TOWNS COUNTY HAZARD MITIGATION PLAN UPDATE 2018 - 2023

Towns County Emergency Management Agency

Lux Mitigation and Planning Corp.

Towns County, Georgia

Hazard Mitigation Plan Update

2018 – 2023

Prepared for the Towns County Commissioner

48 River Street

Hiawassee, Georgia 30546

706.896.2276

www.townscountyga.org

Towns County's
Hazard Mitigation Plan Update 2018

This document was funded in part by the Hazard Mitigation Planning Grant awarded to the Towns County Emergency Management Agency by the Georgia Emergency Management Agency (GEMA) to fulfill the requirements of the Federal Disaster Mitigation Act of 2000 (DMA 2000). Towns County's Hazard Mitigation Plan 2013 was updated by the Towns County Hazard Mitigation Plan Update Committee and was prepared by Lux Mitigation and Planning Corp. For additional information, please contact Towns County Emergency Management Agency.

Director Rickey Mathis
Towns County Emergency Management Agency
1100 Jack Dayton Circle
Hiawassee, Georgia 30546
rm801@windstream.net
706.896.2228

Resolution – Towns County

WHEREAS, Towns County and its municipalities recognize that it is threatened by a number of 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) has required that every county and municipality have a pre-disaster mitigation plan in place, and requires the adoption of such plans in order to receive funding from the Hazard Mitigation Grant Program; 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, the Towns County Hazard Mitigation Plan Update 2018 - 2023 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 Commissioner of Towns County, Georgia and the Mayors and Councils of the Cities of Hiawassee and Young Harris each meeting in respective session, that:

1) Towns County, Georgia, the Cities of Hiawassee and Young Harris have adopted the Towns County Hazard Mitigation Plan Update 2018 - 2023; 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 Towns County and its municipalities.

PASSED, APPROVED AND ADOPTED by the Towns County Commissioner in regular session this _____ day of _____, 2018.

_____

Commissioner

Resolutions – Towns County Municipalities

Requirement §201.6(c)(5)

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PASSED, APPROVED AND ADOPTED by the Hiawassee Mayor and City Council in regular session this _____ day of _____, 2018.

_____ _____

Mayor City Clerk

WHEREAS, Towns County and its municipalities recognize that it is threatened by a number of 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

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PASSED, APPROVED AND ADOPTED by the Young Harris Mayor and City Council in regular session this _____ day of _____, 2018.

_____ _____

Mayor City Clerk

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. In an effort 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.

Towns County and its municipalities realize the benefits achieved by the development and implementation of mitigation plans and strategies in our community. Towns 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:

Towns County
City of Hiawassee
City of Young Harris

Table of Contents

CHAPTER THREE – HAZARD PROFILES (CONTINUED)

APPENDICIES

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 Towns County Hazard Mitigation Plan 2013.

Chapter 1 Section	Updates
Introduction	• Identification of Mitigation Goals
Authority	• New Section – Not in 2013 Mitigation Plan
Funding	• New Section – Not in 2013 Mitigation Plan
Scope	• New Section – Not in 2013 Mitigation Plan
Purpose	• Updated from 2013 Mitigation plan
Consistency with Federal Guidelines	• New Section – Not in 2013 Mitigation Plan
Plan Review	• New Section – Not in 2013 Mitigation Plan
Hazard Mitigation Plan Update Committee	• Updated committee list to match the 2017-2018 planning participants
Public Participation	• New Section – Not in 2013 Mitigation Plan
Multi-Jurisdictional Considerations	• Updated with requirement descriptions
Incorporation of Existing Plans, Studies, and Resources	• Updated with new plan, study, and resource incorporations

Introduction

The Towns 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 in an effort 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. Towns County's Hazard Mitigation Plan Update Committee adopted the following goals during plan development:

GOAL 1 Protect the public health and safety

GOAL 2 Reduce and eliminate (to the extent possible) community exposure to natural and technological hazard events

GOAL 3 Reduce loss and damage to private property and public infrastructure resulting from natural or technological hazards

GOAL 4 Maintain continuity of public and private sector operations during and after hazard events

GOAL 5 Respond promptly, appropriately, and efficiently in the event of natural or technological hazards

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

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, Towns County's Updated Hazard Mitigation Plan will be brought forth to each participating jurisdiction in Towns 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.

Funding

Towns County was awarded a $28,000 Hazard Mitigation Planning Grant by FEMA through GEMA for the update of Towns County's 2013 Hazard Mitigation Plan. FEMA contributed 75% of the total cost of the Plan Update, and GEMA contributed 10% of the total cost. The Hazard Mitigation Planning Grant required a 15% match by Towns 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.

Scope

The scope of the Towns County Hazard Mitigation Plan Update encompasses all areas of Towns County, including municipalities. The Plan identifies all natural and technological hazards that could threaten life and property in Towns 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 Towns 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 CFFR 201.4(c)(2). Additionally, Chapter Three identifies and analyzes potential technological hazards faced by Towns County.

Chapter Four identifies Towns 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).

Purpose

The purpose of the Towns 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 Towns 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.

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 build safer, more disaster resistant communities;
- Develop strategies for long-term community sustainability during community 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 Towns County Hazard Mitigation Plan recognizes, adopts, incorporates, and endorses the following principles:

- Develop a strategic mitigation plan for Towns 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.

The private sector is often an overlooked segment of the community during disasters. It is vital that this sector of a community 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 Towns 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.

Plan Review

Requirement §201.6(c)(1)

The contracted planner, Lux Mitigation and Planning, had the primary responsibility for collecting updated information and presenting data to the committee. The approved 2013 Hazard Mitigation Plan was provided to each member of the Hazard Mitigation Plan Update Committee. Each chapter was reviewed with updated hazard, risk and vulnerability data; updated critical infrastructure information; and revised mitigation strategies based upon whether the strategy was completed, needed to be modified, is an ongoing strategy, or no longer applies. Irregularly attending participants were kept informed with emails containing the updated version of the plan.

Towns County Hazard Mitigation Plan Update Meeting Dates:

Wednesday, March 29, 2017	Kick-Off Meeting
Thursday, July 20, 2017	Hazard Identification and Prioritization; Risk Assessment Analysis
Thursday, August 24, 2017	Analysis of Hazard Profile Research; Review and Edit of Current Hazard Mitigation Strategies
Thursday, September 21, 2017	Identification of New Hazard Mitigation Strategies
Thursday, October 19, 2017	Update of Critical Facilities; Presentation of Towns County Hazard Mitigation Plan Rough Draft
Thursday, November 2, 2017	Review and Edit of Towns County Hazard Mitigation Plan Final Draft
Friday, June 15, 2018	Public Meeting #1

A second public meeting will be held immediately prior to the adoption of the Towns County Hazard Mitigation Plan Update by the Towns County Commissioner.

Each section of Towns County's 2013 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. Major plan changes include the following:

- Addition of Earthquakes to Natural Hazards
- Addition of Landslide to Natural Hazards
- Addition of Tropical Cyclones to Natural Hazards
- Addition of Transportation Incident to Technological Hazards
- Addition of Terrorism to Technological Hazards

Hazard Mitigation Plan Update Committee

Requirement §201.6(b)(2)

The following members, representing various jurisdictions, city and county departments, and community organizations and businesses, participated in the update of Towns County's 2013 Hazard Mitigation Plan.

Towns County Hazard Mitigation Plan Update Committee – 32 Participants

Benny Barrett
Road Signs
Towns County GIS/Mapping Department

Kris Berrong
Mayor Pro Tem
City of Hiawassee

Tony Berrong
Environmental Health
Towns County Health Department

Chris Clinton
Sheriff
Towns County Sheriff's Office

Terry Conner
Chief Deputy
Towns County Sheriff's Office

Harold Copeland
Fire Chief; Coroner
Towns County Fire Rescue

Jim Couch
Captain - Field Operations
Towns County Sheriff's Office

Wendell Farmer, RN
Clinical Director - Clearview @ Chatuge
Chatuge Regional Hospital

Cenlya Galloway
Court Clerk
City of Hiawassee

Richard Green
Superintendent
Towns County Water Authority

Jessie Scott Hamilton
Transportation Supervisor - Towns County Schools
Towns County Board of Education

Alton N. Higgins
Emergency Coordinator - Georgia ARES
FEMA/GEMA Emergency Support Function #2

Machelle Lovell, RN
Chief Nursing Officer
Chatuge Regional Hospital

Rickey Mathis
Director
Towns County Emergency Management Agency

Joel Miller
Fleet/Communications Coordinator
Blue Ridge Mountains EMC

Stuart Miller
City Councilman
City of Young Harris

Liz Ordiales
Mayor Pro-Tem
City of Hiawassee

John Peebles
Building Inspector
Towns County Building Department

Christa Rich, RN
Director of Operations
Tugaloo Home Health

Alisa Richards
Commissioner's Assistant; Road Department Assistant
Towns County Commissioner's Office

Marty Roberts
Director; Deputy Director
Towns County E911/GIS; Towns County Emergency Management Agency

Rosemary Royston
Vice President for Planning and Research; Chief of Staff
Young Harris College

Jeff Scott
Captain; Training Officer
Towns County Fire Rescue

Lisa M. Sellers
Medical Technologist – Laboratory
Chatuge Regional Hospital

Clyde Shook
Superintendent
Towns County Road Department

Ryan Snow
Chatuge Regional Administration
Chatuge Regional Hospital

Jimmy Taff
Retired
USDA Natural Resources Conservation Services

Greg Taylor
Director
Towns County Emergency Medical Services

Sally Varao
Disaster Action Team Captain – Towns County
American Red Cross

Brandon Walls
Firefighter; Paramedic; Special Ops Coordinator
Towns County Fire Rescue

Curtis Walls
Paramedic Supervisor
Towns County Emergency Medical Services

Michael West
County Appraiser; Assessor; Deputy Chief Appraiser
Towns County Assessor's Office

Matt Youngblood
Director
Towns County Parks and Recreation Department

Towns County convened the Hazard Mitigation Plan Update Committee comprised of representatives from various participating jurisdictions. The Committee worked with Lux Mitigation and Planning and provided input at key stages of the process. Efforts were made to involve municipal, city, and county departments and community organizations, which might have a role in the implementation of the mitigation actions or policies. These efforts included invitations to attend meetings, e-mail updates, and opportunities for input and comment on all draft deliverables.

In addition to the Towns County Hazard Mitigation Plan Update Committee, all surrounding counties – Habersham, Rabun, Union, White, and Clay (North Carolina) – will be provided a copy of this FEMA approved plan for their review. This plan will be provided to each County EMA office. Additionally, surrounding jurisdictions were provided the opportunity to review the plan prior to its submission to GEMA and FEMA for approval. Documentation of this review can be found in Appendix F.

Public Participation

Requirement §201.6(b)(1)
State Requirement Element F2

As citizens become more involved in decisions that affect their safety, they are more likely to gain a greater appreciation of the natural hazards present in their community and take the steps necessary to reduce their impact. Public awareness is a key component of any community's overall mitigation strategy aimed at making a home, neighborhood, school, business, or city safer from the potential effects of natural hazards.

Participation from local organizations and businesses during the update process included: American Red Cross, Blue Ridge Mountains EMC, Chatuge Regional Hospital, Tugaloo Home Health, and Young Harris College

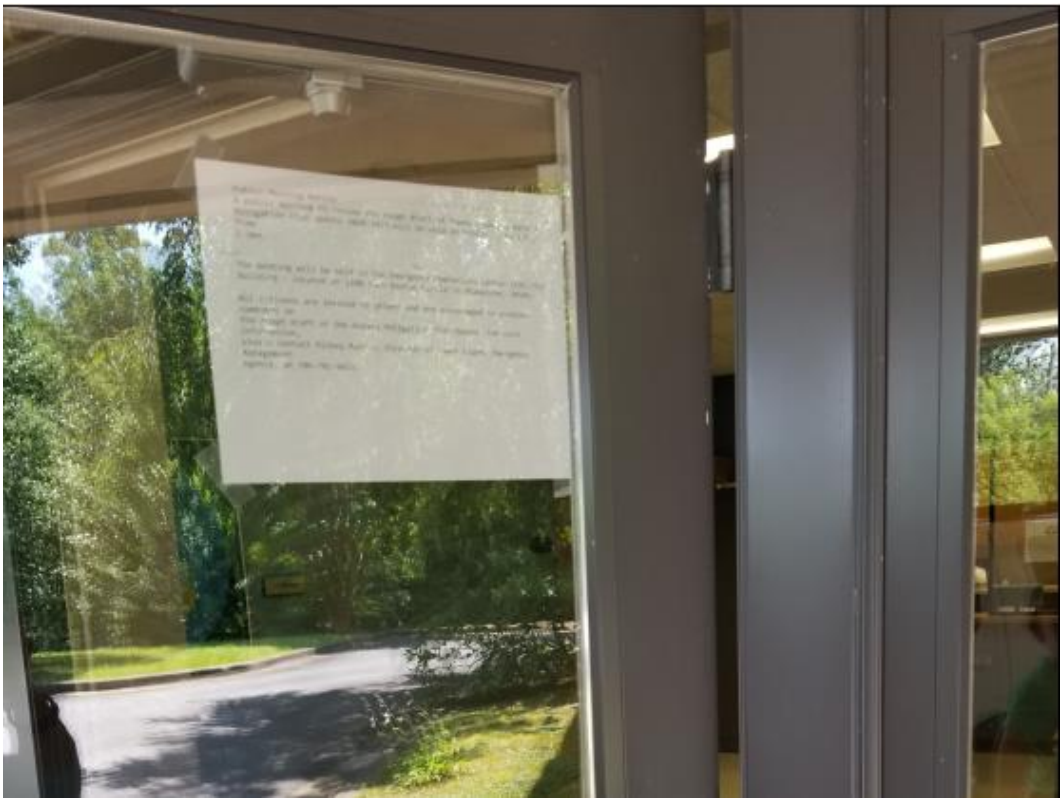
The Towns County Hazard Mitigation Plan Update Committee took it upon themselves to ensure the processes undertaken for the development, implementation, and maintenance of the Towns County Hazard Mitigation Plan Update adequately considered public needs and viewpoints.

A list of public outreach initiatives can be found below:

- Prior to every meeting, an email invitation was sent to all committee members and other stakeholders encouraging their attendance and encouraging them to pass along the invitation to any additional personnel within their organization or other organization that may benefit the update of the Franklin County Hazard Mitigation Plan.
- A Public Meeting was held on June 15, 2018 to provide the public an opportunity to review the plan and provide comment. There were no public comments or recommendation provided prior to, during, or after the Public Meeting.
- A second public meeting will be held immediately prior to the adoption of the Towns County Hazard Mitigation Plan Update by the Towns County Commissioner. This meeting will be advertised through multiple media, including social media, to both notify the public of the meeting and to encourage their participation.

Documentation of Public Meeting Notice

Public Meeting Advertisement



This picture is from the front door of the Towns County 911/EOC, a publicly-accessible building that houses several Towns County government offices – including several who are visited daily by the public.

The sign states the following:

"Public Meeting Notice

A public meeting to review the rough draft of the Towns County Hazard Mitigation Plan update 2018-2023 will be held on Friday, June 15h, 2018 from 2-3 pm.

The meeting will be held in the Emergency Operations Center (EOC/911 Building) – located at 1110 Jack Dayton Circle in Hiawassee, 30546.

All citizens are invited to attend and are encouraged to provide comments on the rough draft of the Hazard Mitigation Plan Update. For more information, please contact Rickey Mathis, Director of Towns County Emergency Management Agency, at 706-781-9653."

Public Meeting Sign In Sheet

Towns County Hazard Mitigation Plan Update – Public Meeting

Sign-In Sheet

Friday, June 15, 2018

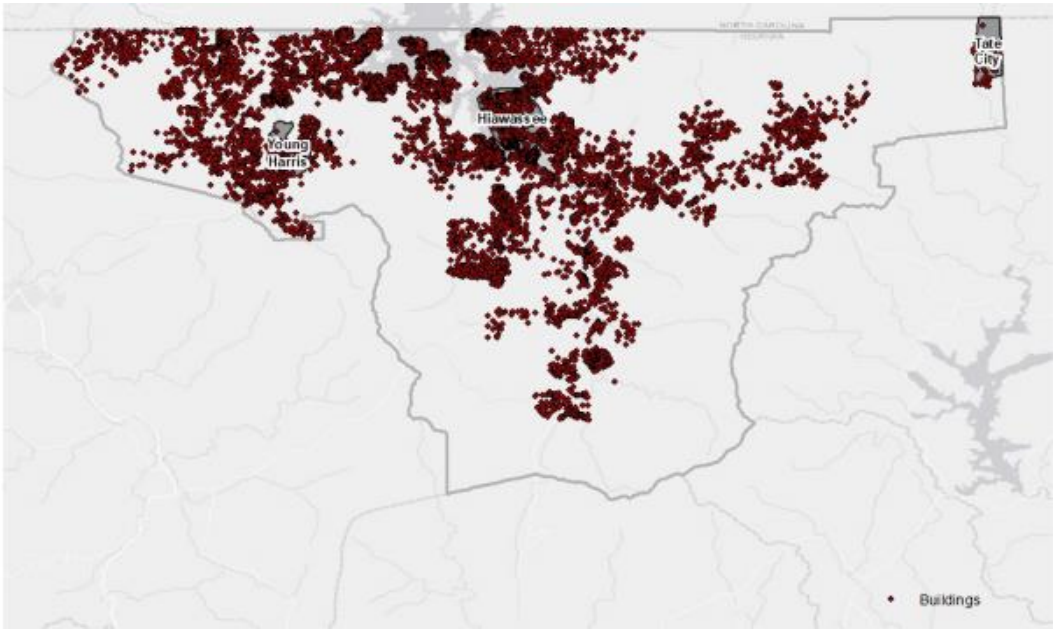
Name/Title	Signature	E-mail Address	Agency/Organization
Marty Roberts 911 - Director EMA - Deputy Director	Marty Roberts	911@townscountyga.com	911 / EMA
Robyn Henson 911 Asst.	Robyn Henson	911asst@townscountyga.com	911 / 911 mapping
Benny Barrett - Sign Dept	Benny Barrett		Mapping Dept.

Multi-Jurisdictional Considerations

While cities are not required by FEMA to adopt hazard mitigation plans, the Federal DMA 2000 requires all municipalities that wish to be eligible to receive FEMA hazard mitigation grants to adopt a local multi-hazard mitigation plan and to update the plan every five years. Towns County's Hazard Mitigation Plan was approved by FEMA in 2013, and the 2018 Plan Update provides the first five-year update. This approved Hazard Mitigation Plan makes Towns County and its municipalities 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. Towns County is dedicated to work in the best interests of the County, as well as, the Cities of Hiawassee and Young Harris. During the creation and update of this Plan, Towns County Emergency Management Agency solicited and received participation from the following Towns County cities: Hiawassee and Young Harris. Therefore, the result is a truly multi-jurisdictional plan. A few mitigation action steps identified in this plan update may apply to selected jurisdictions. These steps are identified in the appropriate sections. Unless specifically noted otherwise, most steps apply equally to all jurisdictions.

Distribution of Buildings in Towns County



Incorporation of Existing Plans, Studies, and Resources

Requirement §201.6(b)(3)

State Requirement Element F3

Existing Plans

2013 Towns County Pre-Disaster Hazard Mitigation Plan
2014 State of Georgia Hazard Mitigation Plan
Towns County Local Emergency Operations Plan
Georgia Forestry Commission's Towns Co. Community Wildfire Protection Plan
Towns County Joint Comprehensive Plan, 2010
2018 Towns County HAZUS Report

Studies

2012 United States Department of Agriculture Ag Census
2010 United States Census
2009 Towns 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
Towns County Tax Assessor's Data
Towns County Website – www.Townscountyga.org
GMIS Database
City University of New York
Colorado State University
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

Application of Existing Plans and Studies

Existing Planning Mechanism	Reviewed? Yes/No	Incorporation Into Mitigation Plan
2013 Towns County Hazard Mitigation Plan	Yes	Baseline for the 2018 Plan; updated mitigation strategies; updated hazards; updated Towns County information
2014 State of Georgia Hazard Mitigation Plan	Yes	Hazard descriptions; potential hazards; mapping mechanisms; potential mitigation strategies that could be adopted on a local level
Towns County Local Emergency Operations Plan (LEOP)	Yes	Identification of current resources; identification of current capabilities
Georgia Forestry's Towns County Community Wildfire Protection Plan (CWPP)	Yes	Mitigation strategies for wildfire and drought; historical data
2012 USDA Agriculture Census	Yes	Agricultural data regarding potential losses for drought and wildfire
2010 United State Census	Yes	To update Towns County's profile information
2009 Towns County Flood Insurance Study	Yes	Identify potential flood prone areas; prioritization of flood-related mitigation strategies
Towns County Comprehensive Plan, 2010	Yes	To identify future development trends; identify mitigation strategies to curb trends in a direction that considers the hazards of the area
2018 Towns County HAZUS Report	Yes	To assist with risk and vulnerability assessment; Identify potential hazard impacts and damages
Towns County Flood Mitigation Assistance Plan	No	No such plan exists

CHAPTER TWO
–
TOWNS 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 Towns County Hazard Mitigation Plan 2013.

Chapter 2 Section	Updates
Past Hazards	• New Section – Not in 2013 Mitigation Plan. 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	• New Section – Not in 2013 Mitigation Plan. Some of these events were listed in the hazard profiles in the previous plan.
Demographics	• Updated data to the 2010 Census information
Economy	• Expanded and updated from previous plan
Government	• Expanded and updated from previous plan
Municipalities	• New Section – Not in 2013 Mitigation Plan
Transportation	• Expanded and updated from previous plan
Climate	• Expanded and updated from previous plan
Utilities	• Expanded and updated from previous plan
NFIP Compliance	• New Section – Not in 2013 Mitigation Plan as a standalone section

Past Hazards

Towns County has faced many hazards in its long history. In the last 50 years, Towns County has been subjected to 33 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 in Towns County, although with much less frequency. There has been 1 documented tornado in the last fifty years in Towns County.

Because of heavy rainfall either within or upstream from Towns County, flooding has occurred in the past as well. Documentation of 6 flooding events exist within the National Climactic Data Center of the National Weather Service for Towns County.

Winter storms and heavy snowfall have affected Towns County infrequently in the last 50 years. These events are not a yearly occurrence and typically do not have the pre-planning in place when compared to Northern and Western states who see this type of weather phenomena regularly. The NCDC record 65 documented winter storm or heavy snow events for Towns County with 14 of those having occurred in the last 5 years.

Due to Towns County's proximity to active fault locations in Tennessee and North Carolina, Earthquakes are another significant threat. One earthquake has originated from within Towns County and 550 have occurred within 75 miles of the City of Hiawassee.

Towns County has been plagued by other less severe or less frequent hazards in the past. These hazards include, but are not limited to, the following: drought, landslides, and wildfires.

History

Towns County, which borders North Carolina in northeast Georgia's Blue Ridge Mountains, is the state's 118th county and comprises 167 square miles. It was created in 1856 from Rabun and Union counties. Originally inhabited by Cherokee Indians, the newly formed county was named for George W. Towns, the governor of Georgia from 1847 to 1851. The first white settlers, attracted by the promise of free land, arrived after the Indian cessions of 1818 and 1819. Many of them came from the state's coastal counties, although those who gravitated to the most remote areas of the county were farmers from the mountains of North Carolina.

An important facet of early life in Towns County was a road built upon a Cherokee trading path running north to south through the county and passing through Unicoi Gap. It served as a line between settlers and the Cherokees until after the Indian cessions, when it fell solely into the hands of the whites. When the Cherokees were expelled from their villages, they were forced into "removal forts," one of which was located in what is now Hiawassee, the county seat.

Its remote location buffered the county from many of the effects of the Civil War (1861-65) and Reconstruction. Many residents of mountainous northeast Georgia were opposed, or at least held no enthusiasm for, the Confederate cause. One group of young men from Towns County, holding anti-Confederate sentiments, fled to Tennessee to escape fighting for the Southern cause, but were ambushed and killed by Confederates.

Hiawassee was incorporated in 1956, although it was originally incorporated in 1870 as "Hiwassee." The name is from the Cherokee for "meadow," "savanna," or "pretty fawn." The first courthouse, completed in 1857, was replaced in 1905. The current courthouse was built in 1964. The county has one other incorporated town, Young Harris, a college town in the mountains. Originally called McTyeire, the town changed its name to Young Harris to honor a major benefactor of the local McTyeire Institute, founded in 1886 by Artemus Lester. When the town changed its name, the college followed suit. Each summer, Young Harris College is the host of The Reach of Song, the official state historic drama, which is performed at the Clegg Fine Arts Center. Unincorporated communities include Gumlog, Jacksonville, Osborn, and Tree.

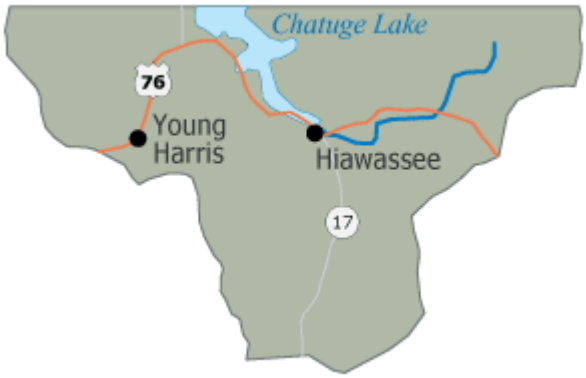
The primary economic focus of the county's residents for more than a century was farming, although some gold and mineral mining occurred in the county's east. The invention and popularization of the automobile after World War I (1917-18) prompted the state to build an east-west road, which linked Towns County to hitherto inaccessible markets. This road contributed to a boost in the commercial development of the county and eventually stimulated a tourist industry as well. Tourism has now supplanted agriculture as the major economic focus in Towns

County.

Travelers are particularly attracted by the area's Appalachian music, arts and crafts, mountains, and rivers. Many are drawn to the annual Georgia Mountain Fair, which has been held in Hiawassee since 1950. The southern and eastern borders of the county are framed by the Appalachian Trail, another important attraction. More than 50 percent of Towns County is owned by the federal government; most of this is forest parkland.

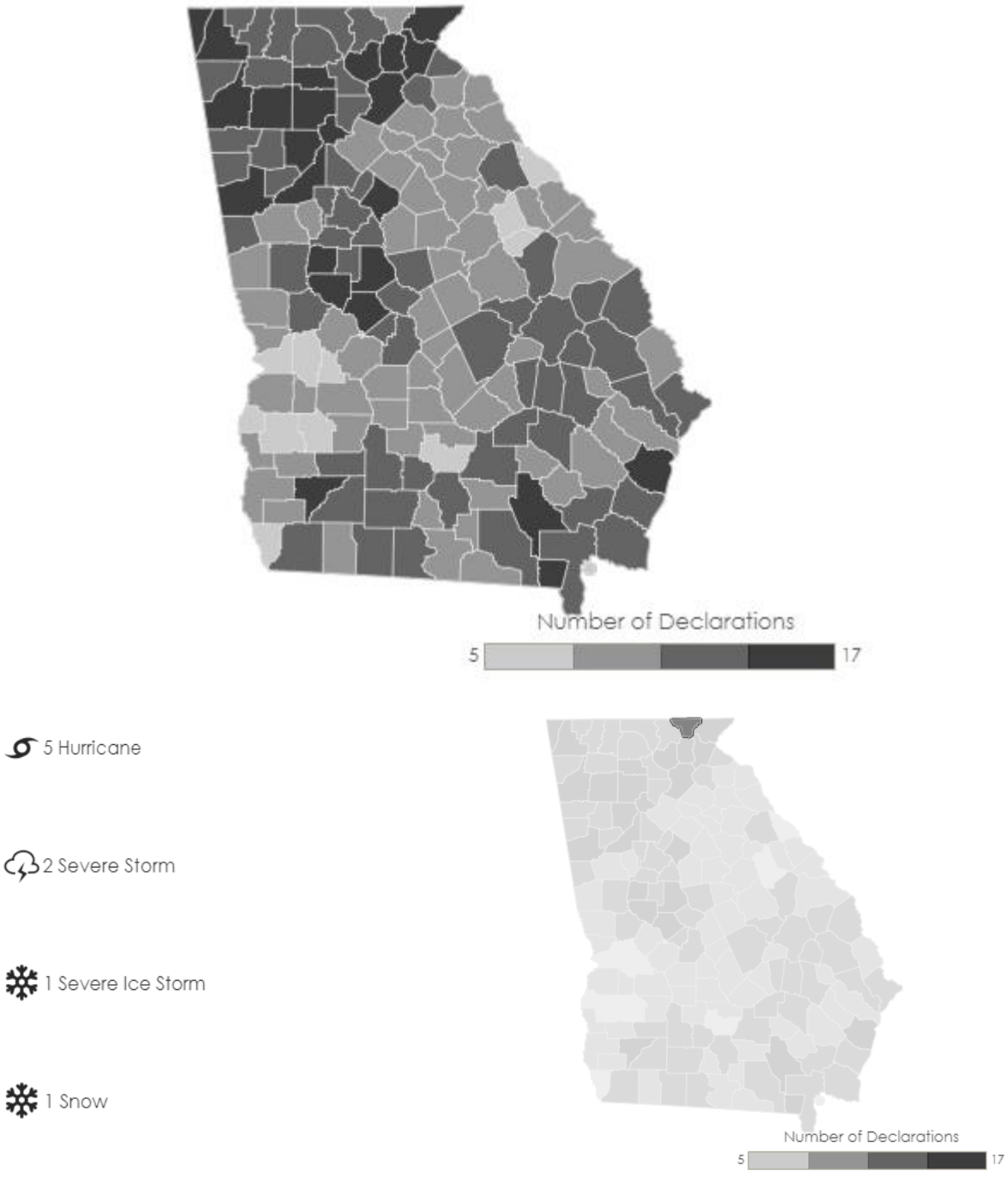
Among the points of interest in Towns County are Brasstown Bald, the highest mountain in Georgia, which is also partly in Union County; the Chattahoochee National Forest; Lake Chatuge, a 7,050-acre reservoir; the Unicoi Turnpike, the first vehicular road in the county and surrounding area; and Unicoi Gap, the first pass in the Georgia Blue Ridge through which a public road was constructed. The Fred Hamilton Rhododendron Garden in Hiawassee is the largest rhododendron garden in the state.

Two important rivers flow through Towns, the Tallulah (Falls) River, which enters Georgia in its northeast corner, and the Hiwassee River, whose headwaters are on the northern side of Unicoi Gap.

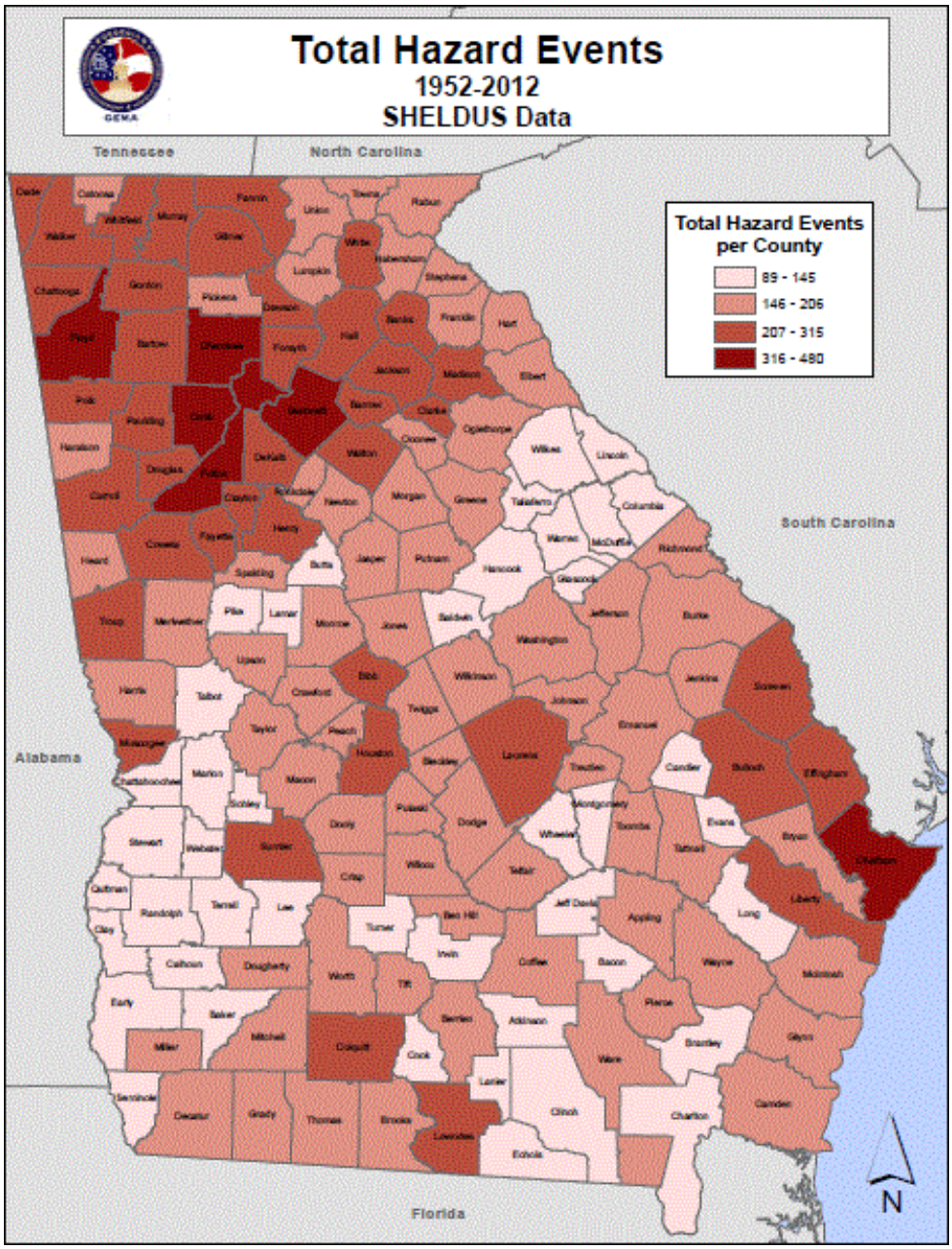


Past Events

- **2017, Hurricane Irma (Federal Declaration)**
- **2016, Severe Storms/Flooding (Federal Declaration)**
- **2014, Winter Storm (Federal Declaration)**
- 2013, Flash Flood
- 2013, Winter Storm
- 2011, Hail Storm
- 2010, Winter Storm
- 2008, Winter Storm
- 2007, Winter Storm
- **2004, Flash Flood (Hurricane Ivan) (Federal Declaration)**
- 2004, Ice Storm
- 2002, Winter Storm
- 2000, Ice Storm
- 2000, Drought
- **1998, Severe Storms/Flooding (Federal Declaration)**
- 1997, Tornado
- **1995, Hurricane Opal (Federal Declaration)**
- **1993, Blizzard (Federal Declaration)**



Source: FEMA Disaster Declarations for State and Counties Data Visualization



Source: 2014 State of Georgia Hazard Mitigation Strategy (most up-to-date version)

Demographics

	2000 Census	2010 Census	2015 Estimation
Population	9,319	10,471	10,800
White	98.8%	97.7%	95.8%
African-American	0.1%	0.4%	0.9%
Hispanic/Latino	0.7%	2.0%	2.4%
Asian	0.3%	0.4%	0.2%
American Indian	0.2%	0.3%	0.9%
Two or More Races	0.4%	0.6%	2.0%
Median Age	48.6	51.1	52.4
Median Household Income	$31,950	$37,000	----
Person Below Poverty Line	8.8%	18.6%	----
Homeowners	85.2%	80.1%	----

	2000 Census	2010 Census	2015 Estimation
Hiawassee	808	880	982
Young Harris	604	899	1,004

Economy

Towns County's economy is primarily agricultural with some light industry. Towns County's cost of living is 2% above the national average. The unemployment rate in Towns County is 6.8%, which is higher than the State average of 5.2% and the National average of 4.5%. Towns County has a median household income of $37,000, which is well below the national average of $51,914. Recent economic problems in Georgia and nationwide have affected these figures.

