Multi-Jurisdictional Hazard Mitigation Plan
Anderson & Oconee County

March 2023

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SECTION 1
INTRODUCTION

This section provides a general introduction to the Anderson & Oconee County Multi-Jurisdictional Hazard Mitigation Plan. It consists of the following five subsections:

- 1.1 Background
- 1.2 Purpose
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- 1.4 Authority
- Summary of Plan Contents

1.1 BACKGROUND

Natural and man-made hazards, such as floods, hurricanes, and fires, are a part of the world around us. In some cases, their occurrence is natural and inevitable, and there is little we can do to control their force and intensity. In others, we have more power to control the intensity and probability but can never truly eliminate the threat entirely. In either case, we must consider these hazards to be legitimate and significant threats to human life, safety, and property.

Anderson County and Oconee County are located in the northwestern part of South Carolina. This area is vulnerable to a wide range of natural hazards such as hurricanes, floods, severe thunderstorms, winter storms, and tornados. It is also vulnerable to man-made hazards, including hazardous materials incidents and transportation incidents. These hazards threaten the life and safety of residents 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 within the counties.

While the threat from hazardous events may never be fully eliminated, there is much we can do to lessen potential impacts 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, furthermore, proposes specific mitigation actions to eliminate or reduce identified vulnerabilities.

Both counties and their respective municipalities participating in the Anderson and Oconee County Multi-Jurisdictional Hazard Mitigation Plan have an existing hazard mitigation plan that has evolved over the years, as described in Section 2, ***Planning Process***. This update of the Plan draws from the previous plan to document the efforts of each jurisdiction to incorporate hazard mitigation principles and practices into routine government activities and functions. At its core, this 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 each County's vulnerability to identified hazards. This 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 Acts

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 Building Resilient Infrastructure and Communities (BRIC) 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 that revised Biggert-Waters. These acts made several changes to the way the National Flood Insurance Program is to operate, 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.

The Multi-Jurisdictional Hazard Mitigation Plan has been prepared in coordination with FEMA Region IV and the South Carolina Emergency Management Division (SCEMD) 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 Anderson and Oconee County Multi-Jurisdictional Hazard Mitigation Plan is to:

- Reduce risk to people, property, and the critical infrastructure
- Increase public awareness and education about the Plan and the planning process
- Maintain grant eligibility for participating jurisdictions
- Maintain compliance with state and federal legislative requirements for local hazard mitigation plans

1.3 SCOPE

The focus of the Anderson and Oconee County Multi-Jurisdictional Hazard Mitigation Plan is on hazards determined to be "high" or "moderate" risks to the respective Counties, as determined through a detailed hazard risk assessment. Other hazards that pose a "low" or "negligible" risk will continue to be evaluated during future updates to the Plan, 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 study area) for the Plan includes all of Anderson County, Oconee County, and includes its incorporated jurisdictions and unincorporated areas. **Table 1.1** indicates the participating jurisdictions.

TABLE 1.1: PARTICIPATING JURISDICTIONS IN THE HAZARD MITIGATION PLAN

Anderson County				
Anderson	Belton	Honea Path	Iva	Pelzer
Pendleton	Starr	West Pelzer	Williamston	

Oconee County				
Salem	Seneca	Wahalla	West Union	Westminster

1.4 AUTHORITY

The Anderson and Oconee County Multi-Jurisdictional 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 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)
- 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
- National Dam Safety Program Act of 2020, (P.L. 116-260) and the National Program for Inspection of Non-Federal Dams of 1972 (P.L. 92-367)

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 planning team 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 each County, 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 county'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 Anderson and Oconee County. The Risk Assessment also attempts to define any hazard risks that may uniquely or exclusively affect specific areas of the Counties.

The Risk Assessment begins by identifying hazards that threaten Anderson and Oconee Counties. Next, detailed profiles are established for each hazard which build on available historical data from past hazard occurrences, spatial extent, and probability of future occurrences. 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, SC SHELDUS loss estimation information is used in conjunction with GIS analysis to evaluate known hazard risks by

their relative long-term cost for expected damages. In essence, the information generated through the risk assessment serves a critical function as the participating jurisdictions in Anderson and Oconee County seek to determine the most appropriate mitigation actions to pursue and implement—enabling them to prioritize and focus their efforts on hazards of greatest concern and structures or planning areas facing the greatest risk(s).

The ***Capability Assessment***, found in Section 7, provides a comprehensive examination of each County'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 activities that should be built upon in order to establish a successful and sustainable local hazard mitigation program.

The Risk Assessment and Capability Assessment collectively serve as a basis for determining the goals for the Anderson and Oconee County Multi-Jurisdictional 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 goals as well as an analysis of hazard mitigation techniques for the jurisdictions participating in the Plan to consider in order to reduce hazard vulnerabilities. The strategy provides the foundation for a detailed ***Mitigation Action Plan***, found in Section 9, which links specific mitigation actions for each jurisdiction 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 each County 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 procedures that the jurisdictions participating in the 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.

SECTION 2
PLANNING PROCESS

This section describes the planning process undertaken to develop the Anderson & Oconee County Multi-Jurisdictional 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 Anderson & Oconee County
- 2.3 Preparing the 2023 Plan
- 2.4 The Hazard Mitigation Planning Team
- 2.5 Meetings and Workshops
- 2.6 Involving the Public
- 2.7 Involving the Stakeholders
- 2.8 Documentation of Plan Progress

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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 experience many benefits, including:

- Saving lives and property
- Saving money
- Speeding up the recovery process 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
- 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 consider other existing community goals or initiatives that will either help complement or hinder their future implementation.

2.2 HISTORY OF HAZARD MITIGATION PLANNING IN ANDERSON AND OCONEE COUNTIES

Each of the 14 participating jurisdictions listed below has a previously adopted hazard mitigation plan. The Federal Emergency Management Agency (FEMA) approval dates for each of these plans are listed below:

- *Anderson and Oconee County Hazard Mitigation Plan* (2017)
    - City of Anderson
    - City of Belton
    - Town of Honea Path
    - Town of Iva
    - Town of Pelzer
    - Town of Pendleton
    - Town of Salem
    - Town of Seneca
    - Town of Starr
    - City of Wahalla
    - Town of Westminster
    - Town of West Union
    - Town of Williamston
    - Unincorporated Anderson County
    - Unincorporated Oconee County

The existing county-level plan was developed using the multi-jurisdictional planning process recommended by FEMA. For this plan update the same process was utilized, and all of the jurisdictions that participated in the previous planning effort have participated in the development of this plan update.

2.3 PREPARING THE 2023 PLAN

Hazard mitigation plans are required to be updated every five years to remain eligible for federal mitigation funding. To simplify planning efforts, the jurisdictions in Anderson and Oconee Counties decided to join together to create the *Anderson and Oconee County Multi-Jurisdictional Hazard Mitigation Plan*. This allows resources to be shared amongst the participating jurisdictions and eases the administrative duties of all of the participants.

To prepare the Plan, a team was facilitated under the leadership of James McAdams, Emergency Planner.

The FEMA recommended mitigation planning process (Publication Series 386 and Local Mitigation Plan Review Guide) was followed and further recommendations were provided by South Carolina Emergency Management Division (SCEMD) mitigation planning staff.[1] The Local Mitigation Plan Review Tool, found in Appendix C, provides a detailed 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). The Planning Team (described in Section 2.4) used FEMA's Local Mitigation Plan Review Guide (April 2023) for reference as they completed the Plan.

Additionally, the Planning Team determined that it was important to include and analyze some man- made hazards in the Plan to provide a more comprehensive approach to hazard management within the county. Although this is not a requirement as per regulations regarding hazard mitigation planning at the state or federal level, it is a noteworthy step in the direction of an all-hazards approach to risk analysis and management.

Key elements from the previously approved plan are referenced throughout the document (e.g., existing actions) and also required a discussion of changes made. For example, all of the risk assessment elements needed to be updated to include the most recent information. It was also necessary to review the goals for the county. 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 6 months beginning in November 2022. 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 the 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 ANDERSON & OCONEE COUNTY

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

2.4 THE HAZARD MITIGATION PLANNING TEAM

In order to guide the development of this Plan, Anderson County, Oconee County, and their respective jurisdictions created the Hazard Mitigation Planning Team (also known as the Planning Team). The Hazard Mitigation Planning Team represents a community-based planning team made up of

representatives from various county and municipal departments and other key stakeholders identified to serve as critical partners in the planning process.

In February 2022, the Steering Committee, involving Emergency Management representatives from Anderson and Oconee County met to begin discussing the plan update process and stakeholders that needed to be involved. The members of this committee were: Josh Hawkins, *Anderson County Emergency Management Director*, Scott Krien, *Oconee County Emergency Services Director*, and James McAdams, *Anderson County Emergency Planner.* In April 2022, the Hazard Mitigation Planning Team members engaged in regular discussions as well as held local meetings and 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, team members routinely communicated and were kept informed through an e-mail distribution list.

Specifically, the tasks assigned to the Hazard Mitigation Planning Team members included:

- Participate in Hazard Mitigation Planning Team 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 countywide 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 2023 *Anderson and Oconee County Hazard Mitigation Plan*

Table 2.1 lists the members of the Hazard Mitigation Planning Team who were responsible for participating in the development of the Plan. Team members are listed in alphabetical order by last name.

TABLE 2.1: MEMBERS OF THE HAZARD MITIGATION PLANNING TEAM

NAME	POSITION	DEPARTMENT/AGENCY
Chad McBride	Sheriff	Anderson County Sheriff's Office
Josh Hawkins	Emergency Management Director	Anderson County Sheriff's Office
Scott Krien	Emergency Services Director	Oconee County
Andrew Strickland	Assistant City Manager	City of Anderson
Alan Sims	City Manager	City of Belton
Leslie Walker	Town Clerk	Town of Honea Path
Timothy Taylor	Town Clerk	Town of Iva
Cheryl Boudreau	Municipal Clerk	Town of Pelzer

Frank Crenshaw	Mayor	Town of Pendleton
Ed Sokol	Mayor	Town of Starr

NAME	POSITION	DEPARTMENT/AGENCY
Blake Sanders	Mayor	Town of West Pelzer
Rockey Burgess	Mayor	Town of Williamston
Lynn Towe	Mayor	Town of Salem
Scott Moulder	City Administrator	City of Seneca
Brandon Burton	City Administrator	City of Wahalla
Linda Oliver	Mayor	Town of West Union
Kevin Bronson	City Administrator	City of Westminster

As drafts of the Updated Plan were prepared, the Anderson and Oconee County (HMPC) used email and website to distribute them to Stakeholders, and requested that they provide comments. The Stakeholders were requested to provide feedback through email, telephone or contact POC, James McAdams or a member of the (HMPC). In addition, drafts were e-mailed to neighboring counties for their review and feedback.

County, city, and town participation must be defined in order to create a standard for participation in the Natural Hazard Mitigation Plan. This criterion was established so that county and municipal representative's participation was sufficient to add to and comment on the plan.

In order for counties and municipalities to approve the plan and be an official participant of this planning process, they must satisfy one of the following considerations:

- The county EMD Director shall be a member of the Natural Hazard Plan Steering Committee and provide input and comments on the plan and the planning process.
- The mayor, administrator, or manager shall attend a county or public meeting concerning the Natural Hazard Mitigation Plan and provide input or comments.
- The mayor, administrator, or manager shall appoint a city or town employee to attend a county or public meeting concerning the Natural Hazard Mitigation Plan and provide input or comments
- A HMPC member shall personally discuss and receive on input or comments on the Natural Hazard Mitigation Plan with a mayor, administrator, manager, or appointed municipal representative.
- A mayor, administrator, or manager, shall send input or comments.

Municipalities were contacted through emails and phone calls explaining the purpose of the Natural Hazards Mitigation Plan and what was covered at the meetings. Officials were informed through these

emails and phone calls that the Anderson and Oconee County HMPC needed their input and comments for the plan. Each municipality satisfied as least one of the above criteria as they did in the previous plan to be considered an official participant.

2.5 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 the planning team, 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. 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.

Table 2.2 - Meetings & Presentations Concerning the Hazard Mitigation Plan 2.2 - Meetings & Presentations Concerning the Hazard Mitigation Plan

Date:	Activity:	Type:
October 4, 2022	Director Hawkins alerted the Anderson County Local Emergency Planning Committee that the 2023 plan updates would be open for public comment in the upcoming months.	Public
December 6, 2022	James McAdams, ACSO-EMD Planner presented an update on the Hazard Mitigation Plan at the Anderson County Local Emergency Planning Committee Meeting; plan review will start after kick off meeting.	Public
January 19, 2023	Kickoff meeting conducted at Anderson Emergency Operations Center and Virtual	Stakeholders SCEMD Anderson and Oconee County Leadership
January 27, 2023	Municipal leaders and stakeholders were invited to the Anderson County Emergency Operations Center to review and discuss the 2023 plan update.	Stakeholders
January 22, 2023	Website and info update to give public the ability to view meeting dates, log on to website to attend meetings and important info on the Mitigation Plan.	Stakeholders/ Public
February 1, 2023	First public information meeting Anderson: Agenda Mitigation Plan Update/Review Scope of the Plan Municipal background Description of Planning process Questions/Comments/Next Meeting	Stakeholders/ Public

Date:	Activity:	Type:
February 8, 2023	Second public information meeting Anderson: Agenda Mitigation Plan Update Hazard Identification Overview types of hazards and locations Questions/Comments/Next Meeting	Stakeholders/ Public
February 9, 2023	Meeting with Alicia Hunter, Anderson County Director Development Standards/Land Use and Barry Holcombe, Anderson County Director Building Standards/Permits; to discuss NFIP/flood information, building standards other county building ordinances information.	Stakeholder/ Subject Matter Expert
Wed February 15, 2023	Oconee County HMP Agenda Mitigation Plan Update Overview Mitigation Strategy Overview Mitigation Objectives and Strategies Overview Prioritize mitigation action and projects Questions/Comments/Next Meeting	Stakeholders/ Public
February 16, 2023	Third public information meeting Anderson Agenda Mitigation Plan Update/Review Scope of the Plan Municipal background Description of Planning process Questions/Comments/Next Meeting	Stakeholders/ Public
February 22, 2023	Fourth public information meeting Anderson Agenda Mitigation Plan Update Hazard Identification Overview types of hazards and locations Questions/Comments/Next Meeting	Stakeholders/ Public
Tuesday February 28, 2023	Oconee County HMP Agenda Mitigation Plan Update Hazard Identification Overview types of hazards and locations Questions/Comments/Next Meeting	Stakeholders/ Public
March 1, 2023	Fifth public information meeting Anderson Agenda Mitigation Plan Update Overview Mitigation Strategy Overview Mitigation Objectives and Strategies Overview Prioritize mitigation action and projects Questions/Comments/Next Meeting	Stakeholders/ Public

Date:	**Activity:**	**Type:**
Thursday March 2, 2023	Oconee County HMP Agenda Mitigation Plan Update Individual Municipal Mitigation Strategy Questions/Comments/Next Meeting	Stakeholders/ Public
March 7, 2023	Anderson and Oconee County meeting via conference call to discuss any updates to the Mitigation Plan	Stakeholders
Tuesday March 7, 2023	Oconee County HMP Agenda Mitigation Plan Update Individual Municipal Mitigation Strategy Questions/Comments/Next Meeting	Stakeholders/ Public
March 8, 2023	Sixth public information meeting Anderson Agenda Mitigation Plan Update Individual Municipal Mitigation Strategy Questions/Comments/Next Meeting	Stakeholders/ Public
Thursday March 9, 2023	Oconee County HMP Agenda Mitigation Plan Update Plan monitoring and maintenance Schedule for Plan updating Questions/Comments/Next Meeting	Stakeholders/ Public
March 16, 2023	City of Anderson Municipal Stakeholders and County Emergency Management met at City Fire Station #3 to review and discuss and update municipal mitigation strategies for the 2023 plan update.	City of Anderson Stakeholder
March 20, 2023	Town of Honea Path Municipal Stakeholders and County Emergency Management met at Town of Honea Path Fire Station to review and discuss and update municipal mitigation strategies for the 2023 plan update.	Town of Honea Path Stakeholders
March 20, 2023	Town of Pendleton Municipal Stakeholders and County Emergency Management met at County Emergency Management Office to review and discuss and update municipal mitigation strategies for the 2023 plan update.	Town of Pendleton Stakeholders
March 22, 2023	Town of Pelzer West Pelzer Municipal Stakeholders and County Emergency Management met at County Emergency Management Office to review and discuss and update municipal mitigation strategies for the 2023 plan update.	Town of Pelzer West Pelzer Stakeholders
March 22, 2023	City of Belton Municipal Stakeholders and County Emergency Management met at City of Belton Fire Station to review and discuss and update municipal mitigation strategies for the 2023 plan update.	City of Belton Stakeholders
March 27, 2023	County of Anderson Municipal Stakeholders and County Emergency Management met at County Emergency Management Office to review and discuss and update municipal mitigation strategies for the 2023 plan update.	County of Anderson Stakeholders
April 5th, 2023	Anderson & Oconee Dams Meeting with SC DHEC	County Stakeholders

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 involved public participation. Individual citizen and community-based input provides the entire Planning Team 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 *Anderson and Oconee County Multi-Jurisdictional Hazard Mitigation Plan* was sought using two methods: (1) public survey instruments were made available in hard copy and online and (2) copies of the draft Plan were made available for public review on county and municipal websites and at government offices. The public was provided two opportunities to be involved in the development of the regional plan 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 including on county and municipal websites.

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.

2.7 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 the County Emergency Management lead 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 from FEMA 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. The County

Emergency Management Coordinator used that list for reference as they invited stakeholders to participate in the planning process.

In addition to the outreach efforts described above, the Hazard Mitigation Planning Team encouraged more open and widespread participation in the mitigation planning process by designing and distributing the *Public Participation Survey*. In addition to the public, this survey was provided for local officials, residents, businesses, academia, and other private interests in the county to be involved and offer input throughout the local mitigation planning process.

Moreover, the Hazard Mitigation Planning Team pushed to get input from stakeholders outside of the planning area including surrounding counties. Surrounding counties were contacted during the planning process. When the draft Plan was developed, the surrounding counties were asked to review the Plan and provide suggestions/comments to the consultant's project manager. These suggestions and comments were vetted through the Hazard Mitigation Planning Team before they were implemented to ensure that they met the needs of the communities for whom the Plan was developed. Surrounding counties that were contacted included: Laurens County, Cherokee County, Chester County, Union County, York County, and Lancaster County. The email documenting this contact can be found in Appendix D.

2.8 DOCUMENTATION OF PLAN PROGRESS

Progress in hazard mitigation planning for the participating jurisdictions in Anderson and Oconee County is documented in this plan update. Since hazard mitigation planning efforts officially began in the county with the development of the initial Hazard Mitigation Plans in the late 1990s and early 2000s, many mitigation actions have been completed and implemented in the participating jurisdictions. These actions have helped to reduce the overall risk to natural hazards for the people and property in Anderson & Oconee County. 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 developing the Hazard Mitigation Planning Team 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 Anderson County, Oconee County, and their participating municipalities. It consists of the following four subsections:

- 3.1 Geography and the Environment
- 3.2 Historical & Geographical Background of Anderson County Municipalities
- 3.3 Historical & Geographical Background of Oconee County Municipalities
- 3.4 Population and Demographics
- 3.5 Housing, Infrastructure, and Land Use
- 3.4 Employment and Industry

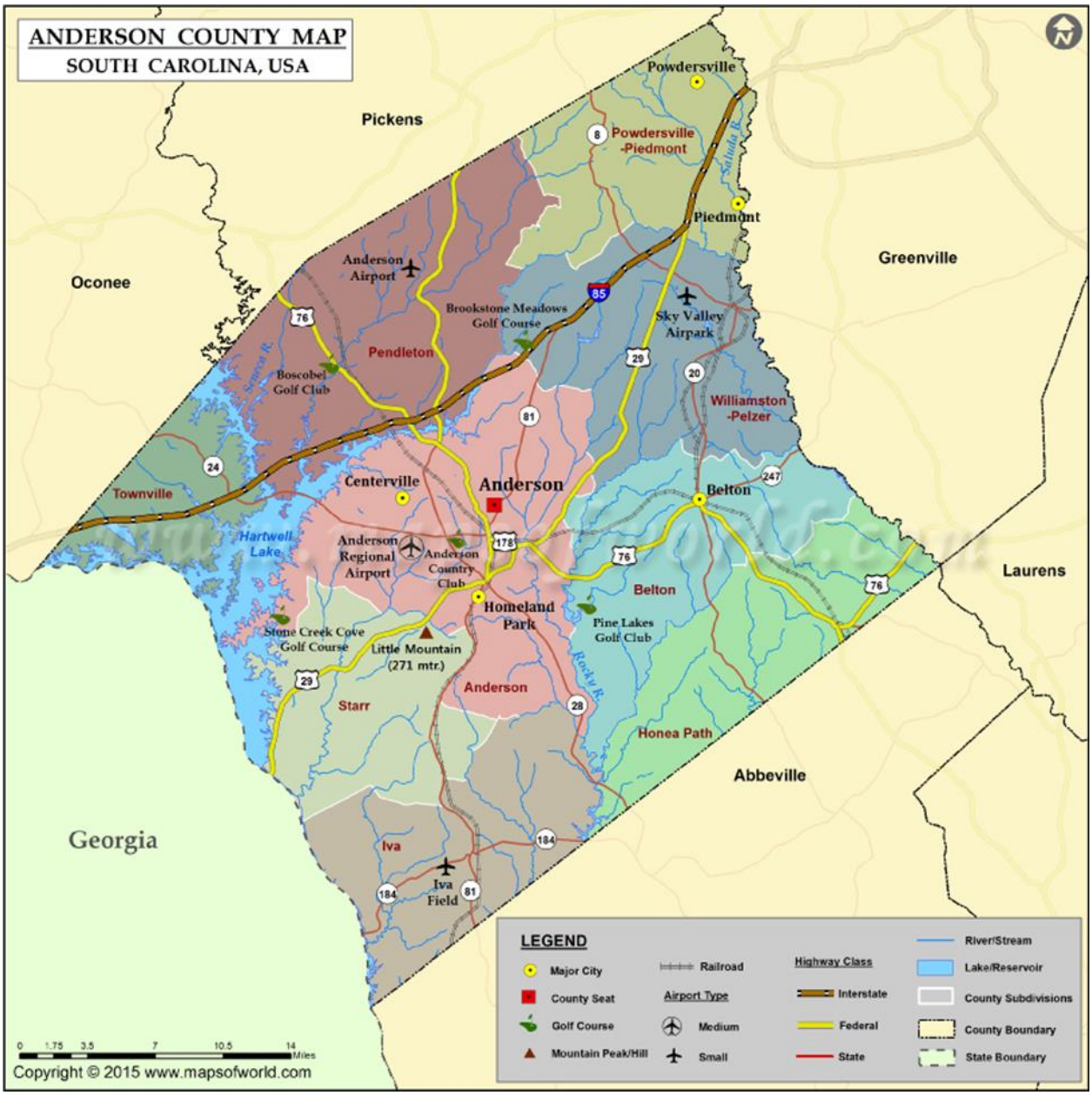
3.1 GEOGRAPHY AND THE ENVIRONMENT

Within Anderson and Oconee Counties there are 15 municipalities. The overall population of these two counties is 282,325 according to the 2020 US Census Bureau estimates. The region has both rural and urban settings with small towns and larger cities spread throughout the area. Anderson and Seneca, the largest cities have population figures of 29,284 and 8,424, respectively. Many of these small towns do not have full-time staff or employ a professional planner. They rely heavily on each County government and the Council of Governments to provide them with technical assistance for planning functions.

Anderson and Oconee County are in the northwest corner of South Carolina. Interstate 85 bisects the region, providing access to many markets in the southeastern United States. Interstate 85 also provides easy access to Charlotte and Atlanta. This is one of the fastest growing regions in the United States. This corridor is characterized by strong economic growth, job creation, and low unemployment. A high quality of life is reflected in lower cost of living standards, affordable home prices, and proximity to many of the recreational amenities people desire, including the mountains and the ocean.

The Appalachian and Blue Ridge Mountains border the region to the northwest and the Atlantic Ocean is approximately 200 miles to the east. The climate of this area is relatively mild, with an average temperature of 61.6 degrees Fahrenheit (Southeastern Regional Climate Center, 2022). This is slightly lower than other portions of the state such as the Columbia region, which has an average annual temperature of 63.1, and the Charleston region with an average annual temperature of 64.8 degrees. Precipitation is relatively constant throughout the year with an average of 4.3 inches of rain per month. The Columbia region averages 4 inches of rain per month while the Charleston region averages 4.2 inches per month. The growing season is from late March to early November and averages 225 days. The region is in an area that has a low natural disaster frequency, with an occasional, ice event, tornado or flood accounting for most events.

FIGURE 3.1: ANDERSON COUNTY ORIENTATION MAP



The geographic location of Anderson County helps to promote various outdoor recreational opportunities for hiking, biking, fishing, and water activities. Historical features also exist throughout the county including battlefields, historic homes, museums, and downtown areas. There are multiple higher education institutions within the county correlating a working partnership between public and private accredited colleges and universities with businesses and the community.

3.2 Historical & Geographical Background of Anderson County Municipalities

City of Anderson:

The City of Anderson is in the northwest corner of the state of South Carolina on the Piedmont Plateau. It is the county seat located in the geographical center of the county and principal city in Anderson County. The City is ideally located on the busy Interstate 85 corridor, to which much of its economic growth can be attributed. The City lies on the southern border of Interstate 85 and is approximately 127 miles north of Atlanta, Georgia and 132 miles south of Charlotte, North Carolina. The City encompasses approximately 14 square miles and is located in the geographical center of the county. The I-85 corridor from Atlanta to Charlotte is now known as one of the nation's hottest growth areas. Anderson County, South Carolina lies midway between Atlanta, Georgia and Charlotte, North Carolina. This stretch of highway is one of the heaviest traveled highways in the southeast. Business leaders and development officials in Anderson have taken advantage of this asset, and visible progress is the result. Anderson County was ranked 14th out of 50 as one of the "Hottest American cities for business location," (based on a survey of leading site consultants) according to the January 2001 issue of Expansion Management.

Anderson is a major contributor to the success of the upstate. Anderson offers all of the basics upon which to build a thriving economy, including affordable land, a good transportation system, infrastructure, and many recreational amenities. In June 2000, Anderson County was one of only ten communities to be designated an All-America City by the National Civic League. The Anderson community offers the feel of small-town living with the attractions and business opportunities of larger cities only a short drive away (City of Anderson, SC, 2022).

City of Belton:

Belton was chartered in 1855 soon after the Columbia and Greenville Railroad was built. It soon became a junction point of the C & G, the Piedmont and Northern and the Blue Ridge (Southern Railway). With 36 passenger trains serving the town. The city is still served today by two railroads: the Greenville & Western Railway and the Pickens Railway.

The city is at the junction of four highway arteries with connections to I-385 in Greenville County, I-26 in Laurens County and I-85 in Anderson and Greenville. Anderson is only 15 minutes away and its only 30 minutes to downtown Greenville. Far enough away for Belton to retain its small-town ambiance and friendliness, but close enough to the big cities for any cultural, educational, work or shopping experience anyone would wish.

With a population of 4,400 it is the second largest town in Anderson County. It is unique in having a thriving downtown business district, the historic Town Square, which is undergoing a $1,000,000.00 revitalization. This has been a cooperative effort between the state, the county, the city and local

organizations. In fact, the local organizations have provided most of the work and much of the money. This is indicative of the involvement of the people in the community that makes Belton a great place to live.

There are many other successful businesses, as well as many historic sites in the city or area which is located on the S.C. National Heritage Corridor. Historic residential areas are within walking distance of the Town Square. One of these, Brown Ave., particularly reflects small town "Old South" charm and appearance. The symbol for Belton is the Standpipe. This is a 155' tall, concrete reinforced water tank with a capacity of 165,000 gallons which was built in 1909. It towers over the city and has the appearance of a medieval castle tower. There are only three remaining in SC, and this is the tallest.

The city is home to two elementary and one middle school, with the high school being only 10 minutes away. Other cultural and educational facilities are the Belton Center for the Arts, the Belton Depot, Ruth Drake Museum and a new branch library.

Belton has the council form of government with six council members and a mayor. Under this form, the mayor and each council member have the same authority. A city administrator is employed to carry out the council's policies, oversee day to day operations and supervise city employees. The mayor and the council members serve for four-year staggered terms. While council members must reside in the ward they represent, all voters vote for all council members and the mayor. This results in all areas of the town being equally represented, but also ensures that each member of the council is responsive to the needs of all citizens (City of Belton, 2022).

Town of Honea Path:

A water stop on the Greenville and Columbia Railroad in the 1850s developed into a town whose name origin is uncertain. Honea Path may be misnamed for William Honey, an early landowner and trader, or it may be double-named by Cherokee Indians, with "Honea" being an Indian name for "path" according to folklore. When the town was chartered in 1885, it was referred to as Honey Path in three different places, and early wills and deeds also bear the Honey Path name. However, in 1917 the town was incorporated under the name Honea Path and it has gone by that name ever since.

Located on the Anderson-Abbeville county line, Honea Path became a cotton mill town. Chiquola Manufacturing Company commenced operations in 1903 and has remained the economic mainstay. The mill's early employees included future U.S. senator Olin D. Johnston, who went to work as a sweeper in the mill at age eleven. In 1934 Honea Path was the site of one of the most infamous events in American labor history. Chiquola mill hands joined the general strike that swept the upstate that summer, which badly divided the community. On the morning of September 6, later dubbed "Bloody Thursday," strikers and their supporters gathered to prevent strikebreakers from entering the mill. Fighting broke out, and gunfire erupted. In less than five minutes, six strikers were dead and more than a dozen lay wounded. Under military guard, the Chiquola Mill reopened the

following Monday. On Memorial Day 1995, a small granite monument was erected in a Honea Path park to commemorate the tragic event.

As the town entered the twenty-first century, the Chiquola Mill continued as Honea Path's largest employer. However, the town had diversified its economy somewhat. Plants opened nearby that produced synthetic fibers, linens, lady's sportswear, shipping containers, and medical equipment. Among the town's claims to fame is its Carnegie Library, built in 1908. Honea Path is the smallest town in the nation with a Carnegie Library, which remains in use as a branch of the Anderson County Library (The Town of Honea Path, 2022).

Town of Iva:

The Town of Iva, incorporated in 1904, is located in southern part of Anderson County. Iva, once a shipping station and busy hub for railroad commerce, is a fascinating small-town rich in history and heritage.

Iva, SC is located in the southern part of Anderson County and is populated by friendly folks who are proud of their rural heritage and progressive town. Come on over and enjoy the many lakes and rivers that are a part of our area and see why Iva is known as the "Gateway to the Fresh Water Coast." (Town of Iva, 2022).

Town of Starr:

Starr is located in **Anderson County**, south of the City of **Anderson** on SC 81. The town was originally named Twiggs, but when the Savannah Valley Railroad was completed in 1884, the name was changed to Starr Station in honor of a popular engineer who drove the train through town. Anderson is the largest city near Starr (Town of Starr, 2022).

Town of Pendleton:

Pendleton, SC is a small town in Anderson County, SC. The town was founded in 1790 and is the largest historic area in the entire United States. The town boasts lovely historic homes and plantations, a town square around a village green, and one of the friendliest populations found anywhere! Just four miles from Clemson University, Pendleton offers a combination of History, Education, Friendship and Laughter! (Town of Pendleton, 2022).

Town of Pelzer:

Pelzer is located in eastern **Anderson County** on the Saluda River. The town's history is linked with that of Pelzer Manufacturing Company, which began textile production in the late 1880s. The company bought the very first generators made by the General Electric Company and was the first factory in the country to have incandescent lights. **Anderson** is the largest city near Pelzer. In 2015, Pelzer annexed commercial business and about 550 houses, raising the population to approximately 600 residents (Independent Mail, 2022).

Town of West Pelzer:

West Pelzer has a rich history as a healthy place to live, work, and play. We celebrate where we were, where we are currently, and where we are going. West Pelzer is forever being revitalized, rejuvenated, and re-energized through new businesses and growth of our core values and vision.
West Pelzer has a population of approximately 969, and is located roughly 30 minutes away from many major cities – including Greenville, Anderson, and Easley – in the heart of upstate South Carolina. As a progressive municipality based on building relationships and community, we strive to be an integral part of both our residents' lives and Anderson County as a whole. Being situated so closely to interstates 85 and 385 also allows for easy access to many larger key interstates, such as I-20, I-40, and I-26 (Town of West Pelzer, 2022).

Town of Williamston:

Located in the Foothills of the Blue Ridge Mountains in the scenic Upstate, Williamston is a thriving area with industrial, commercial, and tourist activity. It is located close to the I-85 business corridor and metropolitan areas. Williamston is 15 minutes from Greenville or Anderson, two hours from Atlanta or Charlotte, and four hours to the beach or the mountains. The city's climate boasts 248 days of sunshine, 49 inches of precipitation, and a comfortable average temperature of 64 degrees (Town of Williamston, 2022).

Figure 3.2 Municipality Area Background - Oconee County Map

3.3 Historical & Geographical Background of Oconee County Municipalities

Town of Salem:

Salem is located in the northeast corner of Oconee County, just off Highway 11, and serves as the gateway to Lakes Jocassee and Keowee (Town of Salem, 2022).

City of Seneca:

Seneca, a railroad town, was named for a 1700's Indian village Esseneca located on the banks of the nearby Seneca River. The City, chartered in 1874 as "Seneca City", dropped "City" from its name in 1906 (City of Seneca, 2022). Nestled in the Foothills of the majestic Blue Ridge Mountains, Seneca is home to residential and commercial properties listed on the National Register of Historic Places. Dubbed "The City of Opportunity" at its founding, Seneca still claims its title. With the cool waters of pristine Lake Keowee, Lake Jocassee, and Lake Hartwell nearby, the area offers many recreational opportunities. Favorably positioned between Atlanta, Georgia, and Greenville, South Carolina, just minutes away from Clemson University, Seneca and Oconee County have gained national acclaim for its natural beauty, quaint towns, antique shopping and as a favorite destination for history buffs and outdoor enthusiast alike (City of Seneca, 2022).

City of Walhalla:

Walhalla, South Carolina is the county seat of Oconee County in the upstate of South Carolina. Today, Walhalla is a southern town with historical homes, churches, and the Walhalla Civic Auditorium where regional and local theater events are held. Walhalla is located just minutes away from the wide variety of activities Oconee County and the surrounding areas have to offer, including an abundance of hiking and mountain biking trails, numerous waterfalls, Stumphouse Tunnel, the Chattooga River, the Blue Ridge Mountains, Clemson University, and more (City of Walhalla, 2022).

Town of West Union:

Located between Seneca and Walhalla, people are attracted to West Union for its shoreline on Keowee Key (West Union, 2022).

City of Westminster:

The City of Westminster is a small town in Oconee County along the foothills of the Blue Ridge Mountains. It's full of charm with quaint shops along its historic Main Street. Our residents enjoy a leisurely paced lifestyle, and a wide variety of occupational and recreational opportunities. Westminster is a great place to visit, but it's even a nicer place to live and work. With award winning schools, a small-town feel, and a progressive plan for continued renewal, it offers families and retirees a perfect place to call home (City of Westminster, 2022).

Climate

The Appalachian and Blue Ridge Mountains border the region to the northwest and the Atlantic Ocean is approximately 200 miles to the east. The climate of this area is relatively mild, with an average temperature of 61.6 degrees Fahrenheit (Southeastern Regional Climate Center, 2022). This is slightly lower than other portions of the state such as the Columbia region, which has an average annual temperature of 63.1, and the Charleston region with an average annual temperature of 64.8 degrees. Precipitation is relatively constant throughout the year with an average of 4.3 inches of rain per month. The Columbia region averages 4 inches of rain per month while the Charleston region averages 4.2 inches per month. The growing season is from late March to early November and averages 225 days. The region is in an area that has a low natural disaster frequency, with an occasional, ice event, tornado or flood accounting for most events.

3.4 POPULATION AND DEMOGRAPHIC

Area Population, Households, Median Incomes by County.

The following tables show the population, households and median household income for the two-county region and their municipalities. Additional detailed census information is identified in the Social Vulnerability section.

Table 3.1: Population by County.

County	Population	Population 65+ (%)	Households	Median Household Income
Anderson	203,718	18.4%	78,636	$53,598
Oconee	78,607	24.1%	32,440	$49,691

United States Census Bureau, 2020.

Table 3.2 - Population by Municipality

County	Municipality	Population
Anderson County	*City of Anderson*	29,284
	City of Belton	4,436
	Town of Honea Path	3,753
	Town of Iva	1,177
	Town of Starr	149
	Town of Pendleton	3,245
	Town of Pelzer	1,653
	Town of West Pelzer	1,049
	Town of Williamston	4,219
Oconee County	*Town of Salem*	175
	City of Seneca	8,424
	City of Walhalla	4,377
	Town of West Union	319
	City of Westminster	2,543

United States Census Bureau, 2020.

Table 3.3 County Demographics.

	Anderson County	*Oconee County*
Total Population:	203,718	79,203
Race:		
White	163,178 (80.1%)	70,570 (89.1%)
Black/African American	33,206 (16.3%)	6,019 (7.6%)
Hispanic/Latino	8,964 (4.4%)	4,673 (5.9%)
American Indian and Alaska Native	815 (0.4%)	317 (0.4%)
Asian	2,445 (1.2%)	713 (0.9%)
Two or More Races	4,074 (2.0%)	1,584 (2.0%)
Civilian Labor Force (ages 16+, %):	60.2%	54.5%
Employed*	86,686	32,885
Unemployed*	3,343	1,238
Unemployment Rate (%)*	3.7%	3.6%

Median Household Income:	$53,598	$49,691
Persons in Poverty (%):	14.0%	11.1%
Households:	78,636	32,440
Persons over 65 (%):	18.4%	24.1%

United States Census Bureau, 2020.

Table 3.4 County Employment Information

	Anderson County			Oconee County		
Year	**Employed**	**Unemployed**	**Unemployment Rate**	**Employed**	**Unemployed**	**Unemployment Rate**
2021	86,686	3,343	3.7%	32,885	1,238	3.6%
2020	83,340	5,100	5.8%	32,421	1,770	5.2%
2019	86,575	2,360	2.7%	33,208	933	2.7%
2018	85,287	2,807	3.2%	32,769	1,123	3.3%
2017	84,199	3,377	3.9%	31,937	1,436	4.3%

2022 South Carolina Department of Employment and Workforce, Community Profile

3.5 Housing, Infrastructure, and Land Use

Transportation

Anderson and Oconee are in the northwest corner of South Carolina. Interstate 85 bisects the region, providing access to many markets in the southeastern United States. Interstate 85 also provides easy access to Charlotte and Atlanta. This is one of the fastest growing regions in the United States. This corridor is characterized by strong economic growth, job creation, and low unemployment. A high quality of life is reflected in lower cost of living standards, affordable home prices, and proximity to many of the recreational amenities people desire, including the mountains and the ocean. There are several major highways that travel through Anderson and Oconee County including US Highways 29, 76, and 11 US Highway 29 cuts across the eastern-portion of Anderson county from south to northeast while US Highway 76 runs south to northwest, and the two intersect in the City of Anderson. US Highway 11 travels from southwest to northeast in Oconee county. Anderson and Oconee county both have small cargo airports. Both airports services local and private aircrafts along with general aviation airports. Flight instruction is also available at the airport. Rail service in Anderson and Oconee county is provided by CSX Transportation and Norfolk Southern Corporation which operate the first and second longest track routes in the state, respectively. . Bus transportation service is provided along multiple routes throughout the city and adjacent areas. The Anderson Area Regional Transit Agency offers public bus service throughout the City of Anderson.

Utilities

Electrical power in Anderson County is provided by Duke Energy, Blue Ridge Electric Cooperative, and Laurens Electric Cooperative. Oconee County is provided electrical power by Duke Energy, Blue Ridge Electric Cooperative, Gibson Electric and Hart Electric Membership Corporation.

Anderson Regional Joint Water System (ARJWS), is a partnership of rural and municipal water districts devoted to providing a high-quality, clean, safe, reliable, economical flow of treated water to its wholesale customers in Anderson and Pickens counties. Anderson Regional Joint Water System provides water to eighteen water systems throughout Anderson County. There are four Utility **Companies in Oconee County, South Carolina, serving a population of 75,926 people in an area of 627 square miles.** The four companies are Blue Ridge Electric Cooperative, Keowee Key Utility System, Pioneer Rural Water District and Salem Water Department. There is 1 Utilities per 18,981 **people, and 1 Utilities per 156 square miles. In South Carolina, Oconee County is ranked 22nd of 46 counties in Utility Companies per capita, and 20th of 46 counties in Utility Companies per square mile.**

Community Facilities

There are a number of public buildings and community facilities located throughout Anderson County. According to the data collected for the vulnerability assessment (Section 6.3.3), there are 52 schools, 36 fire stations, 9 law enforcement stations, 1 hospital, and 1 Emergency Operations Center within Anderson county.

The Anderson hospital is the AnMed Health Medical Center a 461-bed acute care hospital located at 800 N. Fant St. in Anderson, South Carolina. The Medical Center is the anchor facility for AnMed Health, South Carolina's largest independent, not-for-profit health system. AnMed has an emergency department, an intensive care unit, geriatric psychiatric services, a joint care program, cardiology services, inpatient rehabilitation, and a sleep center. Other services provided include open heart surgery, vascular surgery, general surgery, bariatric surgery, emergency/trauma medicine, a stroke/neurological center, and diagnostic MRI, CT and laboratory medicine. Other facilities located at AnMed Health's medical center campus include Pediatric Therapy Works, a speech, occupational and physical therapy program for children; and CareConnect, a walk-in facility that treats non-life-threatening ailments such as influenza, broken bones and minor nosebleeds. AnMed operates additional medical facilities throughout the county.

The county also currently operates five school districts. Higher education programs are also available from institutions including Anderson University and Tri County Technical College. Anderson County Public Library system operates nine library branches throughout the county and a Bookmobile.

Anderson Parks and Recreation System maintains numerous community and regional parks throughout the county. There are also additional federal recreational facilities located along lake Hartwell. Anderson County offers a variety of recreational activities throughout the county. There are many parks that offer biking, hiking, fishing, boating, picnicking, camping,

playgrounds, and outdoor concerts. Various lakes provide outdoor opportunities for boating, fishing, picnicking, and canoe/kayaking. Boat ramps and pontoon sites are available at certain park and lake locations in the county. such as ball parks, playing fields, community centers, recreation centers, trails/greenways, lake access. The famous "Bass Masters Classic" fishing tournament is held on Lake Hartwell in Anderson County.

Oconee county also has a number of public buildings and community facilities located throughout the County. According to the data collected for the vulnerability assessment (Section 6.3.3), there are 22 schools, 13 fire stations, 6 law enforcement stations, 1 hospital, and 1 Emergency Operations Center within Oconee county. Oconee County has one hospital facility. Prisma Health Oconee Memorial Hospital has been caring for the residents of the greater Oconee County community since 1939. Oconee Memorial Hospital consists of a 169-bed hospital featuring a range of inpatient and outpatient services and a host of community-based services. There are additional medical facilities located throughout each county's municipalities.

The Oconee County Emergency Services Fire Division is comprised of thirteen all volunteer fire departments, three municipal fire departments, and one special tax district fire department. Together these fire departments are home to more than 450 volunteer firefighters. These volunteers are supported by a workforce known as Station 21. Station 21 consists of both full-time personnel and part-time personnel. The full-time personnel include Command level staff, Administrative personnel, and Suppression personnel. The part-time staff assists with the day-to-day operations of each department. These personnel help to ensure that each department is always prepared to respond to your emergency should the need ever arise.

Oconee County Public Library operates four branch libraries (Walhalla, Westminster, Seneca and Salem, throughout the county and a Bookmobile. Oconee Parks and Recreation System maintains numerous community and regional parks throughout the county. There are also additional federal recreational facilities located along Lake Hartwell.

Land Use

Land use and development patterns in Anderson and Oconee County are the result of a complex interaction of demographic trends, economic circumstances, and social attitudes. Technological changes in areas such as transportation and construction, as well as the availability and cost of natural resources, including land, water, and energy, have also helped shape existing development patterns.

The forces that influence land development are constantly evolving. Consequently, factors impacting forms of land use are dramatically different today from those that shaped land use patterns in the past. Lifestyle preferences, size and configuration of households, levels of personal income, available transportation modes, and the composition of the economy are a few of the variables responsible for the current geographic distribution of land use and activities.

As both counties grow and continue to develop, more and more land is changing from farmland and woodland to residential, commercial, and industrial use; supported by more roads, schools, churches, and other public and semi-public uses. Local land use and associated regulations are

further discussed in *Section 7: Capability Assessment*.

3.4 EMPLOYMENT AND INDUSTRY

Agriculture was the original mainstay of Anderson and Oconee County's economy, but industrial development started with the start of textile mills in the early 1800s which led to the growth of the textile industry. As traditional textiles began their decline in the mid-1900s, the county's industrial base broadened, eventually making it one of the most internationally diverse locations for business in the nation. The manufacturing industry in Anderson and Oconee region has grown to include automotive manufacturing suppliers, plastics, packaging, metalworking, and distribution.

Today, Anderson and Oconee County have a diverse economy with large industrial companies including international companies. Milliken, Michelin North America, Bosh, Electrolux Major Appliances North America, First Quality Tissue SE, LLC,; Glen Raven, Inc; all operate within Anderson and Oconee county bringing jobs and economic revenue to the area. Localized employers also operate within the county and provide numerous jobs to residents. AnMed hospital system is also a major employer within the county as along with county school system. Economic growth is occurring within both counties and is projected to continue from an economic and population perspective.

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SECTION 4
HAZARD IDENTIFICATION

This section describes how the Planning Team identified the hazards to be included in the Plan. It consists of the following five subsections:

- 4.1 Overview
- 4.2 Description of Full Range of Hazards
- 4.3 Disaster Declarations
- 4.4 Hazard Evaluation
- 4.5 Hazard Identification Results

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.

