NEWTON COUNTY TOTAL	**5**	**$52,456**

*These communities do not participate in the National Flood Insurance Program. Therefore, no values are reported.
Source: Federal Emergency Management Agency, National Flood Insurance Program(Current as of 2015)

REPETITIVE LOSS PROPERTIES

According to the Mississippi Emergency Management Agency, there is one non-mitigated repetitive loss property located in Newton County, which accounted for two losses and almost $25,000 in claims payments under the NFIP. The average claim amount for these properties is $12,425. This property is non-residential. Without mitigation, this property will likely continue to experience flood losses. **Table G.6** presents detailed information on repetitive loss properties and NFIP claims and policies for Newton County.

Table G.6: REPETITIVE LOSS PROPERTIES IN NEWTON COUNTY

Location	Number of Properties	Types of Properties	Number of Losses	Building Payments	Content Payments	Total Payments	Average Payment
Chunky	0	--	0	$0	$0	$0	$0
Decatur*	--	--	0	$0	$0	$0	$0
Hickory*	--	--	0	$0	$0	$0	$0
Newton (city)	1	--	2	$20,550	$4,300	$24,850	$12,425
Union	0	--	0	$0	$0	$0	$0
Unincorporated Area	0	--	0	$0	$0	$0	$0
NEWTON COUNTY TOTAL	**1**		**2**	**$20,550**	**$4,300**	**$24,850**	**$12,425**

* These communities do not participate in the National Flood Insurance Program. Therefore, no values are reported.
Source: National Flood Insurance Program

PROBABILITY OF FUTURE OCCURRENCES

Flood events will remain a threat in Newton County, and the probability of future occurrences will remain likely (between 10 and 100 percent annual probability). The participating jurisdictions and unincorporated areas have risk to flooding, though not all areas will experience flood. The probability of future flood events based on magnitude and according to best available data is illustrated in the figures above**,** which indicates those areas susceptible to the 1-percent annual chance flood (100-year floodplain) and the 0.2-percent annual chance flood (500-year floodplain).

It can be inferred from the floodplain location maps, previous occurrences, and repetitive loss properties that risk varies throughout the county. For example, the City of Newton, Town of Hickory, and Town of Chunky have more floodplain and thus a higher risk of flood than the other municipalities. Flood is not the greatest hazard of concern but will continue to occur and cause damage. Therefore, mitigation actions may be warranted, particularly for repetitive loss properties.

G.2.2 Erosion

LOCATION AND SPATIAL EXTENT

Erosion in Newton County is typically caused by flash flooding events. Unlike coastal areas, areas of concern for erosion in Newton County are primarily rivers and streams. Generally, vegetation helps to prevent erosion in the area, and it is not an extreme threat to the county. No areas of concern were reported by the hazard mitigation council.

HISTORICAL OCCURRENCES

Several sources were vetted to identify areas of erosion in Newton County. This includes searching local newspapers, interviewing local officials, and reviewing previous hazard mitigation plans. No historical erosion occurrences were found in these sources.

PROBABILITY OF FUTURE OCCURRENCES

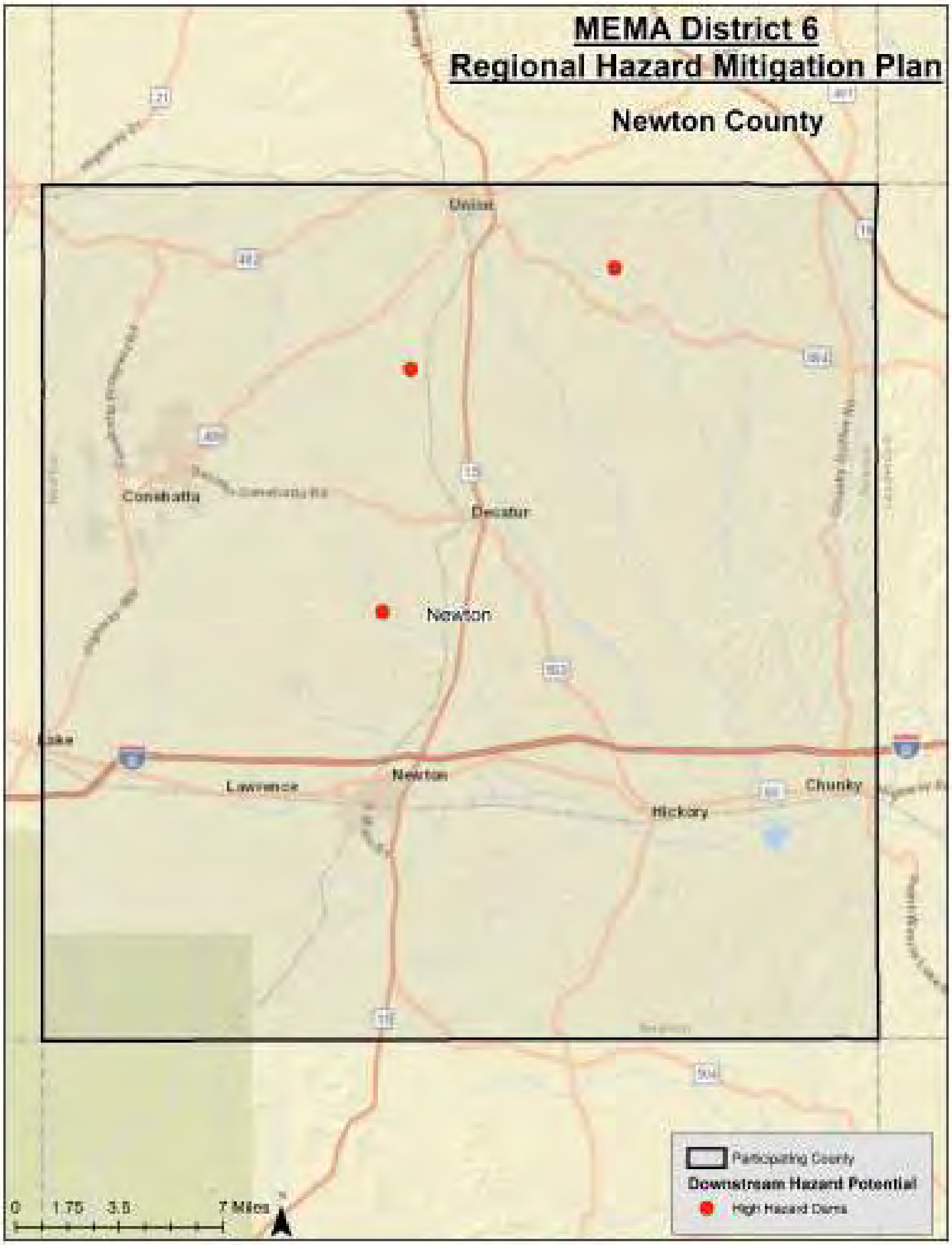
Erosion remains a natural, dynamic, and continuous process for Newton County, and it will continue to occur. The annual probability level assigned for erosion is possible (between 1 and 10 percent annually).

G.2.3 Dam and Levee Failure

LOCATION AND SPATIAL EXTENT

According to the U.S. Army Corps of Engineers National Inventory of Dams, there are three high hazard dams in Newton County. **Figure G.3** shows the location of each of these high hazard dams and **Table G.7** lists them by name.

Figure G.3: NEWTON COUNTY HIGH HAZARD DAM LOCATIONS



Source: U.S. Army Corps of Engineers – National Inventory of Dams

Table G.7: NEWTON COUNTY HIGH HAZARD DAMS

Dam Name	Hazard Potential
Newton County	
CHUNKY RIVER WS STR 47 DAM	High
TURKEY CREEK WATER PARK DAM	High

Dam Name	Hazard Potential
CHUNKY RIVER WS NUMBER 8 DAM	High

Source: Mississippi Department of Environmental Quality

HISTORICAL OCCURRENCES

There is no record of dam breaches in Newton County.

PROBABILITY OF FUTURE OCCURRENCES

Given the current dam inventory and historic data, a dam breach is possible (between 1 and 10 percent annual probability) in the future. However, as has been demonstrated in the past, regular monitoring is necessary to prevent these events.

G.2.4 Winter Storm and Freeze

LOCATION AND SPATIAL EXTENT

Nearly the entire continental United States is susceptible to winter storm and freeze events. Some ice and winter storms may be large enough to affect several states, while others might affect limited, localized areas. The degree of exposure typically depends on the normal expected severity of local winter weather. Newton County is not accustomed to severe winter weather conditions and rarely receives severe winter weather, even during the winter months. Events tend to be mild in nature; however, even relatively small accumulations of snow, ice, or other wintery precipitation can lead to losses and damage due to the fact that these events are not commonplace. Given the atmospheric nature of the hazard, the entire county has uniform exposure to a winter storm.

HISTORICAL OCCURRENCES

According to the National Centers for Environmental Information, there have been a total of 15 recorded winter storm events in Newton County since 1996 (**Table G.8**). These events resulted in over $1.59 million in damages. Detailed information on the recorded winter storm events can be found in **Table G.9**.

Table G.8: SUMMARY OF WINTER STORM EVENTS IN NEWTON COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Newton County	15	0/0	$1,590,000

Source: National Centers for Environmental Information

Table G.9: HISTORICAL WINTER STORM IMPACTS IN NEWTON COUNTY

Location	Date	Type	Deaths / Injuries	Property Damage
Chunky				
None Reported	--	--	--	--
Decatur				
None Reported	--	--	--	--
Hickory				
None Reported	--	--	--	--
Newton (city)				
None Reported	--	--	--	--
Union				
None Reported	--	--	--	--
Unincorporated Area				
NEWTON (ZONE)	2/1/1996	Ice Storm	0/0	$152,096
NEWTON (ZONE)	12/14/1997	Heavy Snow	0/0	$0
NEWTON (ZONE)	12/23/1998	Ice Storm	0/0	$14,640
NEWTON (ZONE)	1/27/2000	Ice Storm	0/0	$13,858
NEWTON (ZONE)	1/19/2008	Heavy Snow	0/0	$0
NEWTON (ZONE)	12/11/2008	Heavy Snow	0/0	$0
NEWTON (ZONE)	2/11/2010	Heavy Snow	0/0	$656,633
NEWTON (ZONE)	1/9/2011	Ice Storm	0/0	$21,218
NEWTON (ZONE)	2/3/2011	Ice Storm	0/0	$636,541
NEWTON (ZONE)	2/9/2011	Heavy Snow	0/0	$106,090
NEWTON (ZONE)	1/16/2013	Heavy Snow	0/0	$0
NEWTON (ZONE)	1/28/2014	Heavy Snow	0/0	$0
NEWTON (ZONE)	12/08/2017	Heavy Snow	0/0	$50,000
NEWTON (ZONE)	1/10/2021	Heavy Snow	0/0	$0
NEWTON (ZONE)	2/17/2021	Ice Storm	0/0	$100,000

Source: National Centers for Environmental Information

There have been several severe winter weather events in Newton County. The text below describes two of the major events and associated impacts on the county. Similar impacts can be expected with severe winter weather.

December 1998

Central Mississippi was hit by a crippling ice storm. Up to 2 inches of ice accumulated on power lines and much of the region experienced long power outages, nearly seven days in some cases. The ice caused numerous power outages and brought down many trees and power lines. Christmas travel was severely hampered for several days with motorists stranded at airports, bus stations, and truck stops. Travel did not return to normal until after Christmas in some locations.

January 2008 Winter Storm

This storm produced heavy snow across the region, with an average of three to four inches of snow. Some heavier amounts, between four to five inches, also fell in isolated areas. At the height of the snow, temperatures fell to near freezing, and accumulations occurred on roadways resulting in a number of traffic accidents. Additionally, some power outages occurred in the heaviest snow band due to the weight of wet snow on limbs and lines.

February 2021 Ice Storm
As an arctic air mass continued to build southward across the South on February 17th, another wave of precipitation overspread this cold air mass across much of Mississippi. The main impacts across central and southern portions of the state were from freezing rain and resulting heavy icing, but some significant accumulations of sleet and snow also occurred in areas mainly north and west of the Natchez Trace. Freezing rain continued through the evening hours, ending from west to east by the early morning of February 18th. Ice accumulated quickly in many locations and downed numerous trees, large limbs, and power lines across the affected areas. Several trees and limbs fell onto power lines, resulting in more widespread power outages as well. Some trees fell onto homes or cars, and significant amounts of ice, sleet, and snow collapsed a few gas station awnings and roofs where accumulations were greatest. In the hardest hit areas, extensive damage to trees and power lines took several months and cost several hundred thousands of dollars to clean up.

Winter storms throughout the planning area have several negative externalities including hypothermia, cost of snow and debris cleanup, business and government service interruption, traffic accidents, and power outages. Furthermore, citizens may resort to using inappropriate heating devices that could to fire or an accumulation of toxic fumes.

PROBABILITY OF FUTURE OCCURRENCES

Winter storm events will continue to occur in Newton County. According to historical information, the annual probability is likely (between 10 and 100 percent).

FIRE-RELATED HAZARDS

G.2.5 Drought / Heat Wave

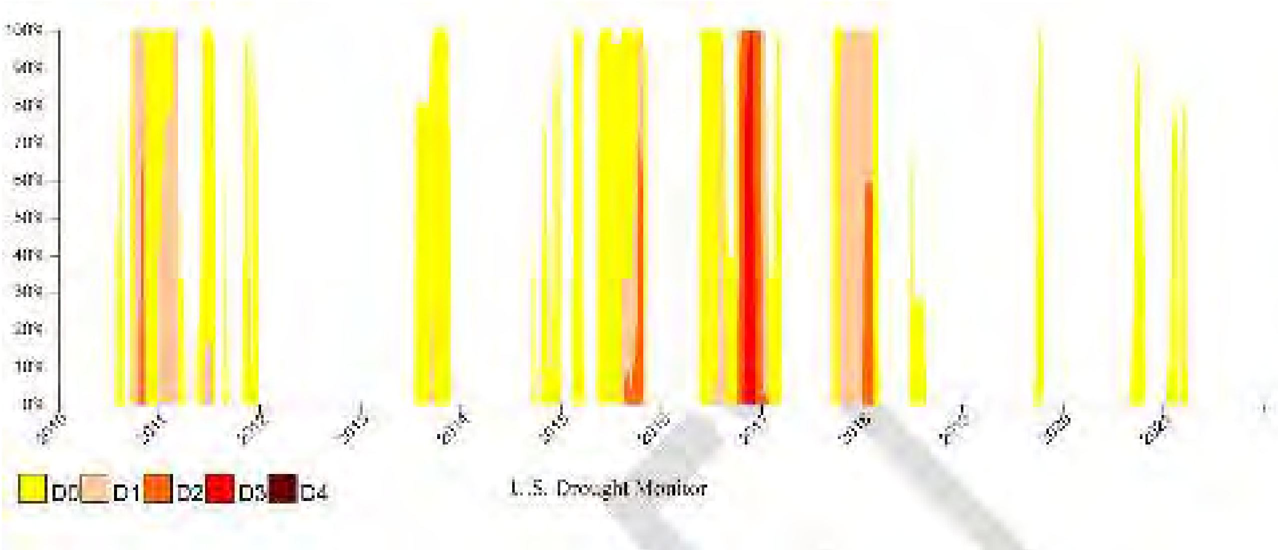
Drought
Drought typically covers a large area and cannot be confined to any geographic or political boundaries. Furthermore, it is assumed that Newton County would be uniformly exposed to drought, making the spatial extent potentially widespread. It is also notable that drought conditions typically do not cause significant damage to the built environment but may exacerbate wildfire conditions.

Heat Wave
Heat waves typically impact a large area and cannot be confined to any geographic or political boundaries.

HISTORICAL OCCURRENCES

Drought
Table G.10 shows the most severe drought classification for each year, according to U.S. Drought Monitor classifications. It should be noted that the U.S. Drought Monitor also estimates what percentage of the county is in each classification of drought severity. For example, the most severe classification reported may be exceptional but a majority of the county may actually be in a less severe condition.

Table G.10: HISTORICAL DROUGHT OCCURRENCES IN NEWTON COUNTY



Source: United States Drought Monitor

Some additional anecdotal information was provided from the National Centers for Environmental Information on droughts in Newton County.

Summer 2006 – During a four-and-a-half-month period, from June to the middle of October, abnormally dry conditions prevailed across most of Jackson, MS County Warning Area (CWA). The drought had a significant impact on the agricultural industry. Non-irrigated crops were destroyed and all other sustainable crops produced a below normal yield. Catfish ponds were drawn down to severe levels and required water to be pumped back into the fish ponds. The cattle industry suffered due to low watering ponds and lack of sufficient grasslands for grazing and hay production. Water supply problems were encountered by those cities who obtained water from local rivers for drinking purposes due to the low river flows. Fire threat was significant causing the issuance of burn bans across the CWA.

Summer 2007 – By the middle of April, drought conditions were being experienced across a large portion of Eastern and some of Central Mississippi. During the month of May, the drought worsened and expanded. In June, the drought peaked across the region. Although drought conditions continued throughout July and August, conditions were less severe than earlier in the summer. As a result of these conditions, area farmers and crop yields were affected.

October 2010 – Very dry conditions continued across central Mississippi during most of October. Crops were put under stress under the warm and dry conditions. The likely impact was less crop yields for harvest time.

Heat Wave
The National Centers for Environmental Information was used to determine historical heat wave occurrences in the county.

July 2005 – A five-day heat wave occurred across the region. Heat index values reached near 110 degrees each day. Each day had high temperatures ranging from 95 to 99 degrees. This was the warmest stretch of weather the area experienced since July 2001.

August 2005 –A heat wave covering the south began in mid-August and lasted about 10 days. High temperatures were consistently over 95 degrees and surpassed 100 degrees or more on some days. It was the first time since August 2000 that 100-degree temperatures reached the area.

July 2006 – A short heat wave impacted most of the area temperatures in the 90s to around 100 for five straight days.

August 2007 – A heat wave gripped most of the area with the warmest temperatures since 2000. It lasted from August 5th to the 16th.

August 2010 – The combination of high humidity and above normal temperatures produced heat index readings ranged between 105 and 109 degrees during the afternoon hours in the middle part of August.

PROBABILITY OF FUTURE OCCURRENCES

Drought
Based on historical occurrence information, it is assumed that Newton County has a probability level of likely (between 10 and 100 percent annual probability) for future drought events. However, the extent (or magnitude) of drought and the amount of geographic area covered by drought, varies with each year. Historic information indicates that there is a much lower probability for extreme, long-lasting drought conditions.

Heat Wave
Based on historical occurrence information, it is assumed that all of Newton County has a probability level of likely (between 10 and 100 percent annual probability) for future heat wave events.

G.2.6 Wildfire

LOCATION AND SPATIAL EXTENT

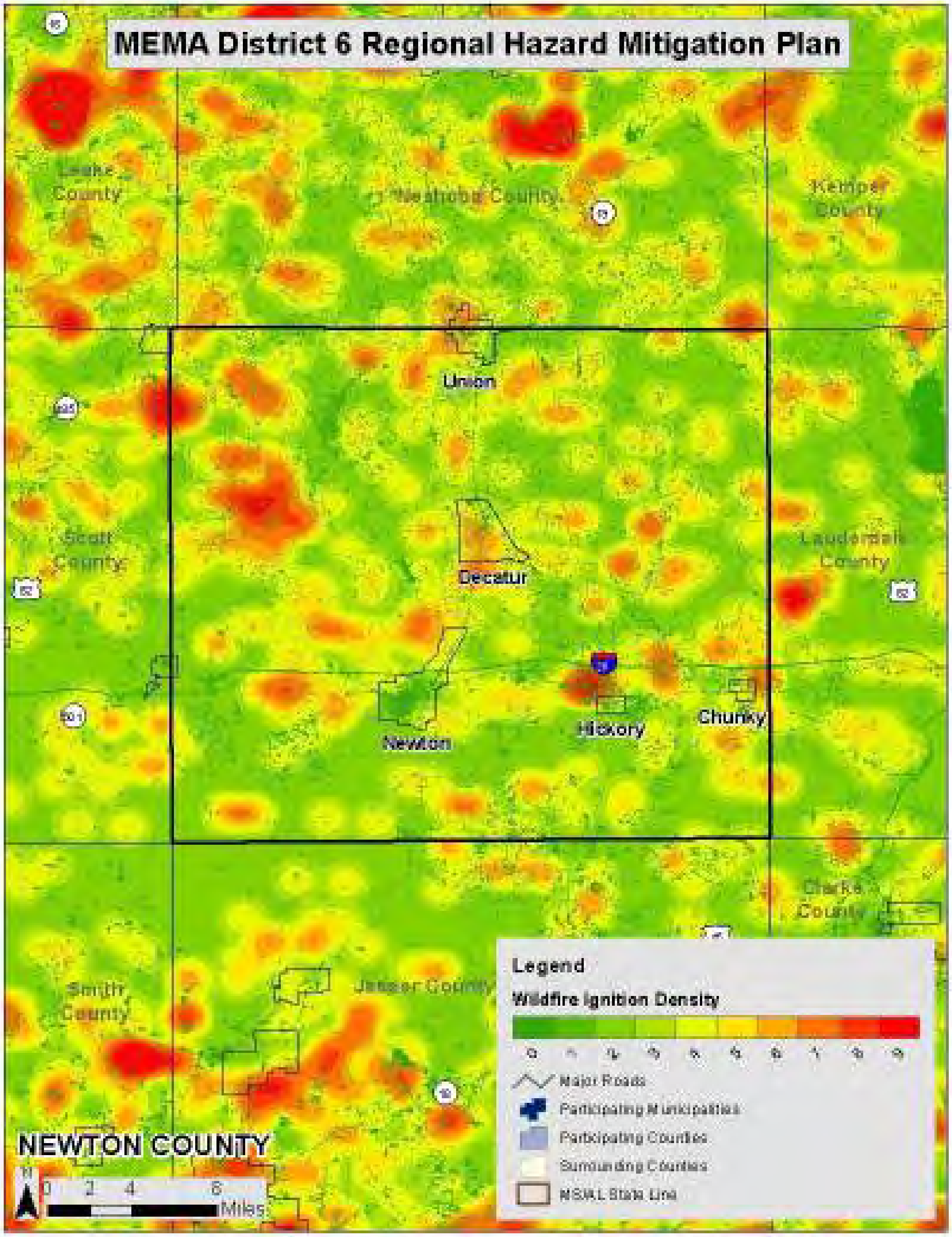
The entire county is at risk to a wildfire occurrence. However, several factors such as drought conditions or high levels of fuel on the forest floor, may make a wildfire more likely. Furthermore, areas in the urban-wildland interface are particularly susceptible to fire hazard as populations abut formerly undeveloped areas. The Wildfire Ignition Density data shown in the figure below give an indication of historic location.

HISTORICAL OCCURRENCES

Figure G.4 shows the Wildfire Ignition Density in Newton County based on data from the Southern Wildfire Risk Assessment. This data is based on historical fire ignitions and the likelihood of a wildfire igniting in an area. Occurrence is derived by modeling historic wildfire ignition locations to create an average ignition rate map. This is measured in the number of fires per year per 1,000 acres.[3]

[3] Southern Wildfire Risk Assessment, 2014.

Figure G.4: WILDFIRE IGNITION DENSITY IN NEWTON COUNTY



Source: Southern Wildfire Risk Assessment

Based on data from the Mississippi Forestry Commission from 2015 to 2020, Newton County experiences an average of 12.8 wildfires annually which burn an average of 70 acres per year. The data indicates that most of these fires are small, averaging 5.46 acres per fire. **Table G.11** provides a summary of wildfire occurrences in Newton County and **Table G.12** lists the number of reported wildfire occurrences in the county between the years 2011 and 2020.

Table G.11: SUMMARY TABLE OF ANNUAL WILDFIRE OCCURRENCES (2015-2020)

	Newton County
Average Number of Fires per year	12.8
Average Number of Acres Burned per year	70
Average Number of Acres Burned per fire	5.46

*These values reflect averages over a 6-year period.
Source: Mississippi Forestry Commission

Table G.12: HISTORICAL WILDFIRE OCCURRENCES IN NEWTON COUNTY

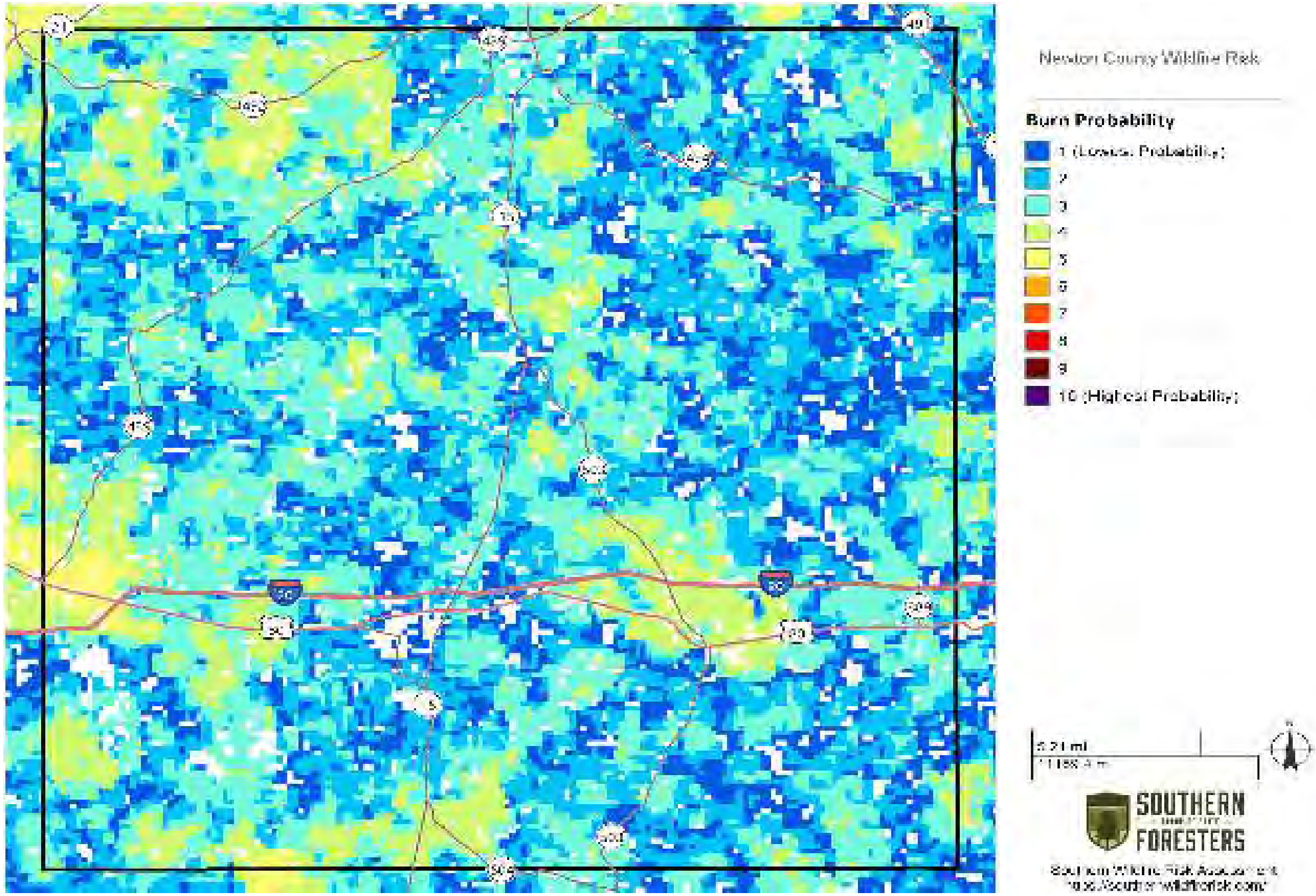
Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Newton County										
Number of Fires	49	18	14	21	24	28	13	4	7	1
Number of Acres Burned	434	112	140	169	81	116	162	17	34	10

Source: Mississippi Forestry Commission

PROBABILITY OF FUTURE OCCURRENCES

Wildfire events will be an ongoing occurrence in Newton County. **Figure G.5** shows that there is some probability a wildfire will occur throughout the county. However, the likelihood of wildfires increases during drought cycles and abnormally dry conditions. Fires are likely to stay small in size but could increase due to local climate and ground conditions. Dry, windy conditions with an accumulation of forest floor fuel (potentially due to ice storms or lack of fire) could create conditions for a large fire that spreads quickly. It should also be noted that some areas do vary somewhat in risk. For example, highly developed areas are less susceptible unless they are located near the urban-wildland boundary. The risk will also vary due to assets. Areas in the urban-wildland interface will have much more property at risk, resulting in increased vulnerability and need to mitigate compared to rural, mainly forested areas. The probability assigned to Newton County for future wildfire events is highly likely (100 percent annual probability).

Figure G.5: BURN PROBABILITY IN NEWTON COUNTY



Source: Southern Wildfire Risk Assessment

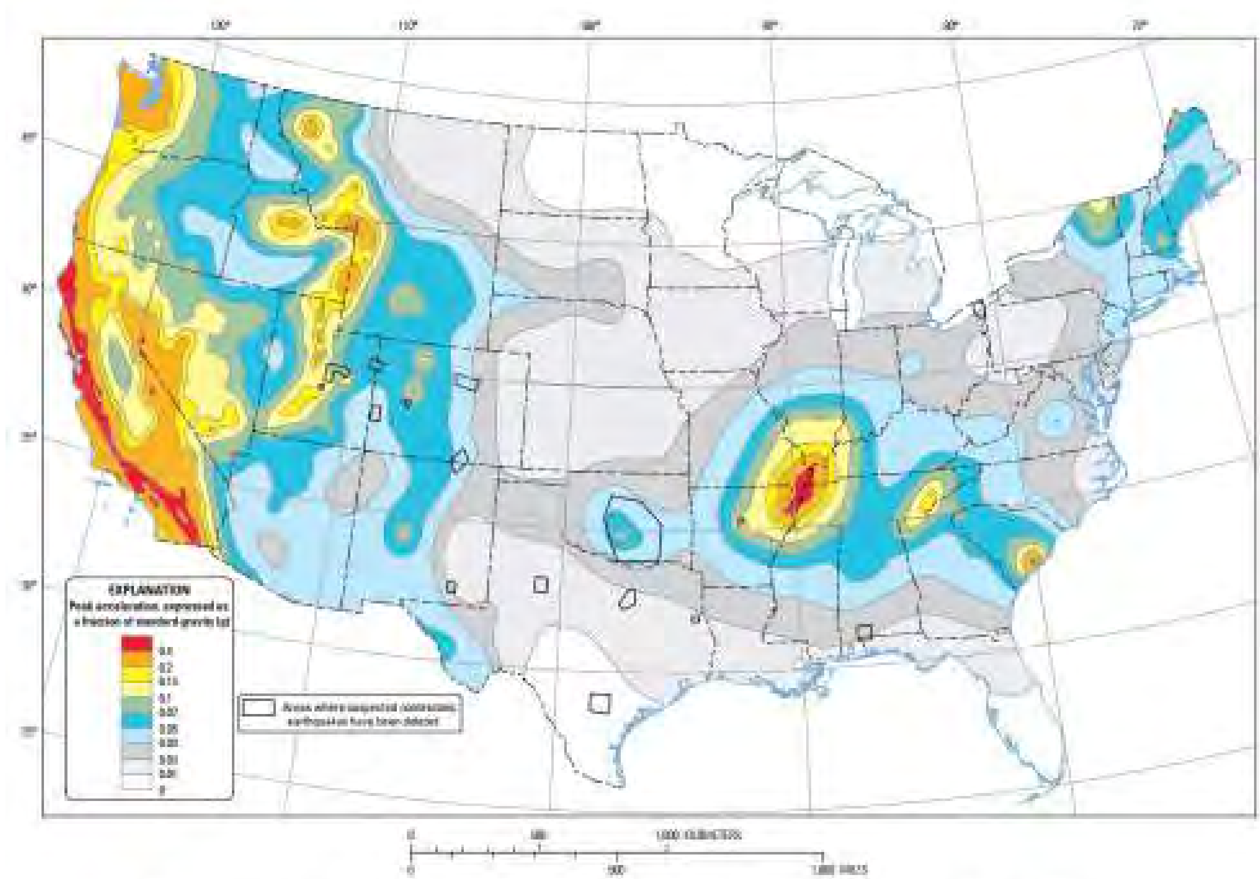
GEOLOGIC HAZARDS

G.2.7 Earthquake

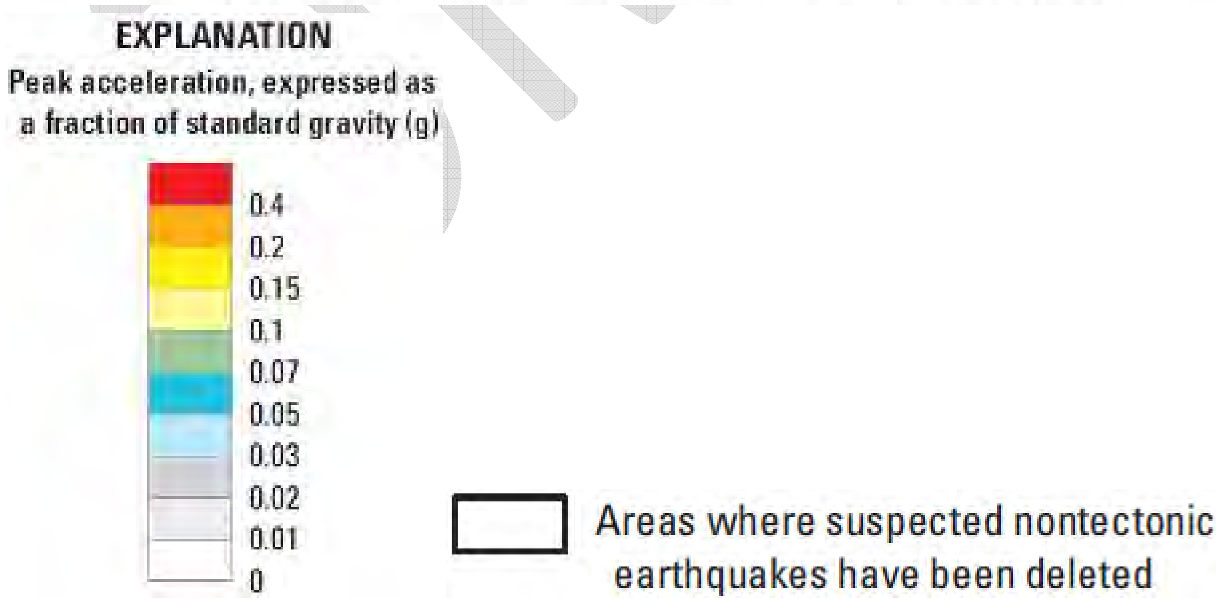
LOCATION AND SPATIAL EXTENT

Figure G.6 shows the intensity level associated with Newton County, based on the national USGS map of peak acceleration with 10 percent probability of exceedance in 50 years. It is the probability that ground motion will reach a certain level during an earthquake. The data show peak horizontal ground acceleration (the fastest measured change in speed, for a particle at ground level that is moving horizontally due to an earthquake) with a 10 percent probability of exceedance in 50 years. The map was compiled by the U.S. Geological Survey (USGS) Geologic Hazards Team, which conducts global investigations of earthquake, geomagnetic, and landslide hazards. According to this map, Newton County lies within an approximate zone of level "2" to "5" ground acceleration. This indicates that the county exists within an area of moderate seismic risk.

Figure G.6: PEAK ACCELERATION WITH 10 PERCENT PROBABILITY OF EXCEEDANCE IN 50 YEARS



Ten-percent probability of exceedance in 50 years map of peak ground acceleration



Source: United States Geological Survey, 2014

HISTORICAL OCCURRENCES

No earthquakes are known to have affected Newton County since 1638. **Table G.13** provides a summary of earthquake events reported by the National Geophysical Data Center between 1638 and 1985. **Table G.14** presents a detailed occurrence of each event including the date, distance for the epicenter, magnitude and Modified Mercalli Intensity (if known).

Table G.13: SUMMARY OF SEISMIC ACTIVITY IN NEWTON COUNTY

Location	Number of Occurrences	Greatest MMI Reported	Richter Scale Equivalent
Chunky	0	--	--
Decatur	0	--	--
Hickory	0	--	--
Newton (city)	0	--	--
Union	0	--	--
Unincorporated Area	0	--	--
NEWTON COUNTY TOTAL	**0**	**--**	**--**

Source: National Geophysical Data Center

Table G.14: SIGNIFICANT SEISMIC EVENTS IN NEWTON COUNTY (1638 -1985)

Location	Date	Epicentral Distance	Magnitude	MMI
Chunky				
None Reported	--	--	--	--
Decatur				
None Reported	--	--	--	--
Hickory				
None Reported	--	--	--	--
Newton (city)				
None Reported	--	--	--	--
Union				
None Reported	--	--	--	--
Unincorporated Area				
None Reported	--	--	--	--

Source: National Geophysical Data Center

PROBABILITY OF FUTURE OCCURRENCES

The probability of significant, damaging earthquake events affecting Newton County is unlikely. However, it is possible that future earthquakes resulting in light to moderate perceived shaking and damages ranging from none to very light will affect the county. The annual probability level for the county is estimated to be between 1 and 10 percent (possible).

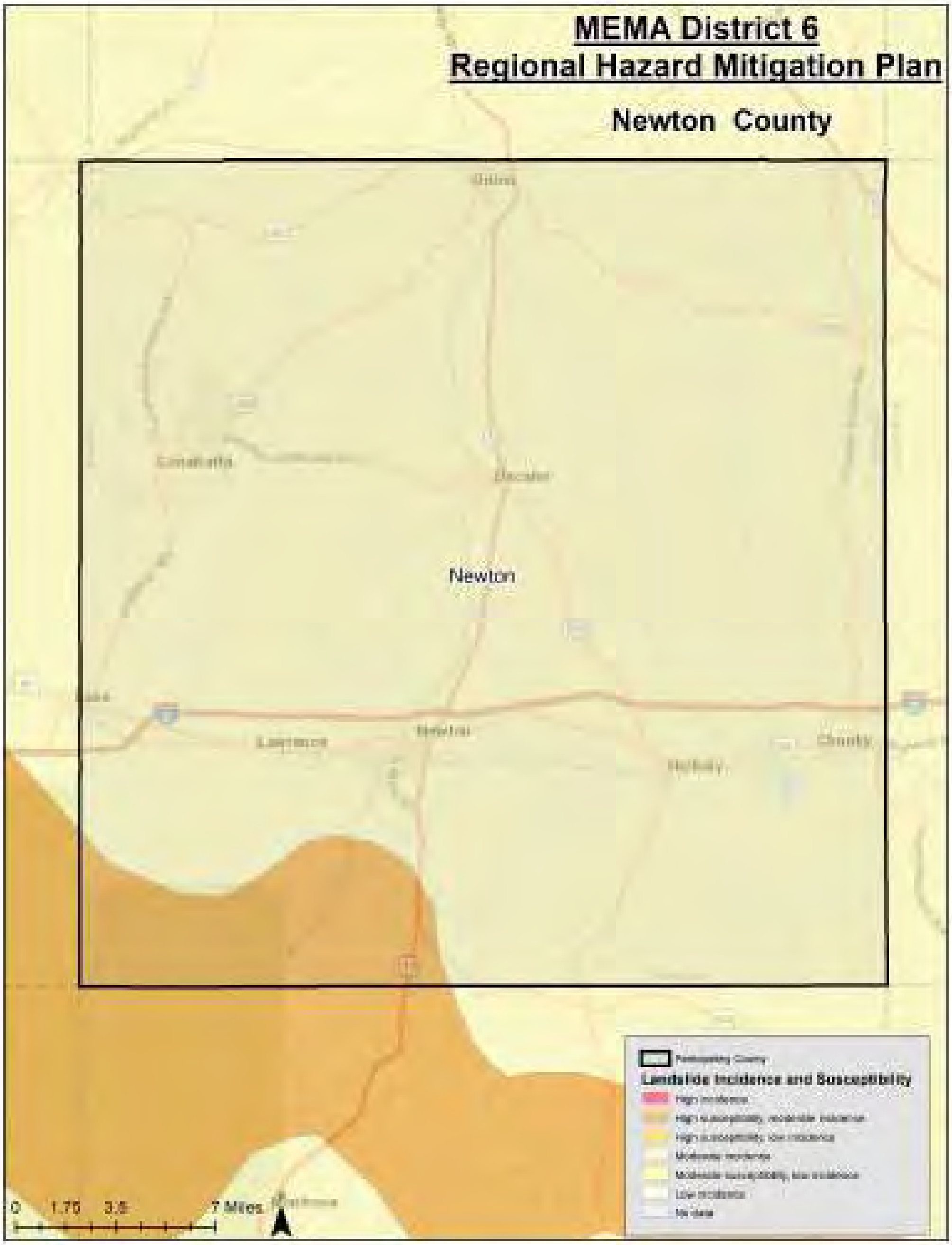
G.2.8 Landslide

LOCATION AND SPATIAL EXTENT

Landslides occur along steep slopes when the pull of gravity can no longer be resisted (often due to heavy rain). Human development can also exacerbate risk by building on previously undevelopable steep slopes. Landslides are possible throughout Newton County, though the risk is relatively low.

According to **Figure G.7** below, the majority of the county falls under a low incidence area. This indicates that less than 1.5 percent of the area is involved in landsliding. There is also an area in the southwestern corner of the county that is a moderate incidence area. This indicates that between 1.5 and 10 percent of the area is involved in landsliding.

Figure G.7: LANDSLIDE SUSCEPTIBILITY AND INCIDENCE MAP OF NEWTON COUNTY



Source: United States Geological Survey

HISTORICAL OCCURRENCES

There is no extensive history of landslides in Newton County. Landslide events typically occur in isolated areas. Reviews of the USGS Landslide Inventory show no historical occurrences of landslides.

PROBABILITY OF FUTURE OCCURRENCES

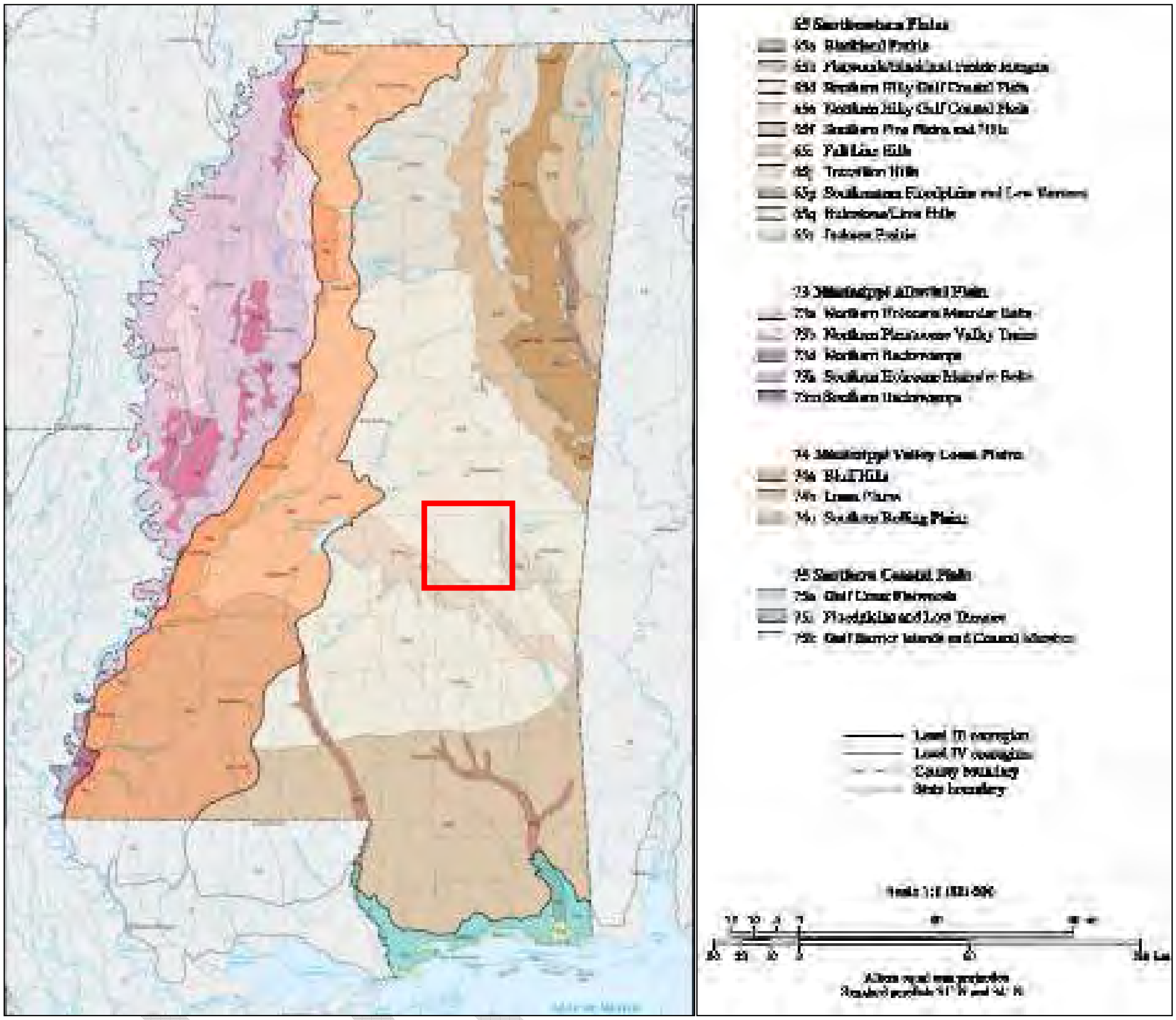
Based on historical information and the USGS susceptibility index, the probability of future landslide events is unlikely (less than 1 percent probability). The USGS data indicates that most areas in Newton County have a low incidence rate and low susceptibly to landsliding activity. There is also an area in the southwestern corner of the county with moderate susceptibility to landsliding and high susceptibility. Local conditions may become more favorable for landslides due to heavy rain, for example. This would increase the likelihood of occurrence. It should also be noted that some areas in Newton County have greater risk than others given factors such as steepness on slope and modification of slopes.

G.2.9 Land Subsidence

LOCATION AND SPATIAL EXTENT

Much of Newton County is located in an area where the soil is substantially clay, causing a shrink and swell effect depending on the current conditions. Indeed, much of the area underlain by the calcareous Yazoo clay which, when combined with sand and marl, is highly susceptible to expansion when wet and shrinking when dry. These areas are denoted below in **Figure G.8**.

Figure G.8: MAP OF MISSISSIPPI SOILS



Source: http://www.eoearth.org/view/article/152119/

HISTORICAL OCCURRENCES

There is no significant historical record of land subsidence in Newton County. However, local county officials have noted the impacts from these swings and changes in soil as roads and other infrastructure have experienced large cracks and breaks, causing stops in daily operations and significant costs to local, state, and federal budgets. Often the cost to repair this infrastructure can be in the range of millions of dollars depending on the degree of damage and necessity for quick repairs.

PROBABILITY OF FUTURE OCCURRENCES

The probability of future land subsidence events in the county is unlikely (less than 1 percent annual probability).

WIND-RELATED HAZARDS

G.2.10 Hurricane and Tropical Storm

LOCATION AND SPATIAL EXTENT

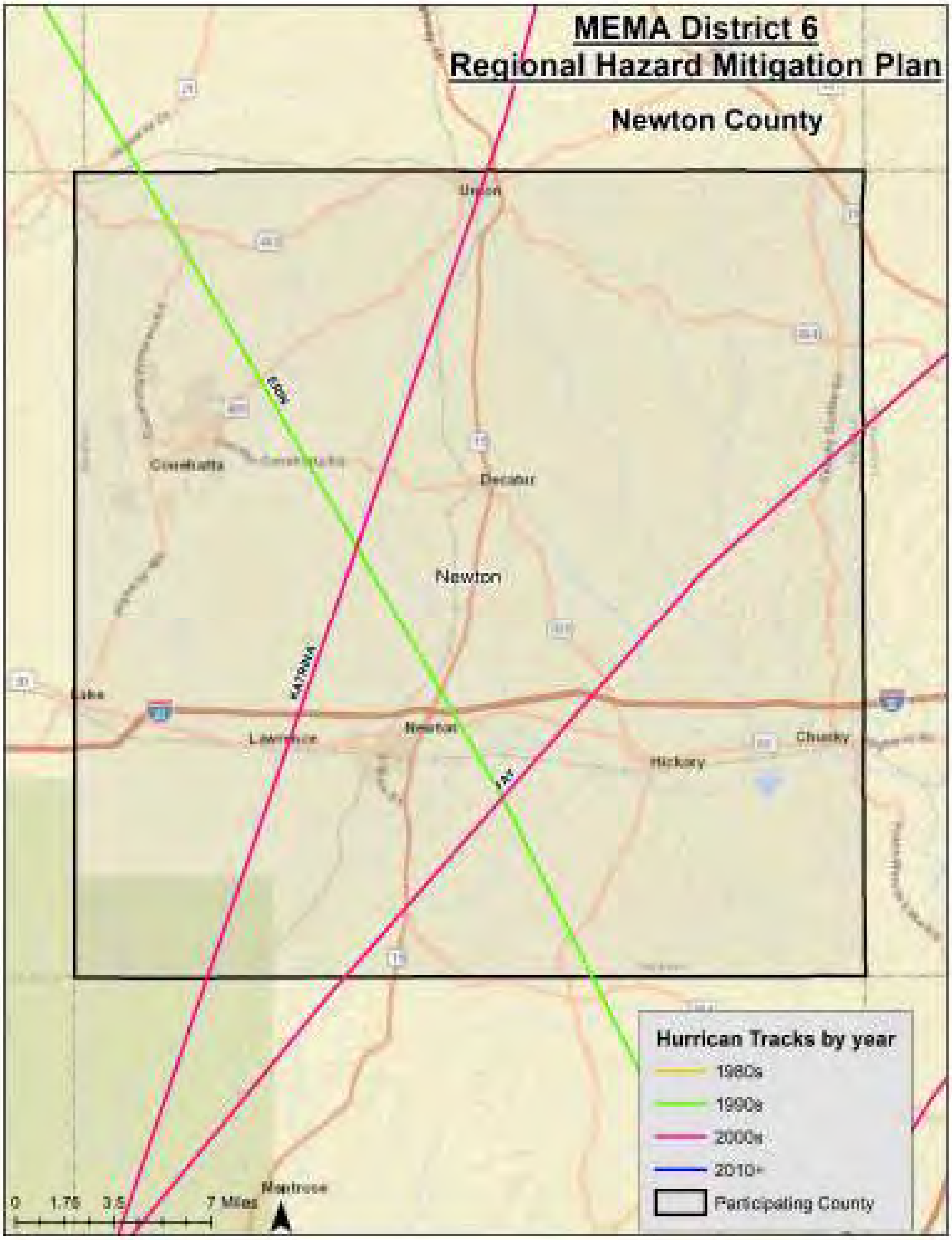
Hurricanes and tropical storms threaten the entire Atlantic and Gulf seaboard of the United States. While coastal areas are most directly exposed to the brunt of landfalling storms, their impact is often felt hundreds of miles inland and they can affect Newton County. All areas in Newton County are equally susceptible to hurricane and tropical storms.

HISTORICAL OCCURRENCES

According to the National Hurricane Center's historical storm track records, 58 hurricane or tropical storm/depression tracks have passed within 75 miles of the MEMA District 6 Region since 1855. This includes: 1 Category 3 hurricane, 2 Category 2 hurricanes, 5 Category 1 hurricanes, 33 tropical storms, and 17 tropical depressions.

Of the recorded storm events, 35 hurricane or tropical storm/depression events traversed directly through the region as shown in **Figure G.9**. Notable storms include Hurricane Frederic (1979) and Hurricane Katrina (2005). **Table G.15** provides for each event the date of occurrence, name (if applicable), maximum wind speed (as recorded within 75 miles of the MEMA District 6 Region) and category of the storm based on the Saffir-Simpson Scale.

Figure G.9: HISTORICAL HURRICANE STORM TRACKS 1980 - 2020



Source: National Oceanic and Atmospheric Administration, National Hurricane Center

Table G.15: HISTORICAL STORM TRACKS WITHIN 75 MILES OF THE MEMA 6 DISTRICT REGION (1850–2020)

Date of Occurrence	Storm Name	Maximum Wind Speed (knots)	Storm Category
9/16/1855	UNNAMED	70	Category 1
9/15/1860	UNNAMED	70	Category 1
7/12/1872	UNNAMED	40	Tropical Storm
9/2/1879	UNNAMED	60	Tropical Storm
10/7/1879	UNNAMED	40	Tropical Storm
10/16/1879	UNNAMED	40	Tropical Storm
9/1/1880	UNNAMED	50	Tropical Storm
8/3/1881	UNNAMED	40	Tropical Storm
6/14/1887	UNNAMED	30	Tropical Depression
8/28/1890	UNNAMED	35	Tropical Storm
9/12/1892	UNNAMED	40	Tropical Storm
9/8/1893	UNNAMED	55	Tropical Storm
8/17/1895	UNNAMED	35	Tropical Storm
8/3/1898	UNNAMED	35	Tropical Storm
8/16/1901	UNNAMED	45	Tropical Storm
10/10/1905	UNNAMED	35	Tropical Storm
9/27/1906	UNNAMED	95	Category 2
9/22/1907	UNNAMED	35	Tropical Storm
6/13/1912	UNNAMED	50	Tropical Storm
7/17/1912	UNNAMED	25	Tropical Depression
9/14/1912	UNNAMED	50	Tropical Storm
9/30/1915	UNNAMED	60	Tropical Storm
7/6/1916	UNNAMED	80	Category 1
7/5/1919	UNNAMED	30	Tropical Depression
10/18/1923	UNNAMED	50	Tropical Storm
7/30/1926	UNNAMED	25	Tropical Depression
9/1/1932	UNNAMED	60	Tropical Storm
10/16/1932	UNNAMED	45	Tropical Storm
8/1/1936	UNNAMED	40	Tropical Storm
9/1/1937	UNNAMED	30	Tropical Depression
6/16/1939	UNNAMED	35	Tropical Storm
8/14/1939	UNNAMED	35	Tropical Storm
9/26/1939	UNNAMED	40	Tropical Storm
9/25/1940	UNNAMED	20	Tropical Depression
9/4/1948	UNNAMED	50	Tropical Storm
9/5/1949	UNNAMED	40	Tropical Storm
8/31/1950	BAKER	65	Category 1
6/1/1959	ARLENE	25	Tropical Depression
9/16/1960	ETHEL	35	Tropical Storm
9/26/1960	FLORENCE	15	Tropical Depression

Date of Occurrence	Storm Name	Maximum Wind Speed (knots)	Storm Category
8/18/1969	CAMILLE	100	Category 3
9/16/1971	EDITH	60	Tropical Storm
7/19/1977	UNNAMED	25	Tropical Depression
9/6/1977	BABE	30	Tropical Depression
7/11/1979	BOB	40	Tropical Storm
9/13/1979	FREDERIC	95	Category 2
8/12/1987	UNNAMED	25	Tropical Depression
8/27/1992	ANDREW	30	Tropical Depression
8/4/1995	ERIN	45	Tropical Storm
8/6/2001	BARRY	20	Tropical Depression
9/26/2002	ISIDORE	55	Tropical Storm
7/1/2003	BILL	45	Tropical Storm
7/11/2005	DENNIS	45	Tropical Storm
8/29/2005	KATRINA	80	Category 1
9/14/2007	HUMBERTO	20	Tropical Depression
8/24/2008	FAY	30	Tropical Depression
8/17/2009	CLAUDETTE	25	Tropical Depression
10/28/2020	Zeta	33	Tropical Depression

*It should be noted that the track of several major hurricanes that impacted the region fell outside of the 75-mile buffer. These storms were included in the table due to their significant impact. (Georges, 1988; Ivan, 2004; Issac, 2012)
Source: National Hurricane Center

Federal records indicate that disaster declarations were made in 2004 (Hurricane Ivan), 2005 (Hurricane Dennis and Hurricane Katrina), and 2012 (Hurricane Issac). Hurricane and tropical storm events can cause substantial damage in the area due to high winds and flooding.[4]

Flooding and high winds from hurricanes and tropical storms can cause damage throughout the county. Anecdotes are available from NCEI for the major storms that have impacted the county as found below:

Tropical Storm Bill – June 30 and July 1, 2003
Heavy rainfall with Tropical Storm Bill resulted in several reports of flash flooding. Forty-eight-hour rainfall totals ranged between 3 and 7 inches, mainly across SE portions of Mississippi. Gradient wind gusts between 30 and 40 mph combined with saturated soils to down numerous trees very close to center's track. Damage from Bill was an estimated $100,000.

Hurricane Ivan – September 16, 2004
Thousands of trees were blown down across Eastern Mississippi during Hurricane Ivan as well as hundreds of power lines. The strong wind itself did not cause much structural damage, however the fallen trees did. These downed trees accounted for several hundred homes, mobile homes and businesses to be damaged or destroyed. Most locations across Eastern Mississippi reported sustained winds between 30 and 40 mph with Tropical Storm force gusts between 48 and 54 mph. The strongest reported winds occurred in Newton, Lauderdale and Oktibbeha Counties.

[4] A complete listing of historical disaster declarations can be found in Section 4: Hazard Identification.

Overall, rainfall totals were held in check as Ivan steadily moved north. The heaviest rains were confined to far Eastern Mississippi where 3 to 4 inches fell over a 15 hour period. Due to the duration of the rain no flooding was reported. Across Eastern Mississippi, Hurricane Ivan was responsible for one fatality. This fatality occurred in Brooksville (Noxubee County) when a tree fell on a man. Damage from Ivan was estimated at $200 million.

Hurricane Dennis – July 10, 2005
Hurricane Dennis moved north-northwest across Southwest Alabama and then into East-Central Mississippi and finally across Northeast Mississippi. Wind gusts over tropical storm force were common across areas east of a line from Starkville to Newton to Hattiesburg. These winds caused several hundred trees to uproot or snap and took down numerous power lines. Additionally, a total of 21 homes or businesses sustained minor to major damage from fallen trees or gusty winds.

Heavy rainfall was not a major issue as Dennis steadily moved across the region. Rainfall totals between 2 and 5 inches fell across Eastern Mississippi over a 12 hour period. One indirect fatality occurred in Jasper County from an automobile accident due to wet roads.

Hurricane Katrina – August 29, 2005
Hurricane Katrina will likely go down as the worst and costliest natural disaster in United States history. The amount of destruction, the cost of damaged property/agriculture and the large loss of life across the affected region has been overwhelming. Catastrophic damage was widespread across a large portion of the Gulf Coast region. The devastation was not only confined to the coastal region, widespread and significant damage occurred well inland up to the Hattiesburg area and northward past Interstate 20.

Hurricane force winds were common across Central Mississippi. The region received sustained winds of 60-80 mph with gusts ranging from 80-120 mph. Wind damage to structures was widespread, with roofs blown off or partially peeled. Hundreds of signs were shredded or blown down. Many businesses sustained structural damage as windows were broken, roofs were blown off, and walls were collapsed. Millions of trees were uprooted and snapped. Power poles and lines were snapped and taken down from wind and trees. It was thousands of downed trees which caused the most significant structural damage as these trees fell onto homes and businesses. Power outages lasted from a few days to as long as four weeks. Agriculture and timber industries were severely impacted. Row crops, including cotton, rice, corn, and soybeans, took a hard hit. Other impacted industries were the catfish industry, dairy and cattle industry, and nursery businesses.

PROBABILITY OF FUTURE OCCURRENCES

Given the inland location of the county, it is more likely to be affected by remnants of hurricane and tropical storm systems (as opposed to a major hurricane) which may result in flooding or high winds. The probability of being impacted is less than coastal areas, but still remains a real threat to Newton County due to induced events like flooding. Based on historical evidence, the probability level of future occurrence is likely (annual probability between 10 and 100 percent). Given the regional nature of the hazard, all areas in the county are equally exposed to this hazard. However, when the county is impacted, the damage could be catastrophic, threatening lives and property throughout the planning area.

G.2.11 Thunderstorm (wind, hail, lightning)

LOCATION AND SPATIAL EXTENT

Thunderstorm / High Wind

A thunderstorm event is an atmospheric hazard, and thus has no geographic boundaries. It is typically a widespread event that can occur in all regions of the United States. However, thunderstorms are most common in the central and southern states because atmospheric conditions in those regions are favorable for generating these powerful storms. It is assumed that Newton County has uniform exposure to an event and the spatial extent of an impact could be large.

Hailstorm

Hailstorms frequently accompany thunderstorms, so their locations and spatial extents coincide. It is assumed that Newton County is uniformly exposed to severe thunderstorms; therefore, all areas of the county are equally exposed to hail which may be produced by such storms.

Lightning

Lightning occurs randomly, therefore it is impossible to predict where and with what frequency it will strike. It is assumed that all of Newton County is uniformly exposed to lightning.

HISTORICAL OCCURRENCES

Thunderstorm / High Wind

Severe storms were at least partially responsible for nine disaster declarations in Newton County in 1976, 1979, 1990, 1992, 2003, 2011, 2014, and twice in 2019. According to NCEI, there have been 270 reported thunderstorm and high wind events since 1956 in Newton County. These events caused over $4.8 million in damages. There were also reports of two injuries. **Table G.17** summarizes this information.

Table G.16: SUMMARY OF THUNDERSTORM / HIGH WIND OCCURRENCES IN NEWTON COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Chunky	15	0/0	$51,500
Decatur	24	0/0	$232,000
Hickory	25	0/1	$195,500
Newton (city)	40	0/0	$648,050
Union	19	0/0	$870,000
Unincorporated Area	147	0/1	$2,856,000
NEWTON COUNTY TOTAL	**270**	**0/2**	**$4,853,050**

Source: National Centers for Environmental Information

Hailstorm

According to the National Centers for Environmental Information, 150 recorded hailstorm events have affected Newton County since 1960. **Table G.17** is a summary of the hail events in Newton County. In all, hail occurrences resulted in approximately $475,000 in property damages. Hail ranged in diameter from 0.75 inches to 1.75 inches. It should be noted that hail is notorious for causing substantial damage to cars, roofs, and other areas of the built environment that may not be reported to the National Centers for Environmental Information. Therefore, it is likely that damages are greater than the reported value.

Table G.17: SUMMARY OF HAIL OCCURRENCES IN NEWTON COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Chunky	10	0/0	$3,000
Decatur	17	0/0	$6,000
Hickory	10	0/0	$1,000
Newton (city)	21	0/0	$162,000
Union	15	0/0	$6,000
Unincorporated Area	77	0/0	$284,332
NEWTON COUNTY TOTAL	**150**	**0/0**	**$475,000**

Source: National Centers for Environmental Information

Lightning

According to the National Centers for Environmental Information, there has been one recorded lightning event in Newton County since 2005. This event resulted in over $183,000 in damages, as listed in summary **Table G.18**. Detailed information on historical lightning events can be found in **Table G.19**.

It is certain that more than one event has impacted the county. Many of the reported events are those that cause damage, and it should be expected that damages are likely much higher for this hazard than what is reported.

Table G.18: SUMMARY OF LIGHTNING OCCURRENCES IN NEWTON COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Chunky	0	0/0	$0
Decatur	1	0/0	$183,286
Hickory	0	0/0	$0
Newton (city)	0	0/0	$0
Union	0	0/0	$0
Unincorporated Area	0	0/0	$0
NEWTON COUNTY TOTAL	**1**	**0/0**	**$183,286**

Source: National Centers for Environmental Information

Table G.19: HISTORICAL LIGHTNING OCCURRENCES IN NEWTON COUNTY

Location	Date	Deaths / Injuries	Property Damage	Details
Chunky				
None Reported	--	--	--	--
Decatur				
DECATUR	8/5/2005	0/0	$183,286	Lighting caused a house to catch fire and burn down off Country Club Road just south of Decatur.
Hickory				
None Reported	--	--	--	--
Newton (city)				
None Reported	--	--	--	--
Union				
None Reported	--	--	--	--
Unincorporated Area				
None Reported	--	--	--	--

Source: National Centers for Environmental Information

PROBABILITY OF FUTURE OCCURRENCES

Thunderstorm / High Wind
Given the high number of previous events, it is certain that thunderstorm events, including straight-line wind events, will occur in the future. This results in a probability level of highly likely (100 percent annual probability) for the entire county.

Hailstorm
Based on historical occurrence information, it is assumed that the probability of future hail occurrences is highly likely (100 percent annual probability). Since hail is an atmospheric hazard, it is assumed that Newton County has equal exposure to this hazard. It can be expected that future hail events will continue to cause minor damage to property and vehicles throughout the county.

