

BARROW COUNTY HAZARD MITIGATION PLAN 2024 - 2029

Barrow County Emergency Management Agency

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Barrow County, Georgia

Hazard Mitigation Plan Update 2024 – 2029



Prepared for the Barrow County Board of Commissioners
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This document was funded in part by the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Planning Grant awarded to Barrow County, Georgia, through the Georgia Emergency Management Agency (GEMA) to fulfill the requirements of the Federal Disaster Mitigation Act of 2000 (DMA 2000). Barrow County's 2019 Hazard Mitigation Plan was updated by the Barrow County Hazard Mitigation Plan Update Committee and was prepared by Lux Mitigation and Planning Corp. For additional information, please contact Barrow County Emergency Management Agency.

Preface

Mitigation Vision for the Future

Emergency Managers succeed or fail based on how well they follow the following fundamental principles of emergency management, mitigation, preparedness, response, and recovery. Purposefully, our emergency management forefathers put the word mitigation first as a “means” to prevent or minimize the effects of disasters.

Mitigation is commonly defined as sustained actions taken to reduce or eliminate long-term risk to people and property from hazards and their effects. Hazard mitigation focuses attention and resources on community policies and actions that will produce successive benefits over time. A mitigation plan states the aspirations and specific courses of action that a community intends to follow to reduce vulnerability and exposure to future hazard events. These plans are formulated through a systematic process centered on the participation of citizens, businesses, public officials, and other community stakeholders.

Mitigation forms, or should form, the very foundation of every emergency management agency. To reduce, minimize, or eliminate hazards in their communities, emergency management agencies adopt and implement mitigation practices. The Federal DMA 2000 sets the benchmark and outlines the criteria for communities with the vision to implement hazard mitigation practices in their communities.

Barrow County and its municipalities realize the benefits achieved by the development and implementation of mitigation plans and strategies in their community. Barrow County’s elected officials, public safety organizations, planners, and many others have proven that by working together towards the development and implementation of this plan, they can reduce the loss of life and property in their communities.

The jurisdictions covered by this plan include the following:

Barrow County
City of Auburn
Town of Bethlehem
Town of Braselton
Town of Carl
City of Statham
City of Winder

Adoption Resolution – Barrow County

Requirement §201.6(c)(5)

RESOLUTION – BARROW COUNTY, GEORGIA

BARROW COUNTY HAZARD MITIGATION PLAN 2025 - 2030

WHEREAS, Barrow County and its municipalities recognize that it is threatened by several different types of natural and man-made hazards that can result in loss of life, property loss, economic hardship and threats to public health and safety; and

WHEREAS, the Federal Emergency Management Agency (FEMA) requires that every county and municipality have a pre-disaster mitigation plan in place, and requires the adoption of such plans in order to receive specific disaster assistance and mitigation grant opportunities; and

WHEREAS, a Hazard Mitigation Plan is a community's plan for evaluating hazards, identifying resources and capabilities, selecting appropriate actions, and developing and implementing the preferred mitigation actions to eliminate or reduce future damage in order to protect the health, safety and welfare of the residents in the community; and

WHEREAS, Barrow County's 2025 Hazard Mitigation Plan has been prepared in accordance with FEMA requirements at 44 CFR 201.6; and

WHEREAS, the Plan will be updated every five years;

NOW, THEREFORE, BE IT RESOLVED, by the Board of Commissioners of Barrow County, Georgia, that:

- 1) Barrow County, Georgia, has adopted Barrow County's 2025 Hazard Mitigation Plan; and
- 2) It is intended that the Plan be a working document and is the first of many steps toward improving rational, long-range mitigation planning and budgeting for Barrow County and its municipalities.

PASSED, APPROVED AND ADOPTED by the Board of Commissioners of Barrow

County, Georgia, in regular session this _____ day of _____, 20____.

Chairperson

County Clerk

RESOLUTION – CITY OF AUBURN, GEORGIA

BARROW COUNTY HAZARD MITIGATION PLAN 2025 - 2030

WHEREAS, Barrow County and its municipalities recognize that it is threatened by several different types of natural and man-made hazards that can result in loss of life, property loss, economic hardship and threats to public health and safety; and

WHEREAS, the Federal Emergency Management Agency (FEMA) requires that every county and municipality have a pre-disaster mitigation plan in place, and requires the adoption of such plans in order to receive specific disaster assistance and mitigation grant opportunities; and

WHEREAS, a Hazard Mitigation Plan is a community's plan for evaluating hazards, identifying resources and capabilities, selecting appropriate actions, and developing and implementing the preferred mitigation actions to eliminate or reduce future damage in order to protect the health, safety and welfare of the residents in the community; and

WHEREAS, Barrow County's 2025 Hazard Mitigation Plan has been prepared in accordance with FEMA requirements at 44 CFR 201.6; and

WHEREAS, the Plan will be updated every five years;

NOW, THEREFORE, BE IT RESOLVED, by the Mayor and City Council of Auburn, Georgia, that:

- 1) The City of Auburn, Georgia, has adopted Barrow County's 2025 Hazard Mitigation Plan;
- 2) It is intended that the Plan be a working document and is the first of many steps toward improving rational, long-range mitigation planning and budgeting for Barrow County and its municipalities.

PASSED, APPROVED AND ADOPTED by the Mayor and Council of the City of Auburn, Georgia, in regular session this ____ day of _____, 20____.

Mayor

City Clerk

RESOLUTION – TOWN OF BETHLEHEM, GEORGIA

BARROW COUNTY HAZARD MITIGATION PLAN 2025 - 2030

WHEREAS, Barrow County and its municipalities recognize that it is threatened by several different types of natural and man-made hazards that can result in loss of life, property loss, economic hardship and threats to public health and safety; and

WHEREAS, the Federal Emergency Management Agency (FEMA) requires that every county and municipality have a pre-disaster mitigation plan in place, and requires the adoption of such plans in order to receive specific disaster assistance and mitigation grant opportunities; and

WHEREAS, a Hazard Mitigation Plan is a community's plan for evaluating hazards, identifying resources and capabilities, selecting appropriate actions, and developing and implementing the preferred mitigation actions to eliminate or reduce future damage in order to protect the health, safety and welfare of the residents in the community; and

WHEREAS, Barrow County's 2025 Hazard Mitigation Plan has been prepared in accordance with FEMA requirements at 44 CFR 201.6; and

WHEREAS, the Plan will be updated every five years;

NOW, THEREFORE, BE IT RESOLVED, by the Mayor and Town Council of Bethlehem, Georgia, that:

- 1) The Town of Bethlehem, Georgia, has adopted Barrow County's 2025 Hazard Mitigation Plan;
- 2) It is intended that the Plan be a working document and is the first of many steps toward improving rational, long-range mitigation planning and budgeting for Barrow County and its municipalities.

PASSED, APPROVED AND ADOPTED by the Mayor and Council of the Town of

Bethlehem, Georgia, in regular session this _____ day of _____, 20____.

Mayor

Town Clerk

RESOLUTION – TOWN OF BRASELTON, GEORGIA

BARROW COUNTY HAZARD MITIGATION PLAN 2025 - 2030

WHEREAS, Barrow County and its municipalities recognize that it is threatened by several different types of natural and man-made hazards that can result in loss of life, property loss, economic hardship and threats to public health and safety; and

WHEREAS, the Federal Emergency Management Agency (FEMA) requires that every county and municipality have a pre-disaster mitigation plan in place, and requires the adoption of such plans in order to receive specific disaster assistance and mitigation grant opportunities; and

WHEREAS, a Hazard Mitigation Plan is a community's plan for evaluating hazards, identifying resources and capabilities, selecting appropriate actions, and developing and implementing the preferred mitigation actions to eliminate or reduce future damage in order to protect the health, safety and welfare of the residents in the community; and

WHEREAS, Barrow County's 2025 Hazard Mitigation Plan has been prepared in accordance with FEMA requirements at 44 CFR 201.6; and

WHEREAS, the Plan will be updated every five years;

NOW, THEREFORE, BE IT *RESOLVED*, by the Mayor and Town Council of Braselton, Georgia, that:

- 1) The Town of Braselton, Georgia, has adopted Barrow County's 2025 Hazard Mitigation Plan;
- 2) It is intended that the Plan be a working document and is the first of many steps toward improving rational, long-range mitigation planning and budgeting for Barrow County and its municipalities.

PASSED, APPROVED AND ADOPTED by the Mayor and Council of the Town of

Braselton, Georgia, in regular session this ____ day of _____, 20____.

Mayor

Town Clerk

RESOLUTION – TOWN OF CARL, GEORGIA

BARROW COUNTY HAZARD MITIGATION PLAN 2025 - 2030

WHEREAS, Barrow County and its municipalities recognize that it is threatened by several different types of natural and man-made hazards that can result in loss of life, property loss, economic hardship and threats to public health and safety; and

WHEREAS, the Federal Emergency Management Agency (FEMA) requires that every county and municipality have a pre-disaster mitigation plan in place, and requires the adoption of such plans in order to receive specific disaster assistance and mitigation grant opportunities; and

WHEREAS, a Hazard Mitigation Plan is a community's plan for evaluating hazards, identifying resources and capabilities, selecting appropriate actions, and developing and implementing the preferred mitigation actions to eliminate or reduce future damage in order to protect the health, safety and welfare of the residents in the community; and

WHEREAS, Barrow County's 2025 Hazard Mitigation Plan has been prepared in accordance with FEMA requirements at 44 CFR 201.6; and

WHEREAS, the Plan will be updated every five years;

NOW, THEREFORE, BE IT *RESOLVED*, by the Mayor and Town Council of Carl, Georgia, that:

- 1) The Town of Carl, Georgia, has adopted Barrow County's 2025 Hazard Mitigation Plan;
- 2) It is intended that the Plan be a working document and is the first of many steps toward improving rational, long-range mitigation planning and budgeting for Barrow County and its municipalities.

PASSED, APPROVED AND ADOPTED by the Mayor and Council of the Town of Carl,

Georgia, in regular session this _____ day of _____, 20____.

Mayor

Town Clerk

RESOLUTION – CITY OF STATHAM, GEORGIA

BARROW COUNTY HAZARD MITIGATION PLAN 2025 - 2030

WHEREAS, Barrow County and its municipalities recognize that it is threatened by several different types of natural and man-made hazards that can result in loss of life, property loss, economic hardship and threats to public health and safety; and

WHEREAS, the Federal Emergency Management Agency (FEMA) requires that every county and municipality have a pre-disaster mitigation plan in place, and requires the adoption of such plans in order to receive specific disaster assistance and mitigation grant opportunities; and

WHEREAS, a Hazard Mitigation Plan is a community's plan for evaluating hazards, identifying resources and capabilities, selecting appropriate actions, and developing and implementing the preferred mitigation actions to eliminate or reduce future damage in order to protect the health, safety and welfare of the residents in the community; and

WHEREAS, Barrow County's 2025 Hazard Mitigation Plan has been prepared in accordance with FEMA requirements at 44 CFR 201.6; and

WHEREAS, the Plan will be updated every five years;

NOW, THEREFORE, BE IT *RESOLVED*, by the Mayor and City Council of Statham, Georgia, that:

- 1) The City of Statham, Georgia, has adopted Barrow County's 2025 Hazard Mitigation Plan;
- 2) It is intended that the Plan be a working document and is the first of many steps toward improving rational, long-range mitigation planning and budgeting for Barrow County and its municipalities.

PASSED, APPROVED AND ADOPTED by the Mayor and Council of the City of Statham, Georgia, in regular session this ____ day of _____, 20____.

Mayor

City Clerk

RESOLUTION – CITY OF WINDER, GEORGIA

BARROW COUNTY HAZARD MITIGATION PLAN 2025 - 2030

WHEREAS, Barrow County and its municipalities recognize that it is threatened by several different types of natural and man-made hazards that can result in loss of life, property loss, economic hardship and threats to public health and safety; and

WHEREAS, the Federal Emergency Management Agency (FEMA) requires that every county and municipality have a pre-disaster mitigation plan in place, and requires the adoption of such plans in order to receive specific disaster assistance and mitigation grant opportunities; and

WHEREAS, a Hazard Mitigation Plan is a community's plan for evaluating hazards, identifying resources and capabilities, selecting appropriate actions, and developing and implementing the preferred mitigation actions to eliminate or reduce future damage in order to protect the health, safety and welfare of the residents in the community; and

WHEREAS, Barrow County's 2025 Hazard Mitigation Plan has been prepared in accordance with FEMA requirements at 44 CFR 201.6; and

WHEREAS, the Plan will be updated every five years;

NOW, THEREFORE, BE IT *RESOLVED*, by the Mayor and City Council of Winder, Georgia, that:

- 1) The City of Winder, Georgia, has adopted Barrow County's 2025 Hazard Mitigation Plan;
- 2) It is intended that the Plan be a working document and is the first of many steps toward improving rational, long-range mitigation planning and budgeting for Barrow County and its municipalities.

PASSED, APPROVED AND ADOPTED by the Mayor and Council of the City of Winder, Georgia, in regular session this ____ day of _____, 20____.

Mayor

City Clerk

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CHAPTER ONE – INTRODUCTION

Summary of Updates for Chapter One

The following table provides a description of each section of this chapter and a summary of the changes that have been made to the Barrow County Hazard Mitigation Plan 2019.

<u>Chapter 1 Section</u>	<u>Updates</u>
Introduction	• Identification of Mitigation Goals
Authority	• Verbiage updated
Funding	• New Section – Not in 2019 Plan
Scope	• Verbiage updated
Purpose	• Verbiage updated
Consistency with Federal Guidelines	• New Section – Not in 2019 Plan
Plan Review	• Verbiage updated • Updated mitigation meeting dates for 2024 planning process
Hazard Mitigation Plan Update Committee	• Updated committee list with the 2024 planning participants • Updated to meet Federal guidelines
Public Participation	• Updated to match the 2024 planning process
Multi-Jurisdictional Considerations	• Updated with requirement descriptions
Incorporation of Existing Plans, Studies, and Resources	• New Section – Not in 2019 Plan

Purpose

The purpose of the Barrow County Hazard Mitigation Plan Update is to:

- Protect life, promote safety, and preserve property by reducing the potential for future damages and economic losses that result from natural and technological hazards;
- Make communities in Barrow County safer places to live, work, and play;
- Qualify for grant funding in both the pre-disaster and post-disaster environments;
- Speed the recovery and redevelopment process following future disaster events;
- Demonstrate a firm local commitment to hazard mitigation principles; and,
- Comply with state and federal legislative requirements for local multi-jurisdictional hazard mitigation plans.

Goals

The Barrow County Hazard Mitigation Plan Update is the first phase of a multi-hazard mitigation strategy for the entire community. This Plan encourages cooperation among various organizations and crosses political sub-divisions. As written, this Plan fulfills the requirements of the Federal DMA 2000. DMA 2000 provides federal assistance to state and local emergency management agencies and other disaster response organizations to reduce damage from disasters. The Act is administered by GEMA and FEMA.

It is important that state and local government, public-private partnerships, and community citizens can see the results of these mitigation efforts; therefore, the goals and strategies need to be achievable. Barrow County's Hazard Mitigation Plan Update Committee adopted the following goals during plan development:

GOAL 1

Maximize the use of all resources by promoting intergovernmental coordination and partnerships in the public and private sectors

GOAL 2

Harden communities against the impacts of disasters through the development of new mitigation strategies and strict enforcement of current regulations that have proven effective

GOAL 3

Reduce and, where possible, eliminate repetitive damage, loss of life and property from disasters

GOAL 4

Bring greater awareness throughout the community about potential hazards and the need for community preparedness

This plan complies with all requirements and scope of work as described in Barrow County's Hazard Mitigation Grant application.

Scope

The scope of the Barrow County Hazard Mitigation Plan Update encompasses all areas of Barrow County, including municipalities. The Plan identifies all natural and technological hazards that could threaten life and property in Barrow County. The scope of this Plan includes both short and long-term mitigation strategies with implementation and possible sources of project funding.

The Hazard Mitigation Plan Update is organized to incorporate the requirements of Interim Final Rule 44 CFR 201.4.

Chapter One includes an overview of the Hazard Mitigation Plan Update, the overall goals of the plan, and details of the planning process as required by Interim Final Rule 44 CFR 201.4(c)(1).

Chapter Two of the Plan details the Barrow County profile, including the demographics, municipalities, and history of the county.

Chapter Three identifies the risk assessment process, past natural hazard events with associated losses, and current natural hazard risks. Potential losses are also analyzed as required by Interim Final Rule 44 CFR 201.4(c)(2). Additionally, Chapter Three identifies and analyzes potential technological hazards faced by Barrow County.

Chapter Four identifies Barrow County's hazard mitigation goals and objectives, mitigation strategies and actions, and sources of potential funding for mitigation projects as required by Interim Final Rule 44 CFR 201.4(c)(3).

Chapter Five identifies the maintenance and implementation strategies for the Plan. The process for evaluation of the Hazard Mitigation Plan implementation progress is also detailed as required by Interim Final Rule 44 CFR 201.4(c)(4) and (5).

Funding

Barrow County was awarded a Hazard Mitigation Planning Grant by FEMA through GEMA for the update of Barrow County's 2019 Hazard Mitigation Plan. FEMA contributed 90% toward the total cost of the Plan Update. The Hazard Mitigation Planning Grant required a 10% match by Barrow County. This match was fulfilled entirely (100%) by In-Kind contributions; time spent by county and municipal employees, local stakeholders, representatives from organizations, and citizen volunteers updating the Plan was provided instead of cash from the County's budget.

Consistency with Federal and State Mitigation Policies

The Plan is intended to enhance and complement state and federal recommendations for the mitigation of natural and technological hazards in the following ways:

- Substantially reduce the risk of life, injuries, and hardship from the destruction of natural and technological disasters on an ongoing basis;
- Create greater public awareness about the need for individual preparedness and about the need to safer, more disaster resistant communities;
- Develop strategies for long-term community sustainability during disasters; and,
- Develop governmental and business continuity plans that will continue essential private sector and governmental activities during disasters.

FEMA publishes several guidance documents for local governments on mitigating natural disasters. The updated Barrow County Hazard Mitigation Plan recognizes, adopts, incorporates, and endorses the following principles:

- Develop a strategic mitigation plan for Barrow County;
- Enforce current building codes;
- Develop incentives to promote mitigation;
- Incorporate mitigation of natural hazards into land use plans;
- Promote awareness of mitigation opportunities and programs throughout our community on a continual basis; and,
- Identify potential funding sources for mitigation projects.

It is vital that the private sector is included in mitigation efforts that are consistent with state and federal recommendations, such as the following:

- Develop mitigation incentives with insurance agencies and lending institutions;
- Encourage the creation of a business continuity plan for the continuance of commerce during and following a disaster; and,
- Partner with local businesses to educate customers about potential hazards in the community and possible mitigation ideas.

Individual citizens must be made aware of the hazards they may encounter. Additionally, they must be educated on how to protect themselves from the hazards they face. They must be shown that mitigation is an important part of reducing loss of life and property in their community. Their support is critical to the success of any mitigation effort. The updated Barrow County Hazard Mitigation Plan supports the following FEMA recommendations regarding individual citizens:

- Become educated on the hazards that may impact your community;
- Become part of the process by supporting and encouraging mitigation programs that reduce vulnerability to disasters; and,
- An individual's responsibility is to safeguard his/her family, as well as themselves, prior to a disaster event.

Authority

In the past, federal legislation has provided funding for disaster relief, recovery, and some hazard mitigation planning. The DMA 2000 is the latest legislation to improve the planning aspect of that process; it reinforces the importance of mitigation planning and emphasizes planning for disasters before they occur. The DMA 2000 establishes a pre-disaster hazard mitigation program and designates new requirements for the national post-disaster Hazard Mitigation Grant Program (HMGP). Section 322 identifies the new requirements for planning activities and increases the amount of HMGP funds available to states that have developed a comprehensive mitigation plan prior to the disaster.

State and local communities must have an approved mitigation plan in place prior to receiving post-disaster HMGP funds. Local mitigation plans must demonstrate that their proposed mitigation measures are based on a sound planning process that accounts for the risk to and the capabilities of the individual communities. To implement the new DMA 2000 requirements, FEMA prepared an Interim Final Rule, published in the Federal Register on February 26, 2002, at 44 CFR Parts 201 and 206, which establishes planning and funding criteria for states and local communities.

Developed in accordance with current state and federal rules and regulations governing local hazard mitigation plans, Barrow County's Updated Hazard Mitigation Plan will be brought forth to each participating jurisdiction in Barrow County to be formally adopted. The Plan shall be routinely monitored and revised to maintain compliance with the following provisions, rules, and legislation:

Section 322, Mitigation Planning, of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as enacted by Section 104 of the Disaster Mitigation Act of 2000 (P.L. 106-390); and FEMA's Interim Final Rule published in the Federal Register on February 26, 2002, at 44 CFR Part 201.

Plan Review

Requirement §201.6(c)(1)

The contractor, Lux Mitigation and Planning, had the primary responsibility for collecting updated information and presenting pertinent data to the Plan Update Committee. An online, Dropbox folder was created for Barrow County's Plan Update. The approved 2019 Hazard Mitigation Plan was uploaded to the Dropbox folder, and the link to the folder was emailed to all members of the Hazard Mitigation Plan Update Committee. Each chapter of the 2019 Plan was reviewed. Hazard vulnerability and risk assessment data was updated, as was critical infrastructure information.

Special attention and consideration were given to the review and edit of mitigation strategies listed in the 2019 Plan. The Plan Update Committee examined each strategy and determined whether the strategy had been completed, needed to be modified, was in progress, or no longer applied. The Committee was highly encouraged to create new mitigation strategies to meet the current needs of the county and municipalities. Mitigation strategies from other Georgia counties were reviewed to help with the creation of new strategies. When the Committee agreed a new mitigation action would be beneficial, it was tailored to Barrow County's needs and was included in the 2024 Plan. The contractor sent the Committee, including sporadically attending participants, regular emails which contained a Dropbox link to the most updated version of the Plan and encouraged the Committee to thoroughly critique each version.

Hazard Mitigation Plan Update Committee Meeting Dates

Wednesday, June 12, 2024

Morning Session
(10:00am – 11:30am)

Kick-Off Meeting; Introduction to Hazard Mitigation

Afternoon Session
(12:00pm – 1:30pm)

Hazard Identification and Prioritization;
Community Risk Assessment Tabletop Exercise

Wednesday, July 10, 2024

Morning Session
(10:00am – 11:30am)

Community Risk Assessment Analysis;
Review and Edit Mitigation Strategies from 2020 Plan

Afternoon Session
(12:00pm – 1:30pm)

Review and Edit Mitigation Strategies from 2020 Plan

Tuesday, August 27, 2024

Morning Session
(10:00am – 11:30am)

Review and Edit Mitigation Strategies from 2020 Plan;
Create New Mitigation Strategies for 2025 Plan

Afternoon Session
(12:00pm – 1:30pm)

Create New Mitigation Strategies for 2025 Plan;
Discuss Available Hazard Mitigation Grants;
Discuss Draft of 2025 Plan

*The public was welcome and encouraged to attend all Hazard Mitigation Plan Update meetings.

Significant Changes to the 2019 Plan

Each section of Barrow County's 2019 Hazard Mitigation Plan has been revised in some manner. Therefore, a summary of those changes will be listed in the first section of each chapter. Significant additions/modifications to this Plan include the following:

- Addition of Extreme Temperatures to Natural Hazards
- Addition of Civil Unrest to Technological Hazards
- Addition of Infrastructure Failure to Technological Hazards
- Removal of Utility Failure (Incorporated into Infrastructure Failure)

Hazard Mitigation Plan Update Participants

Requirement §201.6(b)(2)

The following 40 participants contributed to the update of Barrow County's 2019 Hazard Mitigation Plan: *(in alphabetical order)*

Josh Bowman

Emergency Preparedness Director
Georgia Department of Public Health

Scott Bratcher

Director of Fleet Maintenance
Barrow County Roads and Bridges Division

Gerard Brewer

City Engineer
City of Winder Engineering and Inspections Department

David Brock

Mayor
Town of Carl

KC Calhoun

Hazard Mitigation Planning Specialist
Georgia Emergency Management Agency

Clint Cannon

Director
City of Winder Public Works Department

Penny Clack

Director of Emergency Management (retired)
Barrow County Fire Department

Jeff Collins

Stormwater Manager
City of Winder Utilities Department

Sharon Courson

Director
Barrow County Emergency Management Agency

Maggie Craig

Plant Manager
Syensqo (Solvay Specialty Polymers USA, LLC)

Rob Curott

Captain
City of Winder Police Department

Dean Garrett
Utilities Manager
Barrow County Water Division

Wes Geddings
Deputy County Manager
Barrow County Government

Matt Giudice
Emergency Preparedness Specialist
Northeast Health District

Chris Hodge
Chief
City of Auburn Police Department

Jessica Jackson
Manager
Barrow County Transportation Division

Debi Krause
Mayor
City of Statham

Susan Kristal
County Nurse Manager
Barrow County Health Department

Chris Lelle
Mayor
Town of Bethlehem

Deborah Lynn
Commissioner – District 6
Barrow County Board of Commissioners

Samantha McDaniel
Regulatory Compliance Officer
City of Winder

Carl Morrow
Director
Walton County Emergency Management Agency

Tylor Murphy
Deputy Director
Jackson County Emergency Management Agency

Michael Parks
City Administrator
City of Auburn

Tina Phonekeo
Office Manager
Barrow County Health Department

Beth M. Reynolds
Director
City of Winder Development Services Department

Rick Roquemore
Mayor
City of Auburn

Alan Shuman
Fire Chief
Barrow County Fire Department

Brett Skinner
Deputy Fire Chief
Barrow County Fire Department

John Skinner
Chief Safety and Security Officer
Barrow County Schools

Brian Stewart
Public Information Officer
Barrow County Government

Ted Tillery
Construction Supervisor
City of Winder

Matt Treeter
Stormwater Manager
Barrow County Stormwater Department

Sabrina Westbrook
Board Member
Jasper County 911 Authority

Joseph Whelchel
Emergency Management Specialist
Walton County Emergency Management Agency

Rebecca Whiddon

Director

Barrow County Planning and Community Department

Matt Whiting

Fire Chief

City of Winder Fire Department

Srikanth Yamala

County Manager

Barrow County Government

Chris Yancey

Director

Barrow County Public Works Department

Michelle Yarn

Executive Director

City of Winder Housing Authority

The Plan Update Committee relied on their consultant to guide them through the update process. During meetings, the participants had productive discussions, expanded their professional networks, asked thoughtful questions, made important decisions, and provided critical input during key stages in the update process.

Efforts were made to involve all county and municipal departments, as well as community organizations and local businesses, which may have a role in the implementation of mitigation actions and/or policies. These efforts included sending invitations via email to attend the Kick-off Meeting, sending reminder emails before each upcoming meeting, emailing pertinent information throughout the process, and requesting the review and critique of each chapter in the updated Plan.

All neighboring counties – Clarke, Gwinnett, Hall, Jackson, Oconee, Walton – were asked to peer review the 2024 Mitigation Plan draft. The Plan was sent to each County EMA office. Barrow County had significant support and contribution to the Hazard Mitigation Plan Update process from surrounding jurisdictions. Additionally, the EMA Directors from surrounding counties were asked to attend Plan Update Committee meetings in hopes they would share mitigation ideas from their own counties.

Public Participation

Requirement §201.6(b)(1)

State Requirement Element F2

Public awareness is a key component of any community's overall mitigation strategy. As citizens become more involved in decisions that affect their safety, they may develop a greater respect for the natural hazards present in their community, and thus, may take the steps necessary to reduce potential impacts of those hazards.

The following local organizations and businesses participated in the update of Barrow County's 2019 Mitigation Plan:

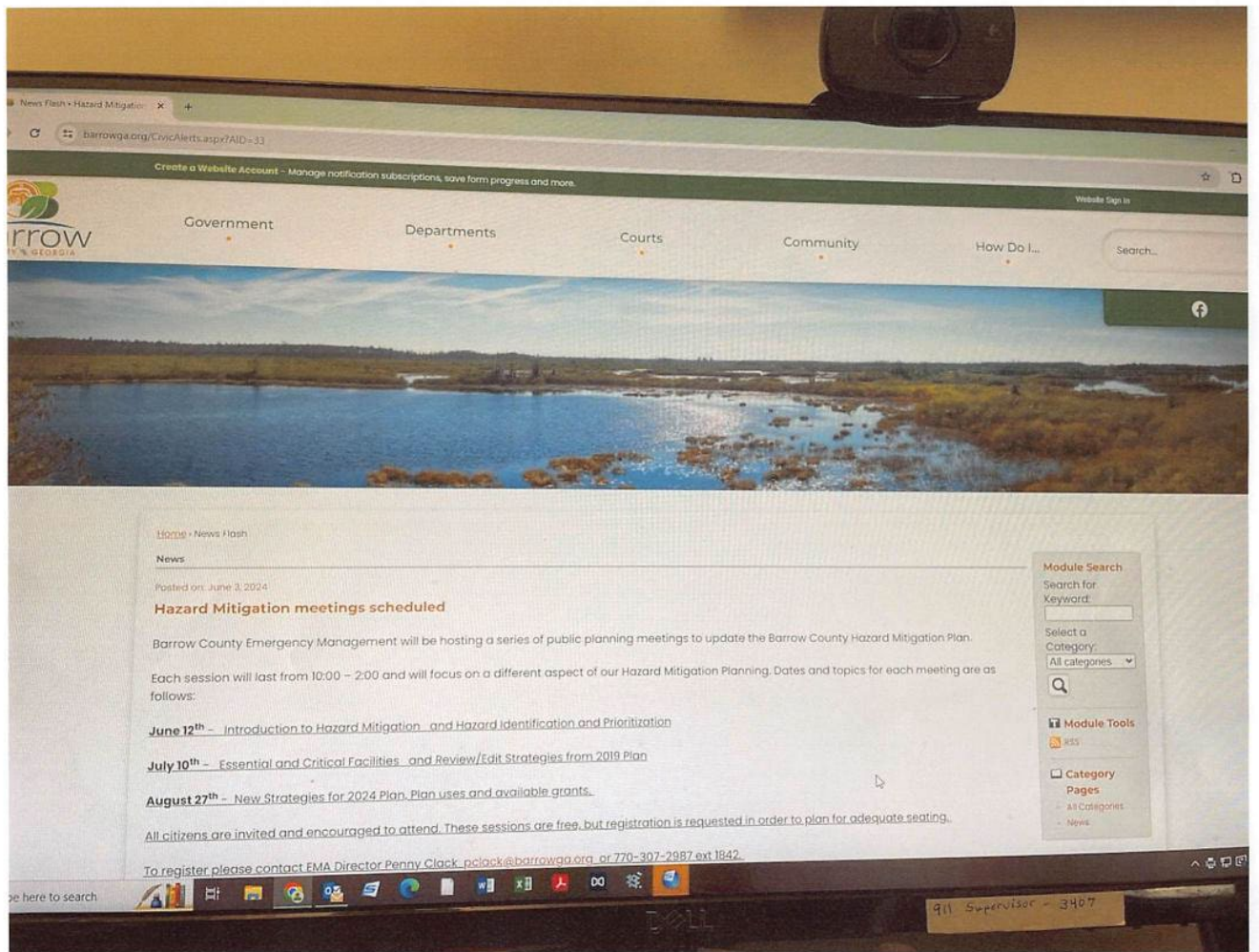
The Plan Update Committee took it upon themselves to ensure the processes undertaken for the development, implementation, and maintenance of the 2024 Hazard Mitigation Plan adequately considered public needs and viewpoints.

A list of public outreach initiatives can be found below:

- Email reminders were sent to all Plan Update Committee members, as well as other stakeholders, prior to every meeting. Recipients were encouraged to share the meeting invitation with anyone they thought would be an asset to the Plan Update process or anyone who may want to learn more about what a Hazard Mitigation Plan is.
- The Barrow County Hazard Mitigation Plan Update Committee made a concerted effort to incorporate vulnerable and underserved populations into the planning efforts. This included inviting specific departments and organizations that work directly with vulnerable and underserved populations within Barrow County. Organizations that work with these populations who did participate in the planning process include the Barrow County Schools, Barrow County Health Department, and the City of Winder Housing Authority. Additionally, information was shared via these groups directly to vulnerable and underserved populations in an effort to encourage their direct participation in the planning process by inviting them to attend meetings of the Barrow County Hazard Mitigation Plan Update Committee. Barrow County also posted a notice on the Barrow County website notifying the public of all meetings of the Barrow County Hazard Mitigation Plan Update Committee. No members of the public attended and no feedback was provided by the general public.

Documentation of Public Meeting Notice

Barrow County Website (posted June 3, 2024)

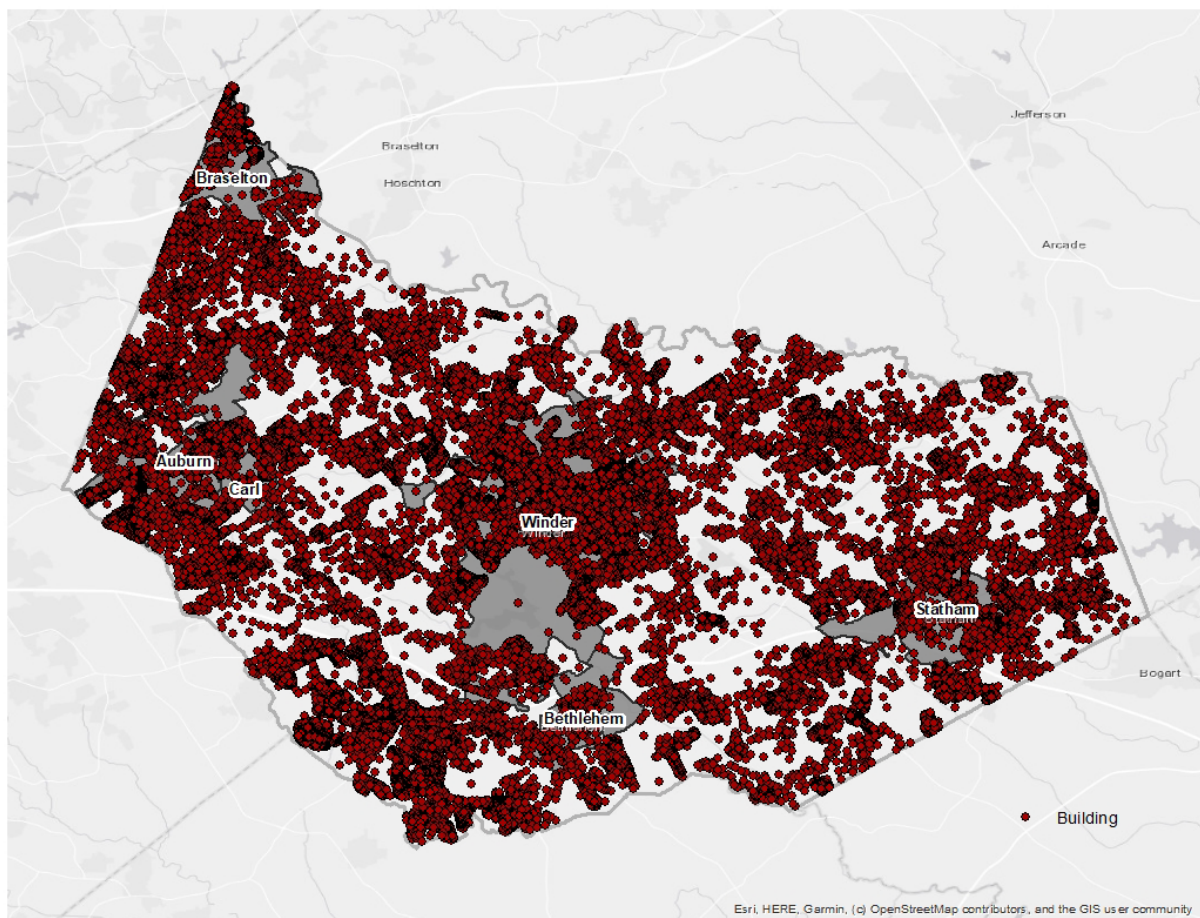


Multi-Jurisdictional Considerations

FEMA does not require cities and Barrow to adopt a local Hazard Mitigation Plan. However, the Federal DMA 2000 requires that all municipalities, wishing to be eligible to receive Hazard Mitigation Grants through FEMA, must adopt a local multi-hazard mitigation plan and must update that plan every five years. 2024 Mitigation Plan is the third five-year update. This FEMA-approved 2024 Hazard Mitigation Plan makes Barrow County, the City of Auburn, the Town of Bethlehem, the Town of Braselton, the Town of Carl, the City of Statham, and the City of Winder eligible for FEMA's Hazard Mitigation Grant Program, Flood Assistance Mitigation Grants, and Pre-Disaster Mitigation Grants.

As set forth by Georgia House Bill 489, the Emergency Management Agency is the implementing agency for projects pertaining to hazard mitigation. Barrow County is dedicated to work in the best interests of the County, as well as its municipalities. A few mitigation strategies in Barrow County's 2024 Mitigation Plan apply to a specific municipality. Unless noted otherwise, mitigation strategies apply equally to all jurisdictions. During the creation and update of this Plan, Barrow County Emergency Management Agency solicited and received participation from the following Barrow County municipalities: Auburn, Bethlehem, Braselton, Carl, Statham, and Winder.

Distribution of Buildings in Barrow County



Source: 2024 Barrow County HAZUS Report

Incorporation of Existing Plans, Studies, and Resources

Requirement §201.6(b)(3)

State Requirement Element F3

Existing Plans

2019 Barrow County Pre-Disaster Hazard Mitigation Plan
2019 State of Georgia Hazard Mitigation Plan
Barrow County Local Emergency Operations Plan
Georgia Forestry Commission's Barrow Co. Community Wildfire Protection Plan
Barrow County Joint Comprehensive Plan

Studies

2024 Hazard Risk Analyses (HAZUS Report)
2017 United States Department of Agriculture Ag Census
2010 United States Census
2020 United States Census
2009 Barrow County Flood Insurance Study
Radeloff, V. C., R. B. Hammer, S. I. Stewart, J. S. Fried, S. S. Holcomb, and J. F. McKeefry. 2005. *The Wildland Urban Interface in the United States*. Ecological Applications 15:799-805.

Resources

2014 City of Boston Natural Hazard Mitigation Plan Update
2010 Camden County Joint Hazard Mitigation Plan Update
2010 Northern Virginia Hazard Mitigation Plan Update
National Climactic Data Center
National Weather Service
Barrow County Tax Assessor's Data
Barrow County Website
Georgia Mitigation Information System Database
Colorado State University (Hurricane mapping)
United States Geological Survey
FEMA Flood Insurance Rate Maps
National Flood Insurance Program
United States Coast Guard National Response Center Data
Georgia Department of Transportation
Georgia Safe Dams Program
Southern Group of State Foresters Wildfire Risk Assessment

Application of Existing Plans and Studies

Existing Planning Mechanism	Reviewed? Yes/No	Incorporation into 2022 Mitigation Plan
2019 Barrow County Hazard Mitigation Plan	Yes	Baseline for the 2022 Plan; updated mitigation strategies; updated hazards; updated Barrow County information
2019 State of Georgia Hazard Mitigation Plan	Yes	Hazard descriptions; potential hazards; mapping mechanisms; potential mitigation strategies that could be adopted on a local level
Barrow County Local Emergency Operations Plan (LEOP)	Yes	Identification of current resources; identification of current capabilities
Georgia Forestry's Barrow County Community Wildfire Protection Plan (CWPP)	Yes	Mitigation strategies for wildfire and drought; historical data
2017 USDA Agriculture Census	Yes	Agricultural data regarding potential losses for drought and wildfire
2020 United States Census	Yes	To update Barrow County's profile information
2009 Barrow County Flood Insurance Study	Yes	Identify potential flood prone areas; prioritization of flood-related mitigation strategies
Barrow County Comprehensive Plan	Yes	To identify future development trends; identify mitigation strategies to curb trends in a direction that considers the hazards of the area
Barrow County Flood Mitigation Assistance Plan	No	No such plan exists
2024 Barrow County HAZUS Report	Yes	Hazard Analysis

CHAPTER TWO – COUNTY PROFILE

Summary of Updates for Chapter Two

The following table provides a description of each section of this chapter and a summary of the changes that have been made to the Barrow County Hazard Mitigation Plan 2019.

<u>Chapter 2 Section</u>	<u>Updates</u>
Past Hazards	• This information involved a review of the hazards listed in the previous plan. • Information was updated for the last 50 years
History	• Expanded and updated from previous plan
Past Events	• Identification of major hazard events in Barrow County for the last 50 years • Focus on Federal Declarations and events since the last Hazard Mitigation Plan Update
Demographics	• Updated data to the 2020 Census information
Social Vulnerability	• New Section – Not in 2019 Plan
Economy	• New Section – Not in 2019 Plan
Government	• New Section – Not in 2019 Plan
Municipalities	• New Section – Not in 2019 Plan
Transportation	• New Section – Not in 2019 Plan
Climate	• New Section – Not in 2019 Plan
Utilities	• New Section – Not in 2019 Plan
NFIP Compliance	• New Section – Not in 2019 Plan

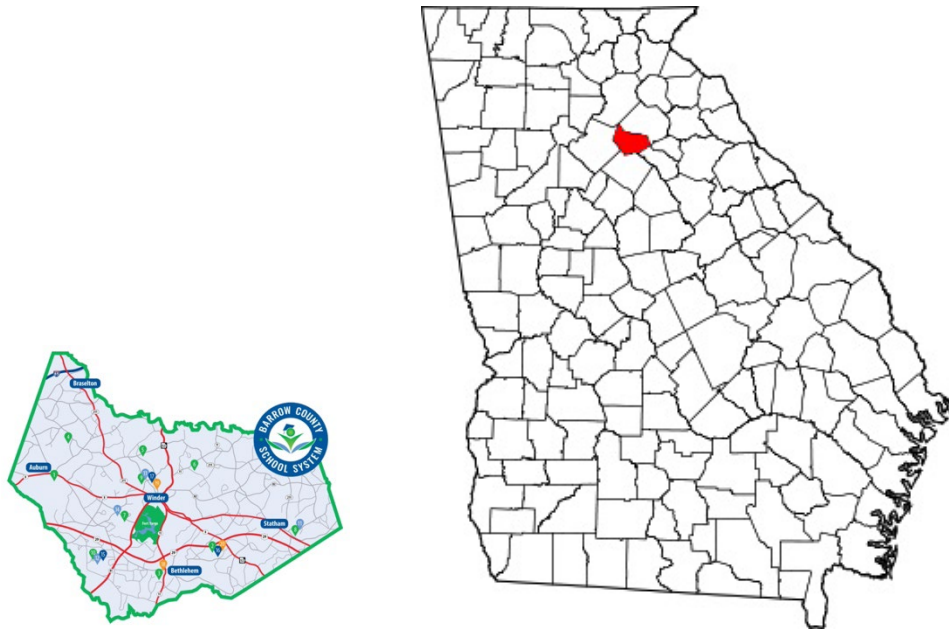
History

Barrow County was created in 1914 from portions of Gwinnett, Jackson, and Walton counties. The county was named in honor of David Crenshaw Barrow, Jr. who was a professor and then Chancellor at the University of Georgia.

Barrow County is formed from land that was originally part of the Creek and Cherokee Nations. As early settlers came to the area a frontier fort was built in 1792. This fort, Fort Yargo, served as a protection to the early settlers and is now a state park.

As with many areas in the State of Georgia, the coming of the railroad during the 1800s played an integral role in the expansion of what eventually became Barrow County.

One notable person from Barrow County was Richard B. Russell, Jr. Russell was a well-known political figure holding office as a Georgia House of Representative, Georgia governor, and as a U.S. Senator.



Past Hazards

Barrow County, Georgia, has faced many natural hazards in its Barrow history. Severe thunderstorms have been the most prevalent of these hazards. In the last 50 years, Barrow County has been subjected to 179 documented severe thunderstorm events. These events include torrential rainfall, hail, thunderstorm-force winds, and lightning.

Tornadoes, which can sometimes spawn from severe thunderstorms, have also occurred, although with much less frequency. In Barrow County, there have been 4 documented tornados in the last 50 years.

Because of heavy rainfall, either within Barrow County or upstream, flooding has also occurred. In the National Climactic Data Center (NCDC) databases of the National Weather Service, there is documentation of 13 flooding events for Barrow County.

Winter storms and heavy snowfall have affected Barrow County on 33 occasions over the last 50 years, according to the NCDC record. Because these natural events are barely an annual occurrence, the pre-planning and preparedness component of emergency management is not as robust as northern or western states that routinely see this type of weather.

Barrow County has also been impacted by the following: drought, excessive heat, tropical cyclones, earthquakes, and wildfires.

Barrow County has had 12 Presidential Disaster Declarations (FEMA-declared major disasters) – two of which have occurred since the adoption of the 2019 Hazard Mitigation Plan (both for COVID-19 in 2020).

Notable Past Events

- **2020, Covid-19 (Federal Declaration x2)**
- 2018, Thunderstorm Wind
- **2017, Hurricane Irma (Federal Declaration x2)**
- 2017, Tornado (EF0)
- **2015, Severe Winter Storm (Federal Declaration)**
- **2014, Severe Winter Storm (Federal Declaration)**
- 2013, Thunderstorm Wind
- 2012, Thunderstorm Wind
- 2011, Thunderstorm Wind
- 2009, Hail
- 2009, Hail
- 2009, Heavy Snow
- 2009, Flood
- 2008, Hail
- 2008, Hail
- 2005, Tornado (F0)
- 2005, Winter Storm
- 2005, Flash Flood
- 2005, Thunderstorm Wind
- 2005, Hail
- **2000, Severe Winter Storm (Federal Declaration)**
- **1998, Severe Storms, Flooding (Federal Declaration)**
- 1998, Thunderstorm Wind
- **1995, Hurricane Opal (Federal Declaration)**
- **1993, Severe snowfall and winter storm (Federal Declaration)**
- 1984, Tornado (F1)
- **1977, Drought (Federal Declaration)**
- 1974, Tornado (F1)

Demographics

Barrow County

	2000 Census	2010 Census	2020 Census	2022 US Estimated Census
Population	46,144	69,367	83,505	89,299
White	84.8%	78.8%	69.0%	68.3%
African American	9.7%	11.4%	12.4%	13.3%
Hispanic/Latino	3.2%	8.7%	12.6%	15.1%
Asian	2.2%	3.4%	3.9%	4.2%
American Indian	0.3%	0.3%	0.5%	0.4%
Two or More Races	1.4%	2.3%	8.1%	8.0%
Median Age	32.5	33.6	36.0	36.0
Median Household Income	\$45,019	\$50,996	\$64,460	\$78,216
Persons in Poverty	8.3%	15.6%	10.1%	9.5%
Homeowners	71.4%	77.4%	76.3%	79.6%

Municipalities – Population

	2000 Census	2010 Census	2020 Census	2022 US Estimated Census
Auburn	6,594	6,887	7,495	7,794
Bethlehem	700	601	715	598
Braselton	1,078	7,511	13,403	13,804
Carl	231	255	209	296
Statham	2,066	2,408	2,813	2,829
Winder	10,042	14,099	18,338	18,414

Social Vulnerability Information

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 a toxic chemical spill. The Center for Disease Control and Prevention and the Agency for Toxic Substances and Disease Registry (CDC/ATSDR) rates social vulnerability on 16 variables.

These variables are:

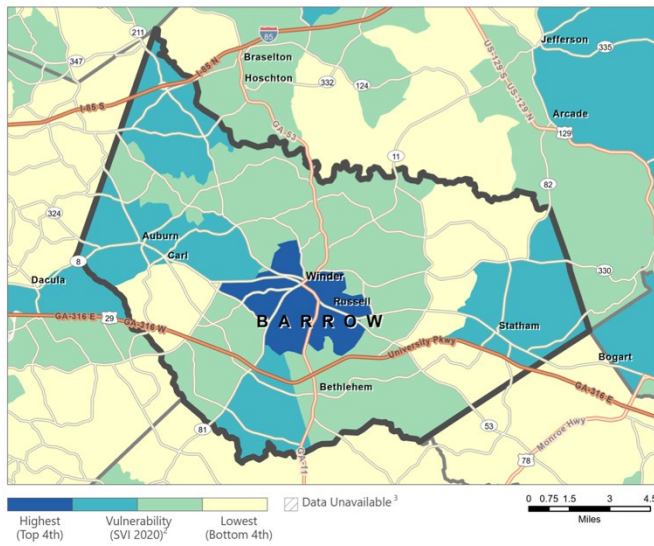
- Percentage below the poverty level
- Unemployment rate
- Per capita income
- Percentage of population 25+ without a high school diploma
- Percentage of population below 65 without insurance
- Percentage of population under 18 years of age
- Percentage of population age 65 and over
- Percentage of the population age 5 or older with a disability
- Percentage of households with a single parent
- Percentage of population that is Hispanic or non-white race
- Percentage of population over the age of 5 who speak English less than "well"
- Number of large apartment buildings (10 or more housing units per building)
- Percentage of mobile homes
- Number of housing units with more than one person per room
- Number of households with no vehicle available
- Percentage of population living in group quarters

These 16 variables are aggregated into four overall factors: Socioeconomic Status, Household Characteristics, Racial and Ethnic Minority Status, and Household Type/Transportation. Each census tract is then mapped based upon each of these four factors and the overall SVI based upon the full 16 variables. A score is assigned based upon these variables from 0 (no social vulnerability) to 1 (very high social vulnerability).

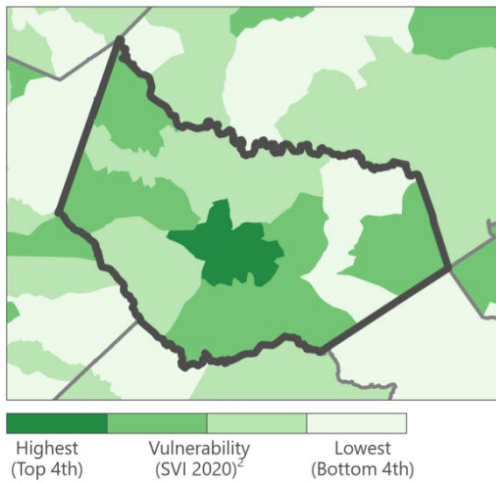
Barrow County has an Overall SVI score of 0.1772, which indicates a low level of vulnerability. Barrow County also has a low level of vulnerability for Housing Type/Transportation (0.057). Barrow County has a low to medium level of vulnerability for Socioeconomic Status (0.2722) and Racial/Ethnic Minority Status (0.3165) and a medium to high level of vulnerability for Household Characteristics (0.6456).

Barrow County does have particular areas that score higher on the SVI Index and higher on each of the four factors. Areas surrounding the City of Winder score higher on all areas of the SVI index.

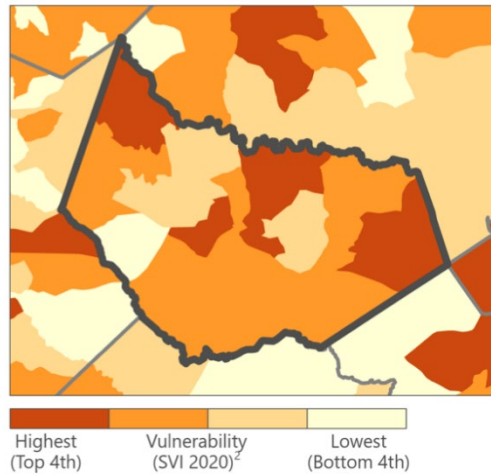
Overall Social Vulnerability



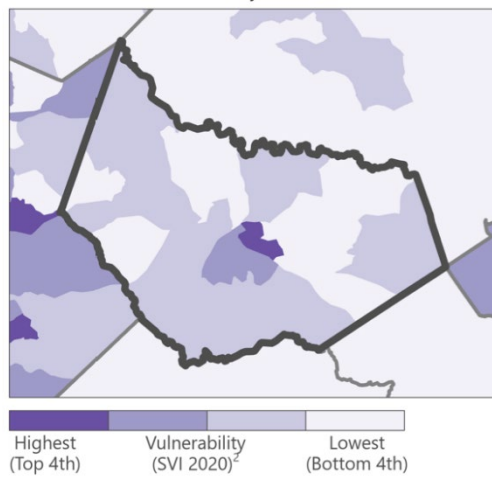
Socioeconomic Status



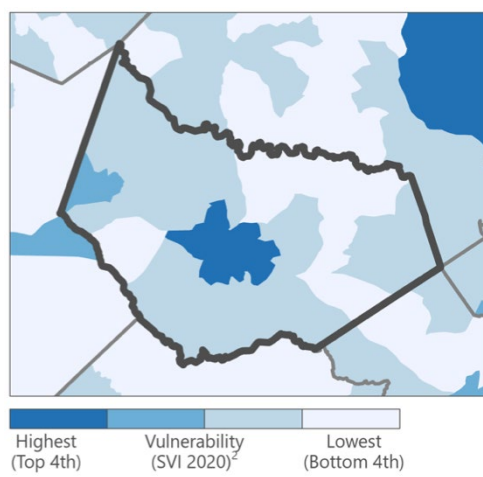
Household Characteristics



Racial and Ethnic Minority Status



Housing Type/Transportation



Economy

Barrow County's economy is primarily light industry. Barrow County's cost of living is 1% below the national average. The unemployment rate in Barrow County is 2.7%, which is below the State average of 3.1% and below the National average of 3.9%. Barrow County has a median household income of \$78,216, which is above the national average of \$74,580. The list of the ten largest private employers is from the Georgia Department of Labor (2023) and is listed in alphabetical order – not in order of company size or impact on the community.

The ten largest private employers in Barrow County are:

Company	Product/Service
Akin Ford, Corp	Automotive Sales
Carvana, Inc	Automotive Sales
Chico's Distribution Services, LLC	Retail: Clothing
Harrison Poultry, Inc	Agriculture: Poultry
Ingles Market, Inc	Retail: Groceries
Innovative Administrative Services	Human Resources
Johns Manville International, Inc	Manufacturing: Insulation
Publix Super Markets, Inc	Retail: Groceries
Sheraton Buckhead	Hospitality
Walmart	Retail: General

Utilities

Barrow County's utility needs are met by a variety of public and private entities.

Electrical power in Barrow County is provided by the Georgia Power, Jackson EMC, and Walton EMC.

Water in Barrow County is provided by Barrow County, the City of Auburn, the Town of Bethlehem, the Town of Braselton, the City of Statham, and the City of Winder.

Natural Gas is supplied in Barrow County by the City of Winder and Atlanta Gas Light.

Transportation

Barrow County's transportation system consists primarily of state highways and county-maintained roads. Interstate 85, US Highway 29, as well as State highways 8, 11, 53, 81, 82, 124, 211, 316, 324, and 330 are major transportation routes that carry the majority of passenger and commercial traffic in and out of Barrow County.

Government

The form of government specified in the County Charter is known as a commissioner/manager form of government, which provides for six elected Commissioners and an elected Chairperson from the county at-large. The Board of Commissioners appoints a County Manager to oversee the day-to-day operations of the county.

The main duties of the commissioners is to pass local laws, known as ordinances, that regulate a variety of things that promote the health, safety and welfare of the citizens covered by them; to pass a balanced budget each year that funds its own operations as well as to allocate funds to the Constitutional Officers, other elected officials, the courts and a variety of programs put in place by the State but funded locally; to ensure that necessary services are funded and provided; to set the millage rate for the County government and many other secondary duties.

The commissioners set the County millage rate each year to fund a portion of the County budget. They also receive the millage rate that is set by the Board of Education and an assessment by the State which is submitted to the Georgia Department of Revenue each year.

The commissioners receive, deliberates, and passes local ordinances each year and amends many others to reflect the changing times. Both require that a public hearing be held, and these are normally held during the regular Commission meetings. They also pass several resolutions and proclamations throughout the year. Generally, with some exceptions, the commissioner can pass any local law and ordinance they feel is needed for the County so long as it does not violate the laws of the State or Federal government or the Constitutional rights of any individual. These are researched thoroughly by legal staff before ever being brought to a hearing.

The commissioners provide many services that citizens expect through the revenues that are raised annually. These include Fire and Ambulance protection; E-911 dispatch services; Zoning and Planning; Inspections; Code Enforcement; Animal Control; Public Library; Parks and Recreation; Public Works; Waste Management Collection Centers; and agencies that service all these such as Building Maintenance, Vehicle Maintenance, and Emergency Management Services. The budget also funds state mandated services such as Law Enforcement and Detention; Superior, Probate, Magistrate and Juvenile courts; Tax Assessment and Tax Collection services; Elections management; District Attorney (shared with other counties) and some smaller funding for local agencies under the State of Georgia.

Climate

Barrow County, like much of Georgia, enjoys a temperate climate with four well-defined seasons: warm to hot summers; brisk fall temperatures; relatively brief, cool winters; and a warm spring season. As a result, there exists a Barrow growing season in Georgia, perfect for ornamental and economic-boosting agricultural plants.

AVERAGE MONTHLY TEMPERATURES IN GEORGIA (FAHRENHEIT)

	Average Georgia Temperature	Average Barrow County Temperature
January	46	43
February	49	47
March	56	54
April	63	62
May	70	70
June	77	77
July	80	80
August	79	78
September	74	73
October	64	63
November	56	54
December	48	46

National Flood Insurance Program Compliance

JURISDICTION	PARTICIPATING?	PARTICIPATION DATE	EFFECTIVE MAP DATE
BARROW COUNTY	YES	10/16/1991	12/1/2022
AUBURN	YES	12/15/1992	12/1/2022
BETHLEHEM	YES	3/24/2016	12/1/2022
BRASELTON	YES	9/29/2006	4/11/2024
CARL	NO	-----	
STATHAM	YES	6/17/1986	12/1/2022
WINDER	YES	1/15/1988	12/1/2022

**The Town of Carl is in the process of exploring NFIP Compliance at this time.*

Municipalities

City of Auburn



The City of Auburn is governed by a Mayor/City Council form of government. The mayor and all city councilmembers are elected by the citizens of Auburn. The City of Auburn provides the following services to the citizens: Administrative, Law Enforcement, Code Enforcement, Public Works, Parks/Recreation, and Water.