The ten largest private employers in Towns County are:

Company	Product/Service
Advanced Digital Cable, Inc.	Electronics Manufacturing
Anchor South Employment Services	Employment Services
Blue Ridge Mountain Electric Membership Corporation	Utilities
Brasstown Manor	Senior Living Facility
Chatuge Regional Hospital, Inc.	Healthcare Facility
Fortune Business Solutions	Employment Services
Ingles Markets, Inc.	Grocery
K-B Health Technology, Inc.	Healthcare
Sodexo USA	Dining Services
Young Harris College	Higher Education

The above list is in alphabetical order, not in order of company size. This data is according to the Georgia Department of Labor, 2015.

Government

The form of government specified in the County Charter is known as a Sole Commissioner form of government, which provides for a single, county-wide elected Commissioner. The Commissioner is responsible for the day-to-day administrative operation of the county government.

The main duties of the Commissioner 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 four 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 Commissioner sets 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 Commissioner receives, 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 Commissioner provide many services that citizens expect through the revenues that are raised annually. These include Fire and Ambulance protection; E-911 dispatch services; Building; Inspections; Code Enforcement; Public Library; Parks and Recreation; Public Works; and agencies that service all of these such as Building Maintenance and Vehicle Maintenance. 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.

Transportation

Towns County's transportation system consists primarily of state highways and county maintained roads. US Highway 76, as well as State highways 2, 17, 66, 75, 180, 288, 339, and 515 are major transportation routes that carry the majority of passenger and commercial traffic in and out of Towns County. Congestion in these transportation corridors create traffic problems, primarily because of population growth.

Climate

Towns County, like much of Georgia, enjoys a temperate climate. As a result, Towns County has 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 long growing season in Georgia, perfect for ornamental and economic-boosting agricultural plants. However, elevation plays a significant role in Towns County's weather patterns. Therefore, Towns County enjoys temperatures that are generally cooler than the averages for the rest of the State of Georgia.

AVERARE MONTHLY TEMPERATURES IN GEORGIA (FAHRENHEIT)

Month	State of Georgia Average Temperature	Towns County Temperature
January	46	37
February	49	43
March	56	48
April	63	57
May	70	64
June	77	72
July	80	72
August	79	72
September	74	68
October	64	55
November	56	43
December	48	45

Utilities

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

Electrical power to Towns County is provided by Blue Ridge Mountain EMC and Georgia Power.

Propane and natural gas is the primary source of heating and cooking fuel for Towns County's residents. This fuel is delivered to residents and businesses by tank truck on an ongoing basis, especially during peak winter months. Many gas marketers do provide limited natural gas service in Towns County. There are many propane distributors with large quantities of propane stored on site.

NFIP Compliance

Jurisdiction	Participating?	Participation Date
Towns County	yes	7/6/1998
Hiawassee	Yes	4/1/1993
Young Harris	Yes	5/4/1988

CHAPTER THREE
–
HAZARD PROFILES

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 Towns County Hazard Mitigation Plan 2013.

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 Thunderstorms	• Updated hazard description to match Georgia State Hazard Mitigation Plan information • Updated and consolidated hazard profile with new data • Content revised
Natural Hazard Winter Storms	• Updated hazard description to match Georgia State Hazard Mitigation Plan information • Updated and consolidated hazard profile with new data • Content revised
Natural Hazard Flooding	• Updated hazard description to match Georgia State Hazard Mitigation Plan information • 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 hazard description to match Georgia State Hazard Mitigation Plan information • Updated and consolidated hazard profile with new data • Content revised
Natural Hazard Drought	• Updated hazard description to match Georgia State Hazard Mitigation Plan information • Content revised

Natural Hazard Wildfire	• Updated hazard description to match information in the Georgia State Hazard Mitigation Plan • Updated and consolidated hazard profile data • Content revised
Natural Hazard Earthquake	• New Section – Not in 2013 Plan
Natural Hazard Landslide	• New Section – Not in 2013 Plan
Natural Hazard Tropical Cyclone	• New Section – Not in 2013 Plan • Separated from Severe Storms, Tornadoes, and Flooding Events (information consolidated into a single section)
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	• New Section – Not in 2013 Plan
Technological Hazard Terrorism	• New Section – Not in 2013 Plan
Technological Hazard Communications Failure	• New Section – Not in 2013 Plan

Risk Assessment

Requirement §201.6(c)(2)(i and ii)
Requirement §201.6(d)(3)

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

1. Hazard Identification: The Towns County Hazard Mitigation Planning Committee identified seven natural hazards and four technological hazards for this Hazard Mitigation Plan. This is an increase of three natural hazards and three technological hazard from the previous iteration of the plan. Each hazard was identified by the use of 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 Towns County.

3. Profile of Hazards: Each hazard was profiled as to how it could potentially impact Towns 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 the 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 particular importance in regards to flooding and dam failure events.

7. Multi-Jurisdictional Concerns: Each jurisdiction was considered when determining the potential hazard impact.

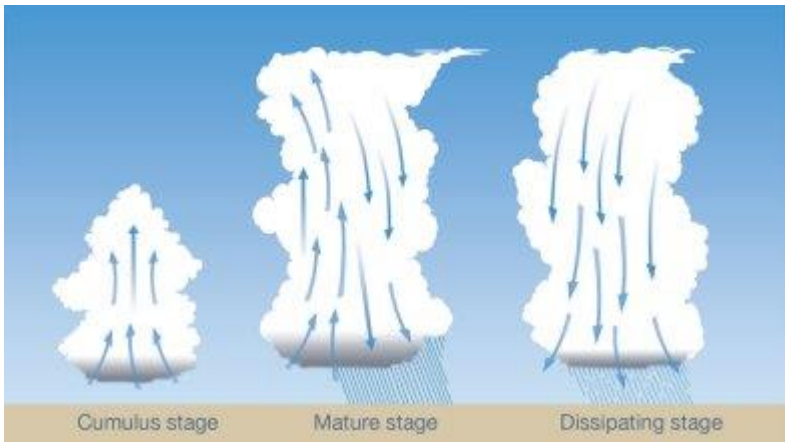
Natural Hazard: **Thunderstorms**

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 has the ability to 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.

Natural Hazard: **Thunderstorms**

(Hazard Description Continued)

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.

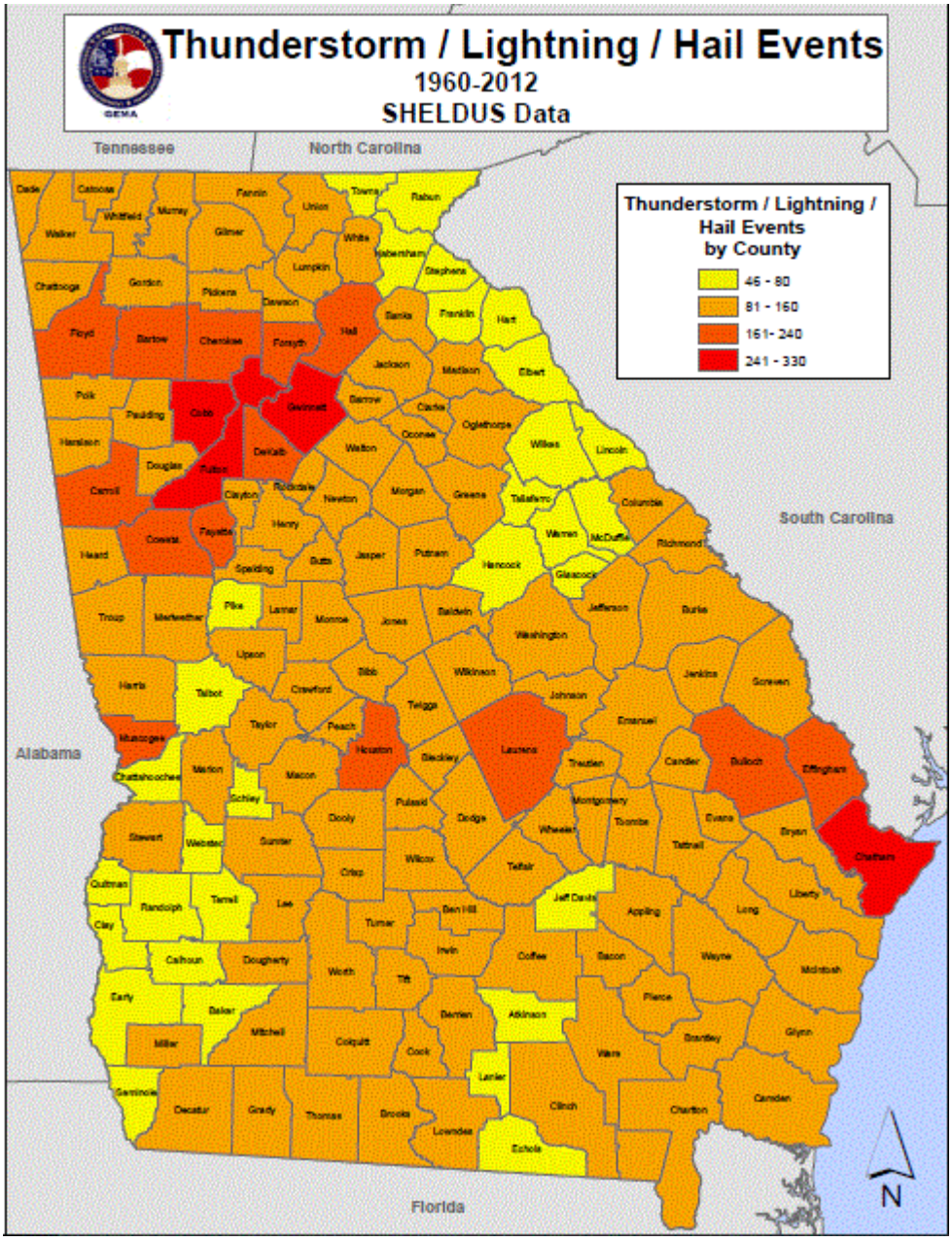
Natural Hazard: **Thunderstorms**

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

Hazard Profile

Severe thunderstorms, including high winds, hail and lightning, are a serious threat to the residents and infrastructure of Towns County. Severe thunderstorms are the most frequently occurring natural hazard in Towns County. Many of these storms include high winds, lightning, and hail. Hail up to 1.75 inches was recorded in Towns County on several occasions, most recently in 2011. Additionally, thunderstorm winds up to 55 mph have been reported in Towns County, most recently in 2014. While there have been dozens of documented thunderstorm events affecting Towns 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 4 thunderstorm events were recorded between 1964 and 1990, likely a vast underestimation of actual events.

Natural Hazard: **Thunderstorms**



Source: 2014 State of Georgia Hazard Mitigation Strategy (most up-to-date version)

Natural Hazard: **Thunderstorms**

(Hazard Profile Continued)

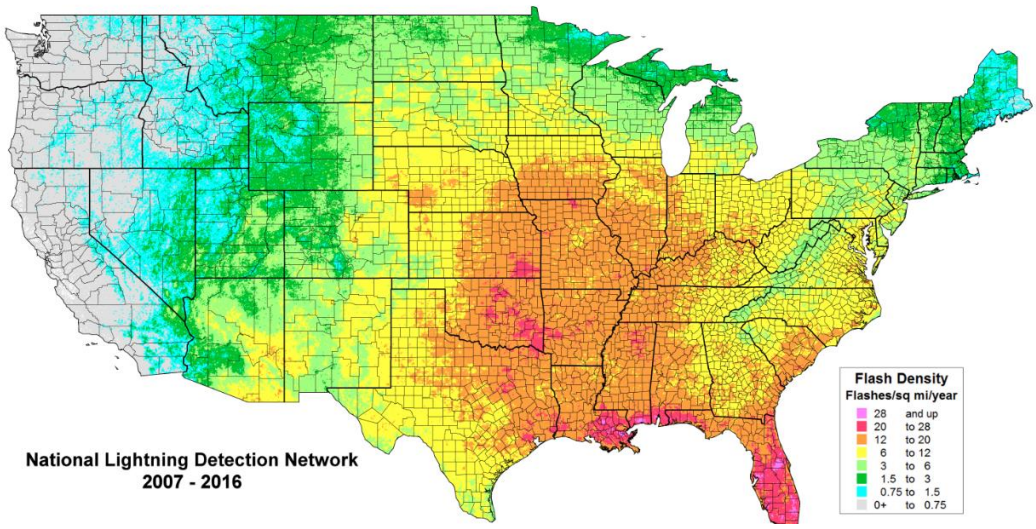
Most of the available information relating to severe thunderstorm events in Towns County fails to describe damage estimates in any detail. For the last 50 years, the total reported damages are just over $600,000. This is thought to be a gross underestimation of actual damages. With each thunderstorm 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 Towns County.

The Towns 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 Towns County LEOP in researching severe thunderstorms and their potential impacts on the county.

During the last 50 years, 35 thunderstorm events were recorded in Towns County, with 31 of those occurring in the last 25 years. This number includes 28 hail events and only 2 lightning reports. According to these records, Towns County has a 0.3% chance daily of a thunderstorm event based upon data from the last 25 years. Over the last 10 years, Towns County has averaged 1.4 thunderstorm events per year (14 events). This includes 0.6 hail events per year over the last 16 years. Due to improved record keeping protocols, the Towns 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 Towns County Hazard Mitigation Plan Update Committee has also determined that the lightning threat is severely under-reported, as shown in the NCDC data numbers. For additional historical data, please see Appendix D.

As indicated by the below graphics, Towns County averages between 3 and 12 flashes of cloud to ground lightning per square mile per year. That equals a 0.8% to 3.3% 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 Towns 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 Towns County.

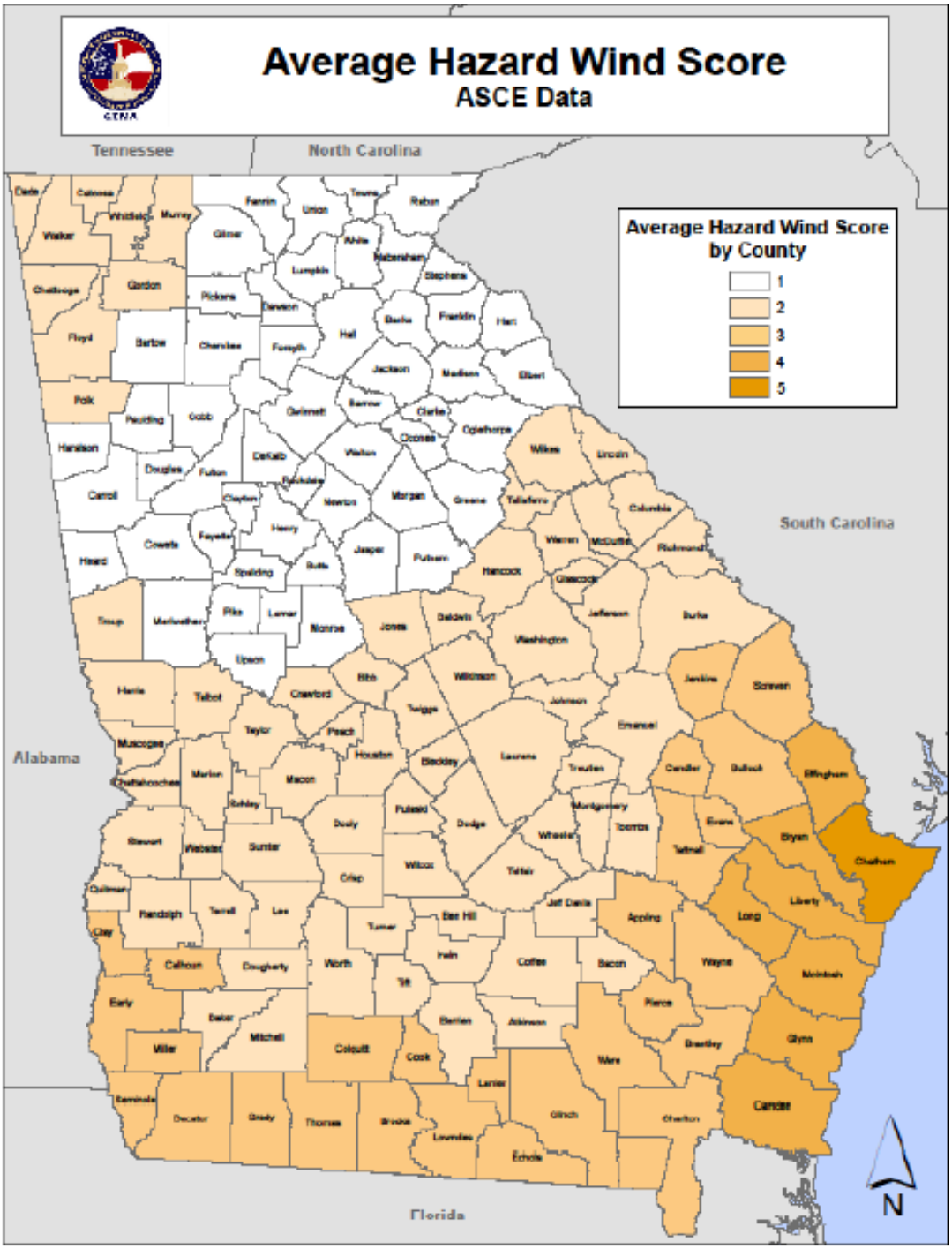
Natural Hazard: **Thunderstorms**



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 effected Towns County. These winds can exceed 100 mph and cause damage comparable to weak tornadoes. Below are two maps that identify the wind risk and the hazard wind score for the State of Georgia, including Towns County. The Hazard Wind Score maps uses the following scale:

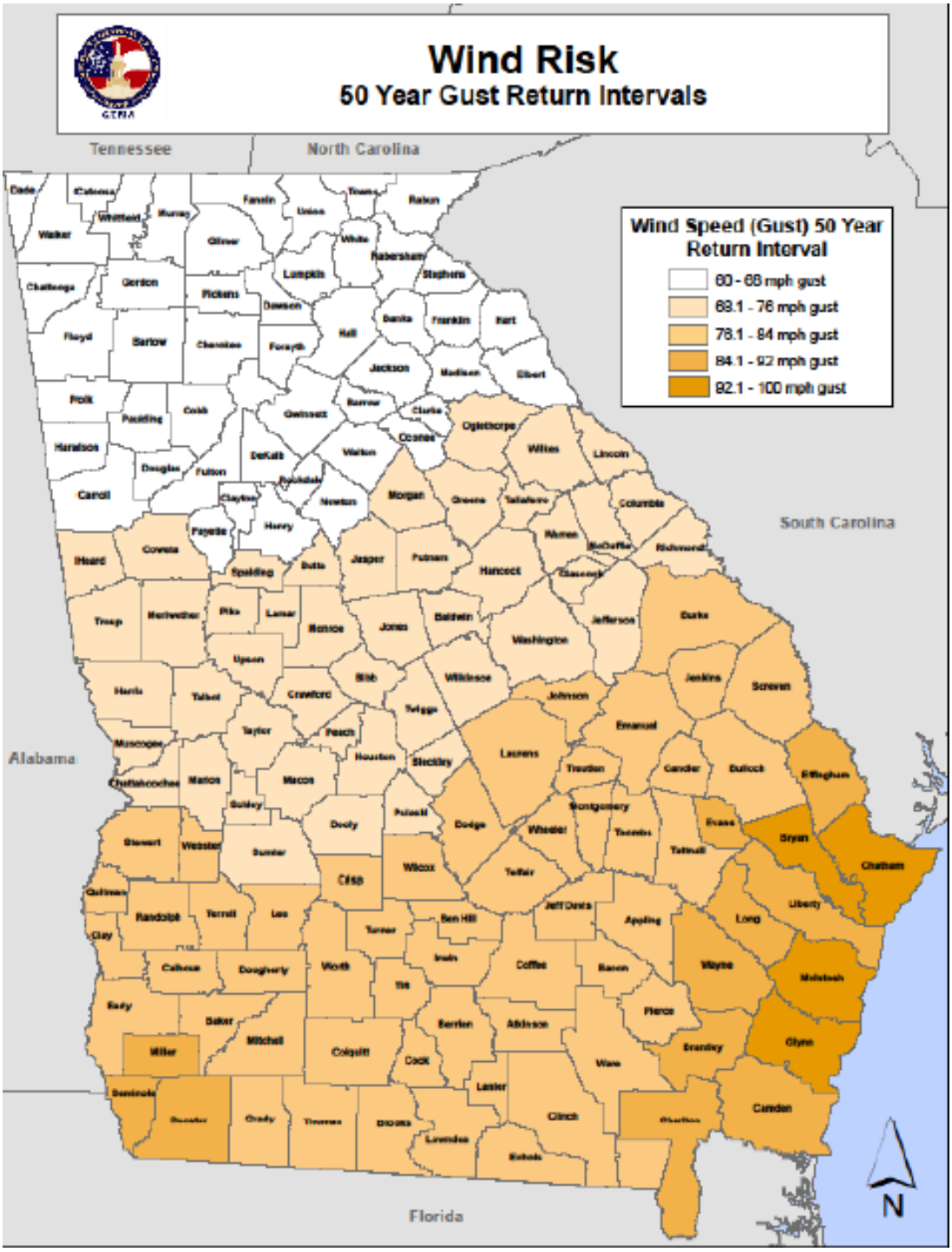
Hazard Score	Wind Speeds
1	<90 mph gust
2	91 – 100 mph gust
3	101 – 110 mph gust
4	111 – 120 mph gust
5	>120 mph gust

Natural Hazard: **Thunderstorms**



Source: 2014 State of Georgia Hazard Mitigation Strategy (most up-to-date version)

Natural Hazard: **Thunderstorms**



Source: 2014 State of Georgia Hazard Mitigation Strategy (most up-to-date version)

Natural Hazard: **Thunderstorms**

Assets Exposed to the Hazard

In evaluating assets that are susceptible to severe thunderstorms, the Towns 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 $590,000, or $11,930 annually. These numbers are thought to be a gross underestimation of actual past damages.

Land Use & Development Trends

Towns County currently has no land use trends related to Thunderstorms.

Multi-Jurisdictional Considerations

Thunderstorm events have occurred across all areas of Towns County. Crop damage from thunderstorm events would likely have the greatest impact in the rural areas of Towns 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 Towns County.

Hazard Summary

Thunderstorm events pose one of the greatest threats of property damage, injuries, and loss of life in Towns County. Thunderstorm events are the most frequently occurring weather event that threatens Towns County. As a result, the Towns 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 Towns County.

Natural Hazard: **Thunderstorms**

Thunderstorms in Towns County since 2013

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	62.50K	0.00K
SUNNYSIDE	TOWNS CO.	GA	01/30/2013	14:00	EST-5	Thunderstorm Wind	55 kts. EG	0	0	2.50K	0.00K
SUNNYSIDE	TOWNS CO.	GA	03/05/2013	16:27	EST-5	Thunderstorm Wind	45 kts. EG	0	0	30.00K	0.00K
HIAWASSEE	TOWNS CO.	GA	06/13/2013	16:45	EST-5	Thunderstorm Wind	55 kts. EG	0	0	2.50K	0.00K
MACEDONIA	TOWNS CO.	GA	06/19/2014	16:30	EST-5	Thunderstorm Wind	55 kts. EG	0	0	1.50K	0.00K
MACEDONIA	TOWNS CO.	GA	06/26/2015	15:35	EST-5	Hail	0.75 in.	0	0	0.00K	0.00K
MACEDONIA	TOWNS CO.	GA	06/26/2015	15:35	EST-5	Hail	1.00 in.	0	0	0.00K	0.00K
SUNNYSIDE	TOWNS CO.	GA	06/26/2015	16:07	EST-5	Hail	1.00 in.	0	0	0.00K	0.00K
HIAWASSEE	TOWNS CO.	GA	07/14/2015	11:20	EST-5	Thunderstorm Wind	50 kts. EG	0	0	6.00K	0.00K
TITUS	TOWNS CO.	GA	07/14/2015	17:17	EST-5	Thunderstorm Wind	50 kts. EG	0	0	8.00K	0.00K
HIAWASSEE	TOWNS CO.	GA	06/23/2018	14:45	EST-5	Thunderstorm Wind	50 kts. EG	0	0	10.00K	0.00K
BRASSTOWN BALD	TOWNS CO.	GA	06/24/2018	14:40	EST-5	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K

Natural Hazard: **Winter Storms**

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 sufficient depths to pose some threat to motorists and pedestrians.

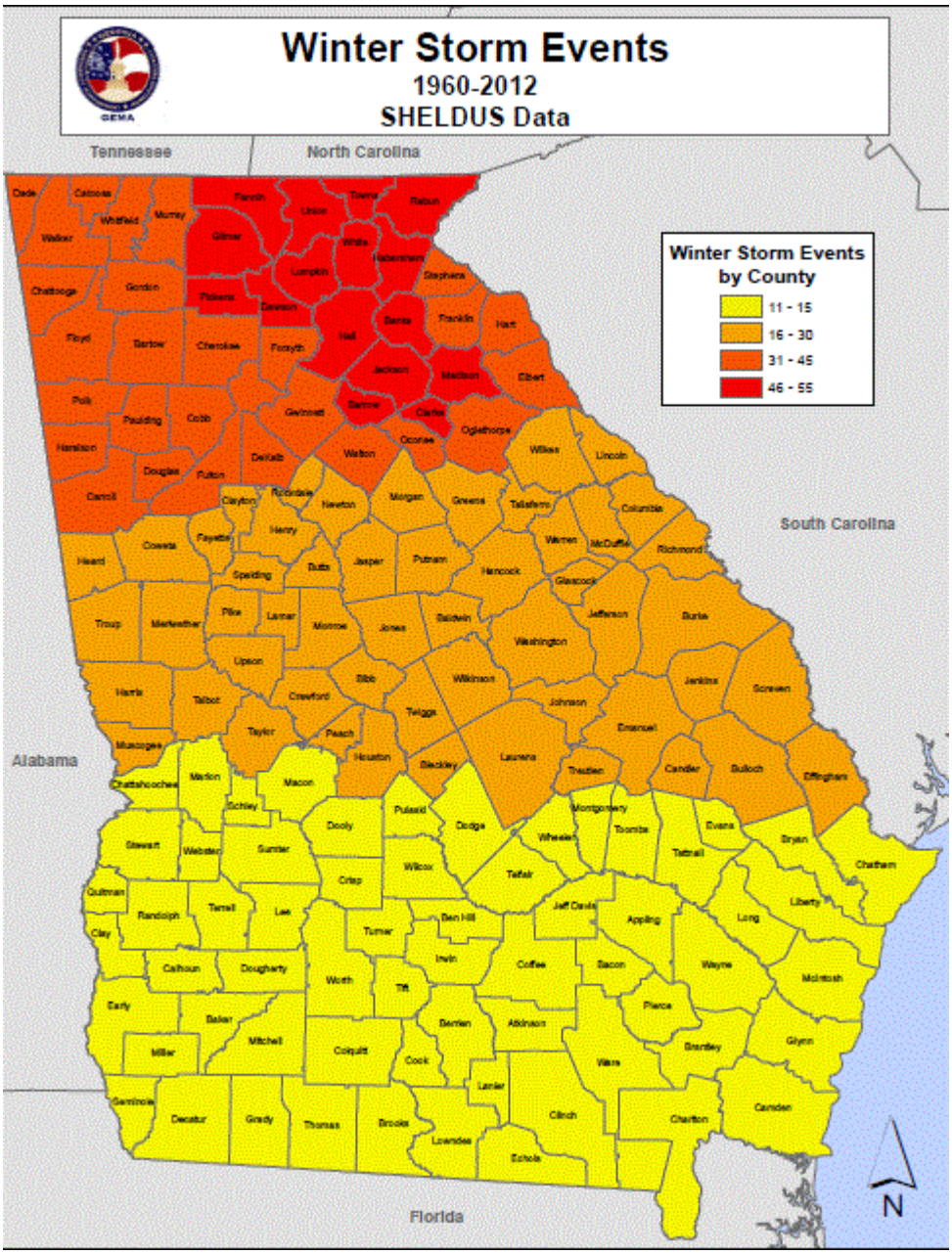
A heavy accumulation of ice, which is often accompanied by high winds, has the ability to devastate infrastructure and vegetation. Destructiveness in the southern states is often amplified due to the lack of preparedness and response measures. Also, the infrastructure was not designed to withstand certain 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.

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 Towns 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 Towns County typically cause drastic damage to infrastructure, such as roads, power lines, and bridges. They also can cause damage to private property, businesses, and trees throughout the county. Due to the county's elevation changes, many highways have steep grades that can become dangerous during icy conditions. The large number of trees in Towns 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.

Natural Hazard: **Winter Storms**



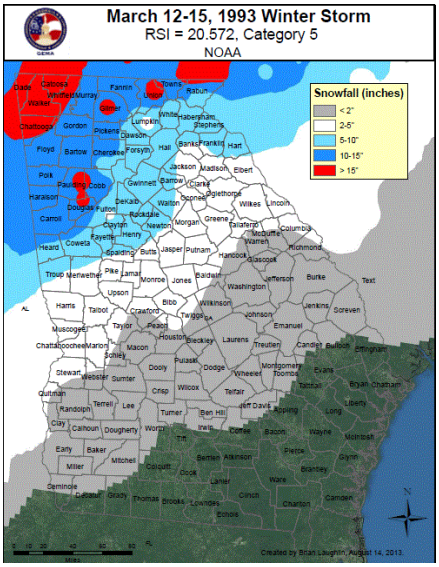
Source: 2014 State of Georgia Hazard Mitigation Strategy (most up-to-date version)

Natural Hazard: **Winter Storms**

(Hazard Profile Continued)

During the past twenty years, documentation exists for 67 winter storm events in Towns County. No data can be located prior to this timeframe. On average, a winter storm has occurred in Towns County on a nearly annual basis. A 100% chance exists of a winter storm occurring in any given year in Towns County. Due to improved record keeping techniques, the HMPC believes that looking at the record for the last 20-year period provides a more accurate representation of the threat of winter storms for Towns County. For additional historical data, please see Appendix D.

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, ¼ inch of ice, or over a foot of snow. Other factors, such as wind, can influence the strength of these events, as happened with wind-blown snow during the March 1993 Winter Storm event. During this event, over a foot of snow was reported in multiple areas across Towns County and most areas received at least 10 inches of snow.



Source: 2014 State of Georgia Hazard Mitigation Strategy (most up-to-date version)

Natural Hazard: **Winter Storms**

Assets Exposed to the Hazard

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

Estimated Potential Losses

Total estimated losses for winter storm events of the last 50 years indicate a total of over $1,000,000 in losses. Extrapolated over 50 years, this averages out to $20,860 per year. However, nearly all of the documented winter storms with loss information have occurred over the last 20 years. As such, the average loss per year for the last 20 years is $51,900 per year. It is estimated that these numbers are a gross underestimation of the impact of past winter storms and caution is expressed when using these figures to make loss determinations for winter storms in Towns County.

Land Use & Development Trends

Towns County currently has no land use trends related to Winter Storms.

Multi-Jurisdictional Considerations

All portions of Towns 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 include all cities and town located within Towns County.

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 Towns County HMPC recognizes the potential threats winter storms could have on the community and have identified specific mitigation actions as a result.

Natural Hazard: **Winter Storms**

Winter Storm Events in Towns County since 2013

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	01/25/2013	07:00	EST-5	Ice Storm		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	02/02/2013	10:00	EST-5	Heavy Snow		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	03/06/2013	03:00	EST-5	Heavy Snow		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	01/28/2014	12:00	EST-5	Winter Storm		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	02/11/2014	07:00	EST-5	Heavy Snow		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	11/01/2014	00:00	EST-5	Winter Weather		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	11/01/2014	00:00	EST-5	Winter Weather		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	02/20/2015	19:00	EST-5	Winter Weather		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	02/24/2015	01:00	EST-5	Winter Storm		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	02/24/2015	01:00	EST-5	Winter Storm		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	02/25/2015	14:00	EST-5	Winter Storm		0	0	0.00K	0.00K

TOWNS (ZONE)	TOWNS (ZONE)	GA	01/20/2016	05:00	EST-5	Winter Weather		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	01/22/2016	00:00	EST-5	Winter Storm		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	01/06/2017	14:00	EST-5	Winter Storm		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	03/11/2017	22:00	EST-5	Winter Weather		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	12/08/2017	10:00	EST-5	Winter Storm		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	01/16/2018	15:00	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 sufficient 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 Towns County HMPC researched flooding information for the last fifty years. The main sources of information used by the Towns County HMPC came from the National Climatic Data Center, the Towns County Emergency Operations Plan, and news media sources. It was determined that flooding has caused significant damage on a relatively small number of occasions over the last 20 years. One significant

Natural Hazard: **Flooding**

(Hazard Profile Continued)

flooding event that affected Towns County occurred in September of 2004. This flood of the Hiawassee River, caused by a flash flood event, led to ten bridges being washed out and significant flooding in the area of the Enchanted Valley Resort. While data was collected for the entire 50-year timeframe, little information was available regarding flood events over that period, possibly due to poor record keeping.

