Sevier County
Multi-Jurisdictional
Hazard Mitigation Plan

2025 Update

Prepared By:
Sevier County Hazard Mitigation Planning Committee
Sevier County Emergency Management Agency/Office of Emergency Management

Assistance Provided By:
Tennessee Emergency Management Agency
as part of the Tennessee Mitigation Initiative

U.S. Department of Homeland Security
Region 4
3005 Chamblee Tucker Road
Atlanta, GA 30341

FEMA

June 30, 2026

Mr. Shannon Ball
State Hazard Mitigation Officer
Tennessee Emergency Management Agency
3041 Sidco Drive
Nashville, TN 37204

Reference: Sevier County Hazard Mitigation Plan

Dear Mr. Ball:

We are pleased to inform you the Sevier County Hazard Mitigation Plan update complies with the Federal hazard mitigation planning requirements resulting from the Disaster Mitigation Act of 2000, as contained in 44 CFR §201.6. FEMA approval does not include the review or approval of content that exceeds these applicable FEMA mitigation planning requirements. Effective June 30, 2026, the plan is approved for a period of five (5) years to June 29, 2031.

Enclosed is the status of all participating jurisdictions. Approved jurisdictions are eligible applicants through the State for the following mitigation grant programs administered by the Federal Emergency Management Agency (FEMA):

- Hazard Mitigation Grant Program (HMGP)
- Flood Mitigation Assistance (FMA)
- Building Resilient Infrastructure and Communities (BRIC)

Please note that all funding requests will be evaluated individually according to the program's specific eligibility requirements.

The State and all plan participants should be commended for their close coordination and communications with our office in the review and subsequent approval of the plan. If you or any plan participant need assistance, please do not hesitate to contact Kymberly Kudla, of my staff, at (202) 655-6712.

Sincerely,

Kristen M. Martinenza, P.E.
Risk Analysis Branch Chief

Enclosure

Enclosure: Plan Participant Status List

Attached is the list of participating jurisdictions in the referenced hazard mitigation plan.

	Community Name	Jurisdiction Status	Date Approved by FEMA
1)	Gatlinburg city	Approved	6/30/26
2)	Pigeon Forge city	Approved	6/30/26
3)	Pittman Center town	APA	
4)	Sevier County	Approved	6/30/26
5)	Sevierville city	Approved	6/30/26

U.S. Department of Homeland Security
Region 4
3005 Chamblee Tucker Road
Atlanta, GA 30341

FEMA

July 22, 2026

Mr. Shannon Ball
State Hazard Mitigation Officer
Tennessee Emergency Management Agency
3041 Sidco Drive
Nashville, TN 37204

Reference: Sevier County Hazard Mitigation Plan

Dear Mr. Ball:

This is a follow-up to our previous correspondence of June 30, 2026, in which we approved the Sevier County Hazard Mitigation Plan and all participating jurisdictions that originally submitted adoption resolutions. We have recently received and approved additional resolution(s) for inclusion. FEMA approval does not include the review or approval of content that exceeds the applicable FEMA mitigation planning requirements.

Enclosed is the status of all participating jurisdictions. Approved jurisdictions are eligible applicants through the State for the following mitigation grant programs administered by the Federal Emergency Management Agency (FEMA):

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2)	Pigeon Forge city	Approved	6/30/26
3)	Pittman Center town	Approved	7/22/26
4)	Sevier County	Approved	6/30/26
5)	Sevierville city	Approved	6/30/26

Executive Summary

Over the past two decades, hazard mitigation has gained increased national attention due to the large number of natural disasters that have occurred throughout the U.S. and the rapid rise in costs associated with those disaster recoveries. It has become apparent that money spent mitigating potential impacts of a disaster event can result in substantial savings of life and property. With these benefit-cost ratios extremely advantageous, the Disaster Mitigation Act of 2000 was developed as U.S. Federal legislation reinforcing the importance of pre-disaster mitigation planning by calling for local governments to develop mitigation plans *(44 CFR 201)*.

A local hazard mitigation plan aims to identify the community's notable risks and specific vulnerabilities and then to create/implement corresponding mitigation projects to address those areas of concern. This methodology helps reduce human, environmental, and economic costs from natural and man-made hazards through the creation of long-term mitigation initiatives.

The advantages of developing a local hazard mitigation plan are numerous and include improved post-disaster decision-making, education on mitigation approaches, and an organizational method for prioritizing mitigation projects. Communities with a mitigation plan receive larger amounts of Federal and State funding opportunities to be used on mitigation projects and can receive these funds faster than communities without a plan. This 2025 update of the Sevier County Hazard Mitigation Plan addresses Building Resilient Communities and Infrastructure (BRIC), Flood Mitigation Assistance (FMA), and Hazard Mitigation Grant Program (HMGP) requirements. Each jurisdiction within the county participated in the preparation of the update, including:

- Sevier County
- City of Gatlinburg
- City of Pigeon Forge
- City of Sevierville
- Town of Pittman Center
- Sevier County Board of Education

In reference to federal code title *44 CFR 201*, the plan is required to be submitted to both TEMA (State) and FEMA (Federal) for review to be approved. When the plan is deemed "approval pending adoption" by FEMA *(44 CFR 201.6(c)5)*, each of the participating jurisdictions will adopt the plan through a local resolution.

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Chapter 1. The Planning Process

1.1 Purpose and Need, Authority and Statement of Problem

1.1.1 Purpose and Need

FEMA defines "hazard mitigation" as any sustained action taken to reduce or eliminate the long-term risk to life and property from a hazard event. Hazard mitigation planning is the process through which hazards are identified, likely impacts determined, mitigation goals set, and appropriate mitigation strategies defined, prioritized, and implemented. The Hazard Mitigation Plan aims to identify, assess, and mitigate risk to better protect the people and property of Sevier County from the effects of natural and man-made hazards. This Plan documents the hazard mitigation planning process and identifies relevant hazards, vulnerabilities, and strategies the County and incorporated jurisdictions will use to decrease vulnerability and increase resiliency and sustainability. This Plan demonstrates the participating communities' commitment to reducing risks from identified hazards and serves as a tool to help decision-makers direct mitigation activities and resources.

1.1.2 Authority

This Hazard Mitigation Plan has been adopted by Sevier County and all participating jurisdictions in accordance with the authority granted to local communities by the State of Tennessee. This Plan was updated per state and federal rules and regulations governing local hazard mitigation plans. The Plan shall be reviewed annually and go through a complete update process every five years to remain eligible for hazard mitigation grants. The following legislation was used for guidance:

- Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act or the Act), 42 U.S.C. 5165, enacted under Section 104 of the Disaster Mitigation Act of 2000 (DMA 2000) Public Law 106-390 of October 30, 2000, as implemented at 44 CFR 201.6 and 201.7 dated October 2011.
- Tennessee Code Annotated
  - **T.C.A. 58-2-106(b)(16)**
  - **T.C.A. 58-2-106(b)(1)**
  - **T.C.A. 58-2-103(a)(5)**

1.1.3 Statement of Problem

Each year in the United States, natural disasters take the lives of hundreds of people and injure thousands more. Taxpayers pay billions of dollars annually to help communities, organizations, businesses, and individuals recover from disasters. Unfortunately, this only partially reflects the cost of disasters because additional expenses incurred by insurance companies and non-governmental organizations are not reimbursed by tax dollars. Many natural disasters are predictable, and much of the damage caused by these events can be reduced or even eliminated.

The original Sevier County Hazard Mitigation Plan was created and approved by FEMA in 2020. Per federal requirements stated in *44 CFR 201*, all local hazard mitigation plans are required to go through a FEMA approval process every five years to remain eligible for hazard mitigation grants. This plan will be re-evaluated and updated every five years to ensure local governments are continuing to assess the hazards and risks within their communities. This plan update has been prepared to meet requirements set forth by FEMA and the Tennessee Emergency Management Agency (TEMA) to ensure Sevier County is eligible for funding and technical assistance from state and federal hazard mitigation programs. All communities are welcome to address man-made hazards and risks in their hazard mitigation plan. However, it's important to note that the State and Federal governments only evaluate and approve based on natural hazards only as per federal code title 44 CFR 201.

1.2 Methodology, Update Process, and Participation Summary

This Hazard Mitigation Plan was developed under the guidance of a Hazard Mitigation Planning Committee (HMPC). The Committee included representatives of Sevier County, City of Gatlinburg, City of Pigeon Forge, City of Sevierville, Town of Pittman Center, and Sevier County Board of Education.

Information in this plan will be used to help guide and coordinate mitigation activities and decisions for local land use policy in the future. Proactive mitigation planning will help reduce the cost of disaster response and recovery to communities and their residents by protecting critical community facilities, reducing liability exposure, and minimizing overall community impacts and disruptions. This plan identifies activities that can be undertaken by both the public and the private sectors to reduce risk to safety, health, and property caused by natural and man-made hazards.

1.2.1 Local Government Participation

The planning regulations and guidance stress that each local government seeking FEMA approval of their mitigation plan must participate in the planning effort in the following ways:

- Participate in the process as part of the HMPC;
- Detail where within the planning area the risk differs from that facing the entire area;
- Identify potential mitigation actions; and
- Formally adopt the plan.

For the HMPC, “participation” meant the following:

- Providing facilities for meetings;
- Attending and participating in the HMPC meetings;
- Collecting and providing other requested data (as available);
- Identifying mitigation actions for the plan;
- Reviewing and providing comments on plan drafts;

- Informing the public, local officials, and other interested parties about the planning process and providing opportunity for them to comment on the plan;
- Coordinating, and participating in the public input process; and
- Coordinating the formal adoption of the plan by the appropriate governing body.

The HMPC met all the above-stated participation requirements. Sevier County and all its incorporated jurisdictions (Gatlinburg, Pigeon Forge, Pittman Center, and Sevierville) participated in the 2025 Plan update, as well as reviewed and provided timely comments on all draft components of the Plan. A summary of past and current community participation is shown below in *Table 1*. All participants were invited to this committee via email by the County EMA Director. Those who did not originally respond were reached out to via phone or email by the County EMA Director.

Table 1 Multi-Jurisdictional HMPC Participation

Jurisdiction	2020 Participation	2025 Participation
Sevier County	Y	Y
City of Gatlinburg	Y	Y
City of Pigeon Forge	Y	Y
Town of Pittman Center	Y	Y
City of Sevierville	Y	Y
Sevier County Board of Education	N	Y

The HMPC for the 2025 plan update included key community representatives. *Table 2* details the HMPC members, meeting dates, associated FEMA Lifeline, and committee member attendance. FEMA Lifelines are fundamental way for a community to recover, however, all participants might not be associated with a FEMA Lifeline. If they are not associated with a FEMA Lifeline, then they will be indicated as not applicable (NA).
The EMA director invited individuals who represented regional and local agencies that have authority in regulating county/city development, individuals that represent vulnerable populations, as well as those that are responsible for responding to the identified hazards of prime concern. These partners include jurisdictional police, fire, public works, and health departments, community representatives, nonprofit organizations, local floodplain administration, the county/city school board, elected officials, and electric utility companies. All committee members provided key information to recognize and mitigate hazards of prime community concern. A more detailed summary of HMPC meeting dates, members seeking approval and FEMA lifeline association follows in *Table 2*. Meeting sign-in sheets are included in Appendix A.

Table 2 HMPC Members

Name	Title	Associated FEMA Lifeline	Organization/ Jurisdiction	Meeting Dates	
				7/31/2025	11/5/2025
Joe Ayers	Sevier County EMA Director	Safety & Security	Sevier County EMA	X	X
Michael	East Region	Safety & Security	TEMA	X	X

Lamphere	Planner				
Dale Phelps	Utilities Director	Water Systems	Gatlinburg	X	
Mike Williams	Assistant EMA Director	Safety & Security	Sevier County EMA	X	
Chris Maples	Safety Director	Safety & Security	Sevier County Gov	X	
Jason Owens	Safety Director	Safety & Security	Gatlinburg	X	
David Valentine	Assistant Utilities Director	Water Systems	Gatlinburg	X	
Beth Maples	SC Health Department Director	Health & Medical	SC Health Department	X	
Joshua Carr	Interim Fire Chief	Safety & Security	Pigeon Forge Fire Dept	X	
Wayne Brandenburg	Assistant Fire Chief	Safety & Security	Gatlinburg Fire Dept	X	
Charlie Cole	Fire Chief	Safety & Security	Gatlinburg Fire Dept	X	
Justin Brown	Assistant Police Chief	Safety & Security	Gatlinburg Fire Dept	X	
Roger Kanipe	Flood Coordinator	Safety & Security	Sevier County EMA	X	
Josh Garner	District Coordinator	Safety & Security	TEMA	X	
Roger Sims	Public Works Director	Water Systems	Gatlinburg	X	
Seth Butter	Director of Ops and Communications	Safety & Security	Gatlinburg	X	
Donnie Schuler	Deputy Chief	Safety & Security	Sevierville Fire Dept	X	
Tyler Basler	PIO	Communications	Sevier County Gov	X	
Donnie Adams	Assistant Highway Superintendent	Transportation	Sevier County Highway Dept	X	
Andrew Temple	Grants Coordinator	Safety & Security	Sevier County Gov	X	
Mike Hinkle	IT Director	Safety & Security, Communications	Gatlinburg	X	
David Taylor	Planning Director	Safety & Security	Pigeon Forge	X	
Luke Mintz	Mayor	Safety & Security	Sevier County Gov	X	
Matt Kulp	Biologist	Safety & Security	National Park Service	X	
Chase Watts	Regional Preparedness Coordinator	Safety & Security, Health & Medical	TN Health Dept	X	
Dalton York	Planner	Safety & Security	Gatlinburg Planning	X	
Stephanie Huskey	Director of Schools	Safety & Security, Transportation	Sevier County Schools	X	
Kristen Reese	LEPC Member	Safety & Security	Johnson Mathey (LEPC)	X	
Sherman Mead	LEPC Chair	Safety & Security	Johnson Mathey	X	

			(LEPC)		
Amanda Marr	Director of Marketing & Communications	Communications	Sevierville Chambers	X	
Charles Powers	Deputy Fire Chief	Safety & Security	Pigeon Forge Fire Dept	X	
Rob Ogle	IT Director	Safety & Security, Communications	Pigeon Forge IT	X	
Durand Hocker	Assistant Director	Water Systems	Sevierville Water	X	
Cory Divel	Planning Director	Safety & Security	Sevierville Development	X	
Angela Atchley	Director of Tourism	Safety & Security	Sevier County	X	
Larry Allen	Storm Water/GIS Coordinator	Safety & Security, Water Systems	Gatlinburg	X	
Erik Bodiscomassink	Plant Manager	Energy	TVA	X	
Mark Miller	Director of Public Works	Water Systems, Transportation	Pigeon Forge	X	
Andrew Clark	Chief of Police	Safety & Security	Pittman Center Police Dept	X	
Sue Carr	Tourism Dept	Safety & Security	Pigeon Forge	X	
Jared Maples	Facilities Office Manager	Safety & Security	Sevier County Gov	X	
Charles Valentine	Building Official / Flood Plain Manager	Safety & Security	Sevierville	X	
Jeff Hedrick	Distribution Engineer	Energy	Sevier County Electric	X	
Tim Howson	Regional Planning Manager	Safety & Security	TEMA		X

1.2.2 Hazard Mitigation Planning Process

The 2025 Sevier County Hazard Mitigation Plan was updated following guidance put forth by FEMA in the *Local Mitigation Planning Policy Guide* which became effective on April 19, 2023. This guidance emphasized the need for a whole community planning approach to include representatives from all sectors of the community with an emphasis on the increased need for vulnerable and underserved population representation. The guidance also highlighted increased emphasis on risk, vulnerability, and resilience assessments, the inclusion of high hazard dams, and future weather trends/patterns.

FEMA guidance proposes a structured four-phase approach to completing a Hazard Mitigation Plan as follows:

1) Planning Process

2) Risk Assessment
3) Mitigation Strategy
4) Plan Maintenance

Phase I - Planning Process

Organize to Prepare the Plan

The planning process officially began with a meeting held on **7/31/2025** at the **Sevier County Courthouse (125 Court Ave)**. The meeting covered the scope of hazard mitigation, the purpose of planning, eligible grants, risk assessments and vulnerabilities impacting the community. During the planning process, the committee communicated through face-to-face meetings, email, and telephone conversations. The neighboring communities were given an opportunity to be involved in the planning process with email invitations by the County EMA Director for the planning committee meetings, with a vast amount of officials, communities, organizations, and responders attending. Some of those neighboring counties that were outreached include: Blount, Cocke, Jefferson, and Knox Counties.

Involve the Public

Early discussions established the significance of involving the public. The HMPC agreed to an approach using established public information mechanisms and resources within the community. Public involvement activities for this plan update included public notices, stakeholder and public meetings, and the collection of public and stakeholder comments on the draft plan. To ensure socially vulnerable and underserved populations were included in organizing efforts the Sevier County EMA director contacted organizations that had roots within the community such as the local school board, Sevier County Communications District, the LEPC members, local businesses and industry (part of Sevier County Economic District), local government, utilities, . Due to the nature of the public meetings, neighboring communities, agencies, utilities, academia, civic organizations, and other interested parties were given the opportunity to participate.

A public notice was posted on **10/29/2025** on the County social media page, the courthouse, Mountain Press, Local radio (Mix 105.5fm), and on SC EMA and government website inviting members of the public to attend the **11/5/2025** Hazard Mitigation Planning Committee meeting. Documentation to support outreach efforts such as emails, community flyers, and social media postings can be found in Appendix A.

Sign-in sheets from all meetings are included in Appendix A. The meeting date and topics discussed are summarized below in *Table 3*. The meeting on **11/5/2025** was open to the public and announced via newspaper and social media. The public did attend and provided input on projects along with asking questions.

Table 3 Summary of Hazard Mitigation Planning Meetings

Meeting Number	Meeting Topic	Meeting Date	Meeting Location
	Overview of hazard		

Meeting #1 and #2	mitigation Hazard Mitigation Planning Process Purpose of the HMP Area growth and changes Identification of Hazards Future weather predictions Assessment of risk, vulnerabilities, resilience Review of NFIP Previous HMP goals/projects New goals/projects	7/31/2025 - 11/5/2025	Sevier County Courthouse (125 Court Ave)

Coordination

Early in the planning process, the committee determined that the risk assessment, mitigation strategy development, and plan approval would be greatly enhanced by inviting other local and state partners to participate in the process. The coordination involved contacting these agencies through email, flyers, in-person and phone conversations. All groups and agencies were advised on how to become involved in the plan development process and were solicited asking for their assistance and input. A summary of agencies and organizations actively involved in the HMPC is as follows:

- Tennessee Emergency Management Agency
- Sevier County Emergency Management Agency / Office of Emergency Management
- City of Gatlinburg
- City of Pigeon Forge
- City of Sevierville
- Town of Pittman Center
- Sevier County Health Department
- Sevier County Board of Education
- National Park Service
- Sevier County Fire and Police Departments
- Sevier County Electric System
- Tennessee Valley Authority
- Sevier County GIS
- Sevierville, Gatlinburg, Pigeon Forge, and Sevier County Public Works
- Sevier County Highway/Road Dept
- Sevierville Planning and Safety Office
- Sevier County, Gatlinburg Planning Department
- Sevier County Government
- IT Departments
- TN Health Department
- LEPC Members
- Sevier County Tourism Director
- Stormwater and Flood Plain Managers

- Gatlinburg Communications

Coordination with other community planning efforts was also paramount to the success of this plan. Mitigation planning involves identifying existing policies, tools, and actions that will reduce a community's risk and vulnerability to hazards. Sevier County uses a variety of planning mechanisms, such as land development regulations and ordinances, to guide growth and development. Integrating existing planning efforts, mitigation policies, and action strategies into this plan establishes a credible and comprehensive plan that ties into and supports other community programs.

Table 4 identifies the existing planning mechanisms that were reviewed and how they were incorporated into the 2025 Hazard Mitigation Plan Update.

Table 4 Planning Mechanism Review

Existing Planning Mechanisms	Reviewed? (Yes/No)	Method of Use in Hazard Mitigation Plan
State Hazard Mitigation Plan	Yes	Identifying hazards, assessing vulnerabilities, and mitigation strategies
Local Emergency Operations Plan	Yes	Identify major capabilities
Community Data Profile	Yes	Development trends, capability assessment
Stormwater Ordinance	Yes	Capability assessment, mitigation strategies
Building and Zoning Codes and Ordinances	Yes	Different years of code regulations utilized in different jurisdictions
CDC Social Vulnerability Index	Yes	Analyze vulnerable populations in jurisdictions
FEMA's National Risk Index	Yes	Analyze natural hazard risk within each jurisdiction
Land Use Maps	Yes	Assessing vulnerabilities, development trends, and mitigation strategies
Critical2TN Infrastructure Database	Yes	Assessing vulnerabilities, mitigation strategies
NOAA Archives	Yes	Analyze weather data and trends
ETSU Geoinformatics & Disaster Science Lab	Yes	Analyze future weather trends and patterns
U.S Census Bureau	Yes	Analyze community demographic data and trends
Local County Hazard Mitigation Plan	Yes	Analyze previous plan for updates
Flood Insurance Rate Maps	Yes	Analyze flood-prone areas within the community

These and other documents were reviewed and considered, as appropriate, during the collection of hazard identification, vulnerability assessment, and capability assessment. Data from these plans and ordinances were incorporated into the plan's risk assessment and hazard vulnerability sections as appropriate. The data was also used to determine the community's capability to implement certain mitigation strategies. To further enhance integration, the local hazard mitigation plan will be strategically synchronized with existing county and jurisdictional policies, plans, and procedures, leveraging investments from their own budgets. This coordinated effort maximizes resources and promotes efficient allocation of funds towards mitigation projects, strengthening community resilience against a spectrum of hazards.

Existing Planning Mechanisms	Updated? (Yes/No)	How was it utilized?
Local Basic Emergency Operations Plan	Yes	Identify major capabilities
Stormwater Ordinance	Yes	Capability assessment, mitigation strategies
Building and Zoning Codes and Ordinances	Yes	Different years of code regulations utilized in different jurisdictions
Critical2TN Infrastructure Database	Yes	Assessing vulnerabilities, mitigation strategies
Budget Hearings	Yes	Financial Budgeting

Phase II – Risk Assessment

Identify the Hazard, Assess the Risk and Vulnerabilities

The committee completed a comprehensive effort to identify/update, document, and profile all hazards that have, or could have, an impact on the community. The committee also conducted a capability assessment to review and document the planning area's current capabilities and gaps. By collecting information about existing government programs, policies, regulations, ordinances, and emergency plans, the committee could assess the activities and measures already in place that contribute to mitigating some of the risks and vulnerabilities identified. A more detailed description of the risk assessment process and the results are included in Chapter 2 Risk and Vulnerability Assessment.

Phase III – Mitigation Strategy

Set Goals and Review Actions

This meeting facilitated brainstorming and discussion sessions that described the purpose and process of developing planning goals and objectives, a comprehensive range of mitigation alternatives, and a method of selecting and defending recommended mitigation actions using a series of selection criteria. This information is included in Chapter 3 Mitigation Strategy.

Draft an Action Plan

A complete first draft of the plan was prepared based on information and input collected during the HMPC meetings, and various agencies and individuals were invited to comment on this draft. Public and agency comments were integrated into the final draft for TEMA and FEMA Region IV to review and approve, contingent upon final adoption by Sevier County.

Phase IV – Plan Maintenance

Adopt the Plan

To secure buy-in and officially implement the plan, the plan was reviewed and adopted by the appropriate governing bodies.

Implement, Evaluate, and Revise the Plan

Implementation and maintenance of the plan is critical to the overall success of hazard mitigation planning and actions. Chapter 4 Plan Integration and Maintenance discusses incorporating the plan into existing planning mechanisms and how to address continued public involvement.

1.3 Plan Update

The 2020 Sevier County Hazard Mitigation Plan contained a hazard identification and risk assessment for each jurisdiction and a corresponding action list aimed at mitigation risk. Since that time, progress has been made by both the County and incorporated jurisdictions on the implementation of the mitigation strategy with 0 completed actions and 43 in progress. The HMPC has met annually over the past five years to monitor, implement, and update the plan. This chapter includes an overview of the approach to updating the plan and identifies new analyses and information included in this plan update.

1.3.1 The New Plan

The updated plan involved a comprehensive review and revision of each section of the 2020 plan and included an assessment of the success of the County and the incorporated jurisdictions in evaluating, monitoring, and implementing the mitigation strategy outlined in the 2025 plan. Only the information and data still valid from the 2020 plan was carried forward as applicable in this update. The following requirements were addressed during this plan update process with consideration of the priorities and goals of the Sevier County Hazard Mitigation Planning Committee:

- Consider changes in vulnerability due to action implementation;
- Document success stories where mitigation efforts have proven effective;
- Document areas where mitigation actions were not effective;
- Document any new hazards that may arise or were previously overlooked;
- Document NFIP as related to the county and jurisdictions;
- Incorporate new data or studies on hazards and risks;
- Incorporate new data related to future climate patterns and trend;
- Incorporate new capabilities or changes in capabilities;
- Incorporate social vulnerability data and vulnerable population information;
- Incorporate growth and development-related changes to inventories; and
- Incorporate new action recommendations or changes in action prioritization;
- Enhanced public outreach and multi-agency coordination efforts.

1.3.2 2025 HMP Strategy Review

During the 2025 update of the Sevier County Hazard Mitigation Plan, the HMPC identified 73 actions as relevant to the county. Of these 73 actions, 0 have been completed, 43 are in progress, and 28 have not been started. Actions that had not been pursued were discussed for relevance to the new plan and were either carried over to the 2025 plan or deleted from the strategy. 60 of these projects were determined to still be viable and will be carried over or revised in this plan update. Details and the status of all previous actions and new projects are listed at the end of Chapter 3.

1.4 Multi-Jurisdictional Special Considerations

Hazards Assessment

Most of the natural hazards identified within this plan have an impact on both Sevier County and the incorporated jurisdictions. Some hazards have a larger impact on the County rather than the incorporated jurisdictions and vice versa. Impacts of identified hazards differ the most at the rural and urban interface where flooding can have different severity levels. Therefore, the flooding section emphasizes the depth, duration, and timing of severe flooding events. Below is a table that shows whether a hazard will have multi-jurisdictional impacts.

Hazards	Will the hazard have multi-jurisdictional differences?
Drought	No
Earthquake	No
Extreme Temperature	No
Wildfire	No
Flooding	No
Geologic	Yes
Severe Weather	No
Tornado	Yes
Communicable Disease	No
Dam/Levee Failure	Yes
Hazardous Materials Release	No
Terrorism	Yes
Infrastructure Incident	Yes

1.5 Public Participation

Public involvement included press releases, public meetings, and a public comment period on the draft plan. Organizations representing vulnerable and underserved populations were contacted in an effort to gain further input from populations most at risk during hazardous events. The formal public meetings for this plan are summarized in *Table 3* (Section 1.2.2) discussed early in this chapter. The **11/5/2025** HMPC meeting was open to the public. The public gave input on new projects and asked questions regarding the plan and how the mitigation process works.

A public notice was posted in the Sevier County courthouse, on social media (County and EMA webpages), Mountain Press, and advertised on local radio on 10/29/2025. Documentation to support the public outreach efforts can be found in Appendix A. Over

the past five years, the community was kept involved in the planning process through the implementation of projects in the plan.

1.6 County Data Profile

East: Sevier_Community_Profile.pdf

Sevier County covers 598 square miles and is located in eastern Tennessee along the Tennessee-North Carolina border. The southern portion of Sevier County is located within the Great Smoky Mountains which is a part of the Great Smoky Mountains National Park. The northern parts of the county are located within the Ridge and Valley Appalachians which is a physiographic region of the larger Appalachian division. Sevier County is bordered by Jefferson County to the north; Cocke County to the east; Haywood County, North Carolina to the southeast; Swain County, North Carolina to the south; Blount County to the west; and Knox County to the northwest. Sevier County also contains parts of the Appalachian Trail, Foothills Parkway, and Great Smoky Mountains National Park which are national protected areas.

Sevier County is drained primarily by the French Broad River, which passes through the northern part of Sevier County. A portion of the French Broad is part of Douglas Lake, an artificial reservoir created by Douglas Dam in the northeastern part of the county. The three forks of the Little Pigeon River (East, Middle, and West) flow northward from the Great Smoky Mountains, converge near Sevierville, and empty into the French Broad north of Sevierville. The West Fork is the best known, as it flows through the popular tourist areas of Gatlinburg and Pigeon Forge (ETSU, 2020).



Gatlinburg: As of 2025, the estimated population is **3,799**, showing modest growth since the 2020 census at 3,577. Known as the "**Gateway to the Smokies**," Gatlinburg serves as the busiest entry point to **the most-visited national park in the U.S.**, offering 800+ miles of scenic hiking trails**,** waterfalls, wildlife, and vistas. According to local travel sources and visitor bureaus, **10 to 12 million people** annually enter Gatlinburg for lodging, food, or attractions like Ripley's Aquarium, Anakeesta, and local shops. **2023** saw **13.30 million** recreational visits to Great Smoky Mountains National Park, making it the second-highest year ever after a peak of 14.16 million in 2021. Outdoor favorites include whitewater rafting, ziplines, horseback riding, and scenic day tours through trails like Roaring Fork Motor Trail and historic routes like Cades Cove. SkyPark at Ober Mountain features the SkyBridge—the longest pedestrian suspension bridge in North America—along with chairlift rides to stunning overlooks. The Gatlinburg Space Needle is a 407-foot tower providing panoramic city and Smoky Mountain views, plus entertainment like arcades and magic shows.



Pigeon Forge: **Projected population for 2025**: ~6,675, based on growth estimates. Over **10 million people** visit Pigeon Forge annually, with **2+ million staying overnight.** Tourism revenues exceed **$2.4 billion annually**, supporting **tens of thousands of jobs** in the Sevier County region. In 2023, Sevier County saw tourism spending totaling **$3.85 billion**, up 2.3% from the prior year. **Dollywood** draws roughly **2–3.8 million visitors annually**, making it the most visited attraction in Tennessee and the anchor for Pigeon Forge tourism. **The Island in Pigeon Forge**, a free-entry amusement district featuring rides, shopping, entertainment, and a giant Ferris wheel.

Sevierville: Sevierville had **17,889 residents** by the 2020 U.S. Census, rising slightly to an estimated **18,062 in 2025.** Historic Downtown Sevierville features restored Victorian architecture, walking trails, boutique shops, and greenways like the **West Prong Greenway** for biking and strolling along the river. Sevierville blends **small-town charm** and **historic heritage** (especially tied to Dolly Parton) with modern tourism offerings. As the county seat and growing gateway to the Smoky Mountains, it plays a key role in accommodating visitors and generating economic activity. Its lower cost of living, robust trade and lodging sector, and local character make it both a compelling place to live and visit.



Sevier County: Sevierville lies at the heart of **Sevier County**, which saw **98,380 residents (2020 census)**, growing to ~99–100k by 2023. In **2023**, visitor spending in Sevier County totaled nearly **$3.85 billion**, supporting over **26,500 jobs** and generating **$247.8M in state tax revenue and $182.4M in local taxes.**

Pittman Center: Provides direct access to hiking, wildlife viewing, golf (Bent Creek at Cobbly Nob), and easy entry to GSMNP through the Greenbrier entrance. Recorded at **454 residents** in the 2020 U.S. Census, with estimates rising slightly to **~462–462** by 2025.



1.6.1 Resources and Assets

LeConte Medical Center in Sevierville provides 24-hour emergency care to residents of the county and is home to 79 beds. The county also has approximately 320 volunteer firefighters with 19 stations, and approximately 300+ full time Law Enforcement officers including the county sheriff. Sevier County School District facilities the learning of approximately 14,435 students via their system of 37 schools within the region. According to the RWJ Foundation County Health Rankings profile Sevier County Schools are underfunded by $2,498 per pupil as related to dollars to test score achievement.

Sevier County houses two radio stations (WSEV-FM (105.5) and WSEV-AM (930),1680 AM Emergency Radio Channel, and 5 tv networks. The main phone companies in the area are AT&T (Covering 84% of the County), Verizon (80%), U.S. Cellular (74.8%), and T-Mobile (100% in Sevierville). Residents in the county can either obtain internet via AT&T, Spectrum, Xfinity, T-Mobile, Verizon, Earthlink, or Starlink. Communication resources, a vital component of emergency response and preparedness, is notably lacking in the more rural portions of Sevier County. 92.6%of households had a computer and 83.5% have broadband internet access according to the United States Census Bureau.

The main roadways that travel through the county are US Highway 321, 441, 411 and State Highways 66, 416, 449, 454, 73, 338, 339, 139, 71, and 35. The nearest interstates are 1-40, I-75, and I-81. The main waterways in the County are the French Broad River, Little Pigeon

River, and Douglas Lake. Other smaller waterways that intersect throughout Sevier County are Walden's Creek, Middle Creek & Gnatty Branch, and LeConte Creek. A further analysis of these water systems will be explored in the hazard flood section as related to their propensity for flood events. Sevier_County.pdf



The nearest international airport is McGhee Tyson (TYS) (approx. 35 miles), and the closest general aviation location is Gatlinburg-Pigeon Forge Airport (GKT) in Sevierville. Given the limited public transportation options and the rural environment of Sevier County, 32% of working individuals endure a commute of more than 30 minutes, and 78.4% of all working individuals drive alone to work.

Sevier County is governed by an elected County Mayor and Board of Commissioners. The jurisdictions within Sevier County are governed by an elected Mayor and Council. There are multiple regulatory committees that are appointed by both the County Mayor and the Board of Commissioners.

1.6.2 Development and Growth

Like a majority of its counterparts, Sevier County, has been experiencing rapid growth over the past few years. The population of the county increased between the 2010 and 2020 censuses from 89,889 to 98,380. 13% of the 42,727 Sevier County households deal with at least 1 severe housing problem (overcrowding, high housing costs, lack of kitchen facilities, or lack of plumbing facilities). Most of Sevier Counties' employed population work within

the Retail Sales industry (13%) and the Food industry (9.26%).
https://datausa.io/profile/geo/sevier-county-tn?utm_source=chatgpt.com.
As stated, Sevier County has experienced much growth since the last planning period in residential, industrial, and commercial areas.

Residential:

-Pittman Center and Red Bank Road Areas
-Entire Cities of Gatlinburg, Pigeon Forge, and Sevierville
-North Sevierville, SR 66 and 416 corridors
-E Parkway, Glades Rd, Circle Dr, and Baskins Rd are seeing expanded housing development and new cabins
-**Short-term rental stabilization**: New permitting and inspection requirements for STRUs came into effect Jan 2024, managing the rapid conversion of residences into vacation rentals.
-Northview area and Sevierville
-According to a May 2025 report, building **100 single-family homes** in Sevier County generates ~$67.2 million in local income, 1,016 jobs, and $10.2 million in local tax revenue. Recurring annually thereafter: ~$6.7 M income, 109 jobs, and $2.9 M revenue (https://www.hbaknoxville.com/news/details/sevier-county-home-building-revenue-costs-2025?)

Industrial:

-E Parkway is zoned for development
-**Flyaway TN**, a new facility project breaking ground in Sevierville

Commercial:

-SR 66 and SR71 corridors
-Entire Cities of Gatlinburg, Pigeon Forge, and Sevierville
-New hospitality venues: **Crayola Experience** (30k sq ft, opened late 2024), **Nerf Action-Xperience**, **Dolly Parton Experience** (opened spring 2024), boutique hotel ("The Wayback"), new restaurants, and theme-park expansions including **Wilderness at the Smokies** and **Anakeesta** upgrades.
-Approximately **12 commercial projects** underway or completed in 2023–2024, alongside **6 multi-family housing**, **5 campgrounds**, **3 vacation-rental projects**, and **1 storage facility.**
-Parkway and E Parkway in Gatlinburg are primary commercial corridors for the city most heavily traveled roads. *Exit 407 Gateway to Adventure*: 200-acre entertainment hub with hotels and restaurants.

1.6.3 Demographics

Throughout the planning process, Sevier County HMPC remained committed to recognizing socially vulnerable and underserved populations. In order to maintain this commitment, the HMPC reached out to key stakeholders and reviewed information throughout this plan including Census data and NOAA storm data.

Table 7 below illustrates the population data of the county according to the 2020 U.S Census. Other important demographics obtained via the U.S Census Bureau and County Health Rankings (RWJ Foundation) are presented in list form. Of the 99,415 (2025) residents living within Sevier County:

- The median household income is $59,665
- 12.8% live below the national poverty line
- 53.4% live in rural areas
- 15% are confronted with food insecurity
- 18.1% of the under 65 years of age population live with a disability
- 15.4% of the under-65 population do not have health insurance
- Population as of 2023 was 167.8 people per square mile

Table 7 Population Data

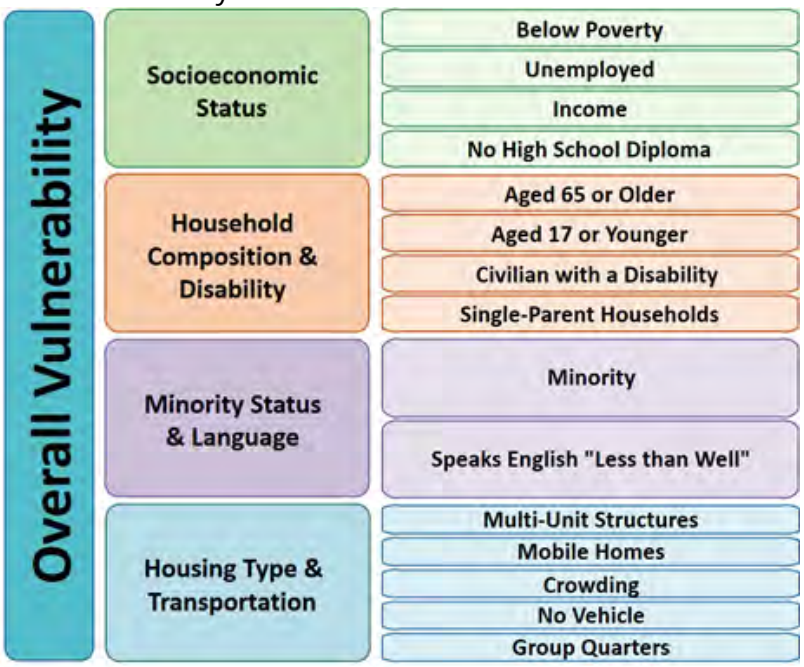
Demographic	Percentage
Identified gender	
Male	49.5%
Female	50.5%
Age Group	
Under 18	20.8%
Over 65	21%
Race/Ethnicity (one)	
White (not Hispanic/Latin)	85.18%
Asian	1.12%
Black or African American	0.78%
American Indian or Alaskan Native	0.32%
Hispanic/Latino	8.8%
Education	
High School Graduate or Higher	86.8%
Bachelor's Degree or Higher	22.3%

Data sources:
https://data.census.gov/profile/Sevier_County,_Tennessee?g=050XX00US47155
https://www.countyhealthrankings.org/health-data/tennessee/sevier?year=2025

1.6.4 Social Vulnerability

Social vulnerability refers to a community's capacity to prepare for and respond to the stress of hazardous events ranging from natural disasters, such as tornadoes or disease outbreaks, to human-caused threats, such as toxic chemical spills. Social vulnerability considerations were included in this plan update to identify areas across the planning area that might be more vulnerable to hazard impacts based on several factors. The County BEOP will also incorporate this information to improve response efforts in socially vulnerable neighborhoods.

The Center for Disease Control and Prevention (CDC) has developed a social vulnerability index (SVI) to measure the resilience of communities when confronted by external stresses such as natural or human-caused disasters or disease outbreaks. The SVI is broken down to the census tract level and provides insight into vulnerable populations to assist emergency planners and public health officials in identifying communities more likely to require additional support before, during, and after a hazardous event. The SVI index combines four main themes of vulnerability, which are, in turn, broken down into subcategories for 16 vulnerability factors. The themes are outlined in the below table.



The specific breakdown for Sevier County and all participating jurisdictions are as follows

Sevier County Social Vulnerability Factors	
Total Square Miles	598
Total Population (as of 2023)	99,415
Housing Units Estimated	60,304
Households	39,221
Persons below Poverty	18,030
Per Capita Income	32,400
Percentage of Persons below poverty	12.8%
Unemployment rate (as of July 2025)	3.2%
Persons w/ no HS diploma 25 yo+	9,406
Persons w/HS diploma 25 yo+	23,120
Persons with Bachelors degree or higher 25 yo+	15,982
Aged 65+ & older	20,969
Age 17 & younger	20,110
Civilian noninstitutionalized population with a disability	11.7%

Percentage of person aged 65+	21.1%
Percentage of persons 17 or younger	20.3%
Percentage of persons 5 or younger	5.7%
Percentage of civilian noninstitutionalized population with a disability	18.1%
Percentage of single parent households with children under 18	28.06%
Minority (all persons except white, non-Hispanic)	14,300
Persons (age 5+) who speak English "less than well"	4.5%
Percentage minority (all persons except white, non-Hispanic)	14.3
Percentage of persons (age 5+) who speak English "less than well"	3.7%
Housing in structures with 10 or more units	6,077
Mobile Homes	7,816
Households w/ no vehicle	1,521
Percentage of housing in structures with 10 or more units	10.1%
Percentage of mobile homes	13%
Percentage of households with no vehicle available	3.6%

1.6.5 Critical Infrastructure

Critical Infrastructure are assets in a community that are considered vital to the public's health and safety. Due to the sensitivity of these assets in Sevier County and the incorporated jurisdictions, these assets are restricted for public viewing. However, the data is viewable to restricted personal on the State of Tennessee's Critical2TN Database. The county and incorporated jurisdictions currently have 89 assets identified. https://cikr-tnema.hub.arcgis.com/

1.7 Resource Capabilities

The committee gathered the following resource capabilities to determine what existing staff and resources are being used to support mitigation programs.

Table 8 Jurisdictional Mitigation Capabilities

Mitigation Capabilities	Sevier County	City of Gatlinburg	City of Pigeon Forge	City of Sevierville	Town of Pittman Center
Building Codes	Y	Y	Y	Y	Y
Zoning Codes	Y	Y	Y	Y	Y
Subdivision Ordinance	Y	Y	Y	Y	
Stormwater Ordinance	Y	Y	Y	Y	
Floodplain Ordinance	Y	Y	Y	Y	Y
Erosion, Sedimentation and Pollution Control Ordinance	N	Y	Y	Y	N
Stormwater Management Program	Y	Y	Y	Y	Y
Site Plan Review Requirements	Y	Y	Y	Y	Y
Capital Improvements Plan	Y	Y	Y	Y	Y
Economic Development Plan	Y	Y	Y	Y	Y
Local Emergency Operations Plan	Y	Y	Y	Y	Y
Flooding or Engineering Study	Y	Y	Y	Y	Y
Repetitive Loss Plan	Y	Y	Y	Y	Y
Elevation Certificates	Y	Y	Y	Y	Y
Grant writer (part-time or full-time)	Y	Y	Y	Y	Y
Public Information Officer	Y	Y	Y	Y	Y
Floodplain Manager	Y	Y	Y	Y	Y
Volunteer Fire Service	Y	Y	Y	N	Y
Full Time Fire Service	Y	Y	Y	Y	Y
School Resource Officers (SROs)	Y	Y	Y	Y	Y
Law Enforcement	Y	Y	Y	Y	Y
Emergency Manager	Y	Y	Y	Y	Y
GIS Personnel	Y	Y	N	Y	N
Capital improvements project funding	Y	Y	Y	Y	Y
Fees for utility services	Y	Y	Y	Y	N
Impact fees for new development	N	N	N	N	N
General obligation bonds	Y	N	Y	Y	Y
Withhold spending in hazard-prone areas	N	N	Y	N	N

Chapter 2: Hazard and Risk Assessment

2.1 Risk Assessment Overview

Hazard Mitigation Planning is about developing a strategy to reduce risk in the long term. An essential part of the process is identifying hazards, risks, impacts and vulnerabilities. In mitigation planning, "risk" is the potential for damage or loss when a hazard interacts with an asset. Assets can be people, buildings, infrastructure, the economy, or natural and cultural resources.

The risk assessment helps communicate vulnerabilities, develop priorities, and inform decision making. It is the factual basis for the mitigation strategy. The hazards and associated impacts in the risk assessment should be the hazards and impacts the mitigation strategy seeks to address. If, for example, the risk assessment shows that the state will have hurricane damage in a specific area, the mitigation strategy should include actions to protect state assets and jurisdictions, especially underserved communities, and socially vulnerable populations, in those areas.



The Sevier County HMPC conducted a hazard identification analysis to determine the natural and man-made hazards that threaten the County. Existing hazard data from TEMA, FEMA, the National Oceanic and Atmospheric Administration (NOAA), and other sources were examined to assess the significance of these hazards to the planning area. Hazard data from the ETSU Geoinformatics & Disaster Science Lab was also analyzed as related to the changing weather trends and their significance. Significance was measured in general terms and focused on key criteria such as frequency and resulting damage, which includes deaths and injuries, as well as property and economic damage. Any hazard that had two or more green lifeline categories is considered low risk for damages and therefore, will not be providing mitigation actions for those specific hazards.

To further focus on the list of identified hazards for this plan update, the HMPC researched past events that resulted in a federal and/or state emergency or disaster declaration in Sevier County to identify known hazards. *Table 8* presents a list of all major disaster and emergency declarations that have occurred in Sevier County since 1953, illustrating which hazards pose the greatest risk to the County.

Table 9 Presidential Disaster Declarations in Sevier County (1953-2025)

Declaration #	Date	Event Details	Individual Assistance	Public Assistance
4832	10/2/2024	Tropical Storm Helene	N	Y
4514	4/2/2020	Biological (Covid)	Y	Y
3473	3/13/2020	Biological (Covid	N	N
4427	4/17/2019	Flood	N	Y
4320	5/27/2017	Severe Storm	N	N
4293	11/28/2016	Wildfire	Y	Y
4211	4/2/2015	Severe Ice Storm	N	Y
1464	5/4/2003	Severe Storm	Y	Y
1408	1/23/2002	Severe Storm	Y	Y
2389	11/12/2001	Wildfire	N	Y
2346	10/30/2000	Wildfire	N	Y
1260	12/23/1998	Severe Storm	Y	Y
1215	4/20/1998	Severe Storm	N	N
1197	1/13/1998	Severe Storm	N	N
1022	4/14/1994	Flood	N	N
3095	3/14/1993	Snowstorm	N	N
366	03/21/1973	Flood	N	N
331	05/15/1972	Flood	N	N

Table 9 documents the hazards of interest to Sevier County and the decision to re-evaluate or delete them from this plan update. The hazards of concern were altered as necessary to ensure the Sevier County Hazard Mitigation Plan is in accordance with the Tennessee Mitigation Strategy.

Table 10 Overview of Updates to Chapter 2: Risk and Vulnerability Assessment

Tennessee 2018 Mitigation Strategy	Sevier County 2020 HMP	Status	Sevier County 2025 HMP Update
Communicable Disease	Y	Reviewed	Y
Dam Failure	Y	Reviewed	Y
Drought	Y	Reviewed	Y
Earthquakes	Y	Reviewed	Y
Extreme Temperatures	Y	Reviewed	Y
Flooding	Y	Reviewed	Y
Geological Hazard	N	Reviewed	Y
Hazardous Materials Release	N	Reviewed	Y
Infrastructure Incident	Y	Reviewed	Y
Terrorism/Civil	Y	Reviewed	Y

Disobedience			
Tornadoes	Y	Reviewed	Y
Severe Weather (thunderstorms, lighting, hail)	Y	Reviewed	Y
Wildfire	Y	Reviewed	Y
Mass Wasting (Geological Hazards)	Y	Reviewed	N
Tropical Cyclones	Y	Reviewed	N

Summary of changes in the 2025 plan update:

- All Hazards from 2020, except for Tropical Cyclones will be carried forward into 2025. Mass Wasting is identified as Geological Hazards.
- *The Sevier County Board of Education wants to be able to apply for their own projects out of their budget, therefore they will be included as a separate Jurisdiction, however, they will fall under the County for the majority of this plan regarding hazards, risk assessments, and mitigation planning.*

2.2 Communicable Diseases

2.2.1 Hazard Overview

Communicable disease (infectious disease) is defined as an illness caused by a specific infectious agent or its toxic product that results from transmission of that agent or its products from an infected person, animal, or reservoir to a susceptible host, directly or indirectly either through an intermediate plant or animal host, vector, or inanimate environment. Vector-borne diseases include bacterial and viral diseases transmitted by mosquitoes, ticks, and fleas.

2.2.2 County Profile

Historically, examples of communicable disease outbreaks in Tennessee are West Nile Virus (mosquito-borne), bed bugs, and pertussis (whooping cough). The most recently declared worldwide communicable disease emergency that affected Tennessee was the COVID-19 (coronavirus) pandemic in 2019. Communicable disease cases are reported to the Tennessee Department of Health which provides reporting guidance and resources for communicable disease outbreaks within the state. Within Tennessee 12 diseases are categorized as immediate notification and 25 as next business day notification.

Past Occurrences

- 2009 H1N1 Pandemic: In the spring of 2009, a strain of H1N1 spread quickly across the U.S. and the globe. The U.S. government declared H1N1 (swine flu) a public health emergency in April 2006. By November 2009, 48 states reported cases of H1N1, mostly in children and young adults. The CDC estimates that 43 million to 89 million people had H1N1 between April 2009 and April 2010, resulting in an estimated 8,870 and 18,300 H1N1-related deaths.
- 2014 Ebola Outbreak: During the 2014 West African Ebola outbreak, 11 people were treated for Ebola Virus Disease (EVD) in the U.S., two of whom died. The majority were infected with the Ebola virus outside of the U.S. and either medically evacuated into the U.S. for treatment or entered the country as airline passengers.
- 2019 Coronavirus Pandemic: In December 2019, a coronavirus disease (COVID-19) outbreak was identified in Wuhan, China. In 2020, COVID-19 quickly spread to the United States, and in March 2020, the World Health Organization characterized COVID-19 as a pandemic. The United States declared a national emergency. It is estimated that 40,357 people were infected, resulting in 483 COVID19-related deaths in Sevier County. Link for updated data: The data is no longer updated and maintained as 11 January 2025.
  https://www.tn.gov/health/cedep/ncov/data/county-data-snapshot.html

2.2.3 Risk Assessment

The entirety of Sevier County, including all assets located within the County, can be considered at risk. Vulnerable and underserved populations have a higher risk of severe illness following disease infections. Historically, these populations include adults aged 65 or older, infants under 2 years old, marginalized populations experiencing health or social

inequities, and individuals with medical conditions. While a pandemic outbreak will not directly impact critical facilities and infrastructure, it could severely impact local healthcare services, with clinical systems and 911 becoming overwhelmed. A severe pandemic may result in an interruption of services and a shortage of supplies.

The Social Vulnerability Index (SVI) is a dataset that uses 16 census variables to help local officials identify communities that may need support before, during, or after disasters. Unfortunately, the National Risk Index does not capture non-natural disaster impacts. Therefore, using the SVI can help public health officials and local planners better prepare for and respond to emergency events such as disease outbreaks.

Social Vulnerability Index Score for Sevier County: Moderate Vulnerability
Although the Social Vulnerability Index (SVI) is a well-valued resource it fails to properly show the feedback from the participating jurisdictions. Therefore, all identified hazards were evaluated in regard to risk in FEMA lifelines per jurisdiction. The scenario that local jurisdictions would evaluate the conditions off of was a mid-level impact of the identified hazard. The results are below:

Communicable Disease Risk based on selected FEMA Lifelines

Communicable Disease Risk	FEMA Lifelines							
Jurisdiction	Safety & Security	Food, Water & Shelter	Health & Medical	Energy	Communications	Transportation	Hazardous Materials	Water Systems
Sevier County								
City of Gatlinburg								
City of Pigeon Forge								
City of Sevierville								
Town of Pittman Center								

Colors indicate lifeline or component conditions:	
Red	Significant Impact, Multiple Required Resources
Yellow	Some Impact, Some Outside Resources Required
Green	Little to No Impact, No Outside Resources Required

Given the information above it becomes vital that all participating jurisdictions are able to prioritize the necessity of mitigation actions in the following lifeline categories so that they can become more resilient in the whole community that they serve. **Tourism-driven population fluctuations** with seasonal visitors may introduce pathogens from other regions.

2.2.4 Land Use & Development

Considering that the entire County is at risk of communicable disease, increased development, and population growth can reasonably translate to increased impacts due to these events. The population in Sevier County is expected to rise similarly to its surrounding counties and Tennessee. An increase in population may lead to an increased risk of infection and new and improved business, which in turn means an increase in the number and value of assets at risk of economic disruption.

2.2.5 Multi-Jurisdictional Differences

The entirety of Sevier County and the incorporated jurisdictions, including all assets located within, can be considered equally at risk of communicable disease outbreaks. This includes the entire population, all critical facilities, buildings (commercial and residential), and infrastructure. The **Tennessee Emerging Infections Program (EIP)**—covering Sevier County—actively monitors a range of diseases including foodborne illnesses (FoodNet), invasive bacterial infections, influenza, and healthcare-associated infections. High tourist and seasonal resident turnover elevate exposure potential throughout the County with over 12 million visitors each year to the county's many attractions, theme parks, and national park.

2.2.6 Summary

Sevier County is subject to communicable diseases through plant or animal host, vector, or inanimate environments. Communicable diseases can spread, leading to deaths, local business impacts and closures, and supply chain disruptions. Infections and hospitalizations due to communicable diseases can overwhelm local healthcare services. Climate models predict warming temperatures and wetter seasons in the Southeast, which can expand mosquito and tick habitats**,** lengthening seasons for diseases like West Nile virus, dengue, Lyme disease, and other vector-borne illnesses.

2.3 Dams

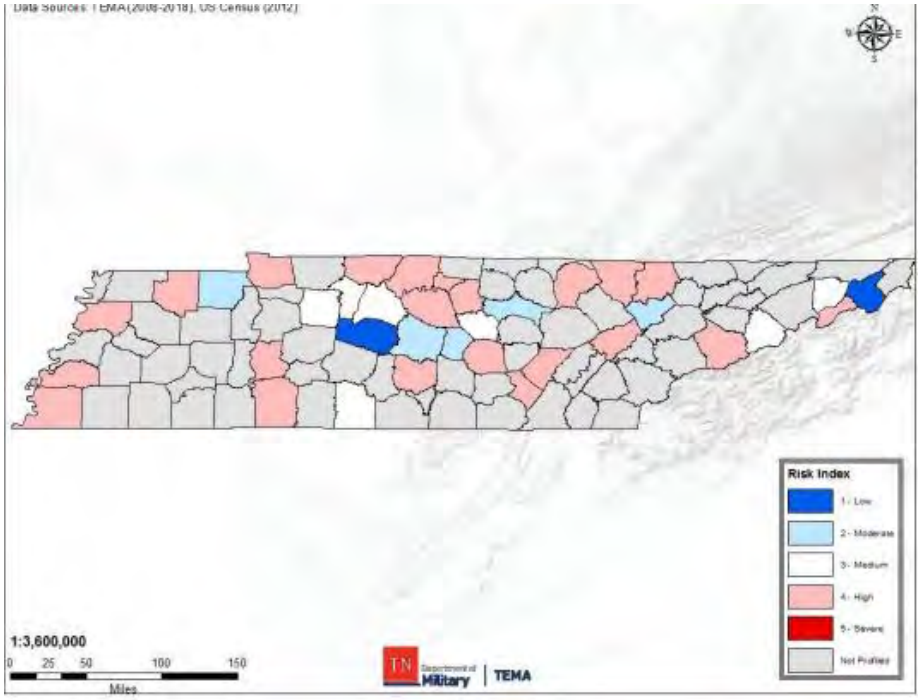
2.3.1 Hazard Overview

A dam is a barrier across flowing water that obstructs, directs, or slows the flow, often creating a reservoir, lake, or impoundment. Most dams have a section called a spillway or weir, over or through, in which water flows, either intermittently or continuously. According to Tennessee Safe Dams Program, a dam is a structure at least 20 feet high or can impound at least 30 acre-feet of water.

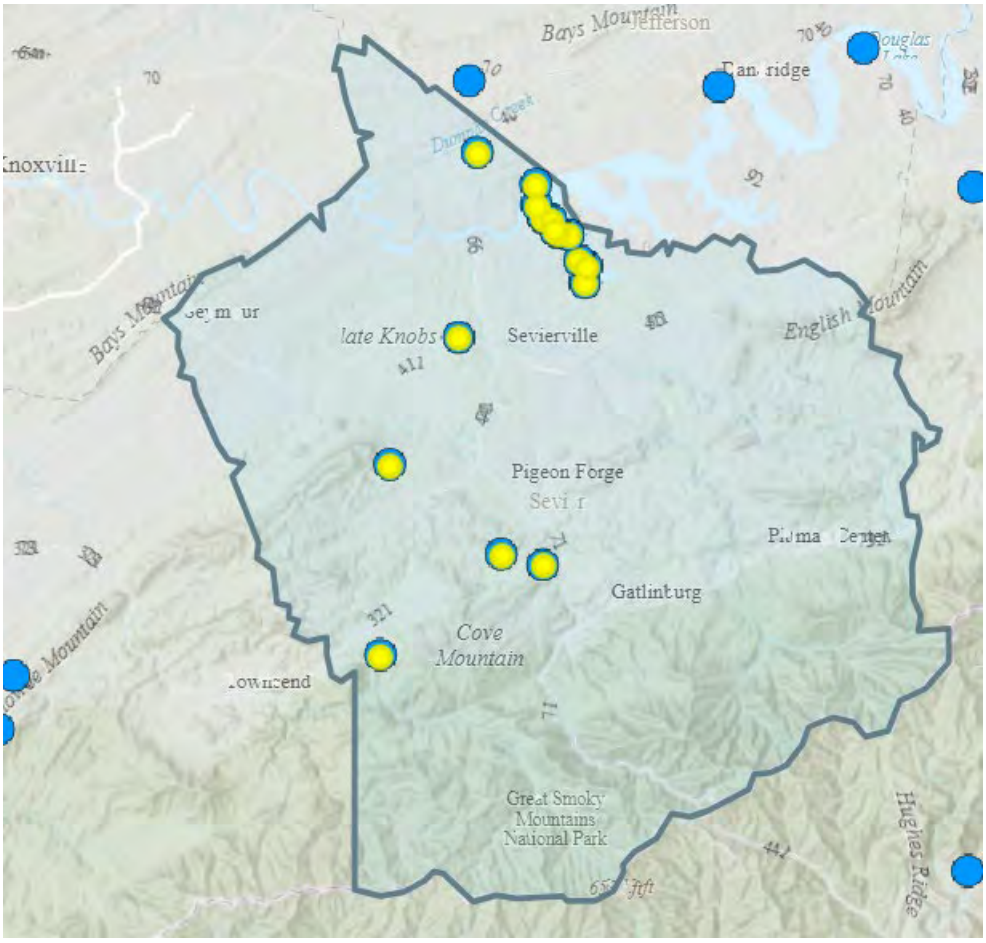
Dams fail in two ways, a controlled spillway release to prevent total failure or the partial or complete collapse of the dam itself. In each instance, an overwhelming amount of water and potential debris is released. Dam failures are rare, but when they occur can cause loss of life and immense damage to infrastructure and the environment.

Common reasons for dam failure are the following:

- Sub-standard construction materials/techniques;
- Spillway design error;
- Geological instability caused by changes to water levels during filling or poor surveying;
- Sliding of a mountain into the reservoir;
- Poor maintenance, especially of outlet pipes (Extreme inflow);
- Human, computer, or design error;
- Internal erosion, especially in earthen dams;
- Earthquakes.



Tennessee Dam Failure Hazard Risk



Sevier County Dam Locations (Source: USACE)

2.3.2 County Profile

Dam failures can occur with little warning. Intense storms may produce a flood in a few hours or even minutes from upstream locations. A dam failure can occur within hours of the first signs of breaching. Although the floodwaters will drain, the area will be affected by flooding from the dam failure for days to weeks, and the destruction will affect the area for years. Tennessee has a total of 1238 dams and levees within its borders, with 660 being state regulated. Roughly 93% are earth dams less than 50 feet tall, 40 of these dams are made of concrete, and 37 of the state's dams are over 100 feet tall. 64% of the state's dams are privately owned, 15% locally, 12% by the state, 8% federally, and 1% by a public utility. Of those, 274 are considered a high-hazard potential, with 355 significant and 609 low hazards. The focus of mitigation efforts is on high-hazard dams owned by the state and local governments and privately owned dams. Tennessee does not consider Federally regulated dams for hazard mitigation due to the inability to conduct projects on those dams.