In 1891, what would become the City of Auburn was surveyed by the Seaboard Railroad Company. In 1892, the City of Auburn was officially incorporated. The city served as the terminus for railroad crews operating daily trains to Athens and Atlanta. As the railroad business grew so did the area. Warehouses and residential homes were constructed to serve the railroad and families living in the area. As more people began to arrive and settle in the area, the downtown of Auburn began to reflect the growth of the population. A cotton gin, tanning yard, and livery stable was built and was soon followed by a bank, general store, soda fountain, and telephone exchange.

In 1892, Appalachian Baptist Church founded the Perry-Rainey Institute which served as a center of education for local students until 1915. In 1915, the institute was sold to the Christian Church, and it became the Southeastern Christian College. The school operated as a college until 1924.

Town of Bethlehem



The Town of Bethlehem is governed by a Mayor/City Council form of government. The Mayor and all City Council members are elected by the citizens of Bethlehem. The Town of Bethlehem provides the following services to its citizens: Administration and Water.

In 1884, the Town of Bethlehem was named at the suggestion of local resident, Judson L. Moore. Mr. Moore was a member of Bethlehem Methodist Church, which holds the distinction of being the oldest church in Barrow County, and Mr. Moore felt that the town should be named after the church.

The Town of Bethlehem is a unique place. All the streets in the town are named after a piece of the nativity story. Christmas is a huge economic boom for the Town of Bethlehem. Each year, a live nativity is held and hundreds of people travel to the Town of Bethlehem to mail their Christmas cards from the Bethlehem Post Office.

Town of Braselton



The Town of Braselton is governed by a Mayor/City Council form of government. The Mayor and all City Council members are elected by the citizens of Braselton. The Town of Braselton provides the following services to its citizens: Administration, Tourism, Planning, Law Enforcement, and Water.

Incorporated in 1916, The Town of Braselton spreads across four Georgia counties and is named for the Braselton family whose history is interwoven into the very fibers of the town. What eventually became the Town of Braselton started as a plantation in 1876 by William Harrison Braselton. William's eldest son, William Henry, would serve as the first mayor of Braselton. Descendants of the family continued to serve the city in either the role of mayor or council member until 2001.

What started out as a plantation quickly grew into a town. In 1887, another of William's sons, John Oliver, constructed a merchandise house in their yard to sell goods to the farmhands. Eventually joined by his brothers, the small "store" turned into a thriving business along the railroad tracks that ran through the property. By 1904, what had started as a six-foot-by-six-foot merchandise house had grown into a brick warehouse which sold groceries, dry goods, notions, shoes, millinery, and clothing. In 1911, the town's first bank was added to the structure.

In the 1980s, Donald and Nancy Panoz established the 3,500-acre Chateau Elan Resort and Winery in Braselton which brought a boom of tourism to the area. This boom continued in 1999 when Donald founded the American Le Mans Series. The Town of Braselton is also home to the Thompson Mills Forest which holds the distinction as being the State of Georgia's official arboretum.

Town of Carl



The Town of Carl is governed by a Mayor/City Council form of government. The Mayor and City Council members are elected by the citizens of the City of Carl. The Town of Carl provides the following services to its citizens: Administration.

In the early 1800s, the Town of Carl was incorporated as Dillard's Crossroads. In 1893, the town received its official name of Carl in honor of Carl Pate who was the son of the town's first postmaster.

During its early years, the Town of Carl saw growth due to its proximity to the railroad and to the Perry-Rainey Institute. In 1903, the Durham family build a grand home, called the Carl House, which became the centerpiece of the town. When the Perry-Rainey Institute was sold in 1915, the Town of Carl saw a decline in population.

City of Statham



The City of Statham is governed by a Mayor/City Council form of government. The Mayor and City Council members are elected by the citizens of the City of Statham. The City of Statham provides the following services to its citizens: Administration, Law Enforcement, Public Works, and Water.

The City of Statham was originally the site of the Talasee Colony which was an Indian Village by the name Calamit on the Ocoloco Trail. The village was inhabited by the Creek and Cherokee Nations. In 1784, early settlers to the area purchased part of the Calamit from Chief Umausauga and named the area Beadland. As more settlers came to the area, a combination country store and post office was erected and called Barber's Creek. What eventually became the City of Statham grew up around this store. In 1892, the name of the Post Office was changed to Statham.

The City of Statham was officially incorporated in 1892 and extended one mile in every direction from the Seaboard Depot. In 1904, the first bank was constructed. At its height, the City of Statham featured a hardware and furniture store, a drug store, a meat market, a hotel, two cotton gins, a cotton warehouse, a brick-making plant, livery stables, blacksmith shops, barber shops, and three churches. As with many towns that relied on the railroad, the City of Statham quickly saw a decline in population as travel by railroad diminished.

City of Winder



The City of Winder is governed by a Mayor/City Council form of government. The Mayor and City Council members are elected by the citizens of the City of Winder. The City of Winder provides the following services to its citizens: Administration, Code Enforcement, Inspections, Fire Protection, Planning and Zoning, Law Enforcement, Public Works, and Utilities.

Originally established as a trading post called Snodon by the Creek and Cherokee Nation, what would eventually become the City of Winder became an important railroad link between Athens and Atlanta. Early settlers to the area changed the name from Snodon to Jug and then to Jug Tavern. In 1884, the city was incorporated as the City of Brandon. In 1890, the city changed its name back to Jug Tavern, and in 1893, the name was changed to Winder.

The name change to Winder was a direct result of the arrival of the railroad. In 1883, the Gainesville Midland Railroad built tracks connecting Jug Tavern with Gainesville, Social Circle, Bethlehem, and Mulberry. The tracks were originally planned to pass four miles south of the city. The citizens at the time were delighted that the railway decided to relocate the tracks and changed the name of the city in honor of John Winder who was the general manager of the rail company.

Today, the City of Winder is considered a bedroom community for the Atlanta Metro Area. Attractions include the Richard B. Russell homestead and Fort Yargo State Park.

CHAPTER THREE – COUNTY PROFILE

Summary of Updates for Chapter Three

The following table provides a description of each section of this chapter, and a summary of the changes that have been made to the Barrow County Hazard Mitigation Plan 2019.

Chapter 3 Section	Updates
Risk Assessment	- Expanded the explanation of the Risk Assessment - Added an explanation of each part of the Hazard Information
Natural Hazard Severe Thunderstorm	- Updated and consolidated hazard profile with new data - Content revised
Natural Hazard Winter Storm	- Updated and consolidated hazard profile with new data - Content revised
Natural Hazard Flooding	- Updated and consolidated hazard profile with new data - Land Use and Development trends updated to include municipal NFIP information - Content revised
Natural Hazard Tornado	- Updated and consolidated hazard profile with new data - Content revised
Natural Hazard Drought	- Updated and consolidated hazard profile with new data - Content revised
Natural Hazard Wildfire	- Updated and consolidated hazard profile with new data - Content revised
Natural Hazard Earthquake	- Updated and consolidated hazard profile with new data - Content revised
Natural Hazard Tropical Cyclone	- Updated and consolidated hazard profile with new data - Content revised
Natural Hazard Extreme Temperatures	New Section – Not in 2019 Plan
Technological Hazard Hazardous Materials	- Updated hazard description - Updated and consolidated hazard profile data - Content revised

Technological Hazard Dam Failure	• Updated hazard description • Updated and consolidated hazard profile data • Content revised
Technological Hazard Transportation Incident	• Updated and consolidated hazard profile with new data • Content revised
Technological Hazard Terrorism	• Updated and consolidated hazard profile with new data • Content revised
Technological Hazard Civil Unrest	• New Section – Not in 2019 Plan
Technological Hazard Infrastructure Failure	• New Section – Not in 2019 Plan • Incorporated Utility Failure Information from 2019 Plan
Technological Hazard Emergent Infectious Diseases	• Updated and consolidated hazard profile with new data • Content revised

Risk Assessment

Requirement §201.6(c)(2)(i and ii)

Requirement §201.6(d)(3)

The Barrow County Hazard Mitigation Planning Committee conducted a comprehensive Threat and Hazard Identification and Risk Assessment (THIRA) for Barrow County and all municipalities. This assessment developed the hazard basis for this plan. The assessment includes the following components for each hazard:

1. *Hazard Identification:* The Barrow County Hazard Mitigation Planning Committee identified nine natural hazards and seven technological hazards for this Hazard Mitigation Plan. This is an increase of one natural hazard and one technological hazard from the previous iteration of the plan. Each hazard was identified using statistical data and records from a variety of sources. The list of hazards is based upon frequency, severity of impact, probability, potential losses, and vulnerability.
2. *Hazard Description:* Each hazard was described in detail. Many hazard descriptions came from the Georgia Hazard Mitigation Plan since many of the hazards that could impact the state could also potentially impact Barrow County.
3. *Profile of Hazards:* Each hazard was profiled as to how it could potentially impact the County.
4. *Assets Exposed to the Hazard:* The plan considers critical facilities and infrastructure as part of the vulnerability assessment. This assessment determines the vulnerability of the municipalities and attempts to identify populations most vulnerable to each hazard, although many have potential countywide impacts.
5. *Estimated Potential Losses:* Using critical facility and past history data, an estimation of potential losses due to a particular hazard event were determined.
6. *Land Use and Development Trends:* Land use trends were considered when determining the potential future impacts of each hazard. This is of importance regarding flooding and dam failure events.
7. *Multi-Jurisdictional Concerns:* Each jurisdiction was considered when determining the potential hazard impact.

The National Risk Index was utilized as a database of risk potential for how natural hazards have impacted Barrow County in the past and for how they could impact Barrow County in the future. 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.

Here is how Barrow County scored in each category overall:

Risk Index is **Relatively Low**

Score **54.7**



Expected Annual Loss is **Relatively Low**

Score **52.1**



Social Vulnerability is **Relatively Moderate**

Score **52.5**



Community Resilience is **Relatively Moderate**

Score **45.5**



These scores indicate that Barrow County has relatively low overall risk and expected annual loss. It also indicates relatively moderate values of social vulnerability and community resilience.

In addition to the overall scores, a matrix for each hazard is also produced by the National Risk Index.

Hazard Type	EAL Value	Social Vulnerability	Community Resilience	CRF	Risk Value	Risk Index Score
Tornado	\$2,467,863	Relatively Moderate	Relatively Moderate	1.23	\$3,041,246	75.3
Hail	\$838,268	Relatively Moderate	Relatively Moderate	1.23	\$1,035,221	88.9
Earthquake	\$545,039	Relatively Moderate	Relatively Moderate	1.23	\$682,764	74.9
Strong Wind	\$468,640	Relatively Moderate	Relatively Moderate	1.23	\$573,244	63.3
Heat Wave	\$449,325	Relatively Moderate	Relatively Moderate	1.23	\$549,953	80
Lightning	\$336,244	Relatively Moderate	Relatively Moderate	1.23	\$412,849	83.6
Hurricane	\$243,337	Relatively Moderate	Relatively Moderate	1.23	\$296,748	53.8
Ice Storm	\$142,124	Relatively Moderate	Relatively Moderate	1.23	\$174,868	70.1
Winter Weather	\$127,557	Relatively Moderate	Relatively Moderate	1.23	\$156,180	74.5
Riverine Flooding	\$106,673	Relatively Moderate	Relatively Moderate	1.23	\$128,607	26.4
Landslide	\$21,900	Relatively Moderate	Relatively Moderate	1.23	\$26,209	48.3
Wildfire	\$14,780	Relatively Moderate	Relatively Moderate	1.23	\$17,850	36.3

As the above graphic indicates, Tornadoes have the highest expected annual loss score of any potential hazard. As far as overall risk score, hail is considered to be a higher risk event than any other hazard identified.

In addition to overall risk, the Barrow County Hazard Mitigation Plan Update Committee considered how each hazard could potentially impact the vulnerable populations in the community. Utilizing the National Risk Index and census tract data, a few trends were identified. Three census tracts were determined to have a higher overall risk than Barrow County as a whole. These three census tracts are 13013180205, 13013180103, and 13013180501. The two census tracts with the highest risk scored Very High

(13013180205) or Relatively High (1301380103) on the Social Vulnerability scale. Census tract 13013180205 includes western portions of the City of Winder and census tract 1301380103 includes areas of northwest Barrow County southwest of Braselton near Interstate 85 near Gwinnett County. Census tract 1301380205 scored high in risk for hail, heat wave, hurricanes, heat wave, ice storms, lightning, strong wind, and tornadoes. Census tract 1301308103 scored high in risk for tornadoes, strong wind, riverine flooding, lightning, ice storm, hurricane, hail, and drought.

At the first meeting of the Barrow County Hazard Mitigation Plan Update Committee, the attendees participated in a risk assessment of hazard for Barrow County. This risk assessment was based upon three primary factors: 1. How likely is a hazard to occur; 2. How prepared the committee meeting participants felt the community was for each hazard; 3. How impactful the hazard would be on Barrow County. This risk assessment relied on the committee meeting attendees to identify the hazards and then rank them by those two factors. As a result, the risk assessment could be skewed by the meeting participants, recency bias, and/or how the hazard would directly impact the organizations represented at this meeting. After additional discussion with the Barrow County Hazard Mitigation Plan Update committee at future meetings, the hazards in this chapter were the agreed upon list. Several of the hazards identified by the committee members were consolidated into expanded hazard descriptions. Those incorporations are notated in the below hazard ranking.

Hazard	Likelihood Score	Preparedness Score	Impact Score	Total Score
Transportation Incident	49	23	41	113
Severe Thunderstorms	92	4	6	102
Terrorism	0	50	48	98
Hazardous Materials Incident	4	28	30	62
Civil Unrest	1	37	10	48
Utility Failure/Incident*	14	12	20	46
Flooding	30	0	2	32
Water Contamination**	0	12	20	32
Severe Winter Weather	12	7	1	20
Pandemic/Epidemic	1	8	9	18
Earthquakes	2	13	0	15
Drought	9	4	1	14
Tornado	4	0	9	13
Wildfire	1	8	2	11
Extreme Temperatures	7	0	2	9
Dam Failure	1	5	3	9
Industrial Incident **	1	3	0	4
Tropical Cyclones	2	1	0	3

* Utility Failure have been expanded into a hazard titled Critical Infrastructure Failure

* Water Contamination and Industrial Incident have been incorporated into Hazardous Materials Incident

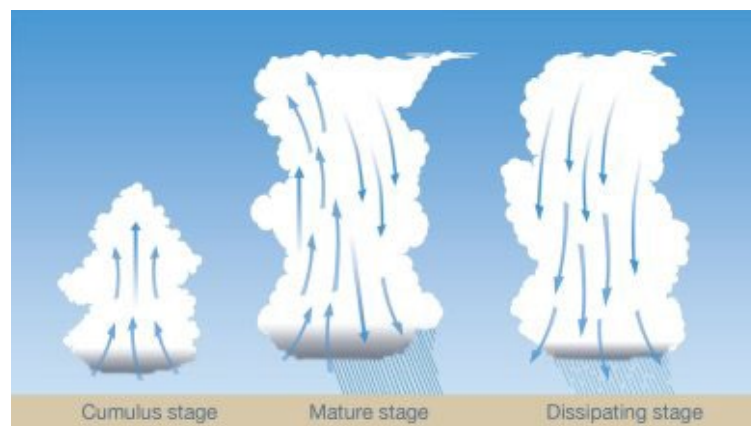
Natural Hazard: Severe Thunderstorm

Hazard Description

This section provides general and historical information about thunderstorms, including high wind, lightning, and hail. Other elements of thunderstorms, such as tornadoes and flooding, are addressed in their own sections.

Thunderstorms are formed when moist air near the earth's surface is forced upward through some catalyst (convection or frontal system). As the moist air rises, the air condenses to form clouds. Because condensation is a warming process, the cloud continues to expand upward. When the initial updraft is halted by the upper troposphere, both the anvil shape and a downdraft form. This system of up-drafting and down-drafting air columns is termed a "cell."

As the process of updrafts and downdrafts feeds the cell, the interior particulates of the cloud collide and combine to form rain and hail, which falls when the formations are heavy enough to push through the updraft. The collision of water and ice particles within the cloud creates a large electrical field that must discharge to reduce charge separation. This discharge is the lightning that occurs from cloud to ground or cloud to cloud in the thunderstorm cell. In the final stage of development, the updraft weakens as the downdraft-driven precipitation continues until the cell dies.



Each thunderstorm cell can extend several miles across its base and to reach 40,000 feet in altitude. Thunderstorm cells may compound and move abreast to form a squall line of cells, extending farther than any individual cell's potential.

In terms of temporal characteristics, thunderstorms exhibit no true seasonality in that occurrences happen throughout the year. Convectively, driven systems dominate the summer while frontal driven systems dominate during the other seasons. The rate of onset is rapid in that a single cell endures only 20 minutes.

However, various cells in different stages of development may form a thunderstorm that lasts up to a few hours as it moves across the surface.

In terms of magnitude, the National Weather Service defines thunderstorms in terms of severity as a severe thunderstorm that produces winds greater than 57 mph and/or hail of at least 1 inch in diameter and/or a tornado. The National Weather Service chose these measures of severity as parameters more capable of producing considerable damage. Therefore, these are measures of magnitude that may project intensity.

Lightning

Lightning occurs when the difference between the positive and negative charges of the upper layers of the cloud and the earth's surface becomes great enough to overcome the resistance of the insulating air. The current flows along the forced conductive path to the surface (in cloud to ground lightning) and reaches up to 100 million volts of electrical potential. In Georgia, lightning strikes peak in July, with June and August being second highest in occurrence.

Hail

Hail is a form of precipitation that forms during the updraft and downdraft-driven turbulence within the cloud. The hailstones are formed by layers of accumulated ice (with more layers creating larger hailstones) that can range from the size of a pea to the size of a grapefruit. Hailstones span a variety of shapes but usually take a spherical form. Hailstorms mostly endanger cars but have been known to damage aircraft and structures.

Hazard Profile

Severe thunderstorms, including high winds, hail, and lightning, are a serious threat to the residents and infrastructure of Barrow County. Severe thunderstorms are the most frequently occurring natural hazard in Barrow County. Many of these storms include high winds, lightning, and hail. Hail up to 2 inches was recorded in Barrow County on several occasions, most recently in 2005. Thunderstorm winds of 70 mph have been reported on many occasions in Barrow County, with the most recent occurring in 2012. While there have been dozens of documented thunderstorm events affecting Barrow County over the last 50 years, it is likely that the official number is a low estimate due to poor record keeping in decades past. For example, only 31 thunderstorm events were recorded between 1973 and 1993, likely a vast underestimation of actual events.

Most of the available information relating to severe thunderstorm events in Barrow County fails to describe damage estimates in any detail. With each thunderstorm event, there are likely unreported costs related to infrastructure costs, public safety response costs, utility repair costs, and personal home and business repair costs. Thunderstorms have occurred during all parts of the day and night and in every month in Barrow County.

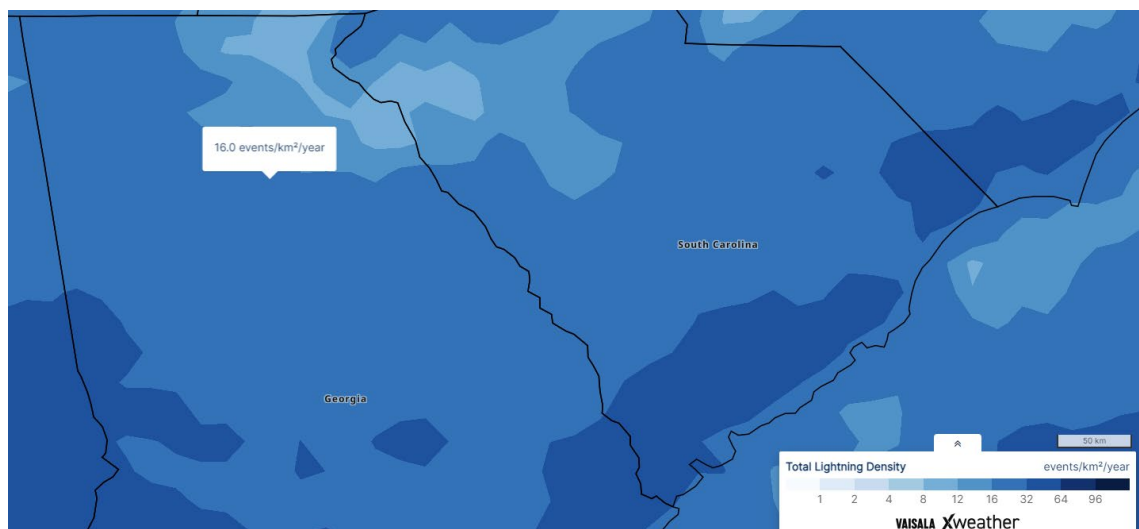
The Barrow County Hazard Mitigation Plan Update Committee utilized data from the National Climatic Data Center, the National Weather Service, numerous weather-related news articles, and the Barrow County LEOP in researching severe thunderstorms and their potential impacts on the county. All information has been gathered on a countywide basis. All thunderstorm hazard data included for Barrow County is limited to countywide data and is not broken down by jurisdiction.

During the last 50 years, 142 thunderstorm events were recorded in Barrow County, with 101 of those occurring in the last 30 years. This number includes 50 hail events and only 16 lightning reports. According to these records, Barrow County has a 0.92% daily chance of a thunderstorm event based upon data from the last 30 years. Over the last 10 years, Barrow County has averaged 2.5 thunderstorm events per year (25 events). Due to improved record keeping protocols, the Barrow County Hazard Mitigation Plan Update Committee believes the data from the last ten years provides a more accurate representation of the thunderstorm threat to the county. The Barrow County Hazard Mitigation Plan Update Committee has also determined that the lightning threat is severely under-reported, as shown in the NCDC data numbers.

Natural Hazard: Severe Thunderstorm

Hailstone size	Measurement		Updraft Speed	
	in.	cm.	mph	km/h
bb	< 1/4	< 0.64	< 24	< 39
pea	1/4	0.64	24	39
marble	1/2	1.3	35	56
dime	7/10	1.8	38	61
penny	3/4	1.9	40	64
nickel	7/8	2.2	46	74
quarter	1	2.5	49	79
half dollar	1 1/4	3.2	54	87
walnut	1 1/2	3.8	60	97
golf ball	1 3/4	4.4	64	103
hen egg	2	5.1	69	111
tennis ball	2 1/2	6.4	77	124
baseball	2 3/4	7.0	81	130
tea cup	3	7.6	84	135
grapefruit	4	10.1	98	158
softball	4 1/2	11.4	103	166

As indicated by the below graphics, Barrow County averages 16 flashes of cloud to ground lightning per square kilometer per year. That equals a 4.4% chance of a cloud-to-ground lightning strike on any given day. This shows a much higher indication of lightning occurrences than has been reported to the National Weather Service and the National Climatic Data Center. It is the determination of the Barrow County Hazard Mitigation Plan Update Committee that this data shows a more accurate representation of the scope of the threat that lightning poses to the citizens and infrastructure of Barrow County.



Natural Hazard: Severe Thunderstorm

Severe thunderstorm winds, which are defined as winds of at least 58 mph in conjunction with a convective event, have occurred with many thunderstorms that have affected Barrow County. These winds can exceed 100 mph and cause damage comparable to weak tornadoes.

Hazard Score	Wind Speeds
1	<90 mph gust
2	91 – 100 mph gust
3	101 – 110 mph gust
4	111 – 120 mph gust
5	>120 mph gust

<i>Municipality</i>	<i># of Thunderstorms</i>	<i>Annual Risk</i>
AUBURN	17	68%
BETHLEHEM	14	56%
BRASELTON*	6	24%
CARL	1	4%
STATHAM	10	40%
WINDER	38	100%

This Table identifies the number of Thunderstorms for municipalities over the last 25 years

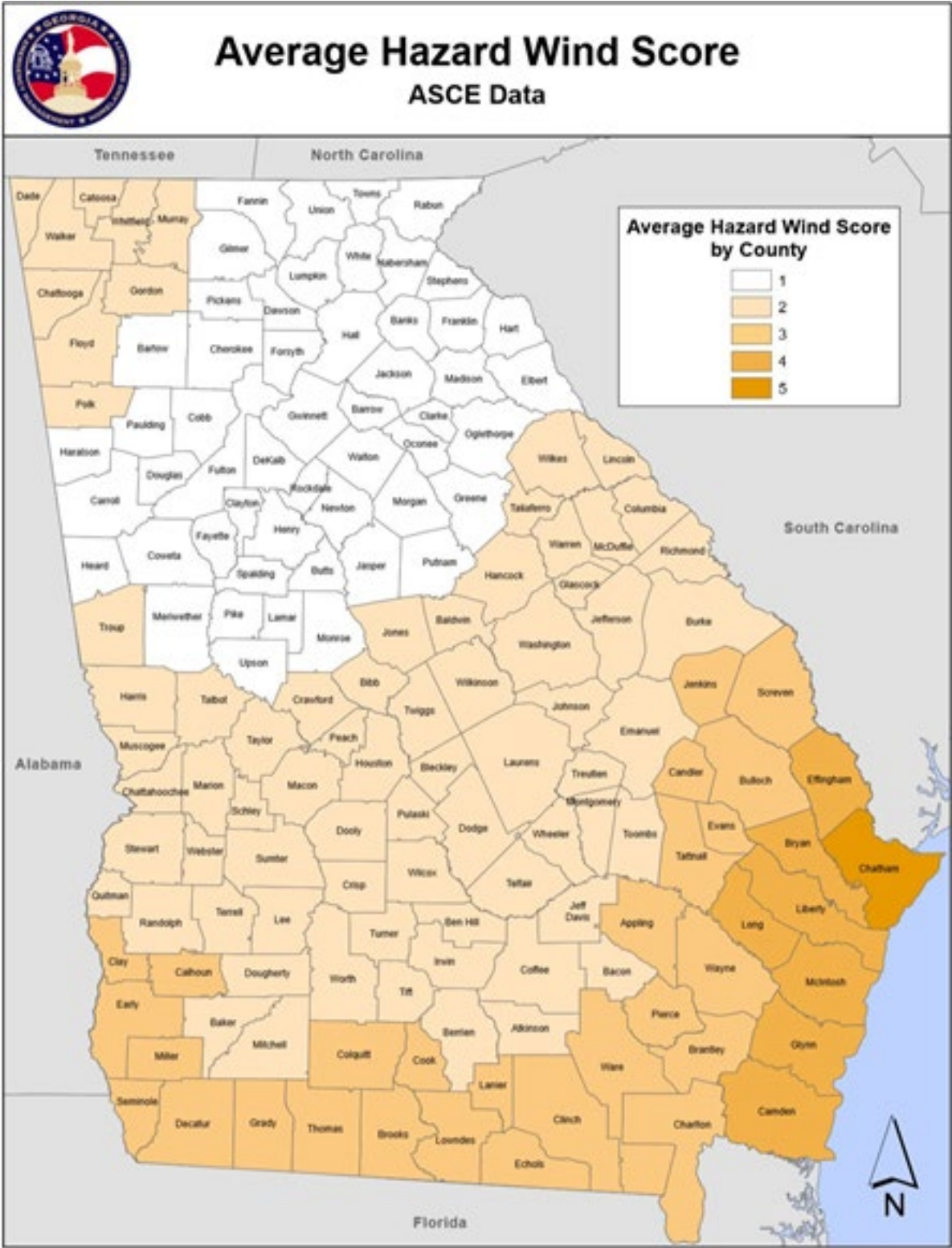
**Includes data from Jackson County*

Assets Exposed to the Hazard

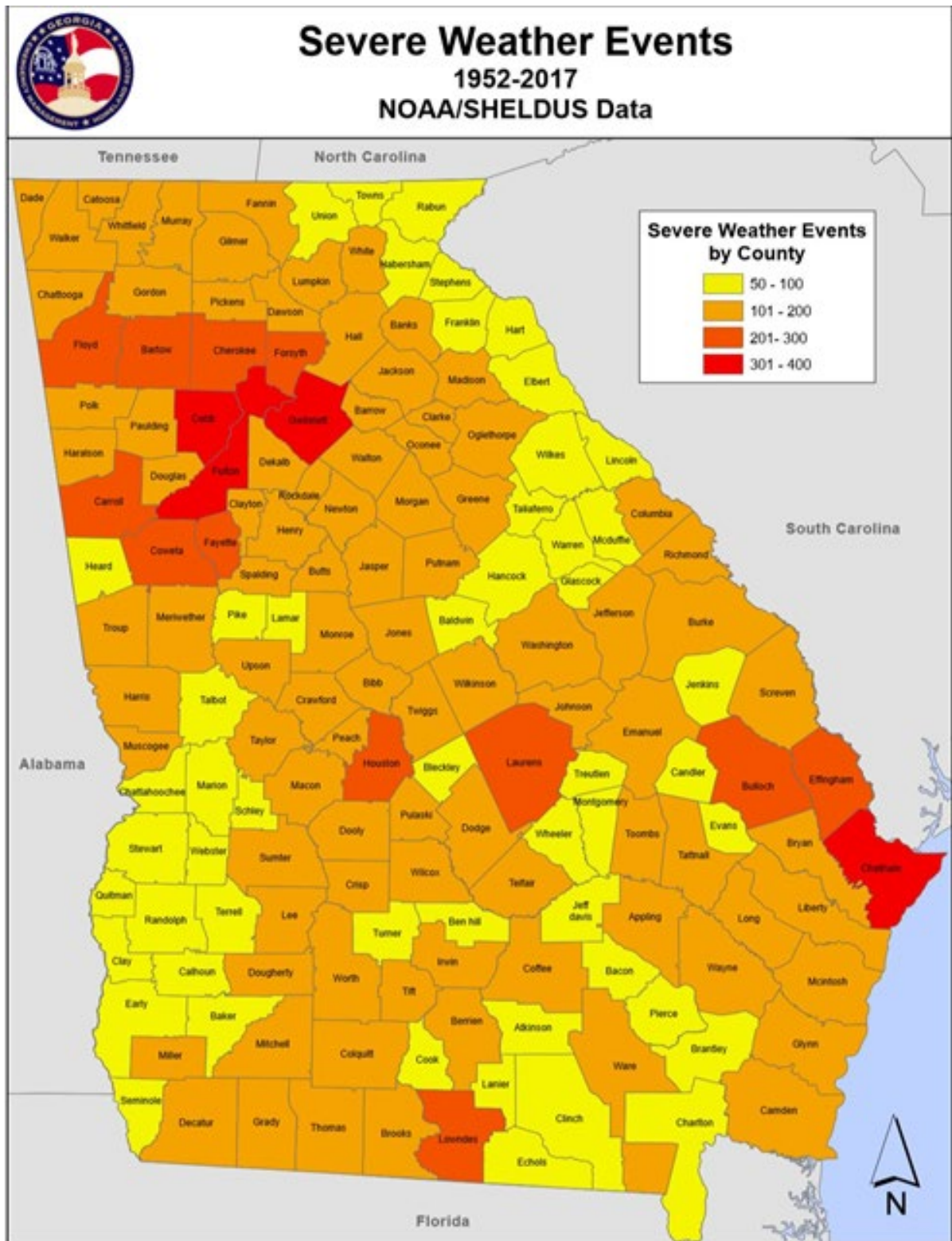
In evaluating assets that are susceptible to severe thunderstorms, the Barrow County HMPC determined that all public and private property is at threat by severe thunderstorms, including all critical facilities. This is due to the lack of spatially prejudice of severe thunderstorm events.

Estimated Potential Losses

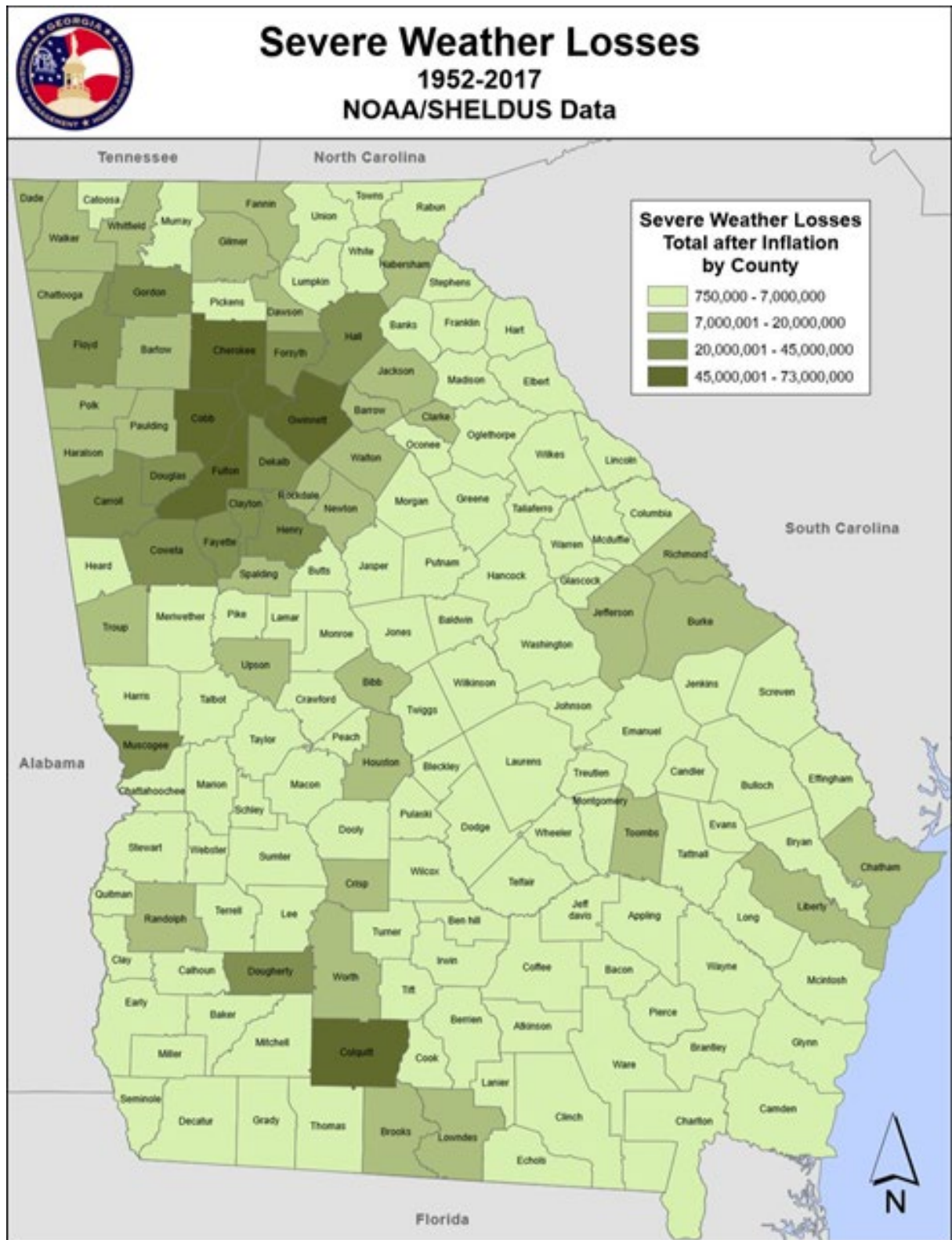
Estimates of damage for the past events of the last 50 years are over \$9.2 million, or \$185,720 annually. However, all estimated damages reported have occurred over the last 30 years. When extrapolated over 30 years, the annual average nearly doubles to \$309,533. These numbers are thought to be a gross underestimation of actual past damages. According to the National Risk Index, Barrow County has an estimated annual loss of \$1,643,152 for lightning, hail, and strong winds.



Source: 2019-2024 State of Georgia Hazard Mitigation Strategy and Enhanced Plan



Source: 2019-2024 State of Georgia Hazard Mitigation Strategy and Enhanced Plan



Source: 2019-2024 State of Georgia Hazard Mitigation Strategy and Enhanced Plan

Natural Hazard: Severe Thunderstorm

Land Use & Development Trends

Barrow County currently has no land use trends related to Thunderstorms beyond continued population growth – particularly in areas near the Gwinnett County border and areas around Braselton, Auburn, and Winder.

Multi-Jurisdictional Considerations

Thunderstorm events have occurred across all areas of Barrow County. Crop damage from thunderstorm events would likely have the greatest impact in the rural areas of Barrow County. However, property damage numbers would be highest in more heavily populated areas due to greater population density. Thunderstorms have the potential to impact all areas of Barrow County.

Hazard Summary

Thunderstorm events pose one of the greatest threats of property damage, injuries, and loss of life in Barrow County. Thunderstorm events are the most frequently occurring weather event that threatens Barrow County. As a result, the Barrow County HMPC recommends that the mitigation measures identified in this plan for thunderstorms should be aggressively pursued due to the frequency of this hazard and the ability for this hazard to affect any part of Barrow County.

Thunderstorm Events Since 2019 in Barrow County

<u>Location</u>	<u>County/Zone</u>	<u>St.</u>	<u>Date</u>	<u>Time</u>	<u>Type</u>	<u>Mag</u>	<u>Dth</u>	<u>Inj</u>	<u>PrD</u>	<u>CrD</u>
WHISTLEVILLE	BARROW CO.	GA	04/14/2019	11:41	Thunderstorm Wind	45 kts. EG	0	0	1.00K	0.00K
BETHLEHEM	BARROW CO.	GA	07/17/2019	15:35	Thunderstorm Wind	50 kts. EG	0	0	15.00K	0.00K
STATHAM	BARROW CO.	GA	07/17/2019	15:44	Thunderstorm Wind	50 kts. EG	0	0	20.00K	0.00K
MULBERRY	BARROW CO.	GA	04/13/2020	02:02	Thunderstorm Wind	50 kts. EG	0	0	10.00K	0.00K
WINDER ARPT	BARROW CO.	GA	04/13/2020	02:04	Thunderstorm Wind	45 kts. EG	0	0	1.00K	0.00K
ALGERNON	BARROW CO.	GA	04/13/2020	02:05	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
BETHLEHEM	BARROW CO.	GA	06/24/2020	14:23	Thunderstorm Wind	50 kts. EG	0	0	8.00K	0.00K
STATHAM	BARROW CO.	GA	07/10/2020	15:48	Thunderstorm Wind	45 kts. EG	0	0	1.00K	0.00K
MULBERRY	BARROW CO.	GA	07/21/2020	14:15	Thunderstorm Wind	50 kts. EG	0	0	20.00K	0.00K
MULBERRY	BARROW CO.	GA	07/21/2020	14:38	Hail	0.88 in.	0	0	0.00K	0.00K

STATHAM	BARROW CO.	GA	08/07/2020	19:06	Thunderstorm Wind	45 kts. EG	0	0	1.00K	0.00K
RUSSELL	BARROW CO.	GA	05/03/2021	11:15	Thunderstorm Wind	50 kts. EG	0	0	20.00K	0.00K
WINDER ARPT	BARROW CO.	GA	04/07/2022	01:00	Hail	1.00 in.	0	0	0.00K	0.00K
MULBERRY	BARROW CO.	GA	01/12/2023	16:37	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
BETHLEHEM	BARROW CO.	GA	08/07/2023	16:15	Thunderstorm Wind	52 kts. EG	0	0	2.00K	0.00K
BETHLEHEM	BARROW CO.	GA	08/07/2023	16:16	Thunderstorm Wind	52 kts. EG	0	0	2.00K	0.00K
STATHAM	BARROW CO.	GA	08/07/2023	16:25	Thunderstorm Wind	52 kts. EG	0	0	2.00K	0.00K

Hazard Description

Severe winter storms bring the threat of ice and snow. There are many types of frozen precipitation that could create a severe winter weather event. Freezing rain consists of super cooled falling liquid precipitation freezing on contact with the surface when temperatures are below freezing. This results in an ice glazing on exposed surfaces including buildings, roads, and power lines. Sleet is easily discernable from freezing rain in that the precipitation freezes before hitting the surface. Often this sleet bounces when hitting a surface and does not adhere to the surface. However, sleet can compound into enough depths to pose some threat to motorists and pedestrians.

A heavy accumulation of ice, which is often accompanied by high winds, can devastate infrastructure and vegetation. Destructiveness in the southern states is often amplified due to the lack of preparedness and response measures. Also, the infrastructure was not designed to withstand certain severe weather conditions such as weight build-up from snow and ice. Often, sidewalks and streets become extremely dangerous to pedestrians and motorists. Primary industries, such as farming and fishing, suffer losses through winter seasons that produce extreme temperatures and precipitation.

Within Georgia, the impacts of winter storms are often contained within the northern part of the State. However, events like the 1993 “storm of the century” illustrated the vast impacts that one storm can have on the entire state. The winter storms with the greatest impacts on Georgia are the result of coastal storms coming up from the Gulf of Mexico, including the winter storms in 1973 and 1993. The 1973 storm produced snowfalls of up to 19 inches in parts of Central Georgia including the City of Thomaston in Upson County. Also, a major ice storm occurred in 2014, bringing up to 1 inch of ice to the eastern portion of the State near Augusta.

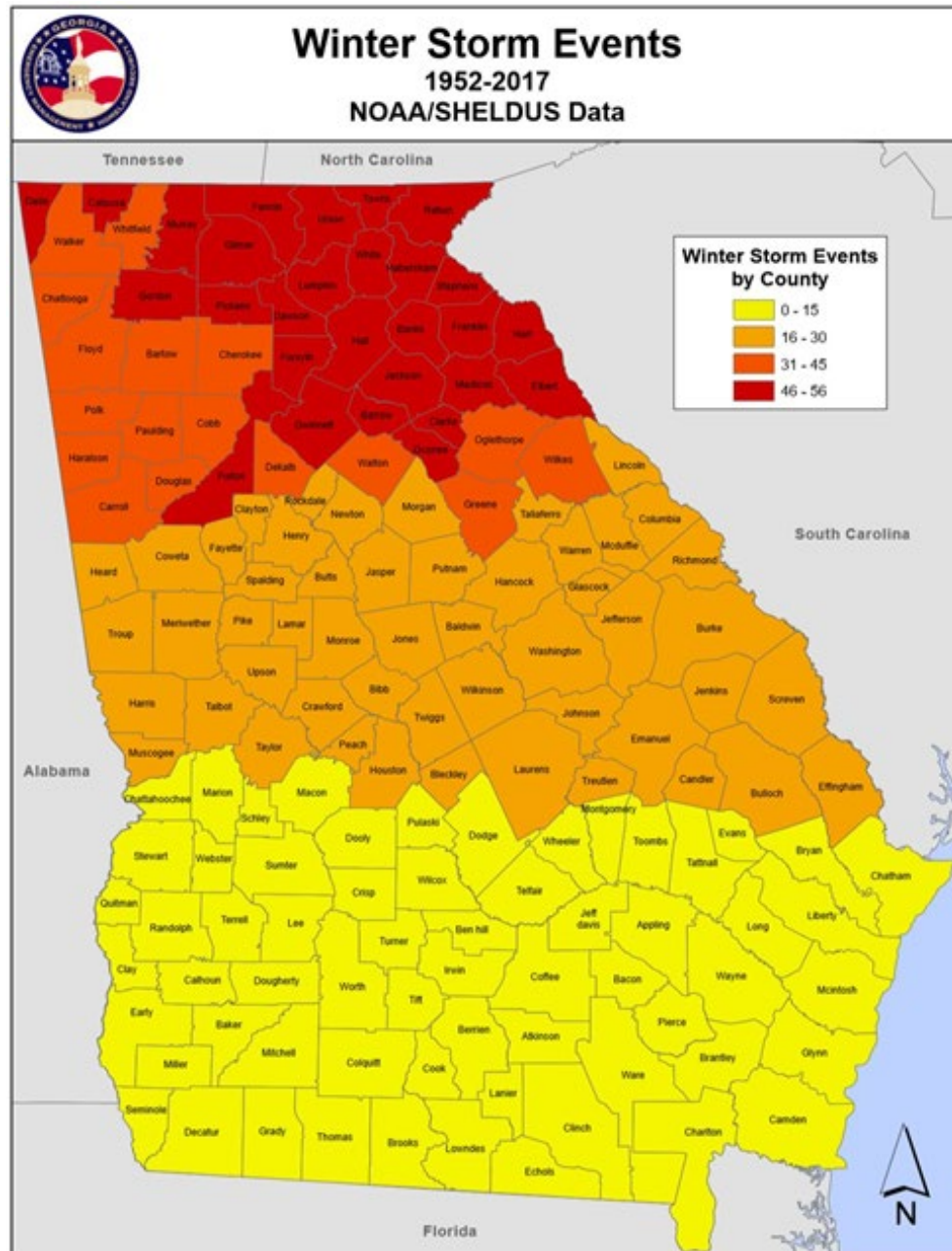
Severe winter weather exhibits seasonal qualities in that most occur within the months of January to March, with the highest probability of occurrence in February. The rate of onset and duration varies from storm to storm, depending on the weather system driving the storm. Severe winter weather rarely frequents the State of Georgia. However, the impacts of the storms substantiate severe winter weather’s inclusion in the risk assessment.

Hazard Profile

While winter storms are not as frequent of an occurrence in Barrow County as they are in areas in the Northern US, they still have the potential to wreak havoc on the community when they do occur. Winter storms in Barrow County typically cause drastic damage to infrastructure, such as roads, power lines, and bridges. The elevation changes, steepness of major roads, and lack of easy accessibility to some areas make winter weather particularly problematic for Barrow County.

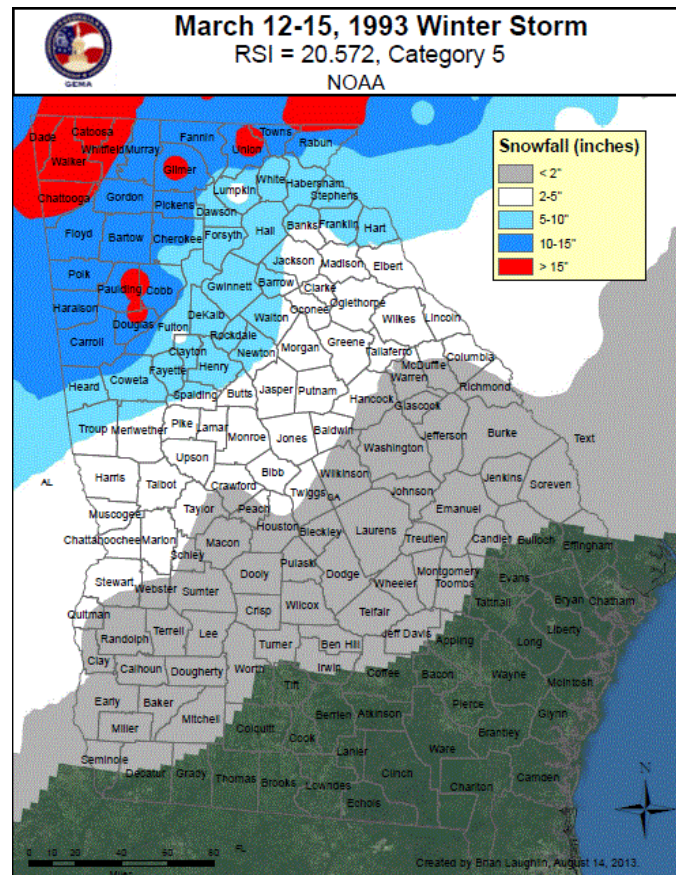
They also can cause damage to private property, businesses, and trees throughout the county. The large number of trees in Barrow County can also become a hazard when the tree limbs become weighed down with snow and ice and begin to break and fall to the ground, potentially damaging private property, public property, or injuring people and animals.

During the past twenty-eight years, documentation exists for 33 winter storm events in Barrow County. This equates to 1.2 winter storms per year in Barrow County. No consolidated data can be located prior to this timeframe. All winter storm data has been gathered on a countywide basis. All winter storm hazard data included for Barrow County is limited to countywide data and is not broken down by jurisdiction.



Source: 2019-2024 State of Georgia Hazard Mitigation Strategy and Enhanced Plan

Individual events of Winter Weather can be drastically different depending on many factors, including the duration of the event, the type of precipitation involved, and the depth of the precipitation. Winter Storm events can be a light dusting of snow, $\frac{1}{4}$ inch of ice, or over a foot of snow. During the 1993 snow event, parts of Barrow County reported up to 10 inches of snow and all areas received at least 2 inches of snow. Ice events are another type of winter storm that has impacted Barrow County in the past. These types of winter storms can be particularly crippling due to the increased threat of tree falls related to the weight of accumulated ice and subsequent utility infrastructure failure.



Source: 2019-2024 State of Georgia Hazard Mitigation Strategy and Enhanced Plan

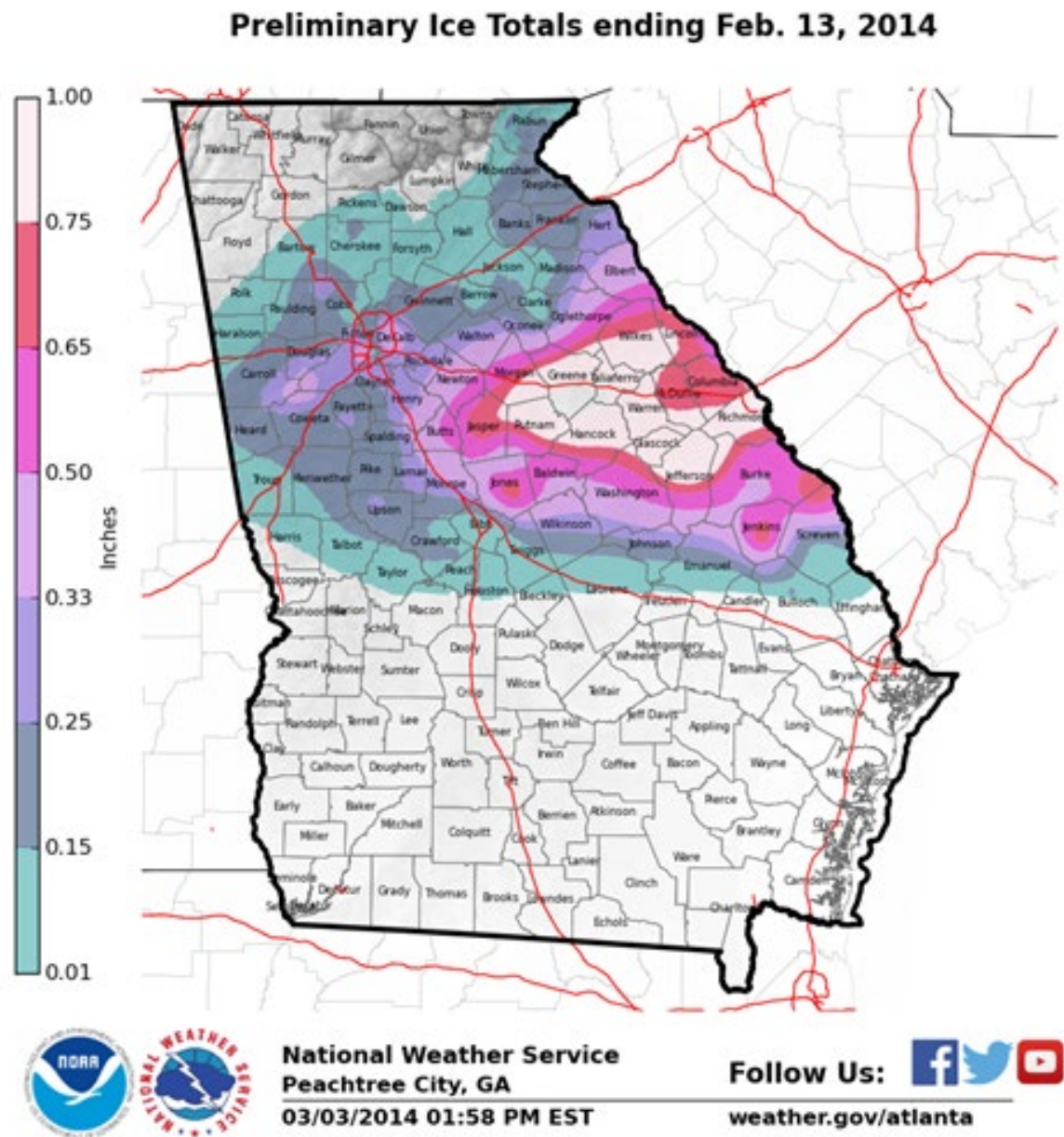
During the 2014 Ice Storm event, parts of eastern Barrow County received up to $\frac{1}{4}$ inch of ice and all areas received at least a trace amount of ice. Additionally, the same areas had received 2-4 inches of snow a couple of days before, which exacerbated the impact of the freezing rain. This event was similar to the 2002 ice storm event in which $\frac{1}{4}$ to $\frac{1}{2}$ inch of ice was recorded in Barrow County.

Assets Exposed to the Hazard

Since winter storms are indiscriminate regarding location, the Barrow County HMPC determined that all public and private property, including all critical infrastructure, are susceptible to impacts from winter storms with areas of higher elevation more likely to receive direct impacts.

Estimated Potential Losses

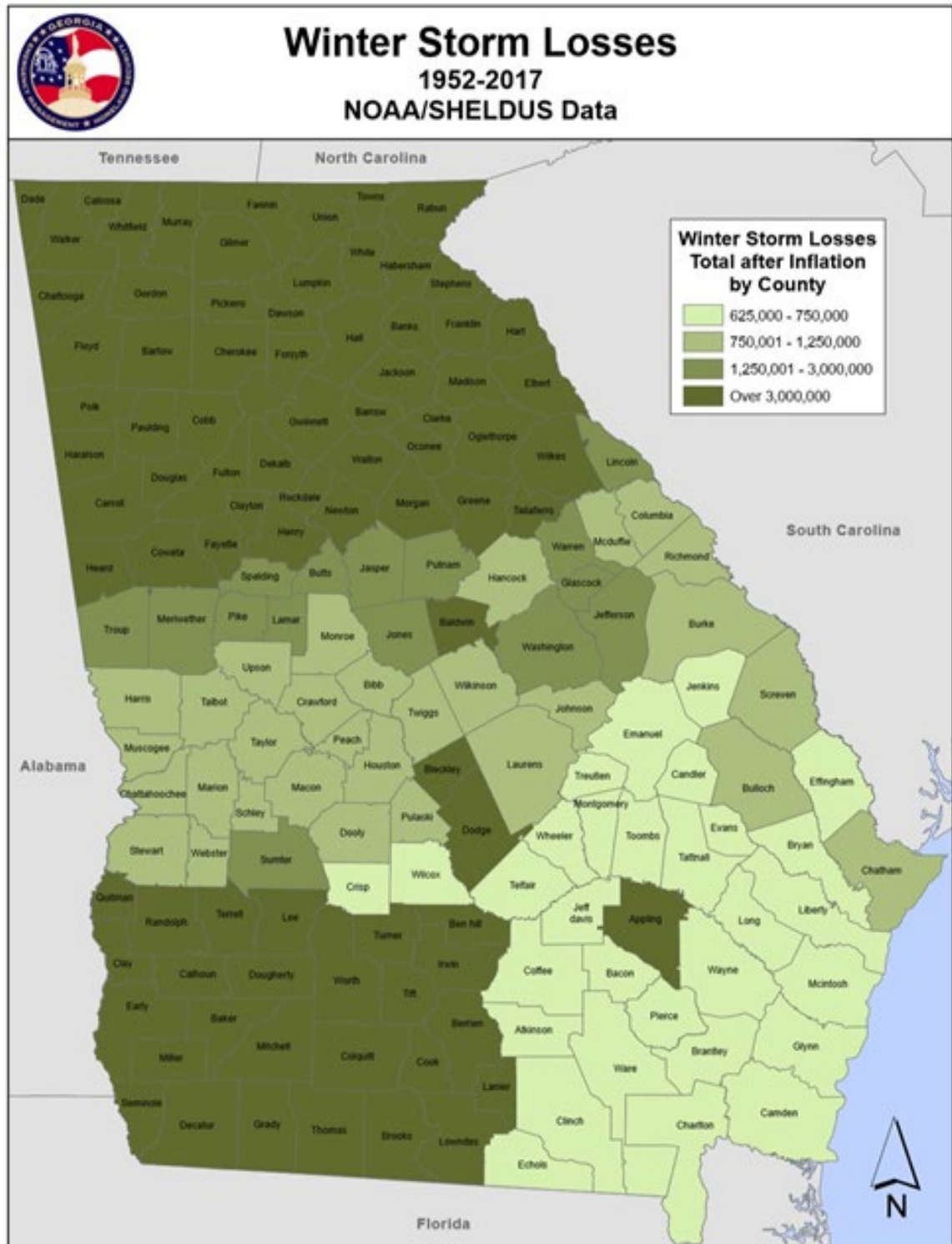
Over the last 50 years, over \$1.2 million in damages have been reported in Barrow County from winter storm events. This equates to \$24,860 annually in damages. However, all reported damages have been from the last 25 years. When extrapolated over 25 years, the annual damage amount doubles to \$49,720. However, this is likely a gross underestimation of the damages winter storms have caused in Barrow County in the past. According to the National Risk Index, Barrow County has an estimated annual loss of \$269,681 related to severe winter weather.



Source: 2019-2024 State of Georgia Hazard Mitigation Strategy and Enhanced Plan

Land Use & Development Trends

Barrow County currently has no land use trends related to Winter Storms beyond continued population growth – particularly in areas near the Gwinnett County border and areas around Braselton, Auburn, and Winder.