IFR §201.6(c)(2): *The plan shall include a risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.*

IFR §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. This description shall include an overall summary of each hazard and its impact on the community.*

OVERVIEW

Anderson and Oconee Counties are 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 man-made hazards (i.e., technological hazards, terrorism, etc.) is encouraged, though not required, for plan approval. Note that eliminating man-made hazards does not suggest that those type hazards are not of concern to the Counties, only that they are not natural hazards, and therefore the HMPC determined that they would not be included in the Plan update. Anderson and Oconee County has included an assessment of primarily natural hazards, but some man-made hazards have also been identified. Some parts of the original Plan were preserved. Where applicable, portions of the historical hazard data have been retained. As part of the update process, the HMPC reviewed the hazards section of the previous plans, and incorporated changes related to recent hazard events that have affected the Counties.

Upon a review of the full range of natural hazards suggested under FEMA planning guidance, Anderson and Oconee County and their fourteen participating municipalities have identified several hazards that are to be addressed in their Multi-Jurisdictional Hazard Mitigation Plan. These hazards were identified through an extensive process that utilized input from the Anderson Oconee County Hazard Mitigation Planning Team members, research of past disaster declarations in the county,[1] and review of the South Carolina State Hazard Mitigation Plan. Readily available information from reputable sources (such as federal and state agencies) was also evaluated to supplement information from these key sources.

Additionally, Hazards which were analyzed and not included in the plan; yet Anderson and Oconee counties often experience aftereffects such as high winds, increased rainfall and possible increase flooding, which are addressed in the plan; yet these hazards are not a direct threat to Anderson and Oconee county yet were analyzed and not included in the plan and they are: Tropical cyclone, tropical depression, tropical storm and major hurricane:

A Tropical cyclone is a rotating, organized system of clouds and thunderstorms that originates over tropical or subtropical waters and has a closed low-level circulation. Tropical cyclones rotate counterclockwise in the Northern Hemisphere. They are classified as follows:

- **Tropical Depression:** A tropical cyclone with maximum sustained winds of 38 mph (33 knots) or less.
- **Tropical Storm:** A tropical cyclone with maximum sustained winds of 39 to 73 mph (34 to 63 knots).
- **Hurricane:** A tropical cyclone with maximum sustained winds of 74 mph (64 knots) or higher. In the western North Pacific, hurricanes are called typhoons; similar storms in the Indian Ocean and South Pacific Ocean are called cyclones.
- **Major Hurricane:** A tropical cyclone with maximum sustained winds of 111 mph (96 knots) or higher, corresponding to a Category 3, 4 or 5 on the Saffir-Simpson Hurricane Wind Scale.

Tropical cyclones forming between 5- and 30-degrees North latitude typically move toward the west. Sometimes the winds in the middle and upper levels of the atmosphere change and steer the cyclone toward the north and northwest. When tropical cyclones reach latitudes near 30 degrees North, they often move northeast.

After a thorough review and analysis, it was determined that Anderson and Oconee counties were not subject to any unique natural hazards. Anderson and Oconee County are located in the northwest corner of South Carolina. The Appalachian and Blue Ridge Mountains border the region to the northwest and the Atlantic Ocean is approximately 200 miles to the east. Therefore, Tropical cyclone, tropical depression, tropical storm and major hurricane do not pose a direct threat to Anderson and Oconee county.

Anderson and Oconee counties also addressed climate change and its effects on both counties (see Annex C). Climate change is generally defined as a significant variation of average weather conditions; conditions becoming warmer, wetter, or drier over several decades or more. It's the longer-term trend that differentiates climate change from natural weather variability. Changes in the probability of future hazard events may include changes in location, increases or decreases to the impacts, and/or extent of known natural hazards, such as floods or droughts. Changes in temperature, intensity, hazard distribution, and/or frequency of weather events may increase vulnerability to these hazards in the future. FEMA's Climate Change Adaptation Policy (2011-OPPA-01) directs FEMA programs and policies to integrate considerations of climate change adaptation. The challenges posed by climate change, such as more intense storms, frequent heavy precipitation, heat waves, drought, extreme flooding, and higher sea levels, could significantly alter the types and magnitudes of hazards impacting states in the future. Due to the inherent uncertainties with projections of future hazard events, states

are expected to look across the whole community of partners (for example, public, private, academic, non-governmental, etc.) to identify the most relevant data and select the most appropriate methodologies to assess risks and vulnerability.

Anderson and Oconee County are located in the northwest corner of South Carolina. The Appalachian and Blue Ridge Mountains border the region to the northwest and the Atlantic Ocean is approximately 200 miles to the east. In comparison to the rest of South Carolina the climate of the upstate area is relatively mild; yet Anderson and Oconee are not immune from the effects of climate change. ,

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 24 individual hazards. Some of these hazards are considered to be interrelated or cascading, but for preliminary hazard identification purposes, these individual hazards are broken out separately.

Next, **Table 4.2** lists the disaster declarations in Anderson and Oconee County.

Next, **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 included at this time may be addressed during future evaluations and updates of the risk assessment if deemed necessary by the Hazard Mitigation Planning Team during the plan update process.

Lastly, **Table 4.4** provides a summary of the hazard identification and evaluation process noting that - 9- of the 24 initially identified hazards are considered significant enough for further evaluation through this Plan's risk assessment (marked with a "").

DESCRIPTION OF FULL RANGE OF HAZARDS

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

Hazard	Description
ATMOSPHERIC HAZARDS	
Avalanche	A rapid fall or slide of a large mass of snow down a mountainside.
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.
Extreme Cold	Extreme cold is generally considered to occur when the temperature is at or below freezing for a period of time. Often these events are associated with winter storms and other winter weather, but extreme cold events can occur on their own. Dangers associated with extreme cold events include frostbite and hypothermia among other impacts to people and these events can often last for several days or weeks in a row.
Hailstorm / Thunderstorms	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 updrafts in thunderstorms carry raindrops into parts of the atmosphere where the temperatures are below freezing.
Heat Wave/Extreme Heat	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.

Hurricane/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.
Lightning Severe Storms / Thunderstorms	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.
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/ High Wind	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 that can down trees and power lines.

Tornado / High Winds	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.
Winter Storm	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.
GEOLOGIC HAZARDS	
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.
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 tectonic 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.
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/Sinkhole	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 pump age, aquifer system compaction, drainage of organic soils, underground mining, hydro compaction, natural compaction, sinkholes, and thawing permafrost.
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, essentially causing the waves from behind to effectively "pile up," and wave heights 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.
HYDROLOGIC HAZARDS	
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.
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.

Floods	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.
OTHER HAZARDS	
Wildfire	An uncontrolled wildfire 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.
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.
Transportation Incident	Transportation incidents come in many forms in the United States, especially given the many forms of transportation available today. The most common types of transportation incidents are motor vehicle

	accidents, but plane, train, and watercraft accidents occur as well and often have higher magnitude impacts.

DISASTER DECLARATIONS

Disaster declarations provide initial insight into the hazards that may impact Anderson and Oconee County planning area. Since 1990, eight presidential disaster declarations have been reported in Anderson and Oconee County. This includes three events related to severe storms and flooding, one severe winter weather events, one hurricane, one tropical storm, one wild fire and one pandemic. However, this list is not inclusive of many of the major disaster events that impacted the counties and which may have resulted in Small Business Administration disaster loan assistance or no federal assistance.

TABLE 4.2: ANDERSON / OCONEE COUNTY DISASTER DECLARATIONS

YEAR	DATE	DISASTER	
2004	10/7	Tropical Storm Frances	DR-1509
2004	2/13	Ice storm	DR-1566
2015	10/5	Severe Storms and Flooding	DR-4241
2016	11/12	South Carolina Pinnacle Mountain Fire (Pickens County) FM-5162	
2017	10/16	Hurricane Irma	DR-4346
2020	3/17	Severe storms, Tornadoes, Straight-line Winds, and Flooding	DR-4479
2020	3/27	Covid-19	DR-4492
2020	5/1	Severe storms, Tornadoes, Straight-line Winds, and Flooding	DR-4542

Source: www.fema.gov

HAZARD EVALUATION

TABLE 4.3: DOCUMENTATION OF THE HAZARD EVALUATION PROCESS

Natural 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?
ATMOSPHERIC HAZARDS			
Avalanche	NO	Review of FEMA's Multi-Hazard Identification and Risk Assessment Review of SC State Hazard Mitigation Plan Review of previous Anderson/Oconee County Hazard Mitigation Plan Review of US Forest Service National Avalanche Center website (https://avalanche.org)	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 included in the SC State Hazard Mitigation Plan. Avalanche was not identified as a hazard in the previous Anderson/Oconee County Hazard Mitigation Plan. There is no risk of avalanche events in South Carolina.

Natural 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?
Drought / Heat Wave	YES	Review of FEMA's Multi-Hazard Identification and Risk Assessment Review of SC State Hazard Mitigation Plan Review of previous Anderson/Oconee County Hazard Mitigation Plan Review of US Drought Monitor website	Drought is a normal part of virtually all climatic regimes, including areas with high and low average rainfall. The SC State Hazard Mitigation Plan found the entire state to be vulnerable to drought, and all buildings and facilities are considered to be equally exposed to this hazard. Drought was included in the previous Anderson/Oconee County Hazard Mitigation Plan. There are reports of moderate to exceptional drought conditions in Anderson/Oconee County according to the US Drought Monitor.
Extreme Cold	NO	Review of FEMA's Multi-Hazard Identification and Risk Assessment Review of SC State Hazard Mitigation Plan Review of previous Anderson/Oconee County Hazard Mitigation Plan Review of NOAA NCEI Storm Events Database	Because South Carolina is located in the southeastern United States, it rarely experiences extreme cold events that are on par with other locations in the country. Extreme cold was not included in the SC State Hazard Mitigation Plan. Extreme cold was not identified as a hazard in the previous Anderson/Oconee County Hazard Mitigation Plan.

Natural 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?
Hailstorm / Thunderstorm	YES	Review of FEMA's Multi-Hazard Identification and Risk Assessment Review of SC State Hazard Mitigation Plan Review of previous Anderson/Oconee County Hazard Mitigation Plan Review of NOAA NCEI Storm Events Database	Although hailstorms occur primarily in the Midwestern states, they do occur in every state on the mainland U.S. Most inland regions experience hailstorms at least two or more days each year. Hail is discussed in the SC State Hazard Mitigation Plan, and due to its unpredictability, all buildings and facilities are considered to be equally exposed to this hazard. According to the state plan, the historical annualized losses from hail from 1960-2020 are $216, 221 for Anderson and $1,828,285 for Oconee County. Hail was included in the previous Anderson/Oconee County Hazard Mitigation Plan.
Heat Wave/Extreme Heat	No	Review of FEMA's Multi-Hazard Identification and Risk Assessment. Review of SC State Hazard Mitigation Plan. Review of previous Anderson/Oconee County Hazard Mitigation Plan. Review of NOAA NCEI Storm Events Database.	Many areas of the United States are susceptible to heat waves, including South Carolina. The SC State Hazard Mitigation Plan identifies extreme heat as a hazard with the potential to affect the state. Extreme heat / Heat Wave was included in the previous Anderson/Oconee County Hazard Mitigation Plan.

1 A complete list of disaster declarations for Anderson and Oconee County can be found above in Table 4.2.

Natural 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?
Hurricane/Trop. Storm	YES	Review of FEMA's Multi-Hazard Identification and Risk Assessment. Review of SC State Hazard Mitigation Plan. Review of previous Anderson/Oconee County Hazard Mitigation Plan. Analysis of NOAA historical tropical cyclone tracks and National Hurricane Center Website. Review of NOAA NCEI 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 SC State Hazard Mitigation Plan found the entire state to be vulnerable to hurricanes. According to the state plan the historical annualized losses from hurricanes in Anderson/Oconee County. Annualized loss estimations (building damage, contents damage, and inventory loss) due to hurricane wind hazards in Anderson/Oconee County. NOAA historical records indicate 42 hurricanes/tropical storms have come within 75 miles of Anderson/Oconee County since 1859. NCEI reports one tropical storm event for Anderson/Oconee County, Four of the eight disaster declarations in Anderson/Oconee County were directly related to a tropical storm or hurricane event. The 50-year return period peak gust for hurricane and tropical storm events in Anderson/Oconee County is 60 mph.

Natural 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?
Lightning Severe Storms / Thunderstorms	YES	Review of FEMA's Multi-Hazard Identification and Risk Assessment. Review of SC State Hazard Mitigation Plan. Review of previous Anderson/Oconee County Hazard Mitigation Plan. Review of NOAA NCEI Storm Events Database Review of Vaisala's NLDN Lightning Flash Density Map.	The central region of Florida has the highest density of lightning strikes in the US; however, lightning events are experienced in nearly every region. Lightning is discussed in the SC State Hazard Mitigation Plan, and due to its unpredictability, all buildings and facilities are considered to be equally exposed to this hazard. According to the state plan the historical annualized losses from 1960-2020 from lightning are Anderson $170,368 and Oconee $30,413. Lightning was included in the previous Anderson/Oconee County Hazard Mitigation Plan. According to Vaisala's U.S. National Lightning Detection Network, Anderson/Oconee County is located in an area that experienced an average of 4 to 8 lightning flashes per square kilometer per year between 2010 and 2019.

Natural 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 SC State Hazard Mitigation Plan Review of previous Anderson/Oconee County Hazard Mitigation Plan. Review of NOAA NCEI Storm Events Database.	Nor'easters are discussed in the SC State Hazard Mitigation Plan as part of the winter storm hazard. Nor'easter was not identified as a hazard in the previous Anderson/Oconee County Hazard Mitigation Plan. NCEI does not report any nor'easter activity for Anderson/Oconee County. However, nor'easters may have affected the area as severe winter storms. In this case, the activity would be reported under winter storm events.
Severe Thunderstorm/High Wind	No	Review of FEMA's Multi-Hazard Identification and Risk Assessment. Review of SC State Hazard Mitigation Plan. Review of previous Anderson/Oconee County Hazard Mitigation Plan; High winds are included with Tornadoes and Thunderstorms are included with Hail Storms. Review of NOAA NCEI Storm Events Database Review of historical presidential disaster declarations.	Over 100,000 thunderstorms are estimated to occur each year on the U.S. mainland, and they are experienced in nearly every region. Severe thunderstorms are discussed in the SC State Hazard Mitigation Plan, and due to its unpredictability, all buildings and facilities are considered to be equally exposed to this hazard. According to the state plan the historical annualized losses from severe thunderstorm are $107,203 for Anderson and $105,775 for Oconee County. Severe thunderstorm/High Wind was not included in the previous Anderson/Oconee County Hazard Mitigation Plan. High winds are included in Tornadoes and Thunderstorms are included with Hail Storms.

Natural 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 / High Winds	YES	Review of FEMA's Multi-Hazard Identification and Risk Assessment. Review of SC State Hazard Mitigation Plan. Review of previous Anderson/Oconee County Hazard Mitigation Plan. Review of NOAA NCEI Storm Events Database Review of historical presidential disaster declarations.	The U.S. reports over 800 tornadoes nationwide, resulting in an average of 80 deaths and 1,500 injuries. Tornadoes are discussed in the SC State Hazard Mitigation Plan, and because the location of tornado strikes are not limited to specific geographic regions of the state, all buildings and facilities are considered to be equally exposed to this hazard. According to the state plan the historical annualized losses from tornadoes are $216,221 for Anderson and $1,828,285 for Oconee County. Tornados were also included in the previous Anderson/Oconee County Hazard Mitigation Plan.

Natural 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?
Winter Storm	YES	Review of FEMA's Multi-Hazard Identification and Risk Assessment. Review of SC State Hazard Mitigation Plan. Review of previous Anderson/Oconee County Hazard Mitigation Plan. Review of NOAA NCEI Storm Events Database Review of historical presidential disaster declarations.	Winter storms affect every state in the continental U.S. and Alaska. Severe winter storms, including blizzard, ice storm, and nor'easter, are discussed in the SC State Hazard Mitigation Plan, and while South Carolina does not regularly encounter winter storms, they can occur anywhere in the state and all buildings and facilities are considered to be equally exposed to this hazard. According to the state plan the historical annualized losses from winter storms are $1,215,466 for Anderson and $1,632,655 for Oconee County. Historically, Anderson/Oconee County have the highest number of loss-causing winter storm events in the state. Winter storms were included in the previous Anderson/Oconee County Hazard Mitigation Plan. NCEI reports that Anderson/Oconee County has been affected by 69 winter weather events since 1996

Natural 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?
Earthquake	YES	Review of FEMA's Multi-Hazard Identification and Risk Assessment. Review of SC State Hazard Mitigation Plan. Review of previous Anderson/Oconee County Hazard Mitigation Plan. Review of National Geophysical Data Center website. Review of USGS Earthquake Hazards Program website.	Although the zone of greatest seismic activity in the United States is along the Pacific Coast, eastern regions have experienced significant earthquakes. Earthquakes are discussed in the SC State Hazard Mitigation Plan, and the Piedmont/Blue Ridge region (which includes Anderson/Oconee County) is generally considered at a low risk of major (magnitude 6+ on the Richter Scale) earthquakes but is susceptible to smaller earthquakes (magnitude 2-4). Earthquake was included in the previous Anderson/Oconee County Hazard Mitigation Plan. Earthquakes have occurred in and around the State of South Carolina in the past. The state is affected by the Charleston Fault line which has generated one magnitude 8.0 earthquake in the last 200 years. Since 2010, 12 earthquakes have been reported within 150 km of Anderson/Oconee County, all below a 3.0 magnitude. According to USGS seismic hazard maps, the peak ground acceleration (PGA) with a 10% probability of exceedance in 50 years for Anderson/Oconee County is approximately 5 to 7%g. FEMA recommends that earthquakes be further evaluated for mitigation purposes in areas with a PGA of 3%g or more.

Natural 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 SC State Hazard Mitigation Plan. Review of previous Anderson/Oconee County Hazard Mitigation Plan. Review of USGS Swelling Clays Map of the Conterminous US.	The effects of expansive soils are most prevalent in parts of the Southern, Central, and Western U.S. Expansive soils were not included in the SC State Hazard Mitigation Plan. Expansive soils were not identified as a hazard in the previous Anderson/Oconee County Hazard Mitigation Plan. Anderson and Oconee County is located in an area that has little to no clay swelling potential.

Natural 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?
Land Subsidence/Sinkhole	NO	Review of FEMA's Multi-Hazard Identification and Risk Assessment. Review of SC State Hazard Mitigation Plan. Review of previous Anderson/Oconee County Hazard Mitigation Plan.	Land subsidence affects at least 45 states, including South Carolina. However, because of the broad range of causes and impacts, there has been limited national focus on this hazard. The SC State Hazard Mitigation Plan did not analyze sinkholes because while South Carolina does experience sinkholes, no loss data has been collected at this time. Land subsidence was not identified as a hazard in the previous Anderson/Oconee County Hazard Mitigation Plan.
Tsunami	NO	Review of FEMA's Multi-Hazard Identification and Risk Assessment. Review of SC State Hazard Mitigation Plan Review of previous Anderson/Oconee County Hazard Mitigation Plan. 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 Atlantic basin tsunami impacting the mid-Atlantic coast of the United States. Tsunami inundation zone maps are not available for communities located along the U.S. East Coast. Tsunamis are described in the SC State Hazard Mitigation Plan as an extremely low threat for South Carolina, and any tsunamis impacting the state would likely be small and mostly inundate the beaches exclusively. Tsunami was not identified as a hazard in the previous Anderson/Oconee County Hazard Mitigation Plan. FEMA mitigation planning guidance suggests that locations along the U.S. East Coast have a relatively low tsunami risk and do not need to conduct a tsunami risk assessment at this time.

Natural 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 SC State Hazard Mitigation Plan Review of previous Anderson/Oconee County 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. Volcano was not included in the SC State Hazard Mitigation Plan. Volcano was not identified as a hazard in the previous Anderson/Oconee County Hazard Mitigation Plan. There has not been a volcanic eruption in South Carolina in over 750 million years. However, the red clay soil found in the area is a result of iron that flowing lava brought to the area. No volcanoes are located in or near Anderson/Oconee County.
HYDROLOGIC HAZARDS			
Dam and Levee Failure	NO	Review of FEMA's Multi-Hazard Identification and Risk Assessment. Review of SC State Hazard Mitigation Plan. Review of previous Anderson/Oconee County Hazard Mitigation Plan.	The National Inventory of Dams shows dams are located in every state. Dam/levee failure is discussed in the SC State Hazard Mitigation Plan as part of the flood hazard. Dam and levee failure was not identified as a hazard in the previous Anderson/Oconee County Hazard Mitigation Plan.

Natural 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	NO	Review of SC State Hazard Mitigation Plan. Review of previous Anderson/Oconee County Hazard Mitigation Plan.	Erosion is discussed in the SC State Hazard Mitigation Plan under costal hazards. Only coastal erosion is identified as a hazard of concern for South Carolina (not riverine or soil erosion). Erosion was not identified as a hazard in the previous Anderson/Oconee County Hazard Mitigation Plan.

Natural 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	YES	Review of FEMA's Multi-Hazard Identification and Risk Assessment. Review of SC State Hazard Mitigation Plan. Review of previous Anderson/Oconee County Hazard Mitigation Plan. Review of National Oceanic and Atmospheric Administration (NOAA). National Centers for Environmental Information (NCEI) Storm Events Database. Review of historical disaster declarations. Review of FEMA Flood Insurance Rate Maps (DFIRM) data. Review of FEMA's National Flood Insurance Program(NFIP)Community Status Book and Community Rating System (CRS).	Floods occur in all 50 states and in the U.S. territories. Flooding is the most frequent and costly hazard in the US; 75% of all presidential disasters have been related to flooding. Flood is thoroughly discussed in the SC State Hazard Mitigation Plan. The State is found to be at risk of riverine flooding, coastal flooding, flash flooding, local drainage problems, and dam/levee failure. According to the state plan the historical annualized losses from flood are $80,982 for Anderson and $115,907 for Oconee County. Flood was included in the previous Anderson/Oconee County Hazard Mitigation Plan. Seven jurisdictions in Anderson county and three in Oconee participate in the NFIP; however, no jurisdictions currently participate in the CRS.

Natural 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 SC State Hazard Mitigation Plan. Review of previous Anderson/Oconee County Hazard Mitigation Plan. Review of NOAA NCEI Storm Events Database.	Given the inland location of Anderson/Oconee County, storm surge would not likely affect the area. Storm surge is discussed in the SC State Hazard Mitigation Plan under the hurricane hazard, and the state plan indicates that only the coastal shoreline counties are subject to storm surge. Storm surge was not identified as a hazard in the previous Anderson Oconee County Hazard Mitigation Plan. NCEI does not report any historical storm surge events for Anderson/Oconee County.

Natural 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?
Coastal Flooding & High Winds	NO	Review of FEMA's Multi-Hazard Identification and Risk Assessment. Review of SC State Hazard Mitigation Plan. Review of previous Anderson/Oconee County Hazard Mitigation Plan. Review of NOAA NCEI Storm Events Database.	Given the inland location of Anderson/Oconee County, coastal flooding would not likely affect the area. Any high winds would be associated with hurricanes traveling inland. Coastal flooding & winds are discussed in the SC State Hazard Mitigation Plan under the hurricane hazard, and the state plan indicates that only the coastal shoreline counties are subject to coastal flooding & winds. Coastal flooding & high winds were not identified as a hazard in the previous Anderson Oconee County Hazard Mitigation Plan. NCEI does not report any historical coastal flooding events for Anderson/Oconee County.

Natural 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			
Wildfire	YES	Review of FEMA's Multi-Hazard Identification and Risk Assessment. Review of SC State Hazard Mitigation Plan. Review of previous Anderson/Oconee County Hazard Mitigation Plan. Review of Southern Wildfire Risk Assessment (SWRA). Data Review of the SC Forestry Commission website and data.	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. Wildfire is discussed in the SC State Hazard Mitigation Plan, and since the majority of wildfires are human-caused or from lightning strikes, they can occur anywhere in South Carolina and all buildings and facilities are considered to be equally exposed to this hazard. According to the state plan, the historical annualized losses from wildfire for Anderson County is $0. However, Anderson experienced one fire in 1985 causing over 239,430 crop damage and 3,900 property damage less than 100 acres damage: Oconee County did experience one major fire in 1985 causing over $26,478.88 in property damage and $264,788.71 in crop damage, and over 100 acres property damage.; however neighboring Pickens county experienced the Pinnacle Mountain fire in 2016, which resulted in more than $5 million in expenses and 10,623 acres burned. Wildfire was included in the previous Anderson/Oconee County Hazard Mitigation Plan. A review of SWRA data indicates that there are some areas of elevated concern in Anderson/Oconee County.

Natural 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?
Hazardous Materials Incident	No	Review of FEMA's Multi-Hazard Identification and Risk Assessment. Review of SC State Hazard Mitigation Plan. Review of previous Anderson/Oconee County Hazard Mitigation Plan. Review of EPA Toxic Release Inventory (TRI). Review of USDOT Pipeline and Hazardous Materials Safety. Administration (PHMSA) incident database. Discussions with local LEPC/HazMat officials.	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. Although hazardous materials incidents are discussed in the SC State Hazard Mitigation Plan, annualized losses from hazardous materials incidents are not reported. The SC State Hazard Mitigation Plan indicates the following hazardous materials sites are located within Anderson County: 56 TRI sites, 1 Hazardous Material Treatment/Storage/Disposal sites, and 25 Solid Waste Landfills. Oconee County: 24 TRI sites, and 8 Solid Waste Landfills.

Natural 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?
Transportation Incident	No	Review of SC State Hazard Mitigation Plan. Review of previous Anderson/Oconee County Hazard Mitigation Plan. Discussions with local officials.	Transportation incident was not included in the SC State Hazard Mitigation Plan. Transportation incident was not identified as a hazard in the previous Anderson/Oconee County Hazard Mitigation Plan.

4.1 HAZARD IDENTIFICATION RESULTS

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

ATMOSPHERIC HAZARDS	GEOLOGIC HAZARDS
☐ Avalanche	☑ Earthquake
☑ Drought	☐ Expansive Soils
☐ Extreme Cold	☑ Landslide
☑ Hailstorm	☐ Land Subsidence/Sinkhole
☑ Heat Wave/Extreme Heat	☐ Tsunami
☑ Hurricane/Tropical Storm	☐ Volcano
☑ Lightning	**HYDROLOGIC HAZARDS**
☐ Nor'easter	☐ Dam and Levee Failure
☑ Severe Thunderstorm/High Wind	☐ Erosion
☑ Tornado	☑ Flood
☑ Winter Storm and Freeze	☐ Storm Surge
	OTHER HAZARDS
	☑ Wildfire
	Hazardous Materials Incident
	Transportation Incident

☑ = Hazard considered significant enough for further evaluation in the Anderson & Oconee County hazard risk assessment.

SECTION 5
HAZARD PROFILES

This section includes detailed hazard profiles for each of the hazards identified in Section 4 (*Hazard Identification*) as significant enough for further evaluation in the Multi-Jurisdictional Hazard Mitigation Plan. It contains the following subsections:

Overview

- 5.1 Overview
- 5.2 Study Area

Atmospheric Hazards

- 5.3 Winter Storms
- 5.4 Hail/Thunderstorms
- 5.5 Lighting/Thunderstorms
- 5.6 Tornado/High Winds
- 5.7 Drought/Heatwave
- 5.8 Floods
- 5.9 Wildfires
- 5.10 Hurricane
- 5.11 Earthquake

Conclusions

- 5.17 Conclusions on Hazard Risk
- 5.18 Final Determinations

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

Overview

5.1 OVERVIEW

This section includes detailed hazard profiles for each of the hazards identified in Section 4 (*Hazard Identification*) as significant enough for further evaluation in the Multi-Jurisdictional Hazard Risk Assessment by creating a hazard profile. Each hazard profile includes a general description of the hazard, its location and extent, notable historical occurrences, and the probability of future occurrences.

Each profile also includes specific items noted by members of the Hazard Mitigation Planning Team as it relates to unique historical or anecdotal hazard information for Anderson County & Oconee County or a participating municipality within it.

The following hazards were identified:

- **Atmospheric**
  - Drought/Heatwave
  - Hail/Thunderstorm
  - Hurricane/Tropical Storm
  - Lightning
  - Severe Thunderstorm/High Wind
  - Tornado
  - Winter Storm and Freeze
  - Wildfire

The DMA 2000 legislation and related FEMA planning guidance require mitigation plans to include discussion of community vulnerability to natural hazards. Vulnerability is generally defined as the damage (including direct damages and loss of function) that would occur when various levels of hazards impact a structure, operation or population. For example, vulnerability can be expressed as the percent damage to a building when it is flooded, or the number of days that a government office will be shut down after a windstorm, etc., assuming there is sufficient detailed data available to support the calculations. Because this Plan update is at the scale of multiple entire Counties, it is not practical to complete vulnerability assessments on the many individual assets, operations and populations in the planning area. It is possible, however, to make some general observations based on the hazard identifications and risk assessments that are the subjects of Section 5 of this Plan update. Therefore, the following terms are used to describe levels of vulnerability.

- High – 66%-100% percent damage to a building when it is flooded, or the number of days that a government office will be shut down.
- Moderate – 34%-65% percent damage to a building when it is flooded, or the number of days that a government office will be shut down.
- Low – 0%-33% percent damage to a building when it is flooded, or the number of days that a government office will be shut down.

As illustrated in Section 4 (Hazard Identification), each County is subject to numerous natural hazards, although in some cases the hazards have rarely impacted the area, or their effects have been relatively minor. It is important to recognize that several other hazards present significant risks (i.e., potential for future losses) to the County, even though they have occurred infrequently in the past, or have not caused much damage.

The impact/extent of damage is derived primarily from utilizing calculations from the University of South Carolina Hazards & Vulnerability Research Institute Department of Geography Spatial Hazard Event Loss Dataset for the US (SHELDUS) information which originally contained only those events that generated greater than $50,000 in combined crop and property damage. This damage assessment is countywide regardless of municipal boundaries. Damage in less severe degrees may have occurred throughout the county and its municipalities affecting each municipality in varying degrees depending on the severity of the hazard and time of year. The full list of events, regardless of dollar amount, can be found on the University of South Carolina Hazards & Vulnerability Research Institute's SHELDUS website. In conjunction with the events noted on data from SHELDUS the vulnerability of the Counties was calculated using the total number of events that met the threshold of $50,000 in damage, number of years, and reoccurrence intervals; to provide a frequency hazard percentage for each hazard.

During the 2023 HMP update FEMA National Risk Index (NRI) was utilized for each hazard. Risk index analysis statistics were provided by FEMA and placed into corresponding sections. Each data set had varying time periods, none going over the year 2017 for each risk. Risk Index scores are calculated by FEMA using an equation that combines scores for Expected Annual Loss due to natural hazards, Social Vulnerability, and Community Resilience:

Expected Annual Loss
×Social Vulnerability
÷Community Resilience
=Risk Index

Other data was compiled from various other sources such as maps from FEMA Resilience Analysis and Planning Tool (RAPT) and climate data from National Centers for Environmental Information. Compiling data from various sources allowed both counties to ensure that ample amounts of research, this would make mitigation strategies simpler in critical moments.

5.2 STUDY AREA

Anderson and Oconee County includes 14 municipalities and the unincorporated area of the counties. **Table 5.1** provides a summary table of the participating municipalities. In addition, **Figure 5.1** provides a base map of Anderson County for reference. **Figure 5.2** provides a base map of Oconee County for reference.

TABLE 5.1: PARTICIPATING JURISDICTIONS IN THE ANDERSON & OCONEE COUNTY HAZARD MITIGATION PLAN

Anderson County	Oconee County
Anderson	Salem
Belton	Seneca
Honea Path	Wahalla
Iva	West Union
Pendleton	Westminster
Pelzer	
Starr	
West Pelzer	
Williamston	

FIGURE 5.1: ANDERSON COUNTY BASE MAP

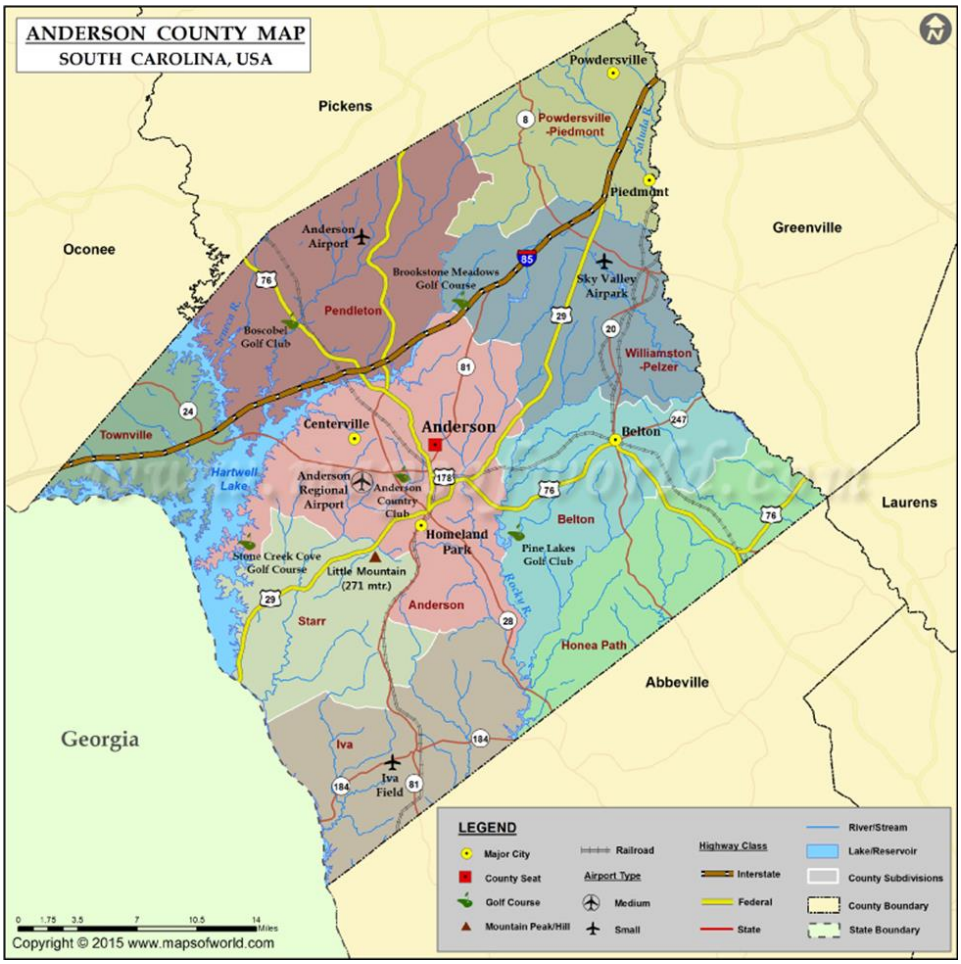
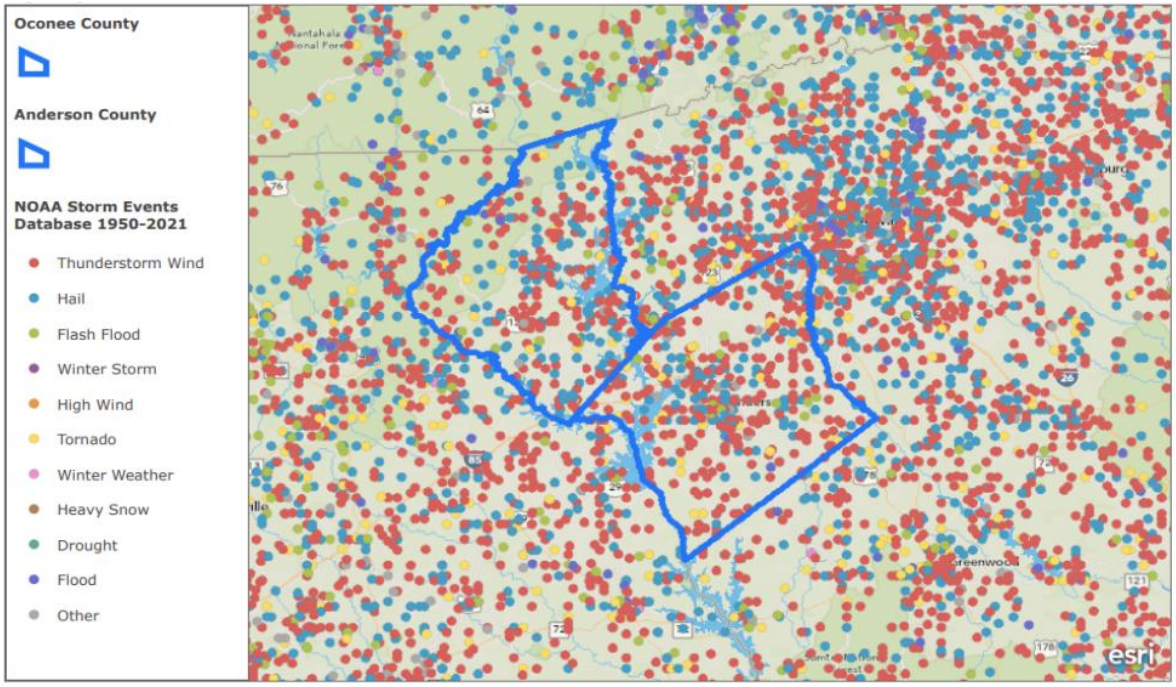


FIGURE 5.2: OCONEE COUNTY BASE MAP

FIGURE 5.3 SUMMARY OF IDENTIFIED HAZARD EVENTS IN ANDERSON & OCONEE COUNTY



https://www.arcgis.com/apps/mapviewer/index.html?layers=5c112c1f08e54108b410a67e8a93a07a

The maps presented in Figure 5.3 are an overview of both Anderson and Oconee counties and their municipalities that are participating in the 2023 update of the hazard mitigation plan. The data provided also gives a brief overview of the particular hazards that will be discussed throughout this portion of the plan. In a conjoining effort, both Anderson and Oconee counties have provided ample amounts of data to calculate risks, event probability, and recommendations for mitigation.

Atmospheric Hazards

5.3 Winter storms

5.3.1 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.

Snowstorms

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 or 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.

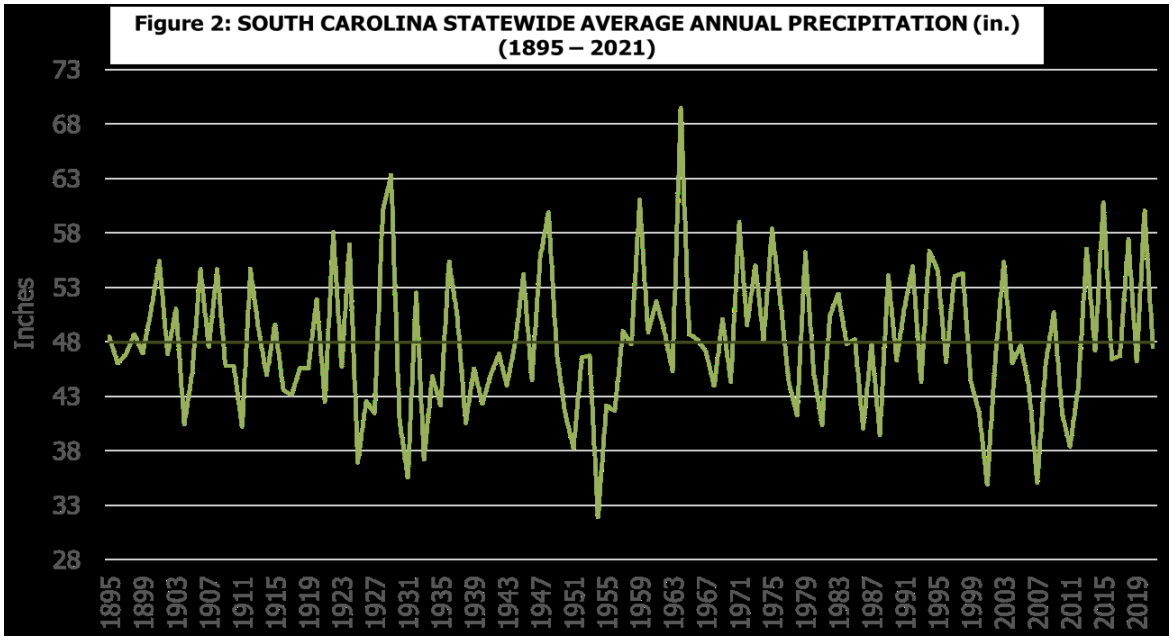
Ice Storms

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, 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.

https://www.ncdc.noaa.gov/stormevents/
https://www.c2es.org/content/tornadoes-and-climate-change/

According to SC Hazard Mitigation Plan winter weather events in South Carolina can be high-impact incidents because of their rarity. In the Upstate, two or three winter events with snow or ice accumulation or freezing rain accretion typically occur per winter season. The Midlands and Pee Dee regions average about one winter precipitation event per season. There may be several years between winter events in the Lowcountry. Most of the state averages two inches or less of snowfall each year. The annual snowfall average is higher in the mountains, with a mean yearly snowfall of five to seven inches at the state's highest elevations. Winter weather events that impact South Carolina often include a combination of snow, sleet, and freezing rain.



Major disaster declarations

Winter storms (consisting of snow, ice, and cold temperatures) can cause major problems in regions that are not prepared for them. These types of storms can damage property, create safety risks, destroy crops and valuable timber, damage infrastructure components such as power lines, and have enormous economic impacts (SCEMD). There were major Southeastern snowstorms in 1899, 1914, 1973, 2000, and 2002. Additionally, there have been many more localized winter storms. In January 1968 and February 1979 large ice storms paralyzed the County for several days. More recently in 2002, 2004, 2005, and 2014 ice and snowstorms covered the Region resulting in power outages and hazardous driving conditions. Each County suffers an average of one to two winter storms each year.

There have been several significant winter storm events within South Carolina designated as "Major Disaster Declaration"

Severe Weather Storm	Incident Start Date:	Incident End Date:	Declared as Major Disaster:
Winter Storm: DR-4166	2/10/2014	2/15/2014	3/12/2014
Ice Storm: DR-1625	12/15/2005	12/16/2005	1/20/2006
Ice Storm: DR-1509	1/26/2004	1/30/2004	2/13/2004
Ice Storm: DR-1451	12/4/2002	12/6/2002	1/8/2003
Winter Storm: DR-1313	1/22/2000	2/1/2000	1/31/2000

Official website of the Department of Homeland Security (https://www.fema.gov/disasters)

5.3.2 Community Risk Analysis

Ice Storms

In data compiled by FEMA, via the National Risk Index, Anderson County has a relatively high risk of ice storms, and an expected annual loss of $0.88M, as shown in figure 5.3.2. Oconee county has a relatively high risk of winter weather, with an expected annual loss of $0.61M as shown in figure 5.3.3.

Figure 5.3.2 Anderson County risk analysis

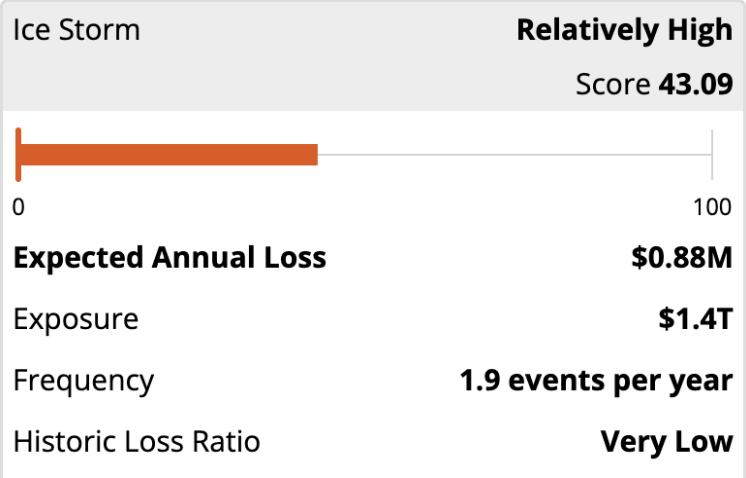
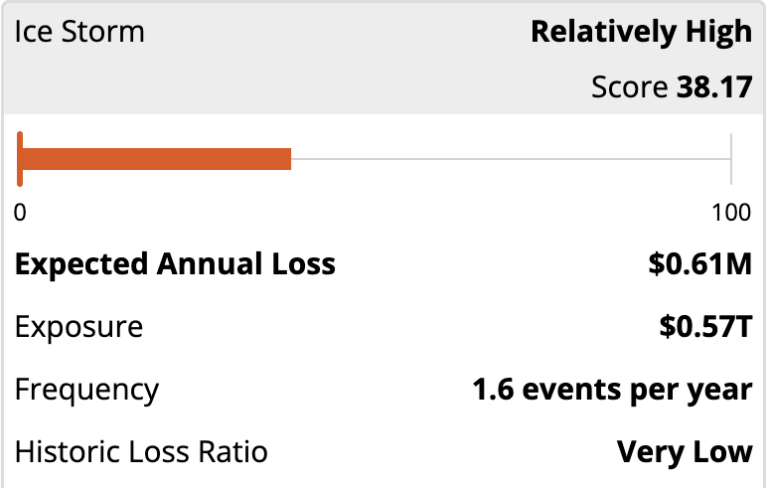


Figure 5.3.3 Oconee County risk analysis



Winter Weather

In data compiled by FEMA, via the National Risk Index, Anderson County has a very low risk of winter weather, and an expected annual loss of $2.1k, as shown in figure 5.3.5. Oconee county has a relatively moderate risk of winter weather, with an expected annual loss of $0.12M as shown in figure 5.3.6.