Sevier County High Hazard Dams

Name	Hazard Potential Classification

Douglas Dam (TVA)	High
Lake Marian Dam (Little Greenbriar HOA)	High
Lake Buena Vista Dam (Lake Buena Vista Owners)	High
Mongiove Dam (Golden, Naomi)	High
Waters Dam (The High Command LLC)	High
Douglas Dam – Saddle Dam #1 (TVA)	High
Douglas Dam – Saddle Dam #2 (TVA)	High
Douglas Dam – Saddle Dam #3 (TVA)	High
Douglas Dam – Saddle Dam #4 (TVA)	High
Douglas Dam – Saddle Dam #5 (TVA)	High
Douglas Dam – Saddle Dam #6 (TVA)	High
Douglas Dam – Saddle Dam #7 (TVA)	High
Douglas Dam – Saddle Dam #8 (TVA)	High
Douglas Dam – Saddle Dam #9 (TVA)	High
Douglas Dam – Saddle Dam #10 (TVA)	High

Pull information from the link: https://nid.sec.usace.army.mil/#/dams

Past Occurrences

The prime illustration of dam failure in the state is the 2008 Kingston Plant retention pond dam failure. The 40-acre pond was used by the Tennessee Valley Authority to hold a slurry of ash generated by the coal-burning plant. The break caused a release of a frigid mix of water, ash, and mud that damaged 12 homes and put hundreds of acres of rural land under water. This incident caused significant interruptions to the surrounding infrastructure, agriculture, and major soil and water quality issues for miles downstream. The Kingston incident displays the second and third-order effects that can occur from a dam failure beyond just flooding and emphasizes the necessity of mitigating the potential of failure through maintenance and downstream projects.

According to the Association of State Dam Safety, there has been **no** recorded history of any dam failure incidents in Sevier County. The database is not considered comprehensive of all dam safety incidents, both historical and current, and reflects only the data that ASDSO has been able to collect. Much of the identifying information on specific dams is obtained from the National Inventory of Dams. Although there have been no dam failures, significant water releases have resulted in areas in the county having substantial flooding.

- **Related event:** During **Hurricane Helene in September 2024**, water levels reached record highs—up to 9.5 feet above the previous record and flows of up to 1.2 million gallons per second at the Nolichucky Dam near Sevier County. TVA issued a Condition Red warning indicating an imminent breach risk, leading to controlled releases from Douglas Dam that flooded lower areas. The dam did not fail, though the powerhouse structure suffered irreparable damage and was later demolished
- **Related event:** Pittman Center experienced severe **flash flooding on September 22, 1989**, when torrential rains caused intense creek flows that inundated a school—though there was no pipe or dam breach involved. Heroic rescues were executed via

rope lines, and fortunately, there were **no fatalities.**

Probability of Future Events – Unlikely in the next 5 years. According to the Association of State Dam Safety Officials (ASDSO), the annual failure rate for U.S. dams is approximately **0.007%** per dam and **0.035%** per dam over 5 years.
Most incidents associated with potential dam risk in the County have involved approaching failure conditions due to extreme flooding, but without actual breaches. Complete dam failure can be triggered by heavy rainfall, earthquakes, and flooding. With several areas in the county increasing in population and infrastructure (both public and private), this could damage a significant amount of infrastructure, property, and commerce disruption. Sevier County has **15 dams classified as high hazard**, meaning that failure—or uncontrolled releases—could pose a serious threat to downstream lives or infrastructure.

2.3.3 Risk Assessment

Many buildings and the majority of infrastructure networks throughout the county can be vulnerable to dam failure. The risk of this is incredibly low, but the nature of the mechanics of a dam failure is complicated to predict. Therefore, the committee found it essential to include this natural hazard in their plan.

The Social Vulnerability Index (SVI) is a dataset that uses 16 census variables that help local officials identify communities that may need support before, during or after disasters. Unfortunately, the National Risk Index does not capture non-natural disaster impacts, therefore, using the SVI can help public health officials and local planners better prepare for and respond to emergency events such as dam failure.

Social Vulnerability Index Score for Sevier County = No Rating

Although the Social Vulnerability Index is a well-valued resource it fails to properly show the feedback from the participating jurisdictions. Therefore, all identified hazards were evaluated in regard to risk in FEMA lifelines per jurisdiction. The scenario that local jurisdictions would evaluate the conditions off of was a mid-level impact of the identified hazard. The results are below:

Dam Failure Risk based on selected FEMA Lifelines

Dam Failure Risk	FEMA Lifelines							
Jurisdiction	Safety & Security	Food, Water & Shelter	Health & Medical	Energy	Communications	Transportation	Hazardous Materials	Water Systems
Sevier County								
City of Gatlinburg								

City of Pigeon Forge								
City of Sevierville								
Town of Pittman Center								

Colors indicate lifeline or component conditions:	
Red	Significant Impact, Multiple Required Resources
Yellow	Some Impact, Some Outside Resources Required
Green	Little to No Impact, No Outside Resources Required

Given the information above it becomes vital that all participating jurisdictions are able to prioritize the necessity of mitigation actions in the following lifeline categories so that they can become more resilient in the whole community that they serve.

2.3.4 Land Use & Development

Dams are assigned potential hazard categories that reflect the threat to life and property in the event of a failure. Safety inspections of dams are performed by Safe Dams staff for one, two, and three years, respectively, for these categories of dams. The responsibility of building and maintaining a dam rests solely with the owner. The dam owner is liable for the water stored behind the dam. A failure resulting in an uncontrolled reservoir release can have a devastating effect on people and property downstream. It can impair many other infrastructure systems, such as roads, bridges, and water systems. Additionally, a dam failure could mean the loss of a vital resource to the owner. Therefore, proper construction, operation, maintenance, repair, and rehabilitation of a dam are critical elements in preventing failure, limiting the owner's liability, and maintaining the water resource.

2.3.5 Multi-Jurisdictional Differences

Due to the locations of dams in Sevier County, Sevierville followed by Gatlinburg is the most at risk for dam failures. However, if there is a complete failure of any of the county dams, then all incorporated jurisdictions are susceptible.

2.3.6 Summary

The risk and consequences of dam failure must be lowered to improve public safety and resilience. Progress requires better planning for mitigating the effects of failures, increased regulatory oversight of dam safety, improved coordination and communication across governing agencies, and the development of tools, training, and technology. Dam failures risk public safety and can cost our economy millions of dollars in damage.

2.4 Drought

2.4.1 Hazard Overview

Drought is a deficiency in precipitation over an extended period. It is a standard, recurrent feature of climate that occurs in virtually all climate zones. The duration of droughts varies widely. In some cases, drought develops relatively quickly and lasts a very short time, exacerbated by extreme heat and/or wind. There are other cases when drought spans multiple years or even decades. Studying the paleoclimate record is often helpful in identifying when long-lasting droughts have occurred. Common types of droughts are detailed below.

Drought Classifications

Type	Details
Meteorological Drought	Meteorological Drought is based on the degree of dryness (rainfall deficit) and the length of the dry period.
Agricultural Drought	Agricultural Drought is based on the impacts on agriculture by factors such as rainfall deficits, soil water deficits, reduced groundwater, or reservoir levels needed for irrigation.
Hydrological Drought	Hydrological Drought is based on the impact of rainfall deficits on the water supply, such as stream flow, reservoir and lake levels, and groundwater table decline.
Socioeconomic Drought	Socioeconomic drought is based on the impact of conditions (meteorological, agricultural, or hydrological drought) on the supply and demand of some economic goods. Socioeconomic deficiency occurs when the demand for an economic good exceeds the supply due to a weather-related deficit in the water supply.

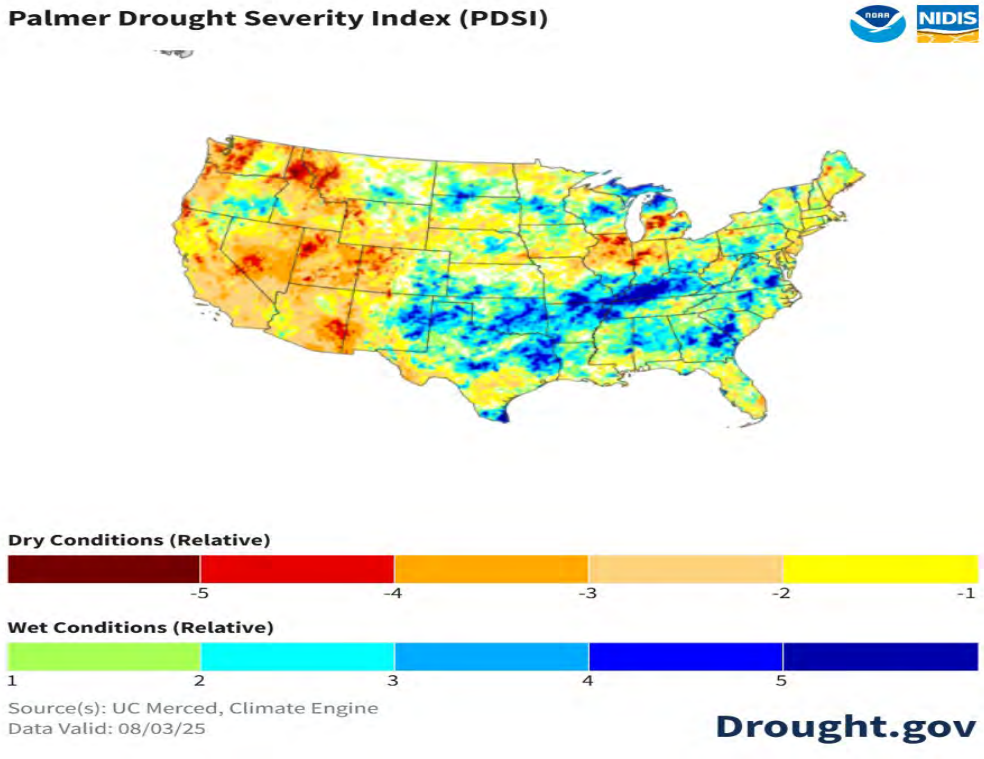
The wide variety of disciplines affected by drought, its diverse geographical and temporal distribution, and the many scales drought operates on make it difficult to develop a definition to describe drought and an index to measure it. Many quantitative measures of droughts have been developed in the United States, depending on the discipline affected, the region being considered, and the particular application. Several indices developed by Wayne Palmer and the Standardized Precipitation Index help describe the many scales of drought.

- The **U.S. Drought Monitor** summarizes drought conditions across the United States and Puerto Rico. Often described as a blend of art and science, the map is updated weekly by combining a variety of data-based drought indices and indicators and local expert input into a single composite drought indicator.
- The **Standardized Precipitation Index** (SPI) measures drought, which differs from the Palmer Drought Index (PDI). Like the PDI, this index is negative for lack and positive for wet conditions. But the SPI is a probability index that considers only precipitation, while Palmer's indices are water balance indices that consider water supply (rain), demand (evapotranspiration), and loss (runoff).
- The **Palmer Drought Severity Index** (PDSI), devised in 1965, was the first drought indicator to assess moisture status comprehensively. It uses temperature and precipitation data to calculate water supply and demand, incorporates soil moisture, and is considered the most effective for unirrigated cropland. It primarily reflects

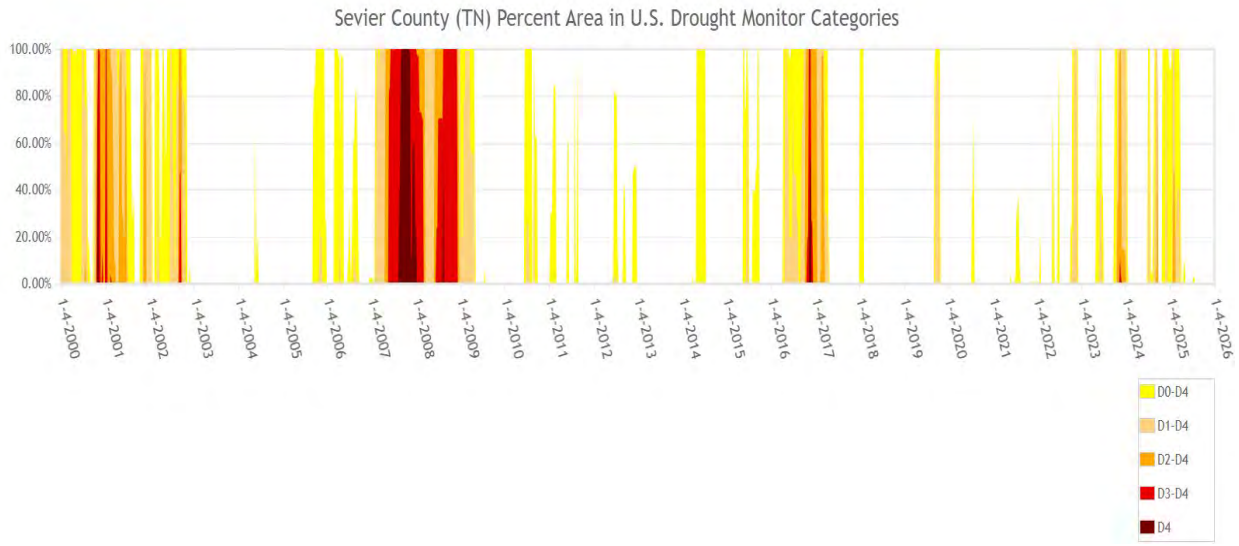
the Perry-term drought and has been used extensively to initiate drought relief. It is more complex than the SPI and the Drought Monitor.

2.4.2 County Profile

According to the PDSI map below, East Tennessee has a relatively low risk of drought hazards. However, drought cannot be confined to geographic or political boundaries, and some areas may experience more severe drought events than what is shown on the map.



Palmer Drought Map



Drought Monitor Time Series (Source: National Drought Mitigation Center)

https://droughtmonitor.unl.edu/DmData/TimeSeries.aspx

The figure above illustrates drought conditions within Sevier County between 2000 and 2025. According to the National Drought Mitigation Center, the last Extreme Drought (D4) period occurred in 2017. D4 (extreme drought) is categorized by browning grass, low lake levels, municipality water restrictions, and increased water prices. D0 (abnormally dry) conditions consist of hard ground and declining agriculture ponds and creeks. A table containing all NOAA-recorded drought events between 1950 - 2025 for Sevier County is listed below.

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	0.00K	0.00K
NORTH SEVIER (ZONE)	NORTH SEVIER (ZONE)	TN	09/01/1998	00:01	EST	Drought		0	0	0.00K	0.00K
SEVIER/SMOKY MOUNTAINS (...	SEVIER/SMOKY MOUNTAINS (...	TN	09/01/1998	00:01	EST	Drought		0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

2016: Severe drought contributed to dry vegetation that fueled the **Gatlinburg wildfires**

Probability Future Events – Based on climate modeling from **NOAA's National Integrated Drought Information System (NIDIS),** there is **a 70-80% chance of a mild to moderate drought, 25-35% chance of a severe drought,** and **10-15% chance of an extreme drought** over the next 5 years**.**
The probability of Sevier County and its municipalities experiencing a drought event can be challenging to quantify but based on the historical record of 2 droughts since 1950; it can reasonably be assumed that this type of event has occurred every few years. To reference the climate trend analyzed by East Tennessee State University, reference Appendix C.

2.4.3 Risk Assessment

Sevier County is vulnerable to drought; however, estimated potential losses are inherently difficult to calculate because drought tends to cause minor damage to the built environment. Therefore, it is assumed that all buildings and facilities in the planning area would technically be exposed to the drought hazard; there is no significant vulnerability to these buildings on a structural level.

Potential drought losses can be calculated in terms of the value of agriculture in the County, which is perhaps most vulnerable to drought. According to the USDA, the net income for agriculture is around $2.6 million. Population growth could contribute directly to this hazard, as more users pull from the available water supply within the region. Drought can also increase the County's vulnerability to wildfires. Dry, hot, and windy weather combined with dry vegetation and a spark through human intent, accident, or lightning can start a wildfire.

The National Risk Index is a dataset and online tool to help illustrate the United States communities most at risk for natural hazards. It was built and designed by FEMA in close collaboration with various stakeholders and partners in academia; local, state and federal government. The Risk Index leverages available source data for natural hazards and community risk factors to develop a baseline relative risk assessment for each county and census trace. Some of these community risk factors include social vulnerability which is determined by the data pulled from the Census Performed every ten years. A higher social vulnerability score is proportional to a higher risk score.

National Risk Index Score for Drought = Very Low

Although the National Risk Index is a well-valued tool it fails to properly show the feedback from the participating jurisdictions. Therefore, all identified hazards were evaluated in regard to risk in FEMA lifelines per jurisdiction. The scenario that local jurisdictions would evaluate the conditions off of was a mid-level impact of the identified hazard. The results are below:

Drought Risk based on selected FEMA Lifelines

Drought Risk	FEMA Lifelines							
Jurisdiction	Safety & Security	Food, Water & Shelter	Health & Medical	Energy	Communications	Transportation	Hazardous Materials	Water Systems
Sevier County								
City of Gatlinburg								
City of Pigeon Forge								
City of Sevierville								
Town of Pittman Center								

Colors indicate lifeline or component conditions:	
Red	Significant Impact, Multiple Required Resources
Yellow	Some Impact, Some Outside Resources Required
Green	Little to No Impact, No Outside Resources Required

Given the information above, it becomes vital that all participating jurisdictions are able to prioritize the mitigation actions in the following lifeline categories so that they can become more resilient to the whole community that they serve.

2.4.4 Land Use and Development

According to the National Drought Mitigation Center, how we use land affects our vulnerability to drought. In general, land use patterns that maintain the integrity of watersheds and that have a smaller paved footprint result in greater resilience in the face

of drought. The projected increase in population will possibly result in an increase in buildings and infrastructure, leading to increased impervious areas. An increase in population may also put increasing pressure on water and other natural resources, particularly during periods of drought. Therefore, future development could impact drought vulnerability in Sevier County.

2.4.5 Multi-Jurisdictional Differences

Due to the nature of drought, Sevier County and the incorporated jurisdictions are equally susceptible to drought conditions.

2.4.6 Summary

Sevier County and all incorporated jurisdictions are equally vulnerable to drought. With historical frequency considered there is a significant chance of this event occurring each year. Drought can affect people's health and safety. Examples of drought impacts on society include anxiety or depression about economic losses, conflicts when there is not enough water, reduced incomes, fewer recreational activities, higher incidents of heat stroke, and even loss of human life. Drought conditions can also provide a substantial increase in wildfire risk. As plants and trees wither and die from a lack of precipitation, increased insect infestations, and diseases—all associated with drought—they become fuel for wildfires. Sevier County periods of drought can equate to more wildfires and more intense wildfires, which affect the economy, the environment, and society in many ways, such as by destroying neighborhoods, crops, and habitats.

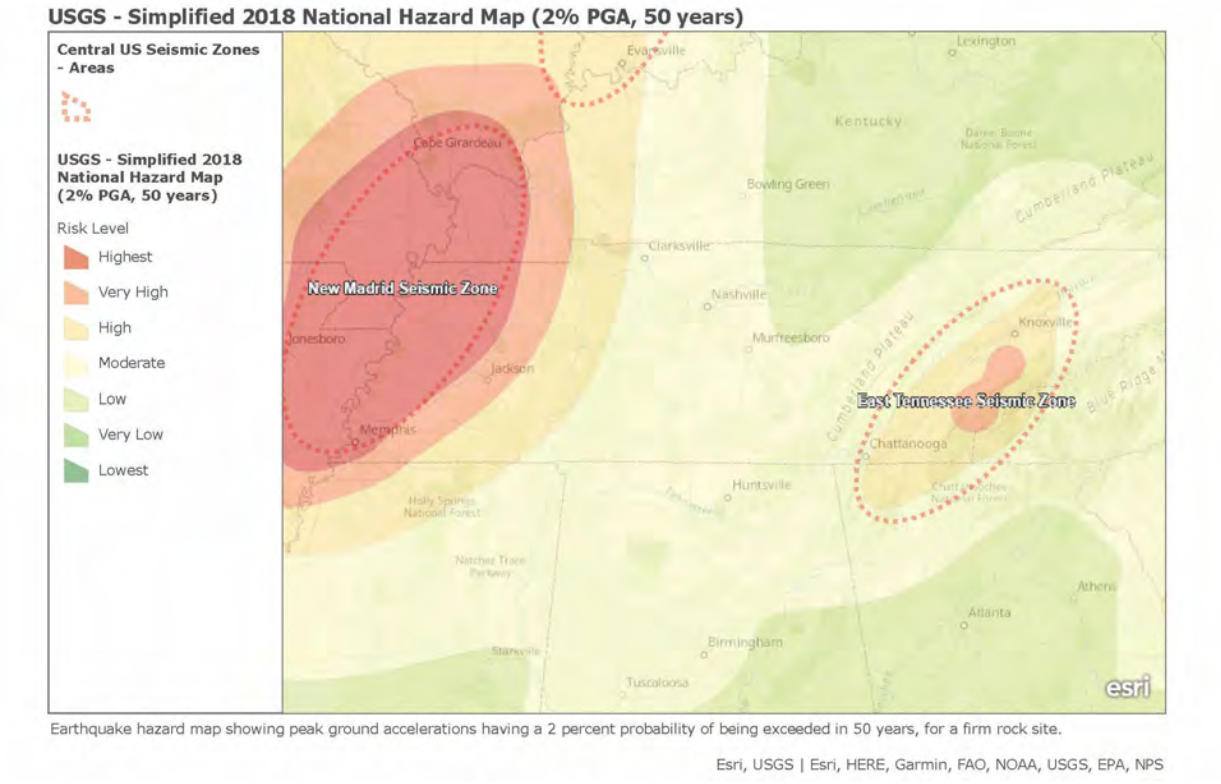
2.5 Earthquakes

2.5.1 Hazard Overview

An earthquake results from a sudden release of energy in the Earth's crust that creates seismic waves. The energy originates from a subsurface fault. A fault is a fracture or discontinuity in a volume of rock along tectonic plates. In the most general sense, the word earthquake describes any event that generates seismic waves. Earthquakes are typically caused by the rupturing of geological faults. Occasionally, they are also caused by other events such as volcanic activity, landslides, mine blasts, and nuclear tests. An earthquake's point of initial rupture is called its focus or hypocenter. The epicenter is the point at ground level directly above the hypocenter.

2.5.2 County Profile

Sevier County is near the major intraplate (within a tectonic plate) seismic zone known as the New Madrid Seismic Zone. The New Madrid Seismic Zone (NMSZ) is an approximately 120-mile-long fault system that stretches across five states, including Western Tennessee. Sevier County is near the East Tennessee Seismic Zone (ETSZ) which stretches across three states. The figure below illustrates the risk level of the NMSZ/ETSZ within the state.



New Madrid Seismic Zone (Source: CUSEC)

Sevier has experienced 2,248 recorded earthquakes since 1950, with 1,175 1.0 and 942 2.0's. Sevier has experienced roughly 600 1.0 or less earthquakes in the past 20 years, or approximately 30 per year for the past 20 years, with the strongest, a 2.5 on Aug 5th, 2024.

The NMSZ is known for producing four of the largest North American earthquakes in recorded history, all of which would have been felt in Sevier County. This includes the noted three-month period between December 1811 and February 1812 that had at least four earthquakes which are understood by scientists to be greater than a M7.0. During this period, there were dozens of strong earthquakes ranging between M6.0 and M7.5. Thousands of smaller shocks were documented. Similar to the 1811-12 New Madrid earthquake sequence which created Reelfoot Lake in Lake County, Tennessee, very large magnitude earthquake sequences are believed to have occurred in pre-historic times as well. Paleo-liquefaction and geologic evidence suggests large earthquake sequences occurred in the New Madrid Seismic Zone in 1450 AD and 900AD.

Based on geologic research on the paleo seismic record of past earthquakes, the USGS estimates that there is a 7 to 10 percent chance of a New Madrid earthquake the size of those in 1811-12 occurring in the next 50 years. However, the occurrence of even a moderate-sized earthquake located in close proximity to urban centers such as Memphis or St. Louis could be locally devastating. The last magnitude-6 earthquake struck near Charleston, Missouri, in 1895. The chance of such an earthquake occurring in the New Madrid region in the next 50 years is 25 to 40 percent.

These probabilities are derived from the USGS National Seismic Hazard Maps, which are developed from geologic information about faults, evidence of prehistoric earthquakes, instrumental and historical earthquake catalogs generated by seismic monitoring, and ground deformation measurements. The National Seismic Hazard Maps are used to estimate probabilities of large earthquakes and the ground shaking to be expected if those earthquakes occur.

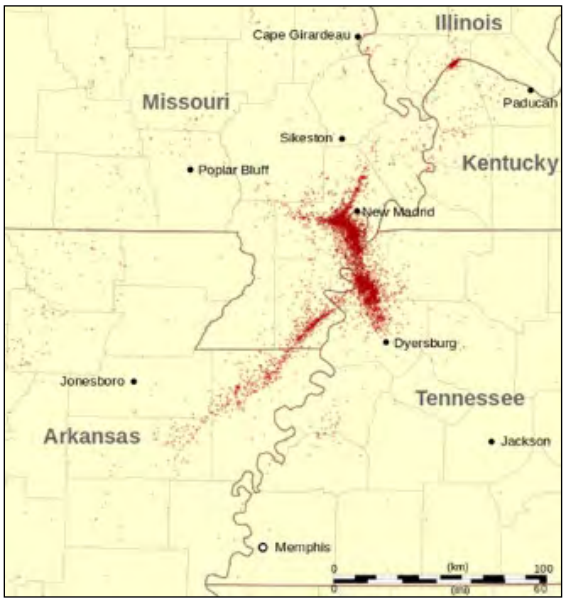
The Eastern Tennessee Seismic Zone (ETSZ), a zone of small earthquakes stretching from northeastern Alabama to southwestern Virginia. The ETSZ is the second-most active natural seismic zone in the central and eastern United States, behind the New Madrid Seismic Zone in the Mississippi River region that produced the 1811-1812 magnitude 7+ earthquakes. In historic times, the ETSZ has not produced earthquakes larger than magnitude 4.8, however scientists believe the ETSZ is capable of generating magnitude 6 or greater. The ETSZ region is home to several nuclear power plants and hydroelectric dams related to the Tennessee Valley Authority, along with major population centers such as Knoxville and Chattanooga.

Richter Scale Classification (Source: USGS)

Richter Scale for Earthquakes		
Magnitudes	**Description**	**Typical Impacts**
< 2.0	Micro	Not felt.
2.0-2.9	Slight	Generally, not felt but recorded.
3.0-3.9	Minor	Often felt, but rarely causes damage.
4.0-4.9	Light	Noticeable shaking of indoor items and rattling noises. Significant damage is likely.

5.0-5.9	Moderate	It can cause major damage to poorly constructed buildings in small regions. At most slight damage to well-designed buildings.
6.0-6.9	Strong	It can be destructive in areas up to about 100 miles across populated areas.
7.0-7.9	Major	It can cause serious damage over larger areas.
8.0-8.9	Great	It can cause severe damage in areas several hundred miles across.
9.0-9.9	Epic	They are devastating in areas several thousand miles across.

Since 1812, the most significant recorded earthquakes from the New Madrid Zone were in 1895 and 1968. Since seismic measurement instruments were installed in and around the zone in the 1970s, more than 4,000 small earthquakes have been recorded, with the vast majority being too small to be felt.



NMSZ Earthquakes Recorded Since 1974 (Source: USGS)

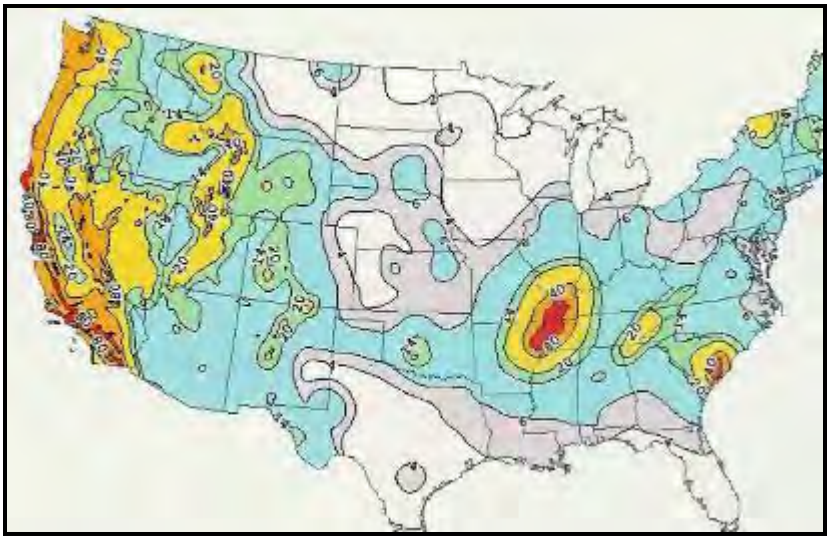
According to a 2008 FEMA report, a severe earthquake in the NMSZ could result in the highest economic loss due to a natural disaster in U.S. history. Based on this report, a 7.7 magnitude quake in the NMSZ would result in thousands of fatalities, hundreds of billions of dollars in damage to structures, and total disruption of vital infrastructure in Western Tennessee.

Probability of Future Events – Smaller earthquakes (~M4–5) are more common due to ETSZ activity—chance of experiencing one is in the **5% range** over 5 years. Magnitude 6.0 from NMSZ is 2-4% over the next 5 years and less than 1% from a 7.0 or greater. It is not uncommon for magnitude 2.0 or less to occur annually but is rarely felt in the county.

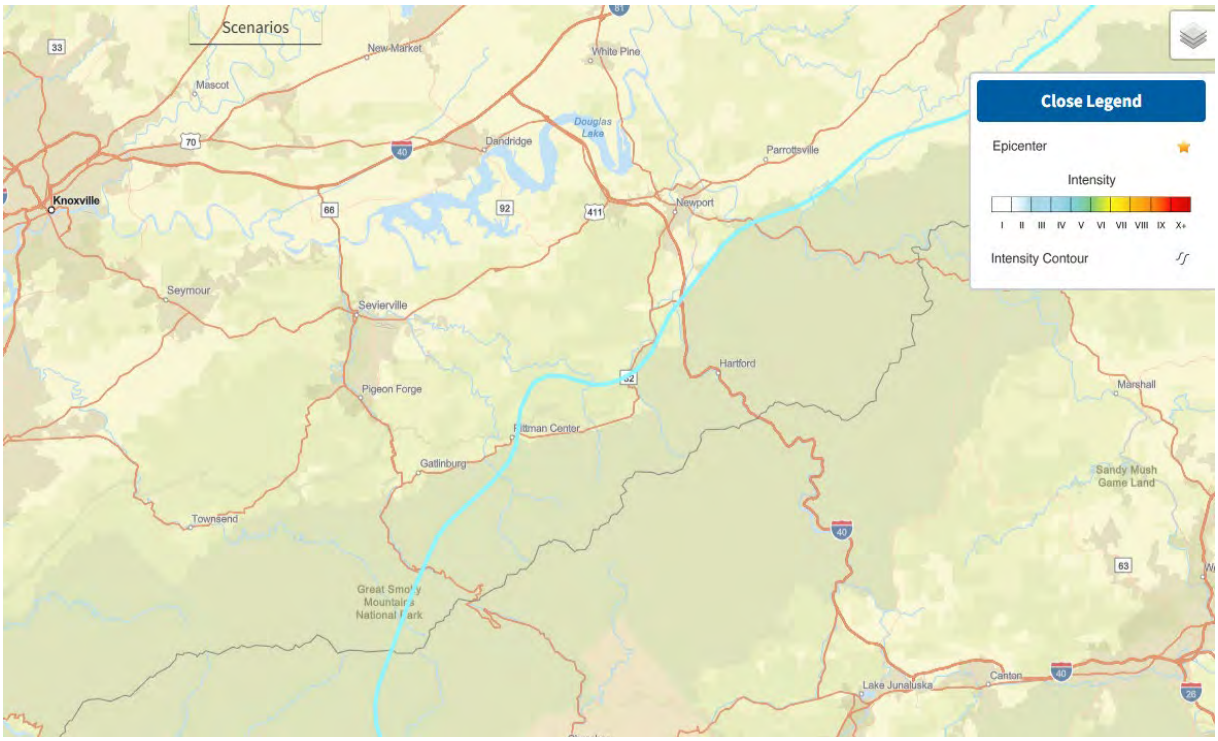
A catastrophic earthquake at the NMSZ would result in $100-200 million in building damages. Furthermore, according to the HAZUS, Sevier County will experience the following in a catastrophic earthquake scenario:

Impact Overview		Numerical Value	
Fatalities		Depends on time of day (anywhere from 0 to 17)	
Injuries		Unknown	
Displaced Households		11	
Residents Requiring Shelter		5	
Debris (tons)		50k tons	
Residencies experiencing >moderate damage			
Day 1			
Households without power		0	
Households without potable water		0	
Resources Functioning on Day 1		**Infrastructure Functioning after Day 1**	
Resource	**Percentage Functioning**	**Resource**	**Percentage Functioning**
Hospitals	1 (100%)	Highway Segments	30 (100%)
Police Stations	6 (100%)	Railway Segments	0 (100%)
Fire Stations	19 (100%)	Airport Segments	1 (100%)
Schools	37 (100%)	Bus facilities	0 (100%)
Communications	2 (100%)	Ports	0 (100%)

Many buildings and the majority of infrastructure networks throughout the county could be vulnerable to earthquake impacts. Sevier County's building stock can be broken down into the following percentage categories: 74.21% residential, 6.83% commercial, 1.51% industrial, 1% agricultural, 0.71% religious, 80.58% governmental, and 0.9% educational. Throughout the county, all buildings and infrastructure are vulnerable to earthquake impacts.

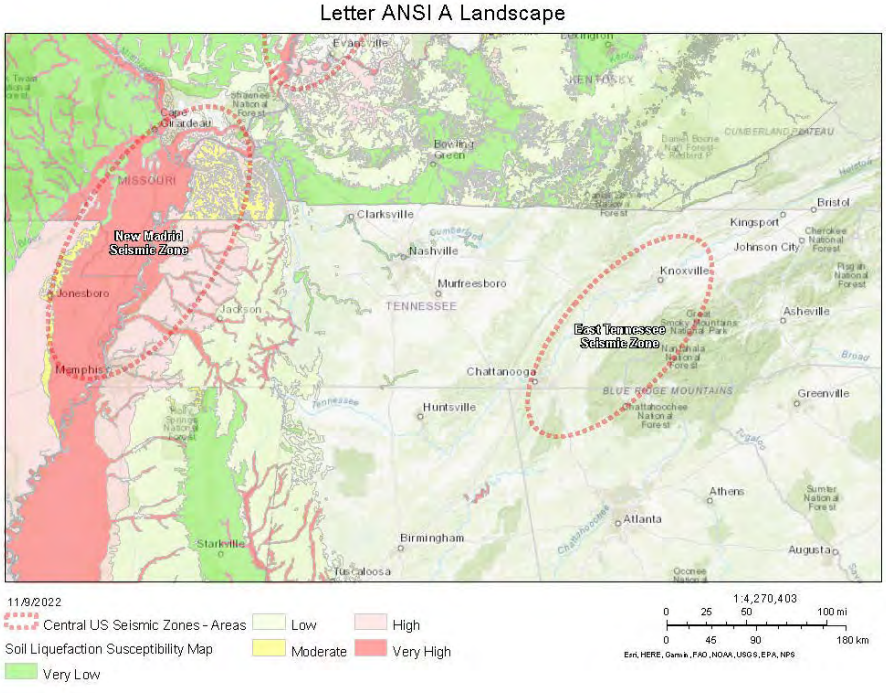


National Seismic Hazard Map (Source: USGS)
Ground Motions with a 2% Chance of Occurring in 50 Years



Mercalli Intensity Zones In Sevier County (Source: USGS)

As indicated in the above maps, all of Sevier County's jurisdictions and districts sit within intensity zones II to III of the Modified Mercalli Intensity Scale due to its proximity to the NMSZ. According to the Central United States Earthquake Consortium (CUSEC), Sevier County is at Low level of risk for liquefaction following an earthquake.



Earthquake Induced Liquification (Source: CUSEC)

2.5.3 Risk Assessment

The National Risk Index is a dataset and online tool to help illustrate the United States communities most at risk for natural hazards. It was built and designed by FEMA in close collaboration with various stakeholders and partners in academia; local, state and federal government. The Risk Index leverages available source data for natural hazards and community risk factors to develop a baseline relative risk assessment for each county and census trace. Some of these community risk factors include social vulnerability which is determined by the data pulled from the Census Performed every ten years. A higher social vulnerability score is proportional to a higher risk score.

National Risk Index Score for Earthquake = Relatively Low

Although the National Risk Index is a well-valued tool it fails to properly show the feedback from the participating jurisdictions. Therefore, all identified hazards were evaluated in regard to risk in FEMA lifelines per jurisdiction. The scenario that local jurisdictions would evaluate the conditions off of was a mid-level impact of the identified hazard. The results are below:

Earthquake Risk based on selected FEMA Lifelines

Earthquake Risk	FEMA Lifelines							
Jurisdiction	Safety & Security	Food, Water & Shelter	Health & Medical	Energy	Communications	Transportation	Hazardous Materials	Water Systems
Sevier County								
City of Gatlinburg								
City of Pigeon Forge								
City of Sevierville								
Town of Pittman Center								

Colors indicate lifeline or component conditions:	
Red	Significant Impact, Multiple Required Resources
Yellow	Some Impact, Some Outside Resources Required
Green	Little to No Impact, No Outside Resources Required

Given the information above it becomes vital that all participating jurisdictions are able to prioritize the necessity of mitigation actions in the following lifeline categories so that they can become more resilient in the whole community that they serve.

2.5.4 Land Use and Development Trends

Heavily populated or industrialized centers are at a higher risk for catastrophic earthquake damage. Sevier County, like much of Tennessee, is experiencing rapid growth increasing the likelihood of significant impacts to life and property from a significant earthquake.

2.5.5 Multi-Jurisdictional Differences

Counties predominantly in the West Portion of Tennessee will be more likely impacted by the New Madrid Zone. However, a significant magnitude earthquake can cause primary and secondary effects across the state. Older buildings in unincorporated and tourist/historic zones that lack seismic retrofit or were built under older/inadequate codes. Uneven code enforcement, especially in rural areas or small towns with less capacity for inspections. Evacuation route planning differences: while Sevierville has updated EOPs, smaller jurisdictions may not have full evacuation mapping or coordinated communications. Transient or tourist population which complicates risk communications & emergency messaging in tourist-heavy jurisdictions vs those with more stable populations.

2.5.6 Summary

Due to its proximity to the New Madrid Fault, the entirety of Sevier County could be subject to an earthquake. This includes the entire County population and all infrastructure. A significant earthquake event would result in a substantial loss of life and billions of dollars in damages.

2.6 Extreme Temperatures

2.6.1 Hazard Overview

Heat Waves

Excessive Heat is when the heat index reaches at least 105ºF for at least three hours on two consecutive days, and the nighttime air temperature does not drop below 75ºF. The definition of Excessive Heat is a "rule of thumb" because the detrimental effects of high temperatures and humidity vary among segments of the population (old, young, etc.) and whether the population, in general, has built up a heat tolerance (residents in desert communities fair better than visitors). While some may be better able to cope with Excessive Heat as defined, others may still be adversely affected by a lower heat index. A "rule of thumb" works for mitigation planning because the benefits of specific mitigation actions start accruing before conditions reach Excessive Heat levels. Exposure to extreme heat can pose health risks, including sunburn, dehydration, heat cramps, and heat stroke. The National Weather Service Heat Index calculates how hot it feels when relative humidity is factored in with the actual air temperature using a 4-factor scale: caution, extreme caution, danger, extreme danger. The National Weather Service (NWS) also issues Heat Alerts.

- A Heat Advisory is issued 12-24 hours before the onset, at least 100ºF but less than 105ºF for at least 2 hours.
- An Excessive Heat Watch is issued when temperatures of 105ºF or greater are forecasted for the next 24 to 72 hours.
- An Excessive Heat Warning is issued when temperatures of 105°F last for more than 3 hours per day for two consecutive days or temperatures exceed 115°F for any period.

Cold Wave

Extreme cold temperatures occur during the winter months and typically accompany winter storm events. Extended periods of extremely cold temperatures result from the movement of high-pressure systems into the United States. When Arctic air masses are present, extreme winter temperatures hover over Tennessee.

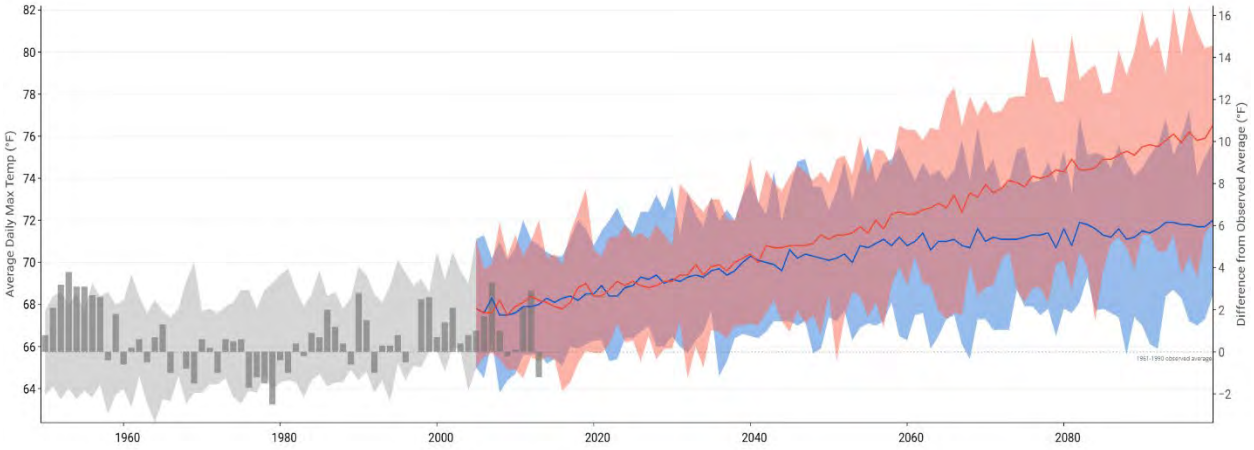
The National Weather Service (NWS) issues the nation's Wind Chill Warning, Watch, and Advisory:

- Wind Chill Warning: NWS issues a wind chill warning when dangerously cold wind chill values are expected or occurring.
- Wind Chill Watch: NWS issues a wind chill watch when dangerously cold wind chill values are possible.
- Wind Chill Advisory: NWS issues a wind chill advisory when seasonably cold wind chill values, but not extremely cold values, are expected or occurring.

The National Weather Service Wind Chill Chart calculates the danger from winter winds and freezing temperatures using a 3-factor time-based scale (30 min, 10 min, 5 min).

2.6.2 County Profile

Highest recorded temperature: **106 °F** on **July 1, 2012,** in Sevierville
Lowest recorded temperature: **−24 °F** on **January 21, 1985,** in Sevierville



Average Daily Temperature Chart

The following narratives were obtained via the NOAA Storm Event Database for Cold/Wind Chill, Excessive Heat, and Extreme Cold/Wind Chill.
No events for Excessive Heat or Extreme Cold/Wind Chill listed.

Probability of Future Events - By 2030, Sevier County could face up to about 40 days in a year when temperatures exceed 95°F and up to 10 days with temperatures below 20 degrees F. It is probable to see an event at least annually every year.

2.6.3 Risk Assessment

In the county, road traveling conditions, electrical lines, human health, and agricultural functions are some of the most vulnerable features. The National Risk Index is a dataset and online tool to help illustrate the United States communities most at risk for natural hazards. It was built and designed by FEMA in close collaboration with various stakeholders and partners in academia; local, state, and federal government. The Risk Index leverages available source data for natural hazards and community risk factors to develop a baseline relative risk assessment for each county and census trace. Some of these community risk factors include social vulnerability which is determined by the data pulled from the Census Performed every ten years. A higher social vulnerability score is proportional to a higher risk score.
National Risk Index Score for Cold Waves = Relatively Low
National Risk Index Score for Hot Waves = No Rating

Although the National Risk Index is a well-valued tool it fails to properly show the feedback from the participating jurisdictions. Therefore, all identified hazards were evaluated in regard to risk in FEMA lifelines per jurisdiction. The scenario that local jurisdictions would evaluate the conditions off of was mid-level impact of the identified hazard. The results are below:

Extreme Temperature Risk based on selected FEMA Lifelines

Extreme Temperature Risk	FEMA Lifelines

Jurisdiction	Safety & Security	Food, Water & Shelter	Health & Medical	Energy	Communications	Transportation	Hazardous Materials	Water Systems
Sevier County								
City of Gatlinburg								
City of Pigeon Forge								
City of Sevierville								
Town of Pittman Center								

Colors indicate lifeline or component conditions:	
Red	Significant Impact, Multiple Required Resources
Yellow	Some Impact, Some Outside Resources Required
Green	Little to No Impact, No Outside Resources Required

Given the information above it becomes vital that all participating jurisdictions are able to prioritize the necessity of mitigation actions in the following lifeline categories so that they can become more resilient in the whole community that they serve.

Future Heat Events and Social Vulnerability

The cross-examination of NOAA Future Heat Events and CDC Social Vulnerability Index (2018) indicates that in 2030, Sevier County will have a projected maximum of **40** total days with temperatures over 95 degrees. Multiple determinates such as socioeconomic status, household composition, disability, minority status, language, housing, and transportation heavily indicate how an individual will be affected by extreme temperatures. Individuals within vulnerable or underserved populations are not only more likely to experience the effects of extreme temperatures but also likely to be impacted to a higher degree than their counterparts.

2.6.4 Land Use and Development

Extreme temperature events have significant or even catastrophic impacts on property and critical infrastructure. Sevier County is interested in protecting facilities, property, and infrastructure owned and managed by the jurisdictions. Disasters can damage not only private property but government property as well, placing a financial and operational burden on the County. Losses can extend from structures and contents to the interruption of services and the general economy. Many of these structures could receive indirect impacts, such as downed electrical lines that cut off electricity to the facilities, frozen pipelines that crack, destroyed crops, and customers not being able to access travel to the structures due to ice-covered roads.

2.6.5 Multi-Jurisdictional Differences

Due to the nature of extreme temperatures, Sevier County and the incorporated jurisdictions are equally susceptible. The entire State is vulnerable to extreme temperatures. Varying land elevations, the landscape's character, and proximity to large bodies of water play a significant role in the State's temperatures.

2.6.6 Summary

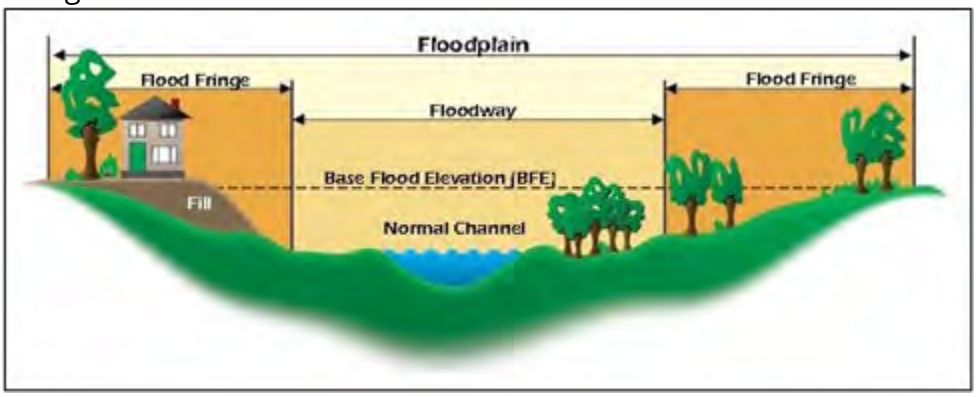
Sevier County and the incorporated jurisdictions are equally vulnerable to extreme temperatures, affecting people's health and safety. Therefore, it is essential to have proper measurements in place to prevent critical structures from being vulnerable to utility failure during extreme temperatures.

2.7 Flood

2.7.1 Hazard Overview

Flooding events occur when excess water from rivers and other bodies of water overflow onto riverbanks and adjacent floodplains. In addition, lower-lying regions can collect water from rainfall, and poorly drained land can accumulate rain through ponding on the surface. Floods in Sevier County are usually caused by rain and may also be caused by snowmelt and man-made incidents.

The area adjacent to a channel is the floodplain, as shown below. A floodplain is flat or nearly flat land adjacent to a stream or river that experiences occasional or periodic flooding. It includes the floodway, which consists of the stream channel and adjacent areas that carry flood flows, and the flood fringe, which are areas covered by the flood but do not experience a strong current. Floodplains are made when floodwaters exceed the capacity of the main channel or escape the channel by eroding its banks. When this occurs, sediments (including rocks and debris) are deposited that gradually build up over time to create the floor of the floodplain. Floodplains generally contain unconsolidated sediments, often extending below the stream's bed.



Characteristics of a Floodplain (Source: FEMA)

Three general health hazards common to flood events:

1. Floodwaters carry anything on the ground that the upstream runoff picked up, including dirt, oil, bacteria, animal waste, lawn, farm, and industrial chemicals. Pastures and areas where farm animals are kept or their wastes are stored can contribute to polluted waters in the receiving streams. Floodwaters also saturate the ground, which leads to infiltration into sanitary sewer lines. When wastewater treatment plants are flooded, there is nowhere for the sewage to flow. Infiltration and lack of treatment can lead to overloaded sewer lines that can back up into low-lying areas and homes. Even when flood waters dilute it, raw sewage can be a breeding ground for bacteria such as *E. coli* and other disease-causing agents.
2. The second health problem arises after most water has gone. Stagnant pools can become breeding grounds for mosquitoes, and wet building areas that have not been adequately cleaned breed mold and mildew. A building that is not thoroughly cleaned becomes a health hazard, especially for small children and the elderly.

Another health hazard occurs when ducts in a forced air system are not adequately cleaned after inundation. When the furnace or air conditioner is turned on, the sediments left in the ducts are circulated throughout the building and breathed in by the occupants. If the county water system loses pressure, a boil order may be issued to protect people and animals from contaminated water.

3. The third problem is the long-term psychological impact of experiencing a flood and seeing one's home damaged and personal belongings destroyed. The cost and labor needed to repair a flood-damaged home severely strain people, especially the unprepared and uninsured. There is also a long-term problem for those who know their homes can be flooded again. The resulting stress on floodplain residents takes its toll in the form of aggravated physical and mental health problems.

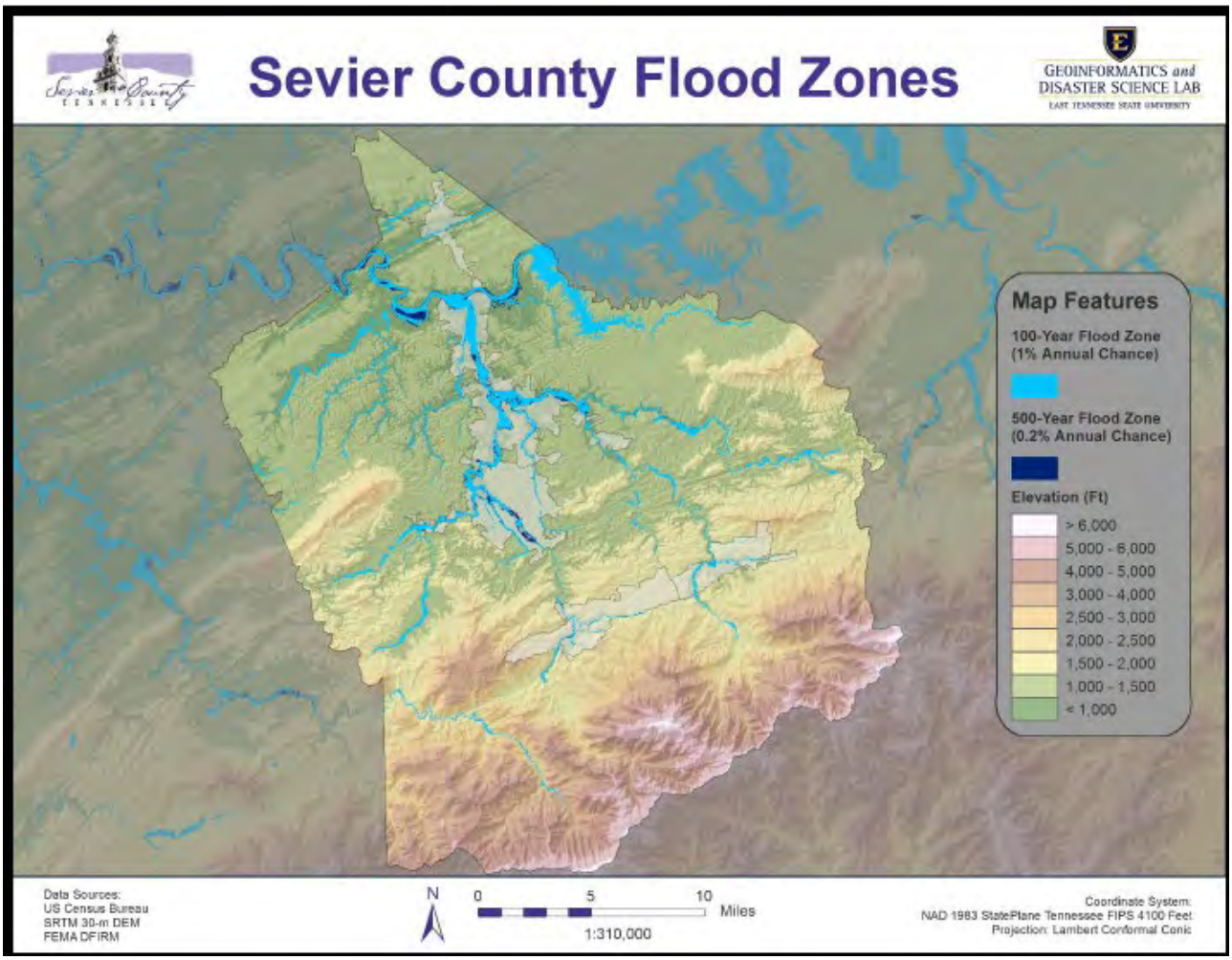
2.7.2 County Profile

Riverine flooding occurs from inland water bodies such as streams and rivers. In Tennessee, flooding is highly dependent on precipitation amounts and is highly variable within the State.

HAZUS is a regional multi-hazard loss estimation model developed by FEMA and the National Institute of Building Sciences (NIBS). The primary purpose of HAZUS is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state, and regional officials to plan and stimulate efforts to reduce multi-hazard risks to prepare for emergency response and recovery.

Mapped Flood Insurance Zones

Flood Hazard Area	Description
HAZUS (100-yr)	Areas subject to inundation by the 1-percent-annual-chance flood event are generally determined using approximate methodologies. Mandatory flood insurance purchase requirements and floodplain management standards apply.
HAZUS (500-yr)	A 500-year flood zone is a moderate flood hazard area and is an area between the limits of the base flood and the 0.2- percent-annual-chance (or 500-year) flood. Mandatory flood insurance is not required.
Non-highlighted Areas	Minimal risk areas outside the 1-percent and .2 percent-annual-chance floodplains.



HAZUS 100- and 500-year Flood Map

NFIP Policy Data

NFIP Policy Data for Sevier County				
Jurisdiction	**CID Number**	**Policies In-Force**	**Insurance In-Force Whole $**	**Written Premium In-Force**
Sevier County	470236	103	27,106,000	137,921
Gatlinburg	475426	374	92,054,000	310,387
Pigeon Forge	475442	401	119,403,000	441,317
Sevierville	475444	266	91,908,000	476,309
Pittman Center	470378	9	3,753,000	37,965

Policies In-force: number of NFIP flood insurance policies
Insurance In-force whole $: the value of building and contents insured by the NFIP
Written Premium In-force: total premiums paid for NFIP insurance policies

According to the National Flood Insurance Program, repetitive flood loss is a facility or structure that has experienced two or more insurance claims of at least $1,000 in any given 10-year period since 1978. Severe repetitive loss is defined as a facility or structure that has experienced four or more insurance claims exceeding $5,000 or two claims exceeding the value of the building. Within the NFIP, flood loss properties are usually considered the most

vital structures to mitigate. The chart below provides a summary of repetitive and severe repetitive losses for Sevier County.

NFIP Loss Data

NFIP Loss Data for Sevier County					
Jurisdiction	**Total Losses**	**Closed Losses**	**Open Losses**	**CWOP Losses**	**Total Payments**
Sevier County	RL: 1/3				$44k
	SRL: 0				0
Gatlinburg	RL: 4/12				$555k
	SRL: 1/4				$490k
Pigeon Forge	RL: 20/73				$1.1M
	SRL: 5/30				$346k
Sevierville	RL: 1/3				$14k
	SRL: 0				0
Pittman Center	RL: 0				0
	SRL: 0				0

RL: Repetitive Loss
SRL: Severe Repetitive Loss
Total Losses: number of flood insurance claims filed by policyholders
Closed Losses: number of flood insurance claims paid to policyholders
Open Losses: claims that are still being processed
CWOP Losses: claims that were "closed without payment"
Total Payments: total dollars paid to policyholders

-No data is available from FEMA, TEMA NFIP, or the NFIP managers to be able to be accessed and document property type or losses.

Over the past 25 years, there have been approximately 60 flooding events in Sevier County. The following narratives were obtained via the NOAA Storm Event Database. Only events resulting in injury, death, or extensive damage (greater than $200.0K property/crop damage) were included as expanded narratives.

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	3.938M	0.00K
PITNER	SEVIER CO.	TN	02/23/2019	14:50	EST-5	Flood		0	0	3.600M	0.00K
PITTMAN CENTER	SEVIER CO.	TN	07/12/2022	22:00	EST-5	Flash Flood		0	0	250.00K	0.00K
Totals:											

Flooding Extent History

Location	Extent & Impact	Event Date
Sevier County	TVA releases from Douglas Lake caused the French Broad River to rise 11 feet in 24 hours, flooding neighborhoods from Boyd's Creek to Sevierville. Mandatory evacuations were issued, and multiple roads and properties were submerged. Crested at 23 feet near Newport, TN.	Sept 27-28, 2024
City of Gatlinburg	**July 2022 – Gatlinburg & Pittman Center Flash Floods** Approximately 4 inches of rain caused widespread standing water,	July 2022

	four threatened structures, and roadway closures. First responders performed multiple swift-water rescues. Several feet of water was reported in some areas.	
City of Pigeon Forge	Heavy precipitation in Pigeon Forge and Sevierville activated the Emergency Operations Center. Rescues occurred; roads closed; several structures were threatened. Water reported from several inches to several feet in some areas.	Sept 2023
City of Sevierville	Multiple localized flash flooding incidents throughout the County.	2018-2019
Town of Pittman Center	**September 22, 1989 – Pittman Center Flash Flood** Intense rainfall caused Little Webb Creek to flood school grounds. Children were rescued via rope lines to safety, no fatalities. Up to 3ft of water reported.	9/22/1989

Probability of Future Events – There is a 95% chance of a flash flood, 75% chance of river/creek flooding, and a 20% chance of a major flood declared disaster in the next 5 years.
Flooding is one of the most frequent natural hazards in Sevier County due to its terrain, rainfall patterns, and growing development. Over the next five years (2025–2030), Sevier County faces a moderate to high probability of flood events, especially flash and riverine flooding. Based on a historical record of 60 flood events over 25 years (2000 - 2025), there is a likelihood for a flood event to occur annually or semiannually. To reference the climate trend analyzed by East Tennessee State University, reference Appendix C.

2.7.3 Risk Assessment

The HMPC meeting cited flooding as a repetitive hazard in the county and jurisdictions. Discussion of commonly flood-prone areas took place, as did mention of improvements that have already been made to mitigate risks, such as the Expansion of the Flood Warning System in 2024. Future projects were also discussed at this time and can be found in the Mitigation Action Plan.

The National Risk Index is a dataset and online tool to help illustrate the United States communities most at risk for natural hazards. It was built and designed by FEMA in close collaboration with various stakeholders and partners in academia; local, state and federal government. The Risk Index leverages available source data for natural hazards and community risk factors to develop a baseline relative risk assessment for each county and census trace. Some of these community risk factors include social vulnerability which is determined by the data pulled from the Census Performed every ten years. A higher social vulnerability score is proportional to a higher risk score.