Source: 2019-2024 State of Georgia Hazard Mitigation Strategy and Enhanced Plan

Natural Hazard: Winter Storm

Assets Exposed to the Hazard

Since winter storms are indiscriminate regarding location, the Barrow County HMPC determined that all public and private property, including all critical infrastructure, are susceptible to impacts from winter

Multi-Jurisdictional Considerations

All portions of Barrow County could potentially be impacted by a winter storm, including freezing rain, sleet, and snow. Therefore, all mitigation actions identified regarding winter storms should be pursued on a countywide basis and including all municipalities.

Hazard Summary

Winter storms, which can include freezing rain, sleet, or snow, typically afford communities some advance warning, which is different from many other severe weather phenomena. The National Weather Service issues winter storm watches, advisories, and warnings as much as a day before the storm's impacts begin. Unfortunately, communities in the Southern United States are not equipped to handle winter storms due to their relative infrequent nature. Oftentimes, communities can face severe impact from these storms. The Barrow County HMPC recognizes the potential threats winter storms could have on the community and have identified specific mitigation actions as a result.

Winter Storm Events since 2019 in Barrow County

<u>Location</u>	<u>County/Zone</u>	<u>St.</u>	<u>Date</u>	<u>Time</u>	<u>T.Z.</u>	<u>Type</u>	<u>Mag</u>	<u>Dth</u>	<u>Inj</u>	<u>PrD</u>	<u>CrD</u>
BARROW (ZONE)	BARROW (ZONE)	GA	02/08/2020	10:00	EST-5	Winter Storm		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	02/06/2021	16:00	EST-5	Winter Weather		0	0	0.00K	0.00K

Natural Hazard: **Flooding**

Requirement §201.6(c)(2)(ii)

Requirement §201.6(c)(3)(ii)

Hazard Description

Flooding is a temporary overflow of water on normally dry lands adjacent to the source of water, such as a river, stream, or lake. The causes of flooding include mass sources of precipitation, such as tropical cyclones, frontal systems, and isolated thunderstorms combined with other environmental variables, such as changes to the physical environment, topography, ground saturation, soil types, basin size, drainage patterns, and vegetative cover. Adverse impacts may include structural damages, temporary backwater effects in sewers and drainage systems, death of livestock, agricultural crop loss, loss of egress and access to critical facilities due to roads being washed-out or over-topped and unsanitary conditions by deposition of materials during recession of the floodwaters.

Floods are loosely classified as either coastal or riverine. Coastal flooding occurs when normally dry, low-lying land is flooded by sea water. Coastal flooding is usually associated with tropical cyclones in Georgia. Riverine flooding occurs from inland water bodies such as streams and rivers. Riverine flooding is often classified based on rate of onset. The first is slow to build, peak, and recede, often allowing enough time for evacuations. The other type of riverine flood is referred to as a “flash” flood, which rapidly peaks and recedes, thus giving insufficient time for evacuations. Flash floods are typically considered the most dangerous of these types.

On a broad scale, flooding can occur around any body of water or low-lying surface given enough precipitation or snowmelt. The spatial extent of the flooding event depends on the amount of water overflow but can usually be mapped because of existing floodplains (areas already prone to flooding).

Flooding in Georgia is highly dependent on precipitation amounts and is highly variable. Certain seasons are more prone to flooding to a greater likelihood of excessive precipitation. Typically, the wet seasons are during the winter, early spring, and midsummer. Late spring and fall are usually drier seasons.

Hazard Profile

The Barrow County HMPC researched flooding information for the last fifty years. The main sources of information used by the Barrow County HMPC came from the National Climatic Data Center, the Barrow County Emergency Operations Plan, and news media sources. It was determined that flooding has caused significant damage on many occasions over the last 25 years.

One significant flooding event that affected Barrow County occurred in 2009. This event caused over \$100,000 in reported damages according to the National Climatic Data Center. During this event, significant rainfall fell over north Georgia for several days causing flooding across the region. In Barrow County, numerous roads were flooded and impassable. Overall, Barrow County has had over \$185,000 in damages from flooding events in the last 25 years. Extrapolated over 25 years, the equates to \$7,410 in annual damages. This is thought to be a gross underestimation of damages during this time period. While data was collected for the entire 50-year timeframe, little information was available regarding flood events prior to 1996, possibly due to poor record keeping. All flood data was gathered on a countywide basis.

Natural Hazard: **Flooding**

Flood events within Barrow County are typically associated with areas of special flood hazard as identified on Flood Rate Insurance Maps (FIRMs) published by FEMA. With each flooding event, it is likely that significant costs arose related to road repair, infrastructure repair, and public safety response operations. Most of the flood damage in Barrow County's history appears to be related to roads and culverts washing out because of flood waters. Barrow County's significant elevation changes also increases the impact of short duration, heavy rain events leading to flash flooding.

Barrow County has two flood gages that provides recent historical data and potential flood levels. One of those gages is located on the Middle Oconee River on Georgia Highway 82 near Arcade. Flood stage at this location begins at 16 feet. At this level, minor flooding of fields and woodlands in the area begins. One residential yard downstream will also flood. At 21 feet, moderate flood stage is reached and water begins to reach Bismarck Circle Road upstream from the gage. At 23 feet, low portions of Bismarck Circle Road begins to flood. At 25 feet, water reaches the foundation of a few homes on Bismarck Circle Road and those homes begin to flood at 26 feet. At 27 feet, major flood stage is reached. One home downstream from the gage will be inundated by up to 4 feet of water at this stage. At 29 feet, one home will be flooded with up to 6 feet of water and several homes on Bismarck Circle Road will see up to 4 feet of water. This gage has a historic crest of 25.35 feet, which occurred in March of 1990. More recently, water reached 23.86 feet in January of 2024.

In the City of Winder, there are some residential areas that could be impacted by flood waters. For example, a few homes on Shenandoah Drive could be inundated by up to 1 foot of water in a 100-year (1% annual risk) flood event. Homes on Miles Patrick Road could see up to 2 feet of water as a result of flooding from Cedar Creek in a 100-year (1% annual risk) flood event. Additionally, some homes on Lacey Lane and Farlow Court could see up to 6 inches of flooding in a 100-year (1% annual risk) flood event.

In Braselton, Duncan Creek is the waterway most likely to cause flooding in a 100-year (1% annual risk) flood event. Several homes on Pinor Noir Way and Chablis Court could be inundated by up to 1 foot of water in this type of event. Additionally, Mulberry Creek could flood multiple homes with up to 3 feet of water on Silk Tree Pointe in a 100-year (1% annual risk) flood event. Most notably, 25-30 homes in this area would be isolated and inaccessible from any direction in this type of event.

In Bethlehem, the only residential structures that would be impacted by a 100-year (1% annual risk) flood event would be some out buildings on Harrison Mill Road. Bethlehem is more likely to be impacted by a flash flood event. Low-lying areas of Bethlehem, such as US Highway 29 near Marbury Creek and portions of Harrison Mill Road, are the most likely areas to be impacted.

There are no residential structures in the 100-year (1% annual risk) floodplain in Statham. A flash flood event, however, would impact low-lying areas of the municipality. The areas of Statham most likely to see impacts would be along Georgia Highway 211 near 1st Street and areas of Providence Road near April Court.

In Carl, there are no residential structures within the 100-year (1% annual risk) floodplain. Low-lying areas of Carl could be impacted in a flash flood event. Areas of Lake Drive and some areas off of Carl-Cedar Hill Road would be the most likely to see impacts during a flash flood event.

Natural Hazard: **Flooding**

In Auburn, few direct impacts would occur in a 100-year (1% annual risk) flood event. Some residential outbuildings on Pinecrest Road could be inundated with up to 1 foot of water in this type of event. In a flash flood event, low-lying areas of Auburn would likely flood. This could include areas of Oakleaf Drive, Willow Gate Trace, Park Mill Road near Rocky Creek, Kilcrease Road near 10th Street, and Quail Valley Road.

There are 12 documented flood events over the last 50 years. Based on the 50-year record, it can be inferred that such an event is likely to occur every 4.2 years in Barrow County. This relates to a 24% chance of a flood event occurring in a given year. However, all identified flood events have occurred over the last 25 years. When extrapolated over 25 years, Barrow County has averaged 2.1 flood events each year and has a near 50% annual chance of a flood event of some magnitude occurring. For additional historical data, please see Appendix D.

Assets Exposed to the Hazard

To evaluate the assets that would potentially be impacted by flooding, the Barrow County HMPC attempted to identify known structures within, or close to, the 100-year floodplain. There are approximately 268 buildings identified in the flood plain.

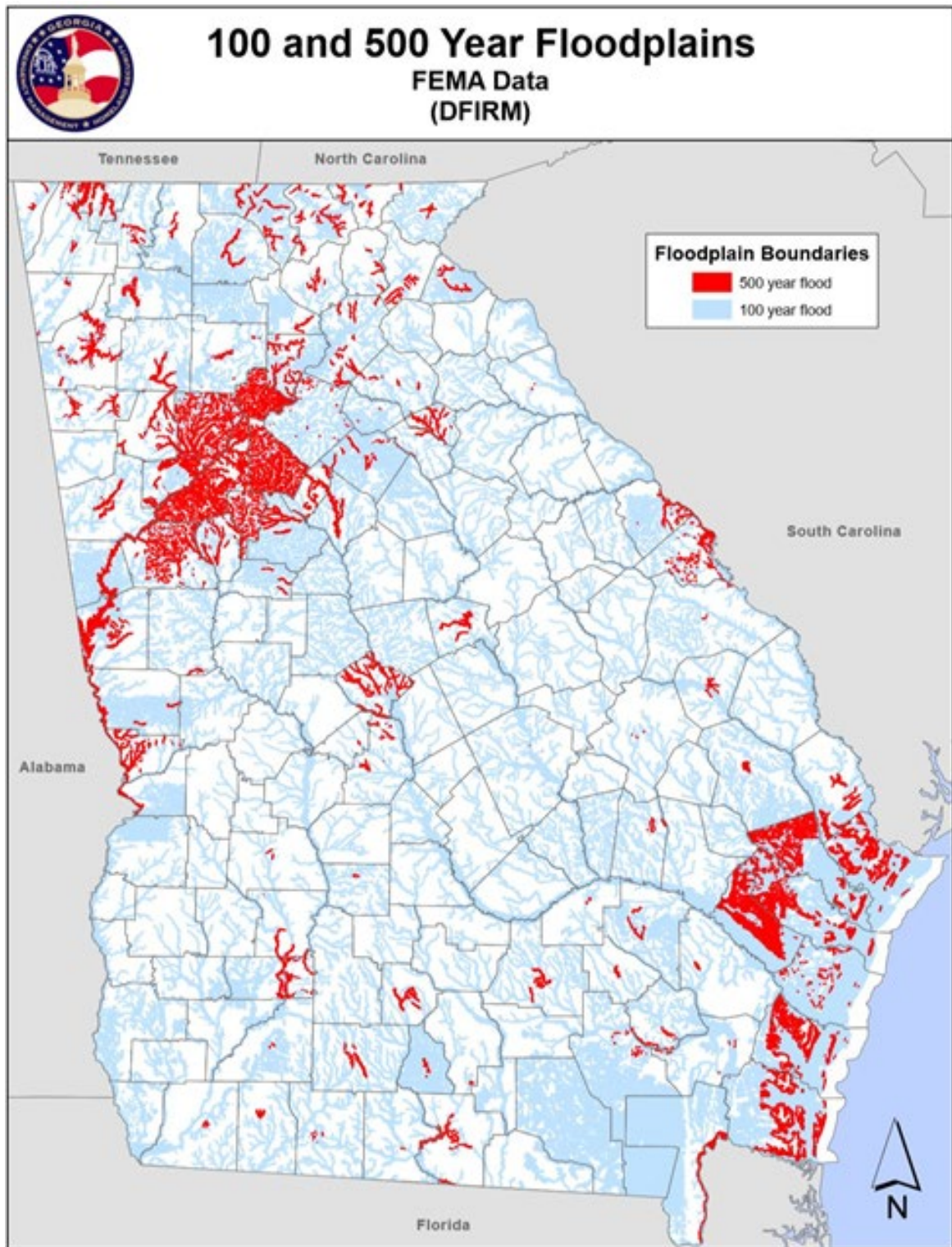
<i>Municipality</i>	<i># of Flood Events</i>	<i>Annual Risk</i>
<i>AUBURN</i>	6	24%
<i>BETHLEHEM</i>	6	24%
<i>BRASELTON*</i>	6	24%
<i>CARL</i>	6	24%
<i>STATHAM</i>	6	24%
<i>WINDER</i>	10	40%

The above information is for the last 25 years

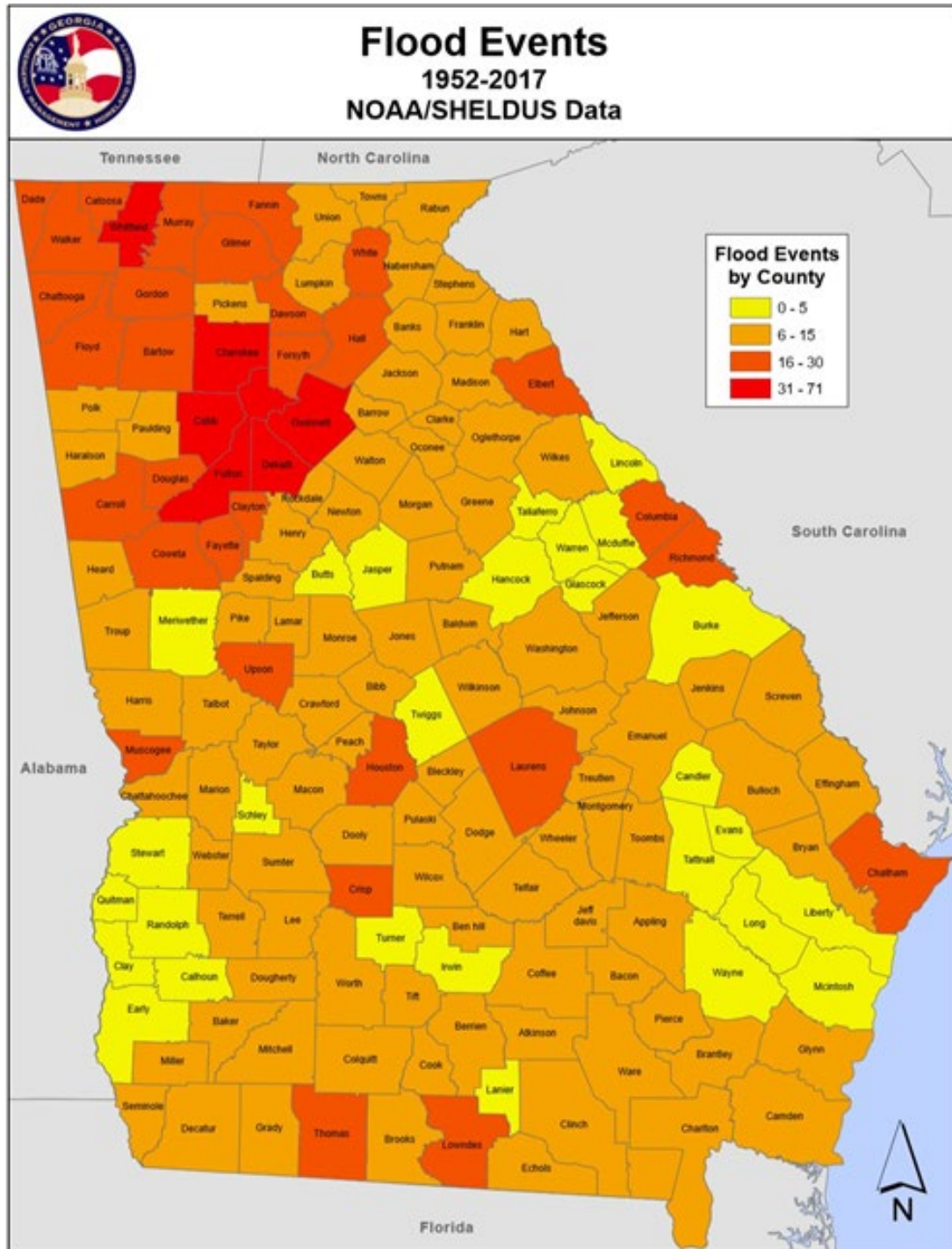
** Includes data from Jackson County*

Estimated Potential Losses

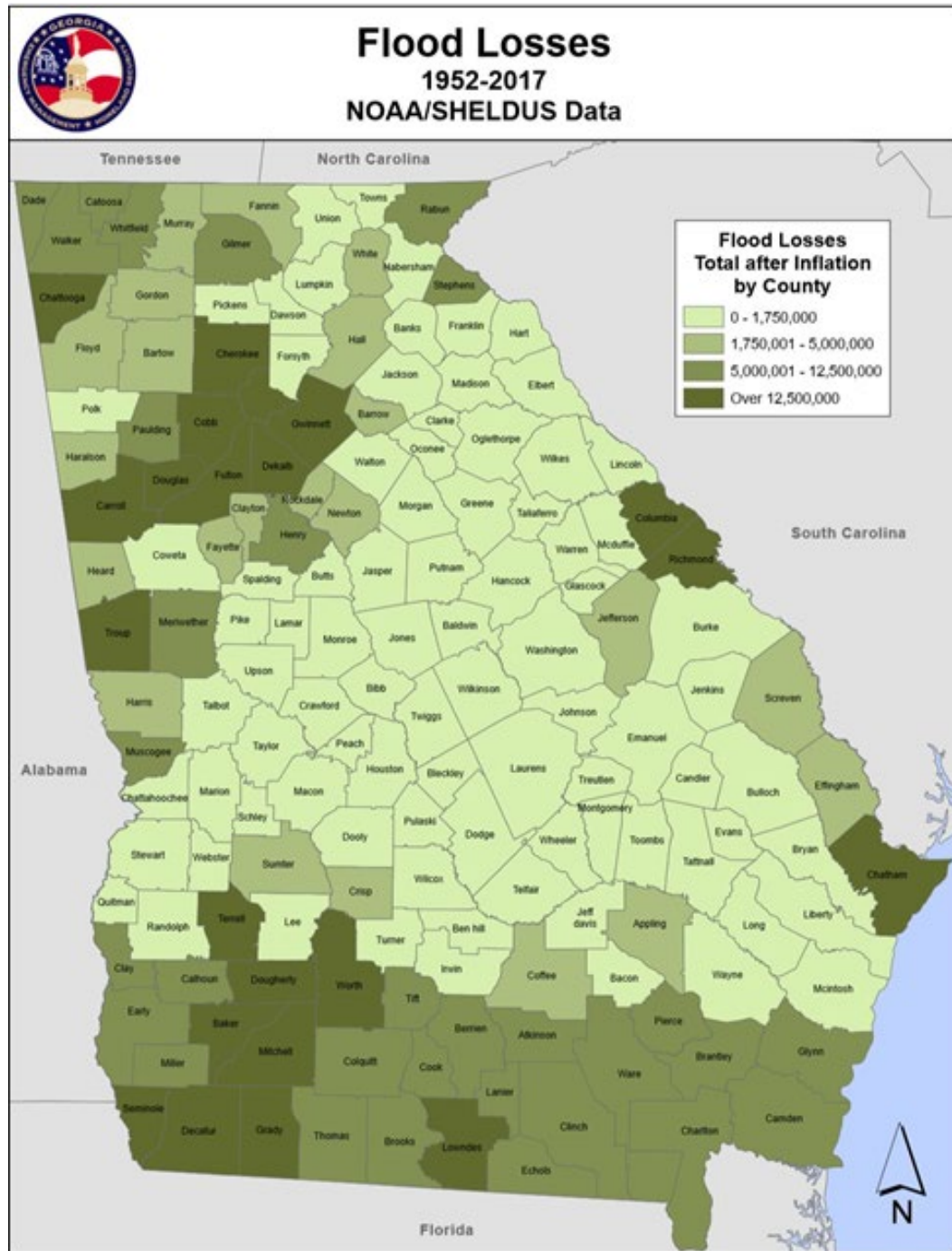
The flooding events in Barrow County over the last 25 years have led to over \$185,000 in damages. Extrapolated over 25 years, this results in an annual average of \$7,410 per year. Based upon the estimations from the 2024 Barrow County HAZUS Report, a flood equivalent to the 1% riverine flood levels could result in estimated losses of more than \$15 million (301 buildings). However, it is possible that some areas may not experience total losses while others not designated in the 1% annual risk areas may be inundated with flood water. According to the National Risk Index, Barrow County has an estimated annual loss of \$106,670 related to Riverine Flooding events.



Source: 2019-2024 State of Georgia Hazard Mitigation Strategy and Enhanced Plan



Source: 2019-2024 State of Georgia Hazard Mitigation Strategy and Enhanced Plan



Source: 2019-2024 State of Georgia Hazard Mitigation Strategy and Enhanced Plan

Land Use & Development Trends

Barrow County participates in the National Flood Insurance Program (NFIP) and follows the program's guidelines to ensure future development is carried out in the best interests of the public. Barrow County (CID No. 130497B) first entered the NFIP on October 16, 1991. According to the NFIP guidelines, the County has executed a Flood Damage Prevention Ordinance. This ordinance attempts to minimize the loss of human life and health as well as minimize public and private property losses due to flooding. The ordinance requires any potential flood damage be evaluated at the time of initial construction and that certain uses be restricted or prohibited based on this evaluation. The ordinance also requires that potential homebuyers be notified that a property is located in a flood area. In addition, all construction must adhere to the Georgia State Minimum Standard Codes and the International Building Codes of 2018 for Barrow County and all municipalities. Currently, the Barrow County municipalities of Auburn, Bethlehem, Braselton, Statham, and Winder also participate in NFIP through the application of appropriate NFIP-compliant ordinances and regulations.

The City of Carl is in the process of reviewing NFIP guidelines to ensure compliance. There is minimal 100-year (1% annual risk) floodplain area in the city limits of Carl.

The Barrow County Planning and Community Development Director is tasked as the administrator of the Barrow County Flood Prevention ordinance. The Flood Prevention ordinance is located in Part I, Chapter 89, Article XI, Division 3 of the Barrow County Codes of Ordinance. The responsibilities of the Flood Prevention administrator includes, but is not limited to:

1. Review proposed development to assure that the permit requirements of this ordinance have been satisfied.
2. Review proposed development to assure that all necessary permits have been received from governmental agencies from which approval is required by Federal or State law, including section 404 of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1334. Require that copies of such permits be provided and maintained on file.
3. Review all permit applications to determine whether proposed building sites will be reasonably safe from flooding.
4. When base flood elevation data or floodway data have not been provided in accordance with subsection (b)(2), then the Barrow County Department of Community and County Development Director shall obtain, review and reasonably utilize any base flood elevation and floodway data available from a Federal, State or other sources in order to administer the provisions of subsection (d).
5. Review and record the actual elevation in relation to mean sea level (or highest adjacent grade) of the lowest floor, including basement, of all new or substantially improved structures in accordance with subsection(c)(2)b.
6. Review and record the actual elevation, in relation to mean sea level to which any new or substantially improved structures have been flood-proofed, in accordance with subsection (c)(2)b.
7. When flood-proofing is utilized for a structure, the Barrow County Department of Community & County Development Director shall obtain certification of design criteria from a registered professional engineer or architect in accordance with subsection (c)(2)a.3. and (d)(2).b or (d)(4)b.
8. Make substantial damage determinations following a flood event or any other event that causes damage to structures in flood hazard areas.

9. Notify adjacent communities and the Georgia Department of Natural Resources prior to any alteration or relocation of a watercourse and submit evidence of such notification to the Federal Emergency Management Agency (FEMA).
10. For any altered or relocated watercourse, submit engineering data/analysis within six months to the FEMA to ensure accuracy of county flood maps through the letter of map revision process. Assure flood carrying capacity of any altered or relocated watercourse is maintained.
11. Where interpretation is needed as to the exact location of boundaries of the Areas of Special Flood Hazard (for example, where there appears to be a conflict between a mapped boundary and actual field conditions) the Barrow County Department of Community and County Development Director shall make the necessary interpretation. Any person contesting the location of the boundary shall be given a reasonable opportunity to appeal the interpretation as provided in this Ordinance.
12. All records pertaining to the provisions of this ordinance shall be maintained in the office of the Barrow County Department of Community and County Development Director and shall be open for public inspection.

Each municipality participating in NFIP has likewise designated an administrator for their flood damage prevention ordinances. In the City of Auburn, this responsibility falls to the Stormwater Coordinator. In Statham, it is the responsibility of the Code Enforcement Officer. In Winder, the City Building Inspector, or their designee, is responsible for the implementation of the Flood Damage Prevention Ordinance. Implementation of the ordinance falls to the Town Manager in Braselton and in Bethlehem.

For the substantial damage portion of the flood prevention ordinance, the floodplain administrator will utilize tax assessor's data to determine market value for all damaged structures. Substantial damage will be determined by assessing whether the repairs needed to bring a structure back to pre-damage conditions exceeds 50% of the market value of the structure. If so, then the structure will be determined to be of "substantial damage." This determination will be communicated to the property owners and any appeals will be held in accordance with established appeals procedures for permit applications. Once appeals are resolved, permitting will commence and inspections will occur as normally scheduled. Any technical assistance needed will be requested from the State of Georgia and/or the Federal Emergency Management Agency.

There are no repetitive loss properties identified in Barrow County.

Multi-Jurisdictional Considerations

During a large-scale flood event, many portions of Barrow County would potentially be impacted by flooding. However, the area's most prone to flooding have historically been those areas located within the 100-year floodplain – particularly those areas along the Middle Oconee River, Apalachee River, Marbury Creek, and Breach Creek and their tributaries. All of Barrow County, including all municipalities, could potentially be impacted.

Hazard Summary

Flooding has the potential to inflict significant damage within Barrow County, particularly along the Soquee River and Glade Creek and their tributaries and distributaries and areas along Yonah Lake. Mitigation of flood damage requires the community to be aware of flood-prone areas, including roads, bridges, and critical facilities. The Barrow County HMPC identified flooding as a hazard requiring

Natural Hazard: **Flooding**

mitigation measures and identified specific goals, objectives, and action items they deemed necessary to lessen the impact of flooding for their communities.

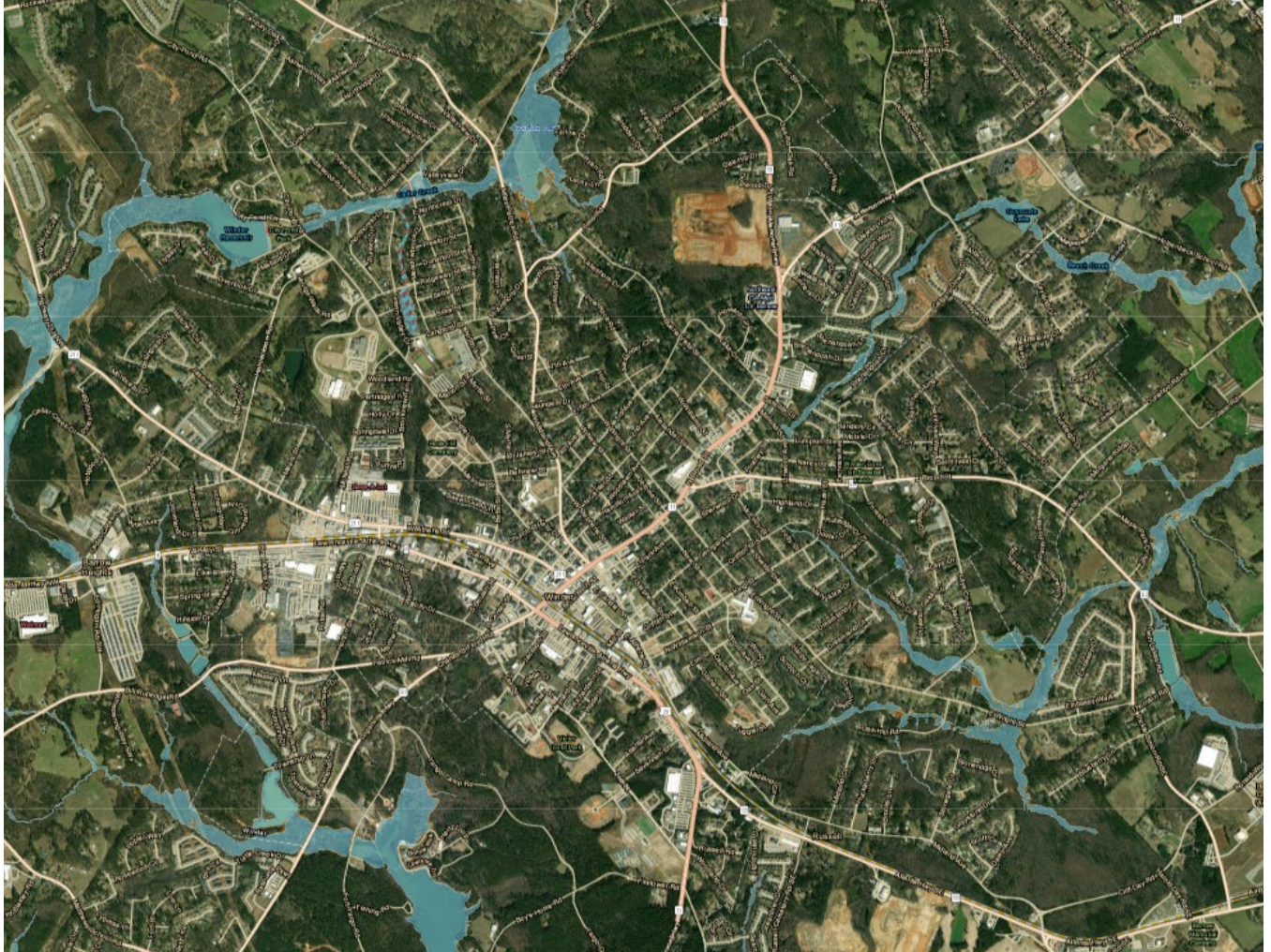
Flood Events in Barrow County since 2019

<u>Location</u>	<u>County/Zone</u>	<u>St.</u>	<u>Date</u>	<u>Time</u>	<u>Type</u>	<u>Mag</u>	<u>Dth</u>	<u>Inj</u>	<u>PrD</u>	<u>CrD</u>
<u>WHISTLEVILLE</u>	BARROW CO.	GA	02/06/2020	10:47	Flash Flood		0	0	0.00K	0.00K

Barrow County



Winder



Statham



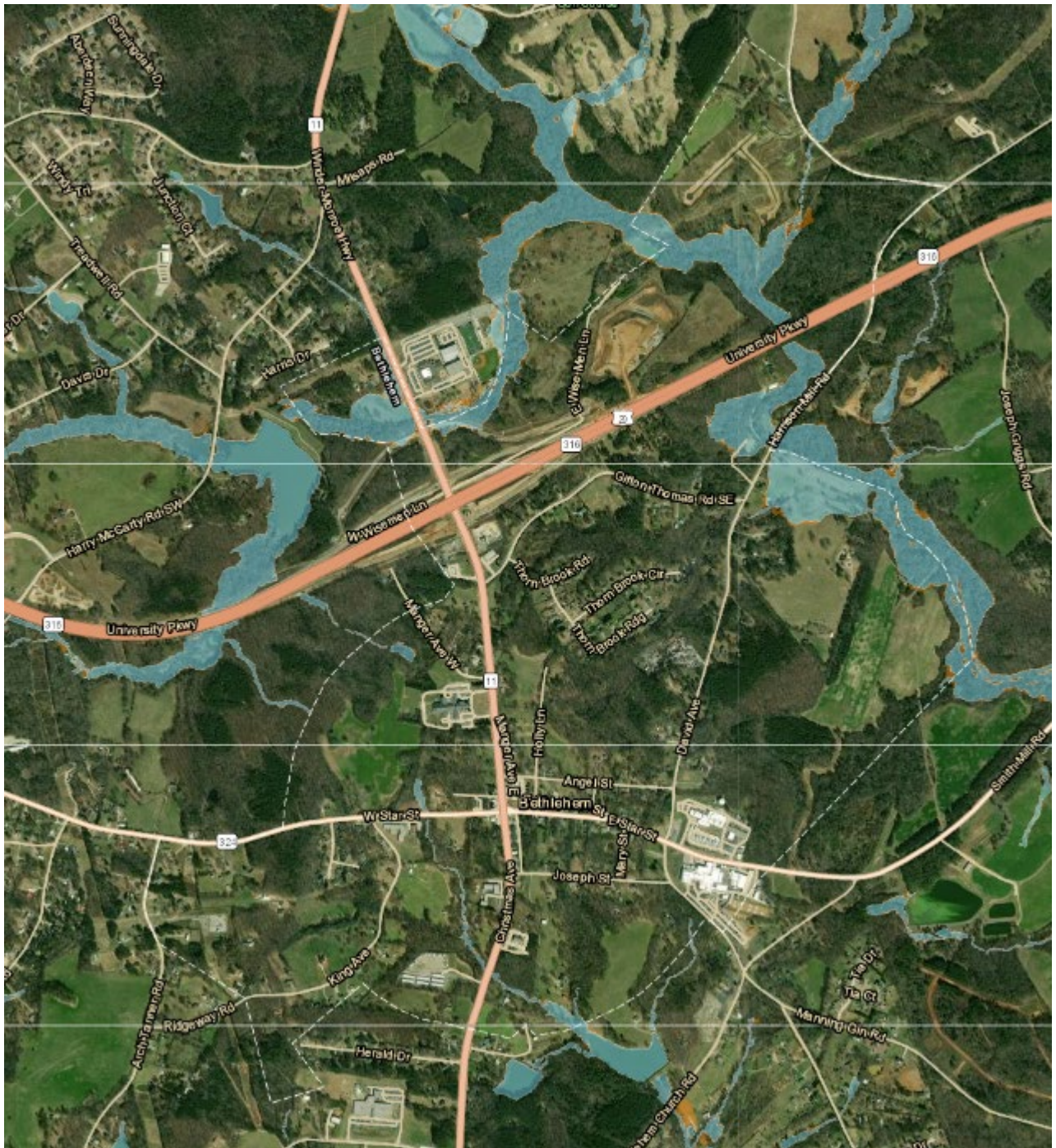
Auburn and Carl



Braselton



Bethlehem



*Note: All “light blue” shaded areas indicate the extent of the 100-year (or 1% annual) flood risk
All Flood Maps are from the Georgia DFIRM Flood Map Program*

Natural Hazard: Tornado

Hazard Description

A tornado is a violently rotating column of air (seen only when containing condensation, dust, or debris) that is in contact with the surface of the ground. Exceptionally large tornadoes may not exhibit the classic “funnel” shape, but may appear as a large, turbulent cloud near the ground or a large rain shaft. Destructive because of strong winds and windborne debris, tornadoes can topple buildings, roll mobile homes, uproot vegetation, and launch objects hundreds of yards.

Most significant tornadoes (excluding some weak tornadoes and waterspouts) stem from the right rear quadrant of large thunderstorm systems where the circulation develops between 15,000 and 30,000 feet. As circulation develops, a funnel cloud, a rotating air column aloft, or tornado descends to the surface. These tornadoes are typically stronger and longer-lived. The weaker, shorter-lived tornadoes can develop along the leading edge of a singular thunderstorm. Although tornadoes can occur in most locations, most of the tornado activity in the United States is in the Midwest and Southeast. Tornadoes can occur anywhere within the State of Georgia.

Enhanced Fujita Scale for Tornadoes		
The Enhanced Fujita Scale (EF), introduced in 2007, provides estimates of tornado strength based on damage surveys. The original scale was developed by Dr. Theodore Fujita and implemented in 1971.		
Wind Speed	EF Scale	Typical Damage
65-85 mph	0	Peels surface off some roofs, some damage to gutters or siding
86-110 mph	1	Roof severely stripped, mobile homes overturned or badly damaged, loss of exterior doors, windows and other glass broken
111-135 mph	2	Roofs torn off well-constructed homes; foundations of frame homes shifted; mobile homes completely destroyed
136-165 mph	3	Entire stories of well-constructed homes destroyed; severe damage to large buildings such as shopping malls
166-200 mph	4	Well-constructed houses and whole-frame homes completely leveled
200+ mph	5	Strong frame houses leveled off foundations and swept away; high-rise buildings have significant structural deformation

Source: International Code Council

In terms of the continuum of area of impact for hazard events, tornadoes are fairly isolated. Typically ranging from a few hundred to one or two miles across, tornadoes affect far less area than larger

Natural Hazard: **Tornado**

meteorological events such as tropical cyclones, winter storms and severe weather events. An exact season does not exist for tornadoes. However, most occur between early spring to mid-summer (February-June). The rate of onset of tornado events is rapid. Typically, the appearance of the first signs of the tornado is the descending funnel cloud. This sign may be only minutes from the peak of the event, giving those in danger minimal sheltering time. However, meteorological warning systems attempt to afford those in danger more time to shelter. The frequency of specific tornado intensities is undetermined because no pattern seems to exist in occurrence. Finally, the duration of tornado events ranges from the few minutes of impact on a certain location to the actual tornado lasting up to a few hours.

Tornadoes are measured after the occurrence using the subjective intensity measures. The Enhanced Fujita Scale describes the damage and then gives estimates of magnitude of peak 3-second gusts in miles per hour.

Hazard Profile

All areas within Barrow County are vulnerable to the threat of a tornado. Due to the indiscriminate and unpredictable nature of tornadoes, there is no reliable method to determine where or when a tornado will strike. There have been 4 documented tornadoes in the last 50 years in Barrow County. It is likely that other tornadoes have occurred within this timeframe, but available records are limited in nature.

Based on the 50-year information available for Barrow County, a tornado occurs every 12.5 years. On an annual basis, Barrow County has a 8% chance of being impacted from a tornado event. When only the last twenty years are considered, the likelihood of a tornado affecting Barrow County increases to 10% (2 tornadoes since 2003).

Individual tornado events can cause extreme damage to an area. This holds true for Barrow County, as well. The strongest and costliest documented tornado to impact Barrow County was a F1 in 1984. This caused over \$250,000 in damages in a 12-mile stretch of Barrow County, including passing through Fort Yargo State park and areas on the far eastern side of the City of Winder.

All tornado hazard data included for Barrow County is limited to countywide data and is not broken down by jurisdiction.

Assets Exposed to the Hazard

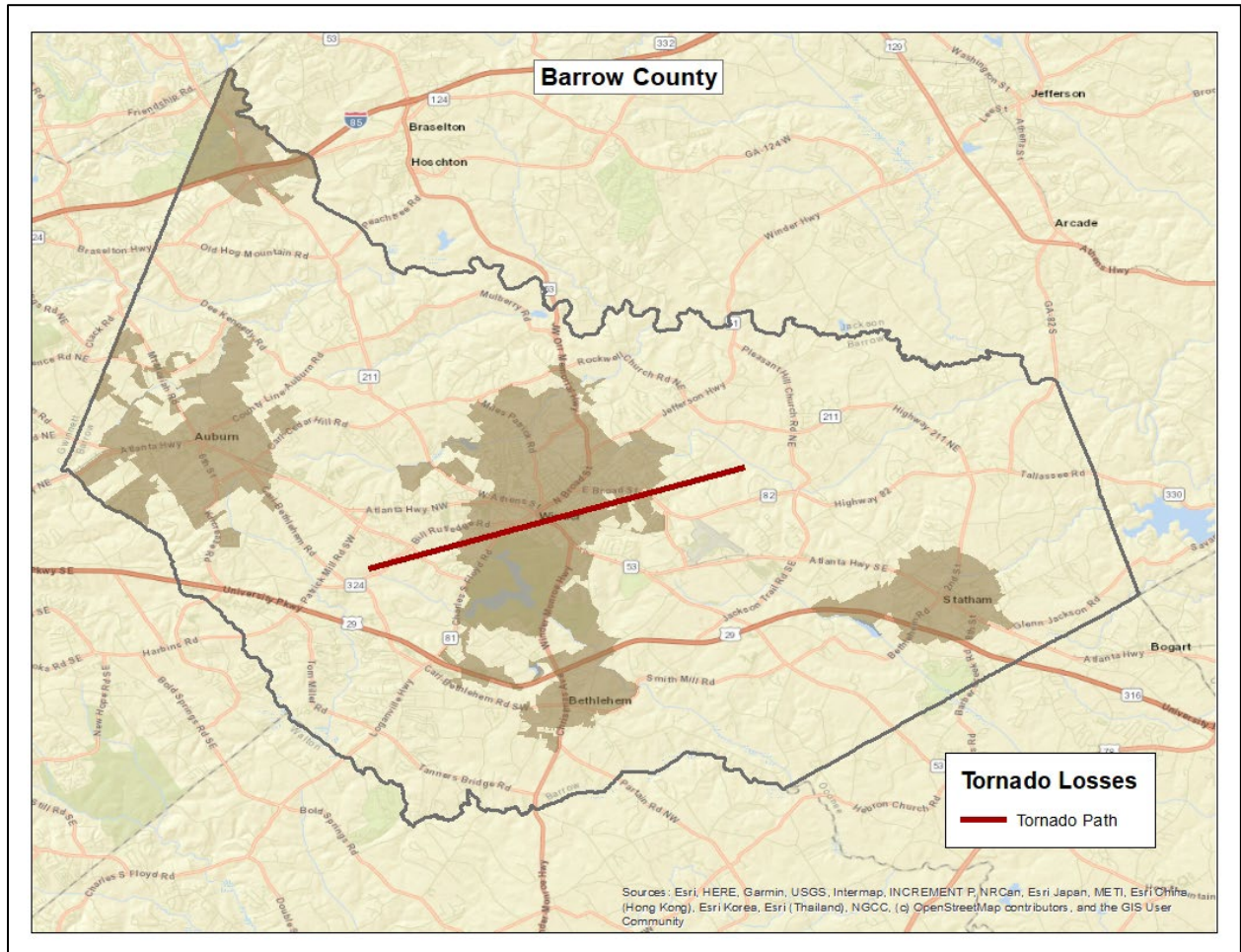
In evaluating assets that are susceptible to tornadoes, the Barrow County HMPC determined that all public and private property is threatened by tornadoes, including all critical facilities. This is due to the lack of spatial prejudice of tornadoes.

Estimated Potential Losses

Estimates of damage for the past events of the last 50 years are nearly \$450,000, or \$8,900 annually. However, singular events can cause a significant impact in the amount of losses. Documented damage estimates for tornado events in Barrow County have varied wildly depending on what was damaged. According to the National Risk Index, Barrow County has an estimated annual loss of \$2.47 million related to tornado events.

Natural Hazard: Tornado

Within the 2024 Barrow County HAZUS report, a theoretical tornado path for an EF3 was identified that would inflict maximum damage. HAZUS estimated that this theoretical tornado would cause damage to approximately 919 buildings and result in losses more than \$36 million with the City of Winder suffering the greatest economic impacts.



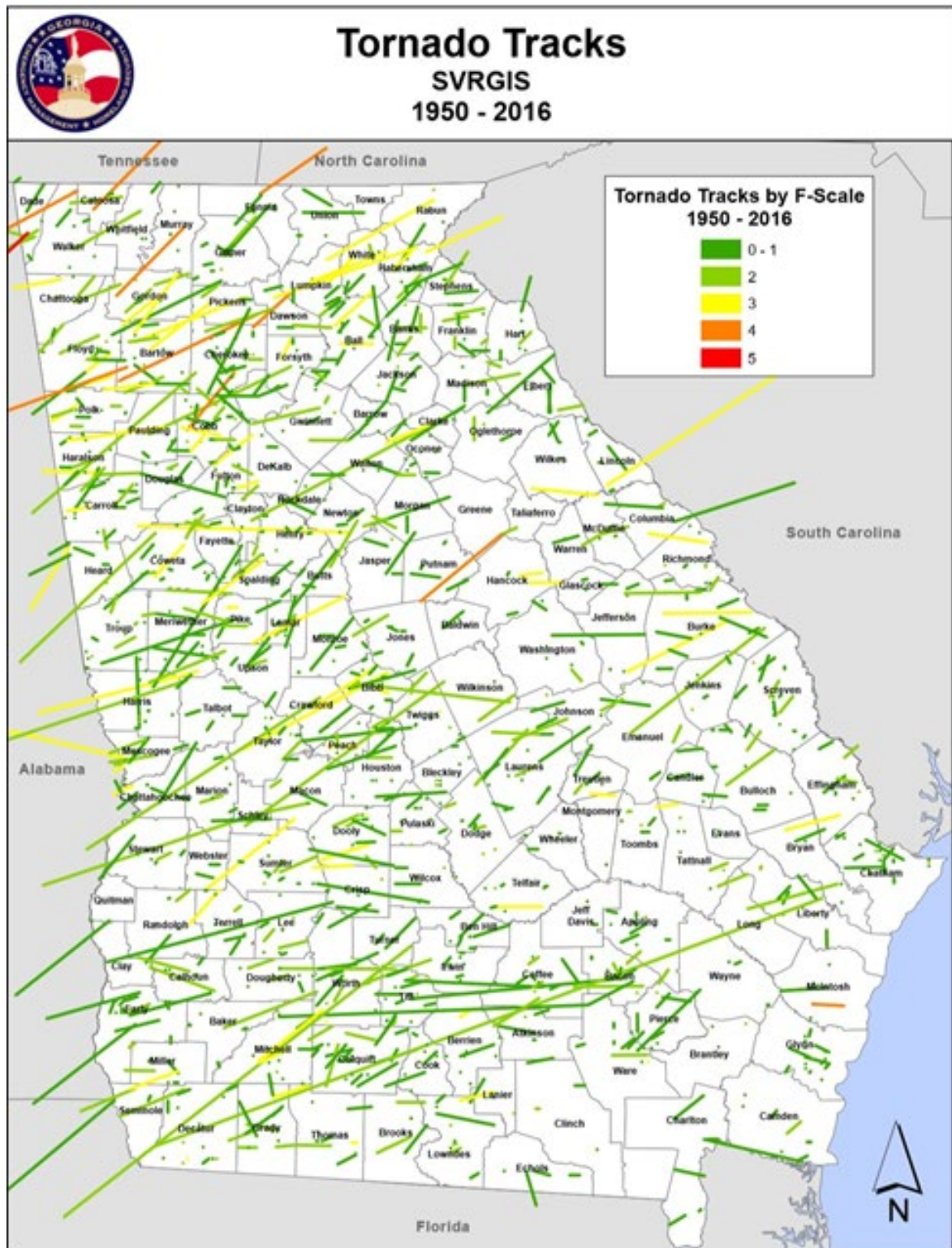
Source: 2024 Barrow County HAZUS Report

Land Use & Development Trends

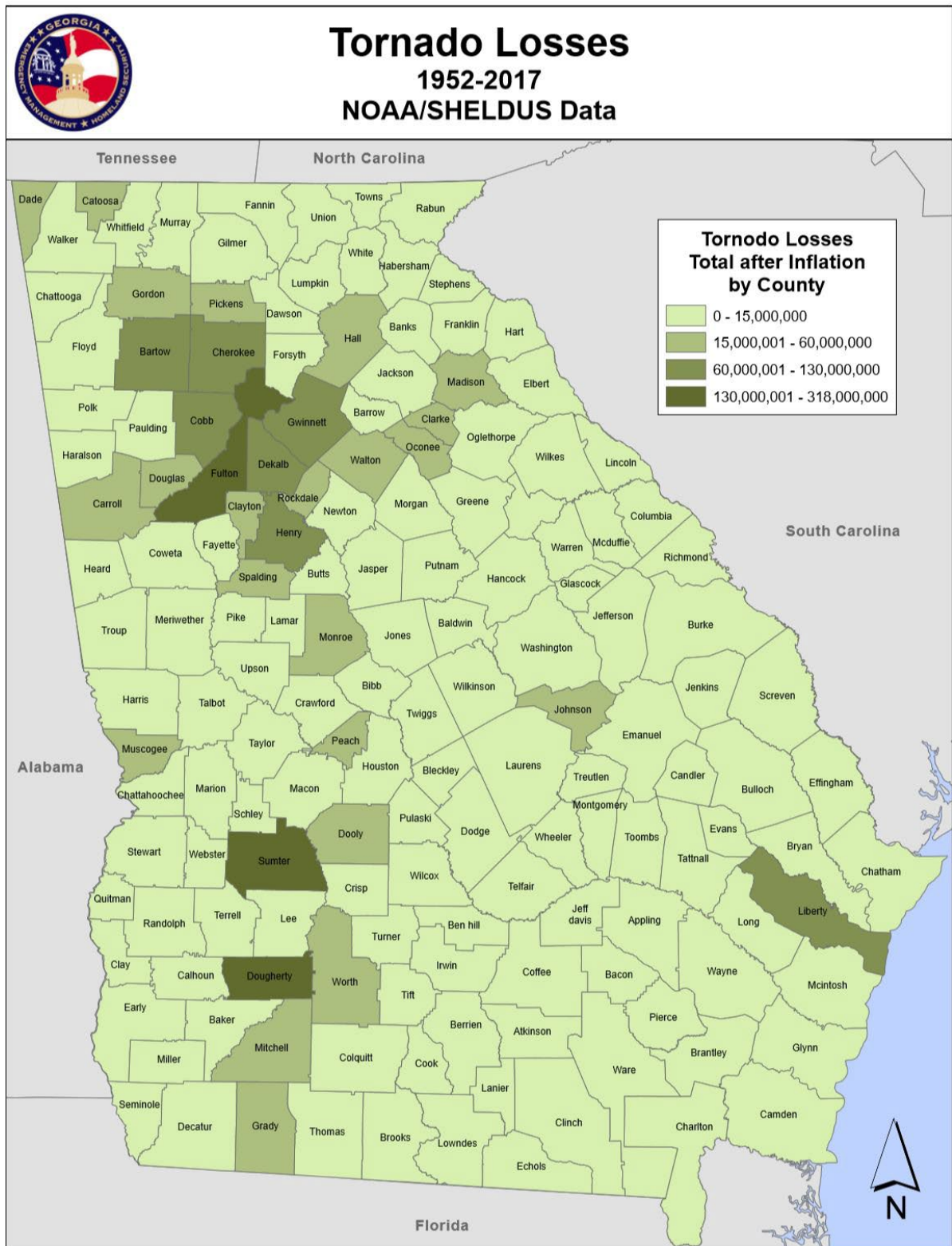
Barrow County main land use trend related to Tornadoes involves continued population growth – particularly in areas near the Gwinnett County border and areas around Braselton, Auburn, and Winder.

Multi-Jurisdictional Considerations

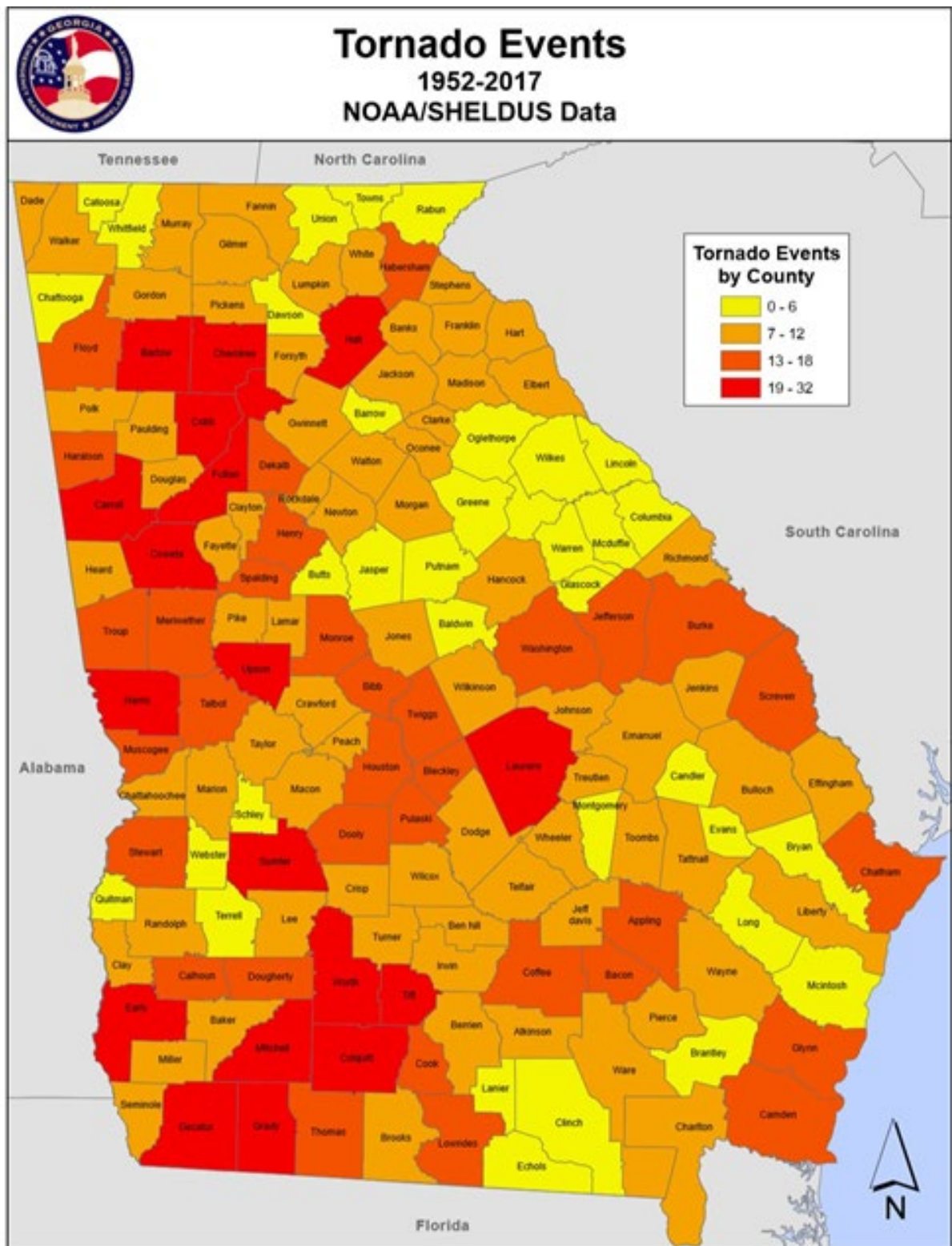
All portions of Barrow County could potentially be impacted by a tornado due to the indiscriminate nature of tornadic events. Therefore, all mitigation actions identified regarding tornadoes should be pursued on a countywide basis and included all municipalities.



Source: 2019-2024 State of Georgia Hazard Mitigation Strategy and Enhanced Plan



Source: 2019-2024 State of Georgia Hazard Mitigation Strategy and Enhanced Plan



Source: 2019-2024 State of Georgia Hazard Mitigation Strategy and Enhanced Plan

Hazard Summary

Barrow County remains at risk to potential damage from tornadoes, especially considering the average of one tornado every 12.5 years over the last 50 years. Should a tornado strike in densely populated areas of the county, significant damage or loss of life could occur. Due to the destructive power of tornadoes, it is essential that the mitigation measures identified in this plan regarding tornado activity receive full consideration.

There have been no tornadoes in Barrow County since the adoption of the 2019 Barrow County Hazard Mitigation Plan.

Hazard Description

Drought is a normal, recurrent feature of climate consisting of a deficiency of precipitation over an extended period (usually a season or more). This deficiency results in a water shortage for some social or environmental sector. Drought should be judged relative to some long-term average condition of balance between precipitation and evapotranspiration in a particular area that is considered “normal.” Drought should not be viewed as only a natural hazard because the demand people place on water supply affects perceptions of drought conditions. From limited water supplies in urban areas to insufficient water for farmland, the impacts of drought are vast.

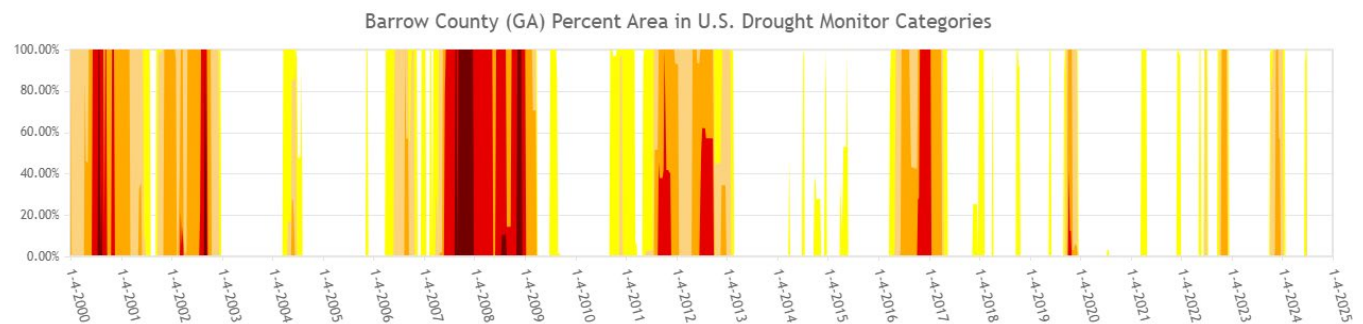
Droughts occur in virtually every climatic zone and on every continent. Because the impacts of drought conditions are largely dependent on the human activity in the area, the spatial extent of droughts can span a few counties to an entire country.

Temporal characteristics of droughts are drastically different from other hazards due to the possibility of extremely lengthy durations as well as a sluggish rate of onset. Drought conditions may endure for years or even decades. This factor implicates drought as having a high potential to cause devastation on a given area. The duration characteristic of droughts is so important that droughts are classified in terms of length of impact. Droughts lasting 1 to 3 months are considered short term, while droughts lasting 4 to 6 months are considered intermediate and droughts lasting longer than 6 months are long term. With the slow rate of onset, most populations have some inkling that drought conditions are increasingly present. However, barring drastic response measures, most only have to adapt to the changing environment.