Figure 5.3.5 Anderson County risk analysis

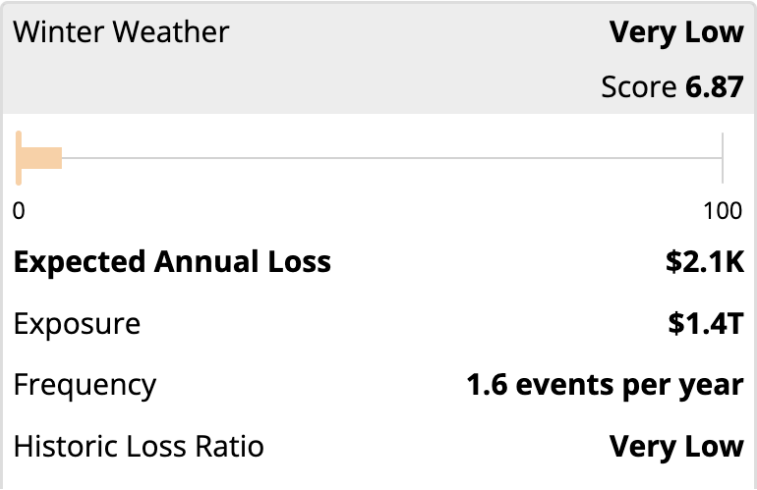
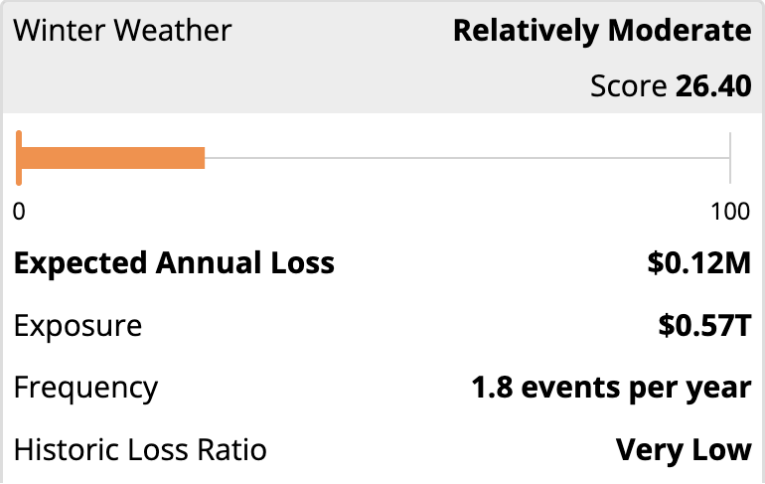


Figure 5.3.6 Oconee County risk analysis

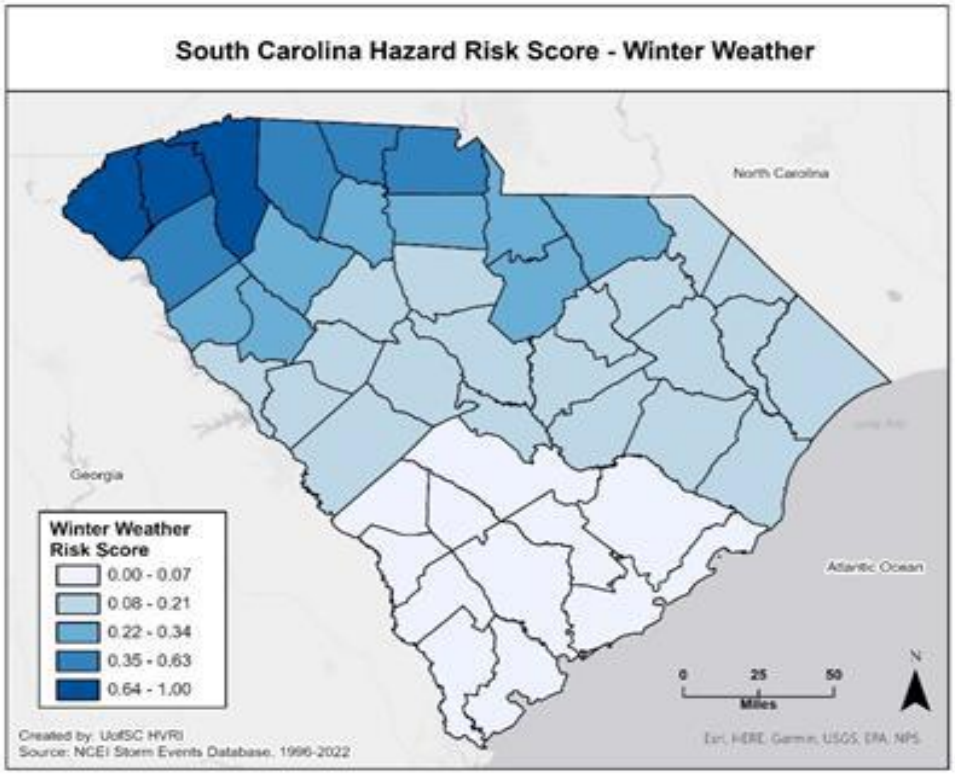


Location and Spatial Extent

Nearly the entire continental United States is susceptible to winter storm 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. Anderson and Oconee Counties are accustomed to severe winter weather conditions and often receives winter weather during the winter months. Given the atmospheric nature of the hazard, all jurisdictions within the counties are uniformly exposed to winter storms. Current climate models indicate global average temperatures may rise between 4.7 to 8.6 degrees by the end of the century, the increased rate of precipitation events will likely cause an increase in the frequency and severity of winter storms impacting Anderson and Oconee Counties County in the future.

https://www.c2es.org/content/climate-impacts/

Figure 5.3.7 South Carolina Hazard Risk Score



Historical Occurrences

According to Spatial Hazard Event and Losses Database (SHELDUS) for the United States, Anderson and Oconee Counties have had a combined 55 winter storm events that have reached a threshold of $50,000. Tables 5.3.8 and 5.3.9 detail those events totaling $36,789,816.80 in total property damage and 1.34 injuries. All data has been updated to 2020 inflation, and charts provided by SHELDUS reflect this change.

Anderson County Extent

Considering the frequency and intensity of winter storm events in Anderson County; the future predictability frequency and intensity of winter storm events is low as the entire county is equally susceptible to winter storm events and likely to cause low to moderate crop damage, property damage and or death and injury as shown in past occurrences over the past 70+ years with the number of event days being 8 days and 2 days event causing property damage, causing property damage ranging from 5,000 to 5,000 dollars in damage for a total of 10,000 dollars property damage, with zero deaths and injuries.

Storm Events Database

Search Results for Anderson County, South Carolina

Event Types: Winter Storm
Anderson county contains the following zones:
Anderson
8 events were reported between 01/01/1950 and 01/31/2023 (26694 days)

Summary Info:

Number of County/Zone areas affected:	1
Number of Days with Event:	8
Number of Days with Event and Death:	0
Number of Days with Event and Death or Injury:	0
Number of Days with Event and Property Damage:	2
Number of Days with Event and Crop Damage:	0
Number of Event Types reported:	1

National Centers for Environmental Information (NCEI) (noaa.gov)

Anderson County has experienced 15 notable winter weather evens from the time frame of 01/01/1970 through 01/01/2021. A winter weather event is considered notable when it causes at or above $50,000 in combined property and crop damages. These winter weather events have caused 1.59 fatalities and .67 injuries to county residents. They caused a collective $21,258,855.88 in property damage and $60,045,920.90 in crop damages adjusted to 2020 inflation. Data has been provided and adjusted through SHELDUS.

Table 5.3.8 Anderson County Notable Winter Weather Events from 1/1/1970-1/1/2021

SHELDUS
Query results

Date	Hazard	Crop Damage (ADJ)	Fatalities	Injuries	Property Damage (ADJ)
3/16/17	*Wind/Winter Weather	52,543,097.72	0	0	0
4/8/07	Winter Weather	3,792,569.38	0	0	0
12/15/05	Winter Weather	0	0	0	268,427.69
12/4/02	Winter Weather	0	0	0	16,027,326.54
1/2/99	Winter Weather	0	0	0	3,146,694.37
3/8/96	Winter Weather	2,784,359.9	0	0	0
3/13/93	Winter Weather	64,784.89	0	0	64,784.89
3/21/90	Winter Weather	217,989.78	0	0	0
2/17/89	Winter Weather	0	0	0	132,116.75
2/17/89	Winter Weather	0	1	0	132,116.75
2/6/79	Winter Weather	601.76	0	0	601,743.91
2/9/73	Winter Weather	641.72	0.2	0	641,695.15
1/7/73	Winter Weather	641,695.15	0	0	64,169.54
3/25/71	Winter Weather	179.79	0.39	0.67	179,780.29
12/3/71	*Severe Storm/Thunderstorm/ Wind/Winter Weather	70,348.83	0	0	70,348.83
Total		**$60,116,269.7**	**1.59**	**.67**	**$21,329,204.60**

Source: Spatial Hazard Event and Losses Database (SHELDUS) for the United States. Arizona State University
*Hazard may be repeated in another section

Winter Storm Probability and Vulnerability

Anderson County: Winter Weather Probability

County	Number of Events	Years	Recurrence Intervals (years)	Hazard Frequency (% change/year)
Anderson	**15**	**50**	**3.33**	**30%**

Vulnerability

Anderson County

Overall, Anderson County has a moderate level vulnerability to winter storms. The probability of one or more winter weather events in Anderson County is 30%. Examining past events, it is evident that winter storms can significantly disrupt normal operations within a community. In addition, some ice storms associated with winter storms have caused significant property damage and disruption of the electric utilities. Overall, when taking into consideration the moderate level vulnerability of winter storms in the county, and the past history of the event, the municipalities have a moderate level vulnerability to winter storms.

Recommendation:

Early warnings are possibly the best hope for residents when a winter storm strikes. Citizens must immediately be aware when a community will be facing a winter storms incident. Communities that do not already possess warning systems should plan to purchase a system. Storm shelters are another important means of mitigating the effects of winter storm events. A community-wide shelter program should be considered for residents who may not have adequate shelter in their homes. Residents should also be encouraged to build their own storm shelters to prepare for emergencies. Local governments should encourage residents to purchase weather radios to ensure that everyone has sufficient access to information in times of severe weather.

Oconee County Extent

Considering the frequency and intensity of winter storm events in Oconee County; the future predictability frequency and intensity of winter storm events is low as the entire county is equally susceptible to winter storm events and likely to cause low to moderate crop damage, property damage and or death and injury as shown in past occurrences over the past 70+ years with the number of days events being 13 with 2 event days causing property damage of 5,000 to 5,000 dollars in property damage with a total of 20,000 in property damage and zero deaths and injury.

Storm Events Database

Search Results for Oconee County, South Carolina

Event Types: Winter Storm
Oconee county contains the following zones:
Oconee Mountains, Greater Oconee
23 events were reported between 01/01/1950 and 01/31/2023 (26694 days)

Summary Info:

Number of County/Zone areas affected:	4
Number of Days with Event:	13
Number of Days with Event and Death:	0
Number of Days with Event and Death or Injury:	0
Number of Days with Event and Property Damage:	2
Number of Days with Event and Crop Damage:	0
Number of Event Types reported:	1

National Centers for Environmental Information (NCEI) (noaa.gov)

Oconee County has experienced 27 notable winter weather events from the time frame of 01/01/1970 through 01/01/2021. A winter weather event is considered notable when it causes at or above $50,000 in combined property and crop damages. These winter weather events have caused 1.18 fatalities and .67 injuries to county residents. They caused a collective $15,460,612.2 in property damage and $125,052,531. in crop damages adjusted to 2020 inflation.

Table 5.3.8: Oconee County Notable Winter Weather Events from 1/1/1970-1/1/2021
SHELDUS
Query results

Date	Hazard	Crop Damage (ADJ)	Fatalities	Injuries	Property Damage (ADJ)
3/16/17	*Wind/ Winter Weather	52,543,097.72	0	0	0
3/16/17	*Wind/ Winter Weather	52,543,097.72	0	0	0
4/8/07	Winter Weather	1,264,189.79	0	0	0
4/8/07	Winter Weather	7,585,138.77	0	0	0
12/15/05	Winter Weather	0	0	0	100,660.38
12/4/02	Winter Weather	0	0	0	7,285,148.43
12/4/02	Winter Weather	0	0	0	2,914,059.37
1/2/99	Winter Weather	0	0	0	3,146,694.37
1/9/97	Winter Weather	0	0	0	65,325.77
3/8/96	Winter Weather	2,784,359.9	0	0	0
3/13/93	Winter Weather	64,784.89	0	0	64,784.89
12/27/92	Winter Weather	33,362.13	0	0	33,362.13
3/21/90	Winter Weather	217,989.78	0	0	0
2/17/89	Winter Weather	0	0	0	132,116.75
2/17/89	Winter Weather	0	0	0	132,116.75
4/10/85	Winter Weather	203,004.67	0	0	0
12/25/83	Winter Weather	28,605.7	0.59	0	28,605.7
4/17/83	Winter Weather	2,860,568.8	0	0	0
4/7/82	Winter Weather	3,395,332.13	0	0	0
3/27/82	Winter Weather	295,247.22	0	0	0
2/6/79	Winter Weather	601.76	0	0	601,743.91
4/11/73	Winter Weather	163,988.78	0	0	0
2/9/73	Winter Weather	641.72	0.2	0	641,695.15
1/7/73	Winter Weather	641,695.15	0	0	64169.54
4/1/72	Winter Weather	356,295.72	0	0	0
3/25/71	Winter Weather	179.79	0.39	0.67	179,780.29
12/3/71	*Severe Storm/Thunderstorm/Wind/Winter Weather	70,348.83	0	0	70,348.83
Total		**125,052,531**	**1.18**	**.67**	**15,460,612.20**

Source: Spatial Hazard Event and Losses Database (SHELDUS) for the United States. Arizona State University

Oconee County: **Oconee County Winter Weather Probability**

County	Number of Events	Number of Years	Recurrence Interval (years)	Hazard Frequency (% chance/year)
Oconee	**27**	**50**	**1.85**	**54%**

Vulnerability

Oconee County

Overall, Oconee County has a moderate level of vulnerability to winter storms. The probability of one or more winter weather events in Oconee County is 54%. Examining past events, it is evident that winter storms can significantly disrupt normal operations within a community. In addition, some ice storms associated with winter storms have caused significant property damage and disruption of the electric utilities. Overall, when taking into consideration the moderate level of vulnerability to winter storms in the county, and the past history of the event, the municipalities have a moderate level of vulnerability to winter storms.

Recommendations

Early warnings are possibly the best hope for residents when a winter storm strikes. Citizens must immediately be aware when a community will be facing a winter storms incident. Communities that do not already possess warning systems should plan to purchase a system. Storm shelters are another important means of mitigating the effects of winter storm events. A community-wide shelter program should be considered for residents who may not have adequate shelter in their homes. Residents should also be encouraged to build their own storm shelters to prepare for emergencies. Local governments should encourage residents to purchase weather radios to ensure that everyone has sufficient access to information in times of severe weather.

5.4 Hail/Thunderstorms

Background

NOAA classifies thunderstorms as a rain-bearing cloud that also produces lightning, along with possible hail. All thunderstorms are dangerous. Every thunderstorm produces lightning. In the United States, an average of 300 people are injured and 80 people are killed each year by lightning.

Although most lightning victims survive, people struck by lightning often report a variety of long-term, debilitating symptoms. Other associated dangers of thunderstorms include tornadoes, strong winds, hail, and flash flooding. Flash flooding is responsible for more fatalities—more than 140 annually—than any other thunderstorm-associated hazard.

Hail is frozen droplets of water that thaw and freeze while wind patterns (updrafts and downdrafts) take them between colder and warmer elevations within a thunderstorm cloud. Each time the droplet re-freezes, another layer of ice is added to the object, thus making it larger until it falls to the earth.

Hail is a costly result of severe weather in the United States. In an average year, hail causes one billion dollars in crop and property damage each year in this country.

Unlike ice pellets, hail stones are layered and can be irregular and clumped together. Hail is composed of transparent ice or alternating layers of transparent and translucent ice at least 1 millimeter (0.039 in) thick, which are deposited upon the hail stone as it cycles through the cloud multiple times, suspended aloft by air with strong upward motion until its weight overcomes the updraft and falls to the ground. There are methods available to detect hail-producing thunderstorms using weather satellites and radar imagery. Hail stones generally fall at higher speeds as they grow in size, though complicating factors such as melting, friction with air, wind, and interaction with rain and other hail stones can slow their descent through Earth's atmosphere. Severe weather warnings are issued for hail when the stones reach a damaging size, as it can cause serious damage to man-made structures and, most commonly, farmers' crops. In the United States, the National Weather Service issues severe thunderstorm warnings for hail 1" or greater in diameter. This threshold, effective January 2010, marked an increase over the previous threshold of ¾" hail. The Service made the change for two main reasons: a) public complacency and b) recent research suggesting that damage does not occur until a hailstone reaches 1" in diameter. (NOAA/ National Weather Service National Centers for Environmental Prediction).

Hailstorms are a potentially damaging outgrowth of severe thunderstorms (thunderstorms are discussed separately). 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.[3] **Table 5.4.1** shows the Tornado and Storm Research Organization's (TORRO) Hailstorm Intensity Scale which is a way of measuring hail severity.[4]

TABLE 5.4.1: TORRO HAILSTORM INTENSITY SCALE

Scale	Intensity category	Typical hail diameter (mm)*	Probable kinetic energy J m^{-2}	Typical damage impacts
H0	Hard hail	5	0-20	No damage
H1	Potentially damaging	5-**15**	>20	Slight general damage to plants, crops
H2	Significant	10-**20**	>100	Significant damage to fruit, crops, vegetation
H3	Severe	20-**30**	>300	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
H4	Severe	25-**40**	>500	Widespread glass damage, vehicle bodywork damage
H5	Destructive	30-**50**	>800	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
H6	Destructive	40-**60**		Bodywork of grounded aircraft dented, brick walls pitted
H7	Destructive	50-**75**		Severe roof damage, risk of serious injuries
H8	Destructive	60-**90**		(Severest recorded in the British Isles) Severe damage to aircraft bodywork
H9	Super Hailstorms	75-**100**		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

[2] https://www.c2es.org/content/drought-and-climate-change/#:~:text=How%20climate%20change%20contributes%20to,the%20timing%20of%20water%20availability.

[3] https://www.nssl.noaa.gov/education/svrwx101/hail/

[4] https://www.torro.org.uk/v2021/ 5 https://www.weather.gov/phi/ThunderstormDefinition

Community Risk Analysis

Hail Risk Analysis

In data compiled by FEMA, via the National Risk Index, Anderson County has a relatively low risk of hail, and an expected annual loss of $0.18M, as shown in figure 5.4.2. Oconee county has a relatively low risk of hail, with an expected annual loss of $0.11M as shown in figure 5.4.3.

Figure 5.4.2 Anderson County risk analysis

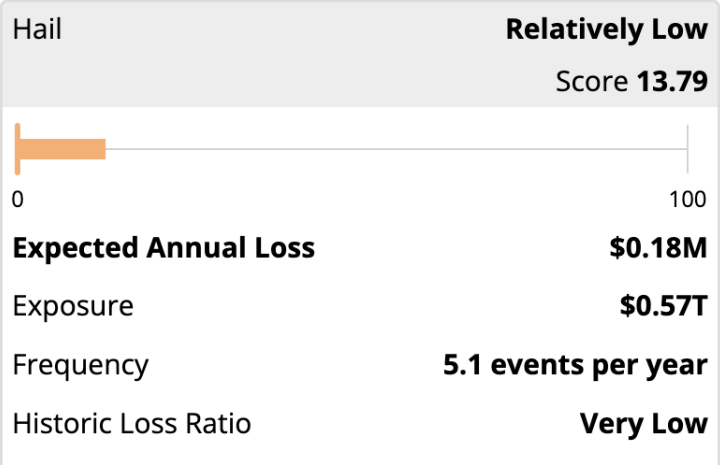
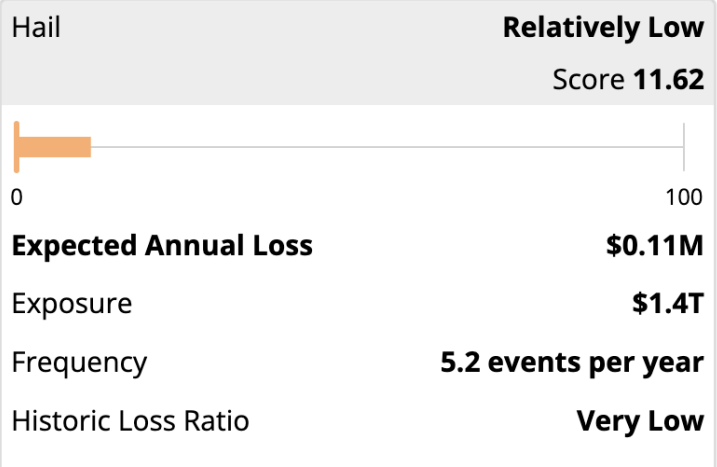


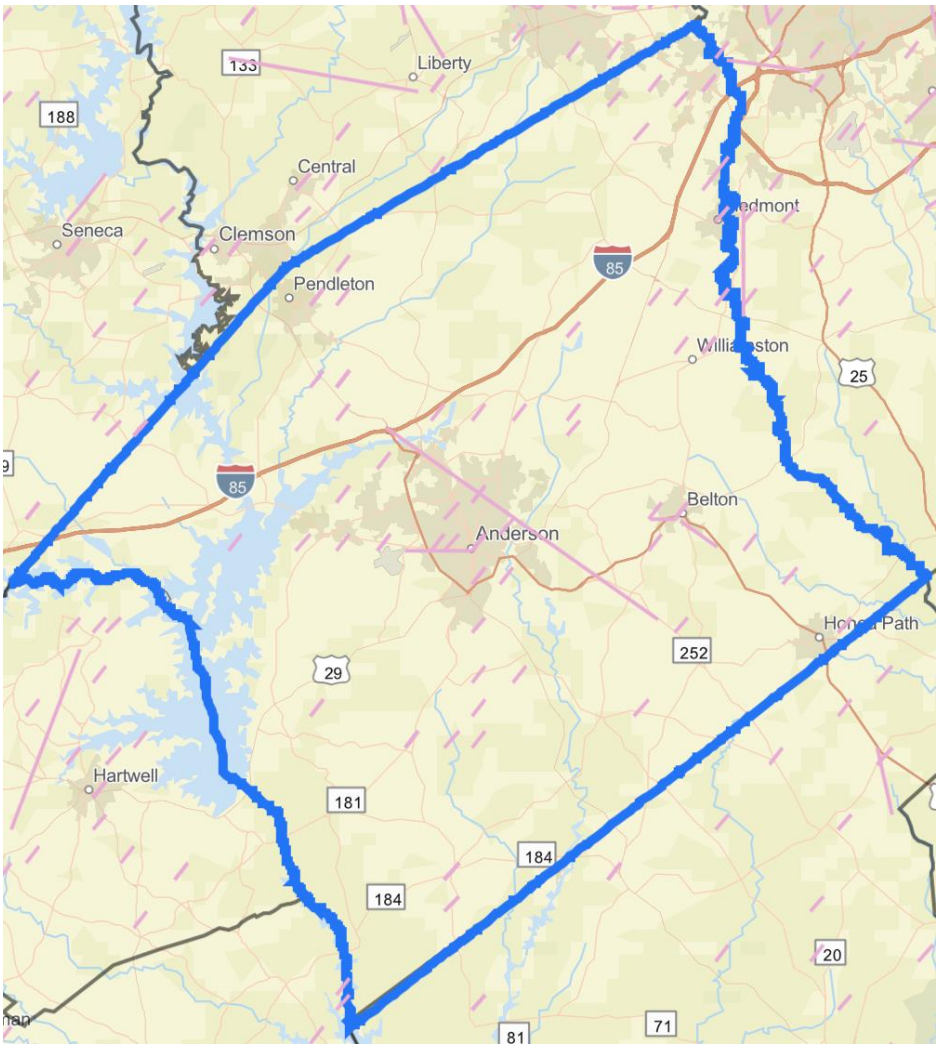
Figure 5.4.3 Oconee County risk analysis



Location and Spatial Extent

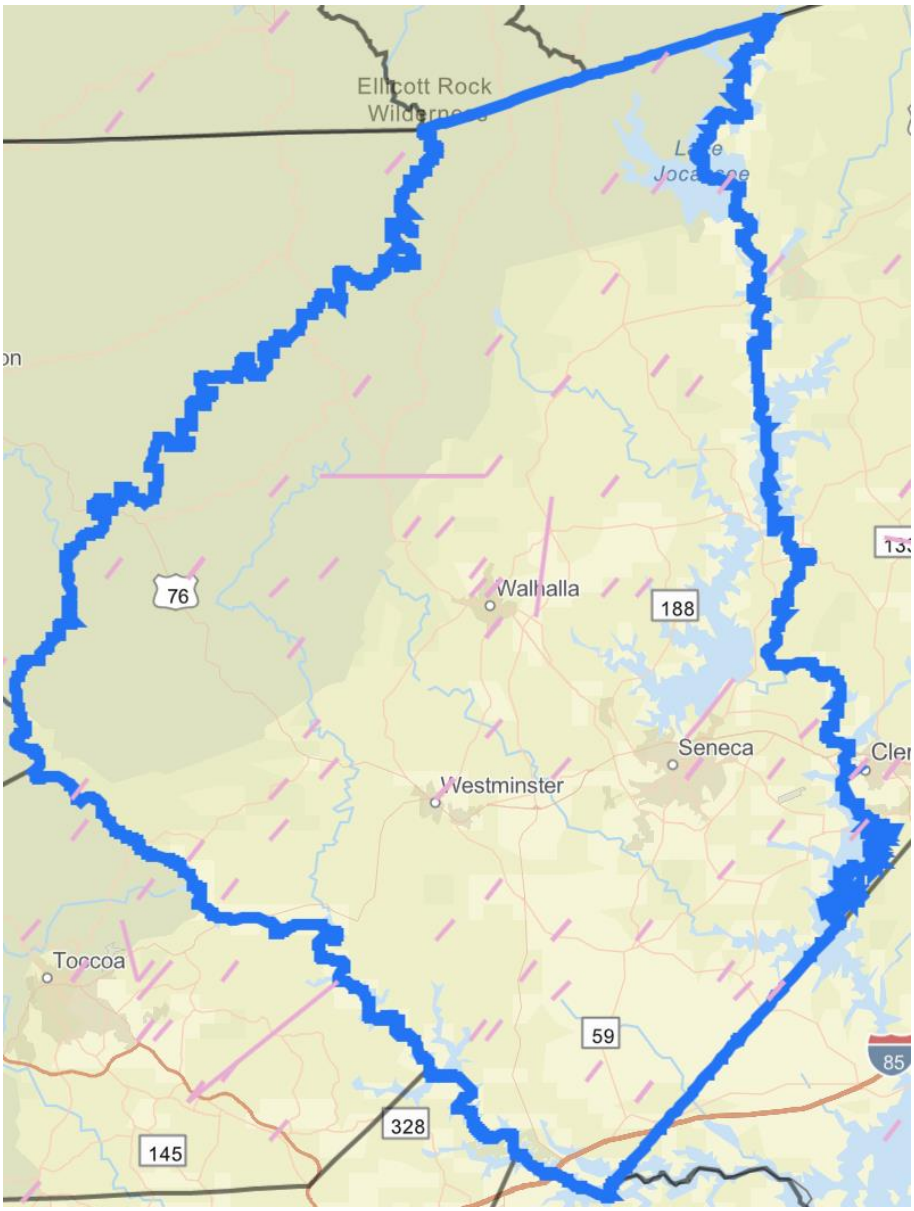
Hailstorms frequently accompany thunderstorms, so their locations and spatial extents coincide. Due to the large spatial extent of thunderstorms and their paths relative to the area of Anderson and Oconee Counties, it is assumed that all jurisdictions within Anderson and Oconee Counties are uniformly exposed to severe thunderstorms. Additionally, because there is no clear distinction between thunderstorms that produce hailstones and thunderstorms that do not, all areas of the county are equally exposed to hail with that in mind, Figure 5.4.4 and 5.4.5 shows the location of hail events that have impacted the county between 1955 and 2021. Furthermore, the link between climate change and increases in the frequency and severity of extreme precipitation events indicates hailstorms may increase in frequency and magnitude within Anderson and Oconee Counties.

Figure 5.4.4 Anderson County Hail events 1955-2017



https://fema.maps.arcgis.com/apps/webappviewer/index.html?id=90c0c996a5e242a79345cdbc5f758fc6#

Figure 5.4.5 Oconee County Hail events 1955-2017



https://fema.maps.arcgis.com/apps/webappviewer/index.html?id=90c0c996a5e242a79345cdbc5f758fc6#

Historical Occurrences

According to Spatial Hazard Event and Losses Database (SHELDUS) for the United States Anderson and Oconee Counties have had a combined 54 hailstorm events that have reached a threshold of $50,000. Tables 5.4.6 and 5.4.7 detail those events totaling $18,581,122.47 in total property damage and 5.89 injuries. All data has been updated to 2020 inflation, and charts provided by SHELDUS reflect this change.

Anderson County

Extent

Considering the frequency and intensity of Hail Storms in Anderson County; the future predictability frequency and intensity of hail storms is moderate as the entire county is equally susceptible to hail storms and likely to cause low to moderate crop damage, property damage and or death and injury as shown in past occurrences over the past 70+ years with the number of event days being 137 days and 2 event days causing property damage ranging from 100 to 200,000 dollars in damage with a total of over 300,000 dollars in property damage, with zero deaths and injuries and hail size ranging from .75 inches (penny size) to 4.00 inches (grapefruit size).

Storm Events Database

Search Results for Anderson County, South Carolina

Event Types: Hail
214 events were reported between 01/01/1950 and 01/31/2023 (26694 days)

Summary Info:

Number of County/Zone areas affected:	2
Number of Days with Event:	137
Number of Days with Event and Death:	0
Number of Days with Event and Death or Injury:	0
Number of Days with Event and Property Damage:	2
Number of Days with Event and Crop Damage:	0
Number of Event Types reported:	1

National Centers for Environmental Information (NCEI) (noaa.gov)

Approximate Hail Size:

Appearance	Approximate Size in Inches
Pea	0.25 - 0.50 inch
Penny	0.75 inch
Nickel	0.88 inch
Quarter	1.00 inch
Half Dollar	1.25 inch
Walnut/Ping Pong	1.50 inch
Golf ball	1.75 inch
Hen Egg	2.00 inch
Tennis Ball	2.50 inch
Baseball	2.75 inch
Tea Cup	3.00 inch
Grapefruit	4.00 inch

Softball	4.50 inch

National Centers for Environmental Information (NCEI) (noaa.gov)

Considering the frequency and intensity of Thunderstorm wind in Anderson County; the future predictability frequency and intensity of Thunderstorm wind is moderate as the entire county is equally susceptible to Thunderstorm wind and likely to cause moderate crop damage, property damage and or death and injury as shown in past occurrences over the past 70+ years with the number of event days being 342 days and 59 event days causing property damage ranging from 1,000 to 500,000 totaling over 4.207 million dollars in damage, with 1 deaths and 15 injuries, with wind speeds ranged from 50 to 75 kts.

Storm Events Database

Search Results for Anderson County, South Carolina

Event Types: Thunderstorm Wind
483 events were reported between 01/01/1950 and 01/31/2023 (26694 days)

Summary Info:

Number of County/Zone areas affected:	2
Number of Days with Event:	342
Number of Days with Event and Death:	1
Number of Days with Event and Death or Injury:	7
Number of Days with Event and Property Damage:	59
Number of Days with Event and Crop Damage:	0
Number of Event Types reported:	1

National Centers for Environmental Information (NCEI) (noaa.gov)

Anderson County has experienced 36 notable hailstorms and thunderstorms from the time frame of 01/01/1970 through 01/01/2021 A hailstorm/thunderstorm is considered notable when it causes at or greater than $50,000 in combined property and crop damages. These 36 notable hailstorms have caused 5.36 injuries to county residents and 0.05 fatalities. These notable hailstorms have caused a collective $11,053,028.99 in property damage and $589,847.26 in crop damage, adjusted for 2020 inflation.

Table 5.4.6: Anderson County Notable Hailstorms/ Thunderstorms from 1/1/1970-1/1/2021
SHELDUS
Query results

Date	Hazard	Crop Damage (ADJ)	Fatalities	Injuries	Property Damage (ADJ)
9/18/75	*Flooding/ Lightning/ Severe Storm/Thunderstorm	12,180.28	0.5	1.5	1,218,028.07
10/8/76	*Flooding/ Severe Storm/Thunderstorm	38,388.92	0	0.33	383,889.32
7/3/14	Hail	0	0	0	221,444.68
7/13/03	Hail	0	0	0	142,456.33
4/23/87	Hail	11,536.96	0	0	115,369.56
6/10/82	*Hail/ Lightning/ Severe Storm/Thunderstorm/ Wind	331,251.92	0	0.2	331,251.92
7/25/93	*Hail/ Severe Storm/Thunderstorm/ Wind	0	0	2	90,698.84
7/8/93	*Hail/ Severe Storm/Thunderstorm/ Wind	0	0	0	181,397.67
4/4/89	*Hail/ Severe Storm/Thunderstorm/ Wind	0	0	0	105693.4
2/21/93	*Hail/ Tornado	0	0	0	90,,698.84
4/4/89	*Hail/ Tornado	0	0	0	1,056,934.03
3/28/84	*Hail/ Wind	126,140.35	0	0	1,261,403.47
9/2/70	*Lightning/ Severe Storm/Thunderstorm	0	0	0	337,783.04
3/23/79	*Severe Storm/Thunderstorm	0	0	1.33	60,174.4
7/21/18	*Severe Storm/Thunderstorm/ Wind	0	0	0	52,192.82
4/5/17	*Severe Storm/Thunderstorm/ Wind	0	0	0	105,086.2
5/12/16	*Severe Storm/Thunderstorm/ Wind	0	0	0	53,631.01
7/18/15	*Severe Storm/Thunderstorm/ Wind	0	0	0	221182.14
6/25/10	*Severe Storm/Thunderstorm/ Wind	0	0	0	120,207.49

6/15/10	*Severe Storm/Thunderstorm/ Wind	0	0	0	300,518.72
7/3/05	*Severe Storm/Thunderstorm/ Wind	0	0	0	53,685.54
6/6/05	*Severe Storm/Thunderstorm/ Wind	0	0	0	53,685.54
11/11/02	*Severe Storm/Thunderstorm/ Wind	0	0	0	145,702.97
7/4/01	*Severe Storm/Thunderstorm/ Wind	0	0	0	2,220,098.59
6/13/01	*Severe Storm/Thunderstorm/ Wind	0	0	0	740,032.86
8/24/00	*Severe Storm/Thunderstorm/ Wind	0	0	0	152,218.14
1/7/98	*Severe Storm/Thunderstorm/ Wind	0	0	0	160,809.6
6/26/94	*Severe Storm/Thunderstorm/ Wind	0	0	0	88,434.43
2/10/90	*Severe Storm/Thunderstorm/ Wind\	0	0	0	100275.3
5/5/89	*Severe Storm/Thunderstorm/ Wind	0	0	0	105,,693.4
8/1/88	*Severe Storm/Thunderstorm/ Wind	0	0	0	110,785.99
7/2/83	*Severe Storm/Thunderstorm/ Wind	0	0	0	131,586.16
12/3/71	*Severe Storm/Thunderstorm/ Wind/Winter Weather	70,348.83	0	0	70,348.83
7/13/13	*Severe Storm/Thunderstorm/ Wind	0	0	0	112,518.46
Total		589,847.26	0.5	5.36	11,053,028.99

Source: Spatial Hazard Event and Losses Database (SHELDUS) for the United States. Arizona State University

*Hazard may be repeated in another section

Anderson County Probability of a Hailstorm/ Thunderstorm

County	Number of Events	Number of Years	Recurrence Interval (years)	Hazard Frequency (% chance/year)
Anderson	**36**	**55**	**1.53**	**65%**

Vulnerability

Anderson County

Overall, Anderson County has a low vulnerability to hailstorms. There is a 65% probability that more than one hail producing storm will occur in Anderson County in a year time frame. Based on passed events, the hailstorms have caused some damage within the County. Overall, the County's vulnerability to a damaging event is low.

Recommendation:

Early warnings are possibly the best hope for residents when hailstorms strike. Citizens must immediately be aware when a community will be facing a severe weather incident. Communities that do not already possess warning systems should plan to purchase a system. Storm shelters are another important means of mitigating the effects of hailstorm events. A community-wide shelter program should be considered for residents who may not have adequate shelter in their homes. Residents should also be encouraged to build their own storm shelters to prepare for emergencies. Local governments should encourage residents to purchase weather radios to ensure that everyone has sufficient access to information in times of severe weather.

Oconee County
Extent

Considering the frequency and intensity of Hail Storm events in Oconee County; the future predictability frequency and intensity of hail storm events is moderate as the entire county is equally susceptible to hail storm events and likely to cause moderate property damage and low to moderate crop damage, and or death and injury as shown in past occurrences over the past 70+ years with the number of event days being 120 days and 1 event days causing property damage of 500,000 dollars in damage, with zero deaths and injuries and hail size ranging from .75 (penny size) inches to 2.75 inches (baseball size).

Storm Events Database

Search Results for Oconee County, South Carolina

Event Types: Hail

194 events were reported between 01/01/1950 and 01/31/2023 (26694 days)

Summary Info:

Number of County/Zone areas affected:	2
Number of Days with Event:	120
Number of Days with Event and Death:	0
Number of Days with Event and Death or Injury:	0
Number of Days with Event and Property Damage:	1
Number of Days with Event and Crop Damage:	0
Number of Event Types reported:	1

National Centers for Environmental Information (NCEI) (noaa.gov)

Approximate Hail Size:

Appearance	Approximate Size in Inches
Pea	0.25 - 0.50 inch
Penny	0.75 inch
Nickel	0.88 inch
Quarter	1.00 inch
Half Dollar	1.25 inch
Walnut/Ping Pong	1.50 inch
Golf ball	1.75 inch
Hen Egg	2.00 inch
Tennis Ball	2.50 inch
Baseball	2.75 inch
Tea Cup	3.00 inch
Grapefruit	4.00 inch
Softball	4.50 inch

National Centers for Environmental Information (NCEI) (noaa.gov)

Considering the frequency and intensity of Thunderstorm wind in Oconee County; the future predictability frequency and intensity of Thunderstorm wind is moderate as the entire county is equally susceptible to Thunderstorm wind and likely to cause moderate crop damage, property damage and or death and injury as shown in past occurrences over the past 70+ years with the number of event days being 242 days and 41 event

days causing property damage ranging from 1,000 to 500,000 totaling over 1.106 million dollars in damage, with 0 deaths and 2 injuries, with wind speeds ranged from 50 to 60 kts.

Storm Events Database

Search Results for Oconee County, South Carolina

Event Types: Thunderstorm Wind

306 events were reported between 01/01/1950 and 01/31/2023 (26694 days)

Summary Info:

Number of County/Zone areas affected:	2
Number of Days with Event:	242
Number of Days with Event and Death:	0
Number of Days with Event and Death or Injury:	2
Number of Days with Event and Property Damage:	41
Number of Days with Event and Crop Damage:	0
Number of Event Types reported:	1

National Centers for Environmental Information (NCEI) (noaa.gov)

Oconee County has experienced 16 notable hailstorms/thunderstorms from the time frame of 01/01/1970 through 01/01/2021. A hailstorm/ thunderstorm is considered notable when it causes at or greater than $50,000 in combined property and crop damages. These 16 notable hailstorms have caused 0.53 injuries to county residents and 0.00 fatalities. These notable hailstorms have caused a collective $7,528,093.4 in property damage and $1,368,135,59 in crop damage, adjusted for 2020 inflation.

Table 5.4.7: Oconee County Notable Hailstorms/ Thunderstorms from 1/1/1970-1/1/2021
SHELDUS
Query results

Date	Hazard	Crop Damage (ADJ)	Fatalities	Injuries	Property Damage (ADJ)
8/6/78	*Flooding/ Severe Storm/Thunderstorm	5,025.3	0	0	502,529.99
10/8/76	*Flooding/ Severe Storm/Thunderstorm	38,388.92	0	0.33	383,889.32
9/13/73	*Flooding/ Severe Storm/Thunderstorm	4,919.64	0	0	4,919,662.91
4/28/02	Hail	0	0	0	728,514.84
6/10/82	*Hail/ Lightning/ Severe Storm/Thunderstorm/ Wind	331,251.92	0	0.2	331,251.92
7/4/75	*Hail/ Lightning/Wind	69,601.58	0	0	6,960.15

5/10/75	*Hail/ Lightning/Wind	135,336.46	0	0	13,533.66
6/14/74	*Hail/ Lightning/Wind	531,682.84	0	0	531.68
5/22/79	*Hail/ Severe Storm/Thunderstorm	180,523.17	0	0	1,805.23
4/4/89	Hail/ Tornado/ Wind	1,056.93	0	0	105,693.4
6/5/89	*Lightning/ Severe Storm/Thunderstorm/ Wind	0	0	0	105,693.4
4/28/02	*Severe Storm/Thunderstorm/ Wind	0	0	0	72,851.48
3/27/94	*Severe Storm/Thunderstorm/ Wind	0	0	0	88,434.43
7/27/93	*Severe Storm/Thunderstorm/ Wind	0	0	0	90,698.84
6/5/89	*Severe Storm/Thunderstorm/ Wind	0	0	0	105,693.4
12/3/71	*Severe Storm/Thunderstorm/ Wind/ Winter Weather	70,348.83	0	0	70,348.83
Total		**1,368,135.59**	**0**	**.53**	**7,528,093.48**

Source: Spatial Hazard Event and Losses Database (SHELDUS) for the United States. Arizona State University

Oconee County Probability of a Hailstorm/Thunderstorm

County	Number of Events	Number of Years	Recurrence Interval (years)	Hazard Frequency (% chance/year)
Oconee	**16**	**55**	**3.44**	**29%**

Vulnerability

Oconee County

Overall, Oconee County has a low vulnerability to hailstorms. There is a 29% probability that more than one hail producing storm will occur in Oconee County in a year time frame. Based on past events, the hailstorms have caused some damage within the County. Overall, the County's vulnerability to a damaging event is low.

Recommendation:

Early warnings are possibly the best hope for residents when hailstorms strike. Citizens must immediately be aware when a community will be facing a severe weather incident. Communities that do not already possess warning systems should plan to purchase a system. Storm shelters are another important means of mitigating the effects of hailstorm events. A community-wide shelter program should be considered for residents who may not have adequate shelter in their homes. Residents should also be encouraged to build their own storm shelters to prepare for emergencies. Local governments should encourage residents to purchase weather radios to ensure that everyone has sufficient access to information in times of severe weather.

5.5 Lightning/Thunderstorms

Background

The formation of lightning is still something of a mystery. Even the perceived motion of lightning is false. The light that seems to come down from the sky actually jumps up from the earth's surface. Lightning bolts are triggered when a negatively charged cloud base induces a positive charge in the ground. Negative particles, small streaming sparks known as stepped leaders, begin to flow downward, creating a conductive channel an inch or two wide. At the same time, similar streamers are moving upward from the ground, especially high places like treetops and tall structures. When the two streamers meet, they form a channel and a subsequent lightning bolt. The bright flash of light happens when the electrical charge excites air molecules in its path, forcing them to release light.

Lightning travels up to 60,000 miles per hour, cutting a jagged path through the air as much as 10 miles long! A lightning flash is brighter than ten million 100-watt light-bulbs, and contains billions of watts – as much power as in all the electricity plants in the United States.

Lightning causes damage to buildings and equipment in three different ways. First, there can be damage caused by a direct lightning strike. Such damage include damage to roofing materials, structures such as chimneys, heating or air conditioning units located on the roof or exterior of a building, or fires caused by lightning igniting combustible material, such as wood-frame buildings or flammable liquids or vapors.

Second, part of the lightning current can be carried inside a building by electric power, telephone, analog or digital data lines (e.g., closed circuit television cameras, sensors in an industrial plant, etc.). This direct injection of lightning current inside a building can cause immense damage to electrical – and especially electronic – circuits and equipment.

Finally, the electromagnetic fields from the current in a lightning stroke can induce currents and voltage in wire and cables inside a building. Such surge currents are typically less intense than direct injection of current, but can easily vaporize integrated circuits in computers, modems, electronic control circuits, etc.

Electronic equipment is typically designed to operate in a well-controlled electrical environment. It is the responsibility of the user to install lighting protection, electrical surge-protective devices, and power conditioning equipment to mitigate the effects of disturbances in the electrical voltage waveform. It is well recognized that the trend toward integrated circuits with more transistors per unit area, and faster switching speeds, makes these circuits more vulnerable to both upset and damage.

Damage is a permanent alteration in the physical properties of one or more components, that requires repair or replacement before the equipment can resume normal operation. Examples of lightning damage to electrical

equipment include flashover of insulation inside motors or transformers, so that the equipment is no longer functional. Examples of lightning damage to electronic equipment includes vaporized traces on printed circuit boards, vaporized transistors and integrated circuits, blown fuses, etc.

Anderson
Extent

Considering the frequency and intensity of Lightning in Anderson County; the future predictability frequency and intensity of Lightning is low to moderate as the entire county is equally susceptible to Lightning and likely to cause low to moderate crop damage, property damage and or death and injury as shown in past occurrences over the past 70+ years with the number of event days being 18 days and 10 event days causing property damage ranging from 1,000 to 100,000 totaling over 5.408 million dollars in damage, with 0 deaths and 5 injuries.

Storm Events Database

Search Results for Anderson County, South Carolina

Event Types: Lightning
19 events were reported between 01/01/1950 and 01/31/2023 (26694 days)

Summary Info:

Number of County/Zone areas affected:	1
Number of Days with Event:	18
Number of Days with Event and Death:	0
Number of Days with Event and Death or Injury:	4
Number of Days with Event and Property Damage:	10
Number of Days with Event and Crop Damage:	0
Number of Event Types reported:	1

National Centers for Environmental Information (NCEI) (noaa.gov)

Considering the frequency and intensity of Thunderstorm wind in Anderson County; the future predictability frequency and intensity of Thunderstorm wind is moderate as the entire county is equally susceptible to Thunderstorm wind and likely to cause moderate crop damage, property damage and or death and injury as shown in past occurrences over the past 70+ years with the number of event days being 342 days and 59 event days causing property damage ranging from 1,000 to 500,000 totaling over 4.207 million dollars in damage, with 1 deaths and 15 injuries, with wind speeds ranged from 50 to 75 kts.

Storm Events Database

Search Results for Anderson County, South Carolina

Event Types: **Thunderstorm Wind**
483 events were reported between 01/01/1950 and 01/31/2023 (26694 days)

Summary Info:

Number of County/Zone areas affected:	2
Number of Days with Event:	342
Number of Days with Event and Death:	1
Number of Days with Event and Death or Injury:	7
Number of Days with Event and Property Damage:	59
Number of Days with Event and Crop Damage:	0
Number of Event Types reported:	1

National Centers for Environmental Information (NCEI) (noaa.gov)

Anderson County has experienced 5 notable Lightning Severe Storms/ Thunderstorms from the time frame of 01/01/1960 through 12/31/2021. A Lightning Severe Storm/ Thunderstorm is considered notable when it causes at or greater than $50,000 in combined property and crop damages. These 5 notable lightning storms/ thunderstorms have caused no injuries to county residents and no fatalities. These notable storms have caused a collective $5.35 million in property damage and $0 in crop damage, adjusted for 2023 inflation.