Flood events within Towns County are typically associated with areas of special flood hazard as identified on Flood Rate Insurance Maps (FIRMs) published by FEMA. Relatively little information is available regarding flooding damage estimates. However, 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 Towns County's history appears to be related to roads and culverts washing out as a result of flood waters.

There are 6 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 8.3 years in Towns County. This relates to a 12% chance of a flood event occurring in any given year. Flooding is of a significant concern to Towns County residents overall, but particularly to those areas along Lake Chatuge and its distributaries.

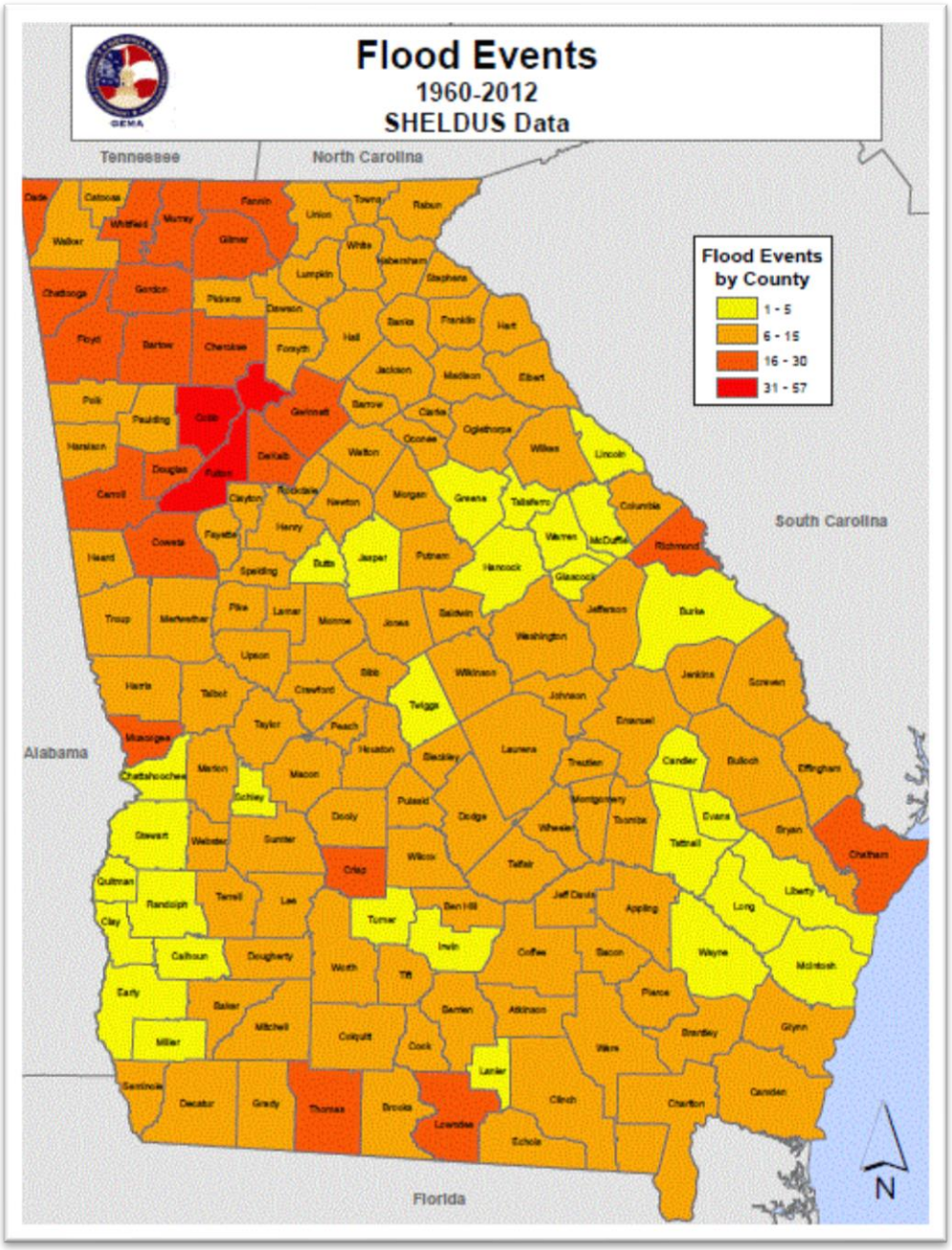
Information from the USGS indicates that major flood stage (14 feet at the flood gauge on the Hiawassee River near Hiawassee) would lead to extensive flooding of mobile homes at Enchanted Valley Resort and water would begin to top toe Riverside Drive bridge. Flood waters in excess of 2 feet could inundate some of the mobile homes at major flood stage.

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 Towns County HMPC attempted to identify known structures within, or close to, the 100-year floodplain.

Natural Hazard: **Flooding**



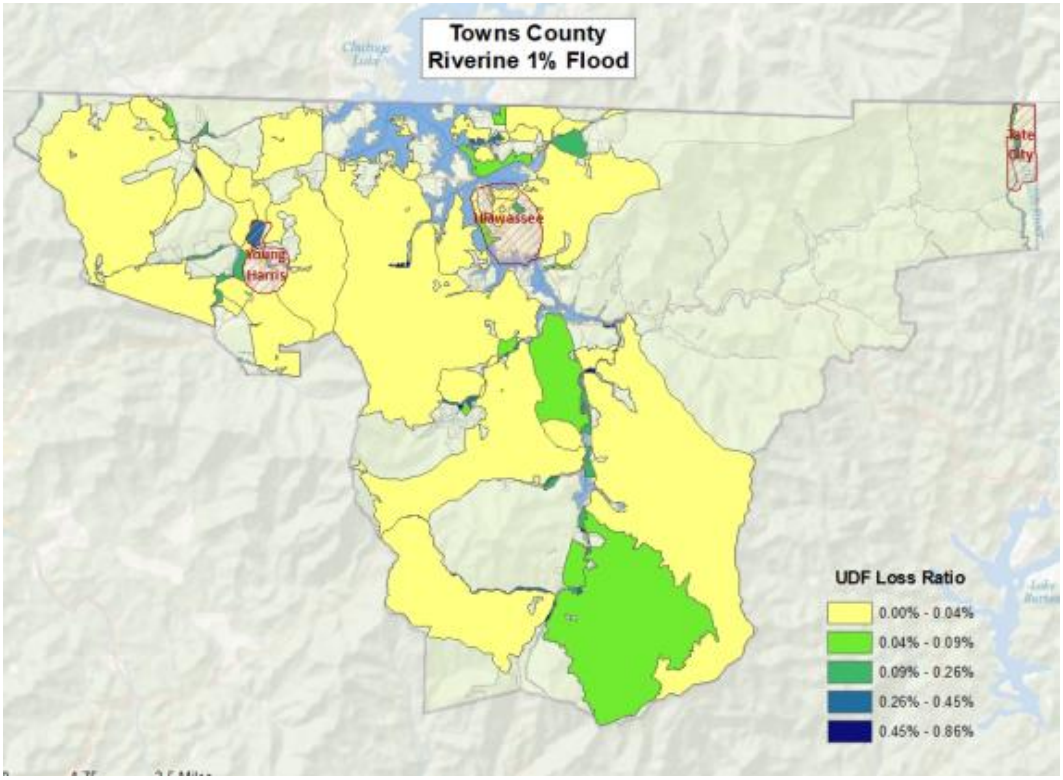
Source: 2014 State of Georgia Hazard Mitigation Strategy (most up-to-date version)

Natural Hazard: **Flooding**

Estimated Potential Losses

The flooding events in Towns County over the last 50 years have led to over $500,000 in damages. Extrapolated over 50 years, this results in an annual average of $11,025 per year. However, all reported damages have occurred in the last 15 years. As a result, the average over the last 15 years is $36,735 annually. These estimations are believed to be a gross underestimation of both prior and potential damages from flood events.

Based upon the 2018 Towns County HAZUS Report, a flood equivalent to the 1% riverine flood levels could result in losses in excess of $11 million. However, it is possible that some areas may not experience total losses while others may be inundated with flood waters who are not designated in the 1% riverine flood areas. Additionally, there are no critical facilities located in the 1% riverine flood areas.



Land Use & Development Trends

Towns County continues to have population increases. This continued growth within Towns County has led to a 12% population increase between 2000 and 2010.

Towns 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. The County (CID No. 130253) first entered the NFIP on July 6, 1998. 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. Currently, the Towns County municipalities of Hiawassee and Young Harris also participate in NFIP through the implementation of Flood Damage Prevention Ordinances.

There are 2 residential repetitive loss property identified in Towns County. These properties total $9,927.

Multi-Jurisdictional Considerations

During a large-scale flood event, many portions of Towns 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. All of Towns County and its municipalities could potentially be impacted.

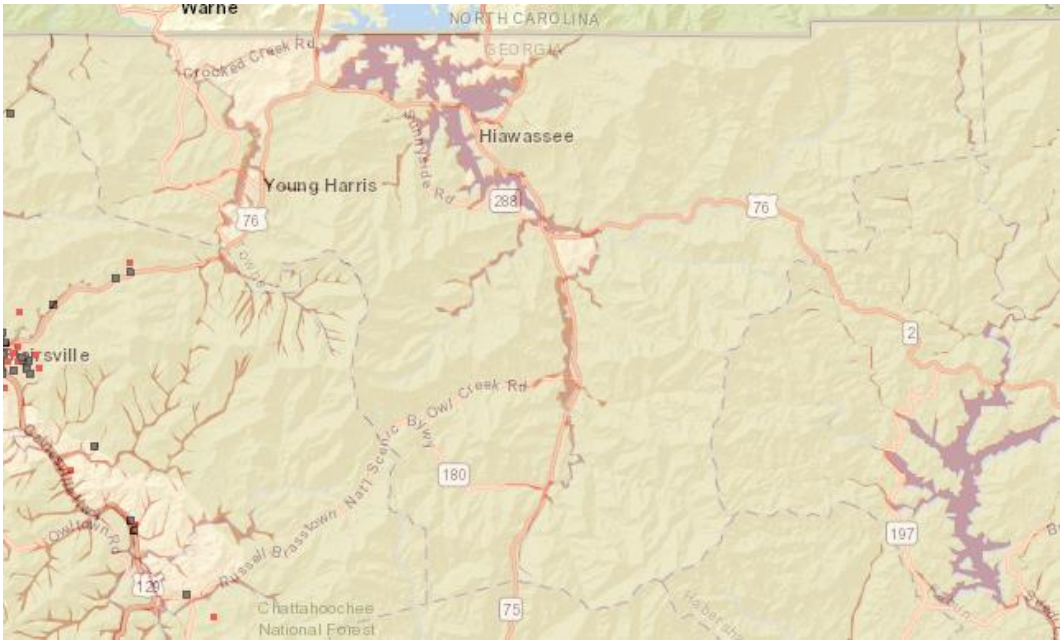
Hazard Summary

Flooding has the potential to inflict significant damage within Towns County, particularly along Lake Chatuge and its distributaries. Mitigation of flood damage requires the community to be aware of flood-prone areas, including roads, bridges, and critical facilities. The Towns County HMPC identified flooding as a hazard requiring mitigation measures and identified specific goals, objectives, and action items they deemed necessary to lessen the impact of flooding for their communities. These maps were updated since the previous plan.

There are 2 residential repetitive loss property identified in Towns County.

Natural Hazard: **Flooding**

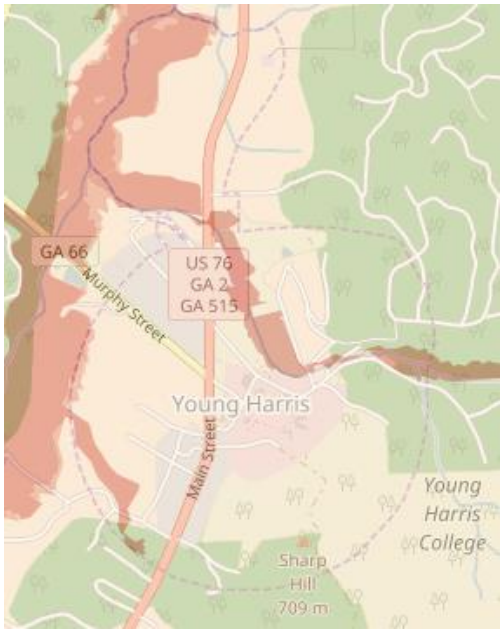
Towns County



Hiawassee

Natural Hazard: **Flooding**

Young Harris



All Flood Maps are from the GEMA Georgia Mitigation Information System (GMIS)

Note: All areas shaded "red" in the Flood Maps indicates areas within the 100-year Floodplain

Flood Events in Towns County since 2013

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	42.50K	0.00K
GUMLOG	TOWNS CO.	GA	07/03/2013	18:12	EST-5	Flash Flood		0	0	40.00K	0.00K
MACEDONIA	TOWNS CO.	GA	05/30/2018	02:00	EST-5	Flash Flood		0	0	2.50K	0.00K

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 in the Midwest and Southeast. Tornadoes can occur anywhere within the State of Georgia.

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 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 range 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.

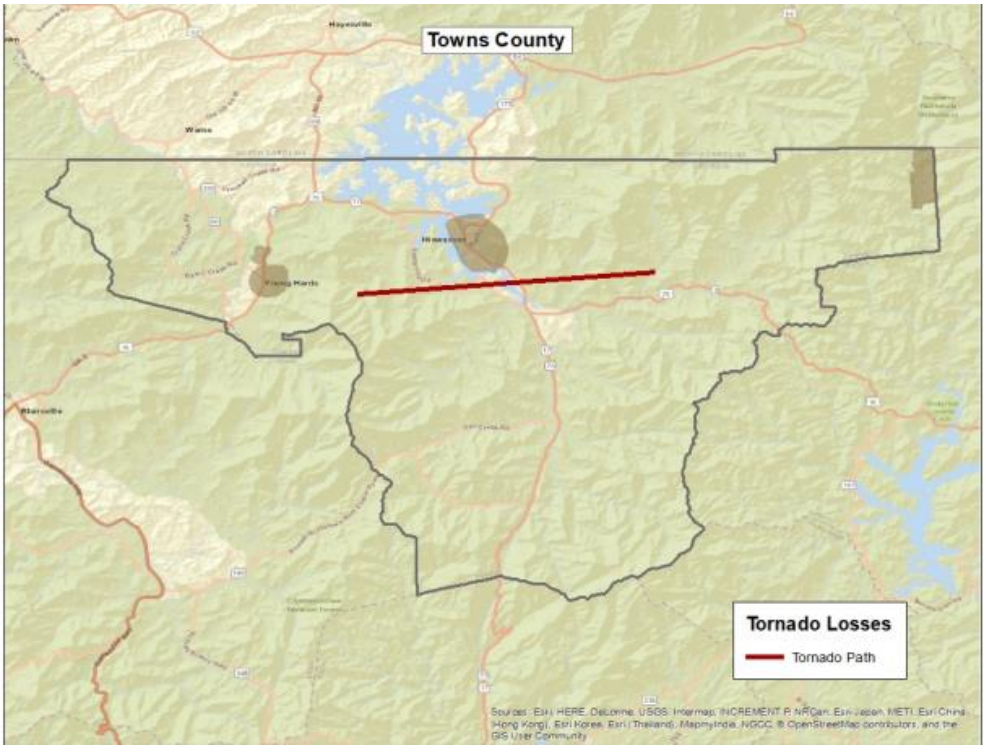
Natural Hazard: **Tornado**

Hazard Profile

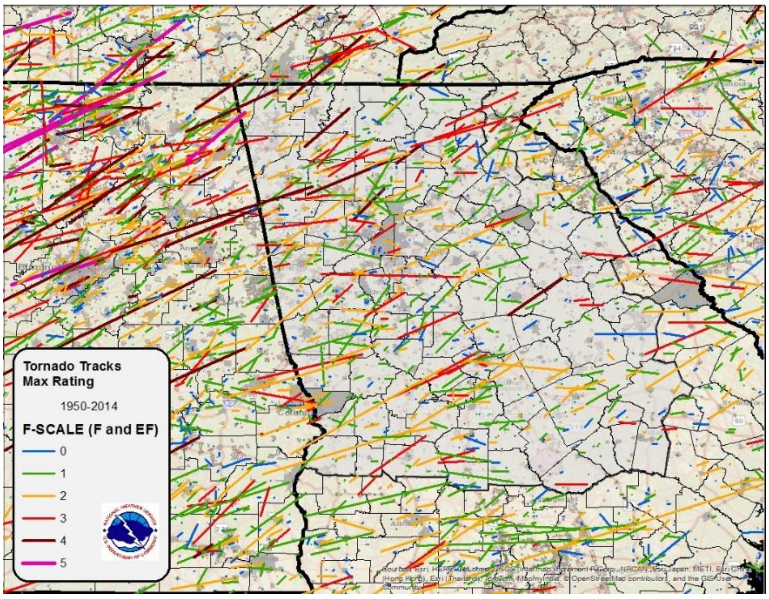
All areas within Towns County are vulnerable to the threat of a tornado. Due to the indiscriminate and unpredictable nature of tornadoes, there is no reliable method to determine where or when a tornado will strike. There has been only 1 documented tornado in the last 50 years in Towns County. It is likely that other tornadoes have occurred within this timeframe, but available records are limited in nature.

Based on the 50-year information available for Towns County, a tornado occurs every 50 years. On an annual basis, Towns County has a 2% chance of being impacted from a tornado event. When only the last twenty years are considered, the likelihood of a tornado affecting Towns County increases to 5% (1 tornado since 1997).

Individual tornado events can cause extreme damage to an area. This holds true for Towns County, as well. The strongest and costliest (and only) documented tornado to impact Towns County was an F1 in 1997. This storm traveled through Hiawassee. The storm caused $75,000 in damages. For additional historical data, please see Appendix D.



Natural Hazard: **Tornado**



Assets Exposed to the Hazard

In evaluating assets that are susceptible to tornadoes, the Towns 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 $75,000, or $1,500 annually. When only events of the last 20 years are considered, yearly estimations increase dramatically to $3,750 annually.

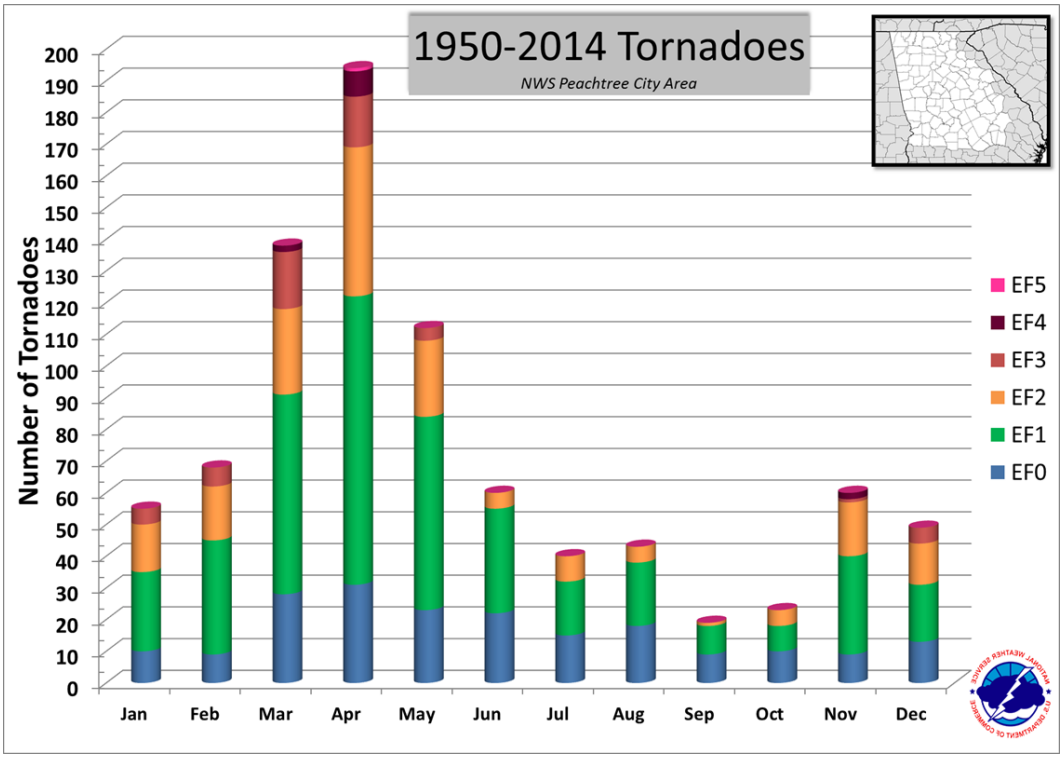
Within the HAZUS report, a theoretical tornado path for an EF3 was identified that would inflict maximum damage. HAZUS estimated that this theoretical tornado would cause damage to approximately 380 buildings and result in losses in excess of $11 million with Hiawassee suffering the greatest economic impact.

The Enhanced Fujita Scale	
EF Rating	3 second gust (mph)
0	65-85
1	86-110
2	111-135
3	136-165
4	166-200
5	over 200

Natural Hazard: **Tornado**

Land Use & Development Trends

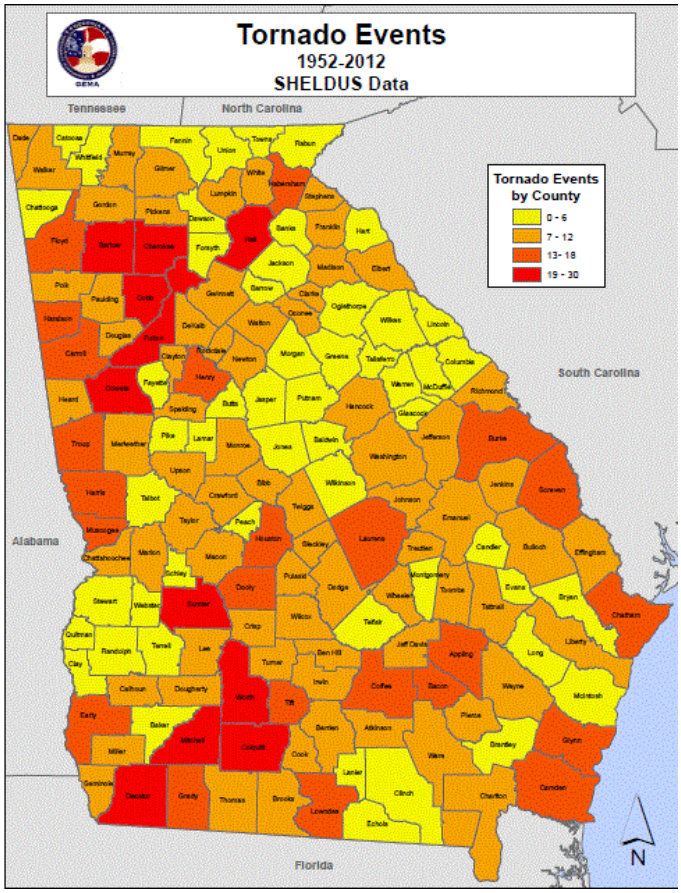
Towns County currently has no land use trends related to Tornadoes.



Multi-Jurisdictional Considerations

All portions of Towns 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 include all cities and towns located within Towns County.

Natural Hazard: **Tornado**



Source: 2014 State of Georgia Hazard Mitigation Strategy (most up-to-date version)

Hazard Summary

Towns County remains at risk to potential damage from tornadoes, especially considering the average of one tornado every 50 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.

Natural Hazard: **Drought**

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 in undetermined due to the fact that 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

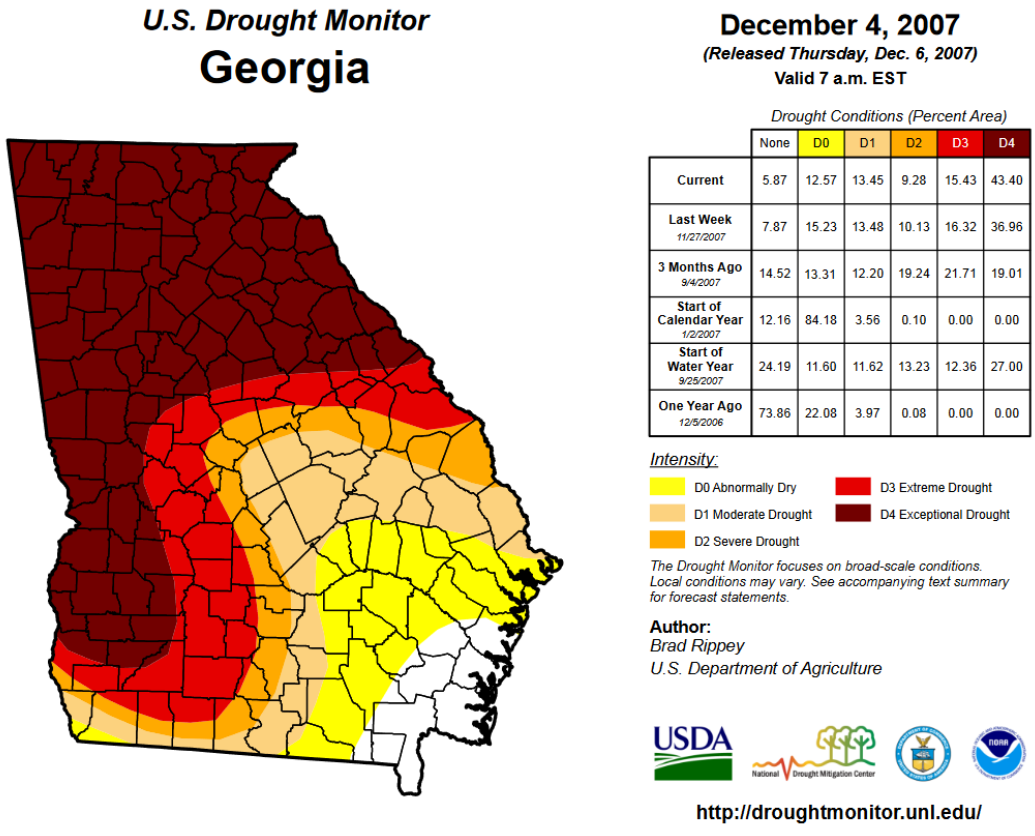
The Towns County HMPC reviewed data for the last 50 years regarding drought conditions. Historically, agricultural losses have accounted for the vast amount of losses related to drought conditions.

Natural Hazard: **Drought**

(Hazard Profile Continued)

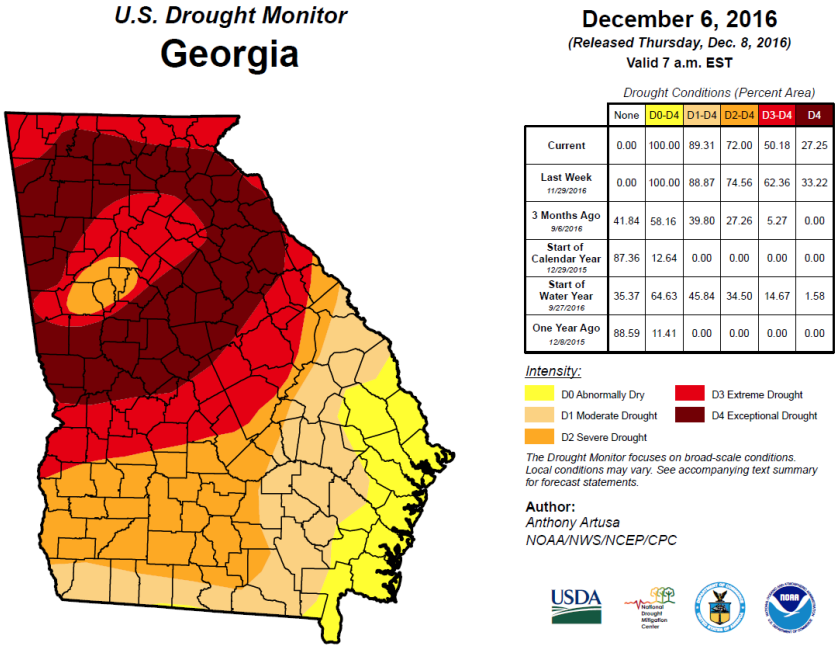
Due to poor record keeping and the unpredictable nature of drought conditions, reliability of historical data for the last 50 years is low. Towns County has been impacted by 10 drought events in the last 20 years, according to data from the National Climatic Data Center. This amounts to a 50% chance of a drought for a given year over the last 20 years. The economic impact of these droughts, including crop damage, is not available.

There have been two recent examples of "exceptional" drought events affecting Towns County. These events occurred in 2007 and 2016. Both of these 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

Natural Hazard: **Drought**



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. 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

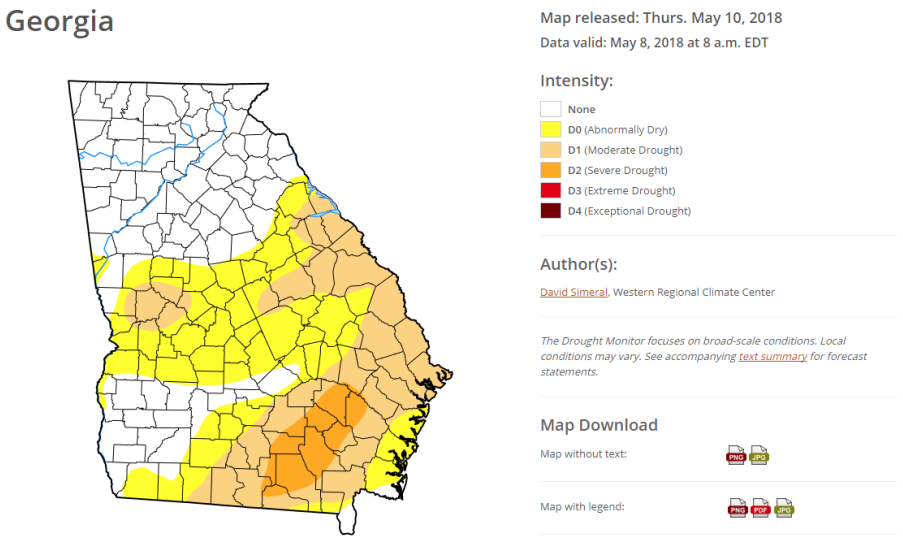
While drought conditions do not typically pose a direct threat to structures, secondary hazards from drought such as increased wildfire threat, does pose a significant threat to all public and private property in Towns County, including all critical facilities. Water resources could also become scarce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

Estimated Potential Losses

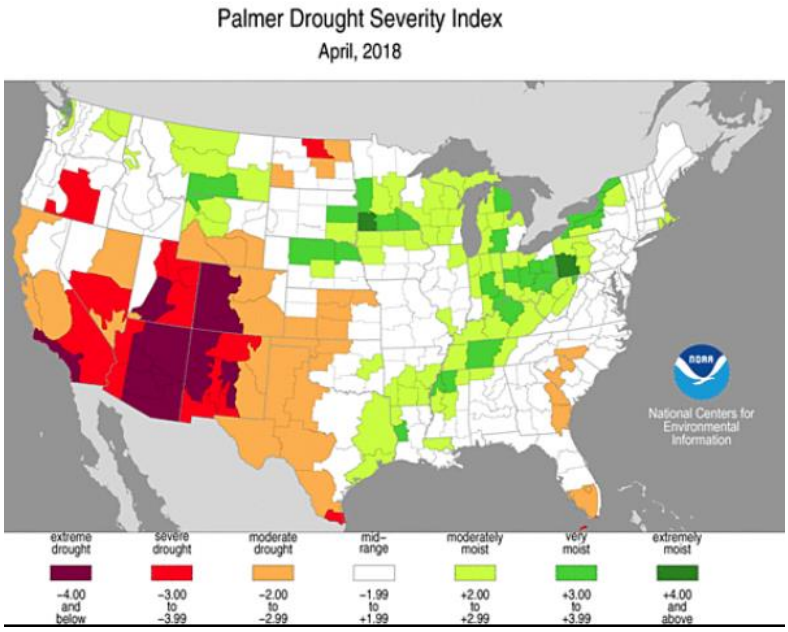
No damage to structures or critical facilities is expected as a direct result of drought conditions. However, crop damage and subsequent losses can be expected to occur as a result of drought conditions. The degree of losses would depend on the duration of the drought, severity of the drought, temperatures 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.

Natural Hazard: **Drought**

According to the 2012 Agriculture Census data, Towns County's market value of products sold was $3,201,000. $1,170,000 of that total represented crop sales, accounting for 37% of the total. Livestock sales accounted for 63%, or $2,031,000, of the total value.



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



Source: National Integrated Drought Information System

Natural Hazard: **Drought**

Land Use & Development Trends

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

Multi-Jurisdictional Considerations

All portions of Towns 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 cities and towns located within Towns County.

Hazard Summary

Drought conditions can cause significant economic stress on the agriculture and forestry interests of Towns 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 Towns County HMPC recognizes the potential threats drought conditions could have on the community and have identified specific mitigation actions as a result.