Seasonality has no general impact on droughts in terms of calendar seasons. However, “wet” and “dry” seasons obviously determine the severity of drought conditions. In other words, areas are less susceptible to drought conditions if the area is experiencing a wet season. The frequency of droughts is undetermined, because the hazard spans such a long period of time. However, climatologists track periods of high and low moisture content similarly to the tracking of cooling and warming periods.

Hazard Profile

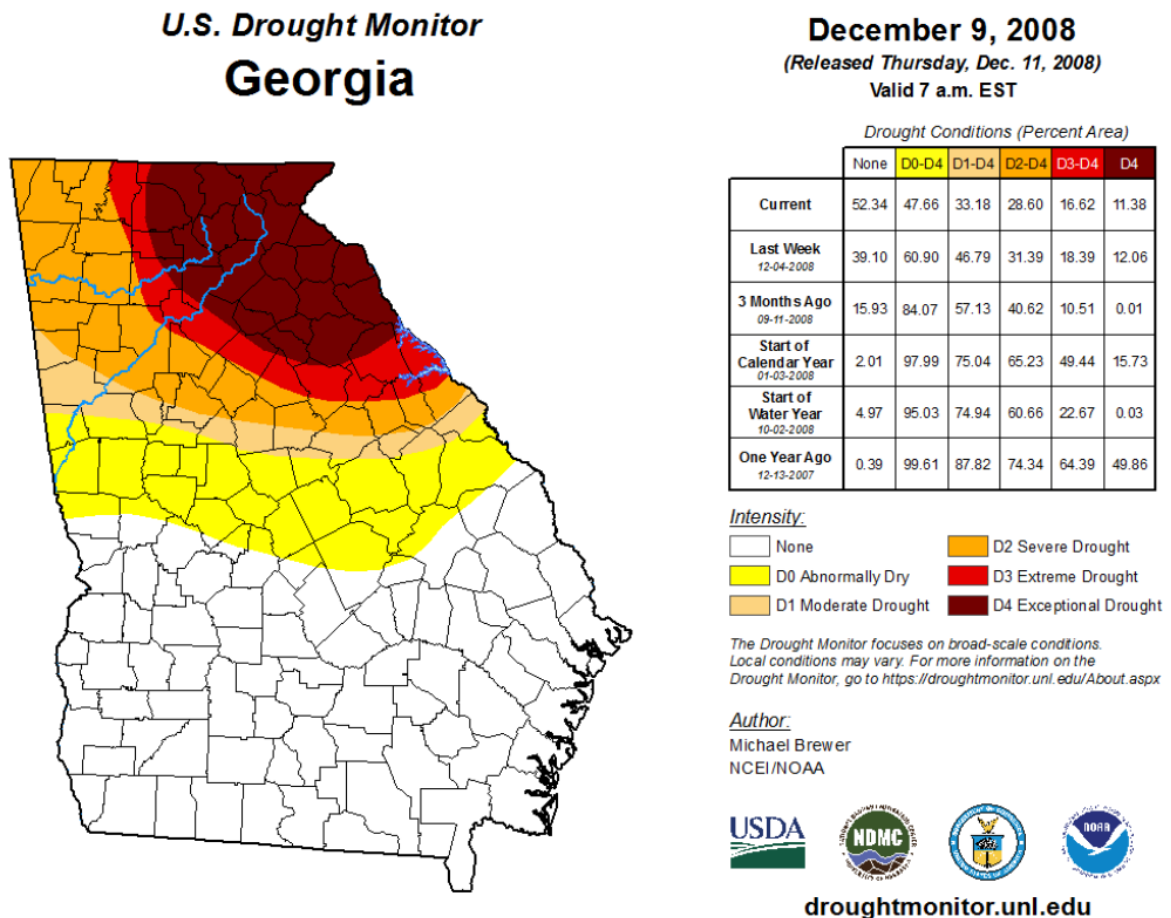
The Barrow County HMPC reviewed data for the last 50 years regarding drought conditions. Historically, agricultural losses have accounted for the vast amount of losses related to drought conditions. Due to poor record keeping and the unpredictable nature of drought conditions, reliability of historical data for the last 50 years is low. Barrow County has been impacted by 9 drought events in the last 25 years, according to data from the National Climatic Data Center. This amounts to a 36% chance of a drought for a given year over the last 25 years. The economic impact of these droughts, including crop damage, is not available.



Natural Hazard: Drought

All drought hazard data included for Barrow County is limited to countywide data and is not broken down by jurisdiction.

There have been one recent example of “exceptional” drought events affecting Barrow County. These events occurred in 2008. Both events reached the D4 (Exceptional Drought) designation, according to data from the United States Drought Monitor. Below are maps of these two events.



Source: USDA Drought Monitor – University of Nebraska-Lincoln

Events of this extent can cause water shortages for residential and corporate needs, as well as affecting the ability for firefighting operations to be properly effective. Of particular concern to Barrow County is the impact drought can have on wildfire. Drought can exacerbate the impacts of a wildfire by increasing fire load and overall fire danger. Drought conditions of this extent can have devastating effects on the local agricultural industries, which has occurred in previous D4 level droughts.

Assets Exposed to the Hazard

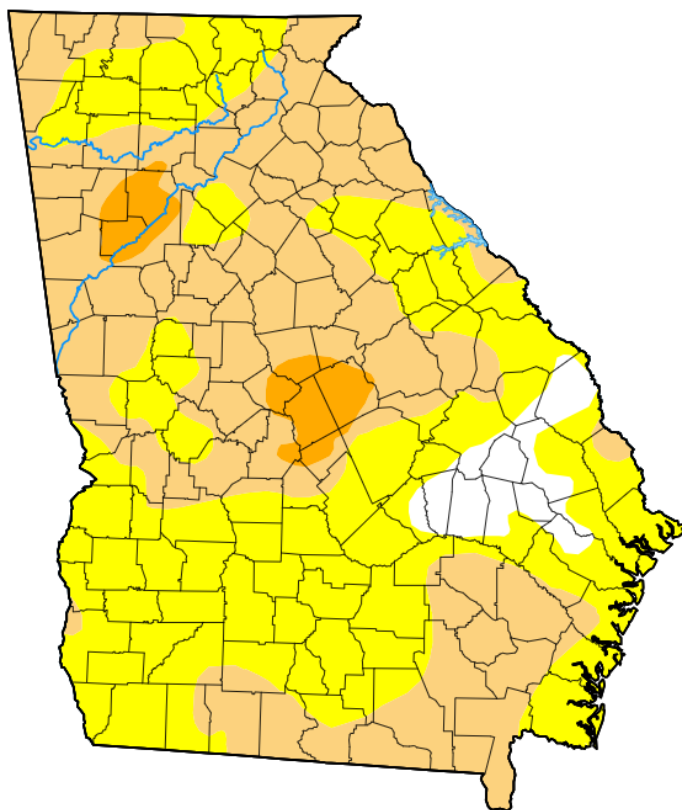
While drought conditions do not typically pose a direct threat to structures, secondary hazards from drought such as increased wildfire threat, does pose a significant threat to all public and private property in Barrow County, including all critical facilities. Water resources could also become scarce during a drought, a condition that would potentially affect all Barrow County residences and critical facilities.

Natural Hazard: **Drought**

Estimated Potential Losses

No damage to structures or critical facilities is expected as a direct result of drought conditions. However, crop damage and subsequent losses can be expected to occur because of drought conditions. The degree of losses would depend on the duration of the drought, severity of the drought, temperatures during the drought, season in which the drought occurs, and the specific needs of the involved crops. Water system shortages and need for supply assistance for those systems could also lead to economic losses associated with the drought.

According to the National Risk Index, Barrow County has an estimated annual loss of \$7,425 related to drought events. Additionally, according to the 2017 Agriculture Census data, Barrow County's market value of products sold was \$122,980,000. The vast majority of this value is in the poultry industry.



Map released: Weds. July 3, 2024

Data valid: July 2, 2024 at 8 a.m. EDT

Intensity

- None
- D0 (Abnormally Dry)
- D1 (Moderate Drought)
- D2 (Severe Drought)
- D3 (Extreme Drought)
- D4 (Exceptional Drought)
- No Data

Authors

United States and Puerto Rico Author(s):

[Adam Hartman](#), NOAA/NWS/NCEP/CPC

Pacific Islands and Virgin Islands Author(s):

[Brad Rippey](#), U.S. Department of Agriculture

Source: United States Drought Monitor (University of Nebraska-Lincoln)

Land Use & Development Trends

As growth continues, drought can become a larger threat for Barrow County due to the increased reliance on water infrastructure and wells countywide. This increased pull on these resources in Barrow County could quicken or deepen the impacts of a drought for residential, commercial, and industrial areas.

Multi-Jurisdictional Considerations

All portions of Barrow County could potentially be impacted by a drought, but agricultural areas of the county are potentially more at risk. Therefore, all mitigation actions identified regarding drought should be pursued on a countywide basis and include all municipalities.

Hazard Summary

Drought conditions can cause significant economic stress on the agriculture and forestry interests of Barrow County. The potential negative secondary impacts of drought are numerous. They include increased wildfire threat, decreased water supplies for residential and industrial needs, stream-water quality, and water recreation facilities. The Barrow County HMPC recognizes the potential threats drought conditions could have on the community and have identified specific mitigation actions as a result.

Hazard Description

A wildfire is an uncontained fire that spreads through the environment. Wildfires can consume large areas, including infrastructure, property, and resources. When massive fires, or conflagrations, develop near populated areas, evacuations could possibly ensue. Not only do the flames impact the environment, but the massive volumes of smoke spread by certain atmospheric conditions also impact the health of nearby populations.

Wildfires result from the interaction of three crucial elements: fuel, ignition (heat), and oxygen. Natural and manmade forces cause the three crucial elements to coincide in a manner that produces wildfire events. Typically, fuel consists of natural vegetation. However, as the urban and suburban footprint expands, wildfires may utilize other means of fuel, such as buildings. In terms of ignition or source of heat, the primary source is lightning. However, humans are more responsible for wildfires than lightning. Manmade sources vary from the unintentional, such as fireworks, campfires, or machinery, to intentional arson. With these two elements provided, the wildfires may spread as long as oxygen is present.

Weather is the most variable factor affecting wildfire behavior. Strong winds propel wildfires quickly across most landscapes unless firebreaks are present. Shifting winds create erratic wildfires, which can complicate fire management efforts. Dry conditions provide faster-burning fuels, either making the area more vulnerable to wildfire or increasing the mobility of preexisting wildfires.

Wildfires are notorious for spawning secondary hazards, such as flash flooding and landslides, long after the original fire is extinguished. Both flash flooding and landslides result from fire consuming the natural vegetation that provides precipitation interception and infiltration as well as slope stability.

All of Georgia is prone to wildfire due to the presence of wildland fuels associated with wildfires. Land cover associated with wildland fuels includes coniferous, deciduous, and mixed forest; shrubland; grassland and herbaceous; transitional; and woody and emergent herbaceous wetlands. The spatial extent of wildfire events greatly depends on both the factors driving the fire as well as the efforts of fire management and containment operations.

In terms of seasonality, wildfires can occur during any season of the year. However, drier seasons, which vary within the State of Georgia, are more vulnerable to severe wildfires because of weather patterns and the abundant quick-burning fuels. In terms of rate of onset and duration, wildfires vary depending on the available fuels and weather patterns. Some wildfires can engulf an area in a matter of minutes from the first signs whereas others may be slower burning and moving. The frequency of wildfires is not typically measured because of the high probability of human ignition being statistically unpredictable. Magnitude and intensity are typically only measured by size of the wildfire and locations of burning.

Three classes of fires include understory, crown, and ground fires. Naturally induced wildfires burn at relatively low intensities, consuming grasses, woody shrubs, and dead trees. These understory fires often play an important role in plant reproduction and wildlife habitat renewal and self-extinguish due to low fuel loads or precipitation. Crown fires, which consist of fires consuming entire living trees, are low probability but high consequence events due to the creation of embers that can be spread by the wind. Crown fires typically match perceptions of wildfires. In areas with high concentrations of organic materials in the soil, ground fires may burn, sometimes persisting undetected for long periods until the surface is ignited.

Hazard Profile

Wildfires pose a serious threat to Barrow County. This is a result of the high amount of forestland and vegetation available to fuel potential wildfires, the significant elevation changes within the county, and the high percentage of inaccessible areas. The latter two make wildland firefighting operations significantly more difficult. Also, there is an increasing amount of wildland-urban interface (WUI) in Barrow County, which is defined as areas where structures and other human development meets undeveloped wildland properties. 97.2% of Barrow County’s population lives within the WUI. All wildfire hazard data included for Barrow County is limited to countywide data and is not broken down by jurisdiction.

Wildfire statistics were not available for the 50-year timeframe at the time of this profile. Georgia Forestry Commission, Barrow County had 82 wildfires from 2012 to 2024 that consumed a total of 140.1 acres. This equates to an average of 6.3 wildfires per year and these fires consume an average of 10.78 acres per year. Barrow County has a 1.7% daily chance of a wildfire. Historically, debris burning has been the top reason for wildfires in Barrow County. In 2023, a single large fire on public land burned a total of 23.3 acres – accounting for nearly 17% of all acreage burned in Barrow County since 2012. This single fire was the result of a camp fire getting into a pasture.

Assets Exposed to the Hazard

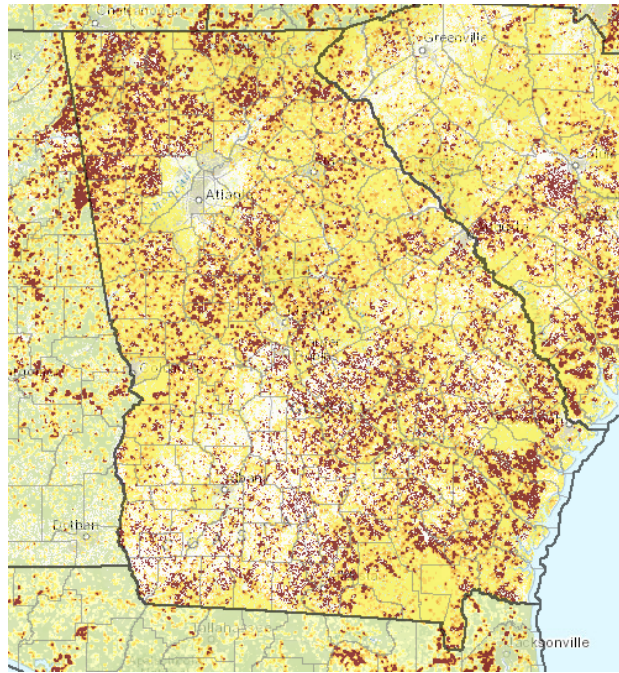
All public and private property located within the Wildland-Urban Interface, including critical infrastructures, are susceptible to impacts from wildfires. Due to the large area of wildland area in Barrow County and the large amount of WIU, all public and private property, including critical infrastructures, could be directly or indirectly impacted by the threat of wildfire.

Jurisdiction	Percentage of Population in WUI
Barrow County	97.2%
Auburn	98.2%
Bethlehem	99.7%
Braselton	97.5%
Carl	100%
Statham	100%
Winder	87.8%

Estimated Potential Losses

Little information is available regarding damages, in terms of dollars, for wildfire losses in Barrow County. According to the 2017 Ag Census by the USDA, Barrow County has just over \$92 million in annual agriculture sales. These areas would potentially be impacted by a wildfire event.

Georgia Wildfire Ignition Density



Source: Southern Group of State Foresters Wildfire Risk Assessment Portal

Land Use & Development Trends

With the continued increase in population, Wildland-Urban Interface (WUI) is increasing in Barrow County. The WUI creates areas where fire can easily move from wildland areas into developed areas and threaten structures and human life. The expansion of the WUI in Barrow County complicated wildland fire management operations and planning initiatives. This development trend is expected to continue in the future.

Multi-Jurisdictional Considerations

All portions of Barrow County, including all municipalities, could potentially be impacted by a wildfire due to the large amount of Wildland-Urban Interface, but the less developed areas of the county are more vulnerable. Therefore, all mitigation actions identified regarding wildfires should be pursued on a countywide basis and include all municipalities.

Hazard Summary

Wildfire is a significant threat to Barrow County due to the increased amount of Wildland-Urban Interface. The increasing amount of area where structures and other human development meets undeveloped, wildland property is where 97.2% of Barrow County's population lives. The mitigation measures identified in this plan should be aggressively pursued based on the high frequency of this hazard and the ability for wildfires to inflict devastation anywhere in Barrow County.

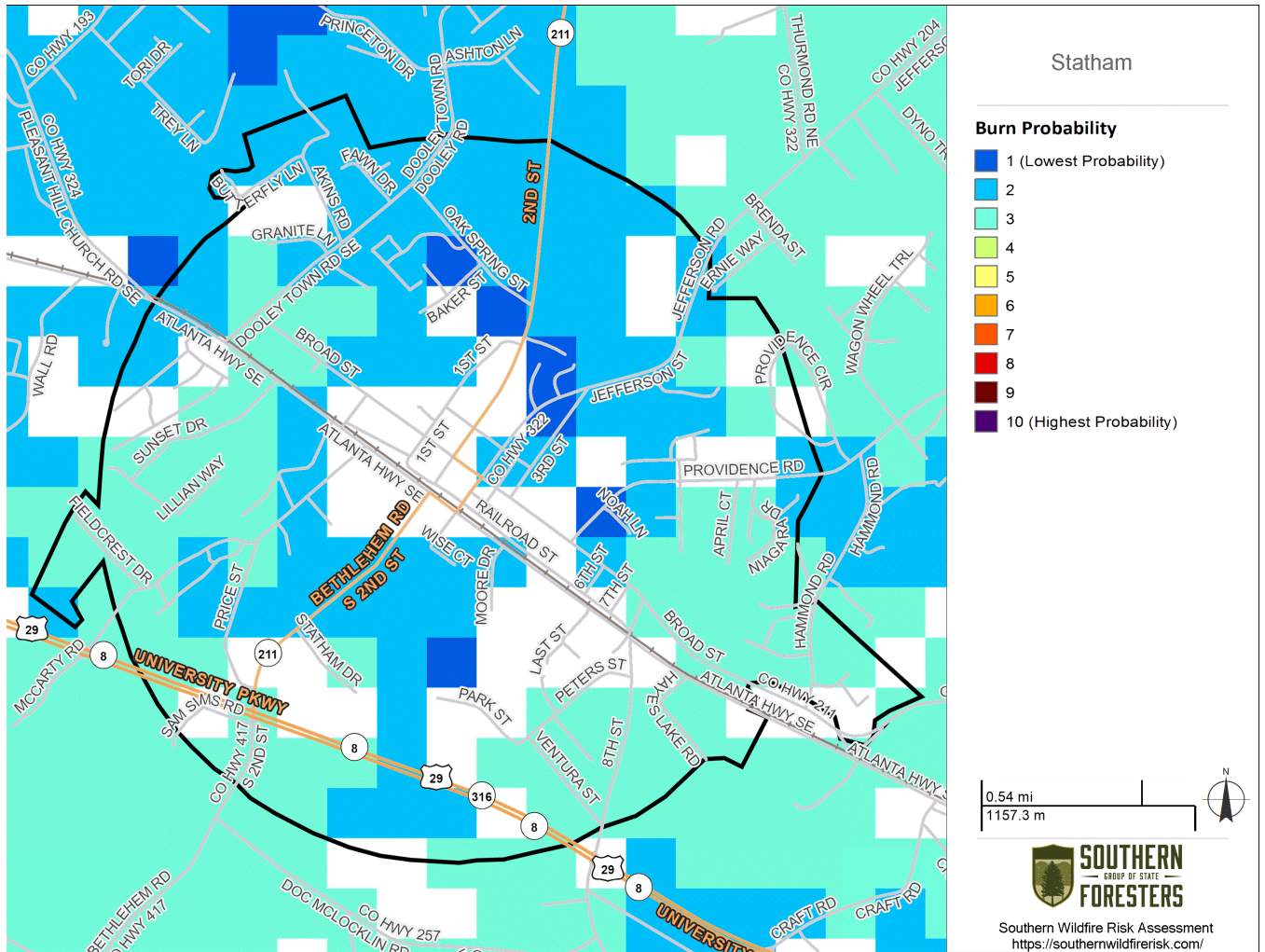
Barrow County WUI Risk

Barrow County Burn Probability

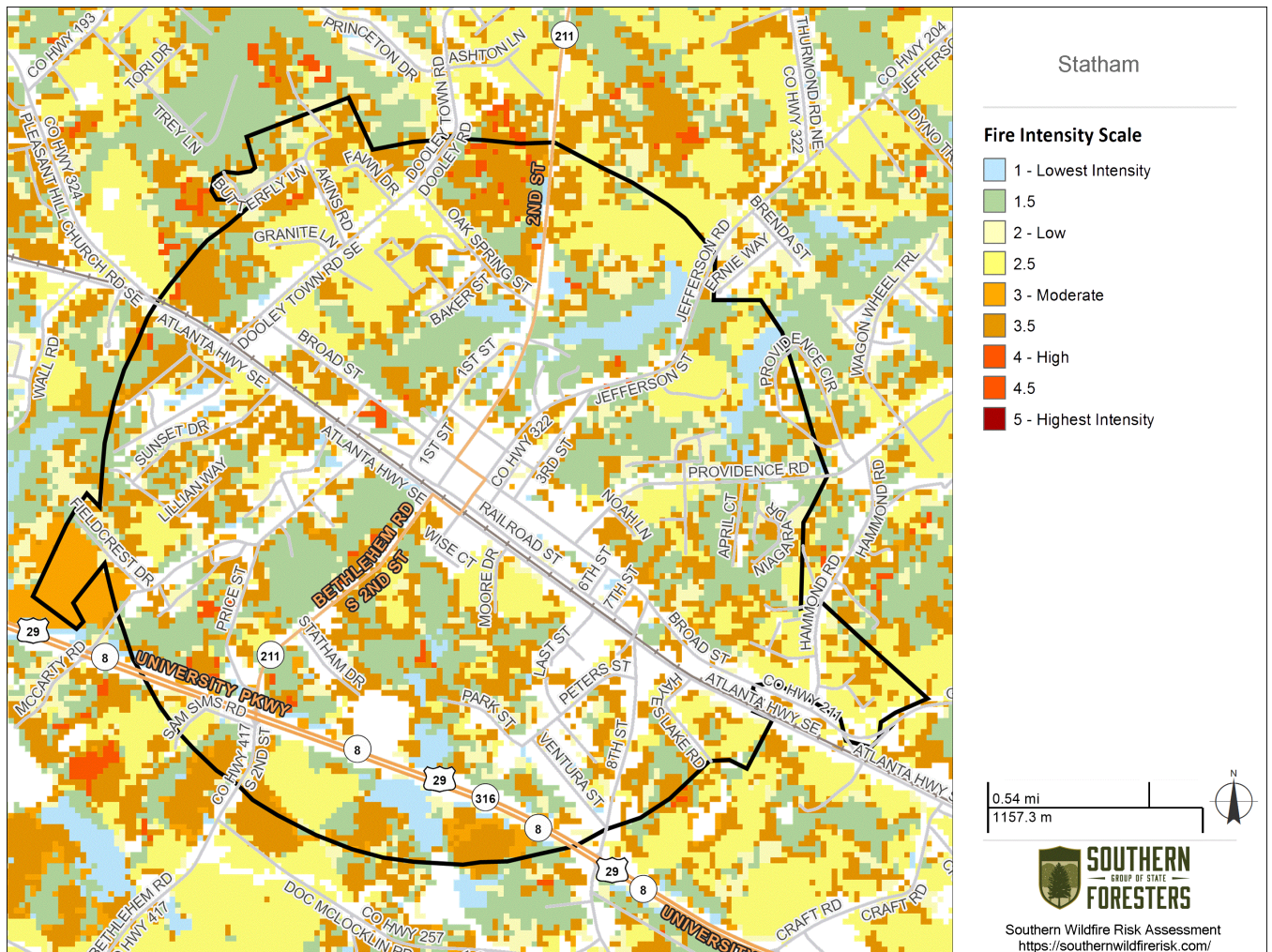
Barrow County Fire Intensity Scale

Statham WUI Risk

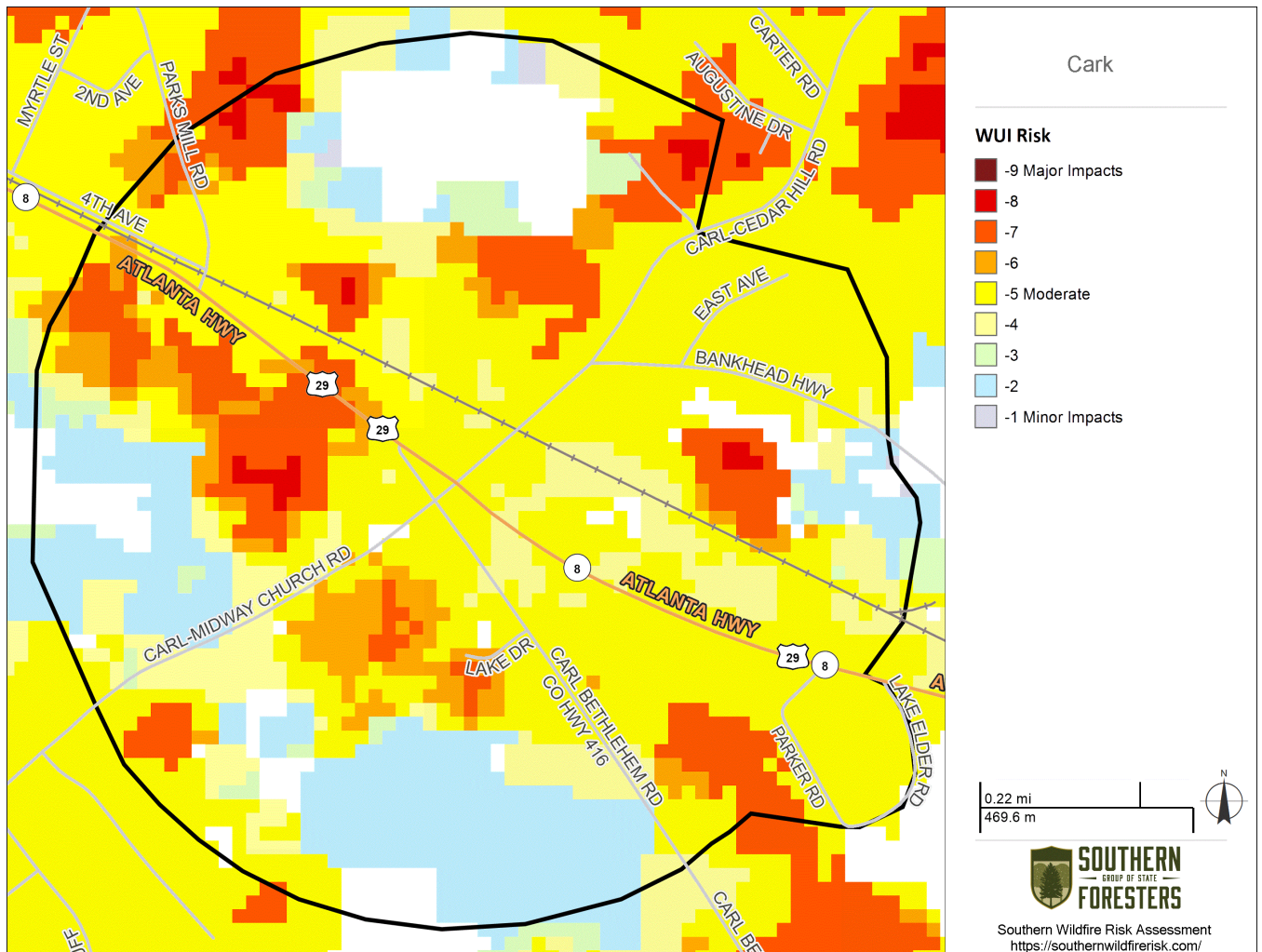
Statham Burn Probability



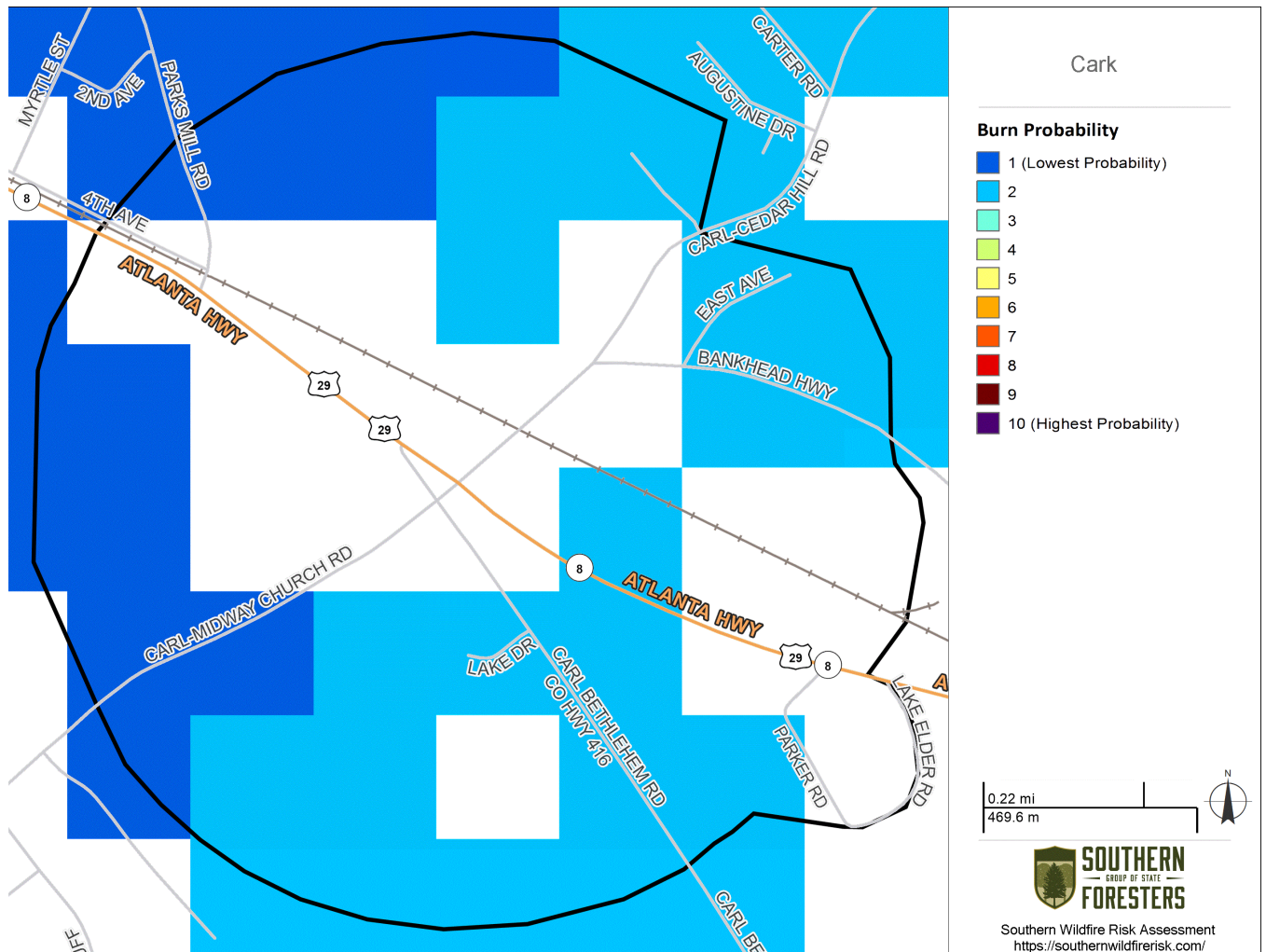
Statham Fire Intensity Scale



Carl WUI Risk



Carl Burn Probability



Carl Fire Intensity Scale

Braselton WUI Risk

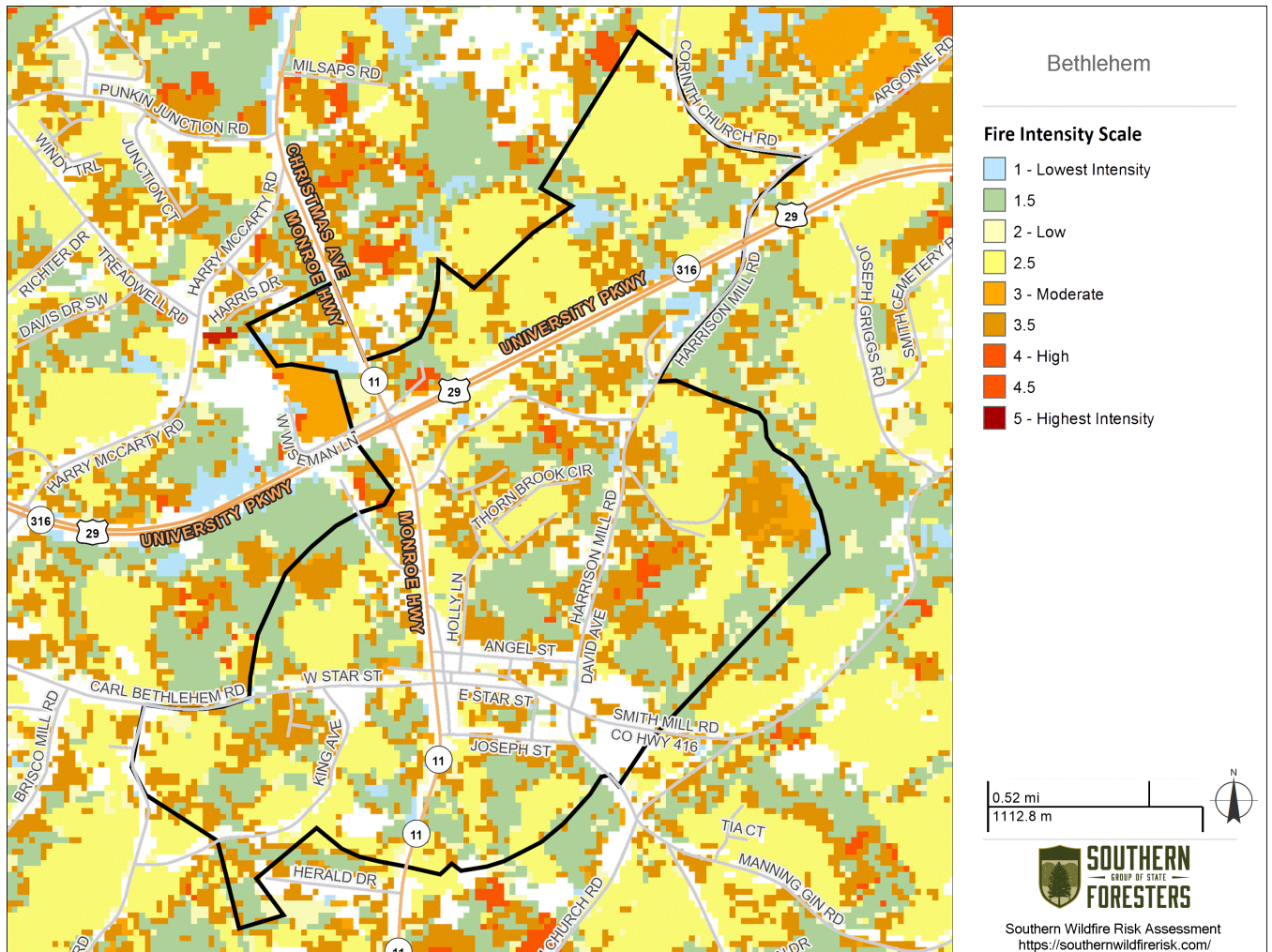
Braselton Burn Probability

Braselton Fire Intensity Scale

Bethlehem WUI Risk

Bethlehem Burn Probability

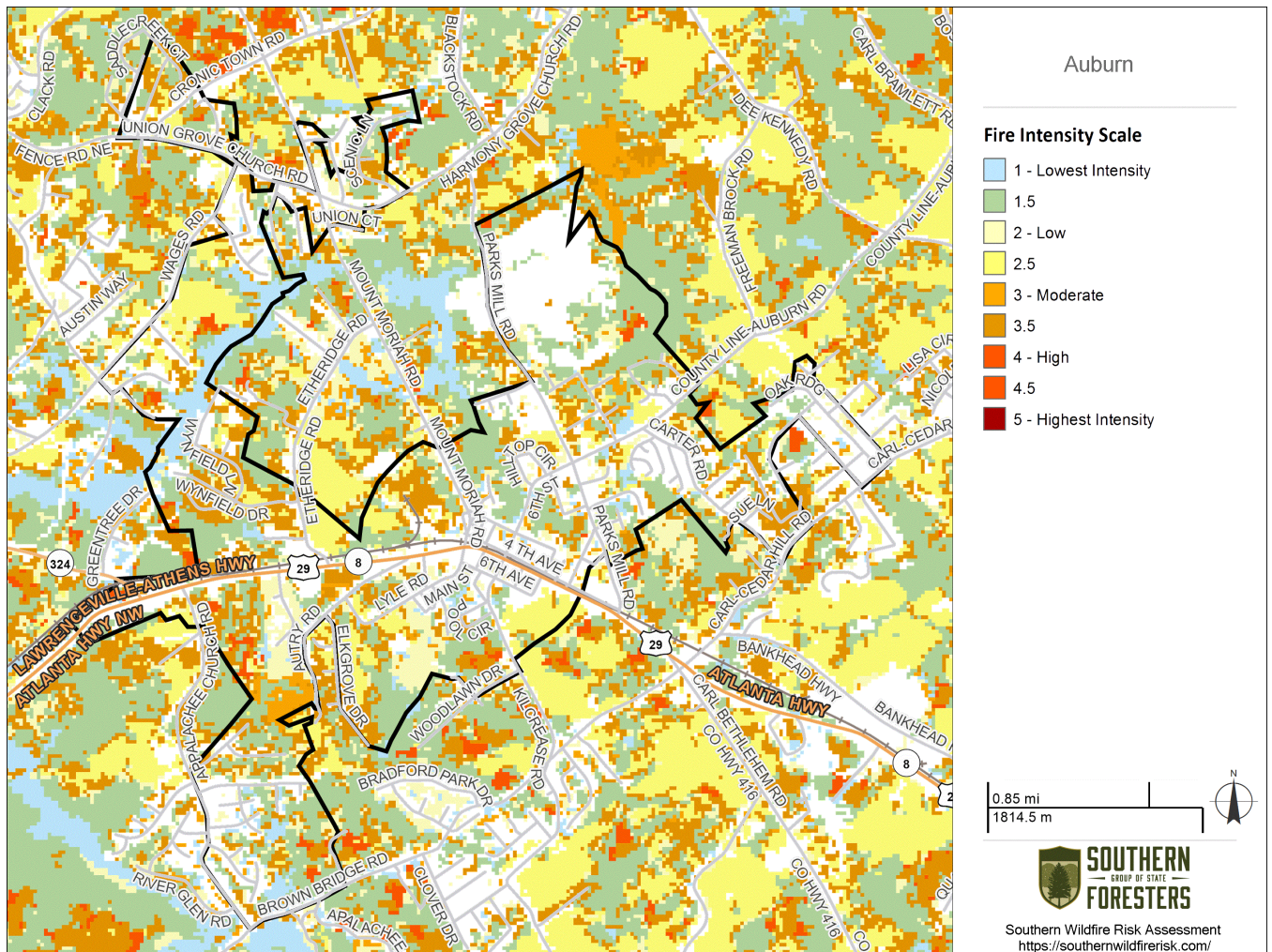
Bethlehem Fire Intensity Scale



Auburn WUI Risk

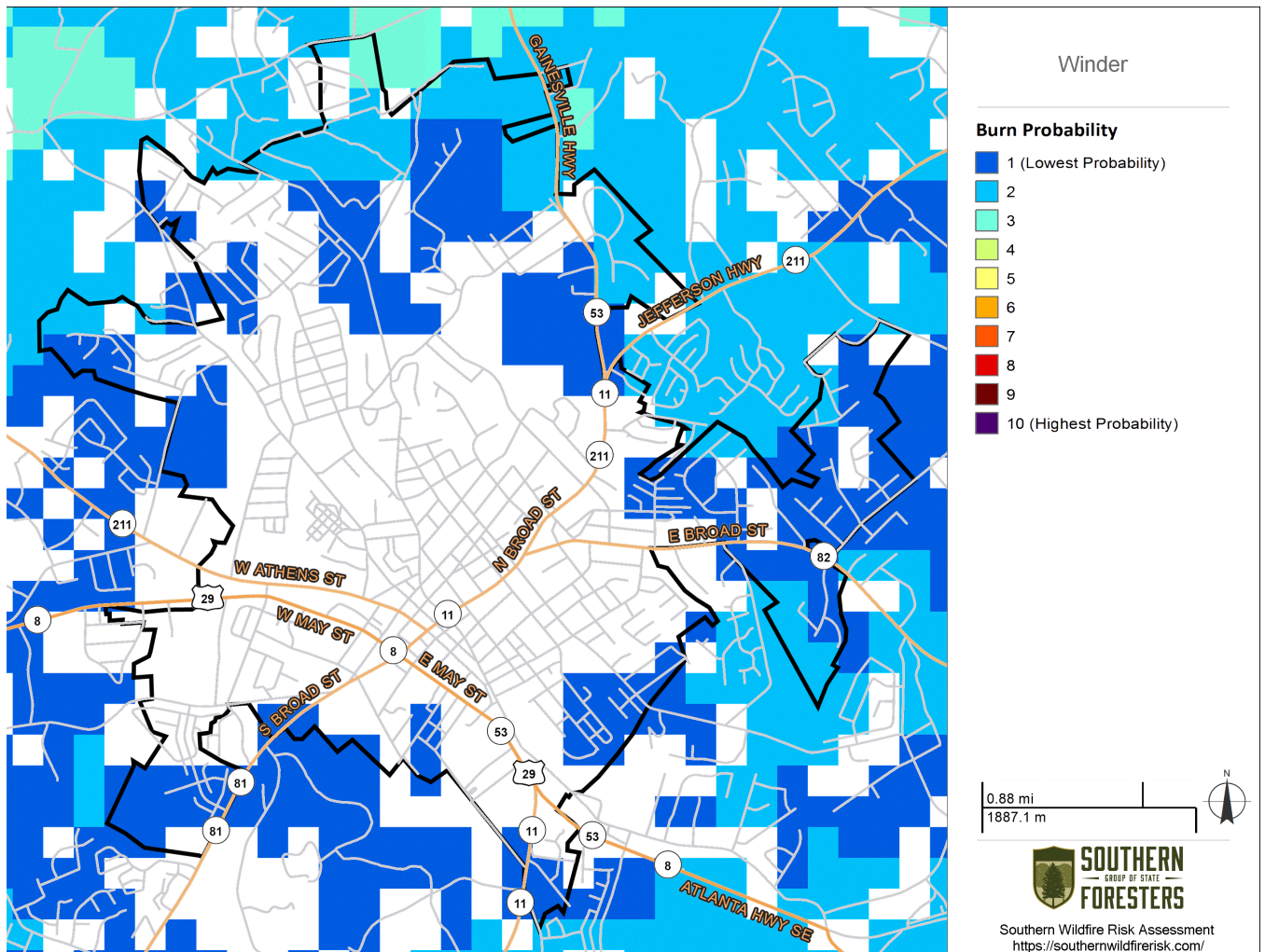
Auburn Burn Probability

Auburn Fire Intensity Scale



Winder WUI Risk

Winder Burn Probability



Winder Fire Intensity Scale

*All maps in this section are from the
Southern Group of State Foresters Wildfire Risk Assessment Portal*

Hazard Description

Earthquakes are generally defined as the sudden motion or trembling of the Earth's surface caused by an abrupt release of slowly accumulated strain. This release typically manifests on the surface as ground shaking, surface faulting, tectonic uplifting and subsidence, or ground failures, and tsunamis. In the United States, earthquake activity east of the Rocky Mountains is relatively low compared to the Western states because it is away from active plate boundaries and the plate interior strain rates are known to be very low.

The physical property of earthquakes that causes most of the damage within the United States is ground shaking. The vibrations from the seismic waves that propagate outward from the epicenter may cause failure in structures not adequately designed to withstand earthquakes. Because the seismic waves have different frequencies of vibration, the waves disseminate differently through sub-surface materials. For example, high frequency compression and shear waves arrive first, whereas lower frequency Rayleigh and love waves arrive later. Not only are the speeds varied between seismic waves, but also the types of movement. The surface vibration may be horizontal, vertical, or a combination of the two, which causes a wider array of structures to collapse.

Another manifestation of earthquakes is surface faulting. This phenomenon is defined as the offset or tearing of the earth's surface by a differential movement across a fault. Structures built across active faults tend to sustain damage regularly. There are no active faults within or near Georgia. Distinct inactive faults are known within the state north of the Columbus to Macon to Augusta fall line and running generally northeast-southwest.

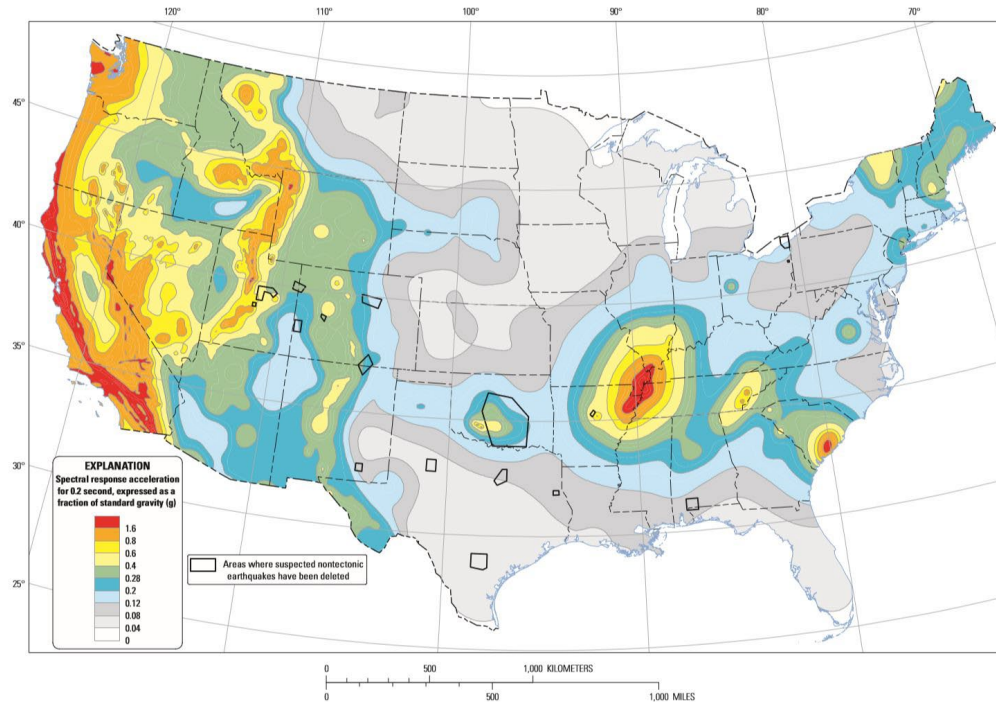
The third earthquake phenomenon that causes damage is tectonic uplift and subsidence. Tectonic uplift can cause shallowing of the harbors and waterways while tectonic subsidence can cause permanent or intermittent inundation. Due to the association of tectonic uplift and subsidence with active faults, Georgia is not at risk to these phenomena.

The fourth earthquake damage-causing phenomena are earthquake-induced ground failures, including liquefaction and landslides. During an earthquake, the areas that are rich in sand and silt have groundwater within 30 feet of the surface temporarily behave as viscous fluids during strong ground shaking. Structures built on these materials can settle, topple, or collapse as the ground "liquefies" beneath it. Landslides can also form when earthquake shaking or seismic activity dislodges rock and debris on steep slopes, triggering rock falls, avalanches, and slides.

Also, unstable, or nearly unstable, slopes consisting of clay soils may lose shear strength when disturbed by ground shaking and fail, resulting in a landslide. Georgia is at very low risk of seismic induced liquefaction or landslides. The last of the earthquake-induced phenomena are tsunamis, which are large, gravity-driven waves triggered by the sudden displacement of a large volume of water. The waves produced travel in all directions from the origin at speeds of up to 600 miles per hour. In deep water, tsunamis normally have small wave heights. However, as the waves reach shallower water near land, the wave speed diminishes, and the amplitude drastically increases. Upon impact with a shoreline, the waves can inundate land rapidly, engulfing everything in its path. Successive wave crests follow, typically arriving minutes to hours later, frequently with later arrivals being more dominant. Frequently, the first tsunami waves are downward, causing dramatic exposure of the beach. Because of this, people are often killed trying to collect newly exposed seashells when the positive waves then arrive.

Natural Hazard: Earthquake

Although large tsunamis are rare in the eastern coast of the US, the possibility of such events occurring anywhere along the Atlantic and Gulf coast exists.



Two-percent probability of exceedance in 50 years map of 0.2 second spectral response acceleration

Source: 2019-2024 State of Georgia Hazard Mitigation Strategy and Enhanced Plan

Hazard Profile

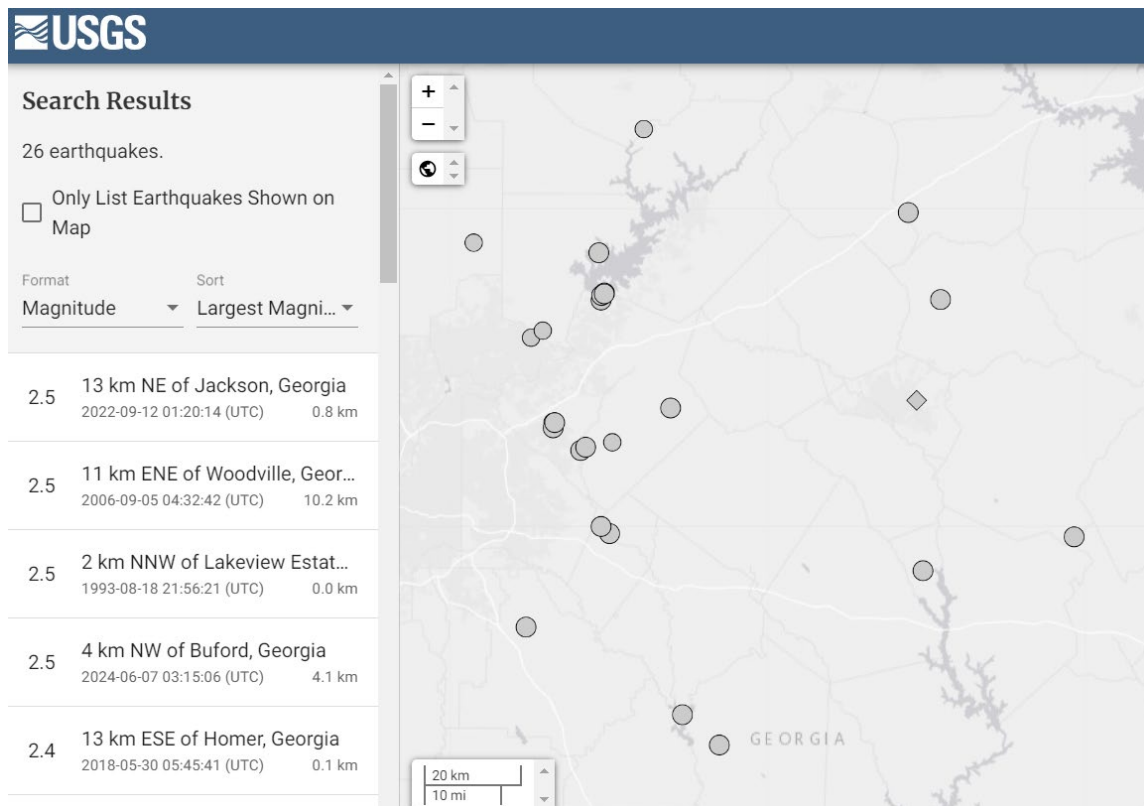
Barrow County is not one of the 37 Georgia counties with the highest earthquake risk, according to Georgia Emergency Management Agency. In reviewing data of the last 50 years, no earthquakes have originated from within Barrow County. However, 26 earthquakes have originated within 75 kilometers of Winder, GA in the last 50 years. The closest earthquake to Barrow County was a 2.2 that occurred 5km south-southeast of Dacula, GA in 1979. The strongest earthquake to occur within the 75-kilometer radius was a 2.5 that occurred 13km northeast of Jackson, GA in 2022. Barrow County averages one earthquake every 1.92 years occurring within 75 kilometers of Winder, GA. This equates to an 52% chance of an earthquake occurring within 75 kilometers of Winder, GA in any given year. The most recent earthquake to occur within this area occurred on September 3, 2023 near Morganton, GA. According to the National Risk Index, Barrow County has a 0.078% annual chance of an earthquake. Historically, the 1886 Charleston, SC earthquake, estimated to be between 6.6 and 7.3 on the modern Richter Scale, likely caused impacts to Barrow County. Although no historical records exist exhibiting any damages, Barrow County was estimated to be in a level VI area of the Modified Mercalli Intensity scale for this event. This would indicate strong shaking felt by everyone inside and outside at the time of the event and characterized by broken windows, movement of heavy furniture, and slight to moderate damage for poorly built buildings. Even with this low number of occurrences, it was determined that if earthquakes occur within or close to the jurisdiction of Barrow County, significant damage could occur. Therefore, the Barrow County HMPC has determined the threat of earthquakes to be higher than the statistics would indicate. All earthquake hazard data included for Barrow County is limited to countywide data and is not broken down by jurisdiction.

Natural Hazard: Earthquake

Instrumental Intensity	Acceleration (%g)	Velocity (cm/s)	Perceived Shaking	Potential Damage
I	< 0.17	< 0.1	Not Felt	None
II-III	0.17 - 1.4	0.1 - 1.1	Weak	None
IV	1.4 - 3.9	1.1 - 3.4	Light	None
V	3.9 - 9.2	3.4 - 8.1	Moderate	Very light
VI	9.2 - 18	8.1 - 16	Strong	Light
VII	18 - 34	16 - 31	Very Strong	Moderate
VIII	34 - 65	31 - 60	Severe	Moderate to Heavy
IX	65 - 124	60 - 116	Violent	Heavy
X+	> 124	> 116	Extreme	Very Heavy

Assets Exposed to the Hazard

The Barrow County HMPC determined that all critical facilities and all public and private property within Barrow County are susceptible to the impacts of an earthquake due to the lower building codes with regards to earthquakes when compared to other parts of the country. This includes all municipalities.



Source: United States Geological Survey (USGS) Earthquake Hazards Program

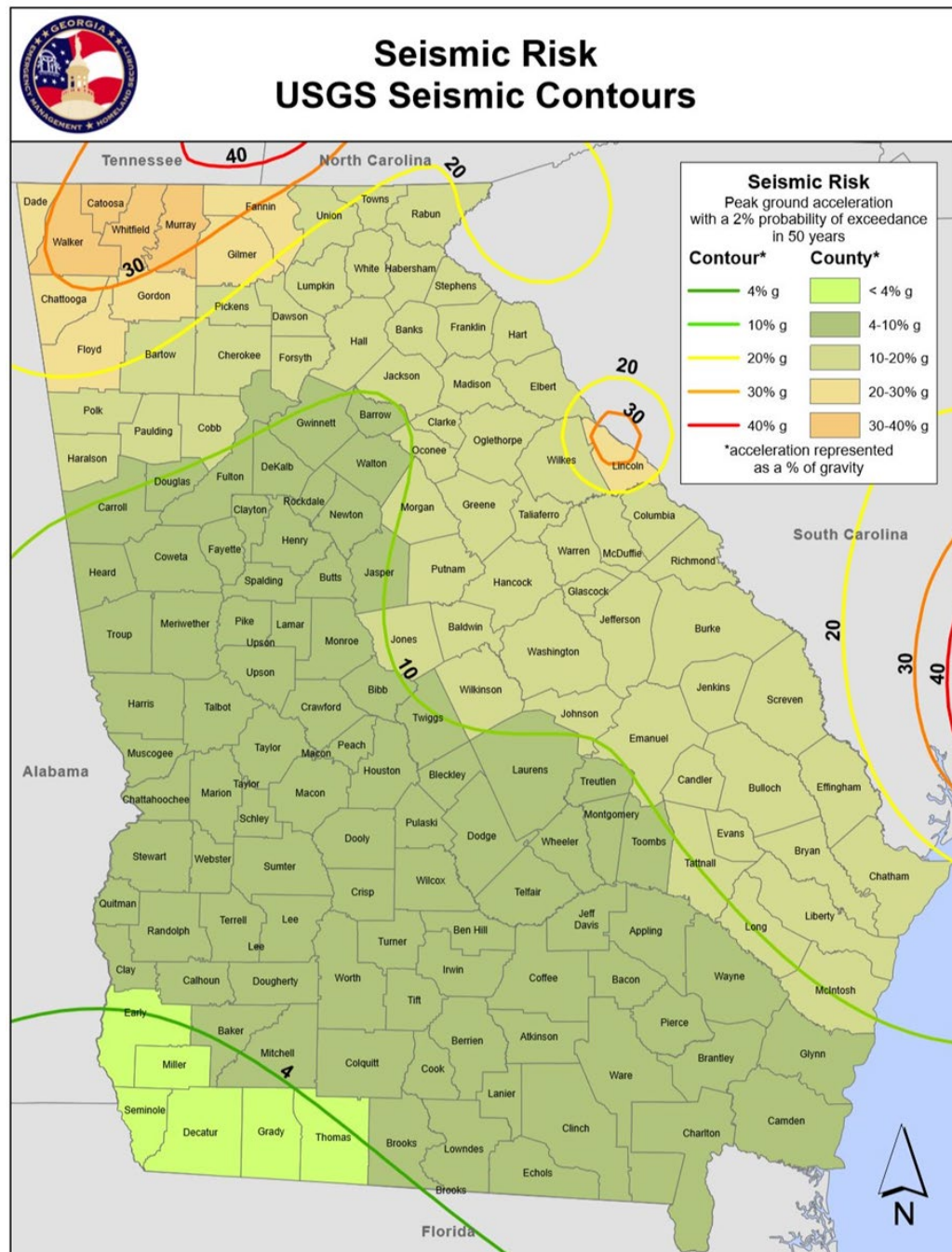
Natural Hazard: Earthquake

Estimated Potential Losses

Little information is available regarding damages, in terms of dollars, for earthquake losses in Barrow County. According to the National Risk Index, Barrow County has an estimated annual loss of \$545,039 related to earthquake events.