The previous 5 notable occurrences of lightning severe storms/thunderstorm events happened throughout Anderson County, signifying that each area/municipality of the County is equally at risk for another future notable event.

5.5.1 Anderson Lightning Data

Year	Hazard	Location	Injuries	Fatalities	Property Damage	Crop Damage
5/25/1996	Lightning	Anderson County	0	0	5.000M	0.00K
6/19/1996	Lightning	Anderson County	0	0	150.00K	0.00K
7/5/1999	Lightning	Anderson County	1	0	0.00K	0.00K
7/6/1999	Lightning	Anderson County	0	0	0.00K	0.00K
8/13/1999	Lightning	Anderson County	0	0	0.00K	0.00K
6/13/2001	Lightning	Anderson County	0	0	0.00K	0.00K
6/25/2001	Lightning	Anderson County	0	0	0.00K	0.00K
7/4/2001	Lightning	Anderson County	0	0	0.00K	0.00K
8/24/2002	Lightning	Anderson County	1	0	0.00K	0.00K
8/25/2002	Lightning	Anderson County	1	0	0.00K	0.00K
8/16/2003	Lightning	Anderson County	0	0	1.00K	0.00K
7/8/2008	Lightning	Anderson Count	0	0	50.00K	0.00K
3/12/2010	Lightning	Anderson County	0	0	15.00K	0.00K

3/28/2010	Lightning	Anderson County	2	0	5.00K	0.00K
6/15/2010	Lightning	Anderson County	0	0	20.00K	0.00K
6/15/2011	Lightning	Anderson County	0	0	50.00K	0.00K
8/12/2011	Lightning	Anderson County	0	0	100.00K	0.00K
8/12/2011	Lightning	Anderson County	0	0	10.00K	0.00K
8/14/2021	Lightning	Anderson County	0	0	7.00K	0.00K
			5		5.408M	

Source: NOAA Storm Events Database

The previous 5 notable occurrences of lightning severe storms/thunderstorm events happened throughout Anderson County, signifying that each area/municipality of the County is equally at risk for another future notable event.

Oconee
Extent

Considering the frequency and intensity of Lightning in Oconee County; the future predictability frequency and intensity of Lightning is low as the entire county is equally susceptible to Lightning and likely to cause low crop damage, property damage and or death and injury as shown in past occurrences over the past 70+ years with the number of event days being 12 days and 6 event days causing property damage ranging from 5,000 to 80,000 totaling over 751,000 dollars in damage, with 0 deaths and 4 injuries.

Storm Events Database

Search Results for Oconee County, South Carolina

Event Types: Lightning
13 events were reported between 01/01/1950 and 01/31/2023 (26694 days)

Summary Info:

Number of County/Zone areas affected:	1
Number of Days with Event:	12
Number of Days with Event and Death:	0
Number of Days with Event and Death or Injury:	2
Number of Days with Event and Property Damage:	6
Number of Days with Event and Crop Damage:	0
Number of Event Types reported:	1

National Centers for Environmental Information (NCEI) (noaa.gov)

Considering the frequency and intensity of Thunderstorm wind in Oconee County; the future predictability frequency and intensity of Thunderstorm wind is moderate as the entire county is equally susceptible to

Thunderstorm wind and likely to cause moderate crop damage, property damage and or death and injury as shown in past occurrences over the past 70+ years with the number of event days being 242 days and 41 event days causing property damage ranging from 1,000 to 500,000 totaling over 1.106 million dollars in damage, with 0 deaths and 2 injuries, with wind speeds ranged from 50 to 60 kts.

Storm Events Database

Search Results for Oconee County, South Carolina

Event Types: **Thunderstorm Wind**

306 events were reported between 01/01/1950 and 01/31/2023 (26694 days)

Summary Info:

Number of County/Zone areas affected:	2
Number of Days with Event:	242
Number of Days with Event and Death:	0
Number of Days with Event and Death or Injury:	2
Number of Days with Event and Property Damage:	41
Number of Days with Event and Crop Damage:	0
Number of Event Types reported:	1

National Centers for Environmental Information (NCEI) (noaa.gov)

Oconee County has experienced 4 notable Lightning Severe Storms/ Thunderstorms from the time frame of 01/01/1960 through 12/31/2021. A Lightning Severe Storm/ Thunderstorm is considered notable when it causes at or greater than $50,000 in combined property and crop damages. These 5 notable lightning storms/ thunderstorms have caused no injuries to county residents and no fatalities. These notable storms have caused a collective $5.35 million in property damage and $0 in crop damage, adjusted for 2023 inflation.

5.5.2 Oconee County Lightning Data

Year	Hazard	Location	Injuries	Fatalities	Property Damage	Crop Damage
3/6/1996	Lightning	Oconee County	0	0	75.00K	0.00K
3/16/1996	Lightning	Oconee County	0	0	0.00K	0.00K
5/26/1996	Lightning	Oconee County	1	0	0.00K	0.00K
7/22/1997	Lightning	Oconee County	0	0	0.00K	0.00K
9/21/2000	Lightning	Oconee County	0	0	0.00K	0.00K
8/18/2004	Lightning	Oconee County	0	0	80.00K	0.00K
4/22/2005	Lightning	Oconee County	0	0	1.00K	0.00K
7/27/2008	Lightning	Oconee County	0	0	500.00K	0.00K
6/18/2011	Lightning	Oconee County	1	0	0.00K	0.00K
8/6/2012	Lightning	Oconee County	1	0	5.00K	0.00K
8/6/2012	Lightning	Oconee County	0	0	20.00K	0.00K
9/6/2014	Lightning	Oconee County	0	0	0.00K	0.00K
7/14/2017	Lightning	Oconee County	0	0	70.00K	0.00K
			3		751.00K	

Source: NOAA Storm Events Database

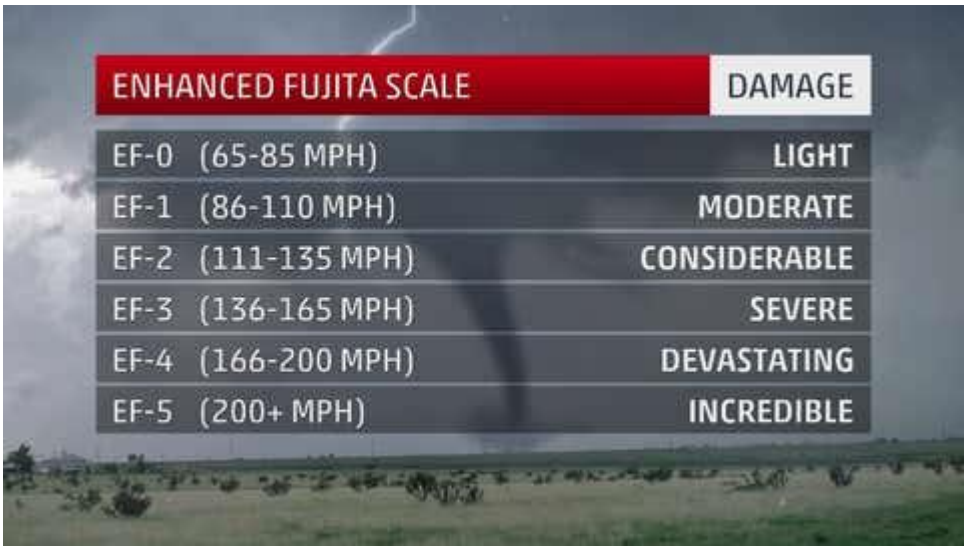
5.6 Tornadoes/ High Winds

Background

A tornado is a “violently rotating column of air extending from a thunderstorm to the ground” (NOAA). Tornadoes can be extremely violent storms that can have relatively low wind speeds (less than 73 mph) to very high winds in excess of 300 miles per hour. In the South, tornadoes touch down most frequently from the month of March through May (NOAA). Since 1950, there have been numerous tornadoes in South Carolina. The State averages approximately eleven tornadoes a year, which ranks twenty-sixth in the nation for tornado strikes. Tornadoes have claimed no casualties in South Carolina, and have injured 3 residents since 1950 (SCEMD).

The following Enhanced Fujita Scale for Tornado Damage explains tornado classifications, wind speeds, and a typical damage description of the various categories of tornadoes.

Table 5.6.1 Enhanced Fujita Scale



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Parameters

The seven categories for the EF scale are listed below, in order of increasing intensity. Although the wind speeds and photographic damage examples have been updated, the damage descriptions given are based on those from the Fujita scale, which are more or less still accurate. However, for the actual EF scale in practice, damage indicators (the type of structure which has been damaged) are predominantly used in determining the tornado intensity.[9]

Scale	Wind speed estimate[10]		Frequency[11]	Potential damage	Example of damage
	mph	km/h			
EFU	N/A	N/A	3.11%	No surveyable damage. Intensity cannot be determined due to a lack of information. This rating applies to tornadoes that traverse areas with no damage indicators, cause damage in an area that cannot be accessed by a survey, or cause damage which cannot be differentiated from that of another tornado.[6]	N/A
EF0	65–85	105–137	52.82%	Minor damage. Small trees are blown down and bushes are uprooted. Shingles are ripped off roofs, windows in cars and buildings are blown out, medium to large branches snapped off of large trees, sheds are majorly damaged, and loose small items are tossed and blown away (i.e. lawn chairs, plastic tables, sports equipment, mattresses). Barns are damaged.[12]	

EF1	86–110	138–177	32.98%	Moderate damage. Roofs stripped from shingles or planting. Small areas of roof may be blown off house. Doors and garage doors blown in, siding ripped off houses, mobile homes flipped or rolled onto their sides, small trees uprooted, large trees snapped or blown down, telephone poles snapped, outhouses and sheds blown away. Cars occasionally flipped or blown over, and moderate roof and side damage to barns. Corn stalks slightly bent and stripped of leaves.	
EF2	111–135	178–217	8.41%	Considerable damage. Whole roofs ripped off frame houses, interiors of frame homes damaged, small and medium trees uprooted. Weak structures such as barns and mobile homes are completely destroyed.	
EF3	136–165	218–266	2.18%	Severe damage. Roofs and numerous outside walls blown away from frame homes, all trees in its path uprooted or lofted. Two-story homes have their second floor destroyed, high-rises have many windows blown out, radio towers blown down, metal buildings (i.e. factories, power plants, and construction sites) are heavily damaged, sometimes completely destroyed. Large vehicles such as tractors, buses, and forklifts are blown from their original positions.	
EF4	166–200	267–322	0.46%	Devastating damage. Trees partially debarked, cars are mangled and thrown in the air, frame homes are completely destroyed and some may be swept away, moving trains blown off railroad tracks, and barns are leveled.	
EF5	>200	>322	0.05%	Incredible damage. Cars are mangled and thrown hundreds, possibly thousands of yards away. Frame homes, brick homes, and small businesses, are swept away, trees debarked, corn stalks flattened or ripped out of the ground, skyscrapers sustain major structural damage, grass ripped out of the ground. Wood and any small solid material become dangerous projectiles.	

Damage indicators and degrees of damage

The EF scale currently has 28 damage indicators (DI), or types of structures and vegetation, each with a varying number of degrees of damage (DoD). Each structure has a maximum DoD value, which is given by total destruction. Lesser damage to a structure will yield lower DoD values.[13] The links in the right column of the following table describe the degrees of damage for the damage indicators listed in each row.

DI No.	Damage indicator (DI)	Maximum degrees of damage
1	Small barns or farm outbuildings (SBO)	8[14]
2	One- or two-family residences (FR12)	10[15]
3	Manufactured home – single wide (MHSW)	9[16]
4	Manufactured home – double wide (MHDW)	12[17]
5	Apartments, condos, townhouses [three stories or less] (ACT)	6[18]
6	Motel (M)	10[19]
7	Masonry apartment or motel building (MAM)	7[20]
8	Small retail building [fast-food restaurants] (SRB)	8[21]
9	Small professional building [doctor's office, branch banks] (SPB)	9[22]
10	Strip mall (SM)	9[23]
11	Large shopping mall (LSM)	9[24]
12	Large, isolated retail building [K-Mart, Wal-Mart] (LIRB)	7[25]
13	Automobile showroom (ASR)	8[26]
14	Automobile service building (ASB)	8[27]
15	Elementary school [single-story; interior or exterior hallways] (ES)	10[28]

DI No.	Damage indicator (DI)	Maximum degrees of damage
16	Junior or senior high school (JHSH)	11[29]
17	Low-rise building [1–4 stories] (LRB)	7[30]
18	Mid-rise building [5–20 stories] (MRB)	10[31]
19	High-rise building [more than 20 stories] (HRB)	10[32]
20	Institutional building [hospital, government or university building] (IB)	11[33]
21	Metal building system (MBS)	8[34]
22	Service station canopy (SSC)	6[35]
23	Warehouse building [tilt-up walls or heavy-timber construction] (WHB)	7[36]
24	Electrical transmission lines (ETL)	6[37]
25	Free-standing towers (FST)	3[38]
26	Free-standing light poles, luminary poles, flag poles (FSP)	3[39]
27	Trees: hardwood (TH)	5[40]
28	Trees: softwood (TS)	5[41]

Differences from the Fujita scale

The new scale takes into account the quality of construction and standardizes different kinds of structures. The wind speeds on the original scale were deemed by meteorologists and engineers as being too high, and engineering studies indicated that slower winds than initially estimated cause the respective degrees of damage.[42] The old scale lists an F5 tornado as wind speeds of 261–318 mph (420–512 km/h), while the new scale lists an EF5 as a tornado with winds above 200 mph (322 km/h), found to be sufficient to cause the damage previously ascribed to the F5 range of wind speeds. None of the tornadoes in the United States recorded before February 1, 2007, will be re-categorized.

Essentially, there is no functional difference in how tornadoes are rated. The old ratings and new ratings are smoothly connected with a linear formula. The only differences are adjusted wind speeds, measurements of which were not used in previous ratings, and refined damage descriptions; this is to standardize ratings and to make it easier to rate tornadoes which strike few structures. Twenty-eight Damage Indicators (DI), with descriptions such as "double-wide mobile home" or "strip mall", are used along with Degrees of Damage (DoD) to determine wind estimates. Different structures, depending on their building materials and ability to survive high winds, have their own DIs and DoDs. Damage descriptors and wind speeds will also be readily updated as new information is learned.[13] Some differences do exist between the two scales in the ratings assigned to damage. An EF5 rating on the new scale requires a higher standard of construction in houses than does an F5 rating on the old scale. So, the complete destruction and sweeping away of a typical American frame home, which would likely be rated F5 on the Fujita scale, would be rated EF4 or lower on the Enhanced Fujita scale.[43]

Since the new system still uses actual tornado damage and similar degrees of damage for each category to estimate the storm's wind speed, the National Weather Service states that the new scale will likely not lead to an increase in the number of tornadoes classified as EF5. Additionally, the upper bound of the wind speed range for EF5 is open—in other words, there is no maximum wind speed designated.[9]

Rating classifications

Tornado rating classifications					
EF0	EF1	EF2	EF3	EF4	EF5
Weak		Strong		Violent	
		Significant			
			Intense		

For purposes such as tornado climatology studies, Enhanced Fujita scale ratings may be grouped into classes.[44][45][46] Classifications are also used by NOAA's Storm Prediction Center to determine whether the tornado was "significant". This same classification is also used by the National Weather Service.

The table shows other variations of the tornado rating classifications based on certain areas.

See also

- ***Weather portal***
- ***Physics portal***

- Beaufort scale
- International Fujita scale
- Saffir–Simpson hurricane wind scale
- Severe weather terminology (United States)
- TORRO scale
- Tornado intensity and damage
- Wind engineering
- Lists of tornadoes and tornado outbreaks
  - List of F4 and EF4 tornadoes
  - List of F5 and EF5 tornadoes

1. ^ Fujita, T. Theodore (February 1971) | "Proposed characterization of tornadoes and hurricanes by area and intensity". SMRP (Satellite and Mesometeorology Research Project) Research Paper 91 (Department of the Geophysical Sciences, University of Chicago, Chicago, Illinois, USA) 42 pages.
2. ^ *"Fujita Tornado Damage Scale". www.spc.noaa.gov.*
3. ^ *"Tornado Scale - The Enhanced Fujita Scale | TornadoFacts.net". www.tornadofacts.net.*
4. ^ *"Enhanced Fujita Scale". Environment Canada. May 10, 2013.*
5. ^ *Mahieu, Pierre; Wesolek, Emmanuel. "Tornado Rating in Europe with the EF-scale" (PDF). Keraunos. Retrieved January 4, 2019.*
6. ^ Jump up to:a b *Murphy, John D. (July 9, 2018). "National Weather Service Instruction 10-1605" (PDF). National Weather Service. pp. A–74–75. Retrieved November 29, 2019.*
7. ^ *"Enhanced Fujita Scale - Tornado Damage Scale". factsjustforkids.com. Retrieved June 14, 2019.*
8. ^ *"Tornado to Be 1st Assessed by New Scale". The Washington Post. Associated Press. February 2, 2007. Retrieved July 11, 2009.*
9. ^ Jump up to:a b *"The Enhanced Fujita Scale (EF Scale)". Storm Prediction Center. February 2, 2007. Retrieved June 21, 2009.*
10. ^ *"Enhanced F Scale for Tornado Damage". Storm Prediction Center. Retrieved June 21, 2009.*
11. ^ *"Storm Prediction Center WCM Data". Storm Prediction Center. Retrieved September 15, 2021.*
12. ^ *"Garrett's Blog: Mobile Home Tornado Risk". 5newsonline.com. February 28, 2013. Retrieved September 30, 2020.*
13. ^ Jump up to:a b *McDonald, James; Kishor C. Mehta (October 10, 2006). A recommendation for an Enhanced Fujita scale (EF-Scale) (PDF). Lubbock, Texas: Wind Science and Engineering Research Center, Texas Tech University. Retrieved May 21, 2013.*
14. ^ c:File:EF DI1 (SBO).jpg
15. ^ c:File:EF DI2 (FR12).jpg
16. ^ c:File:EF DI3 (MHSW).jpg
17. ^ c:File:EF DI4 (MHDW).jpg
18. ^ c:File:EF DI5 (ACT).jpg
19. ^ c:File:EF DI6 (M).jpg
20. ^ c:File:EF DI7 (MAM).jpg
21. ^ c:File:EF DI8 (SRB).jpg
22. ^ c:File:EF DI9 (SPB).jpg
23. ^ c:File:EF DI10 (SM).jpg
24. ^ c:File:EF DI11 (LSM).jpg
25. ^ c:File:EF DI12 (LIRB).jpg
26. ^ c:File:EF DI13 (ASR).jpg
27. ^ c:File:EF DI14 (ASB).jpg
28. ^ c:File:EF DI15 (ES).jpg
29. ^ c:File:EF DI16 (JHSH).jpg
30. ^ c:File:EF DI17 (LRB).jpg
31. ^ c:File:EF DI18 (MROB).jpg
32. ^ c:File:EF DI19 (HROB).jpg
33. ^ c:File:EF DI20 (IB).jpg
34. ^ c:File:EF DI21 (MBS).jpg
35. ^ c:File:EF DI22 (SSC).jpg
36. ^ c:File:EF DI23 (WHB).jpg
37. ^ c:File:EF DI 24 (ETL).jpg
38. ^ c:File:EF DI25 (FST).jpg
39. ^ c:File:EF DI26 (FSP).jpg
40. ^ c:File:EF DI27 (TH).jpg
41. ^ c:File:EF DI28 (TS).jpg
42. ^ Wind Science and Engineering Center. (2006). *A recommendation for an enhanced Fujita scale (EF-scale).* Retrieved from National Weather Service Storm Prediction Center website https://www.spc.noaa.gov
43. ^ *Doswell, Charles A.; Brooks, Harold E.; Dotzek, Nikolai (July 2009). "On the Implementation of the Enhanced Fujita Scale in the USA". Atmospheric Research.* ***93*** *(1–3): 556–557. Bibcode:2009AtmRe..93..554D. doi:10.1016/j.atmosres.2008.11.003. Retrieved January 20, 2020.*
44. ^ *Grazulis, Thomas P. (July 1993). Significant Tornadoes 1680–1991. St. Johnsbury, Vermont: The Tornado Project of Environmental Films. ISBN 1-879362-03-1.*
45. ^ The Fujita Scale of Tornado Intensity Archived December 30, 2011, at the Wayback Machine at tornadoproject.com

46. ^ *"Severe Thunderstorm Climatology". National Severe Storms Laboratory, National Oceanic and Atmospheric Administration, US Department of Commerce. March 29, 2013. Archived from the original on October 4, 2012. Retrieved May 22, 2013.*

- *Edwards, Roger; J. G. LaDue; J. T. Ferree; K. Scharfenberg; C. Maier; W. L. Coulbourne (2013). "Tornado Intensity Estimation: Past, Present, and Future". Bull. Amer. Meteor. Soc.* ***94*** *(5): 641–53. Bibcode:2013BAMS...94..641E. doi:10.1175/BAMS-D-11-00006.1. S2CID 7842905.*

External links

Wikimedia Commons has media related to ***Enhanced Fujita Scale***.

- National Oceanic and Atmospheric Administration
  - NOAA National Weather Service Improves Tornado Rating System at NOAA News
  - The Enhanced Fujita Scale (EF Scale) at Storm Prediction Center
  - EF-Scale Training Archived June 21, 2017, at the Wayback Machine at The Warning Decision Training Branch of National Weather Service (NWS)
  - The Enhanced Fujita Tornado Scale at National Climatic Data Center
  - The Tornado: An Engineering-Oriented Perspective (NWS SR147)
  - A Guide for Conducting Convective Windstorm Surveys (NWS SR146)
- Fujita Scale Enhancement Project (Wind Science and Engineering Research Center at Texas Tech University)
- Symposium on the F-Scale and Severe-Weather Damage Assessment at American Meteorological Society
- A Guide to F-Scale Damage Assessment, MetEd, University Corporation for Atmospheric Research
- Mitigation Assessment Team Report: Midwest Tornadoes of May 3, 1999 (Federal Emergency Management Agency)

Community Risk Analysis

Tornado Risk Analysis

In data compiled by FEMA, via the National Risk Index, Anderson County has a relatively high risk of tornadoes, and an expected annual loss of $4.6M, as shown in figure 5.6.2. Oconee county has a relatively moderate risk of tornadoes, with an expected annual loss of $1.7M as shown in figure 5.6.3.

Figure 5.6.2 Anderson County risk analysis

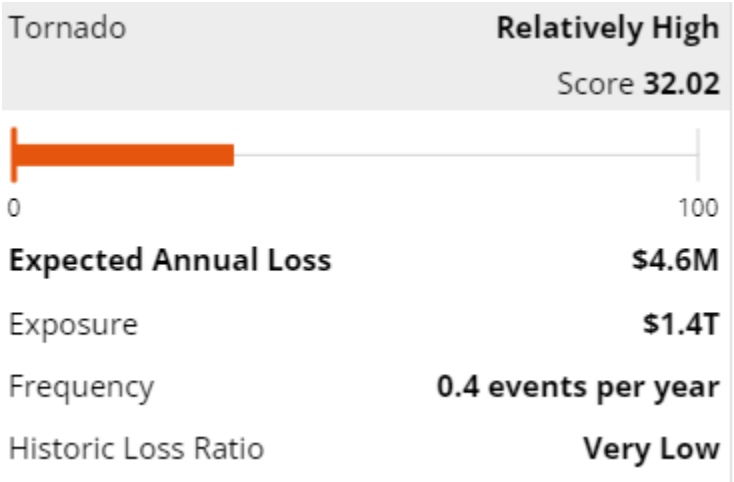
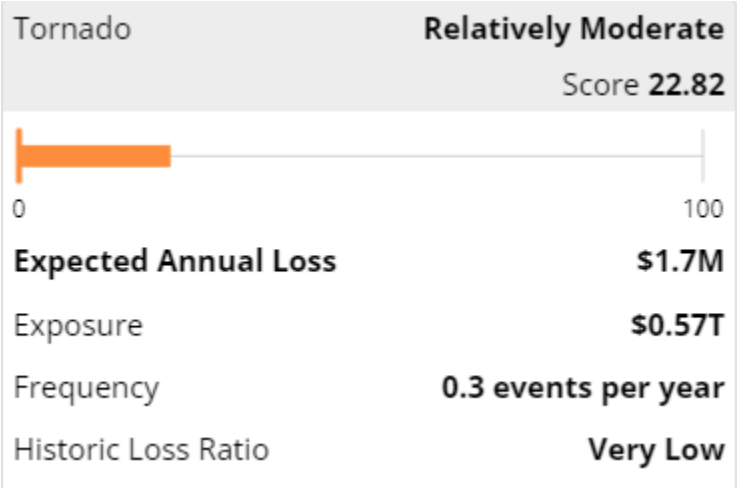


Figure 5.6.3 Oconee County risk analysis



Strong Wind Risk Analysis

In data compiled by FEMA, via the National Risk Index, Anderson County has a relatively high risk of high/ strong winds, and an expected annual loss of $0.82M, as shown in figure 5.6.4. Oconee county has a relatively low moderate risk of high/ strong winds, with an expected annual loss of $0.38M as shown in figure 5.6.5.

Figure 5.6.4 Anderson County risk analysis

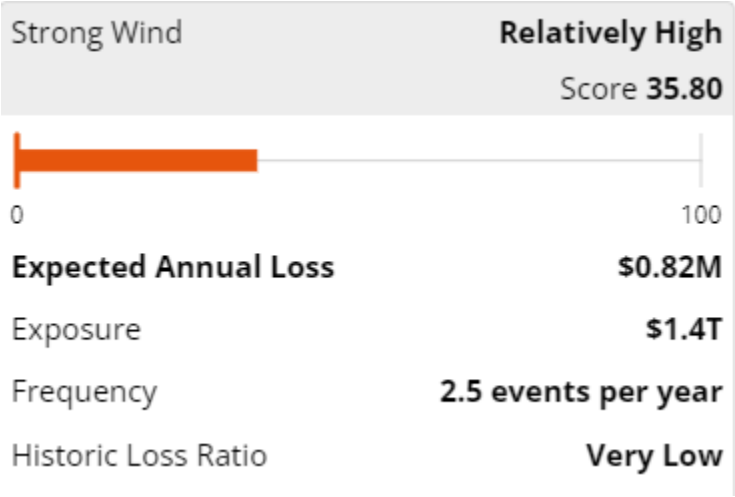
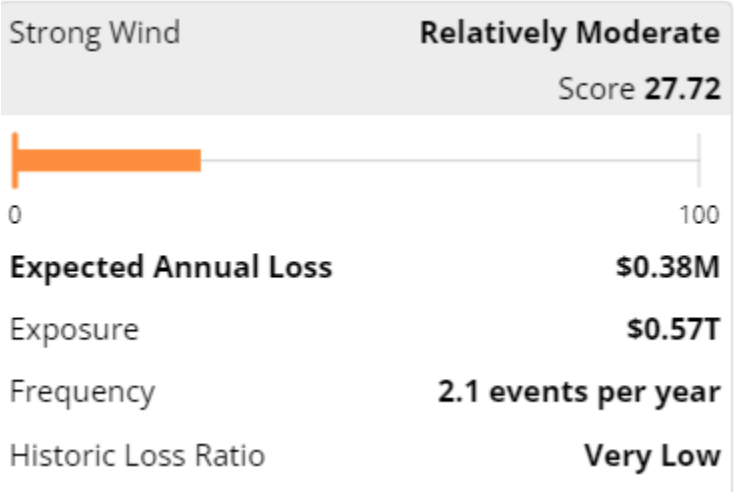


Figure 5.6.5 Oconee County risk analysis



Anderson County
Extent

Considering the frequency and intensity of Tornados in Anderson County; the future predictability frequency and intensity of Tornados is moderate as the entire county is equally susceptible to Tornados and likely to cause low to moderate crop damage, property damage and or death and injury as shown in past occurrences over the past 70+ years with the number of event days being 27 days and 22 event days causing property damage ranging from 5,000 to 1,000,000 dollars totaling over 9.158 million dollars in damage, with 0 deaths and 7 injuries. With tornado wind speeds ranging from F0 to F3.

Storm Events Database

Search Results for Anderson County, South Carolina

Event Types: **Tornado**
38 events were reported between 01/01/1950 and 01/31/2023 (26694 days)

Summary Info:

Number of County/Zone areas affected:	1
Number of Days with Event:	27
Number of Days with Event and Death:	0
Number of Days with Event and Death or Injury:	2
Number of Days with Event and Property Damage:	22
Number of Days with Event and Crop Damage:	0
Number of Event Types reported:	1

National Centers for Environmental Information (NCEI) (noaa.gov)

Considering the frequency and intensity of High Wind events in Anderson County; the future predictability frequency and intensity of High Wind events is moderate as the entire county is equally susceptible to High Wind events and likely to cause low to moderate crop damage, property damage and or death and injury as shown in past occurrences over the past 70+ years with the number of event days being 14 days and 5 event days causing property damage ranging from 5,000 to 20,000 dollars totaling over 62.69 thousand dollars in damage, with 0 deaths and 0 injuries. With wind speeds ranging from 50 to 70 kts.

Storm Events Database

Search Results for Anderson County, South Carolina

Event Types: **High Wind**
Anderson county contains the following zones:
Anderson
14 events were reported between 01/01/1950 and 01/31/2023 (26694 days)

Summary Info:

Number of County/Zone areas affected:	1
Number of Days with Event:	14
Number of Days with Event and Death:	0
Number of Days with Event and Death or Injury:	0
Number of Days with Event and Property Damage:	5
Number of Days with Event and Crop Damage:	0
Number of Event Types reported:	1

National Centers for Environmental Information (NCEI) (noaa.gov)

Anderson County has experienced 42 notable Tornado/ High Wind events from the time frame of 01/01/1960 through 01/01/2020. 12 of these notable events were tornadoes and the remaining 30 were high wind events. The tornadoes that have touched down have primarily been EF1 or EF2 tornadoes. A tornado/ high wind event is considered notable when it causes at or greater than $50,000 in combined property and crop damages. These 42 notable tornadoes/high wind events have caused 17.4 injuries to county residents and 0.00 fatalities. These notable tornadoes/ high wind events have caused a collective $24,027,941.13 in property damage and $53,605,833.9 in crop damage, adjusted for 2020 inflation.

Table 5.6.6: Anderson County Notable Tornadoes/ High Winds from 1/1/1970-1/1/2021
SHELDUS
Query results

Year	Hazard	Location	Inj	Dth	Mg	Property Damage	Crop Damage
4/2/1970	Wind	Anderson County	0.2	0	-	$67,556.61	-
5/10/1975	Wind	Anderson County	0	0	-	$13533.66	$135336.46
7/4/1975	Wind	Anderson County	0	0	-	$6,960.15	$69,601.58
4/13/1980	Tornado	Anderson County	5	0	F2	2.500M	0.00K
6/10/1982	Wind	Anderson County	0.2	0	-	$331,251.92	$331,251.92
7/2/1983	Wind	Anderson County	0	0	-	$131,586.16	-

3/28/1984	Tornado	Anderson County	8	0	F1	$4,204,678.23	$420,467.83
3/28/1984	Wind	Anderson County	0	0	-	$1,261,403.47	$126,140.35
7/3/1984	Wind	Anderson County	0	0	-	$126,140.35	-
4/23/1987	Wind	Anderson County	0	0	-	$115,369.56	$1,153.70
8/1/1988	Wind	Anderson County	0	0	-	$110,785.99	-
4/4/1989	Tornado	Anderson County	0	0	F2	$1,056,934.03	-
4/4/1989	Wind	Anderson County	0	0	-	$105,693.40	-
5/5/1989	Wind	Anderson County	0	0	-	$105,693.40	-
2/10/1990	Wind	Anderson County	0	0	-	$100,275.3	-
2/21/1993	Tornado	Anderson County	0	0	F1	$90,698.84	-
3/13/1993	Wind	Anderson County	0	0	-	$113,373.55	$113,373.55
7/8/1993	Wind	Anderson County	0	0	-	$181,397.677	-
7/25/1993	Wind	Anderson County	2	0	-	$90,698.84	-
6/26/1994	Wind	Anderson County	0	0	-	$88,434.43	-
11/11/1995	Wind	Anderson County	0	0	-	$61,426.62	-
4/26/1996	Tornado	Anderson County	0	0	F1	$125,296.20	-
9/16/1996	Tornado	Anderson County	2	0	F2	$5,011,847.81	-
9/16/1996	Tornado	Anderson County	0	0	F1	$1,670,615.94	-
9/16/1996	Tornado	Anderson County	0	0	F1	$1,670,615.94	-
8/24/2000	Wind	Anderson County	0	0	-	$152,218.14	-
6/13/2001	Wind	Anderson County	0	0	-	$740,032.86	-
7/4/2001	Wind	Anderson County	0	0	-	$2,220,098.59	-
11/11/2002	Wind	Anderson County	0	0	-	$145,702.97	-
6/6/2005	Wind	Anderson County	0	0	-	$53,685.54	-
7/3/2005	Wind	Anderson County	0	0	-	$53,685.54	-
7/7/2005	Tornado	Anderson County	0	0	F1	$201,320.77	-
10/8/2008	Wind	Anderson County	0	0	-	$121,744.54	-
4/10/2009	Tornado	Anderson County	0	0	EF1	$366,537.67	-
4/8/2010	Tornado	Anderson County	0	0	EF1	$120,207.49	-
6/15/2010	Wind	Anderson County	0	0	-	$300,518.72	-
6/25/2010	Wind	Anderson County	0	0	-	$120,207.49	-
6/2/2013	Tornado	Anderson County	0	0	EF1	$168,777.70	-
7/13/2013	Wind	Anderson County	0	0	-	$112,518.46	-
7/18/2015	Wind	Anderson County	0	0	-	$221,182.14	-
5/12/2016	Wind	Anderson County	0	0	-	$53,631.01	-
3/16/17							
4/5/2017	Wind	Anderson County	0	0	-	$105,086.20	-
			17.4	0		$24,027,941.13	$1,095,470.85

Source: Sheldus

Oconee County
Extent

Considering the frequency and intensity of Tornados in Oconee County; the future predictability frequency and intensity of Tornados is moderate to high as the entire county is equally susceptible to Tornados and likely to cause moderate to high crop damage, property damage and or death and injury as shown in past occurrences over the past 70+ years with the number of event days being 23 days and 18 event days causing property damage ranging from 5,000 to 5,000,000 dollars totaling over 106.968 million dollars in damage, with 1 deaths and 20 injuries. With tornado wind speeds ranging from F0 to F3.

Storm Events Database

Search Results for Oconee County, South Carolina

Event Types: **Tornado**
31 events were reported between 01/01/1950 and 01/31/2023 (26694 days)

Summary Info:

Number of County/Zone areas affected:	1
Number of Days with Event:	23
Number of Days with Event and Death:	1
Number of Days with Event and Death or Injury:	5
Number of Days with Event and Property Damage:	18
Number of Days with Event and Crop Damage:	1
Number of Event Types reported:	1

National Centers for Environmental Information (NCEI) (noaa.gov)

Considering the frequency and intensity of High Wind events in Oconee County; the future predictability frequency and intensity of High Wind events is moderate as the entire county is equally susceptible to High Wind events and likely to cause low to moderate crop damage, property damage and or death and injury as shown in past occurrences over the past 70+ years with the number of event days being 26 days and 10 event days causing property damage ranging from 1,000 to 500,000 dollars totaling over 615.30 thousand dollars in damage, with 1 deaths and 0 injuries. With wind speeds ranging from 50 to 70 kts.

Storm Events Database

Search Results for Oconee County, South Carolina

Event Types: **High Wind**
Oconee county contains the following zones:
Oconee Mountains, Greater Oconee
39 events were reported between 01/01/1950 and 01/31/2023 (26694 days)

Summary Info:

Number of County/Zone areas affected:	4
Number of Days with Event:	26
Number of Days with Event and Death:	1
Number of Days with Event and Death or Injury:	1
Number of Days with Event and Property Damage:	10
Number of Days with Event and Crop Damage:	0
Number of Event Types reported:	1

National Centers for Environmental Information (NCEI) (noaa.gov)

Oconee County has experienced 23 notable Tornado/ High Wind events from the time frame of 01/01/1960 through 12/31/2021.

Table 5.6.7: Oconee County Notable Tornadoes/ High Winds from 1/1/1970-1/1/2021
SHELDUS
Query results

Year	Hazard	Location	Mag	Inj	Dth	Property Damage	Crop Damage
12/3/1971	*Wind/ Winter Weather	Oconee County	-	0	0	$70348.83	$70348.83
5/27/1973	Tornado	Oconee County	F2	1	0	$295,179.78	$295.18
6/14/1974	Wind	Oconee County	-	0	0	$531.68	$531,682.84
5/10/1975	Wind	Oconee County	-	0	0	$13,533.66	$135,336.46
7/4/1975	Wind	Oconee County	-	0	0	$6960.15	$69,601.58
6/10/1982	Wind	Oconee County	-	0.2	0	$3331,251.92	$331,251.92
4/4/1989	Tornado	Oconee County	F2	0	0	$105,693.40	$1,056.93
5/5/1989	Tornado	Oconee County	F1	0	0	$105,693.40	$105,693.40
6/5/1989	Wind	Oconee County	-	0	0	$105,693.40	-
2/10/1990	Tornado	Oconee County	F1	1	0	$240,660.73	-
3/13/1993	Wind	Oconee County	-	0	0	$113,373.55	$113,373.55
7/27/1993	Wind	Oconee County	-	0	0	$90,698.84	-

3/27/1994	Tornado	Oconee County	F3	12	0	$5,306,065.60	$4,421,721.33
3/27/1994	Wind	Oconee County	-	0	0	$88,434.43	-
6/26/1994	Tornado	Oconee County	F2	1	0	$442,172.13	-
11/11/1995	Wind	Oconee County	-	0	0	$61,426.62	-
9/16/1996	Tornado	Oconee County	-	0	0	$334,123.19	-
4/28/2002	Wind	Oconee County	-	0	0	$72,851.48	-
9/16/2004	Tornado	Oconee County	F1	0	0	$72,851.48	-
4/16/2007	Wind	Oconee County	60 kts	0	1	$632,094.90	-
3/16/2017	*Wind/ Winter Weather	Oconee County	-	0	0	-	$52,543,097.72
4/13/2020	Tornado	Oconee County	EF3	5	1	$100.000M	-
				20.2	2	109,498,033.28	110,877,616.14

Source: Sheldus *Hazard may be repeated in another section

5.7 Drought/Heatwave

Background

Drought is a period of abnormally dry weather which persists long enough to produce a serious hydrologic imbalance (for example, crop damage, water supply shortage, etc.). The severity of the drought depends upon the degree of moisture deficiency, the duration and the size of the affected area.

There is no precise definition to the term drought, as it is subjective. It is one of those words that you know when one is happening if it is intense, but it is difficult to put into terms that are applicable to all people.
Here are a few ways that drought can be described:

1. Below normal precipitation for several months
2. Agriculture has insufficient supply of precipitation
3. Economy is suffering from a temporary shortage of water

A heat wave is a meteorological condition in which hot temperatures, often combined with high dew-points, produce a large heat index value that exists from days to weeks. Heat waves are often associated with blocking patterns in the atmosphere. A heat wave puts an extreme stress on outdoor activities, those without air-conditioning, and vegetation. Heat waves are often accompanied by “drought-like” conditions.

Location

Anderson and Oconee Counties experienced a severe drought between 1998 and 2003. Other droughts have occurred in this region during 1931-1935, 1954-1957, 1983, 1986, and 1993. Crop and Livestock Feed Assessment Reports confirm the droughts of the summer have devastated crops and pastures in the Counties. Soybeans and other crops have burned up due to extreme heat and below normal rainfall. Pastures and hay crops were extremely short with poor prospects for fall. There are few, if any, cases, of livestock deaths due to

droughts. Droughts are region-wide natural disaster and will be addressed that way. There is no location mapping for droughts in this region.

Community Risk Analysis

Drought Risk Analysis

In data compiled by FEMA, via the National Risk Index, Anderson County has a relatively low risk of drought, and an expected annual loss of $92M, as shown in figure 5.7.1. Oconee county has a relatively moderate risk of drought, with an expected annual loss of $0.80M as shown in figure 5.7.2.

Figure 5.7.1 Anderson County risk analysis

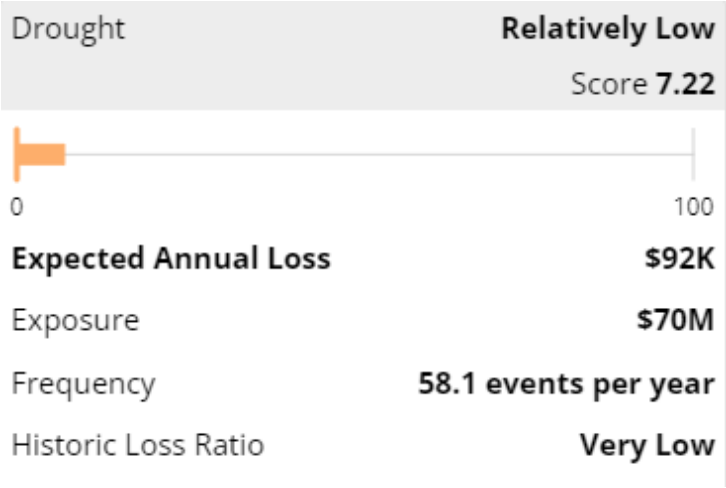


Figure 5.7.2 Oconee County risk analysis

Drought	Relatively Moderate
	Score **14.84**

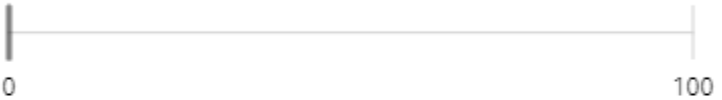
Expected Annual Loss	**$0.80M**
Exposure	**$0.14B**
Frequency	**52.7 events per year**
Historic Loss Ratio	**Very Low**

Heatwave Risk Analysis

In data compiled by FEMA, via the National Risk Index, Anderson County has no risk of heatwave, and an expected annual loss of $0.00M, as shown in figure 5.7.3. Oconee county has no risk of heatwave, with an expected annual loss of $0.00M as shown in figure 5.7.4.

Figure 5.7.3 Anderson County risk analysis

Heat Wave	No Expected Annual Losses
	Score **0.00**



Expected Annual Loss	**$0.00**
Exposure	**$0.00**
Frequency	**0 events per year**
Historic Loss Ratio	**No Rating**

Figure 5.7.4 Oconee County risk analysis

Heat Wave	No Expected Annual Losses
	Score **0.00**

0 100

Expected Annual Loss	**$0.00**
Exposure	**$0.00**
Frequency	**0 events per year**
Historic Loss Ratio	**No Rating**

Anderson County
Extent

Considering the frequency and intensity of Drought events in Anderson County; the future predictability frequency and intensity of Drought events is low as the entire county is equally susceptible to Drought events and likely to cause low crop damage, property damage and or death and injury as shown in past occurrences over the past 70+ years with the number of event days being 40 days and 0 event days causing property damage ranging from 0 dollars in damage, with 0 deaths and 0 injuries.

Storm Events Database

Search Results for Anderson County, South Carolina

Event Types: Drought
Anderson county contains the following zones:
Anderson
40 events were reported between 01/01/1950 and 01/31/2023 (26694 days)

Summary Info:

Number of County/Zone areas affected:	1
Number of Days with Event:	40
Number of Days with Event and Death:	0
Number of Days with Event and Death or Injury:	0
Number of Days with Event and Property Damage:	0
Number of Days with Event and Crop Damage:	0
Number of Event Types reported:	1

National Centers for Environmental Information (NCEI) (noaa.gov)

Considering the frequency and intensity of Heat events in Anderson County; the future predictability frequency and intensity of Heat events is low as the entire county is equally susceptible to Heat events and likely to cause low crop damage, property damage and or death and injury as shown in past occurrences over the past 70+ years with the number of event days being 5 days and 0 event days causing property damage ranging from 0 dollars in damage, with 4 deaths and 0 injuries.

Storm Events Database

Search Results for Anderson County, South Carolina

Event Types: Heat
Anderson county contains the following zones:
Anderson
6 events were reported between 01/01/1950 and 01/31/2023 (26694 days)

Summary Info:

Number of County/Zone areas affected:	1
Number of Days with Event:	5
Number of Days with Event and Death:	3
Number of Days with Event and Death or Injury:	3
Number of Days with Event and Property Damage:	0
Number of Days with Event and Crop Damage:	0
Number of Event Types reported:	1

National Centers for Environmental Information (NCEI) (noaa.gov)

Anderson County has experienced 8 notable drought/ heat events from the time frame of 01/01/1970 thru 01/01/2021. A drought/ heat event is considered notable when it causes at or greater than $50,000 in combined property and crop damages. These have been 8 notable drought/heat events have caused 0.00 injuries to county residents and 0.00 fatalities. These notable drought/heat events have caused a collective $10,670,605.95 in property damage and $18,387,162.37 in crop damage, adjusted for 2020 inflation.