National Risk Index Score for Flooding = Relatively Moderate

Although the National Risk Index is a well-valued tool it fails to properly show the feedback from the participating jurisdictions. Therefore, all identified hazards were evaluated in regard to risk in FEMA lifelines per jurisdiction. The scenario that local jurisdictions would

evaluate the conditions off of was a mid-level impact of the identified hazard. The results are below:

Flooding Risk based on selected FEMA Lifelines

Flooding Risk	FEMA Lifelines							
Jurisdiction	Safety & Security	Food, Water & Shelter	Health & Medical	Energy	Communications	Transportation	Hazardous Materials	Water Systems
Sevier County								
City of Gatlinburg								
City of Pigeon Forge								
City of Sevierville								
Town of Pittman Center								

Colors indicate lifeline or component conditions:	
Red	Significant Impact, Multiple Required Resources
Yellow	Some Impact, Some Outside Resources Required
Green	Little to No Impact, No Outside Resources Required

Given the information above it becomes vital that all participating jurisdictions are able to prioritize the necessity of mitigation actions in the following lifeline categories so that they can become more resilient in the whole community that they serve.

HAZUS Data and Methodology

A Level I HAZUS analysis was completed using a probabilistic risk assessment for the 100-yr and 500-year return periods. The Level I vulnerability assessment is presented below by return period.

Building Inventory (General Building Stock)

HAZUS estimates that 51,686 buildings in the region have an aggregate total replacement value of $18,831 million.

- **Essential Facility Inventory:** HAZUS indicates that there is 1 hospital in the region with a total capacity of 79 beds. There are 37 schools, 19 fire stations, 6 police stations, and 2 emergency operation centers.
- **General Building Stock Damage:** For the 100-year flood scenario, HAZUS estimates that about 613 buildings will be at least moderately damaged. This is over 59% of the total number of buildings in the scenario. There are estimated 133 buildings that will be destroyed completely.

Debris Generation

- ***100-year Scenario:*** The model estimates that a total of 6,750 tons of debris will be generated. Of the total amount, Finishes comprises 40% of the total, Structure comprises 34% of the total, and Foundation comprises 26%. If the debris tonnage is converted into an estimated number of truckloads, it will require 271 truckloads (@25 tons/truck) to remove the debris generated by the flood.
- ***500-year Scenario:*** The model estimates that a total of 10,848 tons of debris will be generated. Of the total amount, Finishes comprises 34% of the total, Structure comprises 38% of the total, and Foundation comprises 29%. If the debris tonnage is converted into an estimated number of truckloads, it will require 434 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Shelter Requirements

HAZUS estimates the number of households expected to be displaced due to the flood and the associated potential evacuation. HAZUS also estimates those displaced people that will require accommodations in temporary public shelters.

- ***100-year Scenario:*** The model estimates 1,578 households (or 4,733 people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 1,015 people (out of a total population of 98,277) will seek temporary shelter in public shelters.
- ***500-year Scenario:*** The model estimates 1,793 households (or 5,378 people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 1,086 people (out of a total population of 98,277) will seek temporary shelter in public shelters.

2.7.4 Land Use and Development

All future development within the floodplain may be considered at risk. An increase in population will likely increase the number of buildings and infrastructure. New development in unincorporated areas could potentially occur in areas prone to flooding and increase vulnerabilities and potential losses; however, most land use regulations require the consideration of flooding during the development process.

2.7.5 Multi-Jurisdictional Differences

Flooding affects all jurisdictions differently; that is why it is essential to document the depth, duration, and time that flooding occurred. These differences are noted in past occurrences to demonstrate the toll that flooding can take on the county's rural and urban areas. Due to the topography of Sevier County with its rolling hills, mountains, and deep valleys, flood events are prone to occur near the streams within the county. FIRM Panels are located within Appendix D to help illustrate the areas at risk and depth of flooding within the county and its incorporated jurisdictions.

(FIRM Panels: https://msc.fema.gov/portal/home)

Intersections & Roads that consistently flood in Sevier County:

- Waldens Creek at Little Valley Rd/Goose Gap Rd: 3 to 4ft in some locations.

- River Divide Rd near Henderson Chapel/Sharp Hollow. Up to 3ft
- Greenbrier Entrance Rd to National Park-Up to 2ft of water.
- Burden Hill Rd at Middle Creek-Up to 2ft of water.
- Walden's Creek at Little Valley. 6" to 3ft
- Red Bank Rd near Red Bank Circle. 2-4ft
- Lower portion of Burden Hill at Eastgate Rd-Up to 2ft of water.
- Maple's Branch & Richardson Cove Rd. Up to 3ft or more depending on rainfall.
- Chapman Hwy along Tarwater Stretch. 6" to over 3ft
- Ridge Rd near intersection w/Veteran's Blvd-Up to 2ft of water.
- Snapp Rd from approx. 1700 to intersection of Ernest McMahan-Up to 5ft of water.
- Property in the rear of Blue Green Resort Office and entire property along length of the river. Up to 3ft of water in parking lot.
- Wears Valley Rd side streets. 6" to 2ft.
- Property in the rear of Quaker Steak and entire property along length of the river. Up to 3ft of water in parking lot.
- Property in the rear of Nascar Speed Park and entire property along length of the river. Up to 3ft of water in parking lot.
- Property in the rear of Tangier Mall, entire property length along river. Up to 3ft of water in parking lot.
- Circle Dr. Up to 6ft
- Sevierville Golf Club. Up to 5ft of water.
- Tiger Dr. up to 10ft
- Ridge Rd at Sevier Solid Waste. Up to 5ft.
- 230 Apple Valley Rd to intersection w/Lonesome Valley Rd. Up to 3ft of water.
- River Rd near Robert Henderson Rd. Up to 4ft of water.
- Greenbriar Academy (Old Pittman Center Elementary School), 2851 Webb Creek Road. Up to 5ft.
- Hemlock Street - Medlin Addition. Up to 6ft.
- Sevierville Primary School, 1146 Blanton Drive. Up to 5ft.
- Glades Road - Buckhorn Road. Up to 2ft.
- River Road - Ripley's Aquarium 2 to 3" of water
- Baskins Creek Rd. - Cherokee Orchard Rd. 6" to 1ft
- Ogle Rd 3 to 4" of water
- Bruce Rd 2 to 3" of water
- Glades Rd 2 to 3" of water

Waterways that are prone to flooding in Sevier County:

- West Prong of the Little Pigeon River: Runs through **Gatlinburg → Pigeon Forge → Sevierville**. Frequently floods urban and low-lying areas during heavy rain events. Significant flash flooding potential
- Middle Prong of the Little Pigeon River: Flows through the **Greenbrier** area and joins the West Prong near Sevierville. Mountain runoff leads to rapid water level rise.

- East Prong of the Little Pigeon River: Runs through **Pittman Center** and converges with the West and Middle Prongs. Subject to localized flooding during snowmelt or tropical storms.
- Waldens Creek: Tributary west of Pigeon Forge. Narrow floodplain. Notorious for flash flooding due to limited absorption in surrounding areas, especially near The Island and Patriot Park.
- Dudley Creek: Small creek in **Gatlinburg** that has caused repeated localized flash flooding—especially in downtown and tourist areas.
- Birds Creek: Tributary that feeds into the East Prong; prone to overflow during back-to-back storms.
- Dunn Creek: Eastern Sevier County; contributes to flood risk in the **Jones Cove** area. Known for low-lying floodplains.
- Boogertown Branch: Small stream in the Boogertown Valley area (between Pigeon Forge and Pittman Center). Flash flood risk due to steep surrounding terrain.

2.7.6 Summary

Severe flooding has the potential to inflict significant damage in Sevier County. The total economic loss estimated for the 100-year riverine flood is $3,021.11 million. The total economic loss estimated for the 500-year riverine flood is $3,884.71 million. Residential, commercial, and public buildings and critical infrastructures such as transportation, water, energy, and communication systems may be damaged or destroyed by flood waters. During a flood event, chemicals and other hazardous substances may contaminate local water bodies. Flooding kills animals and, in general, disrupts the ecosystem. Snakes and insects may also make their way to the flooded areas.

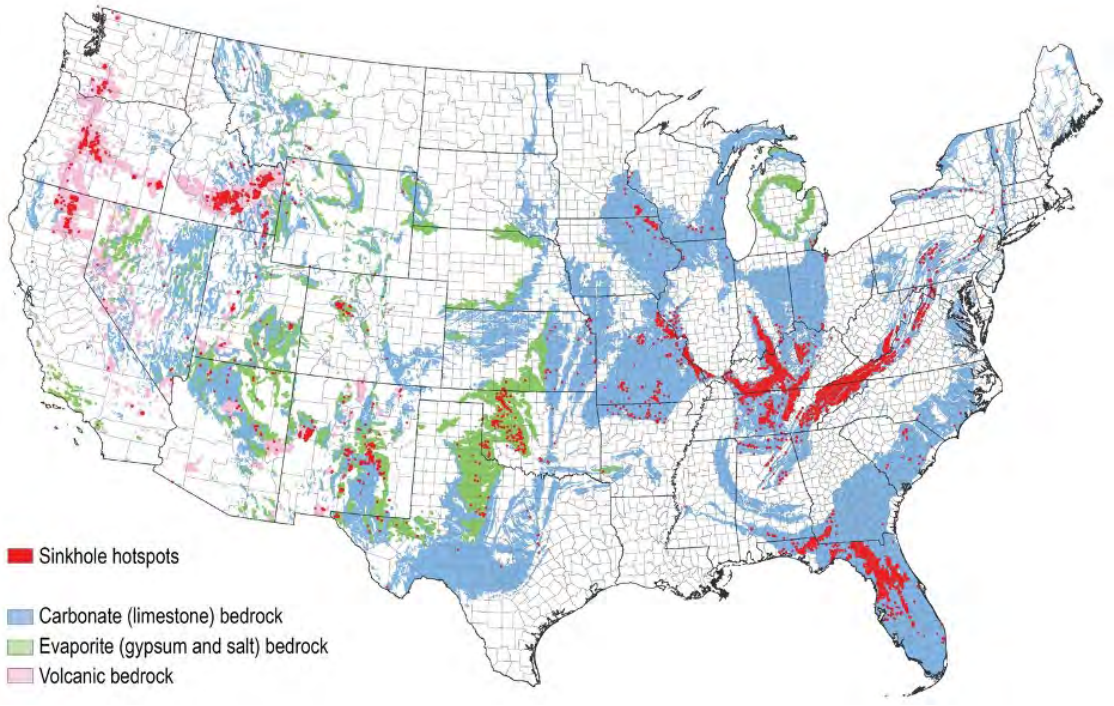
2.8 Geological

2.8.1 Hazard Overview

The speed of onset of a landslide or sinkhole event is very rapid and unpredictable. However, broad areas that are susceptible to this type of hazard may be identified by soil samples and/or surrounding geological/riverine features. This hazard is usually measured in terms of yards of soil displaced and financial damage caused. Land subsidence and sinkholes can develop from both natural processes or as a consequence of indirect or direct human intervention. Sinkholes formed as a consequence of human activity typically result from: the pumping of water, oil, and gas from underground reservoirs; alteration of surface runoff patterns; dissolution of limestone aquifers; the collapse of underground mines; drainage of organic soils; and initial wetting of dry soils (hydro compaction). Land subsidence could occur anywhere in Tennessee and is usually not easily observable because it occurs over a large area. Land subsidence and sinkholes can occur naturally in parts of the country with Karst landscapes. Karst landscapes typically feature caves, underground water sources, and sinkholes.

2.8.2 County Profile

It is difficult to predict where land subsidence and sinkholes will occur accurately. Still, the USGS has managed to identify Tennessee areas with higher risk potential. It is doubtful that a sinkhole will form in an area not considered a Karst formation. The figure below illustrates karst landscapes across the country, the bedrock in which they are found, and the sinkhole hotspots. As shown, eastern and middle Tennessee have a higher tendency for sinkhole hotpots.



Karst Map of the Conterminous United States (Source: United States Geological Service)

The following table contains the documented sinkholes for Sevier County, which were obtained via the USGS Landform database.

Sinkholes in Sevier County

County	Sinkholes	Caves	sinkholes 3m+	depth feet	area km^2	volume m^3
Perry	36	67	19	39.7	0.0744	34,181
Pickett	307	188	134	53.1	0.3581	131,487
Polk	149	6	36	77.4	0.2692	148,011
Putnam	535	575	264	206.0	4.2106	8,530,852
Rhea	203	9	78	47.2	0.1155	81,848
Roane	446	50	197	76.8	0.2637	186,734
Robertson	3,602	162	861	67.9	1.1984	527,084
Rutherford	2,988	130	572	76.8	1.4227	343,784
Scott	6	10	2	12.1	0.0096	1,693
Sequatchie	36	24	14	43.3	0.0821	47,539
Sevier	586	64	236	79.1	0.6025	486,887
Shelby	0	0	0	0	0	0
Smith	150	105	31	45.9	0.0786	39,636
Stewart	145	14	29	53.5	0.2044	85,549
Sullivan	1,876	167	672	89.2	0.4402	309,614
Sumner	371	42	53	47.6	1.2270	758,651
Tipton	0	0	0	0	0	0

county sinkholes of distinction

Sinkhole Database: https://tnlandforms.us/landforms/sinks.php

Probability of Future Events – There is a less than 5% chance of a landslide or sinkhole occurring annually and up to 15% of at least 1 event occurring in the next 5 years.

Heavy rains and flooding can trigger sinkholes. An increase in the number and intensity of severe storms, and resulting heavy rains and flooding, may also result in sinkholes developing more frequently. With several areas within the state increasing in population and infrastructure (both public and private), this could damage infrastructure, property values, and commerce disruption. Historically, most sinkhole impacts have occurred along the border between Tennessee's central and east regions. This makes Sevier County vulnerable to these constant changes.

The below picture is from Sept 27th, 2025 that closed the Gatlinburg Bypass Road after Heavy Rains caused a landslide.



Gatlinburg Bypass closes after landslide. See photos of the flood

2.8.3 Risk Assessment

Sinkholes and surface depressions receive precipitation runoff which filters down through the soil and rock strata into the cavities in the rock and becomes part of the groundwater regime. This serves to replenish the groundwater supply. However, when trash and waste materials are dumped into the sinkholes and depressions, water that filters through the sinkholes then becomes contaminated, significantly affecting the groundwater supply. Many buildings and most infrastructure networks throughout the county can be vulnerable to sinkholes. Experts estimate that **94–95% of Sevier County's land** lies within zones susceptible to landslides. Although no landslides were officially recorded in Sevier between 2010–2021, the county's **steep topography, karst geology, and extreme rainfall potential** suggest meaningful hazard risk.

The National Risk Index is a dataset and online tool to help illustrate the United States communities most at risk for natural hazards. It was built and designed by FEMA in close collaboration with various stakeholders and partners in academia and local, state, and federal government. The Risk Index leverages available source data for natural hazards and community risk factors to develop a baseline relative risk assessment for each county and census trace. Some of these community risk factors include social vulnerability, which is determined by the data pulled from the Census performed every ten years. A higher social vulnerability score is proportional to a higher risk score.

National Risk Index Score for Landslide = Relatively High

Although the National Risk Index is a well-valued tool it fails to show the feedback from the participating jurisdictions properly. Therefore, all identified hazards were evaluated in regard to risk in FEMA lifelines per jurisdiction. The scenario that local jurisdictions would evaluate the conditions off of was a mid-level impact of the identified hazard. The results are below:

Geological Risk based on selected FEMA Lifelines

Geological Risk	FEMA Lifelines							
Jurisdiction	Safety & Security	Food, Water & Shelter	Health & Medical	Energy	Communications	Transportation	Hazardous Materials	Water Systems
Sevier County								
City of Gatlinburg								
City of Pigeon Forge								
City of Sevierville								
Town of Pittman Center								

Colors indicate lifeline or component conditions:	
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Given the information above it becomes vital that all participating jurisdictions are able to prioritize the necessity of mitigation actions in the following lifeline categories so that they can become more resilient in the whole community that they serve.

2.8.4 Land Use and Development Trends

In rural areas, sinkholes usually develop naturally from the normal weathering process. However, sometimes the grading for ponds or ground silos in the soil underlain by a

cavernous rock can and often leads to the development of new sinkholes, as can the concentration of water flow in ditch lines or the re-routing of surface water.

2.8.5 Multi-Jurisdictional Differences

In Sevier County, Tennessee, the risk and impact of geological hazards—including earthquakes, landslides, sinkholes, and unstable soils—vary significantly across its multiple jurisdictions due to differences in topography, development patterns, infrastructure, and land use. Here's a breakdown of multi-jurisdictional differences related to geological hazards in Sevier County:

Jurisdiction	Terrain Characteristics	Geological Risk
Gatlinburg/Pigeon Forge	Mountainous, steep slopes (foothills of the Smokies)	**High risk** of landslides and slope instability
Pittman Center	Mountainous and rural with limited development	**Moderate to high** risk of landslides, erosion
Sevierville	Rolling hills and floodplains	**Moderate** risk of sinkholes, low landslide risk
County Unincorporated Areas	Mixed: ridges, slopes, karst regions	**Variable**—sinkholes in karst areas, landslides in slopes

2.8.6 Summary

The relief of the ridges and mountains can be very dramatic and scenic. However, these unusual and often dramatic scenes can be interrupted by the collapse of a roadway or a house or even the flooding of a sinkhole basin crossed by a road or occupied by a residential, public, or commercial structure. The karst landscape can impact many areas of Tennessee, causing damage to all facilities and landscapes. In rare and dramatic cases, karst may cause bodily harm or injury. Sinkholes are not incredibly dangerous at this time in Sevier County; however, due to their unreliable nature, the HMPC finds it essential to capture this natural occurrence in Tennessee.

2.9 Hazardous Materials

2.9.1 Hazard Overview

Hazardous materials are substances or materials determined to pose an unreasonable risk to health, safety, and property when transported in commerce. These materials include various forms of flammable, combustible, poisonous, and radioactive substances. Hazardous materials represent a public health and safety threat if they are unintentionally released due to transportation or chemical facility accidents. Hazardous material incidents typically occur as either fixed facility incidents or transportation incidents.

Fixed Hazardous Materials

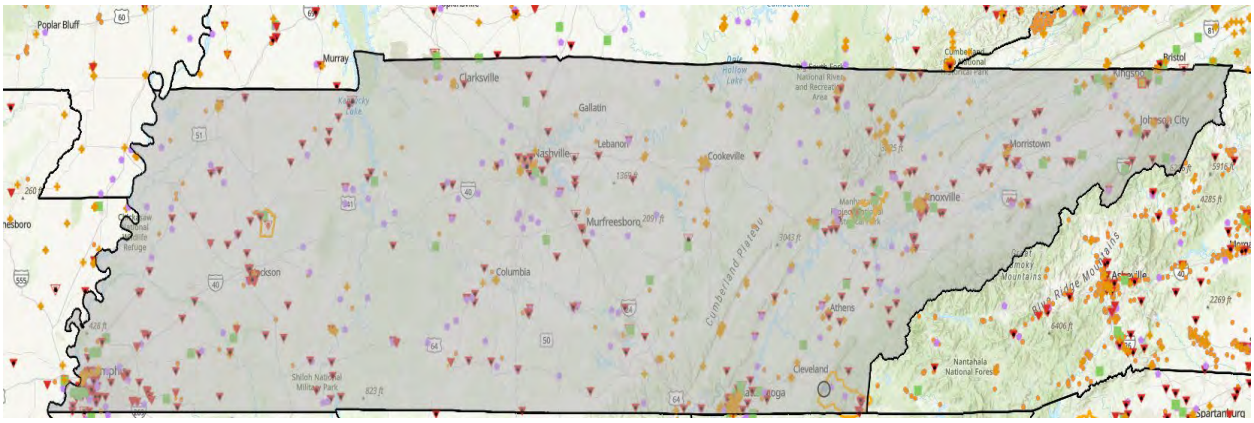
Fixed hazardous material incidents are the accidental release of chemical substances or mixtures which threatens public health or safety during production or handling at a fixed facility. A hazardous substance may cause damage to persons, property, or the environment when released into the soil, water, or air.

Transportation Hazardous Materials

Transportation hazardous material incidents are the accidental release of chemical substances or mixtures that threaten public health or safety during transportation. HazMat incidents can also occur as a result of or in tandem with natural hazard events, such as floods, hurricanes, tornadoes, and earthquakes, which in addition to causing incidents, can also hinder response efforts.

2.9.2 County Profile

Due to the prevalence of hazardous materials in transportation and industry, much of East Tennessee is at risk. There are 146 Tier 2 facilities that house and use hazardous materials in Sevier County. Between 1950-2025, there have been 31 incidents of hazardous materials in Sevier County. A list of hazardous materials clean-up information within the county and the incorporated jurisdictions is located in Appendix C.



Hazardous Materials Incidents and Cleanups in the State of Tennessee (EPA)

County narratives from US Department of Transportation Hazmat Incident Database

https://portal.phmsa.dot.gov/analytics/saw.dll?Portalpages&PortalPath=%2Fshared%2FPublic%20Website%20Pages%2F_portal%2FHazmat%20Incident%20Report%20Search

There is **no public record** of significant hazardous materials releases (e.g. chemical spills or large-scale contamination) specifically in Sevier County. Databases like the EPA's and TN's NTSIP program list statewide data but do not flag local Sevier County incidents in public summaries. Sevier County has **not experienced** major rail-related hazmat accidents on the scale of other Tennessee counties (e.g., 2002 Farragut derailment with oleum release or 2015 Maryville derailment involving acrylonitrile and LPG).

2.9.3 Risk Assessment

The entirety of the Sevier County could be considered at risk for a hazardous material incident. However, areas that contain Industrial Parks and Tier II facilities are at a higher likelihood of incident, as are any roadways that see heavy and consistent interstate traffic. The Social Vulnerability Index (SVI) is a dataset that uses 16 census variables that help local officials identify communities that may need support before, during or after disasters. Unfortunately, the National Risk Index does not capture non-natural disaster impacts, therefore, using the SVI can help public health officials and local planners better prepare for and respond to emergency events such as hazard material releases.

Social Vulnerability Index Score for Sevier County = No Rating

Although the Social Vulnerability Index is a well-valued resource, it fails to properly show the feedback from the participating jurisdictions. Therefore, all identified hazards were evaluated in regard to risk in FEMA lifelines per jurisdiction. The scenario that local jurisdictions would evaluate the conditions off of was the amid-level impact of the identified hazard. The results are below:

Hazardous Materials Risk based on selected FEMA Lifelines

Hazardous Materials Risk	FEMA Lifelines						
Jurisdiction	Safety & Security	Food, Water & Shelter	Health & Medical	Energy	Communications	Transportation	Water Systems
Sevier County							
City of Gatlinburg							
City of Pigeon Forge							
City of Sevierville							
Town of Pittman Center							

Colors indicate lifeline or component conditions:	
Red	Significant Impact, Multiple Required Resources

Yellow	Some Impact, Some Outside Resources Required
Green	Little to No Impact, No Outside Resources Required

Given the information above it becomes vital that all participating jurisdictions are able to prioritize the necessity of mitigation actions in the following lifeline categories so that they can become more resilient in the whole community that they serve.

2.9.4 Land Use & Development

Submission of Tier II forms is required under Section 312 of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA). This form aims to supply officials and the public with specific information on potential hazards relating to hazardous chemicals at certain thresholds. Hazardous materials incidents are often accidental and can occur anytime and without warning. Most incidents are handled well before becoming a disaster. Clean-up time is variable, depending on the nature of the incident. Serious incidents may require long-term environmental remediation.

2.9.5 Multi-Jurisdictional Differences

The entirety of Sevier County and its incorporated jurisdictions are at risk of hazardous materials incidents. However, hazardous materials usage and releases are more prevalent around major Interstate systems. The **Sevier County Local Emergency Planning Committee (LEPC)** oversees hazardous materials planning and response across the entire county, including Gatlinburg, Pigeon Forge, Sevierville, and the Town of Pittman Center. The LEPC coordinates annual Tier II chemical inventory reviews, emergency response planning, community Right-to-Know efforts, and public outreach. HazMat oversight and planning is **county-wide**, not separate by town.

2.9.6 Summary

Hazardous materials include substances or materials that pose risks to health, safety, and property when released in transport or at a fixed facility. Depending on the location, magnitude, and type of material involved, hazardous materials incidents may lead to spills, leaks, explosions, injuries, or the potential of an immediate threat to life, the environment, or property. Because many past incidents have occurred on or near public roadways, all critical facilities are at risk. Clean-up time is variable, depending on the nature of the incident. Serious incidents may require long-term environmental remediation.

2.10 Infrastructure Incidents

2.10.1 Hazard Overview

Infrastructure disasters are complex scenarios. They can be challenging to respond to, prepare for, and mitigate, as the infrastructure is often a mechanism for responding to, preparing for, and mitigating hazards. Further, infrastructure is usually owned by various public and private interests, making delegating responsibilities difficult.

An infrastructure incident can be either natural or man-made due to physical or cyber-attacks, flooding, tornadoes, or other severe weather events. Infrastructure incidents, specifically ones affecting critical infrastructure, can affect the areas in which they reside, affecting transportation, life safety, and economic resources. Critical infrastructure, as defined by the USA Patriot Act of 2001 (42 U.S.C 5195c(e).), is "systems and assets, whether physical or virtual, so vital to the United States that the incapacity or destruction of such systems and assets would have a debilitating impact on security, national economic security, national public health or safety, or any combination of those matters." Infrastructure includes but is not limited to roadways, bridges, hospitals, utilities, airports, and community support facilities (fire, law enforcement, search/rescue).

Infrastructure incidents can lead to a failure of communications systems and energy sources, leading to further issues from primary or secondary disasters. The main infrastructure incidents affecting a locality are roadway incidents, cyberattacks, and utility outages. According to the American Society of Civil Engineers, 4.4% of Tennessee bridges are structurally deficient, 5% of roads are in poor condition, and the state experiences 584 power outages between 2008-2017.

2.10.2 County Profile

Critical infrastructure entities can be found for Sevier County on the Sevier County Critical Infrastructure Dashboard (Critical2TN), which is to be utilized as a resource for situational awareness before, during, and after an incident. Due to the sensitivity of this critical infrastructure, it is for official use only Sevier County contains 89 critical infrastructure entities. **(Obtained via the Critical2TN database).**

Recent Events

Jones Cove Road (SR-339) Bridge Collapse — July 2022

Heavy rainfall in late July caused a box-style bridge near Wilhite Road to fail, forcing an indefinite closure and stranding some residents. The collapse stemmed from structural deficiencies: a 2021 inspection rated the bridge "structurally deficient," with low scores on culvert condition, structural evaluation, and deck geometry. TDOT anticipated reopening by mid-November 2022, but crews completed repairs ahead of schedule. By October 26, both lanes were reopened.

Widespread Power Outage in Sevierville — October 2024

A significant blackout affected much of Sevierville. Traffic signals were disrupted, prompting officials to caution drivers

Rolling Blackouts due to High Demand or Grid Stress
In December 2022, residents reported TVA-led rolling blackouts aimed at reducing grid strain during frigid weather. These occurred across Sevier and nearby counties, with some disruption noted in local discussions.
Flooding Leads to Multiple Road Closures — January 2024
Severe weather triggered widespread flooding. Authorities opened the Emergency Operations Center (Level 2) and shuttered numerous roads—including parts of Parkway, River Divide Road, Webb Creek, and Baskins Creek Rd—until conditions improved.

2.10.3 Risk Assessment

Infrastructure incidents can be challenging to predict as they can occur for many reasons, with or without notice. Severe weather events can cause damage or destruction to infrastructure resulting in complete loss of capabilities, as can any form of cyber or physical attack. All assets are at risk; however, an infrastructure incident is more likely to occur in urban, densely populated areas as that is where most infrastructure is located.
The Social Vulnerability Index (SVI) is a dataset that uses 16 census variables that help local officials identify communities that may need support before, during or after disasters. Unfortunately, the National Risk Index does not capture non-natural disaster impacts, therefore, using the SVI can help public health officials and local planners better prepare for and respond to emergency events such as critical infrastructure incidents.

Social Vulnerability Index Score for Sevier County = No Rating

Although the Social Vulnerability Index is a well-valued resource it fails to properly show the feedback from the participating jurisdictions. Therefore, all identified hazards were evaluated in regard to risk in FEMA lifelines per jurisdiction. The scenario that local jurisdictions would evaluate the conditions off of was a mid-level impact of the identified hazard. The results are below:

Infrastructure Incident Risk based on selected FEMA Lifelines

Infrastructure Incident Risk	FEMA Lifelines							
Jurisdiction	Safety & Security	Food, Water & Shelter	Health & Medical	Energy	Communications	Transportation	Hazardous Materials	Water Systems
Sevier County								
City of Gatlinburg								
City of Pigeon Forge								
City of Sevierville								
Town of Pittman Center								

Colors indicate lifeline or component conditions:	
Red	Significant Impact, Multiple Required Resources
Yellow	Some Impact, Some Outside Resources Required
Green	Little to No Impact, No Outside Resources Required

Given the information above it becomes vital that all participating jurisdictions are able to prioritize the necessity of mitigation actions in the following lifeline categories so that they can become more resilient in the whole community that they serve.

2.10.4 Land Use and Development Trends

Sevier County and its incorporated jurisdictions include codes to regulate safety and are consistent with state and federal regulations to ensure that infrastructure has the best chance of withstanding destructive events.

2.10.5 Multi-Jurisdictional Differences

The entirety of Sevier County is at risk for an infrastructure incident, specifically road-based and utility-based events, usually from flash flooding. However, more highly populated areas are at a higher risk for building-based infrastructure incidents such as Pigeon Forge and Gatlinburg specifically. Critical infrastructure incidents may affect the entire county but would more than likely take a more significant toll on vulnerable populations and tourists within the area.

2.10.6 Summary

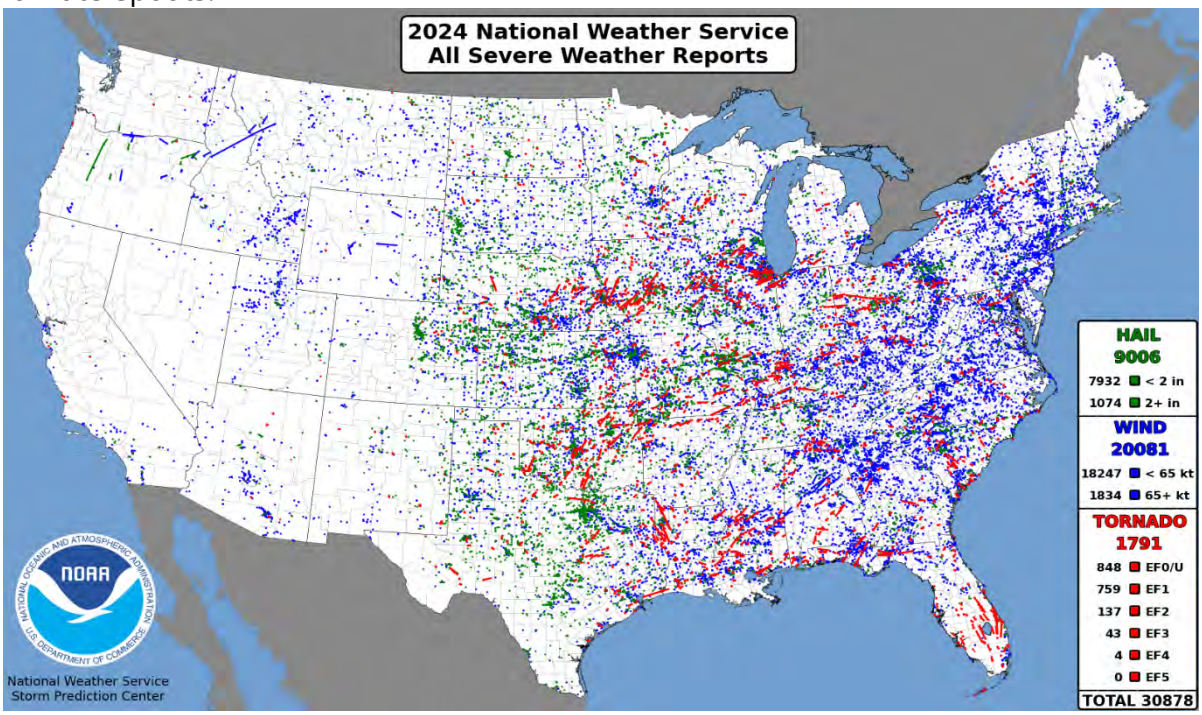
Preparing for incidents before they occur is the most productive way to mitigate the risk of infrastructure incidents throughout Sevier County. All facilities, roadways, and utilities could be at risk for an infrastructure incident including severe weather or direct/indirect attack.

2.11 Severe Weather

2.11.1 Hazard Overview

Thunderstorms

Thunderstorms result from the rapid upward movement of warm, moist air. They can occur inside warm, moist air masses and at fronts. As the warm, moist air moves upward, it cools, condenses, and forms cumulonimbus clouds that can reach heights greater than 35,000 ft. Thunderstorms are responsible for developing and forming many severe weather phenomena, posing significant hazards to the population and landscape. Damage from thunderstorms is mainly inflicted by downburst winds, large hailstones, and flash flooding caused by heavy precipitation. Stronger thunderstorms can produce tornadoes and waterspouts.

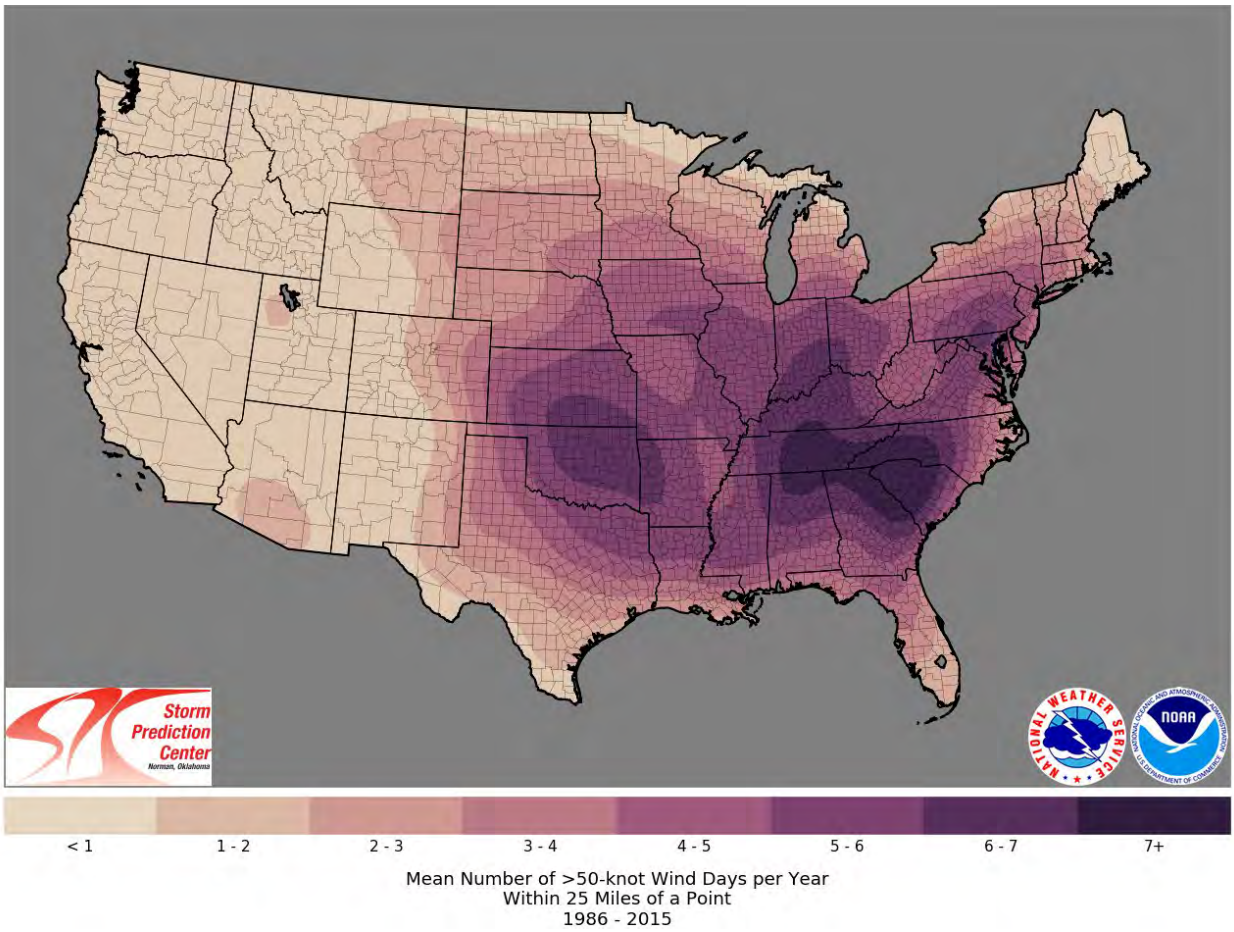


Wind

All jurisdictions are vulnerable to receiving damage from severe winds. The NOAA Storm Data Preparation document categorizes wind into three different types, as defined below.

- High Wind: Sustained non-convective winds of 40mph or greater lasting for one hour or longer or winds (sustained or gusts) of 58 mph for any duration on a widespread or localized basis.
- Strong Wind: Non-convective winds gusting less than 58 mph or sustained winds less than 40 mph, resulting in a fatality, injury, or damage.
- Thunderstorm Wind: Winds arising from convection (occurring within 30 minutes of lightning being observed or detected), with speeds of at least 58 mph, or winds of any speed (non-severe thunderstorm winds below 58 mph) producing a fatality, injury, or damage.

Historically, severe wind events occur multiple times yearly in Sevier County. It is not unusual for Sevier County to experience winds speeds up to 87 knots 100 mph), causing structural damage, power outages, and downed trees. Based on a historical record of 152 wind events over 75 years (1950- 2025), the historic frequency calculates an 20.8% chance of this event occurring yearly. During November 2016, wind-fueled wildfires (Chimney Tops 2 fire) devastated Gatlinburg and Pigeon Forge. With wind gusts up to 87 mph, fires spread rapidly, hydrants failed, communication systems crashed, and 911 calls rerouted.



Mean Number of >50-knot Wind Days per Year (1986-2015) (source: NOAA)

Hail

Hail forms when updrafts carry raindrops into icy areas of the atmosphere, where they freeze into ice. Hailstorms occur throughout the spring, summer, and fall but are more frequent in late spring and early summer. Hailstones are usually less than two inches in diameter and can fall at speeds of 120 mph. Hail causes nearly $1 billion in damage to crops and property yearly in the United States. *The table below* provides an overview of the typical impacts on a community related to hailstone size.

TORRO Hail Index (Source: The Tornado and Storm Research Organization)

Scale	Description	Max Diameter (mm)	Typical Damage

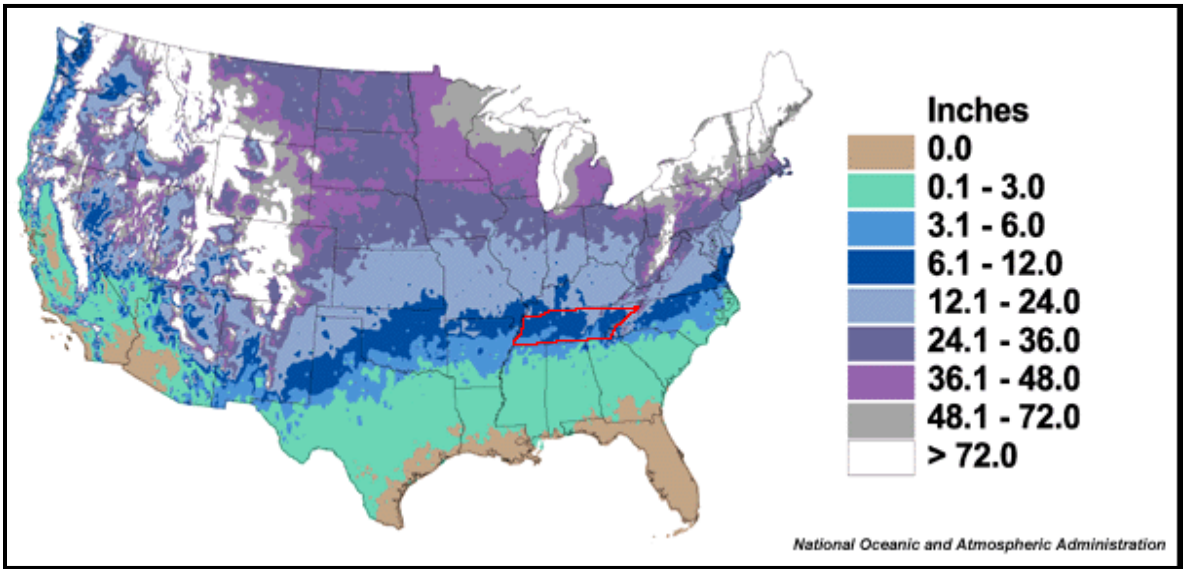
H0	Pea	5-9	No damage
H1	Mothball	10-15	Slight general damage to crops and plants
H2	Marble	16-20	Significant damage to crops and vegetation
H3	Walnut	21-30	Severe damage to fruits and crops, damage to glass and plastic structures, wood and paint scored
H4	Pigeons Egg	31-40	Widespread glass damage, auto-body damage
H5	Golf Ball	41-50	Destruction of glass, damage to tiled roofs, significant risk of injuries
H6	Hens Egg	51-60	Grounded aircrafts dented; brick walls pitted
H7	Tennis Ball	61-75	Severe roof damage and risk of serious injury
H8	Softball	76-90	Severe damage to aircrafts
H9	Grapefruit	91-100	Extensive structural damage, risk of severe or fatal injuries to people caught in storm
H10	Melon	>100	Extensive structural damage, risk of severe or fatal injuries to people caught in storm

Lightning

Lightning is an electrical discharge between positive and negative regions of a thunderstorm. Lightning is one of the more dangerous weather hazards in the United States. Annually, lightning is responsible for deaths, injuries, and millions of dollars in property damage, including damage to buildings, communications systems, power lines, and electrical systems. Lightning also causes forest and brush fires and deaths, and injuries to livestock and other animals. According to the National Lightning Safety Institute, lightning causes more than 26,000 fires in the United States annually. The institute estimates property damage, increased operating costs, production delays, and lost revenue from lightning and secondary effects to be more than $6 billion annually. Impacts can be direct or indirect. People or objects can be struck or damaged when the current passes through or nearby.

Winter Weather

A freeze occurs when temperatures are below 32 degrees Fahrenheit for a period. These temperatures can damage crops, burst water pipes, and create layers of “black ice.” Winter storms are events that can range from a few hours of moderate snow to blizzard-like circumstances that can affect driving conditions and impact communications, electricity, and other services. In Sevier County, all jurisdictions are vulnerable to freezes and moderate winter storms, but not to the severity level seen in much of the northern U.S. Based on previous occurrences, Sevier County can experience multiple winter weather events in one year affecting all jurisdictions equally. The severity of winter storms is commonly measured by inches of snowfall. It is possible for snowfall to accumulate up to 1 foot in Sevier County and/or ice accumulations to cause hazardous conditions due to its proximity to and around the mountains. U.S. Mean snowfall per year is from 6-12” annually average mean snowfall per year is shown below.



Average Snowfall per Year (Source: NOAA)

2.11.2 County Profile

The entirety of Sevier County is at risk of severe weather. Severe weather events are most likely in the spring and summer months and during the afternoon and evening hours, but they can occur year-round and at all hours. In terms of magnitude, the NWS defines thunderstorms in terms of severity. A severe thunderstorm produces winds greater than 57 miles per hour and/or hail greater than 1 inch in diameter, and/or a tornado. The NWS chose these severity measures as parameters more capable of producing considerable damage. Hail stones can vary in diameter, and in Tennessee, there have been records of hail up to 2.75 inches.

Event narratives were obtained via the NOAA Storm Event Database and are included below for each severe weather category. Only the most significant are shown.

Thunderstorms (258 events reported since 1950**)**

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	2	5.104M	387.00K
SEVIER CO.	SEVIER CO.	TN	09/01/1995	12:35	EST	Thunderstorm Wind	0 kts.	0	0	2.000M	0.00K
CATLETTSBURG	SEVIER CO.	TN	07/05/2012	16:55	EST-5	Thunderstorm Wind	60 kts. EG	0	0	1.000M	0.00K
FRENCH BROAD	SEVIER CO.	TN	07/05/2012	17:00	EST-5	Thunderstorm Wind	60 kts. EG	0	0	1.000M	0.00K
Totals:								0	2	5.104M	387.00K

Wind (152 events reported since 1950**)**

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	629.00K	70.00K
SEVIER/SMOKY MOUNTAINS (...	SEVIER/SMOKY MOUNTAINS (...	TN	10/17/2006	01:14	EST-5	High Wind	70 kts. EG	0	0	200.00K	0.00K
SEVIER/SMOKY MOUNTAINS (...	SEVIER/SMOKY MOUNTAINS (...	TN	02/01/2008	03:00	EST-5	High Wind	78 kts. MG	0	0	25.00K	0.00K

SEVIER/SMOKY MOUNTAINS (...	SEVIER/SMOKY MOUNTAINS (...	TN	12/09/2009	02:30	EST-5	High Wind	70 kts. EG	0	0	25.00K	0.00K
SEVIER/SMOKY MOUNTAINS (...	SEVIER/SMOKY MOUNTAINS (...	TN	12/27/2011	04:30	EST-5	High Wind	61 kts. EG	0	0	30.00K	0.00K
Totals:								0	0	629.00K	70.00K

Hail (67 events reported since 1950**)**

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	10.25K	0.00K
GATLINBURG	SEVIER CO.	TN	04/28/2002	14:45	EST	Hail	1.75 in.	0	0	5.00K	0.00K
PIGEON FORGE	SEVIER CO.	TN	05/15/2003	17:40	EST	Hail	1.75 in.	0	0	0.25K	0.00K
GATLINBURG	SEVIER CO.	TN	04/26/2012	12:30	EST-5	Hail	2.75 in.	0	0	0.00K	0.00K
HATCHERTOWN	SEVIER CO.	TN	06/14/2012	17:46	EST-5	Hail	1.75 in.	0	0	0.00K	0.00K
BEECH SPGS	SEVIER CO.	TN	02/06/2025	21:40	EST-5	Hail	1.75 in.	0	0	0.00K	0.00K
Totals:								0	0	10.25K	0.00K

Lightning (2 events reported since 1950, 1 Death Reported**)**

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								1	0	0.00K	0.00K
PIGEON FORGE	SEVIER CO.	TN	05/07/1996	08:00	EST	Lightning		0	0	0.00K	0.00K
KODAK	SEVIER CO.	TN	07/10/2004	19:15	EST	Lightning		1	0	0.00K	0.00K
Totals:								1	0	0.00K	0.00K

Winter Weather (55 events reported since 1950**)**

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	0.00K	0.00K
SEVIER/SMOKY MOUNTAINS (...	SEVIER/SMOKY MOUNTAINS (...	TN	01/28/2024	19:00	EST-5	Winter Weather		0	0	0.00K	0.00K
SEVIER/SMOKY MOUNTAINS (...	SEVIER/SMOKY MOUNTAINS (...	TN	02/13/2024	00:30	EST-5	Winter Weather		0	0	0.00K	0.00K
SEVIER/SMOKY MOUNTAINS (...	SEVIER/SMOKY MOUNTAINS (...	TN	10/15/2024	18:00	EST-5	Winter Weather		0	0	0.00K	0.00K
SEVIER/SMOKY MOUNTAINS (...	SEVIER/SMOKY MOUNTAINS (...	TN	12/20/2024	21:00	EST-5	Winter Weather		0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

Probability of Future Events – *Based on historical data, there is an 80% chance of a severe thunderstorm/lightning in the next year and 99% chance in the next 5 years. Strongs winds greater than 60mph are 20.8% likely per year and 60-70% likely over the next 5 years. There is 5% chance of a hail event greater than 1" in diameter annually and 30% over the next 5 years. There is also a 15% chance of winter weather event annually with 3" of snow or more and a 65% chance over the next 5 years.*

To determine the likelihood of future severe weather occurrences in Sevier County historic data and weather patterns were analyzed. Since 1950, 3 tornadoes have occurred within the county. To reference the climate trend analyzed by East Tennessee State University, reference Appendix C.

2.11.3 Risk Assessment

Severe weather is not as spatially defined in any location in Sevier County; therefore, the entire County is equally at risk of severe weather. This includes the entire County population, all critical facilities, buildings (commercial and residential), and infrastructure. The National Risk Index is a dataset and online tool to help illustrate the United States communities most at risk for natural hazards. It was built and designed by FEMA in close collaboration with various stakeholders and partners in academia; local, state and federal government. The Risk Index leverages available source data for natural hazards and community risk factors to develop a baseline relative risk assessment for each county and census trace. Some of these community risk factors include social vulnerability which is determined by the data pulled from the Census Performed every ten years. A higher social vulnerability score is proportional to a higher risk score.

National Risk Index Score for Hail = Very Low
National Risk Index Score for Strong Wind = Relatively Moderate
National Risk Index Score for Ice Storm = Very Low
National Risk Index Score for Winter Weather = Relatively Moderate

Although the National Risk Index is a well-valued tool it fails to properly show the feedback from the participating jurisdictions. Therefore, all identified hazards were evaluated in regard to risk in FEMA lifelines per jurisdiction. The scenario that local jurisdictions would evaluate the conditions off of was a mid-level impact of the identified hazard. The results are below:

Severe Weather Risk based on selected FEMA Lifelines

Severe Weather Risk	FEMA Lifelines							
Jurisdiction	Safety & Security	Food, Water & Shelter	Health & Medical	Energy	Communications	Transportation	Hazardous Materials	Water Systems
Sevier County								
City of Gatlinburg								
City of Pigeon Forge								
City of Sevierville								
Town of Pittman Center								

Colors indicate lifeline or component conditions:	
Red	Significant Impact, Multiple Required Resources
Yellow	Some Impact, Some Outside Resources Required

Green	Little to No Impact, No Outside Resources Required

Given the information above, it becomes vital that all participating jurisdictions are able to prioritize the mitigation actions in the following lifeline categories so that they can become more resilient to the whole community that they serve.

2.11.4 Land Use & Development

Increased development and population growth can reasonably translate to increased damages resulting from severe weather events. The population in Sevier County is expected to rise similarly to its surrounding counties and Tennessee. An increase in population will lead to an increase in the number of residential and commercial structures as well as new and improved infrastructure, which in turn means an increase in the number and value of assets at risk of wind damage.

2.11.5 Multi-Jurisdictional Differences

The entirety of Sevier County and the incorporated jurisdictions, including all assets, can be considered equally at risk of severe weather events. This includes the entire population, all critical facilities, buildings (commercial and residential), and infrastructure. Severe weather impacts vary by jurisdiction, largely due to terrain, population density, and infrastructure.

2.11.6 Summary

Sevier County is subject to severe weather hazards, including thunderstorms, wind, lightning, and hail. Associated damages include impacts to utilities, residential and commercial buildings/property, and agricultural losses. High wind can cause trees to fall and potentially result in injuries or death; lightning can lead to house fires and serious injury. Hail can cause injury and severe property damage to homes and automobiles.

2.12 Terrorism

2.12.1 Hazard Overview

Terrorism is the use of force or violence against persons or property with the intent to intimidate or coerce. Acts of terrorism include threats of terrorism, assassinations; kidnappings; hijackings; bomb scares and bombings; cyber-attacks and chemical, biological, nuclear, and radiological weapons. Various types of terrorism are listed below.

- Armed Attacks and Assassinations
- Arson and Firebombing
- Bioterrorism
- Bombings
- Cyber Terrorism
- Ecoterrorism
- Hijackings and Skyjackings
- Kidnappings and Hostage-Takings
- Nuclear Terrorism

2.12.2 County Profile

Terrorist attacks can occur anywhere. Targets typically include critical infrastructures such as utilities, roadways, bridges, tunnels, hospitals, schools, civic centers, and other high-profile venues.

Previous Occurrences

The most significant terrorist incident in the United States occurred adjacent to New Jersey in Lower Manhattan, New York, when a radical terrorist group hijacked two commercial airplanes and flew them into Towers 1 and 2 of the World Trade Center. Additionally, a simultaneous attack occurred in Washington D.C., where a plane crashed into the Pentagon.

To date, no known terrorist incidents or credible threats **have been reported in Sevier County specifically**

The closest event with some regional relevance was the **2020 Nashville bombing**, which occurred approximately 400 miles west of Sevier County and was deemed an isolated incident by the FBI, with no connection to broader terror networks.

(Source: SECULORE Solutions)

2.12.3 Risk Assessment

The effect of a terrorist event can vary depending on the type of attack and the magnitude of the event or events.

The Social Vulnerability Index (SVI) is a dataset that uses 16 census variables that help local officials identify communities that may need support before, during or after disasters. Unfortunately, the National Risk Index does not capture non-natural disaster impacts, therefore, using the SVI can help public health officials and local planners better prepare for and respond to emergency events such as terrorism.

Social Vulnerability Index Score for Sevier County = No Rating

Although the Social Vulnerability Index is a well-valued resource it fails to properly show the feedback from the participating jurisdictions. Therefore, all identified hazards were evaluated in regard to risk in FEMA lifelines per jurisdiction. The scenario that local jurisdictions would evaluate the conditions off of was a mid-level impact of the identified hazard. The results are below:

Terrorism Risk based on selected FEMA Lifelines

Terrorism Risk	FEMA Lifelines							
Jurisdiction	Safety & Security	Food, Water & Shelter	Health & Medical	Energy	Communications	Transportation	Hazardous Materials	Water Systems
Sevier County								
City of Gatlinburg								
City of Pigeon Forge								
City of Sevierville								
Town of Pittman Center								

Colors indicate lifeline or component conditions:	
Red	Significant Impact, Multiple Required Resources
Yellow	Some Impact, Some Outside Resources Required
Green	Little to No Impact, No Outside Resources Required

Given the information above it becomes vital that all participating jurisdictions are able to prioritize the necessity of mitigation actions in the following lifeline categories so that they can become more resilient in the whole community that they serve.

2.12.4 Land Use and Development Trends

Sevier County has experienced moderate growth in the past five years. Population centers and areas of heavy industrialization have the potential to be targets of terrorist activity.

2.12.5 Multi-Jurisdictional Differences

Areas containing critical infrastructure or those that are heavily populated are at a higher risk for terrorist attacks. Downtown Gatlinburg, Pigeon Forge, and Dollywood attraction are the biggest targets due to the heavy tourism and large crowds.

2.12.6 Summary

The entirety of Sevier County could be subject to a terrorist attack. This includes the entire County population and all critical facilities, buildings, and infrastructure. While all assets are considered at low to moderate risk from this hazard, a terrorist attack could be executed through various mechanisms, inflicting a variety of damage to buildings, infrastructure, and citizens.

2.13 Tornadoes

2.13.1 Hazard Overview

Tornadoes have the potential to produce winds over 200 mph (EF5 on the Enhanced Fujita Scale) and can be very expansive. Before February 1, 2007, tornado intensity was measured by the Fujita (F) scale. This scale was revised and is now the Enhanced Fujita scale. Both scales are wind estimates (not measurements) based on damage. The new scale provides more damage indicators (28) and associated degrees of damage. The *table below* shows the wind speeds associated with the enhanced Fujita scale ratings and the damage that could result at different intensity levels.

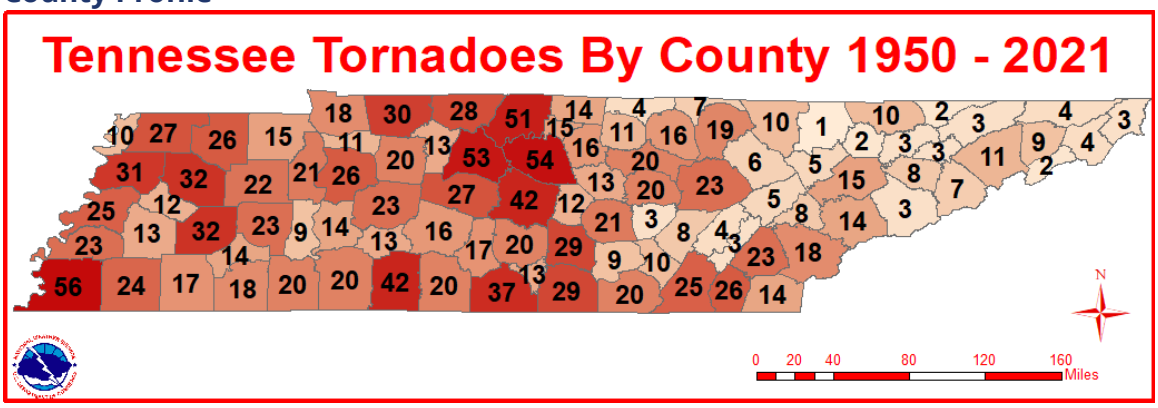
Enhanced Fujita Scale

EF Rating	3 Second Wind Gust (mph)	Estimated Damage
0	65-85	**Light Damage.** Slight damage to roofs, gutters, siding, tree branches broken, shallow-rooted trees overturned
1	86-110	**Moderate Damage**. Mobile homes damaged, exterior portions of homes damaged or lost (i.e., roofs, doors, windows)
2	111-135	**Considerable Damage**. Mobile homes destroyed, cars lifted, well-constructed home frames shifted, roofs torn off, light-object missiles generated, large trees uprooted or snapped.
3	136-165	**Severe Damage**. Severe damage to large buildings, entire home stories destroyed, trees debarked, trains overturned, heavy vehicles lifted and thrown, structures with weaker foundations thrown
4	166-200	**Devastating Damage.** Well-constructed houses and whole frame houses leveled; cars thrown, small missiles generated
5	200+	**Incredible Damage**. Substantial frame houses leveled off foundations and the automobile-sized missiles generated, and high rises experience considerable damage and deformation

According to the Glossary of Meteorology (AMS 2000), a tornado is "a violently rotating column of air, pendant from a cumuliform cloud or underneath a cumuliform cloud, and often (but not always) visible as a funnel cloud." Most tornadoes move from southwest to northeast or west to east.

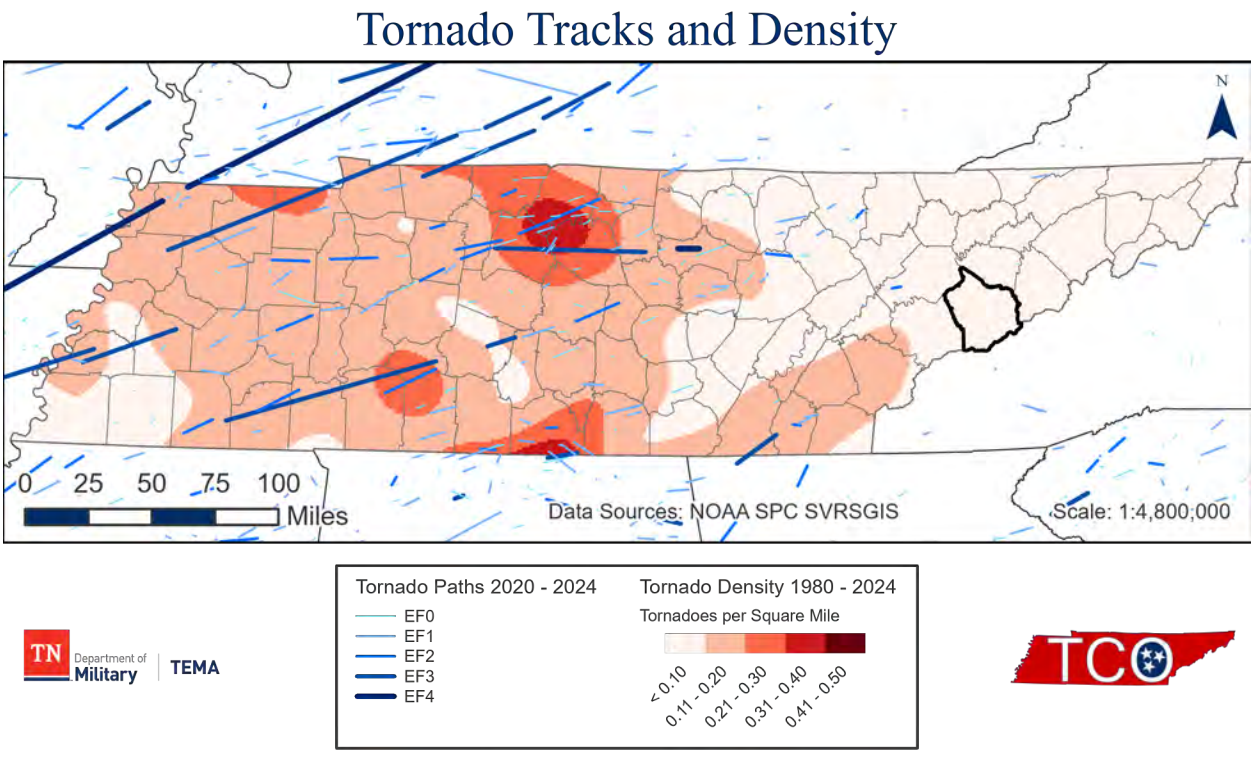
Although tornadoes can occur in any location, most of the tornado activity in the United States exists in the Mid-West and Southeast. An exact season does not exist for tornadoes; however, most occur between early spring and mid-summer (February – June). The onset of tornado events is rapid, giving those in danger minimal time to seek shelter. The current average lead time, according to NOAA, is 13 minutes. A tornado can reach wind speeds of 40 mph to 250 mph and higher. The following map illustrates the frequency of tornadoes in Tennessee.