Lightning
Although there was not a high number of historical lightning events reported in Newton County via NCEI data, it is a regular occurrence accompanied by thunderstorms. In fact, lightning events will assuredly happen on an annual basis, though not all events will cause damage. According to Vaisala's U.S. National Lightning Detection Network (NLDN), Newton County is located in an area of the country that experienced an average of 4 to 6 cloud-to-ground lightning flashes per square kilometer per year between 2015 and 2019.[5] Therefore, the probability of future events is highly likely (100 percent annual probability). It can be expected that future lightning events will continue to threaten life and cause minor property damages throughout the county.

G.2.12 Tornado

LOCATION AND SPATIAL EXTENT

Tornadoes occur throughout the state of Mississippi, and thus in Newton County. Tornadoes typically impact a relatively small area, but damage may be extensive. Event locations are completely random and it is not possible to predict specific areas that are more susceptible to tornado strikes over time. Therefore, it is assumed that Newton County is uniformly exposed to this hazard. With that in mind, **Figure G.10** shows tornado track data for many of the major tornado events that have impacted the county. While no definitive pattern emerges from this data, some areas that have been impacted in the past may be potentially more susceptible in the future.

[5] Vaisala's Annual Lightning Report – 2020. Retrieved on 9.8.2021 from: https://www.vaisala.com/sites/default/files/documents/WEA-MET-Annual-Lightning-Report-2020-B212260EN-A.pdf

Figure G.10: HISTORICAL TORNADO TRACKS IN NEWTON COUNTY

Source: National Weather Service Storm Prediction Center

HISTORICAL OCCURRENCES

Tornadoes were at least partially responsible for eight disaster declarations in Newton County in 1976, 1979, 1990, 1992, 2003, 2011, 2014, and 2019. According to the National Centers for Environmental Information, there have been a total of 45 recorded tornado events in Newton County since 1950 (**Table G.20**), resulting in over

$19.8 million in property damages. In addition, 1 fatality and 42 injuries were reported. The magnitude of these tornadoes ranges from F0 to F4 and EF0 to EF3 in intensity, although an EF5 event is possible.

Table G.20: SUMMARY OF TORNADO OCCURRENCES IN NEWTON COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Chunky	4	0/0	$440,000
Decatur	2	0/0	$70,000
Hickory	2	0/0	$507,000
Newton (city)	5	0/0	$2,071,000
Union	0	0/0	$0
Unincorporated Area	32	1/42	$39,949,823
NEWTON COUNTY TOTAL	**45**	**1/42**	**$19,870,000**

Source: National Centers for Environmental Information

From April 25 to 28, 2011, the largest tornado outbreak ever recorded affected the Southern, Midwestern, and Northeastern U.S., leaving catastrophic destruction in its wake, especially across the states of Alabama and Mississippi. During this outbreak, one EF3 tornado was reported in Newton County on April 27, 2011. This tornado resulted in almost $1.1 million in property damages.

PROBABILITY OF FUTURE OCCURRENCES

According to historical information, tornado events pose a significant threat to Newton County. The probability of future tornado occurrences affecting Newton County is likely (between 10 and 100 percent annual probability).

G.2.13 Hazardous Materials Incidents

LOCATION AND SPATIAL EXTENT

Newton County has four TRI sites. These sites are shown in **Figure G.11.**

Figure G.11: TOXIC RELEASE INVENTORY (TRI) SITES IN NEWTON COUNTY

Source: Environmental Protection Agency

In additional to "fixed" hazardous materials locations, hazardous materials may also impact the county via roadways and rail. Many roads in the county are subject to hazardous materials transport and all roads that permit hazardous material transport are considered potentially at risk to an incident.

HISTORICAL OCCURRENCES

There has been a total of ten recorded HAZMAT incidents in Newton County since 1977 (**Table G.21**). These events resulted in more than $394,000 in property damage as well as two injuries. **Table G.22** presents detailed information on historic HAZMAT incidents in Newton County as reported by the U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA).

Table G.21: SUMMARY OF HAZMAT INCIDENTS IN NEWTON COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Chunky	0	0/0	$0
Decatur	0	0/0	$0
Hickory	0	0/0	$0
Newton (city)	6	0/1	$394,270
Union	2	0/0	$1
Unincorporated Area	2	0/1	$0
NEWTON COUNTY TOTAL	**10**	**0/2**	**$397,671**

Source: United States Department of Transportation Pipeline and Hazardous Materials Safety Administration

Table G.22: HAZMAT INCIDENTS IN NEWTON COUNTY

Report Number	Date	City	Mode	Serious Incident?	Fatalities/ Injuries	Damages ($)*	Quantity Released
Chunky							
None Reported	--	--	--	--	--	--	--
Decatur							
None Reported	--	--	--	--	--	--	--
Hickory							
None Reported	--	--	--	--	--	--	--
Newton (city)							
I-1979080632	2/1/1979	NEWTON	Highway	Yes	0/0	$0	2,000 LGA
I-1985080076	7/18/1985	NEWTON	Highway	No	0/0	$0	5 LGA
I-1986070241	7/8/1986	NEWTON	Highway	Yes	0/0	$0	2,400 LGA
I-1999110105	10/5/1999	NEWTON	Highway	No	0/0	$2,363	60 LGA
I-2012010185	10/27/2011	NEWTON	Highway	Yes	0/1	$391,906	6,000 LGA
I-2020050252	02/26/2020	NEWTON	Highway	No	0/0	$3400	8 LGA
Union							
I-2004010091	12/2/2003	UNION	Highway	No	0/0	$1	1 LGA
I-2004080718	7/29/2004	UNION	Highway	No	0/0	$0	50 LGA
Unincorporated Area							
I-1977070285	7/4/1977	DUFFEE	Rail	Yes	0/1	$0	16,000 LGA
I-1977070286	7/5/1977	DUFFEE	Rail	Yes	0/0	$0	1,500 LGA

Source: United States Department of Transportation Pipeline and Hazardous Materials Safety Administration

PROBABILITY OF FUTURE OCCURRENCES

Given the location of two toxic release inventory sites in Newton County and prior roadway and railway incidents, it is likely (between 10 and 100 percent annual probability) that a hazardous material incident may occur in the county. County and town officials are mindful of this possibility and take precautions to prevent such an event from occurring. Furthermore, there are detailed plans in place to respond to an occurrence.

G.2.14 Pandemic

LOCATION AND SPATIAL EXTENT

Pandemics are global in nature. However, they may start anywhere. Newton County chose to analyze this hazard given the agriculture in the area and potential for this kind of event to occur in any location at any time.

All populations should be considered at risk to pandemic. Buildings and infrastructure are not directly impacted by the virus/pathogen but could be indirectly impacted if people are not able to operate and maintain them due to illness. Many buildings may be shutdown, at least temporarily, as a result. Employers may initiate work from home procedures for non-essential workers in order to help stop infection. Commerce activities, and thus the economy, may suffer greatly during this time.

HISTORICAL OCCURRENCES

Several pandemics have been reported throughout history. A short history of the flu/Spanish Flu was collected from The Historical Text Archive and is described below.

The first known pandemic dates back to 430 B.C. with the Plague of Athens. It reportedly killed a quarter of the population over four years due to typhoid fever. In 165-180 A.D., the Antonine Plague killed nearly 5 million people. Next, the Plague of Justinian (the first bubonic plague pandemic) occurred from 541 to 566. It killed 10,000 people a day at its peak and resulted in a 50 percent drop in Europe's population.

Since the 1500s, influenza pandemics have occurred about three times every century or roughly every 10 to 50 years. The Black Death devastated European populations in the 14th century. Nearly a third of the population (20-30 million) was killed over six years. From 1817 to present, seven Cholera Pandemics have impacted to the world and killed millions. Perhaps most severe, was the Third Cholera Pandemic (1852- 1959) which started in China. Isolated cases can still be found in the Western U.S. today. There were three major pandemics in the 20th century (1918-1919, 1957-1958, and 1968-1969). The most infamous pandemic flu of the 20th century, however, was that of 1918-1919. Since the 1960s, there has only been one pandemic, the 2009 H1N1 influenza. The pandemics of the 20th and 21st centuries that impacted the United States are detailed below.

1918 Spanish Flu: This was the most devastating flu of the 20th century. This pandemic spread across the world in three waves between 1918 and 1919. It typically impacted areas for around twelve weeks and then would largely disappear. However, it would frequently reemerge several months later. Worldwide, approximately 50 million persons died and over a quarter of the population was infected. Nearly 675,000 people died in the United States. The illness came on suddenly and could cause death within a few hours.

The virus impacted those aged 15 to 35 especially hard. The movement of troops during World War I is thought to have facilitated the spread of the virus.

In Mississippi, state officials noted that "epidemics have been reported from a number of places in the State," on October 4th, 1918. By the 18th, twenty-six localities reported 1,934 cases (the real number of cases was likely much higher). West Point, Mississippi was hit especially hard and quarantine was established. Throughout the state, African Americans were impacted at a greater rate than white populations. This is thought to be partly caused from a shortage of caretakers. It is estimated that over 6,000 people died in Mississippi, though that number may be much higher as death records were not widely recorded.

1957 Asian Flu: It is estimated that the Asian Flu caused 2 million deaths worldwide. Approximately 70,000 deaths were in the U.S. However, the proportion of people impacted was substantially higher than that of the Spanish Flu. This flu was characterized as having much milder effects than the Spanish Flu and greater survivability. Similar to other pandemics, this pandemic has two waves. Elderly and infant populations were more likely to succumb to death. This flu is thought to have originated from a genetic mutation of a bird virus.

1968 Hong Kong Flu: The Hong Kong Flu is thought to have caused one million deaths worldwide. It was milder than both the Asian and Spanish influenza viruses. It was similar to the Asian Flu, which may have provided some immunity to the virus. It had the most severe impact on elderly populations.

2009 H1N1 Influenza: This flu was derived from human, swine, and avian virus strains. It was initially reported in Mexico in April 2009. On April 26, the U.S. government declared H1N1 a public health emergency. A vaccine was developed and over 80 million were vaccinated which helped minimize the impacts. The virus had mild impacts on most of the population but did cause death (usually from viral pneumonia) in high-risk populations such as pregnant women, obese persons, indigenous people, and those with chronic respiratory, cardiac, neurological, or immunity conditions. Worldwide, it is estimated that 43 million to 89 million people contracted H1N1 between April 2009 and April 2010, and between 8,870 and 18,300 H1N1 cases resulted in death.

2020 SARS-CoV-2 (COVID-19): Coronavirus Disease 2019 (COVID-19) was declared as pandemic by the World Health Organization on March 11th, 2020 mainly due to the speed and scale of the transmission of the disease. Prior to that, it started as an epidemic in mainland China with the focus being firstly reported in the city of Wuhan, Hubei province on February 26th, 2020. The etiologic agent of COVID-19 was isolated and identified as a novel coronavirus, initially designated as 2019-nCoV. Later, the virus genome was sequenced and because it was genetically related to the coronavirus outbreak responsible for the SARS outbreak of 2003, the virus was named as severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) by the International Committee for Taxonomy of Viruses.

There is a considerable amount of data on the extent of COVID-19 throughout the State of Mississippi and Newton County. The number of reported cases and deaths across the State of Mississippi and Newton County are shown in the figure below.

Figure G.12: COVID-19 Cases as of 08/02/2021[6]

	Cases	Deaths
Mississippi	350,070	7,590
Newton County	2,668	64

In addition to the pandemics above, there have been several cases of pandemic threats, some of which reached epidemic levels. They were contained before spreading globally. Examples include Smallpox, Polio, Tuberculosis, Malaria, AIDS, SARS and Yellow Fever. Advances in medicine and technology have been instrumental in containing the spread of viruses in recent history.

In addition to the pandemics above, there have been several cases of pandemic threats, some of which reached epidemic levels. They were contained before spreading globally. Examples include Smallpox, Polio, Tuberculosis, Malaria, AIDS, SARS and Yellow Fever. Advances in medicine and technology have been instrumental in containing the spread of viruses in recent history.

It is notable that no birds have been infected with Avian Flu in North and South America.

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that all of Newton County has a probability level of unlikely (less than 1 percent annual probability) for future pandemics events. While pandemic can have devastating impacts, they are relatively rare.

The Mississippi State Department of Health maintains a state pandemic plan which can be found here: http://www.msdh.state.ms.us/msdhsite/index.cfm/44,1136,122,154,pdf/SNSPlan.pdf

[6] Mississippi State Department of Health. *COVID-19 Dashboard*. Retrieved from: https://msdh.ms.gov/msdhsite/_static/14,0,420.html

G.2.15 Conclusions on Hazard Risk

The hazard profiles presented in this section were developed using best available data and result in what may be considered principally a qualitative assessment as recommended by FEMA in its "How-to" guidance document titled *Understanding Your Risks: Identifying Hazards and Estimating Losses* (FEMA Publication 386-2). It relies heavily on historical and anecdotal data, stakeholder input, and professional and experienced judgment regarding observed and/or anticipated hazard impacts. It also carefully considers the findings in other relevant plans, studies, and technical reports.

HAZARD EXTENT

Table G.27 describes the extent of each natural hazard identified for Newton County. The extent of a hazard is defined as its severity or magnitude, as it relates to the planning area.

TABLE G.27: EXTENT OF NEWTON COUNTY HAZARDS

Flood-related Hazards	
Flood	Flood extent can be measured by the amount of land and property in the floodplain as well as flood height and velocity. The amount of land in the floodplain accounts for 16.4 percent of the total land area in Newton County. Flood depth and velocity are recorded via United States Geological Survey stream gages throughout the region. While a gage does not exist for each participating jurisdiction, there is one at or near many areas. The greatest peak discharge recorded for the county was at the Potterchitto Creek at Newton on April 7, 2003. Water reached a discharge of 8,520 cubic feet per second and the stream gage height was recorded at 18.64 feet.
Erosion	The extent of erosion can be defined by the measurable rate of erosion that occurs. There are no erosion rate records located in Newton County.
Dam Failure	Dam Failure extent is defined using the Mississippi Department of Environmental Quality criteria. Three dams are classified as high-hazard in Newton County.
Winter Storm and Freeze	The extent of winter storms can be measured by the amount of snowfall received (in inches). Official long term snow records are not kept for any areas in Newton County. However, the greatest snowfall reported in Meridian (east of the county) was 14.0 inches in 1963.

Fire-related Hazards	
Drought / Heat Wave	Drought extent is defined by the U.S. Drought Monitor Classifications which include Abnormally Dry, Moderate Drought, Severe Drought, Extreme Drought, and Exceptional Drought. According to the U.S. Drought Monitor Classifications, the most severe drought condition is Exceptional. Newton County has received this ranking twice over the 15-year reporting period. The extent of extreme heat can be measured by the record high temperature recorded. Official long term temperature records are not kept for any areas in Newton County. However, the highest recorded temperature in Meridian (east of the county) was 107°F in 1980.
Wildfire	Wildfire data was provided by the Mississippi Forestry Commission and is reported annually by county from 2005-2020. The greatest number of fires to occur in Newton County in any year 57 in 2007. The greatest number of acres to burn in the county in a single year occurred in 2006 when 509 acres were burned. Although this data lists the extent that has occurred, larger and more frequent wildfires are possible throughout the county.
Geologic Hazards	
Earthquake	Earthquake extent can be measured by the Richter Scale (Table 5.16), the Modified Mercalli Intensity (MMI) scale (Table 5.17), and the distance of the epicenter from Newton County. According to data provided by the National Geophysical Data Center, no earthquakes have impacted the county.
Landslide	As noted above in the landslide profile, there is no extensive history of landslides in Newton County and landslide events typically occur in isolated areas. This provides a challenge when trying to determine an accurate extent for the landslide hazard. However, when using the USGS landslide susceptibility index, extent can be measured with incidence, which is low throughout the majority of the county, except for an area of moderate incidence in the southwestern corner. There is also low susceptibility throughout most of the county, except for an area in the southwestern corner which has high susceptibility.
Land Subsidence	The extent of land subsidence can be defined by the measurable rate of subsidence that occurs. There are no subsidence rate records located in Newton County nor is there any significant historical record of events.
Wind-related Hazards	
Hurricane and Tropical Storm	Hurricane extent is defined by the Saffir-Simpson Scale which classifies hurricanes into Category 1 through Category 5. The greatest classification of hurricane to traverse directly through Newton County was Hurricane Katrina, a Category 1 storm which carried tropical force winds of 80 knots upon arrival in the county.

Thunderstorm / Hail / Lightning	Thunderstorm extent is defined by the number of thunder events and wind speeds reported. According to a 65-year history from the National Centers for Environmental Information, the strongest recorded wind event in Newton County was reported on April 4, 2008 at 83 knots (approximately 96 mph). It should be noted that future events may exceed these historical occurrences. Hail extent can be defined by the size of the hail stone. The largest hail stone reported in Newton County was 1.75 inches (last reported on March 18, 2013). It should be noted that future events may exceed this. According to the Vaisala's flash density map (Figure 5.17), Newton County is located in an area that experiences 6 to 8 lightning flashes per square kilometer per year. It should be noted that future lightning occurrences may exceed these figures.
Tornado	Tornado hazard extent is measured by tornado occurrences in the US provided by FEMA as well as the Fujita/Enhanced Fujita Scale (Tables 5.27 and 5.28). The greatest magnitude reported in Newton County was an F4 (last reported on November 22, 1992).
Other Hazards	
Hazardous Materials Incident	According to USDOT PHMSA, the largest hazardous materials incident reported in the Newton County was 16,000 LGA released on the railway (reported on July 4, 1977). It should be noted that larger events are possible.
Pandemic	While pandemics remain to be rare occurrences overall, it cannot be ignored that as of the drafting of this plan the world continues to be engulfed by the COVID-19 Pandemic.

PRIORITY RISK INDEX RESULTS

In order to draw some meaningful planning conclusions on hazard risk for Newton County, the results of the hazard profiling process were used to generate countywide hazard classifications according to a "Priority Risk Index" (PRI). More information on the PRI and how it was calculated can be found in Section 5

Table G.23 summarizes the degree of risk assigned to each category for all initially identified hazards based on the application of the PRI. Assigned risk levels were based on the detailed hazard profiles developed for this section, as well as input from the Regional Hazard Mitigation Council. The results were then used in calculating PRI values and making final determinations for the risk assessment.

Table G.23: SUMMARY OF PRI RESULTS FOR NEWTON COUNTY

Hazard	Category/Degree of Risk					
	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score
Flood-related Hazards						
Flood	Likely	Critical	Moderate	6 to 12 hours	Less than 24 hours	**2.9**
Erosion	Possible	Minor	Small	More than 24 hours	More than 1 week	**1.8**
Dam Failure	Possible	Critical	Small	Less than 6 hours	Less than 6 hours	**2.4**
Winter Storm and Freeze	Likely	Limited	Moderate	More than 24 hours	Less than 24 hours	**2.4**
Fire-related Hazards						
Drought / Heat Wave	Likely	Minor	Large	More than 24 hours	More than 1 week	**2.5**
Wildfire	Highly Likely	Minor	Small	Less than 6 hours	Less than 1 week	**2.6**
Geologic Hazards						
Earthquake	Possible	Minor	Moderate	Less than 6 hours	Less than 6 hours	**2.0**
Landslide	Unlikely	Minor	Small	Less than 6 hours	Less than 6 hours	**1.5**
Land Subsidence	Unlikely	Minor	Small	Less than 6 hours	Less than 6 hours	**1.5**
Wind-related Hazards						
Hurricane and Tropical Storm	Likely	Critical	Large	More than 24 hours	Less than 24 hours	**2.9**
Thunderstorm Wind / High Wind	Highly Likely	Critical	Moderate	6 to 12 hours	Less than 6 hours	**3.1**
Hailstorm	Highly Likely	Limited	Moderate	6 to 12 hours	Less than 6 hours	**2.8**
Lightning	Highly Likely	Limited	Negligible	6 to 12 hours	Less than 6 hours	**2.4**
Tornado	Likely	Catastrophic	Small	Less than 6 hours	Less than 6 hours	**3.0**
Other Hazards						
Hazardous Materials Incident	Likely	Limited	Small	Less than 6 hours	Less than 24 hours	**2.5**
Pandemic	Unlikely	Catastrophic	Large	More than 24 hours	More than 24	**2.8**

G.2.16 Final Determinations on Hazard Risk

The conclusions drawn from the hazard profiling process for Newton County, including the PRI results and input from the Regional Hazard Mitigation Council, resulted in the classification of risk for each identified hazard according to three categories: High Risk, Moderate Risk, and Low Risk (**Table G.24**). For purposes of these classifications, risk is expressed in relative terms according to the estimated impact that a hazard will have on human life and property throughout all of Newton County. A more quantitative analysis to estimate potential dollar losses for each hazard has been performed separately, and is described in Section 6: *Vulnerability Assessment* and below in Section G.3. It should be noted that although some hazards are classified below as posing low risk, their occurrence of varying or unprecedented magnitudes is still possible in some cases and their assigned classification will continue to be evaluated during future plan updates.

Table G.24: CONCLUSIONS ON HAZARD RISK FOR NEWTON COUNTY

HIGH RISK	Thunderstorm Wind / High Wind Tornado Flood Hurricane and Tropical Storm Hailstorm Pandemic
MODERATE RISK	Wildfire Drought / Heat Wave Hazardous Materials Incident Dam and Levee Failure Winter Storm and Freeze Lightning
LOW RISK	Earthquake Erosion Landslide Land Subsidence

G.3 NEWTON COUNTY VULNERABILITY ASSESSMENT

This subsection identifies and quantifies the vulnerability of Newton County to the significant hazards previously identified. This includes identifying and characterizing an inventory of assets in the county and assessing the potential impact and expected amount of damages caused to these assets by each identified hazard event. More information on the methodology and data sources used to conduct this assessment can be found in Section 6: *Vulnerability Assessment*.

G.3.1 Asset Inventory

The table below lists the fire stations, police stations, emergency operations centers (EOCs), medical care facilities, and schools located in Newton County according to Hazus-MH Version 2.2.

In addition, **Figure G.13** shows the locations of critical facilities in Newton County. The table at the end of this subsection, shows a complete list of the critical facilities by name, as well as the hazards that affect each facility. As noted previously, this list is not all-inclusive and only includes information provided through Hazus.

Table G.25: CRITICAL FACILITY INVENTORY IN NEWTON COUNTY

Location	Fire Stations	Police Stations	Medical Care Facilities	EOC	Schools
Chunky	1	0	0	0	0
Decatur	1	3	0	1	5
Hickory	1	1	0	0	0
Newton (city)	1	1	0	0	3
Union	1	1	1	0	1
Unincorporated Area	5	0	0	0	0
ASSET VALUATION	**$29,699,147**	**$16,052,081**	**N/A**	**$2,293,154**	**$106,408,558**
NEWTON COUNTY TOTAL	**10**	**6**	**1**	**1**	**9**

Source: Hazus-MH 2.2

Figure G.13: CRITICAL FACILITY LOCATIONS IN NEWTON COUNTY

Source: Hazus-MH 2.2

G.3.2 Social Vulnerability

In addition to identifying those assets potentially at risk to identified hazards, it is important to identify and assess those particular segments of the resident population in Newton County that are potentially at risk to these hazards.

The table below lists the population by jurisdiction according to U.S. Census 2019 American Community Survey population estimates. The total population in Newton County according to Census data is 21,360 persons. Additional population estimates are presented above in Section G.1.

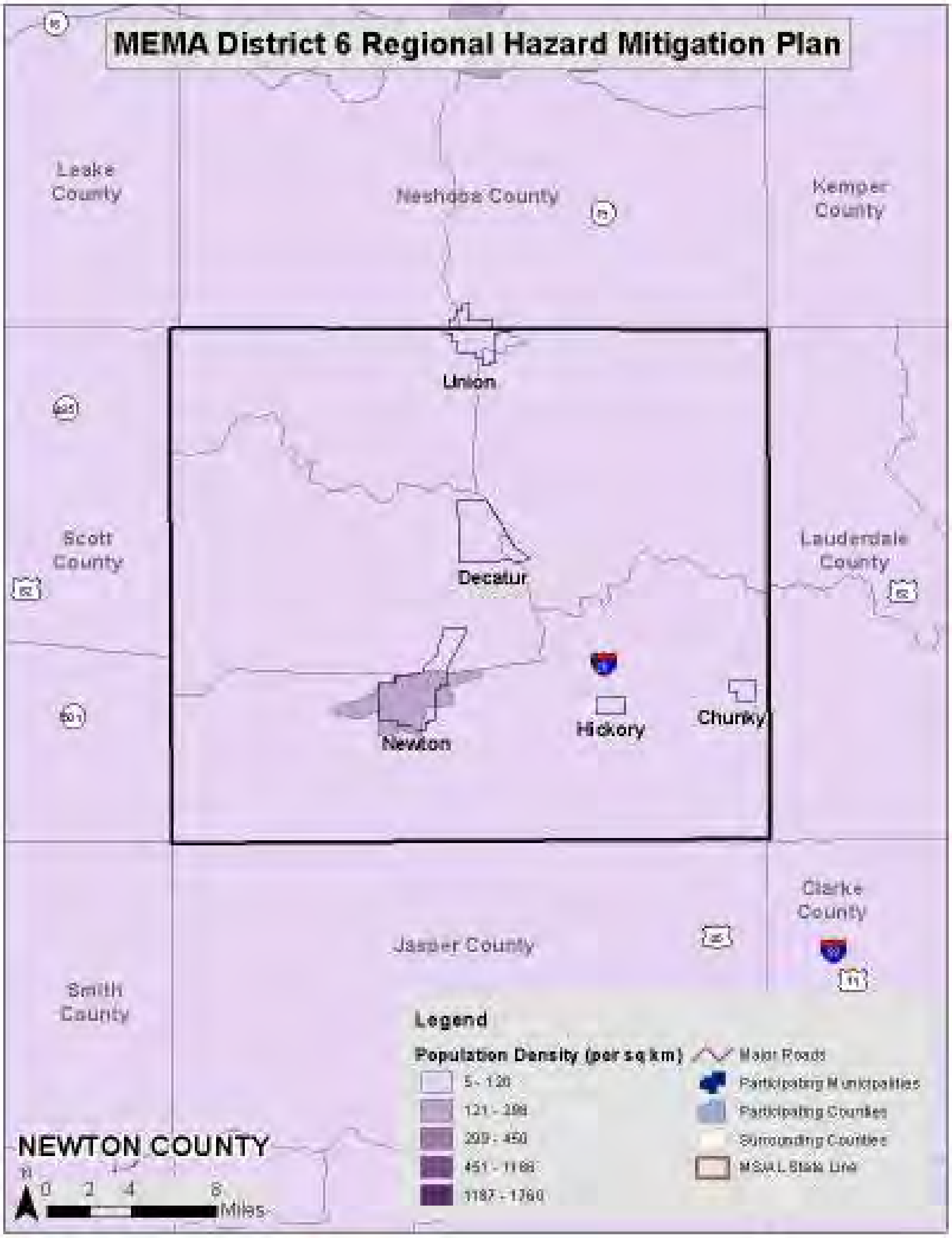
Table G.26: TOTAL POPULATION IN NEWTON COUNTY

Location	Total 2019 Population
Chunky	344
Decatur	1,897
Hickory	632
Newton (city)	3,220
Union	2,349
Unincorporated Area	12,918
NEWTON COUNTY TOTAL	**21,360**

Source: United States Census 2010

In addition, **Figure G.14** illustrates the population density per square kilometer by census tract as it was reported by the U.S. Census Bureau in 2010. This data remains unchanged since last plan update.

Figure G.14: POPULATION DENSITY IN NEWTON COUNTY



Source: United States Census Bureau, 2010

G.3.3 Development Trends and Changes in Vulnerability

Since the previous county hazard mitigation plan was approved (in 2015), Newton County has experienced limited growth and development. The table below shows the number of building units constructed since 2014 according to the U.S. Census American Community Survey.

Table G.27: BUILDING COUNTS FOR NEWTON COUNTY

Jurisdiction	Total Housing Units (2019)	Units Built 2014 or later	% Building Stock Built Post-2014
Chunky	170	9	5.3%
Decatur	723	25	3.5%
Hickory	241	0	0.0%
Newton (city)	1,504	0	0.0%
Union	972	11	1.1%
Unincorporated Area	5,898	102	1.7%
NEWTON COUNTY TOTAL	**9,508**	**147**	**1.5%**

Source: United States Census Bureau – American Community Survey

The table below shows population growth estimates for the county from 2015 to 2019 based on the U.S. Census Annual Estimates of Resident Population.

Table G.28: POPULATION GROWTH FOR NEWTON COUNTY

Jurisdiction	Population Estimates (as of July 1)					% Change 2015-2019
	2015	2016	2017	2018	2019	
Chunky	406	440	436	415	344	-15.27%
Decatur	2,100	2,087	1,888	1,917	1,897	-9.66%
Hickory	604	589	527	654	632	4.63%
Newton (city)	3,347	3,346	3,278	3,251	3,220	-3.79%
Union	1,826	1,860	2,053	2,126	2,349	28.64%
Unincorporated Area	13,380	13,330	13,255	13,161	12,918	-3.45%
NEWTON COUNTY TOTAL	**21,663**	**21,652**	**21,437**	**21,524**	**21,360**	**-1.39%**

Source: United States Census Bureau – American Community Survey

Based on the data above, there has been a low rate of residential development and population growth in the county since 2015, but the county overall has seen a slight population decline. However, the unincorporated area of the county has experienced a slightly higher rate of development compared to the rest of the county, resulting in an increased number of structures that are vulnerable to the potential impacts of the identified hazards. Additionally, there was a slightly higher number of new structures built in the Town of Chunky and Decatur, and the unincorporated area of the county. Since the population has increased in these jurisdictions, there are now greater numbers of people exposed to the identified hazards. Therefore, development and population growth have impacted the county's vulnerability since the previous local hazard mitigation plan was approved and there has been a slight increase in the overall vulnerability.

It is also important to note that as development increases in the future, greater populations and more structures and infrastructure will be exposed to potential hazards if development occurs in the floodplains, moderate and high landside susceptibility areas, high wildfire risk areas, or primary and secondary TRI site buffers.

G.3.4 Vulnerability Assessment Results

As noted in Section 6: *Vulnerability Assessment*, only hazards with a specific geographic boundary, available modeling tool, or sufficient historical data allow for further analysis. Those results, specific to Newton County, are presented here. All other hazards are assumed to impact the entire planning region (drought / heat wave; thunderstorm—wind, hail, lightning; tornado; and winter storm and freeze) or, due to lack of data, analysis would not lead to credible results (dam and levee failure, erosion, and land subsidence). In the case of landslide, local officials determined that the USGS data may be somewhat amiss and that even the areas identified as moderate risks probably entailed an overall low risk.

The hazards to be further analyzed in this subsection include: flood, wildfire, earthquake, hurricane and tropical storm winds, and hazardous materials incident.

The annualized loss estimate for all hazards is presented near the end of this subsection**.**

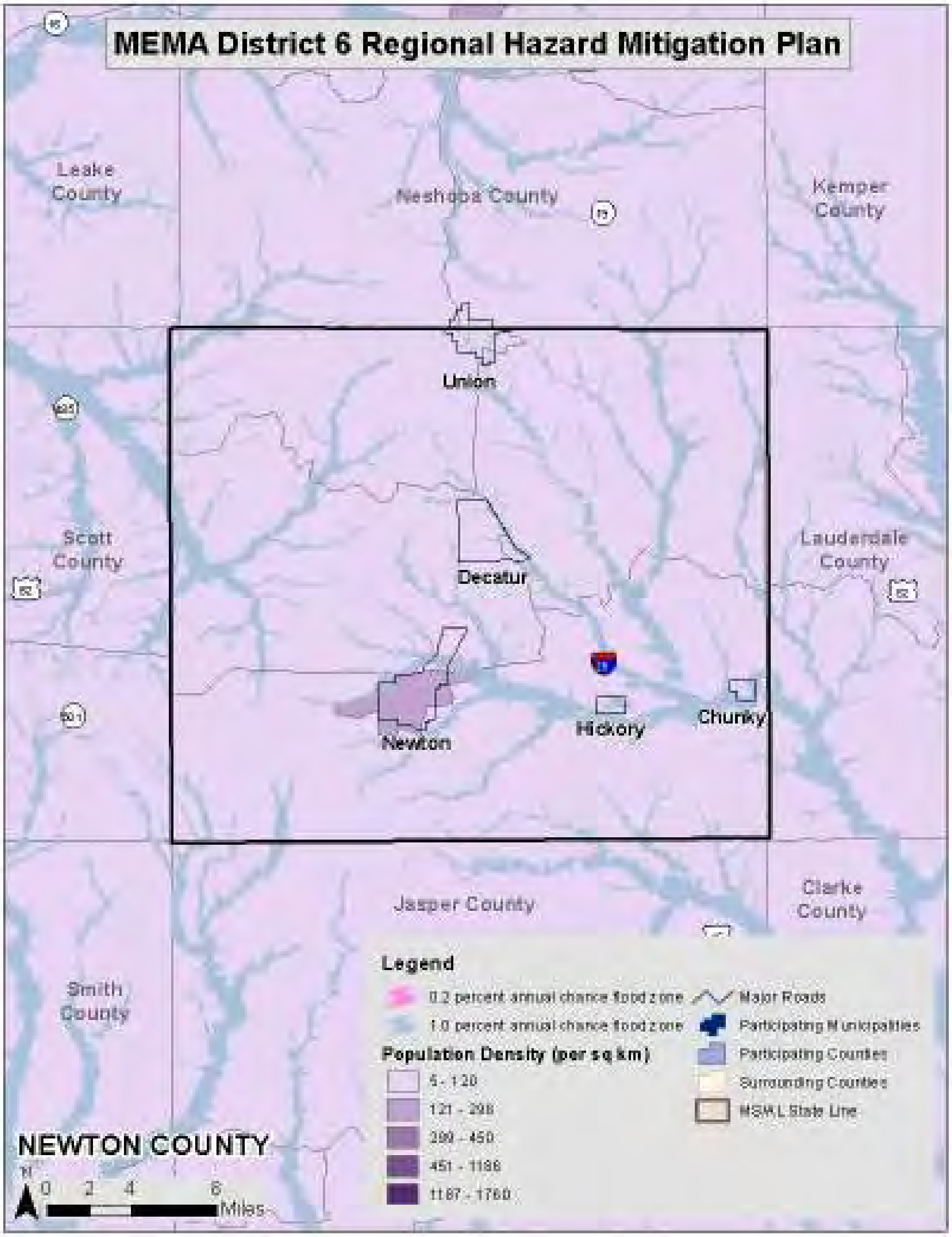
FLOOD

Historical evidence indicates that Newton County is susceptible to flood events. A total of 43 flood events have been reported by the National Centers for Environmental Information resulting in $32 million in property damage. On an annualized level, these damages amounted to $1.34 million for Newton County.

Social Vulnerability

Figure G.15 is presented to gain a better understanding of at-risk population by evaluating census tract level population data against mapped floodplains. There are areas of concern in several areas of the county. Indeed, nearly every incorporated municipality is potentially at risk of being impacted by flooding in some areas of its jurisdiction. Therefore, further investigation in these areas may be warranted.

Figure G.15: POPULATION DENSITY NEAR FLOODPLAINS



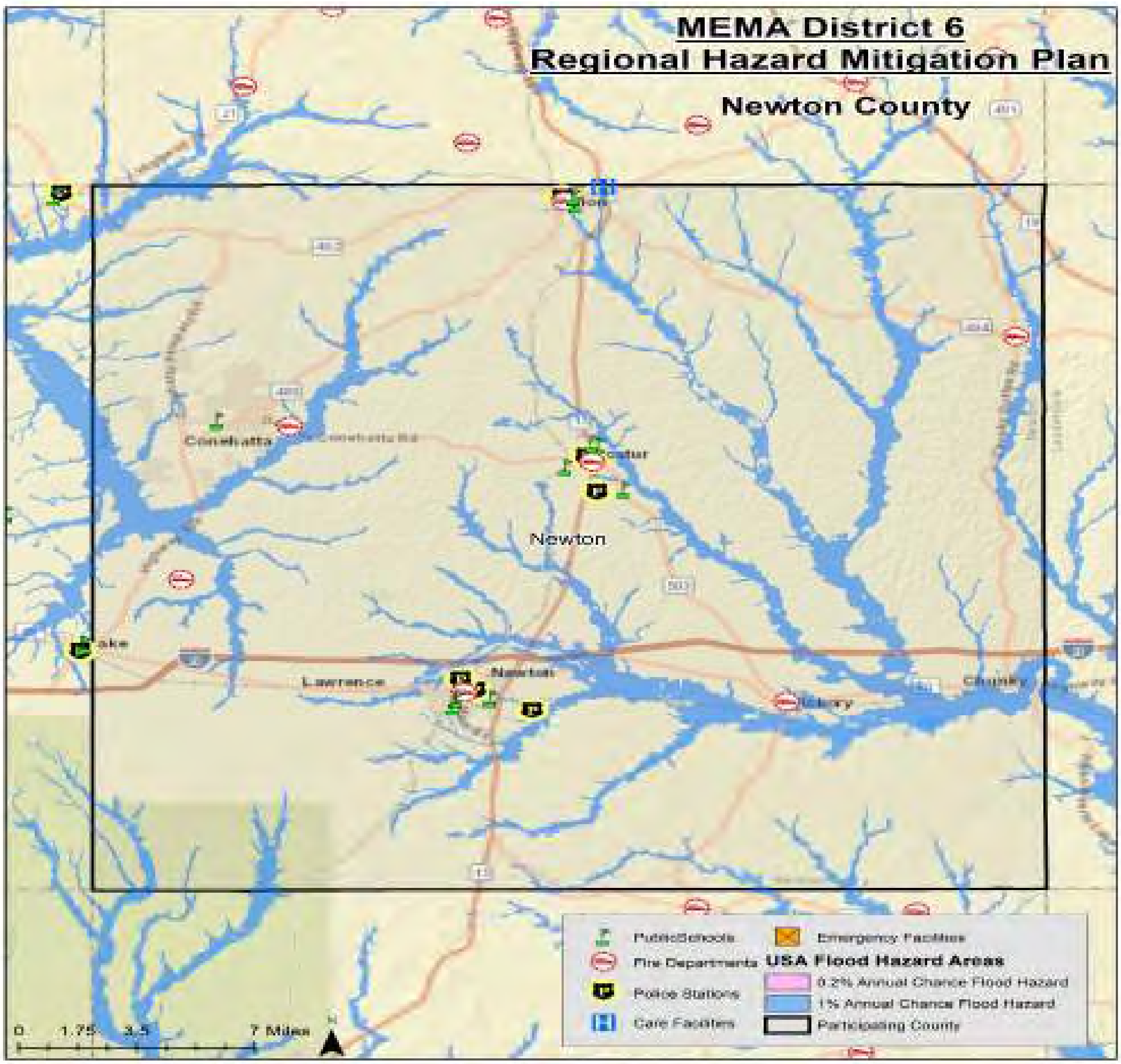
Source: Federal Emergency Management Agency DFIRM, United States Census 2010

Critical Facilities

The following figure is an analysis of critical facilities in relation to Special Flood Hazard Areas. A list of specific critical facilities and their associated risk can be found at the end of this section.

In conclusion, a flood has the potential to impact many existing and future buildings, facilities, and populations in Newton County, though some areas are at a higher risk than others. All types of structures in a floodplain are at-risk, though elevated structures will have a reduced risk. Such site-specific vulnerability determinations are outside the scope of this assessment but will be considered during future plan updates. Furthermore, areas subject to repetitive flooding should be analyzed for potential mitigation actions.

Figure G.16: CRITICAL FACILITY ANALYSIS – SFHA



Source: Federal Emergency Management Agency

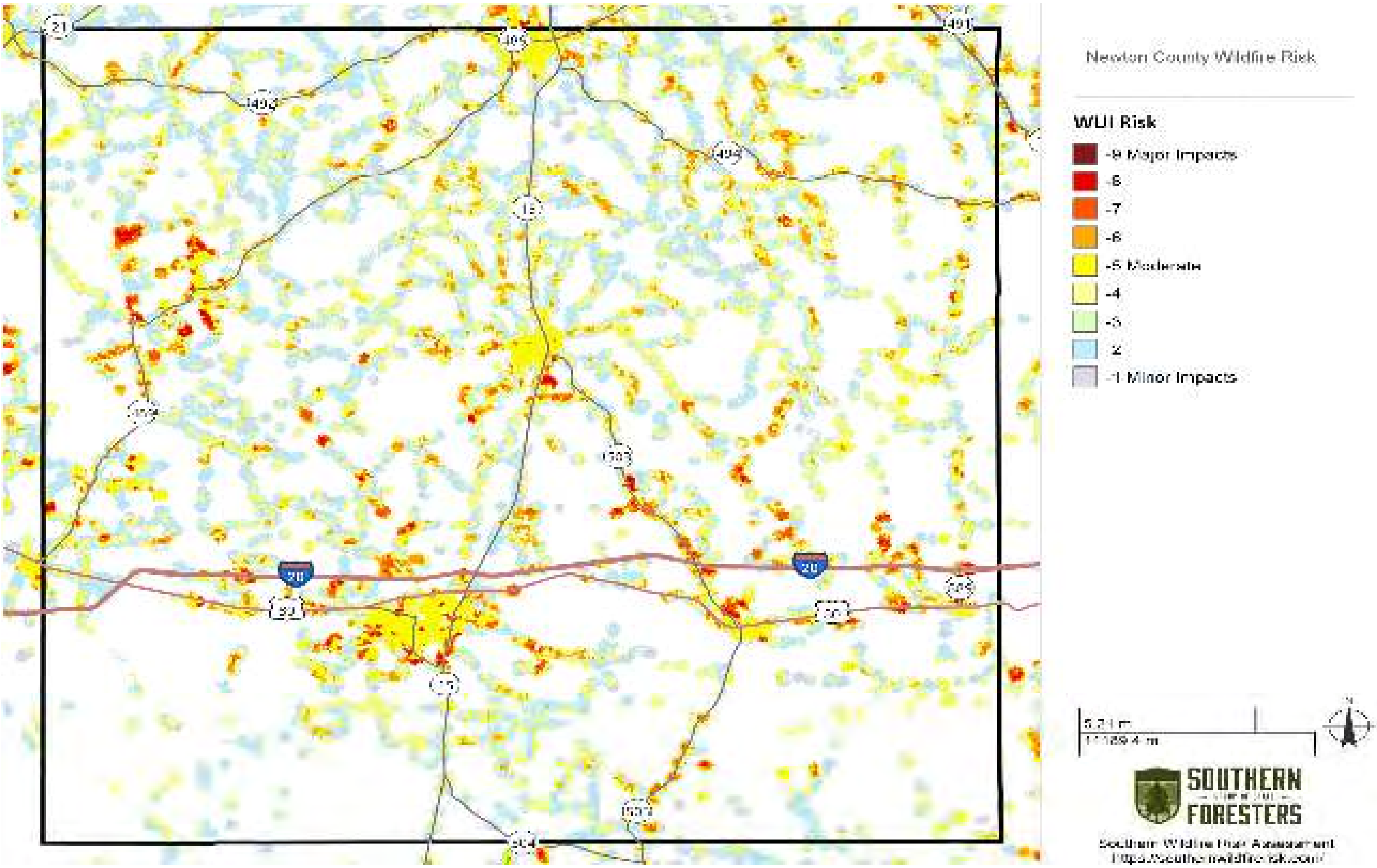
WILDFIRE

Although historical evidence indicates that Newton County is susceptible to wildfire events, there are few reports of damage. Therefore, it is difficult to calculate a reliable annualized loss figure. Annualized loss is considered negligible though it should be noted that a single event could result in significant damages throughout the county.

To estimate exposure to wildfire, building data was obtained from Hazus-MH 2.2 which includes information that has been aggregated at the Census block level and which has been deemed useful for analyzing wildfire vulnerability. However, it should be noted that the accuracy of Hazus data is somewhat lower than that of parcel data. For the critical facility analysis, areas of concern were intersected with critical facility locations.

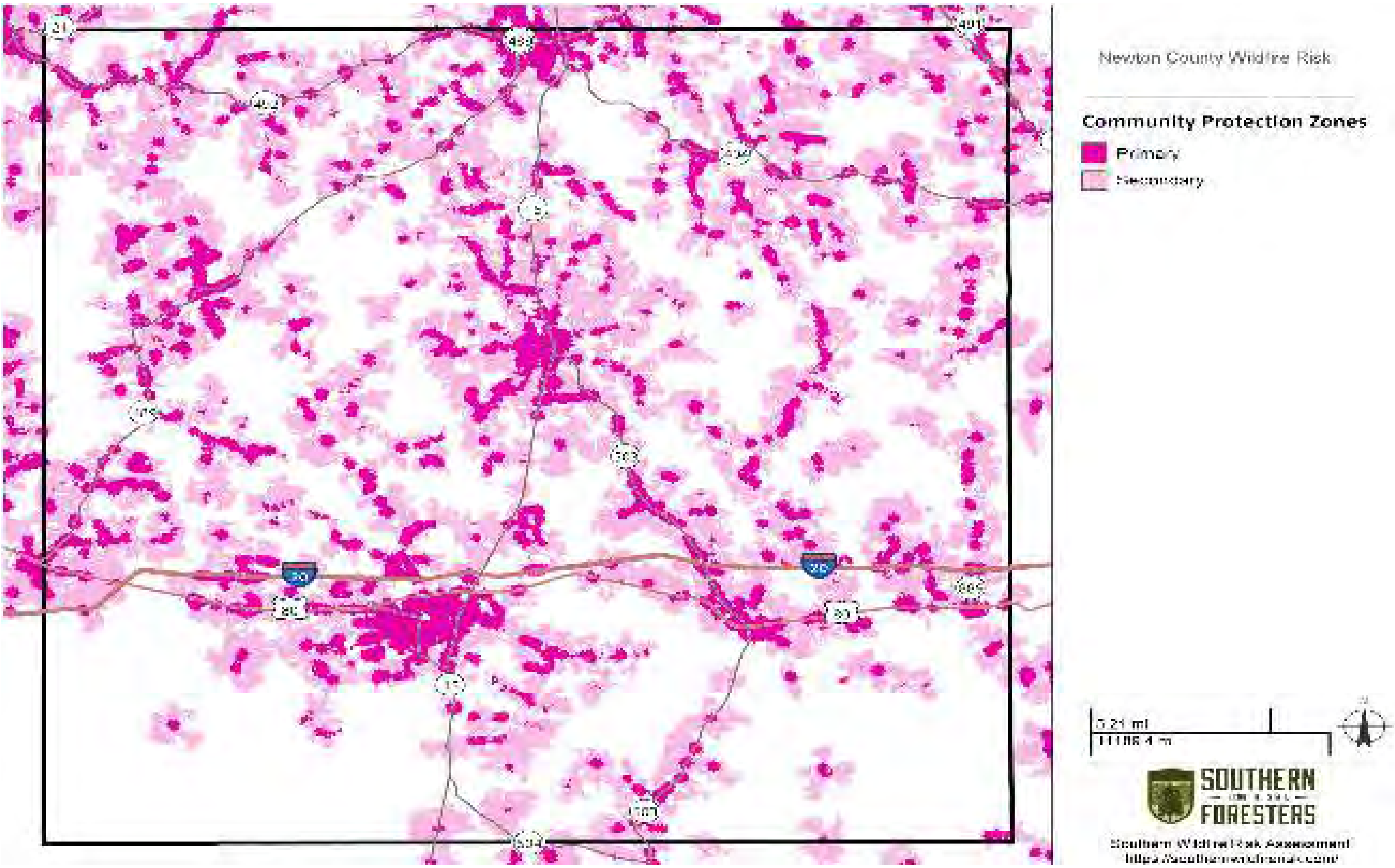
Figure G.17 shows the Wildland Urban Interface Risk Index (WUIRI) data, which is a data layer that shows a rating of the potential impact of a wildfire on people and their homes. The key input, Wildland Urban Interface (WUI), reflects housing density (houses per acre) consistent with Federal Register National standards. The location of people living in the WUI and rural areas is key information for defining potential wildfire impacts to people and homes. Initially provided as raster data, it was converted to a polygon to allow for analysis. The Wildland Urban Interface Risk Index data ranges from 0 to -9 with lower values being most severe (as noted previously, this is only a measure of relative risk). **Figure G.18** Community Protection Zones (CPZ) represent those areas considered highest priority for mitigation planning activities**.** CPZs are based on an analysis of the *Where People Live* housing density data and surrounding fire behavior potential. Rate of Spread data is used to determine the areas of concern around populated areas that are within a 2-hour fire spread distance. This is referred to as the Secondary CPZ. **Figure G.19** shows critical facility locations in relation to historical burns.

Figure G.17: WUI RISK INDEX AREAS IN NEWTON COUNTY



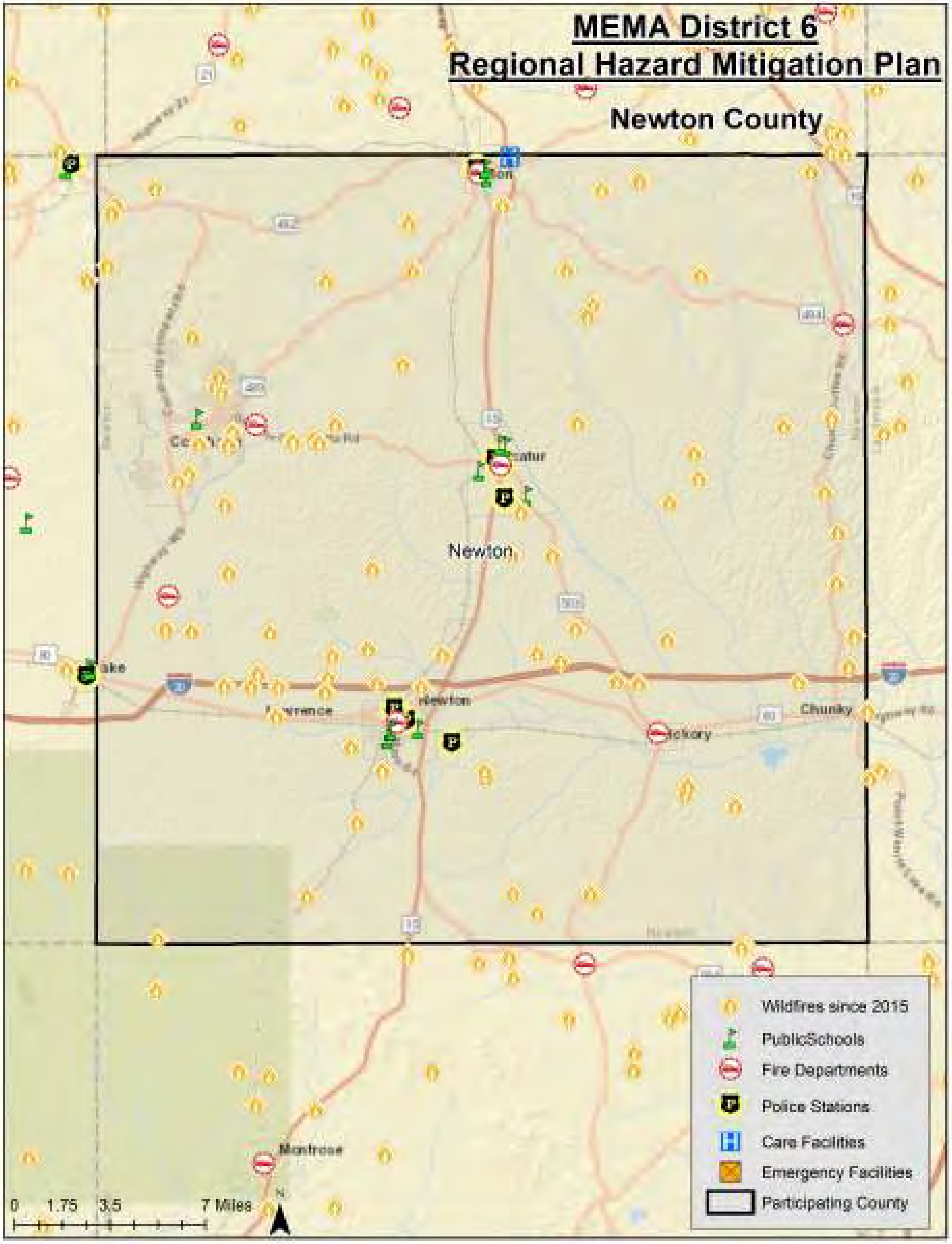
Source: Southern Wildfire Risk Assessment Data

Figure G.18: COMMUNITY PROTECTION ZONES



Source: Southern Wildfire Risk Assessment Data

Figure G.19: CRITICAL FACILITY ANALYSIS – WILDFIRE



Source: Southern Wildfire Risk Assessment Data

Social Vulnerability

Given some level of susceptibility across the entire county, it is assumed that the total population is at risk to the wildfire hazard. Determining the exact number of people in certain wildfire zones is difficult with existing data and could be misleading.

Critical Facilities

The critical facility analysis revealed that there are two critical facilities located in wildfire areas of concern, including two fire stations. It should be noted, that several factors could impact the spread of a wildfire putting all facilities at risk. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

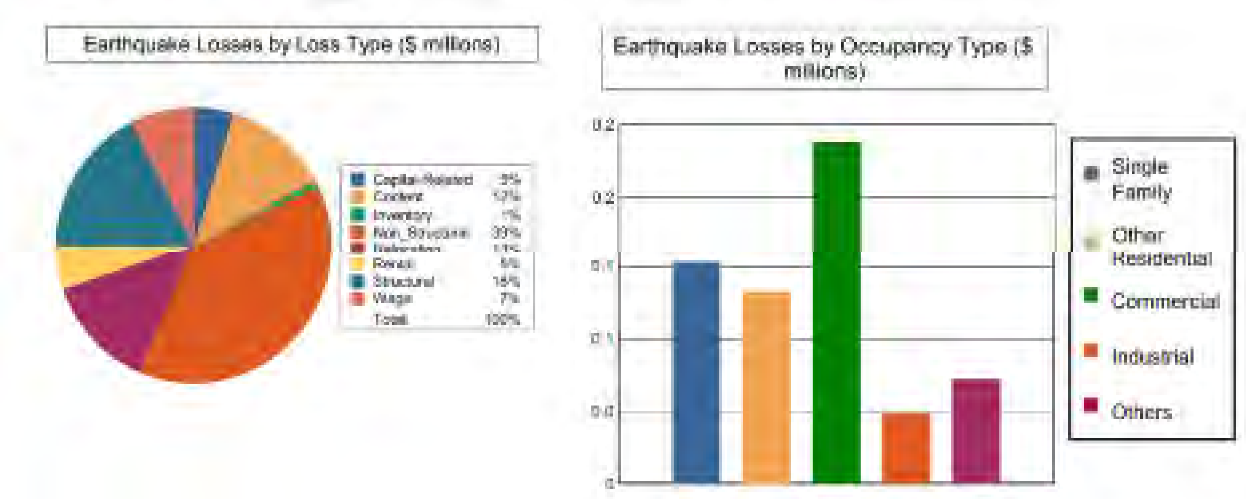
In conclusion, a wildfire event has the potential to impact many existing and future buildings, critical facilities, and populations in Newton County.

EARTHQUAKE

As the Hazus-MH model suggests below, and historical occurrences confirm, any earthquake activity in the area is likely to inflict minor damage to the county.

A probabilistic earthquake model was performed for the MEMA District 6 Region. As the Hazus-MH model suggests below, and historical occurrences confirm, any earthquake activity in the area is likely to inflict minor damage to the county. Hazus-MH 2.2 estimates the total building-related losses were $520,000; 31 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 44 % of the total loss. The figure below provides a summary of the losses associated with the building damage.

Figure G.20: MEMA D6 EARTHQUAKE LOSSES BY TYPE



For the earthquake hazard vulnerability assessment, a probabilistic scenario was created to estimate the average annualized loss for the region. The results of the analysis are generated at the Census Tract level within Hazus-MH and then aggregated to the region level. Since the scenario is annualized, no building counts are provided. Losses reported included losses due to structure failure, building loss, contents damage, and inventory loss.

Social Vulnerability

It can be assumed that all existing and future populations are at risk to the earthquake hazard. Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 39 households to be displaced due to the earthquake. Of these, 32 people (out of a total population of 244,467) will seek temporary shelter in public shelters. [7] The total economic loss estimated for the earthquake is 76.76 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory.

Critical Facilities

The Hazus-MH probabilistic analysis indicated that no critical facilities would sustain measurable damage in an earthquake event. However, all critical facilities should be considered at-risk to minor damage, should an event occur. Before the earthquake, the region had 1,241 hospital beds available for use. On the day of the earthquake, the model estimates that only 1,035 hospital beds (83.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 93.00% of the beds will be back in service. By 30 days, 99.00% will be operational.

In conclusion, an earthquake has the potential to impact all existing and future buildings, facilities, and populations in Newton County. The Hazus-MH scenario indicates that minimal to moderate damage is expected from an earthquake occurrence. While Newton County may not experience a large earthquake, localized damage is possible with an occurrence. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

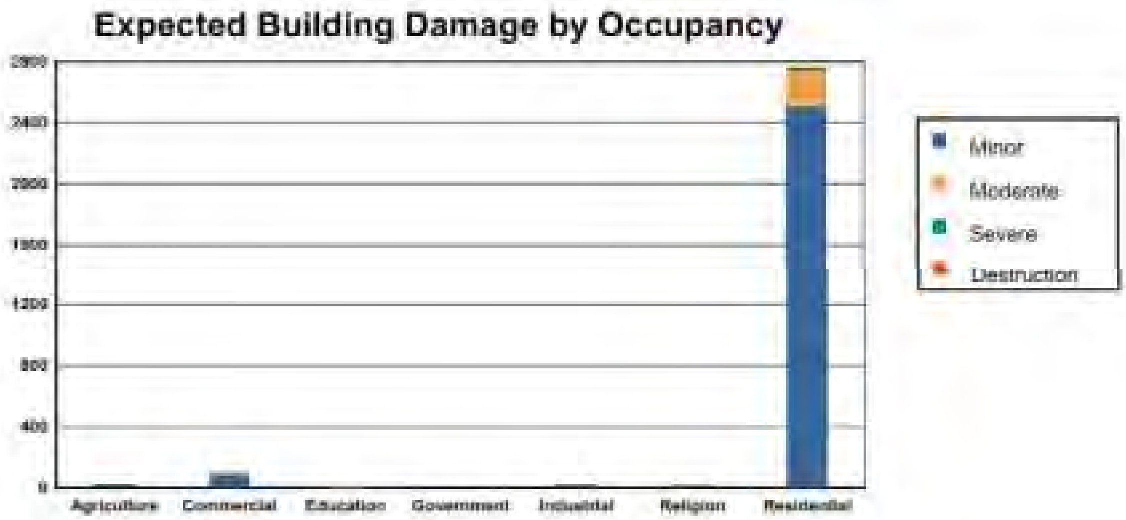
HURRICANE AND TROPICAL STORM

Historical evidence indicates that Newton County has some risk to the hurricane and tropical storm hazard. There have been four disaster declarations due to hurricanes (Hurricanes Ivan, Dennis, Katrina, and Isaac). Several tracks have come near or traversed through the county, as shown and discussed in Section G.2.10.

A probabilistic 100-year hurricane model was performed for the MEMA District 6. Hazus estimates that about 289 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 12 buildings that will be completely destroyed. The figure below summarizes the expected damage by general occupancy for the buildings in the region.

[7] HAZUS-MH utilizes 2010 Census Data

Figure G.21: MEMA D6 100-YEAR HURRICANE



Hurricanes and tropical storms can cause damage through numerous additional hazards such as flooding, erosion, tornadoes, and high winds, thus it is difficult to estimate total potential losses from these cumulative effects. The current Hazus-MH hurricane model only analyzes hurricane winds and is not capable of modeling and estimating cumulative losses from all hazards associated with hurricanes; therefore, only hurricane winds are analyzed in this section. It can be assumed that all existing and future buildings and populations are at risk to the hurricane and tropical storm hazard.

Social Vulnerability
Given equal susceptibility across the county, it is assumed that the total population, both current and future, is at risk to the hurricane and tropical storm hazard. Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 34 households to be displaced due to the hurricane. Of these, 26 people (out of a total population of 244,467) will seek temporary shelter in public shelters.

Critical Facilities
Given equal vulnerability across Newton County, all critical facilities are considered to be at risk. Some buildings may perform better than others in the face of such an event due to construction and age, among other factors. Determining individual building response is beyond the scope of this plan. However, this plan will consider mitigation action for especially vulnerable structures and/or critical facilities to mitigate against the effects of the hurricane hazard. A list of specific critical facilities can be found at the end of this subsection.

In conclusion, a hurricane event has the potential to impact many existing and future buildings, critical facilities, and populations in Newton County.

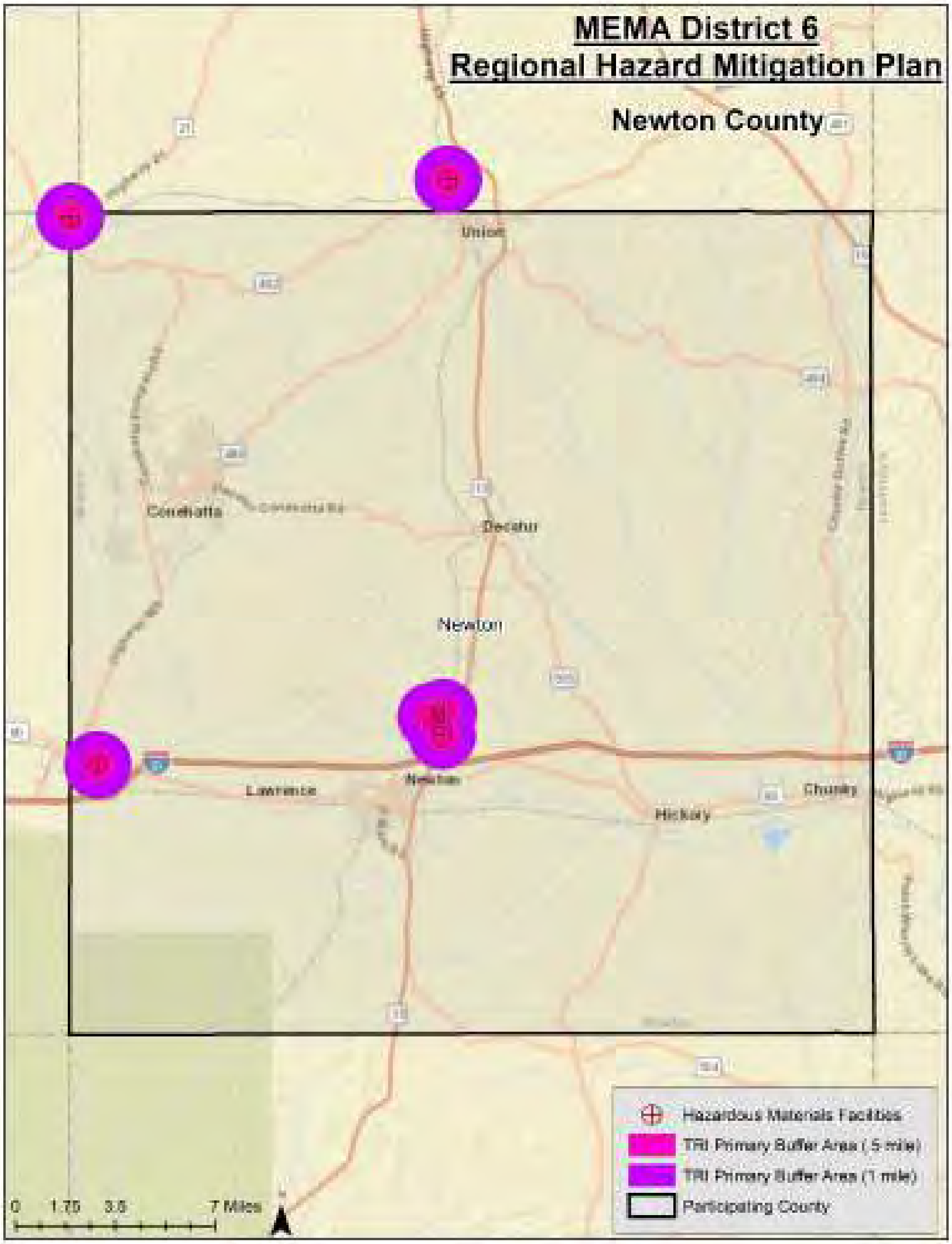
HAZARDOUS MATERIALS INCIDENT

Historical evidence indicates that Newton County is susceptible to hazardous materials events. A total of nine HAZMAT incidents have been reported by the Pipeline and Hazardous Materials Safety Administration, resulting in $397,671 in property damage as well as two injuries. On an annualized level, these damages amount to $10,952 for the county.