Land Use and Development Trends

Barrow County currently has no land use trends related to earthquakes.



Source: 2019-2024 State of Georgia Hazard Mitigation Strategy and Enhanced Plan

Multi-Jurisdictional Considerations

All of Barrow County, including all municipalities, potentially could be threatened by earthquakes. As such, all earthquake mitigation actions should be pursued on a countywide basis and include all municipalities.

Hazard Summary

Even with the infrequency of earthquake impacts in Barrow County, the potential losses and impacts associated with the event would severely damage the infrastructure and economic viability of the County and all municipalities. Secondary impacts, such as landslides during or after an earthquake, are also of a great concern and are detailed in a separate section of this plan. The mitigation measures identified in this plan should be pursued based on the high impact potential of this hazard and the ability for earthquakes to inflict widespread devastation anywhere in Barrow County.

Natural Hazard: Tropical Cyclone

Hazard Description

The National Weather Service describes tropical cyclones systems in the Atlantic Basin, including the Gulf of Mexico and Caribbean Sea, into four types based on strength.

Tropical Disturbance: A discrete tropical weather system of apparently organized thunderstorms – generally 100 to 300 nautical miles in diameter – originating in the tropics or subtropics, and maintaining its identity for 24 hours or more.

Tropical Depression: An organized system of clouds and thunderstorms with a defined circulation and maximum sustained winds of 38 mph (33 knots) or less.

Tropical Storm: An organized system of strong thunderstorms with a defined circulation and maximum sustained winds of 39 mph to 73 mph (34-63 knots).

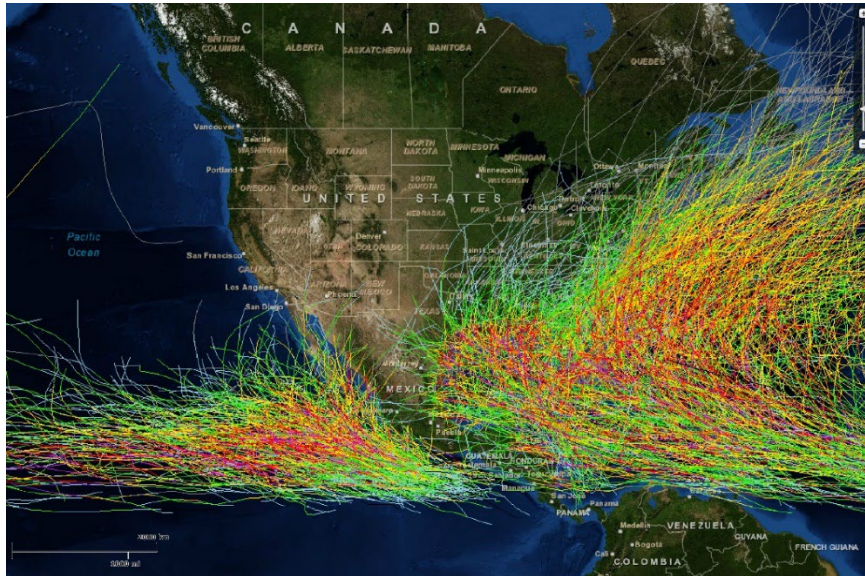
Hurricane: An intense tropical weather system with a well-defined circulation, producing maximum sustained winds of 74 mph (64 knots) or greater. Hurricane intensity is classified into five categories using the Saffir-Simpson Hurricane scale. Winds in a hurricane range from 74-95 mph for a Category 1 hurricane to greater than 156 mph for a Category 5 hurricane.

Saffir-Simpson Scale for Hurricane Classification				
Strength	Wind Speed (Kts)	Wind Speed (MPH)	Pressure (Millibars)	Pressure
Category 1	64- 82 kts	74- 95 mph	>980 mb	28.94 "Hg
Category 2	83- 95 kts	96-110 mph	965-979 mb	28.50-28.91 "Hg
Category 3	96-113 kts	111-130 mph	945-964 mb	27.91-28.47 "Hg
Category 4	114-135 kts	131-155 mph	920-944 mb	27.17-27.88 "Hg
Category 5	>135 kts	>155 mph	919 mb	27.16 "Hg
Tropical Cyclone Classification				
Tropical Depression		20-34kts		
Tropical Storm		35-63kts		
Hurricane		64+kts or 74+mph		

Tropical cyclones can cause catastrophic damage to coastlines and areas several hundred miles inland. Tropical cyclones can produce sustained high winds and spawn tornadoes and microbursts. Additionally, tropical cyclones can create storm surges along the coast and cause extensive damage from heavy rainfall. Floods and flying debris from the excessive winds are often the deadly and destructive results of these weather events.

Slow moving tropical cyclones traveling into mountainous regions tend to produce especially heavy rain. Excessive rain can trigger landslides or mudslides. Flash flooding can also occur due to intense rainfall. Each of these hazards present unique characteristics and challenges; therefore, the following have been separated and analyzed as individual hazards: Tropical cyclones, Thunderstorms, Tornadoes, and Flooding. This section will focus on the direct effects of tropical cyclones.

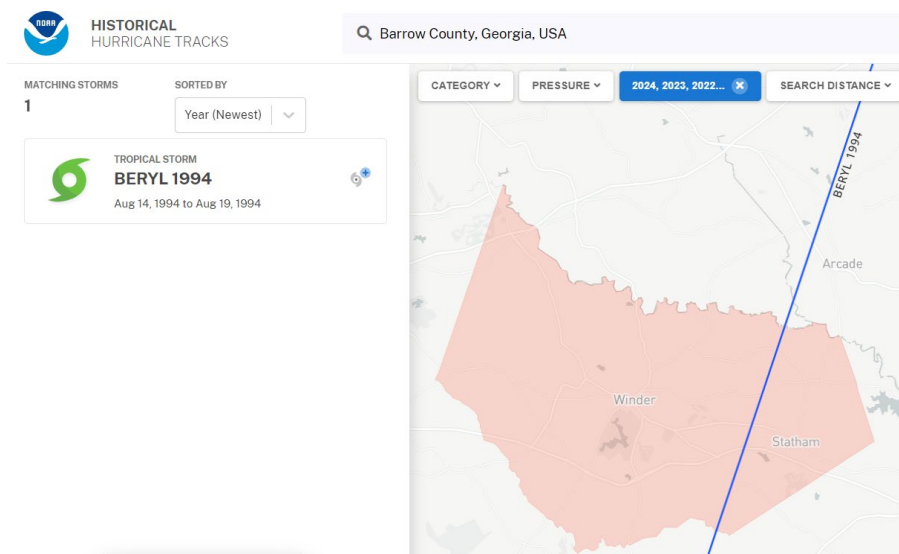
Natural Hazard: Tropical Cyclone



Hazard Profile

Tropical cyclones have directly impacted Barrow County on an infrequent basis over the last 50 years. However, the possibility of a hurricane or tropical storm retaining their wind strength as far inland as Barrow County is possible. According to the National Centers for Environmental Information, there has only been 1 documented impact from Tropical Cyclones in Barrow County over the last 20 years, which was Tropical Storm Zeta in 2020. This equates to a 5% chance of a tropical cyclone impacting Barrow County in any given year. The more likely impacts of a tropical cyclone on Barrow County would be secondary impacts, such as flooding, tornadoes, and severe thunderstorms.

Only one tropical cyclone – Tropical Storm Beryl in 1994 – has had a track that directly dissected Barrow County in the last 50 years. All tropical cyclone hazard data included for Barrow County is limited to countywide data and is not broken down by jurisdiction. In 2017, Hurricane Irma dropped 2-3 inches of rain on Barrow County and wind gusts up to 55 mph (tropical storm-strength) were reported in the county.



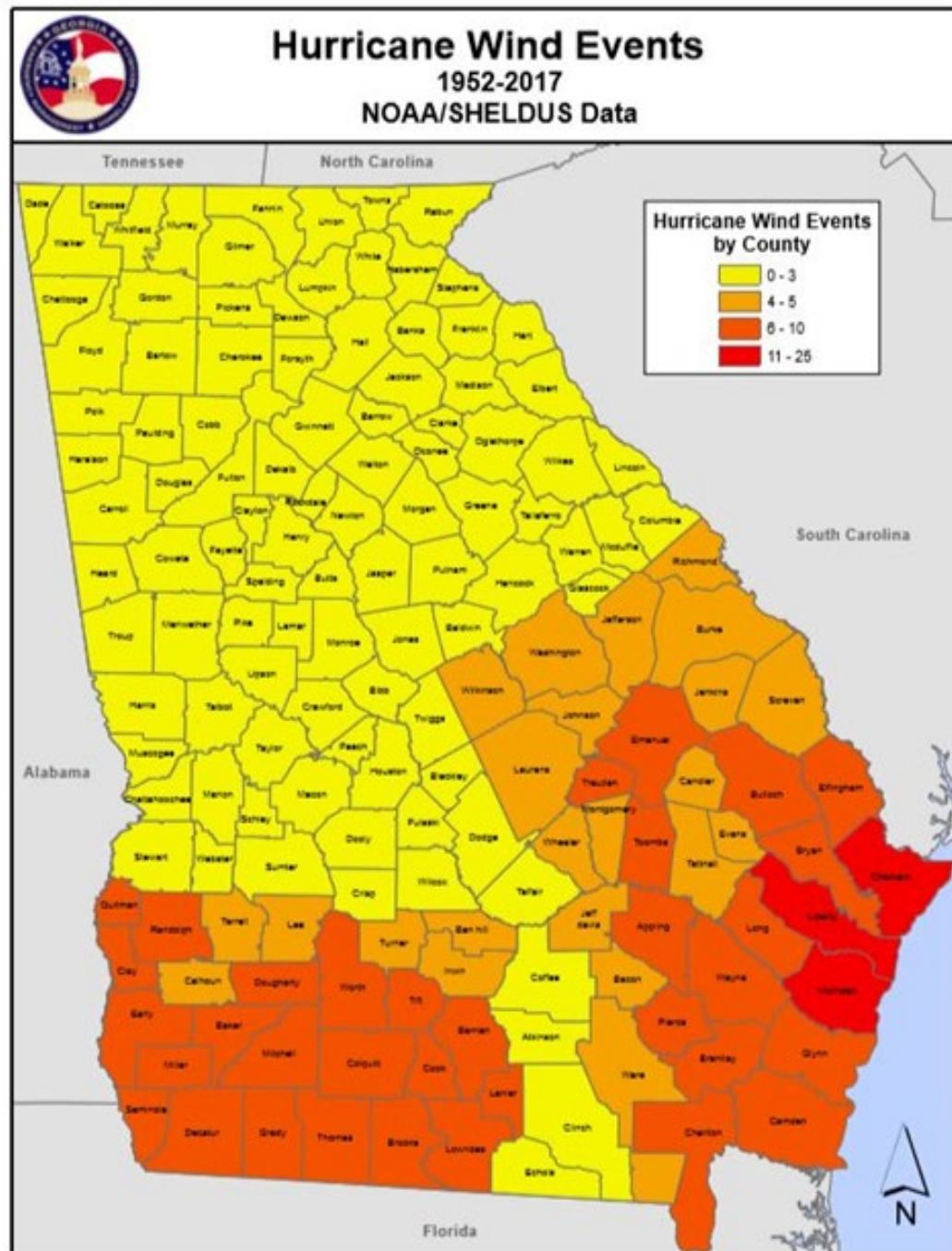
Source: NOAA Office for Coastal Management

Natural Hazard: Tropical Cyclone

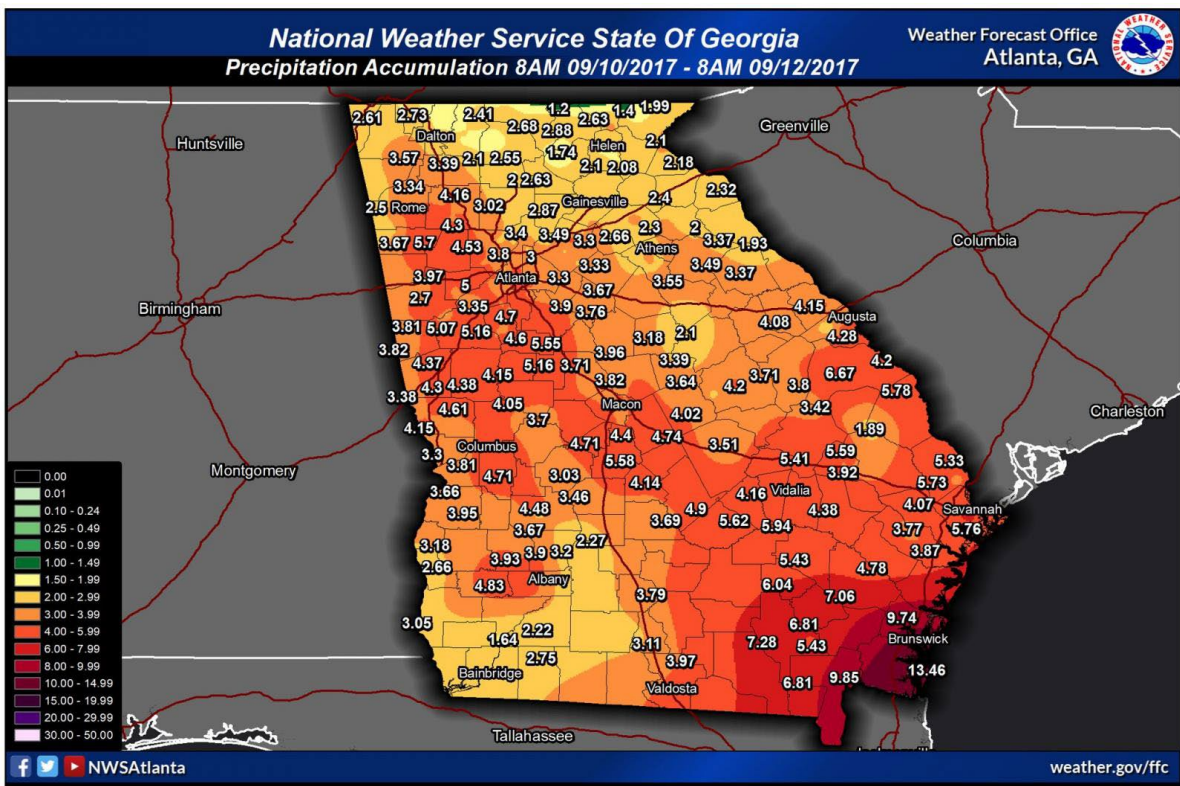
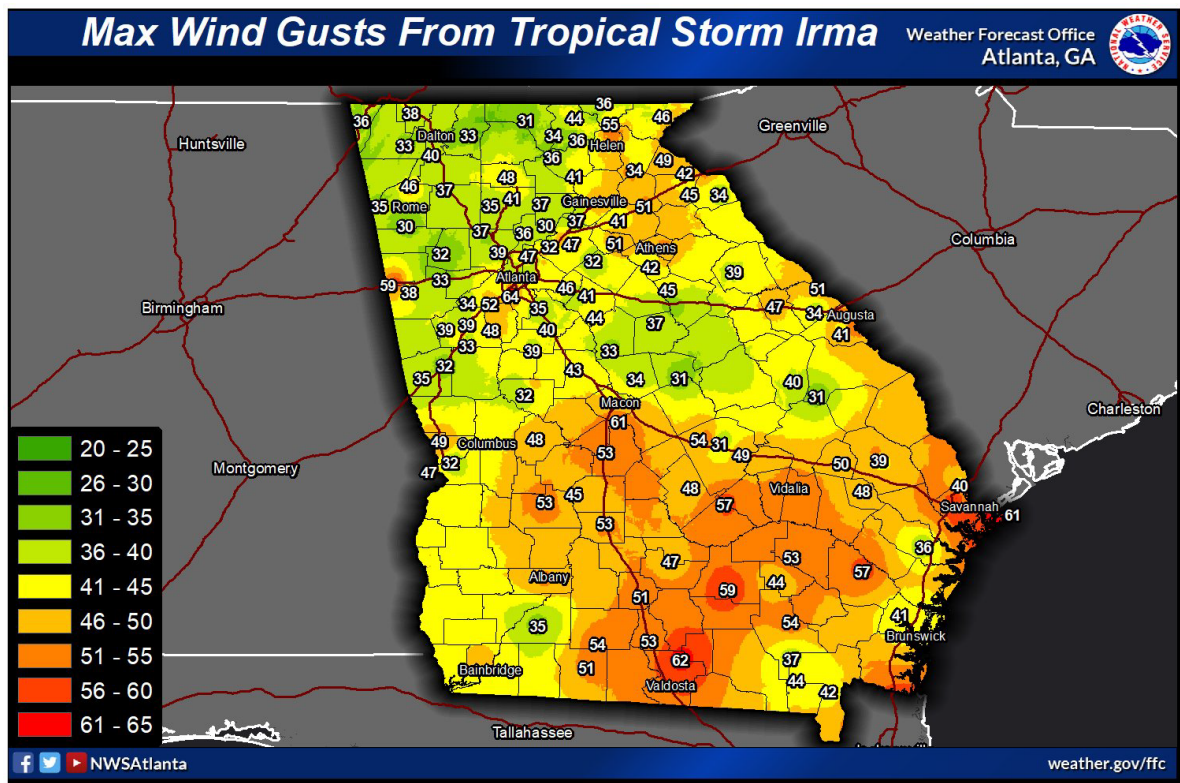
The impacts that would result from hurricane or tropical storm forces on the citizens, infrastructure, and critical facilities of Barrow County could be potentially catastrophic in nature.

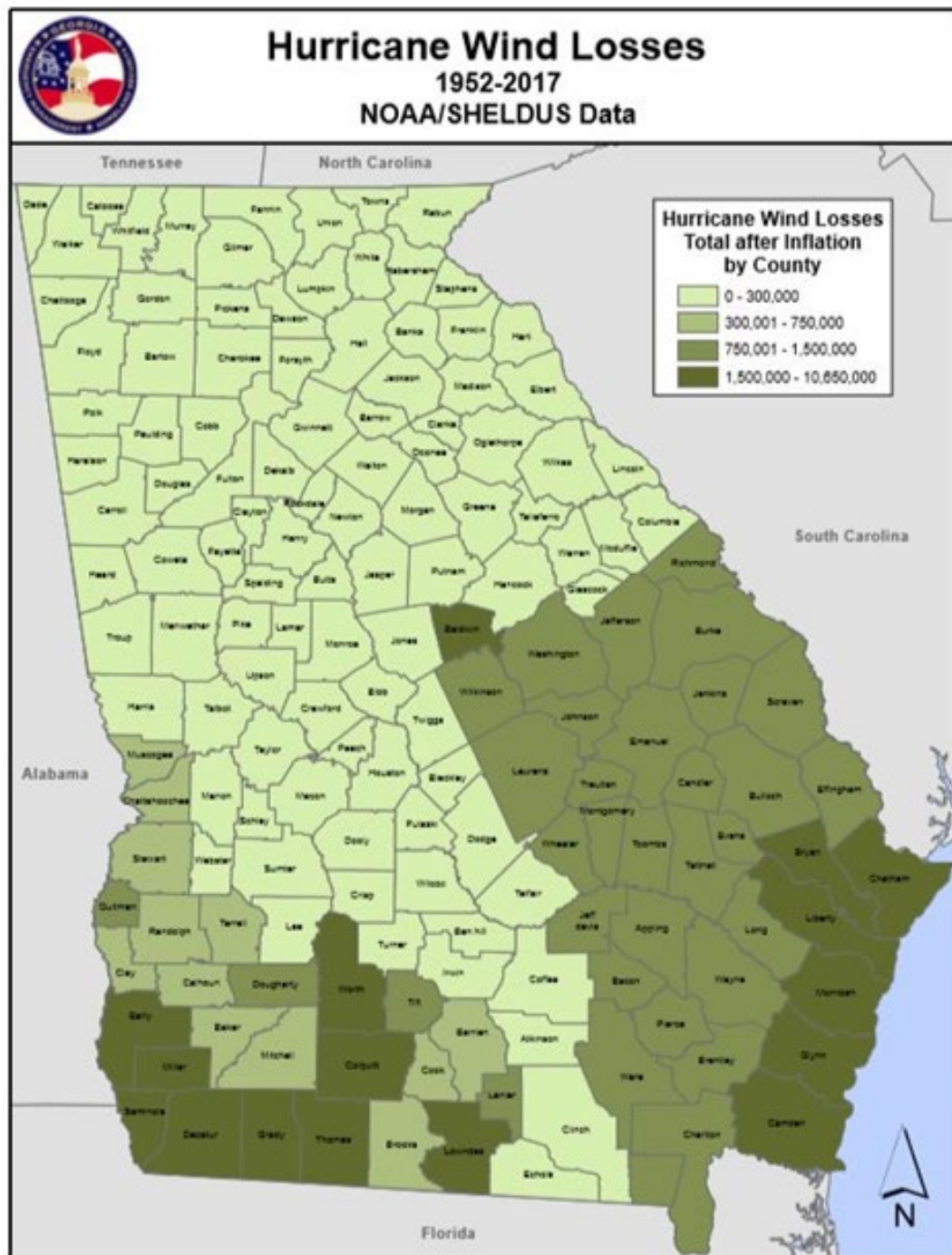
Assets Exposed to the Hazard

The Barrow County HMPC determined that all critical facilities and all public and private property within Barrow County are susceptible to the direct and indirect impacts of a tropical cyclone. This includes all municipalities.



Source: 2019-2024 Georgia Hazard Mitigation Strategy and Enhanced Plan





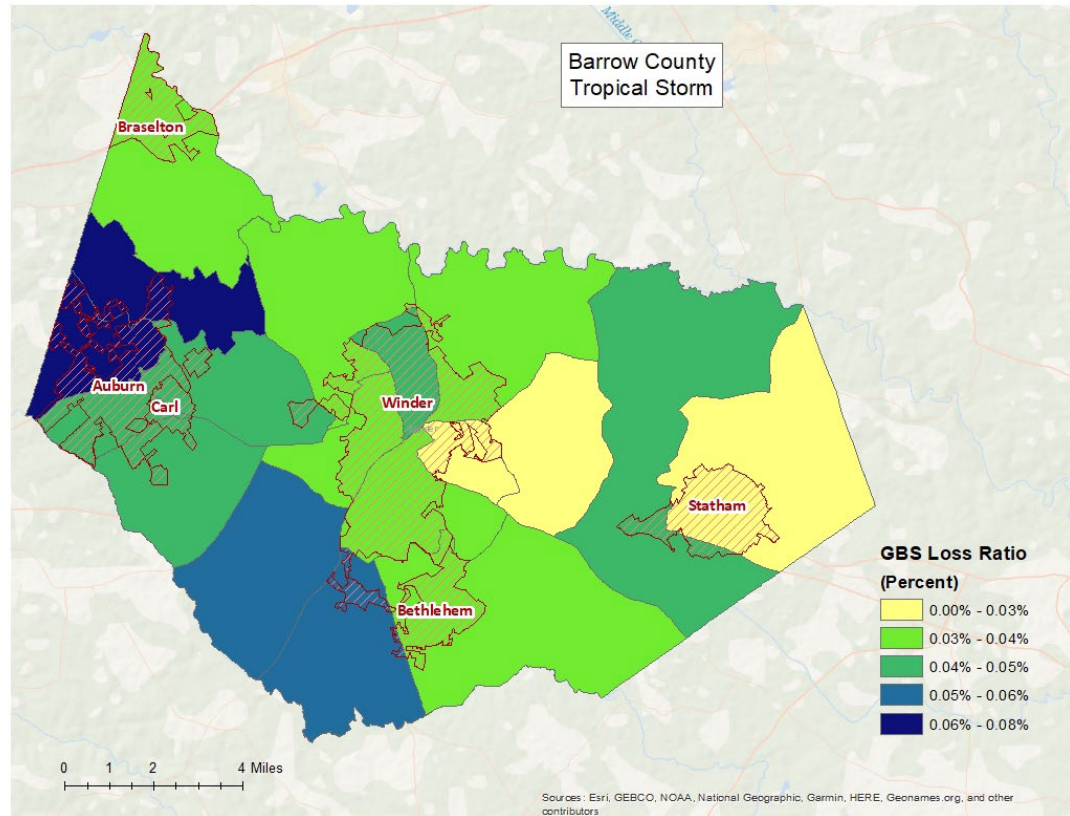
Source: 2019-2024 Georgia Hazard Mitigation Strategy and Enhanced Plan

Estimated Potential Losses

Little information is available regarding damages, in terms of dollars, is available for tropical cyclone losses in Barrow County. Most losses for these events have been labeled under other impacts, such as tornadoes and flooding. According to the National Risk Index, Barrow County has an estimated annual loss of \$243,337 related to hurricane events.

Natural Hazard: Tropical Cyclone

According to the 2024 Barrow County HAZUS Report, a 1% annual risk tropical cyclone event would produce winds up to 66 mph in Barrow County, which would be a Tropical Storm. A storm of this magnitude would create more than \$2.9 million in damages, which equates to a 0.05% loss ratio. A storm of this magnitude would create over 6,000 tons of debris.



Source: 2024 Barrow County HAZUS Report

Land Use and Development Trends

Barrow County currently has no land use trends related to Tropical Cyclones.

Multi-Jurisdictional Considerations

All of Barrow County, including all municipalities, could potentially be threatened by tropical cyclones. As such, all tropical cyclone mitigation actions should be pursued on a countywide basis and include all municipalities.

Hazard Summary

Even with the relative infrequency of tropical cyclone impacts in Barrow County in the recent past, the potential losses and impacts associated with the event would severely damage the infrastructure and economic viability of Barrow County and all municipalities. The mitigation measures identified in this plan for tropical cyclones should be pursued based on the high impact potential of this hazard and the ability for tropical cyclones to inflict widespread devastation anywhere in Barrow County. Barrow County has had three Federally Declared Disaster related to Tropical Cyclones, most recently in 2017 (Hurricane Irma).

Natural Hazard: **Extreme Temperatures**

Hazard Description

Extreme temperatures – both hot and cold – can pose a significant threat to an underprepared population. This is particularly true in areas where a population has a large elderly population, a large population of small children, and a population with lower socioeconomic status.

The term extreme heat can be subjective to a degree. FEMA, in their “Mitigation Ideas” publication defines extreme heat as “the condition where temperatures consistently stay ten degrees or more above a region’s average high temperature for an extended period.” The key to this definition is, extreme heat is relative to the average temperature, regardless of the time of year. For example, the National Center for Environmental Information (NCEI) records heat events in Georgia with 60- and 70-degree temperatures in December and January, simply because they are significantly higher than the average temperature for that time of year. According to www.ready.gov/heat, FEMA also offers another definition of extreme heat: “In most of the United States, extreme heat is defined as a long period (2 to 3 days) of high heat and humidity with temperatures above 90 degrees.” This definition can also lead to some subjectivity in the term “extreme.” For example, people that live in the southern parts of the country are more adapted to temperatures in the 90s and 100s than people that live in the more northern tiers. This is not to say those temperatures are not still dangerous. Notably, in recent years, more heat related deaths have occurred in the southern tier states than the northern tiers. The National Weather Service, however, focuses on “Excessive Heat,” defining it as heat indices of 105 degrees or more using a combination of temperature and humidity as a “real feel.”

Just as extreme heat can be subjective, so can extreme cold. Just as the National Weather Service utilizes heat index to attempt to quantify extreme heat, wind chill is often utilized to quantify extreme cold. Prolonged and/or unprotected exposure to extreme cold can be detrimental to people and animals. Additionally, it can be detrimental to exposed infrastructure, as well.

Hazard Profile

According to the National Climatic Data Center, Barrow County have been exposed to extreme cold/wind chill and excessive heat events on 25 occasions since 1996. This means that Barrow County has averaged 1 extreme temperature event every 1.08 years since 1996. This included 14 extreme cold events and 11 excessive heat events. This averages out to an extreme cold event every 1.9 years (52% annual chance) and an excessive heat event every 2.46 years (41% annual chance).

In August of 2007, Athens had 13 days that cleared 100 degrees and set nine maximum temperature records during the month. On August 22nd, temperatures reached 106 degrees, which was one degree below the record for the month of August. The temperature on August 9th and August 16th were recorded at 105 degrees. An all-time high minimum temperature was set on August 11th when temperatures only got down to 79 degrees.

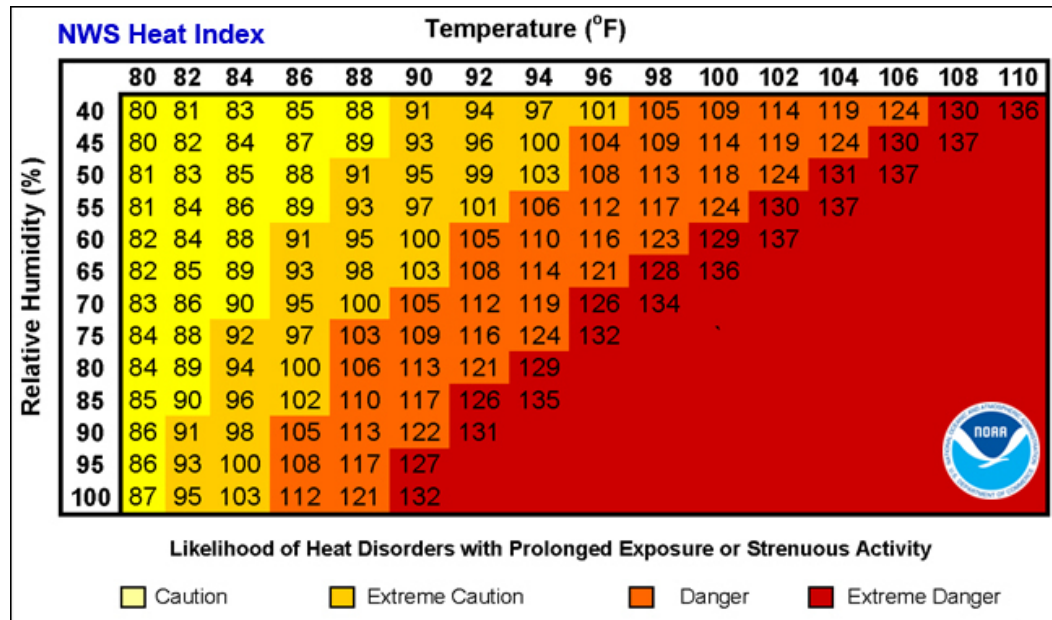
Due to the large elderly population (13% of total population above the age of 65), Barrow County’s population is particularly susceptible to heat-related illnesses.

Barrow County has also been exposed to many extreme cold events. Due to its lower latitude and position within Georgia, Barrow County can avoid much of the extreme cold temperatures that sometimes plague the mountainous regions of northeast Georgia. However, Barrow County’s location and lack of widespread exposure to such events increases the impact those events could have if they were to occur. In 2022, an arctic front sent temperatures into the single digits across north Georgia, including Barrow County. This event was

Natural Hazard: Extreme Temperatures

accompanied by high winds, which pushed wind chills to -10 degrees in the early morning hours. The low recorded at the University of Georgia in Athens on December 24, 2022 was 7.8 degrees.

Barrow County has also been exposed to many extreme cold events. Due to its lower latitude and position within Georgia, Barrow County can avoid much of the extreme cold temperatures that sometimes plague the mountainous regions of northeast Georgia. However, Barrow County's location and lack of widespread exposure to such events increases the impact those events could have if they were to occur



Source: 2019-2024 Georgia Hazard Mitigation Strategy and Enhanced Plan

Assets Exposed to the Hazard

The Barrow County HMPC determined that all critical facilities and all public and private property within Barrow County are susceptible to the direct and indirect impacts of an extreme temperature event.

Estimated Potential Losses

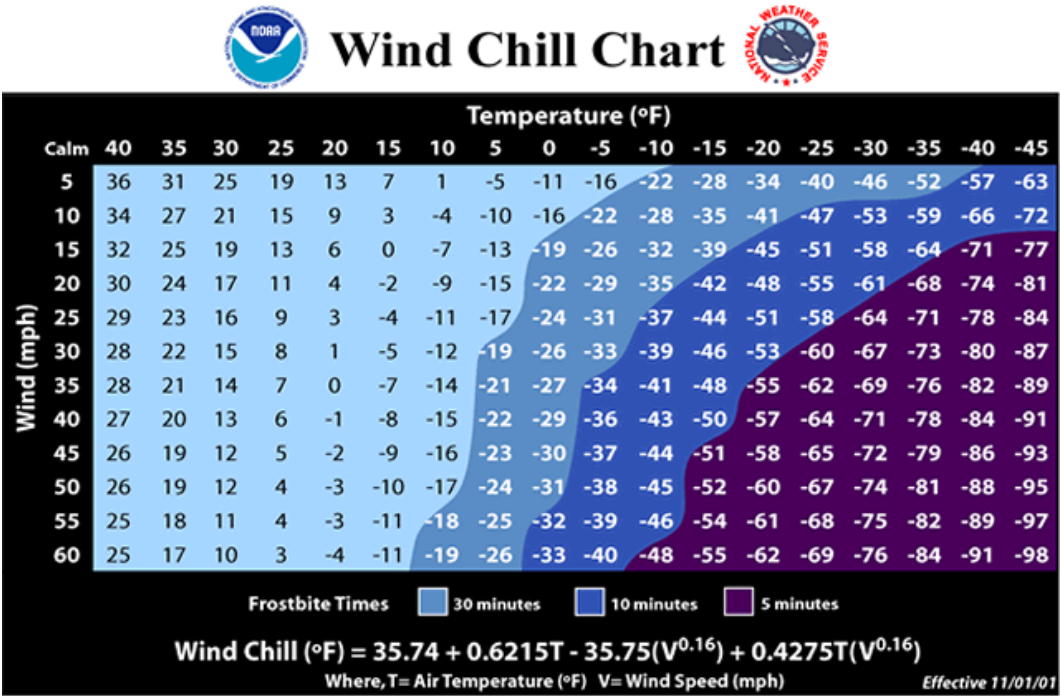
Little information is available regarding damages, in terms of dollars, is available for excessive temperature losses in Barrow County. Most losses for these events have been labeled under other impacts, such as drought and severe winter storms.

Land Use and Development Trends

Barrow County currently has no land use trends related to extreme temperatures beyond increased population growth.

Multi-Jurisdictional Considerations

All of Barrow County, could potentially be threatened by extreme temperatures. As such, all extreme temperature mitigation actions should be pursued on a countywide basis.



Source: National Weather Service

Hazard Summary

Incidents of extreme temperatures – both hot and cold – pose a significant threat to the citizens of Barrow County. Barrow County’s geographical location increases the likelihood of extreme temperature events with extreme heat events generally considered to be more likely. However, the lack of direct preparation for extreme cold events could lead to greater direct impacts.

Technological Hazard: **Hazardous Materials**

Hazard Description

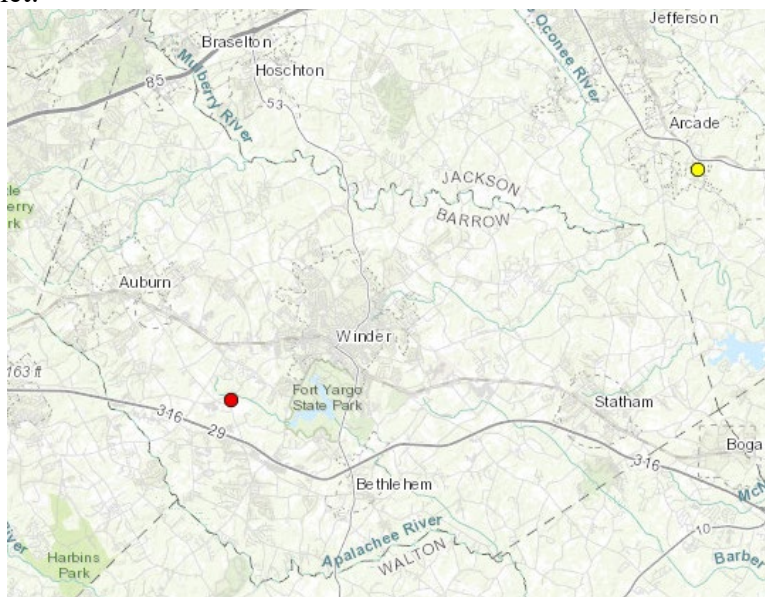
Hazardous materials, or hazmat, refers to any materials that may pose a real hazard to human health and/or the environment because of its quantity, concentration, and/or physical or chemical characteristics. Hazardous materials include explosives, flammables, combustibles, oxidizers, toxic materials, radioactive substances, and corrosives. Specific federal and state regulations exist regarding the transport and storage of hazardous materials.

A hazardous materials spill or release occurs when a hazardous material gets into the environment in an uncontrolled fashion. Response to a hazmat spill or release depends greatly on the type of material involved and the subsequent physical and chemical characteristics. Major sources of hazardous materials spills include transportation accidents on roadways and railways, pipeline breaches, and spills into rivers and creeks. Jurisdictions with facilities that produce, process, or store hazardous materials are at risk, as are facilities that treat or dispose of hazardous materials.

Hazard Profile

Data from the Pipeline and Hazardous Materials Safety Administration was reviewed regarding hazardous materials spill history in Barrow County. Data is available from 1989 to 2024 and all available data was reviewed. There were 14 PHMSA reported hazardous materials spills or releases in Barrow County over a 35-year period. It is anticipated that many more hazardous materials incidents have occurred over the last 35 years but have not been reported. According to the PHMSA data, Barrow County averages a hazardous materials incident of a reportable amount every 2.5 years. This equates to a 40% chance of a hazardous materials spill of a reportable amount each year.

According to the Georgia Department of Natural Resources Environmental Protection Division, there is one Hazardous Site Inventory location in Barrow County. This site is the Speedway SR 324 Landfill. Hazardous Site Inventory locations are areas where a known or suspected release of a regulated substance has occurred that was above a reportable quantity and which has you to properly show that state clean-up standards have been met.



Source: Georgia Department of Natural Resources Environmental Protection Division

Technological Hazard: **Hazardous Materials**

Of concern to the Barrow County Hazard Mitigation Committee is the exposure of water sources to potential hazardous materials incidents. A hazardous materials incident at or near drinking water sources could have devastating effects on a large population in Barrow County.

The greatest threat for a hazardous materials spill comes from the transportation of materials through Barrow County. This is particularly true for the US Highway 29 corridor and Interstate 85. US Highway 29 connects Atlanta to Athens and Interstate 85 connects Atlanta to Charlotte and, eventually, Interstate 95 and the northeastern United States.

Hazardous materials releases can also be the result of railway or fixed facility incidents. Fixed facilities continue to be an increasing concern due to Barrow County's growing industrial footprint. Railways owned and operated by CSX traverse the center of Barrow County, including the municipalities of Auburn, Carl, Winder, and Statham. An incident along this railway could have devastating impacts for these communities.

Of concern to the Barrow County Hazard Mitigation Committee is the exposure of water sources to potential hazardous materials incidents. This includes the Bear Creek Reservoir in Jackson County. A hazardous materials incident at or near drinking water sources could have devastating effects on a large population in Barrow County.

Assets Exposed to Hazard

The environment is particularly vulnerable to the threat posed by hazardous materials. Waterways are at a high risk for contamination from hazardous materials. Water contamination is of concern to the Barrow County HMPC. Public and private property located near fixed hazardous materials facilities are also a greater risk than the general population of Barrow County. Water contamination from a hazardous materials release is of particular concern to the Barrow County Hazard Mitigation Planning Committee.

Estimated Potential Losses

Estimation of potential losses is difficult regarding hazardous materials due to the vast array of potential types of hazardous materials that could be involved in the incident and unknown costs regarding environmental damages. No recorded information was found regarding the losses associated with hazardous materials incidents in Barrow County. However, a hazardous materials release, whether in transport or at a fixed facility, would incur significant costs regarding emergency response, potential road closures, evacuations, watershed protection measures, expended man-hours, and cleanup materials, equipment, and personnel.

Land Use and Development Trends

Barrow County currently has no land use trends related to Hazardous Materials beyond continued population growth – particularly in areas near the Gwinnett County border and areas around Braselton, Auburn, and Winder.

Multi-Jurisdictional Considerations

All of Barrow County, including all municipalities, are vulnerable to both fixed facility and transportation-related hazardous materials releases. However, areas along the US Highway 29 and Interstate 85 corridors, including the municipalities of Auburn, Carl, Winder, and Statham, are of particular concern.

Hazard Summary

Hazardous materials incidents pose a significant threat to the citizens, infrastructure, and critical facilities of Barrow County. Unknown quantities of hazardous materials are transported daily through Barrow County and all municipalities. These materials are often transported via highways. Water contamination because of a hazardous materials spill is of significant concern to the Barrow County HMPC. As a result of the threat posed by hazardous materials, the Barrow County HMPC has identified mitigation actions directly related to this threat.

Hazard Description

Georgia law defines a dam as any artificial barrier, which impounds or diverts water, is 25 feet or more in height from the natural bed of a stream or has an impounding capacity at maximum water storage evaluation of 100 acre-feet or more. Dams are generally constructed to provide a ready supply of water for drinking, irrigation, recreation, and other purposes. Dams can be constructed from earth, rock, masonry, concrete or any combination of these materials.

Dam failure is a term used to describe a significant breach of a dam and the subsequent loss of contained water. Dam failure can cause significant damages downstream to structures, roads, utilities, and crops. Dam failure can also put human and animal lives at risk. National statistics indicate that one-third of all dam failures in the United States are caused by overtopping due to inadequate spillway design, debris blocking spillways, or settlement of the dam crest. Another third of all US dam failures are the result of foundation defects, including settlement and slope instability.

Hazard Profile

There are 4 category I and 12 category II dams located within Barrow County. Category I dams are those that would pose a possible threat to human life if a failure were to occur. All category I dams must be inspected annually according to Georgia's Safe Dams Act.

The threat of a dam failure in Barrow County could potentially lead to downstream flooding. This downstream flooding would have many of the same hazards as a flood event, but with the onset of such an event being much quicker than in a typical flood event.

The dam of most concern would likely be the Fort Yargo State Park Dam. This 49-foot concrete dam has a maximum storage of 7,460 acre-feet of water. However, any of the 4 Category I dams located in Barrow County could have direct, devastating impacts on the local population.

There have not been any dam failures in Barrow County in the last 10 years and no probability estimates can be made regarding the likelihood of a future event.

Assets Exposed to Hazard

To evaluate the assets that would potentially be impacted by a dam failure, the Barrow County HMPC attempted to identify known structures within, or close to, the 100-year floodplain. All municipalities could be exposed to the hazards of other dams or face secondary hazards from the dams.

Estimated Potential Losses

Loss estimations are not applicable since it is not known which dam will fail and how significant of failure will occur.

Land Use and Development Trends

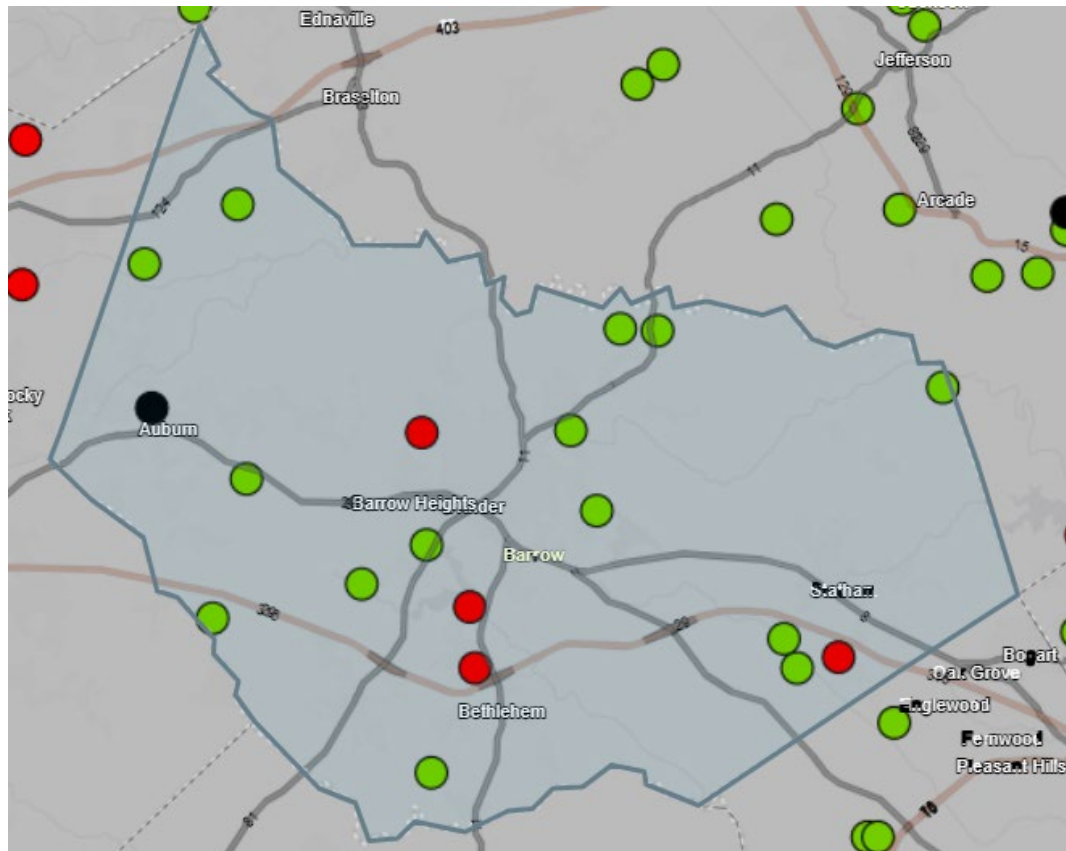
Barrow County participates in the National Flood Insurance Program (NFIP) and follows the program's guidelines to ensure future development is carried out in the best interests of the public. Barrow County (CID No. 130497B) first entered the NFIP on October 16, 1991. According to the NFIP guidelines, the County has executed a Flood Damage Prevention Ordinance. This ordinance attempts to minimize the loss of human life and health as well as minimize public and private property losses due to flooding. The

Technological Hazard: **Dam Failure**

ordinance requires any potential flood damage be evaluated at the time of initial construction and that certain uses be restricted or prohibited based on this evaluation. The ordinance also requires that potential homebuyers be notified that a property is located in a flood area. In addition, all construction must adhere to the Georgia State Minimum Standard Codes and the International Building Codes of 2018.

Multi-Jurisdictional Considerations

During a dam failure event, many portions of Barrow County would potentially be impacted by flooding. However, the area's most prone to flooding have historically been those areas located within the 100-year floodplain and downstream from dams.



Source: National Inventory of Dams – US Army Corps of Engineers

Hazard Summary

Dam failure poses a threat to Barrow County and its citizens, infrastructure, and critical facilities. A dam failure could prove catastrophic for areas downstream of the dam, particularly if the failure were to occur at any of the Category I dams located in Barrow County. As a result, mitigation efforts for dam failure should be focused in this potentially affected area.

Technological Hazard: **Transportation Incident**

Hazard Description

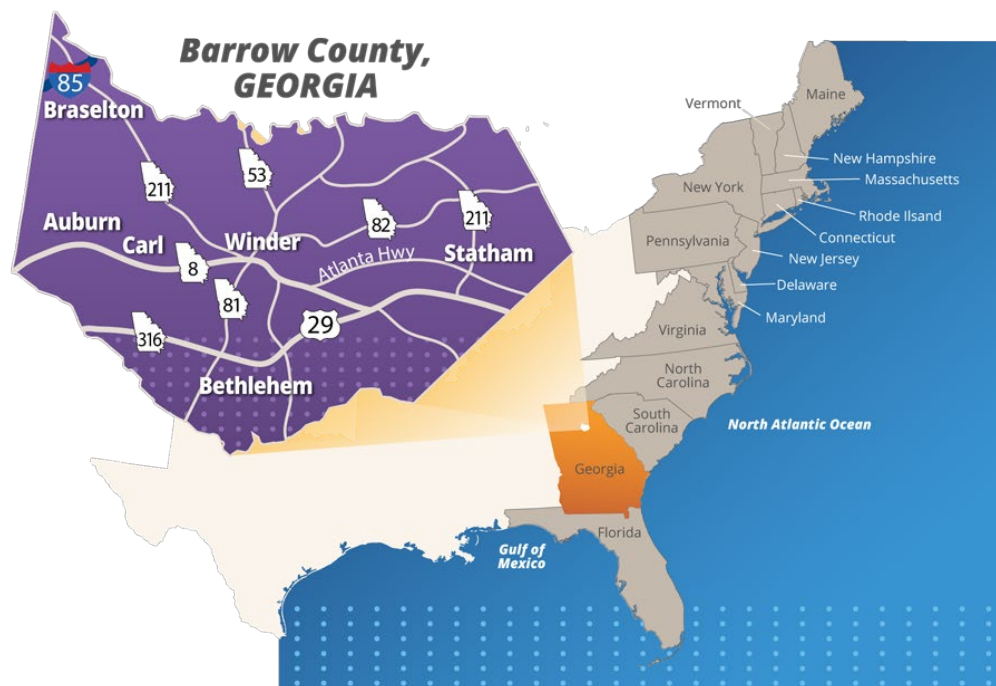
There are many secondary hazards that could be associated with transportation incidents. Injuries or deaths can occur as a result of the impact of a transportation accident, by a hazardous materials release because of a transportation incident, or by other related transportation hazards. Transportation can occur via roadways, highways, interstates, railways, air, or navigable waterways. Each transportation type poses their own unique hazard issues and consequences.

Roadway hazards are most likely to be caused by a motor vehicle accident involving one or more cars, trucks, vans, or transport vehicles. These incidents can have injuries because of the impact of the MVA or a hazardous materials release into the local environment, including waterways. Railway incidents pose many of the same dangers as motor vehicle accidents. However, the threat of a hazardous materials release is greatly increased when railway transportation incidents are considered.

Air accidents can include commercial airplanes, private airplanes, hot air balloons, helicopters, or other forms of air travel. Each of these incidents can cause a significant threat to human life as well as posing a hazardous material threat due to the cargo being transported or the fuel being used. Navigable waterway incidents can create formidable incidents for response organizations. Because of the waterway, technical expertise is needed to carry out rescue operations, especially in swift-moving waterways. Also, any incident in a waterway is likely to have environmental impacts.

Hazard Profile

Transportation incidents are of a significant concern in Barrow County. Passing through Barrow County are Interstate 85, US Highway 29, and Georgia Highways 8, 11, 53, 81, 82, 124, 211, 316, 324, and 330. Interstate 85, US Highway 29, and Georgia Highway 316, in particular, are major transportation routes.



Technological Hazard: **Transportation Incident**

Assets Exposed to Hazard

All assets and critical facilities located along or near any transportation route could potentially be impacted by a transportation incident. Areas within Barrow County that are not located along or near a transportation route could still face residual impacts.

Estimated Potential Losses

Estimated potential losses cannot be anticipated with this event due to the vast number of differing scenarios regarding transportation incidents.

Land Use and Development Trends

Barrow County currently has no land use trends related to Transportation Incidents beyond an increase in overall population which, in turn, increases the likelihood and potential impact of a transportation incident. The primary areas of growth have been near the Gwinnett County line and around the cities of Auburn and Winder.

Multi-Jurisdictional Considerations

Barrow County as well as all municipalities could potentially be impacted by a transportation incident. However, areas along the Interstate 85, US Highway 29, and Georgia Highway 316 corridors are the greatest at risk. This includes the municipalities of Braselton, Auburn, Carl, Winder, and Statham.

Hazard Summary

The Barrow County HMPC has determined that transportation incidents pose a high risk to their jurisdictions due to the unpredictable nature and likelihood of the incident. As a result, the Barrow County HMPC has developed mitigation strategies and actions with transportation incidents in mind.

Hazard Description

The Federal Bureau of Investigation (FBI) defines terrorism as violent acts or acts dangerous to human life that violate federal or state law, appear to be intended to intimidate or coerce a civilian population, affect the conduct of a government by mass destruction, assassination, or kidnapping, and is calculated to influence or affect the conduct of a government by intimidation or retaliate against government conduct. Terrorism is usually referenced as being premeditated and politically motivated.

Terrorist acts are, by their very nature, designed and carried out with the intention of inflicting mass casualties and extensive property damage. When an act of terrorism is carried out in a jurisdiction, it will likely be necessary to implement multiple aspects of the emergency management system and summon additional resources from local, state, and federal partners.

Terrorism is generally divided into two types: domestic terrorism and international terrorism. Domestic terrorism is defined as terroristic acts focused on facilities and populations without foreign direction. International terrorism involves activities that are foreign-based and/or sponsored by organizations outside of the United States.

Terrorists often use threats to create fear among the public, to convince citizens that government is powerless to prevent terrorism and to get immediate publicity for their causes. Weapons of Mass Destruction (WMDs), including incendiary, explosive, chemical, biological, radiological, and nuclear agents, have the capability to cause death or serious bodily injury to a significant number of people, thus posing the threat of a catastrophic incident. Terrorism can also include arson, agro-terrorism, armed attack, intentional hazardous materials release, water or food contamination, and attacks on infrastructure and electronic information systems.

Hazard Profile

Terrorism targets have historically been facilities that make a large economic or social impact on the targeted government or jurisdiction. In Barrow County, all critical facilities could be potential targets. Terrorism includes a multitude of potential approaches, including agro-terrorism, which is terrorism targeted toward agriculture. Due to the high economic impact (over \$90 million in annual agriculture-related sales) of agriculture in Barrow County, agro-terrorism could be of particular concern. Additionally, a terrorist contamination of the water sources is of concern.

Within Barrow County, there are many areas that could be viewed as potential targets for terrorism due to their economic impact on the area. This includes tourist-friendly areas throughout Barrow County, such as Fort Yargo State Park and Chateau Elan.

While active shooter situations are not always classified as terrorism, for this plan, the Barrow County HMPC has chosen to classify them as such. Active shooter situations can occur in any location, including businesses, schools, government buildings, and public spaces. Schools are seen as particularly vulnerable to these types of situations due to the high publicity of recent active shooter events, including the active shooter event which occurred in Barrow County in 2024. This incident occurred at Apalachee High School, which is located in unincorporated Barrow County just southwest of Winder. This incident left four dead – two students and two teachers – and another nine individuals wounded. This active shooter incident led to a massive multi-jurisdictional response and recovery operation in Barrow County. This incident happened after the conclusion of the Barrow County Hazard Mitigation Plan Update committee

Technological Hazard: **Terrorism**

meetings and, as a result, did not impact discussions during the hazard mitigation plan update meetings. However, this incident has impacted the focus of Barrow County on future potential acts of violence events, such as active shooter incidents. Additionally, this incident has impacted the discussions of the Hazard Mitigation Planning Committees in surrounding jurisdictions who responded to the incident in support of Barrow County. This incident has had wide-ranging impacts on policy decisions and approaches to school safety in the State of Georgia.

Assets Exposed to the Hazard

Due to the unpredictable nature of terrorism, all public and private structures are threatened by the terrorism hazard. This includes all critical facilities.

Estimated Potential Losses

Losses due to terrorism are difficult to estimate due to the unpredictable nature of terrorism. The type of terrorist act carried out, location of the act, and the impact of the act would all affect the potential losses. Please see the critical facilities information for estimated potential losses for each critical facility.

Land Use and Development Trends

Barrow County currently has no land use trends related to Terrorism.

Multi-Jurisdictional Considerations

All of Barrow County, including all municipalities, are vulnerable to potential acts of terrorism. However, critical facilities and their surrounding areas are considered to be at the greatest risk.

Hazard Summary

Terrorism, while a low-probability hazard, would have devastating effects on Barrow County and all municipalities. These impacts would be immediate and long-lasting and could be potentially economically crippling to Barrow County and surrounding communities.

Technological Hazard: Critical Infrastructure Failure

Hazard Description

Infrastructures are particularly vulnerable to both natural and technological hazards. These include electrical utilities, water utilities, gas pipelines, fuel supplies, and other infrastructures that supply vital supplies and services to the community. While an infrastructure failure would most likely be a secondary hazard of one of the other hazards identified in this plan, an infrastructure failure could be a solo incident itself.

A lack of connection with outside sources could lead to public panic, poor emergency response capabilities, and other domino hazards. These events pose a significant threat to many jurisdictions.

Hazard Profile

In case of any failure of a utility infrastructure, general difficulties would be exacerbated for both emergency responders and for the public. The reliance on wireless communications, particularly for the public safety sector, increases the vulnerability of Barrow County's emergency response agencies to a communications failure. A failure in the communications sector could have significant impacts to Barrow County's radio system, telephone systems, and internet infrastructure. Each of these would be devastating to both public safety and the general public.