2.13.2 County Profile



Tornadoes by County (NWS/NOAA)

The figure below illustrates the track of tornadoes through Sevier County as recorded by the National Weather Service Nashville and the National Climatic Data Center and compiled into a visual database by Mississippi State University.



The following narratives were obtained via the NOAA Storm Event Database. Only events resulting in injury, death, or extensive damage (greater than $200K property/crop damage) were included as expanded narratives. A table containing all NOAA-recorded tornadoes between 1950- 2025 for Sevier County is shown below

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	58.00K	0.00K
CUSICK	SEVIER CO.	TN	04/27/2011	20:06	EST-5	Tornado	EF0	0	0	5.00K	0.00K
BIRD XRD	SEVIER CO.	TN	04/27/2011	20:31	EST-5	Tornado	EF0	0	0	3.00K	0.00K

SEVIERVILLE	SEVIER CO.	TN	06/13/2013	14:55	EST-5	Tornado	EF1	0	0	50.00K	0.00K
Totals:								0	0	58.00K	0.00K

Probability of Future Events – *Based on historical data, there is a 1% chance or less that a tornado occurs annually and less than a 5% chance one will occur over the next 5 years.* Historical data and weather patterns were analyzed to determine the likelihood of future tornado occurrence in Sevier County. Since 1950, only 3 tornadoes have occurred within the county. To reference the climate trend analyzed by East Tennessee State University, reference Appendix C.

2.13.3 Risk Assessment

The entirety of Sevier County can be considered at risk for a tornado. This includes the entire County population, all critical facilities, buildings (commercial and residential), and infrastructure. Tornadoes tracked in Tennessee predominantly travel in a northeasterly direction in the state. While all assets are considered at risk from this hazard, a particular tornado would only cause damages along its specific track.

The National Risk Index is a dataset and online tool to help illustrate the United States communities most at risk for natural hazards. It was built and designed by FEMA in close collaboration with various stakeholders and partners in academia; local, state and federal government. The Risk Index leverages available source data for natural hazards and community risk factors to develop a baseline relative risk assessment for each county and census trace. Some of these community risk factors include social vulnerability which is determined by the data pulled from the Census Performed every ten years. A higher social vulnerability score is proportional to a higher risk score.

National Risk Index Score for Tornado = Relatively Moderate

Although the National Risk Index is a well-valued tool it fails to properly show the feedback from the participating jurisdictions. Therefore, all identified hazards were evaluated in regard to risk in FEMA lifelines per jurisdiction. The scenario that local jurisdictions would evaluate the conditions off of was a mid-level impact of the identified hazard. The results are below:

Tornado Risk based on selected FEMA Lifelines

Tornado Risk	FEMA Lifelines							
Jurisdiction	**Safety & Security**	**Food, Water & Shelter**	**Health & Medical**	**Energy**	**Communications**	**Transportation**	**Hazardous Materials**	**Water Systems**
Sevier County								

City of Gatlinburg								
City of Pigeon Forge								
City of Sevierville								
Town of Pittman Center								

Colors indicate lifeline or component conditions:	
Red	Significant Impact, Multiple Required Resources
Yellow	Some Impact, Some Outside Resources Required
Green	Little to No Impact, No Outside Resources Required

Given the information above it becomes vital that all participating jurisdictions are able to prioritize the necessity of mitigation actions in the following lifeline categories so that they can become more resilient in the whole community that they serve.

2.13.4 Land Use and Development Trends

Gatlinburg updated its code to the **2018 IBC/IRC series** in 2020, requiring compliance for all new projects after mid-202. **Sevierville** enforces the **2021 IBC family**, 2018 IRC, and other adopted standards for residential and commercial building permits. **Building permits are required** for all new construction and remodeling in Sevierville and Gatlinburg, and include sign permits, structure moving, demolition, and temporary facilities. The Building and Planning Department, together with the Fire Department, enforces codes. Permit applications and design plans must comply fully with these codes.

County-level building permits and inspections historically have been minimal or absent in many rural areas. Lapses in enforcement are not uncommon in Eastern Tennessee, However, new rules on **January 1, 2024,** requires **annual inspection permits for all short-term rental units** (Airbnb/VRBO) outside city limits. These inspections are conducted by the **county fire marshal** and check for compliance with fire safety, CO and smoke alarms, structural soundness, and basic electrical safety.

2.13.5 Multi-Jurisdictional Differences

The entirety of Sevier County and its incorporated jurisdictions are at a low risk for a tornado event; however, historic tornadoes have been weak (EF0–EF1). Sevier County's mountainous terrain and lower population density further reduce the odds of tornadic paths. It is also worth noting that given the county's rural component, some tornadic events may have gone unreported.

2.13.6 Summary

This includes the entire County population, all critical facilities, buildings (commercial and residential), and infrastructure. While all assets are considered at risk from this hazard, a tornado would only cause damages along its specific track. The weakest tornadoes, EF0, can cause minor roof damage, and stronger tornadoes can destroy frame buildings and badly damage steel reinforced concrete structures. Given the strength of the wind impact

and construction techniques, buildings are vulnerable to direct impact, including potential destruction, from tornadoes and wind debris that tornadoes turn into missiles. Structures constructed of light materials such as mobile homes are most susceptible to damage.

2.14 Wildfire

2.14.1 Hazard Overview

According to the Tennessee Division of Forestry, debris burning, and arson are the two leading causes of wildfires. Generally, three significant factors sustain wildfires and allow predictions of a given area's potential to burn. These factors include, fuel, topography; and weather.

Fuel is the material that feeds the fire and is a critical factor in wildfire behavior. Fuel is generally classified by type and by volume. Fuel sources are diverse and include everything from dead tree needles, twigs, and branches to dead standing trees, live trees, brush, and cured grasses. Artificial structures and other associated combustibles are also considered a fuel source. The type of prevalent fuel directly influences the behavior of wildfire. Light fuels such as grasses burn quickly and catalyze spreading wildfires.

An area's **topography** (terrain and land slopes) affects its susceptibility to wildfire spread. Fire intensities and rates of spread increase as the slope increases due to the tendency of heat from a fire to rise via convection and radiation. The natural arrangement of vegetation throughout a hillside can also contribute to increased fire activity on slopes.

Weather components such as temperature, relative humidity, wind, and lightning also affect the potential for wildfire. High temperatures and low relative humidity dry out the fuels that feed the wildfire creating a situation where fuel will more readily ignite and burn more intensely. The wind is the most treacherous weather factor. The issue of drought conditions contributes to concerns about wildfire vulnerability.

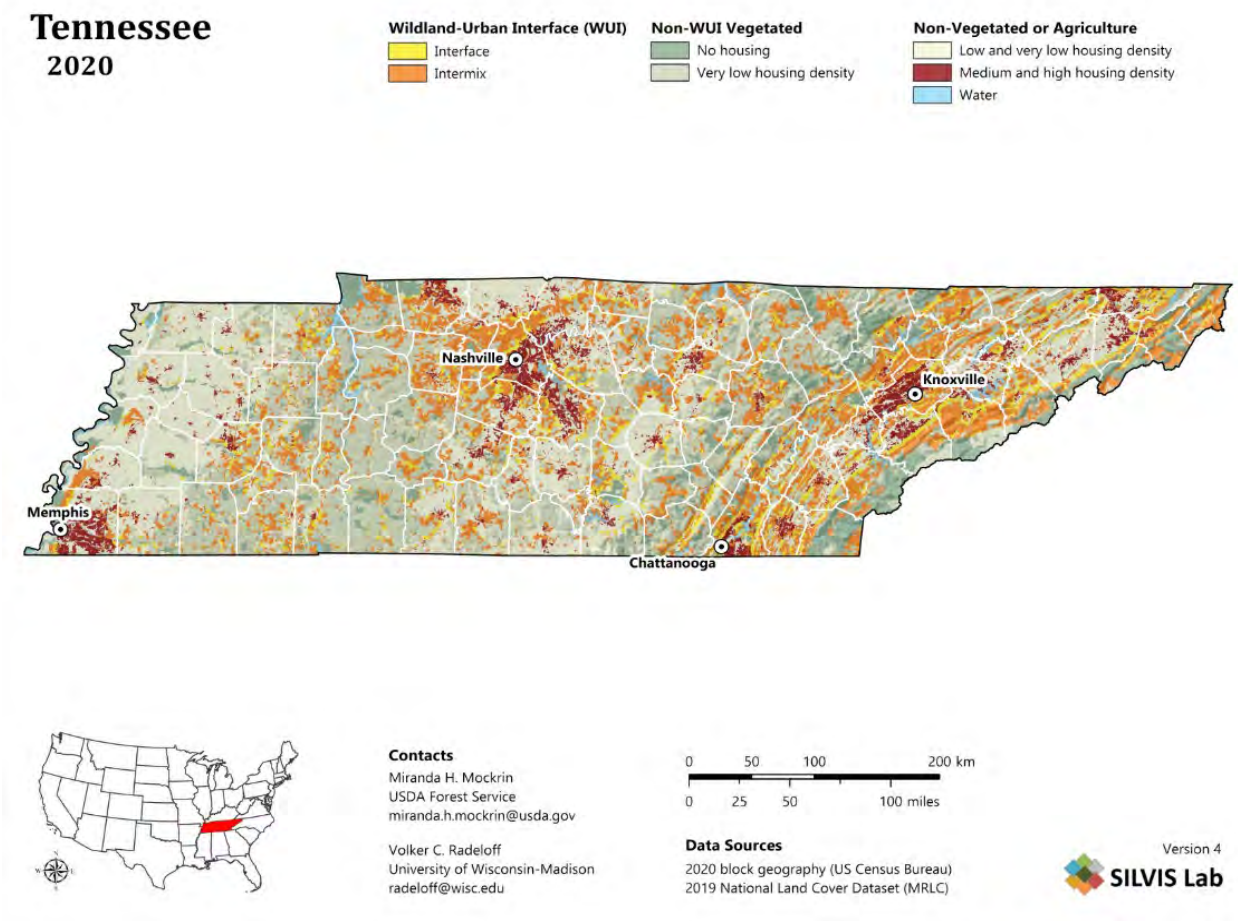
2.14.2 County Profile

Sevier County is in the East District of the Tennessee Division of Forestry. The Tennessee Division of Forestry provides statistics for each region, summarizing wildfire events. Due to outside data sources, including federal and state land, causing confusion in wildfire data, the Tennessee Division of Forestry will always remain the only source of information for Counties within the State of Tennessee. It is not the responsibility of Sevier County to mitigate federal or state land. Hopefully, in the future, a more defined dataset can be provided. At this time, this is the only information Sevier County can obtain that is consistent and confirmed.

> Between **1984 and 2021**, *only five wildfires* were officially recorded in or near Sevier County, with three buildings impacted in a **March 2022** wildfire in Wears Valley near Pigeon Forge.
> The **2016 Great Smoky Mountains wildfires**, one of Tennessee's worst in modern history, burned over **17,900 acres in Sevier County**, destroyed more than **2,400 structures**, and resulted in **14 fatalities.**
> Since 1996, more than **32,700 acres** burned in county-level wildfire incidents across the region.

Wears Valley and Cove-Area Slopes have repeated ignition occurrences, including the **March 2022 Hatcher Mountain/Indigo Lane Fire**, which burned quick and caused evacuations of over 11,000 residents.

Due to the terrain and rural nature of the county, combined with limited resources and capabilities inside the county, wildfire poses a significant risk to the region's agricultural resources and residential structures. As seen by the Wildland Urban Interface map below, most of the county is either intermixed or low to no housing. The sparse population and the availability of fuel create an environment where fires could develop and spread rapidly and delay the notice as well as response.



Wildland-Urban Interface (SILVIS LAB)

Probability of Future Events – While **large-scale wildfires remain rare**, the **5-year risk** of experiencing at least one wildfire event in Sevier County—with potential property or ecological impact—is approximately **40–60%.** The **annual probability** during dry seasons is estimated at **10–15%.**

It is hard to predict the likelihood of wildfires as many factors contribute to the ignition of a wildfire. Wildfires can be part of a natural and healthy forest disturbance process, but they have become increasingly frequent and severe in recent years. Higher spring and summer

temperatures cause soils to be drier for longer, increasing the likelihood of drought and a more extended wildfire season. These hot, dry conditions also increase the chance that wildfires will be more intense and long-burning once they are started by lightning strikes or human error.

Due to changing precipitation patterns, future conditions make forests more susceptible to severe fires. Wildfires emit carbon dioxide, greenhouse gases, and air pollutants such as methane and nitrous oxide, up to 3% of annual U.S. greenhouse gas emissions. Wildfires release carbon that has been sequestered by the trees that are burned. However, these effects are not uniform across all forests.

One of the most severe future conditions concerns about wildfires is that it could lead to an increase in the conditions that lead to more enormous wildfires – which is essential as most of the area burned in the Eastern United States results from a limited number of massive wildfires. After examining what conditions were associated with VLFs (very large fires), the researchers found that they are some of the same related to future conditions.

2.14.3 Risk Assessment

Wildfires have a higher likelihood of occurring during periods of drought due to dryer foliage being quicker to ignite and spread.
The National Risk Index is a dataset and online tool to help illustrate the United States communities most at risk for natural hazards. It was built and designed by FEMA in close collaboration with various stakeholders and partners in academia; local, state and federal government. The Risk Index leverages available source data for natural hazards and community risk factors to develop a baseline relative risk assessment for each county and census trace. Some of these community risk factors include social vulnerability which is determined by the data pulled from the Census Performed every ten years. A higher social vulnerability score is proportional to a higher risk score.

National Risk Index Score for Wildfire = Very Low

Although the National Risk Index is a well-valued tool it fails to properly show the feedback from the participating jurisdictions. Therefore, all identified hazards were evaluated in regard to risk in FEMA lifelines per jurisdiction. The scenario that local jurisdictions would evaluate the conditions off of was a mid-level impact of the identified hazard. The results are below:

Wildfire Risk based on selected FEMA Lifelines

Wildfire Risk	FEMA Lifelines

Jurisdiction	Safety & Security	Food, Water & Shelter	Health & Medical	Energy	Communications	Transportation	Hazardous Materials	Water Systems
Sevier County								
City of Gatlinburg								
City of Pigeon Forge								
City of Sevierville								
Town of Pittman Center								

Colors indicate lifeline or component conditions:	
Red	Significant Impact, Multiple Required Resources
Yellow	Some Impact, Some Outside Resources Required
Green	Little to No Impact, No Outside Resources Required

Given the information above it becomes vital that all participating jurisdictions are able to prioritize the necessity of mitigation actions in the following lifeline categories so that they can become more resilient in the whole community that they serve.

2.14.4 Land Use and Development Trends

Many residential and commercial buildings and most infrastructure networks throughout the county may be vulnerable to wildfire impacts. Many of these structures are at risk for direct impacts and indirect impacts, such as downed electrical lines, decreased water quality, decreased air quality, devastated agriculture crops, and restricted travel routes.

2.14.5 Multi-Jurisdictional Differences

Due to the nature of wildfires, Sevier County and all incorporated jurisdictions are equally susceptible to them. **Gatlinburg** and **Pigeon Forge** face the *highest wildfire exposure* due to elevation, proximity to park lands, and past incidents. **Sevierville** and **Pittman Center** face *moderate to elevated risk* but participate fully in unified mitigation frameworks. Wildfire preparedness is uniform across jurisdictions.

2.14.6 Summary

Sevier County and the incorporated jurisdictions are equally vulnerable to wildfire. Fires, smoke, and air quality can affect people's health and safety. Therefore, it is essential to have proper measurements in place to prevent critical structures, homes, and businesses from being vulnerable to fire and smoke damage.

Chapter 3. Mitigation Strategy

3.1 Mitigation Goals

Goals are general guidelines that explain what is to be achieved. They are usually broad-based policy-type statements, long-term, and represent global visions. Goals help define the benefits that the plan is trying to achieve.

Goal Setting Exercise

In 2025, the HMPC agreed upon the goals for their hazard mitigation plan. It was decided that the goals from the 2020 plan should be carried over into the 2025 plan. They still reflect the current hazards and current conditions in the community.

Resulting 2025 Plan Update Goals

At the end of the meeting, the HMPC agreed upon three general goals for planning efforts. Those goals are as follows:

Goal 1: Protect the lives and health of citizens and visitors from the effects of hazards.

Goal 2: Emphasize mitigation planning to decrease vulnerability of existing and new structures.

Goal 3: Encourage public support and commitment to hazard mitigation by communicating mitigation benefits.

Goal 4: Facilitate sound building practices in the county and jurisdictions so as to reduce or eliminate the potential impact of hazards.

Goal 5: Improve the ability of the county and jurisdictions to rapidly recover and restore facilities and services to the public.

Expanding & Improving Mitigation Programs

The participating jurisdictions determined which areas they could improve or expand based on the table above. Gaps and limitations for each jurisdiction may be addressed in the mitigation strategy.

Expansion Narrative

Jurisdiction/Applicant	How are you able to expand?
Sevier County	-Train, equip, and upgrade fire dep personnel/equipment to better respond and deal with wildfires. Identify wildland fire safehouses and increase fire rating signage. Working to create a county-wide multi-jurisdictional community wildfire protection plan (CWPP). **Flood-warning expansion**: Starting in early 2024, the Sevier County Emergency Management Agency (EMA) extended the advanced flood monitoring system used in Gatlinburg to cover Sevierville, Pigeon Forge, and Pittman Center. The system includes field sensors on tributaries such as the Middle and East Prongs of the Little Pigeon River, as well as Waldens Creek, all feeding into the Contrail web-based monitoring platform. This allows real-time tracking of streamflow, precipitation, temperature, wind, and fuel-moisture levels—critical both for flooding and extreme-fire-risk events. **UT Extension's Firewise Program**: Since 2020, University of Tennessee Extension's Sevier County Firewise initiative has hired a program assistant, trained Master Gardeners and local stakeholders, and worked on developing and deploying fire-resistant landscaping ("firescaping") guidance. This program includes demonstration sites and interpretive signage to show how defensible space reduces wildfire risk in Wildland-Urban Interface areas. **LEPC / HAZMAT planning**: Sevier's Local Emergency Planning Committee continues to meet quarterly (updated through 2024),

	overseeing hazardous materials emergency response planning, annual Tier II chemical reporting, and public "community right to know" activities. **Damage-assessment training**: In August 2024, Sevier EMA offered TEMA-sponsored S715 Damage Assessment training to local responders, empowering them to quickly assess damage in emergencies—an important mitigation-oriented activity. **CERT training expansion**: The county has held multiple Community Emergency Response Team (CERT) trainings since 2024 (example: a free CERT course in September 2024), designed to educate both residents and local businesses in emergency response skills like disaster medical operations, fire safety, and light search and rescue. **CodeRED alerts & public communication upgrades**: Sevier County enhanced its public warning capacity via the CodeRED emergency alert system, an AM radio channel, and an expanded outdoor warning siren system. The county also implemented the Community Connect platform, allowing residents to provide critical household information to first responders ahead of incidents
City of Gatlinburg	Decals indicating emergency preparedness information were distributed to rental properties in Gatlinburg and beyond. Residents and neighborhoods like Chalet Village have actively maintained **Wildland-Urban Interface hazard assessments**, and the city collaborated with Great Smoky Mountains National Park and the state forestry division to promote **defensible-space guidelines**, vegetation management, and outreach to reduce wildfire risk. **Gatlinburg Tunnel rehabilitation** was undertaken in **summer 2022 through mid-2023**. This Federal Lands Highway project included pavement

	repair, drainage improvements, upgraded lighting with emergency backup systems, and structural masonry restoration—enhancing safety and reducing risks during extreme weather events or emergencies. The **Foothills Parkway Section 8D** project planning (publicly reviewed in **2023–mid-2024**) aims to extend access between Wears Valley and the Gatlinburg Spur. While primarily addressing access and congestion, the planned corridor enhances **evacuation capacity** and disperses traffic pressure from major tourism routes. **Bridge repairs and road maintenance** in Great Smoky Mountains National Park—including the Gatlinburg Spur and nearby access roads—were conducted through **August 2023**. Repairs addressed deck replacement, joint fixes, and stone masonry restoration, improving structural resilience and reducing risk of failure during heavy storms or floods. In **August 2024**, Gatlinburg launched a **municipal mobile app** with real-time push notifications—covering emergency alerts, fire or weather warnings, and public safety communications. The platform enhances readiness for both **residents and visitors** by giving instant access to safety updates via smartphones.
City of Pigeon Forge	**County-wide Contrail flood warning system**: Since early 2024, the Sevier County Emergency Management Agency extended the Contrail real-time flood monitoring platform—originally piloted in Gatlinburg—to include major tributaries around Pigeon Forge, such as the Middle and East Prongs of the Little Pigeon River and Walden's Creek. This expansion enhances early-warning capabilities for flash flooding during heavy rains, directly benefiting Pigeon Forge residents and visitors. **Ready, Set, Go! program**

	continuation: Pigeon Forge Fire Department actively promotes the IAFC's Ready, Set, Go! program, guiding residents and businesses on defensible space, evacuation readiness, and home wildfire-hardening. They provide educational packets and home-risk assessment checklists to locals and vacationers alike. **Community Wildfire Protection Plan (CWPP)**: In early 2024, Pigeon Forge joined regional partners—including Sevier County, its neighboring cities, the Tennessee Division of Forestry, and the Great Smoky Mountains National Park—to develop a unified CWPP. The plan focuses on restoring fire-resistant landscapes, fostering fire-ready communities, and improving coordinated response. Completion and public release are expected in early 2026.
City of Sevierville	Signed a fire management/hazmat plan. **Short-Term Rental Unit inspection program**: In December 2023, Sevier County launched a permit and inspection program for short-term rentals (STRUs), effective January 1, 2024. Though county-run, it applies city-wide and aims to enforce fire and building safety standards, indirectly enhancing mitigation resilience in residential occupancy settings. Have conducted multiple exercises since 2020 (Flood and active shooter exercises). Purchased more satellite phones with a push to talk (PTT) feature so that city administration, emergency manager, and most department heads maintain communications during a disaster. Added a backup generator at City Hall (elevated above the flood plain) and replaced the backup generator at the Ridgecrest communications tower site. Participated, along with Sevier County and the other

	cities, in the ACE hydrologic modeling and stream gauge projects. Expansion of Services with North Sevierville Center including a secondary city fueling site. SFD has trained and certified all personnel in wildland firefighting. Wildland fire shelters were also purchased by SFD and training on their use was conducted by the TN Division of Forestry. In 2025, the City of Sevierville received a grant for two slip on wildland fire units that can be put in truck beds for wildland fires. They will be purchased in September 2025. As part of the sewer expansion project, we are getting a second electrical feed from SCES so that if one circuit goes down the other will automatically start. This will allow the sewer plant to keep running under most conditions. Additional security and monitoring camera to be installed around the water plant.
Town of Pittman Center	The **Pittman Center Community Volunteer Fire Department** continues to operate across a 150-square-mile boundary, covering Great Smoky Mountains Park areas and volunteer-rental cabin zones. While Pittman Center actively engages in county-led mitigation initiatives, there are **no standalone mitigation programs** specific to Pittman Center beyond these collaborative efforts. The town benefits primarily through shared infrastructure, planning frameworks, and county EMA-led services.

3.2 Compliance with NFIP

Sevier County, City of Gatlinburg, City of Pigeon Forge, City of Sevierville, and Town of Pittman Center participate in FEMA's National Flood Insurance Program (NFIP). Each participating community enforces a flood damage prevention ordinance that regulates development within the Special Flood Hazard Area (SFHA). Additionally, as members of FEMA's NFIP, each community requires Elevation Certificates on all new buildings and substantial improvements within the SFHA.

Given the flood hazards in the planning area, an emphasis will be placed on continued compliance with the NFIP. Sevier County adopted minimum Floodplain Management Criteria on 11/25/1977 (Resolution 470236), Gatlinburg (475426) on 10/30/1970, Pigeon Forge (475442) on 11/12/1971, Sevierville (474444) on 3/27/1971, and Pittman Center (470378) on 12/07/1979.

Permit Applications Review for SD/SI Buildings Located in Special Flood Hazard Areas

The review of permit applications for structures designated as Substantially Damaged (SD) or Substantially Improved (SI) in special flood hazard areas is conducted with meticulous attention to building codes. Our review process involves comprehensive assessment of proposed construction to determine compliance with floodplain management criteria. We collaborate closely with relevant stakeholders, such as building officials, engineers, and architects, to ensure accurate interpretation and application of regulatory requirements. Permit applications are evaluated based on their potential impact on flood risk reduction and community resilience, with a focus on promoting sustainable development practices and safeguarding against future flood hazards. By determining the appraised value of the structure using the state-provided website, we then compare that to the estimated value of the proposed work. We carefully vet the submitted information to the best of our ability. If the cost of improvements is near or exceeds 50% of the structure's value, we work closely with the applicant to ensure full compliance with NFIP regulations.

Performing Damage Assessments and Substantial Damage Determinations

The Sevier County Emergency Management Director, along with trained staff, makes damage assessments and determinations for all jurisdictions after a flooding event. If the scope of the event is beyond their ability or capability, they reach out to state and local partners to include other counties and TEMA District Coordinators. NFIP's assist the EMA and inspect the properties in person as soon as conditions allow. After assessments are completed, they contact property owners or occupants to share the findings. From there, they guide them through the appropriate permitting process based on the results. Once it is safe to do so, we conduct on-site inspections of affected properties. We utilize FEMA's *Substantial Damage Estimator* (SDE) tool and corresponding desk reference to help make accurate and consistent determinations.

Officials in NFIP-participating communities are responsible for regulating all development in SFHAs by issuing permits and enforcing local floodplain requirements, including SD, for the repairs of damaged buildings. After an event, they must:

- Determine where the damage occurred within the community and if the damaged structures are in an SFHA.
- Determine what to use for "market value" and cost to repair consistently; uniformly applying regulations will protect against liability and promote equitable administration.
- Determine if repairing plus improving the damaged structure equals or exceeds 50% of the structure's pre-damage value.

- Require permits for floodplain development.

Following a disaster event, the floodplain manager should act quickly to move forward with the SI/SD process. If it is determined that the cost to repair is 50% or more of the market value, the structure is considered Substantially Damaged and must be brought into compliance with current local floodplain management standards. Rebuilding to current standards decreases peril to life and property and prevents future disaster suffering. if the proposed work to improve a structure will cost 50% or more of the value, the structure is considered to be Substantially Improved and must be brought into compliance with current local floodplain management standards.

Informing Property Owners for SD/SI Permits

Based on the jurisdiction questionnaire responses, we utilize a variety of communication channels to inform property owners about Substantially Damaged (SD) or Substantially Improved (SI) permits. This includes most often by telephone or direct contact, and direct mail or letters if needed directly to affected property owners to notify them of SD/SI permit requirements. Additionally, we regularly update the jurisdiction's website with relevant information, forms, and guidance on SD/SI permits. The County website is utilized to disseminate information and reminders about SD/SI permits and requirements.

Ongoing Involvement and Engagement

Each jurisdiction participates in NFIP Webinars hosted by the State National Flood Insurance Program Office as illustrated below. Each participating community will take the following steps to meet or exceed the following minimum requirements as set by the NFIP:

- Issuing or denying floodplain development/building permits;
- Inspecting all development to ensure compliance with the local ordinance;
- Maintaining records of floodplain development;
- Assisting in the preparation and revision of floodplain maps; (See Appendix D)
- Helping residents obtain information on flood hazards, floodplain map data, flood insurance, and proper construction measures.

NFIP Designees and Webinar Attendance

Jurisdiction	Title of NFIP Designee
Sevier County	James Temple
City of Gatlinburg	Dalton York
City of Pigeon Forge	Loreto Ferrada
City of Sevierville	Charles Valentine
Town of Pittman Center	Tammy Watts (City Administrator)

3.3 Prioritization Process

The prioritization process was necessary as most mitigation projects represent a significant investment of financial and personal resources. By evaluating each project's degree of feasibility and the level of costs versus benefits, Sevier County could determine which projects should be included based on the available funding and time. The HMPC used the

SAFE-T method to prioritize these projects. This approach was adopted from the successful methodology used by other counties in FEMA Region IV. This rating system uses five variables to evaluate each project's overall feasibility and appropriateness. The *figure below* further explains this method.

Project Prioritization Method: SAFE-T			
Variable		**Value**	**Description**
S	**Societal:** The public must support the overall implementation strategy and specified mitigation actions. The projects will be evaluated in terms of community acceptance, social vulnerability and societal benefits	**1**	Low community acceptance/priority
		2	Moderate community acceptance/priority
		3	High community acceptance/priority
A	**Administrative:** The projects will be evaluated for anticipated staffing and maintenance requirements to determine if the jurisdiction has the personnel and administrative capabilities necessary to implement the project or whether outside help will be needed.	**1**	High staffing, outside help needed
		2	Some staffing, no outside help needed
		3	Low staffing, no outside help needed
F	**Financial:** The projects will be evaluated on their general cost-effectiveness and whether additional outside funding will be required.	**1**	Somewhat cost-effective
		2	Moderately cost effective
		3	Very cost-effective
E	**Environmental:** The projects will be evaluated for any immediate or long-term environmental impacts caused by their construction or operation.	**1**	Many environmental impacts
		2	Some environmental impacts
		3	Few environmental impacts
T	**Technical:** the projects will be evaluated on their ability to reduce losses in the short term or long term.	**1**	Short-term fix
		2	Medium-term fix
		3	Long-term fix

SAFE-T Project Prioritization

The identification and analysis process of mitigation alternatives allowed the HMPC to come to a consensus and prioritize recommended mitigation actions. The HMPC discussed the contribution of the effort to save lives or property first and foremost, with additional consideration given to the benefit-cost aspect of a project; however, this was not a quantitative analysis. The team agreed that prioritizing the actions collectively enabled the actions to be ranked in order of relative importance and helped steer the development of additional actions that meet the more essential objectives while eliminating some of the actions which did not garner much support. The cost-effectiveness of any mitigation alternative will be considered in greater detail by performing benefit-cost project analyses when seeking FEMA mitigation grant funding for eligible actions associated with this plan.

3.4 Mitigation Action Plan

The Mitigation Action Plan was developed to present the recommendations developed by the HMPC for how the communities can reduce the risk and vulnerability of people, property, infrastructure, and natural and cultural resources to future disaster losses. Emphasis was placed on both future and existing development. The action plan summarizes who is responsible for implementing each of the prioritized actions and when and how the actions will be implemented. Due to funding availability and other criteria, it should be clarified that the actions included in this mitigation strategy are subject to further review and refinement, alternatives analyses, and reprioritization. In this plan the term “local funding” occurs when the local governments use revenue to fund mitigation projects. In the table below, the column titled Jurisdiction indicates which local government is using its revenue received via taxes, charges, or fees to fund the mitigation project.

This document does not obligate Sevier County and the incorporated jurisdictions to implement any or all of these projects. Rather, this mitigation strategy represents the community's desire to mitigate the risks and vulnerabilities of identified hazards.

Sevier County Mitigation Actions and Projects

Time Frame	Action Description	Responsible Dept.	Location	Current Status			2025 Plan Update		Funding Source		Priority Score	Est. Cost	New or Existing Infrastructure
				Complete	In-Progress	Not yet Started	Delete Action	Carry Forward or Revise	HMGP	Local			
2020 Projects													
1-3yrs	Educate new staff on local hazards, protection actions, and evacuation procedures during orientation (All Hazards)	Sevier County EMA	All Jurisdictions		X			X	X	X	14	N/A	Existing
1-3yrs	Educate citizens on local hazards, protective actions, and evacuation procedures (All Hazards)	Sevier County EMA	All Jurisdictions		X			X	X	X	14	N/A	Existing
1-5yrs	Enhance public outreach programs to improve community preparedness in county and jurisdiction response to hazards (All Hazards)	Sevier County EMA	All Jurisdictions		X			X	X	X	14	N/A	Existing
1-5yrs	Post the public version of the hazard mitigation plan online (All Hazards)	Sevier County EMA	All Jurisdictions		X			X	X	X	15	N/A	Existing
1-3yrs	Continue to develop infrastructure database to improve GIS data applications, mapping, and Hazus Modeling efforts (All Hazards)	Sevier County EMA	All Jurisdictions		X			X	X	X	13	N/A	Existing
1-3yrs	Conduct exercises for hazard response capabilities in accordance with reference plans (All Hazards)	Sevier County EMA	All Jurisdictions		X			X	X	X	14	N/A	Existing
1-5yrs	Enhance and expand reach of voice/aural alert capabilities & emergency warning systems (i.e., siren system, message boards, AM broadcast system and road signs) (All Hazards)	Sevier County EMA	All Jurisdictions		X			X	X	X	8	Siren: $45k/ Per Site - Digital Message Board $25k -	Existing

												AM Radio Broadca Site $30k	
1-5yrs	Expand/increase emergency communications capabilities (e.g., towers, repeaters, generators) (All Hazards)	Sevier County EMA	All Jurisdictions		X			X	X	X	8	$175k / Per Site	Existing
1-5yrs	Add generators for utilities and install components to connect to critical infrastructure (All Hazards)	Sevier County EMA	All Jurisdictions		X			X	X	X	9	900k to 3M	Existing
1-5yrs	Expand camera systems for improved situational awareness (All Hazards)	Sevier County EMA	All Jurisdictions		X			X	X	X	9	$10k per camera	Existing
1-5yrs	Develop a navigation system and signage for event-specific evacuation routing (All Hazards)	Sevier County EMA	All Jurisdictions		x			X	X	X	11	150k	Existing
1-5yrs	Identify major event spaces and enhance multi-department/agency and multi-jurisdiction collaborative response agreements for human-caused hazards (Terrorism, Comm Diseases, Infrastructure Incidents)	Sevier County EMA	All Jurisdictions		x			X	X	X	12	10k	Existing
1-5yrs	Evaluate and/or implement possible bollard and other built environment (environmental design) alterations to reduce impact of incidents in high traffic (incl. pedestrian) areas. (Terrorism, Infrastructure Incidents)	Sevier County EMA	All Jurisdictions		x			X	X	X	8	$15k / Per Barrier Device	Existing
1-5yrs	Development of a local Fusion Center or Program/ Information Sharing System (Terrorism, Infrastructure Incidents)	Sevier County EMA	All Jurisdictions			X	x		X	X	11	650k	Existing
1-5yrs	Provide timely and accurate health alerts, advisories, and updates on public health issues (Comm Diseases)	Sevier County EMA	All Jurisdictions		x			X	X	X	12	N/A	Existing

1-5yrs	Monitor local onset of flu seasons and prepare health services for vaccination (Comm Diseases)	Sevier County EMA	All Jurisdictions		x			X	X	X	12	N/A	Existing
1-5yrs	Hydrology studies (updating previous studies and conducting new studies in new areas) (Dam Failures, Flooding)	Sevier County EMA	All Jurisdictions		x			X	X	X	6	200k	Existing
1-5yrs	Addition of stream gauges and rain gauges; integrate real time flood modeling system; install static and electronic gauges (Dam Failures, Drought, Flooding)	Sevier County EMA	All Jurisdictions		x			X	X	X	12	$5k - $15k / per site Integration into Real Time Flood Simulation $50k-100k	Existing
1-5yrs	Adopt county-specific policies requiring water-saving measures in time of drought (Drought)	Sevier County EMA	All Jurisdictions			x			X	X	10	N/A	Existing
1-5yrs	Conduct studies to reduce the effects of drought on critical operations (Drought)	Sevier County EMA	All Jurisdictions			x			X	X	9	200k	Existing
1-5yrs	Identify and/or construct safe rooms in buildings with insufficient shelter areas (All Hazards)	Sevier County EMA	All Jurisdictions			x			X	X	8	3M	Existing
1-3yrs	Develop and implement a plan for extreme heat and cold situations (Extreme Temps)	Sevier County EMA	All Jurisdictions		x				X	X	11	N/A	Existing
1-5yrs	Enhance insulation of exposed pipes and other features to prevent damage during cold temperatures (Extreme Temps, Severe Wx)	Sevier County EMA	All Jurisdictions		X				X	X	9	500k to 4M	Existing
1-5yrs	Evaluate insulation standards for remodels and new construction (Extreme Temps, Severe Wx)	Sevier County EMA	All Jurisdictions		X				X	X	8	N/A	Existing

1-5yrs	Build brick barriers around or elevate critical utility infrastructure in flood-prone areas (Flooding)	Sevier County EMA	All Jurisdictions			x			X	X	8	500k	Existing
1-5yrs	Move River Divide Road (Flooding)	Sevier County EMA	All Jurisdictions			X			X	X	7	5M	Existing
1-5yrs	Bank stabilization project at Baskin's Creek (Flooding)	Sevier County EMA	All Jurisdictions		x				X	X	7	4M	Existing
1-5yrs	Residential buyout project (Flooding)	Sevier County EMA	All Jurisdictions			X			X	X	6	3M	Existing
1-5yrs	Assist in improving properties with repetitive loss (Flooding)	Sevier County EMA	All Jurisdictions			X			X	X	7	5M	Existing
1-5yrs	Increase and improve drainage capacity in areas of existing and new construction (incl. increasing tile size where necessary (Flooding, Tropical Cyclone)	Sevier County EMA	All Jurisdictions			x			X	X	11	2M	Existing
1-5yrs	Maintain storm water systems (e.g., clean drainage areas/tiles, replace damaged tiles) (Flooding, Tropical Cyclone)	Sevier County EMA	All Jurisdictions		x				X	X	10	4M	Existing
1-5yrs	Implement flood risk management principles into planning, including emergency protocol changes for flash flood warnings (Flooding, Tropical Cyclone)	Sevier County EMA	All Jurisdictions		X				X	X	13	500k	Existing
1-3yrs	Implement access restriction strategies (e.g., place barriers and signs in area) for frequently flooded roadways	Sevier County EMA	All Jurisdictions		X				X	X	8	$15k / per Barrier	Existing
1-3yrs	Site critical infrastructure (especially electrical) above/out of low-lying areas for new construction (Flooding, Tropical Cyclone)	Sevier County EMA	All Jurisdictions			x			X	X	8	2.5M	Existing
1-3yrs	Harden electrical systems to include surge protection mechanisms (Flooding, Tropical Cyclone)	Sevier County EMA	All Jurisdictions			x			X	X	10	3M	Existing

1-3yrs	Harden underground electrical transmission infrastructure (Flooding, Tropical Cyclone)	Sevier County EMA	All Jurisdictions			x			X	X	8	5M	Existing
1-3yrs	Add surge protection mechanisms specific to fire alarms for all buildings (Flooding, Tropical Cyclone)	Sevier County EMA	All Jurisdictions		x				X	X	7	2.5M	Existing
1-3yrs	Provide and maintain additional signage and road markings for pedestrians and vehicles at crosswalks, as allowed by municipal code (Infrastructure Incident)	Sevier County EMA	All Jurisdictions		X				X	X	11	150k	Existing
1-3yrs	Study the impact of mass/public transportation and other incidents in the county (Infrastructure Incident)	Sevier County EMA	All Jurisdictions		X				X	X	14	100k	Existing
1-3yrs	Retrofit water supply systems (Infrastructure Incident, Wildfires)	Sevier County EMA	All Jurisdictions			x			X	X	11	1M	Existing
1-5yrs	Assess and implement erosion control measures (Geological Hazards)	Sevier County EMA	All Jurisdictions		X				X	X	11	2M	Existing
1-3yrs	Assess and implement soil/ slope stabilization measures (Geological Hazards)	Sevier County EMA	All Jurisdictions		X				X	X	10	2.5M	Existing
1-2yrs	Identify and assess impacts of invasive plant species and how these species may increase risk for various hazards (Geological Hazards, Wildfires)	Sevier County EMA	All Jurisdictions		X				X	X	7	250k	Existing
1-3yrs	Relocate some utilities underground (All Hazards)	Sevier County EMA	All Jurisdictions		X				X	X	7	3M	Existing
1-3yrs	Perform a detailed building assessment for retrofitting buildings to withstand hazard incidents (All Hazards)	Sevier County EMA	All Jurisdictions			X			X	X	9	2M	Existing
1-3yrs	Map, analyze, and assess known sinkhole locations and impacts on infrastructure (Geological Hazards)	Sevier County EMA	All Jurisdictions			x			X	X	9	1M	Existing

1-3yrs	Utilize risk assessment information to inform future policies and codes regarding construction in sinkhole-prone areas (Geological Hazards)	Sevier County EMA	All Jurisdictions			x			X	X	9	100k	Existing
1-3yrs	Evaluate and provide lightning protection for all buildings (All Hazards)	Sevier County EMA	All Jurisdictions			x			X	X	7	2M	Existing
1-3yrs	Expand lightning detection sensors or systems (All Hazards)	Sevier County EMA	All Jurisdictions		X				X	X	9	25k	Existing
	Identify wildland fire safe zones and increase fire rating signage (Wildfires)	Sevier County EMA	All Jurisdictions		X				X	X	14	200k	Existing
1-3yrs	Increase water supply and structure-specific hydration systems (install sprinklers, provide dedicated power sources and cisterns, increase pump capacity, construct dry hydrants (Wildfires)	Sevier County EMA	All Jurisdictions			x			X	X	13	1M	Existing
1-3yrs	Develop a comprehensive plan to ensure wildfire mitigation (incl. protection of external fuel sources) and removal of fire fuels both on & off private property (Wildfires)	Sevier County EMA	All Jurisdictions			x			X	X	14	200k	Existing
1-3yrs	Develop and maintain a database to track community vulnerability to wildfire (Wildfires)	Sevier County EMA	All Jurisdictions			x			X	X	13	250k	Existing
1-3yrs	Implement fuels management program	Sevier County EMA	All Jurisdictions			x			X	X	11	250k	Existing
1-3yrs	Maintain and update fire detection and suppression systems in all buildings at and above code (Wildfires)	Sevier County EMA	All Jurisdictions		x				X	X	10	2M	Existing
1-3yrs	Train personnel to effectively react to wildfires (Wildfires)	Sevier County EMA	All Jurisdictions		x				X	X	15	Unknown	Existing
1-3yrs	Develop process for holistic assessment of spaces with high hazards (incl. safety protocols and	Sevier County EMA	All Jurisdictions			x			X	X	13	100k	Existing

	land-use) for risk-informed sitings (Wildfires)												
1-3yrs	Maintain and improve snow and ice mitigation measures to clear roads (Severe Weather)	Sevier County EMA	All Jurisdictions		x				X	X	9	Unknown	Existing
1-3yrs	Obtain cat-track conversion systems for ATV's to improve search and rescue efforts (Severe Weather)	Sevier County EMA	All Jurisdictions			x			X	X	8	300k	Existing
2025 Projects													
1-5yrs	Expand Sevier County Outdoor Warning System (All Hazards)	Sevier County EMA	All Jurisdictions		x				X	X	11	2M	New
1-5yrs	Install additional Stream/River Gauges to monitor water levels (Flooding)	Sevier County EMA	All Jurisdictions		x				X	X	13	750k	New
1-5yrs	Earthquake Preparedness Workshop (Earthquakes and Geological Hazards)	Sevier County EMA	All Jurisdictions			X			X	X	8	150k	New
1-3yrs	Drinking Water Production Capabilities (All-Hazards)	Sevier County Public Works	Sevier County			X			X	X	10	1M	New
1-5yrs	Public Shelters/Safe Rooms (All-Hazards)	Sevier County EMA	Sevier County			X			X	X	10	4M	New
1-5yrs	Install Wildfire Suppression System at Critical Infrastructure locations within the WUI (Wildfires)	Sevier County EMA	Sevier County			X			X	X	11	4M	New
1-5yrs	Identify Wildfire Protection Strategies for Critical Infrastructure (Wildfires)	SC Fire Dept/EMA	Sevier County			X			X	X	12	250k	New
1-5yrs	Enhance our current AQ weather sites to make them more like the RAWS sites fires maintains that are at Indian Grave (Blount Co) and Cherokee (near Round Bottom) in Swain Co. Sevier County needs a RAWS site, maybe at Twin Creeks. Big gap along our TN-side from Indian Grave (Blount Co) to the	Sevier County EMA	Sevier County			X			X	X	12	1M	New

	Nolichucky site in Greene Co. (Wildfires)												
1-5yrs	Real-time rain gauge on Mt. LeConte. TN-ANG installing a weather device (may have rain) but focused on cloud ceiling for medivac operations. NWS COOP sites are just daily temp/precip called in by the LeConte caretaker (annually);	Sevier County EMA	Sevier County			X			X	X	11	1.5M	New
1-5yrs	Safe Rooms for All County Schools (All Hazards)	SC Board of Education	Sevier County			X			X	X	8	6M	New
1-5yrs	Train staff in emergency response and reunification procedures (All Hazards/Terrorism)	SC Board of Education	Sevier County		X				X	X	13	250k	New
1-3yrs	Coordinate with surrounding Counties to plan and fund Water Supply issues as a Joint Project (All Hazards)	SC EMA	Sevier County			X			X	X	12	10M	New
1-3yrs	Evacuation Route Study to address the growing population/tourism (All Hazards)	SC Commission	Sevier County			X					12	50k	New

Chapter 4. Implementation, Integration, and Maintenance

This section provides an overview of the overall plan implementation, integration and maintenance strategy and outlines the method and schedule for monitoring, evaluating, and updating the plan. This section also discusses incorporating the plan into existing planning mechanisms and how to address continued public involvement.

4.1 Plan Adoption, Implementation, Monitoring, and Evaluation

4.1.1 Plan Adoption

The purpose of formally adopting this plan is to secure buy-in, raise awareness of the plan, and formalize the plan's implementation. This plan will be adopted by the appropriate governing body for each participating community. Copies of the executed resolutions are shown below.

Note to Reviewer: Executed resolutions will be inserted when they become available.

4.1.2 Implementation

Implementation and maintenance of the plan is critical to the overall success of hazard mitigation planning. This section provides an overview of the overall strategy for plan implementation and maintenance.

Mitigation is most successful when it is incorporated into the day-to-day functions and priorities of the government. Implementation will be accomplished by adhering to the schedules identified for each action and through constant, pervasive, and energetic efforts to network and highlight the multi-objective benefits to each program and the community. This effort is achieved through the routine actions of monitoring agendas, attending meetings, and promoting a safe, sustainable community. Additional mitigation strategies could include consistent and ongoing enforcement of existing policies and vigilant review of programs for coordination and multi-objective opportunities.

Simultaneous to these efforts, it is important to maintain constant monitoring of funding opportunities that can be leveraged to implement some of the more costly actions. This will include creating and maintaining a list of ideas on how to meet local match or participation requirements. When funding does become available, the communities will be able to capitalize on the opportunity due to the diligence of the HMPC. Funding opportunities to be monitored include special pre- and post-disaster funds, state and federal funds, benefit assessments, and other grant programs, including those that can serve or support multi-objective applications.

Elected officials, officials appointed to head community departments and community staff are charged with the implementation of various activities in the plan. Recommendations will be made to modify timeframes for the completion of activities, funding resources, and responsible entities. On an annual basis, the priority standing of various activities may also be changed. Some activities that are found unachievable may be removed from the plan

entirely, and activities addressing problems unforeseen during plan development may be added.

4.2 Integration into Local Planning Mechanism

A vital implementation mechanism that is highly effective and low-cost is the incorporation of the Hazard Mitigation Plan recommendations and their underlying principles into other plans and tools. All plan participants will use existing methods and programs to implement hazard mitigation actions where possible. As previously stated, mitigation is most successful when it is incorporated into government and public service's day-to-day functions and priorities. This plan builds upon the momentum developed through previous and related planning efforts and mitigation programs and recommends implementing actions, where possible, through these other program mechanisms. These existing mechanisms include:

- Regularity Capabilities
- Administrative Capabilities
- Fiscal Capabilities

For further information regarding the different capabilities refer to Chapter 3 – Mitigation Strategy.

Implementation and incorporation into existing planning mechanisms will be conducted by respective planning authorities and will be done through the routine actions of:

- Monitoring other planning/program agendas;
- Attending other planning/program meetings;
- Participating in other planning processes; and
- Monitoring community budget meetings for other community program opportunities.

The successful implementation of this mitigation strategy will require constant and vigilant review of existing plans and programs for coordination and multi-objective opportunities that promote a safe, sustainable community. Efforts should continuously be made to monitor the progress of mitigation actions implemented through other planning mechanisms. Where appropriate, priority actions should be incorporated into Hazard Mitigation Plan updates.

4.3 Monitoring, Evaluating, Updating

For the Hazard Mitigation Plan update review process, the Sevier County Emergency Management Agency Director will be responsible for facilitating, coordinating, and scheduling reviews and maintenance of the plan. The review of the Hazard Mitigation Plan will be conducted as follows:

- The Sevier County Emergency Management Agency will be responsible for leading the meeting to review the plan.
- Notices will be emailed to the members of the HMPC, federal, state, and local agencies, non-profit groups, local planning agencies, and representatives of

business interests, neighboring communities, and others advising them of the date, time, and place for the review.
- Local City officials will be notified by email or phone call.
- Before the review, department heads and others tasked with implementing various projects/actions will be queried concerning progress in their area of responsibility and asked to present a report at the review meeting.
- A copy of the current plan will be available for public comment.
- After the review meeting, a status report will be developed outlining the implementation of projects over the past year.

Criteria for Annual Reviews

The criteria recommended for annual reviews will include the following:

- Community growth or change in the past year to include residential, commercial, and industrial growth trends.
- The number of substantially damaged or improved structures by flood zone and review of jurisdictional NFIP membership.
- Renovations to public infrastructure, including water, sewer, drainage, roads, bridges, gas lines, and buildings.
- Natural hazard occurrences that required activation of the Emergency Operations Center (EOC) and whether the event resulted in a presidential disaster declaration.
- Natural hazard occurrences that were not of a magnitude to warrant activation of the EOC or a federal disaster declaration but were severe enough to cause damage in the community or closure of businesses, schools, or public services.
- The dates of hazardous events, narratives, and documented damages.
- Closures of places of employment or schools and the number of days closed.
- Road or bridge closures due to the hazard and the length of time closed.
- Assessment of the number of private and public buildings damaged and whether the damage was minor, substantial, major, or if buildings were destroyed. The assessment will include residences, mobile homes, commercial structures, industrial structures, and public buildings, such as schools and public safety buildings.
- Review of any changes in federal, state, and local policies to determine the impact of these policies on the community and how and if the policy changes can or should be incorporated into the Hazard Mitigation Plan.
- Review of the implementation status of projects/actions (mitigation strategies). The reason for delay will be discussed for any projects that are behind schedule or not yet started.

4.3.1 Continued Public Involvement

Continued public involvement is imperative to the overall success of the plan's implementation. The update process provides an opportunity to solicit participation from new and existing stakeholders, publicize mitigation success stories, and seek additional public comment. The plan maintenance and update process will include continued public

and stakeholder involvement and input through attendance at designated committee meetings, web postings, press releases to local media, and public hearings.

Public Involvement Process for Annual Reviews

The public will be notified via the Sevier County website or any other form of a publicized social platform (i.e., local newspaper, Facebook, Twitter) well in advance of any public meetings or comment periods.

Public Involvement for Five-year Update

When the HMPC reconvenes for the five-year update, they will coordinate with all stakeholders participating in the planning process—including those that joined the committee since the planning process began—to update and revise the plan. In reconvening, the HMPC will develop a plan for public involvement and will be responsible for disseminating information through various media channels detailing the plan update process. As part of this effort, public meetings will be held, and public comments will be solicited on the plan update draft.

APPENDIX A

Sevier County Emergency Management Agency
321 Court Avenue
Sevierville, TN 37862
(865) 453-4919

Hazard Mitigation

Meeting Topic: 2025 Sevier Co Multi-Jurisdictional Plan Update Kick-Off Meeting

Date: 7/3/25

Time: 10am-12pm

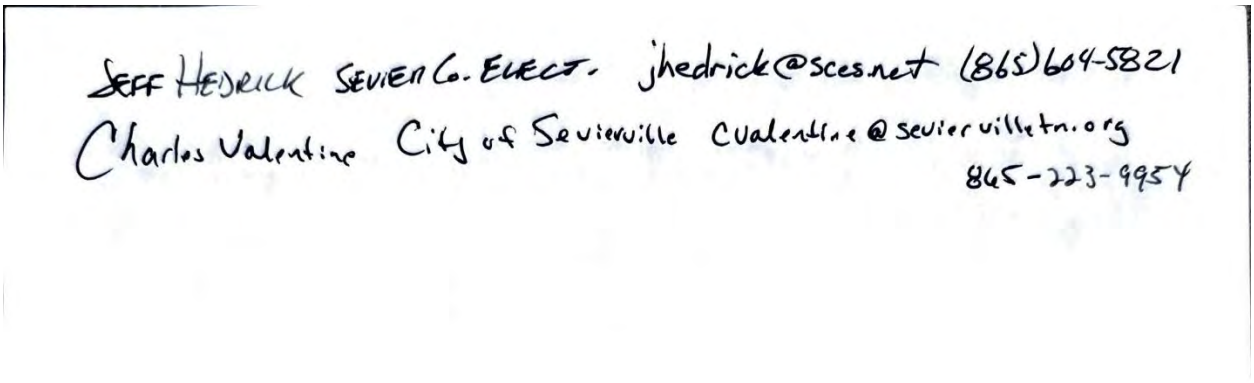
Total Meeting Hours: 2

Location: Sevier Co Courthouse

	Name	Agency	Email Address	Contact #
1	Joe Ayers	Sevier Co EMA	jayers@seviercountytn.gov	
2	Dale Phelps	Gatlinburg	dphelps@gatlinburg tn.gov	865.680.5684
3	MIKE WILLIAMS	SEVIER CO EMA	MWILLIAMS@SEVIERCOUNTY TN. GOV	865 365-7114
4	CHRIS MAPLES	SEVIER CO GOVT	cmaples@seviercountytn.gov	865-253-5329
5	JASON QUEEN	GATLINBURG	jasonq@gatlinburgtn.gov	865-654-7791
6	David Valentine	Gatlinburg	davidv@gatlinburg tn. gov	865-654-5726
7	Beth Maples	Health Dept.	elizabeth-maples@tn.gov	865 296 1677
8	Joshua Carr	Pigeon Forge Fire	JCarr@cityofpigeonforge.com	865-225-2622
9	Wayne Brandeaburg	Gatlinburg Fire	waynebr@gatlinburgtn.gov	865-850-1905
10	Charlie Cook	GFD	charliecook@gatlinburgtn.gov	654 3782
11	Justin Brown	GPD	jbrown@gatlinburg tn.gov	850-6084
12	Roger Knipp	SCEMA	rknipp@seviercotn.org	423-748-4970
13	Josh Garner	TEMA	josh.d.garner@tn.gov	865-599-2773
14	Roger Sims	Gatlinburg	rogers@gatlinburgtn.gov	865-323-6156
15	Seth Butler	Gatlinburg	Sethb@gatlinburgtn.gov	865-436-4401
16	Donnie Shuler	Sevierville FD	dshuler@sevierville tn.gov	865-368-2635
17	TYLER BASLER	SEVIER CO GOV.	TBASLER@SEVIERCOUNTY TN. GOV	865-304-0103
18	Donnie Williams	Sevier Co Hwy	dcock7684@aol.com	865-654-2874
19	Andrew Temple	Sevier Co Govt	atemple@sevier county tn. gov	865-654-6707
20	MIKE HAMBLE	GATLINBURG	mikeh@gatlinburgtn.gov	865-6599497
21	David Taylor	Pigeon Forge	DTaylor@CityofPigeonForge.com	865-603-7256
22	Luke Mintz	Sev. Co. Mayors	lukeamintz@icloud.com	865-712-7350
23	Matt Kulp	National Park Service	Matt_Kulp@nps.gov	865-436-1254
24	Chase Watts	TDH	chase.watts@tn.gov	865-274-2499
25	Dalton York	Gatlinburg - Planning	Daltony@gatlinburg tn.gov	865-436-7992
26	Stephanie Huskey	Sevier Co. Schools	stephaniehuskey@sevier.org	865-320-3814
27	Kristen Reese	JH	Kristen.Reese@matthey.com	
28	Sherman Meade	JH	Sherman.meade@matthey.com	865-273-2690
29	Amanda Marr	Sevierville Chamber	amarr@scoc.org	865-919-5385
30	Charles Powers	Pigeon Forge Fire	cpowers@cityofpigeonforge.gov	865-801-2668
	Rob Ogle	Pigeon Forge IT	rogle@cityofpigeonforge.gov	865-453-9061
	Durand Hacker	Sevierville Water	dhacker@sevierville.org	865-470-5411
	Cory Divel	Sevierville Development	cdivel@sevierville.org	865-868-0934
	Angela Atchley	sevier co.	aatchley@seviercountytn.org	865-774-3816
	Larry Allen	Gatlinburg	larrya@gatlinburgtn.gov	

Sevier County Hazard Mitigation Meeting #1
7/31/2025

Name	Title	Agency/Representing	Email Address	Phone Number
Erik Bolsinger	Plan. Manager	TVA	ewbolsinger@tva.gov	865-632-1112
Mark Miller	Director Public Works	City of Pigeon Forge	mmiller@cityofpigeonforge.com	865-429-7312
Andrew Clark	Chief PCPD	Town of Pittman Center	aclark@pittmancenter.tn.gov	865-436-5499
Sue Carr	Dept Director/PIO	City of Pigeon Forge	Scarr@mypigeonforge.com	865-429-7361
Jared Maples	Senior Co Court		jmaples@seviercountytn.org	865 [illegible]


JEFF HEDRICK SEVIER CO. ELECT. jhedrick@sces.net (865)604-5821
Charles Valentine City of Sevierville CValentine@sevierville tn.org
865-223-9954

Sevier County Government
Director of Public Affairs & Communications Tyler Basler · 1 day ago

Public Meeting: Sevier County Hazard Mitigation Plan

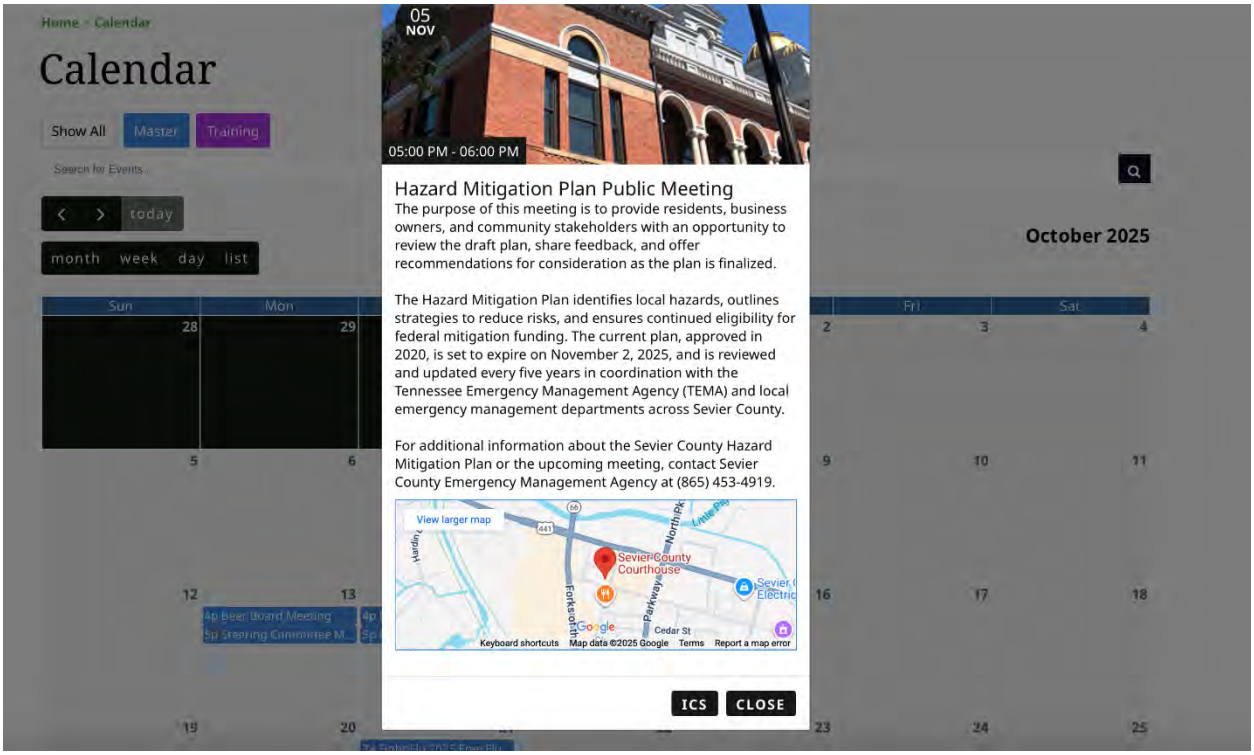
The Sevier County Hazard Mitigation Planning Committee will hold a public meeting on Wednesday, November 5, at 5:00 PM in the Commission Room (306W) of the Sevier County Courthouse.