Drought Events in Towns County since 2013

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	06/01/2016	00:00	EST-5	Drought		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	07/01/2016	00:00	EST-5	Drought		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	08/01/2016	00:00	EST-5	Drought		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	09/01/2016	00:00	EST-5	Drought		0	0	0.00K	0.00K

TOWNS (ZONE)	TOWNS (ZONE)	GA	10/01/2016	00:00	EST-5	Drought		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	11/01/2016	00:00	EST-5	Drought		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	12/01/2016	00:00	EST-5	Drought		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	01/01/2017	00:00	EST-5	Drought		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	02/01/2017	00:00	EST-5	Drought		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	03/01/2017	00:00	EST-5	Drought		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	04/01/2017	00:00	EST-5	Drought		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	05/01/2017	00:00	EST-5	Drought		0	0	0.00K	0.00K

Natural Hazard: **Wildfire**

Hazard Description

A wildfire is an uncontained fire that spreads through the environment. Wildfires have the ability to 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 emergency 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.

Natural Hazard: **Wildfire**

(Hazard Description Continued)

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

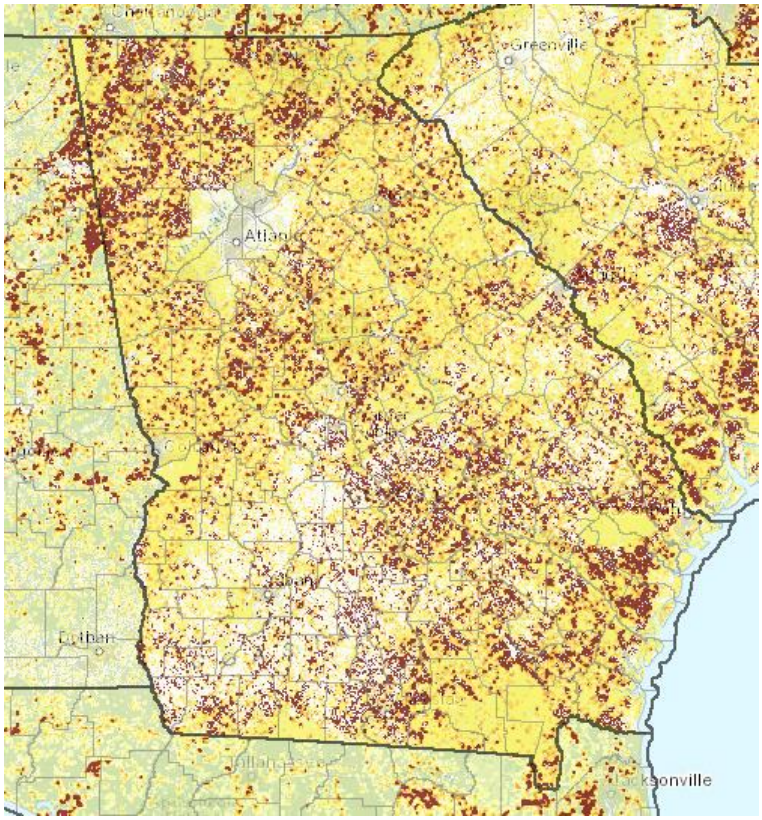
Wildfires pose a serious threat to Towns County. This is a result of the high amount of forestland and vegetation available to fuel potential wildfires. Also, there is an increasing amount of wildland-urban interface (WUI) in Towns County, which is defined as areas where structures and other human development meets undeveloped wildland properties. 98% of Towns County's population lives within the WUI. A large 25,000 acre fire– referenced as the Rock Mountain Fire – occurred in November and December of 2016 and was mostly contained to US Forest Service lands in Towns and Rabun Counties in Georgia. Areas in Tate City and Upper Hightower were placed under pre-evacuation orders, but those orders were lifted prior to a full-scale evacuation order.

According to the 2015 Community Wildfire Protection Plan (CWPP) for Towns County (most currently available) Towns County has averaged 13 fires per year over the last 20 years. These fires have burned an average of 54.63 acres. Over the last six years, Towns County has continued to average 13 fires per year but acreage burned has increased to 84.45 acres per year. During the six year time frame, two residential buildings and six non-residential buildings have been destroyed by wildfire for a total loss of $642,000. This equates to an annual loss of $107,000 per

Natural Hazard: **Wildfire**

year. Over the last 20 years, there is a 3.6% chance of a wildfire on any given day in Towns County according to data from the Georgia Forestry Commission.

Georgia Wildfire Ignition Density



Source: Southern Group of State Foresters Wildfire Risk Assessment Portal

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 Towns 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.

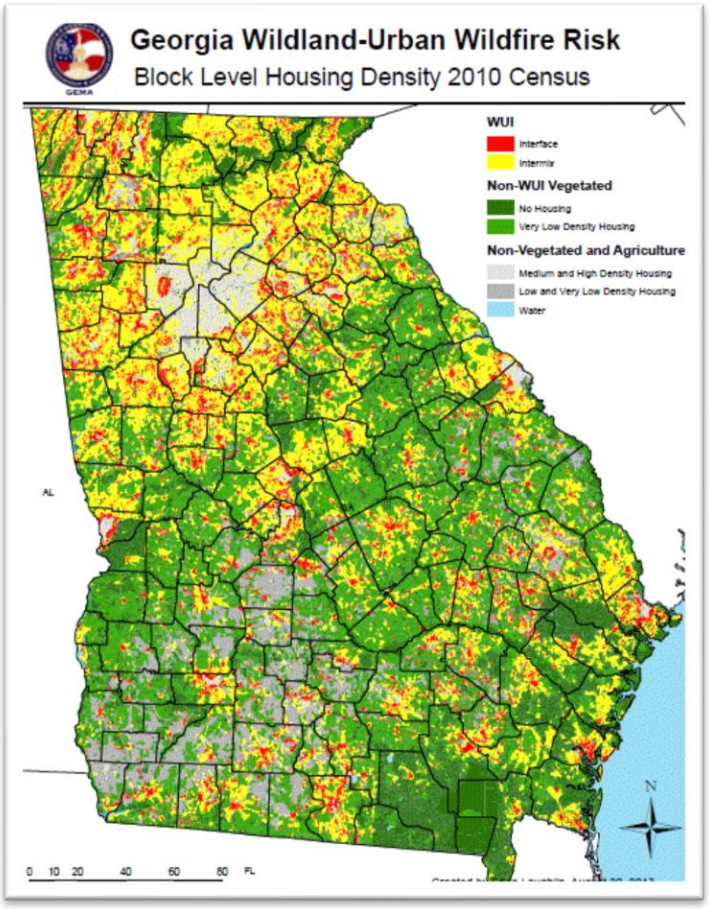
Estimated Potential Losses

Little information is available regarding damages, in terms of dollars, for wildfire losses in Towns County. According to the 2012 Ag Census by the USDA, Towns County has $1,170,000 in annual crop sales. These areas would potentially be impacted by a wildfire event.

Natural Hazard: **Wildfire**

Land Use & Development Trends

With the continued increase in population, Wildland-Urban Interface (WUI) is increasing in Towns 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 Towns County complicated wildland fire management operations and planning initiatives. This development trend is expected to continue in the future.



Multi-Jurisdictional Considerations

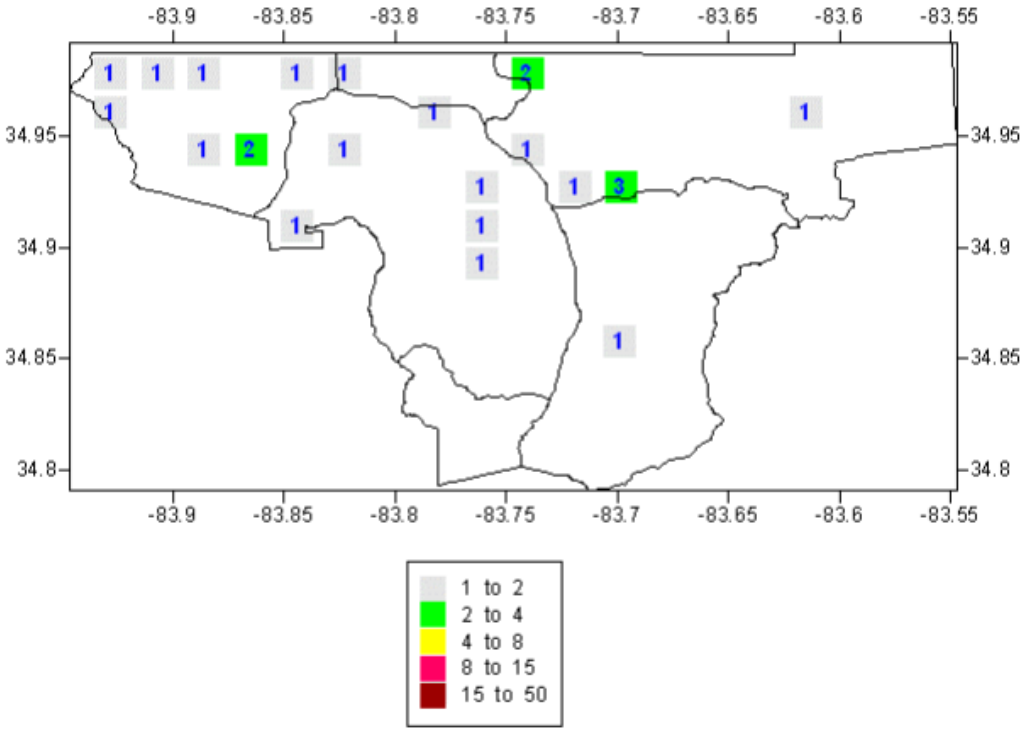
All portions of Towns County, including all municipalities, could potentially be impacted by a wildfire due to the large amount of Wildland-Urban Interface, but the less developed areas of the county are more vulnerable. Therefore, all mitigation actions identified regarding wildfires should be pursued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

Natural Hazard: **Wildfire**

Hazard Summary

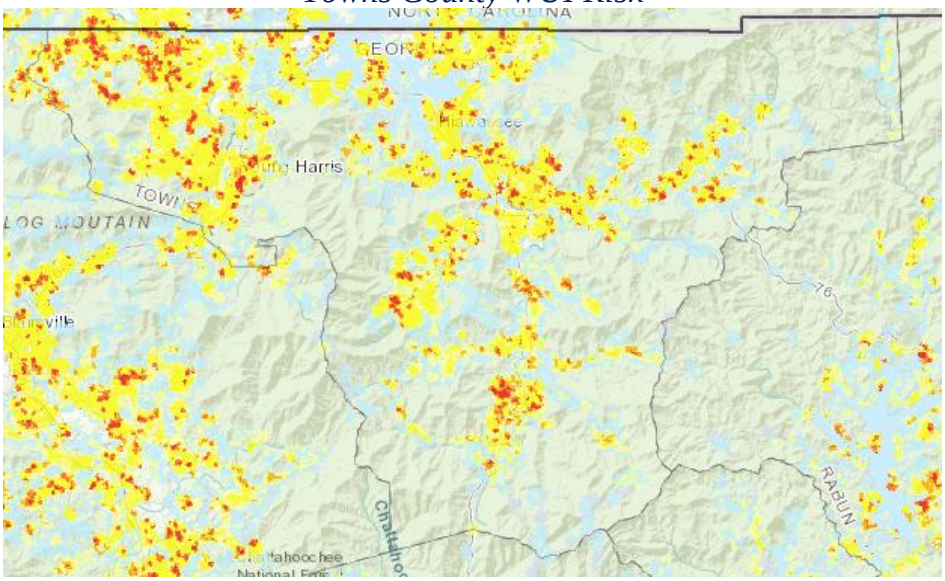
Wildfire is a significant threat to Towns County due to the increased amount of Wildland-Urban Interface. The increasing amount of area where structures and other human development meets undeveloped, wildland property is where 98% of Towns County's population lives. The mitigation measures identified 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 Towns County.

Towns County Fire Occurrences Map – 2011-2015



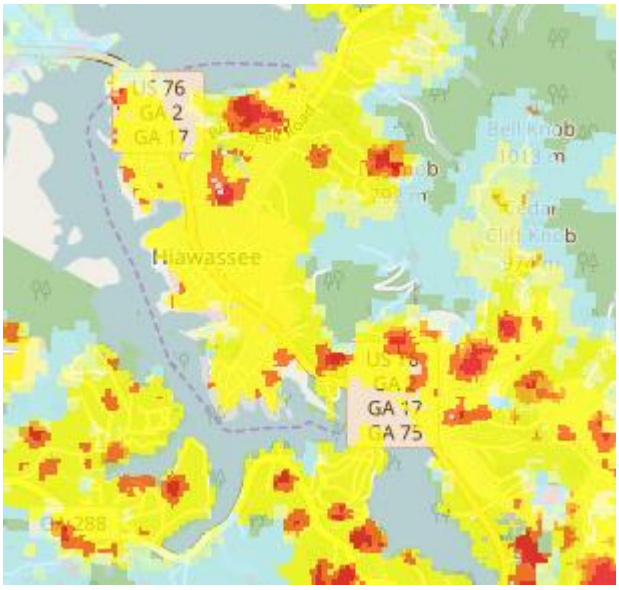
Natural Hazard: **Wildfire**

Towns County WUI Risk



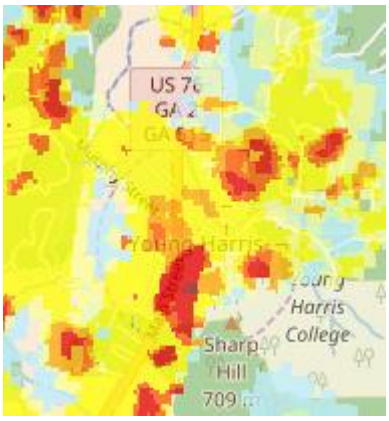
Major Impact----------Moderate Impact----------Minor Impact

Hiawassee WUI Risk

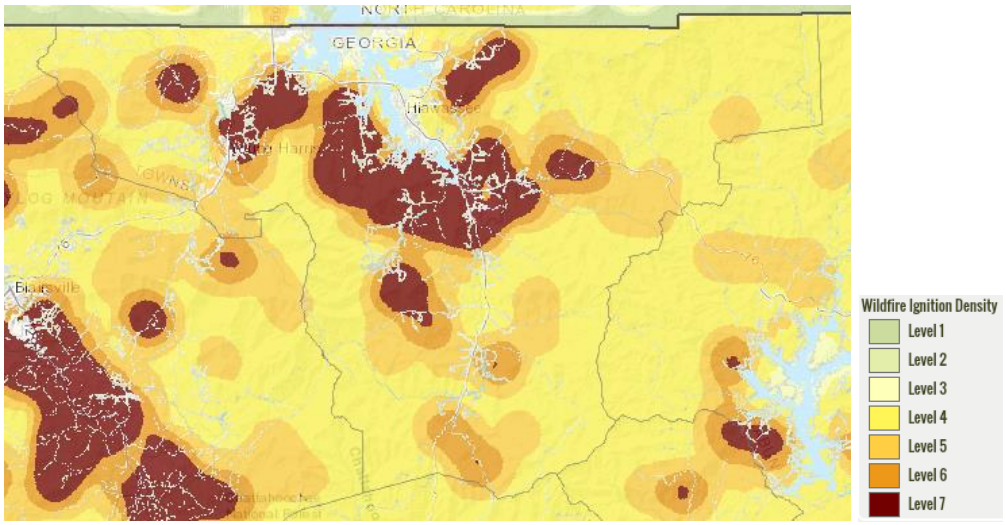


Natural Hazard: **Wildfire**

Young Harris WUI Risk



Towns County Wildfire Ignition Density



Very Low----------Low----------Moderate----------High----------Very High

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

Natural Hazard: Earthquakes

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 the majority of 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 or 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 or 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.

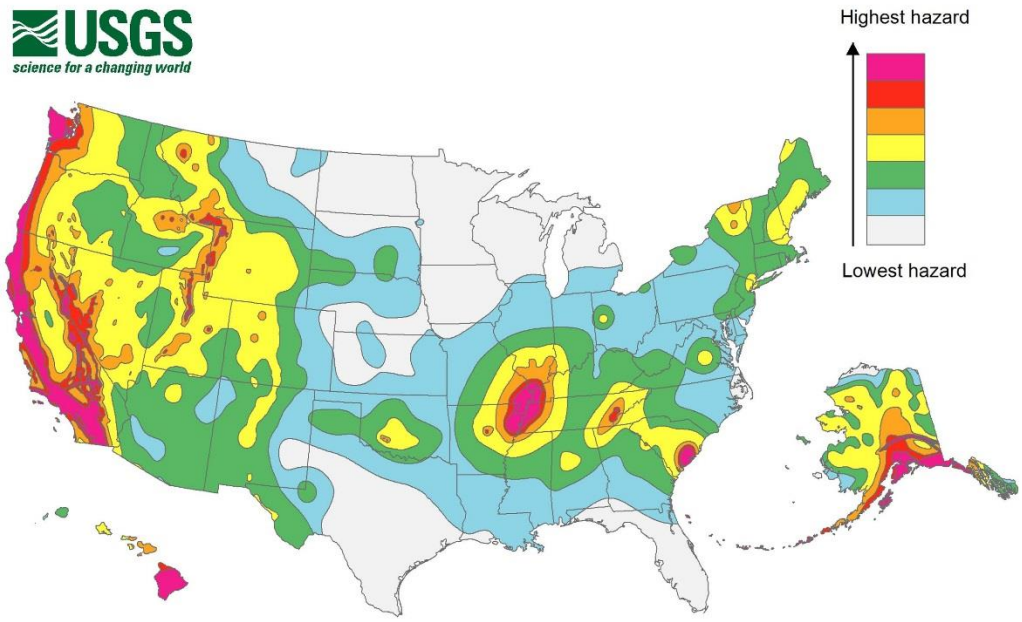
Natural Hazard: **Earthquakes**

(Hazard Description Continued)

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.

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.



Source: United States Geological Survey (USGS)

Natural Hazard: **Earthquakes**

Hazard Profile

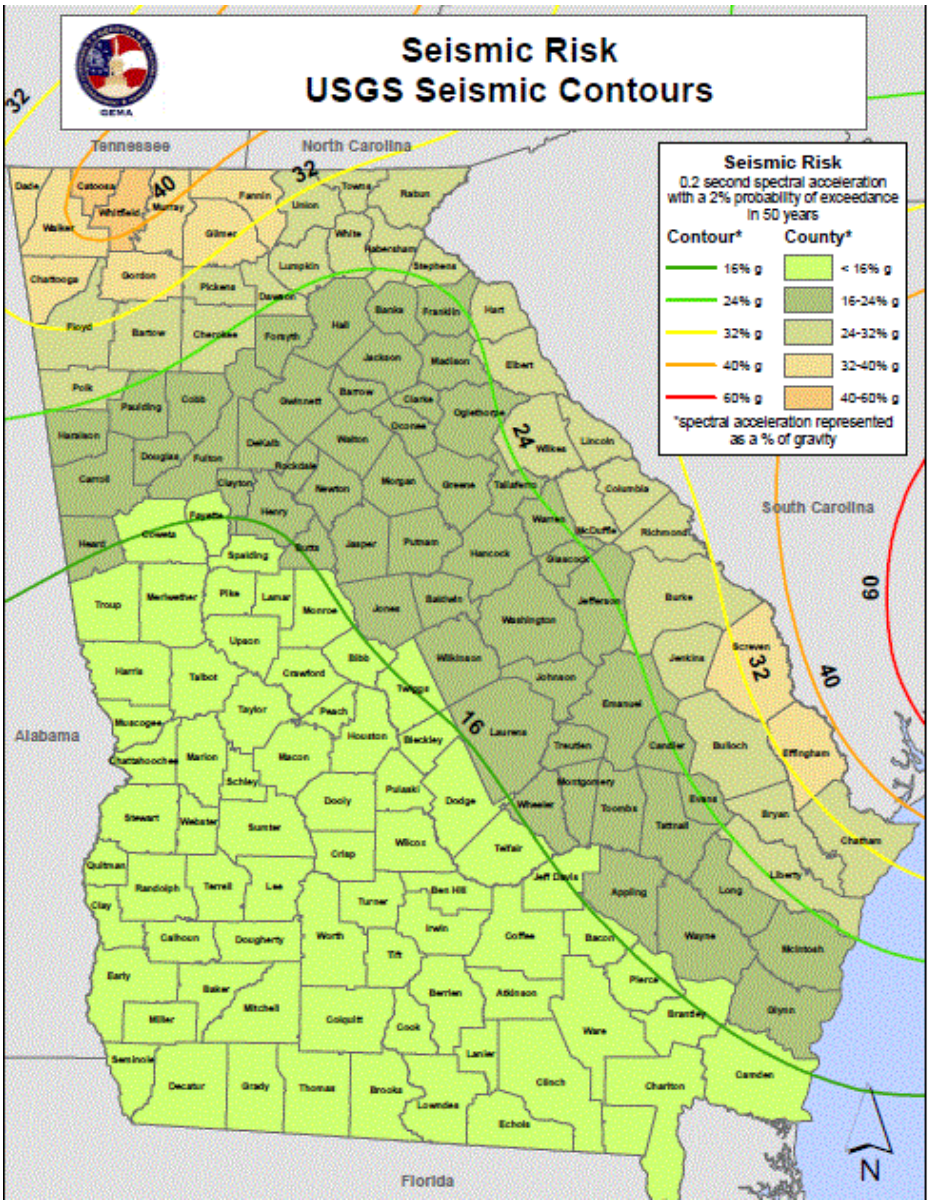
Towns County is one of the 37 Georgia counties with the highest earthquake risk, according to GEMA and Georgia Tech School of Earth and Atmospheric Sciences. In reviewing data of the last 50 years, one earthquake originated from within Towns County. This occurred in 2015 and registered 2.3 on the Richter Scale. However, earthquakes with a magnitude of 3.0 or greater have occurred as close as Abbeville County, South Carolina. 130 earthquakes have originated within 75 km of Hiawassee, GA in the last 50 years. This equates to 2.6 earthquakes per year – essentially a 100% annual chance – that occur within 75 km of Hiawassee, GA. Most of these earthquakes originated in North Carolina and Tennessee. The strongest earthquake to occur within this radius was a 3.7 that occurred in Eastern Tennessee in 1995. Historically, the 1886 Charleston, SC earthquake, estimated to be between 6.6 and 7.3 on the modern Richter Scale, likely caused impacts to Towns County. Although no historical records exist exhibiting any damages, Towns 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 Towns County, significant damage could occur. Therefore, the Towns County HMPC has determined the threat of earthquakes to be higher than the statistics would indicate.

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

Natural Hazard: **Earthquakes**

Assets Exposed to the Hazard

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



Source: 2014 State of Georgia Hazard Mitigation Strategy (most up-to-date version)

Natural Hazard: **Earthquakes**

Estimated Potential Losses

Little information is available regarding damages, in terms of dollars, for earthquake losses in Towns County. .

Land Use and Development Trends

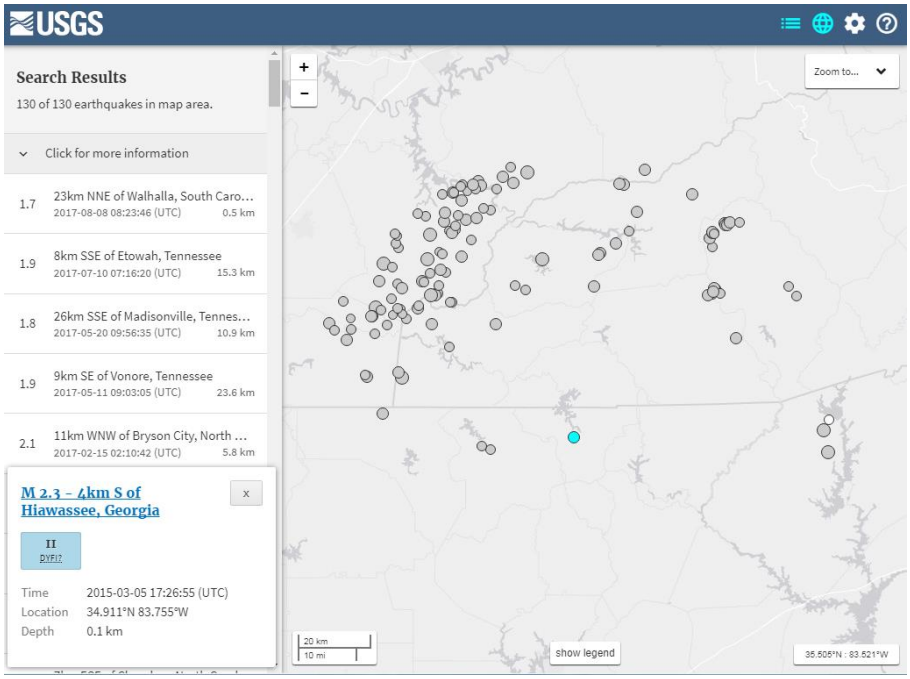
Towns County currently has no land use trends related to Earthquakes.

Multi-Jurisdictional Considerations

All of Towns 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 cities and towns located within Towns County.

Hazard Summary

Even with the infrequency of earthquake impacts in Towns County, the potential losses and impacts associated with the event would severely damage the infrastructure and economic viability of the County and its municipalities. 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 Towns County.



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

Natural Hazard: **Landslide**

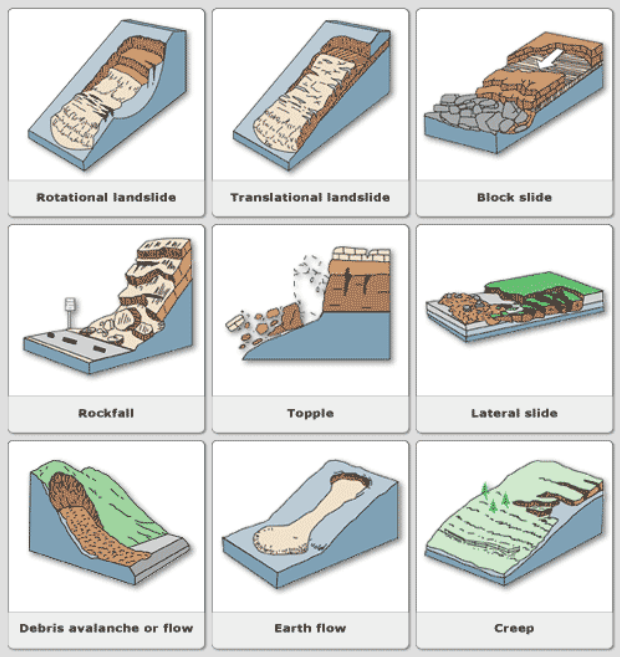
Hazard Description

The term landslide covers a wide range of ground movement. Landslides vary in size and can travel at a rate of a few inches per month to many feet per second depending on slope, type of materials, and moisture content.

Geology, topography, weather and other disasters, such as earthquakes or floods, contribute to landslides. Determining the probability of landslide events is difficult because so many factors can contribute to the cause of a ground failure. Because there is a history of landslides in unincorporated Towns County in the past, it is safe to assume they will occur in the future. Landslides in Towns County are normally associated with intense or prolonged rain. A combination of precipitation and slopes weakened by heavy rain creating saturated soils is one stimulus.

Earthquakes of a magnitude of 4.0 or greater can also induce landslides on susceptible slopes.

The primary types of landslides that occur in Towns County are debris flows and earth flows. Debris flows are also called mudslides, mudflows, or debris avalanches. They are rivers of a combination of loose soil, rock, organic matter, water, and air that flow downhill. As they continue downhill they tend to grow in volume with the addition of water, soil, boulders and other materials. When the flow reaches flatter ground, it can spread over a large area. Earth flows usually occur in fine-grained materials or clay bearing rocks on moderate slopes. The slope's material liquefies and forms a bowl shape depression at the source area.



Natural Hazard: **Landslide**

Hazard Profile

Normally, landslides in Towns County have resulted in traffic problems on both state highways and county roads and property damage on the coast. There have been ongoing traffic blockages in the unincorporated county due to landslides. Roads along steep slopes are very susceptible to landslides and a slide can happen during milder rainfall conditions then would be expected for a major event. A large slide closing Highway 76 for a considerable length of time would be expected to have a devastating effect on the County's economy. It would also be a threat to public health due to problems of access to medical services. According to the US Geological Survey, up to 15% of the Towns Count area is involved in landsliding and the Towns County area is determined to have "high susceptibility" to potential landslides. An exact historical record is difficult to determine as many landslide and debris flow events are minor, do not cause significant damage, or go unreported. Therefore, there is a lack of historical record and limited data available for this hazard, which has led to a lack of appropriate frequency, probability, history, and extent of damage. These records will be kept moving forward to be utilized in the next Hazard Mitigation Plan update.

Expanded development will increase the incidence of landslides, especially on steep slopes. Debris flow on natural slopes is a threat to timber harvest as well. Landslides because of flooding will extend the spread of debris, increase property damages due to weakened structures, and may seriously restrict provision of emergency services.

Assets Exposed to the Hazard

The Towns County HMPC determined that all critical facilities and all public and private property within Towns County are susceptible to the impacts of a landslide due to the unpredictable nature of landslides and overall high elevation of Towns County. This includes all cities and towns located within Towns County.

Estimated Potential Losses

Little information is available regarding damages, in terms of dollars, is available for landslide losses in Towns County. For lost estimation of all critical facilities potentially affected by landslides, please refer to the Critical Facilities information in Appendix C.

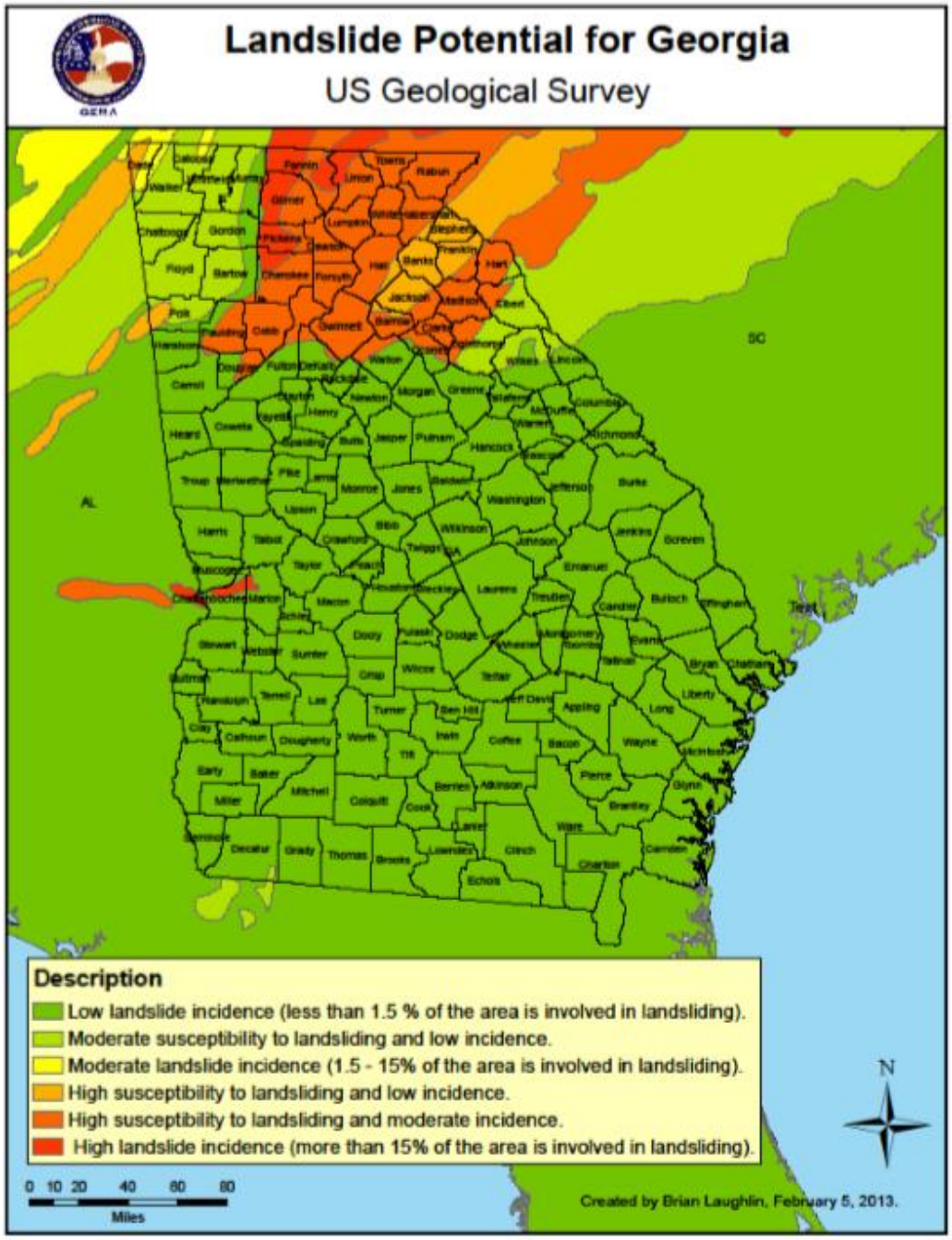
Land Use and Development Trends

Towns County currently has no land use trends related to Landslides.

Natural Hazard: Landslide

Multi-Jurisdictional Considerations

All of Towns County, including all municipalities, potentially could be threatened by landslides. As such, all landslide mitigation actions should be pursued on a countywide basis and include all cities and towns located within Towns County.