Source: National Pipeline Mapping System

Technological Hazard: **Critical Infrastructure Failure**

Additionally, a utility infrastructure failure is also of significant concern to the Barrow County Hazard Mitigation Planning Committee. This includes water, power, and natural gas utility failures. This type of failure would have significant impacts to the citizens of Barrow County. There is a gas transmission line that passes through the eastern portion of Barrow County that is of particular concern. Additionally, there is a hazardous liquid transmission line that traverses the central portion of Barrow County. This pipeline passes between Bethlehem and Winder and Winder and Statham. This is part of the Colonial Pipeline that connects refineries in the Gulf of Mexico region to the northeastern United States.

Assets Exposed to Hazard

All assets and critical facilities within Barrow County could potentially be impacted by an infrastructure failure.

Estimated Potential Losses

Estimated potential losses cannot be anticipated with this event due to the vast number of differing scenarios regarding utility failure.

Land Use and Development Trends

Barrow County currently has no land use trends related to infrastructure failures beyond continued population growth and an ever-increasing industrial footprint.

Multi-Jurisdictional Considerations

All areas of Barrow County could potentially be impacted by an infrastructure failure.

Hazard Summary

The Barrow County HMPC has determined that utility failures pose a high risk to their jurisdictions due to the unpredictable nature of the incident. As a result, the Barrow County HMPC has developed mitigation strategies and actions with infrastructure failures in mind.

Hazard Description

Microorganisms, such as bacteria, viruses, parasites, fungi, or prions, surround us within the environment. They can even be found within our own bodies. Most microorganisms are completely harmless, and many are actually beneficial. However, some of these organisms are pathogenic, meaning they cause or can cause disease. Infectious diseases are caused by these pathogenic organisms and are communicable – meaning they can be spread from person to person either directly or indirectly. Direct transmission of the disease occurs through actual physical contact with an infected person or their bodily fluids. Indirect transmission of a disease occurs when an infected person contaminates a surface by sneezing, coughing, etc., and a non-infected person comes into contact with that infected surface. Another means of indirect transmission includes vectors, such as mosquitos, flies, mites, ticks, fleas, rodents, or dogs, which may carry the pathogenic microorganism and transmit it to people via a bite. Infectious diseases can also impact animal populations, particularly livestock and other farm animals. Even though these diseases may not directly affect humans, the economic impact of these diseases can be just as harmful, if not more so, to the community.

Infectious diseases can occur as primary events or they may occur as a cascading result of another disaster, such as a tornado, flood, or winter weather. Infectious diseases can vary greatly in severity and magnitude. According to the World Health Organization, infectious diseases account for three of the ten leading causes of death worldwide – HIV/AIDS, lower respiratory infections, and diarrheal disease. These three events, combined with tuberculosis and malaria, account for 20% of deaths globally.

In Western countries, the impact of infectious diseases has diminished greatly over the last 75 years due to improved sanitation, personal hygiene, vaccinations, and the use of antibiotics. In the United States, only two infectious diseases – seasonal influenza and pneumonia – rank in the top ten leading causes of death. Annually, there are 1,500 deaths in the United States from seasonal influenza and another 52,000 from pneumonia. Children and older adults are the greatest at risk for both.

Emergent infectious diseases are those that are appearing in a population for the first time. Re-emergent infectious diseases are those that may have previously existed in a population, but levels had dropped to the point where it was no longer considered a public health problem until levels once again began increasing.

During the last 25 years, emergent and re-emergent infectious diseases have been on the rise. The below table outlines some of the contributing factors to this rise:

Contributing Factors to Increasing Occurrence of Emergent Diseases
Agent-Related Factors
Evolution of pathogenic infectious agents
Development of resistance to drugs
Resistance of disease carriers to pesticides
Host-Related Factors
Human demographic changes (humans inhabiting new areas)
Human behavior (sexual practices and drug use)
Human susceptibility to infection
Environment-Related Factors
Economic development and land use patterns
International travel and commerce
Deterioration of surveillance systems

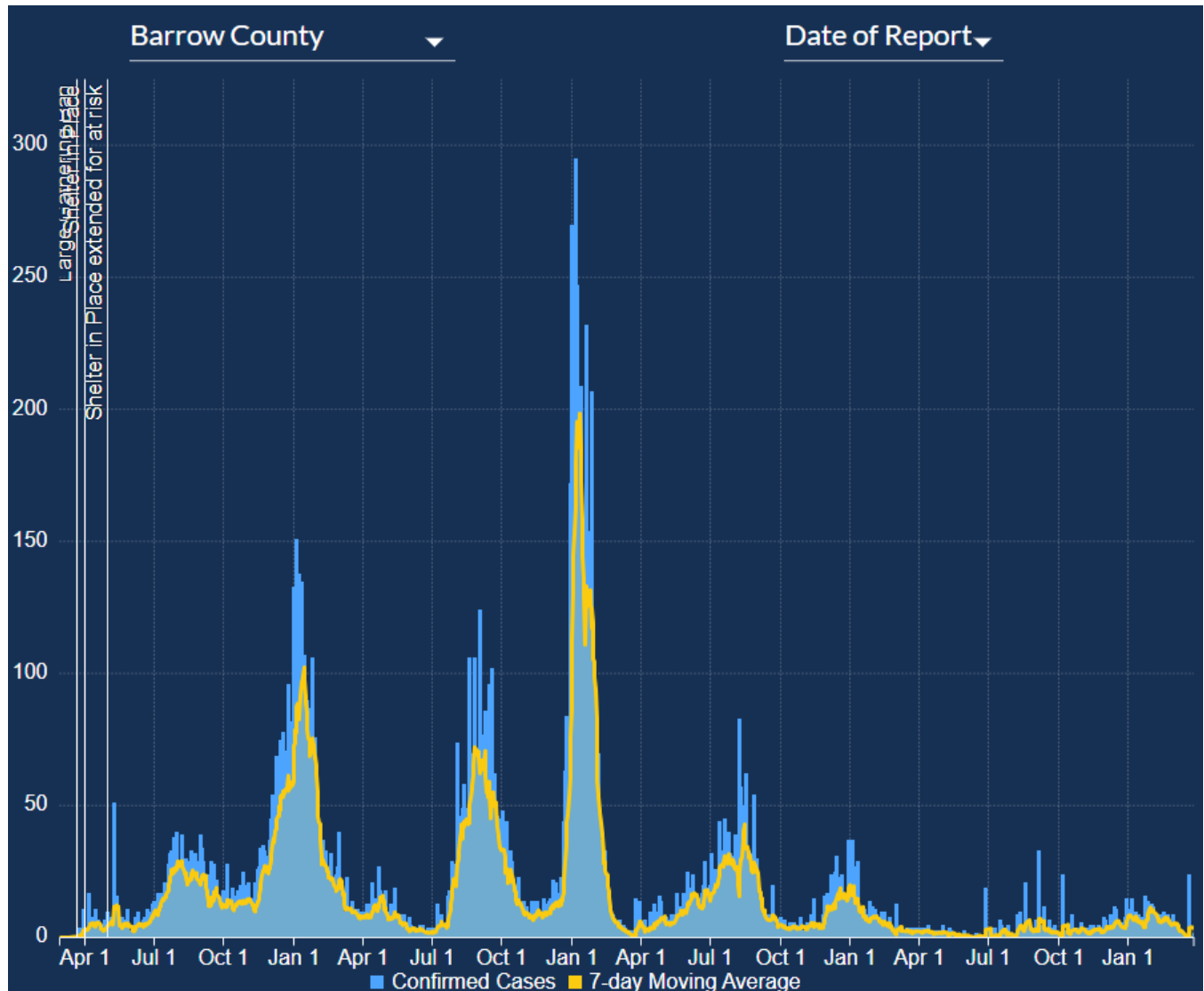
Technological Hazard: Emergent Infectious Diseases

Due to a lack of ready-made vaccines for these diseases and a lack of immunity in the population, emergent and re-emergent infectious diseases are much more likely to escalate to pandemic levels rapidly.

CDC-Identified Emergent and Re-Emergent Infectious Diseases	
Drug-resistant Infections	Mad Cow/Variant Creutzfeldt-Jakob Diseases
Campylobacteriosis	Chagas Disease
Cholera	Cryptococcosis
Cryptosporidiosis (Crypto)	Cyclosporiasis
Cysticercosis	Dengue Fever
Diphtheria	Ebola Hemorrhagic Fever
Group B Streptococcal Infection	Hantavirus Pulmonary Syndrome
Hepatitis C	Hendra Virus Infection
Histoplasmosis	HIV/AIDS
Influenza	Lassa Fever
Legionnaires' Disease and Pontiac Fever	Leptospirosis
Listeriosis	Lyme Disease
Malaria	Marburg Hemorrhagic Fever
Measles	Meningitis
Monkeypox	MRSA
Nipah Virus Infection	Norovirus Infection
Pertussis	Plague
Polio	Rabies
Rift Valley Fever	Rotavirus Infection
Salmonellosis	SARS and COVID-19
Shigellosis	Smallpox
Sleeping Sickness (Trypanosomiasis)	Tuberculosis
Tularemia	Valley Fever (Coccidioidomycosis)
VISA/VRSA	Staphylococcus Aureus
West Nile Virus Infection	Yellow Fever

Hazard Profile

Emergent Infectious diseases are of significant concern to the Barrow County HMPC, particularly those that would have an impact on the human population or animal population of Barrow County. Barrow County would likely see significant economic impacts from an outbreak involving animal populations, such as an Avian Flu, due to the large economic base agriculture provides (over \$120 million in annual sales). The lack of current vaccines and preparatory activities for these diseases has created a situation where the potential impact to Barrow County of a pandemic or epidemic could be catastrophic. The most recent pandemic scare in the Central Georgia area was the 2009-2010 H1N1 Swine Flu. There were 1286 cases of H1N1 in Georgia in 2009-2010 and 33 deaths. Most registered cases occurred with people between the ages of 5 and 29. This equates to a mortality rate of just over 2.5% - which is slightly lower than the 3% rate of the 1918-1919 Spanish Flu Pandemic. The 2019-2021 COVID-19 Pandemic, which was caused by SARS-CoV2, spread worldwide in a matter of weeks. As of February 21, 2023, there were over 674 million cases reported worldwide with nearly 7 million deaths. In Barrow County, as of March 27, 2024, there had been 24,455 confirmed cases and 275 deaths. The COVID-19 Pandemic was a Federally Declared Disaster.



Source: Georgia Department of Public Health

Over the last 25 years, emergent infectious disease outbreaks have occurred in other parts of the country. These include:

- 1993 Cryptosporidium Outbreak (Milwaukee, Wisconsin – 403,000 people ill and 100 deaths)
- 2010 Whooping Cough Outbreak (California – 9,500 people ill and 10 infant deaths)
- 2015 H5N2 Avian Flu Outbreak (Midwest – over 25 million chickens and turkeys destroyed as a precautionary measure at 83 locations)

Assets Exposed to the Hazard

Due to the unpredictable nature of emergent infectious diseases, all public and private structures are threatened by the hazard. This includes all critical facilities.

Estimated Potential Losses

Losses due to emergent infectious diseases are difficult to estimate due to the unpredictable nature of the hazard. The type of emergent infectious disease, location of the outbreak, and the impact of the outbreak would all affect the potential losses. Please see the critical facilities information for estimated potential losses for each critical facility.

Land Use and Development Trends

Barrow County has no land use trends directly related to Emergent Infectious Diseases.

Multi-Jurisdictional Considerations

All of Barrow County, including all municipalities, are vulnerable to emergent infectious diseases. However, livestock and other farm animals are considered to be the greatest at risk, along with areas that have a large, concentrated human population, such as schools.

Hazard Summary

An emergent infectious disease would have devastating effects on Barrow County and all municipalities. These impacts would be immediate and long-lasting and could be potentially economically crippling. Because of these considerations, the Barrow County HMPC has developed mitigation actions with emergent infectious diseases in mind.

CHAPTER FOUR–HAZARD MITIGATION STRATEGIES

Summary of Updates to Chapter Four

The following table provides a description of each section of this chapter, and a summary of the changes that have been made to the Barrow County Hazard Mitigation Plan 2019.

Chapter 4 Section	Updates
Goals and Objectives	Updated goals to match the needs of the Barrow County
Identification and Analysis of Mitigation Techniques	Content Revised Reviewed mitigation strategies identified in the 2019 plan and made updates Identified mitigation strategies that were completed Identified mitigation strategies to be removed

Goals and Objectives

Requirement §201.6(c)(3)

Requirement §201.6(c)(3)(i)

It is important that State and local government, public-private partnerships, and the average citizen can see the results of these mitigation efforts, therefore, the goals and strategies need to be achievable. The mitigation goals and objectives form the basis for the development of specific mitigation actions. Barrow County officials should consider the listed goals before making community policies, public investment programs, economic development programs, or community development decisions for their communities. The goals of Barrow County have changed slightly in the last five years (since 2020) due to specific threat events. Because of the recentness of the impacts of these hazards and the devastation that occurred, these types of events have taken a greater priority, particularly in the increased priority of mitigation strategies directly related to these events and the development of new mitigation strategies related to these hazards.

Each jurisdiction covered by the Barrow County Hazard Mitigation plan update – Barrow County, Auburn, Bethlehem, Braselton, Carl, Statham, and Winder – has limited ability to fully implement the mitigation actions described in this plan. Barrow County and its municipalities lack the needed financial strength and staffing to implement all the actions described in this plan. Many of the actions will be pursued through grant programs and by partnering with public and private organizations who can supplement the needed resources to accomplish the goals outlined in this plan. For actions where grant funding or partnerships are not available, the Barrow County and municipal revenue streams may be supplemented through Special Purpose Local Option Sales Tax (SPLOST) funds, which are voted on by the electorate.

- | | |
|--------|---|
| GOAL 1 | Maximize the use of all resources by promoting intergovernmental coordination and partnerships in the public and private sectors |
| GOAL 2 | Harden communities against the impacts of disasters through the development of new mitigation strategies and strict enforcement of current regulations that have proven effective |
| GOAL 3 | Reduce and, where possible, eliminate repetitive damage, loss of life and property from disasters |
| GOAL 4 | Bring greater awareness throughout the community about potential hazards and the need for community preparedness |

These objectives state a more specific outcome that Barrow County strives to accomplish over the next five years. Action steps are the specific steps necessary to achieve these objectives. Objectives are not listed in order of importance.

- | | |
|-------------|---|
| OBJECTIVE 1 | Reduce damage to property and loss of life through the utilization of preventative activities |
| OBJECTIVE 2 | Minimize the damage to property and loss of life through property protection measures |
| OBJECTIVE 3 | Minimize the damage to property and loss of life through natural resource protection activities |

OBJECTIVE 4	Reduce damage to property and loss of life through the utilization of structural mitigation projects
OBJECTIVE 5	Increase the ability of Barrow County and its citizens to respond to natural and manmade hazards through emergency service measures
OBJECTIVE 6	Increase public education and awareness of natural hazards
OBJECTIVE 7	Minimize the impacts on local citizens, industry, and infrastructure of a dam breach
OBJECTIVE 8	Implement additional protective measures and capabilities in response to manmade incidents
OBJECTIVE 9	Increase public awareness of local manmade hazards and proper response to those hazards

Identification and Analysis of Mitigation Techniques

[Requirement §201.6\(c\)\(3\)\(iv\)](#)

[Requirement §201.6\(c\)\(3\)\(iii\)](#)

In updating Barrow County's mitigation strategy, a wide range of activities were considered to help achieve the mitigation goals and objectives. This includes the following activities as by the Emergency Management Accreditation Program (EMAP):

- 1) The use of applicable building construction standards;
- 2) Hazard avoidance through appropriate land-use practices;
- 3) Relocation, retrofitting, or removal of structures at risk;
- 4) Removal or elimination of the hazard;
- 5) Reduction or limitation of the amount or size of the hazard;
- 6) Segregation of the hazard from that which is to be protected;
- 7) Modification of the basic characteristics of the hazard;
- 8) Control of the rate of release of the hazard;
- 9) Provision of protective systems or equipment for both cyber and/or physical risks;
- 10) Establishment of hazard warning and communication procedures; and
- 11) Redundancy or duplication of essential personnel, critical systems, equipment, and information materials.

Part of the prioritization includes a general assessment according to the STAPLEE criteria, which stands for Social, Technical, Administrative, Political, Legal, Economic and Environmental. This process led to three designated priorities: High, Medium, and Low. Most items that require grant funding must undergo a full Benefit Cost Analysis to determine the action's actual cost effectiveness prior to funding. This process will be completed as part of the grant opportunity application process.

Strategy Priority	Priority Description	Strategies within this priority
LOW	Low priority strategies are those strategies that will have less direct impact on mitigating Barrow County's hazards, are in the early stages of strategy development, or score poorly on a preliminary cost-benefit analysis	
MEDIUM	Medium priority strategies are those strategies that will have a direct impact on mitigating Barrow County's hazards but will not have as large of an anticipated impact as High Priority strategies or may be focused on hazards that are not as potentially impactful or prevalent for Barrow County. These strategies may be in the earlier stages of development or score mediocre on a preliminary cost-benefit analysis	
HIGH	High priority strategies are those strategies that would have a direct, large impact on mitigating Barrow County's hazards. These strategies are oftentimes well-established needs of Barrow County and have score high on a preliminary cost-benefit analysis	

The lead agency listed in the Mitigation Strategy charts will be responsible for the jurisdictional administration and implementation of the mitigation strategy prioritization. Prioritization was determined based on many factors. These include the likelihood of the event, the potential impact of the event, the current readiness posture of Barrow County for the event, the all-hazard impact of the mitigation strategy, and a cost-benefit analysis for the mitigation action. For example, mitigation actions that address high-likelihood, high-impact events with a low cost would rate higher than low-likelihood, high-impact events with a high cost.

The Barrow County Hazard Mitigation Planning Committee also attempted to identify potential funding sources outside of Barrow County budgets for the mitigation strategies that were identified. This is particularly helpful for future grant planning and for items with significant costs that are beyond the capabilities of Barrow County to procure without grant assistance.

Grant Name	Grant Description	Strategies that could be potentially funded
Hazard Mitigation Grant Program	The purpose of the HMGP is to provide funds to State agencies and local governments in the aftermath of a disaster for projects that reduce or eliminate long-term risk to human life and property	
Flood Mitigation Assistance Program	The FMA program provides funding to assist States and communities in implementing measures to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the NFIP.	
Community Development Block Grant	Provides communities with resources to address a wide range of unique community development needs	
Assistance to Firefighters Grant	This program provides funding to meet the firefighting and emergency response needs of fire departments and nonaffiliated emergency medical service organizations	

The following Mitigation Charts meet:

[Requirement §201.6\(c\)\(3\)\(ii\)](#)

[Requirement §201.6\(d\)\(3\)](#)

Strategy #	Mitigation Action	Lead and Supporting Agency, Department, Organization	Flood	Winter Weather	Thunderstorm	Tornado	Tropical Cyclone	Drought/Ex Temp	Geologic	Wildfire	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Previous Strategy #
OBJECTIVE ONE: Reduce damage to property and loss of life through the utilization of preventative activities															
1.a	Continue to update the floodplain maps in GIS as new flood maps are released and adopted	Planning and Zoning and GIS	✓								Local budgets	Staff time	12 months	Completed in Q-Public as released; last update in 2020	1.a (mod)
1.b	Research CRS Program requirements for Barrow County and municipalities	EMA and Planning and Zoning	✓								Local budgets	Staff time	24 months	None; other projects have taken priority	1.f
1.c	Continue to participate in NFIP	Barrow County Board of Commissioners	✓								Local budgets	Staff time	12 months	In place; Continue	1.g
1.d	Continue to participate in NFIP	Auburn City Council	✓								Local budgets	Staff time	12 months	In place; Continue	1.h
1.e	Continue to participate in NFIP	Winder City Council	✓								Local budgets	Staff time	12 months	In place; Continue	1.i
1.f	Continue to participate in NFIP	Statham City Council	✓								Local budgets	Staff time	12 months	In place; Continue	1.j
1.g	Continue to participate in NFIP	Bethlehem City Council	✓								Local budgets	Staff time	12 months	In place; Continue	1.k
1.h	Continue to participate in NFIP	Braselton Town Council	✓								Local budgets	Staff time	12 months	In place; Continue	1.l
1.i	Continue to participate in NFIP	Carl Town Council	✓								Local budgets	Staff time	12 months	In place; Continue	1.m

Strategy #	Mitigation Action	Lead and Supporting Agency, Department, Organization	Flood	Winter Weather	Thunderstorm	Tornado	Tropical Cyclone	Drought/Ex Temp	Geologic	Wildfire	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Previous Strategy #
OBJECTIVE TWO: Minimize the damage to property and loss of life through property protection measures															
2.a	Identify facilities that have generators and those that need generators	EMA and Critical facility operators		✓	✓	✓	✓		✓		Local budgets	Staff time	30 months	None; Other projects have taken priority	6.a
2.b	Purchase a generator for the Public Health Building	EMA and Public Health		✓	✓	✓	✓		✓		Public and private grants and/or local budgets	\$100,000	48 months	None; other projects have taken priority	6.c
2.c	Purchase a generator for Carl City Hall	Carl City Council and EMA		✓	✓	✓	✓		✓		Public and private grants and/or local budgets	\$50,000	48 months	None; other projects have taken priority	6.d
2.d	Purchase a generator for the Highway 53 treatment plant	City of Winder Water Department and EMA		✓	✓	✓	✓		✓		Public and private grants and/or local budgets	\$350,000	60 months	None; other projects have taken priority	6.e
2.e	Purchase a generator for Barrow County Fire Department Stations 1, 4, 5, and 7	EMA and Barrow County Fire Department		✓	✓	✓	✓		✓		Public and private grants and/or local budgets	\$75,000 each	60 months	Generator purchased for station 3 in 2023	6.f (mod)
2.f	Purchase generator for all critical facilities in Barrow County and municipalities	EMA		✓	✓	✓	✓		✓		Public and private grants and/or local budgets	\$50 million	60+ months	Some purchased since last plan update	6.n (mod)
2.g	Add a generator at the Barrow County Sheriff's Office	EMA and Barrow County Sheriff's Office		✓	✓	✓	✓		✓		Public and private grants and/or local budgets	\$150,000	48 months	To be voted on	6.r

Strategy #	Mitigation Action	Lead and Supporting Agency, Department, Organization	Flood	Winter Weather	Thunderstorm	Tornado	Tropical Cyclone	Drought/Ex Temp	Geologic	Wildfire	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Previous Strategy #
2.h	Add a generator to the 8 th Street pump station in Satham	Satham Water Department and EMA		✓	✓	✓	✓		✓		Public and private grants and/or local budgets	\$35,000	36 months	In process	6.s
2.i	Encourage private care facilities to have generators	EMA		✓	✓	✓	✓		✓		Private grants and budgets	\$30,000 each	36 months	NEW	NEW
2.j	Purchase and install a generator at the Wimberly Center	EMA and Wimberly Center		✓	✓	✓	✓		✓		Public and private grants and/or local budgets	\$100,000	60 months	NEW	NEW
2.k	Purchase and install a generator at the Perry Rainey Center in Auburn for warming and cooling shelter operations	EMA and Perry Rainey Center		✓	✓	✓	✓	✓	✓		Public and private grants and/or local budgets	\$45,000	24 months	NEW	NEW
OBJECTIVE THREE: Minimize the damage to property and loss of life through natural resource protection activities															
3.a	Identify problem trees and prune or remove, as needed	Barrow County Public Works		✓	✓	✓	✓		✓	✓	Public and private grants and/or local budgets	Staff time	60 months	NEW	NEW
OBJECTIVE FOUR: Reduce damage to property and loss of life through the utilization of structural mitigation projects															
4.a	Replace culverts in Barrow County and all municipalities, as needed	Barrow County and municipal Public Works/Stormwater departments	✓		✓		✓				Public and private grants and/or local budgets	\$10 million	60 months	Completed as needed	1.o

Strategy #	Mitigation Action	Lead and Supporting Agency, Department, Organization	Flood	Winter Weather	Thunderstorm	Tornado	Tropical Cyclone	Drought/Ex Temp	Geologic	Wildfire	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Previous Strategy #
4.b	Explore building a roundabout for the Highway 11 and Highway 53 intersection	Georgia DOT and City of Winder Planning Department	✓	✓	✓		✓				Public and private grants and/or local and state budgets	\$7.5 million	60 months	Funding from DOT in place; projects on hold.	6.i
4.c	Increase culvert sizes, as needed	Auburn Public Works	✓		✓		✓				Public and private grants and/or local budgets	\$2 million	60 months	NEW	NEW
4.d	Develop drainage solution for the Center Street under pass and implement	Barrow County Public Works	✓		✓		✓				Public and private grants and/or local budgets	Dependent on Solution	60 months	NEW	NEW
OBJECTIVE FIVE: Increase the ability of Barrow County and the citizens to respond to natural and manmade hazards through emergency services measures															
5.a	Obtain address attributes for the “road centerline” map layer to achieve the full benefits of GIS technology within the county and municipalities	GIS	✓								Public and private grants and/or local budgets	\$8,000	36 months	20% complete	1.d
5.b	Develop a policy for response personnel notifying 911 of any road or bridge hazard or area that appears to be experiencing flooding	911	✓		✓		✓				Local budgets	Staff time	24 months	Not in place as an official policy	1.e
5.c	Continue annual inspection of culverts in Barrow County	Barrow County Public Works	✓		✓		✓				Local budgets	Staff time	12 months	20% done annually for a five year rotation cycle	1.n

Strategy #	Mitigation Action	Lead and Supporting Agency, Department, Organization	Flood	Winter Weather	Thunderstorm	Tornado	Tropical Cyclone	Drought/Ex Temp	Geologic	Wildfire	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Previous Strategy #
5.d	Perform a stormwater study to determine the best culvert sizes and types to meet the stormwater needs of Barrow County and all municipalities	Barrow County and municipal Public Works departments	✓		✓		✓				Public and private grants and/or local budgets	\$500,000	60 months	Barrow County done as needed; Winder does as needed; City of Statham performing study	1.p
5.e	Continue to renew StormReady designation on cycle as required by NWS	EMA			✓	✓	✓				Local budgets	Staff time	36 months	Last completed in 2023	2.b
5.f	Maintain drought contingency plan and review outdoor watering ban regulations as part of update	Barrow County and municipal water departments						✓			Local budgets	Staff time	30 months	Upper Oconee Water Authority updates plan annually	4.b and 4.c
5.g	Preplan for drought conditions when designing water systems	Barrow County and municipal water departments						✓			Local budgets	Staff time	60 months	3 water tanks in place since last plan	4.c
5.h	Increase inspection rate on water tanks, water lines, and water mains for small leaks and repair, as needed	Barrow County and municipal water departments						✓		✓	Local budgets	Staff time	48 months	Exploring meter technology that identifies possible leaks	4.f

Strategy #	Mitigation Action	Lead and Supporting Agency, Department, Organization	Flood	Winter Weather	Thunderstorm	Tornado	Tropical Cyclone	Drought/Ex Temp	Geologic	Wildfire	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Previous Strategy #
5.i	Explore additional water source opportunities	Barrow County and municipal water departments						✓			Public and private grants and/or local budgets	Dependent on findings	60 months	Winder updating water treatment facility and exploring alternate water sites; Auburn working on producing their own water; Statham updating Spring House	4.g
5.j	Update the Barrow County Community Wildfire Protection Plan	Georgia Forestry Commission								✓	State budgets	Staff time	36 months	None; Other projects have taken priority	4.i
5.k	Update the Local Emergency Operations Plan every four years	EMA	✓	✓	✓	✓	✓	✓	✓	✓	Local budgets	Staff time	48 months	Anticipated update in 2025	5.b
5.l	Identify key facilities for potential EOCs and provide emergency maps and logistical supplies	EMA	✓	✓	✓	✓	✓	✓	✓	✓	Local budgets	Staff time	30 months	Fire Marshals have been working to update maps; 50% complete	5.c
5.m	Continue to keep critical facility information up to date in GMIS	EMA	✓	✓	✓	✓	✓	✓	✓	✓	Local budgets	Staff time	12 months	Completed for this plan update	5.f

Strategy #	Mitigation Action	Lead and Supporting Agency, Department, Organization	Flood	Winter Weather	Thunderstorm	Tornado	Tropical Cyclone	Drought/Ex Temp	Geologic	Wildfire	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Previous Strategy #
5.n	Update American Red Cross sheltering survey database for Barrow County	American Red Cross and EMA		✓	✓	✓	✓		✓	✓	Local and private budgets	Staff time	18 months	None; other projects have taken priority	5.g
5.o	Increase CERT coordination with ARES and the American Red Cross	CERT, ARES, EMA, and American Red Cross		✓	✓	✓	✓				Local and private budgets	Staff time	24 months	Incorporated trainings with Hall and Jackson Counties in 2024; 3 CERT are now ARES	5.h
5.p	Form partnership with local organizations, churches, and/or houses of worship to identify sites for evacuation and post-impact sheltering	EMA and local organizations	✓	✓	✓	✓	✓	✓	✓	✓	Local and private budgets	Staff time	24 months	Some done with local school system	5.i
5.q	Purchase mobile electronic signs	EMA and local response agencies	✓	✓	✓	✓	✓		✓	✓	Public and private budgets and/or local budgets	\$75,000	30 months	4 purchased by Barrow Co in 2024; Winder purchased 1 in 2022; Auburn purchased 2	5.j (mod)
5.r	Purchase chippers for county and municipal public works agencies	Barrow County and municipal Public Works			✓	✓	✓		✓		Public and private grants and/or local budgets	\$750,000	60 months	Barrow County has 2; Statham has 1 that needs replacement	5.k

Strategy #	Mitigation Action	Lead and Supporting Agency, Department, Organization	Flood	Winter Weather	Thunderstorm	Tornado	Tropical Cyclone	Drought/Ex Temp	Geologic	Wildfire	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Previous Strategy #
5.s	Hold EOC/ESF training through GEMA for Barrow County and municipal agencies so they understand disaster roles more clearly	EMA, GEMA, and local agencies	✓	✓	✓	✓	✓	✓	✓	✓	Local and State budgets	Staff time	36 months	ICS/EOC Interface class held twice in last 5 yrs by GEMA	5.l
5.t	Host pre-disaster training for county and municipal finance and records management personnel and for administrative personnel	EMA	✓	✓	✓	✓	✓	✓	✓	✓	Local and state budgets	Staff time	48 months	None; other projects have taken priority	5.n and 5.o
5.u	Update the City of Auburn COOP, as needed	City of Auburn Administration	✓	✓	✓	✓	✓	✓	✓	✓	Local budgets	Staff time	60 months	None; other projects have taken priority	6.g
5.v	Update the Barrow County COOP every 5 years and as needed	EMA	✓	✓	✓	✓	✓	✓	✓	✓	Local budgets	Staff time	60 months	Updated in 20023	6.h (mod)
5.w	Update electronic backup records, as needed, for Barrow County	Board of Commissioners	✓	✓	✓	✓	✓	✓	✓	✓	Public and private grants and/or local budgets	\$50,000	48 months	Currently performed by 3 rd party vendor	6.j
5.x	Have the Historical Society take video and pictures of county buildings to record in case of damage	Barrow County Historical Society and Barrow County Administration	✓	✓	✓	✓	✓	✓	✓	✓	Local budgets	Staff time	48 months	None; Other projects have taken priority	6.k
5.y	Have the Historical Society take video and pictures of Auburn buildings to record in case of damage	Barrow County Historical Society and City of Auburn Administration	✓	✓	✓	✓	✓	✓	✓	✓	Local budgets	Staff time	48 months	None; Other projects have taken priority	6.l

Strategy #	Mitigation Action	Lead and Supporting Agency, Department, Organization	Flood	Winter Weather	Thunderstorm	Tornado	Tropical Cyclone	Drought/Ex Temp	Geologic	Wildfire	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Previous Strategy #
5.z	Update Barrow County Emergency Management ordinances to reflect the activation and declaration of local states of emergency	EMA and Board of Commissioners	✓	✓	✓	✓	✓	✓	✓	✓	Local budgets	Staff time	30 months	Ordinances have been reviewed	6.m
5.aa	Review existing pre-disaster debris contracts	Barrow County Purchasing, Public Works, Stormwater		✓	✓	✓	✓		✓	✓	Local budgets	Staff time	30 months	Contracts in place for Debris	6.o (mod)
5.bb	Encourage all county and municipal agencies to participate in each other-s emergency initiatives to show a united front	EMA and all response agencies	✓	✓	✓	✓	✓	✓	✓	✓	Local budgets	Staff time	18 months	In place through LEPC meetings and initiatives	6.p
5.cc	Identify internal and external stakeholders and educate them about emergency management plans and operations	EMA	✓	✓	✓	✓	✓	✓	✓	✓	Local budgets	Staff time	12 months	In place through LEPC meetings	6.q
5.dd	Test community communications system	911	✓	✓	✓	✓	✓	✓	✓	✓	Local budgets	Staff time	18 months	NEW	NEW
5.ee	Solidify rental equipment options	Barrow County and municipal purchasing departments	✓	✓	✓	✓	✓	✓	✓	✓	Local budgets	Staff time	24 months	NEW	NEW
5.ff	Purchase drones for damage assessment and search and rescue operations for Barrow County and municipalities	EMA and municipal response agencies	✓	✓	✓	✓	✓		✓	✓	Public and private grants and/or local budgets	\$75,000	36 months	NEW	NEW

Strategy #	Mitigation Action	Lead and Supporting Agency, Department, Organization	Flood	Winter Weather	Thunderstorm	Tornado	Tropical Cyclone	Drought/Ex Temp	Geologic	Wildfire	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Previous Strategy #
5.gg	Purchase debris removal equipment, including dump trucks, chainsaws, skidsteers, etc.	Barrow County and municipal Public Works		✓	✓	✓	✓		✓		Public and private grants and/or local budgets	\$3 million	60 months	NEW	NEW
5.hh	Designate animal emergency shelters for pets and livestock	Animal Control and EMA	✓	✓	✓	✓	✓	✓	✓	✓	Local budgets	Staff time	60 months	NEW	NEW
5.ii	Create a livestock emergency plan	Animal Control and Department of Ag	✓	✓	✓	✓	✓	✓	✓	✓	Local and State budgets	Staff time	48 months	NEW	NEW
5.jj	Purchase brine tanks and winter weather response trucks	Barrow County and municipal Public Works		✓							Public and private grants and/or local budgets	\$750,000	60 months	NEW	NEW
5.kk	Identify warming and cooling center locations	EMA		✓				✓			Local budgets	Staff time	30 months	NEW	NEW
5.ll	Purchase barricades and mobile electronic signage for the City of Satham	Satham Public Works	✓	✓	✓	✓	✓		✓	✓	Public and private grants and/or local budgets	\$75,000	36 months	NEW	NEW
5.m m	Create an Emergency Action Plan for the Sunflower Festival in Satham	City of Satham public safety agencies and EMA			✓	✓	✓		✓	✓	Local budgets	Staff time	12 months	NEW	NEW
5.nn	Hold shelter training sessions with Wimberly Center staff	ARC, EMA, and Wimberly Center		✓	✓	✓	✓		✓	✓	Local and private budgets	Staff time	18 months	NEW	NEW

Strategy #	Mitigation Action	Lead and Supporting Agency, Department, Organization	Flood	Winter Weather	Thunderstorm	Tornado	Tropical Cyclone	Drought/Ex Temp	Geologic	Wildfire	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Previous Strategy #
5.00	Expand water capabilities in the City of Auburn	City of Auburn Administration						✓			Public and private grants and/or local budgets	\$3 million	60 months	NEW	NEW
5.pp	Expand current weather station system at Barrow County Schools	Barrow County Schools and EMA		✓	✓	✓	✓				Public and private grants and/or local budgets	\$50,000	60 months	NEW	NEW
5.qq	Update and expand the Emergency Operations Center	EMA	✓	✓	✓	✓	✓	✓	✓	✓	Public and private grants and/or local budgets	\$700,000	60 months	NEW	NEW
5.rr	Outfit alternate EOC with essential equipment	EMA	✓	✓	✓	✓	✓	✓	✓	✓	Public and private grants and/or local budgets	\$100,000	60 months	NEW	NEW
OBJECTIVE SIX: Increase public education and awareness of natural disasters															
6.a	Promote NFIP to the public utilizing maps in the Planning and Zoning Office, including providing copies of FIRM maps for location	Planning and Zoning and GIS	✓								Local budgets	Staff time	24 months	Provided when requested by public	1.b
6.b	Pursue the purchase of NOAA Weather Radios for low-income residents in Satham and Auburn	Satham and Auburn City Councils		✓	✓	✓					Public and private grants and/or local budgets	\$3,000 each city	30 months	NEW	NEW
6.c	Purchase NOAA Weather radios for elderly and low-income persons and for locations with large gatherings of people	EMA		✓	✓	✓					Public and private grants and/or local budgets	\$5,000	30 months	Some have been purchased and made available	2.a and 2.c (mod)

Strategy #	Mitigation Action	Lead and Supporting Agency, Department, Organization	Flood	Winter Weather	Thunderstorm	Tornado	Tropical Cyclone	Drought/Ex Temp	Geologic	Wildfire	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Previous Strategy #
6.d	Revise public awareness documents to encourage the public to examine their homeowners policies and rental insurance policies to ensure they have adequate coverage for all natural hazards	EMA	✓	✓	✓	✓	✓		✓	✓	Local budgets	Staff time	30 months	Has been included in public education information in past	3.a , 3.b , and 3.c (mod)
6.e	Promote the National Weather Service StormSpotter classes	EMA and NWS			✓	✓					Local and federal budgets	Staff time	12 months	Has promoted virtual classes with NWS cutting back in-person offerings	3.d
6.f	Educate the public about the utilization of NOAA Weather Radios	EMA		✓	✓	✓					Local budgets	Staff time	12 months	Presentation for the City of Auburn in 2024; Social media campaign	3.f
6.g	Encourage the public to sign up for the mass notification system	EMA	✓	✓	✓	✓	✓			✓	Local budgets	Staff time	12 months	Presentation for the City of Auburn in 2024; Social media campaign	3.g
6.h	Encourage water customers to conserve as much water as possible and utilize water efficient practices	Barrow County and municipal water systems						✓			Local budgets	Staff time	12 months	Done via social media	4.d

Strategy #	Mitigation Action	Lead and Supporting Agency, Department, Organization	Flood	Winter Weather	Thunderstorm	Tornado	Tropical Cyclone	Drought/Ex Temp	Geologic	Wildfire	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Previous Strategy #
6.i	Coordinate a community “clean-up” day and encourage individual landowners to create a fire safe environment through vegetation maintenance and removal	Keep Barrow Beautiful, Barrow County and municipal fire departments, Georgia Forestry Commission	✓		✓	✓	✓		✓	✓	Local, private, and state budgets	Staff time	18 months	Annual clean-up day coordinated by Keep Barrow Beautiful; Auburn and Statham have one 2x a year; Bethlehem has annual event; promote on social media	4.h
6.j	Offer the public and private sector and commercial businesses assistance the development of safety plans specific to their areas for natural hazards	EMA and local response agencies	✓	✓	✓	✓	✓	✓	✓	✓	Local budgets	Staff time	30 months	Law enforcement agencies have assisted with acts of violence hazards	5.e
6.k	Begin a public education/awareness campaign on the realities of Artificial Intelligence	Barrow County and municipal governments	✓	✓	✓	✓	✓	✓	✓	✓	Local budgets	Staff time	18 months	NEW	NEW

Strategy #	Mitigation Action	Lead and Supporting Agency, Department, Organization	Dam Failure	Hazardous Materials	Terrorism/Civil	Transportation	Infrastructure Failure	Emer. Disease	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Previous Strategy #
OBJECTIVE SEVEN: Minimize the impact of a dam breach on local citizens, industry, and infrastructure													
7.a	Ensure all Category I dams have an EAP in place and review every two years	EMA and Georgia Safe Dams	✓		✓		✓		Local and State budgets	Staff time	24 months	In place; continue	8.a
7.b	Develop an Emergency Action Plan for the new Auburn Reservoir dam, once completed	EMA and City of Auburn	✓		✓		✓		Local budgets	Staff time	Upon completion of Reservoir	NEW	NEW
OBJECTIVE EIGHT: Implement additional protective measures and capabilities in response to manmade incidents													
8.a	Develop a report of needed equipment, apparatus, training, and manpower to response to a hazardous materials event and purchase, as needed	Barrow County and municipal fire departments		✓	✓	✓		✓	Public and private grants and/or local budgets	\$250,000	60 months	None; other projects have taken priority	7.a
8.b	Create an annex to the EOP to develop protocols for a railroad emergency	EMA		✓	✓	✓			Local budgets	Staff time	48 months	None; Other projects have taken priority	7.b
8.c	Continue to work with CSX to determine rail cargo hazards that pass through Barrow County	EMA		✓	✓	✓			Local and private budgets	Staff time	36 months	CSX teaches class annually for responders about railroad hazards and safety	7.c

Strategy #	Mitigation Action	Lead and Supporting Agency, Department, Organization	Dam Failure	Hazardous Materials	Terrorism/Civil	Transportation	Infrastructure Failure	Emer. Disease	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Previous Strategy #
8.d	Establish water system safety and security analysis for the City of Auburn	Auburn Water Department		✓	✓		✓		Public and private grants and/or local budgets	\$10,000	36 months	Developing with new water system implementation	7.d
8.e	Establish water system safety and security analysis for Barrow County	Barrow County Water Department		✓	✓		✓		Public and private grants and/or local budgets	\$10,000	36 months	None; other projects have taken priority	7.e
8.f	Establish water system safety and security analysis for the City of Statham	Statham Water Department		✓	✓		✓		Public and private grants and/or local budgets	\$10,000	36 months	Implementing software for awareness	7.f
8.g	Perform a security assessment at the Northeast Georgia Medical Center – Barrow and increase security to meet recommendations	Northeast Georgia Medical Center – Barrow			✓			✓	Public and private grants and/or private budgets	Dependent on Assessment	30 months	None; other projects have taken priority	7.g
8.h	Train on interoperability with hospital security personnel	Barrow County law enforcement agencies			✓			✓	Local and private budgets	Staff time	30 months	Tabletop Exercise completed in 2019	7.i
8.i	Enhance security at the Barrow County 911 Center	Barrow County 911			✓		✓		Public and private grants and/or local budgets	\$15,000	42 months	Card access in place; 65% complete	7.l

Strategy #	Mitigation Action	Lead and Supporting Agency, Department, Organization	Dam Failure	Hazardous Materials	Terrorism/Civil	Transportation	Infrastructure Failure	Emer. Disease	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Previous Strategy #
8.j	Perform an analysis of employee safety and building security at all government facilities and implement any recommendations determined	Barrow County and municipal administrations		✓	✓		✓		Public and private grants and/or local budgets	Determined by assessment	60 months	Some updates completed	7.j and 7.k (mod)
8.k	Upgrade natural gas infrastructure	Barrow County gas providers		✓	✓		✓		Public and private grants and/or local budgets	\$10 million	60+ months	NEW	NEW
8.l	Increase number of staff in Barrow County IT and cybersecurity department	Barrow County IT			✓		✓		Local budgets	\$250,000	60 months	NEW	NEW
8.m	Harden Barrow County IT systems and networks for county and all municipalities	Barrow County and municipal IT departments			✓		✓		Public and private grants and/or local budgets	\$5 million	60 months	NEW	NEW
8.n	Create a cybersecurity task force with Barrow County, municipalities, and school system	Barrow County, municipal, and school system IT Departments			✓				Local budgets	Staff time	24 months	NEW	NEW
8.o	Implement weekly cybersecurity trainings	Barrow County IT			✓				Local budgets	Staff time	30 months	NEW	NEW

Strategy #	Mitigation Action	Lead and Supporting Agency, Department, Organization	Dam Failure	Hazardous Materials	Terrorism/Civil	Transportation	Infrastructure Failure	Emer. Disease	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Previous Strategy #
8.p	Implement cyberterrorism awareness training program for all staff and elected officials in the City of Statham	City of Statham Council			✓				Local budgets	Staff time	18 months	NEW	NEW
8.q	Expand the ability of Barrow County, municipalities, and the Barrow County School System to respond to an acts of violence incident	EMA, School System, all public safety agencies			✓				Public and private grants and/or local budgets	\$2.5 million	30 months	NEW	NEW
OBJECTIVE NINE: Increase public awareness of local manmade hazards and proper response to those hazards													
9.a	Continue the implementation of LEPC with county and municipal leaders	EMA and LEPC		✓	✓		✓		Local budgets	Staff time	12 months	LEPC in place; meets quarterly	5.m

Completed Mitigation Strategies

Previous Strategy #	Strategy Description	Status
1.m	Obtain NFIP Compliance (City of Carl)	COMPLETE
2.b	Renew StormReady designation every 3 years	COMPLETE; in 2023
4.a	Utilize air curtain for prescribed burns and GFC Wildfire support operations	COMPLETE
5.a	Open discussion with American Red Cross regarding shelter operations and expectations/abilities of ARC shelters	COMPLETE
5.f	Keep critical facility information updated in GMIS database	COMPLETE as part of Hazard Mitigation Plan Update process
6.h	Create a COOP for Barrow County	COMPLETE
7.c	Work with CSX to determine rail cargo hazards that pass through Barrow County	COMPLETE
7.h	Create and/or implement an electronic locking system that allows the hospital to be locked down quickly and efficiently	COMPLETE

Deleted Mitigation Strategies

Previous Strategy #	Strategy Description
1.q	Build a flood wall near Spring House Senior Living Facility
3.e	Establish a “Hazard identification, Preparedness, and Mitigation” section in the local libraries to increase local awareness of hazard
5.d	Create local emergency action plan in accordance with NIMS standards
5.p	Purchase foam truck for airport fire response operations
5.q	Purchase foam creation and application device for airport fire response capabilities
6.b	Purchase a generator for the Town of Bethlehem

CHAPTER FIVE – MAINTENANCE AND IMPLEMENTATION

Summary of Updates for Chapter Five

The following table provides a description of each section of this chapter, and a summary of the changes that have been made to the Barrow County Hazard Mitigation Plan 2019.

Chapter 5 Section	Updates
Maintenance	Content Revised
Plan Distribution	Content Revised
Implementation	Content Revised
Evaluation	Content Revised
Peer Review	Content Revised
Plan Update	Content Revised
Conclusion	Content Revised

Maintenance

Requirement §201.6(c)(4)(iii)

To adhere to best practices, state and federal guidelines, and lessons learned, the Barrow County Hazard Mitigation Plan Update Committee has developed a method to ensure the regular review and update of the Plan occurs. Plan maintenance protocols identified during the 2019 Barrow County Hazard Mitigation Plan was followed, to the best abilities of Barrow County and its municipalities. This most importantly included an increased attempt for public participation and inclusion in the planning process. The Barrow County Hazard Mitigation Plan Update Committee will reconvene annually in February to monitor and evaluate the progress of the mitigation strategies in the Plan. Barrow County's Homeland Security and Emergency Management Director, Sharon Courson, will be responsible for implementing this meeting. The Committee will discuss the following questions annually:

- Do the goals address current and expected hazards and conditions?
- Are the goals and objectives still relevant to Barrow County?
- Has the nature or magnitude of risks changed?
- Does the risk assessment portion of the Plan need to be updated or modified?
- Are the goals and objectives meeting changes in state and federal policy?
- Are the current resources appropriate for implementing the Plan?
- Are there local implementation problems, such as technical, political, legal, or coordination issues with other agencies?
- Did the jurisdictions, agencies, and other partners participate in the plan implementation process as proposed?

The responsible parties for various mitigation strategies will provide a report during this annual meeting regarding the following:

- How well did the implementation processes work?
- Were any difficulties encountered during implementation?
- How successful was the coordination of efforts?
- Are there any suggestions for revision of any strategies?

Barrow County's Emergency Management Director will send the minutes from this annual meeting to the Barrow County Board of Commissioners for review.

If there are any updates or modifications to the Barrow County Hazard Mitigation Plan, the Emergency Management Director will forward the changes to the Georgia Emergency Management Agency's Hazard Mitigation Officer. All annual reviews of the Barrow County Hazard Mitigation Plan will be open to the public. These meetings will be advertised both in the local newspapers, but also on signage in the publicly used facility hosting the meeting.

Maintenance Log

Revision Date	Revised Section	Reason for Revision	Revised By
2024-2025	Five Year Hazard Mitigation Plan Update	FEMA Requirement	Barrow County Hazard Mitigation Planning Committee with assistance from Lux Mitigation and Planning

Plan Distribution

This Plan will be distributed, but not limited, to the following departments and organizations within Barrow County:

Barrow County Board of Commissioners
Barrow County Emergency Management Agency
Barrow County Sheriff's Office
Barrow County Public Works
Barrow County Roads & Bridges
Barrow County Planning and Community Development
Barrow County Fire Department
Barrow County Emergency Communications
City of Auburn
City of Statham
City of Winder
Town of Bethlehem
Town of Braselton
Town of Carl

A printed copy of the approved Plan will be available for viewing at the Barrow County Emergency Management Agency.

Implementation

Requirement §201.6(c)(4)(ii)

Each jurisdiction participating in the Barrow County Hazard Mitigation Plan is responsible for implementing specific mitigation actions as prescribed in this plan. In the Mitigation Strategies section, every proposed strategy is assigned to a specific local department or agency to assign responsibility and accountability and increase the likelihood of subsequent implementation.

In addition to the designation of a local lead department or agency, some strategies have secondary or assisting department or agencies listed as well. This allows for a sharing of responsibility and coordination of effort for some of the identified strategies that cross lines of departmental responsibility. The completion date has been assigned to assess whether identified mitigation strategies are being implemented in a timely fashion.

Barrow County will seek outside funding sources to implement mitigation projects in both the pre-disaster and post-disaster environments. When applicable, potential funding sources have been identified and targeted for the proposed actions listed in the mitigation strategies. It will be the responsibility of each participating jurisdiction to determine additional implementation procedures beyond those listed within the Barrow County Hazard Mitigation Plan.

This plan, as a joint within Barrow County and will serve as a comprehensive mitigation plan. The mitigation strategies, hazard identification, and other information identified in this plan will be integrated into all comprehensive Barrow County plans in the future. Incorporation of these strategies will occur, as necessary, throughout this planning cycle covered by this Hazard Mitigation Plan Update. Aspects of this plan will be integrated into the Barrow County Comprehensive Plan during the next planning cycle.

Identified hazards and mitigation strategies of the 2019 Barrow County Hazard Mitigation plan were integrated into the Local Emergency Operations Plan, multiple County and City SOPs and SOGs, and future planning and zoning plans. Barrow County and the municipalities of Auburn, Bethlehem, Braselton, Carl, Statham, and Winder will integrate mitigation strategies identified in this plan into the Barrow County Comprehensive Plan, Community Wildfire Protection Plan, Continuity of Operations Plan, and other future plans. Strategies identified in the previous plan were applied to grant applications, building and zoning requirements, and development planning considerations for Barrow County and all municipalities. Once this plan is approved, it will be used by the consultants and planning committees responsible for the update process for the County and City Comprehensive Plans, Short-Term Work Programs, and all other plans that could incorporate the requirements of this plan. To facilitate the inclusion of this Plan, the Barrow County Board of Commissioners and the Municipalities of Auburn, Bethlehem, Braselton, Carl, Statham, and Winder will provide a copy to the persons and/or committees responsible for writing and updating plans. Many of these strategies will be applied using previously identified policies and ordinances, including the NFIP compliance ordinances and water-use ordinances, which have now been applied countywide. All jurisdictions have the authority to adopt locally binding ordinances and policies to enhance the mitigation strategies in their jurisdiction.

The Legal and Regulatory Capability survey documents authorities available to the jurisdiction and/or enabling legislation at the state level affecting planning and land management tools that support local hazard mitigation planning efforts. The identified planning and land management tools are typically used by states and local jurisdictions to implement hazard mitigation activities.

Regulatory Tools/Plans	Regulatory Type: Ordinance, Resolution, Codes, Plans, Etc.	Local Authority	State Prohibited	Higher Authority
Building Codes	Barrow County Code; Auburn, Bethlehem, Braselton, Carl, Statham, and Winder codes and ordinances	Yes	No	No
Capital Improvements Plan		Yes	No	No
Comprehensive Plan	Barrow County Joint Comprehensive Plan (Includes Bethlehem, Carl, and Statham); City of Winder Comprehensive Plan; Town of Braselton Comprehensive Plan; City of Auburn Comprehensive Plan	Yes	No	No
Economic Development Plan	Barrow County Joint Comprehensive Plan (Includes Bethlehem, Carl, and Statham); City of Winder Comprehensive Plan; Town of Braselton Comprehensive Plan; City of Auburn Comprehensive Plan	Yes	No	Yes
Emergency Management Accreditation Program		No	No	Yes
Emergency Response Plan	Barrow County Local Emergency Operations Plan (LEOP)	Yes	No	Yes
Flood Management Plan		Yes	No	No
Historic Preservation		Yes	No	No
National Flood Insurance Program Participation		Yes	No	Yes
Continuity of Government/Operations Plan		No	No	No
Post-Disaster Ordinance		Yes	No	No
Zoning Ordinances	Barrow County Code; Auburn, Bethlehem, Braselton, Carl, Statham, and Winder codes and ordinances	Yes	No	No

Opportunities to integrate the requirements of this Plan into other local planning mechanisms shall continue to be identified. Although it is recognized that there are many possible benefits to integrating components of this Plan into other local planning mechanisms, the development and maintenance of this stand-alone Hazard Mitigation Plan is deemed by the Barrow County Hazard Mitigation Planning Committee to be the most effective and appropriate method to implement local hazard mitigation actions at this time.

Evaluation

Requirement §201.6(c)(4)(i)

Periodic revisions and updates of the Barrow County Hazard Mitigation Plan may be required to ensure that the goals of this plan are kept current with federal, state, and local regulations. These revisions should also consider any potential changes in the hazard vulnerability and mitigation priorities of Barrow County.

The Barrow County Hazard Mitigation Plan Update Committee will meet annually to review the Barrow County Hazard Mitigation Plan. During this annual review, mitigation strategies will be reviewed to evaluate the progress that has occurred for each identified mitigation strategy. The Barrow County Hazard Mitigation Plan Update Committee will also meet following any disaster event to review the identified mitigation strategies for that hazard and determine if timelines should be adjusted or additional mitigation strategies should be identified and added to the plan. These steps will ensure that the Barrow County Hazard Mitigation Plan is continuously updated to allow for changes in hazard vulnerabilities and identified mitigation strategies. The Barrow County Hazard Mitigation Plan Update Committee will complete all evaluations of the Barrow County Hazard Mitigation Plan.

Peer Review

State Requirement Element F1

To maintain standards of quality, improve performance, and provide credibility to the Barrow County Hazard Mitigation Plan Update, representatives of local emergency management agencies bordering Barrow County conducted a peer review of the Plan. The peer review of this Plan constitutes a form of self-regulation, accountability, and new insights offered by qualified professionals in neighboring communities, which face many of the same natural and man-made hazards.

The Barrow County Hazard Mitigation Plan Update was peer reviewed by:

Brian Bullock Director Jackson County Emergency Management Agency	Date
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Carl Morrow Director Walton County Emergency Management Agency	Date
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CJ Worden Director Oconee County Emergency Management Agency	Date
--	------

Michael Shaw Director Gwinnett County Emergency Management Agency	Date
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Plan Update

Requirement §201.6(c)(4)(i)

The Federal Disaster Mitigation Act of 2000 requires that the Hazard Mitigation Plan be updated at least once every five years. The Barrow County Emergency Management Agency is the department responsible with ensuring this requirement is met. The Barrow County Hazard Mitigation Plan Update Committee will be involved in this future process and will aid the Barrow County Emergency Management Agency in ensuring that all jurisdictions provide input into the planning process. The public will be invited to participate in the planning process through public hearings to be held whenever major updates to this plan are needed and during annual review meetings. This plan will expire in the second quarter of 2030; therefore, the approval and adoption of the next plan update must be completed before that time.

In the first quarter of 2029, Barrow County plans to begin the Hazard Mitigation Plan Update process for the fourth time. This planning process will include bi-monthly meetings to accomplish the identified goals of the Barrow County Hazard Mitigation Plan Update. This process will be headed up by the Barrow County Emergency Management Agency. The Barrow County Hazard Mitigation Planning Committee will follow a similar process as was undertaken during this planning cycle to complete all FEMA and GEMA requirements for the Hazard Mitigation Plan Update. This process will be completed by the first quarter of 2030 to meet all identified planning deadlines.

Conclusion

As a result of the hazard mitigation planning process Barrow County, as well as additional participating organizations have gained significant information and knowledge regarding Barrow County's disaster history, natural and technological hazards, vulnerabilities, and potential strategies to lessen the impacts of the identified hazards.

One consistent theme identified by the Barrow County Hazard Mitigation Planning Committee was the inability to consistently identify geographic locations that were more vulnerable to most hazards due to the widespread potential effects and random impact areas of each hazard. This was exceedingly true for most natural hazards. Recognizing this challenge, the Barrow County Hazard Mitigation Plan Update Committee determined it was best to identify many mitigation goals, objectives, and strategies that were both general and specific in nature. These strategies allow the Barrow County Hazard Mitigation Plan Update Committee to adopt strategies that will have the greatest positive effect on the greatest amount of the population.

The Barrow County Hazard Mitigation Planning Committee adopted strategies in all six of the major mitigation categories: Prevention, Property Protection, Natural Resource Protection, Structural Projects, Emergency Services, and Public Education and Awareness. Emergency Services comprised the greatest number (55%) of the mitigation strategies identified by Barrow County.