This meeting gives residents and community members the chance to review and provide input on the draft Sevier County Hazard Mitigation Plan, which identifies local hazards and outlines strategies to reduce risk across the county.

Public feedback is an important part of this process, and all are welcome to attend.

For more information, contact the Sevier County Emergency Management Agency at **(865) 453-4919**.




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October 2025
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Fri
Sat
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NOV
05:00 PM - 06:00 PM
Hazard Mitigation Plan Public Meeting
The purpose of this meeting is to provide residents, business owners, and community stakeholders with an opportunity to review the draft plan, share feedback, and offer recommendations for consideration as the plan is finalized.
The Hazard Mitigation Plan identifies local hazards, outlines strategies to reduce risks, and ensures continued eligibility for federal mitigation funding. The current plan, approved in 2020, is set to expire on November 2, 2025, and is reviewed and updated every five years in coordination with the Tennessee Emergency Management Agency (TEMA) and local emergency management departments across Sevier County.
For additional information about the Sevier County Hazard Mitigation Plan or the upcoming meeting, contact Sevier County Emergency Management Agency at (865) 453-4919.
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Public Meeting Scheduled For Sevier County Hazard Mitigation Plan Update
SHARE
Sevier County, Tennessee (October 29, 2025) – The Sevier County Hazard Mitigation Planning Committee will hold a public meeting to gather community input and review the draft of the updated Sevier County Hazard Mitigation Plan.
The meeting will take place on Wednesday, November 5, at 5:00 PM in the Commission Room (306W) of the Sevier County Courthouse, located at 125 Court Avenue, Sevierville, TN 37862.
The purpose of this meeting is to provide residents, business owners, and community stakeholders with an opportunity to review the draft plan, share feedback, and offer recommendations for consideration as the plan is finalized.
The Hazard Mitigation Plan identifies local hazards, outlines strategies to reduce risks, and ensures continued eligibility for federal mitigation funding. The current plan, approved in 2020, is set to expire on November 2, 2025, and is reviewed and updated every five years in coordination with the Tennessee Emergency Management Agency (TEMA) and local emergency management departments across Sevier County.
For additional information about the Sevier County Hazard Mitigation Plan or the upcoming meeting, contact Sevier County Emergency Management Agency at (865) 453-4919.

National Risk Index

August 05, 2025

Sevier County, Tennessee

Summary

Risk Index is **Relatively Low** — Score **61.7**

Expected Annual Loss is **Relatively Low** — Score **58.0**

Social Vulnerability is **Relatively High** — Score **66.3**

Community Resilience is **Relatively Low** — Score **37.3**



While reviewing this report, keep in mind that low risk is driven by lower loss due to natural hazards, lower social vulnerability, and higher community resilience.

For more information about the National Risk Index, its data, and how to interpret the information it provides, please review the **About the National Risk Index** and **How to Take Action** sections at the end of this report. Or, visit the National Risk Index website at **hazards.fema.gov/nri/learn-more** to access supporting documentation and links.

Risk Index

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





62% of U.S. counties have a lower Risk Index

68% of counties in Tennessee have a lower Risk Index

Risk Index Legend

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

No Rating | Not Applicable | Insufficient Data

Hazard Type Risk Index

Hazard type Risk Index scores are calculated using data for only a single hazard type, and reflect a community's Expected Annual Loss value, community risk factors, and the adjustment factor used to calculate the risk value.

Hazard Type	Risk Index Rating	Risk Index Score	National Percentile
Avalanche	Not Applicable	--	
Coastal Flooding	Not Applicable	--	
Cold Wave	Relatively Low	44.4	0 100
Drought	Very Low	33.7	0 100
Earthquake	Relatively Low	89.2	0 100
Hail	Very Low	34.6	0 100
Heat Wave	No Rating	0	0 100
Hurricane	Very Low	52.3	0 100
Ice Storm	Very Low	7.4	0 100
Landslide	Relatively High	97	0 100
Lightning	Relatively High	90.2	0 100
Riverine Flooding	Relatively Moderate	75.5	0 100
Strong Wind	Relatively Moderate	70.8	0 100
Tornado	Relatively Moderate	70	0 100
Tsunami	Not Applicable	--	
Volcanic Activity	Not Applicable	--	
Wildfire	Very Low	28.7	0 100
Winter Weather	Relatively Moderate	65.7	0 100

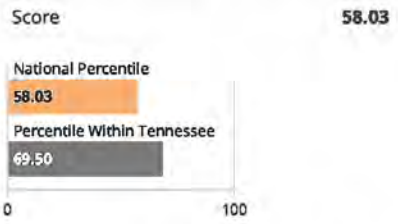
Risk Factor Breakdown

Hazard Type	EAL Value	Social Vulnerability	Community Resilience	CRF	Risk Value	Risk Index Score
Earthquake	$2,213,839	Relatively High	Relatively Low	1.28	$2,863,063	89.2
Tornado	$1,955,287	Relatively High	Relatively Low	1.28	$2,405,076	70
Riverine Flooding	$1,085,416	Relatively High	Relatively Low	1.28	$1,491,940	75.5
Strong Wind	$584,344	Relatively High	Relatively Low	1.28	$724,648	70.8
Lightning	$555,633	Relatively High	Relatively Low	1.28	$670,571	90.2
Landslide	$328,726	Relatively High	Relatively Low	1.28	$447,163	97
Hurricane	$203,812	Relatively High	Relatively Low	1.28	$254,813	52.3
Winter Weather	$87,096	Relatively High	Relatively Low	1.28	$109,150	65.7
Hail	$44,578	Relatively High	Relatively Low	1.28	$54,008	34.6
Cold Wave	$30,335	Relatively High	Relatively Low	1.28	$41,220	44.4
Wildfire	$9,990	Relatively High	Relatively Low	1.28	$11,763	28.7
Drought	$5,027	Relatively High	Relatively Low	1.28	$5,565	33.7
Ice Storm	$2,619	Relatively High	Relatively Low	1.28	$3,208	7.4
Heat Wave	$0	Relatively High	Relatively Low	1.28	$0	0
Avalanche	–	Relatively High	Relatively Low	1.28	--	--
Coastal Flooding	–	Relatively High	Relatively Low	1.28	--	--
Tsunami	–	Relatively High	Relatively Low	1.28	--	--
Volcanic Activity	–	Relatively High	Relatively Low	1.28	--	--

Expected Annual Loss

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





58% of U.S. counties have a lower Expected Annual Loss

69% of counties in Tennessee have a lower Expected Annual Loss

Expected Annual Loss Legend

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

No Expected Annual Losses | Not Applicable | Insufficient Data

Composite Expected Annual Loss			**$7,106,702.76**
Composite Expected Annual Loss Rate National Percentile			**9.3**
Building EAL	**$4,108,286.37**	Population EAL	**0.26** fatalities
Building EAL Rate	**$1 per $4.58K of building value**	Population EAL Rate	**1 per 383.47K people**
Agriculture EAL	**$25,541.41**	Population Equivalence EAL	**$2,972,874.99**
Agriculture EAL Rate	**$1 per $274.68 of agriculture value**		

Expected Annual Loss for Hazard Types

Expected Annual Loss scores for hazard types are calculated using data for only a single hazard type, and reflect a community's relative expected annual loss for only that hazard type.

14 of 18 hazard types contribute to the expected annual loss for **Sevier County, TN.**

Hazard Type	Expected Annual Loss Rating	EAL Value	Score
Earthquake	Relatively Low	$2,213,839	86.9
Tornado	Relatively Moderate	$1,955,288	69.8

Hazard Type	Expected Annual Loss Rating	EAL Value	Score
Riverine Flooding	Relatively Low	$1,085,416	72.4
Strong Wind	Relatively Moderate	$584,344	69.9
Lightning	Relatively High	$555,633	89.4
Landslide	Relatively High	$328,726	96.1
Hurricane	Very Low	$203,812	50.3
Winter Weather	Relatively Moderate	$87,096	65.3
Hail	Very Low	$44,578	36.4
Cold Wave	Relatively Low	$30,335	43.8
Wildfire	Very Low	$9,990	28.1
Drought	Very Low	$5,027	35.4
Ice Storm	Very Low	$2,619	7.9
Heat Wave	No Expected Annual Losses	$0	0.0
Avalanche	Not Applicable	–	–
Coastal Flooding	Not Applicable	–	–
Tsunami	Not Applicable	–	–
Volcanic Activity	Not Applicable	–	–

Expected Annual Loss Values

Hazard Type	Total	Building Value	Population Equivalence	Population	Agriculture Value
Avalanche	–	–	–	–	–
Coastal Flooding	–	–	–	–	–
Cold Wave	$30,335	$198	$30,005	0.00	$132
Drought	$5,027	n/a	n/a	n/a	$5,027
Earthquake	$2,213,839	$1,818,379	$395,460	0.03	n/a
Hail	$44,578	$5,592	$37,075	0.00	$1,911
Heat Wave	$0	$0	$0	0.00	$0
Hurricane	$203,812	$200,212	$2,240	0.00	$1,360
Ice Storm	$2,619	$505	$2,114	0.00	n/a
Landslide	$328,726	$291,232	$37,494	0.00	n/a
Lightning	$555,633	$54,043	$501,590	0.04	n/a
Riverine Flooding	$1,085,416	$256,347	$817,302	0.07	$11,767

Hazard Type	Total	Building Value	Population Equivalence	Population	Agriculture Value
Strong Wind	$584,344	$423,872	$155,258	0.01	$5,214
Tornado	$1,955,287	$1,047,178	$907,980	0.08	$130
Tsunami	--	--	--	--	--
Volcanic Activity	--	--	--	--	--
Wildfire	$9,990	$9,890	$100	0.00	$0
Winter Weather	$87,096	$839	$86,257	0.01	$0

Exposure Values

Hazard Type	Total	Building Value	Population Equivalence	Population	Agriculture Value
Avalanche	--	--	--	--	--
Coastal Flooding	--	--	--	--	--
Cold Wave	$72,559,356,634	$2,491,008,154	$70,068,299,143	6,040.37	$49,338
Drought	$2,330,437	n/a	n/a	n/a	$2,330,437
Earthquake	$1,160,041,962,000	$18,833,962,000	$1,141,208,000,000	98,380.00	n/a
Hail	$1,158,854,495,177	$18,834,279,553	$1,140,013,200,000	98,277.00	$7,015,624
Heat Wave	$0	$0	$0	0.00	$0
Hurricane	$1,155,554,011,814	$18,804,520,601	$1,136,742,510,554	97,995.04	$6,980,660
Ice Storm	$1,158,847,479,553	$18,834,279,553	$1,140,013,200,000	98,277.00	n/a
Landslide	$742,876,757,681	$12,975,237,479	$729,901,520,201	62,922.54	n/a
Lightning	$1,158,847,479,553	$18,834,279,553	$1,140,013,200,000	98,277.00	n/a
Riverine Flooding	$57,309,720,654	$1,481,858,427	$55,826,633,633	4,812.64	$1,228,593
Strong Wind	$1,158,854,495,177	$18,834,279,553	$1,140,013,200,000	98,277.00	$7,015,624
Tornado	$1,158,854,495,177	$18,834,279,553	$1,140,013,200,000	98,277.00	$7,015,624
Tsunami	--	--	--	--	--
Volcanic Activity	--	--	--	--	--
Wildfire	$11,862,580,861	$232,959,266	$11,629,587,726	1,002.55	$33,869
Winter Weather	$1,158,854,495,177	$18,834,279,553	$1,140,013,200,000	98,277.00	$7,015,624

Annualized Frequency Values

Hazard Type	Annualized Frequency	Events on Record	Period of Record
Avalanche	--	--	--

Hazard Type	Annualized Frequency	Events on Record	Period of Record
Coastal Flooding	–	–	–
Cold Wave	0.2 events per year	3	2005-2021 (16 years)
Drought	24.7 events per year	616	2000-2021 (22 years)
Earthquake	0.162% chance per year	n/a	2021 dataset
Hail	3.2 events per year	110	1986-2021 (34 years)
Heat Wave	0 events per year	0	2005-2021 (16 years)
Hurricane	0 events per year	3	East 1851-2021 (171 years) / West 1949-2021 (73 years)
Ice Storm	0.2 events per year	14	1946-2014 (67 years)
Landslide	0 events per year	6	2010-2021 (12 years)
Lightning	55.1 events per year	1,213	1991-2012 (22 years)
Riverine Flooding	1.3 events per year	30	1996-2019 (24 years)
Strong Wind	4.3 events per year	148	1986-2021 (34 years)
Tornado	0.1 events per year	3	1950-2021 (72 years)
Tsunami	–	–	–
Volcanic Activity	–	–	–
Wildfire	0.030% chance per year	n/a	2021 dataset
Winter Weather	2.4 events per year	38	2005-2021 (16 years)

Historic Loss Ratios

Hazard Type	Overall Rating
Avalanche	–
Coastal Flooding	–
Cold Wave	Very Low
Drought	Relatively Low
Earthquake	Relatively Moderate
Hail	Very Low
Heat Wave	No Rating
Hurricane	Relatively Low
Ice Storm	Very Low
Landslide	Very Low
Lightning	Relatively Moderate

Hazard Type	Overall Rating
Riverine Flooding	Very Low
Strong Wind	Very Low
Tornado	Relatively Moderate
Tsunami	–
Volcanic Activity	–
Wildfire	Very Low
Winter Weather	Relatively Low

Expected Annual Loss Rate

Hazard Type	Building EAL Rate (per building value)	Population EAL Rate (per population)	Agriculture EAL Rate (per agriculture value)
Avalanche	–	–	–
Coastal Flooding	–	–	–
Cold Wave	$1 per $95.34M	1 per 37.99M	$1 per $52.99K
Drought	–	–	$1 per $1.40K
Earthquake	$1 per $10.36K	1 per 2.88M	–
Hail	$1 per $3.37M	1 per 30.75M	$1 per $3.67K
Heat Wave	–	–	–
Hurricane	$1 per $94.07K	1 per 508.88M	$1 per $5.16K
Ice Storm	$1 per $37.30M	1 per 539.39M	–
Landslide	$1 per $64.67K	1 per 30.40M	–
Lightning	$1 per $348.51K	1 per 2.27M	–
Riverine Flooding	$1 per $73.47K	1 per 1.39M	$1 per $596.21
Strong Wind	$1 per $44.43K	1 per 7.34M	$1 per $1.35K
Tornado	$1 per $17.99K	1 per 1.26M	$1 per $53.91K
Tsunami	–	–	–
Volcanic Activity	–	–	–
Wildfire	$1 per $1.90M	1 per 11.41B	$1 per $44.39M
Winter Weather	$1 per $22.44M	1 per 13.22M	$1 per $74.45M

Social Vulnerability

Social groups in **Sevier County, TN** have a **Relatively High** susceptibility to the adverse impacts of natural hazards when compared to the rest of the U.S.



Score **66.33**

National Percentile
66.33

Percentile Within Tennessee
73.70

0 100

66% of U.S. counties have a lower Social Vulnerability

74% of counties in Tennessee have a lower Social Vulnerability

Social Vulnerability Legend

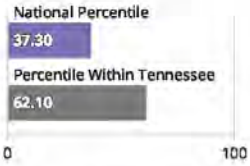
Very High | Relatively High | Relatively Moderate | Relatively Low | Very Low | Data Unavailable

Community Resilience

Communities in **Sevier County, TN** 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.



Score **37.3**



63% of U.S. counties have a higher Community Resilience

38% of counties in Tennessee have a higher Community Resilience

Community Resilience Legend

Very High | Relatively High | Relatively Moderate | Relatively Low | Very Low | Data Unavailable

About the National Risk Index

The National Risk Index is a dataset and online tool to help illustrate the United States communities most at risk for 18 natural hazards: Avalanche, Coastal Flooding, Cold Wave, Drought, Earthquake, Hail, Heat Wave, Hurricane, Ice Storm, Landslide, Lightning, Riverine Flooding, Strong Wind, Tornado, Tsunami, Volcanic Activity, Wildfire, and Winter Weather.

The National Risk Index leverages available source data for Expected Annual Loss due to these 18 hazard types, Social Vulnerability, and Community Resilience to develop a baseline relative risk measurement for each United States county and Census tract. These measurements are calculated using average past conditions, but they cannot be used to predict future outcomes for a community. The National Risk Index is intended to fill gaps in available data and analyses to better inform federal, state, local, tribal, and territorial decision makers as they develop risk reduction strategies.

Explore the National Risk Index Map at **hazards.fema.gov/nri/map**.

Visit the National Risk Index website at **hazards.fema.gov/nri/learn-more** to access supporting documentation and links.

Calculating the Risk Index

Risk Index values are calculated using an equation* that combines values for Expected Annual Loss (EAL) due to natural hazards, with the Community Risk Factor (CRF), which is a function of Social Vulnerability and Community Resilience:

$$\text{Risk Index} = \text{Expected Annual Loss} \times \text{Community Risk Factor}$$

$$\text{where Community Risk Factor} = f\left(\frac{\text{Social Vulnerability}}{\text{Community Resilience}}\right)$$

*County-level risk values are derived by summing the risk values of all Census tracts within that county.

Risk is presented as a composite value and score for all 18 hazard types, as well as individual values and scores for each hazard type.

For more information, visit **hazards.fema.gov/nri/determining-risk.**

Calculating Expected Annual Loss

Expected Annual Loss values are calculated using an equation* that combines values for exposure, annualized frequency, and historic loss ratios for 18 hazard types:

$$\text{Expected Annual Loss} = \text{Exposure} \times \text{Annualized Frequency} \times \text{Historic Loss Ratio}$$

*Excluding Avalanche, Drought, Earthquake, and Tornado, EAL values for each hazard are calculated at the Census block level and summed together to determine Census tract and county-level hazard type EAL values.

Expected Annual Loss is presented as a composite value and score for all 18 hazard types, as well as individual values and scores for each hazard type.

For more information, visit **hazards.fema.gov/nri/expected-annual-loss.**

Calculating Social Vulnerability

Social Vulnerability is measured using the Social Vulnerability Index (SVI) published by the Centers for Disease Control and Prevention (CDC).

For more information, visit **hazards.fema.gov/nri/social-vulnerability.**

Calculating Community Resilience

Community Resilience is measured at the County level using the Baseline Resilience Indicators for Communities (HVRI BRIC) published by the University of South Carolina's Hazards and Vulnerability Research Institute (HVRI).

For more information, visit **hazards.fema.gov/nri/community-resilience.**

Values, Scores, and Ratings

The National Risk Index provides three different types of results for Risk and each component used to derive Risk: EAL, Social Vulnerability, and Community Resilience:

Values. Values for Risk and EAL are in units of dollars, representing the community's average economic loss from natural hazards each year. For Social Vulnerability and Community Resilience, values are the index values for the community provided by the source data sets.

Scores. Scores represent the national percentile ranking of the community's component value compared to all other communities at the same level (county or Census tract).

Ratings. Ratings refer to the qualitative terms that describe the relative risk of an area within the same geographic level. These rating categories range from "Very Low" to "Very High". Ratings for Social Vulnerability and Community Resilience are based on quintiles of those components' scores, while Risk and EAL ratings are based on more advanced statistical calculations on values . As a result, there is no fixed range of scores or values that correspond to the rating categories.

How to Take Action

There are many ways to reduce natural hazard risk through mitigation. Communities with high National Risk Index scores can take action to reduce risk by decreasing Expected Annual Loss due to natural hazards, decreasing Social Vulnerability, and increasing Community Resilience.

For information about how to take action and reduce your risk, visit **hazards.fema.gov/nri/take-action**.

Disclaimer

The National Risk Index (the Risk Index or the Index) and its associated data are meant for planning purposes only. This tool was created for broad nationwide comparisons and is not a substitute for localized risk assessment analysis. Nationwide datasets used as inputs for the National Risk Index are, in many cases, not as accurate as available local data. Users with access to local data for each National Risk Index risk factor should consider substituting the Risk Index data with local data to recalculate a more accurate risk index. If you decide to download the National Risk Index data and substitute it with local data, you assume responsibility for the accuracy of the data and any resulting data index. Please visit the **Contact Us** page if you would like to discuss this process further.

The methodology used by the National Risk Index has been reviewed by subject matter experts in the fields of natural hazard risk research, risk analysis, mitigation planning, and emergency management. The processing methods used to create the National Risk Index have produced results similar to those from other natural hazard risk analyses conducted on a smaller scale. The breadth and combination of geographic information systems (GIS) and data processing techniques leveraged by the National Risk Index enable it to incorporate multiple hazard types and risk factors, manage its nationwide scope, and capture what might have been missed using other methods.

The National Risk Index does not consider the intricate economic and physical interdependencies that exist across geographic regions. Keep in mind that hazard impacts in surrounding counties or Census tracts can cause indirect losses in your community regardless of your community's risk profile.

Nationwide data available for some risk factors are rudimentary at this time. The risk profiles for the vast majority of hazard types are based on historical frequency and loss data. They represent risk and expected annual loss based on average past conditions, not future predictions. The National Risk Index will be continuously updated as new data become available and improved methodologies are identified.

For comprehensive details about how the Risk Index can help you and its limitations, see the **National Risk Index Technical Documentation**

Assumption of Risk

In view of the identified limitations of the National Risk Index associated data, by using the data, you acknowledge and agree that FEMA makes no representations or warranties about the accuracy, completeness, or fitness for any particular purpose of the data; that the data is provided "as is" without warranty of any kind; that you assume full responsibility for any consequences that may arise, including financial losses, legal disputes, or other adverse outcomes; and that you release FEMA and the federal government from any liability that may arise to the extent allowable by law.

Attribution, No Endorsement

Please attribute your use of the National Risk Index and its associated data to the Federal Emergency Management Agency.

However, you acknowledge and agree that nothing herein constitutes and endorsement of you or your work by FEMA or the federal government, and you shall not imply through use of the National Risk Index or its associated data or through providing attribution, that FEMA or the federal government endorses you.

Preferred citation for the National Risk Index:

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The National Risk Index Contact Us page is available at **hazards.fema.gov/nri/contact-us**.

HAZUS™ FEMA

RiskMAP
Increasing Resilience Together

Hazus: Earthquake Global Risk Report

Region Name: Sevier_EQ_2025

Earthquake Scenario: Madisonville_6.1_East_SE

Print Date: July 25, 2025

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

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General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Tennessee

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 598.52 square miles and contains 27 census tracts. There are over 39 thousand households in the region which has a total population of 98,380 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 51 thousand buildings in the region with a total building replacement value (excluding contents) of 18,833 (millions of dollars). Approximately 90.00 % of the buildings (and 68.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 1,388 and 2,435 (millions of dollars) , respectively.

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Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 51 thousand buildings in the region which have an aggregate total replacement value of 18,833 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 60% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 79 beds. There are 37 schools, 19 fire stations, 6 police stations and 2 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 3,823.00 (millions of dollars). This inventory includes over 122.41 miles of highways, 272 bridges, 3,802.79 miles of pipes.

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Table 1: Transportation System Lifeline Inventory

System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	272	387.8469
	Segments	30	974.6809
	Tunnels	3	16.4204
		Subtotal	**1378.9482**
Railways	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	0	0.0000
		Subtotal	**0.0000**
Ferry	Facilities	0	0.0000
		Subtotal	**0.0000**
Port	Facilities	0	0.0000
		Subtotal	**0.0000**
Airport	Facilities	1	5.3000
	Runways	1	4.7337
		Subtotal	**10.0337**
		Total	**1,389.00**

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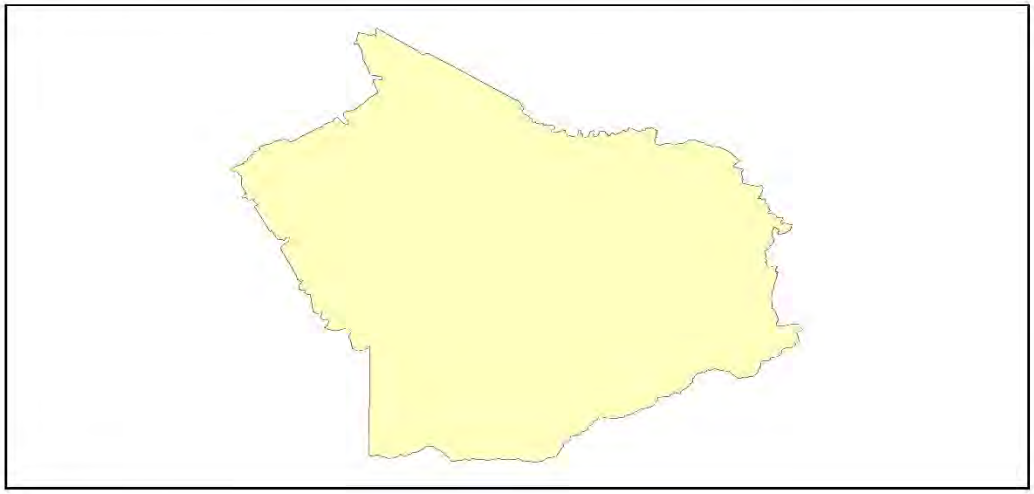
Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	76.0919
	Facilities	1	29.3040
	Pipelines	0	0.0000
		Subtotal	**105.3959**
Waste Water	Distribution Lines	NA	45.6552
	Facilities	11	1411.1229
	Pipelines	0	0.0000
		Subtotal	**1456.7781**
Natural Gas	Distribution Lines	NA	30.4368
	Facilities	1	11.2295
	Pipelines	4	98.1271
		Subtotal	**139.7934**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	1	732.6437
		Subtotal	**732.6437**
Communication	Facilities	6	0.5280
		Subtotal	**0.5280**
		Total	**2,435.10**

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Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	Madisonville_6.1_East_SE
Type of Earthquake	Arbitrary
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	-84.34
Latitude of Epicenter	35.51
Earthquake Magnitude	6.10
Depth (km)	15.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

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Direct Earthquake Damage

Building Damage

Hazus estimates that about 1,260 buildings will be at least moderately damaged. This is over 2.00 % of the buildings in the region. There are an estimated 13 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

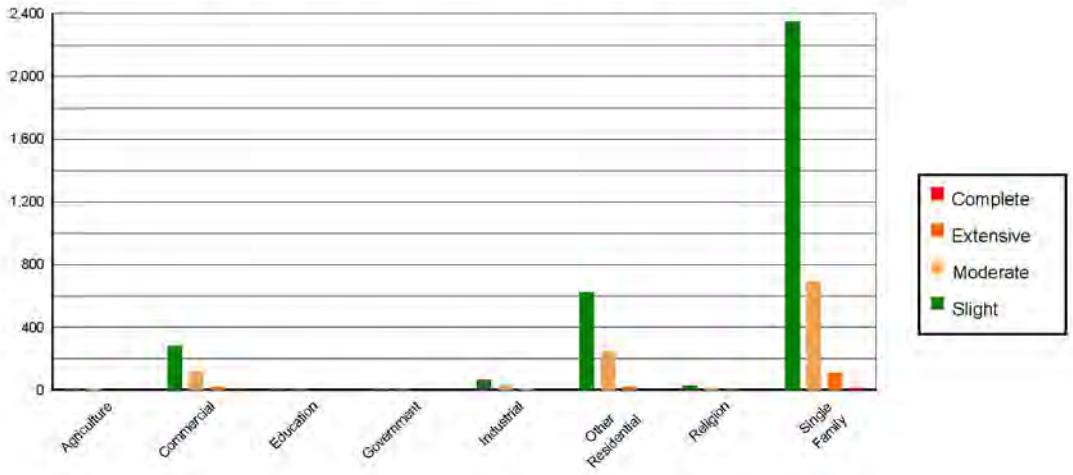


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	95.61	0.20	7.19	0.21	2.78	0.25	0.40	0.27	0.02	0.18
Commercial	3214.28	6.83	279.67	8.33	114.35	10.44	19.04	12.55	1.66	12.22
Education	43.74	0.09	3.66	0.11	1.38	0.13	0.20	0.13	0.02	0.12
Government	80.58	0.17	6.39	0.19	2.56	0.23	0.42	0.28	0.05	0.34
Industrial	711.21	1.51	64.43	1.92	31.16	2.85	4.96	3.27	0.25	1.81
Other Residential	7658.57	16.27	622.28	18.53	244.97	22.37	17.88	11.78	0.30	2.22
Religion	335.02	0.71	25.44	0.76	9.12	0.83	1.34	0.88	0.08	0.62
Single Family	34928.57	74.21	2348.74	69.95	688.94	62.90	107.52	70.85	11.22	82.49
Total	**47,068**		**3,358**		**1,095**		**152**		**14**	

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Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	29495.70	62.67	1409.90	41.99	176.34	16.10	6.86	4.52	0.00	0.00
Steel	1798.89	3.82	119.28	3.55	57.95	5.29	6.16	4.06	0.07	0.50
Concrete	120.75	0.26	7.02	0.21	2.09	0.19	0.10	0.07	0.00	0.00
Precast	68.79	0.15	4.27	0.13	3.12	0.28	0.69	0.46	0.00	0.00
RM	4.76	0.01	0.13	0.00	0.06	0.01	0.00	0.00	0.00	0.00
URM	11564.14	24.57	1391.08	41.43	654.85	59.79	123.48	81.36	13.51	99.37
MH	4014.55	8.53	426.12	12.69	200.85	18.34	14.47	9.53	0.02	0.12
Total	**47,068**		**3,358**		**1,095**		**152**		**14**	

*Note:
RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

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Essential Facility Damage

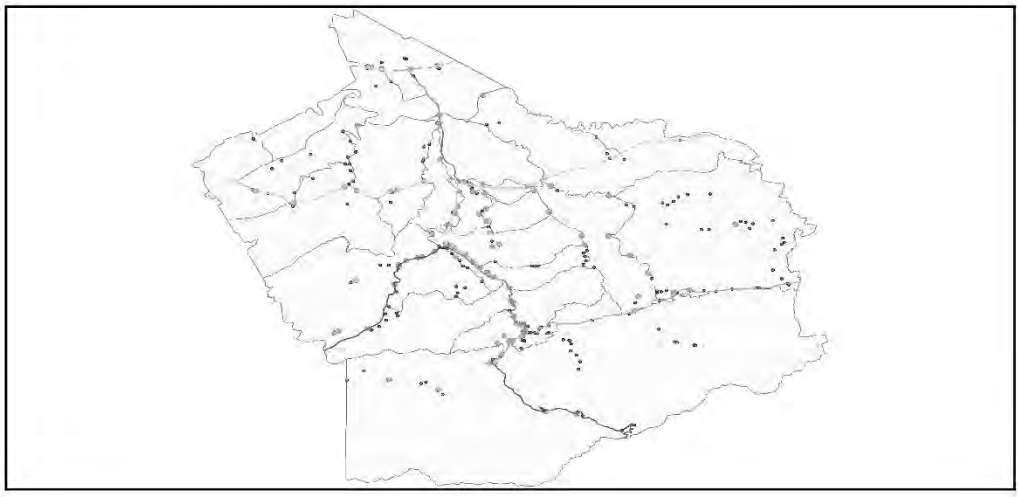
Before the earthquake, the region had 79 hospital beds available for use. On the day of the earthquake, the model estimates that only 73 hospital beds (94.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 98.00% of the beds will be back in service. By 30 days, 100.00% will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	1	0	0	1
Schools	37	0	0	37
EOCs	2	0	0	2
PoliceStations	6	0	0	6
FireStations	19	0	0	19

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Transportation Lifeline Damage



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Table 6: Expected Damage to the Transportation Systems

System	Component	Number of Locations				
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 % After Day 1	With Functionality > 50 % After Day 7
Highway	Segments	30	0	0	30	30
	Bridges	272	0	0	272	272
	Tunnels	3	0	0	3	3
Railways	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	1	0	0	1	1
	Runways	1	0	0	1	1

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

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Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	1	0	0	1	1
Waste Water	11	0	0	0	0
Natural Gas	1	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	1	0	0	0	0
Communication	6	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	2,364	0	0
Waste Water	1,418	0	0
Natural Gas	20	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water						
Electric Power						

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Induced Earthquake Damage

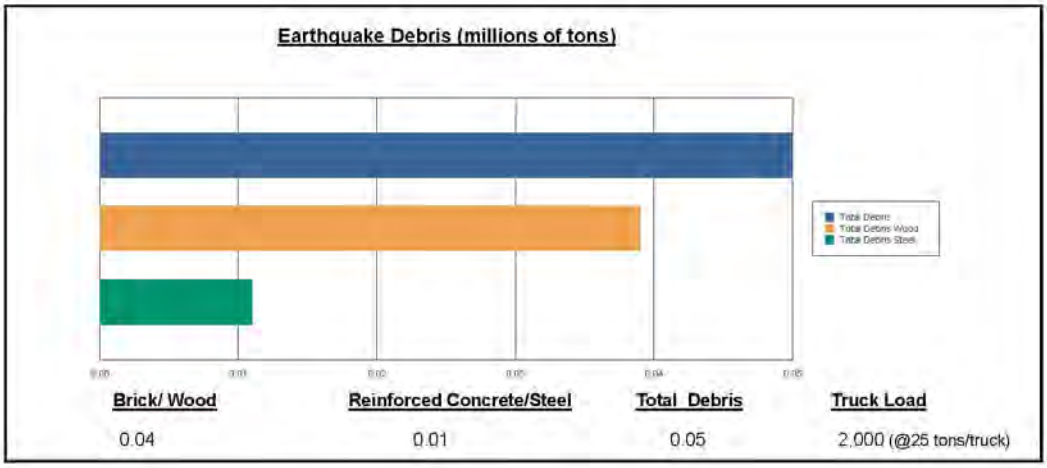
Fire Following Earthquake

Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 50,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 78.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 2,000 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.



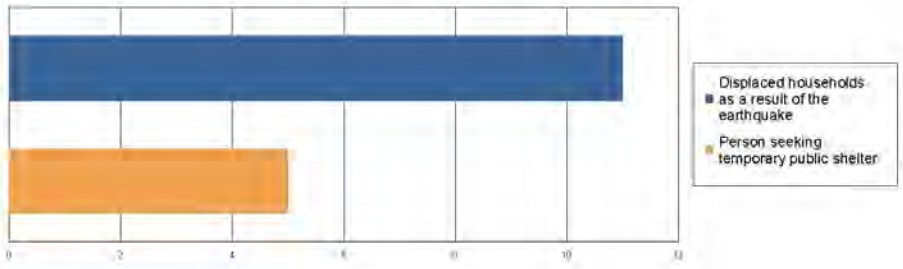
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Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 11 households to be displaced due to the earthquake. Of these, 5 people (out of a total population of 98,380) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
11	5

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows:

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake.

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Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0.26	0.04	0.00	0.01
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.02	0.00	0.00	0.00
	Industrial	0.19	0.02	0.00	0.00
	Other-Residential	2.46	0.20	0.00	0.00
	Single Family	12.32	1.68	0.15	0.29
	Total	**15**	**2**	**0**	**0**
2 PM	Commercial	15.76	2.29	0.21	0.40
	Commuting	0.00	0.00	0.01	0.00
	Educational	4.34	0.65	0.06	0.12
	Hotels	0.00	0.00	0.00	0.00
	Industrial	1.41	0.18	0.01	0.02
	Other-Residential	0.75	0.06	0.00	0.00
	Single Family	3.94	0.55	0.05	0.10
	Total	**26**	**4**	**0**	**1**
5 PM	Commercial	10.06	1.46	0.14	0.25
	Commuting	0.06	0.08	0.14	0.03
	Educational	0.13	0.02	0.00	0.00
	Hotels	0.01	0.00	0.00	0.00
	Industrial	0.88	0.11	0.01	0.02
	Other-Residential	0.89	0.07	0.00	0.00
	Single Family	4.90	0.69	0.07	0.12
	Total	**17**	**2**	**0**	**0**

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Economic Loss

The total economic loss estimated for the earthquake is 146.14 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

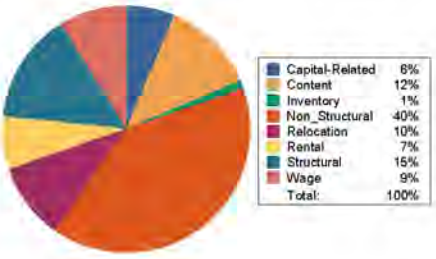
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Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 144.95 (millions of dollars); 32 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 53 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

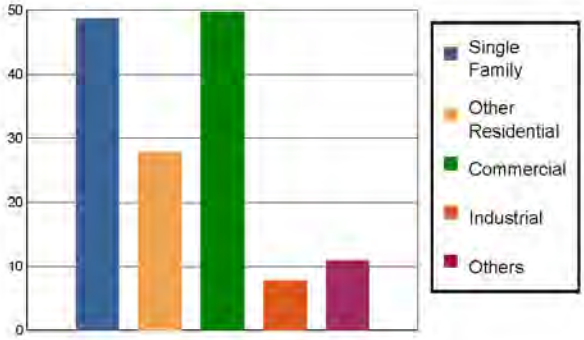


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	3.3891	8.4420	0.1874	0.7144	12.7329
	Capital-Related	0.0000	1.4387	7.5777	0.1125	0.1224	9.2513
	Rental	1.8095	4.2982	3.5158	0.1149	0.1985	9.9369
	Relocation	6.4986	1.1123	4.5924	0.7157	1.6690	14.5880
	Subtotal	**8.3081**	**10.2383**	**24.1279**	**1.1305**	**2.7043**	**46.5091**
Capital Stock Losses							
	Structural	10.1261	2.5740	5.5905	1.3947	1.5797	21.2650
	Non_Structural	24.7059	12.4592	12.9553	3.0540	4.5540	57.7284
	Content	5.5489	2.6534	5.5663	1.8219	1.9821	17.5726
	Inventory	0.0000	0.0000	1.4842	0.3435	0.0453	1.8730
	Subtotal	**40.3809**	**17.6866**	**25.5963**	**6.6141**	**8.1611**	**98.4390**
	Total	**48.69**	**27.92**	**49.72**	**7.74**	**10.87**	**144.95**

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Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	974.6809	0.0000	0.00
	Bridges	387.8469	0.9002	0.23
	Tunnels	16.4204	0.0000	0.00
	Subtotal	**1378.9482**	**0.9002**	
Railways	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	5.3000	0.1511	2.85
	Runways	4.7337	0.0000	0.00
	Subtotal	**10.0337**	**0.1511**	
	Total	**1,388.98**	**1.05**	

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Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	29.3040	0.1386	0.47
	Distribution Lines	76.0919	0.0000	0.00
	Subtotal	**105.3959**	**0.1386**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	1411.1229	0.0000	0.00
	Distribution Lines	45.6552	0.0000	0.00
	Subtotal	**1456.7781**	**0.0000**	
Natural Gas	Pipelines	98.1271	0.0000	0.00
	Facilities	11.2295	0.0000	0.00
	Distribution Lines	30.4368	0.0000	0.00
	Subtotal	**139.7934**	**0.0000**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	732.6437	0.0000	0.00
	Subtotal	**732.6437**	**0.0000**	
Communication	Facilities	0.5280	0.0000	0.00
	Subtotal	**0.5280**	**0.0000**	
	Total	**2,435.14**	**0.14**	

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Appendix A: County Listing for the Region

Sevier,TN

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Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Tennessee					
	Sevier	98,380	12,798	6,035	18,833
Total Region		**98,380**	**12,798**	**6,035**	**18,833**

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Hazus: Flood Global Risk Report

Region Name:	Sevier_100_Flood
Flood Scenario:	Sevier_100yr_Flood
Print Date:	Wednesday, August 20, 2025

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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RiskMAP
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General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Tennessee

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 46 square miles and contains 2,595 census blocks. The region contains over 40 thousand households and has a total population of 98,277 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 51,686 buildings in the region with a total building replacement value (excluding contents) of 18,831 million dollars. Approximately 90.22% of the buildings (and 67.96% of the building value) are associated with residential housing.

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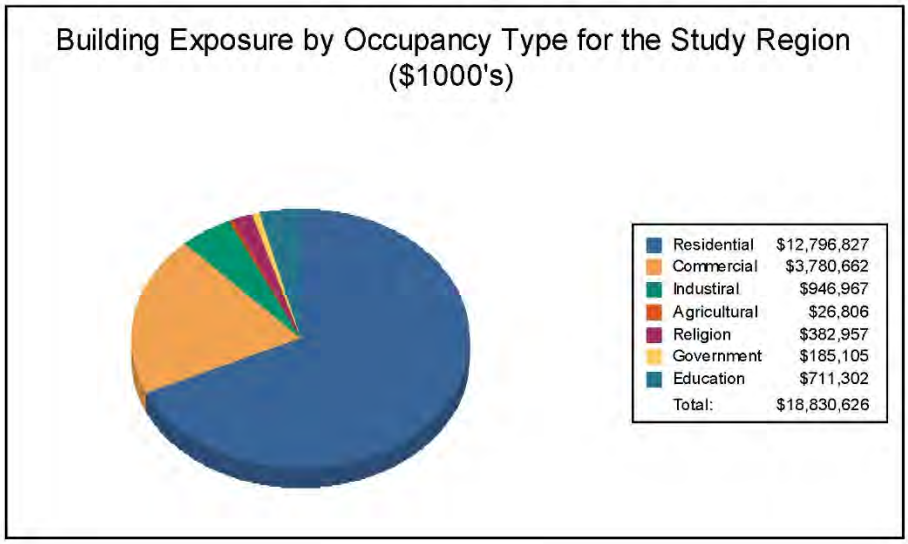
Building Inventory

General Building Stock

Hazus estimates that there are 51,686 buildings in the region which have an aggregate total replacement value of 18,831 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

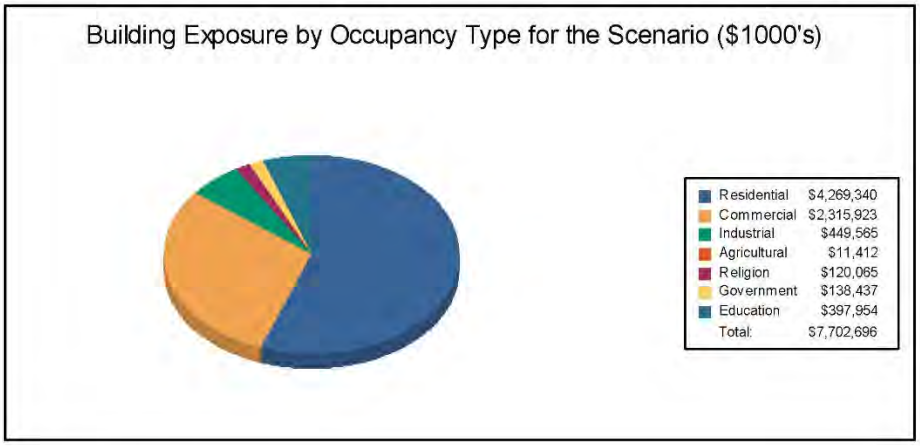
Occupancy	Exposure ($1000)	Percent of Total
Residential	12,796,827	68.0%
Commercial	3,780,662	20.1%
Industrial	946,967	5.0%
Agricultural	26,806	0.1%
Religion	382,957	2.0%
Government	185,105	1.0%
Education	711,302	3.8%
Total	**18,830,626**	**100%**



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Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	4,269,340	55.4%
Commercial	2,315,923	30.1%
Industrial	449,565	5.8%
Agricultural	11,412	0.1%
Religion	120,065	1.6%
Government	138,437	1.8%
Education	397,954	5.2%
Total	**7,702,696**	**100%**



Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 79 beds.
There are 37 schools, 19 fire stations, 6 police stations and 2 emergency operation centers.

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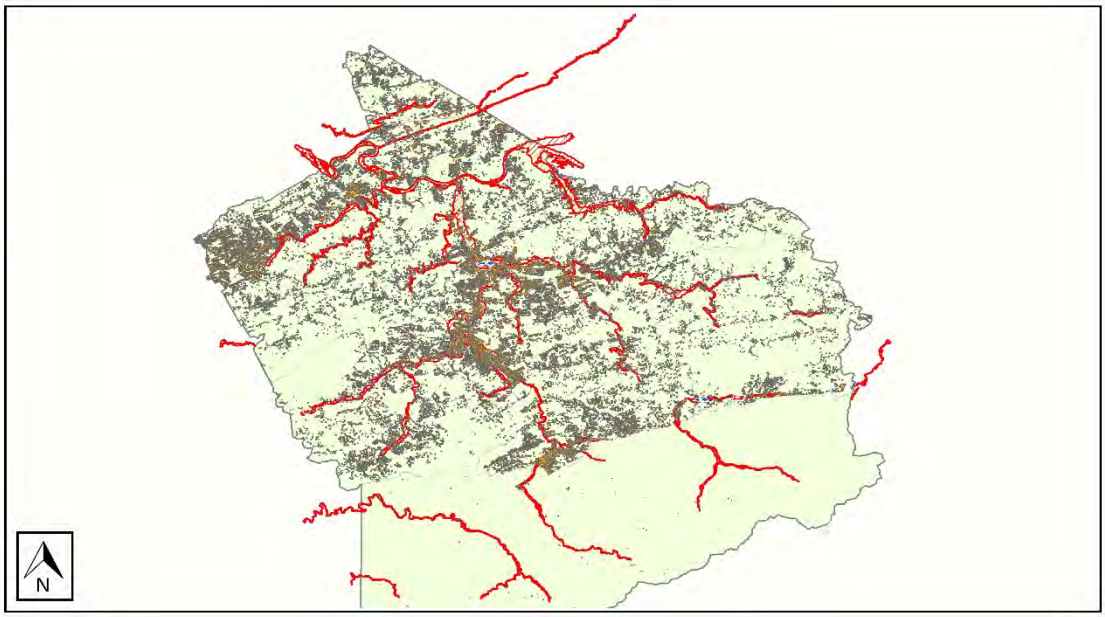
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Sevier_100_Flood
Scenario Name:	Sevier_100yr_Flood
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



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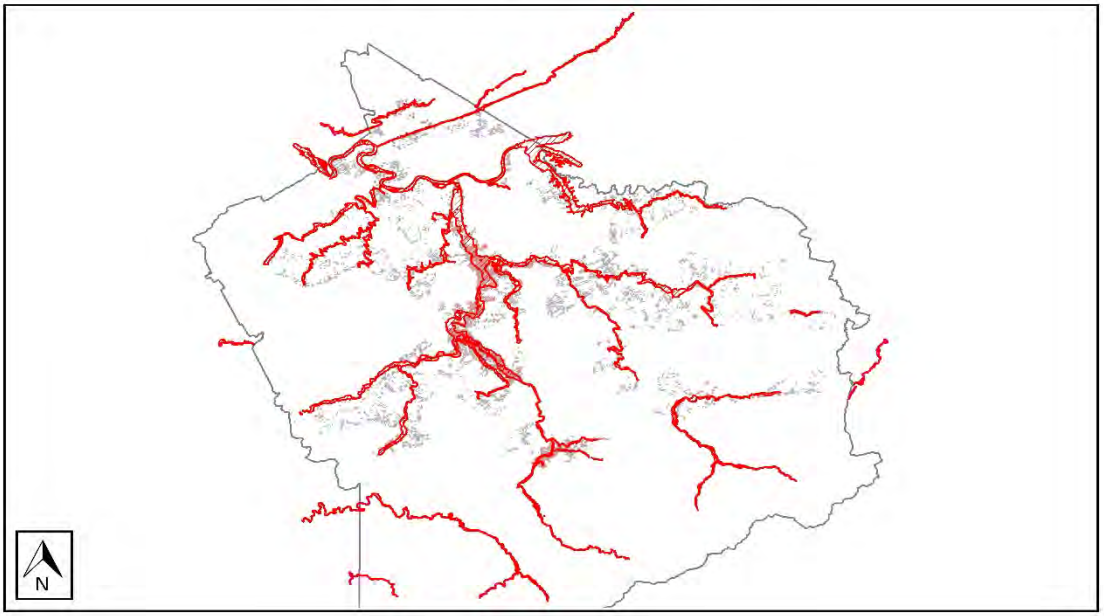
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Building Damage

General Building Stock Damage

Hazus estimates that about 613 buildings will be at least moderately damaged. This is over 59% of the total number of buildings in the scenario. There are an estimated 133 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

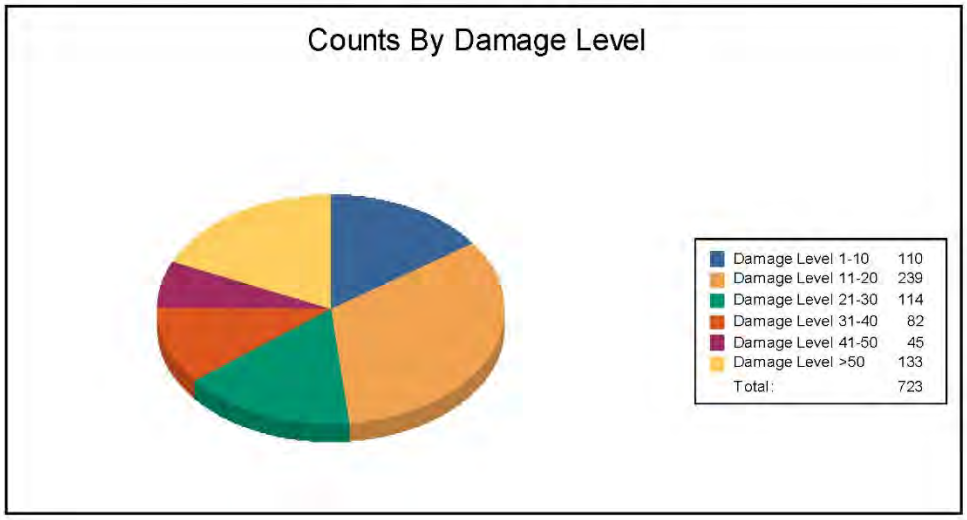
Total Economic Loss (1 dot = $300K) Overview Map



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Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	25	11	128	58	39	18	26	12	2	1	2	1
Education	1	100	0	0	0	0	0	0	0	0	0	0
Government	0	0	1	100	0	0	0	0	0	0	0	0
Industrial	0	0	1	14	3	43	1	14	2	29	0	0
Religion	0	0	5	100	0	0	0	0	0	0	0	0
Residential	84	17	104	21	72	15	55	11	41	8	131	27
Total	**110**		**239**		**114**		**82**		**45**		**133**	



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Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	1	2	0	0	0	0	0	0	0	0	60	98
Masonry	58	23	108	44	38	15	22	9	8	3	14	6
Steel	2	6	17	52	9	27	3	9	2	6	0	0
Wood	47	13	103	29	63	18	53	15	33	9	59	16

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Essential Facility Damage

Before the flood analyzed in this scenario, the region had 79 hospital beds available for use. On the day of the scenario flood event, the model estimates that 79 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

	# Facilities			
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	2	2	0	2
Fire Stations	19	2	0	2
Hospitals	1	0	0	0
Police Stations	6	2	1	3
Schools	37	2	0	2

If this report displays all zeros or is blank, two possibilities can explain this.

(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

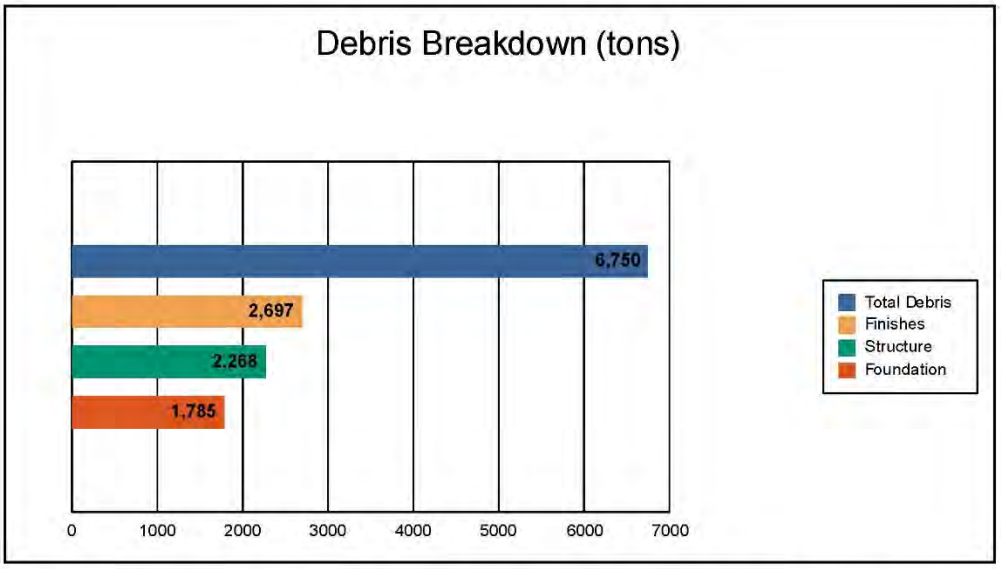
(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

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Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.



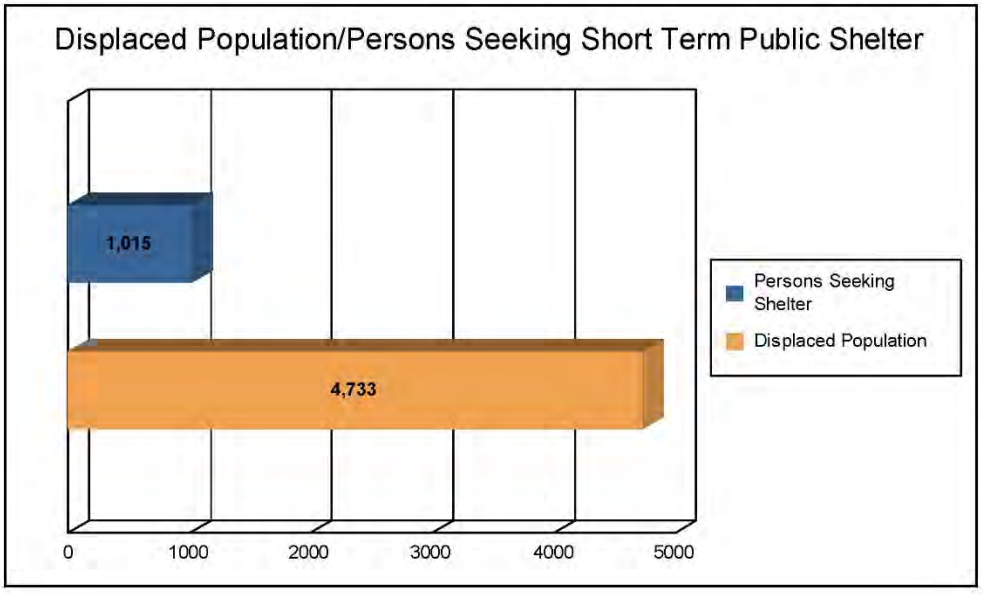
The model estimates that a total of 6,750 tons of debris will be generated. Of the total amount, Finishes comprises 40% of the total, Structure comprises 34% of the total, and Foundation comprises 26%. If the debris tonnage is converted into an estimated number of truckloads, it will require 271 truckloads (@25 tons/truck) to remove the debris generated by the flood.

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Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 1,578 households (or 4,733 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 1,015 people (out of a total population of 98,277) will seek temporary shelter in public shelters.



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Economic Loss

The total economic loss estimated for the flood is 3,021.11 million dollars, which represents 39.22 % of the total replacement value of the scenario buildings.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

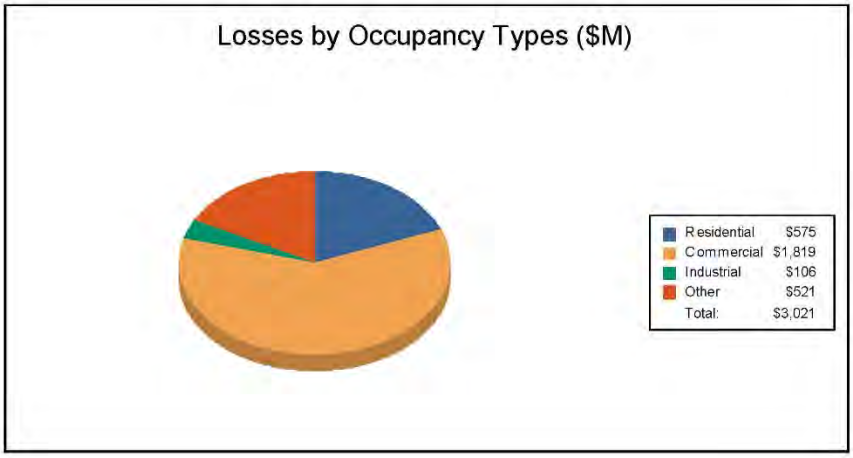
The total building-related losses were 1,268.59 million dollars. 58% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 19.02% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

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Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	158.82	167.78	26.21	16.38	369.18
	Content	112.16	486.39	62.54	85.09	746.18
	Inventory	0.00	140.56	11.79	0.88	153.23
	Subtotal	**270.98**	**794.73**	**100.53**	**102.35**	**1,268.59**
Business Interruption						
	Income	50.56	421.89	1.41	44.12	517.99
	Relocation	33.09	113.18	1.76	23.61	171.64
	Rental Income	100.83	85.43	0.33	3.16	189.76
	Wage	119.26	403.67	2.37	347.84	873.13
	Subtotal	**303.75**	**1,024.18**	**5.87**	**418.73**	**1,752.52**
ALL	**Total**	**574.72**	**1,818.91**	**106.40**	**521.07**	**3,021.11**



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Appendix A: County Listing for the Region

Tennessee
- Sevier

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Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Tennessee				
Sevier	98,277	12,796,827	6,033,799	18,830,626
Total	**98,277**	**12,796,827**	**6,033,799**	**18,830,626**
Total Study Region	**98,277**	**12,796,827**	**6,033,799**	**18,830,626**

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Hazus: Flood Global Risk Report

Region Name:	Sevier_County_500
Flood Scenario:	Sevier 500yr Flood
Print Date:	Thursday, August 21, 2025

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Tennessee

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 46 square miles and contains 2,595 census blocks. The region contains over 40 thousand households and has a total population of 98,277 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 51,686 buildings in the region with a total building replacement value (excluding contents) of 18,831 million dollars. Approximately 90.22% of the buildings (and 67.96% of the building value) are associated with residential housing.