Table 5.7.5: Anderson County Notable Drought/ Heat Events from 1/1/1970- 1/1/2021

SHELDUS
Query results

Date	Hazard	Crop Damage (ADJ)	Fatalities	Injuries	Property Damage (ADJ)
7/1/77	Drought/ Heat	470,152.88	0	0	4701.54
6/1/85	Heat	264,788.71	0	0	0
7/1/86	Drought	2,599,568	0	0	259,956.79
6/1/93	Heat	1,971,713.85	0	0	0
7/1/93	Drought/ Heat	0	0	0	10,410,649.16
8/1/93	Drought/ Heat	10,410,649.16	0	0	0
5/1/94	Drought	1,922,487.53	0	0	0
5/1/95	Drought	747,802.24	0	0	0
Total		18,387,162.37	0	0	10,675,307.49

Source: Spatial Hazard Event and Losses Database (SHELDUS) for the United States. Arizona State University

Table 5.7.6: Average Maximum Temperature in Anderson County

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Avg. Max (°F)	51.6	55.5	63.1	71.9	79.6	86.5	88.9	87.8	82.2	72.7	62.2	54

Data: 1991-2021 Source: en.climate-data.org

Table 5.7.7: Highest Recorded Temperature in Anderson County

Location	Date	Temperature (°F)
Anderson	07/29/1952	108

https://www.dnr.sc.gov/climate/sco/ClimateData/data/max_temp_table.php

Table 5.7.8: Summary of Drought Occurrences in Anderson County

Year	Highest Drought Condition	Number of Weeks
2000	Exceptional Drought	5
2001	Extreme Drought	12
2002	Exceptional Drought	5
2003	None	-
2004	Severe Drought	5
2005	Abnormally Dry	8
2006	Severe Drought	6
2007	Exceptional Drought	16
2008	Exceptional Drought	33

2009	Extreme Drought	11
2010	Moderate Drought	17
2011	Extreme Drought	17
2012	Extreme Drought	12
2013	Severe Drought	8
2014	Abnormally Dry	25
2015	Abnormally Dry	14
2016	Exceptional Drought	6
2017	Extreme Drought	11
2018	Abnormally Dry	12
2019	Extreme Drought	4
2020	None	-
2021	Abnormally Dry	6

Source: United States Drought Monitor

Vulnerability

Anderson County

Overall, Anderson County has a low vulnerability to drought as it relates to property and crop damage at or greater than $50,000. Yet, Anderson County experiences long durations of drought 21-27 weeks per year (U.S. Drought Monitor, 2017). There is a 7% probability that the region would suffer a drought that would cause at or greater than $50,000 of property or crop damage in any one-year time frame. Droughts can greatly affect the agricultural production of the area as well as affect water treatment and wastewater treatment operations. This can have additional impacts that affect the ability of the region to function. Overall, the County's vulnerability to a damaging drought event is low.

Recommendation:

Local governments should adopt water conservation ordinances that limit the amount of water that residents may use during a period of drought. Local governments should develop water monitoring plans as an early warning system. Local governments should inventory and review their reservoir operation plans. A water conservation awareness program should be presented to the public either through pamphlets, workshops or a drought information center. Voluntary water conservation should be encouraged. Local governments should continually look for and fund water system improvements, new systems and new wells. Local governments would certainly benefit from an education program to inform citizens of likely locations and dangers of droughts.

Drought/ Heat Events: Oconee County

Oconee County
Extent

Considering the frequency and intensity of Drought events in Oconee County; the future predictability frequency and intensity of Drought events is low as the entire county is equally susceptible to Drought events and likely to cause low crop damage, property damage and or death and injury as shown in past occurrences over the past 70+ years with the number of event days being 40 days and 0 event days causing property damage ranging from 0 dollars in damage, with 0 deaths and 0 injuries.

Storm Events Database

Search Results for Oconee County, South Carolina

Event Types: Drought
Oconee county contains the following zones:
Oconee Mountains, Greater Oconee
77 events were reported between 01/01/1950 and 01/31/2023 (26694 days)

Summary Info:

Number of County/Zone areas affected:	4
Number of Days with Event:	40
Number of Days with Event and Death:	0
Number of Days with Event and Death or Injury:	0
Number of Days with Event and Property Damage:	0
Number of Days with Event and Crop Damage:	0
Number of Event Types reported:	1

National Centers for Environmental Information (NCEI) (noaa.gov)

Considering the frequency and intensity of Heat events in Oconee County; the future predictability frequency and intensity of Heat events is low as the entire county is equally susceptible to Heat events and likely to cause low crop damage, property damage and or death and injury as shown in past occurrences over the past 70+ years with the number of event days being 3 days and 0 event days causing property damage ranging from 0 dollars in damage, with 1 deaths and 0 injuries.

Storm Events Database

Search Results for Oconee County, South Carolina

Event Types: Heat

Oconee county contains the following zones:
Oconee Mountains, Greater Oconee
3 events were reported between 01/01/1950 and 01/31/2023 (26694 days)

Summary Info:

Number of County/Zone areas affected:	2
Number of Days with Event:	3
Number of Days with Event and Death:	1
Number of Days with Event and Death or Injury:	1
Number of Days with Event and Property Damage:	0
Number of Days with Event and Crop Damage:	0
Number of Event Types reported:	1

National Centers for Environmental Information (NCEI) (noaa.gov)

Oconee County has experienced 8 notable drought/ heat events from the time frame of 01/01/1970 thru 01/01/2021. A drought/ heat event is considered notable when it causes at or greater than $50,000 in combined property and crop damages. There have been 8 notable drought/ heat events have caused 0.00 injuries to county residents and 0.00 fatalities. These notable drought/ heat events have caused a collective $10,675,307.49 in property damage and $18,387,162.37 in crop damage, adjusted for 2020 inflation.

Table 5.7.9: Oconee County Notable Drought/ Heat Events from 1/1/1970- 1/1/2021
SHELDUS
Query results

Date	Hazard	Crop Damage (ADJ)	Fatalities	Injuries	Property Damage (ADJ)
5/1/95	Drought	747,802.24	0	0	0
5/1/94	Drought	1,922,487.53	0	0	0
7/1/86	Drought	2,599,568	0	0	259,956.79
8/1/93	Drought/ Heat	10,410,649.16	0	0	0
7/1/93	Drought/ Heat	0	0	0	10,410,649.16
7/1/77	Drought/ Heat	470,152.88	0	0	4,701.54
6/1/93	Heat	1,971,713.85	0	0	0
6/1/85	Heat	264,788.71	0	0	0
Total		**18,387,162.37**	**0**	**0**	**10,675,307.49**

Source: Spatial Hazard Event and Losses Database (SHELDUS) for the United States. Arizona State University

Table 5.7.10: Average Maximum Temperature in Oconee County

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Avg. Max (°F)	51.1	54.8	62.4	70.8	78.4	85.5	88	87.1	81.4	71.8	61.5	53.4

Data: 1991-2021 Source: en.climate-data.org

Table 5.7.11: Highest Recorded Temperature in Oconee County

Location	Date	Temperature (°F)
Walhalla	09/07/1925	108

https://www.dnr.sc.gov/climate/sco/ClimateData/data/max_temp_table.php

Table 5.7.12: Summary of Drought Occurrences in Oconee County

Year	Highest Drought Condition	Number of Weeks
2000	Exceptional Drought	3
2001	Extreme Drought	14
2002	Exceptional Drought	3
2003	None	-
2004	Moderate Drought	7
2005	Abnormally Dry	5
2006	Severe Drought Moderate Drought	1 29
2007	Exceptional Drought	19
2008	Exceptional Drought	31
2009	Extreme Drought	11
2010	Abnormally Dry	26
2011	Extreme Drought	11
2012	Severe Drought	20
2013	Moderate Drought	3
2014	Abnormally Dry	16
2015	Moderate Drought	7
2016	Exceptional Drought	3
2017	Extreme Drought	11
2018	Abnormally Dry	10
2019	Extreme Drought	3
2020	Abnormally Dry	1
2021	Abnormally Dry	5

Source: United States Drought Monitor

Oconee County

Overall, Oconee County has a low vulnerability to drought as it relates to property and crop damage at or greater than $50,000. Yet, Oconee County experiences long durations of drought 18-21 weeks per year (U.S. Drought Monitor, 2017). There is a 15% probability that the region would suffer a drought that would cause at or greater than $50,000 of property or crop damage in any one-year time frame. Droughts can greatly affect the agricultural production of the area as well as affect water treatment and wastewater treatment operations. This can have additional impacts that affect the ability of the region to function. Overall, using the $50,000 threshold, the County's vulnerability to a damaging drought event is low.

Recommendation:

Local governments should adopt water conservation ordinances that limit the amount of water that residents may use during a period of drought. Local governments should develop water monitoring plans as an early warning system. Local governments should inventory and review their reservoir operation plans. A water conservation awareness program should be presented to the public either through pamphlets, workshops or a drought information center. Voluntary water conservation should be encouraged. Local governments should continually look for and fund water system improvements, new systems and new wells. Local governments would certainly benefit from an education program to inform citizens of likely locations and dangers of droughts.

5.8 Flood

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.[1]

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 timeframe 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.[2]

[1] https://www.govinfo.gov/content/pkg/GAOREPORTS-GAO-04-401T/html/GAOREPORTS-GAO-04-401T.htm

[2] https://www.usgs.gov/faqs/what-are-two-types-floods

Flooding is one of the moderate priority natural hazards in each County. This is largely due to the physical geography of the county, which includes several rivers and creeks as well as a varied topography. Identification of floodplain areas within the county and the incorporated municipalities was based on the most recent Flood Insurance Rate Maps (FIRM) produced by FEMA. These maps display the locations of all of the major water bodies in the county and delineate the 100-year floodplain boundaries. There are areas that
have a one percent chance of equaling or exceeding the recorded base flood elevation during any year. Based on these maps, each county and municipality have 100-year floodplains within their jurisdictions. Each community may also have additional flooding problems not represented on the floodplain maps. Nuisance flooding impacts many roads due to poorly designed and maintained drainage systems. Rivers and creeks designated as flood prone areas include but are not limited to the following: Beaver Dam Creek, Rocky Creek. Potential flooding impact in or near the City of Anderson and Seneca are the areas most noted for potential flooding problems.

Flash Flood – A flood which is caused by heavy or excessive rainfall in a short period of time, generally less than 6 hours. Also, at times a dam failure can cause a flash flood, depending on the type of dam and time period during which the break occurs.

Flash Flood Watch - Issued to indicate current or developing hydrologic conditions that are favorable for flash flooding in and close to the watch area, but the occurrence is neither certain or imminent. Flash Flood Warning – Issued to inform the public, emergency management, and other cooperating agencies that flash flooding is in progress, imminent or highly likely. (http://www.noaawatch.gov/themes/severe.php)

Flood Risk Analysis

In data compiled by FEMA, via the National Risk Index, Anderson County has a relatively low risk of riverine flooding, and an expected annual loss of $0.48M, as shown in figure 5.8.1. Oconee county has a relatively low risk of riverine flooding, with an expected annual loss of $0.21M as shown in figure 5.4.3.

Figure 5.8.1 Anderson County risk analysis

Riverine Flooding	**Relatively Low**
	Score **9.88**

Expected Annual Loss	**$0.48M**
Exposure	**$20B**
Frequency	**1.7 events per year**
Historic Loss Ratio	**Very Low**

Figure 5.8.2 Oconee County risk analysis

Riverine Flooding	**Relatively Low**
	Score **7.51**

Expected Annual Loss	**$0.21M**
Exposure	**$7.7B**
Frequency	**1 event per year**
Historic Loss Ratio	**Very Low**

Estimate of Potential Losses (Risk Assessment)

This section describes the risks to each County, including its citizens, residential, government and commercial assets, and County operations. As noted above, risk is an expression of expected future monetary losses resulting from the impacts of natural hazards. Risk assessment methodologies differ based on the nature of data that is available, the hazard, and the way that the results are expressed. The sections below provide brief descriptions of the methodologies.

Flood Risk in each County

This subsection describes how each county, and its municipalities participate in and continued plans for participation in the National Flood Insurance Program (NFIP). Most of the municipalities that participate in the NFIP have memorandums of understanding with the County for floodplain management duties and enforcement of the County flood damage prevention ordinances within their corporate limits. Those municipalities not participating in the NFIP generally follow the County flood management ordinance as outlined in Table 5.3.2-4 in Chapter 5.

Also, this subsection of the Plan provides estimates of future flood losses, i.e., risk. Each of the loss calculations is based on best available data, but they must be considered estimates because highly detailed engineering studies were not performed as part of this planning process. The present section is intended to provide a moderately-detailed overview of risk in each County.

Flood Risk Assessment Method 1
Analysis of NFIP Repetitive Loss and Severe Repetitive Loss Data:

The first risk assessment method is based on analysis of (NFIP) data on repetitive flood loss properties. The NFIP defines repetitive loss properties as those that have received at least two NFIP insurance payments of more than $1,000 each in any rolling ten-year period. As of 2010, Anderson County had 3 such properties, based on a query of the Department of Natural Resources (CIS). Of this total, there are 3 residential and 0 non-residential properties.

Table 5.8.3 (Anderson County) and table 5.8.4 (Oconee County) summarizes the NFIP claims value and number of claims statistics for both residential and non-residential repetitive loss properties. The Table indicates that 100% percent of paid claims are associated with residential building damages.

Table 5.8.3 Summary of Residential and Non-Residential NFIP Repetitive; Loss Statistics, Anderson County:

Repetitive Loss Category	Properties	Building	Contents	Total	# of Claims	Average
Residential	3	$67,225.00	$0000000	$67,225.00	3	$22,408.33
Non-Residential	0	$0000000	$000000	$00000000	0	$00000000
Grand Total	**3**	**$67,225.00**	**$0000000**	**$67,225.00**	3	**$22,408.33**

There are 5,340 properties in Anderson County that have greater than a 26% chance of being severely affected by flooding over the next 30 years. This represents 5% of all properties in the county (Flood Factor).

Oconee County has filed no repetitive loss claims. There are 3,571 properties in Oconee County that have greater than a 26% chance of being severely affected by flooding over the next 30 years. This represents 6% of all properties in the county (Flood Factor).

Since the 2012 Flood Risk Assessment Analysis update, in which 3 residential priorities experienced repetitive loss to the amount of $67,226.00, there have been no reported loss claims to Anderson County. Additionally, Oconee County has filed no repetitive loss claims.

All municipalities within Anderson and Oconee Counties, including the unincorporated areas, are members of the National Flood Insurance Program (NFIP), with the exceptions of Starr, West Union, Pelzer, and Salem. The municipalities who do participate in the NFIP adopt and enforce floodplain management requirements, rely on updated floodplain maps, and regulate new construction in Special Flood Hazard Areas. (See Table 5.3.2-4). **(**Department of Natural Resources (CIS –Report/CID#450013).

Federal Emergency Management Agency
Community Status Book Report
SOUTH CAROLINA
Communities Not in the National Flood Program

FEMA

Community Status Book Report

Communities Not in the National Flood Program

SOUTH CAROLINA

CID	Community Name	County	Init FHBM Identified	Init FIRM Identified	Curr Eff Map Date	Sanction Date	Tribal	CRS Entry Date	Curr Eff Date	Curr Class	% Disc SFHA	% Disc Non SFHA
450148#	BLENHEIM, TOWN OF	MARLBORO COUNTY	08/12/77	06/16/11	06/16/11	08/12/78	No					
450234B	BONNEAU, TOWN OF	BERKELEY COUNTY		10/16/03	12/07/18	10/16/04	No					
450162#	BRANCHVILLE, TOWN OF	ORANGEBURG COUNTY	06/07/74	02/01/80	01/16/14	02/04/88(S)	No					
450202#	CALHOUN FALLS, TOWN OF	ABBEVILLE COUNTY		03/03/11	03/03/11	03/03/12	No					
450077B	COWARD, TOWN OF	FLORENCE COUNTY	05/31/74	12/16/04	12/16/14	05/31/75	No					
450286#	COWPENS, TOWN OF	SPARTANBURG COUNTY		01/06/11	01/06/11	01/06/12	No					
450239#	EUTAWVILLE, TOWN OF	ORANGEBURG COUNTY		01/16/14	01/16/14	01/16/15	No					
450260A	GASTON, TOWN OF	LEXINGTON COUNTY		07/17/95	07/05/18	07/17/96	No					
450220B	JAMESTOWN, TOWN OF	BERKELEY COUNTY	02/07/75	10/16/03	12/07/18	02/07/76	No					
450289#	JONESVILLE, TOWN OF	UNION COUNTY		08/02/11	08/02/11	08/02/12	No					
450276#	LITTLE MOUNTAIN, TOWN OF	NEWBERRY COUNTY		09/16/11	09/16/11	09/16/12	No					
450150#	MCCOLL, TOWN OF	MARLBORO COUNTY	07/25/75	06/16/11	06/16/11	07/25/76	No					
450243#	MCCONNELLS, TOWN OF	YORK COUNTY		09/26/08	09/26/08	09/26/09	No					
450199#	NORRIS, TOWN OF	PICKENS COUNTY		04/16/08	04/16/08	04/16/09	No					
450154#	PEAK, TOWN OF	NEWBERRY COUNTY		09/16/11	09/16/11	09/16/12	No					
450018#	PELZER, TOWN OF	ANDERSON COUNTY	06/18/76	09/29/11	09/29/11	06/18/77	No					
450299#	POMARIA, TOWN OF	NEWBERRY COUNTY		09/16/11	09/16/11	09/16/12	No					
450277#	PROSPERITY, TOWN OF	NEWBERRY COUNTY		09/16/11	09/16/11	09/16/12	No					
450071A	RIDGEVILLE, TOWN OF	DORCHESTER COUNTY	05/31/74	07/18/17	07/18/17	05/31/75	No					
450212B	SALEM, TOWN OF	OCONEE COUNTY	11/08/74	09/11/09	12/21/17	11/08/75	No					
450155#	SILVERSTREET, TOWN OF	NEWBERRY COUNTY	01/24/75	09/16/11	09/16/11	01/24/76	No					
450057A	SMOAKS, TOWN OF	COLLETON COUNTY	09/06/74	11/07/01	12/21/17	09/06/75	No					
450072A	ST. GEORGE, TOWN OF	DORCHESTER COUNTY	07/23/76	07/18/17	07/18/17	07/23/77	No					
450273#	ST. MATTHEWS, TOWN OF	CALHOUN COUNTY		04/16/07	04/16/07	04/16/08	No					
450247#	STARR, TOWN OF	ANDERSON COUNTY		09/29/11	09/29/11	09/29/12	No					
450287B	WELLFORD, CITY OF	SPARTANBURG COUNTY		01/06/11	05/04/21	01/06/12	No					
450278B	WEST UNION, TOWN OF	OCONEE COUNTY		09/11/09	12/21/17	09/11/10	No					
450272#	WILLISTON, TOWN OF	BARNWELL COUNTY		09/29/10	09/29/10	09/29/11	No					
450292#	WINNSBORO, TOWN OF	FAIRFIELD COUNTY		05/03/11	05/03/11	05/03/12	No					

Summary:

Total Not in Flood Program	29
Total Suspended from Emergency Program	0
Total Suspended from Regular Program	1
Total Withdrawn Communities Not In Program	0
Total Not In Program With Hazard Area Identified	29
Total Not In Program With Hazard Area Identified < 1 Year	0

2023 Data from: Fema.gov. (n.d.). Retrieved January 31, 2023, from https://www.fema.gov/cis/SC.html#comm_not_part_id

Historical Data

Anderson County
Extent

Considering the frequency and intensity of Flood events in Anderson County; the future predictability frequency and intensity of Flood events is low as the entire county is equally susceptible to Flood events and likely to cause

low to moderate crop damage, property damage and or death and injury as shown in past occurrences over the past 70+ years with the number of event days being 15 days and 5 event days causing property damage ranging from 50,000 to 100,000 dollars in damage for a total of over 602,000 dollars in property damage, with 0 deaths and 0 injuries.

Storm Events Database

Search Results for Anderson County, South Carolina

Event Types: **Flood**
Anderson county contains the following zones:
Anderson

15 events were reported between 01/01/1950 and 01/31/2023 (26694 days)

Summary Info:

Number of County/Zone areas affected:	2
Number of Days with Event:	15
Number of Days with Event and Death:	0
Number of Days with Event and Death or Injury:	0
Number of Days with Event and Property Damage:	5
Number of Days with Event and Crop Damage:	0
Number of Event Types reported:	1

National Centers for Environmental Information (NCEI) (noaa.gov)

Anderson County has experienced 15 notable flooding events from the time frame of 01/01/1960 thru 01/01/2021. A flooding event is considered notable when it causes at or greater than $50,000 in combined property and crop damages. These 15 notable flooding events have caused 1.83 injuries to county residents and 0.5 fatalities. These flooding events have caused a collective $3,731,112.02 in property damage and $447,590.73 in crop damage, adjusted for 2020 inflation.

Table 5.8.3: Anderson County Notable Flooding Events from 1/1/1970- 1/1/2021
SHELDUS
Query results

Date	Hazard	Crop Damage (ADJ)	Fatalities	Injuries	Property Damage (ADJ)
2/6/20	Flooding	0	0	0	500000

2/6/20	Flooding	0	0	0	500000
9/13/14	Flooding	0	0	0	55361.17
9/27/04	Flooding	0	0	0	69380.53
6/25/04	Flooding	0	0	0	138761.06
6/21/04	Flooding	0	0	0	69380.53
6/18/03	Flooding	0	0	0	356140.82
3/6/03	Flooding	0	0	0	142456.33
4/17/98	Flooding	0	0	0	771886.06
8/27/95	Flooding	0	0	0	429986.29
8/12/91	Flooding	0	0	0	384904.02
10/1/89	Flooding	0	0	0	105693.4
10/9/76	Flooding	50072.54	0	0	50072.54
9/18/75	*Flooding/ Lightning/ Severe Storm/Thunderstorm	12180.28	0.5	1.5	1218028.07
10/8/76	*Flooding/ Severe Storm/Thunderstorm	38388.92	0	0.33	383889.32
Total		**100,641.74**	**.5**	**1.83**	**5,175,940.14**

Source: Spatial Hazard Event and Losses Database (SHELDUS) for the United States. Arizona State University
*Hazard may be repeated in another section

Anderson

Location and Extent
Anderson – County comms reported Whitner Creek overflowed its banks on the west side of downtown Anderson after more than three inches of rain fell in only a couple of hours. Multiple homes were flooded along Cunningham Dr, with additional property damage reported nearby along Mimosa Park. The exact flood depths were not available.

Antreville and Lake Secession area - County comms and emergency management reported flash flooding developed over northern Abbeville County after 4 to 6 inches of rain fell over just a couple of hours in association with a slow moving thunderstorm cluster. Flash flooding was most concentrated in the Antreville and Lake Secession area, where multiple roads were flooded and some damaged due to inundation. These included Lake Secession Rd, Highway 284, and a portion of Highway 28. A few water rescues occurred in these areas as well. Gilgal Church Rd was also flooded north of Abbeville. The exact flood depths were not available.

Belton - Blake Dairy Road was flooded at Broad Mouth Creek. The exact flood depths were not available.

Campbell and Honea Path - Pea Creek came up again, flooding and closing James Cox Road for a second time during the day. The exact flood depths were not available.

Denver - County comms reported flash flooding developed over northeast Anderson County after 3 to 5 inches of rain fell in just a couple of hours in association with a slow-moving thunderstorm. Affected streams included Jones Creek, which inundated Scotts Bridge Rd and also completely washed out Shackleburg Rd. A motorist was briefly trapped and

had to be rescued after high water swept away his vehicle on Scotts Bridge Rd. A couple of other vehicles were also trapped in high water in this area. Hurricane Creek also inundated Highway 17, causing the highway to be closed for some time. The exact flood depths were not available.

Equinox Mill - A slow moving thunderstorm dropped around three inches of rain in an hour, resulting in urban flooding in the city. Several people were rescued from vehicles on Murray Ave. The bridge on W Franklin St was under 2 feet of water, and water entered several homes in this area, requiring rescue of the occupants. Other areas affected included Greenville St, Bellevue Rd, and Boulevard Rd.

Gluck and Iva - County comms reported some flooding developed across the southern part of the county after more than 3 inches of rain fell in around 36 hours, with much of that falling on the morning of the 2nd. Clinkscales Rd was impassable due to high water near Airline Rd south of Anderson. Sexton Gin Rd was also flooded near Sullivan Rd in Iva, possibly due to water from Wilson Creek. The exact flood depths were not available.

Homeland Park - Big Generostee Creek flooded and closed the Highway 28 bypass. The exact flood depths were not available.

La France – Portions of Shackleford Road were covered by water, especial around Jones Creek. The exact flood depths were not available.

Pelzer and Powdersville - Although heavy rainfall steadily tapered off across the area through the afternoon into the evening, flooding continued along the Eighteen Mile Creek and Saluda River basins into the evening, with major flooding developing along the Saluda in the west Greenville by late evening. Several homes were inundated with water, including along Lakeview Dr in Powdersville, Guy St and Adger St in Pelzer. Flooding persisted along the Saluda through the 7th. The exact flood depths were not available.

Pendleton - Seven-and-a-half inches of rain fell in 3 hours along the Anderson/Pickens County line just after midnight on the nineteenth. The result was flooding of numerous bridges, roads, and buildings. A vehicle was swept from a road by rushing water, and the driver required rescuing. Trees were washed away along highways 8, 81 and 178. The exact flood depths were not available.

Piedmont - A stream flooded River Road and Holiday Road to a depth of 4 feet.

Townville - Pearman Dairy Road/SC28 flooded near Westside High School. A foot of water was flowing over the road with a car in a ditch at the intersection of Old Asbury Road and Whitehall Road (7 W Anderson). Flooding at the intersection of highway 24 and New Hope Road (6 W Anderson). A sink hole opened up on Hattons Ford Road during very heavy rain. Two utility trucks were damaged after driving into the hole which was about 3 feet deep and spanned the entire road (4.5 SE Townville). Indian Trail Road near highway 24 was flooded by a stream near highway 24.

West Anderson - Although most of the flooding was of the urban/poor drainage variety, at least two creeks were involved, including Whitner and Cox Creeks. Affected roads included Southwood St (due to Whitner Creek) and Rantowles Rd (due to Cox Creek), where water entered some homes. At least a half dozen additional streets were closed in the city due to urban flooding. These included Susan St and Booker St, which were covered by as much as 3 feet of water.

Williamston - Numerous creeks overflowed their banks. Several roads were flooded on the west side of the city, either due to poor drainage, or overflowing streams. The exact flood depths were not available.

Previous Occurrences and Impact

According to NCEI and SHELDUS, from 1996 to 2021, Anderson County experienced 12 loss causing flood-related events. The events occurred throughout Anderson County resulting in $2.655 million in property damage. Please see the Location and Extent section for more information on loss causing and non-loss causing flooding events' impact on Anderson County.

Date	Hazard	Location	Crop Damage (ADJ)	Fatalities	Injuries	Property Damage (ADJ)
10/7/21	Flooding	Denver	0	0	0	1000
10/7/21	Flooding	Denver	0	0	0	50000
5/20/20	Flooding	Denver	0	0	0	1000
2/6/20	Flooding	Pendleton	0	0	0	500000
2/6/20	Flooding	Powdersville	0	0	0	500000
9/13/14	Flooding	Anderson	0	0	0	55361.17
9/27/04	Flooding	Anderson	0	0	0	69380.53
6/25/04	Flooding	Anderson	0	0	0	138761.06
6/21/04	Flooding	Iva	0	0	0	69380.53
6/18/03	Flooding	Pendleton	0	0	0	356140.82
3/6/03	Flooding	Anderson, Belton, Iva	0	0	0	142456.33
4/17/98	Flooding	Anderson	0	0	0	771886.06
Total			**0.00**	**0.0**	**0.00**	**2,655,366.50**

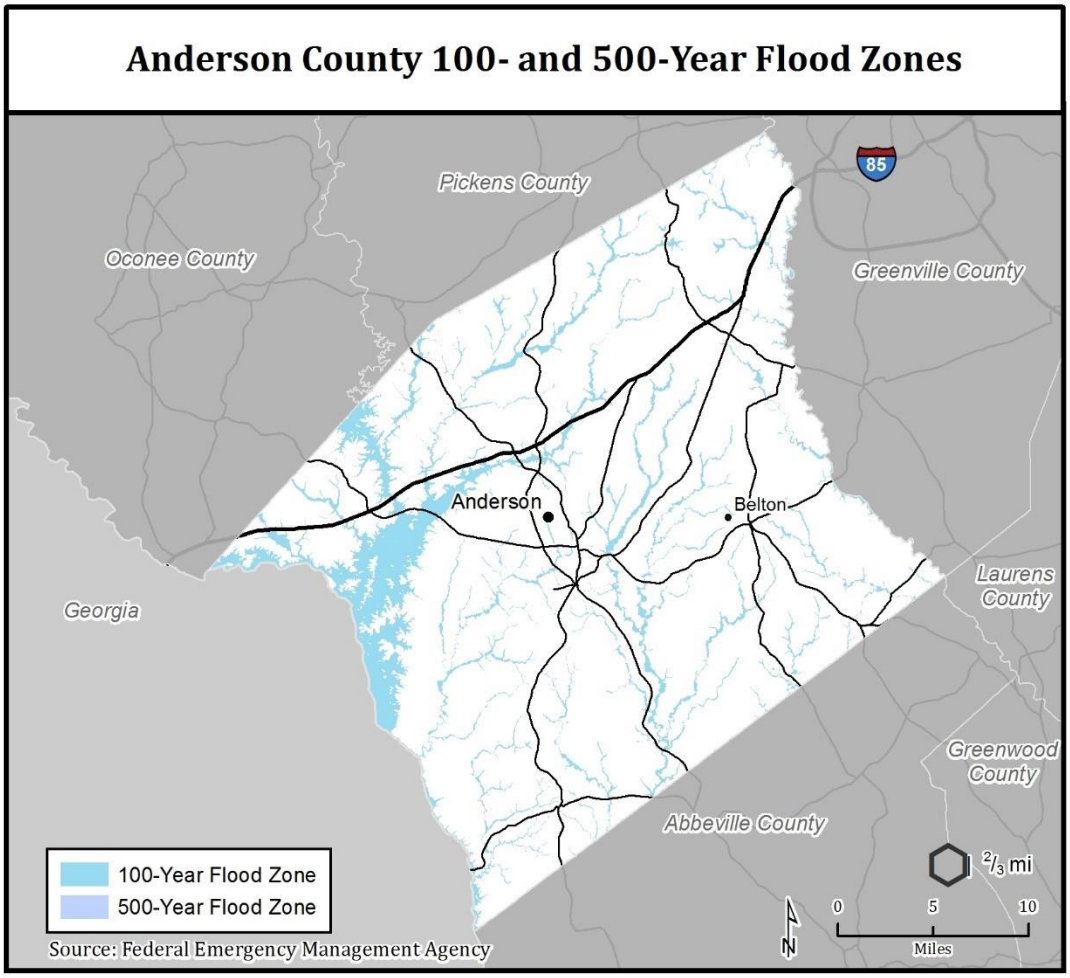
Probability

Based on the Anderson County's recorded flooding events, the county has a 188% chance of experience a flood event in a given year. The future annual probability is calculated by the following: ((# of Events/# Years in Record) *100). "The probability of flooding within the NFIP Special Flood Hazard Area is at least 1% per year."

Vulnerability

Local reports and records show low lying areas such as near creeks and streams have the highest potential to cause issues. Numerous roadways, as mentioned above, are susceptible to flooding from either rainfall or urban flooding. Impacts to roadways will limit transportation routes and potentially lead to secondary impacts to Anderson County's residents. Homes and businesses in low-lying areas along creeks and rivers and areas of urban flooding have experienced various stages of flooding as referenced above.

Figure 5.8.4 Flooding: Anderson County



"Please see Appendix E. Anderson and Oconee Counties FEMA Special Flood Zone Areas for more information on jurisdictional flood locations."

Recommendation:

Counties and municipalities should ensure adoption of Floodplain Management Ordinances concerning construction in floodplain areas. Counties and municipalities should consider doing buyouts of properties that are flood prone and have had repetitive losses to mitigate future disasters. Local governments should make strong efforts to further improve warning systems to ensure that future deaths and injuries do not occur due to the effects of flooding events. Local governments should consider making improvements to roads and low water crossings that consistently flood by placing them on a hazard mitigation projects list and actively seek funding to successfully complete the projects.

Oconee County
Extent

Considering the frequency and intensity of Flood events in Oconee County; the future predictability frequency and intensity of Flood events is low as the entire county is equally susceptible to Flood events and likely to cause low to moderate crop damage, property damage and or death and injury as shown in past occurrences over the past 70+ years with the number of event days being 10 days and 4 event days causing property damage ranging from 3,000 to 1.3 million dollars in damage for a total of over 1.459 million dollars in property damage, with 0 deaths and 0 injuries.

Storm Events Database

Search Results for Oconee County, South Carolina

Event Types: Flood
Oconee county contains the following zones:
Oconee Mountains, Greater Oconee

12 events were reported between 01/01/1950 and 01/31/2023 (26694 days)

Summary Info:

Number of County/Zone areas affected:	3
Number of Days with Event:	10
Number of Days with Event and Death:	0
Number of Days with Event and Death or Injury:	0
Number of Days with Event and Property Damage:	4
Number of Days with Event and Crop Damage:	0
Number of Event Types reported:	1

National Centers for Environmental Information (NCEI) (noaa.gov)

Oconee County has experienced 12 notable flooding events from the time frame of 01/01/1970 thru 01/01/2021. A flooding event is considered notable when it causes at or greater than $50,000 in combined property and crop damages. These 12 notable flooding events have caused 2.66 injuries to county residents and 0.67 fatalities. These flooding events have caused a collective $9,213,204.37 in property damage and $500,437.85 in crop damage, adjusted for 2020 inflation.

Table 5.8.5: Oconee County Notable Flooding Events from 1/1/1970- 1/1/2021
SHELDUS
Query results

Date	Hazard	Crop Damages (ADJ)	Fatalities	Injuries	Property Damages (ADJ)
2/6/20	Flooding	0	0	0	400,000
9/16/04	Flooding	0	0	0	160,962.83
9/7/04	Flooding	0	0	0	1,803,893.77
8/17/94	Flooding	0	0	0	88,434.43
1/1/93	Flooding	394,353.65	0	0	19,717.15
10/1/89	Flooding	0	0	0	10,569.34
7/3/89	Flooding	0	0	0	10,5693.4
10/9/76	Flooding	50,072.54	0	0	50,072.54
5/28/76	Flooding	7,677.8	0.67	2.33	767,778.69
8/6/78	*Flooding/ Severe Storm/Thunderstorm	5025.3	0	0	502,529.99
10/8/76	*Flooding/ Severe Storm/Thunderstorm	38,388.92	0	0.33	383,889.32
9/13/73	*Flooding/ Severe Storm/Thunderstorm	4,919.64	0	0	4,919,662.91
Total		**500,437.85**	**.67**	**2.66**	**9,213,204.37**

Source: Spatial Hazard Event and Losses Database (SHELDUS) for the United States. Arizona State University
*Hazard may be repeated in another section

Oconee

Location and Extent

Courtenay - Urban flash flooding was reported on the east side of Seneca with many low areas filling with water. Water entered one home to a depth of a few inches in this area. Also, several trees fell as a result of the heavy rain.

Madison - Several roads were closed in the southern part of the county due to flooded streams. Some roads affected by flooding included Dr. Johns Rd and Mullins Ford Rd. The exact flood depths were not available.

Mountain Rest - County comms reported flooding developed across northern Oconee County after moderate to heavy rain produced widespread 3 to 5-inch amounts in about 12 hours. Multiple streams overflowed their banks and covered roads west and north of Walhalla, including Camp Rd, Lay Mill Rd, Orr Dr, Duck Pond Rd, and Taylor Creek Rd. The exact flood depths were not available.

Oakway - A low spot along Highway 24 near the intersection with Highway 11 reportedly had water moving swiftly across it, making it difficult for traffic to pass. The exact flood depths were not available.

Salem – Little River overflowed its banks, flooding several yards. The exact flood depths were not available.

Seneca, Walhalla, and Westminster - Levi Lane, Debra Lane, and Seed Farm Road were all washed out, and numerous other roads were closed due to flooding, mainly in areas from Walhalla south to between Seneca and Westminster. Most of the flooding was due to poor drainage, but some of it was likely due to flooding streams. Closed roads included E Halfway Branch, Antebellum, Avondale, Mauldin Mill, Sertoma Field, and Camp. The exact flood depths were not available.

Tokeena Crossroads – Sitton Shoals road was flooded by a stream. The exact flood depths were not available.

Tugaloo River flooding - Moderate to heavy rainfall associated with the remnants of Hurricane Ivan resulted in flooding along a few creeks during mid-evening across the northwest part of the Upstate. The flooding gradually became widespread and more severe during the overnight hours, especially in Oconee County, as the Tugaloo River flooded, trapping a number of families, some of which required rescue via helicopter. A number of bridges and roads were washed out or otherwise damaged by flood water. The exact flood depths were not available.

Welcome Church - Law enforcement officials reported flash flooding developed after a swatch of 5 to 8 inches of rain, most of which fell in around 6 hours developed across mainly central Oconee County. Numerous roads were reported flooded due to a combination of small stream and drainage flooding. Several vehicles were reportedly submerged. The exact flood depths were not available.

Whetstone - Media and EM reported flash flooding developed across central and northern Oconee County after 5.5 to 7 inches of rain fell throughout the area in about 24 hours, with much of that falling during the morning of the 6th. Multiple small streams overflowed their banks and flooded/washed out adjacent roads, including Richland Creek in Seneca, Coneross Creek, and Cane Creek, which inundated Rocky Noll Rd, Lusk Rd, and Tulip Dr in the Walhalla area. Roads washed out included Cobb Bridge Rd, Busch Creek Rd, and Conley Rd. Flooding of several streets also occurred in downtown Walhalla due to poor drainage, including Main St and S College St.Media reported flash flooding developed across central Oconee County after 5.5 to 7 inches of rain fell throughout the area in about 24 hours, with much of that falling during the morning of the 6th. Multiple small streams overflowed their banks and flooded/washed out adjacent roads, including Richland Creek in Seneca, Coneross Creek, and Cane Creek, which inundated Rocky Noll Rd, Lusk Rd, and Tulip Dr in the Walhalla area. Flooding of several streets also occurred in downtown Walhalla due to poor drainage, including Main St and S College St. The exact flood depths were not available.

Previous Occurrences and Impact

According to NCEI and SHELDUS, from 1996 to 2021, Oconee County experienced 9 loss causing flood-related events. The events occurred throughout Oconee County resulting in $2.483 million in property damage. Please see the Location and Extent section for more information on loss causing and non-loss causing flooding events' impact on Oconee County.

Date	Hazard	Location	Crop Damage (ADJ)	Fatalities	Injuries	Property Damage (ADJ)
2/6/2020	Flooding	Whetstone	0	0	0	400000
2/6/2020	Flooding	Whetstone	0	0	0	40000
4/19/2019	Flooding	Welcome Church	0	0	0	20000
5/16/2018	Flooding	Mountain Rest	0	0	0	3000
9/20/2009	Flooding	Mountain Rest	0	0	0	10000
6/26/2006	Flooding	Walhalla	0	0	0	25000
9/27/2004	Flooding	Southern Oconee County	0	0	0	20000
9/16/2004	Flooding	Oconee County	0	0	0	160962.83
9/7/2004	Flooding	Oconee County	0	0	0	1803893.77
Total			**0.00**	**0.0**	**0.00**	**2482856.60**

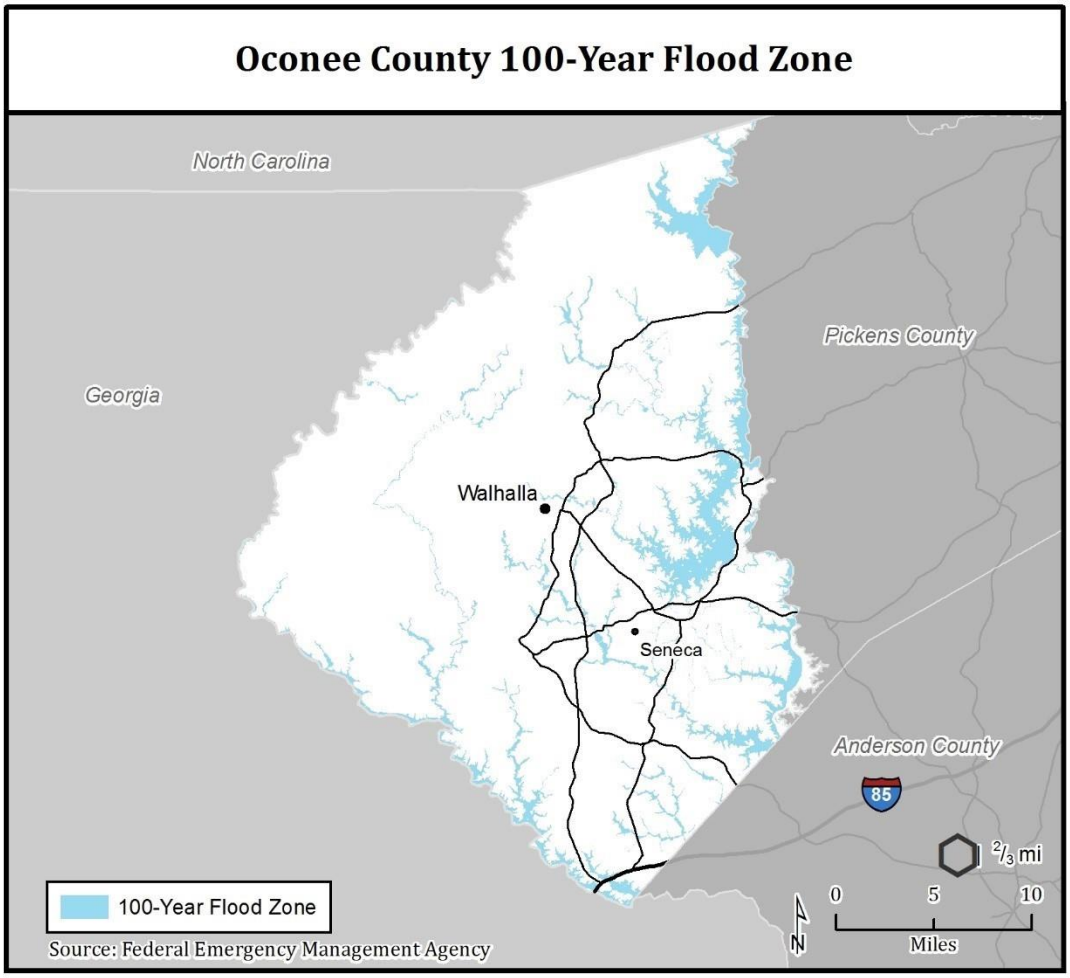
Probability

Based on the Oconee County's recorded flooding events, the county has a 100% chance of experience a flood event in a given year. The future annual probability is calculated by the following: ((# of Events/# Years in Record) *100). " The probability of flooding within the NFIP Special Flood Hazard Area is at least 1% per year."

Vulnerability

Local reports and records show low lying areas such as near creeks and streams have the highest potential to cause issues. The areas around the Tugaloo River seem to experience the greatest impacts. Numerous roadways, as mentioned above, are susceptible to flooding from either rainfall or urban flooding. Impacts to roadways will limit transportation routes and potentially lead to secondary impacts to Oconee County's residents. Homes and businesses in low-lying areas along creeks and rivers and areas of urban flooding have experienced various stages of flooding as referenced above.

5.8.6 Oconee Flooding: Oconee County



"Please see Appendix E. Anderson and Oconee Counties FEMA Special Flood Zone Areas for more

information on jurisdictional flood locations."

Recommendation:

Counties and municipalities should ensure adoption of Floodplain Management Ordinances concerning construction in floodplain areas. Counties and municipalities should consider doing buyouts of properties that are flood prone and have had repetitive losses to mitigate future disasters. Local governments should make strong efforts to further improve warning systems to ensure those future deaths and injuries do not occur due to the effects of flooding events. Local governments should consider making improvements to roads and low water crossings that consistently flood by placing them on a hazard mitigation projects list and actively seek funding to successfully complete the projects.

5.9 Wildfire

Background

Wildfires are the most common natural hazards in South Carolina. Wildfires can result from natural causes, but most actually result from human actions. The most common cause of fires are careless debris burning and arson. There is an average of 5,000 wildfires a year in the State, resulting in 30,000 acres burnt. Late winter to early spring is South Carolina's wildfire season (SC Emergency Management Division, 2022). According to the South Carolina Forestry Commission (2022), the cause of wildfires in South Carolina by percentage are:

5.9.1 Cause of SC Wildfires

Debris Burning	50%
Incendiary	19%
Misc.	10%
Equipment Use	5%
Power Line	4%
Children	4%
Lightning	3%
Smoking	2%
Structure	2%
Campfire	2%
Fireworks	<1%
Railroads	<1%

**Percentages do not add up to 100% due to rounding.*

A significant number of forest fires occur in Anderson and Oconee County region. The majority of fires are caused by humans, including campfires, smoking, debris burning, incendiary equipment use, and railroads. Although the total number of forest fires in each county is documented, there is not a current database of wildfire locations that can be separated out from land clearing activities that burn timber or any map data that represents precise locations within each county. (Source: South Carolina Forestry Commission)

Community Risk Analysis

Wildfire Risk Analysis

In data compiled by FEMA, via the National Risk Index, Anderson County has a very low risk of wildfires, and an expected annual loss of $22k as shown in Figure 5.9.2 Oconee County also has a very low risk of wildfires, and an expected annual loss of $8.7k as shown in Figure 5.9.3

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Figure 5.9.2: Anderson County risk analysis

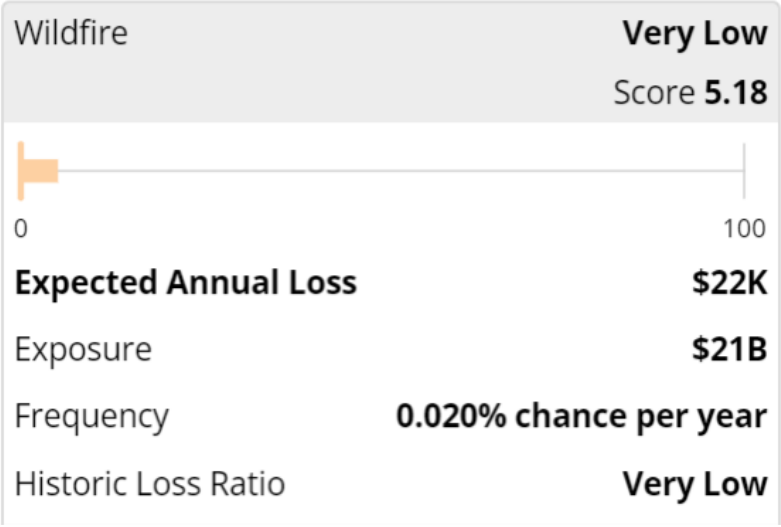
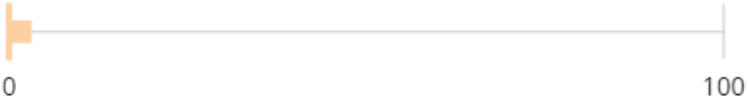


Figure 5.9.3: Oconee County risk analysis

Wildfire	Very Low
	Score **3.80**



Expected Annual Loss	**$8.7K**
Exposure	**$10B**
Frequency	**0.019% chance per year**
Historic Loss Ratio	**Very Low**

Anderson County
Extent

Considering the frequency and intensity of Wildfire events in Anderson County; the future predictability frequency and intensity of Wildfire events is low as the entire county is equally susceptible to Wildfire events and likely to cause low crop damage, property damage and or death and injury as shown in past occurrences over the past 70+ years with the number of event days being 0 days and 0 event days causing property damage ranging from 0 dollars in damage for a total of 0 dollars in property damage, with 0 deaths and 0 injuries.