Most hazardous materials incidents that occur are contained and suppressed before destroying any property or threatening lives. However, they can have a significant negative impact. Such events can cause multiple deaths, completely shut down facilities for 30 days or more, and cause more than 50 percent of affected properties to be destroyed or suffer major damage. In a hazardous materials incident, solid, liquid, and/or gaseous contaminants may be released from fixed or mobile containers. Weather conditions will directly affect how the hazard develops. Certain chemicals may travel through the air or water, affecting a much larger area than the point of the incidence itself. Non-compliance with fire and building codes, as well as failure to maintain existing fire and containment features, can substantially increase the damage from a hazardous materials release. The duration of a hazardous materials incident can range from hours to days. Warning time is minimal to none.

In order to conduct the vulnerability assessment for this hazard, GIS intersection analysis was used for fixed and mobile areas and building footprints/parcels. In both scenarios, two sizes of buffers—0.5-mile and 1.0-mile—were used. These areas are assumed to represent the different levels of effect: immediate (primary) and secondary. Primary and secondary impact zones were selected based on guidance from the PHMSA Emergency Response Guidebook. For the fixed site analysis, geo-referenced TRI sites in the region, along with buffers, were used for analysis as shown in **Figure G.22.** For the mobile analysis, the major roads (Interstate highway, U.S. highway, and State highway) and railroads, where hazardous materials are primarily transported that could adversely impact people and buildings, were used for the GIS buffer analysis. **Figure G.23** shows the areas used for mobile toxic release buffer analysis.

Figure G.22: TRI SITES WITH BUFFERS IN NEWTON COUNTY



Source: Environmental Protection Agency

Figure G.23: MOBILE HAZMAT BUFFERS IN NEWTON COUNTY

Social Vulnerability
Given high susceptibility across the entire county, it is assumed that the total population is at risk to a hazardous materials incident. It should be noted that areas of population concentration may be at an elevated risk due to a greater burden to evacuate population quickly.

Critical Facilities
Fixed Site Analysis:
The critical facility analysis for fixed TRI sites revealed that there is one facility located in a HAZMAT risk zone. This facility is a school located in the secondary impact zone. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

Mobile Analysis:
It should be presumed that any facility located near a public roadway or rail line is susceptible to a potential HAZMAT event. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

A list of specific critical facilities and their associated risk can be found at the end of this subsection.

In conclusion, a hazardous material incident has the potential to impact many existing and future buildings, critical facilities, and populations in Newton County. Those areas in a primary buffer are at the highest risk, though all areas carry some vulnerability due to variations in conditions that could alter the impact area (i.e., direction and speed of wind, volume of release, etc.). Further, incidents from neighboring counties could also impact the county and participating jurisdictions.

CONCLUSIONS ON HAZARD VULNERABILITY

The following table presents a summary of annualized loss for each hazard in Newton County. Due to the reporting of hazard damages primarily at the county level, it was difficult to determine an accurate annualized loss estimate for each municipality. Therefore, an annualized loss was determined through the damage reported through historical occurrences at the county level. These values should be used as an additional planning tool or measure risk for determining hazard mitigation strategies throughout the county.

Table G.29: ANNUALIZED LOSS FOR NEWTON COUNTY

Event	Newton County
Flood-related Hazards	
Flood	$1,345,666
Erosion	Negligible
Dam and Levee Failure	Negligible
Winter Storm & Freeze	$63,600
Fire-related Hazards	
Drought / Heat Wave	$6,250
Wildfire	Negligible
Geologic Hazards	
Earthquake	Negligible
Landslide	Negligible
Land Subsidence	Negligible
Wind-related Hazards	
Hurricane & Tropical Storm	$300,000
Thunderstorm / High Wind	$79,307
Hail	$8,360
Lightning	$9,375
Tornado	$280,070
Other Hazards	
HAZMAT Incident	$10,952
Pandemic	Negligible

**In this table, the term "Negligible" is used to indicate that no records of dollar losses for the particular hazard were recorded. This could be the case either because there were no events that caused dollar damage or because documentation of that particular type of event is not well kept. Annualized losses were calculated based on the total number of years of reporting and damage totals.*

As noted previously, all existing and future buildings and populations (including critical facilities) are vulnerable to atmospheric hazards including drought / heat wave, hurricane and tropical storm, thunderstorm (wind, hail, lightning), tornado, and winter storm and freeze. In addition, all buildings and populations are vulnerable to all of the man-made and technological hazards identified above. Some buildings may be more vulnerable to these hazards based on locations, construction, and building type. The following table shows the critical facilities vulnerable to additional hazards analyzed in this subsection. The table lists those assets that are determined to be exposed to each of the identified hazards (marked with an "**X**").

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Table G.30: AT-RISK CRITICAL FACILITIES IN NEWTON COUNTY

		FLOOD-RELATED					FIRE-RELATED		GEOLOGIC			WIND-RELATED			OTHER						
FACILITY NAME	FACILITY TYPE	Flood – 100 yr	Flood – 500 yr	Erosion	Dam and Levee Failure[32]	Winter Storm and Freeze	Drought / Heat Wave	Wildfire	Earthquake	Landslide	Land Subsidence	Hurricane and Tropical Storm	Thunderstorm (wind, hail,	Tornado	Fixed HAZMAT – 0.5 mile	Fixed HAZMAT – 1.0 mile	Mobile HAZMAT – 0.5 mile (road)	Mobile HAZMAT – 1.0 mile (road)	Mobile HAZMAT – 0.5 mile (rail)	Mobile HAZMAT – 1.0 mile (rail)	Pandemic
NEWTON COUNTY																					
BEULAH HUBBARD VOLUNTEER FIRE	Fire Station																				
CHUNKY VOLUNTEER FIRE	Fire Station																				
CONEHATTA VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X							X
DECATUR VOLUNTEER FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X							X
DUFFEE VOLUNTEER FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X							X
GIBBSTOWN VOLUNTEER FIRE	Fire Station																				
GREENVIELD VOLUNTEER FIRE	Fire Station																				
HICKORY VOLUNTEER FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X							X
NEWTON FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X							X
UNION FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X							X
DECATUR POLICE DEPARTMENT	Police			X	X	X	X		X	X	X	X	X	X							X

		FLOOD-RELATED					FIRE-RELATED		GEOLOGIC			WIND-RELATED			OTHER						
FACILITY NAME	FACILITY TYPE	Flood – 100 yr	Flood – 500 yr	Erosion	Dam and Levee Failure[33]	Winter Storm and Freeze	Drought / Heat Wave	Wildfire	Earthquake	Landslide	Land Subsidence	Hurricane and Tropical Storm	Thunderstorm (wind, hail,	Tornado	Fixed HAZMAT – 0.5 mile	Fixed HAZMAT – 1.0 mile	Mobile HAZMAT – 0.5 mile (road)	Mobile HAZMAT – 1.0 mile (road)	Mobile HAZMAT – 0.5 mile (rail)	Mobile HAZMAT – 1.0 mile (rail)	Pandemic
EAST CENTRAL COMMUNITY COLLEGE	Police			X	X	X	X		X	X	X	X	X	X							X
HICKORY POLICE DEPARTMENT	Police			X	X	X	X		X	X	X	X	X	X							X
MISSISSIPPI DEPARTMENT OF PUBLIC	Police			X	X	X	X		X	X	X	X	X	X							X
NEWTON COUNTY SHERIFFS	Police			X	X	X	X		X	X	X	X	X	X							X
NEWTON POLICE DEPARTMENT	Police			X	X	X	X		X	X	X	X	X	X							X
UNION POLICE DEPARTMENT	Police			X	X	X	X		X	X	X	X	X	X							X
CONEHATTA ELEMENTARY SCHOOL	School			X	X	X	X		X	X	X	X	X	X							X
EAST CENTRAL ALTERNATIVE SCHOOL	School			X	X	X	X		X	X	X	X	X	X							X
EAST CENTRAL COMMUNITY COLLEGE	School			X	X	X	X		X	X	X	X	X	X							X
N H PILATE MIDDLE SCHOOL	School			X	X	X	X		X	X	X	X	X	X							X
NEWTON COUNTY ACADEMY	School			X	X	X	X		X	X	X	X	X	X							X
NEWTON COUNTY ELEMENTARY SCHOOL	School			X	X	X	X		X	X	X	X	X	X							X
NEWTON COUNTY HIGH SCHOOL	School			X	X	X	X		X	X	X	X	X	X							X
NEWTON COUNTY VOC COMPLEX	School			X	X	X	X		X	X	X	X	X	X							X
NEWTON ELEMENTARY SCHOOL	School			X	X	X	X		X	X	X	X	X	X							X
NEWTON HIGH SCHOOL	School			X	X	X	X		X	X	X	X	X	X							X
NEWTON MUNICIPAL CAREER CENTER	School			X	X	X	X		X	X	X	X	X	X							X
UNION ELEMENTARY SCHOOL	School			X	X	X	X		X	X	X	X	X	X							X
UNION HIGH SCHOOL	School			X	X	X	X		X	X	X	X	X	X							X
UNION MIDDLE SCHOOL	School			X	X	X	X		X	X	X	X	X	X							X

G.4 NEWTON COUNTY CAPABILITY ASSESSMENT

This subsection discusses the capability of Newton County to implement hazard mitigation activities. More information on the purpose and methodology used to conduct the assessment can be found in Section 7: *Capability Assessment*.

G.4.1 Planning and Regulatory Capability

The following table provides a summary of the relevant local plans, ordinances, and programs already in place or under development for Newton County. A checkmark (✓) indicates that the given item is currently in place and being implemented. An asterisk (*) indicates that the given item is currently being developed for future implementation. Each of these local plans, ordinances, and programs should be considered available mechanisms for incorporating the requirements of the MEMA District 6 Regional Hazard Mitigation Plan.

Table G.31: RELEVANT PLANS, ORDINANCES, AND PROGRAMS

Planning Tool/Regulatory Tool	Hazard Mitigation Plan	Comprehensive Land Use Plan	Floodplain Management Plan	Open Space Management Plan (Parks & Rec/Greenway Plan	Stormwater Management Plan/Ordinance	Natural Resource Protection Plan	Flood Response Plan	Emergency Operations Plan	Continuity of Operations Plan	Evacuation Plan	Disaster Recovery Plan	Capital Improvements Plan	Economic Development Plan	Historic Preservation Plan	Flood Damage Prevention Ordinance	Zoning Ordinance	Subdivision Ordinance	Unified Development Ordinance	Post-Disaster Redevelopment Ordinance	Building Code	Fire Code	National Flood Insurance Program (NFIP)	NFIP Community Rating System
NEWTON COUNTY	✓							✓					✓		✓							✓	
Chunky	✓							✓					✓		✓							✓	
Decatur	✓	✓						✓					✓			✓					✓		
Hickory	✓							✓					✓										
Newton (city)	✓	✓						✓				✓	✓		✓	✓	✓			✓	✓	✓	
Union	✓	✓						✓				✓	✓		✓	✓				✓	✓	✓	

A more detailed discussion on the county's planning and regulatory capabilities follows.

EMERGENCY MANAGEMENT

Hazard Mitigation Plan
Newton County has previously adopted a hazard mitigation plan. The Town of Chunky, Town of Decatur, Town of Hickory, City of Newton, and Town of Union were also included in this plan.

Emergency Operations Plan
Newton County maintains an Emergency Operations Plan through its Emergency Management Agency. The Town of Chunky, Town of Decatur, Town of Hickory, City of Newton, and Town of Union are each covered by this plan.

GENERAL PLANNING

Comprehensive Land Use Plan
Newton County has not adopted a county comprehensive land use plan. However, the Town of Decatur, City of Newton, and Town of Union have each adopted a municipal comprehensive plan.

Capital Improvements Plan
Newton County has not adopted a county capital improvement plan. However, the City of Newton and Town of Union have each adopted a municipal capital improvement plan.

Zoning Ordinance
Newton County does not have a zoning ordinance in place. However, the Town of Decatur, City of Newton, and Town of Union have adopted zoning ordinances.

Subdivision Ordinance
Newton County does not have a subdivision ordinance in place. However, the City of Newton has adopted a subdivision ordinance.

Building Codes, Permitting, and Inspections
The City of Newton and Town of Union have adopted a building code.

FLOODPLAIN MANAGEMENT

The following table provides NFIP policy and claim information for each participating jurisdiction in Newton County.

Table G.32: NFIP POLICY AND CLAIM INFORMATION

Jurisdiction	Date Joined NFIP	Current Effective Map Date	NFIP Policies in Force	Insurance in Force	Closed Claims	Total Payments to Date
NEWTON COUNTY†	01/02/80	12/17/10	13	$2,358,700	1	$18,423
Chunky	08/01/86	12/17/10(M)	1	$68,800	1	$2,801
Decatur*	--	--	--	--	--	--

Jurisdiction	Date Joined NFIP	Current Effective Map Date	NFIP Policies in Force	Insurance in Force	Closed Claims	Total Payments to Date
Hickory*	--	--	--	--	--	--
Newton (city)	04/15/80	12/17/10	3	$585,000	3	$31,232
Union	04/15/80	12/17/10	2	$335,000	0	$0

†Includes unincorporated areas of county only
*Community does not participate in the NFIP
(M) – No Elevation Determined, All Zone A, C and X
Source: NFIP Community Status information as of 9/2/2015; NFIP claims and policy information as of 6/30/2015

Flood Damage Prevention Ordinance
All communities participating in the NFIP are required to adopt a local flood damage prevention ordinance. Newton County, the Town of Chunky, the City of Newton, and the Town of Union all participate in the NFIP and have adopted flood damage prevention ordinances.

G.4.2 Administrative and Technical Capability

The following table provides a summary of the capability assessment results for Newton County with regard to relevant staff and personnel resources. A checkmark (✓) indicates the presence of a staff member(s) in that jurisdiction with the specified knowledge or skill.

Table G.33: RELEVANT STAFF / PERSONNEL RESOURCES

Staff / Personnel Resource	Planners with knowledge of land development/land management practices	Engineers or professionals trained in construction practices related to buildings and/or infrastructure	Planners or engineers with an understanding of natural and/or human-caused hazards	Emergency Manager	Floodplain Manager	Land Surveyors	Scientists familiar with the hazards of the community	Staff with education or expertise to assess the community's vulnerability to hazards	Personnel skilled in GIS and/or Hazus	Resource development staff or grant writers
NEWTON COUNTY				✓	✓		✓	✓		
Chunky				✓	✓		✓	✓		
Decatur				✓			✓	✓		
Hickory				✓			✓	✓		

Staff / Personnel Resource	Planners with knowledge of land development/land management practices	Engineers or professionals trained in construction practices related to buildings and/or infrastructure	Planners or engineers with an understanding of natural and/or human-caused hazards	Emergency Manager	Floodplain Manager	Land Surveyors	Scientists familiar with the hazards of the community	Staff with education or expertise to assess the community's vulnerability to hazards	Personnel skilled in GIS and/or Hazus	Resource development staff or grant writers
Newton (city)				✓	✓		✓	✓		
Union				✓	✓		✓	✓		

Credit for having a floodplain manager was given to those jurisdictions that have a flood damage prevention ordinance, and therefore an appointed floodplain administrator, regardless of whether the appointee was dedicated solely to floodplain management. Credit was given for having a scientist familiar with the hazards of the community if a jurisdiction has a Cooperative Extension Service or Soil and Water Conservation Department. Credit was also given for having staff with education or expertise to assess the community's vulnerability to hazards if a staff member from the jurisdiction was a participant on the existing hazard mitigation plan's planning committee.

G.4.3 Fiscal Capability

The following table provides a summary of the results for Newton County with regard to relevant fiscal resources. A checkmark (✓) indicates that the given fiscal resource is locally available for hazard mitigation purposes (including match funds for state and federal mitigation grant funds) according to the previous county hazard mitigation plan.

Table G.34: RELEVANT FISCAL RESOURCES

Fiscal Tool / Resource	Capital Improvement Programming	Community Development Block Grants (CDBG)	Special Purpose Taxes (or taxing districts)	Gas/Electric Utility Fees	Water/Sewer Fees	Stormwater Utility Fees	Development Impact Fees	General Obligation, Revenue, and/or Special Tax Bonds	Partnering Arrangements or Intergovernmental Agreements	Other: other state and Federal funding sources
NEWTON COUNTY	✓	✓								✓
Chunky	✓	✓								✓
Decatur	✓	✓								✓
Hickory	✓	✓								✓
Newton (city)	✓	✓								✓
Union	✓	✓								✓

G.4.4 Political Capability

During the months immediately following a disaster, local public opinion in Newton County is more likely to shift in support of hazard mitigation efforts.

G.4.5 Conclusions on Local Capability

The following table shows the results of the capability assessment using the designed scoring methodology described in Section 7: *Capability Assessment*. The capability score is based solely on the information found in existing hazard mitigation plans and readily available on the jurisdictions' government websites. According to the assessment, the average local capability score for the county and its jurisdictions is 17.7, which falls into the limited capability ranking.

Table G.35: CAPABILITY ASSESSMENT RESULTS

Jurisdiction	Overall Capability Score	Overall Capability Rating
NEWTON COUNTY	20	Moderate

Chunky	16	Limited

Jurisdiction	Overall Capability Score	Overall Capability Rating
Decatur	14	Limited
Hickory	9	Limited
Newton (city)	24	Moderate
Union	23	Moderate

G.5 NEWTON COUNTY MITIGATION STRATEGY

This subsection provides the blueprint for Newton County to follow in order to become less vulnerable to its identified hazards. It is based on general consensus of the Regional Hazard Mitigation Council and the findings and conclusions of the capability assessment and risk assessment. Additional Information can be found in Section 8: *Mitigation Strategy* and Section 9: *Mitigation Action Plan*.

G.5.1 Mitigation Goals

Newton County developed 10 mitigation goals in coordination with the other participating MEMA District 6 Region jurisdictions. The regional mitigation goals are presented below.

Table G.36: MEMA DISTRICT 6 REGIONAL MITIGATION GOALS

Goal #		Goals & Objectives	Action #
#1	**Goal**	Local government will be able to maintain **effective mitigation programs**.	PEA-1
	Objective		
#2	**Goal**	The community will work together to create a **disaster-resistant community**.	PEA-2
	Objective	***County maintains a close relationship with RedCross and local churches.***	
#3	**Goal**	The community will be able to initiate and sustain **emergency response operations.**	PEA-2
	Objective	***County maintains mutual aid agreements with surrounding counties and private entities to assist in times of disaster.***	
#4	**Goal**	**Government operations** will not be significantly disrupted by disasters.	
	Objective	***Conducts training exercises to maintain readiness and capabilities.***	
#5	**Goal**	The **health, safety, and welfare of the community's residents and visitors** will be protected.	ES-5
	Objective	***County has various tornado warning sirens, and makes use of social media.***	
#6	**Goal**	**Local government will support effective hazard mitigation programming** in the community.	
	Objective	***Will encourage the adoption of the HMP.***	
#7	**Goal**	Residents of the community will have **homes, institutions, and work places that are safer**.	PEA-3
	Objective	***County EMA promotes saferoom initiatives.***	
#8	**Goal**	The **local economy** of the community will be prepared for a disaster.	
	Objective	***Maintains close relationship with RedCross and other private entities.***	
#9	**Goal**	**Local infrastructure will not be significantly disrupted by a disaster**.	ES-4
	Objective	***Installed some generators at critical facilities, still seeking to procure more.***	
#10	**Goal**	All **members of the community will understand the hazards threatening their community.**	PEA-1
	Objective	***Outreach campaigns and social media programs to make the community aware of the hazards they face.***	

To attain the listed mitigation goals, the county has also identified objectives that will assist them in the mitigation action process. Objectives are broader than specific actions, but are measurable, unlike goals. Objectives connect goals with the actual mitigation actions. The action plan describes how the mitigation actions will be implemented, including how those actions will be prioritized, administered and incorporated into the community's existing planning mechanisms.

G.5.2 Mitigation Action Plan

The mitigation actions proposed by Newton County, Chunky, Decatur, Hickory, Newton, and Union are listed in the following individual Mitigation Action Plans.

Newton County Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-2	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2025	The International Building Code has not been adopted. The county will review this code and consider adoption, so this action will remain in the plan.
P-3	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	County Emergency Management	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
P-4	Collect additional data on the number of buildings located in flood-prone areas near the Chunky River and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	County Emergency Management	FEMA/MEMA, Local funds	2025	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Structural Projects							
SP-1	Replace the 48" culvert with a 5' culvert on Dalmas Vance Road and raise road bed to 1' or higher.	Flood	High	Board of Supervisors	FEMA/MEMA, CDBG, LSBP, Local funds	2017	COMPLETED
SP-2	Replace two 36" culverts on Hugh Huddnall Road with a 5' arch culvert and raise road bed 2' or more.	Flood	High	Board of Supervisors	FEMA/MEMA, CDBG, LSBP, Local funds	2017	COMPLETED
SP-3	Install a 8' rail car on Griffis Fountain Road.	Flood	High	Board of Supervisors	FEMA/MEMA, CDBG, LSBP, Local funds	2025	Ongoing. A rail car has not been installed on this road. The county will continue to seek funding for this project and it will remain in the plan.
SP-4	Replace two 20" culverts on Strebeck Road with two 36" culverts and install rip rap.	Flood	High	Board of Supervisors	FEMA/MEMA, CDBG, LSBP, Local funds	DELETED	DELETED
SP-5	Install two 40' x 30" culverts and one 30' x 24" culvert on Risher Creek Road.	Flood	High	Board of Supervisors	FEMA/MEMA, CDBG, Local funds	2017	COMPLETED
SP-6	Install two 30' x 24" plastic culverts on Landfill Road.	Flood	High	Board of Supervisors	FEMA/MEMA, CDBG, Local funds	2017	COMPLETED
SP-7	Install 35" x 24" x 40' polymer-coated arc culvert on Mapp Road.	Flood	High	Board of Supervisors	FEMA/MEMA, CDBG, Local funds	2017	COMPLETED

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
SP-8	Replace the culvert on Blackwell Road with a bridge.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, CDBG, LSBP, Local funds	2025	This culvert has not been replaced. The county will continue to seek funding for this project and it will remain in the plan.
SP-9	Replace 5’ culvert with tank car and 4’ culvert with 5’ culvert and install fill material and rip rap on Ridge Roade.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, CDBG, LSBP, Local funds	2025	These culverts have not been replaced. The county will continue to seek funding for this project and it will remain in the plan.
SP-10	Replace two 30” culverts on Peavey Road with 48” culverts.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, CDBG, LSBP, Local funds	2020	COMPLETED
SP-11	Replace 20” culvert on Johnson Road with a 36” culvert.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, CDBG, LSBP, Local funds	2025	These culverts have not been replaced. The county will continue to seek funding for this project and it will remain in the plan.
SP-12	Build up Potterchitto Road and install rip rap.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, CDBG, LSBP, Local funds	2025	This road has not been elevated and rip rap has not been installed. The county will continue to seek funding for this project and it will remain in the plan.
SP-13	Install two 20’ x 30” and one 30’ x 30” plastic culverts on Sandspring Church Road.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, CDBG, Local funds	2025	These culverts have not been replaced. The county will continue to seek funding for this project and it will remain in the plan.
SP-14	Install two 30’ x 24” plastic culverts on Ledlow Road.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, CDBG, Local funds	2020	COMPLETED

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
SP-15	Install two 20' x 24" plastic culverts on Savell Road.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, CDBG, Local funds	2025	These culverts have not been replaced. The county will continue to seek funding for this project and it will remain in the plan.
SP-16	Replacement of the bridge on Roberts County-Line Road.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, CDBG, Local funds	2025	This bridge has not been replaced. The county will continue to seek funding for this project and it will remain in the plan.
SP-17	Replace bridge on Greenfield Rd. near Greenfield Fire Station, it's a critical road.	All	Moderate	Board of Supervisors	FEMA/MEMA, CDBG, Local funds	2025	New Action
Emergency Services							
ES-1	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	County Emergency Management	MEMA, FEMA, Local funds	2025	Ongoing. Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding
ES-2	Purchase of generators to provide adequate backup power for County volunteer fire department.	Tornado, High Wind	Moderate	County Fire Service	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	Generators have been installed at Decatur and Union. Still working to procure additional generators for the remaining locations.
Public Education and Awareness							
PEA-1	Purchase of materials to educate the public on being prepared for hazards, including tornadoes, severe weather, flooding, fire, etc.	All	Low	County Emergency Management	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
PEA-2	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2025	County EMA continually promotes tornado shelters to the public.
Previously Completed Actions							

Town of Chunky Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	The International Building Code has been adopted. The county will need to review this code over the next 5 years, so this action will remain in the plan.
P-2	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-4	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
P-5	Collect additional data on the number of buildings located in flood-prone areas near the Chunky River and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1							
Emergency Services							
ES-1	Purchase a generator to provide adequate backup power for City Hall.	Tornado, High Wind	High	Public Works, Volunteer Fire Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	A generator to provide backup power for City Hall has not been purchased. The town would like to continue to search for a funding source for this project so it will remain in the plan.
ES-2	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan.
ES-3	Purchase of a wood chipper so the Town can remove debris following storms.	Tornado, High Wind	Moderate	Public Works	FEMA/MEMA, DEQ, Local funds	2025	The town has not purchased a wood chipper. The town will continue to seek funding for this project.
ES-4	Purchase of a water filtration device for the water system to ensure safe drinking water even after loss of service.	Tornado, High Wind	Moderate	Public Works	FEMA/MEMA, Homeland Security, Local funds	2025	A water filtration device has not been purchased to provide drinking water after loss of service. The town will continue to seek funding for this project.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
ES-5	Purchase of an emergency warning system for the Town.	Tornado, High Wind	Moderate	Board of Aldermen, Volunteer Fire Department	FEMA/MEMA, Homeland Security, Local funds	2025	An emergency warning system has not been installed due to lack of funding. The town will continue to look at the feasibility of this action going forward.
Public Education and Awareness							
PEA-1	Purchase of materials to educate the public on being prepared for hazards, including tornadoes, severe weather, flooding, fire, etc.	All	Low	Volunteer Fire Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.
PEA-2	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2025	Ongoing campaign.
Previously Completed Actions							

Town of Decatur Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	The International Building Code has been adopted. The county will need to review this code over the next 5 years, so this action will remain in the plan.
P-2	Clear/clear all ditches/drains to prevent flooding during heavy rains.	Flood	Moderate	Board of Aldermen	FEMA/MEMA, CDBG, Local funds	2025	Ditches/drains have been cleared on several occasions, but a long-term plan to address this issue needs to be developed, so the town will continue to work on this action.
P-3	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-4	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-5	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
P-6	Collect additional data on the number of buildings located in flood-prone areas and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1	Replacement of two small culverts under South Fifth Street with one large culvert.	Flood	Moderate	Public Works	FEMA/MEMA, CDBG, Local funds	2025	These culverts have not been replaced. The county will continue to seek funding for this project and it will remain in the plan.
Emergency Services							
ES-1	Purchase of a generator to provide adequate backup power for the Town's water/sewer system.	Tornado, High Wind	High	Public Works	FEMA/MEMA, Homeland Security, Local funds	2025	A backup generator to the town's water system has not been purchased. The town would like to focus on implementing this action going forward, so it will seek funding.
ES-2	Purchase of a minim pumper for the fire department.	Wildfire	High	Board of Aldermen, Volunteer Fire Department	FEMA/MEMA, CDBG, AFGP, Local funds	2017	COMPLETED
ES-3	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
ES-4	Purchase of weather radios for Town's public buildings and schools.	Tornado, High Wind	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Weather radios have not been purchased for public buildings/schools due to lack of funding. The town would still like to implement this if funding can be identified.
Public Education and Awareness							
PEA-1	Purchase of materials to educate the public on being prepared for hazards, including tornadoes, severe weather, flooding, fire. Etc.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.
PEA-2	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2025	Ongoing campaign.
Previously Completed Actions							

Town of Hickory Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Cleaning out of ditches within the Town and rerouting them to nearest creek to alleviate flooding in low-lying areas.	Flood	Moderate	Public Works	FEMA/MEMA, CDBG, Local funds	2025	Ditches have been cleared on several occasions, but a long-term solution to address this issue needs to be developed, so the town will continue to work on this action and seek funding to identify and implement a project.
P-2	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	The International Building Code has been adopted. The county will need to review this code over the next 5 years, so this action will remain in the plan.
P-3	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-4	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
P-5	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
P-6	Collect additional data on the number of buildings located in flood-prone areas near the Chunky River and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1							
Emergency Services							
ES-1	Installation of an emergency warning system.	Tornado, High Wind	High	Board of Aldermen, Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2017	COMPLETED

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
ES-3	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan.
Public Education and Awareness							
PEA-1	Purchase of materials to educate the public on being prepared for hazards, including tornadoes, severe weather, flooding, fire, etc.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.
PEA-2	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2025	Ongoing campaign.

City of Newton Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-2	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Fire Department , Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
P-4	Collect additional data on the number of buildings located in flood-prone areas and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	Fire Department , Police Department	FEMA/MEMA, Local funds	2025	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Structural Projects							
SP-1	Rehabilitation of the storm drain system to alleviate localized flooding in the downtown area.	Flood	High	Public Works	FEMA/MEMA, CDBG, Local funds	2025	The storm drain system has not been rehabilitated to sufficiently alleviate all localized flooding downtown. The town will continue to try to address these localized flooding issues with stormwater projects when funding is available.
Emergency Services							
ES-1	Installation of an emergency warning system for the city.	Tornado, High Wind	High	Fire Department , Police Department	FEMA/MEMA, Homeland Security, Local funds	2017	COMPLETED
ES-2	Purchase of a generator to provide adequate backup power for the sewer system.	Tornado, High Wind	High	Public Works	FEMA/MEMA, Homeland Security, Local funds	2025	A generator to provide backup power for the sewer system has not been purchased. The town would like to continue to search for a funding source for this project so it will remain in the plan.
ES-3	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Fire Department , Police Department	FEMA/MEMA, Local funds	2025	Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
ES-4	Purchase a generator to provide adequate backup power for Newton Fire Department.	All	High	Board of Aldermen, Public Works	FEMA/MEMA, Homeland Security, Local funds	2025	A generator to provide backup power for the fire department has not been purchased. The town would like to continue to search for a funding source for this project so it will remain in the plan.
ES-5	Purchase adequate backup power systems for City Hall and Fire Department.	All	High	Board of Aldermen, Public Works	FEMA/MEMA, Homeland Security, Local funds	2025	A generator to provide backup power for City Hall has not been purchased. The town would like to continue to search for a funding source for this project so it will remain in the plan.
Public Education and Awareness							
PEA-1	Purchase of materials to educate the public on being prepared for all hazards, including tornadoes, severe weather, flooding, fire, etc.	All	Low	Fire Department , Police Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.
PEA-2	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2025	Ongoing campaign.
Previously Completed Actions							

Town of Union Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-2	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1	Replacement of two culverts with one larger culvert under Walnut Street.	Flood	Moderate	Public Works	FEMA/MEMA, CDBG, Local funds	2025	These culverts have not been replaced. The county will continue to seek funding for this project and it will remain in the plan.
Emergency Services							
ES-1	Replace the emergency warning system.	All	High	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2017	COMPLETED

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
ES-2	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan.
Public Education and Awareness							
PEA-1	Public Education programs in the local school system on the dangers of severe weather.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	There are a number of resources from the county that reach out to the local school system, but this is an effort that needs to continue going forward, so this action will remain in place.
PEA-2	Purchase of materials to educate the public on being prepared for hazards, including tornadoes, severe weather, flooding, fire, etc.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, AFGP, Local funds	2025	The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place.
PEA-3	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	County Emergency Management	FEMA/MEMA, Local funds	2025	Ongoing campaign.

ANNEX H
SCOTT COUNTY

This annex includes jurisdiction-specific information for Scott County and its participating municipalities. It consists of the following five subsections:

- H.1 Scott County Community Profile
- H.2 Scott County Risk Assessment
- H.3 Scott County Vulnerability Assessment
- H.4 Scott County Capability Assessment
- H.5 Scott County Mitigation Strategy

H.1 SCOTT COUNTY COMMUNITY PROFILE

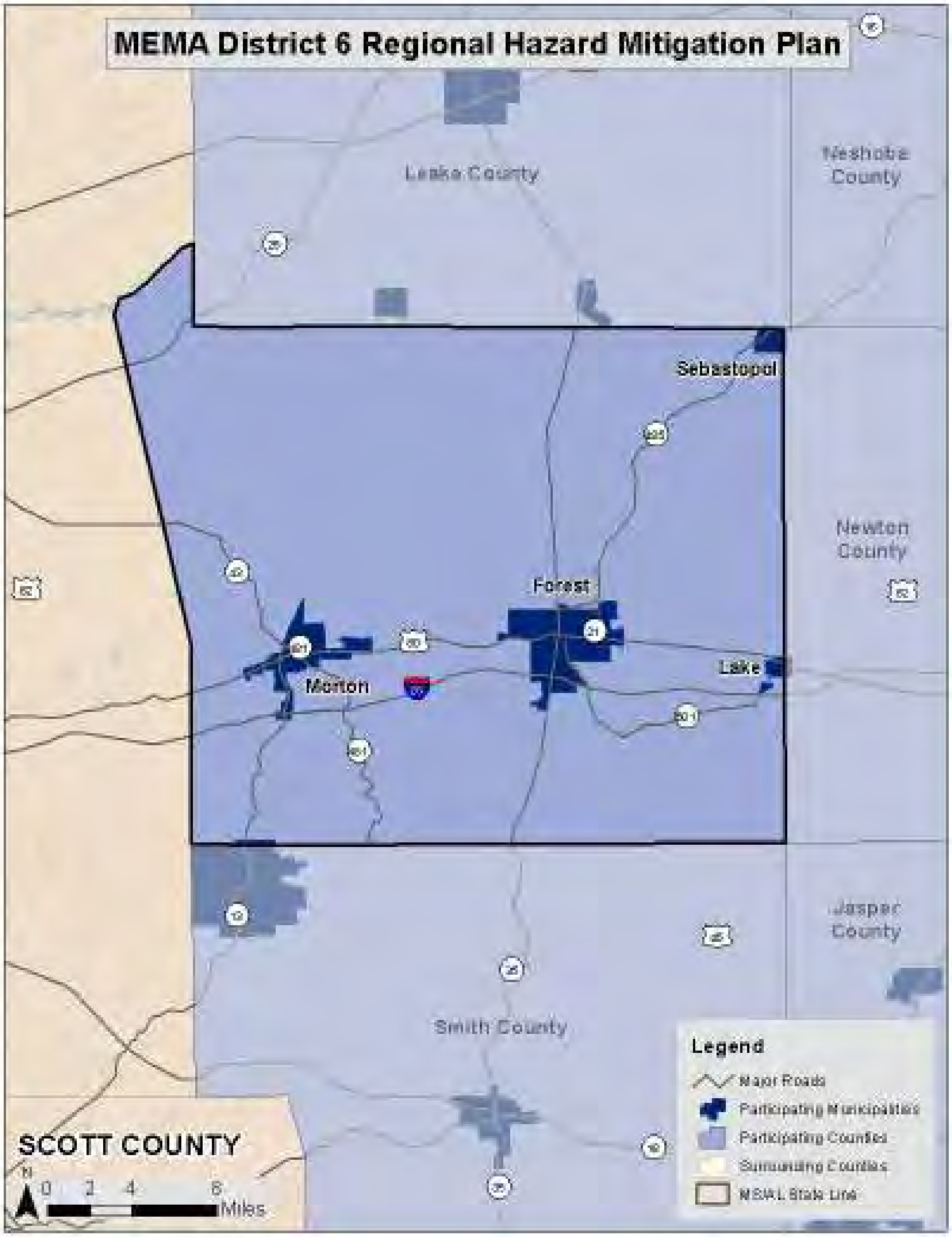
H.1.1 Geography and the Environment

Scott County is located in eastern Mississippi. It comprises two towns and two cities, City of Forest, Town of Lake, City of Morton, and Town of Sebastopol, as well as many small unincorporated communities. An orientation map is provided as **Figure H.1**.

The county is a rural area that incorporates historic aspects and commercial growth within county boundaries. The total area of the county is 610 square miles, 1 square mile of which is water area.

Summer temperatures in the county range from highs of about 90 degrees Fahrenheit (˚F) to lows in the upper 60s. Winter temperatures range from highs in the mid-50s to lows around 30˚F. Average annual rainfall is approximately 56 inches, with the wettest months being November, December, and May.

Figure H.1: SCOTT COUNTY ORIENTATION MAP



H.1.2 Population and Demographics

According to the 2019 American Community Survey, Scott County has a population of 28,332 people. The county has seen a very slight increase in population between 2010 and 2019, however Sebastopol has experienced a substantial rate of growth. The population density is 46.4 people per square mile. Population counts from the US Census Bureau for 2000, 2010, 2019 for the county and participating jurisdictions are presented in **Table H.1**.

Table H.1: POPULATION COUNTS FOR SCOTT COUNTY

Jurisdiction	2000 Census Population	2010 Census Population	2019 Census Population	% Change 2010-2019
Scott County	**28,423**	**28,264**	**28,332**	**-0.32%**
Forest	5,987	5,684	5,629	-5.97%
Lake	408	324	439	7.59%
Morton	3,482	3,462	3,589	3.07%
Sebastopol	233	272	359	54.07%
Unincorporate Areas	18,313	18,522	18,316	

Source: United States Census Bureau – American Community Survey

Based on the 2019 Census, the median age of residents of Scott County is 36.4 years. The racial characteristics of the county are presented in **Table H.2**. Whites make up the majority of the population in the county, accounting for 57.2 percent of the population.

Table H.2: DEMOGRAPHICS OF SCOTT COUNTY

Jurisdiction	White, Percent (2019)	Black or African American, Percent (2019)	American Indian or Alaska Native, Percent (2019)	Asian, Percent (2019)	Native Hawaiian or Other Pacific Islander, Percent (2019)	Other Race, Percent (2019)	Two or More Races, percent (2019)	Persons of Hispanic Origin, Percent (2019)*
Scott County	**57.2%**	**38.1%**	**0.4%**	**0.3%**	**0.0%**	**3.3%**	**0.7%**	**11.3%**
Forest	48.9%	43.1%	0.0%	0.8%	0.0%	7.2%	0.0%	31.4%
Lake	38.3%	61.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Morton	50.4%	39.1%	1.3%	0.0%	0.0%	8.0%	1.2%	26.3%
Sebastopol	83.6%	16.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%

*Hispanics may be of any race, so also are included in applicable race categories
Source: United States Census Bureau – American Community Survey

H.1.3 Housing

According to the 2019 US Census – American Community Survey, there are 11,716 housing units in Scott County, the majority of which are single family homes or mobile homes. Housing information for the county and four municipalities is presented in **Table H.3**. As shown in the table, all of the municipalities have lower percentages of seasonal housing units compared to the unincorporated county.

Table H.3: HOUSING CHARACTERISTICS OF SCOTT COUNTY

Jurisdiction	Housing Units (2010)	Housing Units (2019)	Median Home Value (2019)
Scott County	**11,470**	**11,716**	**$71,300**
Forest	2,135	2,378	$77,200
Lake	134	181	$72,500
Morton	1,271	1,212	$69,800
Sebastopol	125	134	$86,800
Unincorporated Areas	7,805	7,811	-

Source: United States Census Bureau – American Community Survey

H.1.4 Infrastructure

TRANSPORTATION

In Scott County, Interstate 20 provides access to east and west connecting through multiple towns and counties. U.S. Highway 80, which crosses east and west, travels throughout the county and state into Alabama and Louisiana. State Highways 13, 21, and 35 also provide access throughout the County.

There is no local airport currently operating in Scott County. The closest international airport includes Jackson-Evers International Airport, which offers international and domestic flights to a number of locations around the world.

UTILITIES

Electrical power in Scott County is provided by Central Electric Power Association, Mississippi Power, and Tennessee Valley Authority Power and several additional local distributors.

Water and sewer service is provided to residents by the City of Morton and Town of Sebastopol, along with various other local providers such as C&C Water Association, H&H Water System, L&F Water Association, Pineville Water Association, Southwest Leake Water Association, and other local companies.

COMMUNITY FACILITIES

There are a number of buildings and community facilities located throughout Scott County. According to the data collected for the vulnerability assessment (Section 6.4.1), there are 4 fire stations, 3 police stations, and 12 public schools located within the county.

There is one hospital located in Scott County. Scott Regional Hospital is a 25-bed acute-care hospital located in the City of Morton.

Recreational opportunities in Scott County include multiple parks, campground, walking trails, and sport recreational facilities. Roosevelt State Park is located within the county and provides boating, waterskiing, fishing, and hiking. Beinville National Forest is partially located in the county and consists of 178,541 acres used for hiking, fishing, boating, and hunting.

H.1.5 Land Use

Many areas of Scott County are undeveloped or sparsely developed. There are several small incorporated municipalities located throughout the county, with a few larger hubs interspersed. These areas are where the county's population is generally concentrated. The incorporated areas are also where many of the businesses, commercial uses, and institutional uses are located. Land uses in the balance of the study area generally consist of rural residential development, agricultural uses, and recreational areas, although there are some notable exceptions in the larger municipalities. Local land use and associated regulations are further discussed in *Section 7: Capability Assessment.*

H.1.6 Employment and Industry

According to U.S. Census Bureau's American Community Survey (ACS), in 2019, Scott County had an average annual employment of 12,089 workers and according to the Mississippi Department of Employment Security an average unemployment rate of 4.8 percent as of May 2021. In 2019, the Manufacturing industry employed 29.4 percent of the workforce followed by Educational Services, Health Care, and Social Assistance (15.2%). The median household income in Scott County was $34,943 compared to $45,081 in the state of Mississippi.

H.2 SCOTT COUNTY RISK ASSESSMENT

This subsection includes hazard profiles for each of the significant hazards identified in Section 4: *Hazard Identification* as they pertain to Scott County. Each hazard profile includes a description of the hazard's location and extent, notable historical occurrences, and the probability of future occurrences. Additional information can be found in Section 5: *Hazard Profiles*.

H.2.1 Flood

LOCATION AND SPATIAL EXTENT

There are areas in Scott County that are susceptible to flood events. Special flood hazard areas in the county were mapped using Geographic Information System (GIS) and FEMA Digital Flood Insurance Rate Maps (DFIRM). This includes Zone A (1-percent annual chance floodplain), Zone AE (1-percent annual chance floodplain with elevation), and Zone X500 (0.2-percent annual chance floodplain). According to GIS analysis, of the 614 square miles that make up Scott County, there are 92.6 square miles of land in zones A and AE (1-percent annual chance floodplain/100-year floodplain) and 0.0 square miles of land in zone X500 (0.2-percent annual chance floodplain/500-year floodplain).

These flood zone values account for 15.1 percent of the total land area in Scott County. It is important to note that while FEMA digital flood data is recognized as best available data for planning purposes, it does not always reflect the most accurate and up-to-date flood risk. Flooding and flood-related losses often do occur outside of delineated special flood hazard areas. **Figure H.2** illustrates the location and extent of currently mapped special flood hazard areas for Scott County based on best available FEMA Digital Flood Insurance Rate Map (DFIRM) data.[1]

[1] DFIRM Updated 2010

Figure H.2: SPECIAL FLOOD HAZARD AREAS IN SCOTT COUNTY

Source: Federal Emergency Management Agency

HISTORICAL OCCURRENCES

Floods were at least partially responsible for five disaster declarations in Scott County in 1979, 2001, 2003, 2011, 2019. Information from the National Centers for Environmental Information was used to ascertain additional historical flood events. The National Centers for Environmental Information reported a total of 48 events in Scott County since 2001. A summary of these events is presented in **Table H.4**. These events accounted for more than $53.31 million in property damage and one fatality in the county.

Table H.4: SUMMARY OF FLOOD OCCURRENCES IN SCOTT COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Forest	6	0/0	$68,000
Lake	0	0/0	$0
Morton	8	0/0	$504,000
Sebastopol	3	0/0	$57,000
Unincorporated Area	21	1/0	$52,681,000
SCOTT COUNTY TOTAL	**48**	**1/0**	**$53,310,000**

Source: National Centers for Environmental Information

HISTORICAL SUMMARY OF INSURED FLOOD LOSSES

NFIP and Repetitive Loss Properties data was not made available during this plan update. Information below is current as of 2015. According to FEMA flood insurance policy records as of June 2015, there have been 11 flood losses reported in Scott County through the National Flood Insurance Program (NFIP) since 1978, totaling over $185,000 in claims payments. A summary of these figures for the county is provided in **Table H.5**. It should be emphasized that these numbers include only those losses to structures that were insured through the NFIP policies, and for losses in which claims were sought and received. It is likely that many additional instances of flood loss in Scott County were either uninsured, denied claims payment, or not reported.

Table H.5: SUMMARY OF INSURED FLOOD LOSSES IN SCOTT COUNTY

Location	Flood Losses	Claims Payments
Forest	4	$62,767
Lake	0	$0
Morton	4	$4,406
Sebastopol	0	$0
Unincorporated Area	3	$118,069
SCOTT COUNTY TOTAL	**11**	**$185,242**

Source: Federal Emergency Management Agency, National Flood Insurance Program

REPETITIVE LOSS PROPERTIES

According to the Mississippi Emergency Management Agency, there are three non-mitigated repetitive loss properties located in Scott County, which accounted for six losses and almost $66,000 in claims payments under the NFIP. The average claim amount for these properties is $10,973. Of the three properties, two are single family and one is non-residential. Without mitigation, these properties will likely continue to experience flood losses. **Table H.6** presents detailed information on repetitive loss properties and NFIP claims and policies for Scott County.

Table H.6: REPETITIVE LOSS PROPERTIES IN SCOTT COUNTY

Location	Number of Properties	Types of Properties	Number of Losses	Building Payments	Content Payments	Total Payments	Average Payment
Forest	2	1 single family, 1 non-residential	4	$15,369	$47,398	$62,767	$15,692
Lake	0	--	0	$0	$0	$0	$0
Morton	1	1 single family	2	$0	$3,072	$3,072	$1,536
Sebastopol	0	--	0	$0	$0	$0	$0
Unincorporated Area	0	--	0	$0	$0	$0	$0
SCOTT COUNTY TOTAL	**3**		**6**	**$15,369**	**$50,471**	**$65,840**	**$10,973**

Source: National Flood Insurance Program

PROBABILITY OF FUTURE OCCURRENCES

Flood events will remain a threat in Scott County, and the probability of future occurrences will remain likely (between 10 and 100 percent annual probability). The participating jurisdictions and unincorporated areas have risk to flooding, though not all areas will experience flood. The probability of future flood events based on magnitude and according to best available data is illustrated in the figures above**,** which indicates those areas susceptible to the 1-percent annual chance flood (100-year floodplain) and the 0.2-percent annual chance flood (500-year floodplain).

It can be inferred from the floodplain location maps, previous occurrences, and repetitive loss properties that risk varies throughout the county. For example, the City of Forest has more floodplain and thus a higher risk of flood than the other municipalities. Flood is not the greatest hazard of concern but will continue to occur and cause damage. Therefore, mitigation actions may be warranted, particularly for repetitive loss properties.

H.2.2 Erosion

LOCATION AND SPATIAL EXTENT

Erosion in Scott County is typically caused by flash flooding events. Unlike coastal areas, areas of concern for erosion in Scott County are primarily rivers and streams. Generally, vegetation helps to prevent erosion in the area, and it is not an extreme threat to the county. No areas of concern were reported by the hazard mitigation council.

HISTORICAL OCCURRENCES

Several sources were vetted to identify areas of erosion in Scott County. This includes searching local newspapers, interviewing local officials, and reviewing previous hazard mitigation plans. No historical erosion occurrences were found in these sources.

PROBABILITY OF FUTURE OCCURRENCES

Erosion remains a natural, dynamic, and continuous process for Scott County, and it will continue to occur. The annual probability level assigned for erosion is possible (between 1 and 10 percent annually).

H.2.3 Dam and Levee Failure

LOCATION AND SPATIAL EXTENT

According to the U.S. Army Corps of Engineers' National Inventory of Dams, there are two high hazard dams in Scott County. **Figure H.3** shows the location of this high hazard dam and **Table H.7** lists them by name.

Figure H.3: SCOTT COUNTY HIGH HAZARD DAM LOCATIONS

Source: Mississippi Department of Environmental Quality

Table H.7: SCOTT COUNTY HIGH HAZARD DAMS

Dam Name	Hazard Potential
Scott County	
ROOSEVELT STATE PARK LAKE DAM	High
HINES LAKE DAM	High

Source: Mississippi Department of Environmental Quality

HISTORICAL OCCURRENCES

There is no record of dam breaches in Scott County.

PROBABILITY OF FUTURE OCCURRENCES

Given the current dam inventory and historic data, a dam breach is possible (between 1 and 10 percent annual probability) in the future. However, as has been demonstrated in the past, regular monitoring is necessary to prevent these events.

H.2.4 Winter Storm and Freeze

LOCATION AND SPATIAL EXTENT

Nearly the entire continental United States is susceptible to winter storm and freeze events. Some ice and winter storms may be large enough to affect several states, while others might affect limited, localized areas. The degree of exposure typically depends on the normal expected severity of local winter weather. Scott County is not accustomed to severe winter weather conditions and rarely receives severe winter weather, even during the winter months. Events tend to be mild in nature; however, even relatively small accumulations of snow, ice, or other wintery precipitation can lead to losses and damage due to the fact that these events are not commonplace. Given the atmospheric nature of the hazard, the entire county has uniform exposure to a winter storm.

HISTORICAL OCCURRENCES

According to the National Centers for Environmental Information, there have been a total of 14 recorded winter storm events in Scott County since 1996 (**Table H.8**). These events resulted in over $1.3 million in damages. Detailed information on the recorded winter storm events can be found in **Table H.9**.

Table H.8: SUMMARY OF WINTER STORM EVENTS IN SCOTT COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Scott County	11	0/0	$1,220,

Source: National Centers for Environmental Information

Table H.9: HISTORICAL WINTER STORM IMPACTS IN SCOTT COUNTY

Location	Date	Type	Deaths / Injuries	Property Damage*
Forest				
None Reported	--	--	--	--
Lake				
None Reported	--	--	--	--
Morton				
None Reported	--	--	--	--
Sebastopol				
None Reported	--	--	--	--
Unincorporated Area				
SCOTT (ZONE)	2/1/1996	Ice Storm	0/0	$152,096
SCOTT (ZONE)	12/14/1997	Heavy Snow	0/0	$0
SCOTT (ZONE)	12/22/1998	Ice Storm	0/0	$14,640
SCOTT (ZONE)	1/27/2000	Ice Storm	0/0	$13,858
SCOTT (ZONE)	12/11/2008	Heavy Snow	0/0	$27,710
SCOTT (ZONE)	2/11/2010	Heavy Snow	0/0	$547,194
SCOTT (ZONE)	1/9/2011	Ice Storm	0/0	$26,523
SCOTT (ZONE)	2/3/2011	Ice Storm	0/0	$424,360
SCOTT (ZONE)	2/9/2011	Heavy Snow	0/0	$106,090
SCOTT (ZONE)	1/16/2013	Heavy Snow	0/0	$0
SCOTT (ZONE)	1/28/2014	Heavy Snow	0/0	$0
SCOTT (ZONE)	12/08/2017	Heavy Snow	0/0	$0
SCOTT (ZONE)	01/10/2021	Heavy Snow	0/0	$0
SCOTT (ZONE)	02/17/2021	Ice Storm	0/0	$50,000

Source: National Centers for Environmental Information

There have been several severe winter weather events in Scott County. The text below describes one of the major events and associated impacts on the county. Similar impacts can be expected with severe winter weather.

December 1998

Central Mississippi was hit by a crippling ice storm. Up to 2 inches of ice accumulated on power lines and much of the region experienced long power outages, nearly seven days in some cases. The ice caused numerous power outages and brought down many trees and power lines. Christmas travel was severely hampered for several days with motorists stranded at airports, bus stations, and truck stops. Travel did not return to normal until after Christmas in some locations.

Winter storms throughout the planning area have several negative externalities including hypothermia, cost of snow and debris cleanup, business and government service interruption, traffic accidents, and power outages. Furthermore, citizens may resort to using inappropriate heating devices that could to fire or an accumulation of toxic fumes.

PROBABILITY OF FUTURE OCCURRENCES

Winter storm events will continue to occur in Scott County. According to historical information, the annual probability is likely (between 10 and 100 percent).

FIRE-RELATED HAZARDS

H.2.5 Drought / Heat Wave

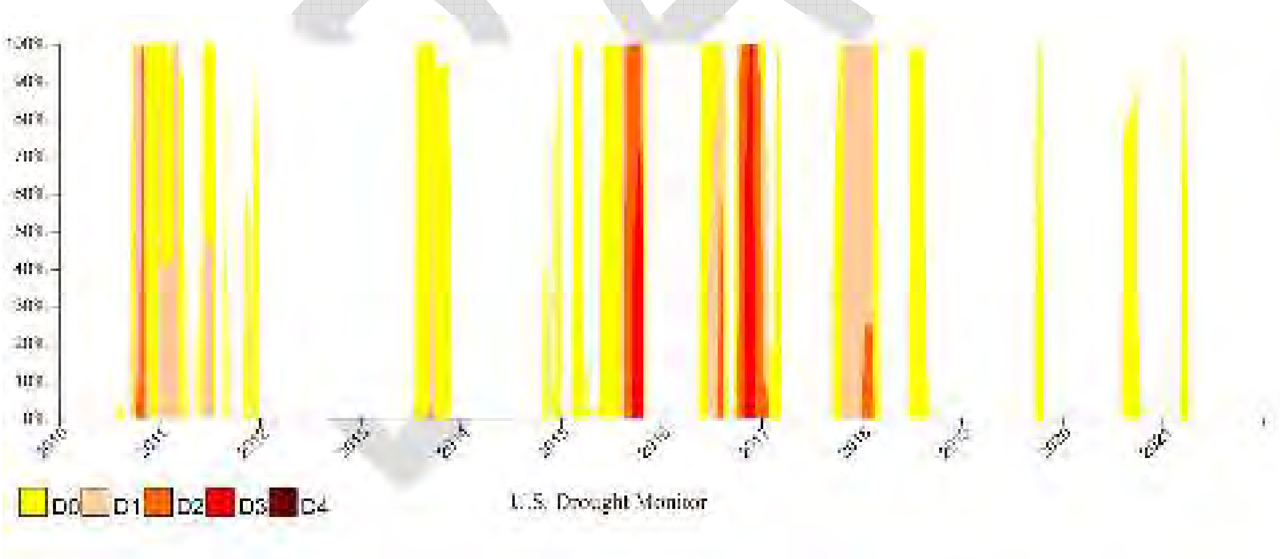
Drought
Drought typically covers a large area and cannot be confined to any geographic or political boundaries. Furthermore, it is assumed that Scott County would be uniformly exposed to drought, making the spatial extent potentially widespread. It is also notable that drought conditions typically do not cause significant damage to the built environment but may exacerbate wildfire conditions.

Heat Wave
Heat waves typically impact a large area and cannot be confined to any geographic or political boundaries.

HISTORICAL OCCURRENCES

Drought
Table H.11 shows the most severe drought classification for each year, according to U.S. Drought Monitor classifications. It should be noted that the U.S. Drought Monitor also estimates what percentage of the county is in each classification of drought severity. For example, the most severe classification reported may be exceptional but a majority of the county may actually be in a less severe condition.

Table H.10: HISTORICAL DROUGHT OCCURRENCES IN SCOTT COUNTY



Source: United States Drought Monitor

Some additional anecdotal information was provided from the National Centers for Environmental Information on droughts in Scott County.

Summer 2006 – During a four-and-a-half-month period, from June to the middle of October, abnormally dry conditions prevailed across most of Jackson, MS County Warning Area (CWA). The drought had a significant impact on the agricultural industry. Non-irrigated crops were destroyed and all other sustainable crops produced a below normal yield. Catfish ponds were drawn down to severe levels and required water to be pumped back into the fish ponds. The cattle industry suffered due to low watering ponds and lack of sufficient grasslands for grazing and hay production. Water supply problems were encountered by those cities who obtained water from local rivers for drinking purposes due to the low river flows. Fire threat was significant causing the issuance of burn bans across the CWA.

Summer 2007 – By the middle of April, drought conditions were being experienced across a large portion of Eastern and some of Central Mississippi. During the month of May, the drought worsened and expanded. In June, the drought peaked across the region. Although drought conditions continued throughout July and August, conditions were less severe than earlier in the summer. As a result of these conditions, area farmers and crop yields were affected.

October 2010 – Very dry conditions continued across central Mississippi during most of October. Crops were put under stress under the warm and dry conditions. The likely impact was less crop yields for harvest time.

Heat Wave
The National Centers for Environmental Information was used to determine historical heat wave occurrences in the county.

July 2005 – A five-day heat wave occurred across the region. Heat index values reached near 110 degrees each day. Each day had high temperatures ranging from 95 to 99 degrees. This was the warmest stretch of weather the area experienced since July 2001.

August 2005 –A heat wave covering the south began in mid-August and lasted about 10 days. High temperatures were consistently over 95 degrees and surpassed 100 degrees or more on some days. It was the first time since August 2000 that 100-degree temperatures reached the area.

July 2006 – A short heat wave impacted most of the area temperatures in the 90s to around 100 for five straight days.

August 2007 – A heat wave gripped most of the area with the warmest temperatures since 2000. It lasted from August 5th to the 16th.

August 2010 – The combination of high humidity and above normal temperatures produced heat index readings ranged between 105 and 109 degrees during the afternoon hours in the middle part of August.

PROBABILITY OF FUTURE OCCURRENCES

Drought
Based on historical occurrence information, it is assumed that Scott County has a probability level of likely (between 10 and 100 percent annual probability) for future drought events. However, the extent (or

magnitude) of drought and the amount of geographic area covered by drought, varies with each year.

Historic information indicates that there is a much lower probability for extreme, long-lasting drought conditions.

Heat Wave
Based on historical occurrence information, it is assumed that all of Scott County has a probability level of likely (between 10 and 100 percent annual probability) for future heat wave events.

H.2.6 Wildfire

LOCATION AND SPATIAL EXTENT

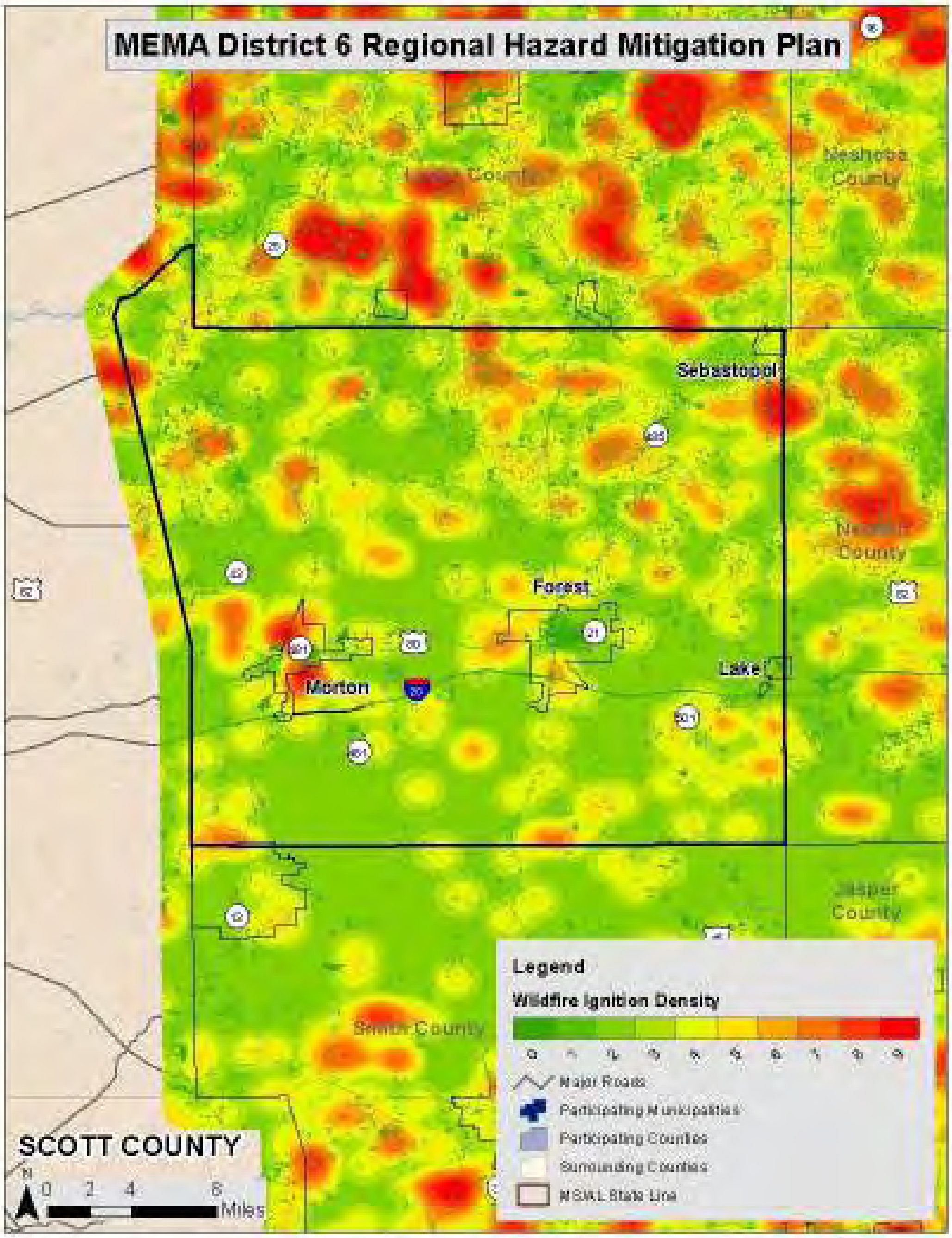
The entire county is at risk to a wildfire occurrence. However, several factors such as drought conditions or high levels of fuel on the forest floor, may make a wildfire more likely. Furthermore, areas in the urban-wildland interface are particularly susceptible to fire hazard as populations abut formerly undeveloped areas. The Wildfire Ignition Density data shown in the figure below give an indication of historic location.

HISTORICAL OCCURRENCES

Figure H.4 shows the Wildfire Ignition Density in Scott County based on data from the Southern Wildfire Risk Assessment. This data is based on historical fire ignitions and the likelihood of a wildfire igniting in an area. Occurrence is derived by modeling historic wildfire ignition locations to create an average ignition rate map. This is measured in the number of fires per year per 1,000 acres.

[8] Southern Wildfire Risk Assessment, 2014.

Figure H.4: WILDFIRE IGNITION DENSITY IN SCOTT COUNTY



Source: Southern Wildfire Risk Assessment

Based on data from the Mississippi Forestry Commission from 2015 to 2020, Scott County experiences an average of 14 wildfires annually which burn an average of 212 acres per year. The data indicates that most of these fires are small, averaging 15 acres per fire. **Table H.12** provides a summary of wildfire occurrences in Scott County and **Table H.13** lists the number of reported wildfire occurrences in the county between the years 2011 and 2020.