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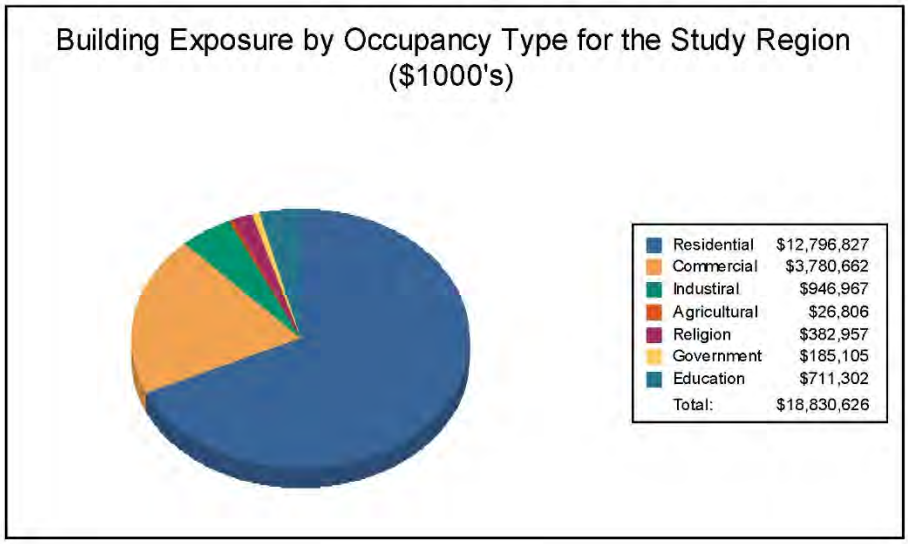
Building Inventory

General Building Stock

Hazus estimates that there are 51,686 buildings in the region which have an aggregate total replacement value of 18,831 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	12,796,827	68.0%
Commercial	3,780,662	20.1%
Industrial	946,967	5.0%
Agricultural	26,806	0.1%
Religion	382,957	2.0%
Government	185,105	1.0%
Education	711,302	3.8%
Total	**18,830,626**	**100%**



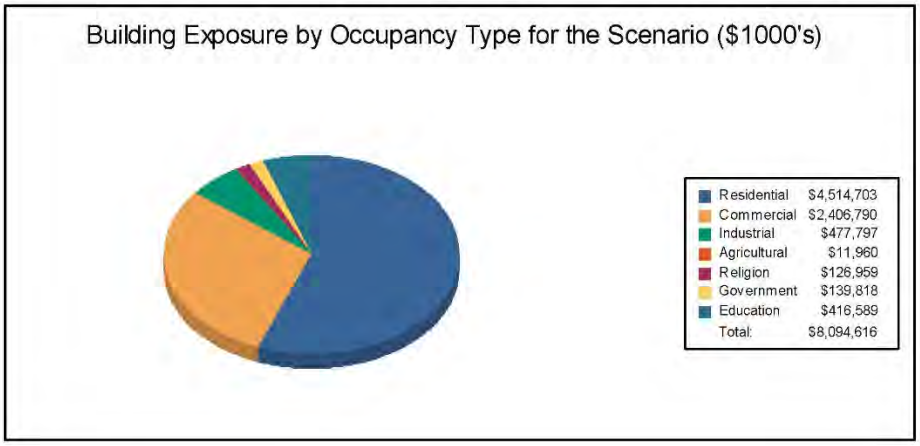
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Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	4,514,703	55.8%
Commercial	2,406,790	29.7%
Industrial	477,797	5.9%
Agricultural	11,960	0.1%
Religion	126,959	1.6%
Government	139,818	1.7%
Education	416,589	5.1%
Total	**8,094,616**	**100%**



Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 79 beds.
There are 37 schools, 19 fire stations, 6 police stations and 2 emergency operation centers.

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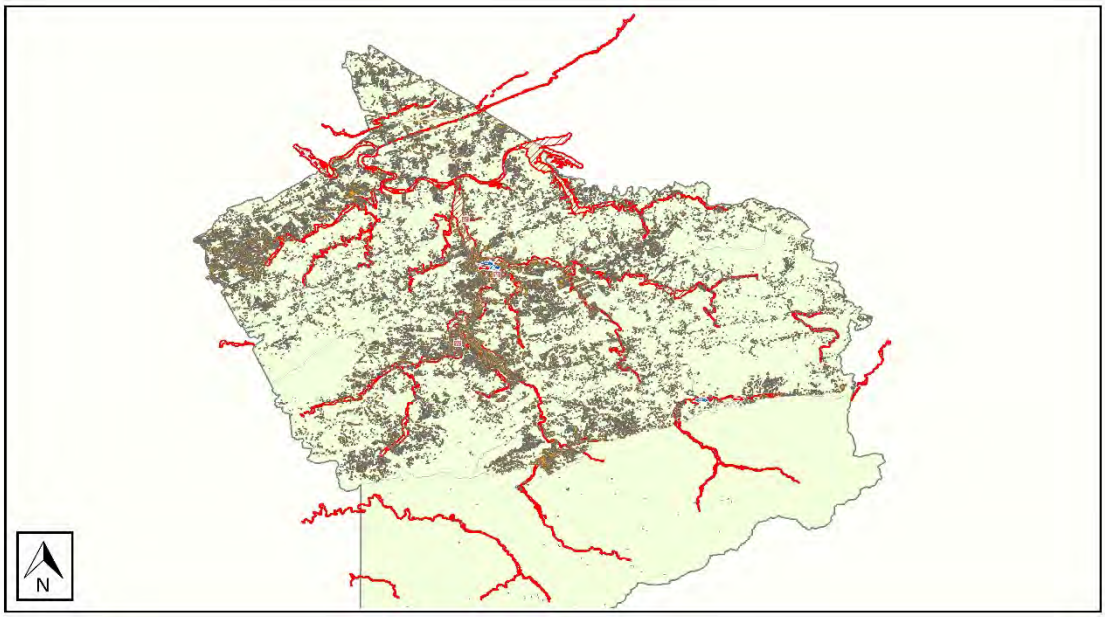
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Sevier_County_500
Scenario Name:	Sevier 500yr Flood
Return Period Analyzed:	500
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



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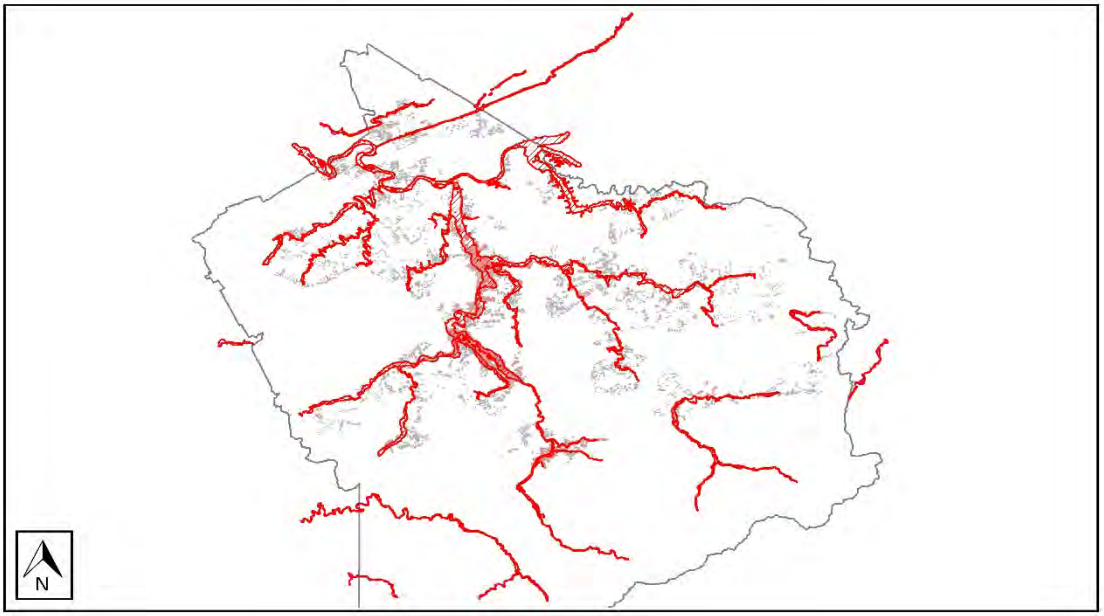
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Building Damage

General Building Stock Damage

Hazus estimates that about 767 buildings will be at least moderately damaged. This is over 53% of the total number of buildings in the scenario. There are an estimated 195 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

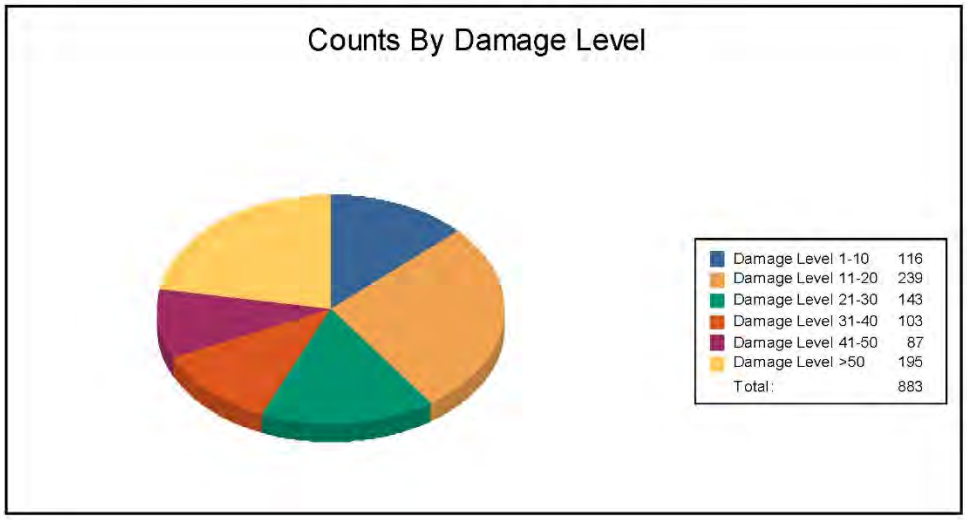
Total Economic Loss (1 dot = $300K) Overview Map



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Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	25	10	117	47	54	22	33	13	16	6	3	1
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	3	50	3	50	0	0	0	0	0	0	0	0
Industrial	2	13	2	13	2	13	7	47	1	7	1	7
Religion	0	0	8	100	0	0	0	0	0	0	0	0
Residential	86	14	109	18	87	14	63	10	70	12	191	32
Total	**116**		**239**		**143**		**103**		**87**		**195**	



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Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	67	100
Masonry	67	23	106	36	47	16	28	10	17	6	28	10
Steel	1	2	16	35	12	26	11	24	6	13	0	0
Wood	42	9	108	24	74	17	59	13	62	14	100	22

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Essential Facility Damage

Before the flood analyzed in this scenario, the region had 79 hospital beds available for use. On the day of the scenario flood event, the model estimates that 79 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

	# Facilities			
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	2	2	0	2
Fire Stations	19	2	0	2
Hospitals	1	0	0	0
Police Stations	6	4	0	3
Schools	37	7	0	6

If this report displays all zeros or is blank, two possibilities can explain this.

(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

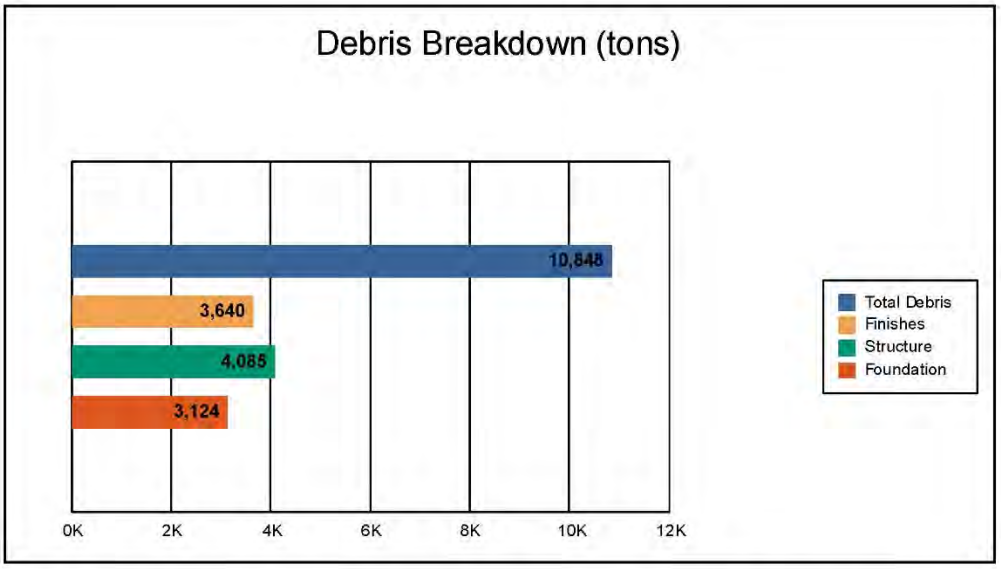
(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

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Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.



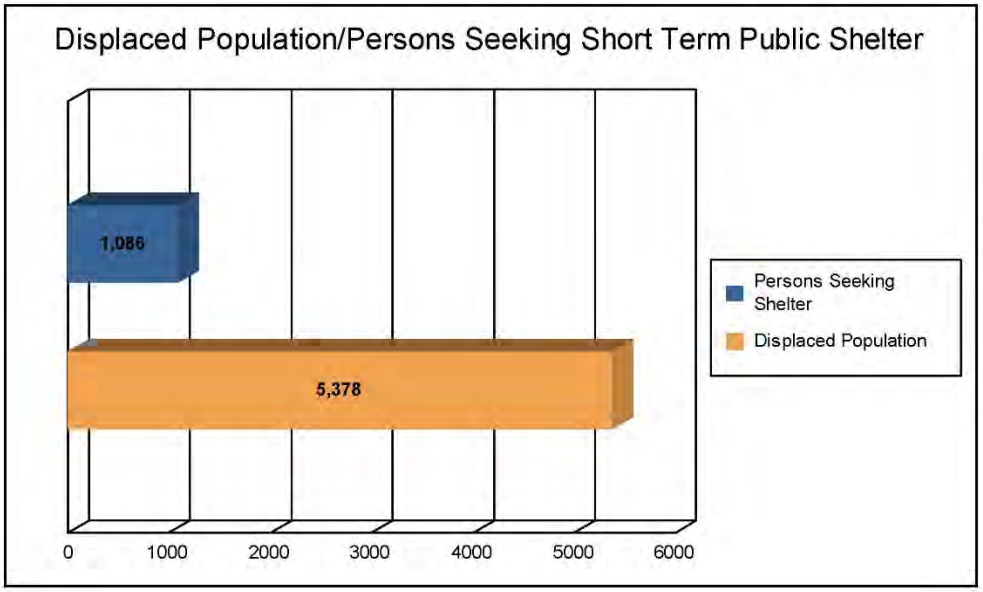
The model estimates that a total of 10,848 tons of debris will be generated. Of the total amount, Finishes comprises 34% of the total, Structure comprises 38% of the total, and Foundation comprises 29%. If the debris tonnage is converted into an estimated number of truckloads, it will require 434 truckloads (@25 tons/truck) to remove the debris generated by the flood.

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Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 1,793 households (or 5,378 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 1,086 people (out of a total population of 98,277) will seek temporary shelter in public shelters.



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Flood Global Risk Report

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Economic Loss

The total economic loss estimated for the flood is 3,884.71 million dollars, which represents 47.99 % of the total replacement value of the scenario buildings.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

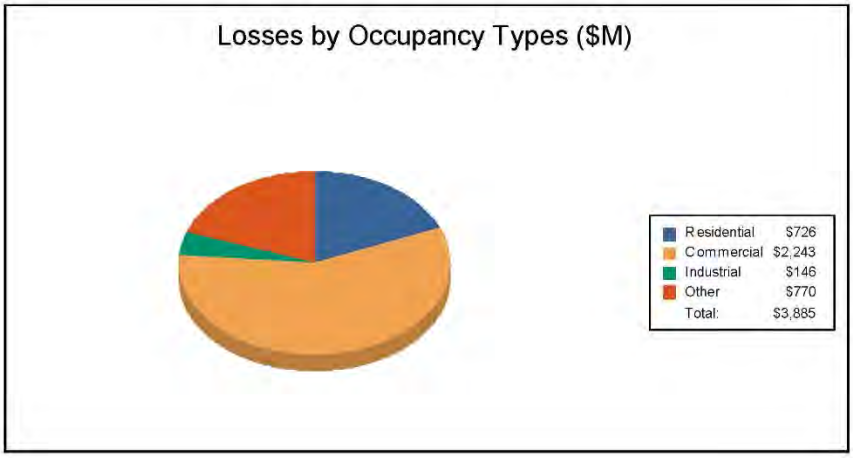
The total building-related losses were 1,651.82 million dollars. 57% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 18.68% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

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Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	209.35	216.42	37.02	24.41	487.20
	Content	146.93	610.98	85.61	128.32	971.84
	Inventory	0.00	176.14	15.25	1.39	192.78
	Subtotal	**356.28**	**1,003.54**	**137.88**	**154.12**	**1,651.82**
Business Interruption						
	Income	61.46	510.51	1.83	73.49	647.29
	Relocation	39.89	136.25	2.34	36.70	215.18
	Rental Income	123.04	102.87	0.40	5.17	231.49
	Wage	144.93	490.08	3.05	500.88	1,138.94
	Subtotal	**369.32**	**1,239.71**	**7.62**	**616.24**	**2,232.89**
ALL	**Total**	**725.60**	**2,243.25**	**145.50**	**770.36**	**3,884.71**



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Appendix A: County Listing for the Region

Tennessee
- Sevier

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Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Tennessee				
Sevier	98,277	12,796,827	6,033,799	18,830,626
Total	**98,277**	**12,796,827**	**6,033,799**	**18,830,626**
Total Study Region	**98,277**	**12,796,827**	**6,033,799**	**18,830,626**

APPENDIX C

Sevier County Climate Trends and Variations

5 Communicable Disease

Climate trends and variations could impact the spread of certain communicable diseases in Sevier County. Many infectious respiratory illnesses (influenza, RSV, etc.) spread between humans easier in cooler, less humid conditions, so a decrease in the length and severity of winter seasons could potentially reduce the impacts of these diseases in Sevier County. For further details on these changes see the Winter Weather sub-section of the Severe Weather section of this appendix.

Studies have found evidence that climate trends and variations contribute to the expanding range of suitable tick habitats. As temperatures and humidity rise, it is believed that tick habitats will continue to expand, increasing the risk of exposure to infected ticks. Longer, warmer summers have given mosquitoes more time to both reproduce and spread disease. Additionally, shifts in average temperature, humidity, and precipitation can potentially allow for increased habitat of invasive mosquito species that could bring with them non-endemic diseases that are usually only found in travelers.

6 Dam Failure

Climate trends and variations could impact the risk of dam failures in Sevier County connected to changes in the hydrologic cycle. Observed increases in annual precipitation and projected increases in the number of extreme precipitation events could increase the pressure on existing dams in and upstream of Sevier County. For a more detailed analysis of these trends see the Floods section of this appendix.

7 Drought

The future risk of drought in Sevier County is tied to changes in the precipitation and temperature patterns the county may experience due to climate trends and variations. The Fifth National Climate Assessment (2023, NCA5) states climate variability is expected to increase the average temperature and the number of high-heat days in the southeastern United States and intensify the hydrologic cycle, leading to an increase in both extreme precipitation events and periods of drought in the southeastern United States. The Climate Mapping Risk Assessment (CMRA) Report for Sevier County shows that while overall annual precipitation may increase, the number of dry days is expected to increase through the 21st century. Also, high-heat days are expected to increase, which could favor short-term periods of drought.

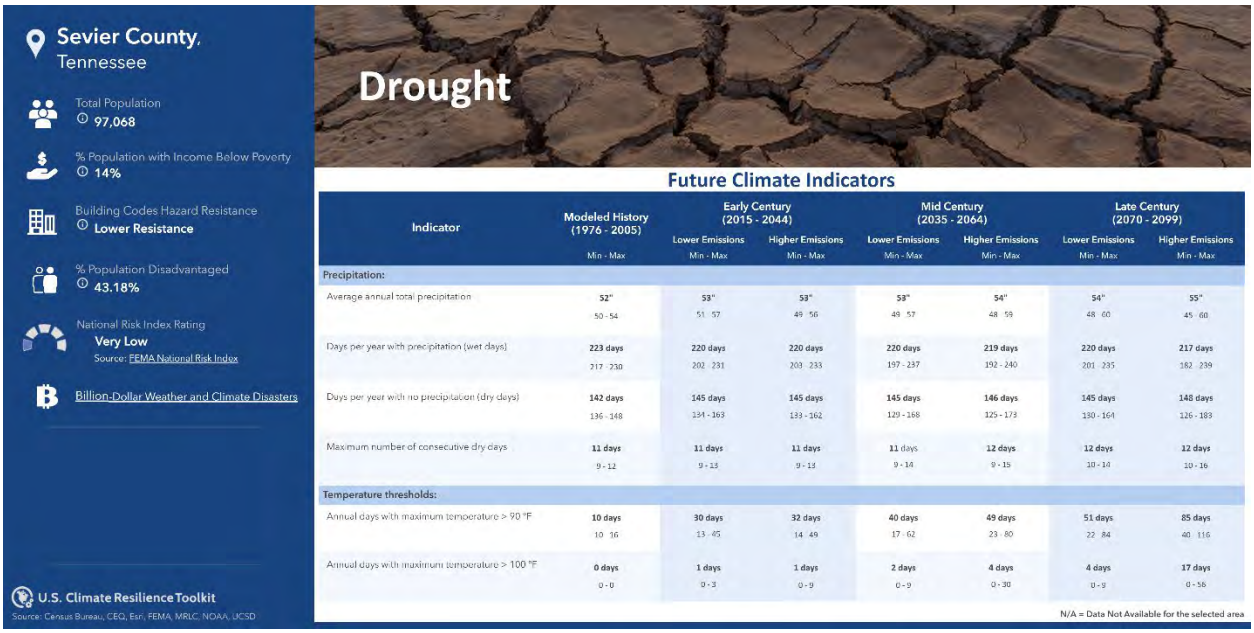


Figure 1: Climate Mapping Risk Assessment Report for Drought in Sevier County.

(Source: US Climate Resilience Toolkit)

The increasing trends in average temperature and total precipitation in Sevier County are also supported by observed historical data available from the NOAA National Centers for Environmental Information Climate-at-a-Glance tool (refer to subsequent figures). The trends of increasing temperature and annual precipitation have been more pronounced over the past several decades compared to the longer-term (1895-2024) trend. The long-term trend in temperature showed an increase of less than 0.1°F per decade due to several warm decades in the early 20th century followed by a cool period from the 1950's to the early 1980's, and then years that were mostly warmer than the 20th century average after 1985. The medium-term (1965-2024) shows an increased warming trend of +0.5°F per decade and the short-term (1995-2024) shows an increase of +0.6°F per decade. Additionally, the county's climate stripes graphics from NOAA show that aside from a few warmer than normal years early in the period, most of the above average temperature years have occurred in the past two decades. This indicates that warming has substantially increased in Sevier County and based on the NCA5, this trend is expected to continue in the future.

However, total precipitation has also been increasing in Sevier County, with the long-term (1895-2024) trend in precipitation having a +0.19" increase per decade, while the medium-term (1965-2024) shows a stronger trend of +1.04" increase per decade and the short-term (1995-2024) shows a much stronger increasing trend of +2.28" per decade. This indicates that precipitation has increased in Sevier County; however, there is a large amount of inter-annual variability. Based on the NCA5, this trend is expected to continue in the future. Refer to Figures 19-21 in the Flood section for additional information. An increasing trend in precipitation may infer a decrease in drought potential; however, the observed pattern has been highly variable year-to-year and on shorter time periods. As temperatures

increase, there can be more rapid evapotranspiration, potentially leading to more rapid onset of drought occurrences (i.e., Flash Droughts).

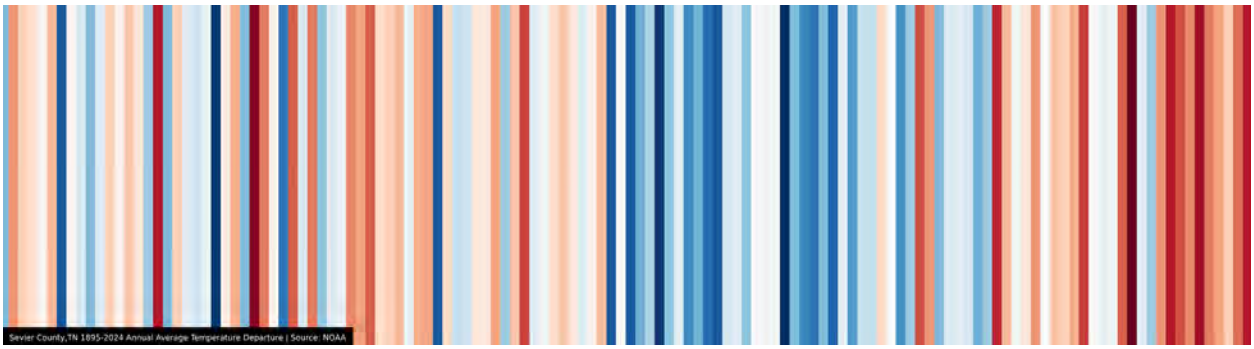


Figure 2: Observed (1895-2024) Annual Temperature for Sevier County, Tennessee, Compared to the 20th Century Average with Darkening Shades of Blue for Below Average Temperature and Darkening Shades of Red for Above Average Temperature.

(Source: NOAA NCEI)



Figure 3: Observed (1895-2024) Annual Precipitation for Sevier County, Tennessee, Compared to the 20th Century Average with Darkening Shades of Brown for Below Average Precipitation and Darkening Shades of Green for Above Average.

(Source: NOAA NCEI)

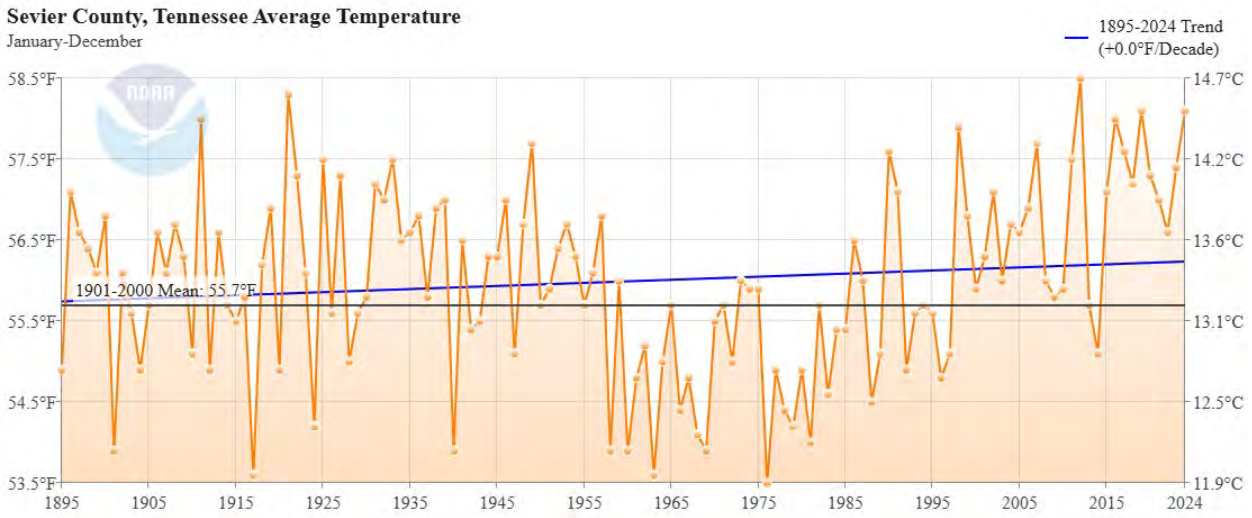


Figure 4: Annual Average Temperature for Sevier County Tennessee, Showing a less than 0.1˚F Increase per Decade Since 1895.

(Source: NOAA NCEI, Climate-at-a-Glance: County Time Series)

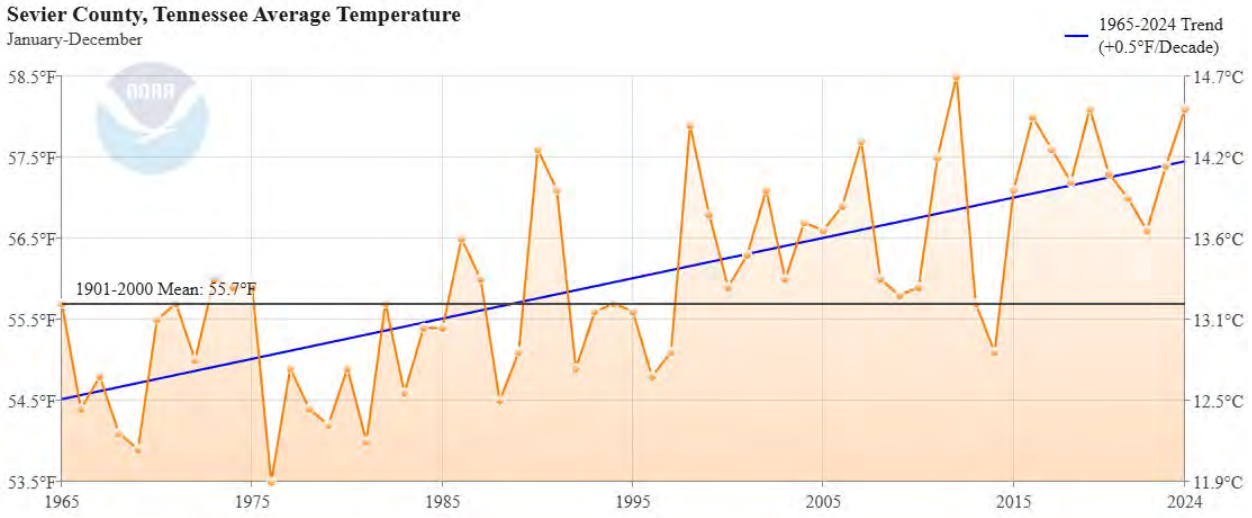


Figure 5: Annual Average Temperature for Sevier County, Tennessee, Showing a +0.5˚F Increase per Decade Since 1965.

(Source: NOAA NCEI, Climate-at-a-Glance: County Time Series)

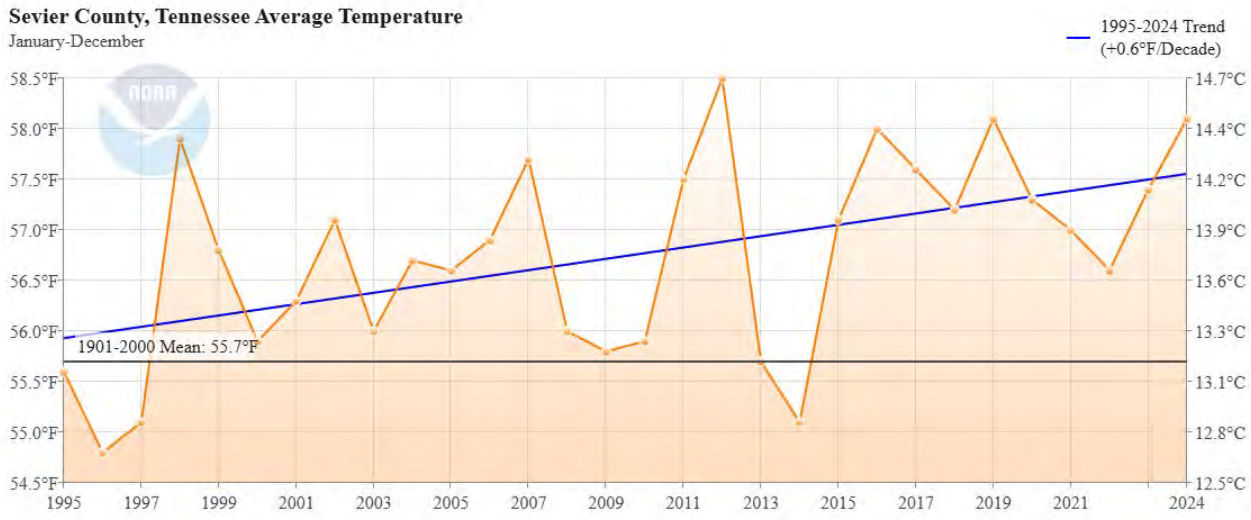


Figure 6: Annual Average Temperature for Sevier County, Tennessee, Showing a +0.6˚F Increase per Decade Since 1995.

(Source: NOAA NCEI, Climate-at-a-Glance: County Time Series)

The U.S. Drought Monitor (USDM) provides a weekly snapshot of drought conditions across the United States, starting in January of 2000 and continuing through the present. Using the timeline of drought conditions from the USDM, the cyclical nature of drought in Sevier County is clear. Several periods of drought were recorded in this time, with the most intense drought seen in 2007-2008, but several other short periods of severe drought were observed, including 2016 and in the later parts of 2023 into early 2024. The Tennessee Climate Office (TCO) analyzed trends in the USDM throughout Tennessee from 2000 to 2024. County-level trends were developed based on the amount of each county that was covered in D1 (Moderate Drought) or worse, D2 (Severe Drought) or worse, D3 (Extreme Drought) or worse, and D4 (Exceptional Drought) each week. Trends were assessed using space-time cube analysis tools in ArcGIS Pro, with the results shown subsequently. There was a modest decreasing trend in the amount of time that Sevier County spent in D3 or worse drought conditions over this period.

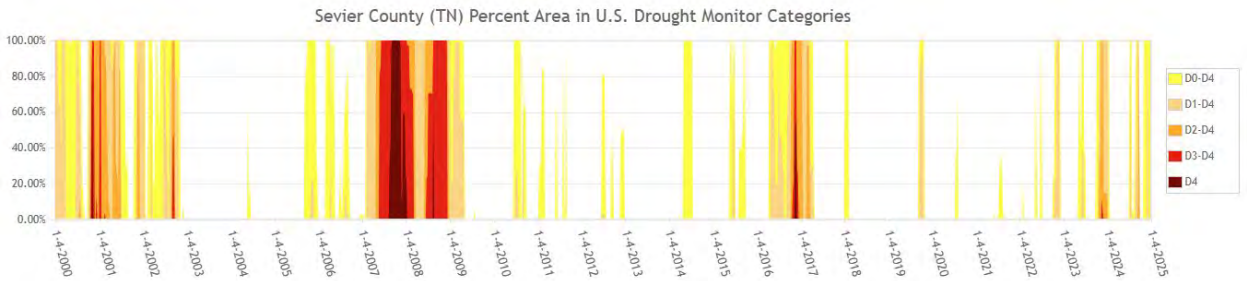


Figure 7: Timeline of drought conditions from the U.S. Drought Monitor from 2000 – 2024 for Sevier County.

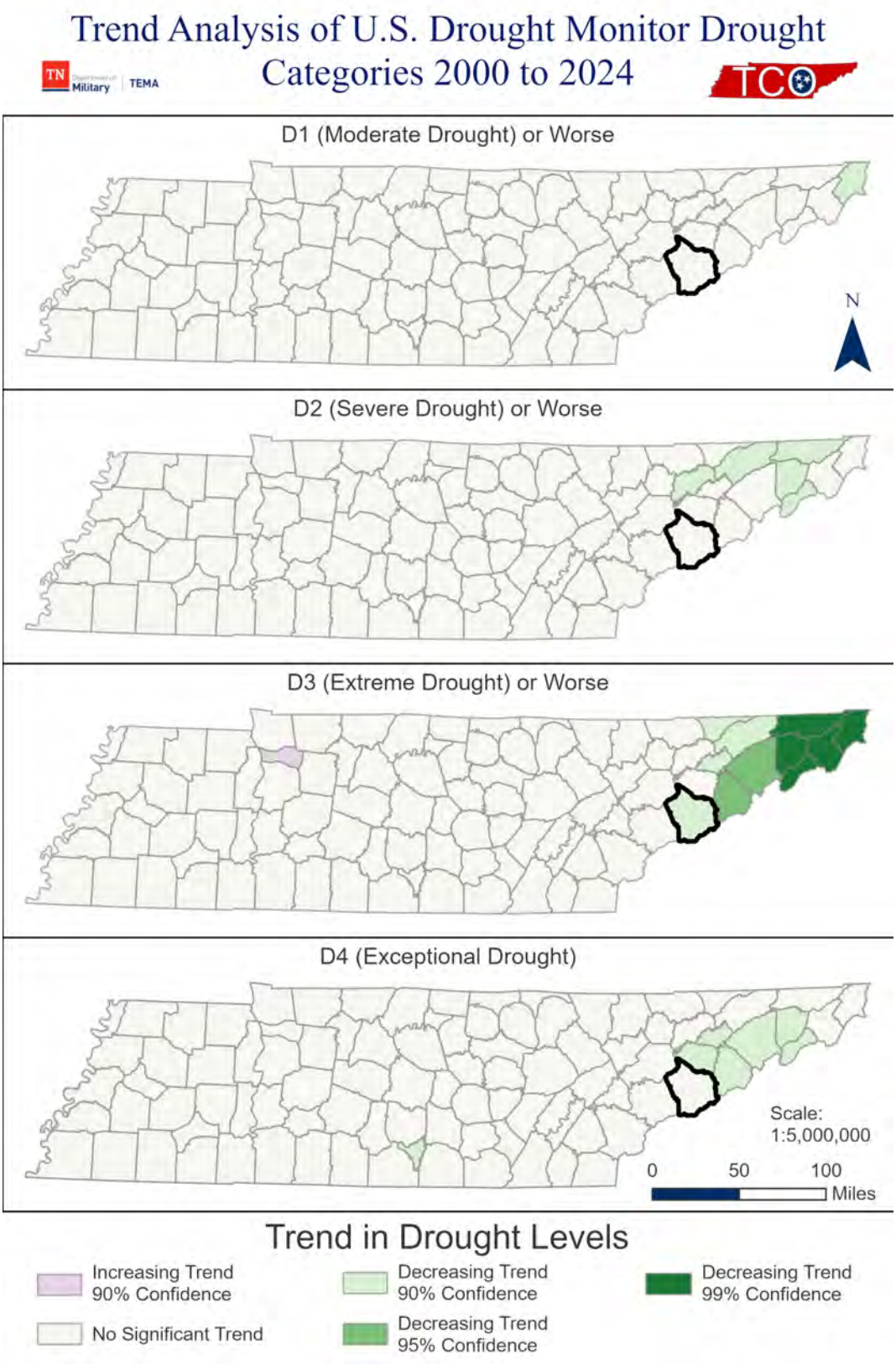


Figure 8: Trend Analysis of U.S. Drought Monitor from 2000 – 2024, Sevier County Outlined in Bold.

Since the USDM only dates back to 2000, other metrics must be used to examine longer trends in drought occurrences. The Standardized Precipitation Index (SPI) is another metric that can quantify drought and periods of wetness by capturing how observed precipitation deviates from the climatological average. Drought.gov provides a timeline of the SPI derived from the Global Historical Climatology Network (GHCN), with data back to 1895 for the contiguous U.S. Red hues indicate drier conditions, while blue hues indicate wetter conditions. With this longer dataset the cyclical nature of dry and wet periods across Sevier County is even more apparent. It also shows that the shorter and less intense dry periods observed from 2008 to 2024 represent one of the longer periods of time with minimal long-term drought impacts for the county.

Looking at the longer-term Standardized Precipitation Index (SPI) from the NCEI nClimGrid-monthly dataset (starting 1895) there is an increasing trend in the 3-month SPI value, indicating an increasing trend in precipitation (averaged over 3-months) across all of Tennessee with a moderate-to-strong increase in values across Sevier County. A gridded SPI dataset is also available at a 5km resolution from NCEI. This gridded dataset with data from 1895 to 2024 was used to analyze the linear trend in 3-month SPI values (SPI value calculated from the dryness or wetness values of the previous 3 months), shown in the following figure. All areas of Tennessee had an increasing trend in SPI values over this time period, indicating an increasing trend in precipitation that is consistent with other observed records and climate models signifying that Tennessee is seeing a decrease in the risk for longer-term droughts. The overall trend in increasing wetness will not prevent future periods of drought, especially short-duration high-intensity Flash Droughts.

Table 1: SPI Category and Value Definitions.

SPI Category	SPI Value	Description
D4	≤ -2	Exceptionally Dry
D3	-1.6 to -1.9	Extremely Dry
D2	-1.3 to -1.5	Severely Dry
D1	-0.8 to -1.2	Moderately Dry
D0	-0.5 to –0.7	Abnormally Dry
W0	+0.5 to + 0.7	Abnormally Wet
W1	+0.8 to +1.2	Moderately Wet
W2	+1.3 to +1.5	Severely Wet
W3	+1.6 to +1.9	Extremely Wet
W4	≥ 2.0	Exceptionally Wet

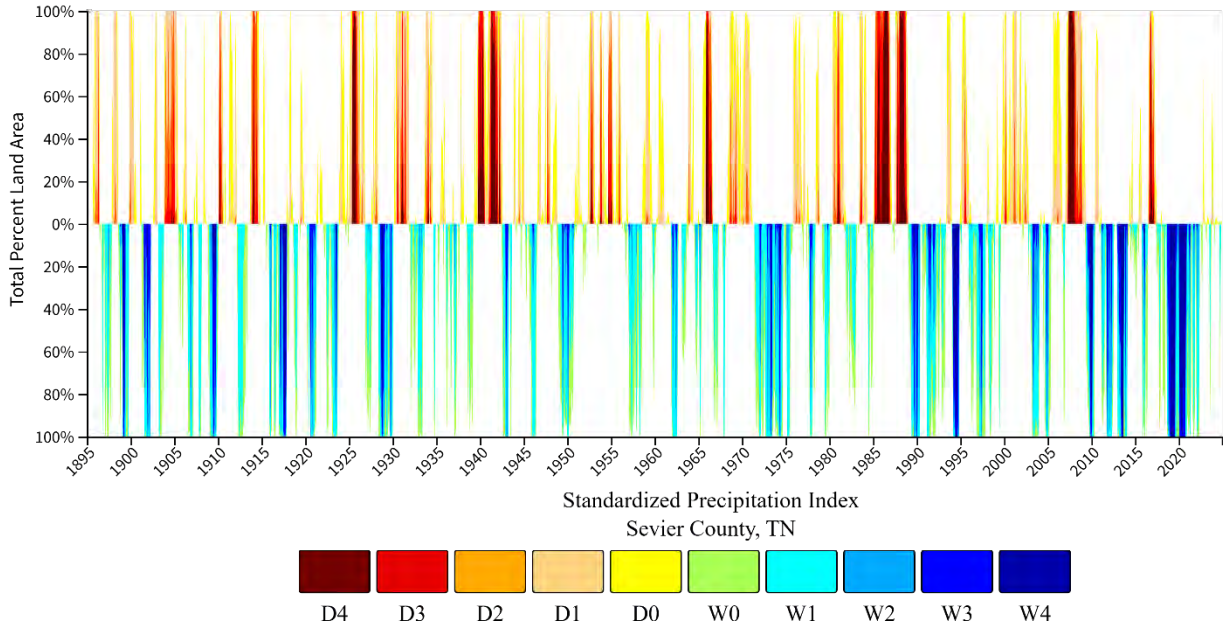


Figure 9: Periods of Drought and Wetness in Sevier County, Tennessee from 1895 to 2024.

(Source: Drought.gov)

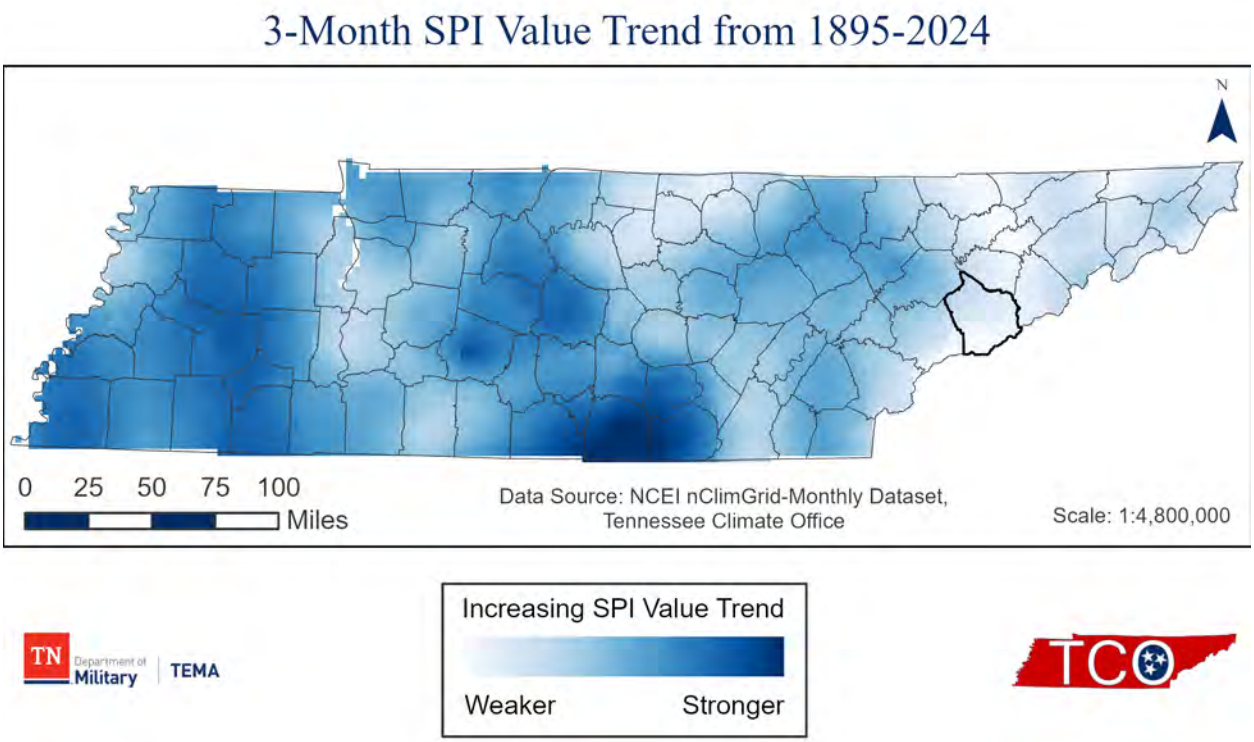


Figure 10: SPI Value Trend for 3-Months from 1895 to 2024, Sevier County Outlined in Bold.

The previous trends are based on observed historical data, but the Climate Mapping for Resilience and Adaptation (CMRA) Assessment tool provides county-level output from future climate projections. Data from this tool indicates Sevier County could expect an increase in the number of dry days per year due to climate variability. However, the tool provides a range of possible outcomes, with higher and lower greenhouse gas emission scenarios, for Early-Century (2015-2044), Mid-Century (2035-2064), and Late Century (2070-2099) time periods, and maximum, minimum, and mean projected values. The following table shows the projected change in the number of dry days per year for Sevier County. The Early-, Mid-, and Late-Century values represent the increase (positive values) or decrease (negative values) in dry days per year compared to the number of dry days per year from modeled history. In the mean projection, Sevier County could see an increase of 2.3 to 3.4 dry days per year by Mid-Century and an increase of 2.8 to 5.3 dry days per year by Late-Century.

Table 2: Possible Change in the Number of Dry Days per Year for Sevier County, Tennessee.

High Emissions Scenario	Modeled History (1976-2005)	Early Century (2015-2044)	Mid Century (2035-2064)	Late Century (2070-2099)
Driest Projection	148.3	+13.7	+24.3	+34.7
Mean Projection	142.5	+2.2	+3.4	+5.3
Wettest Projection	135.5	-2.9	-10.8	-9.5
Low Emissions Scenario	**Modeled History (1976-2005)**	**Early Century (2015-2044)**	**Mid Century (2035-2064)**	**Late Century (2070-2099)**
Driest Projection	148.3	+14.8	+19.5	+16.1
Mean Projection	142.5	+2.4	+2.3	+2.8
Wettest Projection	135.5	-1.7	-6.9	-5.7

The projected increase in high-heat days and the intensification of the hydrologic cycle will likely lead to more Flash Droughts, defined by the rapid onset or intensification of drought conditions. Flash Droughts in the southeastern United States are often connected to short periods of time (a couple of weeks or months) with much higher-than-normal temperatures and much lower-than-normal precipitation leading to the rapid depletion of soil moisture and streamflow. September 2019 and October 2023 are prime examples of recent Flash Droughts in Tennessee, and more broadly across the Southeast. During the 2023 fall flash drought, Sevier County went from 0% of the county in drought conditions (D1-4) on the October 17th release of the U.S. Drought Monitor to 100% of the county being in Severe (D2) or Extreme Drought (D3) conditions by the November 21st release of the US Drought Monitor.

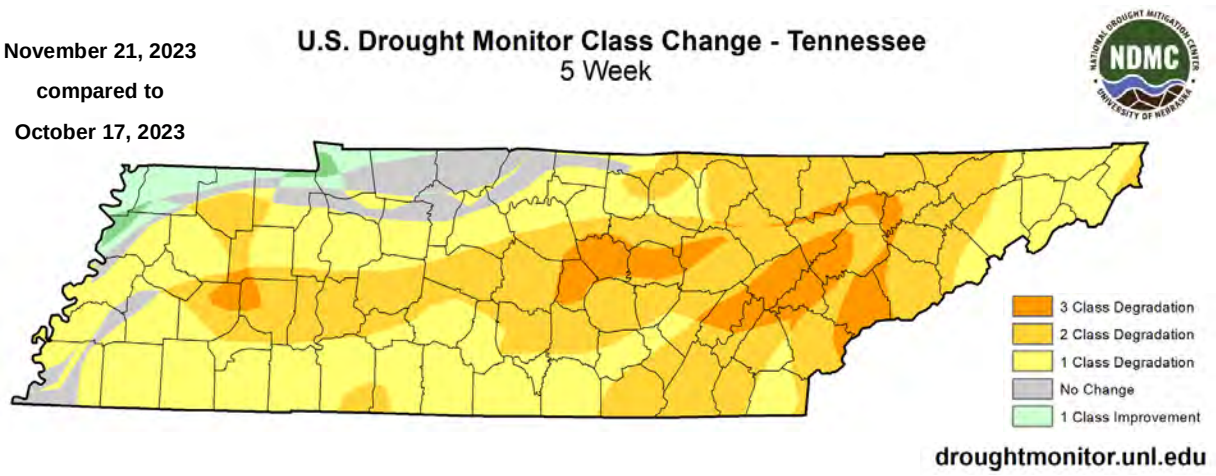


Figure 11: U.S. Drought Monitor Five Week Class Change in the State of Tennessee from October 17, 2023 to November 21, 2023.

(Source: National Drought Mitigation Center)

A study conducted by the U.S. Department of Agriculture (USDA) and U.S. Forest Service Office of Sustainability and Climate compared the length of a 10-year Drought, defined as a once in a decade drought as measured by the number of consecutive dry days (days with less than 0.1 inches of rain) during the summer season (May – September) between historical data and future climate models. For this study, the historical period was based on observed data from 1975 to 2005, and the future scenario was for the 2080's based on the RCP8.5 (higher emissions) ensemble mean of 20 global climate models from the CMIP5 experiment. The output of this study, shown in the following figure, indicates that most areas of Tennessee could expect a 10-year Drought (10% annual probability of occurrence) to maintain its current length or increase by as much as 6 days in the 2080's compared to a 10-year Drought from 1975-2005. In Sevier County, a 10-year drought could increase in length from 0.1 to 6 days compared to the modeled history. This demonstrates that although the average annual precipitation amount may increase in Tennessee and in Sevier County, periods between precipitation events could get longer, leading to flash droughts or shorter-term drought periods.

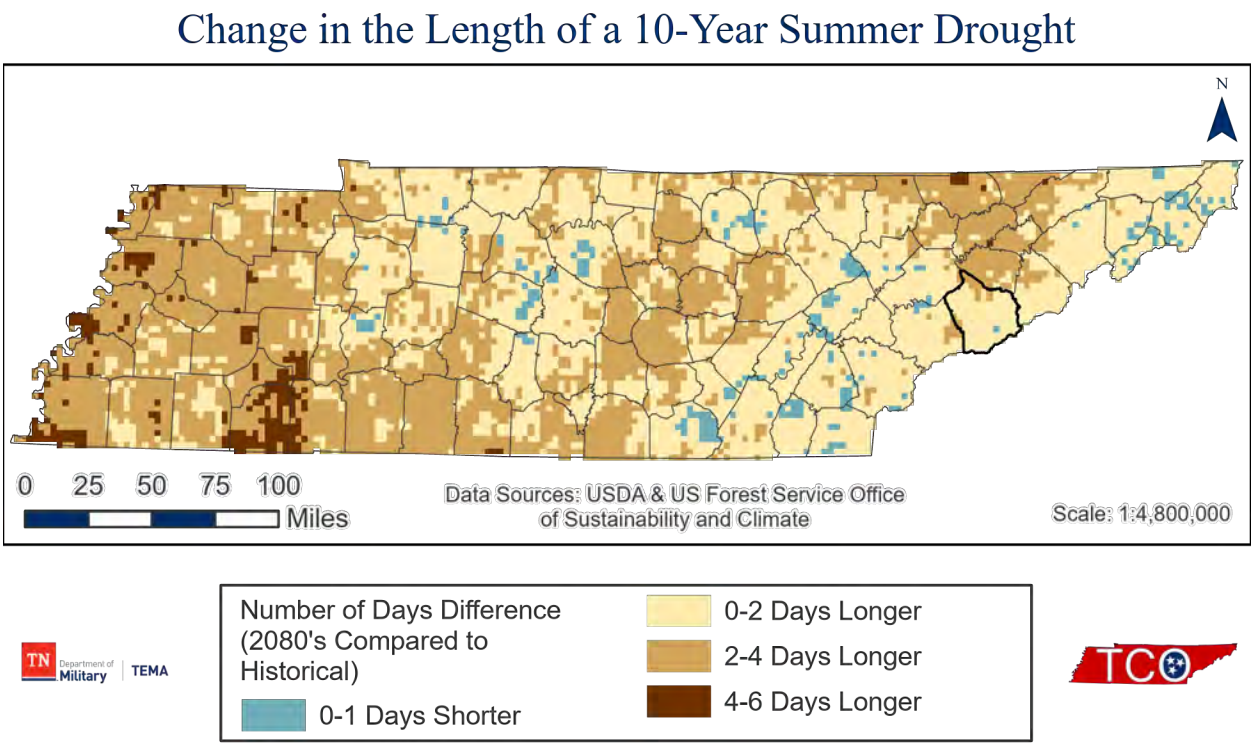


Figure 12: Change in the Length of a 10-Year (10% Annual Probability of Occurrence) Drought from Historical Data (1975-2005) to a 10-Year Drought in the 2080s (RCP8.5 Scenario), Sevier County Outlined in Bold White.

In addition to the variable climate, population growth and development in Tennessee means that the state will be at a higher risk for hydrological droughts and associated impacts in the future as water demand increases.

8 Earthquake

There is little to no direct impact of climate trends and variations on the earthquake risk in Sevier County. However, there are some USGS and NASA scientists who believe melting glaciers in mountainous regions and at the poles could induce tectonic activity due to the tremendous amount of weight that is shifted on the earth's crust as water melts and runs off. This newly freed crust can experience post-glacial isostatic uplift, which could cause seismic plates to slip and stimulate seismic activity as it returns to its original, pre-glacial shape. These shifts in tectonic plates would not directly impact Tennessee, but changes to stress/strain in other parts of the North American tectonic plate could impact existing faults/seismic zones in Tennessee indirectly. Also, secondary impacts of earthquakes such as liquefaction or mass wasting may increase due to soils saturated from repetitive or extreme precipitation.

9 Extreme Temperature

The Fifth National Climate Assessment (2023, NCA5) states climate variability is expected to increase the average temperature and the number of high-heat days in the southeastern United States and intensify the hydrologic cycle, leading to an increase in both extreme temperature and precipitation events in the southeastern United States. The increasing trend in average temperature in Sevier County is also supported by observed historical data available from the NOAA National Centers for Environmental Information Climate-at-a-Glance tool (refer to Figures 4-6 in the Drought section of this appendix), and based on the NCA5, this trend is expected to continue in the future.

9.1 Heat

The Climate Mapping Risk Assessment (CMRA) Report for Sevier County shows the potential for an increase in high heat days, when examining temperature thresholds and annual temperatures. By mid-century, Sevier County could experience between 40 and 49 days of maximum temperatures exceeding 90°F, compared to an historical (1976-2005) average of 10 days. There could be 2-4 days of maximum temperatures exceeding 100°F by mid-century, compared to an historical average of 0 days per year. Additionally, the annual single highest maximum temperature could be 97-99°F by mid-century, compared to an historical average of 93°F.

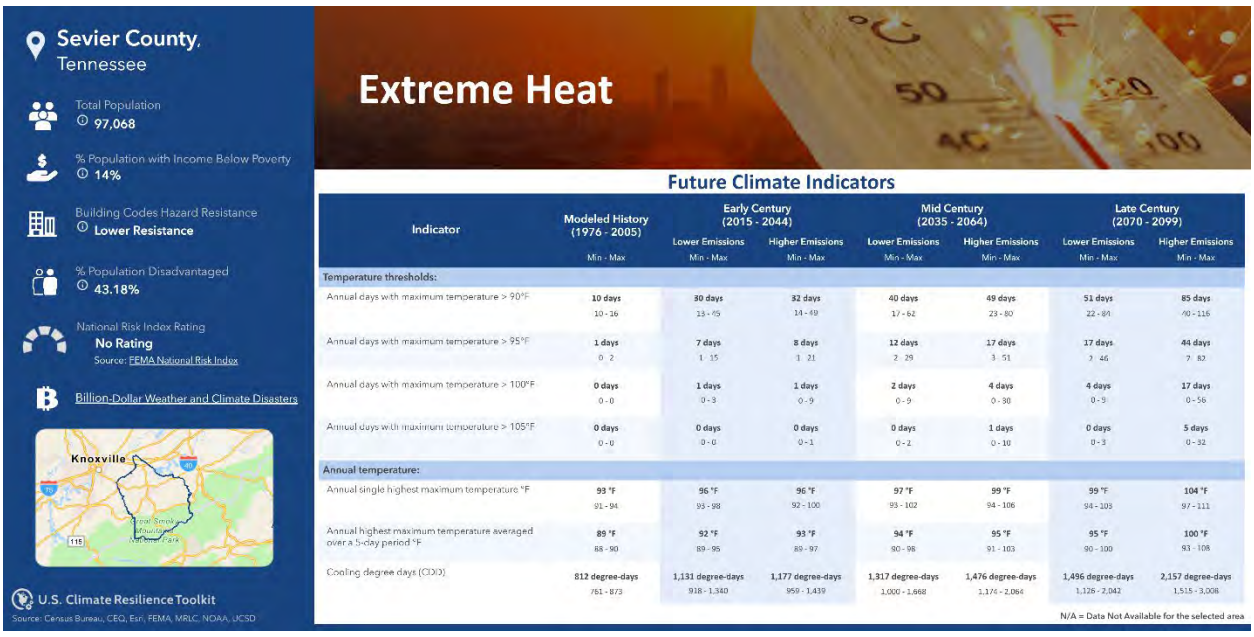


Figure 13: Climate Mapping Risk Assessment Report for Extreme Heat in Sevier County.

(Source: US Climate Resilience Toolkit)

Trend analysis of heat advisories/excessive heat warnings showed no significant increasing or decreasing trend for Sevier County, meaning that these types of advisories and warnings (issued by the National Weather Service) have not increased or decreased between 2005 and 2024. Sevier County was neither an emerging hot or cold spot for heat

advisories/excessive heat warnings, though counties to the north were identified as a sporadic cold spot for heat advisories/excessive heat warnings; meaning the region was statistically less likely to have heat advisories or warnings than other parts of the state in 2024 and on-and-off through the period, but for less than 90% of the time intervals.

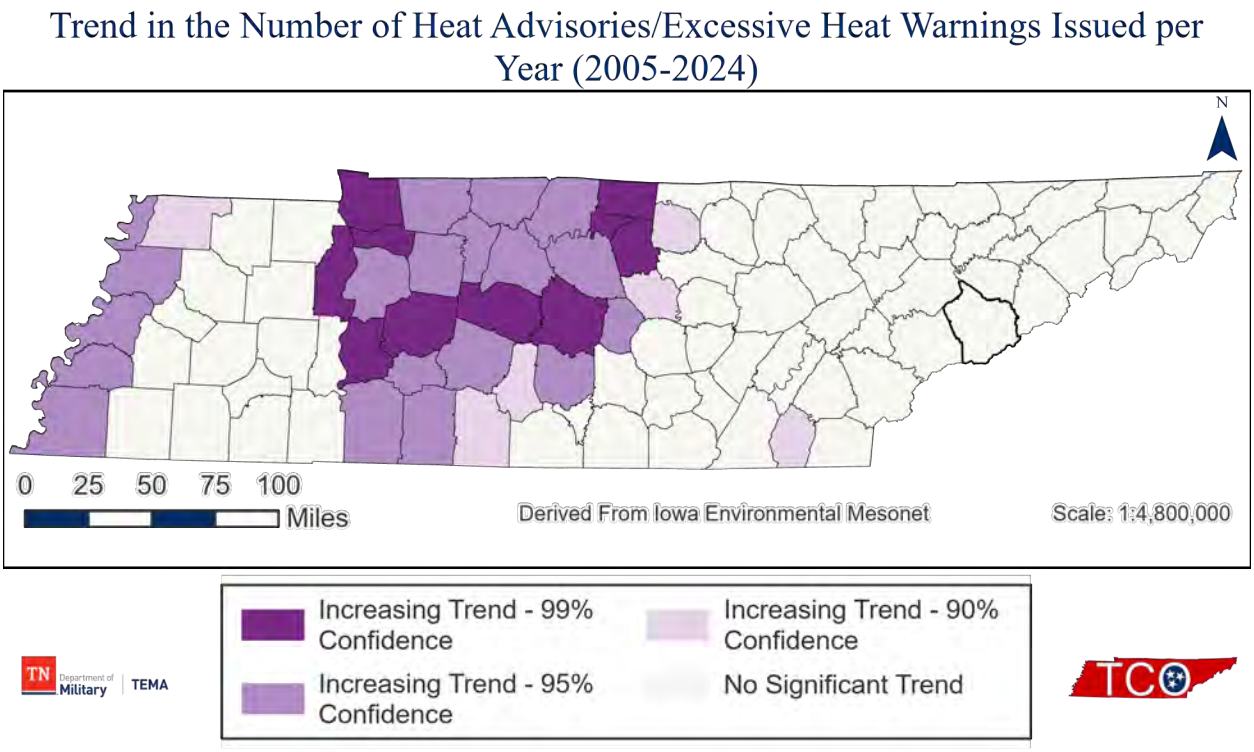


Figure 14: Trend in the Number of Heat Advisories/Excessive Heat Warnings Issued per Year, Sevier County Outlined in Bold.