**Barrow County Hazard Mitigation Plan Update
Committee Meeting #1**

Sign-In Sheet

Wednesday, June 12, 2024

Name/Title	Signature	E-mail Address	Agency/Organization
Penny Clark / EMA Director		P.Clark@barrowga.org	Barrow Co.
John Skinner		JohnSkinner@barrow.k12.ga.us	Barrow County School
Rick Bequemoore		MAYOR@CITYOFALBUQUERQUE.ORG	Albuquerque
Chris Hoose		"	"
Yc Calhoun		Yc.Calhoun@barrowga.org	CFMA
Alvin Simmons		-	B.P.D.
Matt Treter		mtreter@barrowga.org	Barrow Co.
Rob Curt		rob.curt@cityofwindecc.com	Windecc PD
Josh Bowman		joshua.bowman@alphaga.gov	Northeast Health District
Scott Graham		Streckler@barrowga.org	Barrow County Roadside
Matt Whiting		matth.whiting@cityofwindecc.com	Windecc Fire
Beth M. Reynolds Director Der Sevier		beth.reynolds@cityofwindecc.com	Windecc

**Barrow County Hazard Mitigation Plan Update
Committee Meeting #1**

Sign-In Sheet

Wednesday, June 12, 2024

Name/Title	Signature	E-mail Address	Agency/Organization
Samantha McFarland Reg. Compliance	<i>Samantha McFarland</i>	<i>Samantha.McFarland@cityofwindler.com</i>	<i>City of Windler</i>
Ted Tilley Construction	<i>Ted Tilley</i>	<i>ted.tilley@cityofwindler.com</i>	<i>City of Windler</i>
Chris Jarcey	<i>C. Jarcey</i>	<i>chancey@barrowga.org</i>	<i>Barrow County</i>
Rebecca Whidden	<i>Rebecca Whidden</i>	<i>rwhidden@barrowga.org</i>	<i>Barrow County</i>
Debi Krause Mayor	<i>Debi Krause</i>	<i>dkrause@cityofstation.com</i>	<i>City of Station</i>
Michelle Yarn	<i>Michelle Yarn</i>	<i>myarn@windlerhousing.com</i>	<i>Windler Housing</i>
Maggie Craig Plant Manager	<i>Maggie S</i>	<i>maggie.craig@syensqo.com</i>	<i>Syensqo (Solway)</i>
Shadrine Westbrook	<i>Shadrine Westbrook</i>	<i>shadydalefc@bellsouth.net</i>	<i>Jasper Co. 911 Authority</i>

Barrow County Hazard Mitigation Plan Update
Committee Meeting #1

Sign-In Sheet

Wednesday, June 12, 2024

Name/Title	Signature	E-mail Address	Agency/Organization
Jeff Collins / STORMWATER MANAGER		Jeff.Collins@windermere	City of Windermere
Clint Cannon / Public Works Director		clint.cannon@cityofwindermere	City of Windermere
Gerard Brewer / City Engineer		gerard.brewer@windermere	" "
BRIAN STEWART		BSTEWART@BARROWGA.ORG	BARROW COUNTY
Tyler Murphy		T.Murphy@JacksonCountyGA.com	Jackson Co.

Barrow County Hazard Mitigation Plan Update Committee Meeting #1

Sign-In Sheet

Wednesday, June 12, 2024

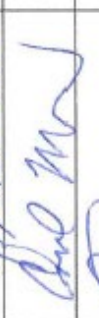
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Barrow County Hazard Mitigation Plan Update Committee Workshop #2

Sign-In Sheet

Wednesday, July 10, 2024

(2)

Name/Title	Signature	E-mail Address	Agency/Organization
✓ Amy Sherman, chair			BLFD
✓ Jessica Jackson, Transportation		jackson@barrowga.org	Barrow Public Works
✓ Matt Giudice		Matt.giudice@phg.ga.gov	NEHD
✓ JB Wheeler, EMA		JOSEPH.WHEELER@CO.WALTON.GA.US	WALTON CNTY EMA
✓ Carl Morrow		Carl.Morrow@Co.Walton.GA.US	Walton CNTY EMA
✓ John Skinner			Barrow County Schools
✓ Matt Truber		mtruber@barrowga.org	Barrow BOC
✓ Rebecca Whiddon		rwhiddon@barrowga.org	Barrow County
✓ Rick Revere		RAYOR@CITYOFBARROWGA.ORG	mayor CITY OF BARROW
✓ Maggie Craig		maggie.craig@syengo.com	Syengo
✓ Brian Steumer		BSTEUMER@BARROWGA.ORG	Barrow County
✓ Debi Krause		dkrause@cityofstatham.com	City of Statham

Plus. Mrs. Penny Clack, EMA Director attended - Labor Match Form available upon request.

pg. 1

**Barrow County Hazard Mitigation Plan Update
Committee Workshop #2**

Sign-In Sheet

Wednesday, July 10, 2024

Name/Title	Signature	E-mail Address	Agency/Organization
✓ Michael Piers/City Admin		mpiers@cityofbarrow.com	Barrow
✓ Susan Branstetter		susan.branstetter@barrowga.org	Barrow Health Dept
✓ Tina Phonerkeo		tina.phonerkeo@barrowga.org	BCHD
✓ Wes Geddings		wgeddings@barrowga.org	Barrow County
✓ Ted Tillery Supervisor		ted.tillery@cityofwinderich.com	City of Winderich
✓ Chris Chancey		chancey@barrowga.org	Barrow County
✓ Travis Brock Barrow		travis@barrowga.org	Town of Barrow

**Barrow County Hazard Mitigation Plan Update
Committee Workshop #2**

Sign-In Sheet

Wednesday, July 10, 2024

Name/Title	Signature	E-mail Address	Agency/Organization
Jeff Collins Barrow Mgt		jeff.collins@barrowga.gov	City of Winden
SRIRANTH YAMALA		SYAMALA@BARROWGA.ORG	BARROW COUNTY
Tyler Magesky		tmagesky@barrowga.gov	Jackson Co. Elyria
Matt Wilkins		matthew.wilkins@barrowga.gov	Winden Fire
Sabrina Westbrook		shadydweltc@bellsouth.net	Jasper Co. 911 Authority

✓
✓
✓
✓
✓

**Barrow County Hazard Mitigation Plan Update
Committee Workshop #3**

Sign-In Sheet ⑮

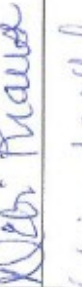
Tuesday, August 27, 2024

Name/Title	Signature	E-mail Address	Agency/Organization
✓ Capt. Rob Currott		rob.currott@cityofwinchester.com	Winchester PD
✓ Michelle Lam, Ex. Director		mylan@winchestersync.com	Winchester Housing
✓ CHIEF CHRIS HOOGE		CHOOGE@CITYOFWINCHESTER-VA.GOV	AUBURN
✓ MAYOR RICK ROQUEMORE		MAYOR@CITYOFWINCHESTER-VA.GOV	CITY OF AUBURN
✓ Matt Traylor		mttraylor@barrowga.org	Barrow Co.
✓ Scott Bratley		sbratley@barrowga.org	Barrow Co.
✓ Jessica Jackson		jackson@barrowga.org	Barrow Co.

**Barrow County Hazard Mitigation Plan Update
Committee Workshop #3**

Sign-In Sheet

Tuesday, August 27, 2024

Name/Title	Signature	E-mail Address	Agency/Organization
Alan Skinner			BLFD
John Skinner			BESS
Mark Whiting			Windsor Fire
Tina Provoked			BCTAP
Debi Krause			Shelham
Sabrina Westbrook			Jasper Co. 911 Authority

Barrow County Hazard Mitigation Plan Update Committee Workshop #3

Sign-In Sheet

Tuesday, August 27, 2024

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Appendix B – Natural Hazard Data Tables

Severe Thunderstorms

<u>Location</u>	<u>County/Zone</u>	<u>St.</u>	<u>Date</u>	<u>Time</u>	<u>Type</u>	<u>Mag</u>	<u>Dth</u>	<u>Ini</u>	<u>PrD</u>	<u>CrD</u>
Totals:							0	1	9.286M	0.00K
BARROW CO.	BARROW CO.	GA	07/10/1975	16:10	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
BARROW CO.	BARROW CO.	GA	06/23/1977	14:00	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
BARROW CO.	BARROW CO.	GA	06/16/1980	19:40	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
BARROW CO.	BARROW CO.	GA	11/12/1982	16:35	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
BARROW CO.	BARROW CO.	GA	07/25/1983	13:30	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
BARROW CO.	BARROW CO.	GA	05/02/1984	17:50	Hail	1.00 in.	0	0	0.00K	0.00K
BARROW CO.	BARROW CO.	GA	05/02/1984	17:50	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
BARROW CO.	BARROW CO.	GA	11/10/1984	18:05	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
BARROW CO.	BARROW CO.	GA	04/05/1985	19:50	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
BARROW CO.	BARROW CO.	GA	06/07/1985	16:00	Thunderstorm Wind	52 kts.	0	0	0.00K	0.00K
BARROW CO.	BARROW CO.	GA	03/13/1986	07:55	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
BARROW CO.	BARROW CO.	GA	05/07/1986	15:00	Hail	1.75 in.	0	0	0.00K	0.00K
BARROW CO.	BARROW CO.	GA	05/07/1986	15:15	Hail	1.75 in.	0	0	0.00K	0.00K
BARROW CO.	BARROW CO.	GA	06/09/1986	16:28	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
BARROW CO.	BARROW CO.	GA	04/23/1988	14:00	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
BARROW CO.	BARROW CO.	GA	06/18/1988	15:55	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
BARROW CO.	BARROW CO.	GA	04/04/1989	14:15	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
BARROW CO.	BARROW CO.	GA	06/05/1989	13:40	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
BARROW CO.	BARROW CO.	GA	02/10/1990	05:33	Thunderstorm Wind	52 kts.	0	0	0.00K	0.00K
BARROW CO.	BARROW CO.	GA	02/10/1990	05:50	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
BARROW CO.	BARROW CO.	GA	02/16/1990	06:50	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
BARROW CO.	BARROW CO.	GA	04/10/1990	17:30	Hail	0.75 in.	0	0	0.00K	0.00K
BARROW CO.	BARROW CO.	GA	06/22/1990	11:20	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
BARROW CO.	BARROW CO.	GA	07/08/1990	16:20	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
BARROW CO.	BARROW CO.	GA	08/22/1990	18:30	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
BARROW CO.	BARROW CO.	GA	04/27/1991	18:00	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
BARROW CO.	BARROW CO.	GA	04/29/1991	14:23	Hail	0.75 in.	0	0	0.00K	0.00K
BARROW CO.	BARROW CO.	GA	07/04/1991	11:15	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
BARROW CO.	BARROW CO.	GA	08/06/1991	19:30	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
BARROW CO.	BARROW CO.	GA	03/19/1992	11:54	Hail	0.88 in.	0	0	0.00K	0.00K
BARROW CO.	BARROW CO.	GA	03/19/1992	12:10	Hail	1.00 in.	0	0	0.00K	0.00K

BARROW CO.	BARROW CO.	GA	06/26/1992	12:30	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
BARROW CO.	BARROW CO.	GA	07/05/1992	16:40	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
Athens	BARROW CO.	GA	05/19/1993	07:50	Hail	1.75 in.	0	0	0.00K	0.00K
Winder	BARROW CO.	GA	04/19/1995	14:17	Thunderstorm Wind	0 kts.	0	0	0.25K	0.00K
Winder	BARROW CO.	GA	04/19/1995	14:20	Hail	1.75 in.	0	0	0.00K	0.00K
BARROW CO.	BARROW CO.	GA	06/11/1995	20:50	Thunderstorm Wind	0 kts.	0	0	1.00K	0.00K
Statham	BARROW CO.	GA	07/21/1995	17:17	Thunderstorm Wind	0 kts.	0	0	0.50K	0.00K
Winder	BARROW CO.	GA	09/01/1995	15:30	Thunderstorm Wind	0 kts.	0	0	0.50K	0.00K
Jefferson	BARROW CO.	GA	09/01/1995	15:45	Hail	1.75 in.	0	0	0.00K	0.00K
WINDER	BARROW CO.	GA	03/15/1996	15:10	Thunderstorm Wind		0	0	10.00K	0.00K
WINDER	BARROW CO.	GA	03/15/1996	15:10	Hail	1.00 in.	0	0	2.00K	0.00K
AUBURN	BARROW CO.	GA	03/19/1996	00:30	Hail	0.75 in.	0	0	0.00K	0.00K
WINDER	BARROW CO.	GA	05/06/1996	15:40	Hail	0.75 in.	0	0	0.00K	0.00K
BETHLEHEM	BARROW CO.	GA	02/21/1997	14:50	Thunderstorm Wind		0	0	2.00K	0.00K
BETHLEHEM	BARROW CO.	GA	03/05/1997	19:25	Thunderstorm Wind		0	0	3.00K	0.00K
STATHAM	BARROW CO.	GA	04/22/1997	14:05	Hail	0.80 in.	0	0	0.00K	0.00K
BETHLEHEM	BARROW CO.	GA	04/28/1997	16:30	Hail	1.00 in.	0	0	0.00K	0.00K
WINDER	BARROW CO.	GA	09/10/1997	18:34	Hail	0.88 in.	0	0	0.00K	0.00K
WINDER	BARROW CO.	GA	11/30/1997	18:30	Thunderstorm Wind		0	0	5.00K	0.00K
AUBURN	BARROW CO.	GA	02/17/1998	08:50	Hail	0.75 in.	0	0	0.00K	0.00K
WINDER	BARROW CO.	GA	04/08/1998	19:42	Hail	0.90 in.	0	0	0.00K	0.00K
AUBURN	BARROW CO.	GA	04/08/1998	22:10	Thunderstorm Wind		0	0	1.00K	0.00K
WINDER	BARROW CO.	GA	04/09/1998	01:25	Thunderstorm Wind		0	0	1.00K	0.00K
WINDER	BARROW CO.	GA	04/22/1998	15:50	Hail	0.75 in.	0	0	0.00K	0.00K
WINDER	BARROW CO.	GA	05/07/1998	09:50	Hail	0.88 in.	0	0	0.00K	0.00K
WINDER	BARROW CO.	GA	05/07/1998	18:06	Hail	1.00 in.	0	0	0.00K	0.00K
WINDER	BARROW CO.	GA	05/07/1998	18:10	Thunderstorm Wind		0	0	150.00K	0.00K
WINDER	BARROW CO.	GA	05/07/1998	20:23	Hail	1.75 in.	0	0	5.00K	0.00K
AUBURN	BARROW CO.	GA	05/07/1998	23:32	Hail	1.75 in.	0	0	2.00K	0.00K
AUBURN	BARROW CO.	GA	05/06/1999	08:27	Hail	0.75 in.	0	0	0.00K	0.00K
AUBURN	BARROW CO.	GA	05/13/1999	15:15	Hail	1.50 in.	0	0	0.00K	0.00K
BETHLEHEM	BARROW CO.	GA	06/29/1999	16:15	Thunderstorm Wind		0	0	1.00K	0.00K
WINDER	BARROW CO.	GA	09/21/1999	14:15	Hail	1.00 in.	0	0	0.00K	0.00K
STATHAM	BARROW CO.	GA	09/21/1999	14:40	Thunderstorm Wind		0	0	2.50K	0.00K
WINDER	BARROW CO.	GA	04/03/2000	03:15	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K

AUBURN	BARROW CO.	GA	05/25/2000	17:15	Hail	1.00 in.	0	0	0.00K	0.00K
WINDER	BARROW CO.	GA	05/25/2000	17:25	Thunderstorm Wind		0	0	10.00K	0.00K
WINDER	BARROW CO.	GA	06/25/2000	13:25	Hail	0.75 in.	0	0	0.00K	0.00K
CARL	BARROW CO.	GA	07/23/2000	15:15	Lightning		0	0	50.00K	0.00K
WINDER	BARROW CO.	GA	08/04/2000	15:30	Hail	0.75 in.	0	0	0.00K	0.00K
COUNTYWIDE	BARROW CO.	GA	02/16/2001	19:00	Thunderstorm Wind		0	0	5.00K	0.00K
WINDER	BARROW CO.	GA	05/19/2001	12:37	Thunderstorm Wind		0	0	1.00K	0.00K
WINDER	BARROW CO.	GA	06/22/2001	14:15	Thunderstorm Wind		0	0	1.50K	0.00K
BETHLEHEM	BARROW CO.	GA	07/03/2001	15:00	Lightning		0	0	35.00K	0.00K
WINDER	BARROW CO.	GA	05/10/2002	17:20	Hail	1.00 in.	0	0	3.00K	0.00K
WINDER	BARROW CO.	GA	05/13/2002	15:20	Thunderstorm Wind		0	0	0.50K	0.00K
AUBURN	BARROW CO.	GA	08/18/2002	16:15	Hail	1.00 in.	0	0	3.00K	0.00K
WINDER	BARROW CO.	GA	08/18/2002	16:25	Thunderstorm Wind		0	0	2.00K	0.00K
WINDER	BARROW CO.	GA	11/11/2002	03:45	Lightning		0	0	15.00K	0.00K
BETHLEHEM	BARROW CO.	GA	02/22/2003	08:00	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
BETHLEHEM	BARROW CO.	GA	03/19/2003	23:45	Hail	0.88 in.	0	0	0.00K	0.00K
AUBURN	BARROW CO.	GA	06/13/2003	17:00	Lightning		0	0	150.00K	0.00K
WINDER	BARROW CO.	GA	07/02/2003	17:00	Thunderstorm Wind	39 kts. EG	0	0	15.00K	0.00K
WINDER	BARROW CO.	GA	07/22/2003	13:10	Thunderstorm Wind	50 kts. EG	0	0	0.50K	0.00K
WINDER	BARROW CO.	GA	08/28/2003	17:08	Lightning		0	0	175.00K	0.00K
AUBURN	BARROW CO.	GA	08/28/2003	17:15	Thunderstorm Wind	56 kts. EG	0	0	45.00K	0.00K
WINDER	BARROW CO.	GA	07/04/2004	19:20	Lightning		0	0	250.00K	0.00K
COUNTYWIDE	BARROW CO.	GA	07/14/2004	17:30	Thunderstorm Wind	52 kts. EG	0	0	10.00K	0.00K
BETHLEHEM	BARROW CO.	GA	02/21/2005	13:47	Hail	1.00 in.	0	0	0.00K	0.00K
AUBURN	BARROW CO.	GA	02/21/2005	18:55	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
THOMPSONS MILL	BARROW CO.	GA	02/21/2005	18:55	Hail	2.00 in.	0	0	1.000M	0.00K
AUBURN	BARROW CO.	GA	02/21/2005	19:00	Lightning		0	0	2.00K	0.00K
WINDER	BARROW CO.	GA	04/07/2005	17:30	Thunderstorm Wind	50 kts. EG	0	0	100.00K	0.00K
BETHLEHEM	BARROW CO.	GA	04/07/2005	19:05	Hail	1.00 in.	0	0	0.00K	0.00K

BETHLEHEM	BARROW CO.	GA	04/07/2005	19:05	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
AUBURN	BARROW CO.	GA	04/22/2005	13:02	Hail	0.88 in.	0	0	0.00K	0.00K
COUNTYWIDE	BARROW CO.	GA	07/14/2005	16:00	Thunderstorm Wind	35 kts. EG	0	0	2.00K	0.00K
BETHLEHEM	BARROW CO.	GA	08/05/2005	18:15	Lightning		0	0	150.00K	0.00K
WINDER	BARROW CO.	GA	08/22/2005	19:15	Lightning		0	0	5.00K	0.00K
WINDER	BARROW CO.	GA	12/04/2005	16:50	Hail	1.00 in.	0	0	0.00K	0.00K
WINDER	BARROW CO.	GA	05/04/2006	16:42	Lightning		0	0	25.00K	0.00K
WINDER	BARROW CO.	GA	05/04/2006	16:44	Hail	0.75 in.	0	0	0.00K	0.00K
WINDER	BARROW CO.	GA	05/25/2006	17:47	Thunderstorm Wind	35 kts. EG	0	0	0.25K	0.00K
WINDER	BARROW CO.	GA	05/26/2006	15:31	Hail	0.75 in.	0	0	0.00K	0.00K
COUNTYWIDE	BARROW CO.	GA	06/22/2006	18:00	Lightning		0	0	0.00K	0.00K
STATHAM	BARROW CO.	GA	06/22/2006	18:30	Thunderstorm Wind	39 kts. EG	0	0	10.00K	0.00K
STATHAM	BARROW CO.	GA	01/05/2007	12:32	Hail	0.88 in.	0	0	0.00K	0.00K
WINDER	BARROW CO.	GA	06/12/2007	18:00	Hail	1.00 in.	0	0	0.00K	0.00K
THOMPSONS MILL	BARROW CO.	GA	06/12/2007	18:00	Thunderstorm Wind	50 kts. EG	0	0	7.00K	0.00K
WINDER	BARROW CO.	GA	08/05/2007	15:36	Lightning		0	0	1.00K	0.00K
WINDER	BARROW CO.	GA	03/15/2008	15:39	Hail	1.75 in.	0	0	400.00K	0.00K
WINDER	BARROW CO.	GA	04/04/2008	17:02	Hail	0.75 in.	0	0	0.00K	0.00K
WINDER	BARROW CO.	GA	05/24/2008	13:30	Hail	0.88 in.	0	0	0.00K	0.00K
THOMPSONS MILL	BARROW CO.	GA	05/24/2008	14:30	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
AUBURN	BARROW CO.	GA	07/22/2008	18:00	Hail	1.75 in.	0	0	800.00K	0.00K
AUBURN	BARROW CO.	GA	07/22/2008	18:00	Thunderstorm Wind	50 kts. EG	0	0	3.00K	0.00K
THOMPSONS MILL	BARROW CO.	GA	04/10/2009	19:00	Hail	1.00 in.	0	0	0.00K	0.00K
WINDER	BARROW CO.	GA	04/10/2009	20:00	Hail	1.75 in.	0	0	900.00K	0.00K
AUBURN	BARROW CO.	GA	04/23/2009	20:00	Hail	1.75 in.	0	0	900.00K	0.00K
BETHLEHEM	BARROW CO.	GA	05/06/2009	14:51	Lightning		0	0	200.00K	0.00K
WINDER ARPT	BARROW CO.	GA	08/11/2009	19:23	Thunderstorm Wind	53 kts. MG	0	0	15.00K	0.00K
STATHAM	BARROW CO.	GA	08/11/2009	20:15	Hail	1.00 in.	0	0	0.00K	0.00K

BETHLEHEM	BARROW CO.	GA	06/25/2010	17:30	Thunderstorm Wind	36 kts. EG	0	0	1.00K	0.00K
WINDER	BARROW CO.	GA	08/01/2010	14:29	Thunderstorm Wind	39 kts. EG	0	0	1.50K	0.00K
AUBURN	BARROW CO.	GA	02/28/2011	17:36	Thunderstorm Wind	48 kts. EG	0	0	3.00K	0.00K
WINDER	BARROW CO.	GA	03/26/2011	21:41	Hail	0.75 in.	0	0	0.00K	0.00K
AUBURN	BARROW CO.	GA	04/04/2011	22:59	Thunderstorm Wind	50 kts. MG	0	0	50.00K	0.00K
BETHLEHEM	BARROW CO.	GA	05/26/2011	18:04	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
COUNTY LINE	BARROW CO.	GA	06/18/2011	17:25	Thunderstorm Wind	50 kts. EG	0	0	3.00K	0.00K
BETHLEHEM	BARROW CO.	GA	06/22/2011	16:07	Thunderstorm Wind	50 kts. EG	0	0	7.00K	0.00K
AUBURN	BARROW CO.	GA	06/26/2011	18:39	Thunderstorm Wind	37 kts. EG	0	0	1.00K	0.00K
AUBURN	BARROW CO.	GA	06/26/2011	18:43	Lightning		0	0	25.00K	0.00K
WINDER	BARROW CO.	GA	07/05/2011	17:10	Thunderstorm Wind	50 kts. EG	0	0	4.00K	0.00K
WINDER	BARROW CO.	GA	08/20/2011	14:55	Thunderstorm Wind	39 kts. EG	0	0	4.00K	0.00K
WINDER ARPT	BARROW CO.	GA	07/01/2012	21:29	Thunderstorm Wind	60 kts. EG	0	0	150.00K	0.00K
WINDER	BARROW CO.	GA	07/17/2012	12:35	Thunderstorm Wind	50 kts. EG	0	0	3.00K	0.00K
WINDER	BARROW CO.	GA	07/26/2012	22:15	Lightning		0	0	3.000M	0.00K
WINDER	BARROW CO.	GA	01/30/2013	15:30	Thunderstorm Wind	55 kts. EG	0	0	5.00K	0.00K
WINDER	BARROW CO.	GA	04/11/2013	21:25	Thunderstorm Wind	50 kts. EG	0	0	1.50K	0.00K
COUNTY LINE	BARROW CO.	GA	06/02/2013	15:35	Thunderstorm Wind	46 kts. MG	0	0	0.50K	0.00K
THOMPSONS MILL	BARROW CO.	GA	06/13/2013	18:27	Thunderstorm Wind	50 kts. EG	0	0	1.50K	0.00K
COUNTY LINE	BARROW CO.	GA	07/17/2013	18:11	Hail	1.00 in.	0	0	0.00K	0.00K
STATHAM	BARROW CO.	GA	08/23/2013	22:00	Thunderstorm Wind	55 kts. EG	0	1	200.00K	0.00K
COUNTY LINE	BARROW CO.	GA	01/11/2014	08:55	Thunderstorm Wind	56 kts. MG	0	0	0.00K	0.00K

WINDER ARPT	BARROW CO.	GA	05/25/2014	17:15	Hail	1.00 in.	0	0	0.00K	0.00K
WINDER	BARROW CO.	GA	09/01/2014	14:52	Thunderstorm Wind	55 kts. EG	0	0	1.00K	0.00K
WINDER	BARROW CO.	GA	04/20/2015	14:16	Thunderstorm Wind	50 kts. EG	0	0	10.00K	0.00K
STATHAM	BARROW CO.	GA	05/26/2015	16:49	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
MULBERRY	BARROW CO.	GA	08/06/2015	14:22	Thunderstorm Wind	50 kts. EG	0	0	8.00K	0.00K
THOMPSONS MILL	BARROW CO.	GA	08/22/2015	22:55	Thunderstorm Wind	55 kts. EG	0	0	15.00K	0.00K
ALGERNON	BARROW CO.	GA	07/21/2016	17:05	Thunderstorm Wind	50 kts. EG	0	0	3.00K	0.00K
STATHAM	BARROW CO.	GA	03/21/2017	18:30	Hail	1.00 in.	0	0	0.00K	0.00K
WINDER	BARROW CO.	GA	03/21/2017	19:11	Hail	1.00 in.	0	0	0.00K	0.00K
AUBURN	BARROW CO.	GA	04/05/2017	22:07	Hail	1.50 in.	0	0	0.00K	0.00K
AUBURN	BARROW CO.	GA	07/23/2017	18:20	Lightning		0	0	1.00K	0.00K
WINDER ARPT	BARROW CO.	GA	06/11/2018	13:00	Thunderstorm Wind	55 kts. EG	0	0	150.00K	0.00K
AUBURN	BARROW CO.	GA	06/28/2018	09:35	Thunderstorm Wind	50 kts. EG	0	0	15.00K	0.00K
WHISTLEVILLE	BARROW CO.	GA	07/21/2018	19:25	Thunderstorm Wind	50 kts. EG	0	0	12.00K	0.00K
RUSSELL	BARROW CO.	GA	07/21/2018	19:30	Hail	1.50 in.	0	0	0.00K	0.00K
WHISTLEVILLE	BARROW CO.	GA	07/22/2018	17:54	Thunderstorm Wind	50 kts. EG	0	0	10.00K	0.00K
WHISTLEVILLE	BARROW CO.	GA	04/14/2019	11:41	Thunderstorm Wind	45 kts. EG	0	0	1.00K	0.00K
BETHLEHEM	BARROW CO.	GA	07/17/2019	15:35	Thunderstorm Wind	50 kts. EG	0	0	15.00K	0.00K
STATHAM	BARROW CO.	GA	07/17/2019	15:44	Thunderstorm Wind	50 kts. EG	0	0	20.00K	0.00K
MULBERRY	BARROW CO.	GA	04/13/2020	02:02	Thunderstorm Wind	50 kts. EG	0	0	10.00K	0.00K
WINDER ARPT	BARROW CO.	GA	04/13/2020	02:04	Thunderstorm Wind	45 kts. EG	0	0	1.00K	0.00K
ALGERNON	BARROW CO.	GA	04/13/2020	02:05	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
BETHLEHEM	BARROW CO.	GA	06/24/2020	14:23	Thunderstorm Wind	50 kts. EG	0	0	8.00K	0.00K

STATHAM	BARROW CO.	GA	07/10/2020	15:48	Thunderstorm Wind	45 kts. EG	0	0	1.00K	0.00K
MULBERRY	BARROW CO.	GA	07/21/2020	14:15	Thunderstorm Wind	50 kts. EG	0	0	20.00K	0.00K
MULBERRY	BARROW CO.	GA	07/21/2020	14:38	Hail	0.88 in.	0	0	0.00K	0.00K
STATHAM	BARROW CO.	GA	08/07/2020	19:06	Thunderstorm Wind	45 kts. EG	0	0	1.00K	0.00K
RUSSELL	BARROW CO.	GA	05/03/2021	11:15	Thunderstorm Wind	50 kts. EG	0	0	20.00K	0.00K
WINDER ARPT	BARROW CO.	GA	04/07/2022	01:00	Hail	1.00 in.	0	0	0.00K	0.00K
MULBERRY	BARROW CO.	GA	01/12/2023	16:37	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
BETHLEHEM	BARROW CO.	GA	08/07/2023	16:15	Thunderstorm Wind	52 kts. EG	0	0	2.00K	0.00K
BETHLEHEM	BARROW CO.	GA	08/07/2023	16:16	Thunderstorm Wind	52 kts. EG	0	0	2.00K	0.00K
STATHAM	BARROW CO.	GA	08/07/2023	16:25	Thunderstorm Wind	52 kts. EG	0	0	2.00K	0.00K

Winter Weather

Location	County/Zone	St.	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
BARROW (ZONE)	BARROW (ZONE)	GA	12/18/1996	18:00	Heavy Snow		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	02/23/1999	11:00	Winter Weather		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	01/22/2000	13:00	Ice Storm		0	0	980.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	01/28/2000	19:00	Ice Storm		0	0	32.79K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	12/13/2000	14:30	Winter Storm		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	12/17/2000	07:30	Winter Storm		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	12/19/2000	00:00	Winter Storm		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	12/21/2000	03:30	Winter Storm		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	01/02/2002	06:00	Heavy Snow		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	12/04/2002	14:00	Ice Storm		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	01/25/2004	05:00	Ice Storm		0	0	10.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	02/26/2004	00:00	Winter Storm		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	01/28/2005	20:00	Winter Storm		0	0	150.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	12/15/2005	00:00	Ice Storm		0	0	20.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	02/06/2006	04:00	Winter Weather		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	01/16/2008	20:30	Winter Weather		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	03/01/2009	12:00	Heavy Snow		0	0	50.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	01/07/2010	16:00	Winter Weather		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	02/12/2010	14:30	Heavy Snow		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	03/02/2010	04:00	Winter Weather		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	12/15/2010	18:30	Winter Weather		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	12/25/2010	15:00	Heavy Snow		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	01/09/2011	22:00	Heavy Snow		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	02/09/2011	23:00	Heavy Snow		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	01/25/2013	07:00	Winter Weather		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	01/28/2014	12:00	Winter Storm		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	02/11/2014	07:00	Winter Storm		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	02/16/2015	18:00	Ice Storm		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	01/22/2016	16:00	Winter Weather		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	12/08/2017	21:00	Winter Storm		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	01/16/2018	20:00	Winter Weather		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	02/08/2020	10:00	Winter Storm		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	02/06/2021	16:00	Winter Weather		0	0	0.00K	0.00K

Flood

<u>Location</u>	<u>County/Zone</u>	<u>St.</u>	<u>Date</u>	<u>Time</u>	<u>Type</u>	<u>Mag</u>	<u>Dth</u>	<u>Inj</u>	<u>PrD</u>	<u>CrD</u>
Totals:						0	0	185.25K	0.00K	
<u>COUNTYWIDE</u>	BARROW CO.	GA	07/25/2001	06:00	Flood	0	0	0.00K	0.00K	
<u>WINDER</u>	BARROW CO.	GA	09/27/2002	00:30	Flood	0	0	0.00K	0.00K	
<u>COUNTYWIDE</u>	BARROW CO.	GA	03/20/2003	03:05	Flash Flood	0	0	0.00K	0.00K	
<u>STATHAM</u>	BARROW CO.	GA	03/20/2003	09:48	Flash Flood	0	0	0.00K	0.00K	
<u>COUNTYWIDE</u>	BARROW CO.	GA	07/01/2003	20:10	Flash Flood	0	0	10.00K	0.00K	
<u>BARROW (ZONE)</u>	BARROW (ZONE)	GA	09/16/2004	19:30	Flood	0	0	5.00K	0.00K	
<u>BARROW (ZONE)</u>	BARROW (ZONE)	GA	09/27/2004	13:00	Flood	0	0	0.00K	0.00K	
<u>WINDER</u>	BARROW CO.	GA	07/14/2005	16:21	Flash Flood	0	0	50.00K	0.00K	
<u>BARROW (ZONE)</u>	BARROW (ZONE)	GA	08/07/2005	13:00	Flood	0	0	0.25K	0.00K	
<u>THOMPSONS MILL</u>	BARROW CO.	GA	09/21/2009	15:58	Flood	0	0	100.00K	0.00K	
<u>WINDER ARPT</u>	BARROW CO.	GA	05/31/2010	20:10	Flash Flood	0	0	20.00K	0.00K	
<u>WINDER ARPT</u>	BARROW CO.	GA	06/01/2010	00:00	Flash Flood	0	0	0.00K	0.00K	
<u>WHISTLEVILLE</u>	BARROW CO.	GA	02/06/2020	10:47	Flash Flood	0	0	0.00K	0.00K	

Drought

Location	County/Zone	St.	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
Totals:							0	0	0.00K	2.920M
BARROW (ZONE)	BARROW (ZONE)	GA	09/01/1997	00:00	Drought		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	05/01/1999	00:00	Drought		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	08/01/1999	00:00	Drought		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	02/01/2000	00:00	Drought		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	04/01/2000	00:00	Drought		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	05/01/2000	00:00	Drought		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	06/01/2000	00:00	Drought		0	0	0.00K	2.920M
BARROW (ZONE)	BARROW (ZONE)	GA	07/01/2000	00:00	Drought		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	10/01/2000	00:00	Drought		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	10/01/2001	00:00	Drought		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	11/01/2001	00:00	Drought		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	12/01/2001	00:00	Drought		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	04/01/2002	00:00	Drought		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	08/01/2002	00:00	Drought		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	01/01/2003	00:00	Drought		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	03/01/2004	00:00	Drought		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	05/01/2007	00:00	Drought		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	09/01/2007	00:00	Drought		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	10/01/2007	00:00	Drought		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	11/01/2007	00:00	Drought		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	12/01/2007	00:00	Drought		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	09/01/2011	00:00	Drought		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	06/01/2016	00:00	Drought		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	07/01/2016	00:00	Drought		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	08/01/2016	00:00	Drought		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	09/01/2016	00:00	Drought		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	10/01/2016	00:00	Drought		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	11/01/2016	00:00	Drought		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	12/01/2016	00:00	Drought		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	01/01/2017	00:00	Drought		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	02/01/2017	00:00	Drought		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	03/01/2017	00:00	Drought		0	0	0.00K	0.00K

BARROW (ZONE)	BARROW (ZONE)	GA	10/08/2019	00:00	Drought		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	11/01/2019	00:00	Drought		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	11/14/2023	00:00	Drought		0	0	0.00K	0.00K
BARROW (ZONE)	BARROW (ZONE)	GA	12/01/2023	00:00	Drought		0	0	0.00K	0.00K

Tornadoes

<u>Location</u>	<u>County/Zone</u>	<u>St.</u>	<u>Date</u>	<u>Time</u>	<u>T.Z.</u>	<u>Type</u>	<u>Mag</u>	<u>Dth</u>	<u>Ini</u>	<u>PrD</u>	<u>CrD</u>
Totals:								0	1	420.00K	0.00K
<u>BARROW CO.</u>	BARROW CO.	GA	03/28/1984	14:25	CST	Tornado	F1	0	1	250.00K	0.00K
<u>WINDER</u>	BARROW CO.	GA	08/29/2005	22:05	EST	Tornado	F0	0	0	150.00K	0.00K
<u>WINDER ARPT</u>	BARROW CO.	GA	03/21/2017	20:03	EST-5	Tornado	EF0	0	0	20.00K	0.00K

GEMA Worksheet #3a**Inventory of Assets****Jurisdiction: Barrow County****Hazard: Non-Spatially Defined Hazard**

Task A. Determine the proportion of buildings, the value of buildings, and the population in your community or state that are located in hazard areas.

Type of Structure (Occupancy Class)	# in Community of State	# in Hazard Area	% in Hazard Area	\$ in Community or State	\$ in Hazard Area	% in Hazard Area	# in Community or State	# in Hazard Area	% in Hazard Area
Residential	55,481	55,481	100.000%	6,796,841,783	6,796,841,783	100.000%	89,299	89,299	100%
Commercial	4,223	4,223	100.000%	689,084,518	689,084,518	100.000%	0	0	#DIV/0!
Industrial	1,202	1,202	100.000%	488,997,290	488,997,290	100.000%	0	0	#DIV/0!
Agricultural	1,899	1,899	100.000%	152,326,575	152,326,575	100.000%	0	0	#DIV/0!
Religious/ Non-profit	652	652	100.000%	105,943,745	105,943,745	100.000%	0	0	#DIV/0!
Government	913	913	100.000%	296,130,630	296,130,630	100.000%	0	0	#DIV/0!
Education	147	147	100.000%	131,799,580	131,799,580	100.000%	0	0	#DIV/0!
Utilities	77	77	100.000%	199,732,613	199,732,613	100.000%	0	0	#DIV/0!
Total	64,594	64,594	100.000%	8,860,856,734	8,860,856,734	100.000%	89,299	89,299	100%

Task B. Determine whether (and where) you want to collect additional inventory data.

	Y	N
1. Do you know where the greatest damages may occur in your area?		N
2. Do you know whether your critical facilities will be operational after a hazard event?		N
3. Is there enough data to determine which assets are subject to the greatest potential damages?		N
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards?		N
5. Is there enough data to determine whether certain areas of historic, environmental, political, or cultural significance are vulnerable to potential hazards?		N
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence?		N
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives?		N

GEMA Worksheet #3a**Inventory of Assets****Jurisdiction: Barrow County****Hazard: Wildfire Hazard**

Task A. Determine the proportion of buildings, the value of buildings, and the population in your community or state that are located in hazard areas.

Type of Structure (Occupancy Class)	# in Community of State	# in Hazard Area	% in Hazard Area	\$ in Community or State	\$ in Hazard Area	% in Hazard Area	# in Community or State	# in Hazard Area	% in Hazard Area
Residential	55,481	53,966	97.269%	6,796,841,783	6,611,242,834	97.269%	89,299	86,861	97%
Commercial	4,223	3,701	87.639%	689,084,518	603,907,601	87.639%	0	0	#DIV/0!
Industrial	1,202	1,088	90.516%	488,997,290	442,619,843	90.516%	0	0	#DIV/0!
Agricultural	1,899	1,899	100.000%	152,326,575	152,326,575	100.000%	0	0	#DIV/0!
Religious/ Non-profit	652	604	92.638%	105,943,745	98,144,205	92.638%	0	0	#DIV/0!
Government	913	844	92.442%	298,130,630	273,750,550	92.442%	0	0	#DIV/0!
Education	147	132	89.796%	131,799,580	118,360,643	89.796%	0	0	#DIV/0!
Utilities	77	68	88.312%	199,732,613	176,387,243	88.312%	0	0	#DIV/0!
Total	64,594	62,302	96.452%	8,880,856,734	8,476,729,494	95.665%	89,299	86,861	97%

Task B. Determine whether (and where) you want to collect additional inventory data.

- | | | |
|---|----------|----------|
| | Y | N |
| 1. Do you know where the greatest damages may occur in your area? | | N |
| 2. Do you know whether your critical facilities will be operational after a hazard event? | | N |
| 3. Is there enough data to determine which assets are subject to the greatest potential damages? | Y | |
| 4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards? | Y | |
| 5. Is there enough data to determine whether certain areas of historic, environmental, political, or cultural significance are vulnerable to potential hazards? | Y | |
| 6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence? | | N |
| 7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives? | | N |

GEMA Worksheet #3a**Inventory of Assets****Jurisdiction: Barrow County****Hazard: Flood Hazard**

Task A. Determine the proportion of buildings, the value of buildings, and the population in your community or state that are located in hazard areas.

Type of Structure (Occupancy Class)	# in Community of State	# in Hazard Area	% in Hazard Area	\$ in Community or State	\$ in Hazard Area	% in Hazard Area	# in Community or State	# in Hazard Area	% in Hazard Area
Residential	55,481	291	0.525%	6,796,841,783	14,363,111	0.211%	89,299	468	1%
Commercial	4,223	8	0.189%	689,084,518	679,115	0.099%	0	0	#DIV/0!
Industrial	1,202	0	0.000%	488,997,290	0	0.000%	0	0	#DIV/0!
Agricultural	1,899	0	0.000%	152,326,575	0	0.000%	0	0	#DIV/0!
Religious/ Non-profit	652	0	0.000%	105,943,745	0	0.000%	0	0	#DIV/0!
Government	913	2	0.219%	296,130,630	9,959	0.003%	0	0	#DIV/0!
Education	147	0	0.000%	131,799,580	0	0.000%	0	0	#DIV/0!
Utilities	77	0	0.000%	199,732,613	0	0.000%	0	0	#DIV/0!
Total	64,594	301	0.468%	8,880,856,734	15,052,185	0.170%	89,299	468	1%

Task B. Determine whether (and where) you want to collect additional inventory data.

- | | | |
|---|----------|----------|
| | Y | N |
| 1. Do you know where the greatest damages may occur in your area? | Y | |
| 2. Do you know whether your critical facilities will be operational after a hazard event? | | N |
| 3. Is there enough data to determine which assets are subject to the greatest potential damages? | Y | |
| 4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards? | Y | |
| 5. Is there enough data to determine whether certain areas of historic, environmental, political, or cultural significance are vulnerable to potential hazards? | Y | |
| 6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence? | Y | |
| 7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives? | | N |

GEMA Worksheet #3a**Inventory of Assets****Jurisdiction: Auburn (Barrow County)****Hazard: Non-Spatially Defined Hazard**

Task A. Determine the proportion of buildings, the value of buildings, and the population in your community or state that are located in hazard areas.

Type of Structure (Occupancy Class)	# in Community of State	# in Hazard Area	% in Hazard Area	\$ in Community or State	\$ in Hazard Area	% in Hazard Area	# in Community or State	# in Hazard Area	% in Hazard Area
Residential	6,746	6,746	100.000%	632,595,308	632,595,308	100.000%	7,794	7,794	100%
Commercial	351	351	100.000%	42,560,653	42,560,653	100.000%	0	0	#DIV/0!
Industrial	52	52	100.000%	13,644,868	13,644,868	100.000%	0	0	#DIV/0!
Agricultural	15	15	100.000%	1,296,500	1,296,500	100.000%	0	0	#DIV/0!
Religious/ Non-profit	50	50	100.000%	5,027,178	5,027,178	100.000%	0	0	#DIV/0!
Government	75	75	100.000%	14,066,988	14,066,988	100.000%	0	0	#DIV/0!
Education	19	19	100.000%	4,428,270	4,428,270	100.000%	0	0	#DIV/0!
Utilities	6	6	100.000%	9,963,405	9,963,405	100.000%	0	0	#DIV/0!
Total	7,314	7,314	100.000%	723,583,170	723,583,170	100.000%	7,794	7,794	100%

Task B. Determine whether (and where) you want to collect additional inventory data.

- | | | |
|---|----------|----------|
| | Y | N |
| 1. Do you know where the greatest damages may occur in your area? | | N |
| 2. Do you know whether your critical facilities will be operational after a hazard event? | | N |
| 3. Is there enough data to determine which assets are subject to the greatest potential damages? | | N |
| 4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards? | | N |
| 5. Is there enough data to determine whether certain areas of historic, environmental, political, or cultural significance are vulnerable to potential hazards? | | N |
| 6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence? | | N |
| 7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives? | | N |

GEMA Worksheet #3a**Inventory of Assets****Jurisdiction: Auburn (Barrow County)****Hazard: Wildfire Hazard**

Task A. Determine the proportion of buildings, the value of buildings, and the population in your community or state that are located in hazard areas.

Type of Structure (Occupancy Class)	# in Community of State	# in Hazard Area	% in Hazard Area	\$ in Community or State	\$ in Hazard Area	% in Hazard Area	# in Community or State	# in Hazard Area	% in Hazard Area
Residential	8,748	8,625	98.206%	632,595,308	621,248,727	98.206%	7,794	7,654	98%
Commercial	351	318	90.598%	42,560,653	38,559,224	90.598%	0	0	#DIV/0!
Industrial	52	48	92.308%	13,644,868	12,595,263	92.308%	0	0	#DIV/0!
Agricultural	15	15	100.000%	1,296,500	1,296,500	100.000%	0	0	#DIV/0!
Religious/ Non-profit	50	46	92.000%	5,027,178	4,625,004	92.000%	0	0	#DIV/0!
Government	75	69	92.000%	14,066,988	12,941,629	92.000%	0	0	#DIV/0!
Education	19	17	89.474%	4,428,270	3,962,136	89.474%	0	0	#DIV/0!
Utilities	6	5	83.333%	9,963,406	8,302,838	83.333%	0	0	#DIV/0!
Total	7,314	7,143	97.662%	723,583,170	703,531,321	97.229%	7,794	7,654	98%

Task B. Determine whether (and where) you want to collect additional inventory data.

- | | | |
|---|----------|----------|
| | Y | N |
| 1. Do you know where the greatest damages may occur in your area? | | N |
| 2. Do you know whether your critical facilities will be operational after a hazard event? | | N |
| 3. Is there enough data to determine which assets are subject to the greatest potential damages? | Y | |
| 4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards? | Y | |
| 5. Is there enough data to determine whether certain areas of historic, environmental, political, or cultural significance are vulnerable to potential hazards? | Y | |
| 6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence? | | N |
| 7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives? | | N |

GEMA Worksheet #3a**Inventory of Assets****Jurisdiction: Auburn (Barrow County)****Hazard: Flood Hazard**

Task A. Determine the proportion of buildings, the value of buildings, and the population in your community or state that are located in hazard areas.

Type of Structure (Occupancy Class)	# in Community of State	# in Hazard Area	% in Hazard Area	\$ in Community or State	\$ in Hazard Area	% in Hazard Area	# in Community or State	# in Hazard Area	% in Hazard Area
Residential	6,748	7	0.104%	632,595,308	204,735	0.032%	7,794	8	0%
Commercial	351	0	0.000%	42,560,653	0	0.000%	0	0	#DIV/0!
Industrial	52	0	0.000%	13,644,888	0	0.000%	0	0	#DIV/0!
Agricultural	15	0	0.000%	1,298,500	0	0.000%	0	0	#DIV/0!
Religious/ Non-profit	50	0	0.000%	5,027,178	0	0.000%	0	0	#DIV/0!
Government	75	0	0.000%	14,066,988	0	0.000%	0	0	#DIV/0!
Education	19	0	0.000%	4,428,270	0	0.000%	0	0	#DIV/0!
Utilities	6	70	1166.667%	9,963,405	116,239,725	1166.667%	0	0	#DIV/0!
Total	7,314	77	1.053%	723,583,170	116,444,460	16.093%	7,794	8	0%

Task B. Determine whether (and where) you want to collect additional inventory data.

- | | | |
|---|----------|----------|
| | Y | N |
| 1. Do you know where the greatest damages may occur in your area? | Y | |
| 2. Do you know whether your critical facilities will be operational after a hazard event? | | N |
| 3. Is there enough data to determine which assets are subject to the greatest potential damages? | Y | |
| 4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards? | Y | |
| 5. Is there enough data to determine whether certain areas of historic, environmental, political, or cultural significance are vulnerable to potential hazards? | Y | |
| 6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence? | | N |
| 7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives? | | N |

GEMA Worksheet #3a**Inventory of Assets****Jurisdiction: Bethlehem (Barrow County)****Hazard: Non-Spatially Defined Hazard**

Task A. Determine the proportion of buildings, the value of buildings, and the population in your community or state that are located in hazard areas.

Type of Structure (Occupancy Class)	# in Community of State	# in Hazard Area	% in Hazard Area	\$ in Community or State	\$ in Hazard Area	% in Hazard Area	# in Community or State	# in Hazard Area	% in Hazard Area
Residential	617	617	100.000%	37,150,850	37,150,850	100.000%	598	598	100%
Commercial	70	70	100.000%	5,554,005	5,554,005	100.000%	0	0	#DIV/0!
Industrial	34	34	100.000%	7,475,900	7,475,900	100.000%	0	0	#DIV/0!
Agricultural	18	18	100.000%	1,508,933	1,508,933	100.000%	0	0	#DIV/0!
Religious/ Non-profit	36	36	100.000%	16,953,603	16,953,603	100.000%	0	0	#DIV/0!
Government	45	45	100.000%	4,839,123	4,839,123	100.000%	0	0	#DIV/0!
Education	9	9	100.000%	6,875,808	6,875,808	100.000%	0	0	#DIV/0!
Utilities	2	2	100.000%	3,808,050	3,808,050	100.000%	0	0	#DIV/0!
Total	831	831	100.000%	84,168,272	84,168,272	100.000%	598	598	100%

Task B. Determine whether (and where) you want to collect additional inventory data.

	Y	N
1. Do you know where the greatest damages may occur in your area?		N
2. Do you know whether your critical facilities will be operational after a hazard event?		N
3. Is there enough data to determine which assets are subject to the greatest potential damages?		N
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards?		N
5. Is there enough data to determine whether certain areas of historic, environmental, political, or cultural significance are vulnerable to potential hazards?		N
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence?		N
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives?		N

GEMA Worksheet #3a**Inventory of Assets****Jurisdiction: Bethlehem (Barrow County)****Hazard: Wildfire Hazard**

Task A. Determine the proportion of buildings, the value of buildings, and the population in your community or state that are located in hazard areas.

Type of Structure (Occupancy Class)	# in Community of State	# in Hazard Area	% in Hazard Area	\$ in Community or State	\$ in Hazard Area	% in Hazard Area	# in Community or State	# in Hazard Area	% in Hazard Area
Residential	617	615	99.676%	37,150,850	37,030,428	99.676%	598	598	100%
Commercial	70	65	92.857%	5,554,005	5,157,290	92.857%	0	0	#DIV/0!
Industrial	34	32	94.118%	7,475,900	7,038,141	94.118%	0	0	#DIV/0!
Agricultural	18	18	100.000%	1,508,933	1,508,933	100.000%	0	0	#DIV/0!
Religious/ Non-profit	38	38	100.000%	16,953,803	16,953,803	100.000%	0	0	#DIV/0!
Government	45	43	95.556%	4,839,123	4,624,051	95.556%	0	0	#DIV/0!
Education	9	9	100.000%	6,875,808	6,875,808	100.000%	0	0	#DIV/0!
Utilities	2	2	100.000%	3,808,050	3,808,050	100.000%	0	0	#DIV/0!
Total	831	820	98.676%	84,166,272	82,994,302	98.608%	598	598	100%

Task B. Determine whether (and where) you want to collect additional inventory data.

- | | | |
|---|----------|----------|
| | Y | N |
| 1. Do you know where the greatest damages may occur in your area? | | N |
| 2. Do you know whether your critical facilities will be operational after a hazard event? | | N |
| 3. Is there enough data to determine which assets are subject to the greatest potential damages? | Y | |
| 4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards? | Y | |
| 5. Is there enough data to determine whether certain areas of historic, environmental, political, or cultural significance are vulnerable to potential hazards? | Y | |
| 6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence? | | N |
| 7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives? | | N |

GEMA Worksheet #3a**Inventory of Assets****Jurisdiction: Bethlehem (Barrow County)****Hazard: Flood Hazard**

Task A. Determine the proportion of buildings, the value of buildings, and the population in your community or state that are located in hazard areas.

Type of Structure (Occupancy Class)	# in Community of State	# in Hazard Area	% in Hazard Area	\$ in Community or State	\$ in Hazard Area	% in Hazard Area	# in Community or State	# in Hazard Area	% in Hazard Area
Residential	817	1	0.162%	37,150,850	123,910	0.334%	598	1	0%
Commercial	70	0	0.000%	5,554,005	0	0.000%	0	0	#DIV/0!
Industrial	34	0	0.000%	7,475,900	0	0.000%	0	0	#DIV/0!
Agricultural	18	0	0.000%	1,508,933	0	0.000%	0	0	#DIV/0!
Religious/ Non-profit	36	0	0.000%	16,953,603	0	0.000%	0	0	#DIV/0!
Government	45	0	0.000%	4,839,123	0	0.000%	0	0	#DIV/0!
Education	9	0	0.000%	6,875,808	0	0.000%	0	0	#DIV/0!
Utilities	2	0	0.000%	3,808,050	0	0.000%	0	0	#DIV/0!
Total	831	1	0.120%	84,168,272	123,910	0.147%	598	1	0%

Task B. Determine whether (and where) you want to collect additional inventory data.

- | | | |
|---|----------|----------|
| | Y | N |
| 1. Do you know where the greatest damages may occur in your area? | Y | |
| 2. Do you know whether your critical facilities will be operational after a hazard event? | | N |
| 3. Is there enough data to determine which assets are subject to the greatest potential damages? | Y | |
| 4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards? | Y | |
| 5. Is there enough data to determine whether certain areas of historic, environmental, political, or cultural significance are vulnerable to potential hazards? | Y | |
| 6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence? | | N |
| 7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives? | | N |

Athens-Clarke County



Hazard Risk Analyses Supplement to the Barrow County Joint Hazard Mitigation Plan



Carl Vinson
Institute of Government
UNIVERSITY OF GEORGIA

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Introduction

The Federal Disaster Mitigation Act of 2000 (DMA2K) requires state, local, and tribal governments to develop and maintain a mitigation plan to be eligible for certain federal disaster assistance and hazard mitigation funding programs.

Mitigation seeks to reduce a hazard's impacts, which may include loss of life, property damage, disruption to local and regional economies, and the expenditure of public and private funds for recovery. Sound mitigation must be based on a sound risk assessment that quantifies the potential losses of a disaster by assessing the vulnerability of buildings, infrastructure, and people.

In recognition of the importance of planning in mitigation activities, FEMA Hazus-MH, a powerful disaster risk assessment tool based on geographic information systems (GIS). This tool enables communities of all sizes to predict estimated losses from floods, hurricanes, earthquakes, and other related phenomena and to measure the impact of various mitigation practices that might help reduce those losses.

In 2023, the Georgia Department of Emergency Management partnered with the Carl Vinson Institute of Government at the University of Georgia to develop a detailed risk assessment focused on defining hurricane, riverine flood, and tornado risks in Barrow County, Georgia. This assessment identifies the characteristics and potential consequences of the disaster, how much of the community could be affected by the disaster, and the impact on community assets.

Risk Assessment Process Overview

Hazus-MH Version 2.2 SP1 was used to perform the analyses for Barrow County. The Hazus-MH application includes default data for every county in the US. This Hazus-MH data was derived from a variety of national sources and in some cases the data are also several years old. Whenever possible, using local provided data is preferred. Barrow County provided building inventory information from the county's property tax assessment system. This section describes the changes made to the default Hazus-MH inventory and the modeling parameters used for each scenario.

County Inventory Changes

The default Hazus-MH site-specific point inventory was updated using data compiled from the Georgia Emergency Management Agency (GEMA). The default Hazus-MH aggregate inventory (General Building Stock) was also updated prior to running the scenarios. Reported losses reflect the updated data sets.

General Building Stock Updates

General Building Stock (GBS) is an inventory category that consists of aggregated data (grouped by census geography — tract or block). Hazus-MH generates a combination of site-specific and aggregated loss estimates based on the given analysis and user input.

The GBS records for Barrow County were replaced with data derived from parcel and property assessment data obtained from Barrow County. The county provided property assessment data was current as of December 2023 and the parcel data current as of December 2023. Records without improvements were deleted. The parcel boundaries were converted to parcel points located in the centroids of each parcel boundary; then, each parcel point was linked to an assessor record based upon matching parcel numbers. The parcel assessor match-rate for Barrow County is 99.9%. The

generated building inventory represents the approximate locations (within a parcel) of structures. The building inventory was aggregated by census block. Both the tract and block tables were updated. Table 1 shows the results of the changes to the GBS tables by occupancy class.

Table 1: GBS Building Exposure Updates by Occupancy Class*

General Occupancy	Default Hazus-MH Count	Updated Count	Default Hazus-MH Exposure	Updated Exposure
Agricultural	26	8	\$960,000	\$4,137,000
Commercial	1,171	1,211	\$334,597,000	\$362,983,000
Education	62	74	\$182,052,000	\$94,674,000
Government	100	117	\$59,219,000	\$55,267,000
Industrial	606	504	\$338,835,000	\$402,357,000
Religious	204	197	\$55,715,000	\$61,203,000
Residential	27,610	31,656	\$4,239,450,000	\$5,530,065,000
Total	29,779	33,767	\$5,210,828,000	\$6,510,686,000

*The exposure values represent the total number and replacement cost for all Barrow County Buildings

For Barrow County, the updated GBS was used to calculate hurricane wind losses. The flood losses and tornado losses were calculated from building inventory modeled in Hazus-MH as User-Defined Facility

(UDF)¹, or site-specific points. Figure 1 shows the distribution of buildings as points based on the county provided data.