Table H.11: SUMMARY TABLE OF ANNUAL WILDFIRE OCCURRENCES (2015-2020)

	Scott County
Average Number of Fires per year	14
Average Number of Acres Burned per year	212
Average Number of Acres Burned per fire	15

*These values reflect averages over a 6-year period.
Source: Mississippi Forestry Commission

Table H.12: HISTORICAL WILDFIRE OCCURRENCES IN SCOTT COUNTY

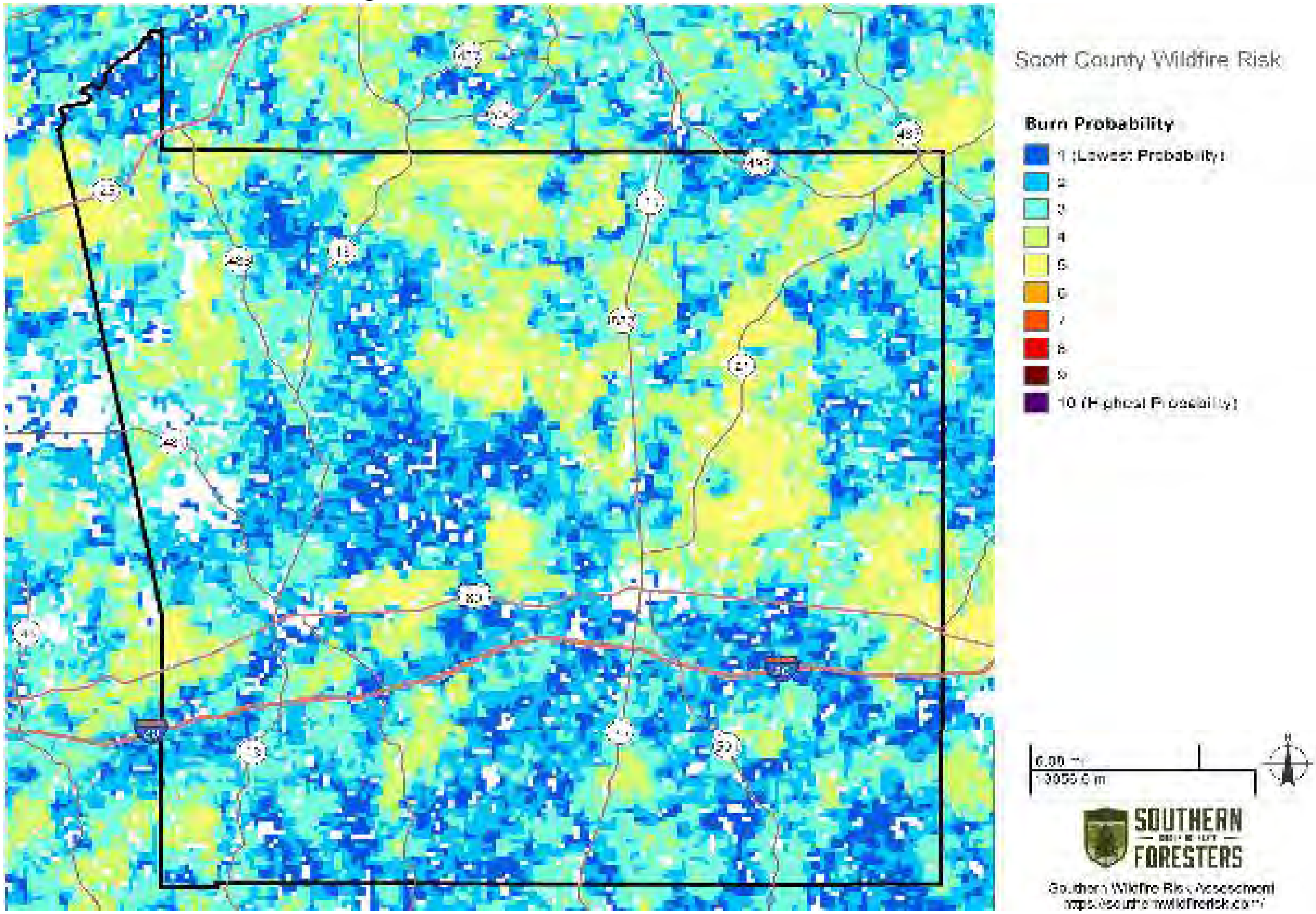
Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Scott County										
Number of Fires	24	9	10	15	20	29	18	9	6	7
Number of Acres Burned	175	31	58	119	523	210	180	43	229	92

Source: Mississippi Forestry Commission

PROBABILITY OF FUTURE OCCURRENCES

Wildfire events will be an ongoing occurrence in Scott County. **Figure H.5** shows that there is some probability a wildfire will occur throughout the county. However, the likelihood of wildfires increases during drought cycles and abnormally dry conditions. Fires are likely to stay small in size but could increase due to local climate and ground conditions. Dry, windy conditions with an accumulation of forest floor fuel (potentially due to ice storms or lack of fire) could create conditions for a large fire that spreads quickly. It should also be noted that some areas do vary somewhat in risk. For example, highly developed areas are less susceptible unless they are located near the urban-wildland boundary. The risk will also vary due to assets. Areas in the urban-wildland interface will have much more property at risk, resulting in increased vulnerability and need to mitigate compared to rural, mainly forested areas. The probability assigned to Scott County for future wildfire events is highly likely (100 percent annual probability).

Figure H.5: BURN PROBABILITY IN SCOTT COUNTY



Source: Southern Wildfire Risk Assessment

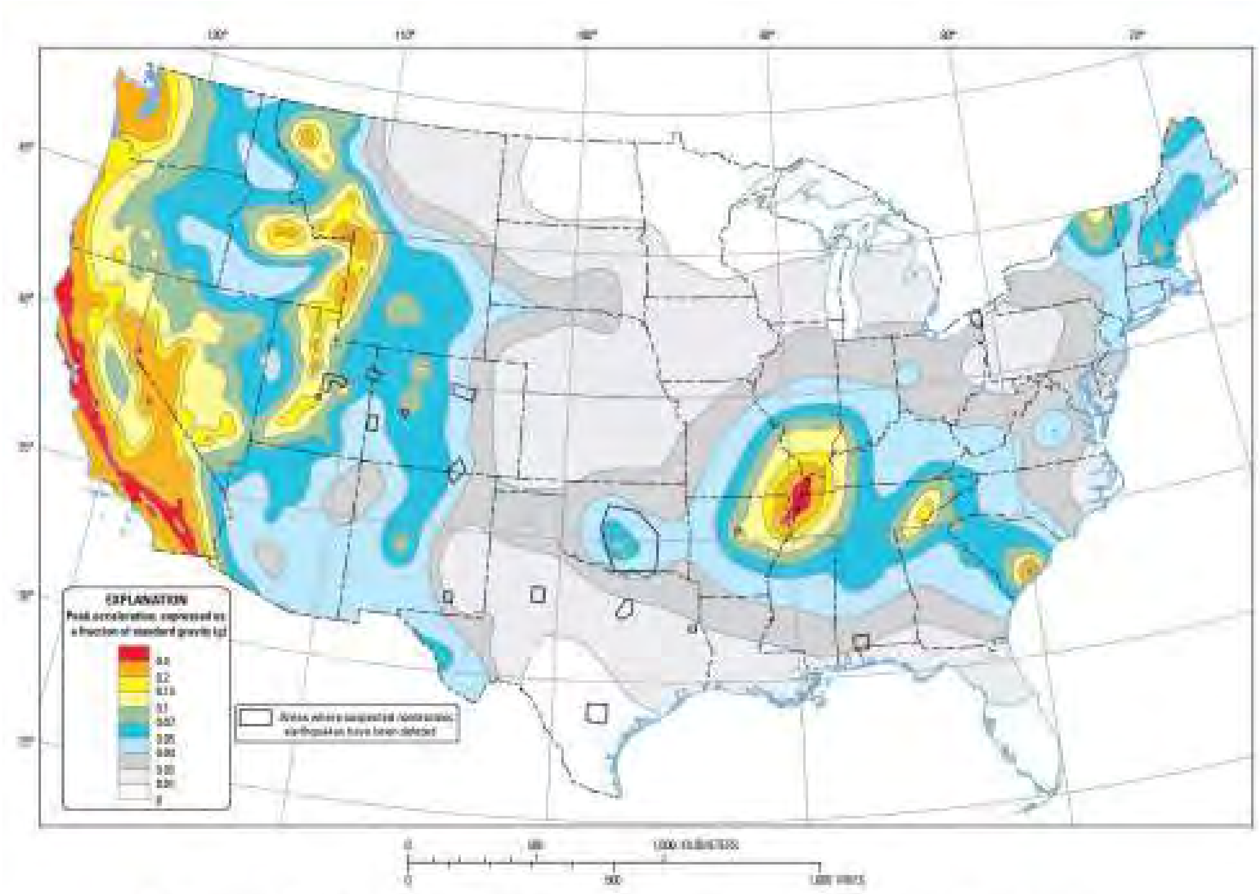
GEOLOGIC HAZARDS

H.2.7 Earthquake

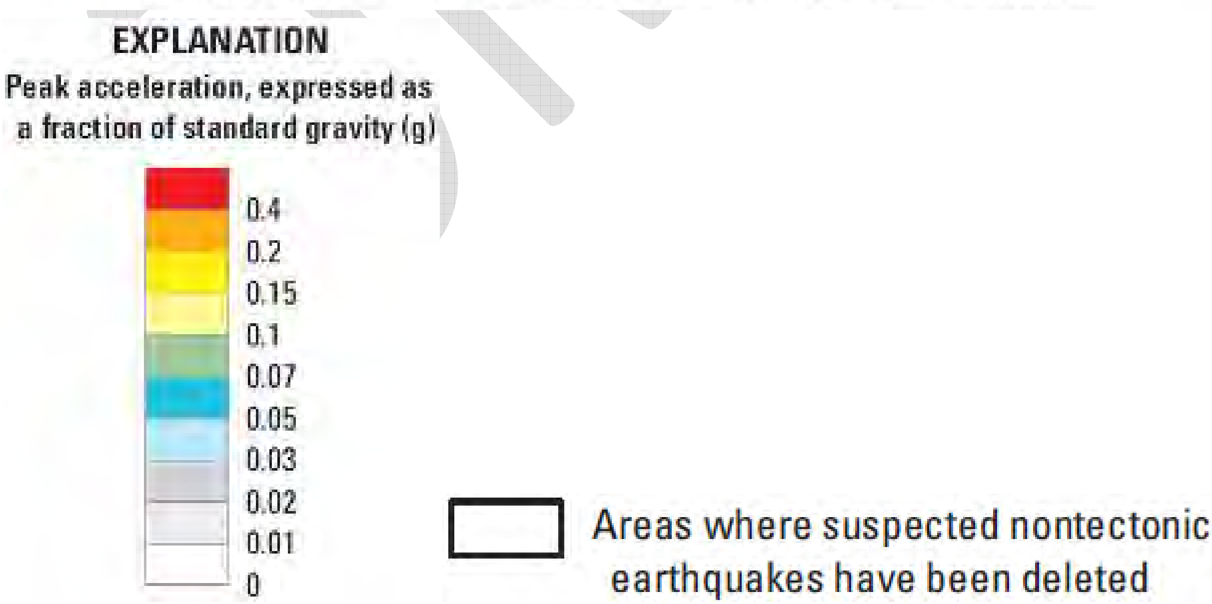
LOCATION AND SPATIAL EXTENT

Figure H.6 shows the intensity level associated with Scott County, based on the national USGS map of peak acceleration with 10 percent probability of exceedance in 50 years. It is the probability that ground motion will reach a certain level during an earthquake. The data show peak horizontal ground acceleration (the fastest measured change in speed, for a particle at ground level that is moving horizontally due to an earthquake) with a 10 percent probability of exceedance in 50 years. The map was compiled by the U.S. Geological Survey (USGS) Geologic Hazards Team, which conducts global investigations of earthquake, geomagnetic, and landslide hazards. According to this map, Scott County lies within an approximate zone of level "2" to "5" ground acceleration. This indicates that the county exists within an area of moderate seismic risk.

Figure H.6: PEAK ACCELERATION WITH 10 PERCENT PROBABILITY OF EXCEEDANCE IN 50 YEARS



Ten-percent probability of exceedance in 50 years map of peak ground acceleration



Source: United States Geological Survey, 2014

HISTORICAL OCCURRENCES

No earthquakes are known to have affected Scott County since 1638. **Table H.13** provides a summary of earthquake events reported by the National Geophysical Data Center between 1638 and 1985. **Table H.14** presents a detailed occurrence of each event including the date, distance for the epicenter, magnitude and Modified Mercalli Intensity (if known).[2]

Table H.13: SUMMARY OF SEISMIC ACTIVITY IN SCOTT COUNTY

Location	Number of Occurrences	Greatest MMI Reported	Richter Scale Equivalent
Forest	0	--	--
Lake	0	--	--
Morton	0	--	--
Sebastopol	0	--	--
Unincorporated Area	0	--	--
SCOTT COUNTY TOTAL	**0**	**--**	**--**

Source: National Geophysical Data Center

Table H.14: SIGNIFICANT SEISMIC EVENTS IN SCOTT COUNTY (1638 -1985)

Location	Date	Epicentral Distance	Magnitude	MMI
Forest				
None Reported	--	--	--	--
Lake				
None Reported	--	--	--	--
Morton				
None Reported	--	--	--	--
Sebastopol				
None Reported	--	--	--	--
Unincorporated Area				
None Reported	--	--	--	--

Source: National Geophysical Data Center

PROBABILITY OF FUTURE OCCURRENCES

The probability of significant, damaging earthquake events affecting Scott County is unlikely. However, it is possible that future earthquakes resulting in light to moderate perceived shaking and damages ranging from none to very light will affect the county. The annual probability level for the county is estimated to be between 1 and 10 percent (possible).

[2] Due to reporting mechanisms, not all earthquake events were recorded during this time. Furthermore, some are missing data, such as the epicenter location, due to a lack of widely used technology. In these instances, a value of "unknown" is reported.

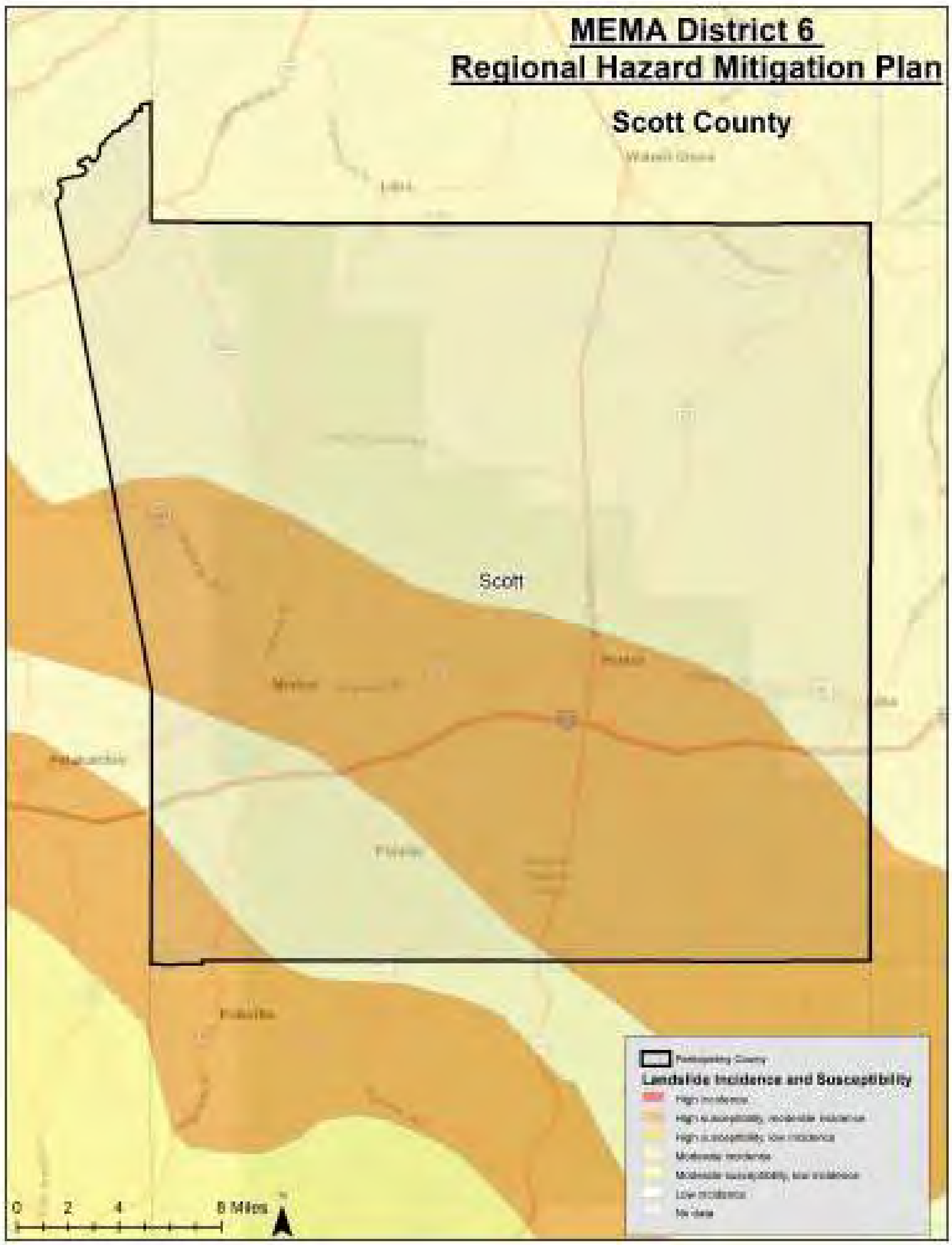
H.2.8 Landslide

LOCATION AND SPATIAL EXTENT

Landslides occur along steep slopes when the pull of gravity can no longer be resisted (often due to heavy rain). Human development can also exacerbate risk by building on previously undevelopable steep slopes. Landslides are possible throughout Scott County, though the risk is relatively low.

According to **Figure H.7** below, the majority of the county falls under a low incidence area. This indicates that less than 1.5 percent of the area is involved in landsliding. There are also some areas in the southwestern half of the county that are moderate incidence areas. This indicates that between 1.5 and 10 percent of the area is involved in landsliding.

Figure H.7: LANDSLIDE SUSCEPTIBILITY AND INCIDENCE MAP OF SCOTT COUNTY



Source: United States Geological Survey

HISTORICAL OCCURRENCES

There is no extensive history of landslides in Scott County. Landslide events typically occur in isolated areas.

PROBABILITY OF FUTURE OCCURRENCES

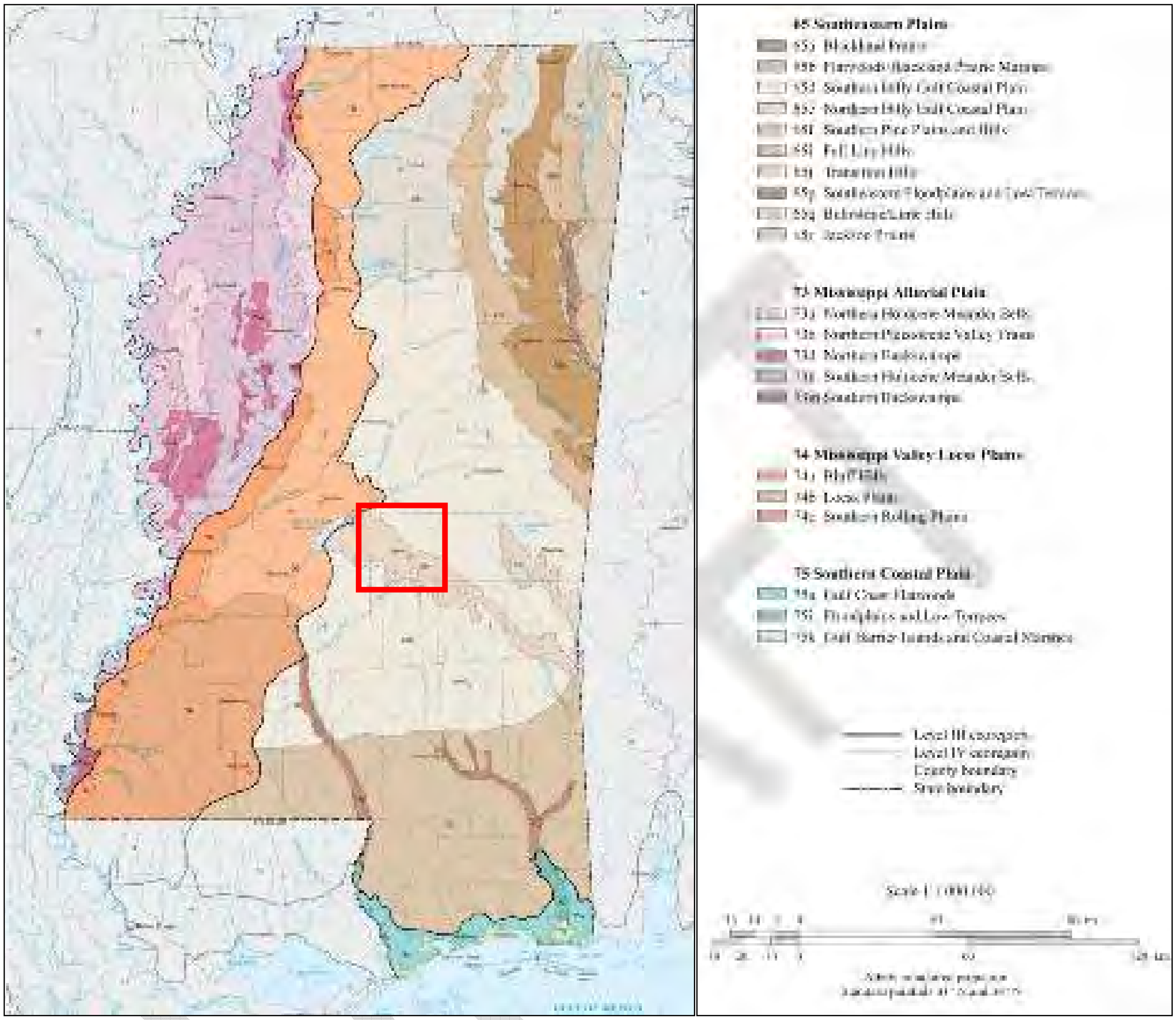
Based on historical information and the USGS susceptibility index, the probability of future landslide events is unlikely (less than 1 percent probability). The USGS data indicates that most areas in Scott County have a low incidence rate and low susceptibly to landsliding activity. There are also some areas in the southwestern half of the county with moderate incidence and high susceptibility. Local conditions may become more favorable for landslides due to heavy rain, for example. This would increase the likelihood of occurrence. It should also be noted that some areas in Scott County have greater risk than others given factors such as steepness on slope and modification of slopes.

H.2.9 Land Subsidence

LOCATION AND SPATIAL EXTENT

Much of Scott County is located in an area where the soil is substantially clay, causing a shrink and swell effect depending on the current conditions. Indeed, much of the area underlain by the calcareous Yazoo clay which, when combined with sand and marl, is highly susceptible to expansion when wet and shrinking when dry. These areas are denoted below in **Figure H.8**.

Figure H.8: MAP OF MISSISSIPPI SOILS



Source: http://www.eoearth.org/view/article/152119/

HISTORICAL OCCURRENCES

There is no significant historical record of land subsidence in Scott County. However, local county officials have noted the impacts from these swings and changes in soil as roads and other infrastructure have experienced large cracks and breaks, causing stops in daily operations and significant costs to local, state, and federal budgets. Often the cost to repair this infrastructure can be in the range of millions of dollars depending on the degree of damage and necessity for quick repairs.

PROBABILITY OF FUTURE OCCURRENCES

The probability of future land subsidence events in the county is unlikely (less than 1 percent annual probability).

WIND-RELATED HAZARDS

H.2.10 Hurricane and Tropical Storm

LOCATION AND SPATIAL EXTENT

Hurricanes and tropical storms threaten the entire Atlantic and Gulf seaboard of the United States. While coastal areas are most directly exposed to the brunt of landfalling storms, their impact is often felt hundreds of miles inland and they can affect Scott County. All areas in Scott County are equally susceptible to hurricane and tropical storms.

HISTORICAL OCCURRENCES

According to the National Hurricane Center's historical storm track records, 58 hurricane or tropical storm/depression tracks have passed within 75 miles of the MEMA District 6 Region since 1855. This includes: 1 Category 3 hurricane, 2 Category 2 hurricanes, 5 Category 1 hurricanes, 33 tropical storms, and 17 tropical depressions.

Of the recorded storm events, 35 hurricane or tropical storm/depression events traversed directly through the region as shown in **Figure H.9**. Notable storms include Hurricane Frederic (1979) and Hurricane Katrina (2005). **Table H.16** provides for each event the date of occurrence, name (if applicable), maximum wind speed (as recorded within 75 miles of the MEMA District 6 Region) and category of the storm based on the Saffir-Simpson Scale.

Figure H.9: HISTORICAL HURRICANE STORM TRACKS 1980 - 2020

Source: National Oceanic and Atmospheric Administration, National Hurricane Center

Table H.15: HISTORICAL STORM TRACKS WITHIN 75 MILES OF THE MEMA 6 DISTRICT REGION (1850–2020)

Date of Occurrence	Storm Name	Maximum Wind Speed (knots)	Storm Category
9/16/1855	UNNAMED	70	Category 1
9/15/1860	UNNAMED	70	Category 1
7/12/1872	UNNAMED	40	Tropical Storm
9/2/1879	UNNAMED	60	Tropical Storm
10/7/1879	UNNAMED	40	Tropical Storm
10/16/1879	UNNAMED	40	Tropical Storm
9/1/1880	UNNAMED	50	Tropical Storm
8/3/1881	UNNAMED	40	Tropical Storm
6/14/1887	UNNAMED	30	Tropical Depression
8/28/1890	UNNAMED	35	Tropical Storm
9/12/1892	UNNAMED	40	Tropical Storm
9/8/1893	UNNAMED	55	Tropical Storm
8/17/1895	UNNAMED	35	Tropical Storm
8/3/1898	UNNAMED	35	Tropical Storm
8/16/1901	UNNAMED	45	Tropical Storm
10/10/1905	UNNAMED	35	Tropical Storm
9/27/1906	UNNAMED	95	Category 2
9/22/1907	UNNAMED	35	Tropical Storm
6/13/1912	UNNAMED	50	Tropical Storm
7/17/1912	UNNAMED	25	Tropical Depression
9/14/1912	UNNAMED	50	Tropical Storm
9/30/1915	UNNAMED	60	Tropical Storm
7/6/1916	UNNAMED	80	Category 1
7/5/1919	UNNAMED	30	Tropical Depression
10/18/1923	UNNAMED	50	Tropical Storm
7/30/1926	UNNAMED	25	Tropical Depression
9/1/1932	UNNAMED	60	Tropical Storm
10/16/1932	UNNAMED	45	Tropical Storm
8/1/1936	UNNAMED	40	Tropical Storm
9/1/1937	UNNAMED	30	Tropical Depression
6/16/1939	UNNAMED	35	Tropical Storm
8/14/1939	UNNAMED	35	Tropical Storm
9/26/1939	UNNAMED	40	Tropical Storm
9/25/1940	UNNAMED	20	Tropical Depression
9/4/1948	UNNAMED	50	Tropical Storm
9/5/1949	UNNAMED	40	Tropical Storm
8/31/1950	BAKER	65	Category 1
6/1/1959	ARLENE	25	Tropical Depression
9/16/1960	ETHEL	35	Tropical Storm
9/26/1960	FLORENCE	15	Tropical Depression

Date of Occurrence	Storm Name	Maximum Wind Speed (knots)	Storm Category
8/18/1969	CAMILLE	100	Category 3
9/16/1971	EDITH	60	Tropical Storm
7/19/1977	UNNAMED	25	Tropical Depression
9/6/1977	BABE	30	Tropical Depression
7/11/1979	BOB	40	Tropical Storm
9/13/1979	FREDERIC	95	Category 2
8/12/1987	UNNAMED	25	Tropical Depression
8/27/1992	ANDREW	30	Tropical Depression
8/4/1995	ERIN	45	Tropical Storm
8/6/2001	BARRY	20	Tropical Depression
9/26/2002	ISIDORE	55	Tropical Storm
7/1/2003	BILL	45	Tropical Storm
7/11/2005	DENNIS	45	Tropical Storm
8/29/2005	KATRINA	80	Category 1
9/14/2007	HUMBERTO	20	Tropical Depression
8/24/2008	FAY	30	Tropical Depression
8/17/2009	CLAUDETTE	25	Tropical Depression
10/28/2020	Zeta	33	Tropical Depression

*It should be noted that the track of several major hurricanes that impacted the region fell outside of the 75-mile buffer. These storms were included in the table due to their significant impact. (Georges, 1988; Ivan, 2004; Issac, 2012)
Source: National Hurricane Center

Federal records indicate that disaster declarations were made in 2004 (Hurricane Ivan), 2005 (Hurricane Dennis and Hurricane Katrina), and 2012 (Hurricane Issac). Hurricane and tropical storm events can cause substantial damage in the area due to high winds and flooding.

Flooding and high winds from hurricanes and tropical storms can cause damage throughout the county. Anecdotes are available from NCEI for the major storms that have impacted the county as found below:

Tropical Storm Isidore – September 26, 2002
The heavy rainfall associated with Tropical Storm Isidore resulted in significant river and flash flooding across much of Mississippi. Twenty-four-hour rainfall totals between 5 and 10 inches were common over much of Mississippi, especially in the southern part of the state, where 24-hour amounts exceeded 9 inches near Hattiesburg. Gradient wind gusts between 35 and 45 miles per hour combined with the saturated ground to lead to numerous downed trees and powerlines over the state. Most of the damage was seen along and east of the Natchez Trace, near the path of the storm's diffuse center. One indirect fatality was reported just east of the Kalem community in Scott County. Here, a falling tree struck a truck driven by a 31-year-old male. Damage from Isidore was an estimated $500,000.

Hurricane Katrina – August 29, 2005
Hurricane Katrina will likely go down as the worst and costliest natural disaster in United States history. The amount of destruction, the cost of damaged property/agriculture and the large loss of life across the affected region has been overwhelming. Catastrophic damage was widespread across a large portion of

the Gulf Coast region. The devastation was not only confined to the coastal region, widespread and significant damage occurred well inland up to the Hattiesburg area and northward past Interstate 20.

Hurricane force winds were common across Central Mississippi. The region received sustained winds of 60-80 mph with gusts ranging from 80-120 mph. Wind damage to structures was widespread, with roofs blown off or partially peeled. Hundreds of signs were shredded or blown down. Many businesses sustained structural damage as windows were broken, roofs were blown off, and walls were collapsed. Millions of trees were uprooted and snapped. Power poles and lines were snapped and taken down from wind and trees. It was thousands of downed trees which caused the most significant structural damage as these trees fell onto homes and businesses. Power outages lasted from a few days to as long as four weeks. Agriculture and timber industries were severely impacted. Row crops, including cotton, rice, corn, and soybeans, took a hard hit. Other impacted industries were the catfish industry, dairy and cattle industry, and nursery businesses.

PROBABILITY OF FUTURE OCCURRENCES

Given the inland location of the county, it is more likely to be affected by remnants of hurricane and tropical storm systems (as opposed to a major hurricane) which may result in flooding or high winds. The probability of being impacted is less than coastal areas, but still remains a real threat to Scott County due to induced events like flooding. Based on historical evidence, the probability level of future occurrence is likely (annual probability between 10 and 100 percent). Given the regional nature of the hazard, all areas in the county are equally exposed to this hazard. However, when the county is impacted, the damage could be catastrophic, threatening lives and property throughout the planning area.

H.2.11 Thunderstorm (wind, hail, lightning)

LOCATION AND SPATIAL EXTENT

Thunderstorm / High Wind
A thunderstorm event is an atmospheric hazard, and thus has no geographic boundaries. It is typically a widespread event that can occur in all regions of the United States. However, thunderstorms are most common in the central and southern states because atmospheric conditions in those regions are favorable for generating these powerful storms. It is assumed that Scott County has uniform exposure to an event and the spatial extent of an impact could be large.

Hailstorm
Hailstorms frequently accompany thunderstorms, so their locations and spatial extents coincide. It is assumed that Scott County is uniformly exposed to severe thunderstorms; therefore, all areas of the county are equally exposed to hail which may be produced by such storms.

Lightning
Lightning occurs randomly, therefore it is impossible to predict where and with what frequency it will strike. It is assumed that all of Scott County is uniformly exposed to lightning.

HISTORICAL OCCURRENCES

Thunderstorm / High Wind

Severe storms were at least partially responsible for seven disaster declarations in Scott County in 1979, 1992, twice in 2001, 2003, 2011, and 2019. According to NCEI, there have been 258 reported thunderstorm and high wind events since 1963 in Scott County. These events caused almost $11.94 million in damages. There were also reports of two injuries. **Table H.16** summarizes this information.

Table H.16: SUMMARY OF THUNDERSTORM / HIGH WIND OCCURRENCES IN SCOTT COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Forest	45	0/0	$530,500
Lake	13	0/0	$561,000
Morton	35	0/0	$1,779,500
Sebastopol	6	0/0	$1,052,000
Unincorporated Area	130	0/2	$8,020,500
SCOTT COUNTY TOTAL	**258**	**0/2**	**$11,943,500**

Source: National Centers for Environmental Information

Hailstorm

According to the National Centers for Environmental Information, 91 recorded hailstorm events have affected Scott County since 1962. **Table H.17** is a summary of the hail events in Scott County. In all, hail occurrences resulted in approximately $5.6 million in property damages. Hail ranged in diameter from 0.75 inches to 2.0 inches. It should be noted that hail is notorious for causing substantial damage to cars, roofs, and other areas of the built environment that may not be reported to the National Centers for Environmental Information. Therefore, it is likely that damages are greater than the reported value.

Table H.17: SUMMARY OF HAIL OCCURRENCES IN SCOTT COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage (2015)
Forest	20	0/0	$7,782
Lake	4	0/0	$0
Morton	13	0/0	$5,269,858
Sebastopol	2	0/0	$9,432
Unincorporated Area	52	0/0	$315,226
SCOTT COUNTY TOTAL	**91**	**0/0**	**$5,602,298**

Source: National Centers for Environmental Information

Lightning

According to the National Centers for Environmental Information, there have been two recorded lightning events in Scott County since 1998. These events resulted in almost $208,000 in damages, as listed in summary **Table H.18**. Detailed information on historical lightning events can be found in **Table H.19**.

It is certain that more than two events have impacted the county. Many of the reported events are those that cause damage, and it should be expected that damages are likely much higher for this hazard than what is reported.

Table H.18: SUMMARY OF LIGHTNING OCCURRENCES IN SCOTT COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage (2015)
Forest	0	0/0	$0
Lake	0	0/0	$0
Morton	2	0/0	$207,582
Sebastopol	0	0/0	$0
Unincorporated Area	0	0/0	$0
SCOTT COUNTY TOTAL	**2**	**0/0**	**$207,582**

Source: National Centers for Environmental Information

Table H.19: HISTORICAL LIGHTNING OCCURRENCES IN SCOTT COUNTY

Location	Date	Deaths / Injuries	Property Damage*	Details
Forest				
None Reported	--	--	--	--
Lake				
None Reported	--	--	--	--
Morton				
MORTON	5/29/1998	0/0	$146,404	Lightning struck a clothing store and started it on fire. The building was a total loss.
MORTON	8/20/2009	0/0	$61,179	Lightning struck a house just south of Morton and caused a fire which burned the entire house.
Sebastopol				
None Reported	--	--	--	--
Unincorporated Area				
None Reported	--	--	--	--

Source: National Centers for Environmental Information

PROBABILITY OF FUTURE OCCURRENCES

Thunderstorm / High Wind

Given the high number of previous events, it is certain that thunderstorm events, including straight-line wind events, will occur in the future. This results in a probability level of highly likely (100 percent annual probability) for the entire county.

Hailstorm

Based on historical occurrence information, it is assumed that the probability of future hail occurrences is highly likely (100 percent annual probability). Since hail is an atmospheric hazard, it is assumed that Scott County has equal exposure to this hazard. It can be expected that future hail events will continue to cause minor damage to property and vehicles throughout the county.

Lightning

Although there was not a high number of historical lightning events reported in Scott County via NCEI data, it is a regular occurrence accompanied by thunderstorms. In fact, lightning events will assuredly happen on an annual basis, though not all events will cause damage. According to Vaisala's U.S. National Lightning Detection Network (NLDN), Scott County is located in an area of the country that experienced an average of 4 to 6 cloud-to-ground lightning flashes per square kilometer per year between 2015 and 2019.[3] Therefore, the probability of future events is highly likely (100 percent annual probability). It can be expected that future lightning events will continue to threaten life and cause minor property damages throughout the county.

[3] Vaisala's Annual Lightning Report – 2020. Retrieved on 9.8.2021 from: https://www.vaisala.com/sites/default/files/documents/WEA-MET-Annual-Lightning-Report-2020-B212260EN-A.pdf

H.2.12 Tornado

LOCATION AND SPATIAL EXTENT

Tornadoes occur throughout the state of Mississippi, and thus in Scott County. Tornadoes typically impact a relatively small area, but damage may be extensive. Event locations are completely random and it is not possible to predict specific areas that are more susceptible to tornado strikes over time. Therefore, it is assumed that Scott County is uniformly exposed to this hazard. With that in mind, **Figure H.10** shows tornado track data for many of the major tornado events that have impacted the county. While no definitive pattern emerges from this data, some areas that have been impacted in the past may be potentially more susceptible in the future.

Figure H.10: HISTORICAL TORNADO TRACKS IN SCOTT COUNTY

Source: National Weather Service Storm Prediction Center

HISTORICAL OCCURRENCES

Tornadoes were at least partially responsible for six disaster declarations in Scott County in 1979, 1992, twice in 2001, 2003, and 2011. According to the National Centers for Environmental Information, there have been a total of 53 recorded tornado events in Scott County since 1954 (**Table H.20**), resulting in over $10 million in property damages. In addition, 2 fatalities and 20 injuries were reported. The magnitude of these tornadoes ranges from F0 to F4 and EF0 to EF3 in intensity, although an EF5 event is possible.

Table H.20: SUMMARY OF TORNADO OCCURRENCES IN SCOTT COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Forest	4	0/3	$748,000
Lake	1	0/0	$1,200,000
Morton	4	0/0	$505,000
Sebastopol	0	0/0	$0
Unincorporated Area	44	2/17	$13,099,152
SCOTT COUNTY TOTAL	**53**	**2/20**	**$10,048,000**

Source: National Centers for Environmental Information

PROBABILITY OF FUTURE OCCURRENCES

According to historical information, tornado events pose a significant threat to Scott County. The probability of future tornado occurrences affecting Scott County is likely (between 10 and 100 percent annual probability).

H.2.13 Hazardous Materials Incidents

LOCATION AND SPATIAL EXTENT

Scott County has seven TRI sites. These sites are shown in **Figure H.11.**

Figure H.11: TOXIC RELEASE INVENTORY (TRI) SITES IN SCOTT COUNTY

Source: Environmental Protection Agency

In additional to “fixed” hazardous materials locations, hazardous materials may also impact the county via roadways and rail. Many roads in the county are subject to hazardous materials transport and all roads that permit hazardous material transport are considered potentially at risk to an incident.

HISTORICAL OCCURRENCES

There have been a total of 15 recorded HAZMAT incidents in Scott County since 1976 (**Table H.25**). These events resulted in almost $2 million in damage and remediation costs as well as one injury. **Table H.22** presents detailed information on historic HAZMAT incidents in Scott County as reported by the U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA).

Table H.21: SUMMARY OF HAZMAT INCIDENTS IN SCOTT COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage (2015)
Forest	8	0/0	$65,508
Lake	1	0/0	$287,290
Morton	5	0/0	$1,916,620
Sebastopol	1	0/1	$0
Unincorporated Area	0	0/0	$0
SCOTT COUNTY TOTAL	**15**	**0/1**	**$2,269,418**

Source: United States Department of Transportation Pipeline and Hazardous Materials Safety Administration

Table H.22: HAZMAT INCIDENTS IN SCOTT COUNTY

Report Number	Date	City	Mode	Serious Incident?	Fatalities/ Injuries	Damages ($)*	Quantity Released
Forest							
I-1976050777	5/5/1976	FOREST	Highway	Yes	0/0	$0	3,894 LGA
I-1985020197	1/23/1985	FOREST	Highway	Yes	0/0	$0	1,500 LGA
I-1988070577	7/18/1988	FOREST	Highway	Yes	0/0	$0	716 LGA
I-2001040502	1/12/1999	FOREST	Highway	No	0/0	$0	20 LGA
I-2002020444	5/25/2001	FOREST	Highway	No	0/0	$4,851	20 LGA
I-2001081106	8/3/2001	FOREST	Highway	No	0/0	$0	0.125 LGA
I-2010010579	1/29/2009	FOREST	Highway	Yes	0/0	$55,617	25 LGA
E-2014040392	4/15/2014	FOREST	Highway	No	0/0	$5,040	2 LGA
Lake							
E-2015030296	12/15/2014	LAKE	Highway	Yes	0/0	$287,290	1,100 LGA
Morton							
I-1983050205	4/20/1983	MORTON	Highway	No	0/0	$0	29 LGA
I-1983050205	4/20/1983	MORTON	Highway	No	0/0	$0	0
I-1995050311	4/19/1995	MORTON	Highway	Yes	0/0	$1,916,620	450 LGA
I-1997060088	5/9/1997	MORTON	Highway	No	0/0	$0	5 LGA
E-2015100419	9/29/2015	MORTON	Highway	No	0/0	$2,000	5 LGA
Sebastopol							
I-1977020686	2/9/1977	SEBASTOPOL	Railway	Yes	0/1	$0	6,133 LGA
Unincorporated Area							
None Reported	--	--	--	--	--	--	--

Source: United States Department of Transportation Pipeline and Hazardous Materials Safety Administration

PROBABILITY OF FUTURE OCCURRENCES

Given the location of seven toxic release inventory sites in Scott County and prior roadway and railway incidents, it is likely (between 10 and 100 percent annual probability) that a hazardous material incident may occur in the county. County and town officials are mindful of this possibility and take precautions to prevent such an event from occurring. Furthermore, there are detailed plans in place to respond to an occurrence.

H.2.14 Pandemic

LOCATION AND SPATIAL EXTENT

Pandemics are global in nature. However, they may start anywhere. Scott County chose to analyze this hazard given the agriculture in the area and potential for this kind of event to occur in any location at any time.

All populations should be considered at risk to pandemic. Buildings and infrastructure are not directly impacted by the virus/pathogen but could be indirectly impacted if people are not able to operate and maintain them due to illness. Many buildings may be shutdown, at least temporarily, as a result. Employers may initiate work from home procedures for non-essential workers in order to help stop infection. Commerce activities, and thus the economy, may suffer greatly during this time.

HISTORICAL OCCURRENCES

Several pandemics have been reported throughout history. A short history of the flu/Spanish Flu was collected from The Historical Text Archive and is described below.

The first known pandemic dates back to 430 B.C. with the Plague of Athens. It reportedly killed a quarter of the population over four years due to typhoid fever. In 165-180 A.D., the Antonine Plague killed nearly 5 million people. Next, the Plague of Justinian (the first bubonic plague pandemic) occurred from 541 to 566. It killed 10,000 people a day at its peak and resulted in a 50 percent drop in Europe's population.
Since the 1500s, influenza pandemics have occurred about three times every century or roughly every 10 to 50 years. The Black Death devastated European populations in the 14th century. Nearly a third of the population (20-30 million) was killed over six years. From 1817 to present, seven Cholera Pandemics have impacted to the world and killed millions. Perhaps most severe, was the Third Cholera Pandemic (1852- 1959) which started in China. Isolated cases can still be found in the Western U.S. today. There were three major pandemics in the 20th century (1918-1919, 1957-1958, and 1968-1969). The most infamous pandemic flu of the 20th century, however, was that of 1918-1919. Since the 1960s, there has only been one pandemic, the 2009 H1N1 influenza. The pandemics of the 20th and 21st centuries that impacted the United States are detailed below.

1918 Spanish Flu: This was the most devastating flu of the 20th century. This pandemic spread across the world in three waves between 1918 and 1919. It typically impacted areas for around twelve weeks and then would largely disappear. However, it would frequently reemerge several months later. Worldwide, approximately 50 million persons died and over a quarter of the population was infected. Nearly 675,000 people died in the United States. The illness came on suddenly and could cause death within a few hours. The virus impacted those aged 15 to 35 especially hard. The movement of troops during World War I is thought to have facilitated the spread of the virus.

In Mississippi, state officials noted that "epidemics have been reported from a number of places in the State," on October 4th, 1918. By the 18th, twenty-six localities reported 1,934 cases (the real number of cases was likely much higher). West Point, Mississippi was hit especially hard and quarantine was established. Throughout the state, African Americans were impacted at a greater rate than white populations. This is thought to be partly caused from a shortage of caretakers. It is estimated that over 6,000 people died in Mississippi, though that number may be much higher as death records were not widely recorded.

1957 Asian Flu: It is estimated that the Asian Flu caused 2 million deaths worldwide. Approximately 70,000 deaths were in the U.S. However, the proportion of people impacted was substantially higher than that of the Spanish Flu. This flu was characterized as having much milder effects than the Spanish Flu and greater survivability. Similar to other pandemics, this pandemic has two waves. Elderly and infant populations were more likely to succumb to death. This flu is thought to have originated from a genetic mutation of a bird virus.

1968 Hong Kong Flu: The Hong Kong Flu is thought to have caused one million deaths worldwide. It was milder than both the Asian and Spanish influenza viruses. It was similar to the Asian Flu, which may have provided some immunity to the virus. It had the most severe impact on elderly populations.

2009 H1N1 Influenza: This flu was derived from human, swine, and avian virus strains. It was initially reported in Mexico in April 2009. On April 26, the U.S. government declared H1N1 a public health emergency. A vaccine was developed and over 80 million were vaccinated which helped minimize the impacts. The virus had mild impacts on most of the population but did cause death (usually from viral pneumonia) in high-risk populations such as pregnant women, obese persons, indigenous people, and those with chronic respiratory, cardiac, neurological, or immunity conditions. Worldwide, it is estimated that 43 million to 89 million people contracted H1N1 between April 2009 and April 2010, and between 8,870 and 18,300 H1N1 cases resulted in death.

2020 SARS-CoV-2 (COVID-19): Coronavirus Disease 2019 (COVID-19) was declared as pandemic by the World Health Organization on March 11th, 2020 mainly due to the speed and scale of the transmission of the disease. Prior to that, it started as an epidemic in mainland China with the focus being firstly reported in the city of Wuhan, Hubei province on February 26th, 2020. The etiologic agent of COVID-19 was isolated and identified as a novel coronavirus, initially designated as 2019-nCoV. Later, the virus genome was sequenced and because it was genetically related to the coronavirus outbreak responsible for the SARS outbreak of 2003, the virus was named as severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) by the International Committee for Taxonomy of Viruses.

There is a considerable amount of data on the extent of COVID-19 throughout the State of Mississippi and Scott County. The number of reported cases and deaths across the State of Mississippi and Scott County are shown in the figure below.

Figure H.12: COVID-19 Cases as of 08/08/2021[4]

	Cases	Deaths
Mississippi	365,061	7,649
Scott County	3,585	77

In addition to the pandemics above, there have been several cases of pandemic threats, some of which

[4] Mississippi State Department of Health. *COVID-19 Dashboard*. Retrieved from: https://msdh.ms.gov/msdhsite/_static/14,0,420.html

reached epidemic levels. They were contained before spreading globally. Examples include Smallpox, Polio, Tuberculosis, Malaria, AIDS, SARS and Yellow Fever. Advances in medicine and technology have been instrumental in containing the spread of viruses in recent history.

In addition to the pandemics above, there have been several cases of pandemic threats, some of which reached epidemic levels. They were contained before spreading globally. Examples include Smallpox, Polio, Tuberculosis, Malaria, AIDS, SARS and Yellow Fever. Advances in medicine and technology have been instrumental in containing the spread of viruses in recent history.
It is notable that no birds have been infected with Avian Flu in North and South America.

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that all of Scott County has a probability level of unlikely (less than 1 percent annual probability) for future pandemics events. While pandemic can have devastating impacts, they are relatively rare.
The Mississippi State Department of Health maintains a state pandemic plan which can be found here: http://www.msdh.state.ms.us/msdhsite/index.cfm/44,1136,122,154,pdf/SNSPlan.pdf

H.2.15 Conclusions on Hazard Risk

The hazard profiles presented in this section were developed using best available data and result in what may be considered principally a qualitative assessment as recommended by FEMA in its "How-to" guidance document titled *Understanding Your Risks: Identifying Hazards and Estimating Losses* (FEMA Publication 386-2). It relies heavily on historical and anecdotal data, stakeholder input, and professional and experienced judgment regarding observed and/or anticipated hazard impacts. It also carefully considers the findings in other relevant plans, studies, and technical reports.

HAZARD EXTENT

Table H.27 describes the extent of each natural hazard identified for Scott County. The extent of a hazard is defined as its severity or magnitude, as it relates to the planning area.

Table H.23: EXTENT OF SCOTT COUNTY HAZARDS

Flood-related Hazards	
Flood	Flood extent can be measured by the amount of land and property in the floodplain as well as flood height and velocity. The amount of land in the floodplain accounts for 15.1 percent of the total land area in Scott County. Flood depth and velocity are recorded via United States Geological Survey stream gages throughout the region. While a gage does not exist for each participating jurisdiction, there is one at or near many areas. The greatest peak discharge recorded for the county was at the Strong River near Morton on December 24, 1974. Water reached a discharge of 5,600 cubic feet per second and the stream gage height was recorded at 22.00 feet.
Erosion	The extent of erosion can be defined by the measurable rate of erosion that occurs. There are no erosion rate records located in Scott County.
Dam Failure	Dam Failure extent is defined using the Mississippi Department of Environmental Quality criteria. Two dams are classified as high-hazard in Scott County.
Winter Storm and Freeze	The extent of winter storms can be measured by the amount of snowfall received (in inches). Official long term snow records are not kept for any areas in Scott County. However, the greatest snowfall reported in Meridian (east of the county) was 14.0 inches in 1963.

Fire-related Hazards	
Drought / Heat Wave	Drought extent is defined by the U.S. Drought Monitor Classifications which include Abnormally Dry, Moderate Drought, Severe Drought, Extreme Drought, and Exceptional Drought. According to the U.S. Drought Monitor Classifications, the most severe drought condition is Exceptional. Scott County has received this ranking once over the 15-year reporting period. The extent of extreme heat can be measured by the record high temperature recorded. Official long term temperature records are not kept for any areas in Scott County. However, the highest recorded temperature in Meridian (east of the county) was 107°F in 1980.
Wildfire	Wildfire data was provided by the Mississippi Forestry Commission and is reported annually by county from 2005-2014. The greatest number of fires to occur in Scott County in any year 37 in 2007. The greatest number of acres to burn in the county in a single year occurred in 2006 when 503 acres were burned. Although this data lists the extent that has occurred, larger and more frequent wildfires are possible throughout the county.
Geologic Hazards	
Earthquake	Earthquake extent can be measured by the Richter Scale, the Modified Mercalli Intensity (MMI) scale, and the distance of the epicenter from Scott County. According to data provided by the National Geophysical Data Center, no earthquakes have impacted the county.
Landslide	As noted above in the landslide profile, there is no extensive history of landslides in Scott County and landslide events typically occur in isolated areas. This provides a challenge when trying to determine an accurate extent for the landslide hazard. However, when using the USGS landslide susceptibility index, extent can be measured with incidence, which is low throughout the majority of the county, except for some areas of moderate incidence in the southwestern half. There is also low susceptibility throughout most of the county, except for some areas in the southwestern half which have high susceptibility.
Land Subsidence	The extent of land subsidence can be defined by the measurable rate of subsidence that occurs. There are no subsidence rate records located in Scott County nor is there any significant historical record of events.
Wind-related Hazards	
Hurricane and Tropical Storm	Hurricane extent is defined by the Saffir-Simpson Scale which classifies hurricanes into Category 1 through Category 5. The greatest classification of hurricane to traverse directly through Scott County was Unnamed 1915 Storm, a tropical storm which carried tropical force winds of 60 knots upon arrival in the county.

Thunderstorm / Hail / Lightning	Thunderstorm extent is defined by the number of thunder events and wind speeds reported. According to a 65-year history from the National Centers for Environmental Information, the strongest recorded wind event in Scott County was reported on April 4, 2008 at 87 knots (approximately 100 mph). It should be noted that future events may exceed these historical occurrences. Hail extent can be defined by the size of the hail stone. The largest hail stone reported in Scott County was 2.0 inches (reported on February 11, 1965). It should be noted that future events may exceed this. According to the Vaisala's flash density map, Scott County is located in an area that experiences 6 to 8 lightning flashes per square kilometer per year. It should be noted that future lightning occurrences may exceed these figures.
Tornado	Tornado hazard extent is measured by tornado occurrences in the US provided by FEMA as well as the Fujita/Enhanced Fujita Scale. The greatest magnitude reported in Scott County was an F4 (last reported on November 22, 1992).
Other Hazards	
Hazardous Materials Incident	According to USDOT PHMSA, the largest hazardous materials incident reported in the Scott County was 6,133 LGA released on the railway (reported on February, 9, 1977). It should be noted that larger events are possible.
Pandemic	While pandemics remain to be rare occurrences overall, it cannot be ignored that as of the drafting of this plan the world continues to be engulfed by the COVID-19 Pandemic.

PRIORITY RISK INDEX RESULTS

In order to draw some meaningful planning conclusions on hazard risk for Scott County, the results of the hazard profiling process were used to generate countywide hazard classifications according to a "Priority Risk Index" (PRI). More information on the PRI and how it was calculated can be found in Section 5.

Table H.24 summarizes the degree of risk assigned to each category for all initially identified hazards based on the application of the PRI. Assigned risk levels were based on the detailed hazard profiles developed for this section, as well as input from the Regional Hazard Mitigation Council. The results were then used in calculating PRI values and making final determinations for the risk assessment.

Table H.24: SUMMARY OF PRI RESULTS FOR SCOTT COUNTY

Hazard	Category/Degree of Risk					
	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score
Flood-related Hazards						
Flood	Likely	Critical	Moderate	6 to 12 hours	Less than 24 hours	**2.9**
Erosion	Possible	Minor	Small	More than 24 hours	More than 1 week	**1.8**
Dam Failure	Possible	Critical	Small	Less than 6 hours	Less than 6 hours	**2.4**
Winter Storm and Freeze	Likely	Limited	Moderate	More than 24 hours	Less than 24 hours	**2.4**
Fire-related Hazards						
Drought / Heat Wave	Likely	Minor	Large	More than 24 hours	More than 1 week	**2.5**
Wildfire	Highly Likely	Minor	Small	Less than 6 hours	Less than 1 week	**2.6**

Hazard	Category/Degree of Risk					
	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score
Geologic Hazards						
Earthquake	Possible	Minor	Moderate	Less than 6 hours	Less than 6 hours	**2.0**
Landslide	Unlikely	Minor	Small	Less than 6 hours	Less than 6 hours	**1.5**
Land Subsidence	Unlikely	Minor	Small	Less than 6 hours	Less than 6 hours	**1.5**
Wind-related Hazards						
Hurricane and Tropical Storm	Likely	Critical	Large	More than 24 hours	Less than 24 hours	**2.9**
Thunderstorm Wind / High Wind	Highly Likely	Critical	Moderate	6 to 12 hours	Less than 6 hours	**3.1**
Hailstorm	Highly Likely	Limited	Moderate	6 to 12 hours	Less than 6 hours	**2.8**
Lightning	Highly Likely	Limited	Negligible	6 to 12 hours	Less than 6 hours	**2.4**
Tornado	Likely	Catastrophic	Small	Less than 6 hours	Less than 6 hours	**3.0**
Other Hazards						
Hazardous Materials Incident	Likely	Limited	Small	Less than 6 hours	Less than 24 hours	**2.5**
Pandemic	Unlikely	Catastrophic	Large	More than 24 hours	More than 24hrs	**2.8**

H.2.16 Final Determinations on Hazard Risk

The conclusions drawn from the hazard profiling process for Scott County, including the PRI results and input from the Regional Hazard Mitigation Council, resulted in the classification of risk for each identified hazard according to three categories: High Risk, Moderate Risk, and Low Risk (**Table H.25**). For purposes of these classifications, risk is expressed in relative terms according to the estimated impact that a hazard will have on human life and property throughout all of Scott County. A more quantitative analysis to estimate potential dollar losses for each hazard has been performed separately, and is described in Section 6: *Vulnerability Assessment* and below in Section H.3. It should be noted that although some hazards are classified below as posing low risk, their occurrence of varying or unprecedented magnitudes is still possible in some cases and their assigned classification will continue to be evaluated during future plan updates.

Table H.25: CONCLUSIONS ON HAZARD RISK FOR SCOTT COUNTY

HIGH RISK	Thunderstorm Wind / High Wind Tornado Flood Hurricane and Tropical Storm Hailstorm Pandemic
MODERATE RISK	Wildfire Drought / Heat Wave Hazardous Materials Incident Dam and Levee Failure Winter Storm and Freeze Lightning
LOW RISK	Earthquake Erosion Landslide Land Subsidence

H.3 SCOTT COUNTY VULNERABILITY ASSESSMENT

This subsection identifies and quantifies the vulnerability of Scott County to the significant hazards previously identified. This includes identifying and characterizing an inventory of assets in the county and assessing the potential impact and expected amount of damages caused to these assets by each identified hazard event. More information on the methodology and data sources used to conduct this assessment can be found in Section 6: *Vulnerability Assessment*.

H.3.1 Asset Inventory

Table H.27 lists the fire stations, police stations, emergency operations centers (EOCs), medical care facilities, and schools located in Scott County according to Hazus-MH Version 2.2.

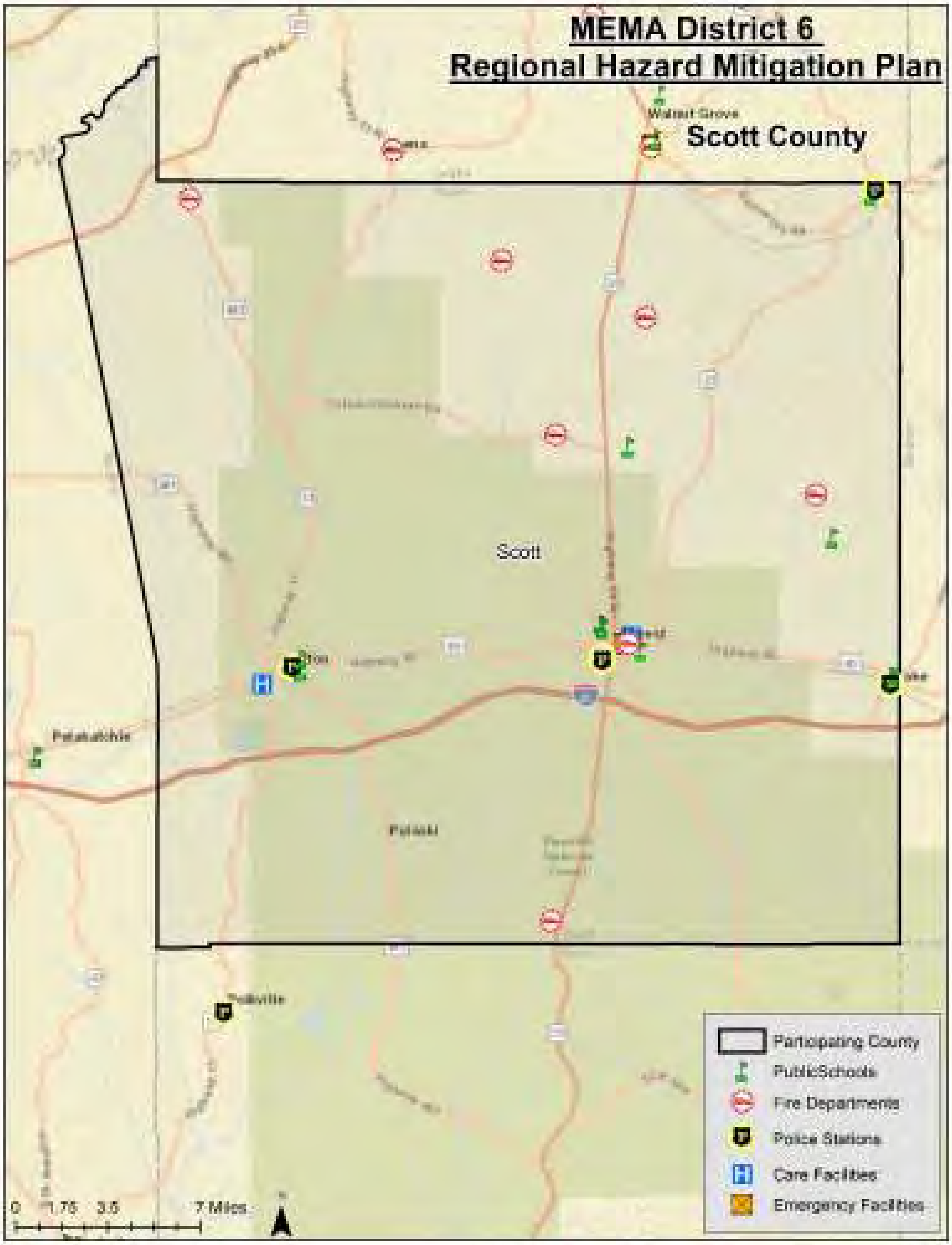
In addition, **Figure H.13** shows the locations of critical facilities in Scott County. At the end of this subsection, shows a complete list of the critical facilities by name, as well as the hazards that affect each facility. As noted previously, this list is not all-inclusive and only includes information provided through Hazus.

Table H.26: CRITICAL FACILITY INVENTORY IN SCOTT COUNTY

Location	Fire Stations	Police Stations	Medical Care Facilities	EOC	Schools
Forest	6	2	1	1	5
Lake	1	1	0	0	3
Morton	0	2	1	0	4
Sebastopol	0	0	0	0	0
Unincorporated Area	2	0	0	0	0
ASSET VALUATION	**$20,862,111**	**$11,605,598**	**$6,775,663**	**$2,321,119**	**$64,968,786**
SCOTT COUNTY TOTAL	**9**	**5**	**2**	**1**	**12**

Source: Hazus-MH 2.2

Figure H.13: CRITICAL FACILITY LOCATIONS IN SCOTT COUNTY



Source: Hazus-MH 2.2

H.3.2 Social Vulnerability

In addition to identifying those assets potentially at risk to identified hazards, it is important to identify and assess those particular segments of the resident population in Scott County that are potentially at risk to these hazards.

Table H.28 lists the population by jurisdiction according to U.S. Census 2019 American Community Survey population estimates. The total population in Scott County according to Census data is 28,332 persons. Additional population estimates are presented above in Section H.1.

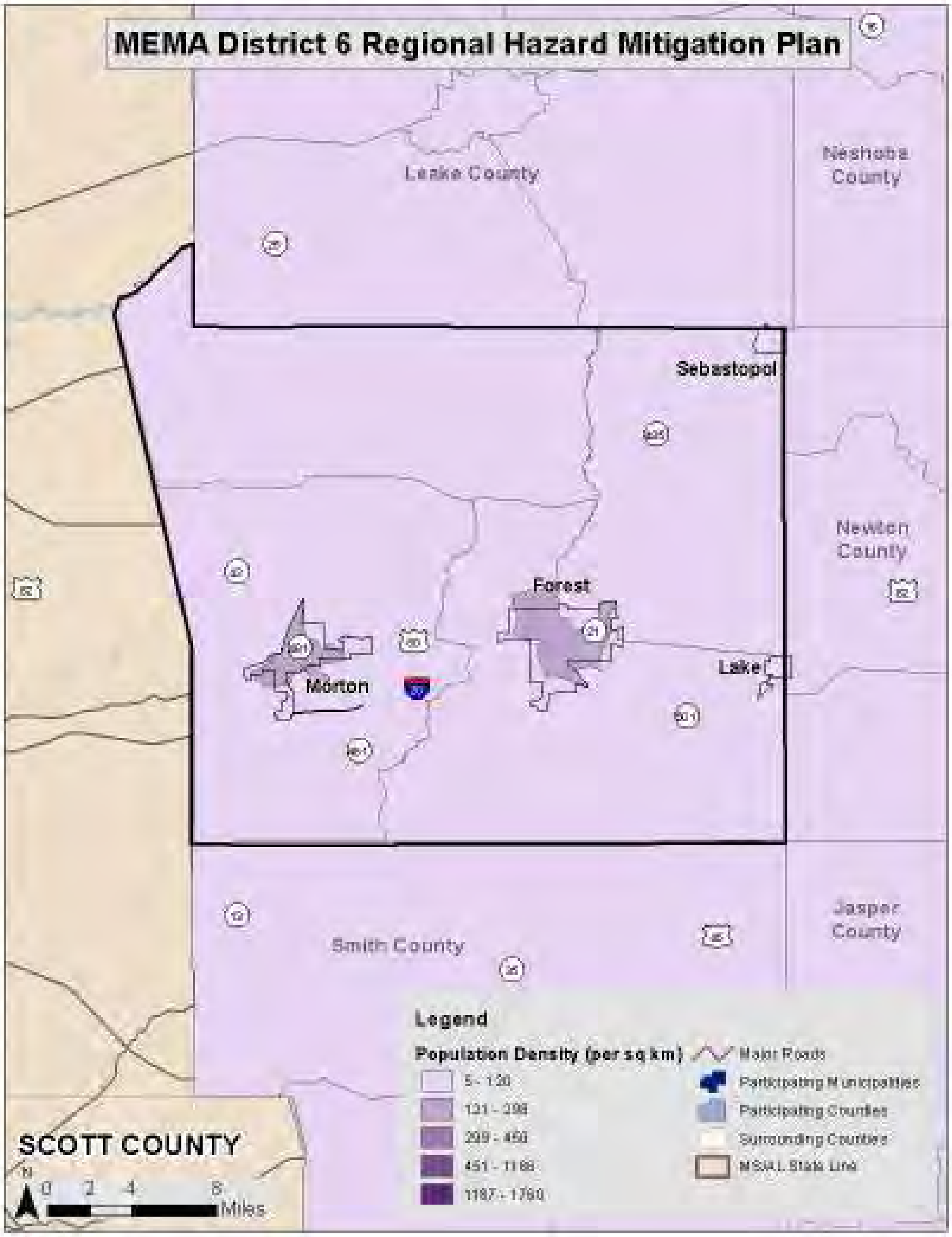
Table H.27: TOTAL POPULATION IN SCOTT COUNTY

Location	Total 2019 Population
Forest	5,629
Lake	439
Morton	3,589
Sebastopol	359
Unincorporated Area	18,316
SCOTT COUNTY TOTAL	**28,332**

Source: United States Census 2019 – American Community Survey

In addition, **Figure H.13** illustrates the population density per square kilometer by census tract as it was reported by the U.S. Census Bureau in 2010. Population density remains unchanged since the last plan update.