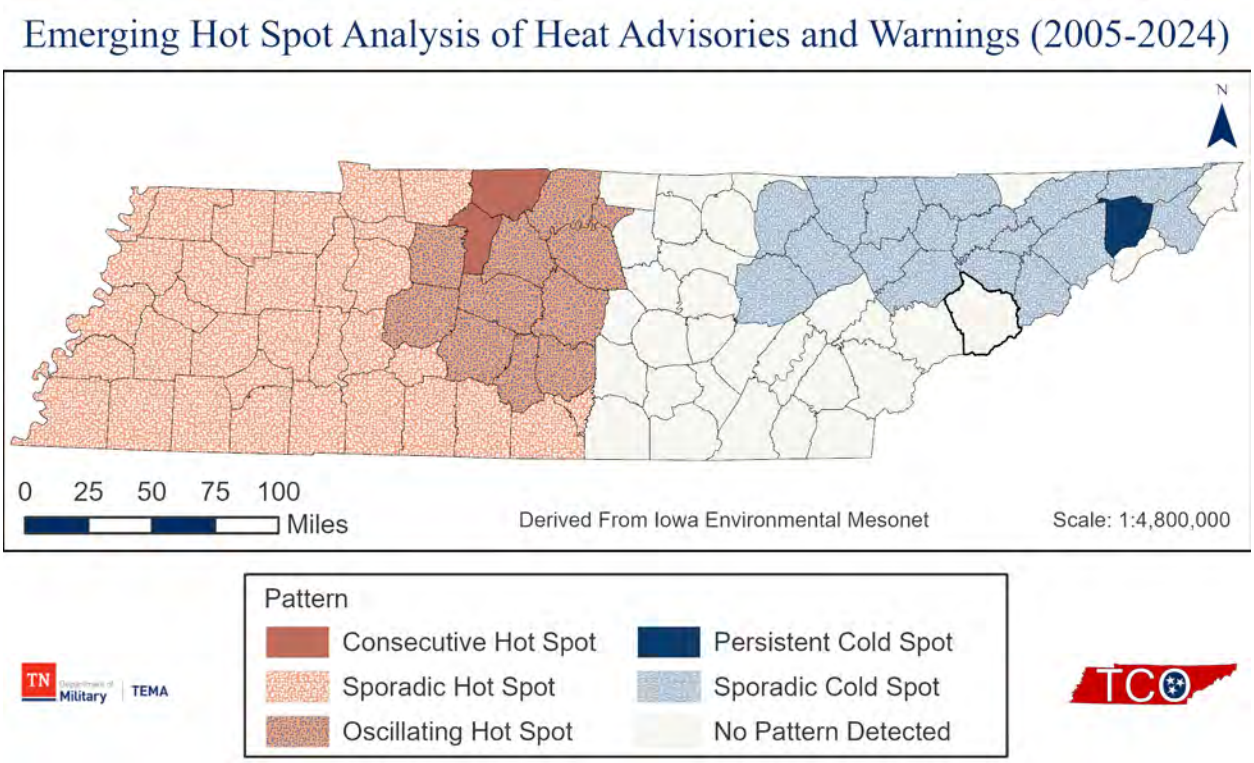


Figure 15: Emerging Hot Spot Analysis of Heat Advisories/Warnings Issued per Year, Sevier County Outlined in Bold.

9.2 Cold

Trend analysis of cold/windchill advisories and extreme cold/extreme windchill warnings showed no significant increasing or decreasing trend for Sevier County, meaning that these types of advisories and warnings (issued by the National Weather Service) have remained relatively stable from 2005 to 2024. Sevier County was not identified as an emerging hot or cold spot for these types of warnings and advisories, meaning it was not statistically more or less likely to have these types of warnings and advisories compared to other parts of the state.

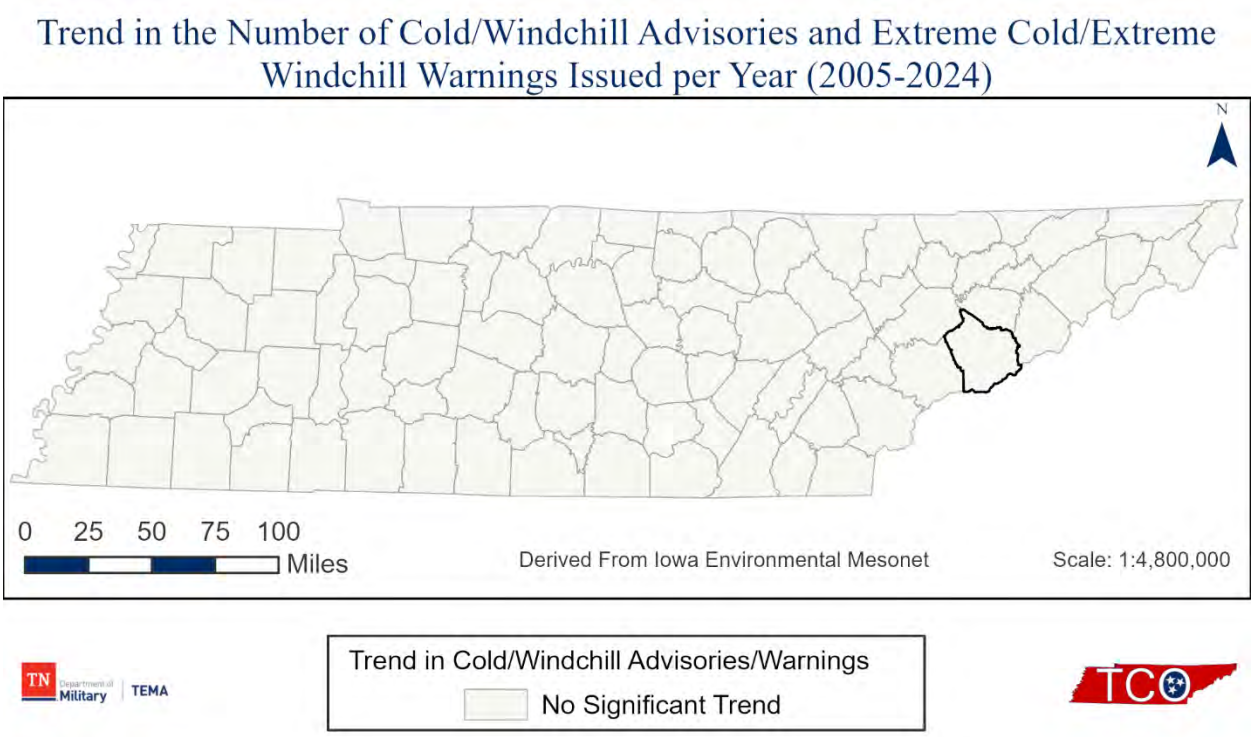


Figure 16: Trend in the Number of Cold/Windchill Advisories and Extreme Cold/Extreme Windchill Warnings Issued per Year, Sevier County Outlined in Bold.

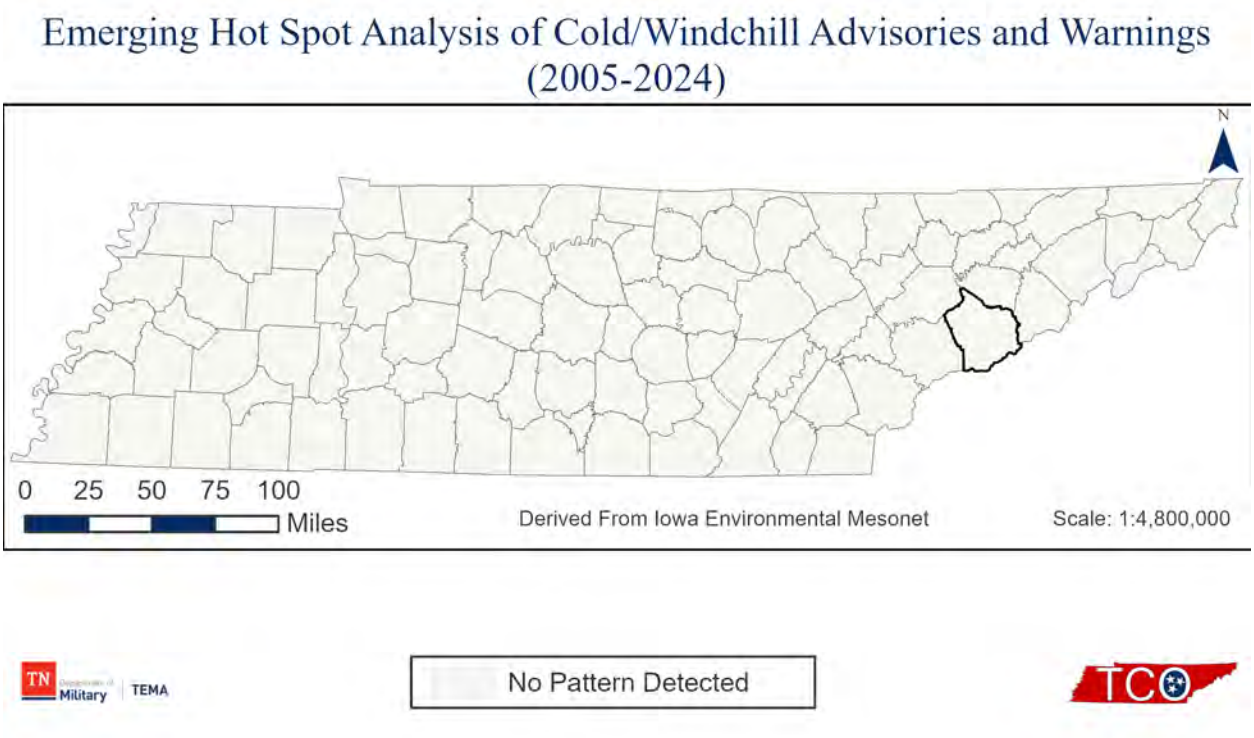


Figure 17: Emerging Hot Spot Analysis of Cold/Windchill Advisories/Warnings, Sevier County Outlined in Bold.

10 Flooding

The future risk of flooding in Sevier County is tied to predicted changes in the precipitation patterns. Tennessee and Sevier County have increasing trends in observed precipitation, and the Fifth National Climate Assessment (2023) reports that the broader Southeast region has seen an increase in the frequency and intensity of extreme rainfall events. There is high confidence that this trend will continue in the future. According to the Climate Mapping Risk Assessment (CMRA) Report, Sevier County is expected to experience a modest increase in various flood indicators by mid- and late-century. Both the increase in total precipitation and extreme rainfall events will increase the risk of flooding in Sevier County. The long-term (1895-2024) trend in annual precipitation shows an increase of +0.19" per decade, the medium-term (1965-2024) trend in precipitation shows a stronger increasing trend of +1.04" per decade, and the short-term (1995-2024) trend shows a much stronger increase of +2.28" per decade. This indicates that precipitation has increased in Sevier County over the past several decades, but with a large amount of inter-annual variation. Comparing annual rainfall totals in the 21st century to the 20th century mean for Sevier County shows that the county has had 16 years with above average precipitation and 9 years with below average precipitation, and 5 years with almost exactly average precipitation.

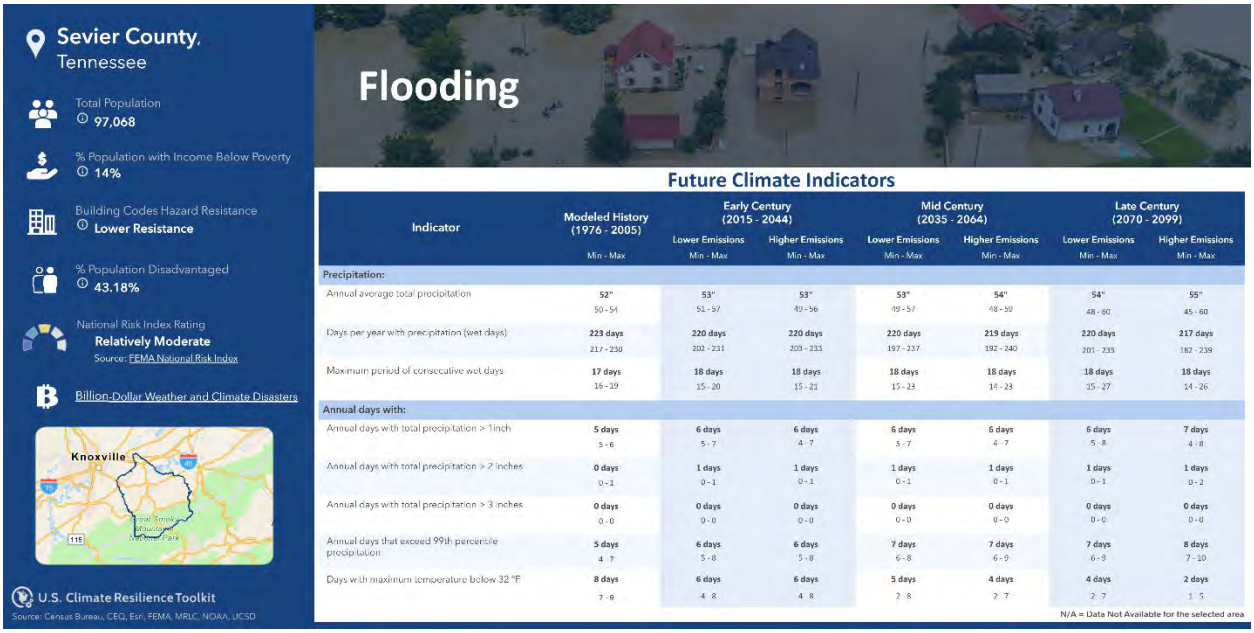


Figure 18: Climate Mapping Risk Assessment Report for Flooding in Sevier County.

(Source: US Climate Resilience Toolkit)

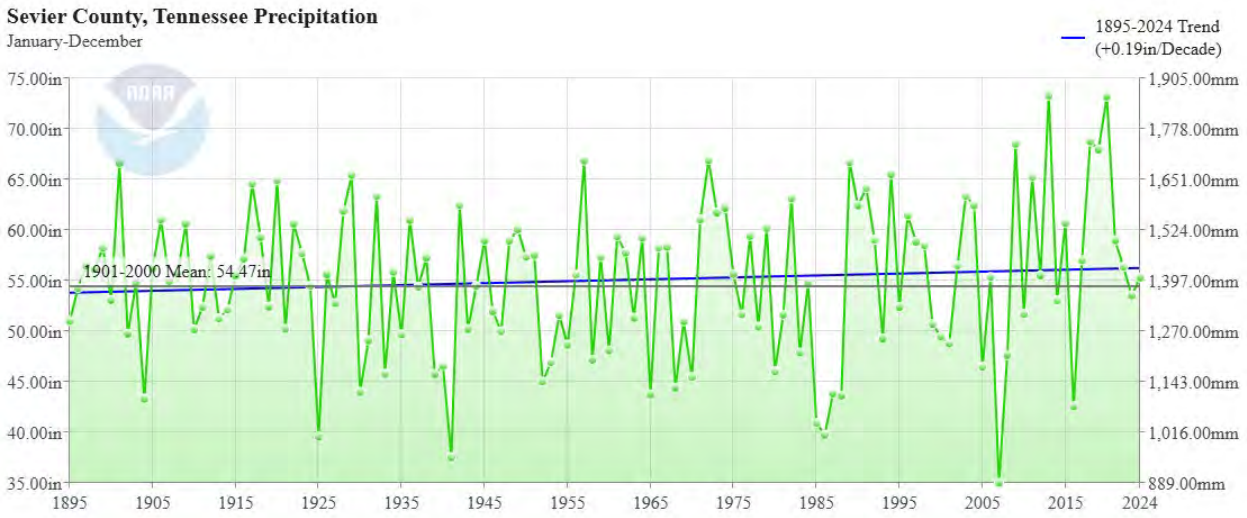


Figure 19: Total Annual Precipitation for Sevier County, Tennessee, Showing a +0.19-inch Increase per Decade Since 1895.

(Source: NOAA NCEI, Climate at a Glance: County Time Series)

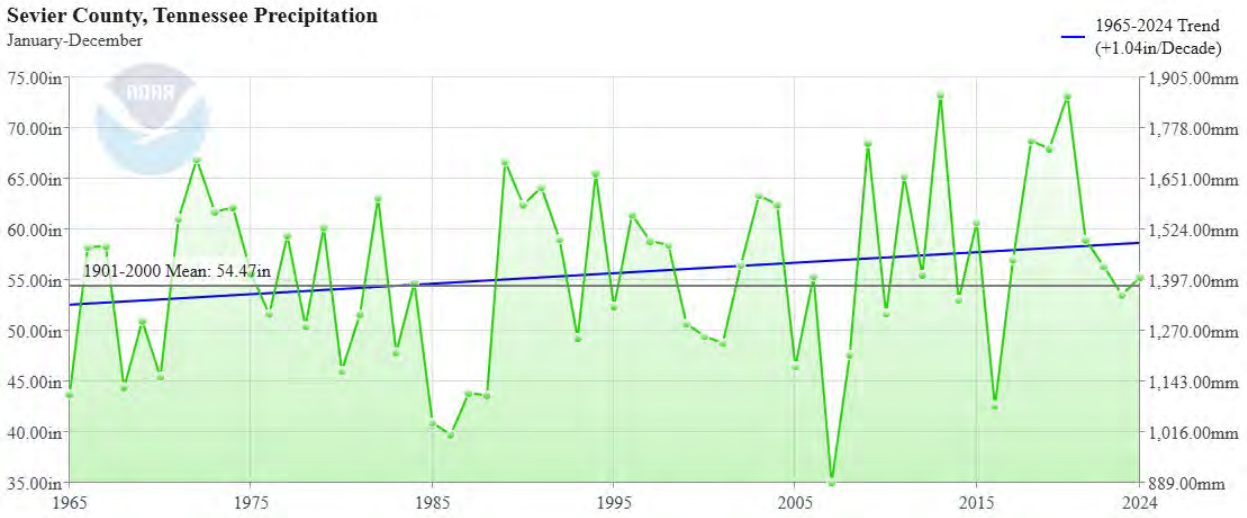


Figure 20: Total Annual Precipitation for Sevier County, Tennessee, Showing a +1.04-inch Increase per Decade Since 1965.

(Source: NOAA NCEI, Climate at a Glance: County Time Series)

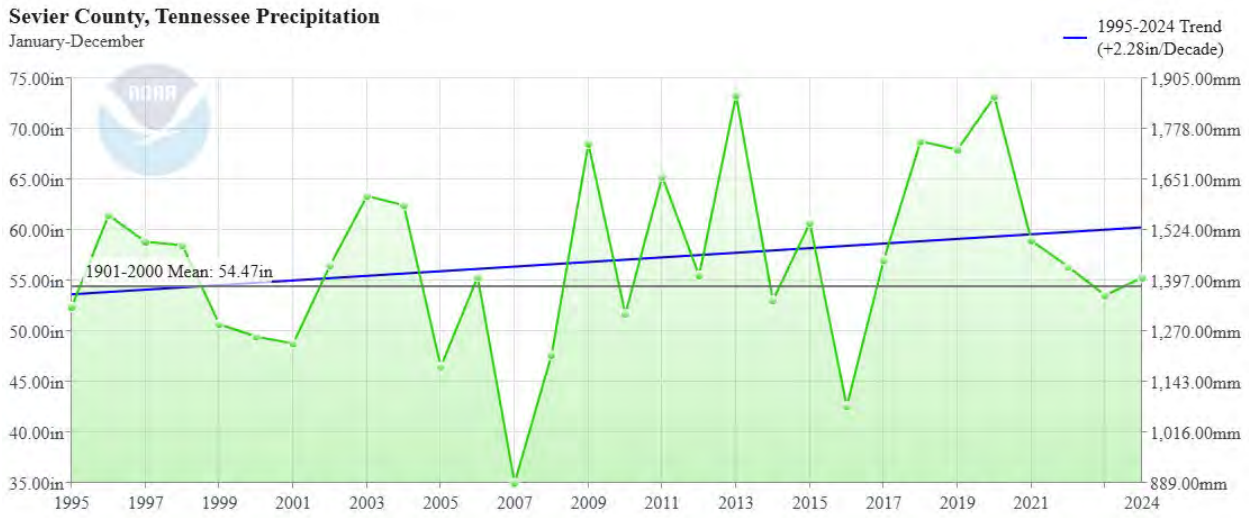


Figure 21: Total Annual Precipitation for Sevier County, Tennessee, Showing a +2.28-inch Increase per Decade Since 1995.

(Source: NOAA NCEI, Climate at a Glance: County Time Series)

Using the NOAA Storm Events Database, flood events and flood damages (dollars) were examined for trends between 1996 and 2024. Sevier County showed no significant increasing trend in the number of flood events or flood damages in the Storm Events Database in this time period. The trends in flood events and flood damages are for riverine flooding, but as overall rainfall increases and trends towards higher intensity precipitation events continue flash flooding may become a higher concern for parts of Tennessee, including Sevier County. The TCO analyzed trends in flash flood events and flash flood related damages from the NOAA Storm Events Database from 1996 to 2024. Sevier County showed no significant trend in the number of flash flood events or amount of damage reported with flash floods in the NOAA Storm Events Database.

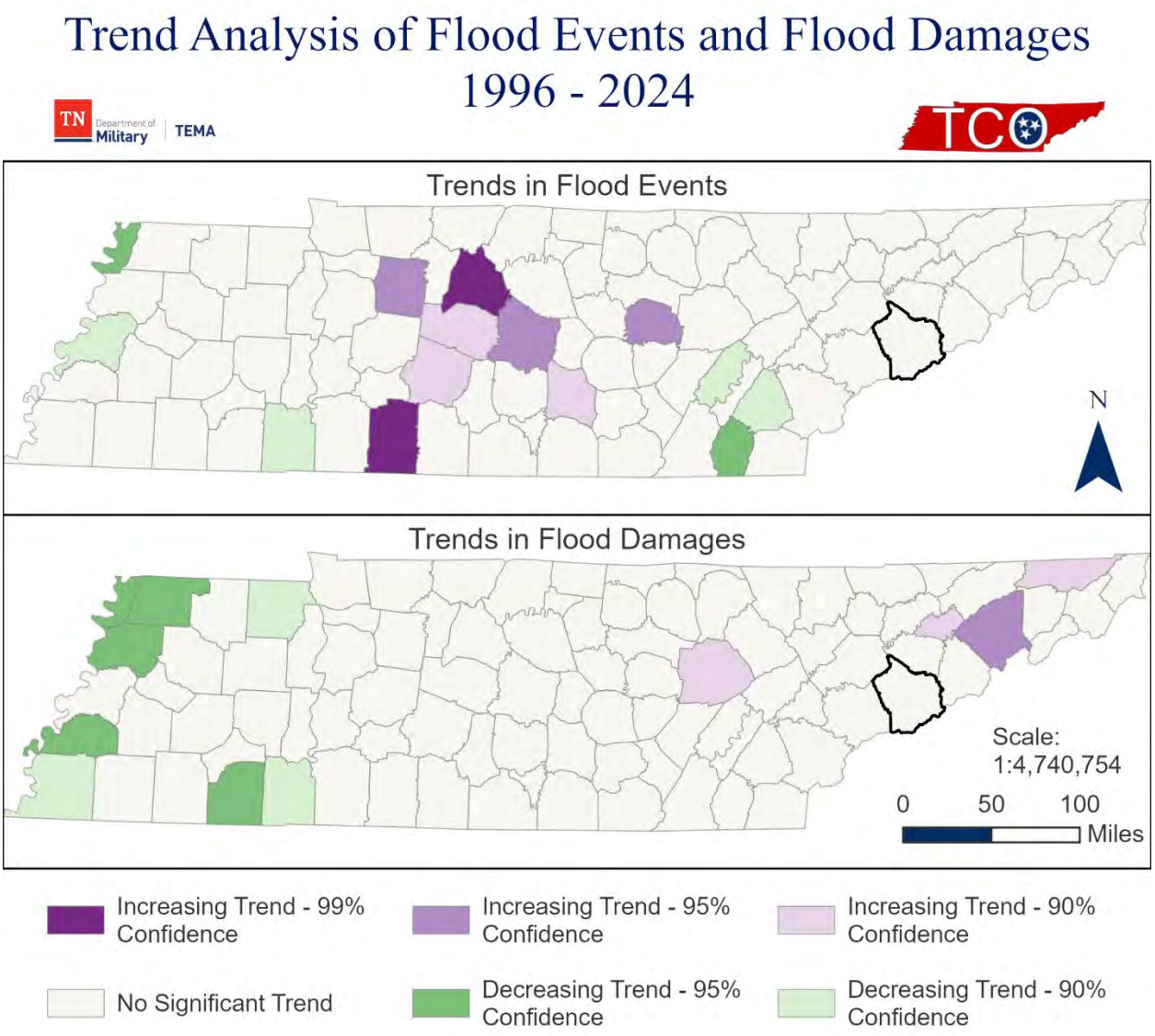


Figure 22: Trend in Flood Events and Flood Damages Reported in the NCEI Storm Events Database from 1996 to 2024, Sevier County Outlined in Bold.

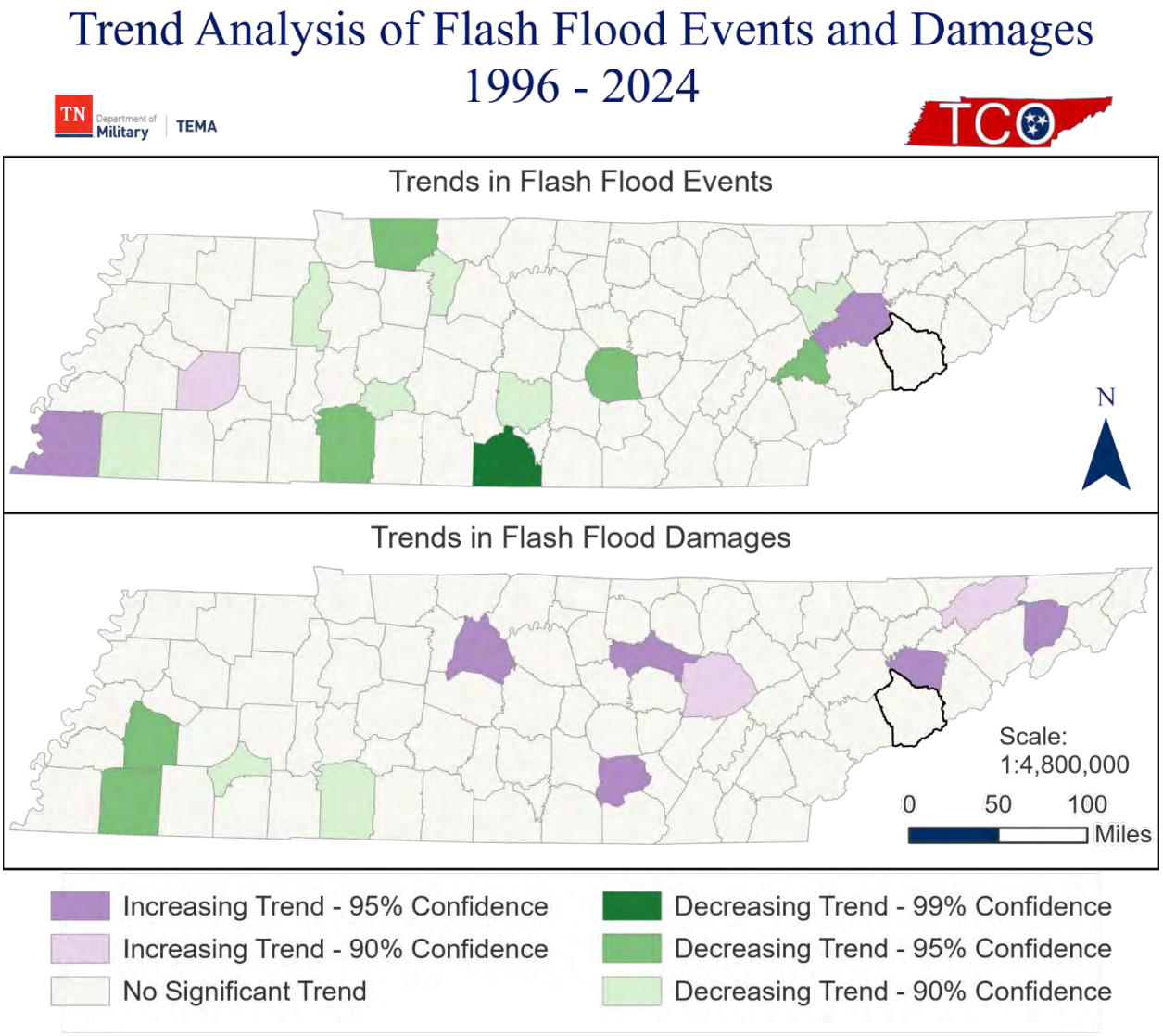


Figure 23: Trend in Flash Flood Events and Flash Flood Damages Reported in the NCEI Storm Events Database from 1996 to 2024, Sevier County Outlined in Bold.

Extreme rainfall events are often categorized based on how much above or below their amounts were compared to the 100-year, or 1% annual probability, rainfall amounts. For Sevier County, a 100-year 1-hour extreme rainfall total would be approximately 2.76-3.75 inches, with the lower amounts in the far northern portions of the county. For a 100-year 24-hour extreme rainfall event, Sevier County would experience 5.01-11.00 inches of rain.

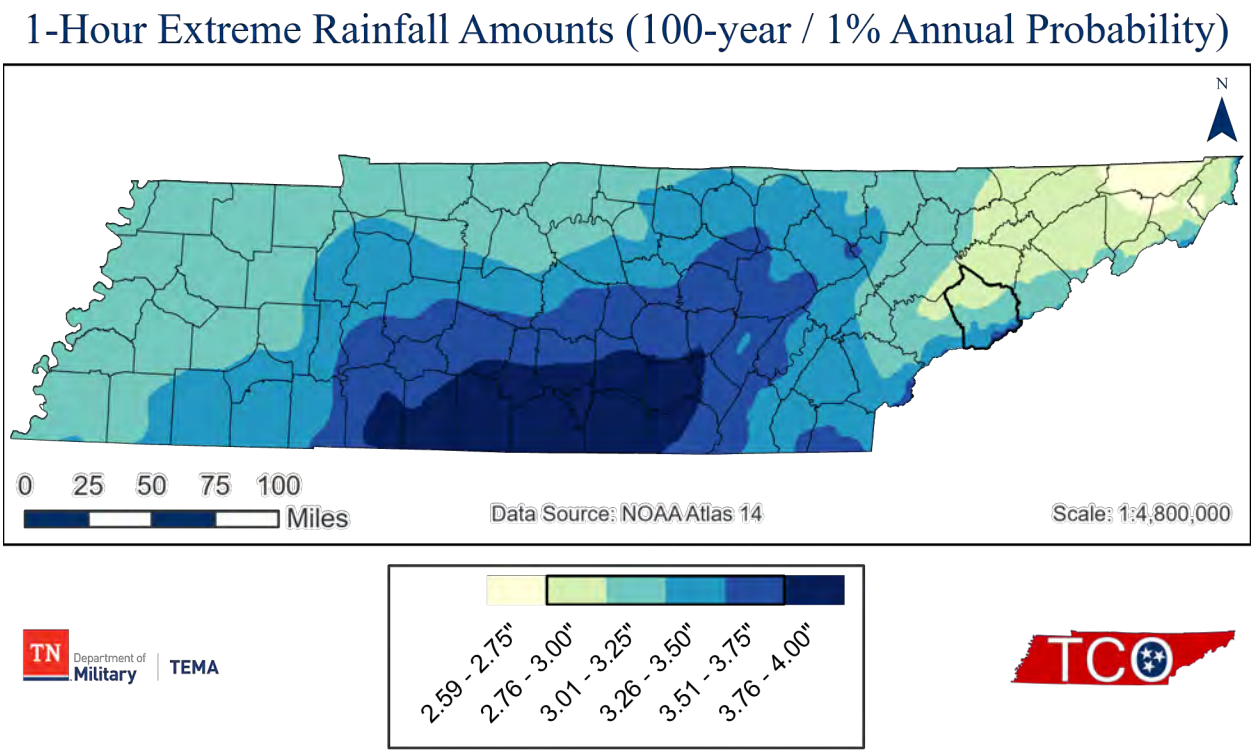


Figure 24: 1-hour Extreme Rainfall Estimates for 100-year Return Period (1% Annual Probability of Exceedance) using NOAA Atlas 14, Sevier County, Outlined in Bold.

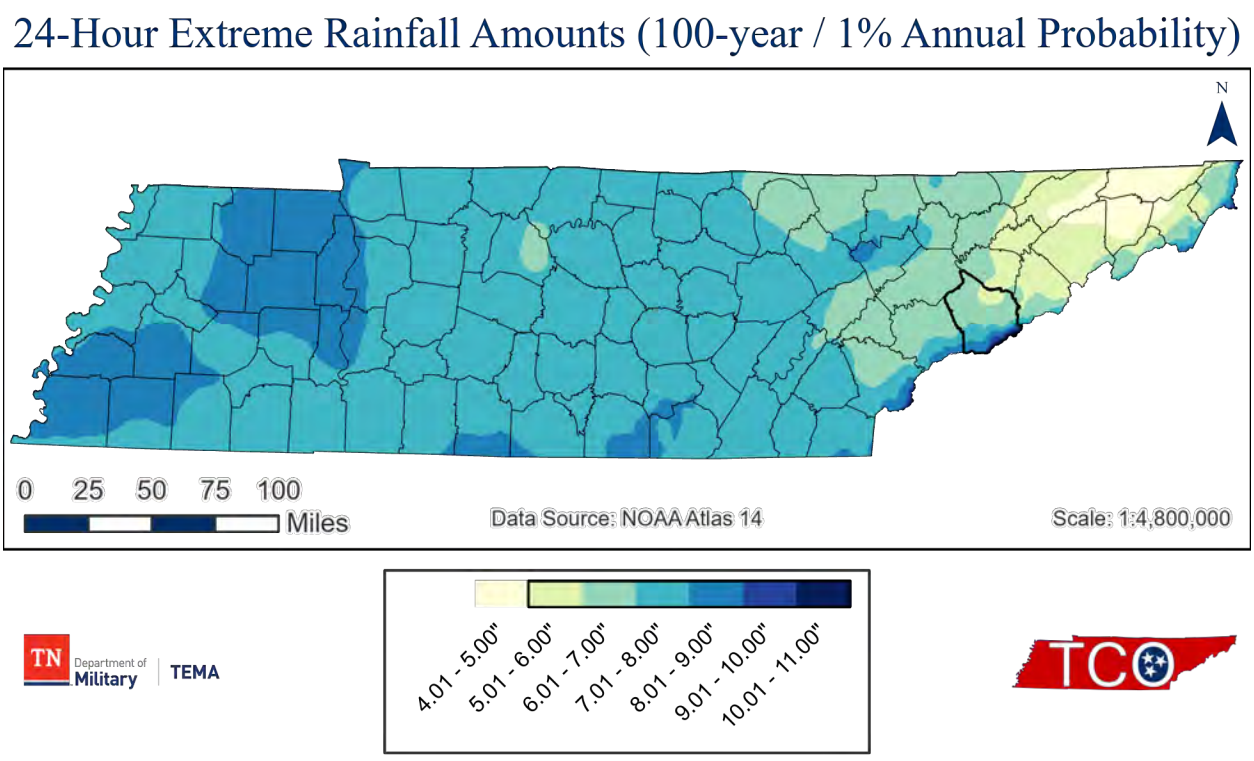


Figure 25: 24-hour Extreme Rainfall Estimates for 100-year Return Period (1% Annual Probability of Exceedance) using NOAA Atlas 14, Sevier County, Outlined in Bold.

The TCO analyzed trends in heavy precipitation days per year in counties across Tennessee, these were the number of days that daily rainfall totals exceeded a 1-year (100% chance of annual probability), 2-year (50% chance of annual probability), or 5-year (20% chance of annual probability) event. Sevier County showed no significant trend for the 1-year, 2-year, or 5-year heavy precipitation events.

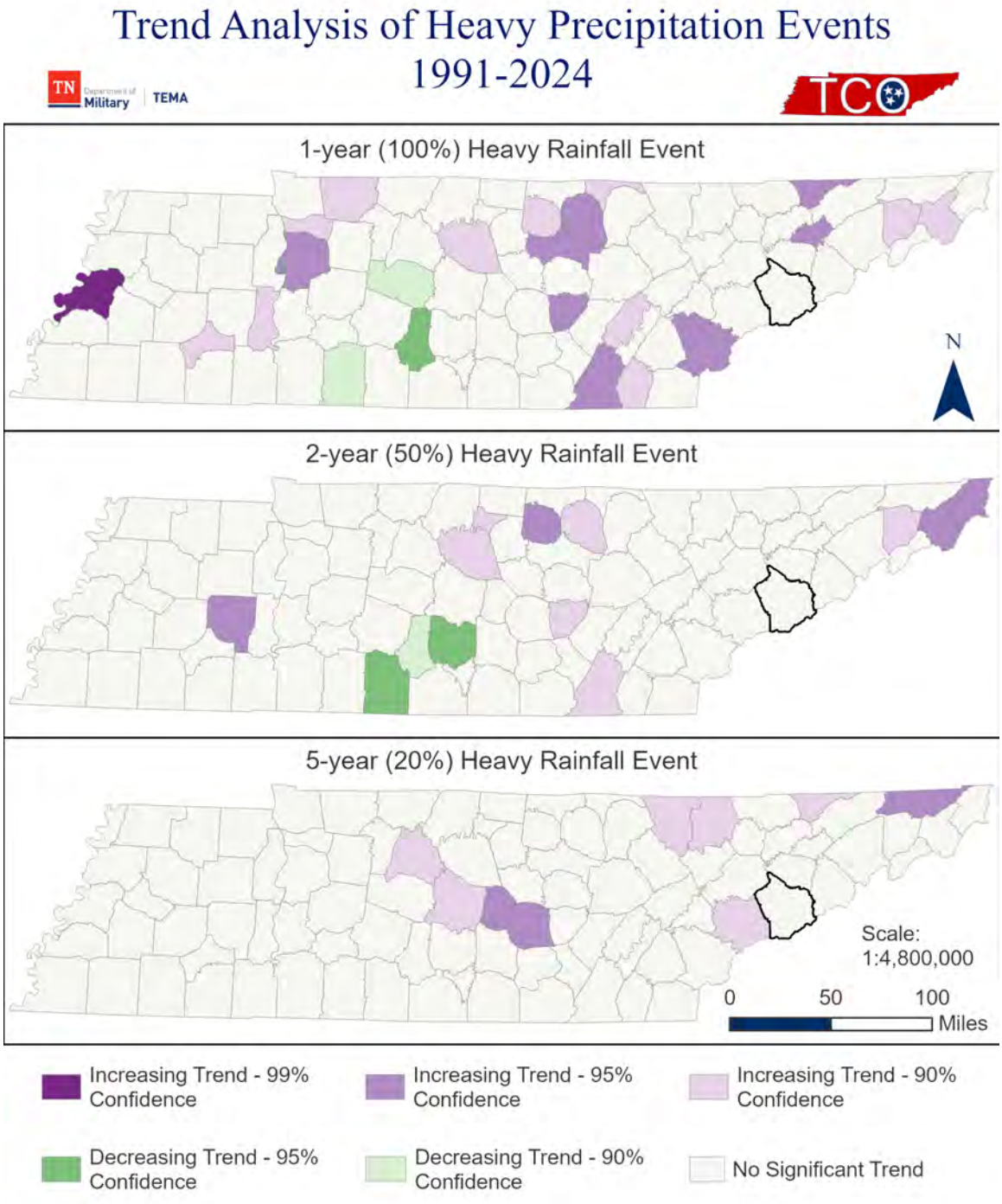


Figure 26: Trend in Heavy Precipitation Events (1-year, 2-year, and 5-year Return Period Exceedance Events), Sevier County Outlined in Bold.

Additional data from the CMRA report for Sevier County predicts an increase in the number of days per year with extreme precipitation throughout the 21st century. Based on analysis by the NCICS and NOAA, Sevierville (the county seat of Sevier County) currently has a 100-year 24-hour extreme rainfall amount of 6.01 inches and that amount is predicted to rise by as much as 1.06 inches (to 7.07") by 2055.

Table 3: Possible Change in the Number of Days per Year with Precipitation Exceeding 99th Percentile (Extreme Precipitation Days).

High Emissions Scenario	Modeled History (1976-2005)	Early Century (2015-2044)	Mid Century (2035-2064)	Late Century (2070-2099)
Driest Projection	4.5	+0.8	+1.3	+2.2
Mean Projection	5.5	+1.0	+1.5	+2.6
Wettest Projection	6.7	+1.4	+2.4	+3.5
Low Emissions Scenario	**Modeled History (1976-2005)**	**Early Century (2015-2044)**	**Mid Century (2035-2064)**	**Late Century (2070-2099)**
Driest Projection	4.5	+0.6	+1.0	+1.4
Mean Projection	5.5	+0.8	+1.2	+1.8
Wettest Projection	6.7	+1.0	+1.6	+2.5

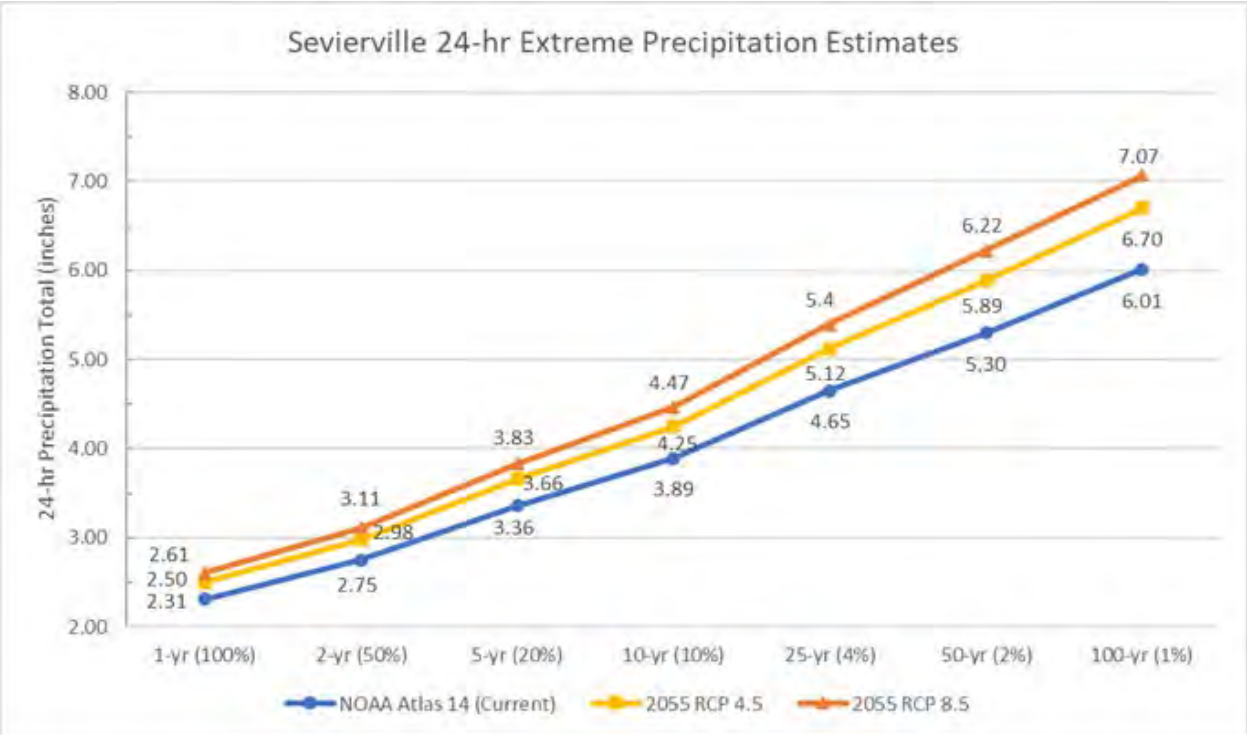


Figure 27: 24-hour Extreme Rainfall Estimates for 1-year, 2-year, 5-year, 10-year, 25-year, 50-year, and

100-year Return Periods using NOAA Atlas 14 (historical data) and Mid-Century Values for 2055 using RCP4.5 and RCP8.5 Emission Scenarios.

The US Department of Agriculture and US Forest Service created a report based on models and projection data from Multivariate Adaptive Constructed Analogs (MACA), and most of Tennessee is expected to see an increase in annual precipitation by the late 21st century. Sevier County is projected to see an increase of up to 6% in annual precipitation by the late 21st century. However, potential changes in precipitation are not expected to be spread equally across all four seasons. Spring precipitation is expected to increase by 4-8% compared to the historical average, summer precipitation is expected to increase 2-4%, fall precipitation is expected to increase by 4-10%, and winter precipitation is expected to increase by 2-4%.

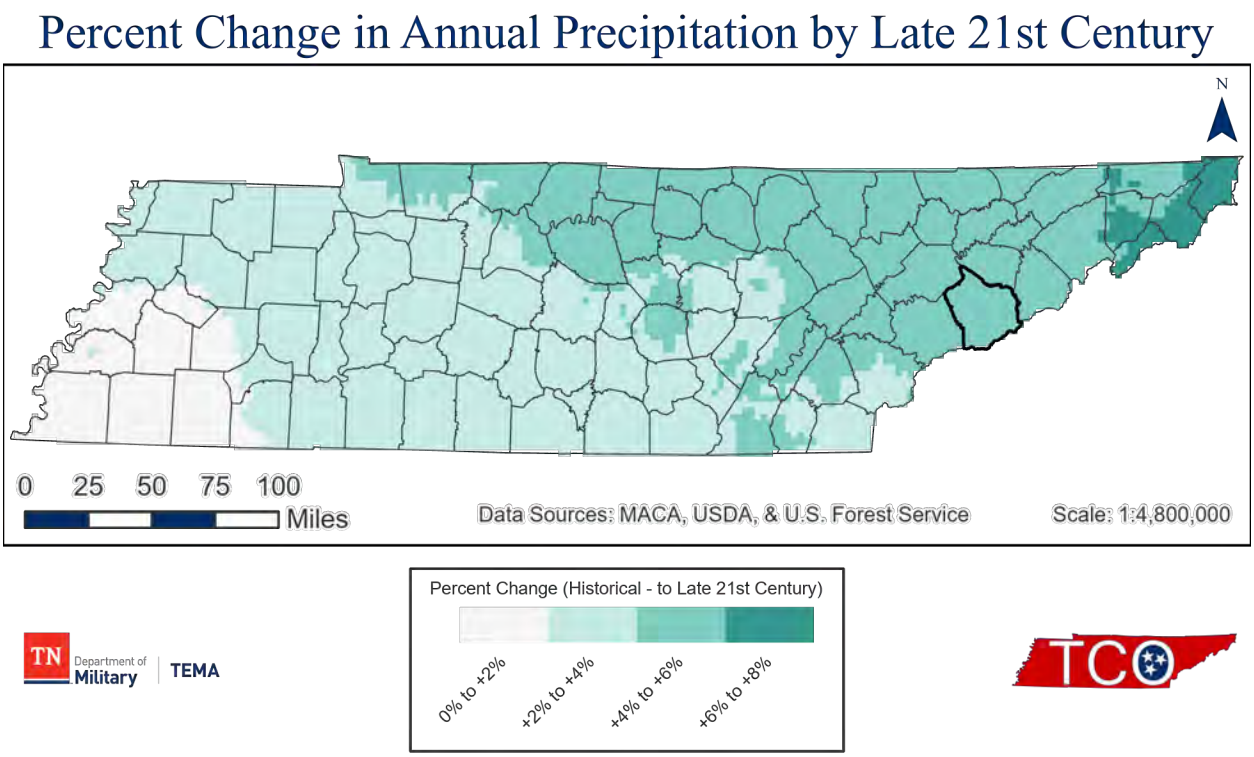


Figure 28: Projected Change in Annual Precipitation for Tennessee, Sevier County Outlined in Bold.

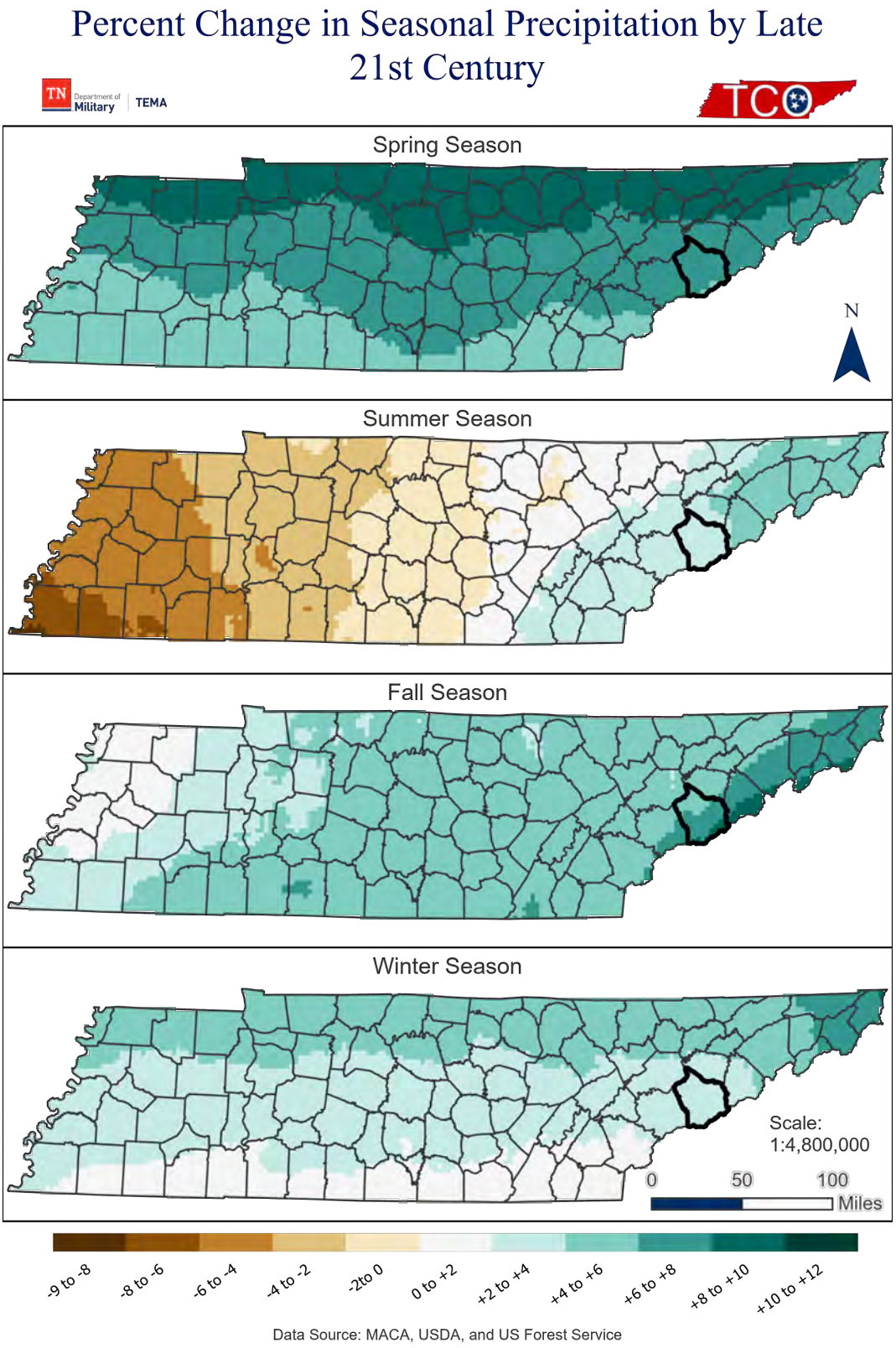


Figure 29: Projected Change in Seasonal Precipitation for Tennessee, Sevier County Outlined in Bold.

11 Geologic Hazards

Specific impacts of climate on geologic hazards may vary depending on the local geological conditions of the area. Other factors, such as land use practices and human interventions, can interact with climate to influence the occurrence and severity of geologic hazards. Increased precipitation can result in greater soil moisture content, causing expansive soils to swell more and potentially lead to landslides and damage to infrastructure. Conversely, increased frequency and severity of drought can cause soils to shrink and crack, leading to subsidence and foundation problems in structures. The impacts of climate on landslides would be increased water from intense rainfalls that would weaken the soil's stability due to an increase in saturation which increases pore water pressure. Landslides and other types of mass wasting events can be triggered by weather events like extreme rainfall or repeated freeze-thaw cycles that destabilize slopes and cause fracturing in exposed rock surfaces. Climate variability is expected to increase the number and severity of extreme precipitation events in the Southeast U.S. (see the Flood section for more details about expected changes in extreme precipitation), which could increase the likelihood of landslides in parts of Sevier County. Climate can also alter vegetation patterns which could drastically impact landslides since vegetation plays a crucial role in stabilizing slopes, and any changes can affect slope stability, potentially leading to increased landslide occurrences.

A study conducted by the USDA and U.S. Forest Service Office of Sustainability and Climate found that the frost-free season (the longest period of the year during which the temperature does not drop below freezing) could increase in length by 54 to 56 days in Sevier County by the late 21st century. The lengthening of the frost-free season and overall decrease in number of days with temperatures below freezing would reduce the amount of time during the year rock surfaces and soils would be exposed to freeze-thaw cycles. This reduction could reduce the number of localized landslides and rockfalls in Sevier County. See the Winter Weather sub-section of the Severe Weather section of this appendix for more information on observed and expected changes to winter temperatures in Sevier County.

12 Hazardous Materials Release

Climate does not have a direct impact on the hazard of hazardous materials release, although weather conditions and long-term shifts in climate patterns could have indirect impacts. For example, if wind speed and/or wind direction shifts (based on daily weather conditions or longer-term pattern shifts), then areas that may currently be less vulnerable to a chemical release may become more vulnerable or vice versa.

13 Infrastructure Incident

Climate trends and variations, especially connected to drought, extreme temperatures, and flooding can have direct and indirect impacts on infrastructure incidents. Droughts, flooding, and extreme heat or cold can all destabilize or damage critical infrastructure.

Based on observed and projected changes in the number of high heat days, and extreme precipitation the risk of weather-related infrastructure incidents could increase for Sevier County. Meanwhile the observed and projected decrease in severe cold and frost/freeze days per year could reduce the probability of weather-related infrastructure incidents related to these conditions in Sevier County. For more detailed analysis of these conditions, see the Drought, Extreme Temperature, and Flooding sections of this appendix.

14 Severe Storms

Climate trends and variations may lead to an increase in frequency and intensity of certain types of severe storms. Warmer air temperatures can contribute to more moisture in the atmosphere, providing fuel for stronger rainfall events and potentially more intense thunderstorms. The increased energy in the atmosphere can also contribute to the development of more powerful storms. Climate trends can also result in altered precipitation patterns influencing the distribution, timing, and intensity of rainfall during storms. Climate trends can influence the paths and tracks of severe storms too. Changes in atmospheric circulation patterns may lead to shifts in the regions where storms typically form or move, potentially affecting the areas that are historically vulnerable to specific types of storms. This can result in new areas being exposed to severe storms while other areas experience a decrease. Research by Ashley et al. (2023) into supercell thunderstorm formation compared historical data (1990-2005) and future climate models for the late 21st century (2085 – 2100), which indicate that the mid-South region of the U.S. could see an increase in the number of supercell thunderstorms capable of producing severe thunderstorm hazards and tornadoes. These increases were mostly found in the late winter to early spring months of February, March, and April. Additionally, they found that an increasing number of supercell thunderstorms in this region could form in the late afternoon to overnight hours. Climate trends can contribute to compound events where multiple extreme weather events can occur simultaneously or in succession. These compound events can amplify the overall impacts on communities and ecosystems, making them more challenging to manage and recover from.

14.1 Severe Thunderstorms (Convective Wind, Hail, and Lightning)

Using data from the NOAA Storm Prediction Center severe storm reports archive from 1980-2024, Sevier County has a low number of severe thunderstorm wind damage reports, and a moderate number of severe hail reports compared to other parts of the state. Sevier County has a low number of lightning strikes per year compared to other areas of the state. The Tennessee Climate Office (TCO) analyzed trends for thunderstorm winds (convective wind) and severe hail reports in counties across Tennessee using the NOAA Storm Events Database with data from 1996 to 2024, and lightning strikes per county from 1996 to 2024 from the NOAA Severe Weather Data Inventory (SWDI). The trend analysis for convective wind reports and severe hail reports showed no significant trends for Sevier County. Trend analysis for lightning strikes showed a significant decreasing trend for Sevier County.

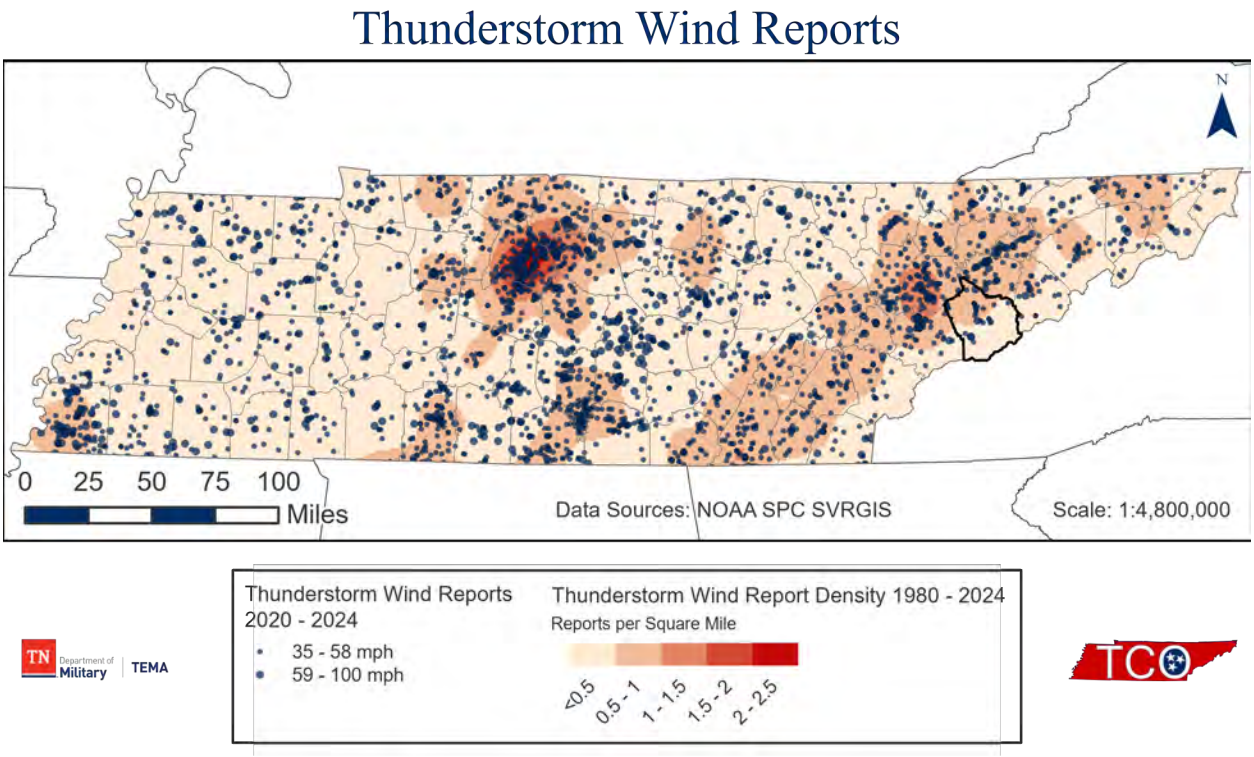


Figure 30: Severe Thunderstorm Wind Reports from 2018-2023 and Severe Thunderstorm Wind Report Density from 1980-2023, Sevier County Outlined in Bold.