Storm Events Database

Search Results for Anderson County, South Carolina

Event Types: **Wildfire**
Anderson county contains the following zones:
Anderson

0 events were reported between 01/01/1950 and 01/31/2023 (26694 days)

Summary Info:

Number of County/Zone areas affected:	0
Number of Days with Event:	0

Number of Days with Event and Death:	0
Number of Days with Event and Death or Injury:	0
Number of Days with Event and Property Damage:	0
Number of Days with Event and Crop Damage:	0
Number of Event Types reported:	0

National Centers for Environmental Information (NCEI) (noaa.gov)

Wildfire

Anderson
According to the South Carolina Forestry Commission, from July 1, 1997 to June 27, 2022, 757 wildfires were reported in Anderson County. Of these, 69 wildfires burned at least 10 acres. A total of seven fires burned 52-, 54-, 55-, 63-, 79-, 202-, and 325-acres total resulting in the highest amount for the county. The main source of the fires resulted from smoking, debris burning, fireworks, and lightning.

Year	Location	Total Acres Burned
2007	Near Andersonville Island	325
2008	River Forks Recreation Area	202
2011	Near Fair Play	79
2001	Near Anderson	63
2016	Near Iva	55
2006	Near Iva	54
2014	Starr	51.9

Source: South Carolina Forestry Commission, 1997-2022

Anderson County has experienced 1 notable wildfire from the time frame of 01/01/1970 through 01/01/2021. A wildfire is considered notable when it causes at or greater than $50,000 in combined property and crop damages. This 1 notable wildfire has caused 0.00 injuries to county residents and 0.00 fatalities. This wildfire has caused a collective $ 3,943.06 in property damage and $239,430.45 in crop damage, adjusted for 2020 inflation and less than 100 acres property damage.

Table 6.3.7-2: Anderson County Notable Wildfires from 1/1/1970- 1/1/2021
SHELDUS
Query results

Date	Hazard	Crop Damage (ADJ)	Fatalities	Injuries	Property Damage (ADJ)
1985	Wildfire	239,430.45	0.00	0.00	23,943.06
Total		**239,430.45**	**0.00**	**0.00**	**23,943.06**

Source: Spatial Hazard Event and Losses Database (SHELDUS) for the United States. Arizona State University

Wildfire Probability and Vulnerability

Anderson County:

Table 6.3.7-3: Anderson County Probability of a Wildfire

County	Number of Events	Years	Recurrence Intervals (years)	Hazard Frequency (% change/year)
Anderson	**1**	**55**	**55**	**2%**

Vulnerability

Anderson County

Overall, Anderson County has a very low-level vulnerability of wildfire events causing significant property damage. The probability of one or more wildfire events causing significant property damage originating in Anderson County is near zero. Since 1988 Anderson County has not experienced any wildfire events causing significant property damage. Examining past wildfire events that have occurred in the County, there have been numerous fires, but they have not caused a great amount of significant reported damage. These wildfire events within the County also have not caused any reported significant property damage within the municipalities. Overall, when taking into consideration the very low probability of fire in the county, and the past history of the event, the county has a very low-level vulnerability to wildfire events causing significant property damage while the municipalities have a very low vulnerability to wildfire events causing significant property damage as well. Overall, when taking into consideration the very low probability of wildfire events in Anderson County the County has a very low-level vulnerability to this hazard causing significant property damage.

Recommendation

Counties and municipalities should consider design and implement a comprehensive community awareness and educational campaign on wildfire event fire danger, targeted at areas of highest risk. Develop capabilities, systems and procedures to pre-deploy fire-fighting resources during times of high wildfire event hazards.

Through training and education, prepare local fire departments for wildfire scenarios. Encourage development and dissemination of maps relating to the fire hazard to help educate and assist builders and homeowners in being engaged in wildfire mitigation activities, and to help guide emergency services during response.

Oconee County
Extent

Considering the frequency and intensity of Wildfire events in Oconee County; the future predictability frequency and intensity of Wildfire events is low as the entire county is equally susceptible to Wildfire events and likely to cause low crop damage, property damage and or death and injury as shown in past occurrences over the past 70+ years with the number of event days being 0 days and 0 event days causing property damage ranging from 0 dollars in damage for a total of 0 dollars in property damage, with 0 deaths and 0 injuries.

Storm Events Database

Search Results for Oconee County, South Carolina

Event Types: Wildfire
Oconee county contains the following zones:
Oconee Mountains, Greater Oconee

0 events were reported between 01/01/1950 and 01/31/2023 (26694 days)

Summary Info:

Number of County/Zone areas affected:	0
Number of Days with Event:	0
Number of Days with Event and Death:	0
Number of Days with Event and Death or Injury:	0
Number of Days with Event and Property Damage:	0
Number of Days with Event and Crop Damage:	0
Number of Event Types reported:	0

National Centers for Environmental Information (NCEI) (noaa.gov)

Oconee
According to the South Carolina Forestry Commission, from July 1, 1997 to June 27, 2022, 880 wildfires were reported in Oconee County. Of these, 115 wildfires burned at least 10 acres. A total of eight fires burned 50-, 61-, 100-, 125-, 167-, 200-, 205-, and 225-acres total resulting in the highest amount for the county. The main source of the fires resulted from smoking, debris burning, fireworks, and lightning.

Year	Location	Total Acres Burned
2012	Near Salem	225
2007	Near Salem	205
2008	Near Salem	200
2008	Near Rocky Bottom	167
2021	Mountain Rest	125
2004	Madison	100

2005	Walhalla	61
2004	Seneca	50

Source: South Carolina Forestry Commission, 1997-2022

Based on the criteria, Oconee County has experienced 1 notable wildfire from the time frame of 01/01/1970 thru 01/01/2021. A wildfire is considered notable when it causes at or greater than $50,000 in combined property and crop damages. This 1 notable wildfire has caused 0.00 injuries to county residents and 0.00 fatalities. This 1 wildfire has caused a collective $26,478.88 in property damage and $264,788.71 in crop damage, adjusted for 2020 inflation.

However, Oconee County experience a fire in 1985 causing over $26,478.88 in property damage and $264,788.71 in crop damage, and over 100 acres property damage. Neighboring Pickens County experienced the Pinnacle Mountain Fire in 2016. There was no crop damage, property damage, or fatalities. However, 10,623 acres were burned and the fire cost more than $5 million.

Table 6.3.7-5: Oconee County Notable Wildfire Events from 1/1/1970- 1/1/2021
SHELDUS
Query results

Date	Hazard	Crop Damages (ADJ)	Fatalities	Injuries	Property Damages (ADJ)
3/1/85	Wildfire	264,788.71	0	0	26,478.88
Total		**264,788.71**	**0**	**0**	**26,478.88**

Source: Spatial Hazard Event and Losses Database (SHELDUS) for the United States. Arizona State University

Wildfire Probability and Vulnerability

Oconee County:

Table 6.3.7-6: Oconee County Probability of a Wildfire

County	Number of Events	Years	Recurrence Intervals (years)	Hazard Frequency (% change/year)
Oconee	2	**55**	27.5	**4%**

Vulnerability

Oconee County

Overall, Oconee County has a very low-level vulnerability of wildfire events causing significant property damage. The probability of one or more wildfire events causing significant property damage originating in Oconee County is near zero. Since 1988, Oconee County has not experienced any wildfire events causing significant property damage. Examining past wildfire events that have occurred in the County, there have been numerous fires, but they have not caused a great amount of significant reported damage. These wildfire events within the County also have not caused any reported significant property damage within the municipalities. Overall, when taking into consideration the very low probability of fire in the county, and the past history of the event, the county has a very low-level vulnerability to wildfire events causing significant property damage while the municipalities have a very low vulnerability to wildfire events causing significant property damage as well. Overall, when taking into consideration the very low probability of wildfire events in Oconee County the County has a very low-level vulnerability to this hazard causing significant property damage.

Recommendation

Counties and municipalities should consider design and implement a comprehensive community awareness and educational campaign on wildfire event fire danger, targeted at areas of highest risk. Develop capabilities, systems and procedures to pre-deploy fire-fighting resources during times of high wildfire event hazards. Through training and education, prepare local fire departments for wildfire scenarios. Encourage development and dissemination of maps relating to the fire hazard to help educate and assist builders and homeowners in being engaged in wildfire mitigation activities, and to help guide emergency services during response.

5.10 Hurricanes

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. Most 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 5.12**), which rates hurricane intensity on a scale of 1 to 5, with 5 being the most intense.

TABLE 5.10.1: SAFFIR-SIMPSON SCALE

Category	Maximum Sustained Wind Speed (MPH)	Minimum Surface Pressure (Millibars)
1	74–95	Greater than 980
2	96–110	979–965
3	111–129	964–945
4	130–156	944–920
5	157 +	Less than 920

Source: National Hurricane Center (2012)

The Saffir-Simpson Scale categorizes hurricane intensity linearly based upon maximum sustained winds and barometric pressure, 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 5.13** 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 5.10.2: 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

Hurricane Risk Analysis

In data compiled by FEMA, via the National Risk Index, Anderson County has a relatively low risk of a Hurricane event, and an expected annual loss of $0.12M, as shown in figure 5.10.3. Oconee county has a relatively low risk of a Hurricane event, with an expected annual loss of $0.29M as shown in figure 5.10.4.

Figure 5.10.3 Anderson County Risk Analysis

Hurricane	Relatively Low
	Score **6.05**
0	100
Expected Annual Loss	**$0.12M**
Exposure	**$1.4T**
Frequency	**0 events per year**
Historic Loss Ratio	**Very Low**

Figure 5.10.4 Oconee County Risk Analysis

Hurricane	Relatively Low
	Score **8.20**
0	100
Expected Annual Loss	**$0.29M**
Exposure	**$0.57T**
Frequency	**0 events per year**
Historic Loss Ratio	**Very Low**

A Tropical cyclone is a rotating, organized system of clouds and thunderstorms that originates over tropical or subtropical waters and has a closed low-level circulation. Although tropical depression, tropical storm and major hurricane do not pose a direct threat to Anderson and Oconee counties they often experience aftereffects such as high winds, increased rainfall and possible increase flooding, which are addressed in the plan. Anderson and Oconee County are located in the northwest corner of South Carolina the Appalachian and Blue Ridge Mountains border the region to the northwest and the Atlantic Ocean is approximately 200 miles to the east. Therefore, Tropical cyclone, tropical depression, tropical storm and major hurricane do not pose a direct threat to Anderson and Oconee county. Tropical cyclones rotate counterclockwise in the Northern Hemisphere. They are classified as follows:

- **Tropical Depression:** A tropical cyclone with maximum sustained winds of 38 mph (33 knots) or less.
- **Tropical Storm:** A tropical cyclone with maximum sustained winds of 39 to 73 mph (34 to 63 knots).
- **Hurricane:** A tropical cyclone with maximum sustained winds of 74 mph (64 knots) or higher. In the western North Pacific, hurricanes are called typhoons; similar storms in the Indian Ocean and South Pacific Ocean are called cyclones.
- **Major Hurricane:** A tropical cyclone with maximum sustained winds of 111 mph (96 knots) or higher, corresponding to a Category 3, 4 or 5 on the Saffir-Simpson Hurricane Wind Scale.

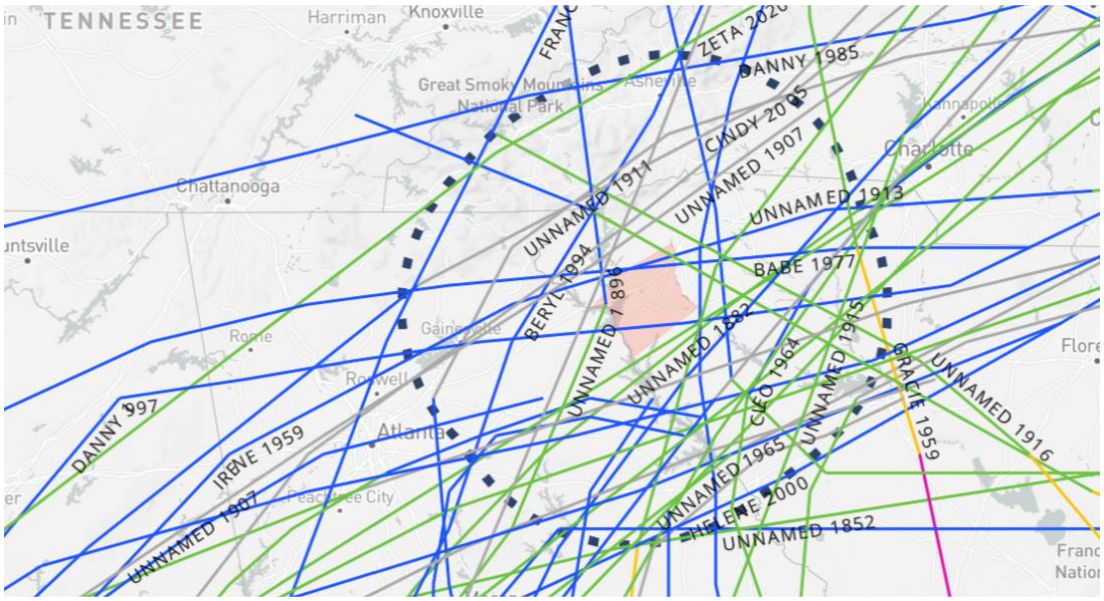
Tropical cyclones forming between 5- and 30-degrees North latitude typically move toward the west. Sometimes the winds in the middle and upper levels of the atmosphere change and steer the cyclone toward the north and northwest. When tropical cyclones reach latitudes near 30 degrees North, they often move northeast.

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 Anderson and Oconee County. All jurisdictions in Anderson and Oconee County are equally susceptible to hurricane and tropical storms.

Storms track across the areas regularly but usually not with severe events and/or losses. Flooding is generally the greatest hazard of concern with hurricane and tropical storm events in Anderson and Oconee Counties though some events do carry winds that can have significant impacts on the county. The tables of Storm Track data clearly show how the intensity of the storm decreases with its travel inland.

5.10.5 Anderson Storm Tracks



https://coast.noaa.gov/hurricanes/45 hurricane tracks from 1852-2021

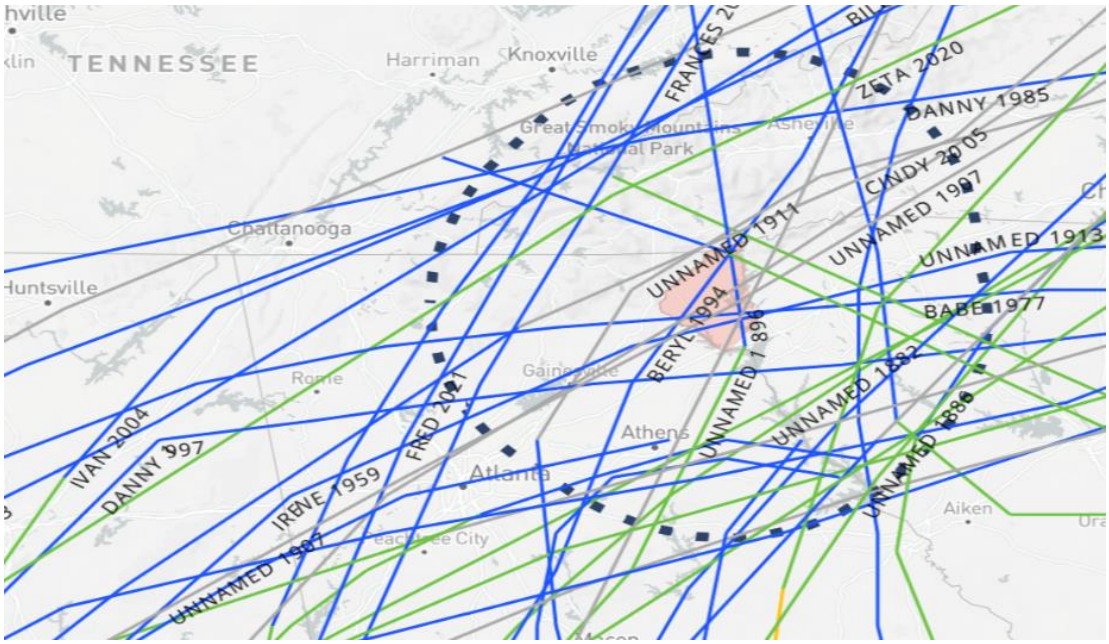
Anderson Storm Track Data

Storm Name	Date	Category in Anderson County	Minimum Pressure (mb)	Max Category along entire path	Max Wind Speed (knots)
Claudette	6/17/ to 6/23/2021	Tropical Depression	1007	Tropical Storm	40
Zeta	10/24 to 10/302020	Tropical Storm	986	H3	100
Sally	9/11/to 9/18/2020	ET	1004	H2	95
Fay	7/5 to 7/11/2020	Tropical Depression	1014	Tropical Storm	50
Michael	10/6 to 10/15/2018	Tropical Storm	979	H5	140

Florence	8/30 to 9/18/2018	Tropical Storm	1002	H4	130
Cindy	7/3 to 7/11/2005	Tropical Depression	1008	H1	65
Jeanne	9/13 to 9/29/2004	Tropical Depression	998	H3	105
Frances	8/25 to 9/10/2004	Tropical Depression	1000	H4	125
Helene	9/15 to 9/25/2000	Tropical Depression	1011	Tropical Storm	60
Danny	7/16 to 7/27/1997	Tropical Depression	1012	H1	70
Jerry	8/22 to 8/28/1995	Tropical Depression	1006	Tropical Storm	35
Beryl	8/14 to 8/19/1994	Tropical Depression	1005	Tropical Storm	50
Marco	10/9 to 10/13/1990	ET	1005	Tropical Storm	55
Danny	8/12 to 8/20/1985	Tropical Depression	1011	H1	80
Babe	9/3 to 9/9/1977	Tropical Depression	-1	H1	65
Abby	6/1 to 6/13/1968	Tropical Depression	-1	H1	65
Unnamed 1965	6/13 to 6/20/1965	Tropical Storm	-1	Tropical Storm	50
Cleo	8/20 to 9/11/1964	Tropical Storm	-1	H4	130
Irene	10/6 to 10/9/1959	Tropical Depression	-1	Tropical Storm	40
Gracie	9/20 to 10/2/1959	H1	-1	H4	115
Arlene	5/28 to 6/2/1959	Tropical Depression	-1	Tropical Storm	55
Unnamed 1949	8/23 to 9/1/1949	Tropical Storm	1000	H4	115
Unnamed 1947	10/5 to 10/9/1947	Tropical Depression	-1	Tropical Storm	50
Unnamed 1946	10/5 to 10/14/1946	Tropical Storm	-1	H2	85
Unnamed 1933	8/31 to 9/7/1933	Tropical Depression	-1	H4	120
Unnamed 1928	8/3 to 8/13/1928	Tropical Depression	-1	H2	90
Unnamed 1916	7/11 to 7/15/1916	Tropical Storm	-1	H3	100
Unnamed 1915	7/31 to 8/5/1915	Tropical Storm	-1	H1	65

https://coast.noaa.gov/hurricanes/

5.10.6 Oconee Storm Tracks



https://coast.noaa.gov/hurricanes/41 Hurricane tracks 1859-2021

Oconee County Storm Track data

Storm Name	Date	Category in Oconee County	Minimum Pressure (mb)	Max Category along entire path	Max Wind Speed (knots)
Fred	8/9 to 8/20/21	Tropical Depression	1008	Tropical Storm	55
Claudette	6/17/ to 6/23/2021	Tropical Depression	1007	Tropical Storm	40
Zeta	10/24 to 10/302020	Tropical Storm	986	H3	100
Sally	9/11/to 9/18/2020	ET	1004	H2	95
Florence	8/30 to 9/18/2018	Tropical Storm	1002	H4	130

Cindy	7/3 to 7/11/2005	Tropical Depression	1008	H1	65
Jeanne	9/13 to 9/29/2004	Tropical Depression	998	H3	105
Ivan	9/2 to 9/24/2004	Tropical Depression	991	H5	145
Frances	8/25 to 9/10/2004	Tropical Depression	1000	H4	125
Bill	6/28 to 7/3/2003	Tropical Depression	1007	Tropical Storm	50
Danny	7/16 to 7/27/1997	Tropical Depression	1012	H1	70
Jerry	8/22 to 8/28/1995	Tropical Depression	1006	Tropical Storm	35
Beryl	8/14 to 8/19/1994	Tropical Depression	1005	Tropical Storm	50
Andrew	8/16 to 8/28/1992	Tropical Depression	1000	H5	150
Danny	8/12 to 8/20/1985	Tropical Depression	1010	H1	80
Babe	9/3 to 9/9/1977	Tropical Depression	-1	H1	65
Abby	6/1 to 6/13/1968	Tropical Depression	-1	H1	65
Cleo	8/20 to 9/11/1964	Tropical Storm	-1	H4	130
Irene	10/6 to 10/9/1959	Tropical Depression	-1	Tropical Storm	40
Arlene	5/28 to 6/2/1959	Tropical Depression	-1	Tropical Storm	55
Unnamed 1949	8/23 to 9/1/1949	Tropical Storm	1000	H4	115
Unnamed 1947	10/5 to 10/9/1947	Tropical Depression	-1	Tropical Storm	50
Unnamed 1928	8/7 to 8/17/1928	Tropical Depression	-1	H1	80
Unnamed 1928	8/3 to 8/13/1928	Tropical Depression	-1	H2	90
Unnamed 1916	7/11 to 7/15/1916	Tropical Storm	-1	H3	100
Unnamed 1913	8/30 to 9/4/1913	Tropical Depression	-1	H1	75
Unnamed 1912	6/7 to 6/17/1912	ET	-1	Tropical Storm	60
Unnamed 1911	8/23 to 8/31/1911	Tropical Depression	-1	H2	85
Unnamed 1907	9/18 to 9/23/1907	ET	-1	Tropical Storm	40
Unnamed 1906	9/3 to 918/1906	Tropical Storm	-1	H1	80
Unnamed 1905	10/5 to 10/11/1905	ET	-1	Tropical Storm	45
Unnamed 1903	9/9 to 9/16/1903	Tropical Depression	-1	H1	80

Unnamed 1902	10/3 to 10/13/1902	ET	-1	H2	90
Unnamed 1901	9/21 to 10/2/1901	ET	-1	Tropical Storm	45
Unnamed 1900	9/11 to 9/15/1900	Tropical Depression	-1	Tropical Storm	45
Unnamed 1896	7/4 to 7/12/1896	Tropical Storm	-1	H2	85
Unnamed 1893	9/27 to 10/5/1893	Tropical Storm	-1	H4	115
Unnamed 1889	9/12 to 9/26/1889	Tropical Storm	-1	H2	95
Unnamed 1886	6/17 to 6/24/1886	Tropical Storm	-1	H2	85
Unnamed 1882	9/2 to 9/13/1882	Tropical Storm	-1	H3	110
Unnamed 1859	9/15 to 9/18/1859	Tropical Storm	-1	H1	70

https://coast.noaa.gov/hurricanes/

Historical Data

Anderson County
Extent

Considering the frequency and intensity of Hurricane events in Anderson County; the future predictability frequency and intensity of Hurricane events is low as the entire county is equally susceptible to Hurricane events and likely to cause low crop damage, property damage and or death and injury as shown in past occurrences over the past 70+ years with the number of event days being 0 days and 0 event days causing property damage ranging from 0 dollars in damage for a total of 0 dollars in property damage, with 0 deaths and 0 injuries.

Storm Events Database

Search Results for Anderson County, South Carolina

Event Types: **Hurricane (Typhoon)**
Anderson county contains the following zones:
Anderson

0 events were reported between 01/01/1950 and 01/31/2023 (26694 days)

Summary Info:

Number of County/Zone areas affected:	0
Number of Days with Event:	0
Number of Days with Event and Death:	0
Number of Days with Event and Death or Injury:	0
Number of Days with Event and Property Damage:	0

Number of Days with Event and Crop Damage:	0
Number of Event Types reported:	0

National Centers for Environmental Information (NCEI) (noaa.gov)

Anderson County has experienced 1 notable hurricane from the time frame of 01/01/1970 thru 01/01/2021. A hurricane is considered notable when it causes at or greater than $50,000 in combined property and crop damages. This hurricane caused 0.00 injuries to county residents and 0.00 fatalities. This hurricane caused a collective $373,901.11 in property damage and $3,739.01 in crop damage, adjusted for 2020 inflation.

Table 5.10.3: Anderson County Notable Hurricanes from 1/1/1970- 1/1/2021
SHELDUS
Query results

Date	Hazard	Crop Damage (ADJ)	Injuries	Fatalities	Property Damage (ADJ)
8/24/1995	Hurricane/Tropical Storm	3,739.01	0.00	0.00	373901.11
Total		3,739.01	0.00	0.00	373901.11

Source: Spatial Hazard Event and Losses Database (SHELDUS) for the United States. Arizona State University

Hurricane Probability and Vulnerability

Anderson County Probability of a Hurricane

County	Number of Events	Years	Recurrence Intervals (years)	Hazard Frequency (% change/year)
Anderson	**1**	**55**	**55**	**2%**

Vulnerability

Anderson County

Overall, Anderson County has a very low-level vulnerability to hurricanes, primarily due to it being far inland. The probability of hurricane effects in Anderson County is 2% for any given year. While Anderson County is far inland for hurricanes to strike, it is clear from examining past events that hurricane effects do have the potential to do damage within the County. Since hurricane effects may be experienced randomly throughout the county,

one jurisdiction has the same chance of this hazard as the rest of the county and its municipalities. Thus, each municipality has the same vulnerability as the County.

Recommendation

Early warnings are possibly the best hope for residents when hurricanes strike. Citizens must immediately be aware when a community will be facing a hurricane incident. Communities that do not already possess warning systems should plan to purchase a system. Storm shelters are another important means of mitigating the effects of hurricane events. A community-wide shelter program should be considered for residents who may not have adequate shelter in their homes. Residents should also be encouraged to build their own storm shelters to prepare for emergencies. Local governments should encourage residents to purchase weather radios to ensure that everyone has sufficient access to information in times of severe weather.

Oconee County
Extent

Considering the frequency and intensity of Hurricane events in Anderson County; the future predictability frequency and intensity of Hurricane events is low as the entire county is equally susceptible to Hurricane events and likely to cause low crop damage, property damage and or death and injury as shown in past occurrences over the past 70+ years with the number of event days being 0 days and 0 event days causing property damage ranging from 0 dollars in damage for a total of 0 dollars in property damage, with 0 deaths and 0 injuries.

Storm Events Database

Search Results for Oconee County, South Carolina

Event Types: Hurricane (Typhoon)
Oconee county contains the following zones:
Oconee Mountains, Greater Oconee
0 events were reported between 01/01/1950 and 01/31/2023 (26694 days)

Summary Info:

Number of County/Zone areas affected:	0
Number of Days with Event:	0
Number of Days with Event and Death:	0
Number of Days with Event and Death or Injury:	0
Number of Days with Event and Property Damage:	0
Number of Days with Event and Crop Damage:	0
Number of Event Types reported:	0

National Centers for Environmental Information (NCEI) (noaa.gov)

Oconee County has experienced 1 notable hurricane/tropical storm from the time frame of 01/01/1970 thru 01/01/2021. A hurricane/tropical is considered notable when it causes at or greater than $50,000 in combined property and crop damages. This hurricane/tropical storm caused 0.00 injuries to county residents and 0.00 fatalities. This hurricane/tropical storm caused a collective $373,901.11 in property damage and $3,379.01 in crop damage, adjusted for 2020 inflation.

Table 5.10.11: Oconee County Notable Hurricanes/Tropical Storm from 1/1/1970- 1/1/2021

SHELDUS
Query results

Date	Hazard	Crop Damage (ADJ)	Fatalities	Injuries	Property Damage (ADJ)
8/24/1995	Hurricane/ Tropical Storm	3,379.01	0.00	0.00	373,901.11
Total		3,739.01	0.00	0.00	373,901.11

Source: Spatial Hazard Event and Losses Database (SHELDUS) for the United States. Arizona State University

Hurricane Probability and Vulnerability

Oconee County: Probability of a Hurricane/Tropical Storm

County	Number of Events	Years	Recurrence Intervals (years)	Hazard Frequency (% change/year)
Oconee	**1**	**55**	**55**	**2%**

Vulnerability

Oconee County

Overall, Oconee County has a very low-level vulnerability to hurricanes, primarily due to it being far inland. The probability of hurricane effects in Oconee County is 2% for any given year. While Oconee County is far inland for hurricanes to strike, it is clear from examining past events that hurricane effects do have the potential to do damage within the County. Since hurricane effects may be experienced randomly throughout the county, one

jurisdiction has the same chance of this hazard as the rest of the county and its municipalities. Thus, each municipality has the same vulnerability as the County.

Recommendation

Early warnings are possibly the best hope for residents when hurricanes strike. Citizens must immediately be aware when a community will be facing a hurricane incident. Communities that do not already possess warning systems should plan to purchase a system. Storm shelters are another important means of mitigating the effects of hurricane events. A community-wide shelter program should be considered for residents who may not have adequate shelter in their homes. Residents should also be encouraged to build their own storm shelters to prepare for emergencies. Local governments should encourage residents to purchase weather radios to ensure that everyone has sufficient access to information in times of severe weather.

Probability of Future Occurrences

Given the inland location of the Anderson and Oconee Counties, 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 Anderson County 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 county are equally exposed to this hazard. When the county is impacted, the damage could be widespread, threatening lives and property throughout the planning area.[23] Furthermore, the Center for Climate and Energy Solutions indicates climate change is exacerbating the effects of hurricanes by increasing the intensity and decreasing the speed at which storm systems travel. While researchers are currently uncertain whether the United States will see a change in the number of annual hurricanes, it is certain that the intensity and severity of this hazard will continue to increase.[24]

5.11 Earthquakes

Background

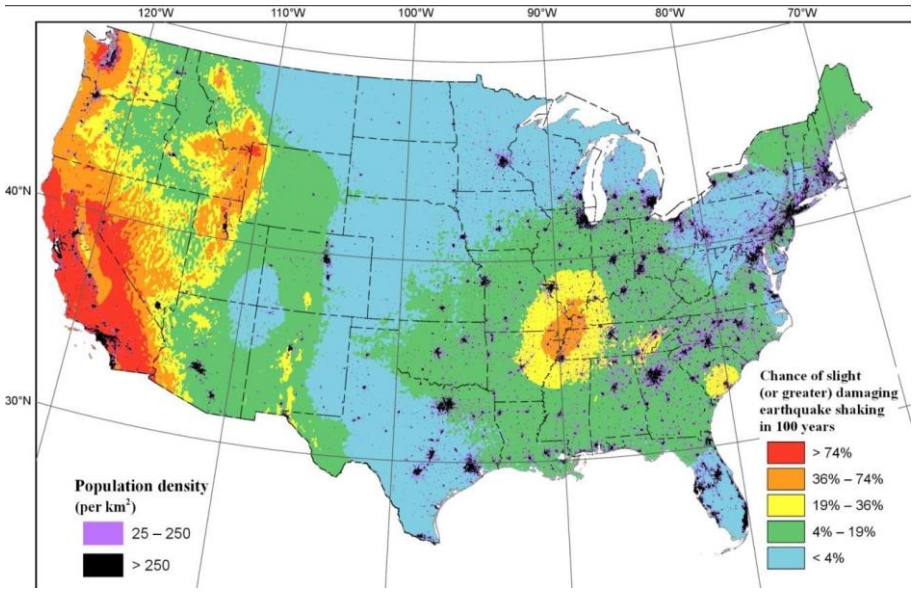
An earthquake is movement or trembling of the ground produced by sudden displacement of rock in the Earth's crust. Earthquakes result from crustal strain, volcanism, landslides, or the collapse of caverns. Earthquakes can affect hundreds of thousands of square miles, cause damage to property measured 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.[56]

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 quicksand. In the case of liquefaction, anything relying on the substrata for support can shift, tilt, rupture, or collapse.[57]

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 rock's 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 5.11.1** shows relative seismic risk for the United States.

FIGURE 5.11.1: UNITED STATES EARTHQUAKE HAZARD MAP



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 5.11.2**). 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 5.11.3**.

TABLE 5.11.2: 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 5.11.3: MODIFIED MERCALLI INTENSITY SCALE FOR EARTHQUAKES

SCALE	INTENSITY	DESCRIPTION OF EFFECTS	CORRESPONDING 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

Earthquake Risk Analysis

In data compiled by FEMA, via the National Risk Index, Anderson County has a relatively low risk of earthquakes, and an expected annual loss of $1.4M as shown in Figure 5.11.3 Oconee County also has a relatively low risk of wildfires, and an expected annual loss of $0.53M as shown in Figure 5.11.4.

Figure 5.11.3 Anderson County Risk Analysis

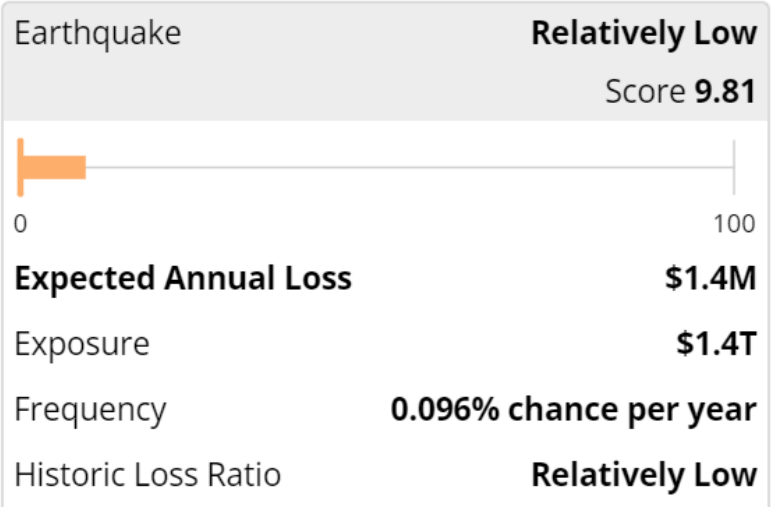
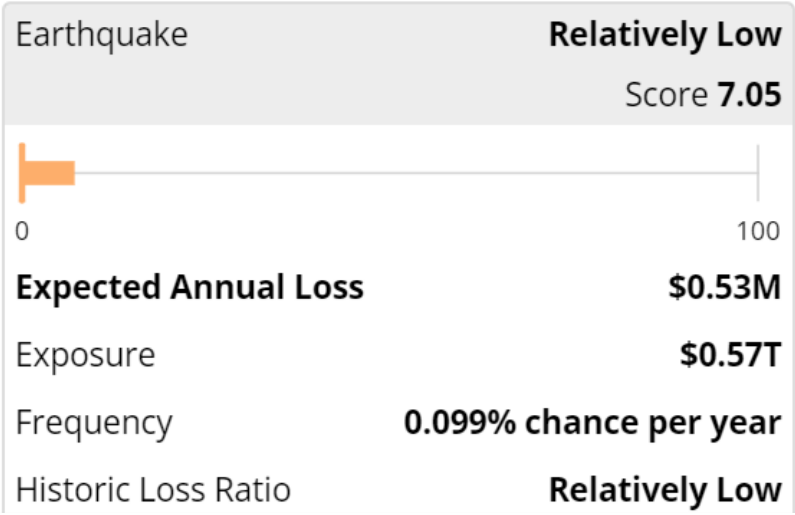


Figure 5.11.4 Oconee County Risk Analysis

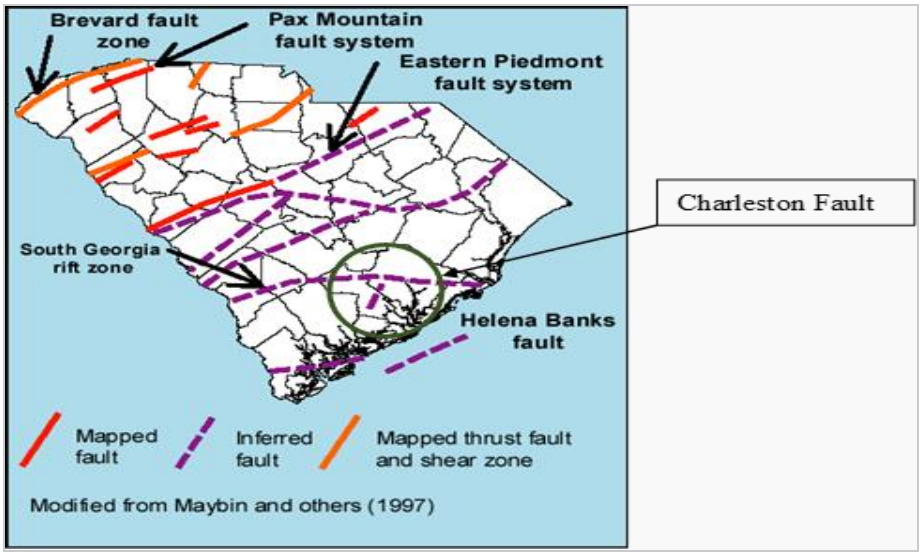


Location and Spatial Extent

Figure 5.11.4 shows the fault lines in South Carolina. The Charleston Fault, located near the southern coast, is the greatest threat to the state. This fault has generated an earthquake measuring greater than 8 on the Richter Scale in the last 200 years.[58]

[58] https://www.scemd.org/media/1055/eq-printer-friendly.pdf

FIGURE 5.11.4: GEOLOGICAL AND SEISMIC INFORMATION FOR SOUTH CAROLINA



Source: South Carolina Geological Survey

[59] https://www.dnr.sc.gov/geology/pdfs/Publications/GGMS/GGMS4.pdf

Historical Data

Anderson County
Extent

Considering the frequency and intensity of Earthquake events in Anderson County; the future predictability frequency and intensity of Earthquake events is low as the entire county is equally susceptible to Earthquake events and likely to cause low crop damage, property damage and or death and injury as shown in past occurrences over the past 70+ years with the number of event days being 0 days and 0 event days causing property damage ranging from 0 dollars in damage for a total of 0 dollars in property damage, with 0 deaths and 0 injuries.

Anderson County has experienced no notable earthquakes from the time frame of 01/01/1970 thru 01/01/2021. An earthquake is considered notable when it causes at or greater than $50,000 in combined property and crop damages. Earthquakes have caused 0.00 injuries to county residents and 0.00 fatalities. Additionally, earthquakes have caused no property or crop damage.

SHELDUS

Query results

Table 5.11.5: Anderson County Notable Earthquakes from 1/1/1970- 1/1/2021

Date	Hazard	Crop Damage (ADJ)	Fatalities	Injuries	Property Damage (ADJ)
Total		**0.00**	**0.00**	**0.00**	**0.00**

Source: Spatial Hazard Event and Losses Database (SHELDUS) for the United States. Arizona State University

Oconee County
Extent

Considering the frequency and intensity of Earthquake events in Oconee County; the future predictability frequency and intensity of Earthquake events is low as the entire county is equally susceptible to Earthquake events and likely to cause low crop damage, property damage and or death and injury as shown in past occurrences over the past 70+ years with the number of event days being 0 days and 0 event days causing property damage ranging from 0 dollars in damage for a total of 0 dollars in property damage, with 0 deaths and 0 injuries.

Oconee County has experienced no notable earthquakes from the time frame of 01/01/1970 thru 01/01/2021. An earthquake is considered notable when it causes at or greater than $50,000 in combined property and crop damages. Earthquakes have caused 0.00 injuries to county residents and 0.00 fatalities. Additionally, earthquakes have caused no property or crop damage.

SHELDUS
Query results

Table 5.11.6: Oconee County Notable Earthquakes from 1/1/1970- 1/1/2021

Date	Hazard	Crop Damage (ADJ)	Fatalities	Injuries	Property Damage (ADJ)
Total	Earthquake	**0.00**	**0.00**	**0.00**	**0.00**

Source: Spatial Hazard Event and Losses Database (SHELDUS) for the United States. Arizona State University

Historical Occurrences

Significant earthquakes are determined by a combination of magnitude, community reports, and the PAGER alert level. Events that reach the level of “significant” based on the US Geological Survey’s formula appears on the USGS database list.

These are the only occurrences listed for Anderson and Oconee Counties. None of these meet the "significant" threshold set by USGS as stated above.

Magnitude	Location	Date	Depth
3.0	9 km SSE of Salem, SC	2/13/1986	3.7 km
3.7	4 km N of Salem, SC	8/26/1979	2.0 km
2.8	2 km N of Seneca, SC	1/19/19791	1.0 km
3.2	2 km SE of Salem, SC	11/25/75	5.0 km
3.7	5 km E of West Union, SC	7/13/71	No data

Source: https://earthquake.usgs.gov/earthquakes/map/ 1900-2023 Entire upstate region

Two significant earthquakes are known to have occurred in South Carolina, according to the South Carolina Geological Survey. The first and most severe was the Charleston Earthquake of 1886. The epicenter was near Charleston, South Carolina and the magnitude were an estimated 7.6. Nearly 60 people died, and damage was extensive. The South Carolina Geological Survey also reports an earthquake in Union County. In January 1913, the county experienced a strong, magnitude 5.5 earthquake. However, damage was minimal.

More recently, areas around Lugoff and Elgin, South Carolina have experienced a high frequency of small magnitude earthquakes known as an earthquake swarm. More than 56 earthquakes have been reported in the Interstate 20 corridor between Elgin and Lugoff between December 2021 and July 2022. The largest earthquakes in this swarm had magnitudes between 3.3 and 3.6. [61]

Due to the location of faults within the state, most earthquake events occur near Columbia, South Carolina, or further east. The National Geophysical Data Center also provides historical earthquake information from 1638 to 1985. Their database returned no significant incidents in Anderson County.

Probability of Future Occurrences

Overall Anderson and Oconee Counties have a very low-level vulnerability to earthquakes. The probability of one or more earthquake epicenters to originate in both counties is near 0%. The counties have not experienced any earthquakes that have resulted in significant damage. Overall, when taking into consideration the very low probability of earthquakes in Anderson and Oconee Counties, both have a very low-level vulnerability to this hazard.

Impacts from climate change are not expected to change the probability of earthquakes effecting Anderson and Oconee Counties. One climate related variable that effects seismic activity is changing stress loads on faults due to increased surface water in the form of rain and snow. However, fault stressing from surface water changes primarily correlates with micro seismicity, or tiny earthquakes with magnitudes less than 0 on the Modified Mercalli Intensity scale.

Recommendation

Local governments should encourage residents to purchase earthquake hazard insurance. Local governments should consider establishing structurally sound emergency shelters in several parts of the county. The community would also benefit from an education program to inform citizens and developers of the causes and likely locations and dangers of earthquakes.

5.12 Conclusions

CONCLUSIONS ON HAZARD RISK

The hazard profiles presented in this section were developed using best available data, (NCEI event reports, NOAA Storm Prediction Center GIS storm data, FEMA NFIP data, and EPA Toxic Release Inventory information) 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.

5.13 Final Determinations and Recommendations

The conclusions drawn from the hazard profiling process for Anderson and Oconee Counties, including the input from the Anderson County Hazard Mitigation Planning Team, resulted in the classification of risk for each identified hazard according to three categories: High Risk, Moderate Risk, and Low Risk (**Table 5.13.1 and 5.13.2)**. 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 Anderson 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.* It should be noted that although some hazards are classified below as posing low risk, their occurrence of varying or unprecedented magnitudes are still possible in some cases and their assigned classification will continue to be evaluated during plan updates.

TABLE 5.13.1: CONCLUSIONS ON HAZARD RISK FOR ANDERSON COUNTY

HIGH RISK	Winter Storm Freeze Storm Severe Thunderstorm High Wind Storm Tornado Lightning Storm
MODERATE RISK	Drought Flood Wildfire Hailstorm Heat Wave Extreme Heat
LOW RISK	Earthquake Hurricane Tropical Storm

TABLE 5.13.2: CONCLUSIONS ON HAZARD RISK FOR OCONEE COUNTY

HIGH RISK	Winter Weather Storm Ice Storm Tornado High Wind Storm Lightning Storm Thunderstorms
MODERATE RISK	Hail Drought Flood Wildfire Hailstorm Heat Wave Extreme Heat
LOW RISK	Earthquake Hurricane Tropical Storm

SECTION 6
VULNERABILITY ASSESSMENT

This section identifies and quantifies the vulnerability of the jurisdictions within Anderson & Oconee County to the significant hazards identified in the previous sections (Section 4*: Hazard Identification and* Section 5*: Hazard 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
- 6.7 At-Risk Critical Facilities

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 both Anderson and Oconee Counties. 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, Anderson County, Oconee County, and the participating jurisdictions may better understand their unique risks to identified hazards and be better prepared to evaluate and prioritize specific hazard mitigation actions.

6.2 Methodology

Various national, regional and local sources were used to identify and classify different hazards for Anderson and Oconee Counties. The criteria used were the data compiled by SHELDUS which gives historical data. The FEMA National Risk Index data is calculated on historical data as shown in each Hazard-specific section. Here is a review of the methodology used:

The impact/extent of damage is derived primarily from utilizing calculations from the University of South Carolina Hazards & Vulnerability Research Institute Department of Geography Spatial Hazard Event Loss Dataset for the US (SHELDUS) information which originally contained only those events that generated greater than $50,000 in combined crop and property damage. This damage assessment is countywide regardless of municipal boundaries. Damage in less severe degrees may have occurred throughout the county and its municipalities affecting each municipality in varying degrees depending on the severity of the hazard and time of year. The full list of events, regardless of dollar amount, can be found on the University of South Carolina Hazards & Vulnerability Research Institute's SHELDUS website.