Figure H.14: POPULATION DENSITY IN SCOTT COUNTY



Source: United States Census Bureau, 2010

H.3.3 Development Trends and Changes in Vulnerability

Since the previous county hazard mitigation plan was approved (in 2015), Scott County has experienced limited growth and development. **Table H.29** shows the number of building units constructed since 2014 according to the U.S. Census American Community Survey.

Table H.28: BUILDING COUNTS FOR SCOTT COUNTY

Jurisdiction	Total Housing Units (2019)	Units Built 2014 or later	% Building Stock Built Post-2014
Forest	2,378	88	3.7%
Lake	181	2	1.1%
Morton	1,212	12	1.0%
Sebastopol	134	4	3.0%
Unincorporated Area	7,811	116	1.4%
SCOTT COUNTY TOTAL	**11,716**	**222**	**1.9%**

Source: United States Census Bureau – American Community Survey

Table H.34 shows population growth estimates for the county from 2015 to 2019 based on the U.S. Census Annual Estimates of Resident Population.

Table H.29: POPULATION GROWTH FOR SCOTT COUNTY

Jurisdiction	Population Estimates (as of July 1)					% Change 2015-2019
	2015	2016	2017	2018	2019	
Forest	5,713	5,700	5,679	5,668	5,629	-1.47%
Lake	435	532	477	397	439	0.91%
Morton	3,456	3,430	3,429	3,648	3,589	3.87%
Sebastopol	314	317	383	387	359	14.33%
Unincorporated Area	18,375	18,289	18,431	18,315	18,316	-0.32%
SCOTT COUNTY TOTAL	**28,293**	**28,268**	**28,399**	**28,415**	**28,332**	**0.13%**

Source: United States Census Bureau

Based on the data above, there has been a low rate of residential development and population growth in the county since 2015, and one municipality has actually experienced a slight population decline. However, the City of Forest and the unincorporated area of the county have experienced a slightly higher rate of development compared to the rest of the county, resulting in an increased number of structures that are vulnerable to the potential impacts of the identified hazards. Additionally, there was a slightly higher rate of population growth in the Town of Sebastopol. Since the population has increased in this jurisdiction, there are now greater numbers of people exposed to the identified hazards. Therefore, development and population growth have impacted the county's vulnerability since the previous local hazard mitigation plan was approved and there has been a slight increase in the overall vulnerability.

It is also important to note that as development increases in the future, greater populations and more structures and infrastructure will be exposed to potential hazards if development occurs in the floodplains, moderate and high landside susceptibility areas, high wildfire risk areas, or primary and secondary TRI site buffers.

H.3.4 Vulnerability Assessment Results

As noted in Section 6: *Vulnerability Assessment*, only hazards with a specific geographic boundary, available modeling tool, or sufficient historical data allow for further analysis. Those results, specific to Scott County, are presented here. All other hazards are assumed to impact the entire planning region (drought / heat wave; thunderstorm—wind, hail, lightning; tornado; and winter storm and freeze) or, due to lack of data, analysis would not lead to credible results (dam and levee failure, erosion, and land subsidence). In the case of landslide, local officials determined that the USGS data may be somewhat amiss and that even the areas identified as moderate risks probably entailed an overall low risk.

The hazards to be further analyzed in this subsection include: flood, wildfire, earthquake, hurricane and tropical storm winds, and hazardous materials incident.

The annualized loss estimate for all hazards is presented near the end of this subsection**.**

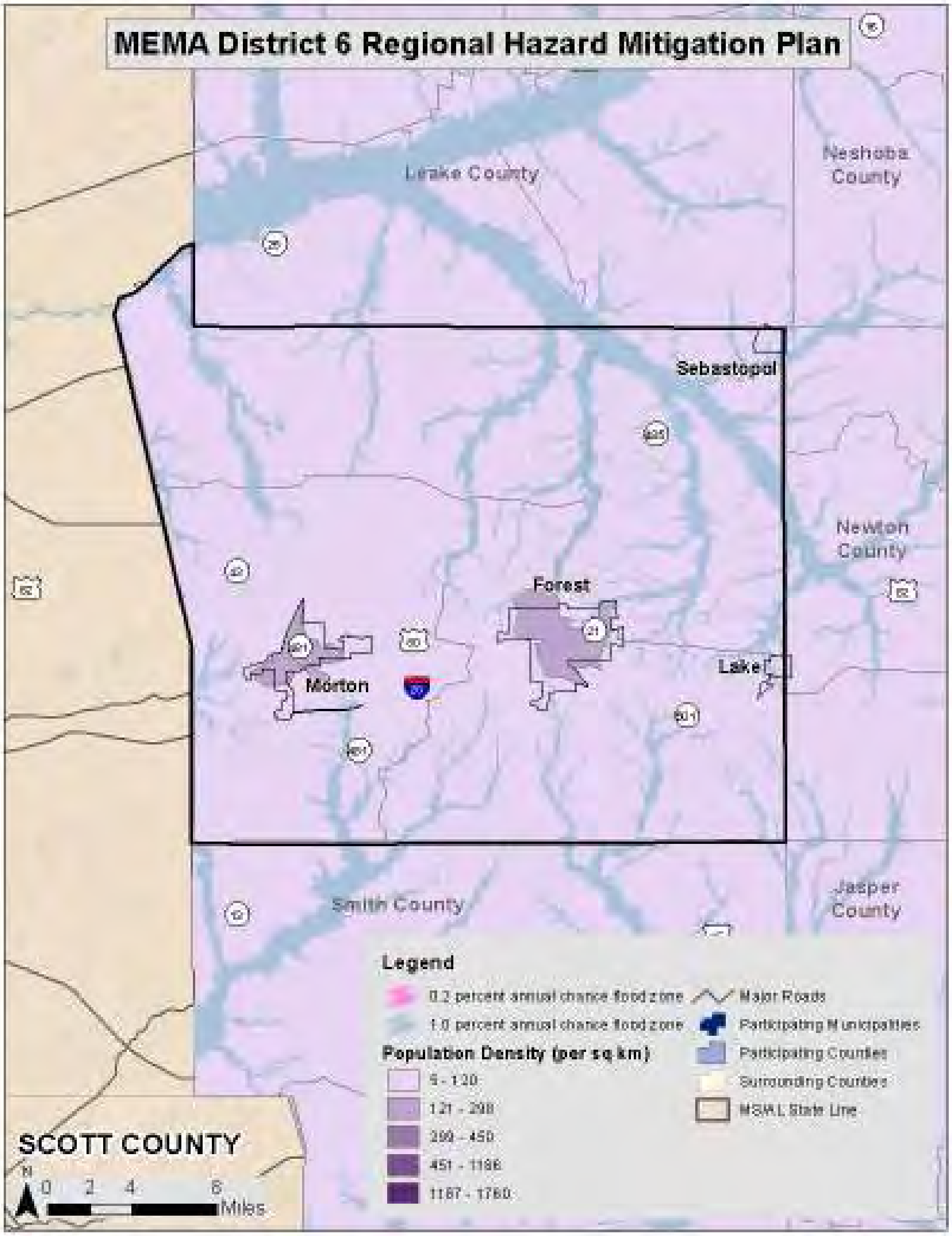
FLOOD

Historical evidence indicates that Scott County is susceptible to flood events. A total of 49 flood events have been reported by the National Centers for Environmental Information resulting in $53 million in property damage as well as one fatality. On an annualized level, these damages amounted to $2.66 million for Scott County.

Social Vulnerability

Figure H.15 is presented to gain a better understanding of at-risk population by evaluating census tract level population data against mapped floodplains. There are areas of concern in several areas of the county. Indeed, nearly every incorporated municipality is potentially at risk of being impacted by flooding in some areas of its jurisdiction. Therefore, further investigation in these areas may be warranted.

Figure H.15: POPULATION DENSITY NEAR FLOODPLAINS



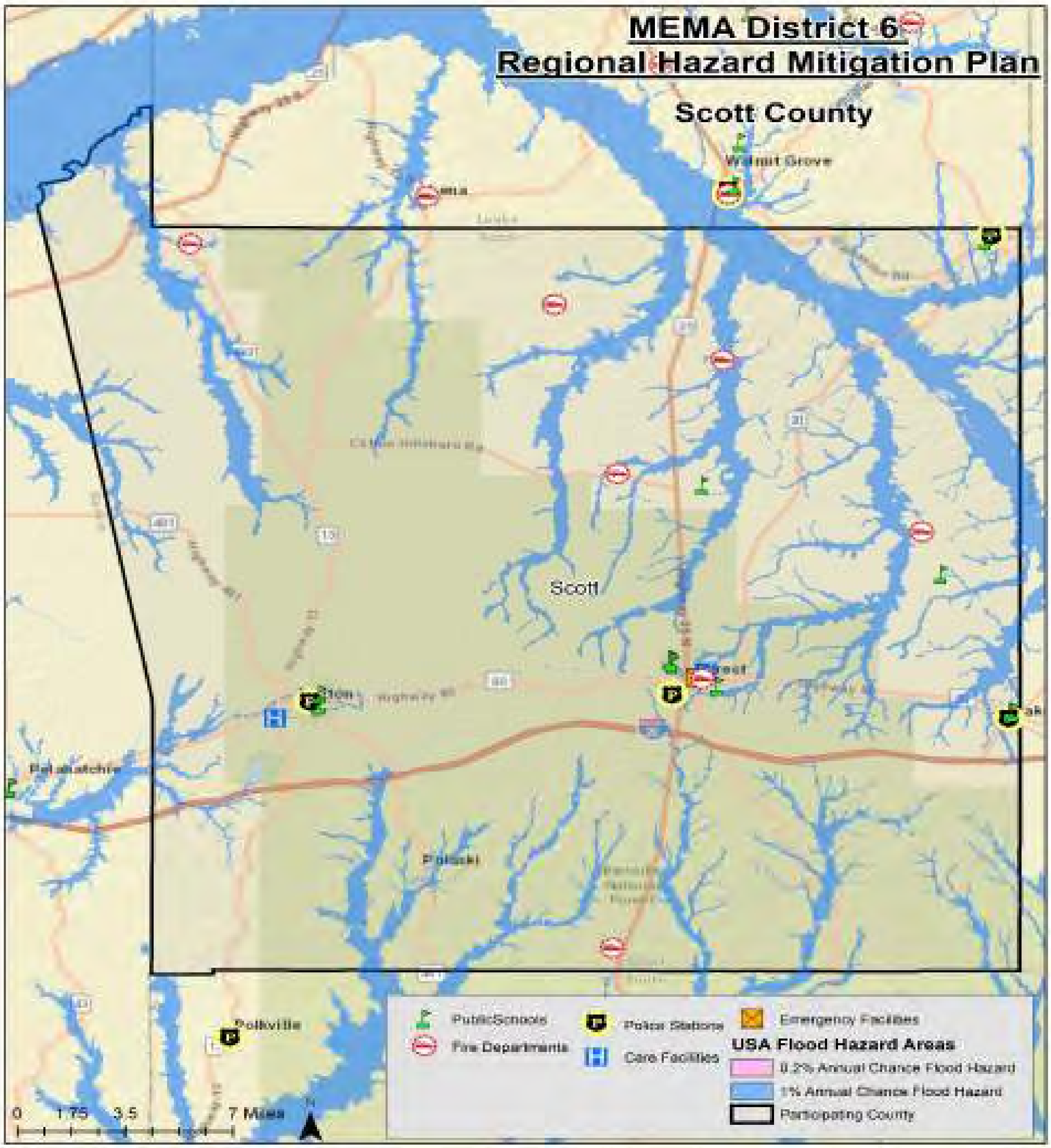
Source: Federal Emergency Management Agency DFIRM, United States Census 2010

Critical Facilities

The following figure is an analysis of critical facilities in relation to Special Flood Hazard Areas. (Please note, as previously indicated, this analysis does not consider building elevation, which may negate risk.) This facility is a medical care facility located in the 1.0 percent annual chance flood zone. A list of specific critical facilities and their associated risk can be found at the end of this section.

In conclusion, a flood has the potential to impact many existing and future buildings, facilities, and populations in Scott County, though some areas are at a higher risk than others. All types of structures in a floodplain are at-risk, though elevated structures will have a reduced risk. Such site-specific vulnerability determinations are outside the scope of this assessment but will be considered during future plan updates. Furthermore, areas subject to repetitive flooding should be analyzed for potential mitigation actions.

Figure H.16: CRITICAL FACILITY ANALYSIS – SFHA



Source: Federal Emergency Management Agency

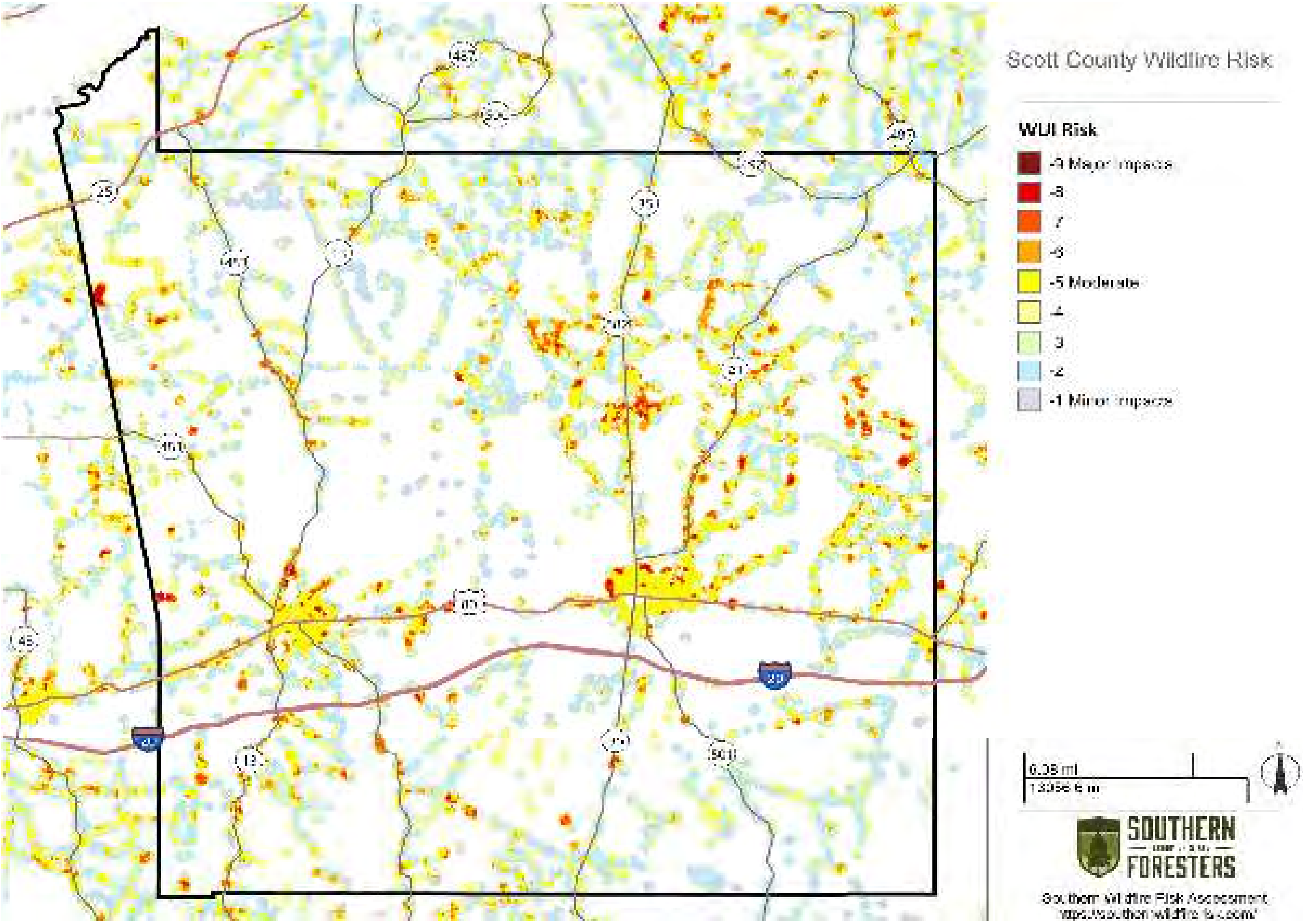
WILDFIRE

Although historical evidence indicates that Scott County is susceptible to wildfire events, there are few reports of damage. Therefore, it is difficult to calculate a reliable annualized loss figure. Annualized loss is considered negligible though it should be noted that a single event could result in significant damages throughout the county.

To estimate exposure to wildfire, building data was obtained from Hazus-MH 2.2 which includes information that has been aggregated at the Census block level and which has been deemed useful for analyzing wildfire vulnerability. However, it should be noted that the accuracy of Hazus data is somewhat lower than that of parcel data. For the critical facility analysis, areas of concern were intersected with critical facility locations.

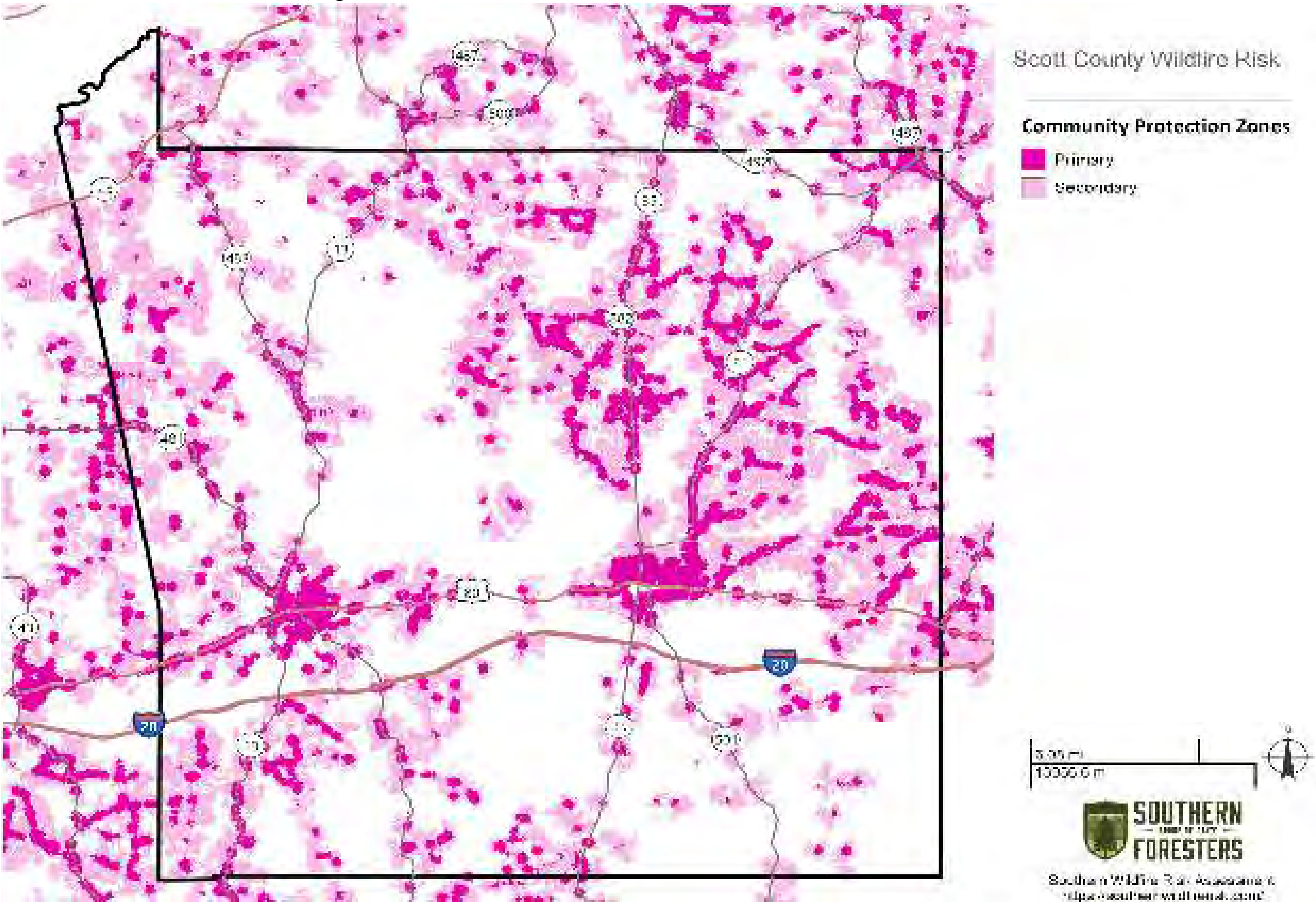
Figure H.17 shows the Wildland Urban Interface Risk Index (WUIRI) data, which is a data layer that shows a rating of the potential impact of a wildfire on people and their homes. The key input, Wildland Urban Interface (WUI), reflects housing density (houses per acre) consistent with Federal Register National standards. The location of people living in the WUI and rural areas is key information for defining potential wildfire impacts to people and homes. Initially provided as raster data, it was converted to a polygon to allow for analysis. The Wildland Urban Interface Risk Index data ranges from 0 to -9 with lower values being most severe (as noted previously, this is only a measure of relative risk). **Figure H.18** Community Protection Zones (CPZ) represent those areas considered highest priority for mitigation planning activities**.** CPZs are based on an analysis of the *Where People Live* housing density data and surrounding fire behavior potential. Rate of Spread data is used to determine the areas of concern around populated areas that are within a 2-hour fire spread distance. This is referred to as the Secondary CPZ. **Figure H.19** shows critical facility locations in relation to historical wildfire burns.

Figure H.17: WUI RISK INDEX AREAS IN SCOTT COUNTY



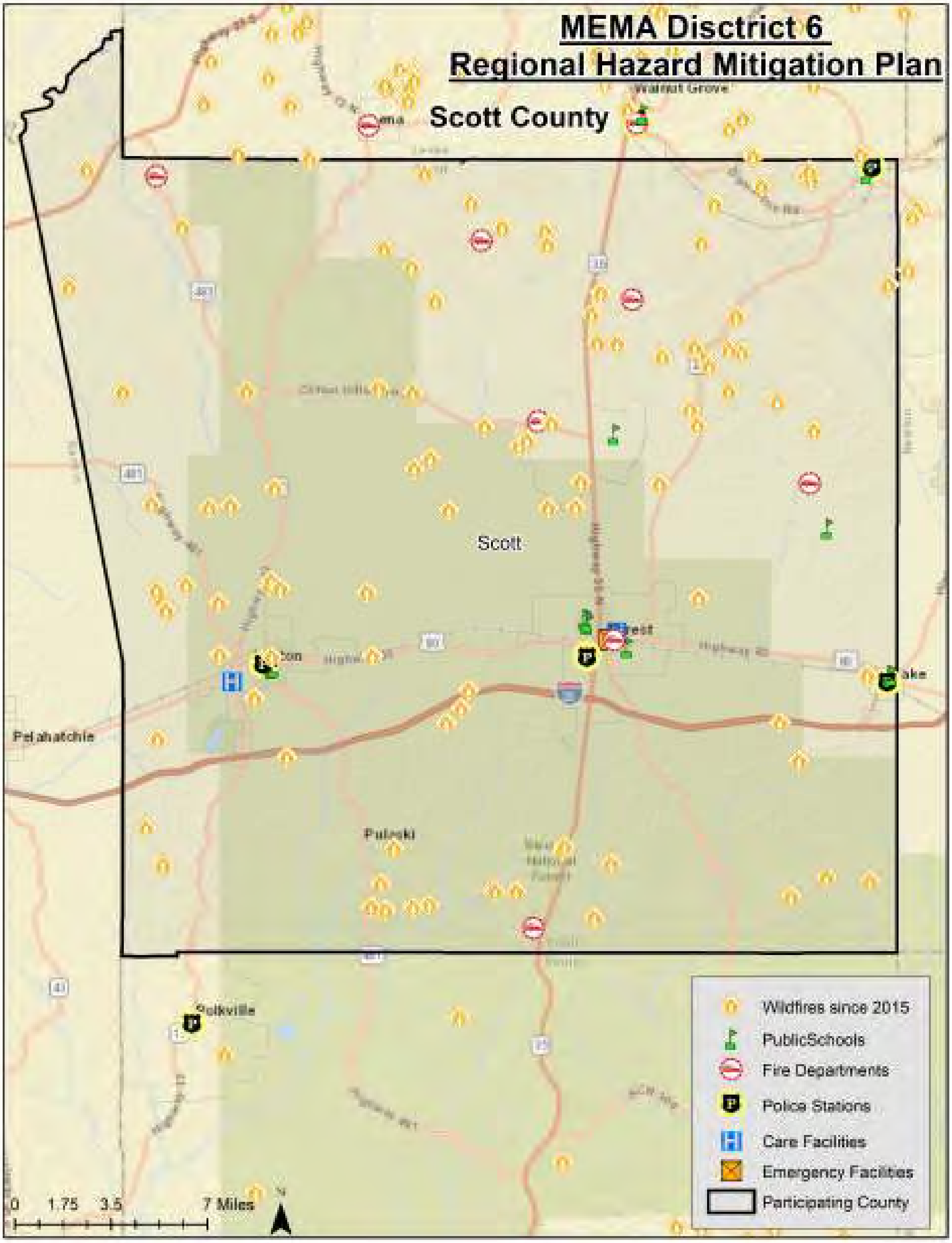
Source: Southern Wildfire Risk Assessment Data

Figure H.18: WILDFIRE RISK AREAS IN SCOTT COUNTY



Source: Southern Wildfire Risk Assessment Data

Figure H.19: CRITICAL FACILITY ANALYSIS – WILDFIRE



Source: Southern Wildfire Risk Assessment Data

Social Vulnerability

Given some level of susceptibility across the entire county, it is assumed that the total population is at risk to the wildfire hazard. Determining the exact number of people in certain wildfire zones is difficult with existing data and could be misleading. In particular, the expansion of residential development from urban centers out into rural landscapes, increases the potential for wildland fire threat to public safety and the potential for damage to forest resources and dependent industries. This increase in population across the region will impact counties and communities that are located within the Wildland Urban Interface (WUI). The WUI is described as the area where structures and other human improvements meet and intermingle with undeveloped wildland or vegetative fuels. Population growth within the WUI substantially increases the risk from wildfire.

For the Scott County Wildfire Risk project area, it is estimated that 27,837 people or 98.5 % percent of the total project area population (28,274) live within the WUI.

Critical Facilities

The critical facility analysis revealed that there is one critical facility located in wildfire areas of concern, a school. It should be noted, that several factors could impact the spread of a wildfire putting all facilities at risk. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

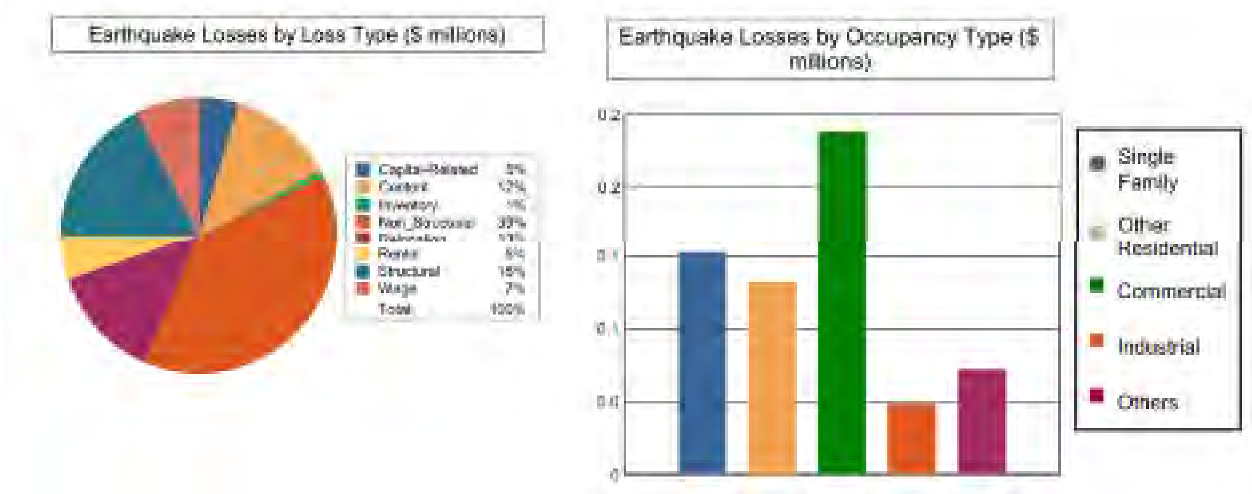
In conclusion, a wildfire event has the potential to impact many existing and future buildings, critical facilities, and populations in Scott County.

EARTHQUAKE

As the Hazus-MH model suggests below, and historical occurrences confirm, any earthquake activity in the area is likely to inflict minor damage to the county.

A probabilistic earthquake model was performed for the MEMA District 6 Region. As the Hazus-MH model suggests below, and historical occurrences confirm, any earthquake activity in the area is likely to inflict minor damage to the county. Hazus-MH 2.2 estimates the total building-related losses were $520,000; 31 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 44 % of the total loss. The figure below provides a summary of the losses associated with the building damage.

Figure H.20: MEMA D6 EARTHQUAKE LOSSES BY TYPE



For the earthquake hazard vulnerability assessment, a probabilistic scenario was created to estimate the average annualized loss for the region. The results of the analysis are generated at the Census Tract level within Hazus-MH and then aggregated to the region level. Since the scenario is annualized, no building counts are provided. Losses reported included losses due to structure failure, building loss, contents damage, and inventory loss.

Social Vulnerability

It can be assumed that all existing and future populations are at risk to the earthquake hazard. Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 39 households to be displaced due to the earthquake. Of these, 32 people (out of a total population of 244,467) will seek temporary shelter in public shelters. [5] The total economic loss estimated for the earthquake is 76.76 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory.

Critical Facilities

The Hazus-MH probabilistic analysis indicated that no critical facilities would sustain measurable damage in an earthquake event. However, all critical facilities should be considered at-risk to minor damage, should an event occur. Before the earthquake, the region had 1,241 hospital beds available for use. On the day of the earthquake, the model estimates that only 1,035 hospital beds (83.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 93.00% of the beds will be back in service. By 30 days, 99.00% will be operational.

In conclusion, an earthquake has the potential to impact all existing and future buildings, facilities, and populations in Scott County. The Hazus-MH scenario indicates that minimal to moderate damage is expected from an earthquake occurrence. While Scott County may not experience a large earthquake, localized damage is possible with an occurrence. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

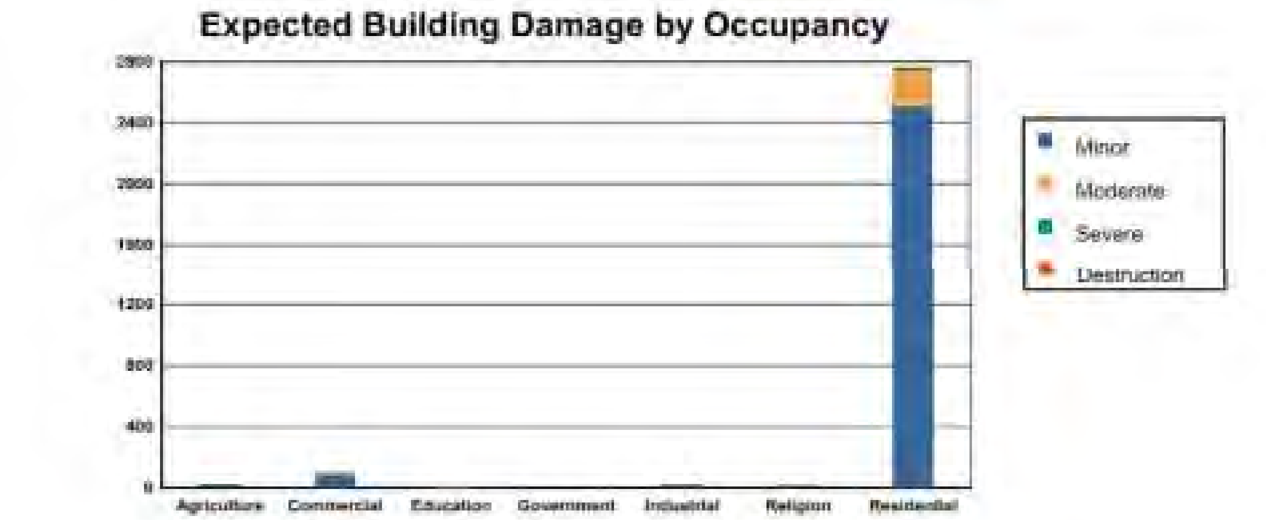
HURRICANE AND TROPICAL STORM

[5] HAZUS-MH utilizes 2010 Census Data

Historical evidence indicates that Scott County has some risk to the hurricane and tropical storm hazard. There have been four disaster declarations due to hurricanes (Hurricanes Ivan, Dennis, Katrina, and Isaac). Several tracks have come near or traversed through the county, as shown and discussed in Section H.2.10.

A probabilistic 100-year hurricane model was performed for the MEMA District 6. Hazus estimates that about 289 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 12 buildings that will be completely destroyed. The figure below summarizes the expected damage by general occupancy for the buildings in the region.

Figure H.21: MEMA D6 100-YEAR HURRICANE



Hurricanes and tropical storms can cause damage through numerous additional hazards such as flooding, erosion, tornadoes, and high winds, thus it is difficult to estimate total potential losses from these cumulative effects. The current Hazus-MH hurricane model only analyzes hurricane winds and is not capable of modeling and estimating cumulative losses from all hazards associated with hurricanes; therefore, only hurricane winds are analyzed in this section. It can be assumed that all existing and future buildings and populations are at risk to the hurricane and tropical storm hazard.

Social Vulnerability
Given equal susceptibility across the county, it is assumed that the total population, both current and future, is at risk to the hurricane and tropical storm hazard. Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 34 households to be displaced due to the hurricane. Of these, 26 people (out of a total population of 244,467) will seek temporary shelter in public shelters.

Social Vulnerability
Given equal susceptibility across the county, it is assumed that the total population, both current and future, is at risk to the hurricane and tropical storm hazard.

Critical Facilities
Given equal vulnerability across Scott County, all critical facilities are considered to be at risk. Some buildings may perform better than others in the face of such an event due to construction and age, among other factors. Determining individual building response is beyond the scope of this plan. However, this plan will consider mitigation action for especially vulnerable structures and/or critical facilities to mitigate against the effects of the hurricane hazard. A list of specific critical facilities can be found at the end of this subsection.

In conclusion, a hurricane event has the potential to impact many existing and future buildings, critical facilities, and populations in Scott County.

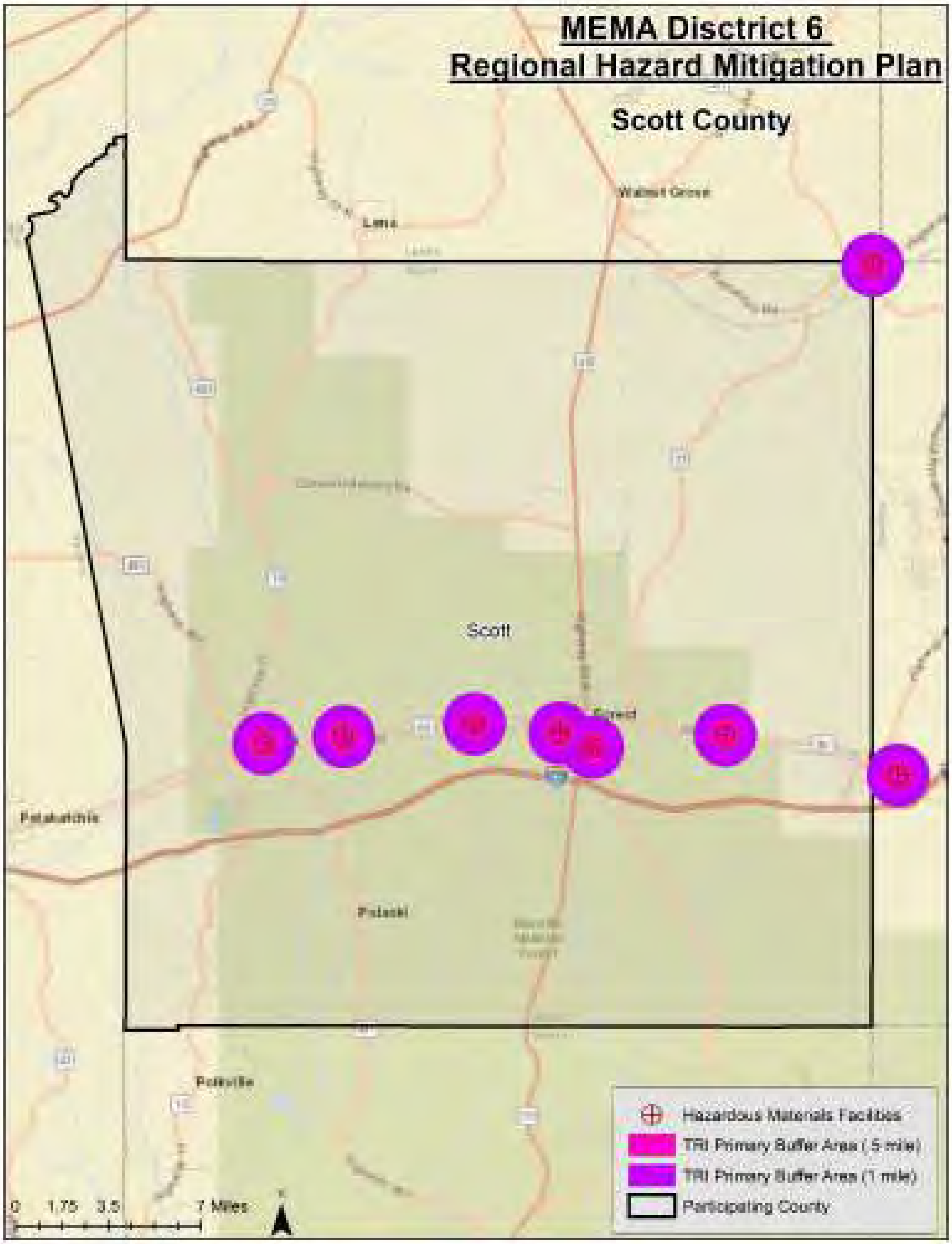
HAZARDOUS MATERIALS INCIDENT

Historical evidence indicates that Scott County is susceptible to hazardous materials events. A total of 15 HAZMAT incidents have been reported by the Pipeline and Hazardous Materials Safety Administration, resulting in $2.3 million in property damage as well as 1 injury. On an annualized level, these damages amount to $348,864 for the county.

Most hazardous materials incidents that occur are contained and suppressed before destroying any property or threatening lives. However, they can have a significant negative impact. Such events can cause multiple deaths, completely shut down facilities for 30 days or more, and cause more than 50 percent of affected properties to be destroyed or suffer major damage. In a hazardous materials incident, solid, liquid, and/or gaseous contaminants may be released from fixed or mobile containers. Weather conditions will directly affect how the hazard develops. Certain chemicals may travel through the air or water, affecting a much larger area than the point of the incidence itself. Non-compliance with fire and building codes, as well as failure to maintain existing fire and containment features, can substantially increase the damage from a hazardous materials release. The duration of a hazardous materials incident can range from hours to days. Warning time is minimal to none.

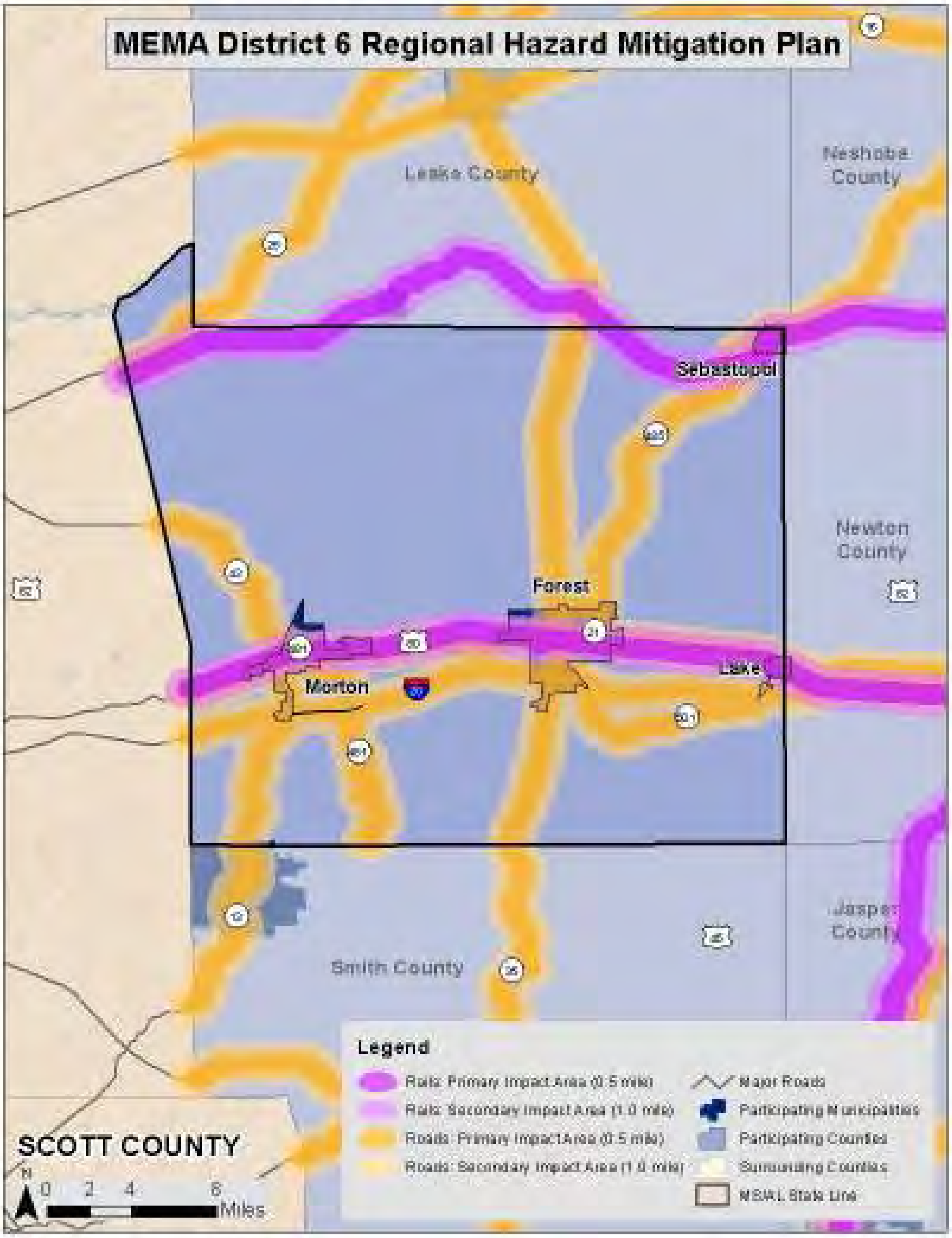
In order to conduct the vulnerability assessment for this hazard, GIS intersection analysis was used for fixed and mobile areas and building footprints/parcels. In both scenarios, two sizes of buffers—0.5-mile and 1.0-mile—were used. These areas are assumed to represent the different levels of effect: immediate (primary) and secondary. Primary and secondary impact zones were selected based on guidance from the PHMSA Emergency Response Guidebook. For the fixed site analysis, geo-referenced TRI sites in the region, along with buffers, were used for analysis as shown in **Figure H.22.** For the mobile analysis, the major roads (Interstate highway, U.S. highway, and State highway) and railroads, where hazardous materials are primarily transported that could adversely impact people and buildings, were used for the GIS buffer analysis. **Figure H.23** shows the areas used for mobile toxic release buffer analysis.

Figure H.22: TRI SITES WITH BUFFERS IN SCOTT COUNTY



Source: Environmental Protection Agency

Figure H.23: MOBILE HAZMAT BUFFERS IN SCOTT COUNTY



Social Vulnerability

Given high susceptibility across the entire county, it is assumed that the total population is at risk to a hazardous materials incident. It should be noted that areas of population concentration may be at an elevated risk due to a greater burden to evacuate population quickly.

Critical Facilities

Fixed Site Analysis:

The critical facility analysis for fixed TRI sites revealed that there are eight facilities located in a HAZMAT risk zone. This includes one medical care facility, three police stations, and four schools. Only three facilities are located within the primary impact zone. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

Mobile Analysis:

It should be presumed that any facility located near a public roadway or rail line is susceptible to a potential HAZMAT event. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

A list of specific critical facilities and their associated risk can be found at the end of this subsection.

In conclusion, a hazardous material incident has the potential to impact many existing and future buildings, critical facilities, and populations in Scott County. Those areas in a primary buffer are at the highest risk, though all areas carry some vulnerability due to variations in conditions that could alter the impact area (i.e., direction and speed of wind, volume of release, etc.). Further, incidents from neighboring counties could also impact the county and participating jurisdictions.

CONCLUSIONS ON HAZARD VULNERABILITY

The table below presents a summary of annualized loss for each hazard in Scott County. Due to the reporting of hazard damages primarily at the county level, it was difficult to determine an accurate annualized loss estimate for each municipality. Therefore, an annualized loss was determined through the damage reported through historical occurrences at the county level. These values should be used as an additional planning tool or measure risk for determining hazard mitigation strategies throughout the county.

Table H.30: ANNUALIZEDLOSS FOR SCOTT COUNTY

Event	Scott County
Flood-related Hazards	
Flood	$2,665,600
Erosion	Negligible
Dam and Levee Failure	Negligible
Winter Storm & Freeze	$48,800
Fire-related Hazards	
Drought / Heat Wave	$37,500
Wildfire	Negligible
Geologic Hazards	
Earthquake	Negligible
Landslide	Negligible
Land Subsidence	Negligible
Wind-related Hazards	
Hurricane & Tropical Storm	$359,000
Thunderstorm / High Wind	$209,155
Hail	$94,677
Lightning	$6,739
Tornado	$149,970
Other Hazards	
HAZMAT Incident	$348,864
Pandemic	

**In this table, the term "Negligible" is used to indicate that no records of dollar losses for the particular hazard were recorded. This could be the case either because there were no events that caused dollar damage or because documentation of that particular type of event is not well kept. Annualized losses were calculated based on the total number of years of reporting and damage totals.*

As noted previously, all existing and future buildings and populations (including critical facilities) are vulnerable to atmospheric hazards including drought / heat wave, hurricane and tropical storm, thunderstorm (wind, hail, lightning), tornado, and winter storm and freeze. In addition, all buildings and populations are vulnerable to all of the man-made and technological hazards identified above. Some buildings may be more vulnerable to these hazards based on locations, construction, and building type. **Table H.43** shows the critical facilities vulnerable to additional hazards analyzed in this subsection. The table lists those assets that are determined to be exposed to each of the identified hazards (marked with an "**X**").

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Table H.31: AT-RISK CRITICAL FACILITIES IN SCOTT COUNTY

		FLOOD-RELATED					FIRE-RELATED		GEOLOGIC			WIND-RELATED			OTHER						
FACILITY NAME	FACILITY TYPE	Flood – 100 yr	Flood – 500 yr	Erosion	Dam and Levee Failure	Winter Storm and Freeze	Drought / Heat Wave	Wildfire	Earthquake	Landslide	Land Subsidence	Hurricane and Tropical Storm	Thunderstorm (wind, hail,	Tornado	Fixed HAZMAT – 0.5 mile	Fixed HAZMAT – 1.0 mile	Mobile HAZMAT – 0.5 mile (road)	Mobile HAZMAT – 1.0 mile (road)	Mobile HAZMAT – 0.5 mile (rail)	Mobile HAZMAT – 1.0 mile (rail)	Pandemic
SCOTT COUNTY																					
GIBBSTOWN-LAWRENCE VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X							X
HOMEWOOD VOLUNTEER FIRE	Fire Station			X	X	X	X		X	X	X	X	X	X							X
LAKE VOLUNTEER FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X							X
LUDLOW VOLUNTEER FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X							X
NORTH CENTRAL SCOTT COUNTY 1	Fire Station			X	X	X	X		X	X	X	X	X	X							X
NORTH CENTRAL SCOTT COUNTY 2	Fire Station			X	X	X	X		X	X	X	X	X	X							X
NORTH CENTRAL SCOTT COUNTY 3	Fire Station			X	X	X	X		X	X	X	X	X	X							X
PINEVILLE VOLUNTEER FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X							X
THE CITY OF FOREST FIRE DEPARTMENT	Fire Station			X	X	X	X		X	X	X	X	X	X							X
FOREST POLICE DEPARTMENT	Police			X	X	X	X		X	X	X	X	X	X							X
SCOTT COUNTY SHERIFFS DEPARTMENT /	Police			X	X	X	X		X	X	X	X	X	X							X
LAKE POLICE DEPARTMENT	Police			X	X	X	X		X	X	X	X	X	X							X
MORTON POLICE DEPARTMENT	Police			X	X	X	X		X	X	X	X	X	X							X
POLKVILLE POLICE DEPARTMENT	Police			X	X	X	X		X	X	X	X	X	X							X
SCOTT COUNTY EOC	EOC			X	X	X	X		X	X	X	X	X	X							X
ALPHA & OMEGA ACADEMY	School			X	X	X	X		X	X	X	X	X	X							X
BETTYE MAE JACK MIDDLE SCHOOL	School			X	X	X	X		X	X	X	X	X	X							X
FOREST ELEMENTARY SCHOOL	School			X	X	X	X		X	X	X	X	X	X							X
FOREST HIGH SCHOOL	School			X	X	X	X		X	X	X	X	X	X							X
FOREST SCOTT CO VOC TECH CENTER	School			X	X	X	X		X	X	X	X	X	X							X

		FLOOD-RELATED					FIRE-RELATED		GEOLOGIC			WIND-RELATED			OTHER						
FACILITY NAME	FACILITY TYPE	Flood – 100 yr	Flood – 500 yr	Erosion	Dam and Levee Failure	Winter Storm and Freeze	Drought / Heat Wave	Wildfire	Earthquake	Landslide	Land Subsidence	Hurricane and Tropical Storm	Thunderstorm (wind, hail,	Tornado	Fixed HAZMAT – 0.5 mile	Fixed HAZMAT – 1.0 mile	Mobile HAZMAT – 0.5 mile (road)	Mobile HAZMAT – 1.0 mile (road)	Mobile HAZMAT – 0.5 mile (rail)	Mobile HAZMAT – 1.0 mile (rail)	Pandemic
SCOTT COUNTY																					
HAWKINS MIDDLE SCHOOL	School			X	X	X	X		X	X	X	X	X	X							X
LAKE ELEMENTARY SCHOOL	School			X	X	X	X		X	X	X	X	X	X							X
LAKE HIGH SCHOOL	School			X	X	X	X		X	X	X	X	X	X							X
LAKE MIDDLE SCHOOL	School			X	X	X	X		X	X	X	X	X	X							X
MORTON ELEMENTARY SCHOOL	School			X	X	X	X		X	X	X	X	X	X							X
MORTON HIGH SCHOOL	School			X	X	X	X		X	X	X	X	X	X							X
SCOTT CENTRAL ATTENDANCE CENTER	School			X	X	X	X		X	X	X	X	X	X							X

H.4 SCOTT COUNTY CAPABILITY ASSESSMENT

This subsection discusses the capability of Scott County to implement hazard mitigation activities. More information on the purpose and methodology used to conduct the assessment can be found in Section 7: *Capability Assessment*.

H.4.1 Planning and Regulatory Capability

The table below provides a summary of the relevant local plans, ordinances, and programs already in place or under development for Scott County. A checkmark (✓) indicates that the given item is currently in place and being implemented. An asterisk (*) indicates that the given item is currently being developed for future implementation. Each of these local plans, ordinances, and programs should be considered available mechanisms for incorporating the requirements of the MEMA District 6 Regional Hazard Mitigation Plan.

Table H.32: RELEVANT PLANS, ORDINANCES, AND PROGRAMS

Planning Tool/Regulatory Tool	Hazard Mitigation Plan	Comprehensive Land Use Plan	Floodplain Management Plan	Open Space Management Plan (Parks & Rec/Greenway Plan	Stormwater Management Plan/Ordinance	Natural Resource Protection Plan	Flood Response Plan	Emergency Operations Plan	Continuity of Operations Plan	Evacuation Plan	Disaster Recovery Plan	Capital Improvements Plan	Economic Development Plan	Historic Preservation Plan	Flood Damage Prevention Ordinance	Zoning Ordinance	Subdivision Ordinance	Unified Development Ordinance	Post-Disaster Redevelopment Ordinance	Building Code	Fire Code	National Flood Insurance Program (NFIP)	NFIP Community Rating System
SCOTT COUNTY	✓							✓					✓		✓							✓	
Forest	✓	✓						✓					✓		✓	✓	✓			✓	✓	✓	
Lake	✓							✓					✓		✓							✓	
Morton	✓	✓						✓					✓		✓	✓				✓	✓	✓	
Sebastopol	✓							✓					✓		✓							✓	

A more detailed discussion on the county's planning and regulatory capabilities follows.

EMERGENCY MANAGEMENT

Hazard Mitigation Plan
Scott County has previously adopted a hazard mitigation plan. The City of Forest, Town of Lake, City of

Morton, and Town of Sebastopol were also included in this plan.

Emergency Operations Plan
Scott County maintains an Emergency Operations Plan through its Emergency Management Agency. The City of Forest, Town of Lake, City of Morton, and Town of Sebastopol are each covered by this plan.

GENERAL PLANNING

Comprehensive Land Use Plan
Scott County has not adopted a county comprehensive land use plan. However, the City of Forest and City of Morton have each adopted a municipal comprehensive plan.

Zoning Ordinance
Scott County does not have a zoning ordinance in place. However, the City of Forest and City of Morton have adopted zoning ordinances.

Subdivision Ordinance
Scott County does not have a subdivision ordinance in place. However, the City of Forest has adopted a subdivision ordinance.

Building Codes, Permitting, and Inspections
The City of Forest and City of Morton have adopted a building code.

FLOODPLAIN MANAGEMENT

The table below provides NFIP policy and claim information for each participating jurisdiction in Scott County.

Table H.33: NFIP POLICY AND CLAIM INFORMATION

Jurisdiction	Date Joined NFIP	Current Effective Map Date	NFIP Policies in Force	Insurance in Force	Closed Claims	Total Payments to Date
SCOTT COUNTY†	09/01/87	12/17/10(M)	23	$4,415,100	3	$118,069
Forest	02/01/87	12/17/10(M)	45	$6,362,600	4	$62,767
Lake	08/05/85	12/17/10(M)	1	$20,700	0	$0
Morton	09/29/86	12/17/10(M)	18	$1,694,000	4	$4,406
Sebastopol	06/03/86	12/17/10(M)	0	$0	0	$0

†Includes unincorporated areas of county only
(M) – No Elevation Determined, All Zone A, C and X
Source: NFIP Community Status information as of 9/2/2015; NFIP claims and policy information as of 6/30/2015

Flood Damage Prevention Ordinance
All communities participating in the NFIP are required to adopt a local flood damage prevention ordinance. Scott County, the City of Forest, the Town of Lake, the City of Morton, and the Town of Sebastopol all participate in the NFIP and have adopted flood damage prevention ordinances.

H.4.2 Administrative and Technical Capability

The table below provides a summary of the capability assessment results for Scott County with regard to relevant staff and personnel resources. A checkmark (✓) indicates the presence of a staff member(s) in that jurisdiction with the specified knowledge or skill.

Table H.34: RELEVANT STAFF / PERSONNEL RESOURCES

Staff / Personnel Resource	Planners with knowledge of land development/land management practices	Engineers or professionals trained in construction practices related to buildings and/or infrastructure	Planners or engineers with an understanding of natural and/or human-caused hazards	Emergency Manager	Floodplain Manager	Land Surveyors	Scientists familiar with the hazards of the community	Staff with education or expertise to assess the community' s vulnerability to hazards	Personnel skilled in GIS and/or Hazus	Resource development staff or grant writers
SCOTT COUNTY				✓	✓		✓	✓	✓	
Forest		✓		✓	✓		✓	✓	✓	
Lake				✓	✓		✓	✓	✓	
Morton				✓	✓		✓	✓	✓	
Sebastopol				✓	✓		✓	✓	✓	

Credit for having a floodplain manager was given to those jurisdictions that have a flood damage prevention ordinance, and therefore an appointed floodplain administrator, regardless of whether the appointee was dedicated solely to floodplain management. Credit was given for having a scientist familiar with the hazards of the community if a jurisdiction has a Cooperative Extension Service or Soil and Water Conservation Department. Credit was also given for having staff with education or expertise to assess the community's vulnerability to hazards if a staff member from the jurisdiction was a participant on the existing hazard mitigation plan's planning committee.

H.4.3 Fiscal Capability

The table below provides a summary of the results for Scott County with regard to relevant fiscal resources. A checkmark (✓) indicates that the given fiscal resource is locally available for hazard mitigation purposes (including match funds for state and federal mitigation grant funds) according to the previous county hazard mitigation plan.

Table H.35: RELEVANT FISCAL RESOURCES

Fiscal Tool / Resource	Capital Improvement Programming	Community Development Block Grants (CDBG)	Special Purpose Taxes (or taxing districts)	Gas/Electric Utility Fees	Water/Sewer Fees	Stormwater Utility Fees	Development Impact Fees	General Obligation, Revenue, and/or Special Tax Bonds	Partnering Arrangements or Intergovernmental Agreements	Other: other state and Federal funding sources
SCOTT COUNTY	✓	✓								✓
Forest	✓	✓								✓
Lake	✓	✓								✓
Morton	✓	✓								✓
Sebastopol	✓	✓								✓

H.4.4 Political Capability

During the months immediately following a disaster, local public opinion in Scott County is more likely to shift in support of hazard mitigation efforts.

H.4.5 Conclusions on Local Capability

The table below shows the results of the capability assessment using the designed scoring methodology described in Section 7: *Capability Assessment*. The capability score is based solely on the information found in existing hazard mitigation plans and readily available on the jurisdictions' government websites. According to the assessment, the average local capability score for the county and its jurisdictions is 20.8, which falls into the moderate capability ranking.

Table H.36: CAPABILITY ASSESSMENT RESULTS

Jurisdiction	Overall Capability Score	Overall Capability Rating
SCOTT COUNTY	21	Moderate
Forest	26	Moderate
Lake	17	Limited

Jurisdiction	Overall Capability Score	Overall Capability Rating
Morton	23	Moderate
Sebastopol	17	Limited

H.5 SCOTT COUNTY MITIGATION STRATEGY

This subsection provides the blueprint for Scott County to follow in order to become less vulnerable to its identified hazards. It is based on general consensus of the Regional Hazard Mitigation Council and the findings and conclusions of the capability assessment and risk assessment. Additional Information can be found in Section 8: *Mitigation Strategy* and Section 9: *Mitigation Action Plan*.

H.5.1 Mitigation Goals

Scott County developed 10 mitigation goals in coordination with the other participating MEMA District 6 Region jurisdictions. The regional mitigation goals are presented below.

Table H.37: MEMA DISTRICT 6 REGIONAL MITIGATION GOALS

Goal #		Goals & Objectives	Action #
#1	**Goal**	Local government will be able to maintain **effective mitigation programs**.	
	Objective		
#2	**Goal**	The community will work together to create a **disaster-resistant community**.	
	Objective		
#3	**Goal**	The community will be able to initiate and sustain **emergency response operations.**	
	Objective		
#4	**Goal**	**Government operations** will not be significantly disrupted by disasters.	
	Objective		
#5	**Goal**	The **health, safety, and welfare of the community's residents and visitors** will be protected.	
	Objective		
#6	**Goal**	**Local government will support effective hazard mitigation programming** in the community.	
	Objective		
#7	**Goal**	Residents of the community will have **homes, institutions, and work places that are safer**.	
	Objective		
#8	**Goal**	The **local economy** of the community will be prepared for a disaster.	
	Objective		
#9	**Goal**	**Local infrastructure will not be significantly disrupted by a disaster**.	
	Objective		
#10	**Goal**	All **members of the community will understand the hazards threatening their community.**	
	Objective		

To attain the listed mitigation goals, the county has also identified objectives that will assist them in the mitigation action process. Objectives are broader than specific actions, but are measurable, unlike goals. Objectives connect goals with the actual mitigation actions. The action plan describes how the mitigation actions will be implemented, including how those actions will be prioritized, administered and incorporated into the community's existing planning mechanisms.

H.5.2 Mitigation Action Plan

The mitigation actions proposed by Scott County, Forest, Lake, Morton, and Sebastopol are listed in the following individual Mitigation Action Plans.