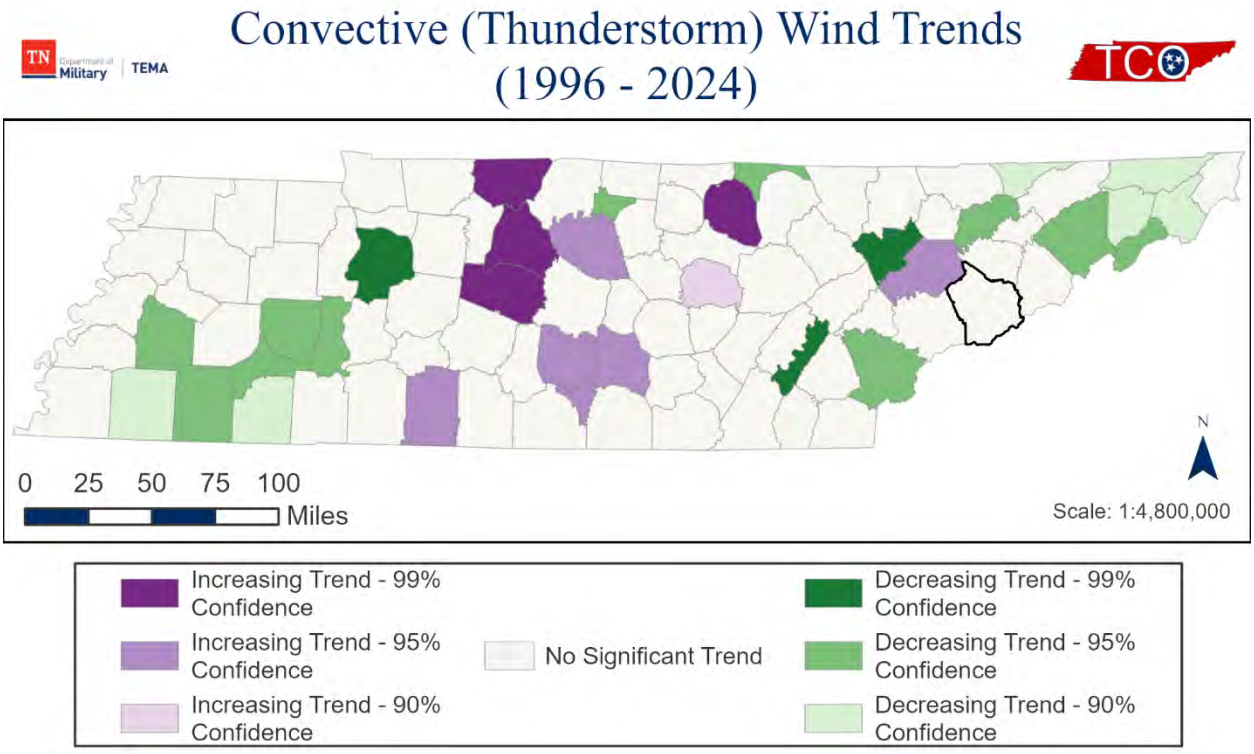


Figure 31: Trends in the Number of Thunderstorm Wind Events Recorded in the NCEI Storm Events Database from 1996 to 2024, Sevier County Outlined in Bold.

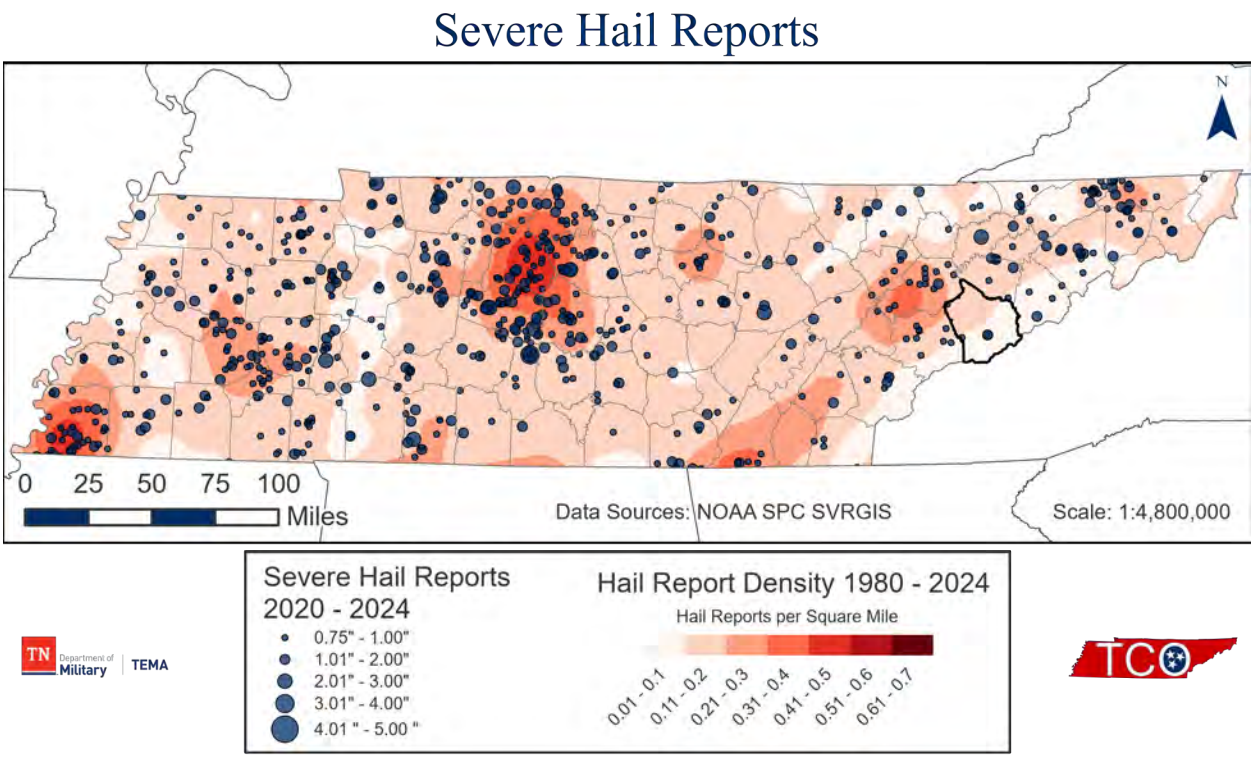


Figure 32: Severe Hail Reports from 2018-2023 and Severe Hail Density from 1980-2023, Sevier County Outlined in Bold.

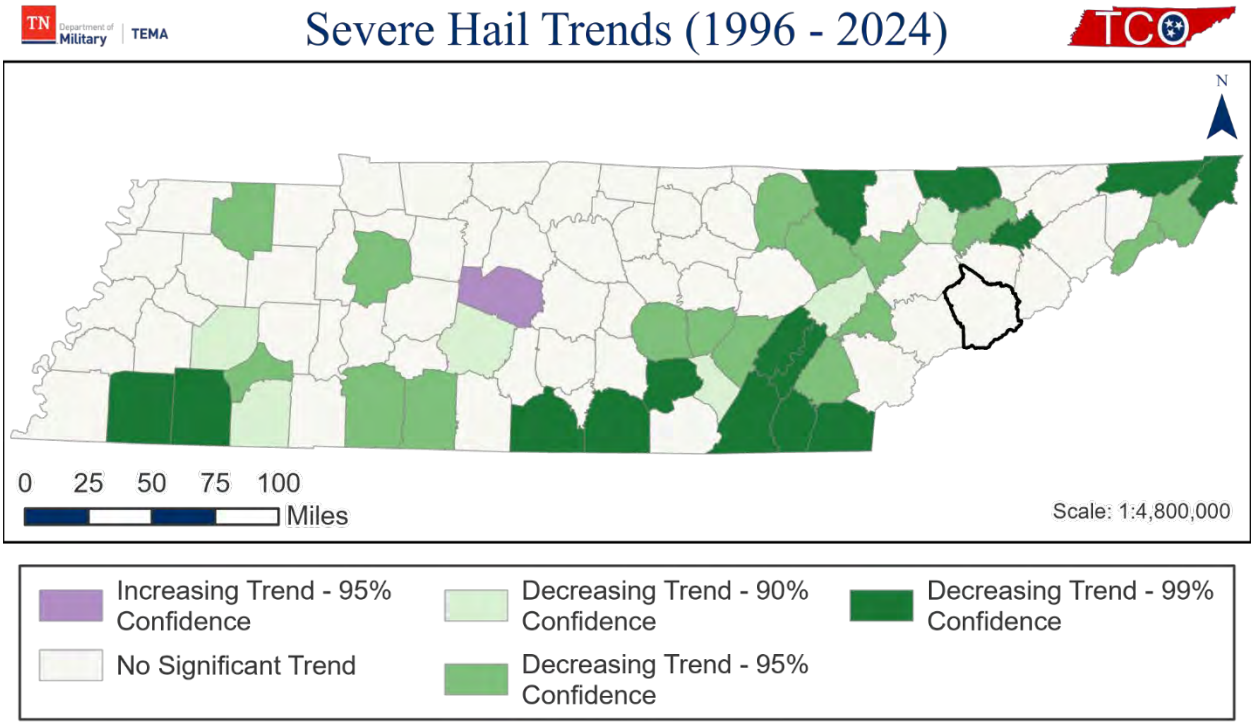


Figure 33: Trends in the Number of Severe Hail Events Recorded in the NCEI Storm Events Database from 1996 to 2024, Sevier County Outlined in Bold.

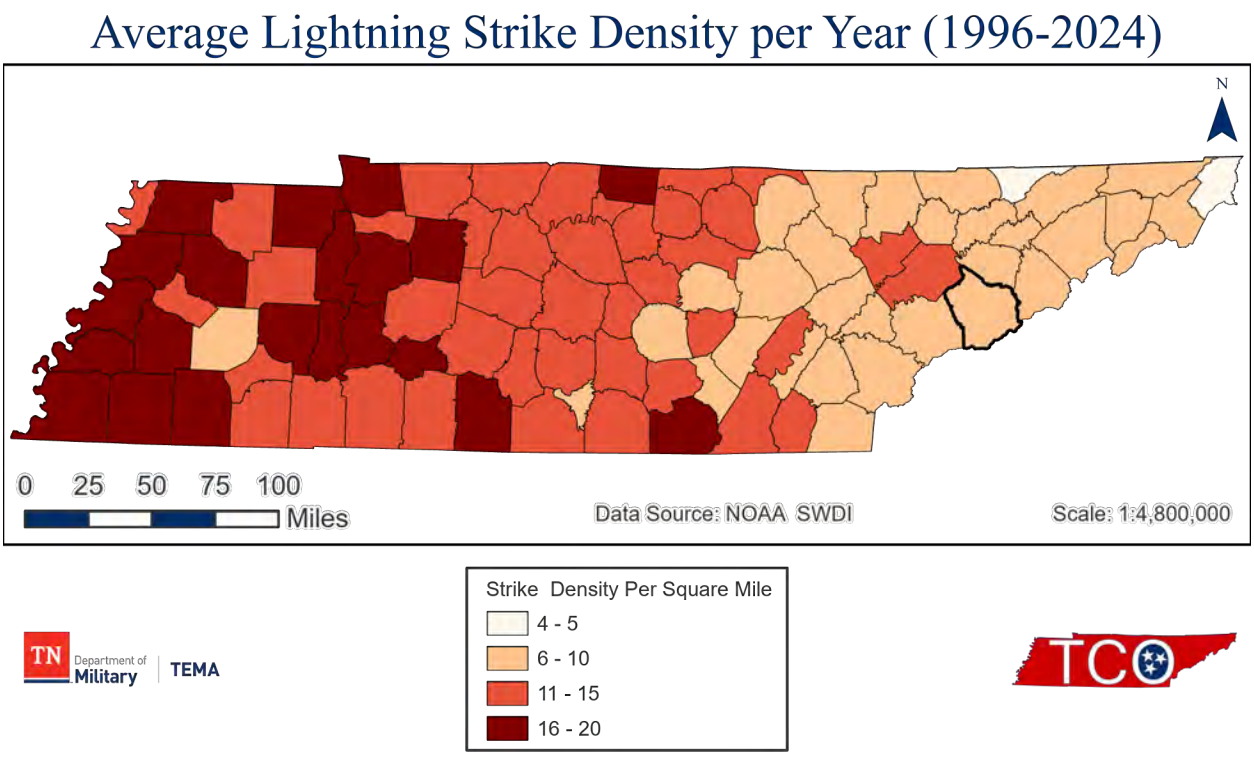


Figure 34: Average Annual Lightning Strike Density from 1996 to 2024, Sevier County Outlined in Bold.

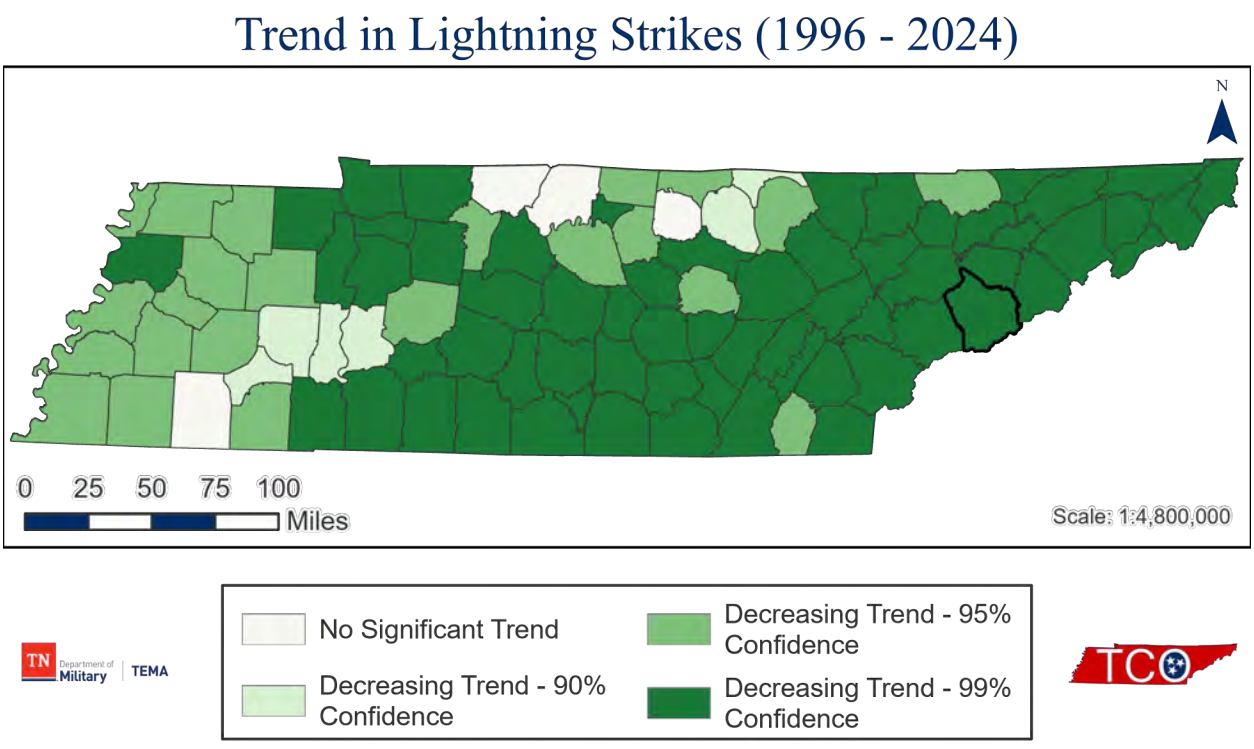


Figure 35: Trends in the Number of Lightning Strikes per County Recorded in the NOAA Severe Weather Data Inventory from 1996 to 2024, Sevier County Outlined in Bold.

14.2 Non-Thunderstorm Winds

The Tennessee Climate Office (TCO) also analyzed trends for non-convective (non-thunderstorm) wind reports in counties across Tennessee using the NOAA Storm Events Database with data from 1996 to 2024, and Sevier County showed a significant increasing trend in non-convective wind events during this time.

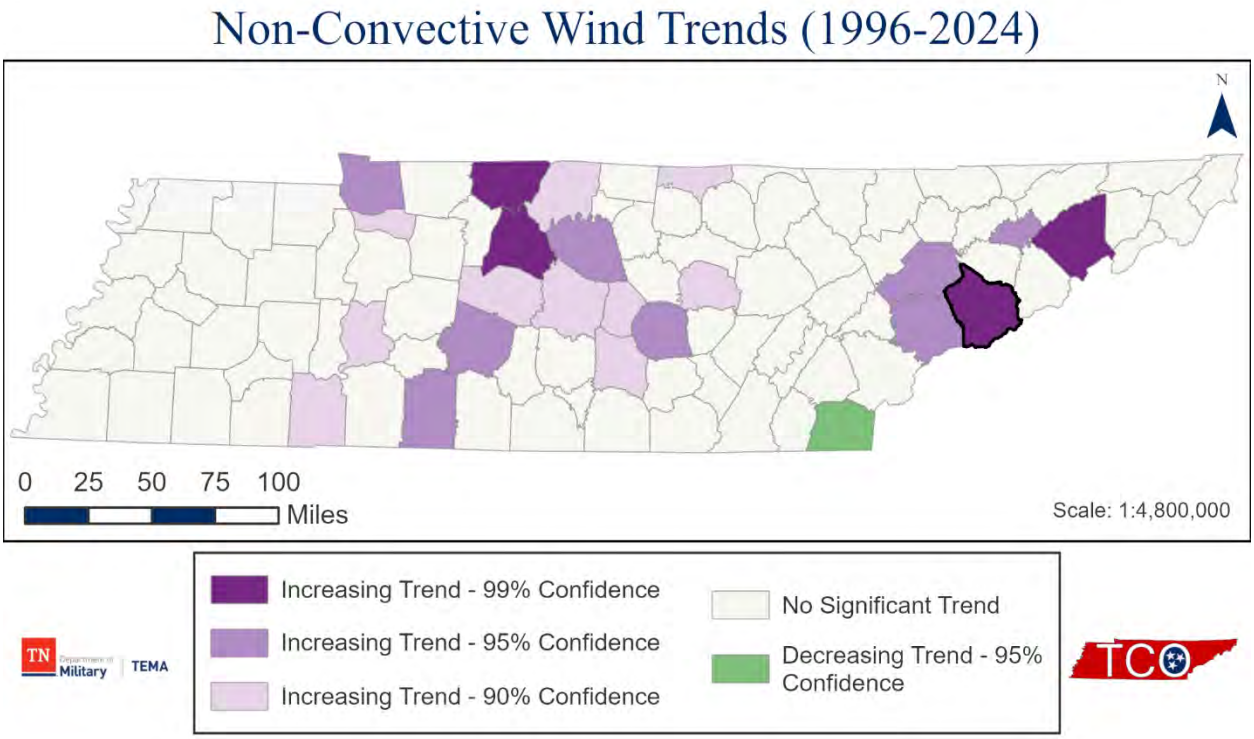


Figure 36: Trends in the Number of Non-Convective Wind Events Recorded in the NCEI Storm Events Database from 1996 to 2024, Sevier County Outlined in Bold.

14.3 Winter Weather

Data from the National Weather Service NOHRSC National Gridded Snowfall Analysis webpage covering the winters of 2008-2009 to 2024-2025 (the last 17-years) indicates that the average annual snowfall for Sevier County ranges from 6 to 48-inches per year. Using data from the NOAA Storm Events Database, trend analysis was performed on winter weather-related storms from 1996 to 2024 across the state of Tennessee. In this time period there was a decreasing trend in the number of winter storms impacting Sevier County, this trend was significant to the 99% confidence level.

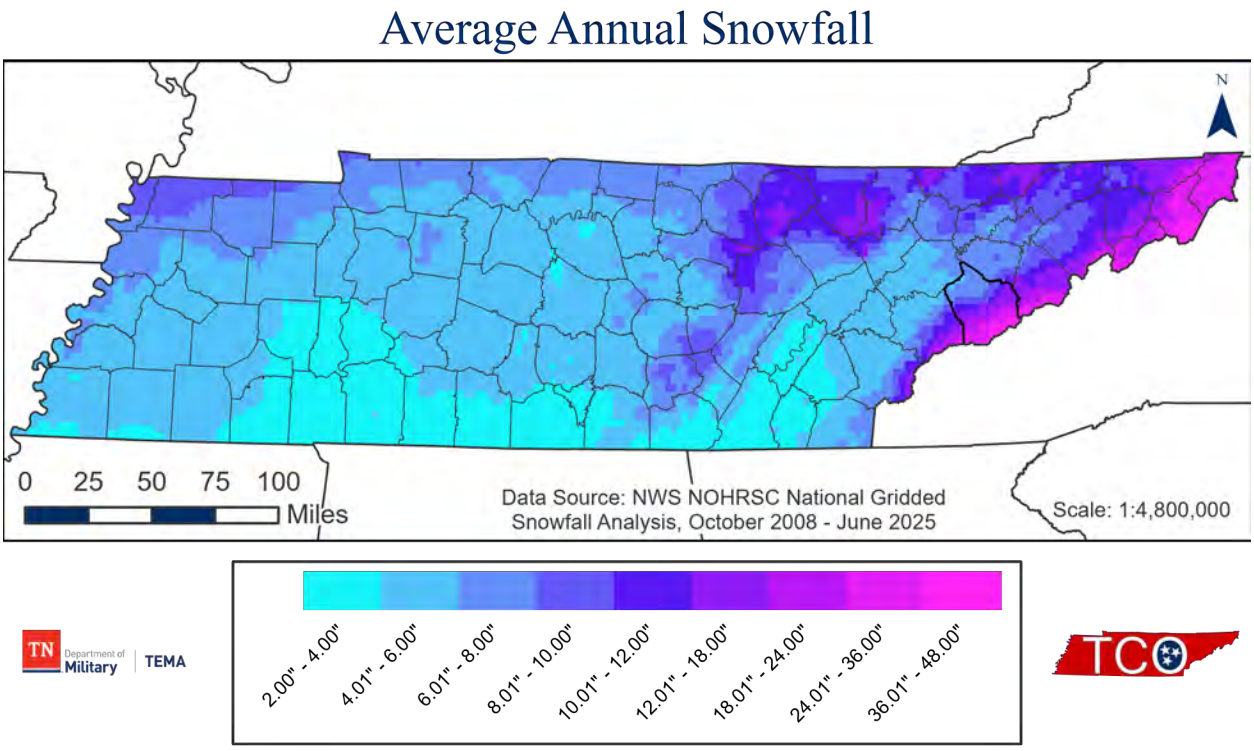


Figure 37: Average Annual Snowfall from the Winter of 2008/2009 to the Winter of 2023/2024, Sevier County Outlined in Bold.

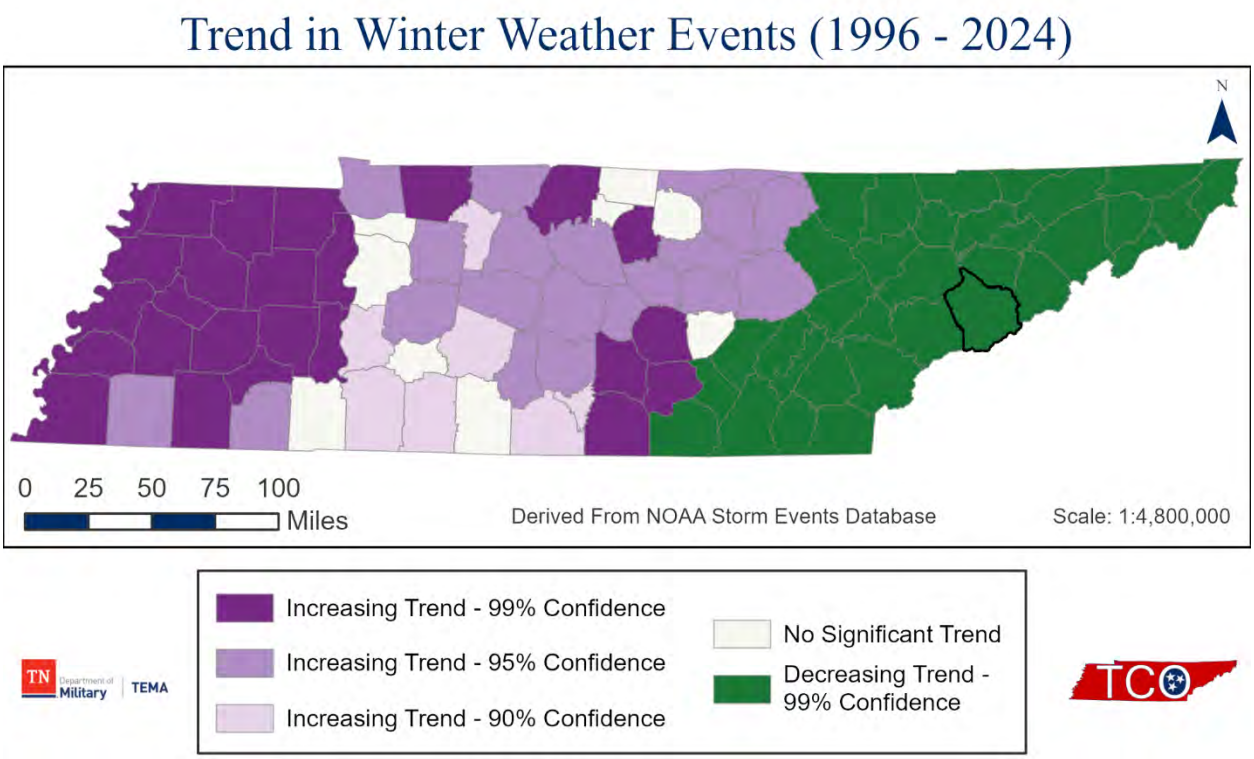


Figure 38: Trends in the Number of Winter Weather-Related Events Recorded in the NCEI Storm Events Database from 1996 to 2024, Sevier County Outlined in Bold.

Climate trends and variability will impact the future likelihood of winter weather events or severe winter storms in Tennessee, likely decreasing but not eliminating the overall risk. Average annual temperatures are expected to increase across the Southeast US, including temperatures during the winter season. Sevier County has an observed warming trend of +0.1°F per decade from 1896 to 2024 throughout the meteorological/climatological winter season (December – February). In the medium-term (1965 - 2024) the winter temperature trend shows greater warming at +0.8°F per decade, and the short-term (1995 - 2024) trend shows an even stronger warming of +0.9°F per decade during the winter season.

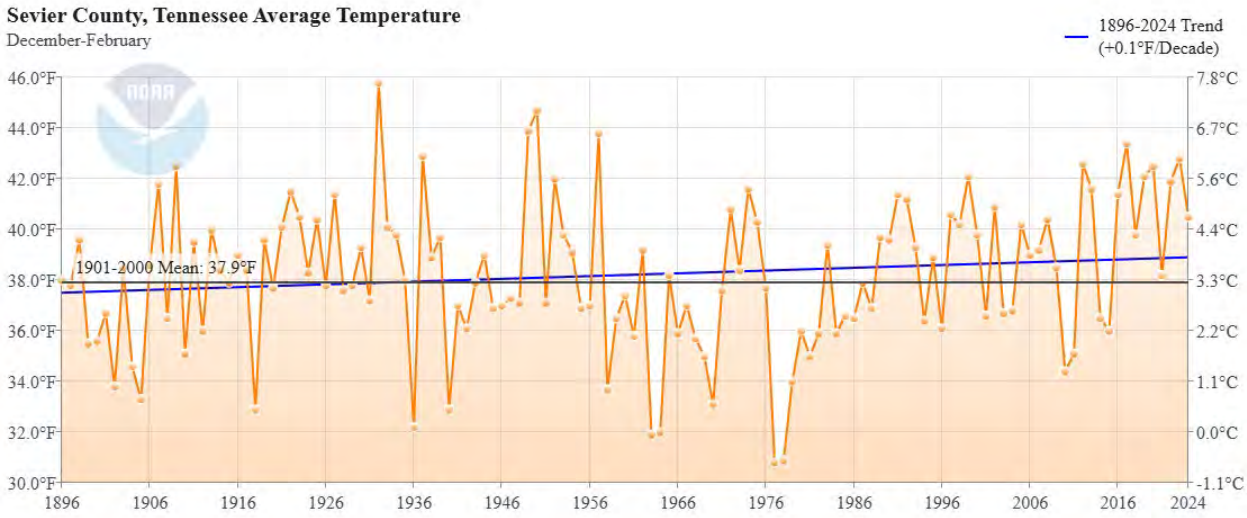


Figure 39: Winter (December to February) Mean Temperature for Sevier County, Tennessee, Showing a +0.1°F Increase per Decade Since 1896.

(Source: NOAA NCEI, Climate-at-a-Glance: County Time Series)

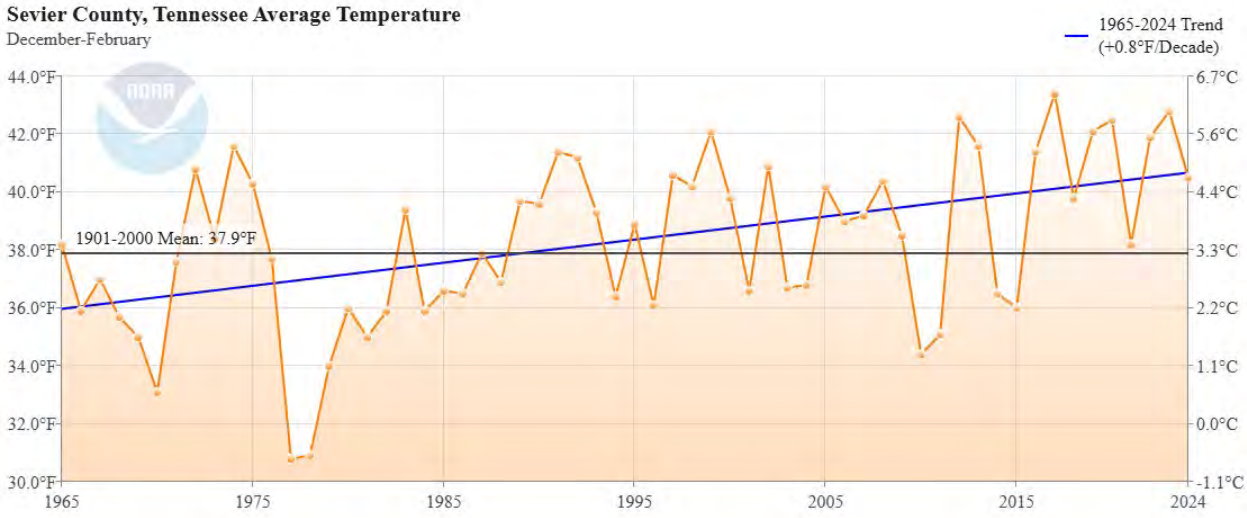


Figure 40: Winter (December to February) Mean Temperature for Sevier County, Tennessee, Showing a +0.8°F Increase per Decade Since 1965.

(Source: NOAA NCEI, Climate-at-a-Glance: County Time Series)

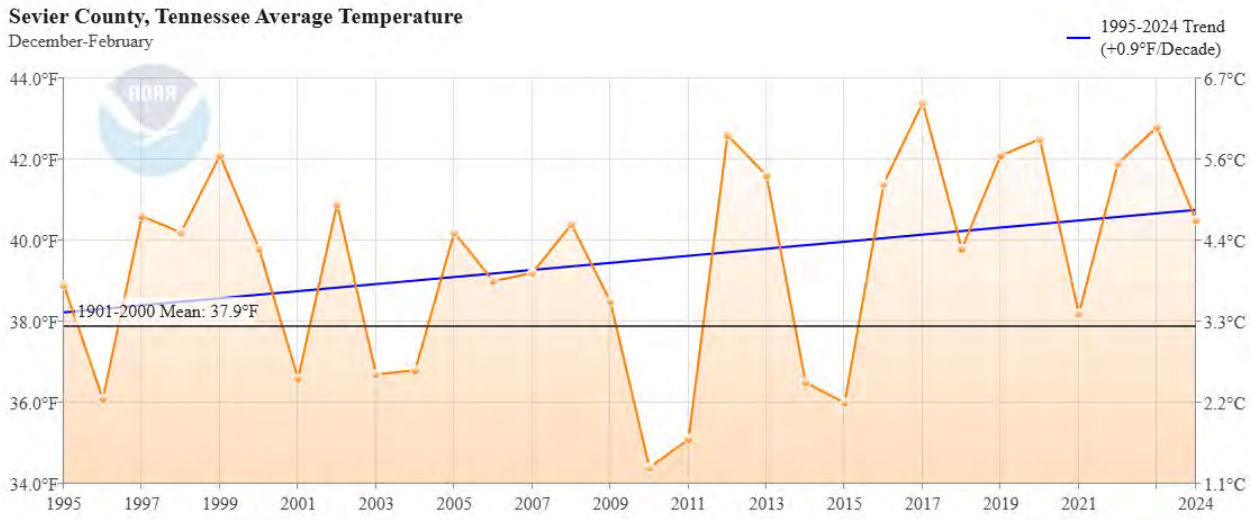


Figure 41: Winter (December to February) Mean Temperature for Sevier County, Tennessee, Showing a +0.9°F Increase per Decade Since 1995.

(Source: NOAA NCEI, Climate-at-a-Glance: County Time Series)

In addition to the increasing average annual and winter temperatures, the USDA and U.S. Forest Service Office of Sustainability and Climate projects that the length of the frost-free season will increase by 39-54 days across Sevier County by the late 21st century. This means that the amount of time during the year where winter weather is possible will decrease. Currently, the average frost season in Sevier County lasts for about six to seven months (October to April), but by the late 21st century that is projected to decrease to just about four to five months of the year. In the following two figures the historical and projected number of Frost Days (days with a minimum temperature below freezing) and Icing Days (days with a maximum temperature below freezing) are shown for Sevier County from the U.S. Climate Resilience Toolkit Climate Explorer. The mean projection for the low emissions scenario indicates that Sevier County could have 39 fewer Frost Days per year by the end of the century, while the mean projection for the high emissions scenario indicates there could be 54 fewer Frost Days per year than the 1961-1990 observed average number of frost days. The mean projection for the low emissions scenario shows that Sevier County could observe approximately eight fewer Icing Days per year, while the high emissions scenario shows that there could be approximately nine fewer Icing Days per year by the end of the century compared to the 1961-1990 observed average.

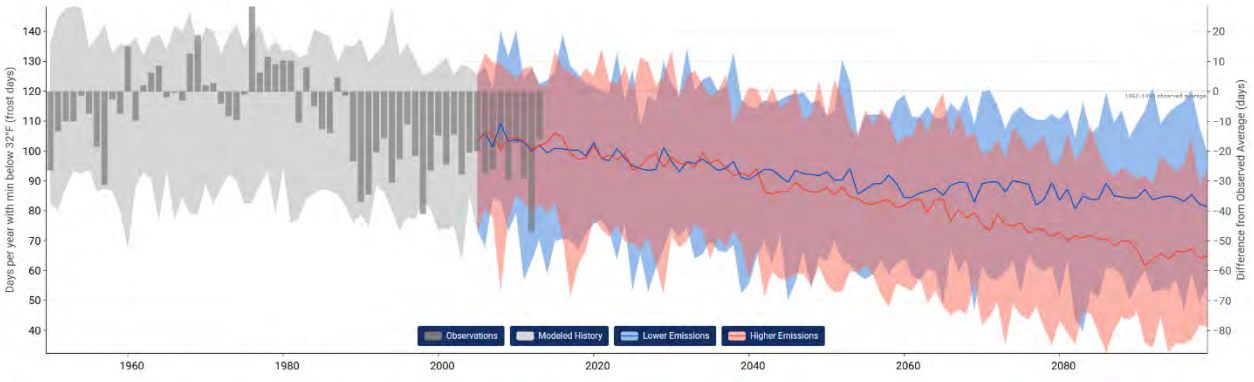


Figure 42: Days Per Year with Minimum Temperature Below 32°F (Frost Days) with Historical Observations from 1950 to 2013 and High (red) and Low (blue) Emission Scenarios Going to 2100 for Sevier County, Tennessee.

(Source: U.S. Climate Resilience Toolkit Climate Explorer)

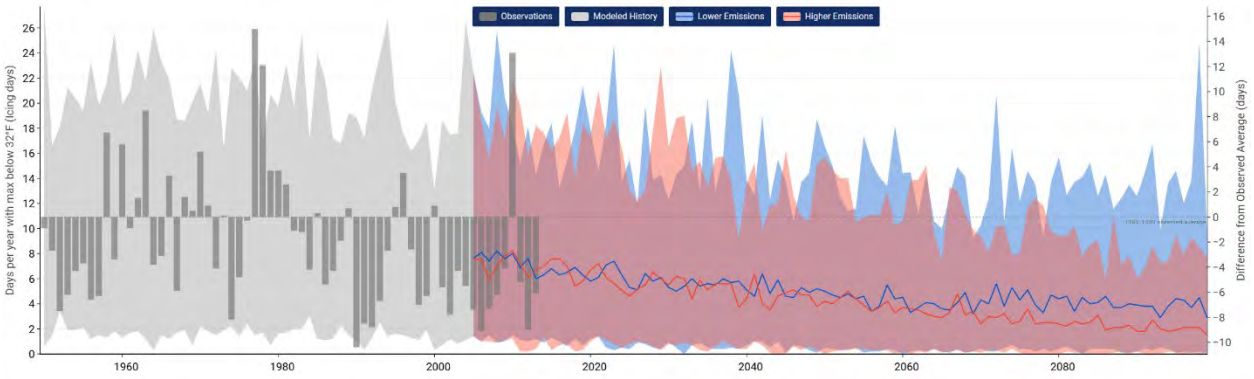


Figure 43: Days per Year with a Maximum Temperature Below 32°F (Icing Days) With Historical Observations from 1950 to 2013 and High (red) and Low (blue) Emission Scenarios Going to 2100 for Sevier County, Tennessee.

(Source: U.S. Climate Resilience Toolkit Climate Explorer)

Additionally, the USDA forecasted changes in Plant Hardiness zones for the Southeast U.S. The following figure, from the Fifth National Climate Assessment (2023) indicates that Sevier County may transition from Plant Hardiness Zone 7a/7b (historical data, 1976-2005) to Plant Hardiness Zone 8b/9a by 2070-2099, based on climate models using the SSP5-8.5 (higher emissions) greenhouse gas emissions scenario. That would correlate to a warming of approximately 10-15 degrees in the average coldest temperature expected in parts of the county, from historical values of 0°F to 10°F to future values of 15°F to +25°F.

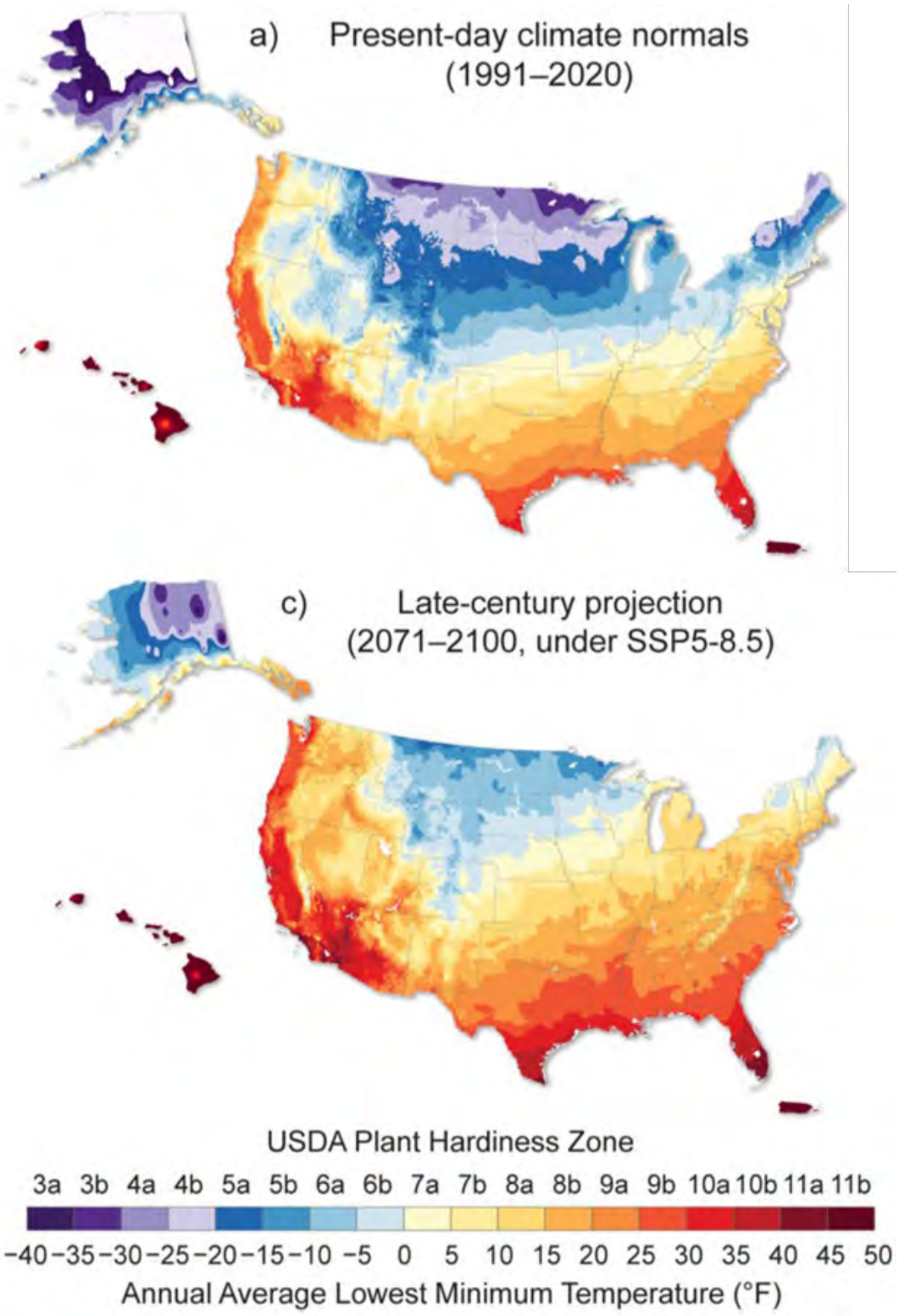


Figure 44: Comparison of Plant Hardiness Zones Across the Southeast U.S. from Current Averages and Projected Values for Late Century using SSP5-8.5 (high emissions) Scenario Models.

(Source: Fifth National Climate Assessment (Chapter 11))

15 Terrorism/Civil Disobedience

Climate does not have a direct impact on the hazard of terrorism; however, it is considered a “threat multiplier” by United States military officials, in that it can exacerbate the damage caused by a terroristic event. Additionally, instability of foreign states can be exacerbated by climate-based hazards (e.g., drought, flooding, or tropical cyclones) which could increase the risk of future terroristic actions.

16 Tornado

It is uncertain how climate trends will impact the overall frequency of tornadoes, with convective storms (from which tornadoes form) being the least well understood extreme events when it comes to attributing future changes to climate trends and variations. However, some studies suggest that the number of days conducive to severe thunderstorms, which can spawn tornadoes, may increase in certain regions. Additionally, warmer temperatures can provide more energy to storms, potentially leading to more intense tornadoes. Tornado formation depends on the interaction of multiple atmospheric factors, including temperature, humidity, wind shear, and instability. While climate trends may alter some of these factors, the precise impact on tornado formation remains uncertain. Warmer temperatures and increased moisture content in the atmosphere can contribute to more favorable conditions for tornado formation, but other factors like wind shear patterns may also change and reduce the chances for tornado formation.

Using historical data from 1980 to 2024, Sevier County has a moderate-to-high density for tornadoes in Tennessee, with an average of less than 0.10 tornado tracks per square mile, with higher totals in the north-central portions of the county. Using data from the NOAA Storm Events Database, trend analysis and emerging hotspot analysis were performed on the number of tornadoes reported in each county of Tennessee from 1996 to 2024. There was no significant increasing or decreasing trend in the number of tornadoes observed in Sevier County and it was not identified as an emerging hot spot. These results indicate that there is a low number of tornadoes occurring in Sevier County and no significant increasing or decreasing trend in the number of tornadoes observed per year over the past 29 years.

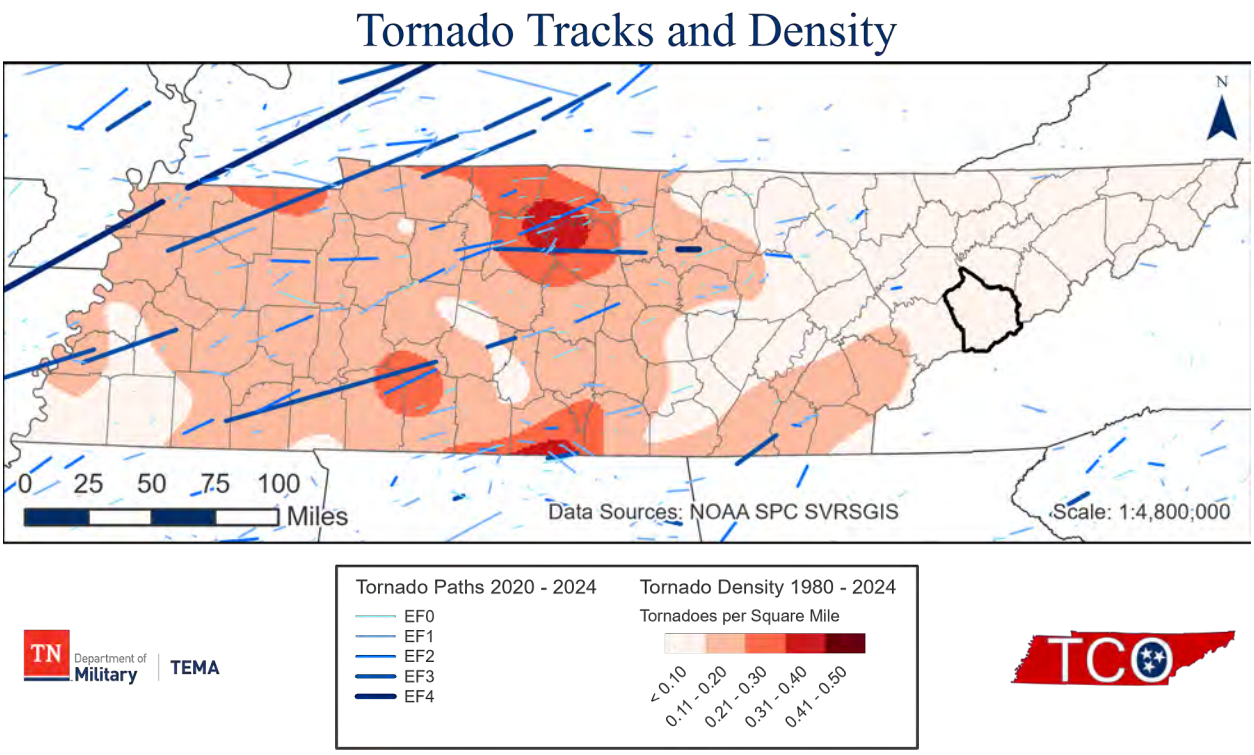


Figure 45: Tornado Tracks from 2020-2024 and the Density of Tornado Tracks across Tennessee from 1980 to 2024, Sevier County Outlined in Bold.

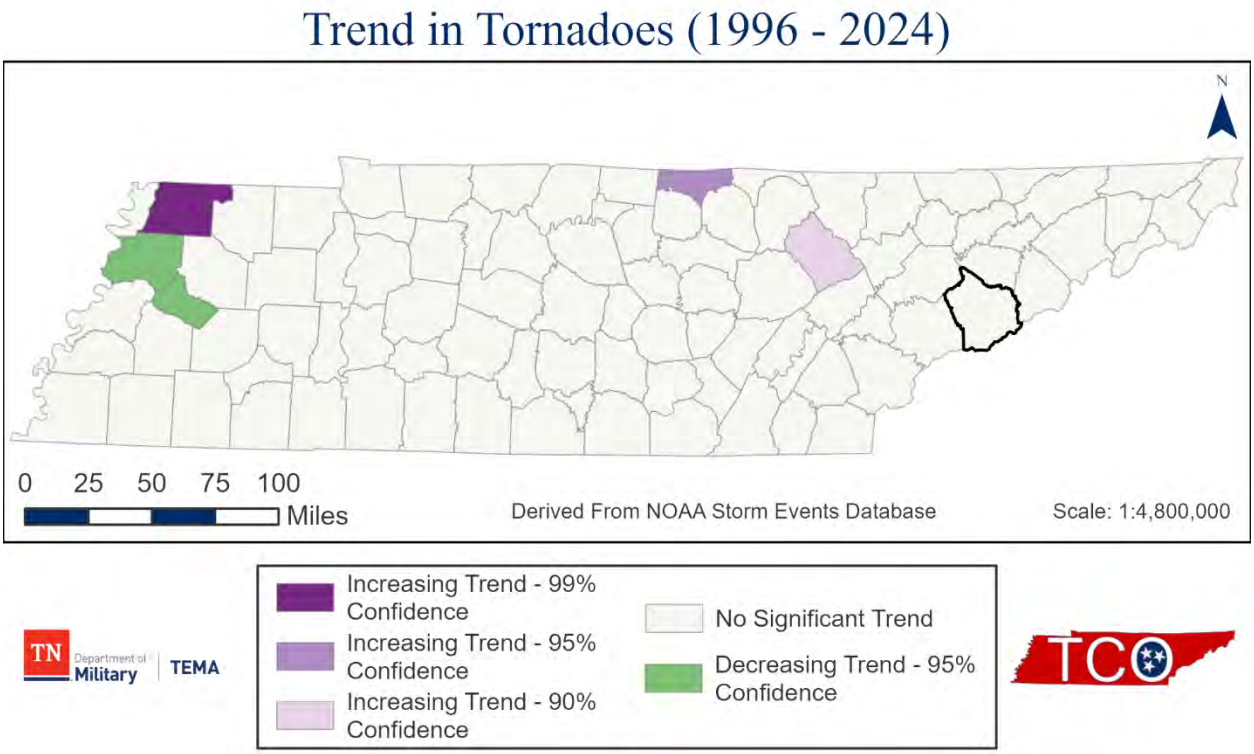


Figure 46: Trends in the Number of Tornadoes Recorded in the NCEI Storm Events Database from 1996 to 2024, Sevier County Outlined in Bold.

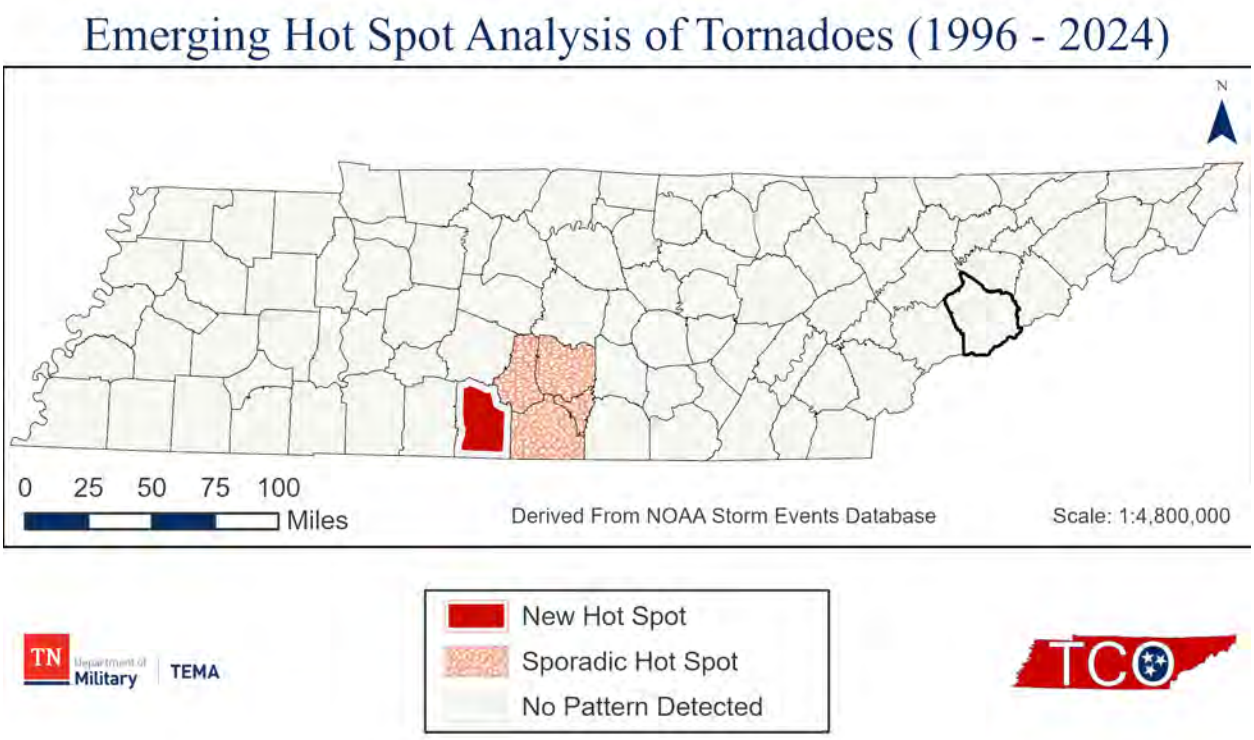


Figure 47: Emerging Hot Spot Analysis based on the Number of Tornadoes per Year Recorded in the NCEI Storm Events Database from 1996 to 2024, Sevier County Outlined in Bold.

17 Tropical Cyclones

Although Sevier County lies several hundred miles from the coast and will not experience storm surge, tropical cyclones frequently retain impactful wind and rainfall far inland, especially while transitioning to post-tropical systems. Hurricane Helene (Sept 26-29, 2024) is a recent example. As Helene accelerated across the southern Appalachians on September 27-28, it produced tropical-storm-force wind gusts (40-60 mph) and record-breaking rainfall across western North Carolina and eastern Tennessee, contributing to widespread power outages and extreme flooding in the mountains, especially along the Pigeon, French Broad, Nolichucky, and Doe rivers.

Major flooding from Helene occurred along the Pigeon River, destroying long stretches of I-40 through the Pigeon River Gorge near the TN/NC line and severing a critical east-west corridor that is often used for emergency services, mutual-aid response, and regional commerce that affect Sevier County even though the greatest damage occurred in adjacent Cocke County. State and national reports documented over a mile of eastbound lanes washed away and months-long closures before staged reopenings.

Key implications for Sevier County include (1) short-notice wind impacts capable of downing trees and power lines; (2) riverine flooding and landslide risk from extreme rainfall, including on headwater catchments that drain toward the county; and (3) transportation and supply-chain disruptions when regional corridors (e.g., I-40 in the Pigeon Gorge) are compromised, negatively impacting evacuation, re-entry, and recovery

operations. During Helene, TEMA confirmed multiple fatalities across nearby counties and widespread infrastructure impacts across northeast Tennessee. Refer to the Flooding, Geologic Hazards, and Severe Storms sections for additional information on trends related to these hazards.

Observational and modeling studies show increasing tropical-cyclone rain rates, with ~14% higher rainfall rates for ~2 °C warming and documented upward trends in the North Atlantic. This elevates inland flash- and riverine-flood risk even far from the coast. Stronger/longer-lasting inland impacts may include slower decay of landfalling hurricanes in a warmer environment, allowing damaging winds and organized cores to travel farther inland, consistent with Helene's maintenance of tropical storm-force winds over the Tennessee Valley. Antecedent rain, orographic lift, and PRE (Predecessor Rain Event) dynamics (as was the case with Hurricane Helene) can prime the southern Appalachians for catastrophic flooding when a tropical cyclone or its transitioning remnant arrives.

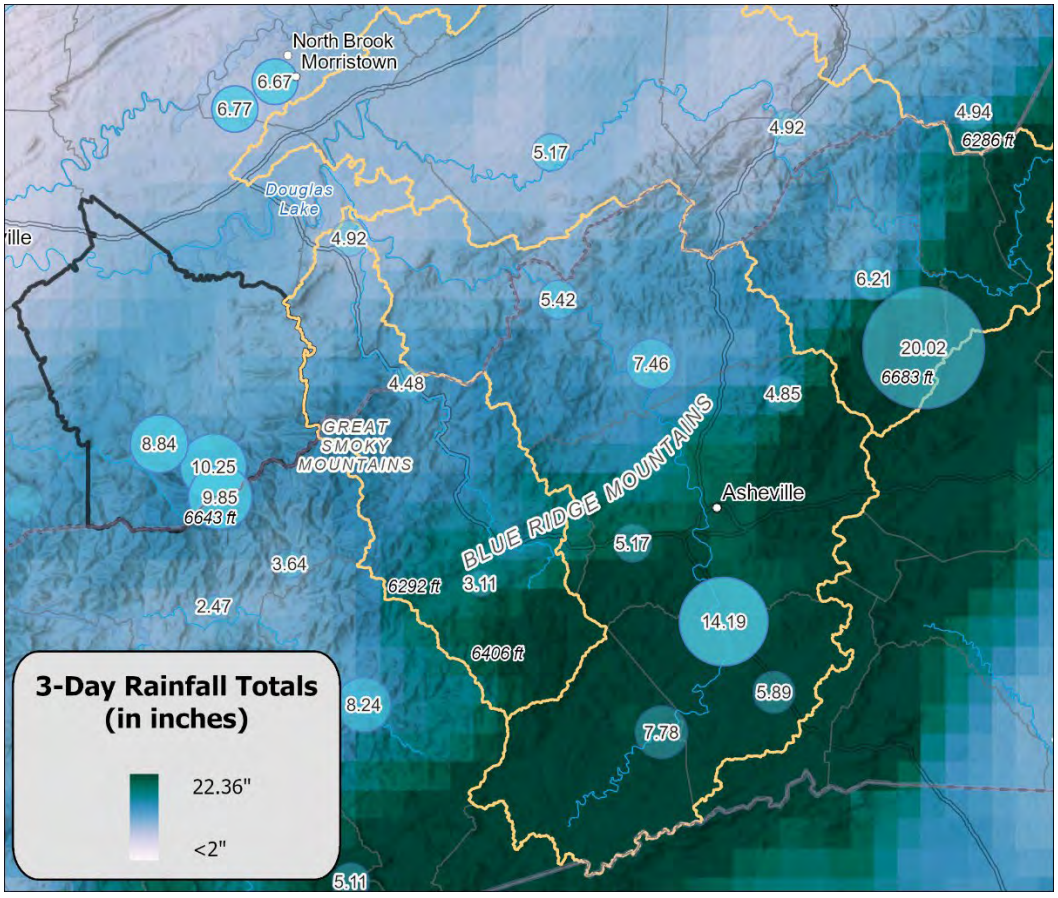


Figure 48: Rainfall Totals are Shown from a Predecessor Rain Event and Hurricane Helene with Three Watersheds Highlighted in Yellow (Pigeon, French Broad, Nolichucky – from southwest to northeast) and Sevier County Outlined in Bold.

18 Wildfire

Climate trends and variations are expected to increase the intensity of the hydrological cycle (more precipitation coming in extreme rainfall events with longer dry stretches between precipitation events) which could lead to an increased risk of wildfires for Sevier County. According to the Climate Mapping Risk Assessment (CMRA) Report, Sevier County is expected to experience a modest increase in wildfire risk indicators like the number of dry days per year, and high heat days per year, by mid- and late-century.



Figure 49: Climate Mapping Risk Assessment Report for Wildfire in Sevier County.

(Source: US Climate Resilience Toolkit)

The Fifth National Climate Assessment (2023) states that wildfires occur with greater frequency in the Southeast U.S. than in any other region of the country. However, mitigation measures, particularly prescribed fire, can significantly reduce wildfire risk and have been widely adopted across rural communities in the Southeast. They found that a doubling of prescribed fire at the landscape scale reduced wildfire ignitions by a factor of four, and that prescribed fires reduce the potential for crown fires.

While climate variability will impact the future risk of wildfires in Sevier County, a stronger impact will likely come from development within the county. Of particular concern is development in the wildland urban interface (WUI) where structures are at an enhanced risk of burning during a wildfire.

Please see attached FIRM Panels and FIS Reports.