Source: 2014 Georgia Hazard Mitigation Strategy

Natural Hazard: Landslide

Hazard Summary

Even with the infrequency of landslide impacts in Towns County, the potential losses and impacts associated with the event would severely damage the infrastructure and economic viability of the County and its municipalities. The mitigation measures identified in this plan should be pursued based on the high impact potential of this hazard and the ability for landslides to inflict widespread devastation anywhere in Towns 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			

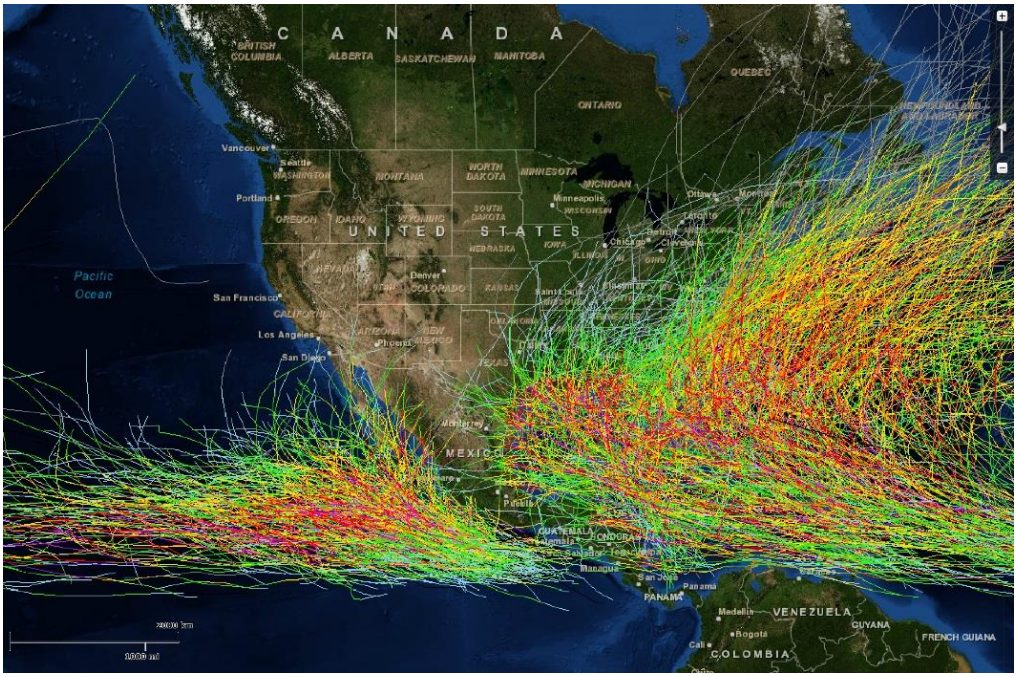
Natural Hazard: **Tropical Cyclone**

(Hazard Description Continued)

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.



Hazard Profile

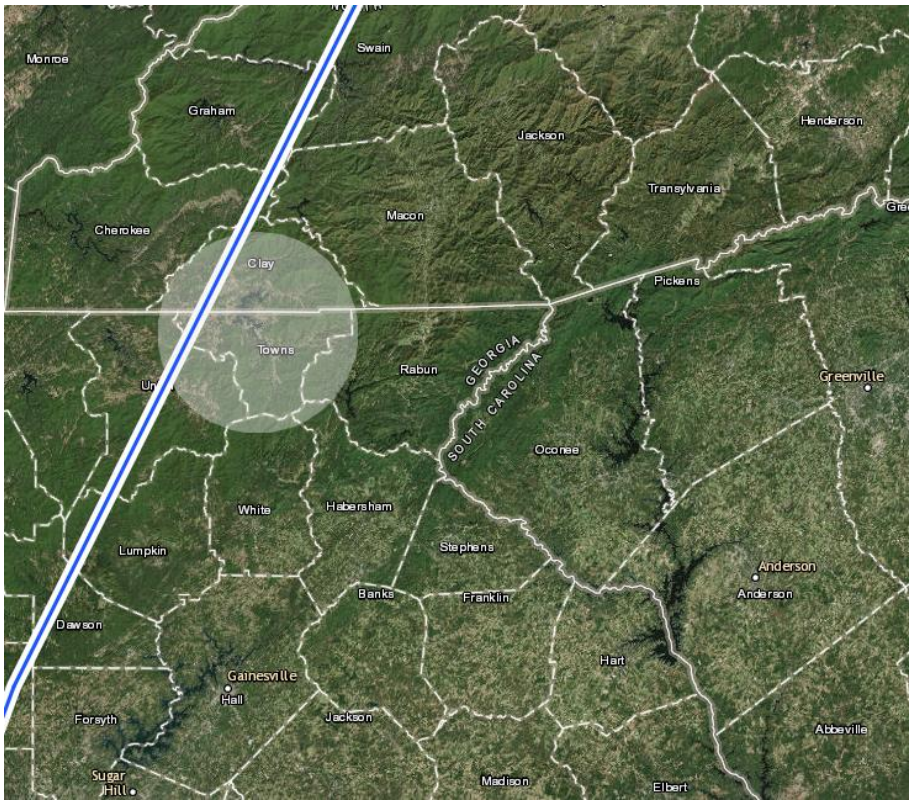
Tropical cyclones have directly impacted Towns County on an infrequent basis over the last 50 years. However, the possibility of a hurricane or tropical storm retaining their wind strength as far inland as Towns County is possible. There

Natural Hazard: **Tropical Cyclone**

(Hazard Profile Continued)

have been fourteen documented impacts from Topical Cyclones in Towns County. This equates to a 28% chance of a tropical cyclone impacting Towns County in any given year. All of these impactful storms have occurred in the last 16 years, which equates to a 87% chance of a tropical cyclone impacting Towns County in a given year. The Towns County Hazard Mitigation Update Committee believes this percentage is more representative of the potential impact.

Only one storm – Hurricane Frances in 2004 – had a track that directly dissected Towns County in the last 50 years. This storm was below Tropical Storm strength at the time they entered Towns County. Frances brought strong winds across north Georgia with sustained speeds of 35-40 mph and gusts in excess of 50 mph.

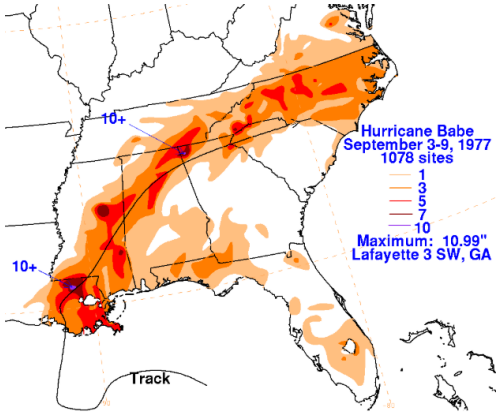


Source: Office of Coastal Management (NOAA)

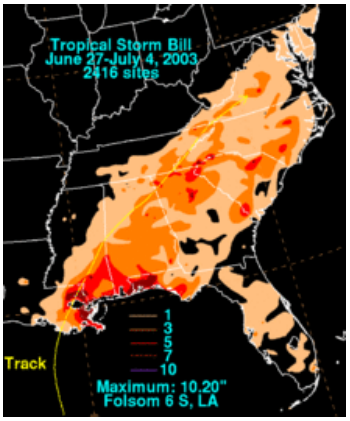
According to the 2018 Towns County HAZUS, Towns County has been impacted by three additional Tropical Cyclones in the last 50 years – Hurricane Babe in 1977, Tropical Storm Bill in 2003, and Hurricane Cindy in 2005. Additionally, Towns County was impacted by Hurricane Irma in 2017.

Natural Hazard: **Tropical Cyclone**

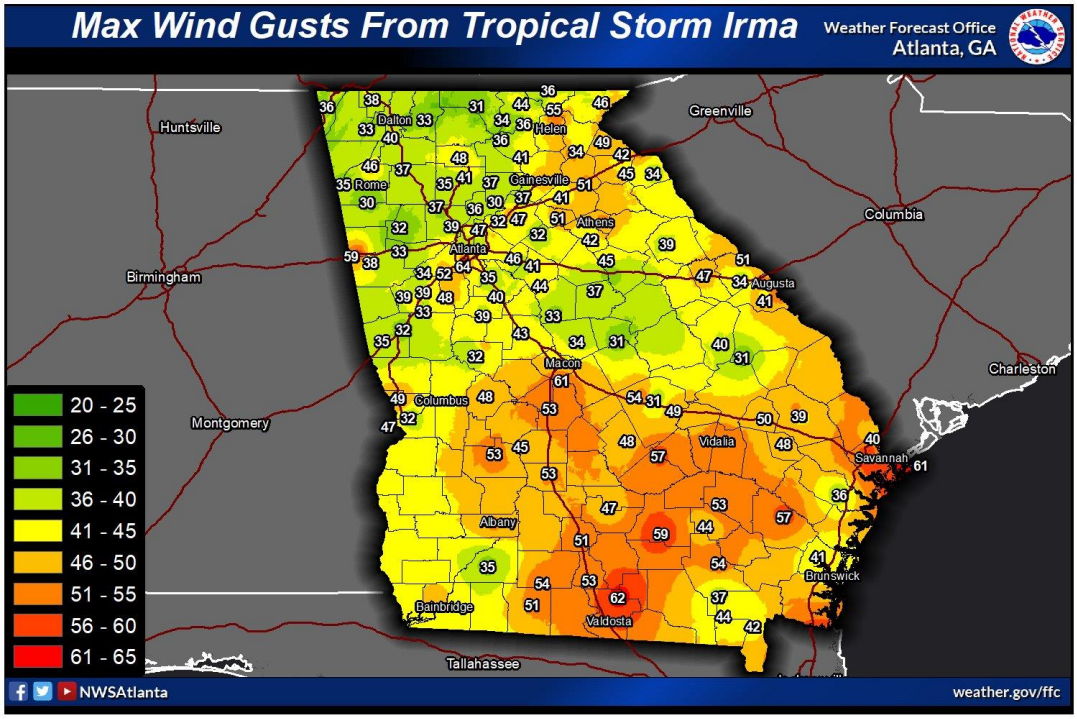
Hurricane Babe (1977)



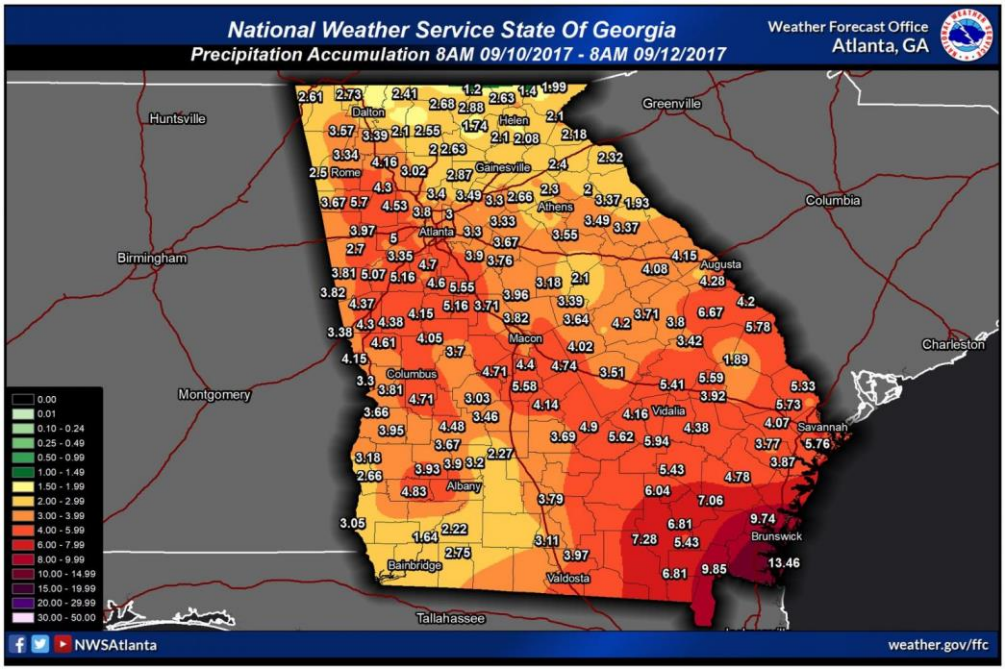
Tropical Storm Bill (2003)



Hurricane Irma downed numerous trees in Towns County, according to the National Weather Service Storm Report. Several major roadways were closed due to fallen trees and thousands of customers were without power. A gust of 55 mph was recorded at the Brasstown RAWS. A total of $30,000 in damages was reported for Hurricane Irma, although this is thought to be a significant underestimation.



Natural Hazard: **Tropical Cyclone**



Even with the infrequent occurrences, the impacts that would result from hurricane or tropical storm forces on the citizens, infrastructure, and critical facilities of Towns County could be potentially catastrophic in nature.

Assets Exposed to the Hazard

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

Estimated Potential Losses

Little information is available regarding damages, in terms of dollars, is available for tropical cyclone losses in Towns County. Most losses for these events have been labeled under other impacts, such as tornadoes and flooding. However, the 2018 Towns County HAZUS Report projected a loss ratio of 0.01% and a total loss of $110,820 for a 100-year Tropical Storm Event.

Land Use and Development Trends

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

Natural Hazard: **Tropical Cyclone**

Multi-Jurisdictional Considerations

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

Hazard Summary

Even with the relative infrequency of tropical cyclone impacts in Towns County in the recent past, the potential losses and impacts associated with the event would severely damage the infrastructure and economic viability of the County and its municipalities. Towns County's proximity to the Atlantic coast increases the likelihood of a tropical cyclone impacting the area. 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 Towns County.

Natural Hazard: Tropical Cyclone

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
TOWNS (ZONE)	TOWNS (ZONE)	GA	09/14/2002	11:00	EST	Tropical Storm		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	07/01/2003	00:00	EST	Tropical Storm		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	09/06/2004	12:00	EST	Tropical Storm		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	09/16/2004	00:00	EST	Tropical Storm		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	09/26/2004	00:00	EST	Tropical Storm		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	06/12/2005	00:00	EST	Tropical Storm		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	07/06/2005	15:00	EST	Tropical Storm		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	07/10/2005	10:00	EST	Hurricane (typhoon)		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	08/29/2005	11:00	EST	Hurricane (typhoon)		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	10/05/2005	04:00	EST	Tropical Storm		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	09/14/2007	00:00	EST-5	Hurricane (typhoon)		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	08/21/2008	12:00	EST-5	Tropical Storm		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	11/10/2009	05:00	EST-5	Tropical Storm		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	09/04/2011	11:00	EST-5	Tropical Storm		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	09/11/2017	17:00	EST-5	Tropical Storm		0	0	30.00K	0.00K

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 United States Coast Guard National Response Center was reviewed regarding hazardous materials spill history in Towns County. Data is available from 1982 to 2016 and all available data was reviewed. There were 3 NRC reported hazardous materials spills or releases in Towns County over a 25 year period. It is anticipated that many more hazardous materials incidents have occurred over the last 25 years, but have not been reported. According to the NRC data, Towns County averages 0.1 hazardous materials incidents of a reportable amount in any given year or one incident every 8.3 years. The reported incidents led to 3 injuries. The greatest threat for a hazardous materials spill comes from the transportation of materials through Towns County. This is particularly true for the US Highway 76 corridor that runs through the center of the county.

Hazardous materials releases can also be the result of railway or fixed facility incidents. Fixed facilities continue to be an increasing concern due to Towns County's growing industrial footprint. 33% of reported hazardous materials incidents have occurred at fixed facilities.

Technological Hazard: **Hazardous Materials**

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. Public and private property located near fixed hazardous materials facilities are also a greater risk than the general population of Towns County.

Estimated Potential Losses

Estimation of potential losses is difficult with regard to 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 Towns 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

Towns County currently has no land use trends related to Hazardous Materials.

Multi-Jurisdictional Considerations

All of Towns County, including all municipalities, are vulnerable to both fixed facility and transportation-related hazardous materials releases.

Hazard Summary

Hazardous materials incidents pose a significant threat to the citizens, infrastructure, and critical facilities of Towns County. Unknown quantities of hazardous materials are transported daily through Towns County and its municipalities. These materials are transported via highways, with Interstate 85 being of greatest concern. As a result of the threat posed by hazardous materials, the Towns County HMPC has identified mitigation actions directly related to this threat.

Technological Hazard: **Dam Failure**

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 3 category I and 2 category II dams located within Towns 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. However, the Chatuge Dam, located in Clay County, North Carolina, impounds over 7,000 acres of water. A failure at this location could have direct and indirect impacts on Towns County.

The threat of a dam failure in Towns 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.

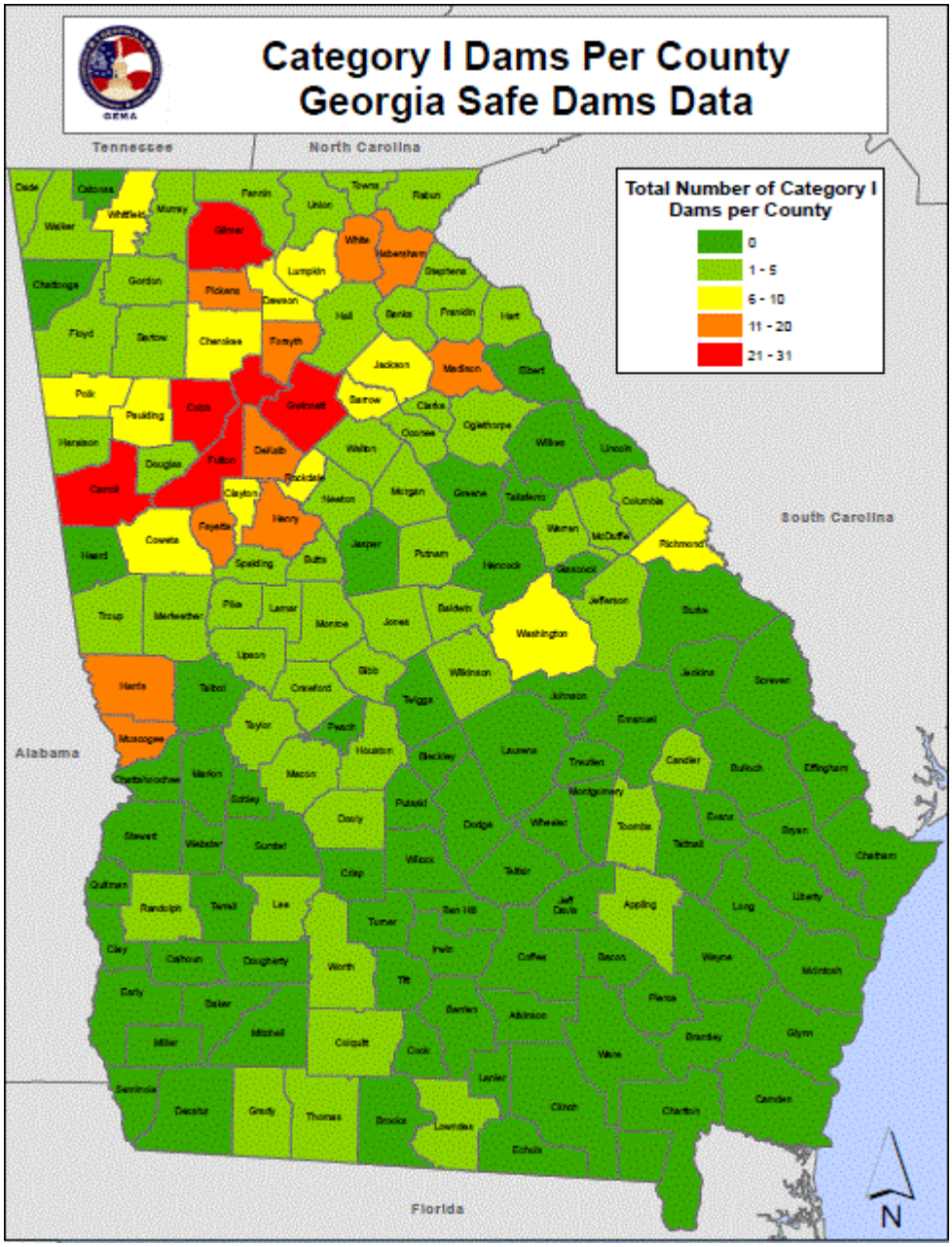
Assets Exposed to Hazard

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

Technological Hazard: **Dam Failure**



Source: 2014 State of Georgia Hazard Mitigation Strategy (most up-to-date version)

Technological Hazard: **Dam Failure**

Land Use and Development Trends

Towns County continues to have population increases. This continued growth within Towns County has led to a 12% population increase between 2000 and 2010.

Towns 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. The County (CID No. 130253) first entered the NFIP on July 6, 1998. 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. Currently, the Towns County municipalities of Hiawassee and Young Harris also participate in NFIP.

Multi-Jurisdictional Considerations

During a dam failure event, many portions of Towns 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.

Hazard Summary

Dam failure poses a threat to Towns County and its citizens, infrastructure, and critical facilities. A dam failure could prove catastrophic for areas downstream of the dam, particularly those areas downstream of one of the Category I dams. 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 as a result of a transportation incident, or by other related transportations 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 as a result 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 Towns County. Passing through Towns County are US Highway 76, and Georgia Highways 2,17, 66, 75, 180, 288, 339, and 515.

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 Towns 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

Towns 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.

Multi-Jurisdictional Considerations

Towns County as well as all municipalities could potentially be impacted by a transportation incident. However, areas along US Highway 76 are the greatest at risk. This includes the municipalities of Hiawassee and Young Harris.

Technological Hazard: **Transportation Incident**

Hazard Summary

The Towns 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 Towns County HMPC has developed mitigation strategies and actions with transportation incidents in mind.

Technological Hazard: **Terrorism**

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, agri-terrorism, armed attack, intentional hazardous materials release, 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 Towns County, all critical facilities could be seen as potential targets. Terrorism includes a multitude of potential approaches, including agri-terrorism, which is terrorism targeted toward agriculture. Due to the high economic impact of agriculture in Towns County, agri-terrorism could be of particular concern.

Technological Hazard: **Terrorism**

While active shooter situations are not always classified as terrorism, for this plan, the Towns 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. While active shooter events and other acts of terrorism occur worldwide, they have low probability for Towns County but would have devastating impacts if they were to occur. To help mitigate some of these impacts, Towns County has exercised an active shooter response in the past to better prepare for any such event.

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

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

Multi-Jurisdictional Considerations

All of Towns 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 Towns County and its municipalities. These impacts would be immediate and long-lasting and could be potentially economically crippling. Because of these considerations, the Towns County HMPC has developed mitigation actions with terrorism in mind.

Technological Hazard: **Communications Failure**

Hazard Description

Communications infrastructures are particularly vulnerable to both natural and technological hazards. While a communications failure would most likely be a secondary hazard of one of the other hazards identified in this plan, a communications failure could be a solo incident itself.

A lack of communication 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 communications infrastructure, general communication difficulties would be exacerbated for both emergency responders and for the general public. The reliance on wireless communications, particularly for the public safety sector, increases the vulnerability of Towns County's emergency response agencies to a communications failure.

Assets Exposed to Hazard

All assets and critical facilities within Towns County could potentially be impacted by a transportation incident.

Estimated Potential Losses

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

Land Use and Development Trends

Towns County currently has no land use trends related to communications failures.

Multi-Jurisdictional Considerations

Towns County as well as all municipalities could potentially be impacted by a communications failure. However, the City of Hiawassee is particularly vulnerable due to population density and higher reliability on technological communications.

Hazard Summary

The Towns County HMPC has determined that communications failures pose a high risk to their jurisdictions due to the unpredictable nature of the incident. As a result, the Towns County HMPC has developed mitigation strategies and actions with communications failures 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 Towns County Hazard Mitigation Plan 2013.

Chapter 4 Section	Updates
Goals and Objectives	• Updated goals to match the needs of Towns County and its municipalities
Identification and Analysis of Mitigation Techniques	• The beginning of this section includes new information regarding rating the mitigation strategies based upon the EMAP Standard Hazard Mitigation Section • The Mitigation Strategies have been updated, reorganized by objective, and new strategies have been added • A chart of completed Mitigation Strategies has been added
Multi-Jurisdictional Considerations	• Revised • Multi-Jurisdictional considerations listed for each identified hazard

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. County and municipal 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 Towns County have changed slightly in the last five years (since 2013) due to specific threat events, such as the snow and ice storms of 2014 and Hurricane Irma in 2017. The 2014 Ice Storms, in particular, led to changes at the State and local levels regarding the importance of winter weather preparedness, both for the general public and the response ability of local jurisdictions, including Towns County. 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 Towns County Hazard Mitigation plan update – Towns County and the Cities of Hiawassee and Young Harris – has limited ability to fully implement the mitigation actions described in this plan. These jurisdictions are severely hampered by their small population and tax base when attempting to raise sufficient revenue to pursue many of these actions. All jurisdictions lack the needed financial strength and staffing to implement all of 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, Towns County or municipality revenue streams may be supplemented through Special Purpose Local Option Sales Tax (SPLOST) funds, which are voted on by the electorate.

Since the adoption of the 2013 Towns County Hazard Mitigation Plan, Towns County has implemented many mitigation strategies to protect their community. Towns County has promoted hazard awareness information on the county website, ran a multi-jurisdictional exercise (including state and federal response partners), created a debris management plan, and created a list of approved debris removal contractors. Additionally, Towns County purchased generators for three fire departments, the Hiawassee Wastewater Treatment plan, and the Sheriff's

Department. Finally, Towns County purchase 11 four-wheel drive vehicles – 2 for the Sheriff's Department and 9 for the Fire department.

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 Towns 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.

OBJECTIVE1	Reduce damage to property and loss of life from flooding
OBJECTIVE 2	Minimize the damage to property and loss of life resulting from high wind events
OBJECTIVE 3	Provide advanced severe weather warning
OBJECTIVE 4	Provide educational awareness to citizens regarding the dangers of natural hazards
OBJECTIVE 5	Increase the ability of Towns County, its municipalities, and its citizens to respond to natural and technological hazards
OBJECTIVE 6	Maintain continuity of critical operations during and after hazard events
OBJECTIVE 7	Implement additional protective measures and capabilities in response to technological incidents

Identification and Analysis of Mitigation Techniques

Requirement §201.6(c)(3)(iv)

Requirement §201.6(c)(3)(iii)

In updating Towns County's mitigation strategy, a wide range of activities were considered in order 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 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. All estimations listed in the plan are just that – estimations. Actual costs associated with the project will be determined prior to implementation and will subjected to a full Benefit-Cost Analysis to ensure the most appropriate use of local tax monies.

Strategy Priority	Priority Description	Strategies within this priority
LOW	Low priority strategies are those strategies that will have less direct impact on mitigating Towns County's hazards, are in the early stages of strategy development, or score poorly on a preliminary cost-benefit analysis	**3.a; 4.d; 5.d; 5.p; 6.a; 6.f**
MEDIUM	Medium priority strategies are those strategies that will have a direct impact on mitigation Towns 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 Towns County. These strategies may be in the earlier stages of development or score mediocre on a preliminary cost-benefit analysis	**1.a 3.h; 3.j; 4.a; 4.b; 4.c; 4.e; 4.f; 5.b; 5.c; 5.e; 5.f; 5.g; 5.h; 5.j; 5.k; 5.l; 5.n; 5.o; 5.s; 5.t; 6.e; 6.j**
HIGH	High priority strategies are those strategies that would have a direct, large impact on mitigation Towns County's hazards. These strategies are oftentimes well-established needs of Towns County and/or its municipalities and have score high on a preliminary cost-benefit analysis	**1.b; 1.c; 1.d; 1.e; 2.a; 3.b; 3.c; 3.d; 3.e; 3.f; 3.g; 3.i; 3.k; 3.l; 3.m; 3.n; 4.g; 5.a; 5.i; 5.m; 5.q; 5.r; 5.u; 6.b; 6.c; 6.d; 6.g; 6.h; 6.i**

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 Towns County for the event, the all-hazard impact of the mitigation strategy, and a cost-benefit analysis for the action. For example, mitigation actions addressing high-likelihood, high-impact events with low cost would rate higher than low-likelihood, high-impact events with high cost.

Many of the mitigation strategies identified in this and previous plans have had little to no progress towards completion. This is due to a lack of funding associated with the project, grant opportunities to complete the project, and personnel to dedicate to the project and/or project management.

All mitigation strategies considered by the Towns County Hazard Mitigation Plan Update Committee can be classified under one of the following six (6) broad categories of mitigation techniques:

Prevention

Requirement §201.6(c)(3)(ii)

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

Natural Hazards	Mitigation Strategies
Drought	1.b
Earthquake	1.a; 1.b
Flood	1.a; 1.b; 1.c; 1.d; 1.e
Landslide	1.a; 1.b
Thunderstorms	1.a; 1.b; 1.c; 1.d; 1.e
Tornadoes	
Tropical Cyclone	1.a; 1.b; 1.c; 1.d; 1.e
Wildfire	1.a; 1.b
Winter Storms	1.a
Technological Hazards	**Mitigation Strategies**
Communications Failure	
Dam Failure	
Hazardous Materials	
Terrorism	
Transportation	

Property Protection

Property protection measures involve the modification of existing buildings and structures to help them better withstand the forces of a hazard, or involve the removal of the structures from hazardous locations. Examples of property protection in this updated plan are listed in the following table:

Natural Hazards	Mitigation Strategies
Drought	
Earthquake	6.c; 6.d; 6.e; 6.f; 6.g; 6.h; 6.i
Flood	6.i
Landslide	6.c; 6.d; 6.e; 6.f; 6.g; 6.h; 6.i
Thunderstorms	2.a; 6.c; 6.d; 6.e; 6.f; 6.g; 6.h; 6.i
Tornadoes	2.a; 6.c; 6.d; 6.e; 6.f; 6.g; 6.h; 6.i
Tropical Cyclone	2.a; 6.c; 6.d; 6.e; 6.f; 6.g; 6.h; 6.i
Wildfire	6.i
Winter Storms	2.a; 6.c; 6.d; 6.i
Technological Hazards	**Mitigation Strategies**
Communications Failure	
Dam Failure	
Hazardous Materials	
Terrorism	
Transportation	

Natural Resource Protection

Natural resource protection activities reduce the impact of natural hazards by preserving or restoring natural areas (ex: floodplains, wetlands, steep slopes, sand dunes) and their protective functions. Parks, recreation, or conservation agencies and organizations often implement these protective measures. Examples of natural resource protection in this updated plan are listed in the following table:

Natural Hazards	Mitigation Strategies
Drought	
Earthquake	
Flood	
Landslide	
Thunderstorms	
Tornadoes	
Tropical Cyclone	
Wildfire	
Winter Storms	
Technological Hazards	**Mitigation Strategies**
Communications Failure	
Dam Failure	
Hazardous Materials	
Terrorism	
Transportation	

Structural Projects

Structural mitigation projects are intended to lessen the impact of a hazard by modifying the environmental natural progression of the hazard event through construction. They are usually designed by engineers and managed or maintained by public works staff. Examples of structural projects in this updated plan are listed in the following table:

Natural Hazards	Mitigation Strategies
Drought	
Earthquake	
Flood	
Landslide	
Thunderstorms	
Tornadoes	
Tropical Cyclone	
Wildfire	
Winter Storms	
Technological Hazards	**Mitigation Strategies**
Communications Failure	
Dam Failure	
Hazardous Materials	
Terrorism	
Transportation	

Emergency Services

Although not typically considered a "mitigation" technique, emergency service measures do minimize the impact of a hazard event on people and property. These commonly are actions taken immediately prior to, during, or in response to a hazard event. Examples of emergency services in this updated plan are listed in the following table:

Natural Hazards	Mitigation Strategies
Drought	5.a; 5.h; 5.n
Earthquake	5.a; 5.b; 5.c; 5.d; 5.f; 5.g; 5.h; 5.i; 5.j; 5.k; 5.m; 5.n; 5.o; 5.r; 5.s; 5.t; 5.u; 6.a; 6.b
Flood	3.d; 3.e; 3.f; 3.g; 3.j; 3.k; 3.l; 3.m; 5.a; 5.b; 5.c; 5.d; 5.f; 5.g; 5.h; 5.i; 5.j; 5.k; 5.l; 5.m; 5.n; 5.o; 5.r; 5.s; 5.t; 6.a; 6.j
Landslide	5.a; 5.b; 5.c; 5.d; 5.f; 5.g; 5.h; 5.i; 5.j; 5.k; 5.m; 5.n; 5.o; 5.r; 5.s; 5.t; 5.u; 6.a; 6.b
Thunderstorms	3.a; 3.d; 3.e; 3.f; 3.g; 3.h; 3.i; 3.j; 3.k; 3.l; 3.m; 5.a; 5.b; 5.c; 5.d; 5.f; 5.g; 5.h; 5.i; 5.j; 5.k; 5.l; 5.m; 5.n; 5.p; 5.r; 5.s; 5.t; 6.a; 6.b; 6.j
Tornadoes	3.a; 3.b; 3.c; 3.d; 3.e; 3.f; 3.g; 3.h; 3.i; 3.j; 3.k; 3.l; 3.m; 5.a; 5.b; 5.c; 5.d; 5.f; 5.g; 5.h; 5.i; 5.j; 5.k; 5.m; 5.n; 5.o; 5.p; 5.r; 5.s; 5.t; 5.u; 6.a; 6.b
Tropical Cyclone	3.a; 3.b; 3.c; 3.d; 3.e; 3.f; 3.g; 3.h; 3.i; 3.j; 3.k; 3.l; 3.m; 5.a; 5.b; 5.c; 5.d; 5.f; 5.g; 5.h; 5.i; 5.j; 5.k; 5.l; 5.m; 5.n; 5.o; 5.p; 5.r; 5.s; 5.t; 5.u; 6.a; 6.b; 6.j
Wildfire	5.a; 5.d; 5.f; 5.g; 5.h; 5.i; 5.j; 5.k; 5.m; 5.n; 5.o; 5.r; 6.a
Winter Storms	3.a; 3.d; 3.e; 3.f; 3.g; 3.h; 3.i; 3.j; 3.k; 3.l; 3.m; 5.a; 5.b; 5.c; 5.d; 5.f; 5.g; 5.h; 5.i; 5.j; 5.k; 5.m; 5.n; 5.p; 5.r; 5.s; 5.t; 5.u; 6.a; 6.b
Technological Hazards	**Mitigation Strategies**
Communications Failure	
Dam Failure	
Hazardous Materials	
Terrorism	
Transportation	

Public Education and Awareness

Public education and awareness activities are used to advise residents, elected officials, business owners, potential property buyers, and visitors about hazards, hazardous areas, and mitigation techniques that they can use to protect themselves and their property. Examples of public education and awareness strategies in this updated plan are listed in the following table:

Natural Hazards	Mitigation Strategies
Drought	4.a; 4.b; 4.c; 4.d
Earthquake	4.a; 4.d
Flood	3.n; 4.a; 4.b; 4.c; 4.d; 4.e; 4.f; 4.g; 5.e
Landslide	4.a; 4.d
Thunderstorms	3.n; 4.a; 4.b; 4.c; 4.d; 4.e; 4.f; 4.g; 5.e; 5.q
Tornadoes	3.n; 4.a; 4.b; 4.c; 4.d; 4.e; 4.f; 4.g; 5.e; 5.q
Tropical Cyclone	3.n; 4.a; 4.b; 4.c; 4.d; 4.e; 4.f; 4.g; 5.e; 5.q
Wildfire	4.a; 4.d; 5.e
Winter Storms	3.n; 4.a; 4.b; 4.c; 4.d; 4.e; 4.f; 4.g; 5.e; 5.q
Technological Hazards	**Mitigation Strategies**
Communications Failure	
Dam Failure	
Hazardous Materials	
Terrorism	
Transportation	

Overall

Mitigation Technique	Percentage
Prevention	8.6%
Property Protection	13.8%
Natural Resource Protection	0.0%
Structural Projects	0.0%
Emergency Services	60.4%
Public Education and Awareness	17.2%

The following Mitigation Charts meet:
Requirement §201.6(c)(3)(ii)
Requirement §201.6(d)(3)

#	Mitigation Action	Lead Agency or Department *Jurisdiction*	Flood	Winter Weather	Thunderstorm	Tornado	Drought	Wildfire	Earthquake	Landslide	Tropical Cyclone	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Priority	Source	Previous Strategy Number
OBJETIVE ONE: Reduce damage to property and loss of life from flooding																		
1.a	Maintain and Enforce Mountain Protection Act	Towns County Building Deparment *Towns County and all municipalities*	**X**	**X**	**X**			**X**	**X**	**X**	**X**	Public and private grants and/or local budgets	$10,000 annually	12 months	**Ongoing**	**Med**	**2013 Plan**	**Unk**
1.b	Maintain and enforce Erosion and Sediment Control Act	Georgia DNR EPD *Towns County and all municipalities*	**X**		**X**		**X**	**X**	**X**	**X**	**X**	State budgets	Staff time	12 months	**Ongoing**	**High**	**NEW**	**NEW**

#	Mitigation Action	Lead Agency or Department *Jurisdiction*	Flood	Winter Weather	Thunderstorm	Tornado	Drought	Wildfire	Earthquake	Landslide	Tropical Cyclone	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Priority	Source	Previous Strategy Number
1.c	Maintain NFIP Compliance	Towns County Government (building department) *Towns County and all municipalities*	**X**		**X**						**X**	local budgets	Staff time	12 months	**Ongoing**	**High**	**NEW**	**NEW**
1.d	Maintain NFIP Compliance	City of Hiawassee (building department) *City of Hiawassee*	**X**		**X**						**X**	local budgets	Staff time	12 months	**Ongoing**	**High**	**NEW**	**NEW**

#	Mitigation Action	Lead Agency or Department *Jurisdiction*	Flood	Winter Weather	Thunderstorm	Tornado	Drought	Wildfire	Earthquake	Landslide	Tropical Cyclone	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Priority	Source	Previous Strategy Number
1.e	Maintain NFIP Compliance	City of Young Harris (Planning Commission) *City of Young Harris*	**X**		**X**						**X**	Local budgets	Staff time	12 months	**Ongoing**	**High**	**NEW**	**NEW**
OBJECTIVE TWO: Minimize damage to property and loss of life resulting from high winds events																		
2.a	Provide adequate shelters for county citizens, especially vulnerable populations	Towns County EMA and American Red Cross *Towns County and all municipalities*		**X**	**X**	**X**					**X**	Public and private grants and/or local budgets	$2,500	30 months	**Ongoing**	**High**	**2013 Plan**	**Unk**
OBJECTIVE THREE: Provide advanced severe weather warning																		

#	Mitigation Action	Lead Agency or Department *Jurisdiction*	Flood	Winter Weather	Thunderstorm	Tornado	Drought	Wildfire	Earthquake	Landslide	Tropical Cyclone	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Priority	Source	Previous Strategy Number
3.a	Purchase 2 weather monitoring stations	Towns County EMA *Towns County and all municipalities*		**X**	**X**	**X**					**X**	Public and private grants and/or local budgets	$1,500 each	24 months	**Stations Research ongoing**	**Low**	**2013 Plan**	**Unk**
3.b	Perform a study to determine where warning sirens would be most effective	Towns County EMA *Towns County and all municipalities*				**X**					**X**	Public and private grants and/or local budgets	$10,000	24 months	**NEW**	**High**	**NEW**	**NEW**
3.c	Implement recommendations from study in 3.b	Towns County EMA *Towns County and all municipalities*				**X**					**X**	Public and private grants and/or local budgets	$75,000	48 months	**NEW**	**High**	**NEW**	**NEW**

#	Mitigation Action	Lead Agency or Department *Jurisdiction*	Flood	Winter Weather	Thunderstorm	Tornado	Drought	Wildfire	Earthquake	Landslide	Tropical Cyclone	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Priority	Source	Previous Strategy Number
3.d	Purchase weather radios for schools and colleges	Towns County Schools and Young Harris College *Towns County and all municipalities*	**X**	**X**	**X**	**X**					**X**	Public and private grants and/or local budgets	$5,000	18 months	**NEW**	**High**	**NEW**	**NEW**
3.e	Purchase weather radios for local healthcare facilities (hospital, nursing homes, assisted living facilities)	Towns County EMA and local healthcare facilities *Towns County and all municipalities*	**X**	**X**	**X**	**X**					**X**	Public and private grants and/or local budgets	$15,000	18 months	**NEW**	**High**	**NEW**	**NEW**

#	Mitigation Action	Lead Agency or Department *Jurisdiction*	Flood	Winter Weather	Thunderstorm	Tornado	Drought	Wildfire	Earthquake	Landslide	Tropical Cyclone	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Priority	Source	Previous Strategy Number
3.f	Purchase weather radios for local daycare centers and recreation centers	Towns County EMA, local daycares, and local rec center *Towns County and all municipalities*	**X**	**X**	**X**	**X**					**X**	Public and private grants and/or local budgets	$10,000	24 months	**NEW**	**High**	**NEW**	**NEW**
3.g	Purchase weather radios for Big Sky apartments and Georgia Baptist Hiawassee Park	Towns County EMA and facilities *Towns County and all municipalities*	**X**	**X**	**X**	**X**					**X**	Public and private grants and/or local budgets	$5,000	24 months	**NEW**	**High**	**NEW**	**NEW**

#	Mitigation Action	Lead Agency or Department *Jurisdiction*	Flood	Winter Weather	Thunderstorm	Tornado	Drought	Wildfire	Earthquake	Landslide	Tropical Cyclone	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Priority	Source	Previous Strategy Number
3.h	Purchase voice-over alert system at Recreation Center	Towns County Recreation *Towns County and all municipalities*		**X**	**X**	**X**					**X**	Public and private grants and/or local budgets	$50,000	42 months	**NEW**	**Med**	**NEW**	**NEW**
3.i	Provide lightning and severe weather monitoring system for Recreation Center	Towns County Recreation *Towns County and all municipalities*		**X**	**X**	**X**					**X**	Public and private grants and/or local budgets	$25,000	30 months	**NEW**	**High**	**NEW**	**NEW**
3.j	Perform annual update to mass notification system database via mail out	Towns County EMA *Towns County and all municipalities*	**X**	**X**	**X**	**X**					**X**	Public and private grants and/or local budgets	$7,500	24 months	**NEW**	**Med**	**NEW**	**NEW**

#	Mitigation Action	Lead Agency or Department *Jurisdiction*	Flood	Winter Weather	Thunderstorm	Tornado	Drought	Wildfire	Earthquake	Landslide	Tropical Cyclone	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Priority	Source	Previous Strategy Number
3.k	Purchase NOAA Weather radios for City of Hiawassee	City of Hiawassee (assisted by Towns County EMA) *City of Hiawassee*	**X**	**X**	**X**	**X**					**X**	Public and private grants and/or local budgets	$2,500	12 months	**NEW**	**High**	**NEW**	**NEW**
3.l	Purchase NOAA Weather radios for City of Young Harris	City of Young Harris (assisted by Towns County EMA) *City of Young Harris*	**X**	**X**	**X**	**X**					**X**	Public and private grants and/or local budgets	$2,500	12 months	**NEW**	**High**	**NEW**	**NEW**

#	Mitigation Action	Lead Agency or Department *Jurisdiction*	Flood	Winter Weather	Thunderstorm	Tornado	Drought	Wildfire	Earthquake	Landslide	Tropical Cyclone	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Priority	Source	Previous Strategy Number
3.m	Encourage local churches to have a NOAA Weather Radio	Towns County EMA *Towns County and all municipalities*	**X**	**X**	**X**	**X**					**X**	Local budgets	Staff time	`12 months	**NEW**	**High**	**NEW**	**NEW**
3.n	Encourage local businesses to have a NOAA Weather Radio	Towns County EMA *Towns County and all municipalities*	**X**	**X**	**X**	**X**					**X**	Local budgets	Staff time	12 months	**NEW**	**High**	**NEW**	**NEW**
OBJECTIVE FOUR: Provide educational awareness to citizens regarding the dangers of natural hazards																		

#	Mitigation Action	Lead Agency or Department *Jurisdiction*	Flood	Winter Weather	Thunderstorm	Tornado	Drought	Wildfire	Earthquake	Landslide	Tropical Cyclone	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Priority	Source	Previous Strategy Number
4.a	Have preparedness awareness program in schools for all hazards	Towns County EMA and Towns County Schools *Towns County and all municipalities*	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	Public and private grants and/or local budgets	$25,000 annually	30 months	**Programs in planning stages**	**Med**	**2013 Plan**	**Unk**
4.b	Public articles about weather awareness and drought and water restrictions in local newspapers	Towns County EMA *Towns County and all municipalities*	**X**	**X**	**X**	**X**	**X**				**X**	Local budgets	Staff time	18 months	**Ongoing**	**Med**	**2013 Plan**	**Unk**

#	Mitigation Action	Lead Agency or Department *Jurisdiction*	Flood	Winter Weather	Thunderstorm	Tornado	Drought	Wildfire	Earthquake	Landslide	Tropical Cyclone	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Priority	Source	Previous Strategy Number
4.c	Public articles about weather awareness via social media	Towns County EMA *Towns County and all municipalities*	**X**	**X**	**X**	**X**	**X**				**X**	Local budgets	Staff time	12 months	**Ongoing**	**Med**	**2013 Plan**	**Unk**
4.d	Provide a section in the local libraries for preparedness and severe weather	Mountain Regional Library and Towns County Public Library *Towns County and all municipalities*	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	Public and private grants and/or local budgets	$8,000	36 months	**NEW**	**Low**	**NEW**	**NEW**

#	Mitigation Action	Lead Agency or Department *Jurisdiction*	Flood	Winter Weather	Thunderstorm	Tornado	Drought	Wildfire	Earthquake	Landslide	Tropical Cyclone	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Priority	Source	Previous Strategy Number
4.e	Provide a flier to Lincare regarding the equipment that individuals need to take with them to a shelter and provide it to their patients	Towns County EMA and Lincare *Towns County and all municipalities*	**X**	**X**	**X**	**X**					**X**	Public and private grants and/or local budgets	$3,000	18 months	**NEW**	**Med**	**NEW**	**NEW**
4.f	Hold public awareness seminars regarding what to do before, during, and after severe weather	Towns County EMA *Towns County and all municipalities*	**X**	**X**	**X**	**X**					**X**	Public and private grants and/or local budgets	$10,000	24 months	**Info promoted via website and social media**	**Med**	**2013 Plan**	**Unk**

#	Mitigation Action	Lead Agency or Department *Jurisdiction*	Flood	Winter Weather	Thunderstorm	Tornado	Drought	Wildfire	Earthquake	Landslide	Tropical Cyclone	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Priority	Source	Previous Strategy Number
4.g	Put article in local newspaper regarding signing up for Code Red	Towns County EMA *Towns County and all municipalities*	**X**	**X**	**X**	**X**					**X**	Local budgets	Staff time	12 months	**NEW**	**High**	**NEW**	**NEW**
OBJECTIVE FIVE: Increase the ability of Towns County, its municipalities, and its citizens to respond to natural and technological hazards																		
5.a	Purchase laptop computers for EOC	Towns County EMA *Towns County and all municipalities*	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	Public and private grants and/or local budgets	$15,000	30 months	**Research into best options underway**	**High**	**2013 Plan**	**Unk**

#	Mitigation Action	Lead Agency or Department *Jurisdiction*	Flood	Winter Weather	Thunderstorm	Tornado	Drought	Wildfire	Earthquake	Landslide	Tropical Cyclone	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Priority	Source	Previous Strategy Number
5.b	Equip Damage Assessment Teams with tablets and/or iPads	Towns County EMA and Towns County Tax Assessors *Towns County and all municipalities*	**X**	**X**	**X**	**X**			**X**	**X**	**X**	Public and private grants and/or local budgets	$25,000	48 months	**NEW**	**Med**	**NEW**	**NEW**
5.c	Train Damage Assessment Teams	Towns County EMA and Towns County Tax Assessors *Towns County and all municipalities*	**X**	**X**	**X**	**X**			**X**	**X**	**X**	Local budgets	Staff time	12 months	**NEW**	**Med**	**NEW**	**NEW**

#	Mitigation Action	Lead Agency or Department *Jurisdiction*	Flood	Winter Weather	Thunderstorm	Tornado	Drought	Wildfire	Earthquake	Landslide	Tropical Cyclone	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Priority	Source	Previous Strategy Number
5.d	Purchase a Mobile Command Vehicle	Towns County *Towns County and all municipalities*	**X**	**X**	**X**	**X**		**X**	**X**	**X**	**X**	Public and private grants and/or local budgets	$300,000	60 months	**MCV options researched**	**Low**	**2013 Plan**	**Unk**
5.e	Encourage those on Oxygen to bring concentrator when going to a shelter	Towns County EMA *Towns County and all municipalities*	**X**	**X**	**X**	**X**		**X**			**X**	Local budgets	Staff time	18 months	**NEW**	**Med**	**NEW**	**NEW**

#	Mitigation Action	Lead Agency or Department *Jurisdiction*	Flood	Winter Weather	Thunderstorm	Tornado	Drought	Wildfire	Earthquake	Landslide	Tropical Cyclone	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Priority	Source	Previous Strategy Number
5.f	Coordinate with Young Harris College regarding an evacuation plan	Towns County EMA and Young Harris College *Towns County and all municipalities*	**X**	**X**	**X**	**X**		**X**	**X**	**X**	**X**	local budgets	Staff time	18 months	**Risk Mngment Committee formed**	**Med**	**2013 Plan**	**Unk**
5.g	Purchase four-wheel drive vehicles for public safety agencies	Towns County EMA *Towns County and all municipalities*	**X**	**X**	**X**	**X**		**X**	**X**	**X**	**X**	Public and private grants and/or local budgets	$40,000 each	30 months	**2 purchase by Sheriff's Office (2017); 9 purchase by Fire Dept (2013-2017)**	**Med**	**2013 Plan**	**Unk**

#	Mitigation Action	Lead Agency or Department *Jurisdiction*	Flood	Winter Weather	Thunderstorm	Tornado	Drought	Wildfire	Earthquake	Landslide	Tropical Cyclone	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Priority	Source	Previous Strategy Number
5.h	Continue to coordinate efforts with State (GA and NC) and Federal agencies	Towns County Public Safety Agencies *Towns County and all municipalities*	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	Local budgets	Staff time	12 months	**Ongoing; held multi-jurisdictional exercise in 2017, including GEMA, Coast Guard, DNR, and local public safety agencies**	**Med**	**2013 Plan**	**Unk**

#	Mitigation Action	Lead Agency or Department *Jurisdiction*	Flood	Winter Weather	Thunderstorm	Tornado	Drought	Wildfire	Earthquake	Landslide	Tropical Cyclone	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Priority	Source	Previous Strategy Number
5.i	Update debris removal plan	Towns County EMA *Towns County and all municipalities*	**X**	**X**	**X**	**X**		**X**	**X**	**X**	**X**	Public and private grants and/or local budgets	$10,000	24 months	**Created Debris removal plan since 2013**	**High**	**2013 Plan (Mod.)**	**Unk**
5.j	Update debris removal contractor list	Towns County and all municipalities governments *Towns County and all municipalities*	**X**	**X**	**X**	**X**		**X**	**X**	**X**	**X**	Local budgets	Staff time	18 months	**Created debris removal list since 2013**	**Med**	**2013 Plan**	**Unk**

#	Mitigation Action	Lead Agency or Department *Jurisdiction*	Flood	Winter Weather	Thunderstorm	Tornado	Drought	Wildfire	Earthquake	Landslide	Tropical Cyclone	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Priority	Source	Previous Strategy Number
5.k	Purchase two UTV/ATVs that can carry 4 people	Towns County public safety agencies *Towns County and all municipalities*	**X**	**X**	**X**	**X**		**X**	**X**	**X**	**X**	Public and private grants and/or local budget	$36,000	30 months	**NEW**	**Med**	**NEW**	**NEW**
5.l	Purchase flat bottom boat for water rescue and flash flood events	Towns County EMA *Towns County and all municipalities*	**X**		**X**						**X**	Public and private grants and/or local budgets	$10,000	30 months	**NEW**	**Med**	**NEW**	**NEW**

#	Mitigation Action	Lead Agency or Department *Jurisdiction*	Flood	Winter Weather	Thunderstorm	Tornado	Drought	Wildfire	Earthquake	Landslide	Tropical Cyclone	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Priority	Source	Previous Strategy Number
5.m	Update mutual aid/automatic aid agreements with North Carolina	Towns County EMA and Towns County Government *Towns County and all municipalities*	**X**	**X**	**X**	**X**		**X**	**X**	**X**	**X**	Local budgets	Staff time	12 months	**NEW**	**High**	**NEW**	**NEW**
5.n	Update to next generation 911 CAD system	Towns County 911 *Towns County and all municipalities*	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	Public and private grants and/or local budgets	$100,000	36 months	**NEW**	**Med**	**NEW**	**NEW**

#	Mitigation Action	Lead Agency or Department *Jurisdiction*	Flood	Winter Weather	Thunderstorm	Tornado	Drought	Wildfire	Earthquake	Landslide	Tropical Cyclone	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Priority	Source	Previous Strategy Number
5.o	Hold quarterly meeting with DNR and US Forest Service to coordinate efforts on search and rescue and weather events	Towns County EMA and Fire Departments *Towns County and all municipalities*	**X**			**X**		**X**	**X**	**X**	**X**	Local, State, and Federal Budgets	Staff time	12 months	**Ongoing**	**Med**	**NEW**	**NEW**
5.p	Update Code Red Phone line	Towns County EMA *Towns County and all municipalities*		**X**	**X**	**X**					**X**	Local budgets	Staff time	12 months	**NEW**	**Low**	**NEW**	**NEW**

#	Mitigation Action	Lead Agency or Department *Jurisdiction*	Flood	Winter Weather	Thunderstorm	Tornado	Drought	Wildfire	Earthquake	Landslide	Tropical Cyclone	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Priority	Source	Previous Strategy Number
5.q	Encourage citizens to sign up for Code Red Mass Notification System	Towns County EMA *Towns County and all municipalities*		**X**	**X**	**X**					**X**	Public and private grants and/or local budgets	$10,000	24 months	**NEW**	**High**	**NEW**	**NEW**
5.r	Add additional repeaters throughout county	Towns County 911 and public safety agencies *Towns County and all municipalities*	**X**	**X**	**X**	**X**		**X**	**X**	**X**	**X**	Public and private grants and/or local budgets	$300,000	30 months	**NEW**	**High**	**NEW**	**NEW**
5.s	Purchase a new chipper for debris management	Towns County Public Works *Towns County and all municipalities*	**X**	**X**	**X**	**X**			**X**	**X**	**X**	Public and private grants and/or local budgets	$100,000	48 months	**NEW**	**Med**	**NEW**	**NEW**

#	Mitigation Action	Lead Agency or Department *Jurisdiction*	Flood	Winter Weather	Thunderstorm	Tornado	Drought	Wildfire	Earthquake	Landslide	Tropical Cyclone	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Priority	Source	Previous Strategy Number
5.t	Purchase chainsaws for debris management	City of Hiawassee *City of Hiawassee*	**X**	**X**	**X**	**X**			**X**	**X**	**X**	Public and private grants and/or local budgets	$5,000	24 months	**NEW**	**Med**	**NEW**	**NEW**
5.u	Develop a Regional Search and Rescue Team	Towns County public safety agencies *Towns County and all municipalities*		**X**		**X**			**X**	**X**	**X**	Public and private grants and/or local budgets	$20,000	36 months	**NEW**	**High**	**NEW**	**NEW**
OBJECTIVE SIX: Maintain continuity of critical operations during and after hazard events																		

#	Mitigation Action	Lead Agency or Department *Jurisdiction*	Flood	Winter Weather	Thunderstorm	Tornado	Drought	Wildfire	Earthquake	Landslide	Tropical Cyclone	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Priority	Source	Previous Strategy Number
6.a	Purchase satellite phones for each public safety agency (county and municipal)	Towns County, Hiawassee, and Young Harris Public Safety agencies *Towns County and all municipalities*	**X**	**X**	**X**	**X**		**X**	**X**	**X**	**X**	Public and private grants and/or local budgets	$25,000	36 months	**Expanded needs list**	**Low**	**2013 Plan**	**Unk**
6.b	Maintain a list of individuals dependent upon electricity for life-sustaining equipment and medications	Towns County EMA *Towns County and all municipalities*		**X**	**X**	**X**			**X**	**X**	**X**	Public and private grants and/or local budgets	$8,000	24 months	**Partial list maintained by Tugaloo Home Health**	**High**	**2013 Plan**	**Unk**

#	Mitigation Action	Lead Agency or Department *Jurisdiction*	Flood	Winter Weather	Thunderstorm	Tornado	Drought	Wildfire	Earthquake	Landslide	Tropical Cyclone	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Priority	Source	Previous Strategy Number
6.c	Purchase generators for critical facilities	Towns County and municipal governments (purchase will be made by county and municipal purchasing departments with specifications identified by critical facility operators) *Towns County and all municipalities*		**X**	**X**	**X**			**X**	**X**	**X**	Public and private grants and/or local budgets	$ 5,000,000	60 months	**Purchase made for Hiawassee waste water plant, Fire Stations (3), and Sheriff's Office (for mobile command post)**	**High**	**2013 Plan**	**Unk**

#	Mitigation Action	Lead Agency or Department *Jurisdiction*	Flood	Winter Weather	Thunderstorm	Tornado	Drought	Wildfire	Earthquake	Landslide	Tropical Cyclone	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Priority	Source	Previous Strategy Number
6.d	Purchase generator for Water Plant at Hiawassee	City of Hiawassee Water Department *City of Hiawassee*		**X**	**X**	**X**			**X**	**X**	**X**	Public and private grants and/or local budgets	$500,000	36 months	**NEW**	**High**	**NEW**	**NEW**
6.e	Purchase generator for each resident hall (6) at Young Harris College	Young Harris College *Towns County and City of Young Harris*		**X**	**X**	**X**			**X**	**X**	**X**	Public and private grants and/or local budgets	$750,000	60 months	**NEW**	**Med**	**NEW**	**NEW**
6.f	Purchase generator for Recreation Department	Towns County Recreation *Towns County and all municipalities*		**X**	**X**	**X**			**X**	**X**	**X**	Public and private grants and/or local budgets	$100,000	60 months	**NEW**	**Low**	**NEW**	**NEW**

#	Mitigation Action	Lead Agency or Department *Jurisdiction*	Flood	Winter Weather	Thunderstorm	Tornado	Drought	Wildfire	Earthquake	Landslide	Tropical Cyclone	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Priority	Source	Previous Strategy Number
6.g	Install transfer switch at county vehicle maintenance center	Towns County Building Department *Towns County and all municipalities*		**X**	**X**	**X**			**X**	**X**	**X**	Public and private grants and/or local budgets	$40,000	24 months	**NEW**	**High**	**NEW**	**NEW**
6.h	Install transfer switch at Fire Stations 1, 2, and 4	Towns County Fire Department *Towns County and all municipalities*		**X**	**X**	**X**			**X**	**X**	**X**	Public and private grants and/or local budgets	$120,000	36 months	**NEW**	**High**	**NEW**	**NEW**
6.i	Purchase and install a generator at the 911/EOC/ Health Department Facility	Towns County EMA *Towns County and all municipalities*	**X**	**X**	**X**	**X**		**X**	**X**	**X**	**X**	Public and private grants and/or local budgets	$100,000	24 months	**NEW**	**High**	**NEW**	**NEW**

#	Mitigation Action	Lead Agency or Department *Jurisdiction*	Flood	Winter Weather	Thunderstorm	Tornado	Drought	Wildfire	Earthquake	Landslide	Tropical Cyclone	Funding Source	Estimated Cost	Completion Timeframe	Progress/ Status	Priority	Source	Previous Strategy Number
6.j	Equip and Train a Swift Water Rescue Team	Towns County EMA *Towns County and all municipalities*	**X**		**X**						**X**	Public and private grants and/or local budgets	$100,000	48 months	**Ongoing**	**Med**	**2013 Plan**	**Unk**

Completed Strategies

Previous Strategy #	Strategy Description	Status
	Purchase 4-wheel drive vehicles for public safety agencies	COMPLETE
	Coordinate efforts with State (GA and NC) and Federal agencies	COMPLETE
	Create Debris Management Plan	COMPLETE
	Create Debris removal private contractor list	COMPLETE
	Work with Georgia Forestry Commission	COMPLETE
	Clear brush, mow right-of-ways	COMPLETE
	Enforce State Mandated Water Restrictions	COMPLETE
	Promote Firewise and Fire Adapted Communities Programs	COMPLETE
	Keep ditches and culverts clear to allow water to flow freely	COMPLETE

Prepare creek banks	COMPLETE

Deleted Strategies

Previous Strategy #	Strategy Description	Reason for Deletion
	Build bridges over flood-prone areas higher so that even if a flood occurs, bridge won't be damaged	Very cost prohibitive (in excess of $25 million); efforts better focused on other strategies
	Weather Radios	Strategy split into several more specific strategies
	Purchase Warning Sirens	Replaced with Strategies 3.b (siren assessment) and 3.c (purchase sirens based upon 3.b assessment)

Multi-Jurisdictional Considerations

Thunderstorms

Thunderstorm events have occurred across all areas of Towns County. Property damage numbers would be most impactful due to greater population density than many other Georgia jurisdictions. Thunderstorms have the potential to impact all areas of Towns County.

Winter Storms

All portions of Towns 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.

Flooding

During a large-scale flood event, many portions of Towns 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. All of Towns County and its municipalities could potentially be impacted.

Tornado

All portions of Towns 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.

Drought

All portions of Towns County could potentially be impacted by a drought. Therefore, all mitigation actions identified regarding drought should be pursued on a countywide basis.

Wildfire

All portions of Towns County 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 considered to be more vulnerable. Therefore, all mitigation actions identified regarding wildfires should be pursued on a countywide basis within Towns County.

Earthquakes

All of Towns 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 cities and towns located within Towns County.

Hazardous Materials Incidents

All of Towns County, including all municipalities, are vulnerable to both fixed facility and transportation-related hazardous materials releases.

Dam Failure

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

Transportation Incidents

Towns County as well as all municipalities could potentially be impacted by a transportation incident. However, areas along US Highway 76 are the greatest at risk. This includes the municipalities of Hiawassee and Young Harris.

Terrorism

All of Towns 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.

Communications Failure

All of Towns County, including all municipalities, are vulnerable to a communications failure.

CHAPTER FIVE
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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 Towns County Hazard Mitigation Plan 2013.

Chapter 5 Section	Updates
Maintenance	• Content Revised
Plan Distribution	• New Section – Not in 2013 Plan
Implementation	• Content expanded and revised from 2013 Plan
Evaluation	• Content Revised from Monitoring, Evaluating, and Updating the Mitigation Plan Section
Peer Review	• New Section – Not in 2013 Plan
Plan Update	• Content Revised
Conclusion	• Content Revised

Maintenance

Requirement §201.6(c)(4)(iii)

In order to adhere to best practices, state and federal guidelines, and lessons learned, the Towns 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 2013 Towns County Hazard Mitigation Plan was followed, to the best abilities of Towns County. This most importantly included an increased attempt for public participation and inclusion in the planning process. The Towns County Hazard Mitigation Plan Update Committee will reconvene annually in February to monitor and evaluate the progress of the mitigation strategies in the Plan. Towns County's Emergency Management Director, Rickie Mathis, 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 the 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?
- Have the outcomes occurred as expected?
- 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?

Towns County's Emergency Management Director will send the minutes from this annual meeting to Towns County Commissioner and City Councils of Hiawassee and Young Harris for review. If there are any updates or modifications to the Towns 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 Towns 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

Plan Distribution

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

Towns County Commissioner
Towns County Fire Department
Towns County Emergency Management Agency
Towns County Sheriff's Office
Towns County Public Works Department
Towns County Building Department
Towns County Board of Education
City of Hiawassee
City of Young Harris

A printed copy of the approved Plan will be available for viewing at the Towns County Emergency Management Agency located at 1400 Jack Dayton Circle, Hiawassee, GA 30546. A printed copy of the approved Plan will also be available for viewing at the Towns County Public Library located at 99 South Berrong Street in Hiawassee. The existence and location of these copies will be publicized in the County's local newspapers, the Towns County Herald.

All comments, questions, concerns, and opinions about the Plan will be directed to Director Rickie Mathis of the Towns County Emergency Management Agency for follow-up.

Implementation

Requirement §201.6(c)(4)(ii)

Each jurisdiction participating in the Towns 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 in order 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 in order to assess whether identified mitigation strategies are being implemented in a timely fashion.

Towns County and its municipalities 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 Towns County Hazard Mitigation Plan.

This plan, as a joint effort between Towns County and all municipalities therein, 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 Towns County plans, as well as all municipality plans in the future. Incorporation of these strategies will occur, as necessary, throughout this planning cycle covered by this Hazard Mitigation Plan Update. In particular, aspects of this plan will be integrated into the Towns County Comprehensive Plan during the next planning cycle.

Identified hazards and mitigation strategies of the 2013 Towns 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. Towns County will integrate mitigation strategies identified in this plan into the Towns County Comprehensive Plan, Community Wildfire Protection Plan, Continuity of Operations Plan and other future plans. This will be accomplished by utilizing the Towns County Hazard Mitigation Plan as a starting source of information when those plans come up for review or, in regards to new planning initiatives, when those planning initiatives are started. By integrating strategies, such as the Mountain Protection Act (strategy 1.a), into future plans, Towns County

will ensure the viability of the current mitigation strategies, increase the implementation of previously identified mitigation strategies, and identify new mitigation strategies through other planning efforts that can then be integrated into future versions of the Towns County Hazard Mitigation Plan. Strategies identified in the previous plan were applied to grant applications, building and zoning requirements, and development planning considerations for Towns County and all municipalities therein. 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	County/Municipal Code	Yes	No	No
Capital Improvements Plan	Report (SPLOST)	Yes	No	No
Comprehensive Plan	2016 Towns County Joint Comprehensive Plan	Yes	No	No
Economic Development Plan	2012 GMRC Comprehensive Economic Development Strategy	Yes	No	Yes
Emergency Management Accreditation Program		No	No	Yes
Emergency Response Plan	Towns County Local Emergency Operations Plan (LEOP)	Yes	No	Yes

Flood Management Plan		Yes	No	No
Historic Preservation	Towns County Codes Part II, Chapter 40, Article IV, Section 40-109	Yes	No	No
National Flood Insurance Program Participation	Towns County Codes Part II, Chapter 40, Article IV, Section 40-106	Yes	No	Yes
Continuity of Government/ Operations Plan		No	No	No
Post-Disaster Ordinance	Towns County Codes Part II, Chapter 14, Article I, Section 14-3	Yes	No	No
Zoning Ordinances	County and Municipal Codes	Yes	No	No

The City of Hiawassee has several administrative and technical services to the community. City departments include: City Clerk, Police Department, Water Department, Wastewater treatment plant, and water treatment plant.

The City of Young Harris has several administrative and technical services to the community. City departments include: City Clerk, Water Department, and Wastewater treatment.

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 Towns 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 Towns 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 take into account any potential changes in the hazard vulnerability and mitigation priorities of Towns County.

The Towns County Hazard Mitigation Plan Update Committee will meet annually to review the Towns 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 Towns 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 Towns County Hazard Mitigation Plan is continuously updated to allow for changes in hazard vulnerabilities and identified mitigation strategies.

The Towns County Hazard Mitigation Plan Update Committee will complete all evaluations of the Towns County Hazard Mitigation Plan.

Peer Review

State Requirement Element F1

In order to maintain standards of quality, improve performance, and provide credibility to the Towns County Hazard Mitigation Plan Update, representatives of local emergency management agencies bordering Towns 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.

Towns County Hazard Mitigation Plan Update was peer reviewed by:

Chief David Dyer Date
Director
Union County Emergency Management Agency

Michael Mazarky Date
Director
Rabun County Emergency Management Agency

Lynn Smith Date
Director
Habersham County Emergency Management Agency

David Murphy Date
Director
White County Emergency Management Agency

Plan Update

Requirement §201.6(c)(4)(i)

The Federal DMA 2000 requires that the Hazard Mitigation Plan be updated at least once every five years. The Towns County Emergency Management Agency is the department responsible with ensuring this requirement is met. The Towns County Hazard Mitigation Plan Update Committee will be involved in this future process and will aid the Towns 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 fourth quarter of 2022; therefore, the approval and adoption of the next plan update must be completed before that time.

In the fourth quarter of 2021, Towns 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 Towns County Hazard Mitigation Plan Update. This process will be headed up by the Towns County Emergency Management Agency. The Towns 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 third quarter of 2022 to meet all identified planning deadlines.

Conclusion

As a result of the hazard mitigation planning process, Towns County, and the Cities of Hiawassee and Young Harris, as well as additional participating organizations have obtained a great deal of information and knowledge regarding Towns 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 Towns 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 each hazard could have. This was exceedingly true for most natural hazards. Recognizing this challenge, the Towns 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 Towns County Hazard Mitigation Plan Update Committee to adopt strategies that will have the greatest positive effect on the greatest amount of the population.