Scott County Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with Forest Municipal Schools and Scott County Schools to identify which roads their buses have trouble crossing during heavy rains because of flooding.	Flood	Low	County EMA, County School System, Forest Municipal School System	FEMA/MEMA, CDBG, State DOE, Local funds	2017	Data has been collected for this analysis, but specific roads have not been identified and there has not been action undertaken to address these issues. This will remain in the plan going forward as the county seeks to complete the action.
P-2	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2020	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2020	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-4	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2020	The International Building Code has not been adopted. The county will review this code and consider adoption, so this action will remain in the plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
P-5	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	County EMA	FEMA/MEMA, Homeland Security, Local funds	2020	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
P-6	Collect additional data on the number of buildings located in flood-prone areas and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	County EMA	FEMA/MEMA, Local funds	2020	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1	Replacement of three 72” culverts with one 31’ bridge on Rocky Creek Road to alleviate flooding at the intersection of this road and Morton-Rankin County Line Road.	Flood	High	Board of Supervisors	FEMA/MEMA, CDBG, State Aid, Bridge Replacement Program, Local funds	2017	These culverts have not been replaced. The county will continue to seek funding for this project and it will remain in the plan.
SP-2	Elevation of Rocky Creek Road, including building the road up to 24” for 0.2 miles and 12” for 0.2 miles and the installation of two 48” culverts and one 36” culvert.	Flood	High	Board of Supervisors	FEMA/MEMA, CDBG, Local funds	2020	This road has not been elevated and culverts have not been installed. The county will continue to seek funding for this project and it will remain in the plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
SP-3	Replacement of bridge on Old Jackson Road.	Flood	High	Board of Supervisors	FEMA/MEMA, Local funds	2020	This bridge has not been replaced. The county will continue to seek funding for this project and it will remain in the plan.
SP-4	Elevation of Doc Webb Road by 12" and the replacement of two 36" culverts with two 48" culverts.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, US Army Corps of Engineers, CDBG, Local funds	2020	This road has not been elevated and culverts have not been installed. The county will continue to seek funding for this project and it will remain in the plan.
SP-5	Elevation of Steve Lee Drive by 12" and the installation of an additional 9' culvert.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, CDBG, Local funds	2020	This road has not been elevated and culvert has not been installed. The county will continue to seek funding for this project and it will remain in the plan.
SP-6	Replacement of the bridge, replacement of two (2) 48" culverts, and elevation of approximately 0.5 miles of Hillsboro-Ludlow Road.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2020	This bridge has not been replaced and culverts have not been installed. The county will continue to seek funding for this project and it will remain in the plan.
Emergency Services							
ES-1	Work to secure adequate backup power or alternate shelter for the residents of Magnolia Manor Personal Care Home in Forest.	Flood	High	County EMA, Magnolia Manor	FEMA/MEMA, Private funds, Local funds	2017	Backup power for residents of care home has not been added. The county will seek funding to implement this project in the future.
ES-2	Purchase of additional tankers for the rural volunteer fire departments.	Wildfire	High	County EMA, Volunteer Fire Departments	FEMA/MEMA, AFGP, CDBG, Local funds	2017	Some tankers have been purchased, but there is still a need for additional tankers so this project will be deferred and remain in the plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
ES-3	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	County EMA	FEMA/MEMA, Local funds	2017	Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan.
ES-4	Increase the number of emergency warning systems throughout the County, especially inside the municipalities. Also, increase the size and number of existing warning systems.	Tornado, High Wind	Moderate	County EMA	FEMA/MEMA, Homeland Security, Local funds	2020	The county would still like to increase the number of early warning systems it has in place and will work on seeking additional grant funding to implement these systems.
ES-5	Conducting mock emergency exercises to improve local response capabilities.	All	Moderate	County EMA	FEMA/MEMA, AFGP, Homeland Security, Local funds	2020	The county has conducted mock exercises in the past to improve local response capabilities, but these exercises need to be carried out in the future as well, so this action will remain in place.
ES-6	Installation of generator quick connect/transfer switches at all County schools.	All	Moderate	County EMA	FEMA/MEMA, Local funds	2020	There have been some quick connects added to county schools, but there is a definitive need for additional transfer switches. This action will be carried forward.
Public Education and Awareness							
PEA-1	Education of local citizens on the dangers of driving across flooded roads.	Flood	High	County EMA	FEMA/MEMA, LLEBG, AAA (free booklets?), Local funds	2020	The county has undertaken numerous public education campaigns to make citizens aware of the dangers of driving across flooded roads, but this is still a top priority for the county and will remain as an action going forward.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
PEA-2	Education of local residents on being prepared for severe weather and hazards.	All	High	County EMA	FEMA/MEMA, Local funds	2020	The county works with local media and does many outreach events to inform residents about preparing for hazards. However, there is still significant outreach that needs to take place going forward so this action will remain in place.
Previously Completed Actions							
	Replacement of the bridge on Horseshoe Road that washed out in a past flood.	Flood	High	Board of Supervisors	FEMA/MEMA, CDBG, Local funds	1-2 years	Completed.
	Purchase of weather radios for public meeting places – i.e., schools, community centers, senior citizen centers.	Tornado, High Wind	High	County EMA	FEMA/MEMA, Local funds	1-2 years	Completed.
	Contact local cable systems in Sebastopol and Lake to see if they have the capability to allow emergency alerts to be broadcast over local television channels.	Tornado, High Wind	High	County EMA	Public Service	1-2 years	Completed. Done except for the Town of Lake.
	Work with administration at S.E. Lackey Critical Access Hospital/Convalescent Home to provide extra manpower to help move patients into hallways during severe weather warnings.	Tornado, High Wind	High	County EMA, Lackey Hospital	Public Service	1-2 years	Completed. Part of Hospital Emergency Plan.
	Installation of a texting/paging system for the County.	All	High	County EMA, Board of Supervisors	FEMA/MEMA, Homeland Security, AFGP, Local funds	1-2 years	Completed.
	Purchase of a paging system for Scott County Schools.	All	Moderate	County School System	FEMA/MEMA, DOE, Local funds	2-5 years	Completed. Texting system in place.
	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Low	County EMA	FEMA/MEMA, Local funds	Ongoing	Completed.

City of Forest Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with Forest Municipal Schools to identity which roads their buses have trouble crossing during heavy rains because of flooding.	Flood	High	Fire Department , Police Department , Forest Municipal Schools	FEMA, MEMA, CDBG, State DOE, Local funds	2017	Data has been collected for this analysis, but specific roads have not been identified and there has not been action undertaken to address these issues. This will remain in the plan going forward as the county seeks to complete the action.
P-2	Passage and enforcement of wind codes on new construction.	Tornado, High Wind	Moderate	Board of Aldermen	Local funds	2020	The city has wind codes in place to govern new construction, but these codes will likely need further evaluation and amendment in the future, so this action will remain in place.
P-3	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Aldermen	FEMA, MEMA, Local funds	2020	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-4	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Board of Aldermen	FEMA, MEMA, Local funds	2020	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
P-5	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Fire Department , Police Department	FEMA, MEMA, Homeland Security, Local funds	2020	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
P-6	Collect additional data on the number of buildings located in flood-prone areas and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	Fire Department , Police Department	FEMA, MEMA, Local funds	2020	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.
Property Protection							
PP-1	Retrofitting of existing buildings to conform to wind codes.	Tornado, High Wind	Moderate	Public Works	FEMA, MEMA, Local funds	2020	The city has retrofit some of its buildings to conform with wind codes, but there are still some buildings that are not up to code, so the city will continue to pursue this action as funding is available.
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1	Installation of larger culverts and clean out of debris in channel at Hillsboro Street at West Banks Street.	Flood	High	Public Works	FEMA, MEMA, CDBG, Local funds	2017	These culverts have not been replaced. The county will continue to seek funding for this project and it will remain in the plan.
SP-2	Installation of larger culverts and clean out of debris in channel at Highway 35 and Highway 80.	Flood	Low	Public Works	FEMA, MEMA, MDOT, Local funds	2020	These culverts have not been replaced. The county will continue to seek funding for this project and it will remain in the plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Emergency Services							
ES-1	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Fire Department , Police Department	FEMA, MEMA, Local funds	2017	Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan.
ES-2	Construction of a new fire station south of I-20.	All	High	Board of Aldermen, Fire Department	FEMA, MEMA, Homeland Security, CDBG, Local funds	2017	A new fire station has not been constructed due to lack of available funding. The city will continue to look into options to build this station.
ES-3	Purchase of generators to provide adequate backup power for all water and wastewater facilities.	All	High	Public Works	FEMA, MEMA, CDBG, Local funds	2017	Generators have not been purchased for all water and wastewater facilities. The city has not had funds for these projects, but will continue to try to find funding streams for these going forward.
ES-4	Expand warning siren network to notify residents of dangers.	All	High	Public Works	FEMA, MEMA, Local funds	2017	The warning siren network has been expanded to some degree, but there are still many improvements that could be made and the city would like to continue to look into potential options for improving the system.
ES-5	Purchase of a radio system for Forest Municipal School District that is compatible with the City's system.	All	Moderate	Fire Department, Police Department, School District	FEMA, MEMA, DOE, Local funds	2020	Radio system for the school district has not been purchased. The city wants to keep this as an action and continue to pursue it going forward.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Public Education and Awareness							
PEA-1	Education of local citizens on the dangers of driving across flooded roads.	Flood	High	Fire Department , Police Department	FEMA, MEMA, LLEBG, Local funds	2020	The county has undertaken numerous public education campaigns to make citizens aware of the dangers of driving across flooded roads, but this is still a top priority for the county and will remain as an action going forward.
PEA-2	Education of local citizens on how to prevent stoppage of culverts from debris on private property.	Flood	Moderate	Public Works	FEMA, MEMA, Local funds	2020	Some outreach efforts have taken place to educate citizens on preventing culvert stoppage, but this effort needs to continue so it will remain an action.
PEA-3	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Moderate	Fire Department , Police Department	FEMA, MEMA, Local funds	2020	Citizens are encouraged to construct safe rooms and identify shelters, but this action will need to remain in place as additional outreach efforts are needed in the future.
PEA-4	Education of local residents on being prepared for severe weather and hazards.	All	High	County EMA	FEMA/MEMA, Local funds	2020	New action. The county works with local media and does many outreach events to inform residents about preparing for hazards. However, there is still significant outreach that needs to take place going forward so this action will remain in place.
Previously Completed Actions							
	Installation of larger culverts and clean out of debris in channel on Martin Luther King Jr. Drive.	Flood	High	Public Works	FEMA, MEMA, CDBG, Local funds	1-2 years	Completed.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
	Installation of larger culverts and clean out of debris in channel at Front Street at Wade Street.	Flood	High	Public Works	FEMA, MEMA, CDBG, Local funds	1-2 years	Completed.
	Installation of larger culverts and clean out of debris in channel at Jones Street at Old Fairground.	Flood	High	Public Works	FEMA, MEMA, CDBG, Local funds	1-2 years	Completed.
	Installation of larger culverts and clean out of debris in channel at Highway 80 at Eastwood.	Flood	Low	Public Works	FEMA, MEMA, MDOT, Local funds	3-5 years	Completed.
	Establishing a regular maintenance schedule of existing culverts to prevent debris buildup.	Flood	Low	Public Works	Local funds	3-5 years	Completed.

Town of Lake Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Clearing and removal of debris from Warrior Creek to alleviate flooding south of Town.	Flood	Moderate	Public Works	FEMA, MEMA, CDBG, Local funds	2020	Efforts have been made in the past to clear the creek, but further steps need to be taken to alleviate the flooding on the south side of town, so this action will remain in place.
P-2	Work with ECPDD to develop a model ordinance to regulate construction in flood prone areas.	Flood	Moderate	Board of Aldermen	FEMA, MEMA, Local funds	2020	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Board of Aldermen	FEMA, MEMA, Local funds	2020	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-4	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Board of Aldermen	FEMA, MEMA, Local funds	2020	The International Building Code has been adopted. The county will need to review this code over the next 5 years, so this action will remain in the plan.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Structural Projects							
SP-1	Elevation of Steve Lee Drive by 12" and the installation of an additional 9' culvert.	Flood	High	Scott County Board of Supervisors, Board of Aldermen	FEMA, MEMA, CDBG, Local funds	2020	This road has not been elevated and culvert has not been installed. The town will continue to seek funding for this project and it will remain in the plan.
Emergency Services							
ES-1	Purchase a generator to provide reliable standby power for the Lake Volunteer Fire Department.	Tornado, High Wind	High	Fire Department	FEMA, MEMA, AFGP, Local funds	2017	Generators have not been purchased for fire department. The town has not had funds for these projects, but will continue to try to find funding streams for these going forward.
ES-2	Installation of an emergency warning system for the Town.	Tornado, High Wind	High	Board of Aldermen, Volunteer Fire Department, Police	FEMA, MEMA, Local funds	2017	A warning siren network has not been installed and the town would like to continue to look into potential options for funding the system.
ES-3	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Volunteer Fire Department, Police Department	FEMA, MEMA, Local funds	2017	Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan.
ES-4	Contact local cable system to see if they have the capability to allow emergency alerts to be broadcast over local television channels.	Tornado, High Wind	Moderate	Board of Aldermen	FEMA, MEMA, Local funds	Deleted	Deleted. Not feasible, most residents have satellite.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Public Education and Awareness							
PEA-1	Education of local citizens on the dangers of driving across flooded roads.	Flood	Low	Volunteer Fire Department, Police Department	FEMA, MEMA, LLEBG, AAA (free booklets?), Local funds	2020	The county has undertaken numerous public education campaigns to make citizens aware of the dangers of driving across flooded roads, but this is still a top priority for the county and will remain as an action going forward.
PEA-2	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Low	Volunteer Fire Department, Police Department	FEMA, MEMA, Local funds	2020	Citizens are encouraged to construct safe rooms and identify shelters, but this action will need to remain in place as additional outreach efforts are needed in the future.
PEA-3	Education of local residents on being prepared for sever weather and hazards.	All	Low	Volunteer Fire Department, Police Department	FEMA, MEMA, Local funds	2020	The county works with local media and does many outreach events to inform residents about preparing for hazards. However, there is still significant outreach that needs to take place going forward so this action will remain in place.
Previously Completed Actions							
	Purchase of weather radios for public meeting places – i.e., schools, community centers, and senior citizen centers.	Tornado, High Wind	High	Board of Aldermen, Fire Department, Police	FEMA, MEMA, Local funds	1-2 years	Completed.

City of Morton Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Board of Aldermen	FEMA, MEMA, Local funds	2020	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-2	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Fire Department, Police Department	FEMA, MEMA, Homeland Security, Local funds	2020	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
P-3	Collect additional data on the number of buildings located in flood-prone areas and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	Fire Department, Police Department	FEMA, MEMA, Local funds	2020	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1	Work with US Army Corps of Engineers to identify projects to alleviate flooding in flood-prone areas.	Flood	High	Board of Aldermen	FEMA, MEMA, US Army Corps of Engineers, CDBG, Local funds	2017	The town has not worked with the USACE to identify projects, so this action will need to be carried forward and implemented before future structural projects can be installed.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Emergency Services							
ES-1	Purchase of weather radios for public meeting places – i.e., schools, community centers, senior citizen centers.	Tornado, High Wind	High	Board of Aldermen	FEMA, MEMA, Local funds	2020	Weather radios for the schools, community centers, etc have not been purchased. The town wants to keep this as an action and continue to pursue it going forward.
ES-2	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Fire Department , Police Department	FEMA, MEMA, Local funds	2017	Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan.
ES-3	Expand warning siren network to notify residents of dangers.	All	High	Public Works	FEMA, MEMA, Local funds	2017	The warning siren network has been expanded to some degree, but there are still many improvements that could be made and the city would like to continue to look into potential options for improving the system.
ES-4	Work to secure more satellite telephones for emergency personnel so they can communicate with Scott Regional Hospital.	Tornado, High Wind	Moderate	Fire Department, Police Department, Scott Regional	FEMA, MEMA, Local funds	2020	Satellite telephones for emergency personnel have not been purchased, but this is a need, so the town will continue to look into funding options.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Public Education and Awareness							
PEA-1	Education of local citizens on the dangers of driving across flooded roads.	Flood	Low	Fire Department , Police Department	FEMA, MEMA, LLEBG, AAA (free booklets?), Local funds	2020	The county has undertaken numerous public education campaigns to make citizens aware of the dangers of driving across flooded roads, but this is still a top priority for the county and will remain as an action going forward.
PEA-2	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Low	Fire Department , Police Department	FEMA, MEMA, Local funds	2020	Citizens are encouraged to construct safe rooms and identify shelters, but this action will need to remain in place as additional outreach efforts are needed in the future.
PEA-3	Education of local residents on being prepared for severe weather and hazards.	All	Low	Fire Department , Police Department	FEMA, MEMA, Local funds	2020	The county works with local media and does many outreach events to inform residents about preparing for hazards. However, there is still significant outreach that needs to take place going forward so this action will remain in place.
Previously Completed Actions							
	Purchase of a generator to provide standby power for the water system.	Tornado, High Wind	High	Public Works	FEMA, MEMA, Homeland Security, Local funds	1-2 years	Completed.
	Work to secure transportation for non-critical patients at Scott Regional Hospital during emergencies.	Tornado, High Wind	High	Fire Department, Police Department, Scott	FEMA, MEMA, Local funds	1-2 years	Completed. Part of Hospital Emergency Plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Aldermen	FEMA, MEMA, Local funds	2-5 years	Completed.

Town of Sebastopol Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Aldermen	FEMA, MEMA, Local funds	2020	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-2	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Board of Aldermen	FEMA, MEMA, Local funds	2020	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Board of Aldermen	FEMA, MEMA, Local funds	2020	The International Building Code has been adopted. The county will need to review this code over the next 5 years, so this action will remain in the plan.
P-4	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Volunteer Fire Department, Police Department	FEMA, MEMA, Homeland Security, Local funds	2020	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
P-5	Collet additional data on the number of buildings located in flood-prone areas and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	Volunteer Fire Department, Police Department	FEMA, MEMA, Local funds	2020	Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1							
Emergency Services							
ES-1	Installation of an emergency warning system for the Town.	Tornado, High Wind	High	Board of Aldermen	FEMA, MEMA, Local funds	2017	A warning siren network has not been installed and the town would like to continue to look into potential options for funding the system.
ES-2	Purchase of a generator to provide standby power for Sebastopol Fire Department.	Tornado, High Wind	High	Volunteer Fire Department	FEMA, MEMA, AFGP, Homeland Security, Local funds	2017	A generator has not been purchased for fire department. The town has not had funds for these projects, but will continue to try to find funding streams for these going forward.
ES-3	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Volunteer Fire Department, Police Department	FEMA, MEMA, Local funds	2017	Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan.
ES-4	Contact local cable system to see if they have the capability to allow emergency alerts to be broadcast over local television channels.	Tornado, High Wind	Moderate	Board of Aldermen	Public Service	Deleted	Deleted. Not feasible, most residents have satellite.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Public Education and Awareness							
PEA-1	Education of local citizens on the dangers of driving across flooded roads.	Flood	Low	Volunteer Fire Department, Police Department	FEMA, MEMA, LLEBG, AAA (free booklets?), Local funds	2020	The county has undertaken numerous public education campaigns to make citizens aware of the dangers of driving across flooded roads, but this is still a top priority for the county and will remain as an action going forward.
PEA-2	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Low	Volunteer Fire Department, Police Department	FEMA, MEMA, Local funds	2020	Citizens are encouraged to construct safe rooms and identify shelters, but this action will need to remain in place as additional outreach efforts are needed in the future.
PEA-3	Education of local residents on being prepared for sever weather and hazards.	All	Low	Volunteer Fire Department, Police Department	FEMA, MEMA, Local funds	2020	The county works with local media and does many outreach events to inform residents about preparing for hazards. However, there is still significant outreach that needs to take place going forward so this action will remain in place.
Previously Completed Actions							
	Purchase of weather radios for public meeting places – i.e., schools, community centers, senior citizen centers.	Tornado, High Wind	Moderate	Board of Aldermen	FEMA, MEMA, Local funds	2-5 years	Completed.

ANNEX I
SMITH COUNTY

This annex includes jurisdiction-specific information for Smith County and its participating municipalities. It consists of the following five subsections:

- I.1 Smith County Community Profile
- I.2 Smith County Risk Assessment
- I.3 Smith County Vulnerability Assessment
- I.4 Smith County Capability Assessment
- I.5 Smith County Mitigation Strategy

I.1 SMITH COUNTY COMMUNITY PROFILE

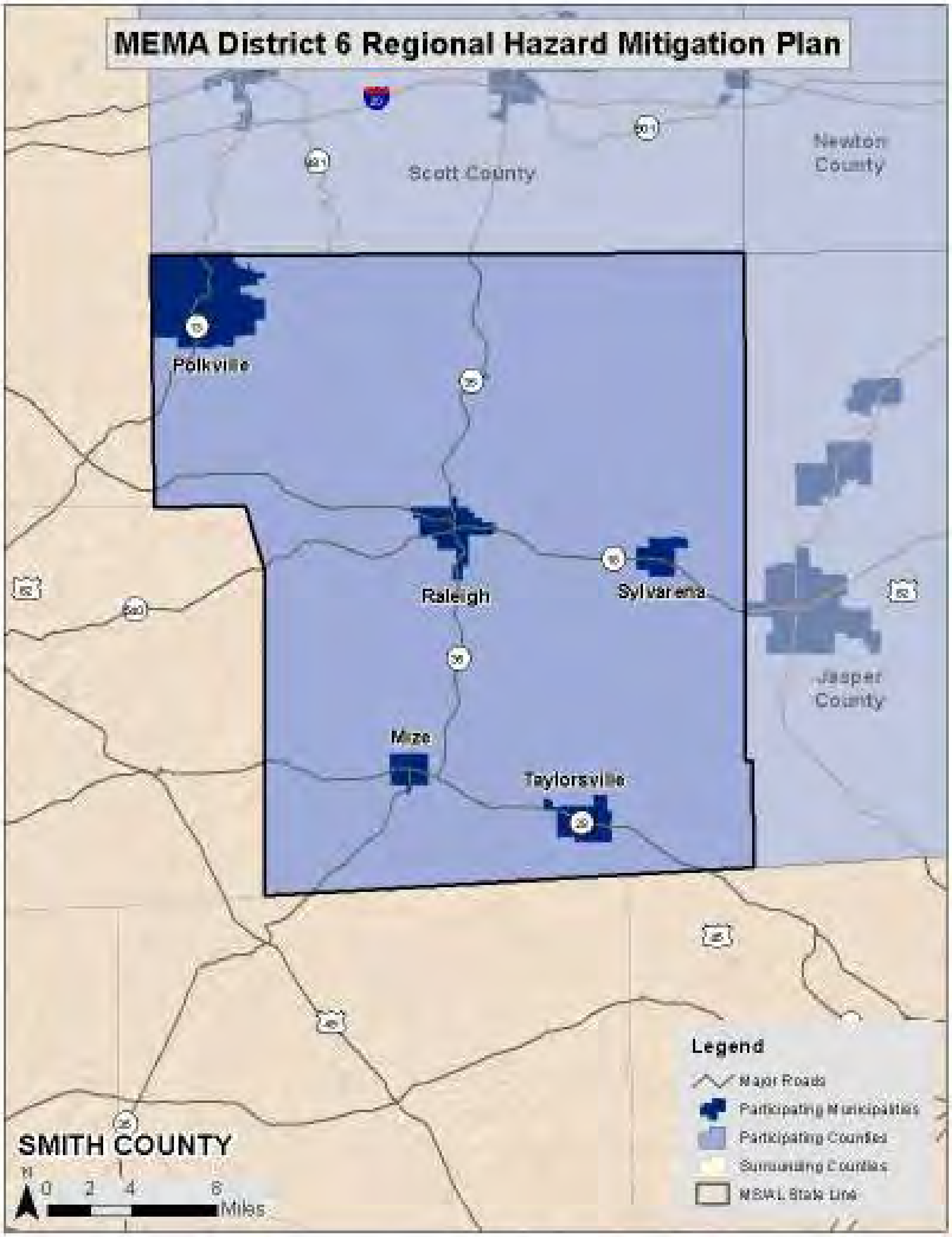
I.1.1 Geography and the Environment

Smith County is located in south central Mississippi. It comprises four towns and one village, Town of Mize, Town of Polkville, Town of Raleigh, Village of Sylvarena, and Town of Taylorsville, as well as many small unincorporated communities. An orientation map is provided as **Figure I.1**.

The county provides a various range of recreational and economic opportunities for residents and visitors. The total area of the county is 636 square miles, 1 square mile of which is water area.

Summer temperatures in the county range from highs of about 90 degrees Fahrenheit (˚F) to lows in the upper 60s. Winter temperatures range from highs in the mid-50s to lows around 30˚F. Average annual rainfall is approximately 56 inches, with the wettest months being November, December, and May.

Figure I.1: SMITH COUNTY ORIENTATION MAP



I.1.2 Population and Demographics

According to the 2019 American Community Survey, Smith County has a population of 16,009 people. The county has seen a slight decrease in population between 2010 and 2019, however Polkville experienced a significant rate of growth while Sylvarena experienced a decline. The population density is 25 people per square mile. Population counts from the US Census Bureau for 2000, 2010, and 2019 for the county and participating jurisdictions are presented in **Table I.1**.

Table I.1: POPULATION COUNTS FOR SMITH COUNTY

Jurisdiction	2000 Census Population	2010 Census Population	2019 Census Population	% Change 2010-2019
Smith County	**16,182**	**16,491**	**16,009**	**-2.92%**
Mize	285	340	270	-20.58%
Polkville	132	833	813	-2.4%
Raleigh	1,255	1,462	1,152	-21.2%
Sylvarena	120	112	147	31.25%
Taylorsville	1,341	1,353	2,080	53.73%

Source: United States Census Bureau – American Community Survey

Based on the 2019 American Community Survey, the median age of residents of Smith County has increased from 39.1 to 41.5 years. The racial characteristics of the county are presented in **Table I.2**. Whites make up the majority of the population in the county, accounting for almost 75.8% percent of the population.

Table I.2: DEMOGRAPHICS OF SMITH COUNTY

Jurisdiction	White, Percent (2019)	Black or African American, Percent (2019)	American Indian or Alaska Native, Percent (2019)	Asian, Percent (2019)	Native Hawaiian or Other Pacific Islander, Percent (2019)	Other Race, Percent (2019)	Two or More Races, percent (2019)	Persons of Hispanic Origin, Percent (2019)*
Smith County	**75.8%**	**23.0%**	**0.0%**	**0.5%**	**0.2%**	**0.1%**	**0.4%**	**1.7%**
Mize	80.7%	0.0%	0.0%	1.9%	0.0%	1.1%	16.3%	6.3%
Polkville	96.4%	3.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Raleigh	51.0%	49.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%
Sylvarena	92.5%	7.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Taylorsville	68.6%	30.4%	0.0%	0.0%	0.0%	0.7%	0.4%	2.9%

*Hispanics may be of any race, so also are included in applicable race categories
Source: United States Census Bureau

I.1.3 Housing

According to the 2019 American Community Survey, there are 7,377 housing units in Smith County, the majority of which are single family homes or mobile homes. Housing information for the county and five municipalities is presented in **Table I.3**.

Table I.3: HOUSING CHARACTERISTICS OF SMITH COUNTY

Jurisdiction	Housing Units (2010)	Housing Units (2019)	Median Home Value (2019)
Smith County	**7,237**	**7,377**	**$102,600**
Mize	147	113	$73,000
Polkville	353	340	$62,500
Raleigh	584	630	$91,700
Sylvarena	53	54	$80,000
Taylorsville	654	722	$121,800

Source: United States Census Bureau – American Community Survey

I.1.4 Infrastructure

TRANSPORTATION

In Smith County, multiple State Highways provides service throughout the county. State Highways 13, 35, and 37 provide access north and south. State Highways 18 and 28 travels east and west.

The Smith County Airport provides local service. The closest international airport includes Jackson-Evers International Airport, which offers international and domestic flights to a number of locations around the world.

UTILITIES

Electrical power in Smith County is provided by the Entergy Mississippi Incorporated, Mississippi Power Company, and Southern Pine EPA and several local distributors.

Water and sewer service is provided to residents by the City of Taylorsville, Morris Water Association, Pineville Water Association, Polkville Municipal Water, Sylvarena Water Association, Town of Mize, and Union Water Association, and other various local providers.

COMMUNITY FACILITIES

There are a number of buildings and community facilities located throughout Smith County. According to the data collected for the vulnerability assessment (Section 6.4.1), there are 6 fire station, 4 police stations, and 6 public schools located within the county.

There is one medical care facility located in Smith County. Patients Choice Medical Center is a 30-bed acute-care hospital located in the Town of Raleigh. Mississippi Care Center is a 40 bed skilled nursing facility is also located in the Town of Raleigh.

Recreational opportunities in Smith County include multiple parks, civics centers, sports facilities, and annual community events and festivals. Beinville National Forest is partially located in the county and consists of 178,541 acres used for hiking, fishing, boating, and hunting.

I.1.5 Land Use

Many areas of Smith County are undeveloped or sparsely developed. There are several small incorporated municipalities located throughout the county, with a few larger hubs interspersed. These areas are where the county's population is generally concentrated. The incorporated areas are also where many of the businesses, commercial uses, and institutional uses are located. Land uses in the balance of the study area generally consist of rural residential development, agricultural uses, and recreational areas, although there are some notable exceptions in the larger municipalities. Local land use and associated regulations are further discussed in *Section 7: Capability Assessment.*

I.1.6 Employment and Industry

According to U.S. Census Bureau's American Community Survey (ACS), in 2019, Smith County had an average annual employment of 6,538 workers and according to the Mississippi Department of Employment Security an average unemployment rate of 4.4 percent as of May 2021. In 2019, according to the ACS, the Educational Services, Health Care, and Social Assistance industry employed 22.3 percent of the workforce. Manufacturing was the second largest industry, employing 22.2 percent of workers, Agriculture, Forestry, Fishing, Hunting, (8.7%), and Construction (7.5%). The median household income in Smith County was $43,105 compared to $45,081 in the state of Mississippi.

I.2 SMITH COUNTY RISK ASSESSMENT

This subsection includes hazard profiles for each of the significant hazards identified in Section 4: *Hazard Identification* as they pertain to Smith County. Each hazard profile includes a description of the hazard's location and extent, notable historical occurrences, and the probability of future occurrences. Additional information can be found in Section 5: *Hazard Profiles*.

I.2.1 Flood

LOCATION AND SPATIAL EXTENT

There are areas in Smith County that are susceptible to flood events. Special flood hazard areas in the county were mapped using Geographic Information System (GIS) and FEMA Digital Flood Insurance Rate Maps (DFIRM).[1] This includes Zone A (1-percent annual chance floodplain), Zone AE (1-percent annual chance floodplain with elevation), and Zone X500 (0.2-percent annual chance floodplain). According to GIS analysis, of the 635 square miles that make up Smith County, there are 110.0 square miles of land in zones A and AE (1-percent annual chance floodplain/100-year floodplain) and 0.5 square miles of land in zone X500 (0.2-percent annual chance floodplain/500-year floodplain).

These flood zone values account for 17.4 percent of the total land area in Smith County. It is important to note that while FEMA digital flood data is recognized as best available data for planning purposes, it does not always reflect the most accurate and up-to-date flood risk. Flooding and flood-related losses often do occur outside of delineated special flood hazard areas. **Figure I.2** illustrates the location and extent of currently mapped special flood hazard areas for Smith County based on best available FEMA Digital Flood Insurance Rate Map (DFIRM) data. According to FEMA's Flood Insurance Study no major flood problems have been identified within Smith County.[2]

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[1] The county-level DFIRM data used for Smith County were updated in 2010.

[2] FEMA. Flood Insurance Study. July 2021

Figure I.2: SPECIAL FLOOD HAZARD AREAS IN SMITH COUNTY

Source: Federal Emergency Management Agency

HISTORICAL OCCURRENCES

Floods were at least partially responsible for seven disaster declarations in Smith County in 1974, 1990, 2003, 2011, 2019, and two in 2020. Information from the National Centers for Environmental Information was used to ascertain additional historical flood events. The National Centers for Environmental Information reported a total of 34 events in Smith County since 1998. A summary of these events is presented in **Table I.4**. These events accounted for almost $630,000 in property damage in the county.

Table I.4: SUMMARY OF FLOOD OCCURRENCES IN SMITH COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Mize	0	0/0	$0
Polkville	3	0/0	$15,000
Raleigh	6	0/0	$40,000
Sylvarena	2	0/0	$8,000
Taylorsville	4	0/0	$77,000
Unincorporated Area	19	0/0	$490,000
SMITH COUNTY TOTAL	**34**	**0/0**	**$630,000**

Source: National Centers for Environmental Information

HISTORICAL SUMMARY OF INSURED FLOOD LOSSES

Updated NFIP and Repetitive Loss Properties data was not made available during this plan update. The following information is current as of 2015. According to FEMA flood insurance policy records as of June 2015, there have been six flood losses reported in Smith County through the National Flood Insurance Program (NFIP) since 1978, totaling over $27,000 in claims payments. A summary of these figures for the county is provided in **Table I.5**. It should be emphasized that these numbers include only those losses to structures that were insured through the NFIP policies, and for losses in which claims were sought and received. It is likely that many additional instances of flood loss in Smith County were either uninsured, denied claims payment, or not reported.

Table I.5: SUMMARY OF INSURED FLOOD LOSSES IN SMITH COUNTY

Location	Flood Losses	Claims Payments
Mize	6	$27,348
Polkville*	--	--
Raleigh	0	$0
Sylvarena*	--	--
Taylorsville	0	$0
Unincorporated Area	0	$0
SMITH COUNTY TOTAL	**6**	**$27,348**

*These communities do not participate in the National Flood Insurance Program. Therefore, no values are reported.
Source: Federal Emergency Management Agency, National Flood Insurance Program

REPETITIVE LOSS PROPERTIES

According to the Mississippi Emergency Management Agency, there are no non-mitigated repetitive loss properties located in Smith County. **Table I.6** presents detailed information on repetitive loss properties and NFIP claims and policies for Smith County.

Table I.6: REPETITIVE LOSS PROPERTIES IN SMITH COUNTY

Location	Number of Properties	Types of Properties	Number of Losses	Building Payments	Content Payments	Total Payments	Average Payment
Mize	0	--	0	$0	$0	$0	$0
Polkville*	--	--	--	--	--	--	--
Raleigh	0	--	0	$0	$0	$0	$0
Sylvarena*	--	--	--	--	--	--	--
Taylorsville	0	--	0	$0	$0	$0	$0
Unincorporated Area	0	--	0	$0	$0	$0	$0
SMITH COUNTY TOTAL	**0**		**0**	**$0**	**$0**	**$0**	**$0**

*These communities do not participate in the National Flood Insurance Program. Therefore, no values are reported.
Source: National Flood Insurance Program

PROBABILITY OF FUTURE OCCURRENCES

Flood events will remain a threat in Smith County, and the probability of future occurrences will remain likely (between 10 and 100 percent annual probability). The participating jurisdictions and unincorporated areas have risk to flooding, though not all areas will experience flood. The probability of future flood events based on magnitude and according to best available data is illustrated in the figures above**,** which indicates those areas susceptible to the 1-percent annual chance flood (100-year floodplain) and the 0.2-percent annual chance flood (500-year floodplain).

It can be inferred from the floodplain location maps, previous occurrences, and repetitive loss properties that risk varies throughout the county. For example, the Town of Raleigh has less floodplain and thus a lower risk of flood than the other municipalities. Flood is not the greatest hazard of concern but will continue to occur and cause damage. Therefore, mitigation actions may be warranted, particularly for repetitive loss properties.

I.2.2 Erosion

LOCATION AND SPATIAL EXTENT

Erosion in Smith County is typically caused by flash flooding events. Unlike coastal areas, areas of concern for erosion in Smith County are primarily rivers and streams. Generally, vegetation helps to prevent erosion in the area, and it is not an extreme threat to the county. No areas of concern were reported by the hazard mitigation council.

HISTORICAL OCCURRENCES

Several sources were vetted to identify areas of erosion in Smith County. This includes searching local newspapers, interviewing local officials, and reviewing previous hazard mitigation plans. No historical erosion occurrences were found in these sources.

PROBABILITY OF FUTURE OCCURRENCES

Erosion remains a natural, dynamic, and continuous process for Smith County, and it will continue to occur. The annual probability level assigned for erosion is possible (between 1 and 10 percent annually).

I.2.3 Dam and Levee Failure

LOCATION AND SPATIAL EXTENT

According to the U.S. Army Corps of Engineers – National Inventory of Dams, there are three high hazard dams in Smith County. **Figure I.3** shows the location of each of these high hazard dams and **Table I.8** lists them by name.

Figure I.3: SMITH COUNTY HIGH HAZARD DAM LOCATIONS

Source: U.S. Army Corps of Engineers – National Inventory of Dams

Table I.7: SMITH COUNTY HIGH HAZARD DAMS

Dam Name	Hazard Potential
Smith County	
PRENTISS WALKER LAKE	High
UPPER LEAF RIVER STRUCTURE 9 DAM	High
BIG CREEK WATERSHED STRUCTURE 15 DAM	High

Source: U.S. Army Corps of Engineers - National Inventory of Dams

HISTORICAL OCCURRENCES

There have been two instances reported according to the Mississippi State Hazard Mitigation Plan 2019.

- March 2016 – Piping occurred at Vowell Lake Dam
- May 2017 – Slide occurred in the center of the crest and downstream slope at the Vowell Lake Dam.

PROBABILITY OF FUTURE OCCURRENCES

Given the current dam inventory and historic data, a dam breach is possible (between 1 and 10 percent annual probability) in the future. However, as has been demonstrated in the past, regular monitoring is necessary to prevent these events.

I.2.4 Winter Storm and Freeze

LOCATION AND SPATIAL EXTENT

Nearly the entire continental United States is susceptible to winter storm and freeze events. Some ice and winter storms may be large enough to affect several states, while others might affect limited, localized areas. The degree of exposure typically depends on the normal expected severity of local winter weather. Smith County is not accustomed to severe winter weather conditions and rarely receives severe winter weather, even during the winter months. Events tend to be mild in nature; however, even relatively small accumulations of snow, ice, or other wintery precipitation can lead to losses and damage due to the fact that these events are not commonplace. Given the atmospheric nature of the hazard, the entire county has uniform exposure to a winter storm.

HISTORICAL OCCURRENCES

According to the National Centers for Environmental Information, there have been a total of eleven recorded winter storm events in Smith County since 1996 (**Table I.8**). These events resulted in over $1.37 million in damages. Detailed information on the recorded winter storm events can be found in **Table I.9**.

Table I.8: SUMMARY OF WINTER STORM EVENTS IN SMITH COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Smith County	11	0/0	$1,375,000

Source: National Centers for Environmental Information

TABLE I.10: HISTORICAL WINTER STORM IMPACTS IN SMITH COUNTY

Location	Date	Type	Deaths / Injuries	Property Damage
Mize				
None Reported	--	--	--	--
Polkville				
None Reported	--	--	--	--
Raleigh				
None Reported	--	--	--	--
Sylvarena				
None Reported	--	--	--	--
Taylorsville				
None Reported	--	--	--	--
Unincorporated Area				
SMITH (ZONE)	2/1/1996	Ice Storm	0/0	$152,096
SMITH (ZONE)	1/19/2008	Heavy Snow	0/0	$0
SMITH (ZONE)	12/11/2008	Heavy Snow	0/0	$0
SMITH (ZONE)	12/4/2009	Heavy Snow	0/0	$0
SMITH (ZONE)	2/11/2010	Heavy Snow	0/0	$766,072
SMITH (ZONE)	1/9/2011	Ice Storm	0/0	$79,568
SMITH (ZONE)	2/3/2011	Ice Storm	0/0	$424,360
SMITH (ZONE)	1/16/2013	Heavy Snow	0/0	$0
SMITH (ZONE)	1/28/2014	Heavy Snow	0/0	$0
SMITH (ZONE)	12/07/2017	Heavy Snow	0/0	$0
SMITH (ZONE)	2/17/2021	Ice Storm	0/0	$100,000

Source: National Centers for Environmental Information

There have been several severe winter weather events in Smith County. The text below describes one of the major events and associated impacts on the county. Similar impacts can be expected with severe winter weather.

January 2008 Winter Storm

This storm produced heavy snow across the region, with an average of three to four inches of snow. Some heavier amounts, between four to five inches, also fell in isolated areas. At the height of the snow, temperatures fell to near freezing, and accumulations occurred on roadways resulting in a number of traffic accidents. Additionally, some power outages occurred in the heaviest snow band due to the weight of wet snow on limbs and lines.

Winter storms throughout the planning area have several negative externalities including hypothermia, cost of snow and debris cleanup, business and government service interruption, traffic accidents, and power outages. Furthermore, citizens may resort to using inappropriate heating devices that could to fire or an accumulation of toxic fumes.

February 2021 Ice Storm

As an arctic air mass continued to build southward across the South on February 17th, another wave of precipitation overspread this cold air mass across much of Mississippi. The main impacts across central and southern portions of the state were from freezing rain and resulting heavy icing, but some significant accumulations of sleet and snow also occurred in areas mainly north and west of the Natchez Trace. Freezing rain continued through the evening hours, ending from west to east by the early morning of

February 18th. Ice accumulated quickly in many locations and downed numerous trees, large limbs, and power lines across the affected areas. Several trees and limbs fell onto power lines, resulting in more widespread power outages as well. Some trees fell onto homes or cars, and significant amounts of ice, sleet, and snow collapsed a few gas station awnings and roofs where accumulations were greatest. In the hardest hit areas, extensive damage to trees and power lines took several months and cost several hundred thousands of dollars to clean up.

PROBABILITY OF FUTURE OCCURRENCES

Winter storm events will continue to occur in Smith County. According to historical information, the annual probability is likely (between 10 and 100 percent).

FIRE-RELATED HAZARDS

I.2.5 Drought / Heat Wave

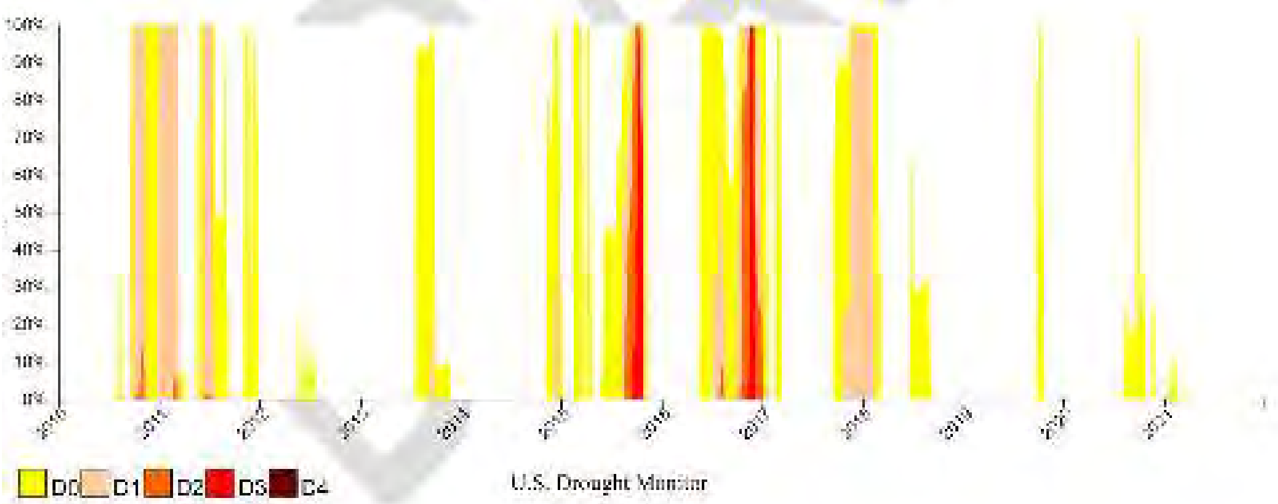
Drought
Drought typically covers a large area and cannot be confined to any geographic or political boundaries. Furthermore, it is assumed that Smith County would be uniformly exposed to drought, making the spatial extent potentially widespread. It is also notable that drought conditions typically do not cause significant damage to the built environment but may exacerbate wildfire conditions.

Heat Wave
Heat waves typically impact a large area and cannot be confined to any geographic or political boundaries.

HISTORICAL OCCURRENCES

Drought
Table I.9 shows the most severe drought classification for each year, according to U.S. Drought Monitor classifications. It should be noted that the U.S. Drought Monitor also estimates what percentage of the county is in each classification of drought severity. For example, the most severe classification reported may be exceptional but a majority of the county may actually be in a less severe condition.

Table I.9: HISTORICAL DROUGHT OCCURRENCES IN SMITH COUNTY



Source: United States Drought Monitor

Some additional anecdotal information was provided from the National Centers for Environmental Information on droughts in Smith County.

Summer 2006 – During a four-and-a-half-month period, from June to the middle of October, abnormally dry conditions prevailed across most of Jackson, MS County Warning Area (CWA). The drought had a significant impact on the agricultural industry. Non-irrigated crops were destroyed and all other sustainable crops produced a below normal yield. Catfish ponds were drawn down to severe levels and required water to be pumped back into the fish ponds. The cattle industry suffered due to low watering ponds and lack of sufficient grasslands for grazing and hay production. Water supply problems were encountered by those cities who obtained water from local rivers for drinking purposes due to the low river flows. Fire threat was significant causing the issuance of burn bans across the CWA.

Summer 2007 – By the middle of April, drought conditions were being experienced across a large portion of Eastern and some of Central Mississippi. During the month of May, the drought worsened and expanded. In June, the drought peaked across the region. Although drought conditions continued throughout July and August, conditions were less severe than earlier in the summer. As a result of these conditions, area farmers and crop yields were affected.

October 2010 – Very dry conditions continued across central Mississippi during most of October. Crops were put under stress under the warm and dry conditions. The likely impact was less crop yields for harvest time.

Heat Wave
The National Centers for Environmental Information was used to determine historical heat wave occurrences in the county.

July 2005 – A five-day heat wave occurred across the region. Heat index values reached near 110 degrees each day. Each day had high temperatures ranging from 95 to 99 degrees. This was the warmest stretch of weather the area experienced since July 2001.

August 2005 –A heat wave covering the south began in mid-August and lasted about 10 days. High temperatures were consistently over 95 degrees and surpassed 100 degrees or more on some days. It was the first time since August 2000 that 100-degree temperatures reached the area.

July 2006 – A short heat wave impacted most of the area temperatures in the 90s to around 100 for five straight days.

August 2007 – A heat wave gripped most of the area with the warmest temperatures since 2000. It lasted from August 5th to the 16th.

August 2010 – The combination of high humidity and above normal temperatures produced heat index readings ranged between 105 and 109 degrees during the afternoon hours in the middle part of August.

PROBABILITY OF FUTURE OCCURRENCES

Drought
Based on historical occurrence information, it is assumed that Smith County has a probability level of likely (between 10 and 100 percent annual probability) for future drought events. However, the extent (or

magnitude) of drought and the amount of geographic area covered by drought, varies with each year. Historic information indicates that there is a much lower probability for extreme, long-lasting drought conditions.

Heat Wave
Based on historical occurrence information, it is assumed that all of Smith County has a probability level of likely (between 10 and 100 percent annual probability) for future heat wave events.

I.2.6 Wildfire

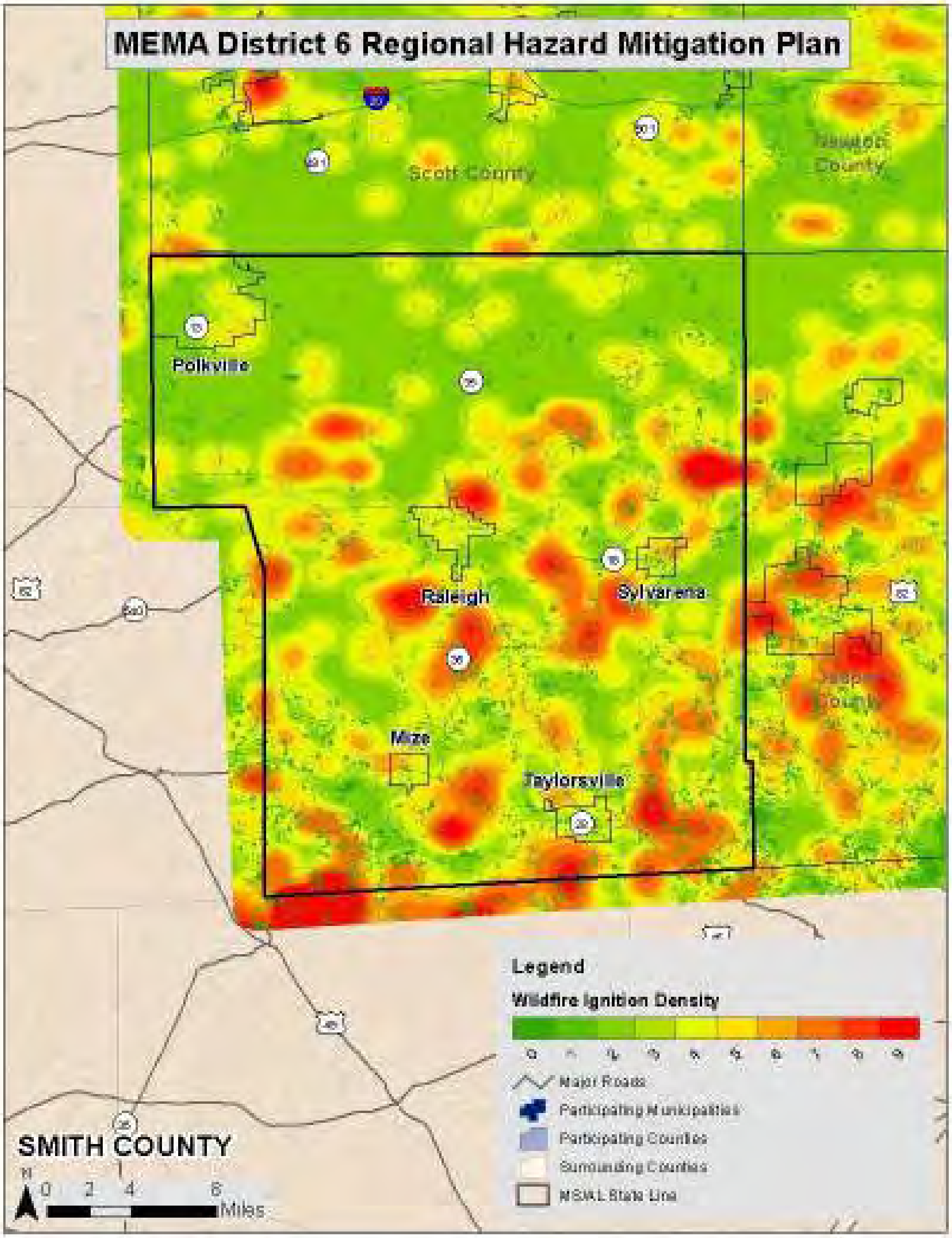
LOCATION AND SPATIAL EXTENT

The entire county is at risk to a wildfire occurrence. However, several factors such as drought conditions or high levels of fuel on the forest floor, may make a wildfire more likely. Furthermore, areas in the urban-wildland interface are particularly susceptible to fire hazard as populations abut formerly undeveloped areas. The Wildfire Ignition Density data shown in the figure below give an indication of historic location.

HISTORICAL OCCURRENCES

Figure I.4 shows the Wildfire Ignition Density in Smith County based on data from the Southern Wildfire Risk Assessment. This data is based on historical fire ignitions and the likelihood of a wildfire igniting in an area. Occurrence is derived by modeling historic wildfire ignition locations to create an average ignition rate map. This is measured in the number of fires per year per 1,000 acres.

Figure I.4: WILDFIRE IGNITION DENSITY IN SMITH COUNTY



Source: Southern Wildfire Risk Assessment

Based on data from the Mississippi Forestry Commission from 2015 to 2020, Smith County experienced an average of 16 wildfires annually which burn an average of 146 acres per year. The data indicates that most of these fires are small, averaging 9 acres per fire. **Table I.12** provides a summary of wildfire occurrences in Smith County and **Table I.13** lists the number of reported wildfire occurrences in the county between the years 2015 and 2020.

Table I.10: SUMMARY TABLE OF ANNUAL WILDFIRE OCCURRENCES (2015-2020)

	Smith County
Average Number of Fires per year	16
Average Number of Acres Burned per year	146
Average Number of Acres Burned per fire	9

*These values reflect averages over a 6-year period.

Source: Mississippi Forestry Commission

TABLE I.13: HISTORICAL WILDFIRE OCCURRENCES IN SMITH COUNTY

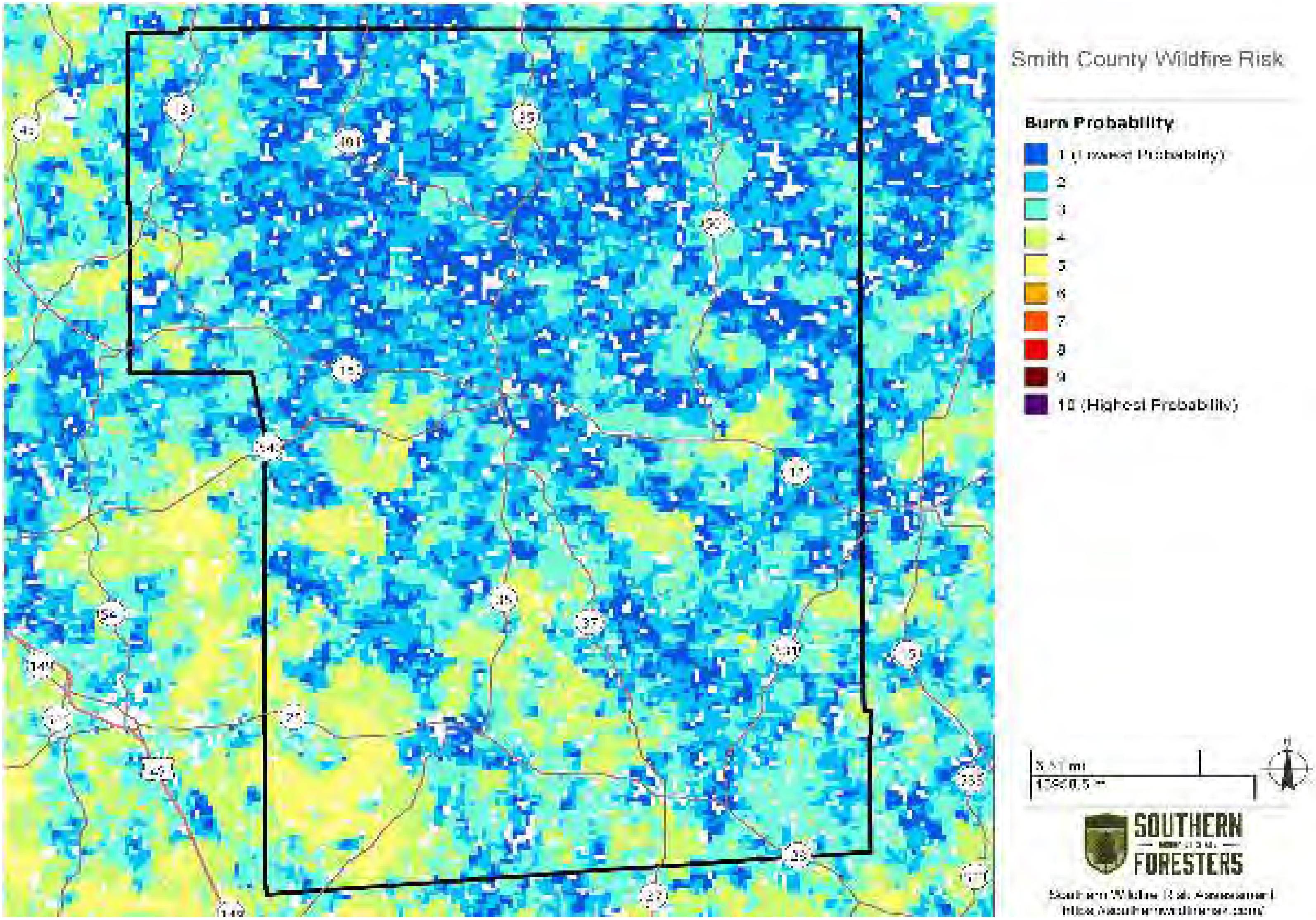
Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Smith County										
Number of Fires	32	16	14	16	41	26	9	9	9	4
Number of Acres Burned	641	99	69	114	273	317	73	67	61	86

Source: Mississippi Forestry Commission

PROBABILITY OF FUTURE OCCURRENCES

Wildfire events will be an ongoing occurrence in Smith County. **Figure I.5** shows that there is some probability a wildfire will occur throughout the county. However, the likelihood of wildfires increases during drought cycles and abnormally dry conditions. Fires are likely to stay small in size but could increase due to local climate and ground conditions. Dry, windy conditions with an accumulation of forest floor fuel (potentially due to ice storms or lack of fire) could create conditions for a large fire that spreads quickly. It should also be noted that some areas do vary somewhat in risk. For example, highly developed areas are less susceptible unless they are located near the urban-wildland boundary. The risk will also vary due to assets. Areas in the urban-wildland interface will have much more property at risk, resulting in increased vulnerability and need to mitigate compared to rural, mainly forested areas. The probability assigned to Smith County for future wildfire events is highly likely (100 percent annual probability).

Figure I.5: BURN PROBABILITY IN SMITH COUNTY



Source: Southern Wildfire Risk Assessment

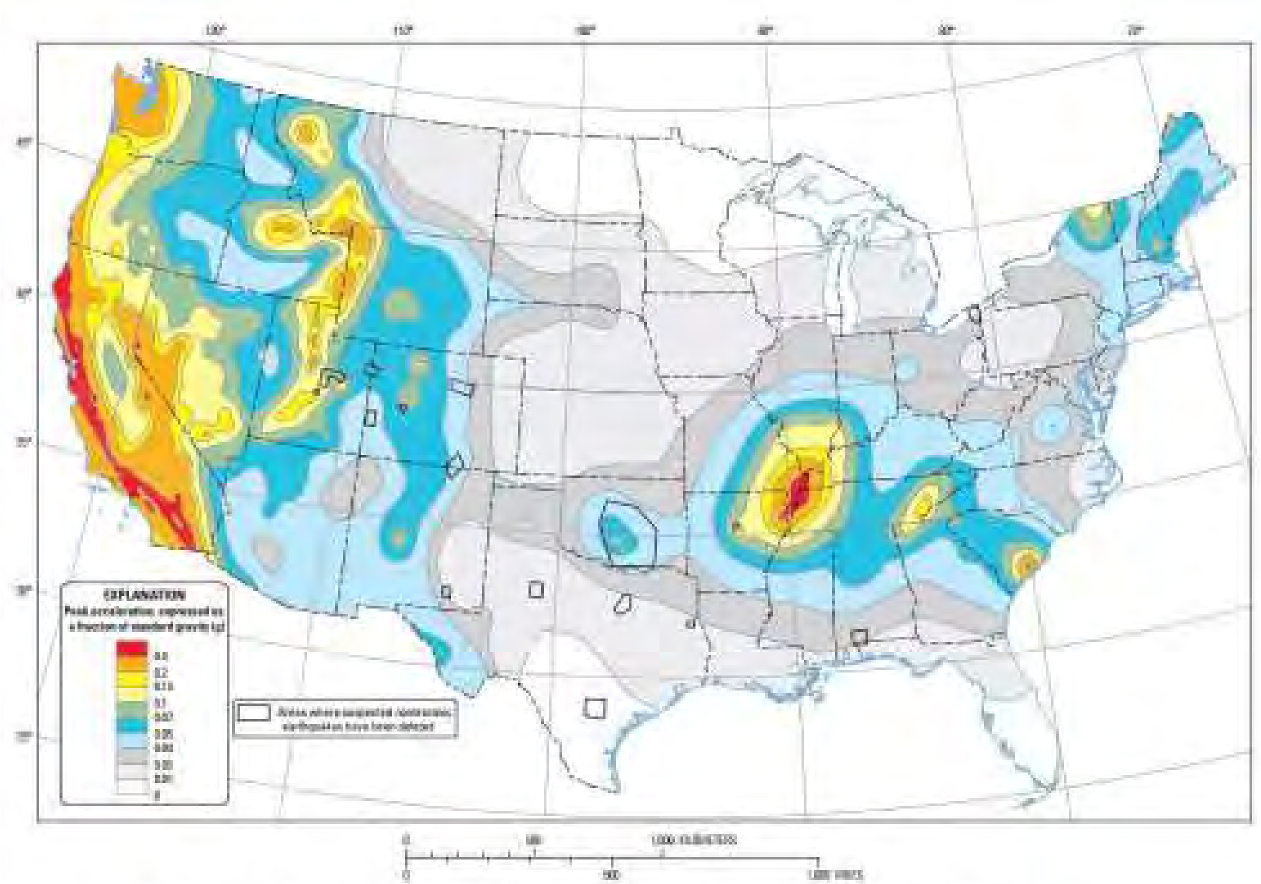
GEOLOGIC HAZARDS

I.2.7 Earthquake

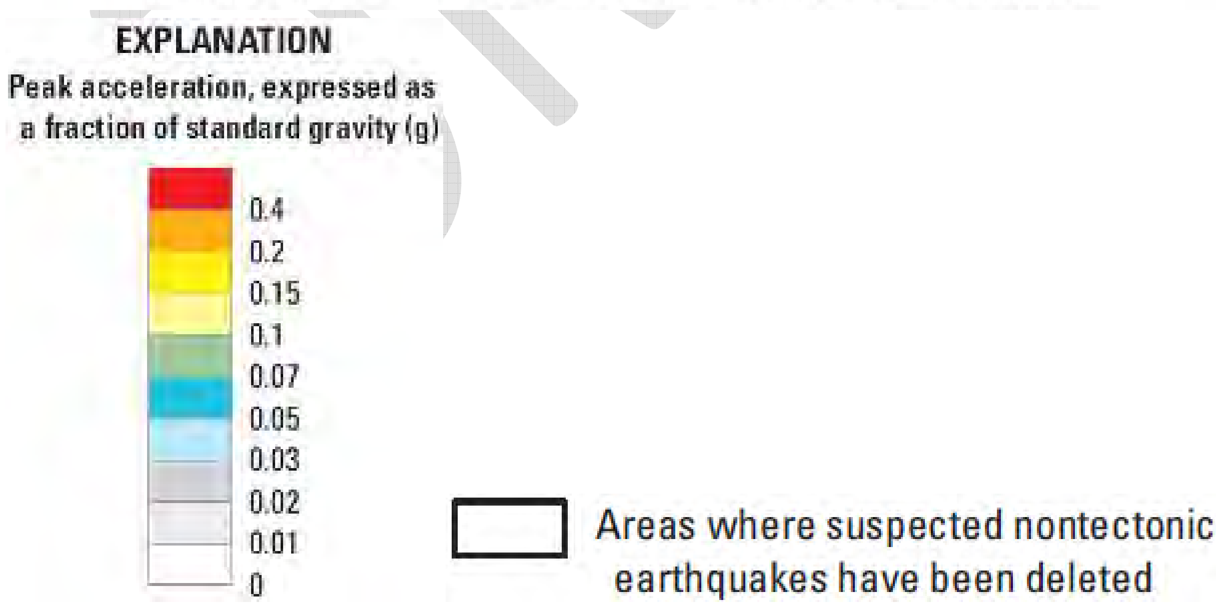
LOCATION AND SPATIAL EXTENT

Figure I.6 shows the intensity level associated with Smith County, based on the national USGS map of peak acceleration with 10 percent probability of exceedance in 50 years. It is the probability that ground motion will reach a certain level during an earthquake. The data show peak horizontal ground acceleration (the fastest measured change in speed, for a particle at ground level that is moving horizontally due to an earthquake) with a 10 percent probability of exceedance in 50 years. The map was compiled by the U.S. Geological Survey (USGS) Geologic Hazards Team, which conducts global investigations of earthquake, geomagnetic, and landslide hazards. According to this map, Smith County lies within an approximate zone of level "2" to "5" ground acceleration. This indicates that the county exists within an area of moderate seismic risk.

Figure I.6: PEAK ACCELERATION WITH 10 PERCENT PROBABILITY OF EXCEEDANCE IN 50 YEARS



Ten-percent probability of exceedance in 50 years map of peak ground acceleration



Source: United States Geological Survey, 2014

HISTORICAL OCCURRENCES

No earthquakes are known to have affected Smith County since 1638. This measured a II on the Modified Mercalli Intensity (MMI) scale. **Table I.14** provides a summary of earthquake events reported by the National Geophysical Data Center between 1638 and 1985. **Table I.15** presents a detailed occurrence of each event including the date, distance for the epicenter, magnitude and Modified Mercalli Intensity (if known). [3]

Table I.11: SUMMARY OF SEISMIC ACTIVITY IN SMITH COUNTY

Location	Number of Occurrences	Greatest MMI Reported	Richter Scale Equivalent
Mize	0	--	--
Polkville	0	--	--
Raleigh	0	--	--
Sylvarena	0	--	--
Taylorsville	0	--	--
Unincorporated Area	0	--	--
SMITH COUNTY TOTAL	**0**	**--**	**--**

Source: National Geophysical Data Center

Table I.12: SIGNIFICANT SEISMIC EVENTS IN SMITH COUNTY (1638 -1985)

Location	Date	Epicentral Distance	Magnitude	MMI
Mize				
None Reported	--	--	--	--
Polkville				
None Reported	--	--	--	--
Raleigh				
None Reported	--	--	--	--
Sylvarena				
None Reported	--	--	--	--
Taylorsville				
None Reported	--	--	--	--
Unincorporated Area				
None Reported	--	--	--	--

Source: National Geophysical Data Center

PROBABILITY OF FUTURE OCCURRENCES

The probability of significant, damaging earthquake events affecting Smith County is unlikely. However, it is possible that future earthquakes resulting in light to moderate perceived shaking and damages ranging from none to very light will affect the county. The annual probability level for the county is estimated to be between 1 and 10 percent (possible).