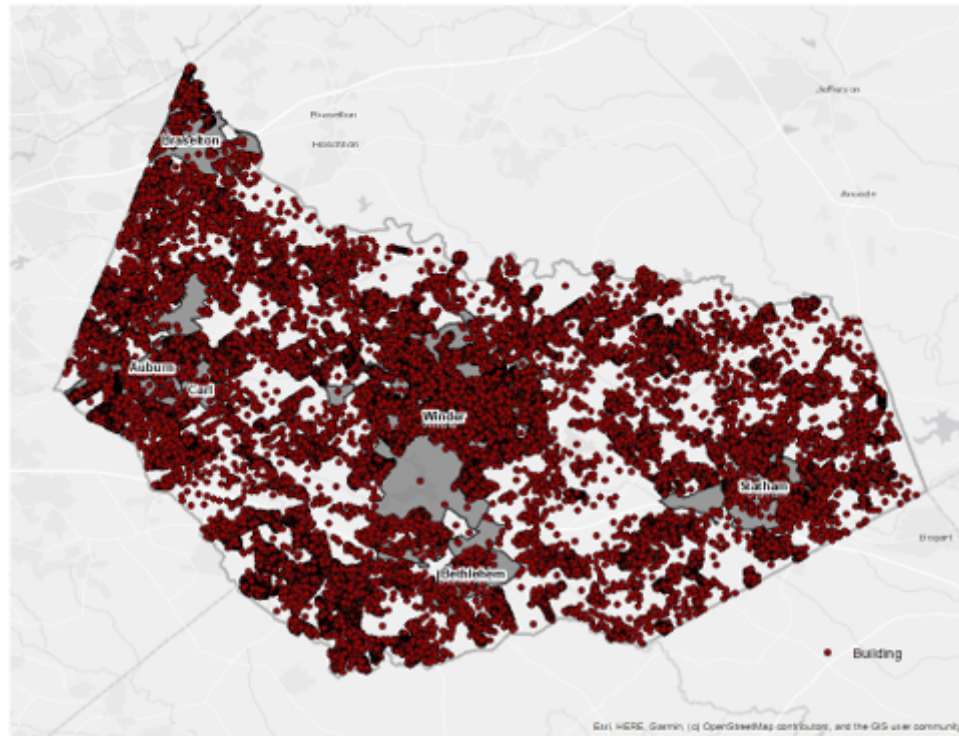


Figure 1: Barrow County Overview

Essential Facility Updates

The default Hazus-MH essential facility data was updated to reflect improved information available in the Georgia Mitigation Information System (GMIS) as of December 2023. For these risk analyses, only GMIS data for buildings that Hazus-MH classified as Essential Facilities was integrated into Hazus-MH because the application provides specialized reports for these five facilities. Essential Facility inventory was updated for the analysis conducted for this report. The following table summarizes the counts and exposures, where available, by Essential Facility classification of the updated data.

Essential facilities include:

- Care facilities
- EOCs
- Fire stations
- Police stations
- Schools

^d The UDF inventory category in Hazus-MH allows the user to enter site-specific data in place of GBS data.

Table 2: Updated Essential Facilities

Classification	Updated Count	Updated Exposure
Auburn		
EOC	0	\$0
Care	0	\$0
Fire	1	\$277,000
Police	1	\$385,000
School	1	\$3,124,000
Total	3	\$3,786,000
Bethlehem		
EOC	0	\$0
Care	0	\$0
Fire	1	\$2,072,000
Police	0	\$0
School	3	\$6,927,000
Total	4	\$8,999,000
Braselton		
EOC	0	\$0
Care	0	\$0
Fire	0	\$0
Police	0	\$0
School	0	\$0
Total	0	\$0
Carl		
EOC	0	\$0
Care	0	\$0
Fire	0	\$0
Police	0	\$0
School	0	\$0
Total	0	\$0

Classification	Updated Count	Updated Exposure
Statham		
EOC	0	\$0
Care	1	\$930,000
Fire	1	\$281,000
Police	1	\$224,000
School	2	\$15,623,000
Total	5	\$17,058,000
Winder		
EOC	0	\$0
Care	6	\$15,268,000
Fire	2	\$2,456,000
Police	3	\$19,060,000
School	5	\$25,238,000
Total	16	\$62,022,000
Unincorporated Areas of Barrow County		
EOC	1	\$2,561,000
Care	1	\$6,510,000
Fire	3	\$1,459,000
Police	0	\$0
School	13	\$60,635,000
Total	18	\$71,165,000

Assumptions and Exceptions

Hazus-MH loss estimates may be impacted by certain assumptions and process variances made in this risk assessment.

- The Barrow County analysis used Hazus-MH Version 2.2 SP1, which was released by FEMA in May 2015.
- County provided parcel and property assessment data may not fully reflect all buildings in the county. For example, some counties do not report not-for-profit buildings such as government buildings, schools and churches in their property assessment data. This data was used to update the General Building Stock as well as the User Defined Facilities applied in this risk assessment.
- Georgia statute requires that the Assessor's Office assign a code to all of the buildings on a parcel based on the buildings primary use. If there is a residential or a commercial structure on a parcel and there are also agricultural buildings on the same parcel Hazus-MH looks at the residential and commercial "primary" structures first and then combines the value of all secondary structures on that parcel with the value of the primary structure. The values and building counts are still accurate but secondary structures are accounted for under the same classification as the primary structure. Because of this workflow, the only time that a parcel would show a value for an agricultural building is when there are no residential or commercial structures on the parcel thus making the agricultural building the primary structure. This is the reason that agricultural building counts and total values seem low or are nonexistent.
- GBS updates from assessor data will skew loss calculations. The following attributes were defaulted or calculated:
 - Foundation Type was set from Occupancy Class
 - First Floor Height was set from Foundation Type
 - Content Cost was calculated from Replacement Cost
- It is assumed that the buildings are located at the centroid of the parcel.
- The essential facilities extracted from the GMIS were only used in the portion of the analysis designated as essential facility damage. They were not used in the update of the General Building Stock or the User Defined Facility inventory.

The hazard models included in this risk assessment included:

- Hurricane assessment which was comprised of a wind only damage assessment.
- Flood assessment based on the 1% annual chance event that includes riverine assessments.
- Tornado assessment based on GIS modeling.

Hurricane Risk Assessment

Hazard Definition

The National Hurricane Center describes a hurricane as a tropical cyclone in which the maximum sustained wind is, at minimum, 74 miles per hour (mph)². The term hurricane is used for Northern Hemisphere tropical cyclones east of the International Dateline to the Greenwich Meridian. The term typhoon is used for Pacific tropical cyclones north of the Equator west of the International Dateline. Hurricanes in the Atlantic Ocean, Gulf of Mexico, and Caribbean form between June and November with the peak of hurricane season occurring in the middle of September. Hurricane intensities are measured using the Saffir-Simpson Hurricane Wind Scale (Table 3). This scale is a 1 to 5 categorization based on the hurricane's intensity at the indicated time.

Hurricanes bring a complex set of impacts. The winds from a hurricane produce a rise in the water level at landfall called storm surge. Storm surges produce coastal flooding effects that can be as damaging as the hurricane's winds. Hurricanes bring very intense inland riverine flooding. Hurricanes can also produce tornadoes that can add to the wind damages inland. In this risk assessment, only hurricane winds, and coastal storm surge are considered.

Table 3: Saffir-Simpson Hurricane Wind Scale

Category	Wind Speed (mph)	Damage
1	74 - 95	Very dangerous winds will produce some damage
2	96 - 110	Extremely dangerous winds will cause extensive damage
3	111 - 130	Devastating damage will occur
4	131 - 155	Catastrophic damage will occur
5	> 155	Catastrophic damage will occur

The National Oceanic and Atmospheric Administration's National Hurricane Center created the HURDAT database, which contains all of the tracks of tropical systems since the mid-1800s. This database was used to document the number of tropical systems that have affected Barrow County by creating a 20-mile buffer around the county to include storms that didn't make direct landfall in Barrow County but impacted the county. Note that the storms listed contain the peak sustained winds, maximum pressure and maximum attained storm strength for the entire storm duration. Since 1859, Barrow County has had 14 tropical systems within 20 miles of its county borders (Table 4).

Table 4: Tropical Systems affecting Barrow County³

YEAR	DATE RANGE	NAME	MAX WIND(Knots)	MAX PRESSURE	MAX CAT
1859	September 15 - 18	UNNAMED	81	0	H1

² National Hurricane Center (2011). "Glossary of NHC Terms." National Oceanic and Atmospheric Administration. <http://www.nhc.noaa.gov/aboutgloss.shtml#h>. Retrieved 2012-23-02.

³ Atlantic Oceanic and Meteorological Laboratory (2012). "Data Center." National Oceanic and Atmospheric Administration. http://www.aoml.noaa.gov/hrd/data_sub/re_anal.html. Retrieved 7-20-2015.

YEAR	DATE RANGE	NAME	MAX WIND(Knots)	MAX PRESSURE	MAX CAT
1896	July 04 - 12	UNNAMED	98	0	H2
1900	September 11 - 15	UNNAMED	52	0	TS
1901	September 21 - October 02	UNNAMED	52	0	TS
1902	October 03 - 13	UNNAMED	104	970	H2
1903	September 09 - 16	UNNAMED	92	988	H1
1907	September 18 - 23	UNNAMED	46	0	TS
1911	August 23 - 31	UNNAMED	98	972	H2
1912	June 07 - 17	UNNAMED	69	0	TS
1959	October 06 - 09	IRENE	46	1003	TS
1994	August 14 - 19	BERYL	58	1013	TS
1995	August 22 - 28	JERRY	40	1010	TS
1997	July 16 - 27	DANNY	81	1013	H1
2021	June 17 - 23	CLAUDETTE	46	1008	E

Category Definitions:

TS – Tropical storm

TD – Tropical depression

H1 – Category 1 (same format for H2, H3, and H4)

E – Extra-tropical cyclone



Figure 2: Continental United States Hurricane Strikes: 1950 to 2022⁴

Probabilistic Hurricane Scenario

The following probabilistic wind damage risk assessment modeled a Tropical Storm with maximum winds of 66 mph.

Wind Damage Assessment

Separate analyses were performed to determine wind and hurricane storm surge related flood losses. This section describes the wind-based losses to Barrow County. Wind losses were determined from probabilistic models run for the Tropical Storm which equates to the 1% chance storm event. Figure 3 shows wind speeds for the modeled Tropical Storm.

⁴ Source: NOAA National Centers for Environmental Information

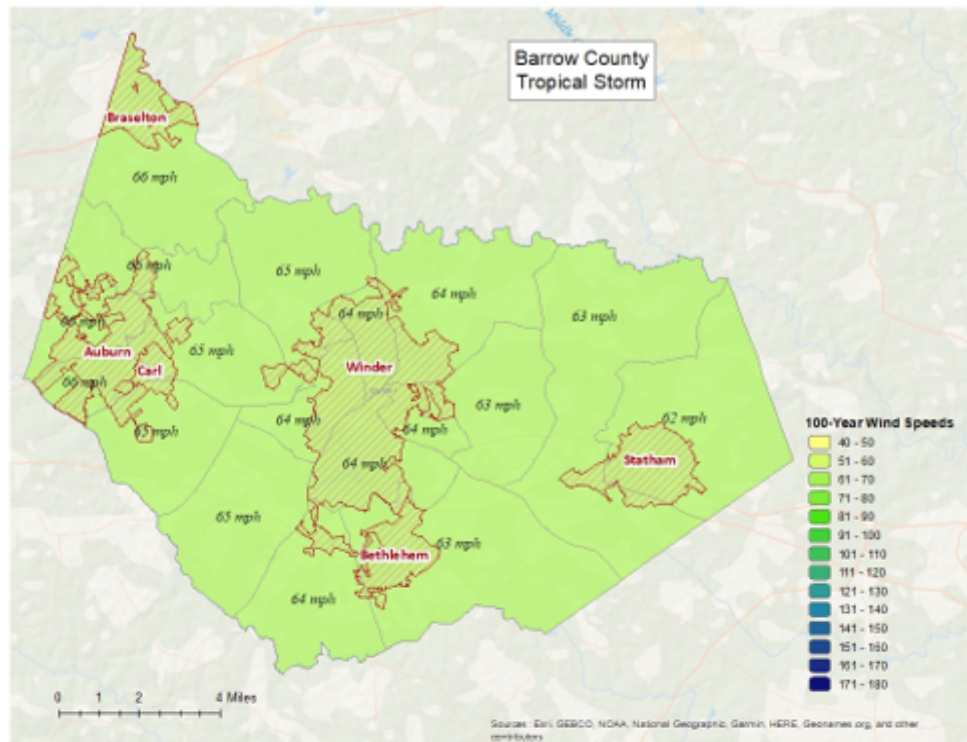


Figure 3: Wind Speeds by Storm Category

Wind-Related Building Damages

Buildings in Barrow County are vulnerable to storm events, and the cost to rebuild may have significant consequences to the community. The following table shows a summary of the results of wind-related building damage in Barrow County for the Tropical Storm (100 Year Event). The loss ratio expresses building losses as a percentage of total building replacement cost in the county. Figure 4 illustrates the building loss ratios of the modeled Tropical Storm.

Table 5: Hurricane Wind Building Damage

Classification	Number of Buildings Damaged	Total Building Damage	Total Economic Loss ^a	Loss Ratio
Tropical Storm	31	\$2,952,100	\$3,678,850	0.05%

^a Includes property damage (infrastructure, contents, and inventory) as well as business interruption losses.

Note that wind damaged buildings are not reported by jurisdiction. This is due to the fact that census tract boundaries – upon which hurricane building losses are based – do not closely coincide with jurisdiction boundaries.

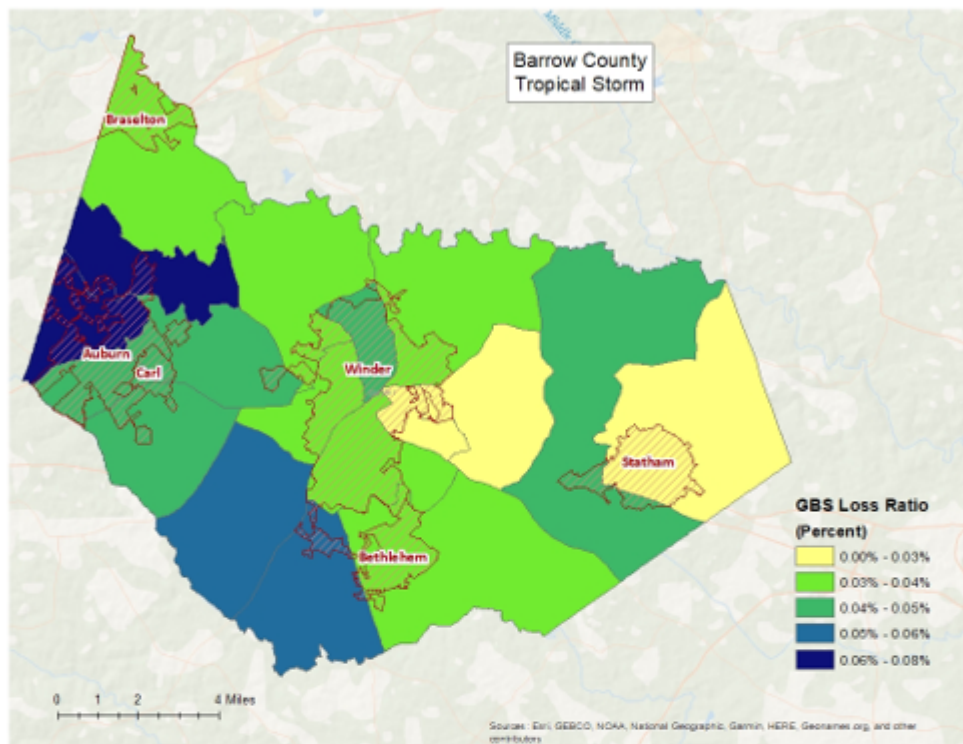


Figure 4: Hurricane Wind Building Loss Ratios

Essential Facility Losses

Essential facilities are also vulnerable to storm events, and the potential loss of functionality may have significant consequences to the community. Hazus-MH identified the essential facilities that may be moderately or severely damaged by winds. The results are compiled in Table 6.

There are 46 essential facilities in Oconee County.

Classification	Number
EOCs	1
Fire Stations	8
Care Facilities	8
Police Stations	5
Schools	24

Table 6: Wind-Damaged Essential Facility Losses

Classification	Facilities At Least Moderately Damaged > 50%	Facilities Completely Damaged > 50%	Facilities with Expected Loss of Use (< 1 day)
Tropical Storm	0	0	46

Shelter Requirements

Hazus-MH estimates the number of households evacuated from buildings with severe damage from high velocity winds as well as the number of people who will require short-term sheltering. Since the 1% chance storm event for Barrow County is a Tropical Storm, the resulting damage is not enough to displace Households or require temporary shelters as shown in the results listed in Table 7.

Table 7: Displaced Households and People

Classification	# of Displaced Households	# of People Needing Short-Term Shelter
Tropical Storm	0	0

Debris Generated from Hurricane Wind

Hazus-MH estimates the amount of debris that will be generated by high velocity hurricane winds and quantifies it into three broad categories to determine the material handling equipment needed:

- Reinforced Concrete and Steel Debris
- Brick and Wood and Other Building Debris
- Tree Debris

Different material handling equipment is required for each category of debris. The estimates of debris for this scenario are listed in Table 8. The amount of hurricane wind related tree debris that is estimated to require pick up at the public's expense is listed in the eligible tree debris column.

Table 8: Wind-Related Debris Weight (Tons)

Classification	Brick, Wood, and Other	Reinforced Concrete and Steel	Eligible Tree Debris	Other Tree Debris	Total
Tropical Storm	158	0	1,085	4,783	6,026

Figure 5 shows the distribution of all wind related debris resulting from a Tropical Storm. Each dot represents 20 tons of debris within the census tract in which it is located. The dots are randomly distributed within each census tract and therefore do not represent the specific location of debris sites.

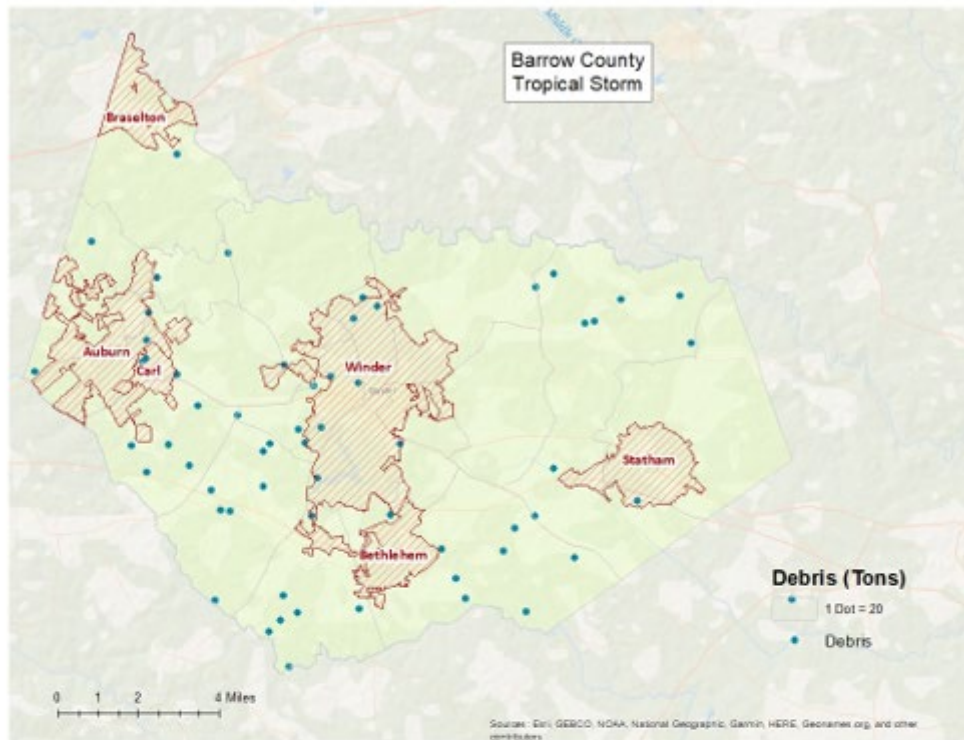


Figure 5: Wind-Related Debris Weight (Tons)

Flood Risk Assessment

Hazard Definition

Flooding is a significant natural hazard throughout the United States. The type, magnitude, and severity of flooding are functions of the amount and distribution of precipitation over a given area, the rate at which precipitation infiltrates the ground, the geometry and hydrology of the catchment, and flow dynamics and conditions in and along the river channel. Floods can be classified as one of three types: upstream floods, downstream floods, or coastal floods.

Upstream floods, also called flash floods, occur in the upper parts of drainage basins and are generally characterized by periods of intense rainfall over a short duration. These floods arise with very little warning and often result in locally intense damage, and sometimes loss of life, due to the high energy of the flowing water. Flood waters can snap trees, topple buildings, and easily move large boulders or other structures. Six inches of rushing water can upend a person; another 18 inches might carry off a car. Generally, upstream floods cause damage over relatively localized areas, but they can be quite severe in the local areas in which they occur. Urban flooding is a type of upstream flood. Urban flooding involves the overflow of storm drain systems and can be the result of inadequate drainage combined with heavy rainfall or rapid snowmelt. Upstream or flash floods can occur at any time of the year in Georgia, but they are most common in the spring and summer months.

Downstream floods, also called riverine floods, refer to floods on large rivers at locations with large upstream catchments. Downstream floods are typically associated with precipitation events that are of relatively long duration and occur over large areas. Flooding on small tributary streams may be limited, but the contribution of increased runoff may result in a large flood downstream. The lag time between precipitation and time of the flood peak is much longer for downstream floods than for upstream floods, generally providing ample warning for people to move to safe locations and, to some extent, secure some property against damage.

Coastal floods occurring on the Atlantic and Gulf coasts may be related to hurricanes or other combined offshore, nearshore, and shoreline processes. The effects of these complex interrelationships vary significantly across coastal settings, leading to challenges in the determination of the base (1-percent-annual-chance) flood for hazard mapping purposes. Land area covered by floodwaters of the base flood is identified as a Special Flood Hazard Area (SFHA).

The SFHA is the area where the National Flood Insurance Program's (NFIP) floodplain management regulations must be enforced and the area where the mandatory purchase of flood insurance applies. The owner of a structure in a high-risk area must carry flood insurance, if the owner carries a mortgage from a federally regulated or insured lender or servicer.

The Barrow County flood risk assessment analyzed at risk structures in the SFHA.

The following probabilistic risk assessment involves an analysis of a 1% annual chance riverine flood event (100-Year Flood) and a 1% annual chance coastal flood.

Riverine 1% Flood Scenario

Riverine losses were determined from the 1% flood boundaries downloaded from the FEMA Flood Map Service Center in December 2023. The flood boundaries were overlaid with the USGS 10 meter DEM

using the Hazus-MH Enhanced Quick Look tool to generate riverine depth grids. The riverine flood depth grid was then imported into Hazus-MH to calculate the riverine flood loss estimates. Figure 6 illustrates the riverine inundation boundary associated with the 1% annual chance.

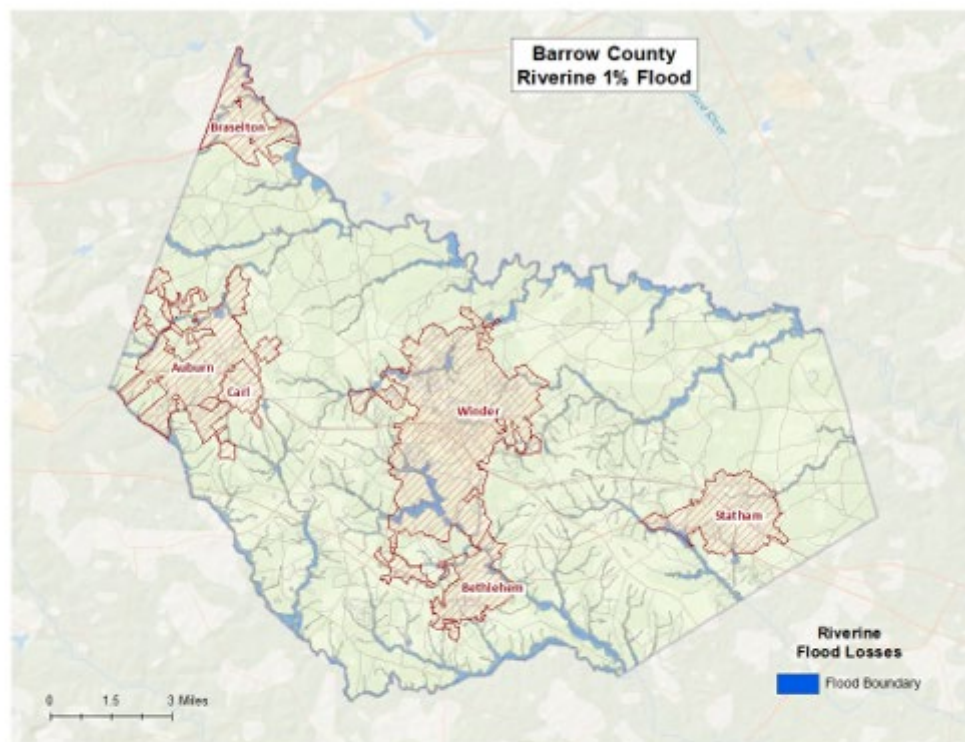


Figure 6: Riverine 1% Flood Inundation

Riverine 1% Flood Building Damages

Buildings in Barrow County are vulnerable to flooding from events equivalent to the 1% riverine flood. The economic and social impacts from a flood of this magnitude can be significant. Table 9 provides a summary of the potential flood-related building damage in Barrow County by jurisdiction that might be experienced from the 1% flood. Figure 7 maps the potential loss ratios of total building exposure to losses sustained to buildings from the 1% flood by 2010 census block and Figure 8 illustrates the relationship of building locations to the 1% flood inundation boundary.

Table 9: Barrow County Riverine 1% Building Losses

Occupancy	Total Buildings in the Jurisdiction	Total Buildings Damaged in the Jurisdiction	Total Building Exposure in the Jurisdiction	Total Losses to Buildings in the Jurisdiction	Loss Ratio of Exposed Buildings to Damaged Buildings in the Jurisdiction
Auburn					
Residential	3,132	7	\$459,500,699	\$204,735	0.04%
Bethlehem					
Residential	262	1	\$35,798,200	\$123,910	0.35%
Braselton					
Residential	710	9	\$276,083,761	\$715,476	0.26%
Unincorporated					
Commercial	307	8	\$115,820,715	\$679,115	0.59%
Government	20	2	\$3,031,096	\$9,959	0.33%
Residential	20,145	247	\$3,554,999,905	\$12,069,219	0.34%
Winder					
Residential	6,225	27	\$1,040,884,389	\$1,249,771	0.12%
County Total					
	30,801	301	\$5,486,118,766	\$15,052,185	

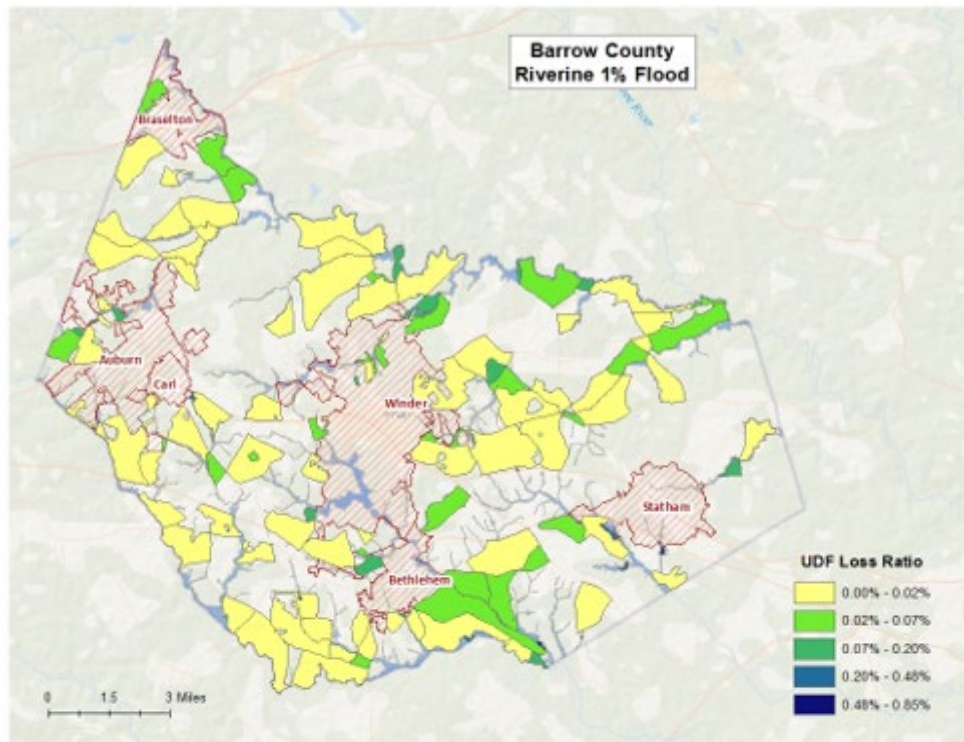


Figure 7: Barrow County Potential Loss Ratios of Total Building Exposure to Losses Sustained to Buildings from the 1% Riverine Flood by 2010 Census Block

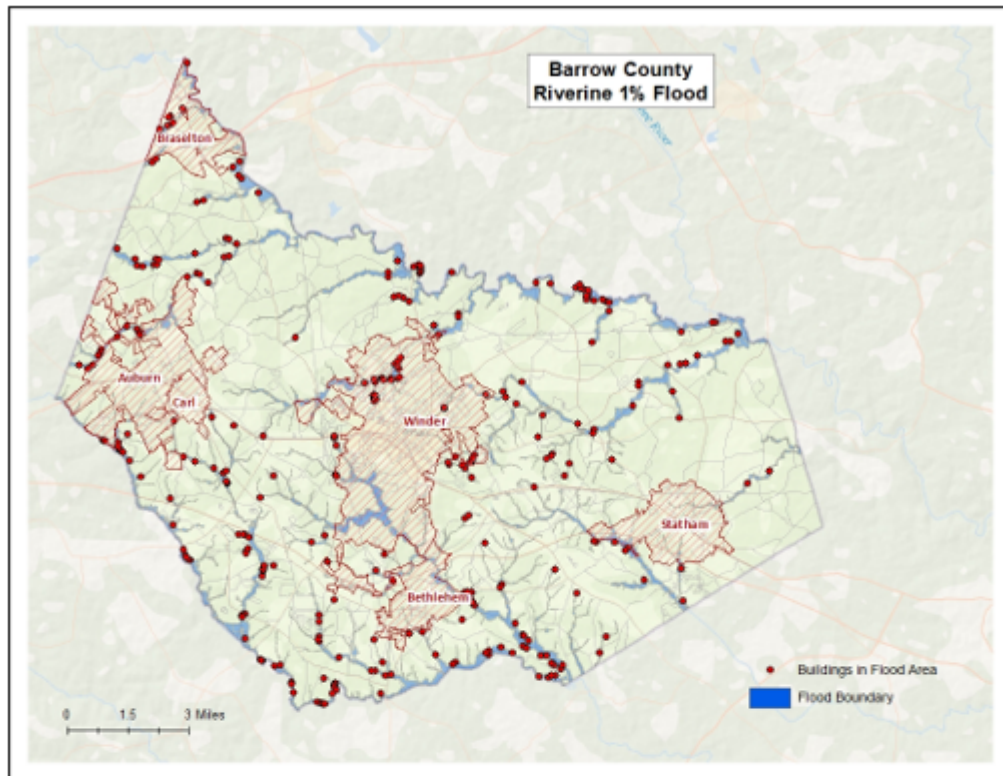


Figure 8: Barrow County Damaged Buildings in Riverine Floodplain (1% Flood)

Riverine 1% Flood Essential Facility Losses

An essential facility may encounter many of the same impacts as other buildings within the flood boundary. These impacts can include structural failure, extensive water damage to the facility and loss of facility functionality (e.g. a damaged police station will no longer be able to serve the community). The analysis identified no essential facility that were subject to damage in the Barrow County riverine 1% probability floodplain.

Riverine 1% Flood Shelter Requirements

Hazus-MH estimates that the number of households that are expected to be displaced from their homes due to riverine flooding and the associated potential evacuation. The model estimates 1,059 households might be displaced due to the flood. Displacement includes households evacuated within or very near to the inundated area. Displaced households represent 3,178 individuals, of which 1,892 may require short term publicly provided shelter. The results are mapped in Figure 9.

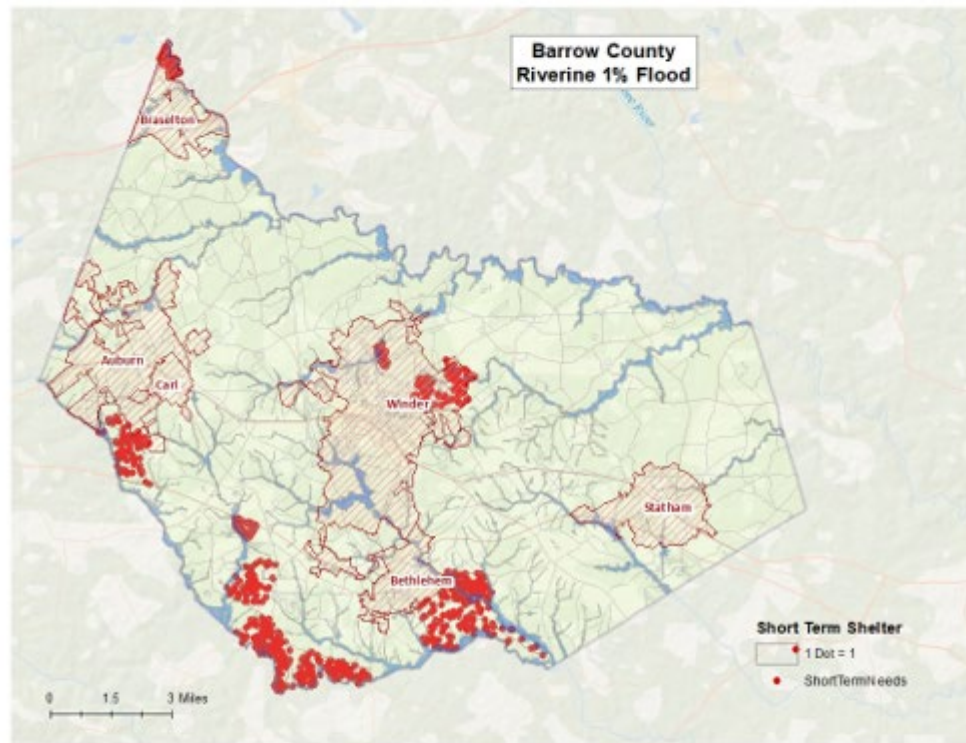


Figure 9: Riverine 1% Estimated Flood Shelter Requirements

Riverine 1% Flood Debris

Hazus-MH estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories:

- Finishes (dry wall, insulation, etc.)
- Structural (wood, brick, etc.)
- Foundations (concrete slab, concrete block, rebar, etc.)

Different types of material handling equipment will be required for each category. Debris definitions applied in Hazus-MH are unique to the Hazus-MH model and so do not necessarily conform to other definitions that may be employed in other models or guidelines.

The analysis estimates that an approximate total of 15,002 tons of debris might be generated: 1) Finishes- 5,859 tons; 2) Structural – 4,476 tons; and 3) Foundations- 4,667 tons. The results are mapped in Figure 10.

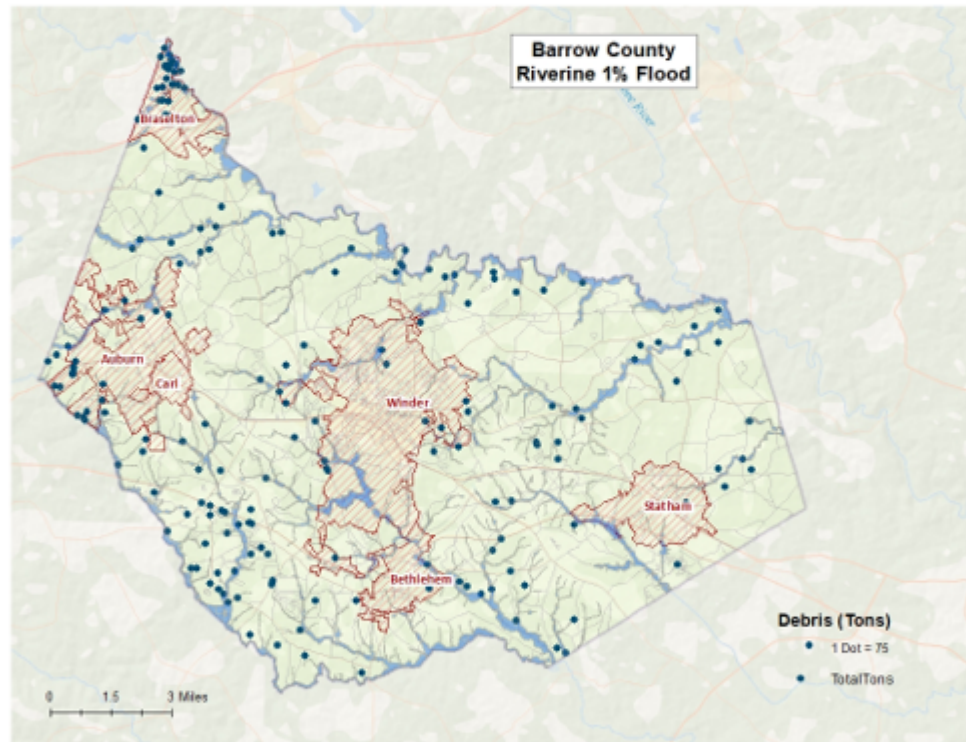


Figure 10: Riverine 1% Flood Debris Weight (Tons)

Tornado Risk Assessment

Hazard Definition

Tornadoes pose a great risk to the state of Georgia and its citizens. Tornadoes can occur at any time during the day or night. They can also happen during any month of the year. The unpredictability of tornadoes makes them one of Georgia's most dangerous hazards. Their extreme winds are violently destructive when they touch down in the region's developed and populated areas. Current estimates place the maximum velocity at about 300 miles per hour, but higher and lower values can occur. A wind velocity of 200 miles per hour will result in a wind pressure of 102.4 pounds per square foot of surface area—a load that exceeds the tolerance limits of most buildings. Considering these factors, it is easy to understand why tornadoes can be so devastating for the communities they hit.

Tornadoes are defined as violently-rotating columns of air extending from thunderstorms and cyclonic events. Funnel clouds are rotating columns of air not in contact with the ground; however, the violently-rotating column of air can reach the ground very quickly and become a tornado. If the funnel cloud picks up and blows debris, it has reached the ground and is a tornado.

Tornadoes are classified according to the Fujita tornado intensity scale. Originally introduced in 1971, the scale was modified in 2006 to better define the damage and estimated wind scale. The Enhanced Fujita Scale ranges from low intensity EF0 with effective wind speeds of 65 to 85 miles per hour, to EF5 tornadoes with effective wind speeds of over 200 miles per hour. The Enhanced Fujita intensity scale is included in Table 10.

Table 10: Enhanced Fujita Tornado Rating

Fujita Number	Estimated Wind Speed	Path Width	Path Length	Description of Destruction
EF0 <i>Gale</i>	65-85 mph	6-17 yards	0.3-0.9 miles	Light damage, some damage to chimneys, branches broken, sign boards damaged, shallow-rooted trees blown over.
EF1 <i>Moderate</i>	86-110 mph	18-55 yards	1.0-3.1 miles	Moderate damage, roof surfaces peeled off, mobile homes pushed off foundations, attached garages damaged.
EF2 <i>Significant</i>	111-135 mph	56-175 yards	3.2-9.9 miles	Considerable damage, entire roofs torn from frame houses, mobile homes demolished, boxcars pushed over, large trees snapped or uprooted.
EF3 <i>Severe</i>	136-165 mph	176-566 yards	10-31 miles	Severe damage, walls torn from well-constructed houses, trains overturned, most trees in forests uprooted, heavy cars thrown about.
EF4 <i>Devastating</i>	166-200 mph	0.3-0.9 miles	32-99 miles	Complete damage, well-constructed houses leveled, structures with weak foundations blown off for some distance, large missiles generated.
EF5 <i>Incredible</i>	> 200 mph	1.0-3.1 miles	100-315 miles	Foundations swept clean, automobiles become missiles and thrown for 100 yards or more, steel-reinforced concrete structures badly damaged.

Source: <http://www.srh.noaa.gov>

Hypothetical Tornado Scenario

For this report, an EF3 tornado was modeled to illustrate the potential impacts of tornadoes of this magnitude in the county. The analysis used a hypothetical path based upon an EF3 tornado event running along the predominant direction of historical tornados (southeast to northwest). The tornado path was placed to travel through Winder. The selected widths were modeled after a re-creation of the Fujita-Scale guidelines based on conceptual wind speeds, path widths, and path lengths. There is no guarantee that every tornado will fit exactly into one of these categories. Table 11 depicts tornado path widths and expected damage.

Table 11: Tornado Path Widths and Damage Curves

Fujita Scale	Path Width (feet)	Maximum Expected Damage
EF-5	2,400	100%
EF-4	1,800	100%
EF-3	1,200	80%
EF-2	600	50%
EF-1	300	10%
EF-0	300	0%

Within any given tornado path there are degrees of damage. The most intense damage occurs within the center of the damage path, with decreasing amounts of damage away from the center. After the hypothetical path is digitized on a map, the process is modeled in GIS by adding buffers (damage zones) around the tornado path. Figure 11 describes the zone analysis.

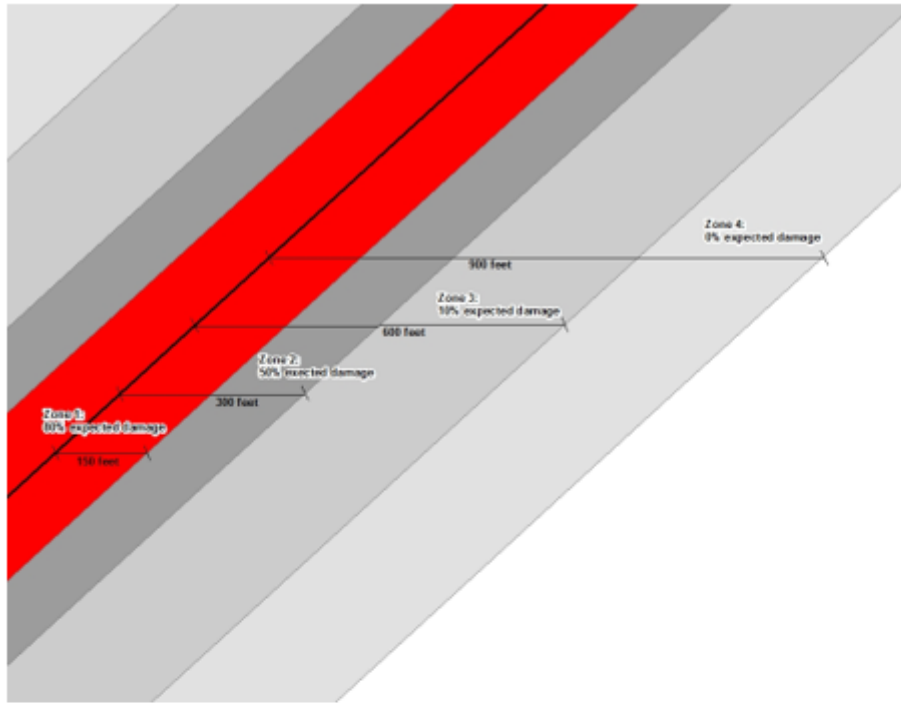


Figure 11: EF Scale Tornado Zones

An EF3 tornado has four damage zones, depicted in Table 12. Major damage is estimated within 150 feet of the tornado path. The outer buffer is 900 feet from the tornado path, within which buildings will not experience any damage. The selected hypothetical tornado path is depicted in Figure 12 and the damage curve buffer zones are shown in Figure 13.

Table 12: EF3 Tornado Zones and Damage Curves

Zone	Buffer (feet)	Damage Curve
1	0-150	80%
2	150-300	50%
3	300-600	10%
4	600-900	0%

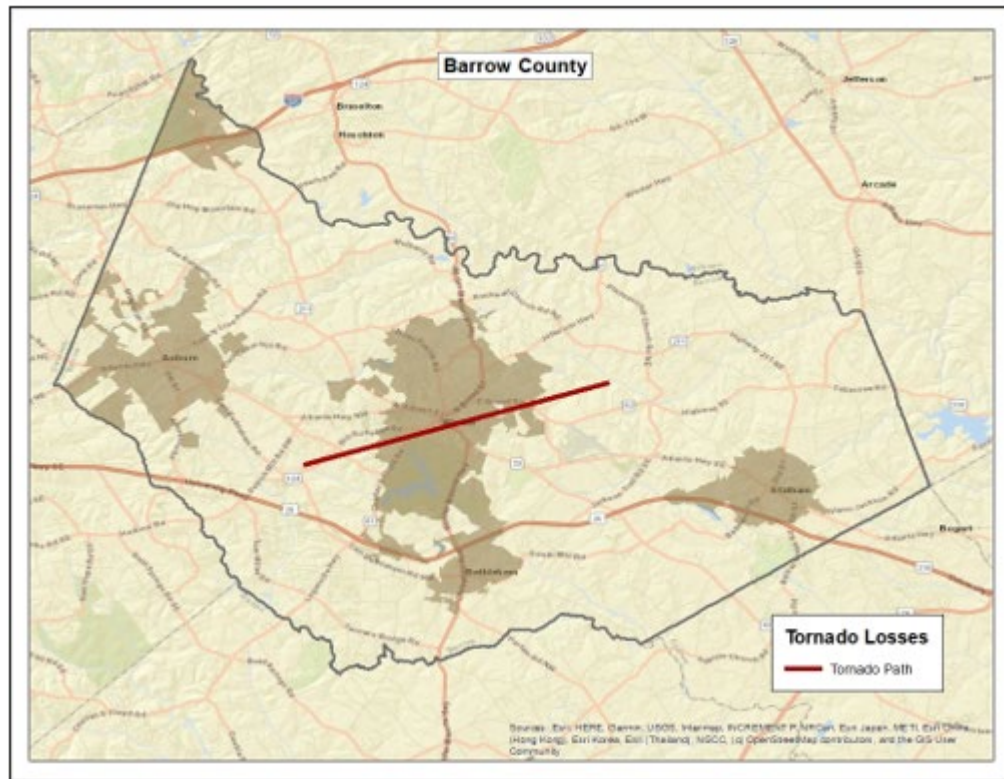


Figure 12: Hypothetical EF3 Tornado Path in Barrow County

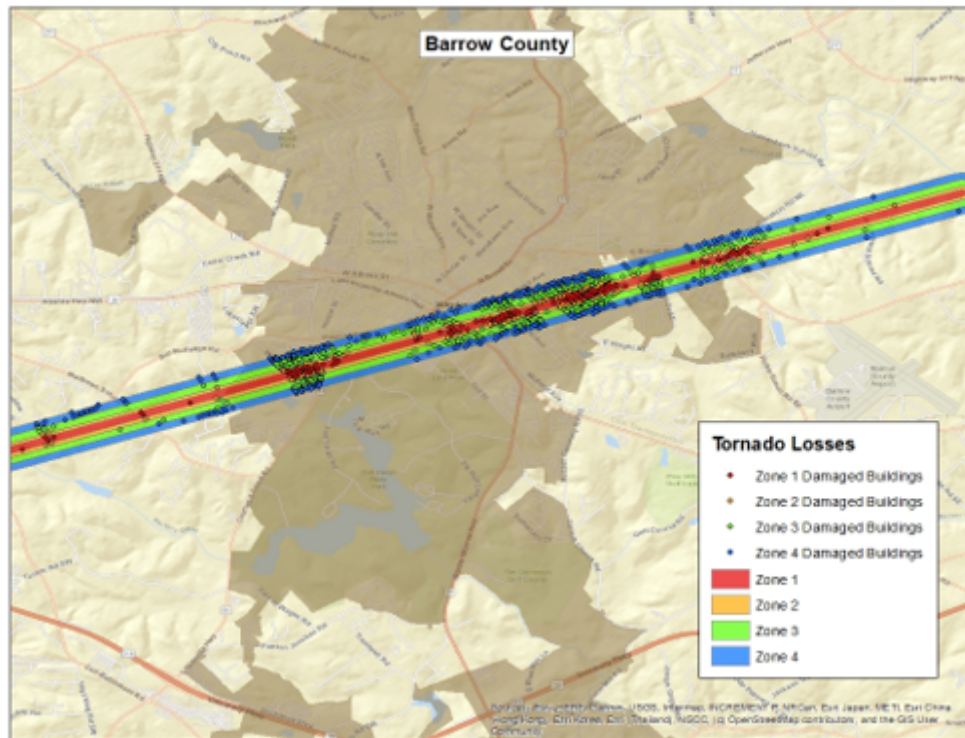


Figure 13: Modeled EF3 Tornado Damage Buffers in Barrow County

EF3 Tornado Building Damages

The analysis estimated that approximately 919 buildings could be damaged, with estimated building losses of \$36 million. The building losses are an estimate of building replacement costs multiplied by the percentages of damage. The overlay was performed against parcels provided by Barrow County that were joined with Assessor records showing estimated property replacement costs. The Assessor records often do not distinguish parcels by occupancy class if the parcels are not taxable and thus the number of buildings and replacement costs may be underestimated. The results of the analysis are depicted in Table 13.

Table 13: Estimated Building Losses by Occupancy Type

Occupancy	Buildings Damaged	Building Losses
Residential	787	\$25,110,715
Commercial	83	\$9,416,216
Industrial	27	\$843,085
Religious	5	\$102,060
Education	6	\$475,428
Government	11	\$109,565
Total	919	\$36,057,069

EF3 Tornado Essential Facility Damage

There were two essential facilities located in the tornado path – two schools. Table 14 outlines the specific facility and the amount of damage under the scenario.

Table 14: Estimated Essential Facilities Damaged

Facility	Amount of Damage
Westside Middle School	Major Damage
Kennedy Elementary School	Minor Damage

According to the Georgia Department of Education, Westside Middle School's enrollment was approximately 744 students and Kennedy Elementary School's enrollment was approximately 748 students as of October 2023. Depending on the time of day, a tornado strike as depicted in this scenario could result in significant injury and loss of life. In addition, arrangements would have to be made for the continued education of the students in another location.

The location of the damaged Essential Facility is mapped in Figure 14.

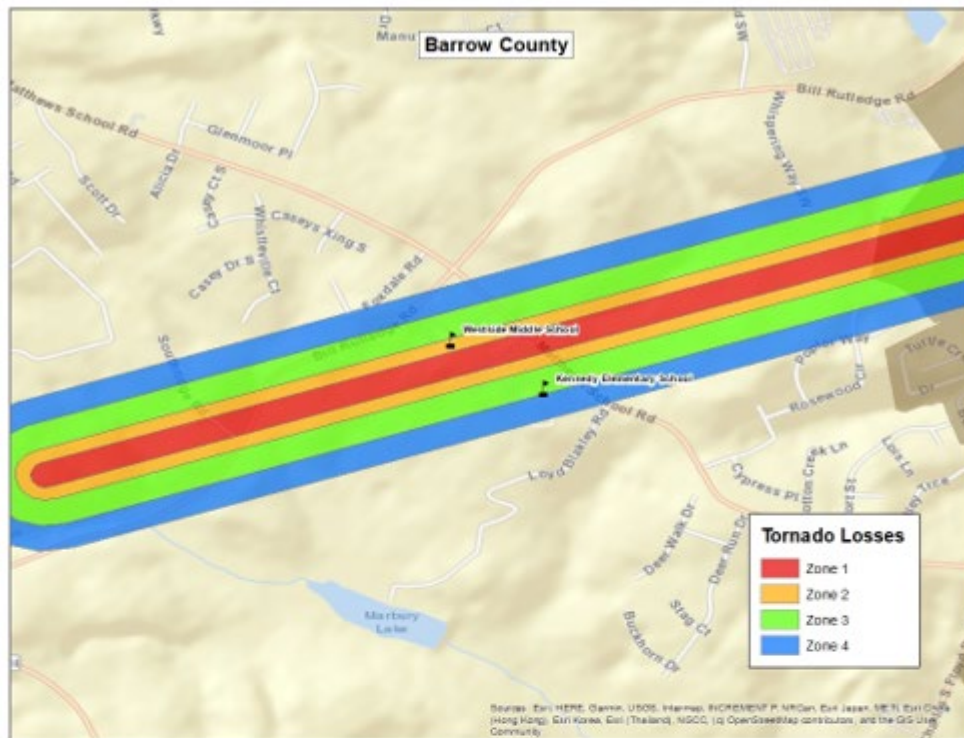


Figure 14: Modeled Essential Facility Damage in Barrow County

Exceptions Report

Hazus Version 2.2 SP1 was used to perform the loss estimates for Barrow County, Georgia. Changes made to the default Hazus-MH inventory and the modeling parameters used to setup the hazard scenarios are described within this document.

Reported losses reflect the updated data sets. Steps, algorithms and assumptions used during the data update process are documented in the project workflow named PDM_GA_Workflow.doc.

Statewide Inventory Changes

The default Hazus-MH Essential Facility inventory was updated for the entire state prior to running the hazard scenarios for Barrow County.

Updates to the Critical Facility data used in GMIS were provided by Barrow County in December 2023. These updates were applied by The Carl Vinson Institute of Government at the University of Georgia. Table 15 summarizes the difference between the original Hazus-MH default data and the updated data for Barrow County.

Table 15: Essential Facility Updates

Site Class	Feature Class	Default Replacement Cost	Default Count	Updated Replacement Cost	Updated Count
EF	Care	\$11,775,000	5	\$22,708,000	8
EF	EOC	\$3,680,000	1	\$2,561,000	1
EF	Fire	\$3,116,000	8	\$6,545,000	8
EF	Police	\$16,879,000	4	\$19,669,000	5
EF	School	\$80,369,000	18	\$111,547,000	24

County Inventory Changes

The GBS records for Barrow County were replaced with data derived from parcel and property assessment data obtained from Barrow County. The county provided property assessment data was current as of December 2023 and the parcel data current as of December 2023.

General Building Stock Updates

The parcel boundaries and assessor records were obtained from Barrow County. Records without improvements were deleted. The parcel boundaries were converted to parcel points located in the centroids of each parcel boundary. Each parcel point was linked to an assessor record based upon matching parcel numbers. The generated Building Inventory represents the approximate locations (within a parcel) of building exposure. The Building Inventory was aggregated by Census Block and imported into Hazus-MH using the Hazus-MH Comprehensive Data Management System (CDMS). Both the 2010 Census Tract and Census Block tables were updated.

The match between parcel records and assessor records was based upon a common Parcel ID. For this type of project, unless the hit rate is better than 85%, the records are not used to update the default aggregate inventory in Hazus-MH. The Parcel-Assessor hit rate for Barrow County was 99.9%.

Adjustments were made to records when primary fields did not have a value. In these cases, default values were applied to the fields. Table 16 outlines the adjustments made to Barrow County records.

Table 16: Building Inventory Default Adjustment Rates

Type of Adjustment	Building Count	Percentage
Area Unknown	178	1%
Construction Unknown	882	3%
Condition Unknown	87	0%
Foundation Unknown	985	3%
Year Built Unknown	2,757	8%
Total Buildings	33,767	3%

Approximately 3% of the CAMA values were either missing (<Null> or '0'), did not match CAMA domains or were unusable ('Unknown', 'Other', 'Pending'). These were replaced with 'best available' values. Missing Year Built values were populated from average values per Census Block. Missing Condition, Construction and Foundation values were populated with the highest-frequency CAMA values per Occupancy Class. Missing Area values were populated with the average CAMA values per Occupancy Class.

The resulting Building Inventory was used to populate the Hazus-MH General Building Stock and User Defined Facility tables. The updated General Building Stock was used to calculate flood and tornado losses. Changes to the building counts and exposure that were modeled in Barrow County are sorted by General Occupancy in Table 1 at the beginning of this report. If replacements cost or building value were not present for a given record in the Assessor data, replacement costs were calculated from the Building Area (sq ft) multiplied by the Hazus-MH RS Means (\$/sq ft) values for each Occupancy Class.

Differences between the default and updated data are due to various factors. The Assessor records often do not distinguish parcels by occupancy class when the parcels are not taxable; therefore, the total number of buildings and the building replacement costs for government, religious/non-profit, and education may be underestimated.

User Defined Facilities

Building Inventory was used to create Hazus-MH User Defined Facility (UDF) inventory for flood modeling. Hazus-MH flood loss estimates are based upon the UDF point data. Buildings within the flood boundary were imported into Hazus-MH as User Defined Facilities and modeled as points.

Table 17: User Defined Facility Exposure

Class	Hazus-MH Feature	Counts	Exposure
BI	Building Exposure	33,767	\$6,510,809,420
Riverine UDF	Structures Inside 1% Annual Chance Riverine Flood Area	342	\$60,244,722

Assumptions

- Flood analysis was performed on Building Inventory. Building Inventory within the flood boundary was imported as User Defined Facilities. The point locations are parcel centroid accuracy.
- The analysis is restricted to the county boundary. Events that occur near the county boundary do not contain loss estimates from adjacent counties.
- The following attributes were defaulted or calculated:
 - First Floor Height was set from Foundation Type
 - Content Cost was calculated from Building Cost