The Towns 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. Public Education/Awareness and Emergency Services comprised the greatest number (over 77%) of the mitigation strategies identified by Towns County.

Appendix A – Towns County Dams Information

Towns County Category I Dams

Name	Latitude	Longitude	Height (feet)	Storage (acres)
Hightower Creek Ws Str # 13	34.967090	-83.604180	75.00	294.00
Hightower Creek WS Str #25	34.955278	-83.640833	70.50	427.50
Trout Farm Lake Dam	34.985240	-83.708420	41.00	47.00

Towns County Category II Dams

Name	Latitude	Longitude	Height (feet)	Storage (acres)
Hightower Creek Ws Str # 18	34.956944	-83.672500	54.00	281.00
Hightower Creek Ws Str #11	34.959167	-83.616667	51.00	147.00

Appendix B – Towns County Hazard Mitigation Plan Update Committee Sign In Sheets

Towns County Hazard Mitigation Plan Update Committee Meeting

Sign-In Sheet

Wednesday, March 29, 2017

Name/Title	Signature	E-mail Address	Agency/Organization
Matt Youngblood P&R Recreation Director	[illegible]	tcrecreation2600@gmail.com	Parks & Recreation
Clyde Shook RC	Clyde Shook		
Scott Hamilton Supervisor	Scott Hamilton	shamilton@townscountyschools.org	Towns Co Schools Trans
Alisa Richards Comm Off	Alisa	crfrontdesk@yahoo.com crfrontdesk@yahoo.com	Commissioner office
Tony Berrong	Tony Berrong	Tony.Berrong@dph.ga.gov	Health Dept.
Stuart Miller	[illegible]	smiller2153@gmail.com	YH City Council
Laura Gustavson	Laura Gustavson	laura.radford@gema.ga.gov	GEMA/HS
Lisa Sellers	Lisa Sellers	lisa.sellers@uniongeneral.org 729 Hazel Creek Rd	Chatuge Reg. Hosp.
Ryan Snow	[illegible]	ryansnow@uniongeneral.org	Chatuge Reg. Hosp.
Wendell Farmer, RN	[illegible] RN	wendellfarmer@uniongeneral.org	CRH
Machelle Lovell CNO	Machelle Lovell RN CNO	machellelovell@uniongeneral.org	CRH

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Towns County Hazard Mitigation Plan Update Committee Meeting

Sign-In Sheet

Wednesday, March 29, 2017

Name/Title	Signature	E-mail Address	Agency/Organization
Michael West / Appraiser		[illegible]@townscountyga.com	assessors
Brandon Walls ED		bWalls817@Gmail.com	Fire / EMA
Curtis Walls		clwalls@windstream.net	Towns EMS
JEFF SCOTT		townsfire@gmail.com	TCFD
Harold Copeland		hc_tcfr@yahoo.com	TCFR
Greg Taylor		tcems8072@gmail.com	Town EMS
Rosemary Royster		rosemary@ghc.edu	GHC
JIMMY TAFF		JCTTomato@Windstream.com	
ALTON HIGGINS GA RACES EC		[illegible]	GA RACES
Capt. Jim Couch		JCouchTCSO@gmail.com	TCSO
SALLY VARAS		varas@windstream.net	RED CROSS

Towns County Hazard Mitigation Plan Update Committee Meeting

Sign-In Sheet

Wednesday, March 29, 2017

Name/Title	Signature	E-mail Address	Agency/Organization
Liz Ordiales MAYOR PRO TEM		LIZORDIALES@windstream.net	City of Hiawassee
Marty Roberts		[illegible]@gmail.com	Towns 911/EMA
Cliff Bradshaw Commissioner		bradshawcommissioner@yahoo.com	Towns
Chris Clinton SHERIFF		chrisclinton@windstream.net	Towns Sheriff
Terry Conner Chief Deputy		t.conner@townssheriff.com	Towns Co Sheriff's Office
Joel Miller		joel-miller@brmemc.com	BRMEMC
Benny Barrett	Benny Barrett		
Richey Mathis		rm4001@windstream.net	EMA

Towns County Hazard Mitigation Plan Update Committee Meeting

Sign-In Sheet

Monday, August 7, 2017

Name/Title	Signature	E-mail Address	Agency/Organization
Stuart Miller/MH City Council		Smiller2153@gmail.com	Young Harris City Council
Harold Copeland Fire Chief		hc_tctfr@yahoo.com	Towns County Fire Rescue
Jeff Scott Capt		townsfire@gmail.com	Towns Co Fire+Rescue
Liz Ordiales		MAYOR@Hiawassee.gov	City of Hiawassee
Marty Roberts		tcmep@gmail.com	Towns 911/EMA
Alton Higgins		MAPMTN@windstream.net	GA ARES
Terry Conner		t.conner@townssheriff.com	Towns County Sheriff's Office
Jim Couch		JCOUCHTCSO@gMail.com	Towns Co. Sheriff's OFC

Towns County Hazard Mitigation Plan Update Committee Meeting

Sign-In Sheet

Monday, August 7, 2017

Name/Title	Signature	E-mail Address	Agency/Organization
Machelle Lovell RNCNO	Machelle Lovell	machelle.lovell@unicoigeneral.org	Chatuge Regional Hospital
Wendell Farmer RN	Wendell Farmer RN	wendellfarmer@unicoigeneral.org	CRH/Clearview
Matt Youngblood / Rec Director		terecrestion2600@gmail.com	TCPR
SALLY VARAS / DAT LEADER	Sally Varas	varas@windstream.net	RED CROSS
Christa Rich RN Director of Operations	Christa Rich	christa.rich@amedisys.com	Tugaloo Home Health
Jimmy TAFF Retired 8-7-17		JCTTomato.Windstream.Net	
Ricky Mathis	Ricky Mathis	rm801@windstream.net	EMA
Benny Barrett	Benny Barrett		Mapping

Towns County Hazard Mitigation Plan Update Committee Meeting

Sign-In Sheet

Monday, August 7, 2017

Name/Title	Signature	E-mail Address	Agency/Organization
Alysia Pritchett		arfrontdesk@yahoo.com	Towns Co. Commissioner
Clyde Ash			
Tony D. Berrong		tony.berrong@dph.ga.gov	Towns Co. Health Dept
Scott Hamilton		shamilton@townscoschools.org	Towns Co School

Towns County Hazard Mitigation Plan Update Committee Meeting

Sign-In Sheet

Thursday, August 24, 2017

Name/Title	Signature	E-mail Address	Agency/Organization
Ricky Mathis Dir EMA	Ricky Mathis	rm801@windstream.net	EMA
Stuart Miller		Smiller2153@gmail.com	Young Harris, City Council
Jimmy TA FF			Retired
MARTY ROBERTS		911@townscountyga.com	911-EMA
Tyler Garrett		TGarrett@TownsCountyRec.com	Recreation
Brayden Walls		Bwalls817@Gmail.com	EMA/Fire
~~Robyn Henson~~	~~Robyn Henson~~	~~911asst.townscountyga.com~~	~~911~~
Liz Morales		MAYOR@HiawasseeGA.gov	City of Hiawassee
SALLY VARAO	Sally Varao	varao@windstream.net	RED CROSS/TOWNS CO.
Robyn Henson 911Asst.	Robyn Henson	911asst@townscountyga.com	911

Towns County Hazard Mitigation Plan Update Committee Meeting

Sign-In Sheet

Thursday, September 21, 2017

Name/Title	Signature	E-mail Address	Agency/Organization
Rickey Mathis		rm601@windstream.net	EMA
MARTY ROBERTS	[illegible]	911@townscountyga.com	911/EMA
Tony Berrong	[illegible]	tony.berrong@dph.ga.gov	Towns County Health
Brandon Walls	[illegible]	bwalls817@Gmail.com	EMA
Alisa Richards	[illegible]	arfrontdesk@yahoo.com	Commissioner Office
Anne Mitchell	[illegible]	mayor@hiawasseega.gov	Mayor-pro-tem
Jimmy TAFF	[illegible]	FCTTOMATO@Windstream.net	Retired
Robin Henson	[illegible]	911asst@townscountyga.com	911 Asst.
Rosemary Royston	[illegible]	rosemary@yhc.edu	YHC
Terry Conner	[illegible]	t.conner@townssheriff.com	Towns Co. Sheriff's Office
Harold Copeland Firechief	[illegible]	hc-tcfr@yahoo.com	Towns County Fire

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Towns County Hazard Mitigation Plan Update Committee Meeting

Sign-In Sheet

Thursday, September 21, 2017

Name/Title	Signature	E-mail Address	Agency/Organization
JEFF SCOTT	Jeff Scott	townsfire@gmail.com	TOWNS COUNTY FIRE RESCUE

Towns County Hazard Mitigation Plan Update Committee Meeting

Sign-In Sheet

Thursday, October 19, 2017

Name/Title	Signature	E-mail Address	Agency/Organization
Robin Hanson / Asst. 911	[illegible]	911asst@townscountyga	911
Marty Roberts / 911 Director	[illegible]	911@townscountyga.com	911/EMA/GIS
Jimmy Taff	[illegible]		Retired – USDA
Benny Barrett			
Alisa Richards	[illegible]	cofrontdesk@yahoo.com Commissioners office	T.C. Commissioner
Matt Youngblood	[illegible]	tcrecreation2600@gmail.com	TCRD
Rickey Mathis	[illegible]	rm801@windstream.net	EMA
Terry Conner	[illegible]	t.conner@townssheriff.com	Towns Sheriff's office
Jim Couch	[illegible]	jcouchtcso@gmail.com	Towns Co. Sheriff's office
Stuart Miller	[illegible]	smiller2153@gmail.com	Young Harris City Council
ALTON HIGGINS	[illegible]	MANMTN@WINDSTREAM.NET	GA ARES AMATEUR RADIO

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Lux Mitigation and Planning Corp.

Towns County Hazard Mitigation Plan Update Committee Meeting

Sign-In Sheet

Thursday, October 19, 2017

Name/Title	Signature	E-mail Address	Agency/Organization
Curtis Walls	Curtis Walls	clwalls@windstream.net	Towns Co EMS
Jimmy TAFF	Jimmy Taff	JTAFFTOMATO@WINDSTREAM.NET	Retired USDA
~~Jeff Scott~~		townsfireboard@gmail.com	TCFR

Towns County Hazard Mitigation Plan Update Committee Meeting

Sign-In Sheet

Thursday, November 2, 2017

Name/Title	Signature	E-mail Address	Agency/Organization
Captain Jim Couch		scouchtcso@gmail.com	Towns Co. Sheriff's Office
ALTON HIGGINS		MANATN@CLEARSTREAM.COM	GA ARES
Alisa Richards		acfrontdesk@yahoo.com	Towns Co. Commissioner
MARTY ROBERTS		911@townscountyga.com	911 - GIS - EMA
Curtis Walls		clwalls@windstream.net	Towns Co EMS
Christa Rich		christa.rich@amedisys.com	Tugaloo Home Health
JEFF SCOTT		townsfire@gmail.com	Towns Co FIRE & RESCUE
Benny Barrett	Benny Barrett		Towns Co. Mapping
JIMMY TAFF			Retired USDA
MATT YOUNGBLOOD		tcrecreation2600@gmail.com	Rec Dept
Robyn Henson		911asst@townscountyga.com	911

Towns County Hazard Mitigation Plan Update Committee Meeting

Sign-In Sheet

Thursday, November 2, 2017

Name/Title	Signature	E-mail Address	Agency/Organization
Wendell Farmer, RN Clinical Director	Wendell Farmer RN	wendellfarmer@uniongeneral.org	CRH
Carolyn Dillon	Carolyn Dillon	CDillon@hiawassee.gov	City of Hiawassee

Appendix C – Towns County Critical Facilities

Name	Jurisdiction	Facility Type
Towns County Water Authority	*Hiawassee town*	Government, Government, Water/Sewer, Water/Sewer
City of Young Harris	*Young Harris city*	Government, Government, Water/Sewer, Water/Sewer
Chatuge Regional Hospital	*Hiawassee town*	Medical, Medical, Hospital, Hospital
Towns County 911 Dispatch	*Towns County*	Government, Government, Water/Sewer, Water/Sewer
Towns County Law Enforcement Center	*Towns County*	Law Enforcement, Law Enforcement, Jails, Jails
Towns County Law Enforcement Center	*Towns County*	Law Enforcement, Jails
Towns County Emergency Services/EMS	*Towns County*	Law Enforcement, Law Enforcement, Jails, Jails
Towns County Fire Station #1	*Towns County*	Emergency Services, Fire Fighters
Towns County Fire Station #2	*Towns County*	Emergency Services, Emergency Services, Fire Fighters, Fire Fighters
Towns County Fire Station #3	*Towns County*	Emergency Services, Fire Fighters
Towns County Fire Station #4	*Towns County*	Emergency Services, Fire Fighters
Towns County 911 Dispatch Center	*Towns County*	Emergency Services, Fire Fighters
Towns County Fire Station#5	*Towns County*	Emergency Services, Fire Fighters
Towns County Fire Station #6	*Towns County*	Emergency Services, Fire Fighters
Hiawassee Water Treatment Plant	*Hiawassee town*	Government, Water/Sewer
Hiawassee Sewage Treatment Plant	*Hiawassee town*	Government, Water/Sewer
Hiawassee City Hall/Police Department	*Hiawassee town*	Government, Private
Towns County Courthouse Annex	*Towns County*	Government, Private
Towns County Radio Transmission Station	*Towns County*	Government, Private
Towns County Day Care Center	*Towns County*	Government, Government, Private, Private
Towns County Health Dept./Mental Health Center	*Towns County*	Government, Government, Private, Private
Brasstown Manor(Nursing Home)	*Hiawassee town*	NGO, NGO, Private, Private
Towns County Maintenance Shop/Road Department	*Towns County*	Government, Private

Towns County Transfer Station(scale house for land fill)	*Towns County*	Government, Private
Towns County Recreation Center	*Towns County*	Government, Private
Towns County Public Library	*Towns County*	Education, Library
Chatuge Regional Nursing Home	*Towns County*	Medical, EMS
Suburban Propane	*Towns County*	Medical, EMS
Blue Ridge Propane (Storage Tanks)	*Towns County*	NGO, NGO, Private, Private
Tate City Community Building	*Towns County*	Medical, EMS
Mohawk Industries	*Towns County*	Emergency Services, Emergency Services, Fire Fighters, Fire Fighters
Towns County Courthouse	*Towns County*	Law Enforcement, Law Enforcement, Court House, Court House
Young Harris College	*Towns County*	Education, Jr Colleges
Towns County Industrial Park	*Towns County*	NGO, NGO, Private, Private
Young Harris City Hall	*Young Harris city*	Government, Private
Mountain Regional Library	*Towns County*	Education, Education, Library, Library
Young Harris Waste-Water Treatment Plant	*Young Harris city*	Government, Water/Sewer
Towns County Comprehensive School	*Towns County*	Medical, Medical, Hospital, Hospital
Towns County Elementary School	*Towns County*	Medical, Hospital
Blue Ridge EMC	*Young Harris city*	Government, Government, Water/Sewer, Water/Sewer

Appendix D – Towns County Hazard Data Tables

Thunderstorms

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	596.50K	0.00K
TOWNS CO.	TOWNS CO.	GA	04/05/1985	19:17	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
TOWNS CO.	TOWNS CO.	GA	06/15/1989	01:20	CST	Thunderstorm Wind	52 kts.	0	0	0.00K	0.00K
TOWNS CO.	TOWNS CO.	GA	04/28/1990	13:20	CST	Hail	0.88 in.	0	0	0.00K	0.00K
TOWNS CO.	TOWNS CO.	GA	05/01/1990	16:25	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
TOWNS CO.	TOWNS CO.	GA	02/13/1991	23:30	CST	Thunderstorm Wind	52 kts.	0	0	0.00K	0.00K
TOWNS CO.	TOWNS CO.	GA	02/13/1991	23:45	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
TOWNS CO.	TOWNS CO.	GA	11/22/1992	12:45	PST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
HIAWASSEE	TOWNS CO.	GA	05/26/1996	15:50	EST	Hail	0.75 in.	0	0	0.00K	0.00K
HIAWASSEE	TOWNS CO.	GA	07/04/1997	19:20	EST	Thunderstorm Wind		0	0	3.00K	0.00K
HIAWASSEE	TOWNS CO.	GA	05/07/1998	14:40	EST	Hail	1.00 in.	0	0	0.00K	0.00K
YOUNG HARRIS	TOWNS CO.	GA	05/07/1998	15:06	EST	Hail	2.75 in.	0	0	5.00K	0.00K
HIAWASSEE	TOWNS CO.	GA	05/06/1999	03:30	EST	Thunderstorm Wind	50 kts. EG	0	0	20.00K	0.00K
HIAWASSEE	TOWNS CO.	GA	05/07/1999	15:15	EST	Hail	0.75 in.	0	0	0.00K	0.00K
HIAWASSEE	TOWNS CO.	GA	07/28/2000	19:28	EST	Thunderstorm Wind		0	0	3.00K	0.00K
HIAWASSEE	TOWNS CO.	GA	05/13/2002	14:45	EST	Thunderstorm Wind		0	0	2.00K	0.00K
HIAWASSEE	TOWNS CO.	GA	07/23/2002	15:00	EST	Thunderstorm Wind		0	0	2.00K	0.00K

HIAWASSEE	TOWNS CO.	GA	07/23/2002	15:00	EST	Hail	0.88 in.	0	0	0.00K	0.00K
HIAWASSEE	TOWNS CO.	GA	05/31/2004	04:35	EST	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
HIAWASSEE	TOWNS CO.	GA	02/21/2005	17:08	EST	Hail	0.75 in.	0	0	0.00K	0.00K
YOUNG HARRIS	TOWNS CO.	GA	05/13/2006	20:45	EST	Hail	1.00 in.	0	0	0.00K	0.00K
TITUS	TOWNS CO.	GA	05/20/2006	14:09	EST	Hail	1.25 in.	0	0	0.00K	0.00K
TITUS	TOWNS CO.	GA	05/20/2006	14:30	EST	Hail	1.25 in.	0	0	0.00K	0.00K
ALEXANDERS MILL	TOWNS CO.	GA	05/20/2006	15:30	EST	Hail	1.00 in.	0	0	0.00K	0.00K
ALEXANDERS MILL	TOWNS CO.	GA	05/20/2006	21:17	EST	Hail	1.75 in.	0	0	160.00K	0.00K
YOUNG HARRIS	TOWNS CO.	GA	05/26/2006	14:51	EST	Hail	0.75 in.	0	0	0.00K	0.00K
HIAWASSEE	TOWNS CO.	GA	04/11/2008	19:32	EST-5	Hail	1.00 in.	0	0	0.00K	0.00K
GUMLOG	TOWNS CO.	GA	02/28/2011	15:39	EST-5	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
GUMLOG	TOWNS CO.	GA	04/04/2011	21:12	EST-5	Thunderstorm Wind	52 kts. EG	0	0	10.00K	0.00K
YOUNG HARRIS	TOWNS CO.	GA	04/04/2011	21:17	EST-5	Hail	1.00 in.	0	0	0.00K	0.00K
MACEDONIA	TOWNS CO.	GA	04/27/2011	21:49	EST-5	Thunderstorm Wind	43 kts. EG	0	0	25.00K	0.00K
MACEDONIA	TOWNS CO.	GA	05/26/2011	16:25	EST-5	Hail	1.75 in.	0	0	290.00K	0.00K
ALEXANDERS MILL	TOWNS CO.	GA	07/04/2011	13:28	EST-5	Thunderstorm Wind	50 kts. EG	0	0	15.00K	0.00K
HIAWASSEE	TOWNS CO.	GA	04/26/2012	08:37	EST-5	Hail	1.00 in.	0	0	0.00K	0.00K
HIAWASSEE	TOWNS CO.	GA	04/26/2012	18:06	EST-5	Hail	1.00 in.	0	0	0.00K	0.00K

MACEDONIA	TOWNS CO.	GA	07/05/2012	19:00	EST-5	Thunderstorm Wind	50 kts. EG	0	0	1.00K	0.00K
SUNNYSIDE	TOWNS CO.	GA	01/30/2013	14:00	EST-5	Thunderstorm Wind	55 kts. EG	0	0	2.50K	0.00K
SUNNYSIDE	TOWNS CO.	GA	03/05/2013	16:27	EST-5	Thunderstorm Wind	45 kts. EG	0	0	30.00K	0.00K
HIAWASSEE	TOWNS CO.	GA	06/13/2013	16:45	EST-5	Thunderstorm Wind	55 kts. EG	0	0	2.50K	0.00K
MACEDONIA	TOWNS CO.	GA	06/19/2014	16:30	EST-5	Thunderstorm Wind	55 kts. EG	0	0	1.50K	0.00K
MACEDONIA	TOWNS CO.	GA	06/26/2015	15:35	EST-5	Hail	0.75 in.	0	0	0.00K	0.00K
MACEDONIA	TOWNS CO.	GA	06/26/2015	15:35	EST-5	Hail	1.00 in.	0	0	0.00K	0.00K
SUNNYSIDE	TOWNS CO.	GA	06/26/2015	16:07	EST-5	Hail	1.00 in.	0	0	0.00K	0.00K
HIAWASSEE	TOWNS CO.	GA	07/14/2015	11:20	EST-5	Thunderstorm Wind	50 kts. EG	0	0	6.00K	0.00K
TITUS	TOWNS CO.	GA	07/14/2015	17:17	EST-5	Thunderstorm Wind	50 kts. EG	0	0	8.00K	0.00K
Totals:								0	0	596.50K	0.00K

Winter Storms

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	1.043M	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	01/06/1996	15:00	EST	Winter Storm		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	01/11/1996	16:00	EST	Heavy Snow		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	02/02/1996	10:00	EST	Winter Storm		0	0	5.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	03/20/1996	16:00	EST	Heavy Snow		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	01/08/1997	19:00	EST	Ice Storm		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	12/29/1997	06:00	EST	Heavy Snow		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	02/04/1998	01:00	EST	Winter Weather		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	12/24/1998	19:00	EST	Ice Storm		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	01/06/1999	13:00	EST	Winter Weather		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	01/31/1999	15:00	EST	Winter Weather		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	02/01/1999	00:00	EST	Sleet		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	02/23/1999	11:00	EST	Winter Weather		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	01/22/2000	13:00	EST	Ice Storm		0	0	980.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	01/28/2000	19:00	EST	Ice Storm		0	0	32.79K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	11/19/2000	08:00	EST	Winter Storm		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	12/03/2000	05:00	EST	Heavy Snow		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	12/17/2000	07:30	EST	Winter Storm		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	12/19/2000	00:00	EST	Winter Storm		0	0	0.00K	0.00K

TOWNS (ZONE)	TOWNS (ZONE)	GA	12/29/2000	18:30	EST	Winter Weather		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	01/20/2001	12:00	EST	Winter Weather		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	03/19/2001	18:00	EST	Winter Storm		0	0	0.00K	0.00K
HIAWASSEE	TOWNS CO.	GA	04/17/2001	08:50	EST	Heavy Snow		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	01/02/2002	06:00	EST	Heavy Snow		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	01/06/2002	05:00	EST	Heavy Snow		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	01/16/2003	12:00	EST	Heavy Snow		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	01/23/2003	00:00	EST	Heavy Snow		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	02/06/2003	15:00	EST	Winter Weather		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	01/25/2004	05:00	EST	Ice Storm		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	02/26/2004	00:00	EST	Winter Storm		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	12/19/2004	17:00	EST	Winter Weather		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	01/22/2005	19:00	EST	Winter Weather		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	01/28/2005	20:00	EST	Winter Storm		0	0	25.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	02/02/2005	10:00	EST	Winter Weather		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	04/02/2005	10:00	EST	Winter Weather		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	11/21/2005	19:00	EST	Winter Weather		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	01/14/2006	00:00	EST	Winter Weather		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	02/06/2006	04:00	EST	Winter Weather		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	02/06/2006	19:00	EST	Winter Weather		0	0	0.00K	0.00K

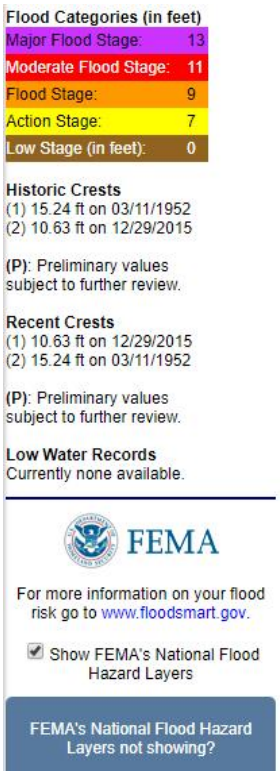
TOWNS (ZONE)	TOWNS (ZONE)	GA	02/11/2006	01:00	EST	Winter Weather		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	02/12/2006	00:00	EST	Winter Weather		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	02/01/2007	04:00	EST-5	Heavy Snow		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	02/17/2007	20:00	EST-5	Winter Weather		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	01/16/2008	19:30	EST-5	Heavy Snow		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	03/08/2008	06:00	EST-5	Winter Weather		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	01/07/2010	15:00	EST-5	Winter Weather		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	01/29/2010	15:00	EST-5	Winter Weather		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	02/04/2010	14:30	EST-5	Winter Weather		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	02/12/2010	15:30	EST-5	Winter Weather		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	03/02/2010	05:00	EST-5	Heavy Snow		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	12/12/2010	12:00	EST-5	Winter Weather		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	12/15/2010	21:00	EST-5	Winter Weather		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	12/25/2010	10:00	EST-5	Heavy Snow		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	01/07/2011	16:00	EST-5	Winter Weather		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	01/09/2011	23:00	EST-5	Heavy Snow		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	02/09/2011	23:00	EST-5	Winter Weather		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	01/25/2013	07:00	EST-5	Ice Storm		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	02/02/2013	10:00	EST-5	Heavy Snow		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	03/06/2013	03:00	EST-5	Heavy Snow		0	0	0.00K	0.00K

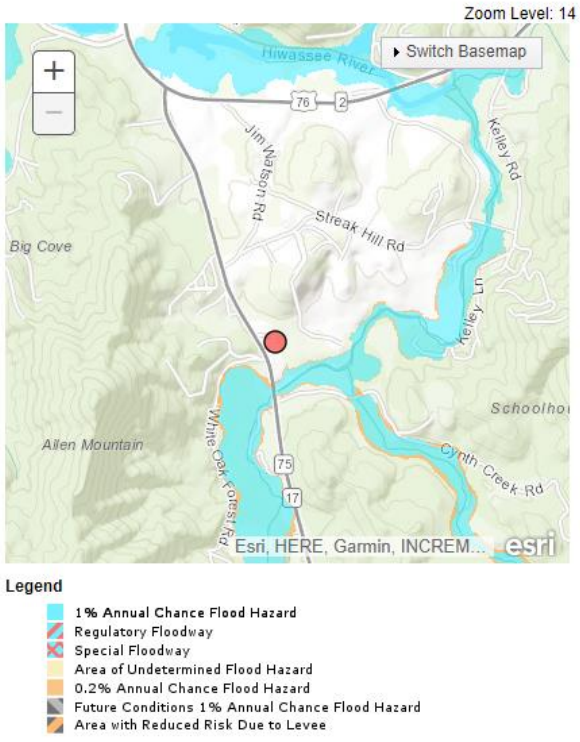
TOWNS (ZONE)	TOWNS (ZONE)	GA	01/28/2014	12:00	EST-5	Winter Storm		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	02/11/2014	07:00	EST-5	Heavy Snow		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	11/01/2014	00:00	EST-5	Winter Weather		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	11/01/2014	00:00	EST-5	Winter Weather		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	02/20/2015	19:00	EST-5	Winter Weather		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	02/24/2015	01:00	EST-5	Winter Storm		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	02/24/2015	01:00	EST-5	Winter Storm		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	02/25/2015	14:00	EST-5	Winter Storm		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	01/20/2016	05:00	EST-5	Winter Weather		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	01/22/2016	00:00	EST-5	Winter Storm		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	01/06/2017	14:00	EST-5	Winter Storm		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	03/11/2017	22:00	EST-5	Winter Weather		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	12/08/2017	10:00	EST-5	Winter Storm		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	01/16/2018	15:00	EST-5	Winter Weather		0	0	0.00K	0.00K
Totals:								0	0	1.043M	0.00K

Flooding

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	551.25K	0.00K
COUNTYWIDE	TOWNS CO.	GA	05/07/2003	07:25	EST	Flash Flood		0	0	5.00K	0.00K
COUNTYWIDE	TOWNS CO.	GA	09/16/2004	19:30	EST	Flash Flood		0	0	500.00K	0.00K
HIAWASSEE	TOWNS CO.	GA	06/12/2005	14:30	EST	Flash Flood		0	0	0.25K	0.00K
MACEDONIA	TOWNS CO.	GA	08/26/2008	13:15	EST-5	Flash Flood		0	0	1.00K	0.00K
MACEDONIA	TOWNS CO.	GA	07/08/2009	07:30	EST-5	Flash Flood		0	0	5.00K	0.00K
GUMLOG	TOWNS CO.	GA	07/03/2013	18:12	EST-5	Flash Flood		0	0	40.00K	0.00K
Totals:								0	0	551.25K	0.00K

Hiawassee River near Macedonia





Hiawassee River near Hiawassee

Flood Categories (in feet)

Major Flood Stage:	14
Moderate Flood Stage:	12
Flood Stage:	10
Action Stage:	8
Low Stage (in feet):	0

Historic Crests
(1) 10.40 ft on 08/26/2008
(2) 10.36 ft on 12/29/2015
(3) 9.51 ft on 10/02/2012
(4) 9.00 ft on 07/08/2009
(5) 8.89 ft on 11/28/2011
Show More Historic Crests

(P): Preliminary values subject to further review.

Recent Crests
(1) 10.36 ft on 12/29/2015
(2) 9.51 ft on 10/02/2012
(3) 8.89 ft on 11/28/2011
(4) 8.11 ft on 04/16/2011
(5) 9.00 ft on 07/08/2009
Show More Recent Crests

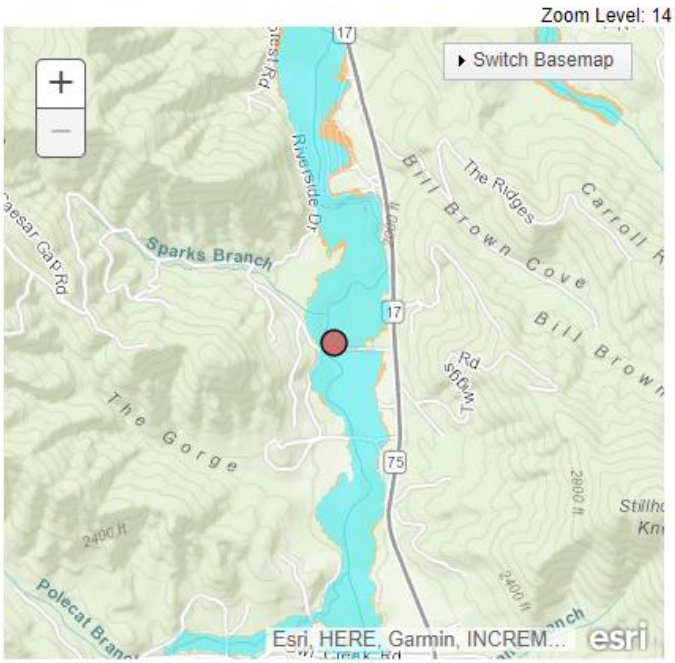
(P): Preliminary values subject to further review.

Low Water Records
(1) 2.38 ft on 09/09/2007

FEMA

For more information on your flood risk go to www.floodsmart.gov.

Show FEMA's National Flood Hazard Layers



Legend

- 1% Annual Chance Flood Hazard
- Regulatory Floodway
- Special Floodway
- Area of Undetermined Flood Hazard
- 0.2% Annual Chance Flood Hazard
- Future Conditions 1% Annual Chance Flood Hazard
- Area with Reduced Risk Due to Levee

FEMA Layer

Tornadoes

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	75.00K	0.00K
HIAWASSEE	TOWNS CO.	GA	03/29/1997	03:00	EST	Tornado	F1	0	0	75.00K	0.00K
Totals:								0	0	75.00K	0.00K

Drought

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	0.00K	422.72K
TOWNS (ZONE)	TOWNS (ZONE)	GA	09/01/1997	00:00	EST	Drought		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	05/01/1999	00:00	EST	Drought		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	08/01/1999	00:00	EST	Drought		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	02/01/2000	00:00	EST	Drought		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	05/01/2000	00:00	EST	Drought		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	06/01/2000	00:00	EST	Drought		0	0	0.00K	422.72K
TOWNS (ZONE)	TOWNS (ZONE)	GA	07/01/2000	00:00	EST	Drought		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	10/01/2000	00:00	EST	Drought		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	10/01/2001	00:00	EST	Drought		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	11/01/2001	00:00	EST	Drought		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	12/01/2001	00:00	EST	Drought		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	04/01/2002	00:00	EST	Drought		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	08/01/2002	00:00	EST	Drought		0	0	0.00K	0.00K

TOWNS (ZONE)	TOWNS (ZONE)	GA	01/01/2003	00:00	EST	Drought		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	03/01/2004	00:00	EST	Drought		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	05/01/2007	00:00	EST-5	Drought		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	09/01/2007	00:00	EST-5	Drought		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	10/01/2007	00:00	EST-5	Drought		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	11/01/2007	00:00	EST-5	Drought		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	12/01/2007	00:00	EST-5	Drought		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	09/01/2011	00:00	EST-5	Drought		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	06/01/2016	00:00	EST-5	Drought		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	07/01/2016	00:00	EST-5	Drought		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	08/01/2016	00:00	EST-5	Drought		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	09/01/2016	00:00	EST-5	Drought		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	10/01/2016	00:00	EST-5	Drought		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	11/01/2016	00:00	EST-5	Drought		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	12/01/2016	00:00	EST-5	Drought		0	0	0.00K	0.00K

TOWNS (ZONE)	TOWNS (ZONE)	GA	01/01/2017	00:00	EST-5	Drought		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	02/01/2017	00:00	EST-5	Drought		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	03/01/2017	00:00	EST-5	Drought		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	04/01/2017	00:00	EST-5	Drought		0	0	0.00K	0.00K
TOWNS (ZONE)	TOWNS (ZONE)	GA	05/01/2017	00:00	EST-5	Drought		0	0	0.00K	0.00K
Totals:								0	0	0.00K	422.72K

Appendix E – Towns County Worksheet 3As

GEMA Worksheet #3a **Inventory of Assets**
Jurisdiction: Towns 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.