During the 2023 HMP update FEMA National Risk (NRI) was utilized for each hazard. Risk index analysis statistics were provided by FEMA and placed into corresponding sections. Risk Index scores are calculated by FEMA using an equation that combines scores for Expected Annual Loss due to natural hazards, Social Vulnerability and Community Resilience:

Expected Annual Loss
×Social Vulnerability
÷Community Resilience
=Risk Index

The following data are summaries to help evaluate the risk of each natural hazard identified for Anderson and Oconee Counties from the FEMA National Risk Index. Examining compiled data helps to prioritize efforts and dollars to mitigate these hazards.

6.3 EXPLANATION OF DATA SOURCES

All hazard probabilities were determined by the SC SHELDUS database. This methodology bases determinations on historic records to determine probability of future occurrences.

All census information was pulled from the U.S. Census Bureau. All critical facility information was provided by the participating counties and municipalities.

6.4 Asset Inventory

An inventory of geo-referenced assets within Anderson County, Oconee County, and their jurisdictions was compiled in order to identify and characterize 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. These are presented below in Section 6.4.1.

6.4.1 Physical and Improved Assets

The two categories of physical assets consist of:

1. Improved Property: Includes all land upon which a residential, commercial, or other building has been built in Anderson & Oconee County according to local parcel data provided by the county. The information has been expressed in terms of the number of parcels and total assessed value of improvements (buildings) that may be exposed to the identified hazards.

2. Critical Facilities: Critical facilities vary by jurisdiction and the critical facilities provided by each jurisdiction are utilized in this section.

It should be noted that this list is not all-inclusive for assets located in the county, and it is anticipated that it may be expanded or adjusted 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 Anderson County.

Table 6.1A lists the number of parcels, the number of improved parcels, and the total assessed value of improved parcels for participating areas of Anderson County (study area of vulnerability assessment).

TABLE 6.1A: IMPROVED PROPERTY IN ANDERSON COUNTY

Location	Number of Parcels	Number of Improved Parcels	Total Assessed Value of Improved Parcels
Anderson County	124,175	83,201	$20,071,636,714

Source: Anderson County GIS Department

Table 6.1B lists the number of parcels, the number of improved parcels, and the total assessed value of improved parcels for participating areas of Oconee County (study area of vulnerability assessment).[3]

TABLE 6.1B: IMPROVED PROPERTY IN OCONEE COUNTY

Location	Number of Parcels	Number of Improved Parcels	Total Assessed Value of Improved Parcels
Oconee County	66,030	38,056	$10,730,961,142

Source: Oconee County GIS Department

Table 6.2A lists the critical facilities located in Anderson County and categorized by type. These facilities were identified as primary critical facilities in that they are necessary to maintain government functions and protect the life, health, safety, and welfare of citizens. These facilities were geospatially mapped and used as the basis for further geographic analysis of the hazards that could potentially affect critical facilities. All critical facility information has been provided by the Anderson County GIS department.

TABLE 6.2A: EMERGENCY SERVICES CRITICAL FACILITY INVENTORY IN ANDERSON COUNTY

Location	Emergency Operations Centers	Fire Stations	Medical Care Facilities	Emergency Medical Service (EMS)	Local Law Enforcement	Schools
Anderson	1	3	2	1	1	24
Belton	1	1	0	0	1	5
Honea Path	1	1	0	1	1	2
Iva	1	1	0	1	1	2
Pelzer	1	1	0	1	1	0
Pendleton	1	1	0	1	1	5
Starr	1	1	0	1	1	2
West Pelzer	1	1	0	1	1	3
Williamston	1	1	0	1	1	3

Source: Anderson County GIS Department, Homeland Infrastructure Foundation-Level Data.

Table 6.2B lists the critical facilities located in Oconee County and categorized by type. These facilities were identified as primary critical facilities in that they are necessary to maintain government functions and protect the life, health, safety, and welfare of citizens. These facilities were geospatially mapped and used as the basis for further geographic analysis of the hazards that could potentially affect critical facilities. All critical facility information has been provided by the Oconee County GIS department.

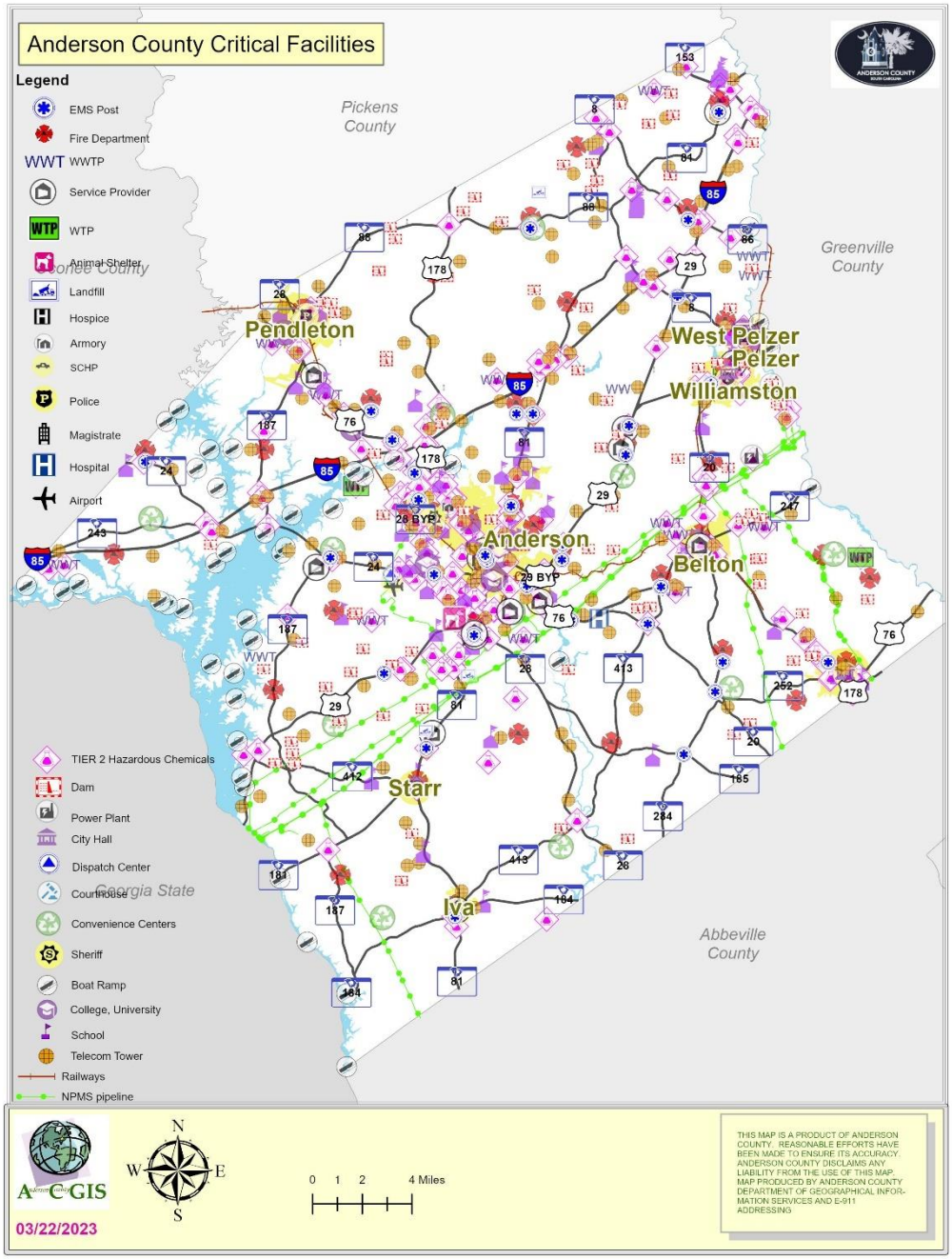
In addition, **Figure 6.2A and 6.2B** shows the locations of the primary critical facilities in the two Counties. **Table 6.16**, at the end of this section, shows a complete list of the critical facilities by name as well as the hazards that affect each facility. As noted previously, this list is not all-inclusive and only includes information provided by local governments.

TABLE 6.2B: EMERGENCY SERVICES CRITICAL FACILITY INVENTORY IN OCONEE COUNTY

Location	Emergency Operations Centers	Fire Stations	Medical Care Facilities	Emergency Medical Service (EMS)	Local Law Enforcement	Schools
Salem	0	1	0	1	1	0
Seneca	1	1	1	1	1	6
Wahalla	1	0	0	1	1	3
West Union	1	1	0	1	1	1
Westminster	1	1	0	1	1	5

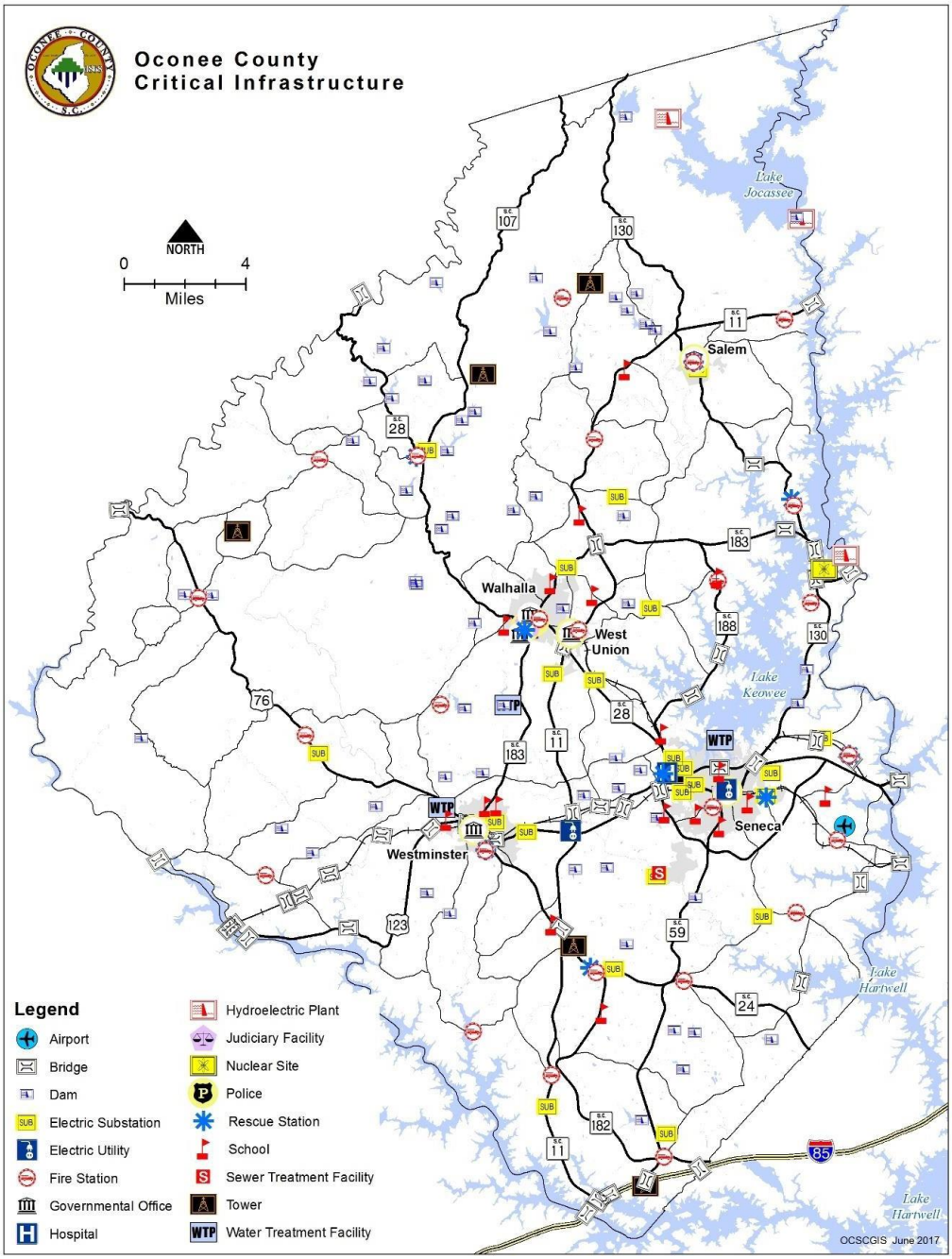
Source: Oconee County GIS Department, Homeland Infrastructure Foundation-Level Data.

FIGURE 6.2: EMERGENCY SERVICES AND CRITICAL FACILITIES IN ANDERSON COUNTY



Source: Anderson County GIS Department and Homeland Infrastructure Foundation Level Data

FIGURE 6.2: EMERGENCY SERVICES AND CRITICAL FACILITIES IN OCONEE COUNTY



Source: Oconee County GIS Department and Homeland Infrastructure Foundation Level Data

6.4.2 Social Vulnerability

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

The total population in Anderson County according to Census data is 203,718 persons**.** The total population in Oconee County according to Census data is 79,203 persons. **Tables 6.3A and 6.3B** lists the population by jurisdiction recorded in the 2020 U.S. Census. Additional population estimates are presented in Section 3: *Community Profile*.

TABLE 6.3A: TOTAL POPULATION IN ANDERSON COUNTY

Location	Total 2020 Population
City of Anderson	29,284
Belton	4,320
Honea Path	3,659
Iva	1,253
Pendleton	3,447
Pelzer	1,335
Starr	149
West Pelzer	1,136
Williamston	4,047
Unincorporated Areas	155,088
ANDERSON COUNTY TOTAL	**203,718**

Source: United States Census Bureau, 2020 Census

TABLE 6.3B: TOTAL POPULATION IN OCONEE COUNTY

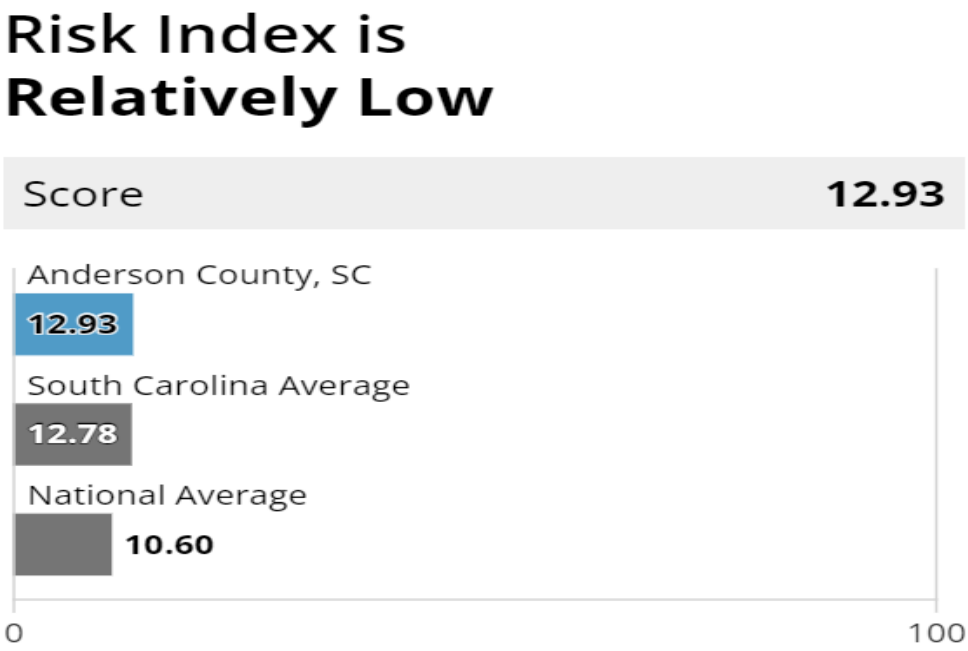
Location	Total 2020 Population
Salem	120
Seneca	8,900
Wahalla	4095
West Union	377
Westminster	2363
Unincorporated Areas	63,348
OCONEE COUNTY TOTALS	**79,203**

Source: United States Census Bureau, 2020 Census

In addition, **Figure 6.3** illustrates the population density by census tract as it was reported by the 2020 U.S. Census.

6.5 Vulnerability Assessment Results

ANDERSON COUNTY, SC



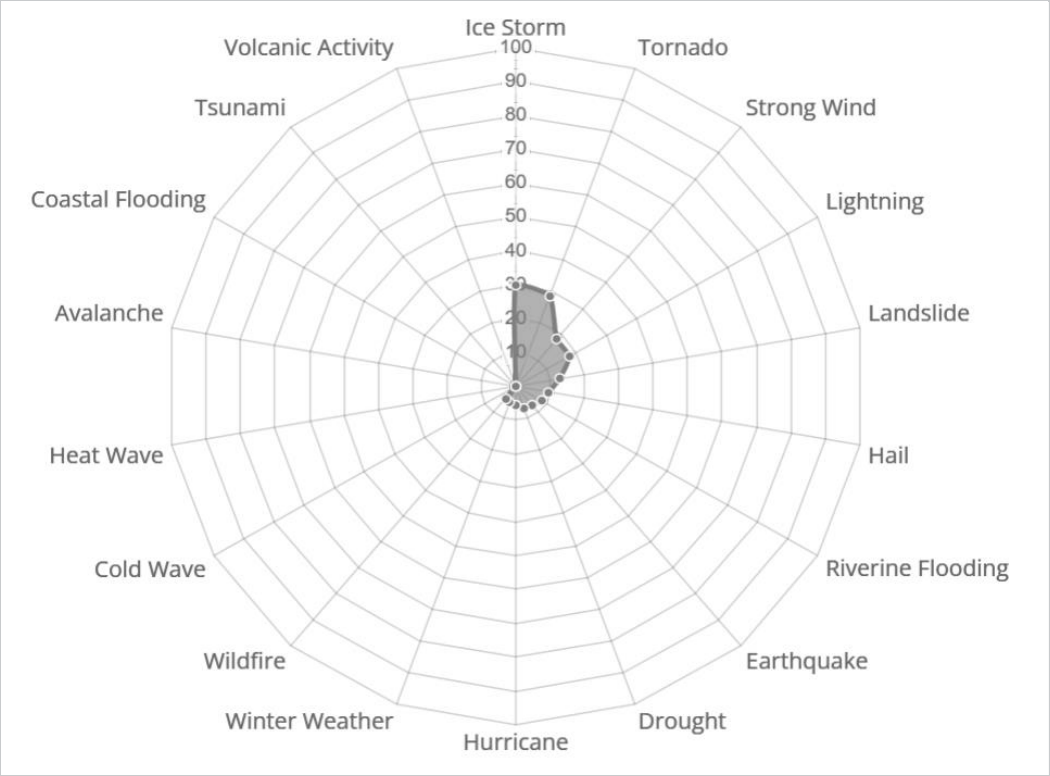
The Risk Index rating is **Relatively Low** for Anderson County, SC when compared to the rest of the U.S.

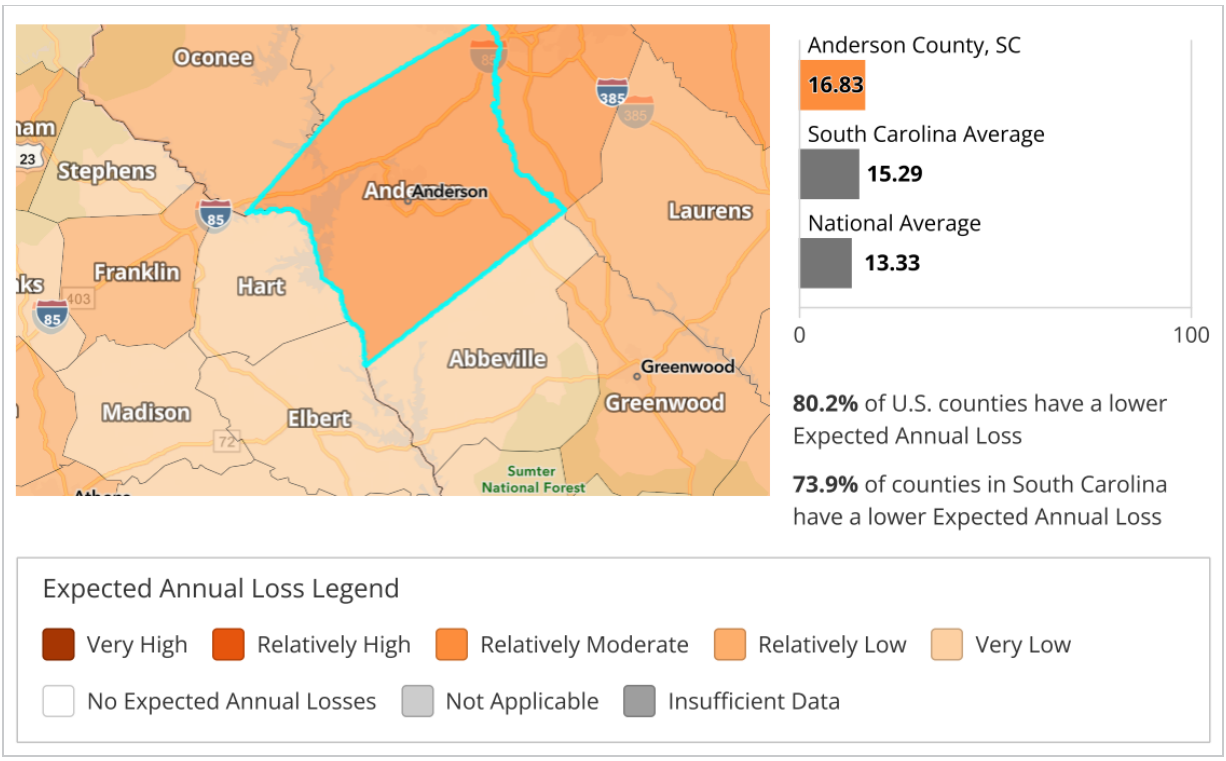
76.7% of U.S. counties have a lower Risk Index.
56.5% of counties in South Carolina have a lower Risk Index.

Anderson County Hazard Type Risk Index

Hazard type Risk Index scores are calculated using data for only a single hazard type, and reflect a community's relative risk for only that hazard type.

HAZARD TYPE	RISK INDEX RATING	RISK INDEX SCORE (0-100)
Tornado/High Winds	Relatively High	28.59
Lightning/Thunderstorms	Relatively Moderate	18.06
Hail/Thunderstorms	Relatively Low	9.54
Riverine Flooding	Relatively Low	8.82
Earthquake	Relatively Low	7.54
Drought/Heatwave	Relatively Low	6.75
Hurricane	Relatively Low	5.40
Winter Storms	Very Low	4.93
Wildfire	Very Low	4.63





Expected Annual Loss

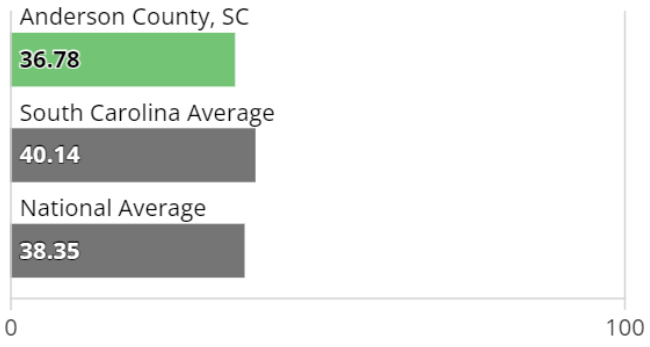
HAZARD TYPE	EXPECTED ANNUAL LOSS RATING	EXPECTED ANNUAL LOSS SCORE (0-100)
Winter Storms	Relatively Moderate	26.4
Lightning/Thunderstorms	Relatively Moderate	25.9
Tornado/High Winds	Relatively Moderate	22.82
Drought/Heatwave	Relatively Moderate	14.84
Hail/Thunderstorms	Relatively Low	13.79
Hurricane	Relatively Low	8.20
Riverine Flooding	Relatively Low	7.51
Earthquake	Relatively Low	7.05
Wildfires	Very Low	3.80

Composite Expected Annual Loss			$8,807,792.72
Building Value	$4,528,182.36	Population	0.53 fatalities
Population Equivalence	$4,035,435.52	Agriculture Value	$244,174.84

HAZARD TYPE	TOTAL	BUILDING VALUE	AGRICULTURAL VALUE
Tornado/High Winds	$4,610,069	$1,960,161	$1,822
Earthquake	$1,377,134	$1,264,224	N/A
Riverine Flooding	$482,806	$73,595	$23,879
Lightning/ Thunderstorms	$244,239	$81,558	N/A
Hurricane	$115,291	$24,028	$80,195
Drought/Heatwave	$91,965	N/A	$91,965
Wildfires	$22,065	$21,858	$8

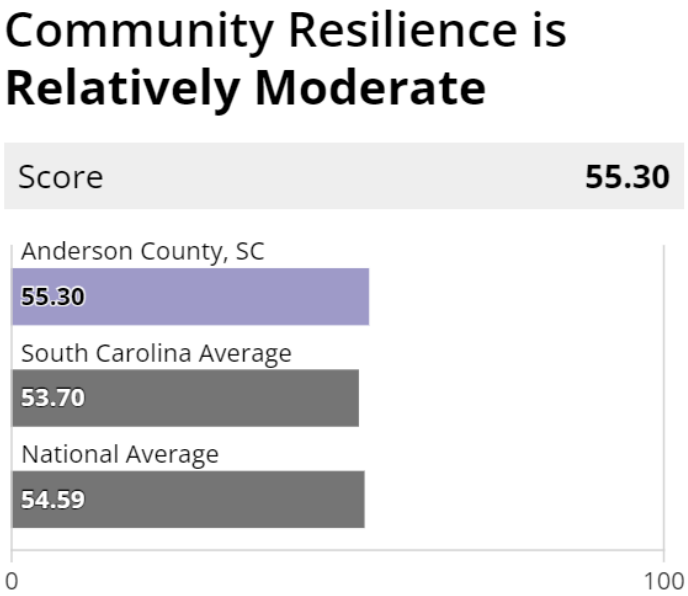
Social Vulnerability is **Relatively Moderate**

Score	36.78



Social groups in **Anderson County, SC** have a **Relatively Moderate** susceptibility to the adverse impacts of natural hazards when compared to the rest of the U.S.

43.5% of U.S. counties have a lower Social Vulnerability
28.2% of counties in South Carolina have a lower Social Vulnerability

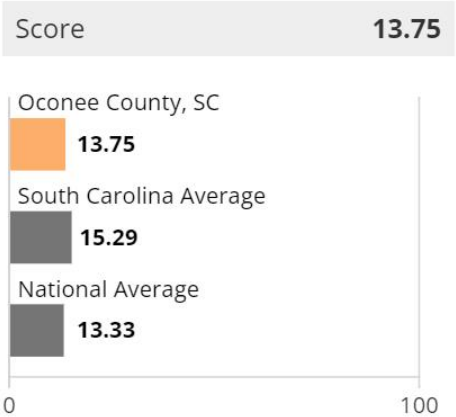


Communities in **Anderson County, SC** have a **Relatively Moderate** ability to prepare for anticipated natural hazards, adapt to changing conditions, and withstand and recover rapidly from disruptions when compared to the rest of the U.S.

41.5% of U.S. counties have a higher Community Resilience
19.6% of counties in South Carolina have a higher Community Resilience

Oconee County, South Carolina

In **Oconee County, SC**, expected loss each year due to natural hazards is **Relatively Low** when compared to the rest of the U.S.



65.9% of U.S. counties have a lower Expected Annual Loss

54.3% of counties in South Carolina have a lower Expected Annual Loss

Expected Annual Loss Legend

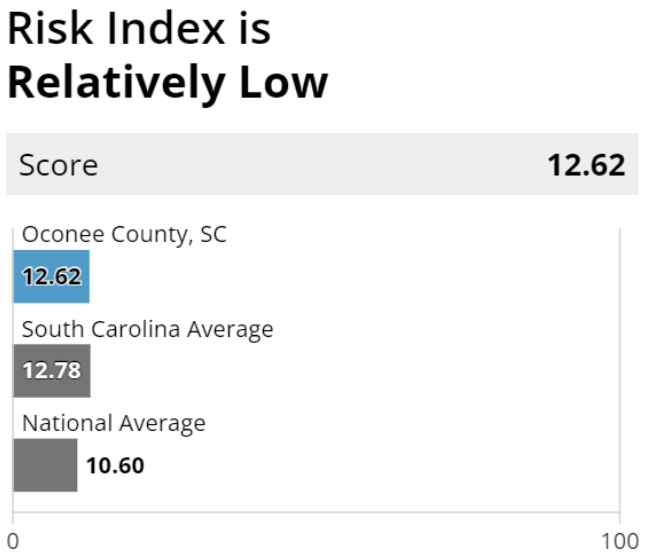
Very High | Relatively High | Relatively Moderate | Relatively Low | Very Low

The Risk Index rating is **Relatively Low** for Oconee County, SC when compared to the rest of the U.S.

75.3% of U.S. counties have a lower Risk Index.
52.1% of counties in South Carolina have a lower Risk Index.

Oconee County Hazard Type Risk Index

Hazard type Risk Index scores are calculated using data for only a single hazard type, and reflect a community's relative risk for only that hazard type.



The Risk Index rating is **Relatively Low** for Oconee County, SC when compared to the rest of the U.S.

75.3% of U.S. counties have a lower Risk Index.
52.1% of counties in South Carolina have a lower Risk Index.

Oconee County Hazard Type Risk Index

Hazard type Risk Index scores are calculated using data for only a single hazard type, and reflect a community's relative risk for only that hazard type.

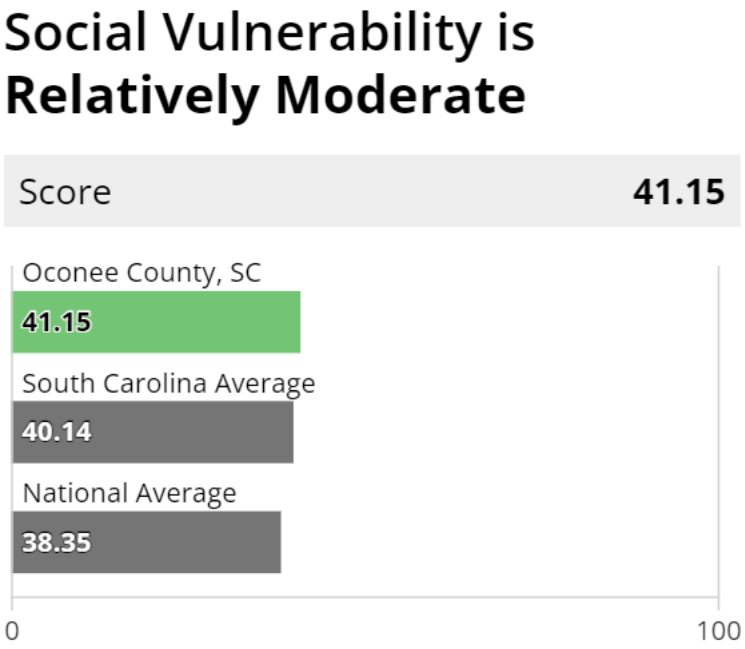
HAZARD TYPE	RISK INDEX RATING	RISK INDEX SCORE (0-100)
Winter Storms	Relatively Moderate	26.2
Tornado/High Winds	Relatively Moderate	24.35
Lightning/Thunderstorms	Relatively Moderate	18.47
Drought/Heatwave	Relatively Moderate	16.57
Hail/Thunderstorms	Relatively Moderate	13.52
Hurricane	Relatively Low	8.75
Riverine Flooding	Relatively Low	8.02
Earthquake	Relatively Low	6.47
Wildfires	Very Low	4.06

Expected Annual Loss

HAZARD TYPE	EXPECTED ANNUAL LOSS RATING	EXPECTED ANNUAL LOSS SCORE (0-100)
Winter Storms	Relatively Moderate	26.4
Lightning/Thunderstorms	Relatively Moderate	25.9
Tornado/High Winds	Relatively Moderate	22.82
Drought/Heatwave	Relatively Moderate	14.84
Hail/Thunderstorms	Relatively Low	13.79
Hurricane	Relatively Low	8.20
Riverine Flooding	Relatively Low	7.51
Earthquake	Relatively Low	7.05
Wildfires	Very Low	3.80

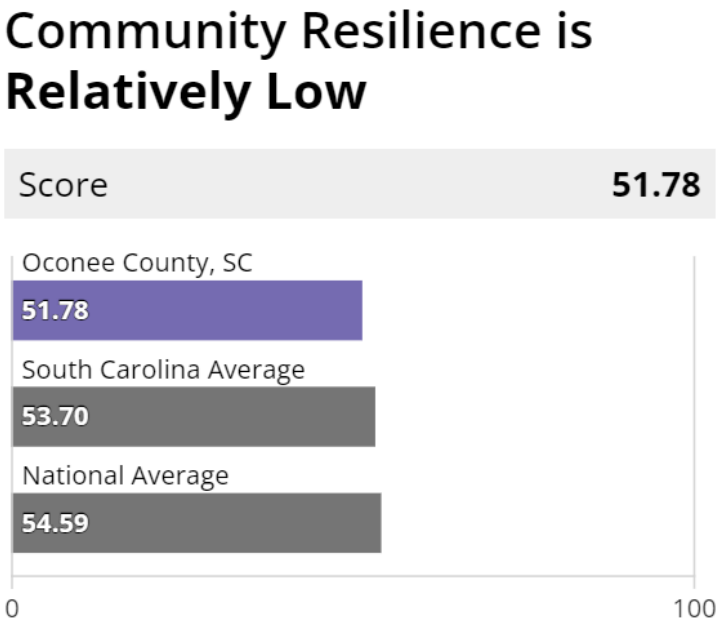
Composite Expected Annual Loss			**$5,122,368.52**
Building Value	**$2,113,155.22**	Population	**0.23** fatalities
Agriculture Value	**$1,241,852.35**	Population Equivalence	**$1,767,360.96**

HAZARD TYPE	TOTAL	BUILDING VALUE	AGRICULTURAL VALUE
Tornado/High Winds	$1,674,768	$670,946	$3,549
Drought/Heatwave	$797,523	N/A	$797,523
Earthquake	$526,464	$489,684	N/A
Hurricane	$287,532	$7,847	$275,796
Riverine Flooding	$212,530	$87,014	$41,127
Hail/Thunderstorm	$175,738	$68,829	$91,777
Lightning/ Thunderstorms	$159,488	$36,910	N/A
Winter Storms	$118,458	$248	$673
Wildfires	$87,023	$8,616	$21



Social groups in **Oconee County, SC** have a **Relatively Moderate** susceptibility to the adverse impacts of natural hazards when compared to the rest of the U.S.

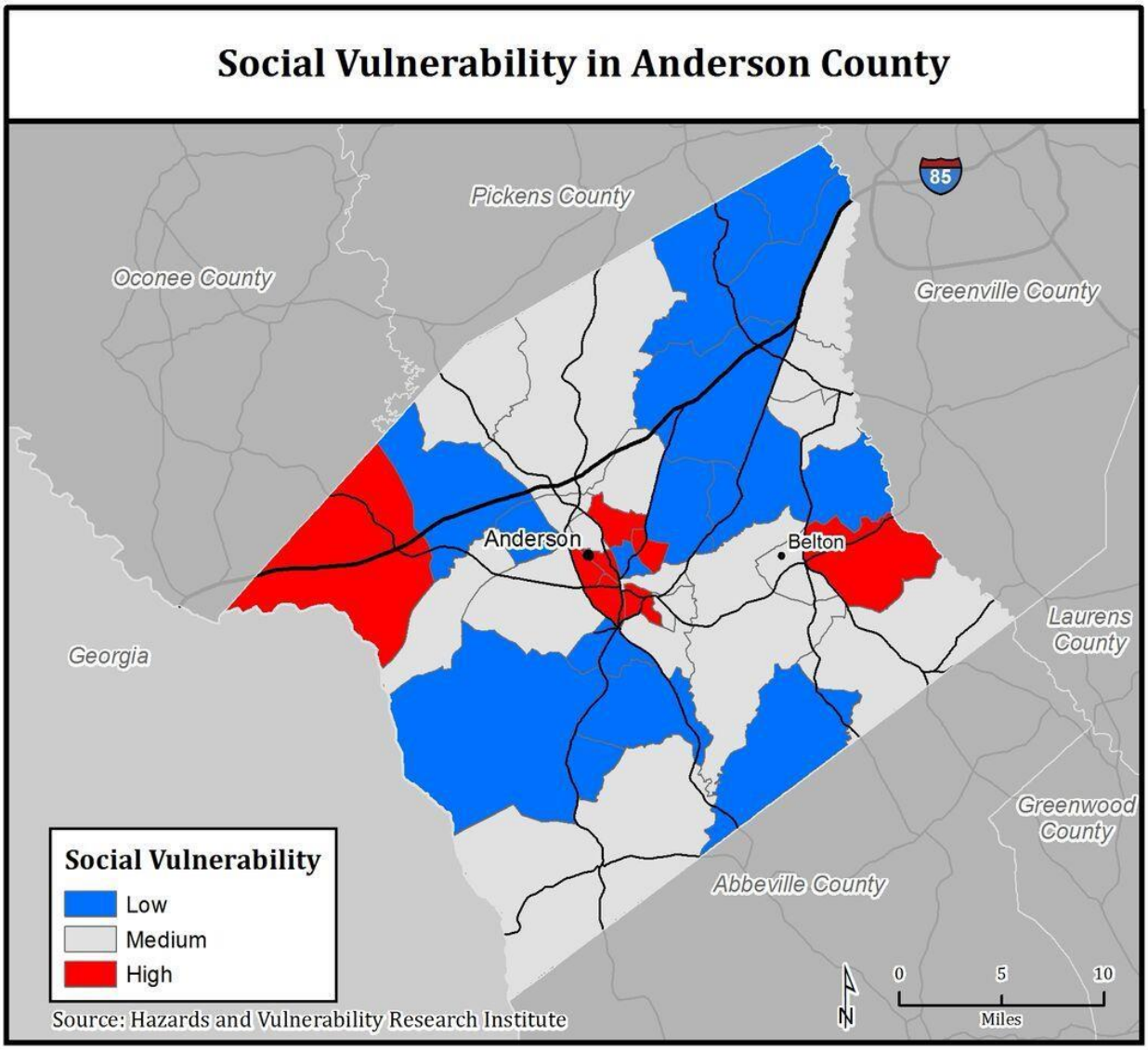
62.4%of U.S. counties have a lower Social Vulnerability
52.1%of counties in South Carolina have a lower Social Vulnerability



Communities in **Oconee County, SC** have a **Relatively Low** ability to prepare for anticipated natural hazards, adapt to changing conditions, and withstand and recover rapidly from disruptions when compared to the rest of the U.S.

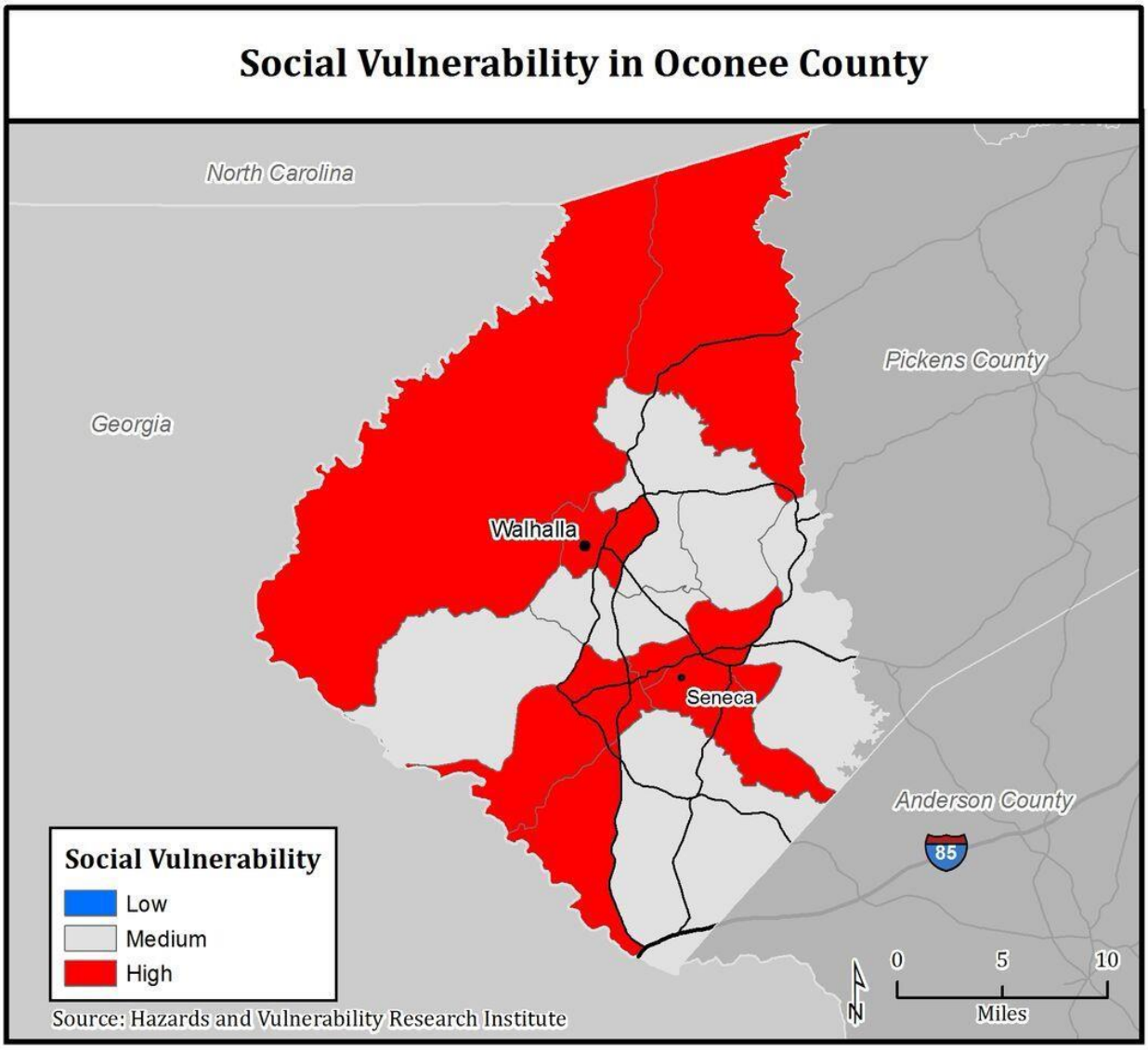
83.3% of U.S. counties have a higher Community Resilience
76.1% of counties in South Carolina have a higher Community Resilience

FIGURE 6.3: SOCIAL VULNERABILITY IN ANDERSON COUNTY



Source: Anderson County GIS

FIGURE 6.4: SOCIAL VULNERABILITY IN OCONEE COUNTY



6.5.1 Development Trends and Changes in Vulnerability

Since the previous hazard mitigation plans were approved, Anderson and Oconee County has experienced moderate growth and development. **Table 6.4** shows the number of building units constructed since 2014 according to the U.S. Census American Community Survey (ACS).

Table 6.5 shows population growth estimates for both counties and all municipalities from 2015 to 2020 based on the ACS five-year estimates.

TABLE 6.5: POPULATION GROWTH FOR ANDERSON & OCONEE COUNTIES

Jurisdiction	Population Estimates						% Change 2015-2020
	2015	2016	2017	2018	2019	2020	
Anderson	27,058	27,014	27,265	27,344	27,612	29,170	7.8%
Belton	4,284	4,324	4,374	4,411	4,451	4,348	1.49%
Honea Path	3,668	3,703	3,748	3,783	3,818	3,690	0.6%
Iva	1,274	1,287	1,303	1,316	1,327	1,124	-11.7%
Pendleton	3,132	3,169	3,211	3,244	3,280	3,499	1.11%
Pelzer	1,338	1,352	1,371	1,385	1,399	1,347	0.12%
Salem	146	147	149	151	151	119	-18.4%
Seneca	8,193	8,244	8,332	8,445	8,509	8,836	7.8%
Starr	182	185	188	188	190	165	-17%
Wahalla	4,255	4,281	4,326	4,366	4,434	4,069	-4.4%
Westminster	2,479	2,497	2,522	2,545	2,585	2,352	-5.12%
West Pelzer	907	916	929	935	944	967	6.6%
West Union	318	320	325	326	332	374	17.6%
Williamston	4,091	4,130	4,182	4,221	4,263	4,059	-0.78%

Source: United States Census Bureau, 2015, 2016, 2017, 2018, 2019, and 2020 American Community Survey 5-Year Estimates

Jurisdiction	Population Estimates						% Change 2015-2020
	2015	2016	2017	2018	2019	2020	
ANDERSON COUNTY TOTAL	**193,806**	**195,672**	**198,255**	**200,209**	**202,424**	**204,353**	**5.44%**
OCONEE COUNTY TOTAL	**75,908**	**76,508**	**77,382**	**78,215**	**79,450**	**80,015**	**5.41%**

Since the population has increased across both counties, there is now a greater number of people exposed to the identified hazards. Therefore, development and population growth have impacted the county's vulnerability since the previous local hazard mitigation plans were 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, wildfire risk areas, or other identified hazard areas.

6.6 VULNERABILITY ASSESSMENT RESULTS

As noted earlier, only hazards with a specific geographic boundary, modeling tool, or sufficient historical data allow for further analysis. The results of this analysis are presented here. All other hazards are assumed to impact the entire planning region (drought, hailstorm, heat wave/extreme heat, lightning, severe thunderstorm/high wind, tornado, winter storm/freeze) or, due to lack of data, analysis would not lead to credible results (transportation incident). The total county exposure, and thus risk, was presented in **Table 6.1**.

The annualized loss estimate for all hazards is presented near the end of this section in **Table 6.15.** The hazards presented in these subsections include: hurricane/tropical storm winds, earthquake, flood, landslide, hazardous materials incident, and wildfire.

6.7 CONCLUSIONS ON HAZARD VULNERABILITY

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

- Improving our understanding of the risk associated with the hazards in Anderson County & Oconee County 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 Anderson County and Oconee County. 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.
- Revealing the socio-economic dynamics that impact disaster recovery. Population growth (or decline), median income, racial demographics, and other factors all impact resilience and hazard mitigation needs.

SECTION 7
CAPABILITY ASSESSMENT

This section of the Plan discusses the capability of the jurisdictions in Anderson County and Oconee County 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, amount 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 Anderson County, Oconee County and their municipalities 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 county 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 considering 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 for Anderson County, Oconee County, and their municipalities, a detailed Capability Assessment Survey was completed for each of the participating jurisdictions based on the information found in the 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 jurisdictions' ability to implement hazard mitigation actions. Other indicators included information related to the communities' 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 that the county 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[2] was then applied to quantify each jurisdiction's overall capability. 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 jurisdictions in both Anderson County and Oconee County to implement hazard mitigation activities. All information is based upon the review of the existing hazard mitigation plans and local government websites through the Capability Assessment Survey and input provided by local government officials during meetings of the Hazard Mitigation Planning Team.