[3] Due to reporting mechanisms, not all earthquakes events were recorded during this time. Furthermore, some are missing data, such as the epicenter location, due to a lack of widely used technology. In these instances, a value of "unknown" is reported

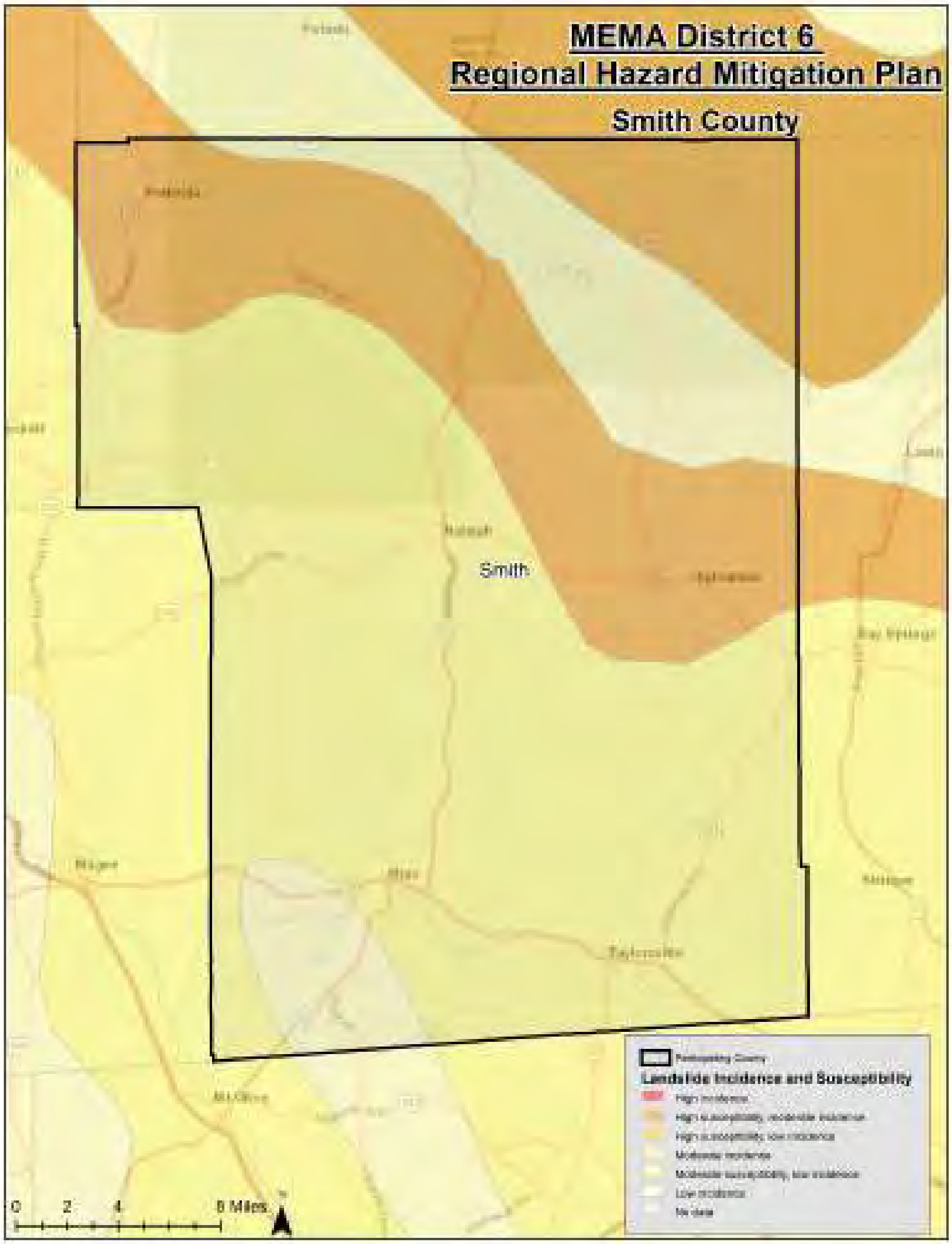
I.2.8 Landslide

LOCATION AND SPATIAL EXTENT

Landslides occur along steep slopes when the pull of gravity can no longer be resisted (often due to heavy rain). Human development can also exacerbate risk by building on previously undevelopable steep slopes. Landslides are possible throughout Smith County, though the risk is relatively low.

According to **Figure I.7** below, the majority of the county falls under a low incidence area. This indicates that less than 1.5 percent of the area is involved in landsliding. There are also some areas in the northeastern half of the county that are moderate incidence areas. This indicates that between 1.5 and 10 percent of the area is involved in landsliding.

Figure I.7: LANDSLIDE SUSCEPTIBILITY AND INCIDENCE MAP OF SMITH COUNTY



Source: United States Geological Survey

HISTORICAL OCCURRENCES

There is no extensive history of landslides in Smith County. Landslide events typically occur in isolated areas. Reviews of the USGS Landslide Inventory show no historical occurrences of landslides.

PROBABILITY OF FUTURE OCCURRENCES

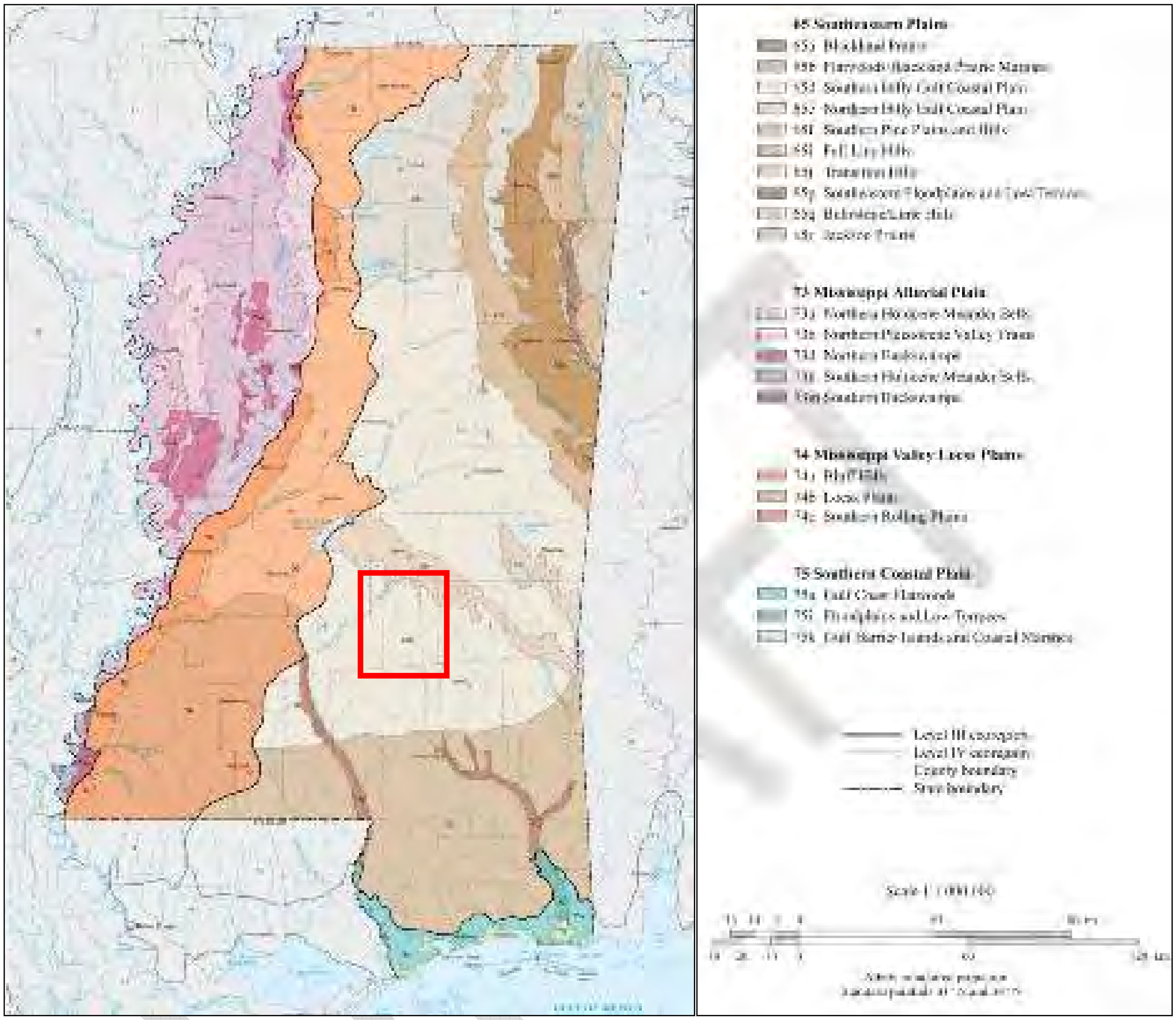
Based on historical information and the USGS susceptibility index, the probability of future landslide events is unlikely (less than 1 percent probability). The USGS data indicates that most areas in Smith County have a low incidence rate and moderate susceptibly to landsliding activity. There are also some areas in the county with low incidence and low susceptibility as well as additional areas in the northeastern half with moderate incidence and high susceptibility. Local conditions may become more favorable for landslides due to heavy rain, for example. This would increase the likelihood of occurrence. It should also be noted that some areas in Smith County have greater risk than others given factors such as steepness on slope and modification of slopes.

I.2.9 Land Subsidence

LOCATION AND SPATIAL EXTENT

Much of Smith County is located in an area where the soil is substantially clay, causing a shrink and swell effect depending on the current conditions. Indeed, much of the area underlain by the calcareous Yazoo clay which, when combined with sand and marl, is highly susceptible to expansion when wet and shrinking when dry. These areas are denoted below in **Figure I.8**.

Figure I.8: MAP OF MISSISSIPPI SOILS



Source: http://www.eoearth.org/view/article/152119/

HISTORICAL OCCURRENCES

There is no significant historical record of land subsidence in Smith County. However, local county officials have noted the impacts from these swings and changes in soil as roads and other infrastructure have experienced large cracks and breaks, causing stops in daily operations and significant costs to local, state, and federal budgets. Often the cost to repair this infrastructure can be in the range of millions of dollars depending on the degree of damage and necessity for quick repairs.

PROBABILITY OF FUTURE OCCURRENCES

The probability of future land subsidence events in the county is unlikely (less than 1 percent annual probability).

WIND-RELATED HAZARDS

I.2.10 Hurricane and Tropical Storm

LOCATION AND SPATIAL EXTENT

Hurricanes and tropical storms threaten the entire Atlantic and Gulf seaboard of the United States. While coastal areas are most directly exposed to the brunt of landfalling storms, their impact is often felt hundreds of miles inland and they can affect Smith County. All areas in Smith County are equally susceptible to hurricane and tropical storms.

HISTORICAL OCCURRENCES

According to the National Hurricane Center's historical storm track records, 57 hurricane or tropical storm/depression tracks have passed within 75 miles of the MEMA District 6 Region since 1855. This includes: 1 Category 3 hurricane, 2 Category 2 hurricanes, 5 Category 1 hurricanes, 33 tropical storms, and 17 tropical depressions.

Of the recorded storm events, 36 hurricane or tropical storm/depression events traversed directly through the region as shown in **Figure I.9**. Notable storms include Hurricane Frederic (1979) and Hurricane Katrina (2005). **Table I.13** provides for each event the date of occurrence, name (if applicable), maximum wind speed (as recorded within 75 miles of the MEMA District 6 Region) and category of the storm based on the Saffir-Simpson Scale.

Figure I.9: HISTORICAL HURRICANE STORM TRACKS 1980 - 2020

Source: National Oceanic and Atmospheric Administration, National Hurricane Center

Table I.13: HISTORICAL STORM TRACKS WITHIN 75 MILES OF THE MEMA 6 DISTRICT REGION (1850–2020)

Date of Occurrence	Storm Name	Maximum Wind Speed (knots)	Storm Category
9/16/1855	UNNAMED	70	Category 1
9/15/1860	UNNAMED	70	Category 1
7/12/1872	UNNAMED	40	Tropical Storm
9/2/1879	UNNAMED	60	Tropical Storm
10/7/1879	UNNAMED	40	Tropical Storm
10/16/1879	UNNAMED	40	Tropical Storm
9/1/1880	UNNAMED	50	Tropical Storm
8/3/1881	UNNAMED	40	Tropical Storm
6/14/1887	UNNAMED	30	Tropical Depression
8/28/1890	UNNAMED	35	Tropical Storm
9/12/1892	UNNAMED	40	Tropical Storm
9/8/1893	UNNAMED	55	Tropical Storm
8/17/1895	UNNAMED	35	Tropical Storm
8/3/1898	UNNAMED	35	Tropical Storm
8/16/1901	UNNAMED	45	Tropical Storm
10/10/1905	UNNAMED	35	Tropical Storm
9/27/1906	UNNAMED	95	Category 2
9/22/1907	UNNAMED	35	Tropical Storm
6/13/1912	UNNAMED	50	Tropical Storm
7/17/1912	UNNAMED	25	Tropical Depression
9/14/1912	UNNAMED	50	Tropical Storm
9/30/1915	UNNAMED	60	Tropical Storm
7/6/1916	UNNAMED	80	Category 1
7/5/1919	UNNAMED	30	Tropical Depression
10/18/1923	UNNAMED	50	Tropical Storm
7/30/1926	UNNAMED	25	Tropical Depression
9/1/1932	UNNAMED	60	Tropical Storm
10/16/1932	UNNAMED	45	Tropical Storm
8/1/1936	UNNAMED	40	Tropical Storm
9/1/1937	UNNAMED	30	Tropical Depression
6/16/1939	UNNAMED	35	Tropical Storm
8/14/1939	UNNAMED	35	Tropical Storm
9/26/1939	UNNAMED	40	Tropical Storm
9/25/1940	UNNAMED	20	Tropical Depression
9/4/1948	UNNAMED	50	Tropical Storm
9/5/1949	UNNAMED	40	Tropical Storm
8/31/1950	BAKER	65	Category 1
6/1/1959	ARLENE	25	Tropical Depression
9/16/1960	ETHEL	35	Tropical Storm
9/26/1960	FLORENCE	15	Tropical Depression

Date of Occurrence	Storm Name	Maximum Wind Speed (knots)	Storm Category
8/18/1969	CAMILLE	100	Category 3
9/16/1971	EDITH	60	Tropical Storm
7/19/1977	UNNAMED	25	Tropical Depression
9/6/1977	BABE	30	Tropical Depression
7/11/1979	BOB	40	Tropical Storm
9/13/1979	FREDERIC	95	Category 2
8/12/1987	UNNAMED	25	Tropical Depression
8/27/1992	ANDREW	30	Tropical Depression
8/4/1995	ERIN	45	Tropical Storm
8/6/2001	BARRY	20	Tropical Depression
9/26/2002	ISIDORE	55	Tropical Storm
7/1/2003	BILL	45	Tropical Storm
7/11/2005	DENNIS	45	Tropical Storm
8/29/2005	KATRINA	80	Category 1
9/14/2007	HUMBERTO	20	Tropical Depression
8/24/2008	FAY	30	Tropical Depression
8/17/2009	CLAUDETTE	25	Tropical Depression
10/28/2020	Zeta	33	Tropical Depression

*It should be noted that the track of several major hurricanes that impacted the region fell outside of the 75-mile buffer. These storms were included in the table due to their significant impact. (Georges, 1988; Ivan, 2004; Issac, 2012)
Source: National Hurricane Center

Federal records indicate that disaster declarations were made in 1969 (Hurricane Camille), 2004 (Hurricane Ivan), 2005 (Hurricane Dennis and Hurricane Katrina), and 2012 (Hurricane Issac).[11] Hurricane and tropical storm events can cause substantial damage in the area due to high winds and flooding.

Flooding and high winds from hurricanes and tropical storms can cause damage throughout the county. Anecdotes are available from NCEI for the major storms that have impacted the county as found below:

Tropical Storm Bill – June 30 and July 1, 2003
Heavy rainfall with Tropical Storm Bill resulted in several reports of flash flooding. Forty-eight-hour rainfall totals ranged between 3 and 7 inches, mainly across SE portions of Mississippi. Gradient wind gusts between 30 and 40 mph combined with saturated soils to down numerous trees very close to center's track. Damage from Bill was an estimated $100,000.

Hurricane Katrina – August 29, 2005
Hurricane Katrina will likely go down as the worst and costliest natural disaster in United States history. The amount of destruction, the cost of damaged property/agriculture and the large loss of life across the affected region has been overwhelming. Catastrophic damage was widespread across a large portion of the Gulf Coast region. The devastation was not only confined to the coastal region, widespread and significant damage occurred well inland up to the Hattiesburg area and northward past Interstate 20.

Hurricane force winds were common across Central Mississippi. The region received sustained winds of 60-80 mph with gusts ranging from 80-120 mph. Wind damage to structures was widespread, with roofs blown off or partially peeled. Hundreds of signs were shredded or blown down. Many businesses sustained structural damage as windows were broken, roofs were blown off, and walls were collapsed. Millions of trees were uprooted and snapped. Power poles and lines were snapped and taken down from wind and trees. It was thousands of downed trees which caused the most significant structural damage as these trees fell onto homes and businesses. Power outages lasted from a few days to as long as four weeks. Agriculture and timber industries were severely impacted. Row crops, including cotton, rice, corn, and soybeans, took a hard hit. Other impacted industries were the catfish industry, dairy and cattle industry, and nursery businesses.

PROBABILITY OF FUTURE OCCURRENCES

Given the inland location of the county, it is more likely to be affected by remnants of hurricane and tropical storm systems (as opposed to a major hurricane) which may result in flooding or high winds. The probability of being impacted is less than coastal areas, but still remains a real threat to Smith County due to induced events like flooding. Based on historical evidence, the probability level of future occurrence is likely (annual probability between 10 and 100 percent). Given the regional nature of the hazard, all areas in the county are equally exposed to this hazard. However, when the county is impacted, the damage could be catastrophic, threatening lives and property throughout the planning area.

I.2.11 Thunderstorm (wind, hail, lightning)

LOCATION AND SPATIAL EXTENT

Thunderstorm / High Wind
A thunderstorm event is an atmospheric hazard, and thus has no geographic boundaries. It is typically a widespread event that can occur in all regions of the United States. However, thunderstorms are most common in the central and southern states because atmospheric conditions in those regions are favorable for generating these powerful storms. It is assumed that Smith County has uniform exposure to an event and the spatial extent of an impact could be large.

Hailstorm
Hailstorms frequently accompany thunderstorms, so their locations and spatial extents coincide. It is assumed that Smith County is uniformly exposed to severe thunderstorms; therefore, all areas of the county are equally exposed to hail which may be produced by such storms.

Lightning
Lightning occurs randomly, therefore it is impossible to predict where and with what frequency it will strike. It is assumed that all of Smith County is uniformly exposed to lightning.

HISTORICAL OCCURRENCES

Thunderstorm / High Wind
Severe storms were at least partially responsible for seven disaster declarations in Smith County in 1990, 1992, 2003, 2011, 2019, and twice in 2020. According to NCEI, there have been 308 reported thunderstorm and high wind

events since 1962 in Smith County. These events caused almost $5.6 million in damages. **Table I.14** summarizes this information.

Table I.14: SUMMARY OF THUNDERSTORM / HIGH WIND OCCURRENCES IN SMITH COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Mize	35	0/0	$200,500
Polkville	28	0/0	$439,000
Raleigh	60	0/0	$787,000
Sylvarena	12	0/0	$81,500
Taylorsville	37	0/0	$1,985,500
Unincorporated Area	107	0/0	$2,107,500
SMITH COUNTY TOTAL	**308**	**0/0**	**$5,601,000**

Source: National Centers for Environmental Information

Hailstorm

According to the National Centers for Environmental Information, 121 recorded hailstorm events have affected Smith County since 1962. **Table I.19** is a summary of the hail events in Smith County. **Table I.20** provides detailed information about each event that occurred in the county. In all, hail occurrences resulted in approximately $2.2 million in property damages. Hail ranged in diameter from 0.75 inches to 2.75 inches. It should be noted that hail is notorious for causing substantial damage to cars, roofs, and other areas of the built environment that may not be reported to the National Centers for Environmental Information. Therefore, it is likely that damages are greater than the reported value.

TABLE I.19: SUMMARY OF HAIL OCCURRENCES IN SMITH COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Mize	24	0/0	$1,051,000
Polkville	12	0/0	$245,000
Raleigh	25	0/0	$669,000
Sylvarena	3	0/0	$10,000
Taylorsville	14	0/0	$20,000
Unincorporated Area	39	0/0	$214,000
SMITH COUNTY TOTAL	**121**	**0/0**	**$2,209,000**

Source: National Centers for Environmental Information

Lightning

According to the National Centers for Environmental Information, there have been two recorded lightning events in Smith County since 2007. These events resulted in more than $1.2 million in damages, as listed in summary **Table I.21**. Detailed information on historical lightning events can be found in **Table I.22**.

It is certain that more than two events have impacted the county. Many of the reported events are those that cause damage, and it should be expected that damages are likely much higher for this hazard than what is reported.

Table I.15: SUMMARY OF LIGHTNING OCCURRENCES IN SMITH COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Mize	0	0/0	$0
Polkville	0	0/0	$0
Raleigh	1	0/0	$1,203,827
Sylvarena	0	0/0	$0
Taylorsville	0	0/0	$0
Unincorporated Area	1	0/0	$3,453
SMITH COUNTY TOTAL	**2**	**0/0**	**$1,207,280**

Source: National Centers for Environmental Information

TABLE I.22: HISTORICAL LIGHTNING OCCURRENCES IN SMITH COUNTY

Location	Date	Deaths / Injuries	Property Damage	Details
Mize				
None Reported	--	--	--	--
Polkville				
None Reported	--	--	--	--
Raleigh				
RALEIGH	8/13/18	0/0	$1,203,827	A storage tank was struck by lighting and caused the tank to catch fire. The initial fire spread to two other tanks engulfing three 1000 gallons tanks into a huge fire. Each tank had a small amount of crude oil and salt water in them.
Sylvarena				
None Reported	--	--	--	--
Taylorsville				
None Reported	--	--	--	--
Unincorporated Area				
BURNS	8/27/2007	0/0	$3,453	A home was struck by lightning and damaged the air condition unit.

Source: National Centers for Environmental Information

PROBABILITY OF FUTURE OCCURRENCES

Thunderstorm / High Wind

Given the high number of previous events, it is certain that thunderstorm events, including straight-line wind events, will occur in the future. This results in a probability level of highly likely (100 percent annual probability) for the entire county.

Hailstorm

Based on historical occurrence information, it is assumed that the probability of future hail occurrences is highly likely (100 percent annual probability). Since hail is an atmospheric hazard, it is assumed that Smith County has equal exposure to this hazard. It can be expected that future hail events will continue to cause minor damage to property and vehicles throughout the county.

Lightning

Although there was not a high number of historical lightning events reported in Smith County via NCEI data, it is a regular occurrence accompanied by thunderstorms. In fact, lightning events will assuredly happen on an annual basis, though not all events will cause damage. According to Vaisala's U.S. National Lightning Detection Network (NLDN), Smith County is located in an area of the country that experienced an average of 4 to 6 cloud-to-ground lightning flashes per square kilometer per year between 2015 and 2019.[4] Therefore, the probability of future events is highly likely (100 percent annual probability). It can be expected that future lightning events will continue to threaten life and cause minor property damages throughout the county.

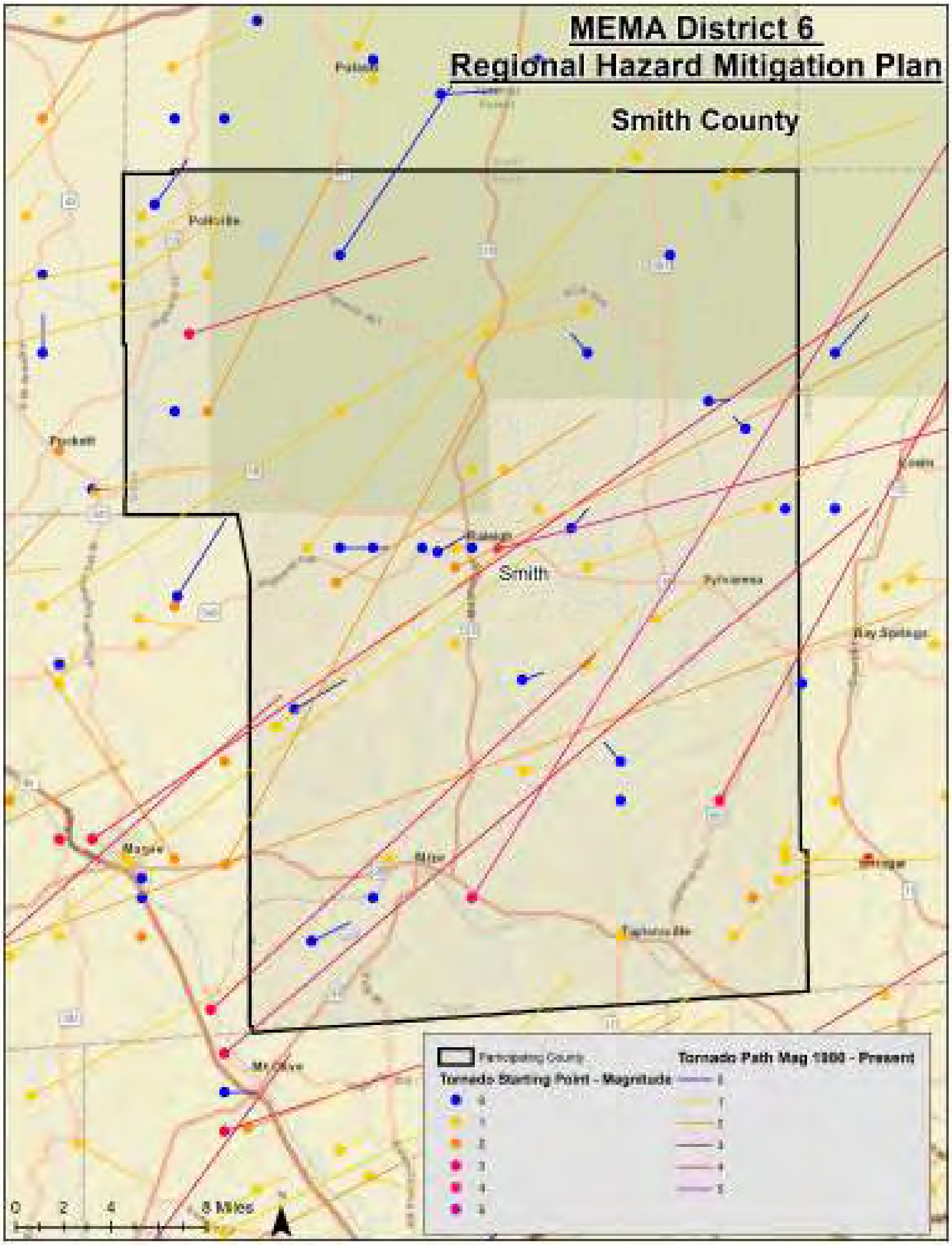
I.2.12 Tornado

LOCATION AND SPATIAL EXTENT

Tornadoes occur throughout the state of Mississippi, and thus in Smith County. Tornadoes typically impact a relatively small area, but damage may be extensive. Event locations are completely random and it is not possible to predict specific areas that are more susceptible to tornado strikes over time. Therefore, it is assumed that Smith County is uniformly exposed to this hazard. With that in mind, **Figure I.10** shows tornado track data for many of the major tornado events that have impacted the county. While no definitive pattern emerges from this data, some areas that have been impacted in the past may be potentially more susceptible in the future.

[4] Vaisala's Annual Lightning Report – 2020. Retrieved on 9.8.2021 from: https://www.vaisala.com/sites/default/files/documents/WEA-MET-Annual-Lightning-Report-2020-B212260EN-A.pdf

Figure I.10: HISTORICAL TORNADO TRACKS IN SMITH COUNTY



Source: National Weather Service Storm Prediction Center

HISTORICAL OCCURRENCES

Tornadoes were at least partially responsible for six disaster declarations in Smith County in 1990, 1992, 2003, 2011, and twice in 2020. According to the National Centers for Environmental Information, there have been a total of 78 recorded tornado events in Smith County since 1951 (**Table I.16**), resulting in almost $92.8 million in property damages. In addition, 11 fatalities and 84 injuries were reported. The magnitude of these tornadoes ranges from F0 to F4 and EF0 to EF3 in intensity, although an EF5 event is possible.

Table I.16: SUMMARY OF TORNADO OCCURRENCES IN SMITH COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Mize	3	0/0	$8,706,000
Polkville	7	0/0	$291,000
Raleigh	9	1/3	$5,190,000
Sylvarena	2	0/0	$550,000
Taylorsville	5	0/0	$432,000
Unincorporated Area	52	10/81	$36,899,000
SMITH COUNTY TOTAL	**78**	**11/84**	**$52,068,000**

Source: National Centers for Environmental Information

From April 25 to 28, 2011, the largest tornado outbreak ever recorded affected the Southern, Midwestern, and Northeastern U.S., leaving catastrophic destruction in its wake, especially across the states of Alabama and Mississippi. During this outbreak, two EF3 tornadoes were reported in Smith County on April 27, 2011. These tornadoes resulted in one fatality and almost $849,000 in property damages.

PROBABILITY OF FUTURE OCCURRENCES

According to historical information, tornado events pose a significant threat to Smith County. The probability of future tornado occurrences affecting Smith County is likely (between 10 and 100 percent annual probability).

I.2.13 Hazardous Materials Incidents

LOCATION AND SPATIAL EXTENT

Smith County has two TRI sites. These sites are shown in **Figure I.11.**

Figure I.11: TOXIC RELEASE INVENTORY (TRI) SITES IN SMITH COUNTY

Source: Environmental Protection Agency

In additional to “fixed” hazardous materials locations, hazardous materials may also impact the county via roadways and rail. Many roads in the county are subject to hazardous materials transport and all roads that permit hazardous material transport are considered potentially at risk to an incident.

HISTORICAL OCCURRENCES

There have been a total of four recorded HAZMAT incidents in Smith County since 2006 (**Table I.17**). These events resulted in more than $268,000 in remediation costs and property damage. **Table I.18** presents detailed information on historic HAZMAT incidents in Smith County as reported by the U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA).

Table I.17: SUMMARY OF HAZMAT INCIDENTS IN SMITH COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage
Mize	0	0/0	$0
Polkville	1	0/0	$268,435
Raleigh	0	0/0	$0
Sylvarena	0	0/0	$0
Taylorsville	4	0/0	$0
Unincorporated Area	0	0/0	$0
SMITH COUNTY TOTAL	**5**	**0/0**	**$268,435**

Source: United States Department of Transportation Pipeline and Hazardous Materials Safety Administration

Table I.18: HAZMAT INCIDENTS IN SMITH COUNTY

Report Number	Date	City	Mode	Serious Incident?	Fatalities/ Injuries	Damages ($)*	Quantity Released
Mize							
	6//10/2021	Mize		--	--	--	--
Polkville							
I-2010090304	4/18/2010	POLKVILLE	Highway	Yes	0/0	$268,435	4,000 LGA
Raleigh							
None Reported	--	--	--	--	--	--	--
Sylvarena							
None Reported	--	--	--	--	--	--	--
Taylorsville							
E-2006070265	7/6/2006	TAYLORSVILLE	Highway	No	0/0	$0	0.5 LGA
E-2007020108	1/23/2007	TAYLORSVILLE	Highway	No	0/0	$0	1 LGA
I-2007030523	3/6/2007	TAYLORSVILLE	Highway	No	0/0	$0	0.25 LGA
E-2018100603	10/18/2018	TAYLORSVILLE	Highway	No	0/0	$0	1 SLB
Unincorporated Area							
None Reported	--	--	--	--	--	--	--

Source: United States Department of Transportation Pipeline and Hazardous Materials Safety Administration

PROBABILITY OF FUTURE OCCURRENCES

Given the location of five toxic release inventory sites in Smith County and prior roadway incidents, it is likely (between 10 and 100 percent annual probability) that a hazardous material incident may occur in

[22] Adjusted dollar values were calculated based on the average Consumer Price Index for a given calendar year. This index value has been calculated every year since 1913. For 2015, the June 2015 monthly index was used.

the county. County and town officials are mindful of this possibility and take precautions to prevent such an event from occurring. Furthermore, there are detailed plans in place to respond to an occurrence.

I.2.14 Pandemic

LOCATION AND SPATIAL EXTENT

Pandemics are global in nature. However, they may start anywhere. Smith County chose to analyze this hazard given the agriculture in the area and potential for this kind of event to occur in any location at any time.

All populations should be considered at risk to pandemic. Buildings and infrastructure are not directly impacted by the virus/pathogen but could be indirectly impacted if people are not able to operate and maintain them due to illness. Many buildings may be shutdown, at least temporarily, as a result. Employers may initiate work from home procedures for non-essential workers in order to help stop infection. Commerce activities, and thus the economy, may suffer greatly during this time.

HISTORICAL OCCURRENCES

Several pandemics have been reported throughout history. A short history of the flu/Spanish Flu was collected from The Historical Text Archive and is described below.

The first known pandemic dates back to 430 B.C. with the Plague of Athens. It reportedly killed a quarter of the population over four years due to typhoid fever. In 165-180 A.D., the Antonine Plague killed nearly 5 million people. Next, the Plague of Justinian (the first bubonic plague pandemic) occurred from 541 to 566. It killed 10,000 people a day at its peak and resulted in a 50 percent drop in Europe's population. Since the 1500s, influenza pandemics have occurred about three times every century or roughly every 10 to 50 years. The Black Death devastated European populations in the 14th century. Nearly a third of the population (20-30 million) was killed over six years. From 1817 to present, seven Cholera Pandemics have impacted to the world and killed millions. Perhaps most severe, was the Third Cholera Pandemic (1852-1959) which started in China. Isolated cases can still be found in the Western U.S. today. There were three major pandemics in the 20th century (1918-1919, 1957-1958, and 1968-1969). The most infamous pandemic flu of the 20th century, however, was that of 1918-1919. Since the 1960s, there has only been one pandemic, the 2009 H1N1 influenza. The pandemics of the 20th and 21st centuries that impacted the United States are detailed below.

1918 Spanish Flu: This was the most devastating flu of the 20th century. This pandemic spread across the world in three waves between 1918 and 1919. It typically impacted areas for around twelve weeks and then would largely disappear. However, it would frequently reemerge several months later. Worldwide, approximately 50 million persons died and over a quarter of the population was infected. Nearly 675,000 people died in the United States. The illness came on suddenly and could cause death within a few hours. The virus impacted those aged 15 to 35 especially hard. The movement of troops during World War I is thought to have facilitated the spread of the virus.

In Mississippi, state officials noted that "epidemics have been reported from a number of places in the State," on October 4th, 1918. By the 18th, twenty-six localities reported 1,934 cases (the real number of cases was likely much higher). West Point, Mississippi was hit especially hard and quarantine was established. Throughout the state, African Americans were impacted at a greater rate than white populations. This is thought to be partly caused from a shortage of caretakers. It is estimated that over 6,000 people died in Mississippi, though that number may be much higher as death records were not widely recorded.

1957 Asian Flu: It is estimated that the Asian Flu caused 2 million deaths worldwide. Approximately 70,000 deaths were in the U.S. However, the proportion of people impacted was substantially higher than that of the Spanish Flu. This flu was characterized as having much milder effects than the Spanish Flu and greater survivability. Similar to other pandemics, this pandemic has two waves. Elderly and infant populations were more likely to succumb to death. This flu is thought to have originated from a genetic mutation of a bird virus.

1968 Hong Kong Flu: The Hong Kong Flu is thought to have caused one million deaths worldwide. It was milder than both the Asian and Spanish influenza viruses. It was similar to the Asian Flu, which may have provided some immunity to the virus. It had the most severe impact on elderly populations.

2009 H1N1 Influenza: This flu was derived from human, swine, and avian virus strains. It was initially reported in Mexico in April 2009. On April 26, the U.S. government declared H1N1 a public health emergency. A vaccine was developed and over 80 million were vaccinated which helped minimize the impacts. The virus had mild impacts on most of the population but did cause death (usually from viral pneumonia) in high-risk populations such as pregnant women, obese persons, indigenous people, and those with chronic respiratory, cardiac, neurological, or immunity conditions. Worldwide, it is estimated that 43 million to 89 million people contracted H1N1 between April 2009 and April 2010, and between 8,870 and 18,300 H1N1 cases resulted in death.

2020 SARS-CoV-2 (COVID-19): Coronavirus Disease 2019 (COVID-19) was declared as pandemic by the World Health Organization on March 11th, 2020 mainly due to the speed and scale of the transmission of the disease. Prior to that, it started as an epidemic in mainland China with the focus being firstly reported in the city of Wuhan, Hubei province on February 26th, 2020. The etiologic agent of COVID-19 was isolated and identified as a novel coronavirus, initially designated as 2019-nCoV. Later, the virus genome was sequenced and because it was genetically related to the coronavirus outbreak responsible for the SARS outbreak of 2003, the virus was named as severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) by the International Committee for Taxonomy of Viruses.

There is a considerable amount of data on the extent of COVID-19 throughout the State of Mississippi and Smith County. The number of reported cases and deaths across the State of Mississippi and Smith County are shown in the figure below.

Figure I.12: COVID-19 Cases as of 08/09/2021[5]

	Cases	Deaths
Mississippi	368,549	7,685
Smith County	1,918	37

In addition to the pandemics above, there have been several cases of pandemic threats, some of which reached epidemic levels. They were contained before spreading globally. Examples include Smallpox, Polio, Tuberculosis, Malaria, AIDS, SARS and Yellow Fever. Advances in medicine and technology have been instrumental in containing the spread of viruses in recent history.

[5] Mississippi State Department of Health. *COVID-19 Dashboard*. Retrieved from: https://msdh.ms.gov/msdhsite/_static/14,0,420.html

In addition to the pandemics above, there have been several cases of pandemic threats, some of which reached epidemic levels. They were contained before spreading globally. Examples include Smallpox, Polio, Tuberculosis, Malaria, AIDS, SARS and Yellow Fever. Advances in medicine and technology have been instrumental in containing the spread of viruses in recent history.
It is notable that no birds have been infected with Avian Flu in North and South America.

PROBABILITY OF FUTURE OCCURRENCES
Based on historical occurrence information, it is assumed that all of Smith County has a probability level of unlikely (less than 1 percent annual probability) for future pandemics events. While pandemic can have devastating impacts, they are relatively rare.
The Mississippi State Department of Health maintains a state pandemic plan which can be found here: http://www.msdh.state.ms.us/msdhsite/index.cfm/44,1136,122,154,pdf/SNSPlan.pdf

I.2.15 Conclusions on Hazard Risk

The hazard profiles presented in this section were developed using best available data and result in what may be considered principally a qualitative assessment as recommended by FEMA in its "How-to" guidance document titled *Understanding Your Risks: Identifying Hazards and Estimating Losses* (FEMA Publication 386-2). It relies heavily on historical and anecdotal data, stakeholder input, and professional and experienced judgment regarding observed and/or anticipated hazard impacts. It also carefully considers the findings in other relevant plans, studies, and technical reports.

HAZARD EXTENT

Table I.19 describes the extent of each natural hazard identified for Smith County. The extent of a hazard is defined as its severity or magnitude, as it relates to the planning area.

Table I.19: EXTENT OF SMITH COUNTY HAZARDS

Flood-related Hazards	
Flood	Flood extent can be measured by the amount of land and property in the floodplain as well as flood height and velocity. The amount of land in the floodplain accounts for 17.4 percent of the total land area in Smith County. Flood depth and velocity are recorded via United States Geological Survey stream gages throughout the region. While a gage does not exist for each participating jurisdiction, there is one at or near many areas. The greatest peak discharge recorded for the county was at the Leaf River near Taylorsville on April 14, 1974. Water reached a discharge of 37,600 cubic feet per second and the stream gage height was recorded at 57.44 feet.
Erosion	The extent of erosion can be defined by the measurable rate of erosion that occurs. There are no erosion rate records located in Smith County.
Dam Failure	Dam Failure extent is defined using the Mississippi Department of Environmental Quality criteria (Table 5.7). Two dams are classified as high-hazard in Smith County.
Winter Storm and Freeze	The extent of winter storms can be measured by the amount of snowfall received (in inches). Official long term snow records are not kept for any areas in Smith County. However, the greatest snowfall reported in Meridian (northeast of the county) was 14.0 inches in 1963.

Fire-related Hazards	
Drought / Heat Wave	Drought extent is defined by the U.S. Drought Monitor Classifications which include Abnormally Dry, Moderate Drought, Severe Drought, Extreme Drought, and Exceptional Drought. According to the U.S. Drought Monitor Classifications, the most severe drought condition is Exceptional. Smith County has received this ranking twice over the 15-year reporting period. The extent of extreme heat can be measured by the record high temperature recorded. Official long term temperature records are not kept for any areas in Smith County. However, the highest recorded temperature in Meridian (northeast of the county) was 107°F in 1980.
Wildfire	Wildfire data was provided by the Mississippi Forestry Commission and is reported annually by county from 2005-2014. The greatest number of fires to occur in Smith County in any year 50 in 2006. The greatest number of acres to burn in the county in a single year occurred in 2008 when 4,405 acres were burned. Although this data lists the extent that has occurred, larger and more frequent wildfires are possible throughout the county.
Geologic Hazards	
Earthquake	Earthquake extent can be measured by the Richter Scale (Table 5.16), the Modified Mercalli Intensity (MMI) scale (Table 5.17), and the distance of the epicenter from Smith County. According to data provided by the National Geophysical Data Center, no earthquakes have impacted the county.
Landslide	As noted above in the landslide profile, there is no extensive history of landslides in Smith County and landslide events typically occur in isolated areas. This provides a challenge when trying to determine an accurate extent for the landslide hazard. However, when using the USGS landslide susceptibility index, extent can be measured with incidence, which is low throughout the majority of the county, except for some areas of moderate incidence in the northeastern half. There is also moderate susceptibility throughout most of the county, except for some areas which have low and high susceptibility.
Land Subsidence	The extent of land subsidence can be defined by the measurable rate of subsidence that occurs. There are no subsidence rate records located in Smith County nor is there any significant historical record of events.
Wind-related Hazards	
Hurricane and Tropical Storm	Hurricane extent is defined by the Saffir-Simpson Scale which classifies hurricanes into Category 1 through Category 5 (Table 5.20). The greatest classification of hurricane to traverse directly through Smith County was Hurricane Katrina, a Category 1 storm which carried tropical force winds of 80 knots upon arrival in the county.

Thunderstorm / Hail / Lightning	Thunderstorm extent is defined by the number of thunder events and wind speeds reported. According to a 65-year history from the National Centers for Environmental Information, the strongest recorded wind event in Smith County was reported on February 12, 2008 at 90 knots (approximately 104 mph). It should be noted that future events may exceed these historical occurrences. Hail extent can be defined by the size of the hail stone. The largest hail stone reported in Smith County was 2.75 inches (last reported on April 27, 2011). It should be noted that future events may exceed this. According to the Vaisala's flash density map (Figure 5.17), Smith County is located in an area that experiences 6 to 8 lightning flashes per square kilometer per year. It should be noted that future lightning occurrences may exceed these figures.
Tornado	Tornado hazard extent is measured by tornado occurrences in the US provided by FEMA (Figure 5.18) as well as the Fujita/Enhanced Fujita Scale (Tables 5.27 and 5.28). The greatest magnitude reported in Smith County was an F4 (last reported on November 22, 1992).
Other Hazards	
Hazardous Materials Incident	According to USDOT PHMSA, the largest hazardous materials incident reported in the Smith County was 4,000 LGA released on the highway (reported on April 18, 2010). It should be noted that larger events are possible.
Pandemic	While pandemics remain to be rare occurrences overall, it cannot be ignored that as of the drafting of this plan the world continues to be engulfed by the COVID-19 Pandemic.

PRIORITY RISK INDEX RESULTS

In order to draw some meaningful planning conclusions on hazard risk for Smith County, the results of the hazard profiling process were used to generate countywide hazard classifications according to a "Priority Risk Index" (PRI). More information on the PRI and how it was calculated can be found in Section 5.16.2.

Table I.20 summarizes the degree of risk assigned to each category for all initially identified hazards based on the application of the PRI. Assigned risk levels were based on the detailed hazard profiles developed for this section, as well as input from the Regional Hazard Mitigation Council. The results were then used in calculating PRI values and making final determinations for the risk assessment.

Table I.20: SUMMARY OF PRI RESULTS FOR SMITH COUNTY

Hazard	Category/Degree of Risk					
	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score
Flood-related Hazards						
Flood	Likely	Critical	Moderate	6 to 12 hours	Less than 24 hours	**2.9**
Erosion	Possible	Minor	Small	More than 24 hours	More than 1 week	**1.8**
Dam Failure	Possible	Critical	Small	Less than 6 hours	Less than 6 hours	**2.4**
Winter Storm and Freeze	Likely	Limited	Moderate	More than 24 hours	Less than 24 hours	**2.4**
Fire-related Hazards						
Drought / Heat Wave	Likely	Minor	Large	More than 24 hours	More than 1 week	**2.5**
Wildfire	Highly Likely	Minor	Small	Less than 6 hours	Less than 1 week	**2.6**
Geologic Hazards						
Earthquake	Possible	Minor	Moderate	Less than 6 hours	Less than 6 hours	**2.0**
Landslide	Unlikely	Minor	Small	Less than 6 hours	Less than 6 hours	**1.5**
Land Subsidence	Unlikely	Minor	Small	Less than 6 hours	Less than 6 hours	**1.5**
Wind-related Hazards						
Hurricane and Tropical Storm	Likely	Critical	Large	More than 24 hours	Less than 24 hours	**2.9**
Thunderstorm Wind / High Wind	Highly Likely	Critical	Moderate	6 to 12 hours	Less than 6 hours	**3.1**
Hailstorm	Highly Likely	Limited	Moderate	6 to 12 hours	Less than 6 hours	**2.8**
Lightning	Highly Likely	Limited	Negligible	6 to 12 hours	Less than 6 hours	**2.4**
Tornado	Likely	Catastrophic	Small	Less than 6 hours	Less than 6 hours	**3.0**
Other Hazards						
Hazardous Materials Incident	Likely	Limited	Small	Less than 6 hours	Less than 24 hours	**2.5**
Pandemic	Unlikely	Catastrophic	Large	More than 24 hours	More than 24hrs	**2.8**

I.2.16 Final Determinations on Hazard Risk

The conclusions drawn from the hazard profiling process for Smith County, including the PRI results and input from the Regional Hazard Mitigation Council, resulted in the classification of risk for eachidentified hazard according to three categories: High Risk, Moderate Risk, and Low Risk (**Table I.21**). For purposes of these classifications, risk is expressed in relative terms according to the estimated impact that a hazard will have on human life and property throughout all of Smith County. A more quantitative analysis to estimate potential dollar losses for each hazard has been performed separately, and is described in Section 6: *Vulnerability Assessment* and below in Section I.3. It should be noted that although some hazards are classified below as posing low risk, their occurrence of varying or unprecedented magnitudes is still possible in some cases and their assigned classification will continue to be evaluated during future plan updates.

Table I.21: CONCLUSIONS ON HAZARD RISK FOR SMITH COUNTY

HIGH RISK	Thunderstorm Wind / High Wind Tornado Flood Hurricane and Tropical Storm Hailstorm Pandemic
MODERATE RISK	Wildfire Drought / Heat Wave Hazardous Materials Incident Dam and Levee Failure Winter Storm and Freeze Lightning
LOW RISK	Earthquake Erosion Landslide Land Subsidence

I.3 SMITH COUNTY VULNERABILITY ASSESSMENT

This subsection identifies and quantifies the vulnerability of Smith County to the significant hazards previously identified. This includes identifying and characterizing an inventory of assets in the county and assessing the potential impact and expected amount of damages caused to these assets by each identified hazard event. More information on the methodology and data sources used to conduct this assessment can be found in Section 6: *Vulnerability Assessment*.

I.3.1 Asset Inventory

Table I.22 lists the fire stations, police stations, emergency operations centers (EOCs), medical care facilities, and schools located in Smith County according to Hazus-MH Version 2.2.

In addition, **Figure I.12** shows the locations of critical facilities in Smith County. At the end of this subsection, shows a complete list of the critical facilities by name, as well as the hazards that affect each facility. As noted previously, this list is not all-inclusive and only includes information provided through Hazus.

Table I.22: CRITICAL FACILITY INVENTORY IN SMITH COUNTY

Location	Fire Stations	Police Stations	Medical Care Facilities	EOC	Schools
Mize	1	1	0	0	2
Polkville	1	1	0	0	0
Raleigh	1	2	0	1	2
Sylvarena	1	0	0	0	0
Taylorsville	1	1	0	0	2
Unincorporated Area	1	0	0	0	0
ASSET VALUATION	**$6,963,357**	**$9,284,478**	**N/A**	**$2,321,119**	**$35,108,247**
SMITH COUNTY TOTAL	**6**	**5**	**0**	**1**	**6**

Source: Hazus-MH 2.2

Figure I.13: CRITICAL FACILITY LOCATIONS IN SMITH COUNTY

Source: Hazus-MH 2.2

I.3.2 Social Vulnerability

In addition to identifying those assets potentially at risk to identified hazards, it is important to identify and assess those particular segments of the resident population in Smith County that are potentially at risk to these hazards.

Table I.32 lists the population by jurisdiction according to U.S. Census 2010 population estimates. The total population in Smith County according to Census data is 16,491 persons. Additional population estimates are presented above in Section I.1.

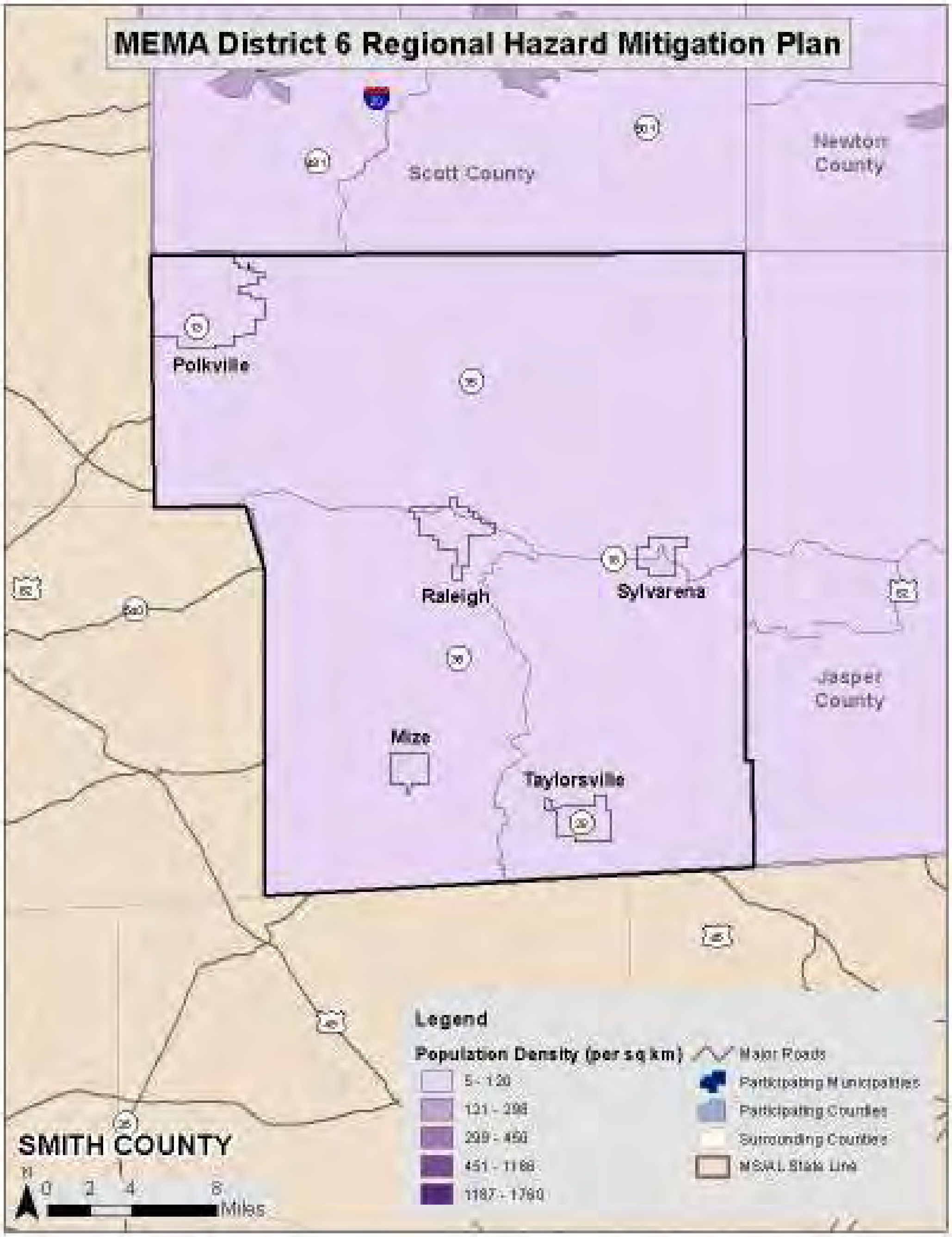
Table I.23: TOTAL POPULATION IN SMITH COUNTY

Location	Total 2019 Population
Mize	270
Polkville	813
Raleigh	1,152
Sylvarena	147
Taylorsville	2,080
Unincorporated Area	11,547
SMITH COUNTY TOTAL	**16,009**

Source: United States Census 2019 – American Community Survey

In addition, **Figure I.13** illustrates the population density per square kilometer by census tract as it was reported by the U.S. Census Bureau in 2010. This data remains unchanged since last plan update.

Figure I.14: POPULATION DENSITY IN SMITH COUNTY



Source: United States Census Bureau, 2010

I.3.3 Development Trends and Changes in Vulnerability

Since the previous county hazard mitigation plan was approved (in 2015), Smith County has experienced limited growth and development. **Table I.24** shows the number of building units constructed since 2014 according to the U.S. Census American Community Survey.

Table I.24: BUILDING COUNTS FOR SMITH COUNTY

Jurisdiction	Total Housing Units (2019)	Units Built 2014 or later	% Building Stock Built Post-2019
Mize	113	0	0.0%
Polkville	340	0	0.0%
Raleigh	630	0	0.0%
Sylvarena	54	0	0.0%
Taylorsville	722	9	1.2%
Unincorporated Area	5,518	105	1.9%
SMITH COUNTYTOTAL	**7,377**	**114**	**1.5%**

Source: United States Census Bureau – American Community Survey

Table I.34 shows population growth estimates for the county from 2010 to 2014 based on the U.S. Census Annual Estimates of Resident Population.

TABLE I.34: POPULATION GROWTH FOR SMITH COUNTY

Jurisdiction	Population Estimates (as of July 1)					% Change 2015-2019
	2015	2016	2017	2018	2019	
Mize	305	221	265	229	270	-11.47%
Polkville	820	784	676	633	813	-0.85%
Raleigh	1,454	1,536	1,438	1,409	1,152	20.77%
Sylvarena	101	100	116	98	147	45.54%
Taylorsville	1,348	1,534	1,667	1,998	2,080	54.30%
Unincorporated Area	12,229	11,962	11,952	11,696	11,547	-5.57%
SMITH COUNTY TOTAL	**16,257**	**16,137**	**16,114**	**16,063**	**16,009**	**-1.52%**

Source: United States Census Bureau – American Community Survey

Based on the data above, there has been a low rate of residential development and population growth in the county since 2015, and the county has actually experienced a slight population decline. However, the unincorporated area of the county experienced a slightly higher rate of development compared to the rest of the county, resulting in an increased number of structures that are vulnerable to the potential impacts of the identified hazards. Conversely, since the population has decreased throughout the county, there are now fewer numbers of people exposed to the identified hazards. Therefore, development and population growth have impacted the county's vulnerability since the previous local hazard mitigation plan was approved but there has been no change in the overall vulnerability since the changes offset one another.

It is also important to note that as development increases in the future, greater populations and more structures and infrastructure will be exposed to potential hazards if development occurs in the floodplains, moderate and high landside susceptibility areas, high wildfire risk areas, or primary and secondary TRI site buffers.

I.3.4 Vulnerability Assessment Results

As noted in Section 6: *Vulnerability Assessment*, only hazards with a specific geographic boundary, available modeling tool, or sufficient historical data allow for further analysis. Those results, specific to

Smith County, are presented here. All other hazards are assumed to impact the entire planning region (drought / heat wave; thunderstorm—wind, hail, lightning; tornado; and winter storm and freeze) or, due to lack of data, analysis would not lead to credible results (dam and levee failure, erosion, and land subsidence). In the case of landslide, local officials determined that the USGS data may be somewhat amiss and that even the areas identified as moderate risks probably entailed an overall low risk.

The hazards to be further analyzed in this subsection include: flood, wildfire, earthquake, hurricane and tropical storm winds, and hazardous materials incident.

The annualized loss estimate for all hazards is presented near the end of this subsection**.**

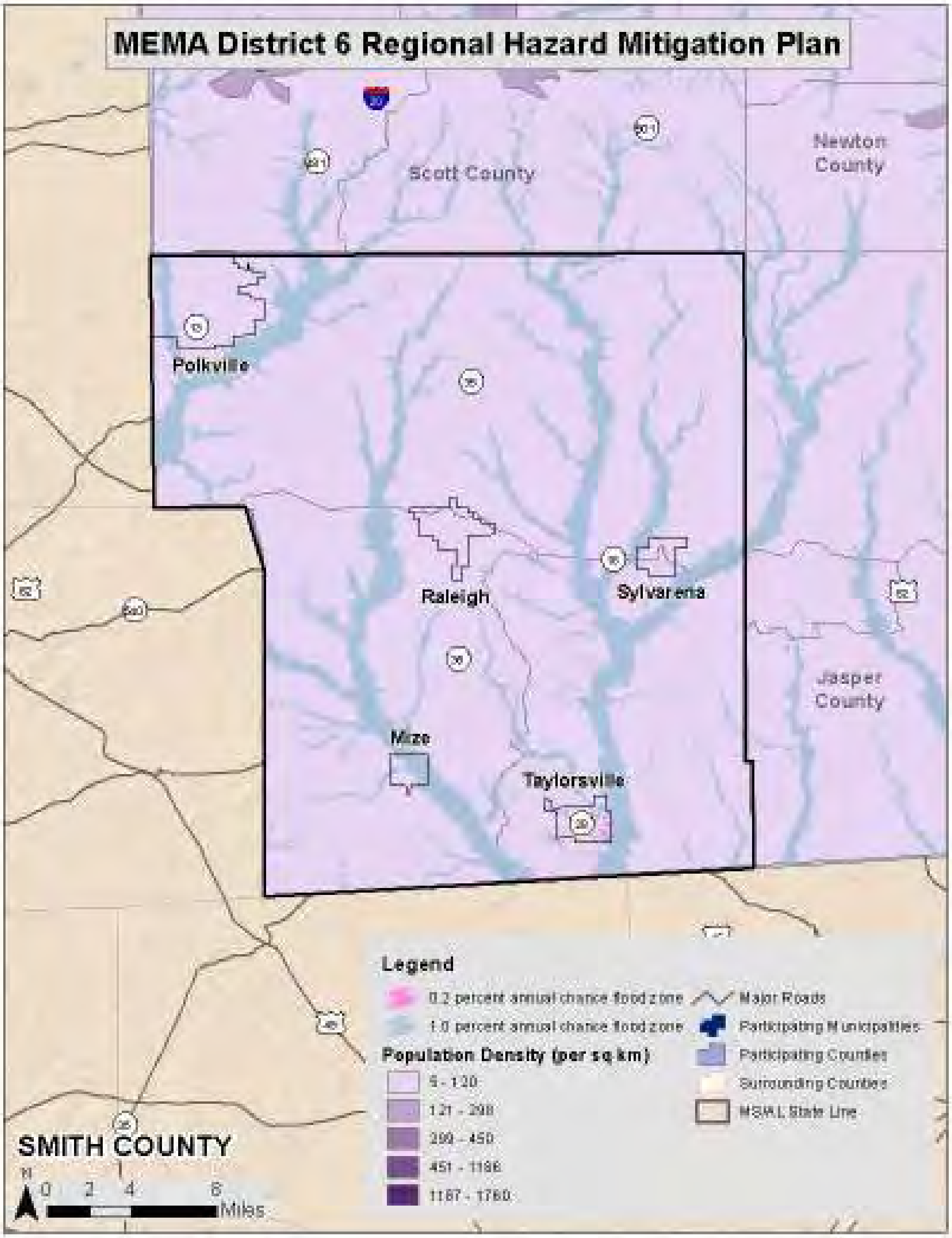
FLOOD

Historical evidence indicates that Smith County is susceptible to flood events. A total of 36 flood events have been reported by the National Centers for Environmental Information resulting in $632,000 in property damage. On an annualized level, these damages amounted to $27,478 for Smith County.

Social Vulnerability

Figure I.14 is presented to gain a better understanding of at-risk population by evaluating census tract level population data against mapped floodplains. There are areas of concern in several areas of the county. Indeed, nearly every incorporated municipality is potentially at risk of being impacted by flooding in some areas of its jurisdiction. Therefore, further investigation in these areas may be warranted.

Table I.25: POPULATION DENSITY NEAR FLOODPLAINS



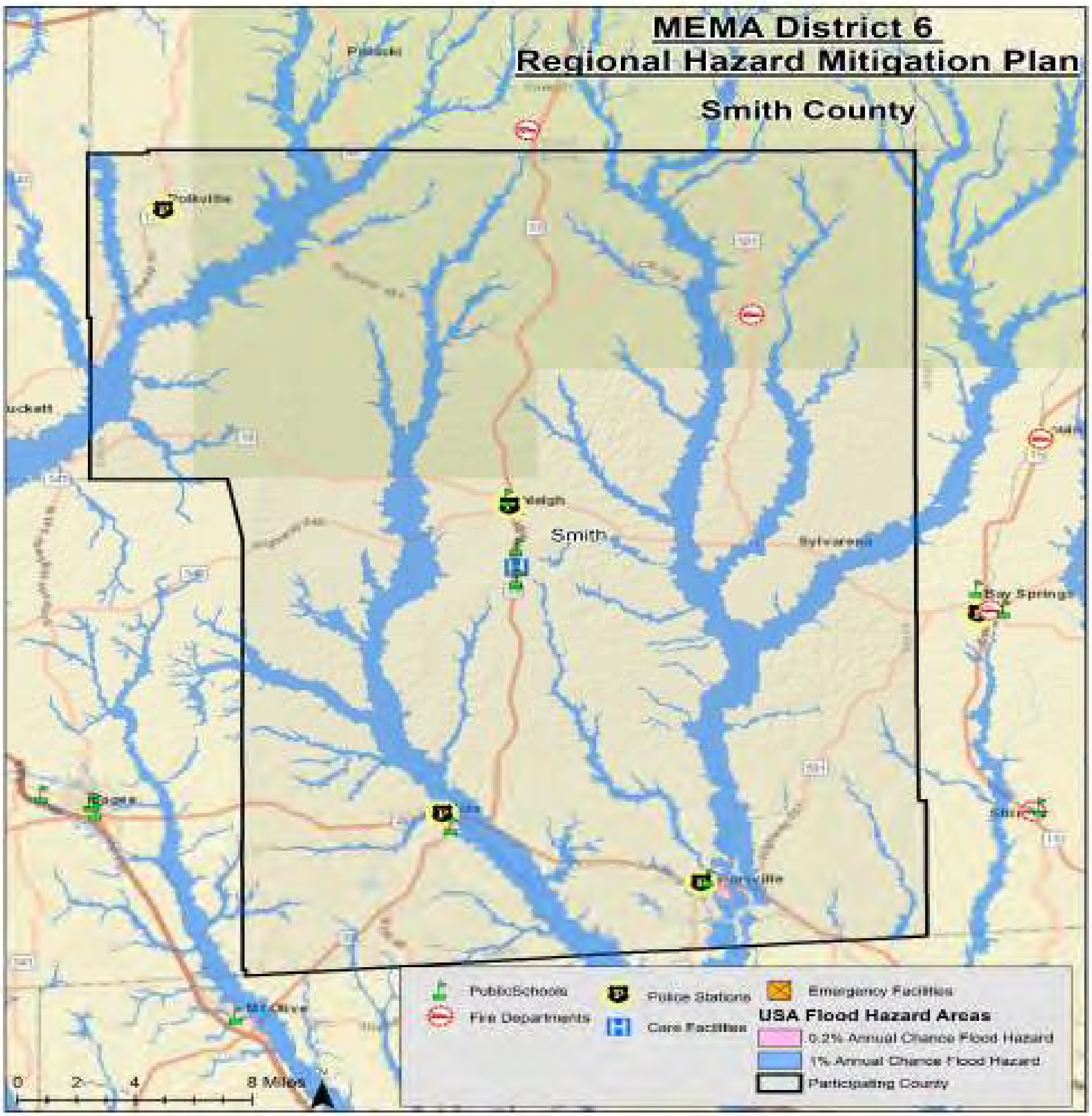
Source: Federal Emergency Management Agency DFIRM, United States Census 2010

Critical Facilities

The following figure shows critical facility location in relation to Special Flood Hazard Areas. (Please note, as previously indicated, this analysis does not consider building elevation, which may negate risk.) This facility is a police station located in the 1.0 percent annual chance flood zone. A list of specific critical facilities and their associated risk can be found at the end of this section.