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

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

cultural resources in the community. Although some conflicts can arise, these planning initiatives 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 jurisdictions in both Counties 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 jurisdictions within the two Counties. 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. A dagger (†) indicates that the given item is administered for that municipality by the county. Each of these local plans, ordinances, and programs should be considered available mechanisms for incorporating the requirements of the Anderson & Oconee County Hazard Mitigation Plan.

TABLE 7.1: RELEVANT PLANS, ORDINANCES, AND PROGRAMS

Planning/Regulatory Tool	ANDERSON COUNTY	Anderson	Belton	Honea Path	Starr/Iva	Pelzer	Pendleton	West Pelzer	Williamston	OCONEE	Salem	Seneca	Wahalla	Westminster	West Union
Hazard Mitigation Plan	✓	†	†	†	†	†	†	†	†	✓	†	†	†	†	†
Threat and Hazard Identification and Risk Assessment (THIRA)	*														
Comprehensive Land Use Plan	✓		✓		✓	✓	✓	✓	✓	✓		✓		✓	
Floodplain Management Plan/Flood Mitigation 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	✓	†	†	†	†	†	†	†	†	✓	†	†	†	†	†

Planning/Regulatory Tool	ANDERSON COUNTY	Anderson	Belton	Honea Path	Starr/Iva	Pelzer	Pendleto	West Pelzer	Williamston	OCONEE	Salem	Seneca	Wahalla	Westminster	West Union
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/Reconstruction Plan/Ordinance	✓														
Building Code	✓	†	†	†		†	†	†	✓	†	✓	✓		✓	
Fire Code	✓	†	✓	✓		✓	†	✓	✓	✓		✓		✓	
National Flood Insurance Program (NFIP)	✓	✓	✓		✓	✓	✓	✓	✓	✓		✓		✓	

A more detailed discussion on the county'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 participating jurisdictions' 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.

- Anderson County and Oconee County have previously adopted a hazard mitigation plan. Each participating municipality was included in the 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.

- Anderson County, and Oconee County have adopted disaster recovery plans. The other participating jurisdictions should consider developing a plan to guide the recovery and reconstruction process following a disaster.

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

- Anderson County maintains an emergency operation plan through the County Emergency Management Department.
- Oconee County maintains an emergency operation plan through the County Emergency Management Department.

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.

- Anderson County has developed a county continuity of operations plan.
- Oconee County has developed a county continuity of operations plan.

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.

- Anderson County has adopted a flood response plan.
- Oconee County 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 Anderson & Oconee Counties.

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.

- Anderson and Oconee Counties have both adopted individual county comprehensive plan.

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.

- Anderson County, Oconee County, and Anderson City have adopted respective Capital Improvement Plans.

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.

- Neither Anderson County nor Oconee has not developed a historic preservation plan; however, the City of Anderson does have historic preservation plans in place.

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.

- Anderson County, Oconee County and each of the participating municipalities have adopted zoning ordinances.

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.

- Anderson County, Oconee County, and the City of Anderson have adopted subdivision ordinances.

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.

- Both Anderson and Oconee Counties have adopted the South Carolina State Building Code. The counties also provide building code enforcement for all unincorporated areas of the counties.

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 South Carolina, the South Carolina Building Codes Council, which is under the SC Department of Labor, Licensing, and Regulation, 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 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.

Specific BCEGS rating for the participating jurisdictions can be obtained by contacting the department for building inspections within that jurisdiction.

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.

[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

Anderson County, City of Anderson, Town of Belton, Town of Iva, Town of Pendleton, Town of Honea Path, and Town of Williamston have adopted the NFIP Ordinance, adopted the FIRM Rate Map, and enforce floodplain regulation. The Town of Starr and Town of West Pelzer do not currently participate in the NFIP due to their limited staff and not being aware of the benefits for their residents. The County of Anderson is preparing to assist these municipalities to become participants of NFIP. Anderson County administers the NFIP ordinance for the county. Anderson County implements the Anderson County Damage Assessment Team to determine flood damage after an event.

Due to limited staffing and funding the Anderson County municipalities rely on Anderson county for enforcement of NFIP requirements. Anderson County assist the Town of Belton with floodplain management: Source-Agreement with Town of Belton and Anderson County.

Anderson County joined the National Flood Insurance Program shortly before 1981 for the following reasons;
* So that residents would be able to purchase flood insurance. Source: FEMA-National Flood Insurance Program
*Anderson County could apply for federal assistance in times of disasters. Source: FEMA-National Flood Insurance Program

Anderson County has a flood plain ordinance. Anderson County Code of Ordinance Chapter 24, Article IV, Section 24-579. The Ordinance last updated in 2017. Source: Anderson County Ordinance 2017-038 ARTICLE IV. - FLOOD DAMAGE PREVENTION | Code of Ordinances | Anderson County, SC | Municode Library

Anderson County adopted a Land Use Development Ordnance for implementation and enforcement of local floodplain management regulations; to regulate and permit development implementation and enforcement of local floodplain management regulations to regulate and permit development. The County's Comprehensive Plan is updated every five(5) years and an entire new plan is adopted every 10 years. In addition, the Capital Improvement Plan is included with the county's Comprehensive Plan. Source: See link. Mini TOC: Chapter 24 - LAND USE | Code of Ordinances | Anderson County, SC | Municode Library Planning & Development - Anderson County (andersoncountysc.org)

Anderson County does enforce the International Building Code. You can click on the link below to access the current adopted codes in Anderson County: https://www.andersoncountysc.org/wp-content/uploads/2022/12/Adopted-Codes-Ordinances-12-22-2023.pdf

Anderson County and its municipalities implement substantial improvement/substantial damage provisions of their floodplain management regulations after an event. *State Law reference— Provisions for protection against floods authorized in local planning commission's comprehensive plan, S.C. Code 1976, § 6-7-510; authority of county to promulgate zoning regulations for protection against floods, S.C. Code 1976, § 6-7-710; authority of local planning commission to establish subdivision regulations concerning flood protection, S.C. Code 1976, § 6-7-1030.*

ANDERSON COUNTY FLOOD PROGRAM INFORMATION LISTED BELOW ARE THE SERVICES PROVIDED BY ANDERSON COUNTY TO COMMUNICATE INFORMATION ABOUT FLOOD HAZARDS, FLOOD INSURANCE RATE MAPS (FIRM), ELEVATION CERTIFICATES, FLOOD DEPTHS, SPECIAL FLOOD RELATED HAZARDS, PAST FLOODING, MANDATORY PURCHASE OF FLOOD INSURANCE, AND NATURAL FLOODPLAIN FUNCTIONS: ELEVATION CERTIFICATES FEMA Elevation Certificates are available, including instructions for completion, verification of building compliance, and estimate of flood depths. Please visit our website for the newest version of the elevation certificate. FLOOD INSURANCE RATE MAPS (FIRM) FIRMs will provide basic information needed to accurately rate a flood insurance policy, including community ID or NFIP number, panel number, date of FIRM,

FIRM zone AE, A, AO, X, or C, NAVD, floodways and flood fringe. Regulatory requirements must be addressed if developing in a floodway. FLOOD PROBLEMS NOT SHOWN ON THE FIRM Not all waterways have designated floodplains, but all waterways will flood. Flash floods are the most dangerous type of flood, killing more people annually than any other weather event. Unincorporated areas of Anderson County are susceptible to the breach of at least one high hazard dam. MANDATORY PURCHASE OF FLOOD INSURANCE The NFIP (National Flood Insurance Program) is a federal program enabling property owners to purchase flood insurance. The maximum amount of coverage available for a single-family residence is $250,000 and $500,000 for non-residential structures. Content coverage is also available. Manufactured homes are also insurable. Visit https://www.floodsmart.gov/ for insurance agents in our area. Anderson County South Carolina Planning & Development BUILDING CODES ADMINISTRATION • DEVELOPMENT STANDARDS 2 FLOOD DEPTH DATA Flood water depth data is available in given areas of Anderson County. Our GIS and Planning staff can provide data showing the approximate depth of flooding at different flood recurrence levels. SPECIAL FLOOD RELATED HAZARDS Mud-flow hazards are possible in the foothill areas of Anderson County. Closed-basin lakes that have a small or nonexistent outlet structure can also pose flooding hazards for properties down-stream. HISTORICAL FLOOD INFORMATION Areas adjacent to the Broadway Lake, Booker Street, and Susan Street in Anderson County have been known to flood in the past. Photographs of past flooding at these sites are available along with locations of high-water marks. NATURAL FLOODPLAIN FUNCTIONS Undisturbed wetlands provide a wide range of benefits to the human and natural systems, water quality, support a high rate of growth, maintain biodiversity and the integrity of the ecosystem, and provide green space, protecting creeks and streams from development effects and erosion.

https://riskfactor.com/county/anderson-county-southcarolina/45007_fsid/flood

Oconee County, City of Seneca, Town of Walhalla, and the Town of Westminster have adopted the NFIP Ordinance, adopted the FIRM Rate map, and enforce floodplain regulation. The Town of Salem and Town of West Union do not currently participate in the NFIP due to their limited staff and not being aware of the benefits for their residents. The County of Oconee is preparing to assist these municipalities to become participants of NFIP. Oconee County administers the NFIP ordinance for the county. Oconee County implements the Oconee County Damage Assessment Team to determine flood damage after an event.

Residential and Commercial Contractors Oconee County's participation in the National Flood Insurance Program (NFIP) enables our citizens to purchase flood insurance. Our ability to purchase flood insurance makes it possible for lending institutions to loan money for development on properties located within or adjacent to Special Flood Hazard Areas. In order to operate under the NFIP, the County must adopt and enforce an Ordinance designed to control development in floodplain areas and must utilize Flood Insurance Rate Maps prepared by the Federal Emergency Management Agency (FEMA). The following information is designed to provide you with general guidance for construction projects located in the vicinity of mapped floodplain areas. This guidance is not intended to cover all requirements and you are encouraged to contact the Oconee County Floodplain Administrator for consultation regarding a proposed construction project. 1% Special Flood Hazard Area (SFHA) Under the NFIP, the County is required to manage development in or near the 1% SFHA, or what used to be called the "100 yr" floodplain. The 1% SFHA is a portion of land that has a 1% chance of flooding in any given year and is shown on the FEMA Flood Insurance Rate Maps (FIRM). If a stream has been modeled, a "100-yr" flood elevation will be shown at various locations on the FIRM and is identified as the Base Flood Elevation (BFE). Important! A proposed construction project must use BFE's on the current FIRM or, if the stream has not been modeled, the "best available data." This may or may not be the BFE shown on a subdivision plan. If purchasing property or building near a flood prone area, you should contact the Floodplain Administrator to determine if your project may be impacted by the new study. Oconee County

Floods Ordinance The Oconee County Flood Damage Prevention Ordinance (Ordinance) has been approved by FEMA and is used to administer our floodplain program (Link to Ordinance). The Ordinance addresses many floodplain management issues including but not limited to the following: • Floodplain Development Permits • Floodplain Encroachments • Structure Elevation • Flood proofing (Non-residential structures only) • Manufactured Homes • Accessory Structures • Subdivision Proposals • Floodplain Development Permit A Floodplain Development Permit will be required as necessary in order to insure that the proposed structure meets Ordinance requirements. The following factors are among those considered by the Planning Department in issuing the development permit, if required: • Type of project (residential, commercial or manufactured home) • Proposed basement • Structure location - inside or outside the 1% SFHA • Flood zone type and location • Applicable Base Flood Elevation(s) • Topography Site access and grading Application Process • Contact Planning Department to determine if a permit is required • Obtain application form and instructions (Link to form and instructions) • Complete application as directed by Floodplain Administrator or designee • Floodplain permit, if required, must be issued prior to building permit Points to Remember • Determine floodplain requirements early to avoid project delays. The Ordinance requires flood protection of structures including electrical and mechanical units. • The lowest floor of residential structures (including basement floor) must be elevated at least three feet above the BFE. • Mechanical and electrical systems must be elevated or designed to prevent flood water from entering components to an elevation at least three feet above the BFE. • Commercial structures may be elevated or flood proofed to achieve the required protection. • Encroachments or construction within the 1% SFHA require additional measures and certifications. No unauthorized fill allowed in the floodplain. • Floodplain permits for major site development will be managed through a separate review process. • For additional information, see the following SC Dept. of Natural Resources website – http://www.dnr.sc.gov/water/flood/ Inspections An initial floodplain inspection will be set up approximately 2 weeks after permit issuance and follow up inspections will be scheduled as required to confirm compliance with the Ordinance. When the approved floodplain inspection has been completed, subsequent building inspections, including the permanent power inspection, may be scheduled. The Planning Department will try to determine floodplain ordinance compliance early in the construction process to minimize any disruption to the project. In some cases, a FEMA Elevation Certificate on the completed structure may be required before the Certificate of Occupancy is issued. Flood Insurance The most important reason to construct outside the 1% SFHA is to protect life and property. Over a typical 30 yr mortgage period, a structure located inside the 1% SFHA has a 26% chance of flooding. However, there are economic reasons to construct outside the flood hazard area as mapped in the most current FIRM. This is a typical scenario for obtaining a loan for a structure located within or immediately adjacent to a 1% SFHA. • The lending institution or their flood service contractor makes a determination on whether or not the structure is located in the 1% SFHA. • A Standard Flood Hazard Determination Form is completed indicating the flood • zone for the structure. Zone A or AE indicates the structure is located in the 1% SFHA while Zone X indicates it is outside the flood hazard area. • If the structure is determined to be inside the flood zone, flood insurance must be in place as a requirement of the loan. The lending institution can obtain flood insurance on behalf of the borrower if the borrower fails to get flood insurance within a specified period of time. • The lending institution has the option to require flood insurance for the loan regardless of whether or not the structure is inside the 1% SFHA. • Obviously, structures located in floodplain areas may encounter issues that could affect closing and future marketability. Even structures located outside the mapped floodplain areas (Zone X) may flood and flood insurance is still recommended. However, reduced rate insurance premiums apply to structures in Zone X. • The FEMA website www.floodsmart.gov contains a wealth of information on flood risk and insurance.

The current code utilized by the department is the 2018 International Property Maintenance Code (IPMC). The IPMC was adopted by Oconee County, which regulates the minimum maintenance requirements for existing structures and property. Oconee County's code is a maintenance document intended to establish minimum maintenance standards for basic equipment, light, ventilation, heating, sanitation and fire safety. Responsibility is fixed among owners, operators and occupants for code compliance. The code provides for the regulation and safe use of existing structures in the interest of the social and economic welfare of the

community.

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 the South Carolina Department of Natural Resources (SCDNR) 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.

7.3.5 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 results for Anderson & Oconee 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. A dagger (†) indicates a county-level staff member(s) provides the specified knowledge or skill to that municipality.

TABLE 7.4: RELEVANT STAFF/PERSONNEL RESOURCES

Staff/Personnel Resource	ANDERSON COUNTY	Anderson	Belton	Honea Path	Starr/Iva	Pelzer	Pendleton	West Pelzer	Williams	OCONEE	Salem	Seneca	Wahalla	Westminster	West Union
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	✓	✓								✓		✓			
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.

7.3.6 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 Hazard Mitigation Planning Team 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 Anderson and Oconee Counties to follow in order to become less vulnerable to its identified hazards. It is based on general consensus of the Hazard Mitigation Planning Team 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 Anderson & Oconee County
- 8.5 Plan Update Requirement

8.1 INTRODUCTION

The intent of the Mitigation Strategy is to provide Anderson and Oconee Counties with the goals that will serve as guiding principles for future mitigation policy and project administration along with an analysis of mitigation techniques 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 Anderson County, Oconee County and their municipalities (provided separately in Section 9: *Mitigation Action Plan*). The county and each participating jurisdiction have 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 both Anderson and Oconee County and its municipalities 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 Hazard Mitigation Plan.

In preparing each Mitigation Action Plan for Anderson and Oconee County, 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

The point of contact for each jurisdiction 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.

[1] Only a general economic cost/benefit review was considered by the Hazard Mitigation Planning Team 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.

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, Anderson County, Oconee County, and the participating municipalities have developed six goal statements for local hazard mitigation planning in each county. In developing these goals, the previous hazard mitigation plan was reviewed to determine if the goals remained applicable. Two goals were combined, and the remaining five goals were reworded and expanded. The modified goals were presented, reviewed, voted on, and accepted by the Hazard Mitigation Planning Team. Each goal, purposefully broad in nature, serves to establish parameters that were used in developing mitigation actions. The Anderson and Oconee County Mitigation Goals are presented in **Table 8.1**. Consistent implementation of actions over time will ensure that community goals are achieved.

TABLE 8.1: MITIGATION GOALS FOR ANDERSON & OCONEE COUNTIES

	Goal
Goal #1	Local government and the community shall have the capability to initiate and sustain emergency response operations to include shelter designations and services.
Goal #2	Provide for continuity of local government operations during disasters to include plan development, resource identification, redundant equipment, facilities, and/or supplies to facilitate reestablishing local government operations after a disaster.
Goal #3	The health, safety, and welfare of the community's residents and visitors shall be provided for during disasters by ensuring adequate systems for notifying the public at risk and providing emergency instruction during a disaster is available in all identified hazard areas as well as adequate resources, equipment, and supplies to meet citizens' health and safety needs after a disaster.
Goal #4	The policies and regulations of local government shall support effective hazard mitigation programming throughout the community to include reducing the vulnerability of facilities in the community posing an extra health or safety risk when damaged or disrupted by a disaster. Land use policies, plans, and regulations shall discourage and/or prohibit inappropriate location of structures or infrastructure components in areas of higher risk and enforce appropriate development codes.
Goal #5	The availability and functioning of the community's infrastructure shall not be significantly disrupted by a disaster. Transportation facilities and systems serving the community shall be constructed and/or retrofitted to minimize the potential for disruption during a disaster.
Goal #6	Develop and maintain an education program to inform all members of the community of the risks/hazards threatening the local area and assist them in understanding their vulnerability to disasters and provide technique ideas 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 Anderson and Oconee County, 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 Hazard Mitigation Planning Team meetings. In general, all activities considered by the Hazard Mitigation Planning Team can be classified under one of the following six 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., wind proofing, 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

In order to determine the most appropriate mitigation techniques for the communities in Anderson and Oconee County, the Hazard Mitigation Planning Team 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 plans were evaluated to determine their 2022 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 2022 planning process.

SECTION 9
MITIGATION ACTION PLAN

This section includes the listing of the mitigation actions proposed by the participating jurisdictions in Anderson and Oconee Counties. 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 Anderson and Oconee County. 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 Anderson & Oconee County Multi-Jurisdictional 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 should be completed. More information is provided when possible.
- Implementation Status (2023)—Indication of completion, progress, deferment, or no change since the previous plan. If the action is new, that will be noted here.

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Anderson and Oconee County Mitigation Action Plan

Action #		Hazard(s) Addressed	Relative Priority	Potential Funding Sources	Implementation Status (2023)	Anderson County	Oconee County
P-1	Utilize the existing Local Emergency Planning Committee to meet following disasters and to review response effectiveness and mitigation needs. **Lead Agency**: County EMD **Schedule:** 2023-2028	All	Moderate	General Funds, revenue as available and grants	Completed & Ongoing Continuing effort. When possible, the LEPC is utilized to review response effectiveness and mitigation needs. The Hazard Vulnerability Subcommittee plays a vital role in assessing local industry and making them safer prior to hazards occurring. Since this goal was established, we've had one declared disaster with little no impact on industry.	Standard procedure for all jurisdictions Anderson County Anderson Belton Honea Path Iva Pelzer Pendleton Starr West Pelzer Pendleton	Standard procedure for all jurisdictions. Oconee County Salem Seneca Wahalla West Union Westminster
P-2	Develop a tracking system for mitigation activities that reviews effectiveness following disaster events. **Lead Agency**: County Municipal Govt. & EMD **Schedule:** Ongoing	All	Moderate	General Funds, revenue as available and grants	Completed & Ongoing Repetitive disaster areas of concern are routinely monitored and tracked by county, city , or municipal departments/divisions. Through the development of ordinances and codes by council, effective mitigation activities can be adopted following repetitive disaster events.	Standard procedure for all jurisdictions Anderson County Anderson Belton Honea Path Iva Pelzer Pendleton Starr West Pelzer Pendleton	Standard procedure for all jurisdictions Oconee County Salem Seneca Wahalla West Union Westminster

P-3	Review local government stormwater regulations to assess how well they prevent hazardous situations due to stormwater flooding. **Lead Agency:** Public Works Dept. **Schedule:** Ongoing	All	Moderate	Local Funds	It is the responsibility of the municipalities for initiating review of storm water regulations and for contacting County EMD when resources are exhausted.	Standard procedure for all jurisdictions Anderson County Anderson Belton Honea Path Iva Pelzer Pendleton Starr West Pelzer Pendleton	Standard procedure for all jurisdictions Oconee County Salem Seneca Wahalla West Union Westminster
P-4	Establish data backup options (i.e., laptops, off-site backups) for critical data that are easily removed and accessed at different locations in case evacuation of public facilities is necessary. **Lead Agency**: County IT, EMD **Schedule**: 2023-2028	All	Moderate	Local Funds	Completed & Ongoing All jurisdictions should continually be exploring continued best practices.	**Anderson County**: Laptops & Cloud Software already in use **Anderson:** Laptops & Cloud Software already in use **Belton:** All critical data backed up on the cloud **Honea Path:** Backups data on the Cloud. **Iva:** Critical data backed up offsite. **Pelzer:** All critical data is backed up on the cloud. **Pendleton:** All critical data backed up offsite and can be accessed offsite. **Starr:** **West Pelzer:** All critical data backed up **Williamston:** All critical data backed up	**Oconee County:** IT uses cloud and external hard drives to backup data **Salem:** Data backed up with the cloud and hard drive system. **Seneca:** Data backed up with the cloud and hard drive system. **Wahalla:** Uses cloud and external hard drive to back up critical data. **West Union:** Uses cloud and external hard drive to back up critical data **Westminster**: Power provider backs up critical data

Action #	Description	Hazard(s) Addressed	Relative Priority	Potential Funding Sources	Implementation Status (2023)	Anderson County	Oconee County
P-5	Establish procedures and location for setting up an operations center for local government in the event a natural disaster forces the evacuation of local government buildings and the primary Emergency Operations Center. **Lead Agency**: County EMD **Schedule:** Completed	All	High	Local Funds	Completed Procedures have been established to location and set up an operations center in the event of evacuation of the primary Emergency Operations Center.	Standard procedure for all jurisdictions Anderson County Anderson Belton Honea Path Iva Pelzer Pendleton Starr West Pelzer Pendleton	Standard procedure for all jurisdictions Oconee County Salem Seneca Wahalla West Union Westminster
P-6	Strictly adhere to the ISO 9000 Building Code adopted in the community. **Lead Agency**: County Building & Codes Dept. **Schedule**: Ongoing	All	High	Local Funds	Ongoing Continuing effort to enforce the adopted ISO 9000 Building Code.	Standard procedure for all jurisdictions Anderson County Anderson Belton Honea Path Iva Pelzer Pendleton Starr West Pelzer Pendleton	Standard procedure for all jurisdictions Oconee County Salem Seneca Wahalla West Union Westminster

P-7	Examine ways to identify and acquire parcels of land subject to the effects of disasters that could provide for parks and open space in the community.	All	Moderate	Local Funds	Deleted Realized that the funding will not be available to support this effort and enough of a reoccurring flood problem to warrant the county pursuing this.		
Action #	**Description**	**Hazard(s) Addressed**	**Relative Priority**	**Potential Funding Sources**	**Implementation Status (2023)**	**Anderson County**	**Oconee County**
P-8	Review local codes to determine whether they address the hazards identified for the community. **Lead Agency**: County Building & Codes Dept. **Schedule**: Ongoing	All	Moderate	Local Funds	Ongoing Continuing effort to review local codes and determine if they address identified hazards. The county will need to adopt revisions to these codes when those take place so, this action will remain.	Standard procedure for all jurisdictions Anderson County Anderson Belton Honea Path Iva Pelzer Pendleton Starr West Pelzer Pendleton	Standard procedure for all jurisdictions Oconee County Salem Seneca Wahalla West Union Westminster
P-9	Address resource needs for victims during times of disaster by taking pre- disaster measures. **Lead Agency**: EMD, Police, Fire & EMS **Schedule**: Ongoing	All	High	Grant Money	Deferred We continue to work with LEPC to identify facilities and then work with these facilities that can pose large health/safety risk when damaged. In addition, we contact every landline/registered cell phone in the community each year to ensure we have connectivity following a disaster in an effort to provide our public with	Standard procedure for all jurisdictions Anderson County Anderson Belton Honea Path Iva Pelzer Pendleton Starr West Pelzer Pendleton	Standard procedure for all jurisdictions Oconee County Salem Seneca Wahalla West Union Westminster

					resource center locations. While we work on effective communication, we also practice delivery of resources through various POD/Donation center trainings or real-life activations.		

Action #	Description	Hazard(s) Addressed	Relative Priority	Potential Funding Sources	Implementation Status (2023)	Anderson County	Oconee County
Property Protection							
PP-1	Structurally analyze all buildings or rooms identified as shelters and strengthen these as necessary. **Lead Agency:** County EMD **Schedule**: 2023 to 2028	All	High	Local Funds	Red Cross, with assistance from Emergency Management (as needed), analyzes their shelter locations and determine what hazard mitigation measures can be taken to address any potential problems. However, as leadership changes in several of our designated shelter locations (e.g., churches) this is an ongoing process.	Standard procedure for all jurisdictions Anderson County Anderson Belton Honea Path Iva Pelzer Pendleton Starr West Pelzer Pendleton	Standard procedure for all jurisdictions Oconee County Salem Seneca Wahalla West Union Westminster

PP-2	Survey critical emergency response facilities (fire stations, law enforcement centers, and emergency headquarters) to identify risks posed to structures and seek funding to mitigate the problems. **Lead Agency:** County EMD, EMS, Police, Fire **Schedule**: 2023 to 2028	All	High	Local Funds	Ongoing Various first response agencies continue to identify risks posed at their respective locations and as their structures continue to age, addressing these issues will always be ongoing. The responsibility for addressing these issues is that of each respective first response agency. However, when feasible, EM can assist with Mitigation grant proposals.	Standard procedure for all jurisdictions Anderson County Anderson Belton Honea Path Iva Pelzer Pendleton Starr West Pelzer Pendleton	Standard procedure for all jurisdictions Oconee County Salem Seneca Wahalla West Union Westminster
PP-3	Evaluate medical facilities within the community to ensure they are protected from the threats posed by natural disasters. **Lead Agency**: Hospital Systems **Schedule:** Ongoing	All	High	Hospital System SOP	Ongoing Hospital systems conduct their own HVA analysis for their respective facilities.	Standard procedure for all jurisdictions Anderson County Anderson Belton Honea Path Iva Pelzer Pendleton Starr West Pelzer Pendleton	Standard procedure for all jurisdictions Oconee County Salem Seneca Wahalla West Union Westminster

PP-5	Inspect water and sewer infrastructure for vulnerability to natural hazards. Identify and elevate vulnerable equipment and electrical controls at wastewater and potable water treatment facilities. **Lead Agency**: Public Works **Schedule:** Ongoing	All	High	Local Funds	All local water/sewer districts continually inspect and maintain their infrastructure to lessen their vulnerability to natural hazards.	Standard procedure for all jurisdictions Anderson County Anderson Belton Honea Path Iva Pelzer Pendleton Starr West Pelzer Pendleton	Standard procedure for all jurisdictions Oconee County Salem Seneca Wahalla West Union Westminster
PP-6	Identify roadways and traffic systems susceptible to natural hazards (i.e., flooding) and prioritize improvement projects to minimize disruption to the roadways. **Lead Agency**: Public Works **Schedule:** Ongoing	All	High	Local Funds	Relevant stakeholders continually identify areas susceptible to natural hazards.	Standard procedure for all jurisdictions Anderson County Anderson Belton Honea Path Iva Pelzer Pendleton Starr West Pelzer Pendleton	Standard procedure for all jurisdictions Oconee County Salem Seneca Wahalla West Union Westminster

PP-7	Determine whether there are incremental mitigating improvements that can be made to facilities as part of ongoing maintenance and performance enhancement. **Lead Agency**: Public Works (County & Municipal) **Schedule**: Ongoing	All	High	Local Funds	Ongoing Facilities Maintenance Departments all public service entities are taken the mitigations measures they are afforded to take with their respective budget constraints. With the natural aging of building or poor building placements this is an ongoing process.	Standard procedure for all jurisdictions Anderson County Anderson Belton Honea Path Iva Pelzer Pendleton Starr West Pelzer Pendleton	Standard procedure for all jurisdictions Oconee County Salem Seneca Wahalla West Union Westminster
PP-8	Replace low bridges or other obstructions that may induce flooding of houses or businesses. **Lead Agency**: Public Works **Schedule**: Ongoing	All	Moderate	Local Funds	Deferred Continuing effort to replace low bridges and other obstructions. There are still a number of structures that need to be upgraded going forward so this action will remain in place.	Standard procedure for all jurisdictions Anderson County Anderson Belton Honea Path Iva Pelzer Pendleton Starr West Pelzer Pendleton	Standard procedure for all jurisdictions Oconee County Salem Seneca Wahalla West Union Westminster

PP-9	In conjunction with LEPC, identify facilities in the community posing serious health/safety risk on the community when damaged and identify mitigation measures that can be taken to lessen the impact. **Lead Agency**: County EMD, LEPC **Schedule**: 2023-2028	All	High	Local Funds	Deferred We continue to work with LEPC to identify facilities and then work with these facilities that can pose large health/safety risk when damaged. However, as our area grows and new industries call the Upstate home, this will always be an ongoing action item.	Standard procedure for all jurisdictions Anderson County Anderson Belton Honea Path Iva Pelzer Pendleton Starr West Pelzer Pendleton	Standard procedure for all jurisdictions Oconee County Salem Seneca Wahalla West Union Westminster

Action #	Description	Hazard(s) Addressed	Relative Priority	Potential Funding Sources	Implementation Status (2023)	Implementation Schedule	
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1							
Emergency Services							
ES-1	Identify special needs populations and establish procedures for providing transportation to shelters in the case of a natural disaster. **Lead Agency**: County EMD **Schedule**: 2023 to 2028	All	High	Local Funds	**Deferred** SCOEM has added a Special Needs Registry and has utilized the ENS system to promote the registry. However, with the transient nature of our population and the reluctance of some of admit their loved one is specials needs this will be an ongoing challenge for our department.	**Anderson County*** **Anderson*** **Belton**: Maintains Assistance Contact Hotline **Honea Path*** **Iva**: Fire department trains annually with Nursing Home annually for emergency response **Pelzer*** **Pendleton*** **Starr*** **West Pelzer*** **Pendleton*** ***Rely on Anderson County Emergency Operations Plan. Roles and responsibilities further defined thru emergency support functions.**	**Oconee County*** **Salem*** **Seneca*** **Wahalla*** **West Union*** **Westminster*** ***Rely on Oconee County Emergency Operations Plan. Roles and responsibilities further defined thru emergency support functions. All municipalities participate in the County's Special Needs Task Force**

ES-2	Provide emergency back-up power to critical facilities: emergency generators, secondary feeds, etc. **Lead Agency**: Municipal public works departments; American Red Cross **Schedule**: 2028	All	High	Local Funds & Grant Money	**Ongoing** Each municipality is responsible installing their own emergency generators to critical facilities. Ongoing activity as new needs are determined.	**Anderson County**: 20-25 natural gas generators needed for sewer lift pump stations to pump sewer out of floodplain areas. 5-6 portable generators also needed. Fixed station generator needed at Broadway Dam. **Anderson:** Add generators to public works operations center for refueling & operations. **Belton**: **Honea Path**: Backup generators for police department, public works, & town hall community shelter. **Iva**: **Pelzer*** **Pendleton:** Add backup generators to sewer pump lift stations. **Starr*** **West Pelzer*** **Pendleton***	. **Oconee County*** **Salem*** **Seneca*** **Wahalla*** **West Union*** **Westminster*** *Critical facilities have been identified and many have backup generators. The county also has portable generators for some facilities without a permanent generator.

ES-3	Review communications procedures on a regular basis to ensure communication between response agencies is maintained during a disaster. **Lead Agency**: EMD, EMS, Police, Fire, 911 **Schedule:** 2023-2028	All	High	Local Funds	Ongoing Reviewing Communication Procedures to ensure interoperability and maintain communications during a disaster is an ongoing effort.	Anderson County* Anderson * Belton * Honea Path * Iva * Pelzer* Pendleton* Starr* West Pelzer* Pendleton* *All emergency response agencies within the county, including municipalities, are equipped with interoperable communication devices including Palmetto 800 MHz radios.	Oconee County* Salem* Seneca* Wahalla* West Union* Westminster* *Radio committee discusses communication shortfalls and researches ways of handling them.
ES-4	Update communications equipment, especially the E-911 Center, as needed and funding is available. **Lead Agency:** EMD, EMS, Police, Fire **Schedule:** 2028	All	High	Local Funds	Ongoing Options are being explored for replacement of county-wide communications systems for resilience in disasters.	Anderson County* Anderson * Belton * Honea Path * Iva * Pelzer* Pendleton* Starr* West Pelzer* Pendleton* *Equipment on track to be completed in next five years	Oconee County* Salem* Seneca* Wahalla* West Union* Westminster* *Equipment on track to be completed in next five years

ES-5	Inventory Emergency Response personnel and equipment to identify areas where the community is deficient in disaster response and establish actions to remedy the situation. **Lead agency**: County EMD **Schedule**: Ongoing	All	High	Local Funds	Ongoing Each municipality is responsible for maintaining awareness of current equipment, and future equipment needs.	Anderson County* Anderson * Belton * Honea Path * Iva * Pelzer* Pendleton* Starr* West Pelzer* Pendleton* *Personnel and equipment records maintained.	Oconee County* Salem* Seneca* Wahalla* West Union* Westminster* *Personnel and equipment records maintained.
ES-6	Establish a program to provide disaster training for all first responders. Lead Agency: EMD, EMS, Police, Fire Schedule: 2023-2027	All	High	Local Funds	Ongoing As first responders come and go in this profession, training will always be an ongoing action item. With the cooperation of our Emergency Services Academy and all our first responders, we continue to provide disaster training that is NIMS/ICS compliant.	Anderson County* Anderson * Belton * Honea Path * Iva * Pelzer* Pendleton* Starr* West Pelzer* Pendleton* *Exercises are regularly planned and executed to train for various scenarios across municipalities and departments.	Oconee County* Salem* Seneca* Wahalla* West Union* Westminster* *Exercises are regularly planned and executed to train for various scenarios across municipalities and departments.

ES-7	Include utility providers in all planning and drills for mitigation planning. **Lead Agency:** EMD, Utility Providers **Schedule:** 2023-2028	All	High	Local Funds	**Ongoing** Continuing effort to invite utility companies to EM exercises and special events. The county would like to continue efforts to try to get more participation from utilities going forward.		
Public Education and Awareness							
PEA-2	Provide information to residents about the community warning systems and how to respond in case of a disaster. **Lead Agency**: County EMD **Schedule**: 2023-2028	All	High	Local Funds	**Deferred** Municipalities are encouraged to order FEMA educational resources and to incorporate emergency preparedness programs and information into their public council meetings, educational outreach, and official website, etc.	Anderson County* Anderson * Belton * Honea Path * Iva * Pelzer* Pendleton* Starr* West Pelzer* Pendleton* *Municipalities are encouraged to order FEMA educational resources and to incorporate emergency preparedness programs and information into their public council meetings, educational outreach, and official website, etc.	Oconee County* Salem* Seneca* Wahalla* West Union* Westminster* *Municipalities are encouraged to order FEMA educational resources and to incorporate emergency preparedness programs and information into their public council meetings, educational outreach, and official website, etc.

PEA-3	Develop informational pamphlets to notify tourists of the location of local shelters they can utilize in case of a disaster. **Lead Agency**: EMD, American Red Cross **Schedule:** 2023-2027	All	Moderate	Local Funds	informational website, and social media posts about local sheltering, with reliable contact information since our local Red Cross will not release shelter locations prior to a disaster. In addition, continue our public education campaign about our joint Pet Sheltering initiative.	Anderson County* Anderson * Belton * Honea Path * Iva * Pelzer* Pendleton* Starr* West Pelzer* Pendleton*	Oconee County* Salem* Seneca* Wahalla* West Union* Westminster*
PEA-4	Develop a display to be used at public events. The display will provide information on natural hazards that threaten the area and what individuals can do to reduce these risks. Existing brochures and manuals from FEMA and SCEMD would be available for distribution. **Lead Agency**: County EMD	All	High	Local Funds	Continuing effort to modify and enhance public relations campaign as funding permits. Displays at public events are continually needed so this action will remain in place	Anderson County* Anderson * Belton * Honea Path * Iva * Pelzer* Pendleton* Starr* West Pelzer* Pendleton* *Municipalities are encouraged to order FEMA	. Oconee County* Salem* Seneca* Wahalla* West Union* Westminster* *Municipalities are encouraged

	Schedule: 2023-2028					educational resources and to incorporate emergency preparedness programs and information into their public council meetings, educational outreach, and official website, etc.	to order FEMA educational resources and to incorporate emergency preparedness programs and information into their public council meetings, educational outreach, and official website, etc.
PEA-5	Utilize the media for the distribution and publication of hazard information. Send news releases and regular public relations pieces to local newspapers and radio stations. Promote pre-disaster planning. **Lead Agency**: County EMD **Schedule:** 2023 to 2028	All	High	Local Funds	Continuing effort to distribute and publish hazard information and promote pre- disaster planning. Public education materials are continually needed so this action will remain in place.	**Anderson County:** Utilizes website and local media to disseminate preparedness information. **Anderson** * **Belton:** Utilizes your gov. app., Reverse 911, and social media **Honea Path**: Utilize website and social media **Iva:** Utilize town website and social media **Pelzer*** **Pendleton*** **Starr*** **West Pelzer*** **Pendleton*** *Municipalities ae encouraged to link the County's website to their own for disaster preparedness information.	**Oconee County*** **Salem*** **Seneca*** **Wahalla*** **West Union*** **Westminster*** *All municipalities maintain their own websites and utilize social media to distribute disaster preparedness information

PEA-6	Provide information to residents of the community regarding flood insurance availability. **Lead Agency:** County Engineering **Schedule:** 2023-2028	All	Moderate	Local Funds	Continuing effort to provide information on flood insurance availability to residents. Materials on flood insurance availability are continually needed so this action will remain in place.	Anderson County* Anderson * Belton * Honea Path * Iva * Pelzer* Pendleton* Starr* West Pelzer* Pendleton* *County encourages municipalities to be member of the NFIP.	Oconee County* Salem* Seneca* Wahalla* West Union* Westminster* *All participating municipalities maintain their own websites and utilize social media to distribute NFIP information to the public.
PEA-7	Develop information brochures in conjunction with visitor's bureau that informs tourists of the natural hazards present in the community and what they should do in case one occurs. This information would be available at welcome centers, hotels, and other tourist attractions. **Lead Agency:** County EMD **Schedule**: 2023-2028	All	Moderate	Local Funds	Continuing effort to develop information brochures for visitors. Public education materials are continually needed so this action will remain in place.	Anderson County* Anderson * Belton * Honea Path * Iva * Pelzer* Pendleton* Starr* West Pelzer* Pendleton* *Municipalities are encouraged to order FEMA educational resources and to incorporate emergency preparedness programs and information into their public council meetings, educational outreach, and official website, etc.	Oconee County* Salem* Seneca* Wahalla* West Union* Westminster* *Municipalities are encouraged to order FEMA educational resources and to incorporate emergency preparedness programs and information into their public council meetings, educational outreach, and official website, etc.

SECTION 10
PLAN MAINTENANCE

This section discusses how the Anderson and Oconee County Mitigation Strategy and Mitigation Action Plan will be implemented and how the Multi-Jurisdictional 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 plans were adopted, each jurisdiction has worked to ensure that mitigation was integrated into local activities and that the mitigation plan was appropriately implemented. The participants outlined a process in the previous mitigation plans for monitoring and evaluating the plan throughout the interim period between plan updates.

All participants were ultimately successful in implementing the monitoring and evaluation processes that were outlined in previous plans as the county and participated in annual meetings to discuss the mitigation plans and the priorities that were outlined in them. The specific processes are outlined below with an explanation of how the monitoring and evaluating process was carried out as well as any changes that were identified that would be useful to implement during the next update.

Anderson and Oconee County Multi-Jurisdictional Plan

The Anderson and Oconee County Hazard Mitigation Plan (2018) included a review process and progress report on the plan. This review process was carried out by the County Emergency Management Staff to evaluate progress on the plan. During this review process, the Hazard Mitigation Planning Team, which was composed of a representative from each jurisdiction, used established criteria to assess the plan's

effectiveness as well as any issues encountered in terms of implementing the plan.

Once the progress and issues were documented, the Planning Team made recommendations for changes to the plan and the overall evaluation process. Although there were some minor revisions made to the plan during the interim update period, there were few major revisions identified during this time, and the Planning Team generally agreed that the plan was on course and that the monitoring and evaluating process itself was sufficient to ensure implementation of the plan.

The planning team noted that while reporting was done on the progress of the plan through the interim review period, a notable area of opportunity/improvement for the Anderson and Oconee County Hazard Mitigation Team is to hold annual meetings wherein the entire Hazard Mitigation Planning Team meets at one time to discuss the progress reports.

10.2 IMPLEMENTATION AND INTEGRATION

Each agency, department, or other partner participating under the Anderson and Oconee County Multi-Jurisdictional 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. 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, town, 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 Hazard Mitigation Planning Team 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 with, or do not conflict with, the goals and actions of the Hazard Mitigation Plan and will not contribute to increased hazard vulnerability in Anderson and Oconee County.

Since the previous plan was adopted, each 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 emergency operations plans
- Integrating information in the mitigation plan into county Geographic Information Systems
- Integrating the mitigation plan into the local reserve fund 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 Planning Team and the 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 Multi-Jurisdictional Hazard Mitigation Plan is deemed by the Planning Team 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 Multi-Jurisdictional Hazard Mitigation Plan are required to ensure that the goals of the Plan are kept current, considering 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 Anderson and Oconee County Hazard Mitigation Planning Team shall meet once every year to evaluate the progress attained and to revise, where needed, the activities set forth in the Plan. This meeting shall be held in the month upon which final plan approval is attained; however, it may be necessary to schedule in the month prior or after in any given year, depending on the schedules of local officials. The findings and recommendations of the Planning Team will be documented in the form of a report that can be shared with interested municipalities, the county, and other stakeholders. The Planning Team 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 Anderson and Oconee County. The Emergency Management Coordinator will be responsible for reconvening the Hazard Mitigation Planning Team for these reviews.

Five Year Plan Review

The Plan will be thoroughly reviewed by the Anderson and Oconee County Hazard Mitigation Planning Team every five years to determine whether there have been any significant changes in Anderson or Oconee County 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 each County/municipal 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 address mitigation actions that may not have been successfully implemented as assigned. The Anderson County Emergency Management Planner will be responsible for reconvening the Planning Team and conducting 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 Anderson and Oconee County Multi-Jurisdictional Hazard Mitigation Plan will be submitted to the State Hazard Mitigation Officer at the South Carolina Emergency Management Division (SCEMD) 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 Anderson and Oconee County Multi-Jurisdictional 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 Anderson and Oconee County Multi-Jurisdictional 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 the Anderson County Emergency Management Director to reconvene the Hazard Mitigation Planning Team 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 Planning Team in a report that will include an evaluation of the effectiveness of the Plan and any required or recommended changes or amendments. The report 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 recommended strategies to overcome them.

Plan Amendment Process

Upon the initiation of the amendment process, representatives from Anderson County, Oconee County. and the participating municipalities will forward information on the proposed change(s) to all interested parties including, but not limited to, all directly affected county/municipal departments, residents, and businesses. Information will also be forwarded to the South Carolina Emergency Management Division. 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 Planning Team for final consideration. The Planning Team 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 Planning Team:

- 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 Planning Team, and prior to adoption of the Plan, the participating jurisdictions will hold a public hearing. The governing bodies of each participating jurisdiction will review the recommendation from the Planning Team (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 Planning Team for further revision
- Defer the amendment request back to the Planning Team for further consideration and/or additional hearings

Incorporation into Existing Planning Documents

The Hazard Mitigation Planning Team intends to make available to each County and its municipalities a process by which the requirements of this hazard mitigation plan will be incorporated into other plans. During the planning process for new and updated local planning documents, such as a comprehensive plan, capital improvements plan, or emergency management plan to name a few examples, the Office of Emergency Management will provide a copy of the Hazard Mitigation Plan to the advisory committee of each relevant planning document. The Office of Emergency Management will advise the advisory committee members to ensure that all goals and strategies of new and updated local planning documents are consistent with the Hazard Mitigation Plan and will not increase hazard vulnerability in the jurisdictions.

This process will be carried out for each of the planning documents described in Section 7*: Capability Assessment* of this document. It should also be noted that most jurisdictions within the county are participants in the county-level version of each type of plan and do not have stand-alone municipal plans of their own. Therefore, when the Office of Emergency Management shares and advises on the Hazard Mitigation Plan, they are acting on behalf of the municipalities. It should be further noted that due to the smaller size of many municipalities, municipal representatives of the Hazard Mitigation Planning Team are often the same person who participates in the update of comprehensive plans, zoning ordinances, and other planning documents. As such, much of the engrained knowledge these officials have gained from participating in the hazard mitigation planning process is transferred to these processes.

Therefore, each municipality's process for integrating the Hazard Mitigation Plan into other planning mechanisms is the same as the county-level process because these planning mechanisms are carried out as countywide plans or ordinances and each community's stake in each process is intricately linked.

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 also be made. These efforts include:

- Advertising meetings of the Hazard Mitigation Planning Team in local newspapers, public bulletin boards, and/or county and municipal office buildings
- Designating willing and voluntary citizens and private sector representatives as official members of the Planning Team
- Utilizing local media to update the public on any maintenance and/or periodic review activities taking place
- Utilizing the websites of participating jurisdictions to advertise any maintenance and/or periodic review activities taking place
- Keeping copies of the Plan in public locations