In conclusion, a flood has the potential to impact many existing and future buildings, facilities, and populations in Smith County, though some areas are at a higher risk than others. All types of structures in a floodplain are at-risk, though elevated structures will have a reduced risk. Such site-specific vulnerability determinations are outside the scope of this assessment but will be considered during future plan updates. Furthermore, areas subject to repetitive flooding should be analyzed for potential mitigation actions.

Figure I.15: CRITICAL FACILITY ANALYSIS – SFHA



Source: Federal Emergency Management Agency

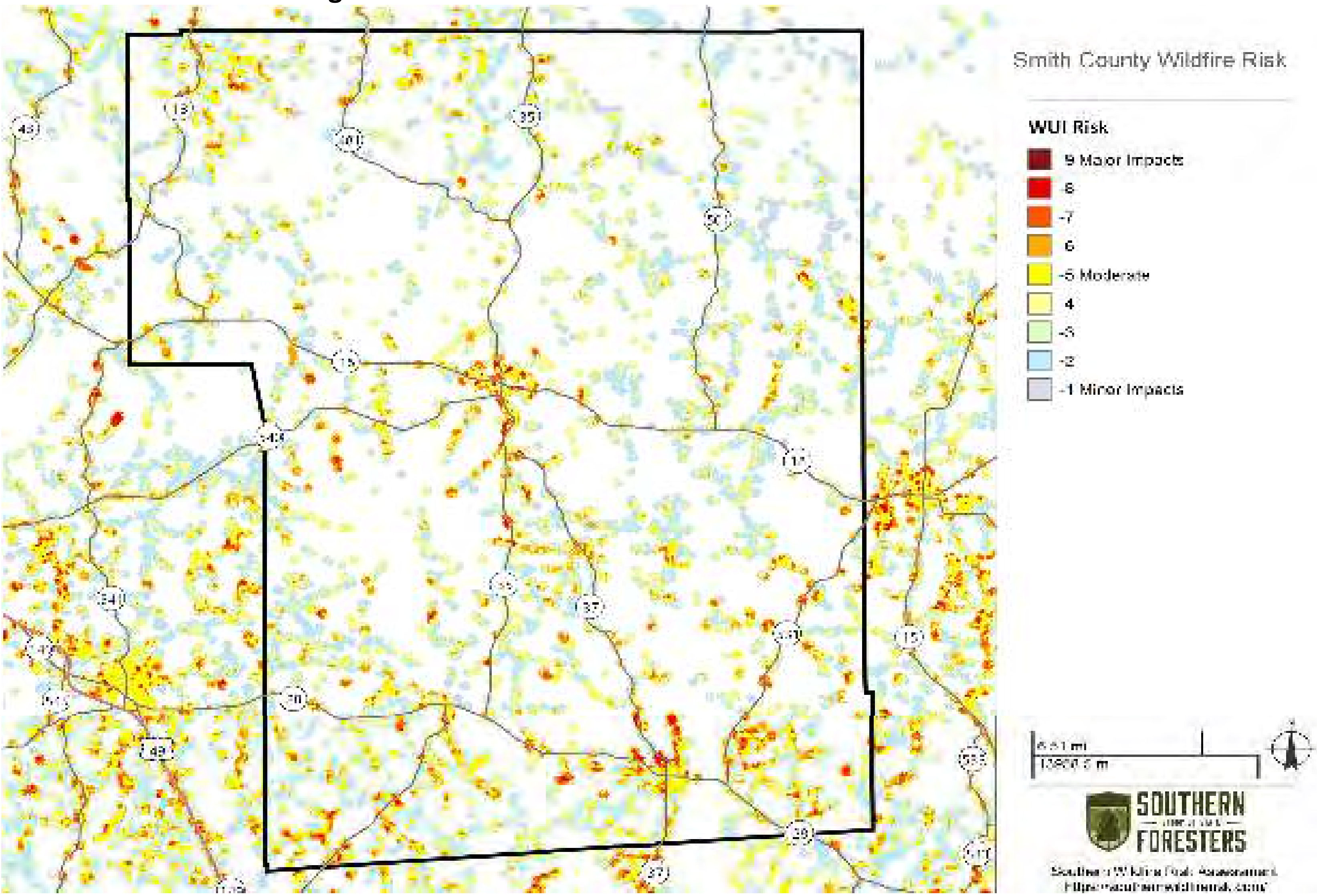
WILDFIRE

Although historical evidence indicates that Smith County is susceptible to wildfire events, there are few reports of damage. Therefore, it is difficult to calculate a reliable annualized loss figure. Annualized loss is considered negligible though it should be noted that a single event could result in significant damages throughout the county.

To estimate exposure to wildfire, building data was obtained from Hazus-MH 2.2 which includes information that has been aggregated at the Census block level and which has been deemed useful for analyzing wildfire vulnerability. However, it should be noted that the accuracy of Hazus data is somewhat lower than that of parcel data. For the critical facility analysis, areas of concern were intersected with critical facility locations.

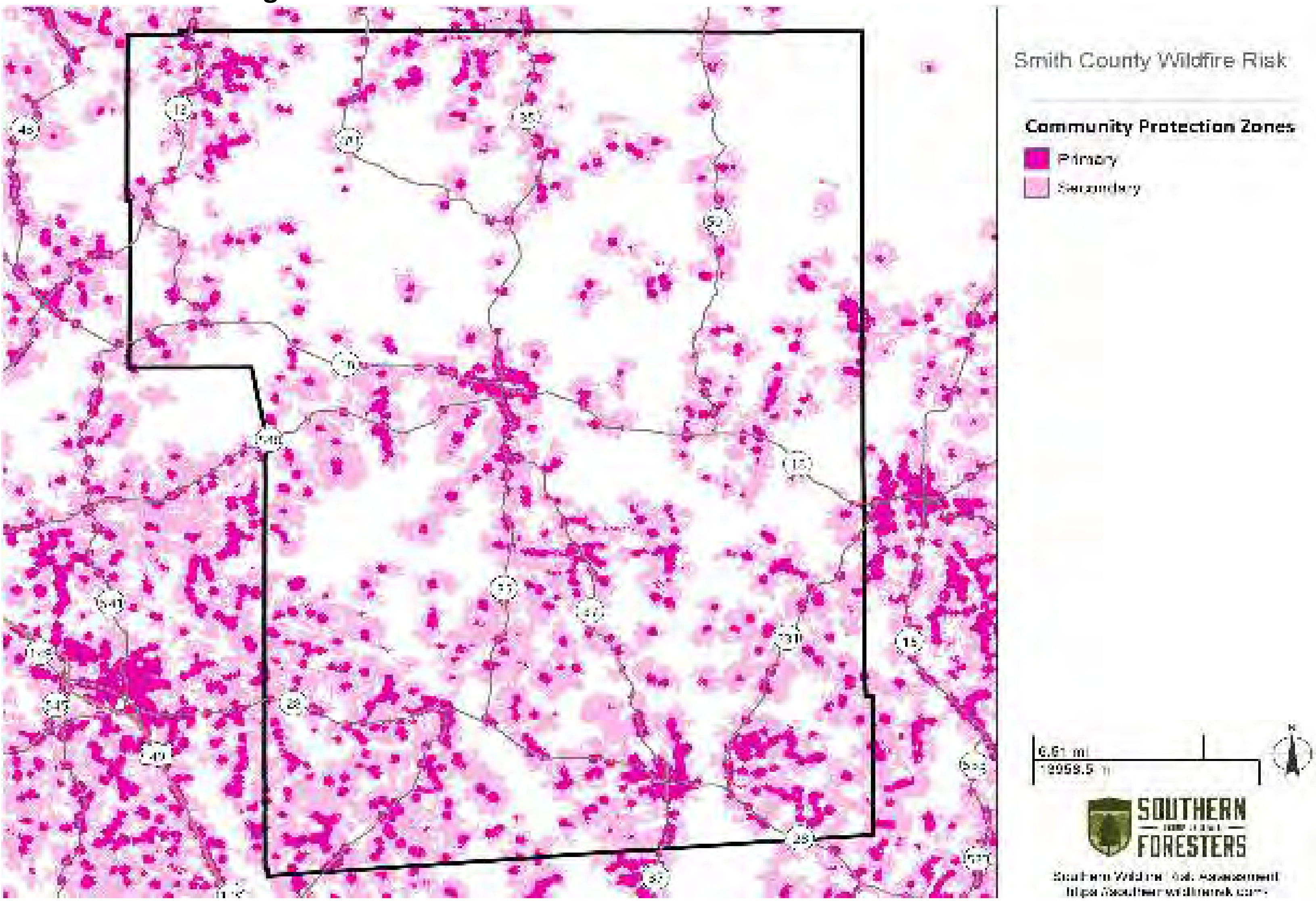
Figure I.16 shows the Wildland Urban Interface Risk Index (WUIRI) data, which is a data layer that shows a rating of the potential impact of a wildfire on people and their homes. The key input, Wildland Urban Interface (WUI), reflects housing density (houses per acre) consistent with Federal Register National standards. The location of people living in the WUI and rural areas is key information for defining potential wildfire impacts to people and homes. Initially provided as raster data, it was converted to a polygon to allow for analysis. The Wildland Urban Interface Risk Index data ranges from 0 to -9 with lower values being most severe (as noted previously, this is only a measure of relative risk). **Figure I.17** Community Protection Zones (CPZ) represent those areas considered highest priority for mitigation planning activities**.** CPZs are based on an analysis of the *Where People Live* housing density data and surrounding fire behavior potential. Rate of Spread data is used to determine the areas of concern around populated areas that are within a 2-hour fire spread distance. This is referred to as the Secondary CPZ. **Figure I.18** shows critical facilities in relation to historical wildfire burns.

Figure I.16: WUI RISK INDEX AREAS IN SMITH COUNTY



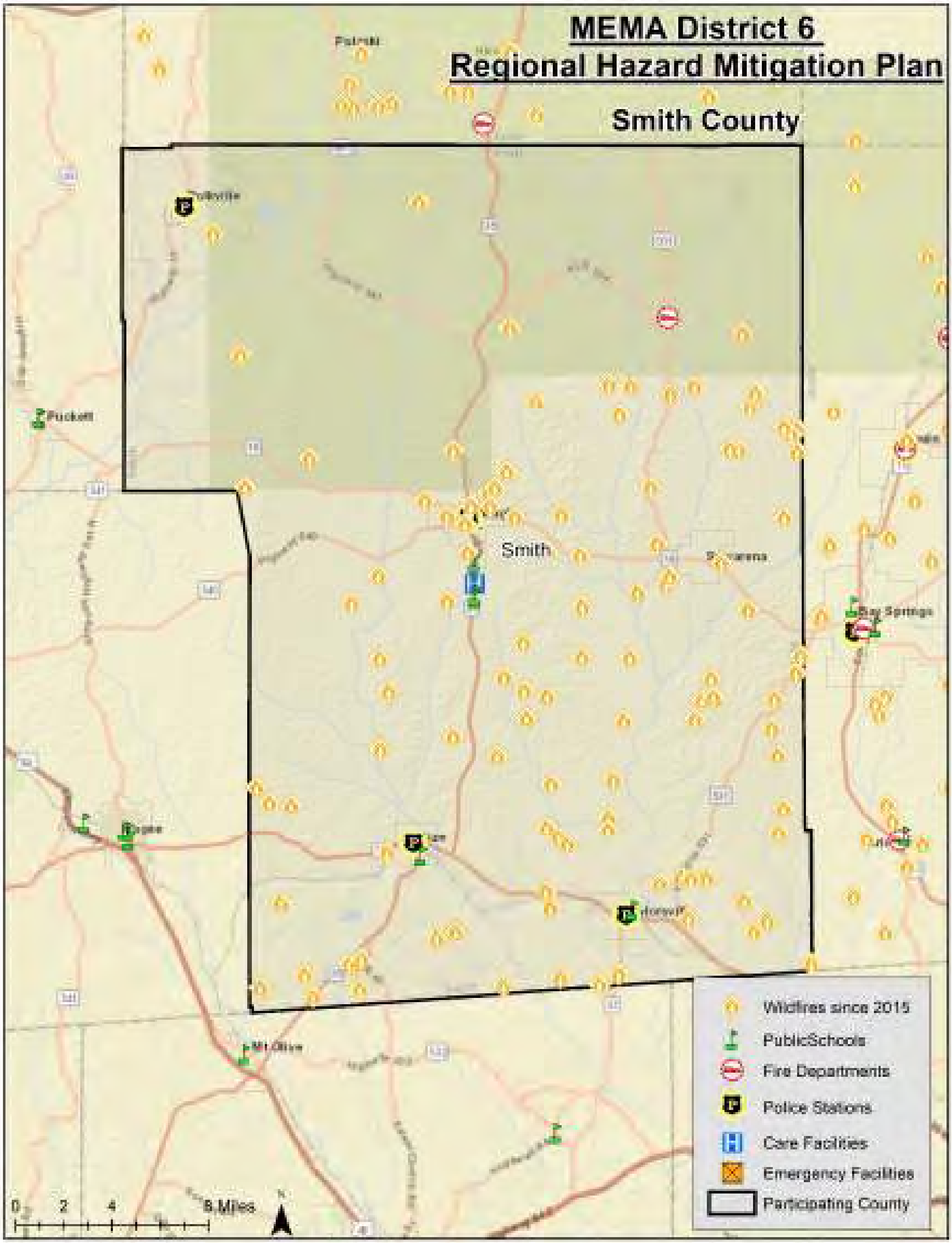
Source: Southern Wildfire Risk Assessment Data

Figure I.17: COMMUNITY PROTECTION ZONES IN SMITH COUNTY



Source: Southern Wildfire Risk Assessment Data

Figure I.18: CRITICAL FACILITIY ANALYSIS - WILDFIRE



Source: Southern Wildfire Risk Assessment Data

Social Vulnerability

Given some level of susceptibility across the entire county, it is assumed that the total population is at risk to the wildfire hazard. Determining the exact number of people in certain wildfire zones is difficult with existing data and could be misleading. In particular, the expansion of residential development from urban centers out into rural landscapes, increases the potential for wildland fire threat to public safety and the potential for damage to forest resources and dependent industries. This increase in population across the region will impact counties and communities that are located within the Wildland Urban Interface (WUI). The WUI is described as the area where structures and other human improvements meet and intermingle with undeveloped wildland or vegetative fuels. Population growth within the WUI substantially increases the risk from wildfire.

For the Smith County Wildfire Risk project area, it is estimated that 16,449 people or 99.6 % percent of the total project area population (16,522) live within the WUI.

Critical Facilities

The critical facility analysis revealed that there are no critical facilities located in wildfire areas of concern. It should be noted, that several factors could impact the spread of a wildfire putting all facilities at risk. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

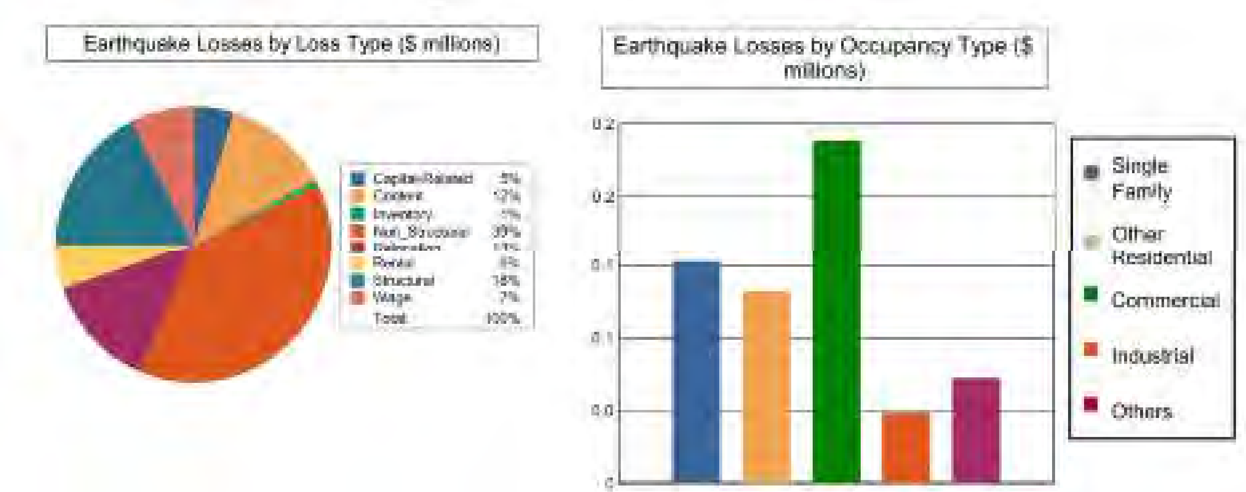
In conclusion, a wildfire event has the potential to impact many existing and future buildings, critical facilities, and populations in Smith County.

EARTHQUAKE

As the Hazus-MH model suggests below, and historical occurrences confirm, any earthquake activity in the area is likely to inflict minor damage to the county.

A probabilistic earthquake model was performed for the MEMA District 6 Region. As the Hazus-MH model suggests below, and historical occurrences confirm, any earthquake activity in the area is likely to inflict minor damage to the county. Hazus-MH 2.2 estimates the total building-related losses were $520,000; 31 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 44 % of the total loss. The figure below provides a summary of the losses associated with the building damage.

Figure I.19: MEMA D6 EARTHQUAKE LOSSES BY TYPE



For the earthquake hazard vulnerability assessment, a probabilistic scenario was created to estimate the average annualized loss for the region. The results of the analysis are generated at the Census Tract level within Hazus-MH and then aggregated to the region level. Since the scenario is annualized, no building counts are provided. Losses reported included losses due to structure failure, building loss, contents damage, and inventory loss.

Social Vulnerability

It can be assumed that all existing and future populations are at risk to the earthquake hazard. Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 39 households to be displaced due to the earthquake. Of these, 32 people (out of a total population of 244,467) will seek temporary shelter in public shelters. [6] The total economic loss estimated for the earthquake is 76.76 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory.

Critical Facilities

The Hazus-MH probabilistic analysis indicated that no critical facilities would sustain measurable damage in an earthquake event. However, all critical facilities should be considered at-risk to minor damage, should an event occur. Before the earthquake, the region had 1,241 hospital beds available for use. On the day of the earthquake, the model estimates that only 1,035 hospital beds (83.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 93.00% of the beds will be back in service. By 30 days, 99.00% will be operational.

In conclusion, an earthquake has the potential to impact all existing and future buildings, facilities, and populations in Smith County. The Hazus-MH scenario indicates that minimal to moderate damage is expected from an earthquake occurrence. While Smith County may not experience a large earthquake, localized damage is possible with an occurrence. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

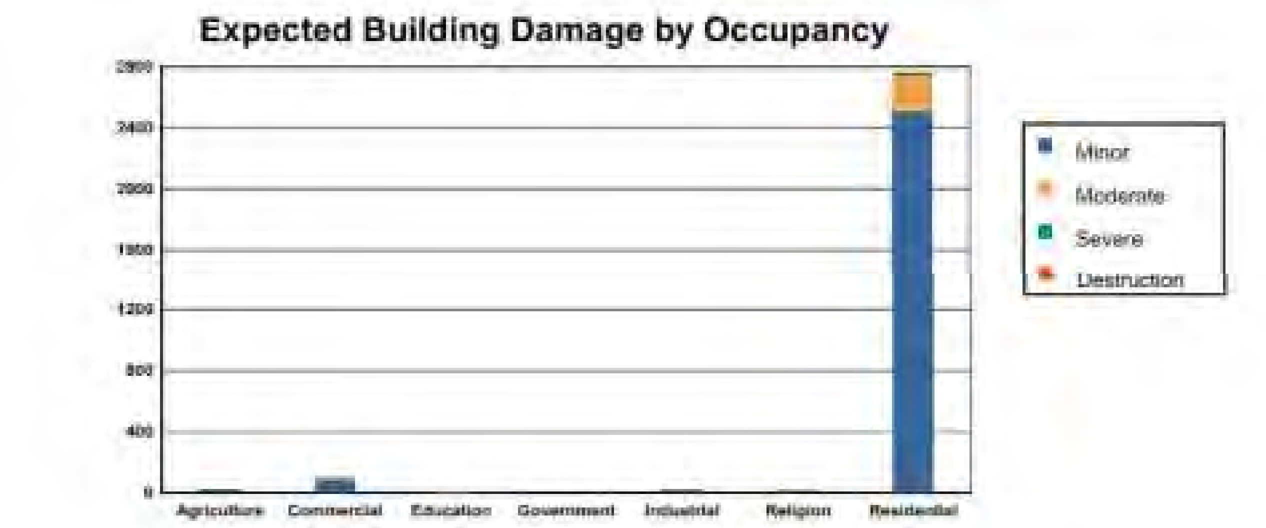
HURRICANE AND TROPICAL STORM

Historical evidence indicates that Smith County has some risk to the hurricane and tropical storm hazard. There have been five disaster declarations due to hurricanes (Hurricanes Camille, Ivan, Dennis, Katrina, and Isaac). Several tracks have come near or traversed through the county, as shown and discussed in Section I.2.10.

A probabilistic 100-year hurricane model was performed for the MEMA District 6. Hazus estimates that about 289 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 12 buildings that will be completely destroyed. The figure below summarizes the expected damage by general occupancy for the buildings in the region.

[6] HAZUS-MH utilizes 2010 Census Data

Figure I.20: MEMA D6 100-YEAR HURRICANE



Hurricanes and tropical storms can cause damage through numerous additional hazards such as flooding, erosion, tornadoes, and high winds, thus it is difficult to estimate total potential losses from these cumulative effects. The current Hazus-MH hurricane model only analyzes hurricane winds and is not capable of modeling and estimating cumulative losses from all hazards associated with hurricanes; therefore, only hurricane winds are analyzed in this section. It can be assumed that all existing and future buildings and populations are at risk to the hurricane and tropical storm hazard.

Social Vulnerability

Given equal susceptibility across the county, it is assumed that the total population, both current and future, is at risk to the hurricane and tropical storm hazard. Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 34 households to be displaced due to the hurricane. Of these, 26 people (out of a total population of 244,467) will seek temporary shelter in public shelters.

Social Vulnerability

Given equal susceptibility across the county, it is assumed that the total population, both current and future, is at risk to the hurricane and tropical storm hazard.

Critical Facilities

Given equal vulnerability across Smith County, all critical facilities are considered to be at risk. Some buildings may perform better than others in the face of such an event due to construction and age, among other factors. Determining individual building response is beyond the scope of this plan. However, this plan will consider mitigation action for especially vulnerable structures and/or critical facilities to mitigate against the effects of the hurricane hazard. A list of specific critical facilities can be found at the end of this subsection.

In conclusion, a hurricane event has the potential to impact many existing and future buildings, critical facilities, and populations in Smith County.

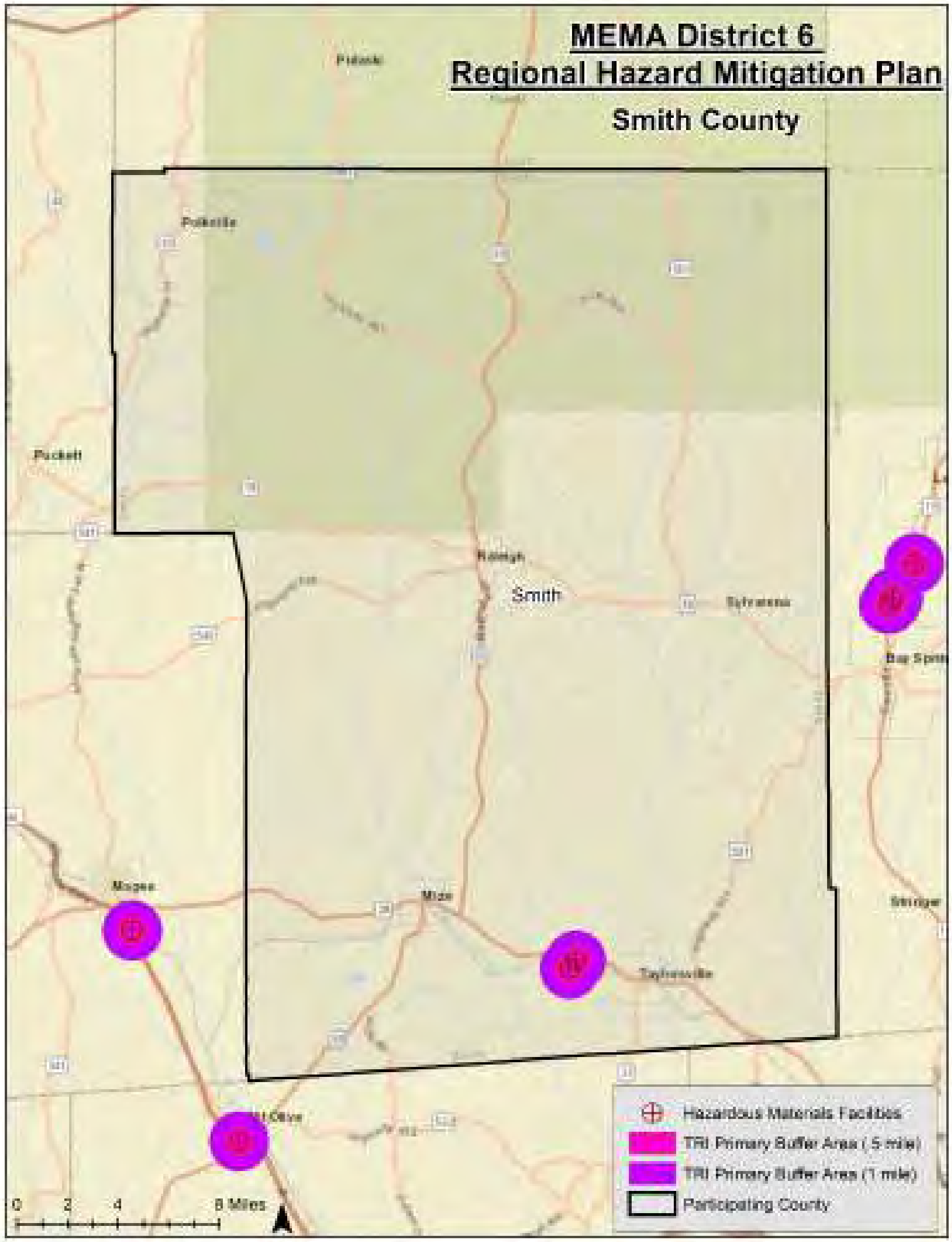
HAZARDOUS MATERIALS INCIDENT

Historical evidence indicates that Smith County is susceptible to hazardous materials events. A total of four HAZMAT incidents have been reported by the Pipeline and Hazardous Materials Safety Administration, resulting in $268,435 in property damage. On an annualized level, these damages amount to $53,687 for the county.

Most hazardous materials incidents that occur are contained and suppressed before destroying any property or threatening lives. However, they can have a significant negative impact. Such events can cause multiple deaths, completely shut down facilities for 30 days or more, and cause more than 50 percent of affected properties to be destroyed or suffer major damage. In a hazardous materials incident, solid, liquid, and/or gaseous contaminants may be released from fixed or mobile containers. Weather conditions will directly affect how the hazard develops. Certain chemicals may travel through the air or water, affecting a much larger area than the point of the incidence itself. Non-compliance with fire and building codes, as well as failure to maintain existing fire and containment features, can substantially increase the damage from a hazardous materials release. The duration of a hazardous materials incident can range from hours to days. Warning time is minimal to none.

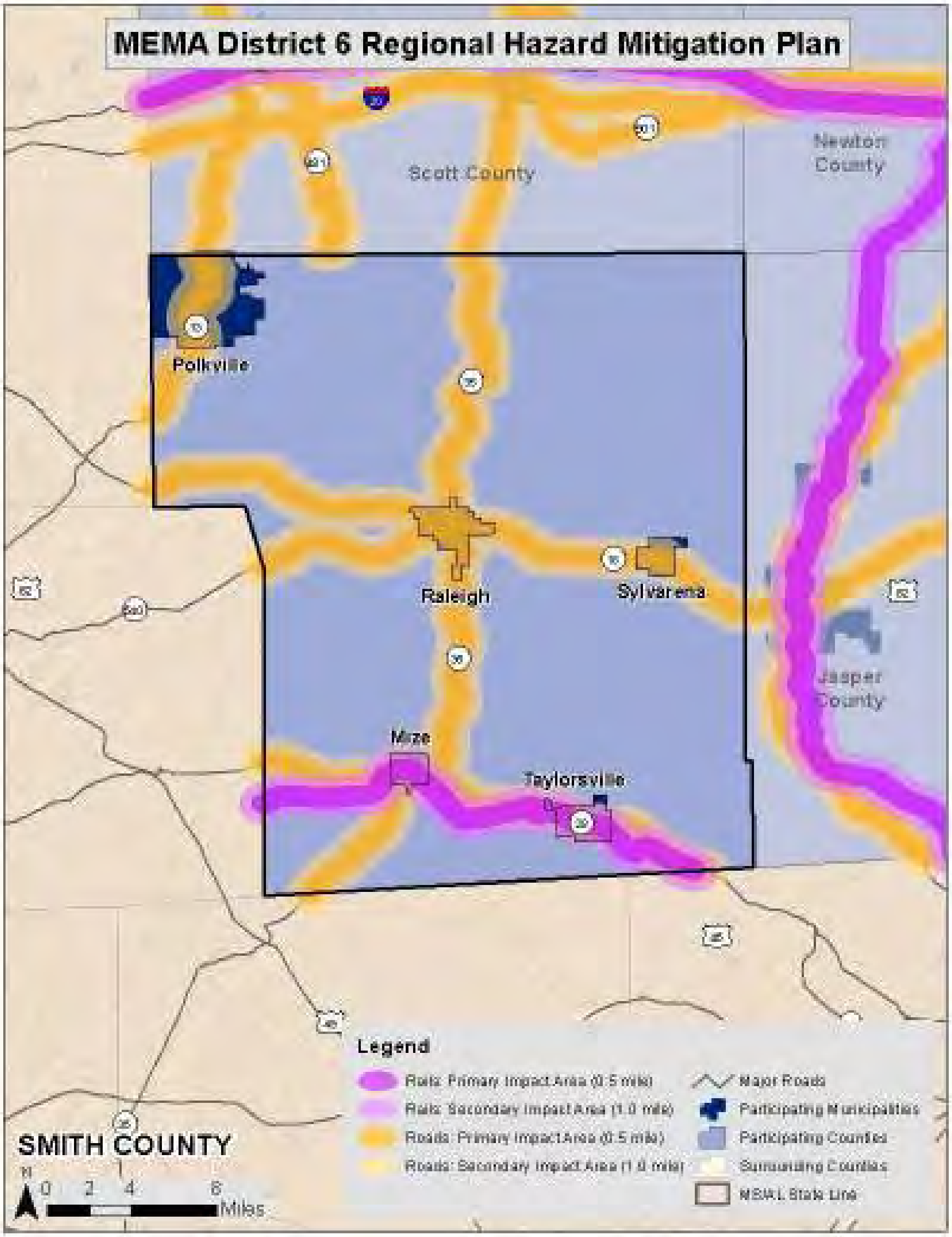
In order to conduct the vulnerability assessment for this hazard, GIS intersection analysis was used for fixed and mobile areas. In both scenarios, two sizes of buffers—0.5-mile and 1.0-mile—were used. These areas are assumed to represent the different levels of effect: immediate (primary) and secondary. Primary and secondary impact zones were selected based on guidance from the PHMSA Emergency Response Guidebook. For the fixed site analysis, geo-referenced TRI sites in the region, along with buffers, were used for analysis as shown in **Figure I.21.** For the mobile analysis, the major roads (Interstate highway, U.S. highway, and State highway) and railroads, where hazardous materials are primarily transported that could adversely impact people and buildings, were used for the GIS buffer analysis. **Figure I.22** shows the areas used for mobile toxic release buffer analysis.

Figure I.21: TRI SITES WITH BUFFERS IN SMITH COUNTY



Source: Environmental Protection Agency

Figure I.22: MOBILE HAZMAT BUFFERS IN SMITH COUNTY



Social Vulnerability

Given high susceptibility across the entire county, it is assumed that the total population is at risk to a hazardous materials incident. It should be noted that areas of population concentration may be at an elevated risk due to a greater burden to evacuate population quickly.

Critical Facilities

Fixed Site Analysis:

The critical facility analysis for fixed TRI sites revealed that there is one facility located in a HAZMAT risk zone. This facility is a police station located in the secondary impact zone. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

Mobile Analysis:

It should be presumed that any facility located near a public roadway or rail line is susceptible to a potential HAZMAT event. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

A list of specific critical facilities and their associated risk can be found at the end of this subsection.

In conclusion, a hazardous material incident has the potential to impact many existing and future buildings, critical facilities, and populations in Smith County. Those areas in a primary buffer are at the highest risk, though all areas carry some vulnerability due to variations in conditions that could alter the impact area (i.e., direction and speed of wind, volume of release, etc.). Further, incidents from neighboring counties could also impact the county and participating jurisdictions.

CONCLUSIONS ON HAZARD VULNERABILITY

The following table presents a summary of annualized loss for each hazard in Smith County. Due to the reporting of hazard damages primarily at the county level, it was difficult to determine an accurate annualized loss estimate for each municipality. Therefore, an annualized loss was determined through the damage reported through historical occurrences at the county level. These values should be used as an additional planning tool or measure risk for determining hazard mitigation strategies throughout the county.

Table I.26: ANNUALIZED LOSS FOR SMITH COUNTY

Event	Smith County
Flood-related Hazards	
Flood	$27,478
Erosion	Negligible
Dam and Levee Failure	Negligible
Winter Storm & Freeze	$55,000
Fire-related Hazards	
Drought / Heat Wave	$8,125
Wildfire	Negligible
Geologic Hazards	
Earthquake	$8,000
Landslide	Negligible
Land Subsidence	Negligible
Wind-related Hazards	
Hurricane & Tropical Storm	$436,000
Thunderstorm / High Wind	$95,694
Hail	$37,440
Lightning	$78,785
Tornado	$743,828
Other Hazards	
HAZMAT Incident	$53,687
Pandemic	Negligible

**In this table, the term "Negligible" is used to indicate that no records of dollar losses for the particular hazard were recorded. This could be the case either because there were no events that caused dollar damage or because documentation of that particular type of event is not well kept. Annualized losses were calculated based on the total number of years of reporting and damage totals.*

As noted previously, all existing and future buildings and populations (including critical facilities) are vulnerable to atmospheric hazards including drought / heat wave, hurricane and tropical storm, thunderstorm (wind, hail, lightning), tornado, and winter storm and freeze. In addition, all buildings and populations are vulnerable to all of the man-made and technological hazards identified above. Some buildings may be more vulnerable to these hazards based on locations, construction, and building type. The following table shows the critical facilities vulnerable to additional hazards analyzed in this subsection. The table lists those assets that are determined to be exposed to each of the identified hazards (marked with an "**X**").

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Table I.27: AT-RISK CRITICAL FACILITIES IN SMITH COUNTY

		FLOOD-RELATED					FIRE-RELATED		GEOLOGIC			WIND-RELATED			OTHER						
FACILITY NAME	FACILITY TYPE	Flood – 100 yr	Flood – 500 yr	Erosion	Dam and Levee Failure	Winter Storm and Freeze	Drought / Heat Wave	Wildfire	Earthquake	Landslide	Land Subsidence	Hurricane and Tropical Storm	Thunderstorm (wind, hail,	Tornado	Fixed HAZMAT – 0.5 mile	Fixed HAZMAT – 1.0 mile	Mobile HAZMAT – 0.5 mile (road)	Mobile HAZMAT – 1.0 mile (road)	Mobile HAZMAT – 0.5 mile (rail)	Mobile HAZMAT – 1.0 mile (rail)	Pandemic
SMITH COUNTY																					
Smith County EOC	EOC			X	X	X	X		X	X	X	X	X	X			X	X			X
Sylvarena Volunteer Fire Department	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
Polkville Volunteer Fire Department	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
Mize Volunteer Fire Department	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
Taylorsville Volunteer Fire Department	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
Raleigh Volunteer Fire Department	Fire Station			X	X	X	X		X	X	X	X	X	X			X	X			X
Pineville Volunteer Fire Department	Fire Station			X	X	X	X		X	X	X	X	X	X							X
Mize City Police Dept	Police Station	X		X	X	X	X		X	X	X	X	X	X				X		X	X
Polkville Police Department	Police Station																				
Raleigh Police Dept	Police Station			X	X	X	X		X	X	X	X	X	X			X	X			X
Smith County Sheriff	Police Station			X	X	X	X		X	X	X	X	X	X			X	X			X
Taylorsville Police Dept	Police Station			X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
Community Learning Center	School			X	X	X	X		X	X	X	X	X	X			X	X			X
Mize Attendance Center	School			X	X	X	X		X	X	X	X	X	X			X	X		X	X
Raleigh Elementary School	School			X	X	X	X		X	X	X	X	X	X			X	X			X
Raleigh High School	School			X	X	X	X		X	X	X	X	X	X			X	X			X
Smith Co Voc Complex	School			X	X	X	X		X	X	X	X	X	X							X
Taylorsville Attendance Center	School			X	X	X	X		X	X	X	X	X	X			X	X	X	X	X

I.4 SMITH COUNTY CAPABILITY ASSESSMENT

This subsection discusses the capability of Smith County to implement hazard mitigation activities. More information on the purpose and methodology used to conduct the assessment can be found in Section 7: *Capability Assessment*.

I.4.1 Planning and Regulatory Capability

The following table provides a summary of the relevant local plans, ordinances, and programs already in place or under development for Smith County. A checkmark (✓) indicates that the given item is currently in place and being implemented. An asterisk (*) indicates that the given item is currently being developed for future implementation. Each of these local plans, ordinances, and programs should be considered available mechanisms for incorporating the requirements of the MEMA District 6 Regional Hazard Mitigation Plan.

Table I.28: RELEVANT PLANS, ORDINANCES, AND PROGRAMS

Planning Tool/Regulatory Tool	Hazard Mitigation Plan	Comprehensive Land Use Plan	Floodplain Management Plan	Open Space Management Plan (Parks & Rec/Greenway Plan	Stormwater Management Plan/Ordinance	Natural Resource Protection Plan	Flood Response Plan	Emergency Operations Plan	Continuity of Operations Plan	Evacuation Plan	Disaster Recovery Plan	Capital Improvements Plan	Economic Development Plan	Historic Preservation Plan	Flood Damage Prevention Ordinance	Zoning Ordinance	Subdivision Ordinance	Unified Development Ordinance	Post-Disaster Redevelopment Ordinance	Building Code	Fire Code	National Flood Insurance Program (NFIP)	NFIP Community Rating System
SMITH COUNTY	✓		✓				✓	✓	✓		✓		✓		✓							✓	
Mize	✓		✓				✓	✓	✓		✓		✓		✓							✓	
Polkville	✓		✓				✓	✓	✓		✓		✓		✓							✓	
Raleigh	✓		✓				✓	✓	✓		✓		✓		✓					✓		✓	
Sylvarena	✓		✓				✓	✓	✓		✓		✓										
Taylorsville	✓		✓				✓	✓	✓		✓		✓		✓	✓				✓		✓	

A more detailed discussion on the county's planning and regulatory capabilities follows.

EMERGENCY MANAGEMENT

Hazard Mitigation Plan
Smith County has previously adopted a hazard mitigation plan. The Town of Mize, Town of Polkville, Town of Raleigh, Village of Sylvarena, and Town of Taylorsville were also included in this plan.

Emergency Operations Plan
Smith County maintains an Emergency Operations Plan through its Emergency Management Agency. The Town of Mize, Town of Polkville, Town of Raleigh, Village of Sylvarena, and Town of Taylorsville are each covered by this plan.

Continuity of Operations Plan
Smith County has a COOP that covers all jurisdictions.

Disaster Recovery Plan
Smith County maintains a Disaster Recovery Plan that covers all of the jurisdictions.

Floodplain Management Plan
Smith County, and the Town of Mize, Town of Polkville, Town of Raleigh, Village of Sylvarena, and Town of Taylorsville each have their own Floodplain Management Plan.

GENERAL PLANNING

Zoning Ordinance
Smith County does not have a zoning ordinance in place. However, the Town of Taylorsville has adopted a zoning ordinance.

Subdivision Ordinance
Smith County does not have a subdivision ordinance in place. However, the Town of Taylorsville has adopted a subdivision ordinance.

Building Codes, Permitting, and Inspections
The Town of Raleigh and Town of Taylorsville have adopted a building code.

FLOODPLAIN MANAGEMENT

The following table provides NFIP policy and claim information for each participating jurisdiction in Smith County.

Table I.29: NFIP POLICY AND CLAIM INFORMATION[7]

Jurisdiction	Date Joined NFIP	Current Effective Map Date	NFIP Policies in Force	Insurance in Force	Closed Claims	Total Payments to Date
SMITH COUNTY†	07/01/91	08/16/11	10	$2,717,500	0	$0

[7] Updated NFIP and RLP data was not made available for this plan update.

Mize	01/01/86	08/16/11	10	$1,503,600	6	$27,348
Polkville*	--	--	--	--	--	--
Raleigh	05/02/13	(NSFHA)	0	$0	0	$0
Sylvarena*	--	--	--	--	--	--
Taylorsville	06/17/86	08/16/11	3	$1,113,600	0	$0

†Includes unincorporated areas of county only
*Community does not participate in the NFIP
(NSFHA) – No Special Flood Hazard Area – All Zone C
Source: NFIP Community Status information as of 9/2/2015; NFIP claims and policy information as of 6/30/2015

Flood Damage Prevention Ordinance

All communities participating in the NFIP are required to adopt a local flood damage prevention ordinance. Smith County, the Town of Mize, the Town of Raleigh, and the Town of Taylorsville all participate in the NFIP and have adopted flood damage prevention ordinances.

I.4.2 Administrative and Technical Capability

The following table provides a summary of the capability assessment results for Smith County with regard to relevant staff and personnel resources. A checkmark (✓) indicates the presence of a staff member(s) in that jurisdiction with the specified knowledge or skill.

Table I.30: RELEVANT STAFF / PERSONNEL RESOURCES

Staff / Personnel Resource	Planners with knowledge of land development/land management practices	Engineers or professionals trained in construction practices related to buildings and/or infrastructure	Planners or engineers with an understanding of natural and/or human-caused hazards	Emergency Manager	Floodplain Manager	Land Surveyors	Scientists familiar with the hazards of the community	Staff with education or expertise to assess the community's vulnerability to hazards	Personnel skilled in GIS and/or Hazus	Resource development staff or grant writers
SMITH COUNTY				✓	✓	✓		✓		
Mize				✓	✓			✓		
Polkville				✓	✓			✓		
Raleigh				✓	✓			✓		
Sylvarena				✓	✓			✓		
Taylorsville		✓		✓	✓			✓		

Credit for having a floodplain manager was given to those jurisdictions that have a flood damage prevention ordinance, and therefore an appointed floodplain administrator, regardless of whether the appointee was dedicated solely to floodplain management. Credit was given for having a scientist familiar with the hazards of the community if a jurisdiction has a Cooperative Extension Service or Soil and Water Conservation Department. Credit was also given for having staff with education or expertise to assess the community's vulnerability to hazards if a staff member from the jurisdiction was a participant on the existing hazard mitigation plan's planning committee.

I.4.3 Fiscal Capability

The following table provides a summary of the results for Smith County with regard to relevant fiscal resources. A checkmark (✓) indicates that the given fiscal resource is locally available for hazard mitigation purposes (including match funds for state and federal mitigation grant funds) according to the previous county hazard mitigation plan.

Table I.31: RELEVANT FISCAL RESOURCES

Fiscal Tool / Resource	Capital Improvement Programming	Community Development Block Grants (CDBG)	Special Purpose Taxes (or taxing districts)	Gas/Electric Utility Fees	Water/Sewer Fees	Stormwater Utility Fees	Development Impact Fees	General Obligation, Revenue, and/or Special Tax Bonds	Partnering Arrangements or Intergovernmental Agreements	Other: other state and Federal funding sources
SMITH COUNTY	✓	✓								✓
Mize	✓	✓								✓
Polkville	✓	✓								✓
Raleigh	✓	✓								✓
Sylvarena	✓	✓								✓
Taylorsville	✓	✓								✓

I.4.4 Political Capability

During the months immediately following a disaster, local public opinion in Smith County is more likely to shift in support of hazard mitigation efforts.

I.4.5 Conclusions on Local Capability

The table below shows the results of the capability assessment using the designed scoring methodology described in Section 7: *Capability Assessment*. The capability score is based solely on the information found in existing hazard mitigation plans and readily available on the jurisdictions' government websites. According to the assessment, the average local capability score for the county and its jurisdictions is 15.5, which falls into the limited capability ranking.

Table I.32: CAPABILITY ASSESSMENT RESULTS

Jurisdiction	Overall Capability Score	Overall Capability Rating
SMITH COUNTY	20	Moderate
Mize	15	Limited
Polkville	9	Limited
Raleigh	17	Limited
Sylvarena	9	Limited
Taylorsville	23	Moderate

I.5 SMITH COUNTY MITIGATION STRATEGY

This subsection provides the blueprint for Smith County to follow in order to become less vulnerable to its identified hazards. It is based on general consensus of the Regional Hazard Mitigation Council and the findings and conclusions of the capability assessment and risk assessment. Additional Information can be found in Section 8: *Mitigation Strategy* and Section 9: *Mitigation Action Plan*.

I.5.1 Mitigation Goals and Objectives

Smith County developed 10 mitigation goals in coordination with the other participating MEMA District 6 Region jurisdictions. The regional mitigation goals are presented below.

Table I.33: MEMA DISTRICT 6 REGIONAL MITIGATION GOALS

Goal #		Goals & Objectives	Action #
#1	Goal	Local government will be able to maintain **effective mitigation programs**.	PEA-1
	Objective	***County EMA stresses the importance of mitigation projects along with grants to obtain funding.***	
#2	Goal	The community will work together to create a **disaster-resistant community**.	PEA-1
	Objective	***Working relationship with all of the jurisdictions. Works with RedCross and other non-profits.***	
#3	Goal	The community will be able to initiate and sustain **emergency response operations.**	PEA-2
	Objective	***County has CodeRed, and works to engage the community through the dissemination of information.***	
#4	Goal	**Government operations** will not be significantly disrupted by disasters.	P-4
	Objective	***County has a COOP that includes all of the jurisdictions.***	
#5	Goal	The **health, safety, and welfare of the community's residents and visitors** will be protected.	P-4
	Objective	***County EMA promotes saferoom projects, and is currently looking at adding a community shelter at the AG Complex.***	
#6	Goal	**Local government will support effective hazard mitigation programming** in the community.	P-5
	Objective	***County and all the jurisdictions have a floodplain management plan.***	
#7	Goal	Residents of the community will have **homes, institutions, and work places that are safer**.	ES-6
	Objective	***Standby generators have been installed at several critical facility locations, county also has CodeRed to get out important information to residents.***	
#8	Goal	The **local economy** of the community will be prepared for a disaster.	PEA-2
	Objective	***Works closely with non-profits to provide necessary resources in times of disaster.***	
#9	Goal	**Local infrastructure will not be significantly disrupted by a disaster**.	ES-6
	Objective	***Several generators have been installed at critical facilities such as fire stations and water wells. Worked to update Taylorsville's 911 System, and implemented a Text to 911.***	
#10	Goal	All **members of the community will understand the hazards threatening their community.**	PEA-1
	Objective	***Public outreach programs to get information and education out. Safety Day.***	

To attain the listed mitigation goals, the county has also identified objectives that will assist them in the mitigation action process. Objectives are broader than specific actions, but are measurable, unlike goals. Objectives connect goals with the actual mitigation actions. The action plan describes how the mitigation actions will be implemented, including how those actions will be prioritized, administered and incorporated into the community's existing planning mechanisms.

I.5.2 Mitigation Action Plan

The mitigation actions proposed by Smith County, Mize, Polkville, Raleigh, Sylvarena, and Taylorsville are listed in the following individual Mitigation Action Plans.

Smith County Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2020	COMPLETED
P-2	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	2020	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Board of Supervisors	FEMA/MEMA, Local funds	DELETED	DELETED
P-4	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	County EMA	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
P-5	Conduct an H&H Study in Taylorsville and Mize.	Flooding	High	County EMA	FEMA/MEMA, Local	2025	New Action

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Property Protection							
PP-1	Elevation of County Road 131.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, CDBG, Local funds	2020	COMPLETED
PP-2	Elevation of County Road 503-S.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, CDBG, Local funds	2025	This road has not been elevated, but the county is still interested in pursuing the project going forward if funding becomes available. This action will remain in the plan.
PP-3	Elevation of County Road 48.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, CDBG, Local funds	2025	This road has not been elevated, but the county is still interested in pursuing the project going forward if funding becomes available. This action will remain in the plan.
PP-4	Elevation of County Road 563.	Flood	Moderate	Board of Supervisors	FEMA/MEMA, CDBG, Local funds	2025	This road has not been elevated, but the county is still interested in pursuing the project going forward if funding becomes available. This action will remain in the plan.
Natural Resource Protection							
NRP-1							

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Structural Projects							
SP-1	Cleaning out Cohay Creek in Mize to alleviate flooding in the downtown area. Another possible solution is to install a dyke to retain water.	Flood	Moderate	Board of Supervisors, Town of Mize Board of Aldermen	FEMA/MEMA, CDBG, Local funds	2025	Ongoing. A dyke has not been installed in this area and although it has been cleaned out on several occasions, a long-term solution to this flooding issue is required, so this action will remain in the plan
Emergency Services							
ES-1	Increase the number of emergency warning systems throughout the County, especially inside the municipalities. Also, increase the size and number of existing warning systems.	Tornado, High Wind	High	County EMA	FEMA/MEMA, Local funds	2017	COMPLETED
ES-2	Purchase of weather radios for public meeting places – i.e., community centers and senior citizen centers.	Tornado, High Wind	High	County EMA	FEMA/MEMA, Local funds	2017	COMPLETED
ES-3	Seek ways to bring local hospital care back into Smith County.	Tornado, High Wind	High	Board of Supervisors		2025	The county has not been able to bring local hospital care back into the county. This is something that local officials would like to continue to pursue, so it will remain in the plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
ES-4	Purchase and installation of the “Alert Now” text messaging system, which would allow Smith County Schools to quickly notify teachers, parents, and students of disasters.	All	High	County Schools	FEMA/MEMA, DOE, Local funds	2017	COMPLETED
ES-5	Establishment of at least three (3) new fire districts and stations in the rural areas of the County to help improve overall emergency response.	All	Moderate	Board of Supervisors, County EMA	FEMA/MEMA, AFGP, CDBG, Rural Development, Local funds	2020	COMPLETED
ES-6	Installation of a generator with quick connect/transfer switches at all Smith County Schools campuses.	All	Moderate	County Schools	FEMA/MEMA, DOE, Local funds	2025	Some generators have been purchased for the county, but there is still a strong need for generators at schools. The county will continue to look for funding sources for these.
ES-7	Seek funds to help pay overtime costs for Smith County Schools when they have to provide personnel if school buildings are used as shelters during emergencies.	Tornado, High Wind	Low	Board of Supervisors, County School System	FEMA/MEMA, DOE, Local funds	2025	The county does not have a separate fund for paying overtime costs when schools have to be used for sheltering during storm events. This is something the county will look at establishing in the future and will remain an action in the plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Public Education and Awareness							
PEA-1	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Low	County EMA	FEMA/MEMA, Local funds	2025	Ongoing. The county has encouraged the construction of safe rooms and tornado shelters, however, this is an effort that requires continual attention so the county will leave it as an action and continue to pursue it going forward.
PEA-2	Education of local residents on being prepared for severe weather and other hazards.	All	Low	County EMA	FEMA/MEMA, Local funds	2025	Ongoing. The county has worked hard to inform citizens of how to be prepared for severe weather and other hazards, but this action needs to be continued
Previously Completed Actions							

Town of Mize Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2020	COMPLETED
P-2	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2025	Ongoing. The International Building Code has been adopted. The county will need to review this code over the next 5 years, so this action
P-4	Conduct a base flood elevation study for the Town.	Flood	Low	Board of Aldermen	FEMA/MEMA, US Army Corps of Engineers, Pat Harrison Waterway District, Local funds	2025	Ongoing. A base flood elevation study has not been conducted for the town, but this is something that the town would like to continue to pursue because of the information that would be gained for possible mitigation. This will remain in the plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
P-5	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
P-6	Collect additional data on the number of buildings located in flood-prone areas near the Oakahay River and determine their assessed value in order to determine potential losses due to a flood event.	Flood	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	The town has not collected data on the number of buildings located in flood prone areas, but there have been some loss estimations carried out through this planning process. Nevertheless, town officials would like to continue to evaluate and assess the potential damages to determine what projects could be implemented.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1	Cleaning out of Cohay Creek in Mize to alleviate flooding in the downtown area. Another possible solution is to install a dyke to retain water.	Flood	Moderate	Public Works	FEMA/MEMA, CDBG, Local funds	2022	A dyke has not been installed in this area and although it has been cleaned out on several occasions, a long-term solution to this flooding issue is required, so this action will remain in the plan in the future.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Emergency Services							
ES-1	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2017	Completed
ES-2	Purchase of generators to provide adequate backup power for all water and wastewater facilities to prevent interruption of service during and after a disaster.	All	High	Board of Aldermen	FEMA/MEMA, Local funds	2020	Completed
Public Education and Awareness							
PEA-1	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	The county has encouraged the construction of safe rooms and tornado shelters, however, this is an effort that requires continual attention so the county will leave it as an action and continue to pursue it going forward.
PEA-2	Education of local residents on being prepared for severe weather and other hazards.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	The county has worked hard to inform citizens of how to be prepared for severe weather and other hazards, but this action needs to be continued going forward.
Previously Completed Actions							

Town of Polkville Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Board of Aldermen	FEMA/MEMA, Local funds	2020	Completed
P-2	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Consider adoption of the International Code Council's International Building Code.	All	Moderate		FEMA/MEMA, Local funds	2025	The International Building Code has been adopted. The county will need to review this code over the next 5 years, so this action will remain in the plan.
P-4	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1							

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Emergency Services							
ES-1	Installation of an emergency warning system for the Town.	Tornado, High Wind	High	Board of Aldermen	FEMA/MEMA, Homeland Security, Local funds	2017	COMPLETED
ES-2	Purchase of 10 sets of turnout gear and four (4) SCBAs for the Polkville Volunteer Fire Department.	All	High	Volunteer Fire Department	FEMA/MEMA, AFGP, Homeland Security, Local funds	2017	COMPLETED
ES-3	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2017	COMPLETED
ES-4	Purchase a new tanker for the Polkville Volunteer Fire Department.	All	High	Board of Aldermen, Volunteer Fire Department	FEMA/MEMA, AFGP, Rural Development, CDBG, Local funds	2017	COMPLETED
ES-5	Purchase of weather radios for public meeting places – i.e., schools, community centers, senior citizen centers.	Tornado, High Wind	Moderate	Board of Aldermen, Volunteer Fire Department	FEMA/MEMA, Local funds	2025	Weather radios have not been purchased for public meeting places due to cost constraints. The county would still like to implement this action, pending finding funding.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Public Education and Awareness							
PEA-1	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Low	Volunteer Fire Department	FEMA/MEMA, Local funds	2025	The county has encouraged the construction of safe rooms and tornado shelters, however, this is an effort that requires continual attention so the county will leave it as an action and continue to pursue it going forward.
PEA-2	Education of local residents on being prepared for severe weather and other hazards.	All	Low	Volunteer Fire Department	FEMA/MEMA, Local funds	2025	The county has worked hard to inform citizens of how to be prepared for severe weather and other hazards, but this action needs to be continued going forward.
Previously Completed Actions							

Town of Raleigh Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2020	COMPLETED
P-2	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2020	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Consider adoption of the International Code Council's International Building Code.	All	Moderate	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2020	The International Building Code has been adopted. The county will need to review this code over the next 5 years, so this action will remain in the plan.
P-4	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Property Protection							
PP-1	Rehabilitation of wastewater pumping stations to install submersible pumps that will not fail during heavy rainfall.	Flood	High	Board of Aldermen	FEMA/MEMA, CDBG, Rural Development, SRF, Local funds	2017	COMPLETED
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1	Drainage improvements to help control storm water during periods of heavy and/or prolonged rain, including the replacement of culverts, clearing and dredging of debris from ditches and creeks, and erosion control measures.	Flood	Moderate	Board of Aldermen	FEMA/MEMA, CDBG, US Army Corps of Engineers, Pat Harrison Waterway District, Local funds	2025	The town has installed some drainage improvements to reduce localized flooding from stormwater, however, there are still many drainage projects that could be implemented and the town would like to continue to pursue funding for these.
Emergency Services							
ES-1	Increase the number of emergency warning systems throughout the Town.	Tornado, High Wind	High	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2017	COMPLETED

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
ES-2	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2017	COMPLETED
ES-3	Purchase of generators to provide adequate backup power to all water and wastewater facilities to prevent interruption of service during and after a disaster.	All	High	Board of Aldermen	FEMA/MEMA, Local funds	2020	COMPLETED
ES-4	Purchase of a generators for the Senior Citizens Center, which will be used as a shelter during and after disasters.	All	High	Board of Aldermen	FEMA/MEMA, Local funds	2025	Generators for the Senior Center have not been purchased due to lack of funding. The county is looking at possible alternative funding sources.
ES-5	Installation of a new water well to serve the Town.	All	High	Board of Aldermen	FEMA/MEMA, CDBG, Rural Development, SRF, Local funds	2025	A new water well has not been installed to serve the town, but this action will remain in place as it is still a need for the town.
ES-6	Purchase of a generator for Raleigh Police Department.	Tornado, High Wind	Moderate	Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	A generator for the police department has not been purchased due to lack of funding. The county is looking at possible alternative funding sources.
ES-7	Purchase of weather radios for public meetings places – i.e., schools, community centers, and senior citizen centers.	Tornado, High Wind	Low	Volunteer Fire Department, County EMA	FEMA/MEMA, Local funds	2017	COMPLETED

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Public Education and Awareness							
PEA-1	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Low	Volunteer Fire Department, County EMA	FEMA/MEMA, Local funds	2025	The county has encouraged the construction of safe rooms and tornado shelters, however, this is an effort that requires continual attention so the county will leave it as an action and continue to pursue it going forward.
PEA-2	Education of local residents on being prepared for severe weather and other hazards.	All	Low	Volunteer Fire Department, County EMA	FEMA/MEMA, Local funds	2025	The county has worked hard to inform citizens of how to be prepared for severe weather and other hazards, but this action needs to be continued going forward.
Previously Completed Actions							

Village of Sylvarena Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-2	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Consider adoption of the International Code Council's International Building Code.	All	Moderate		FEMA/MEMA, Local funds	2025	The International Building Code has been adopted. The county will need to review this code over the next 5 years, so this action will remain in the plan.
P-4	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Volunteer Fire Department, Police Department	FEMA/MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.
Property Protection							
PP-1							
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1							

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Emergency Services							
ES-1	Installation of an emergency warning system for the Town.	Tornado, High Wind	High	Board of Aldermen	FEMA/MEMA, Homeland Security, Local funds	2025	A warning system for the town has not been purchased. The county has an emergency warning system in place, and there is interest in expanding this system and giving it a broader range of coverage. The county will continue to pursue this action, but needs funding to do so.
ES-2	Construction of a new fire station so the Sylvarena VFD can most effectively respond to emergencies and serve as the emergency response post during emergencies.	Tornado, High Wind	High	Volunteer Fire Department	FEMA/MEMA, CDBG, Local funds	2017	COMPLETED
ES-3	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Volunteer Fire Department, Police Department	FEMA/MEMA, Local funds	2025	Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan.
ES-4	Purchase of weather radios for public meetings places – i.e., schools, community centers, senior citizen centers.	Tornado, High Wind	Moderate	Board of Aldermen, Volunteer Fire Department	FEMA/MEMA, Local funds	2025	Weather radios have not been purchased for public meeting places due to cost constraints. The county would still like to implement this action, pending finding funding.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Public Education and Awareness							
PEA-1	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Low	Volunteer Fire Department	FEMA/MEMA, Local funds	2025	The county has encouraged the construction of safe rooms and tornado shelters, however, this is an effort that requires continual attention so the county will leave it as an action and continue to pursue it going forward.
PEA-2	Education of local residents on being prepared for severe weather and other hazards.	All	Low	Volunteer Fire Department	FEMA/MEMA, Local funds	2025	The county has worked hard to inform citizens of how to be prepared for severe weather and other hazards, but this action needs to be continued going forward.
Previously Completed Actions							

Town of Taylorsville Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Prevention							
P-1	Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas.	Flood	Moderate	Volunteer Fire Department, Police Department	FEMA, MEMA, Local funds	2020	COMPLETED
P-2	Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas.	Wildfire	Moderate	Volunteer Fire Department, Police Department	FEMA, MEMA, Local funds	2025	Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan.
P-3	Consider adoption of the International Code Council's International Building Code.	All	Moderate		FEMA, MEMA, Local funds	2025	The International Building Code has been adopted. The county will need to review this code over the next 5 years, so this action will remain in the plan.
P-4	Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan.	All	Low	Volunteer Fire Department, Police Department	FEMA, MEMA, Homeland Security, Local funds	2025	Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Property Protection							
PP-1	Elevation or acquisition/relocation of flood-prone structures.	Flood	Moderate	Board of Aldermen	FEMA, MEMA, Local funds	2025	Ongoing. Although the town has not had any major acquisition or elevation projects in the past several years, this is still something the town is interested in pursuing if citizens located in flood-prone areas voluntarily determine that an acquisition/elevation
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1	Installation of a larger culvert at Moore and Gamble Streets.	Flood	High	Public Works	FEMA, MEMA, CDBG, Local funds	2017	COMPLETED
SP-2	Installation of larger culvert on Mayhall Street.	Flood	High	Public Works	FEMA, MEMA, CDBG, Local funds	2025	The town has not installed a larger culvert, so this action will remain in the plan as it is still a project the town would like to pursue.
SP-3	Replacement of the old clay culvert on Eaton Street.	Flood	High	Public Works	FEMA, MEMA, CDBG, Local funds	2017	COMPLETED
SP-4	Installation of a larger culvert at Dallas Street and Highway 37.	Flood	Moderate	Public Works	FEMA, MEMA, CDBG, Local funds	2025	The town has not installed a larger culvert, so this action will remain in the plan as it is still a project the town would like to pursue.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
Emergency Services							
ES-1	Increasing the number of emergency warning systems throughout the Town.	Tornado, High Wind	High	Volunteer Fire Department, Police Department	FEMA, MEMA, Local funds	2017	COMPLETED
ES-2	Update Town's 911 equipment, including making it compatible with enhanced 911.	Tornado, High Wind	High	Board of Aldermen, Volunteer Fire Department, Police Department	FEMA, MEMA, Local funds	2017	COMPLETED
ES-3	Installation of reverse 911 system.	Tornado, High Wind	High	Board of Aldermen, Volunteer Fire Department, Police Department	FEMA, MEMA, Local funds	2017	COMPLETED
ES-4	Purchase of generators to provide adequate backup power for all water and wastewater facilities to prevent interruption of service during and after a disaster.	All	High	Board of Aldermen	FEMA, MEMA, Local funds	2020	COMPLETED

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
ES-5	Purchase additional equipment for local emergency responders to improve their response capabilities.	All	High	Volunteer Fire Department, Police Department	FEMA, MEMA, AFGP, Local funds	2025	Some equipment has been purchased to improve emergency responder capabilities, but there is still a need for additional equipment, so this action will remain in place going forward.
ES-6	Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes.	Hurricane	High	Volunteer Fire Department, Police Department	FEMA, MEMA, Local funds	2025	Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan.
ES-7	Continue training of more emergency personnel to improve the Town's response capabilities.	All	Low	Volunteer Fire Department, Police Department	FEMA, MEMA, AFGP, Local funds	2025	Although the town has done a great deal of training to improve capabilities of local employees, there is still a continuing need to maintain this capacity, so the town will continue to pursue this action.
Public Education and Awareness							
PEA-1	Encourage the construction of safe rooms and tornado shelters.	Tornado, High Wind	Low	Volunteer Fire Department	FEMA, MEMA, Local funds	2025	The county has encouraged the construction of safe rooms and tornado shelters, however, this is an effort that requires continual attention so the county will leave it as an action and continue to pursue it going forward.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2021)
PEA-2	Education of local residents on being prepared for severe weather and other hazards.	All	Low	Volunteer Fire Department	FEMA, MEMA, Local funds	2025	The county has worked hard to inform citizens of how to be prepared for severe weather and other hazards, but this action needs to be continued going forward.