	Number of Structures			Value of Structures			Number of People		
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	7,834	7,834	100.000%	995,453,653	995,453,653	100.000%	10,800	10,800	100%
Commercial	397	397	100.000%	90,900,385	90,900,385	100.000%	0	0	#DIV/0!
Industrial	1	1	100.000%	255,875	255,875	100.000%	0	0	#DIV/0!
Agricultural	132	132	100.000%	6,291,338	6,291,338	100.000%	0	0	#DIV/0!
Religious/ Non-profit	62	62	100.000%	38,777,168	38,777,168	100.000%	0	0	#DIV/0!
Government	170	170	100.000%	45,485,520	45,485,520	100.000%	0	0	#DIV/0!
Education	22	22	100.000%	2,934,095	2,934,095	100.000%	0	0	#DIV/0!
Utilities	15	15	100.000%	46,154,370	46,154,370	100.000%	0	0	#DIV/0!
Total	8,633	8,633	100.000%	1,226,252,404	1,226,252,404	100.000%	10,800	10,800	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: Towns 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.

	Number of Structures			Value of Structures			Number of People		
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	7,834	6,985	89.163%	995,453,653	887,572,602	89.163%	10,800	9,630	89%
Commercial	397	374	94.207%	90,900,385	85,634,116	94.207%	0	0	#DIV/0!
Industrial	1	1	100.000%	255,875	255,875	100.000%	0	0	#DIV/0!
Agricultural	132	114	86.364%	6,291,338	5,433,428	86.364%	0	0	#DIV/0!
Religious/ Non-profit	62	58	93.548%	38,777,168	36,275,415	93.548%	0	0	#DIV/0!
Government	170	162	95.294%	45,485,520	43,345,025	95.294%	0	0	#DIV/0!
Education	22	20	90.909%	2,934,095	2,667,359	90.909%	0	0	#DIV/0!
Utilities	15	14	93.333%	46,154,370	43,077,412	93.333%	0	0	#DIV/0!
Total	8,633	7,728	89.517%	1,226,252,404	1,104,261,233	90.052%	10,800	9,630	89%

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?	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: Hiawassee
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.

	Number of Structures			Value of Structures			Number of People		
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	494	494	100.000%	67,422,325	67,422,325	100.000%	982	982	100%
Commercial	147	147	100.000%	44,280,098	44,280,098	100.000%	0	0	#DIV/0!
Industrial	0	0	#DIV/0!	0	#DIV/0!	#DIV/0!	0	#DIV/0!	#DIV/0!
Agricultural	0	0	#DIV/0!	0	#DIV/0!	#DIV/0!	0	#DIV/0!	#DIV/0!
Religious/ Non-profit	7	7	100.000%	1,719,198	1,719,198	100.000%	0	0	#DIV/0!
Government	17	17	100.000%	8,437,305	8,437,305	100.000%	0	0	#DIV/0!
Education	0	0	#DIV/0!	0	#DIV/0!	#DIV/0!	0	#DIV/0!	#DIV/0!
Utilities	4	4	100.000%	3,390,228	3,390,228	100.000%	0	0	#DIV/0!
Total	669	669	100.000%	125,249,154	#DIV/0!	#DIV/0!	982	#DIV/0!	#DIV/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?	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?	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: Towns 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.

	Number of Structures			Value of Structures			Number of People		
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	7,834	240	3.064%	995,453,653	30,496,410	3.064%	10,800	331	3%
Commercial	397	6	1.511%	90,900,385	1,373,809	1.511%	0	0	#DIV/0!
Industrial	1	0	0.000%	255,875	0	0.000%	0	0	#DIV/0!
Agricultural	132	0	0.000%	6,291,338	0	0.000%	0	0	#DIV/0!
Religious/ Non-profit	62	0	0.000%	38,777,168	0	0.000%	0	0	#DIV/0!
Government	170	0	0.000%	45,485,520	0	0.000%	0	0	#DIV/0!
Education	22	0	0.000%	2,934,096	0	0.000%	0	0	#DIV/0!
Utilities	15	0	0.000%	46,154,370	0	0.000%	0	0	#DIV/0!
Total	8,633	248	2.850%	1,226,252,404	31,870,219	2.599%	10,800	331	3%

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?	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: Hiawassee
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.

	Number of Structures			Value of Structures			Number of People		
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	494	7	1.417%	67,422,325	955,377	1.417%	982	14	1%
Commercial	147	1	0.680%	44,280,098	301,225	0.680%	0	0	#DIV/0!
Industrial	0	0	#DIV/0!	0	#DIV/0!	#DIV/0!	0	#DIV/0!	#DIV/0!
Agricultural	0	0	#DIV/0!	0	#DIV/0!	#DIV/0!	0	#DIV/0!	#DIV/0!
Religious/ Non-profit	7	0	0.000%	1,719,198	0	0.000%	0	0	#DIV/0!
Government	17	0	0.000%	8,437,305	0	0.000%	0	0	#DIV/0!
Education	0	0	#DIV/0!	0	#DIV/0!	#DIV/0!	0	#DIV/0!	#DIV/0!
Utilities	4	0	0.000%	3,390,228	0	0.000%	0	0	#DIV/0!
Total	669	8	1.196%	125,249,154	#DIV/0!	#DIV/0!	982	#DIV/0!	#DIV/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?	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?	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: Hiawassee
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.

	Number of Structures			Value of Structures			Number of People		
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	494	428	86.640%	67,422,325	58,414,484	86.640%	982	851	87%
Commercial	147	142	96.599%	44,280,098	42,773,972	96.599%	0	0	#DIV/0!
Industrial	0	0	#DIV/0!	0	#DIV/0!	#DIV/0!	0	#DIV/0!	#DIV/0!
Agricultural	0	0	#DIV/0!	0	#DIV/0!	#DIV/0!	0	#DIV/0!	#DIV/0!
Religious/ Non-profit	7	6	85.714%	1,719,198	1,473,598	85.714%	0	0	#DIV/0!
Government	17	15	88.235%	8,437,305	7,444,681	88.235%	0	0	#DIV/0!
Education	0	0	#DIV/0!	0	#DIV/0!	#DIV/0!	0	#DIV/0!	#DIV/0!
Utilities	4	4	100.000%	3,390,228	3,390,228	100.000%	0	0	#DIV/0!
Total	669	595	88.939%	125,249,154	#DIV/0!	#DIV/0!	982	#DIV/0!	#DIV/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?	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?	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: Young Harris
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.

	Number of Structures			Value of Structures			Number of People		
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	106	5	4.717%	8,024,905	378,533	4.717%	1,004	47	5%
Commercial	21	1	4.762%	7,016,578	334,123	4.762%	0	0	#DIV/0!
Industrial	0	0	#DIV/0!	0	#DIV/0!	#DIV/0!	0	#DIV/0!	#DIV/0!
Agricultural	0	0	#DIV/0!	0	#DIV/0!	#DIV/0!	0	#DIV/0!	#DIV/0!
Religious/ Non-profit	3	0	0.000%	299,442	0	0.000%	0	0	#DIV/0!
Government	23	0	0.000%	2,024,275	0	0.000%	0	0	#DIV/0!
Education	19	0	0.000%	1,007,595	0	0.000%	0	0	#DIV/0!
Utilities	6	0	0.000%	3,986,670	0	0.000%	0	0	#DIV/0!
Total	178	6	3.371%	22,359,465	#DIV/0!	#DIV/0!	1,004	#DIV/0!	#DIV/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?	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?	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: Young Harris

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.

	Number of Structures			Value of Structures			Number of People		
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	106	106	100.000%	8,024,905	8,024,905	100.000%	1,004	1,004	100%
Commercial	21	21	100.000%	7,016,578	7,016,578	100.000%	0	0	#DIV/0!
Industrial	0	0	#DIV/0!	0	#DIV/0!	#DIV/0!	0	#DIV/0!	#DIV/0!
Agricultural	0	0	#DIV/0!	0	#DIV/0!	#DIV/0!	0	#DIV/0!	#DIV/0!
Religious/ Non-profit	3	3	100.000%	299,442	299,442	100.000%	0	0	#DIV/0!
Government	23	23	100.000%	2,024,275	2,024,275	100.000%	0	0	#DIV/0!
Education	19	19	100.000%	1,007,596	1,007,595	100.000%	0	0	#DIV/0!
Utilities	6	6	100.000%	3,986,670	3,986,670	100.000%	0	0	#DIV/0!
Total	178	178	100.000%	22,359,466	#DIV/0!	#DIV/0!	1,004	#DIV/0!	#DIV/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?	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	

Appendix F – Documentation of Peer Review

Union County

Katy Westbrook <lux.planning@att.net> Today at 3:22 PM
To Chief Dyer

Good afternoon, Chief Dyer,

As part of FEMA's requirements for the Towns County Hazard Mitigation Plan Update 2018-2023, surrounding jurisdictions are provided an opportunity to review the plan before it is submitted to FEMA for final review and approval. Since Union County is a contiguous jurisdiction, I am sharing the Towns County HMPU for your review.

Here is the link to the plan: https://www.dropbox.com/s/zrco7xmm7rfotee/Towns%20County%20-%20FINAL%20Draft%206.19.18.docx?dl=0

If you have any questions, recommendations, or comments, please feel free to email them to me.

Have a good week!

Katy
lux.planning@att.net
954.288.8364

Rabun County

Katy Westbrook <lux.planning@att.net> Today at 3:23 PM
To Michael Mazarky

Good afternoon, Michael,

As part of FEMA's requirements for the Towns County Hazard Mitigation Plan Update 2018-2023, surrounding jurisdictions are provided an opportunity to review the plan before it is submitted to FEMA for final review and approval. Since RabunCounty is a contiguous jurisdiction, I am sharing the Towns County HMPU for your review.

Here is the link to the plan: https://www.dropbox.com/s/zrco7xmm7rfotee/Towns%20County%20-%20FINAL%20Draft%206.19.18.docx?dl=0

If you have any questions, recommendations, or comments, please feel free to email them to me.

Have a good week!

Katy
lux.planning@att.net
954.288.8364

Habersham County

Katy Westbrook <lux.planning@att.net> Today at 3:24 PM
To Lynn R. Smith

Hi, Ms. Lynn,

As part of FEMA's requirements for the Towns County Hazard Mitigation Plan Update 2018-2023, surrounding jurisdictions are provided an opportunity to review the plan before it is submitted to FEMA for final review and approval. Since Habersham County is a contiguous jurisdiction, I am sharing the Towns County HMPU for your review.

Here is the link to the plan: https://www.dropbox.com/s/zrco7xmm7rfotee/Towns%20County%20-%20FINAL%20Draft%206.19.18.docx?dl=0

If you have any questions, recommendations, or comments, please feel free to email them to me.

Have a good week!

Katy
lux.planning@att.net
954.288.8364

White County

Katy Westbrook <lux.planning@att.net> Today at 3:26 PM
To white.county@gema.ga.gov

Good afternoon, Director Murphy,

As part of FEMA's requirements for the Towns County Hazard Mitigation Plan Update 2018-2023, surrounding jurisdictions are provided an opportunity to review the plan before it is submitted to FEMA for final review and approval. Since White County is a contiguous jurisdiction, I am sharing the Towns County HMPU for your review.

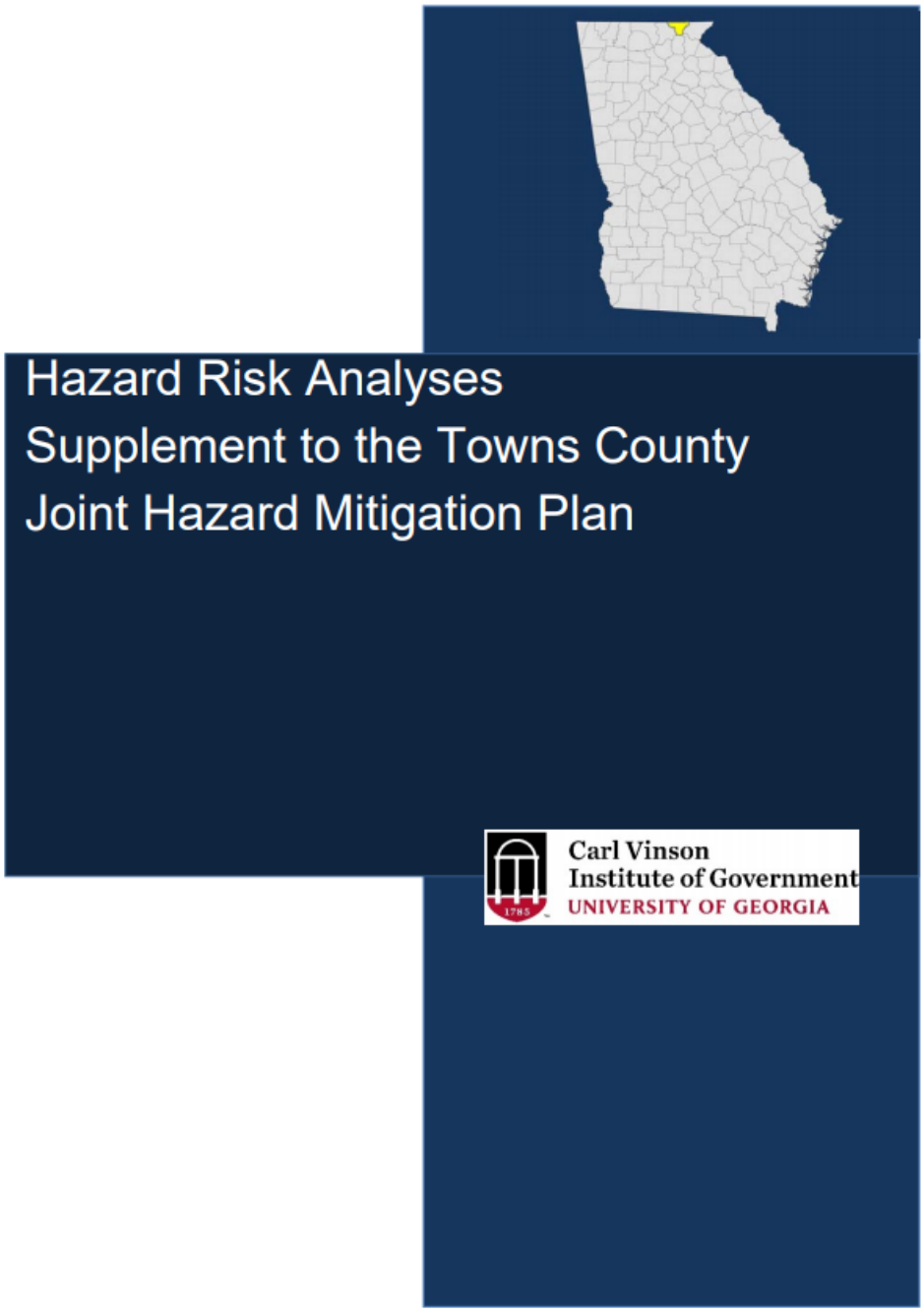
Here is the link to the plan: https://www.dropbox.com/s/zrco7xmm7rfotee/Towns%20County%20-%20FINAL%20Draft%206.19.18.docx?dl=0

If you have any questions, recommendations, or comments, please feel free to email them to me.

Have a good week!

Katy
lux.planning@att.net
954.288.8364

Appendix G – Towns County HAZUS Report



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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 2018, 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 Towns 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 Towns 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. Towns 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 Towns County were replaced with data derived from parcel and property assessment data obtained from Towns County. The county provided property assessment data was current as of April 2018 and the parcel data current as of April 2018. 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 Towns County is 95.7%. 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	20	1	$3,601,000	$30,000
Commercial	336	319	$186,508,000	$29,220,000
Education	15	3	$9,905,000	$663,000
Government	15	4	$10,999,000	$669,000
Industrial	97	44	$27,906,000	$2,794,000
Religious	31	2	$22,390,000	$151,000
Residential	7,625	8,510	$1,266,915,000	$1,264,588,000
Total	8,139	8,883	$1,528,224,000	$1,298,115,000

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

For Towns 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.

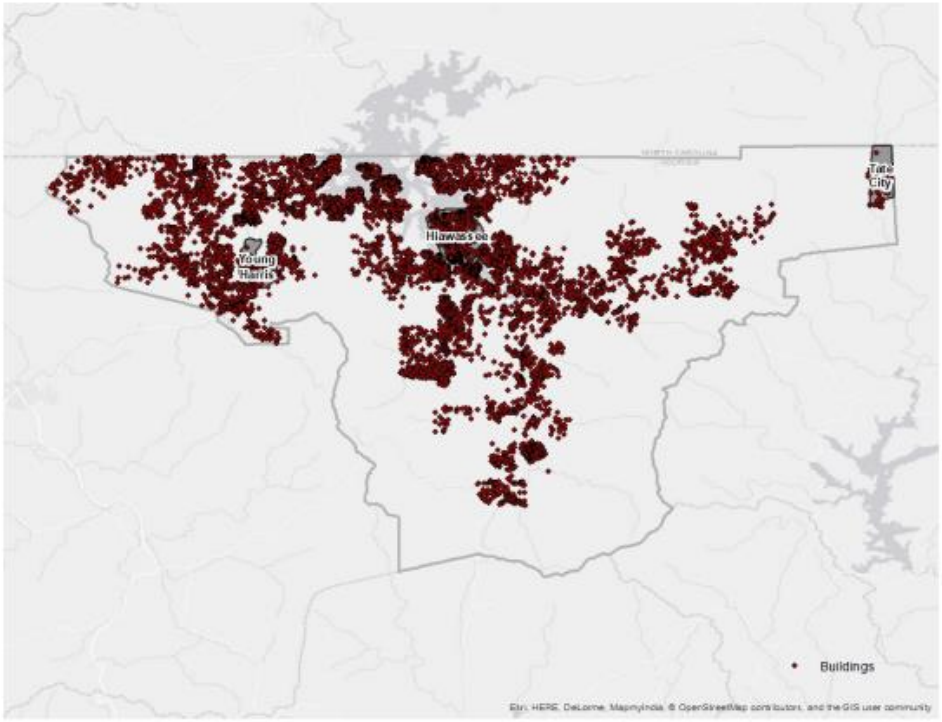

Figure 1: Towns County Overview

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 April 2018. 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

[1] 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
Hiawassee		
EOC	0	$0
Care	3	$14,636,000
Fire	1	$132,000
Police	0	$0
School	0	$0
Total	4	$14,768,000
Tate City		
EOC	0	$0
Care	0	$0
Fire	0	$0
Police	0	$0
School	0	$0
Total	0	$0
Young Harris		
EOC	0	$0
Care	0	$0
Fire	1	$95,000
Police	0	$0
School	1	$2,561,000
Total	2	$2,656,000
Unincorporated Areas of Towns County		
EOC	1	$41,000
Care	1	$1,176,000
Fire	5	$679,000
Police	1	$3,203,000
School	2	$17,810,000
Total	10	$22,909,000

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Assumptions and Exceptions

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

- The Towns 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 Towns County by creating a 20-mile buffer around the county to include storms that didn't make direct landfall in Towns County but impacted the county. Since 1906, Towns County has had 7 tropical systems within 20 miles of its county borders (Table 4).

Table 4: Tropical Systems affecting Towns County[3]

YEAR	DATE RANGE	NAME	MAX WIND(Knots)	MAX PRESSURE	MAX CAT
1906	September 03-18	UNNAMED	80	977	H1
	DATE RANGE	NAME	MAX	MAX	MAX

[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			WIND(Knots)	PRESSURE	CAT
1911	August 23-31	UNNAMED	85	972	H1
1928	August 07-17	UNNAMED	80	0	H1
1977	September 03-09	BABE	65	1012	TD
2003	June 28 - July 03	BILL	50	1009	TD
2004	August 25 - September 10	FRANCES	125	1009	H3
2005	July 03-11	CINDY	65	1011	TD

Category Definitions:

TS – Tropical storm

TD – Tropical depression

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

E – Extra-tropical cyclone

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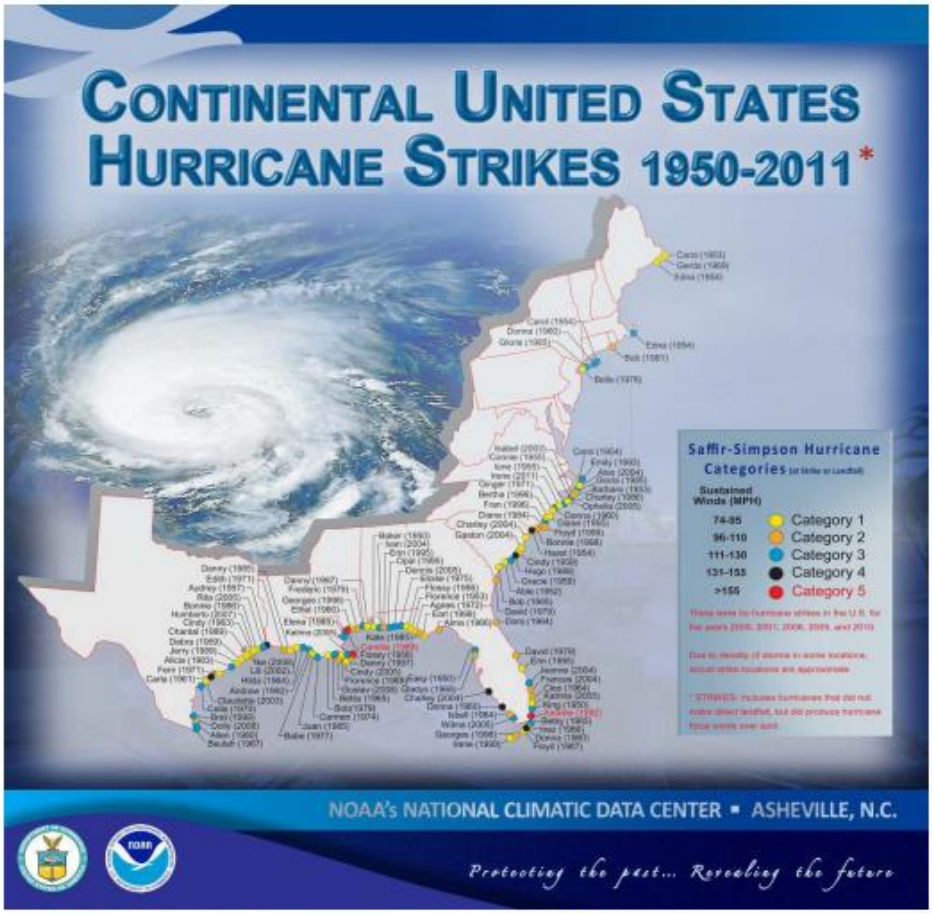

Figure 2: Continental United States Hurricane Strikes: 1950 to 2011[4]

[4] Source: NOAA National Climatic Data Center

Probabilistic Hurricane Scenario

The following probabilistic wind damage risk assessment modeled a Tropical Storm with maximum winds of 62 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 Towns 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.

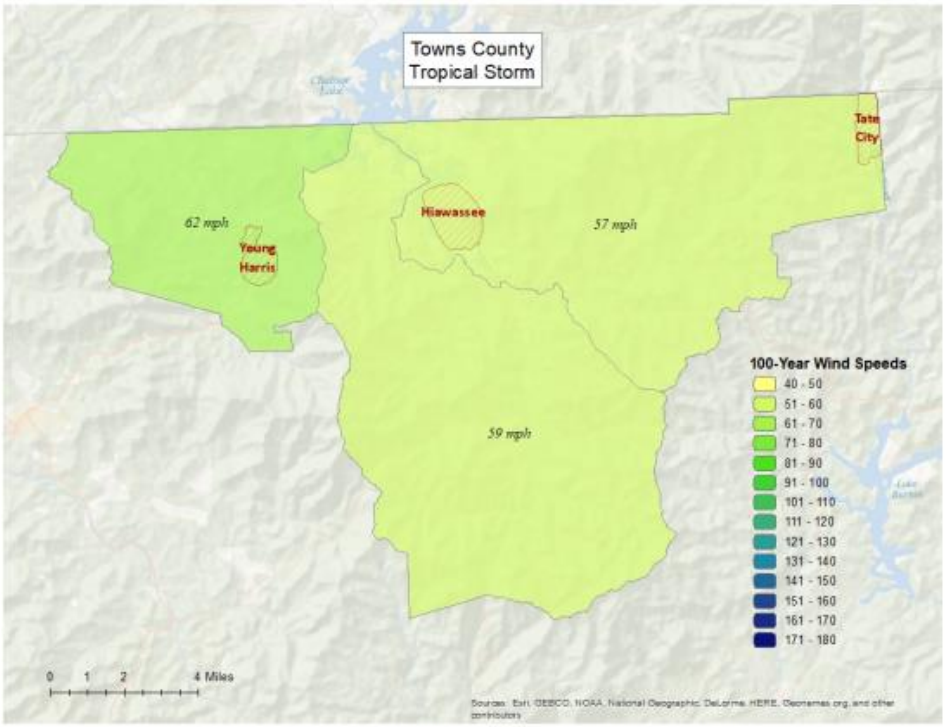

Figure 3: Wind Speeds by Storm Category

Wind-Related Building Damages

Buildings in Towns 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 Towns 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[5]	Loss Ratio
Tropical Storm	1	$110,770	$110,820	0.01%

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.

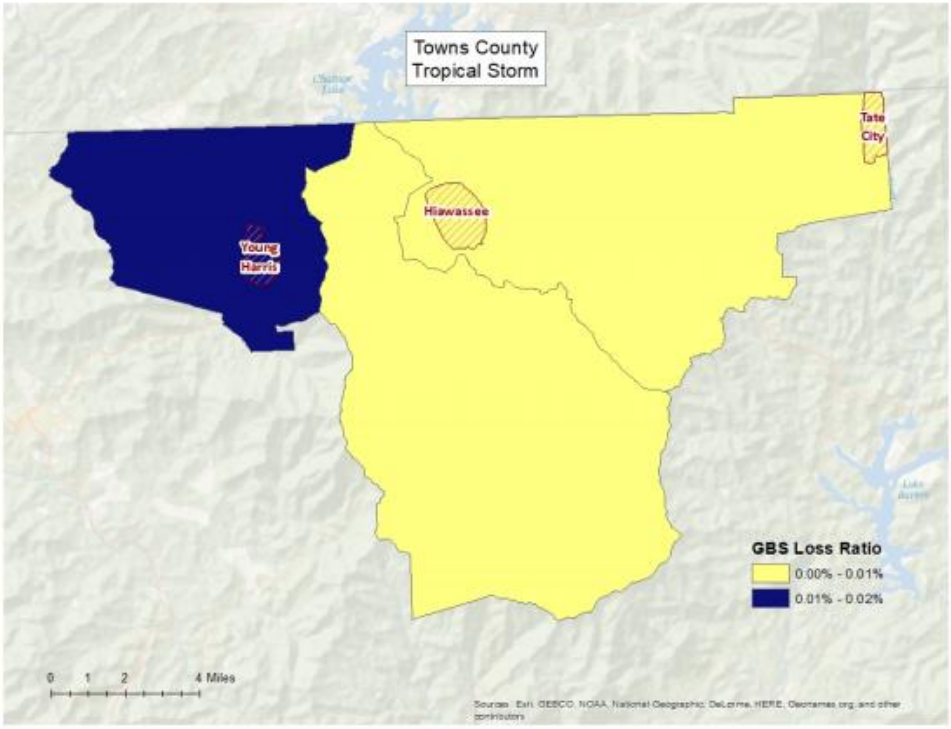

Figure 4: Hurricane Wind Building Loss Ratios

[5] Includes property damage (infrastructure, contents, and inventory) as well as business interruption losses.

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 16 essential facilities in Towns County.

Classification	Number
EOCs	1
Fire Stations	7
Care Facilities	4
Police Stations	1
Schools	3

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	16

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. The results are 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	0	0	0	0	0

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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 Towns County flood risk assessment analyzed at risk structures in the 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 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 April 2018. 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 5 illustrates the riverine inundation boundary associated with the 1% annual chance.

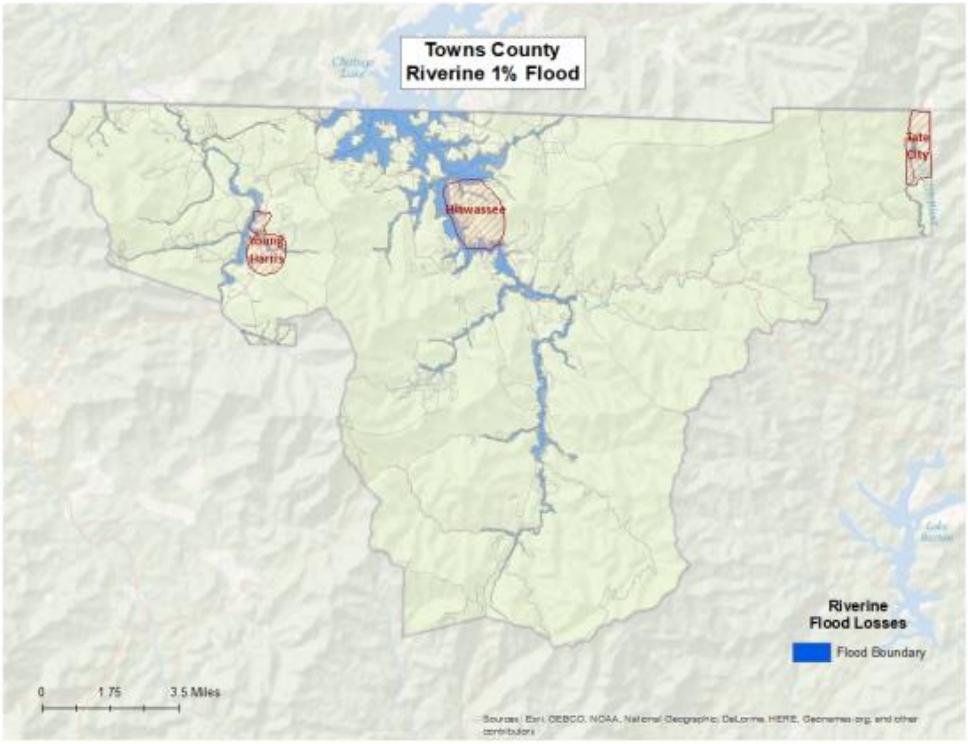

Figure 5: Riverine 1% Flood Inundation

Riverine 1% Flood Building Damages

Buildings in Towns 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 Towns County by jurisdiction that might be experienced from the 1% flood. Figure 6 maps the potential loss ratios of total building exposure to losses sustained to buildings from the 1% flood by 2010 census block and Figure 7 illustrates the relationship of building locations to the 1% flood inundation boundary.

Table 9: Towns 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
Hiawassee					
Residential	566	7	$108,870,969	$417,899	0.38%
Commercial	123	1	$13,947,261	$20,332	0.15%
Tate City					
Residential	46	2	$6,828,610	$139,058	2.04%
Young Harris					
Residential	148	5	$26,484,840	$655,897	2.48%
Commercial	24	1	$1,860,672	$3,366	0.18%
Unincorporated					
Residential	7,750	238	$1,122,410,889	$10,454,655	0.93%
Commercial	172	6	$13,419,661	$67,496	0.50%
County Total					
	8,829	**260**	**$1,293,822,902**	**$11,758,703**	

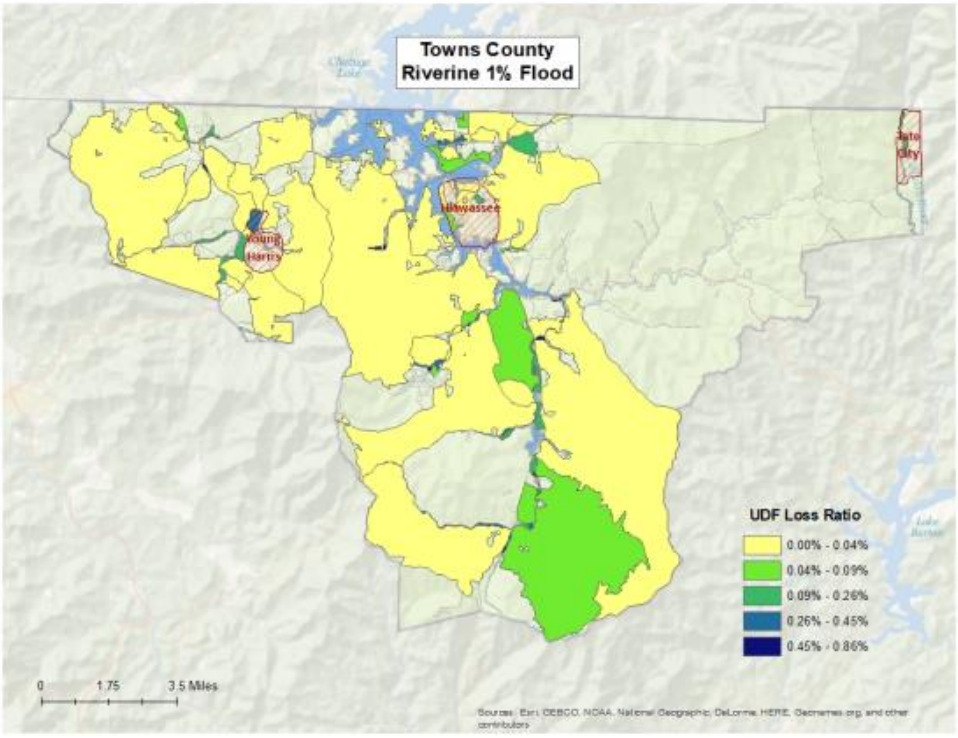

Figure 6: Towns County Potential Loss Ratios of Total Building Exposure to Losses Sustained to Buildings from the 1% Riverine Flood by 2010 Census Block

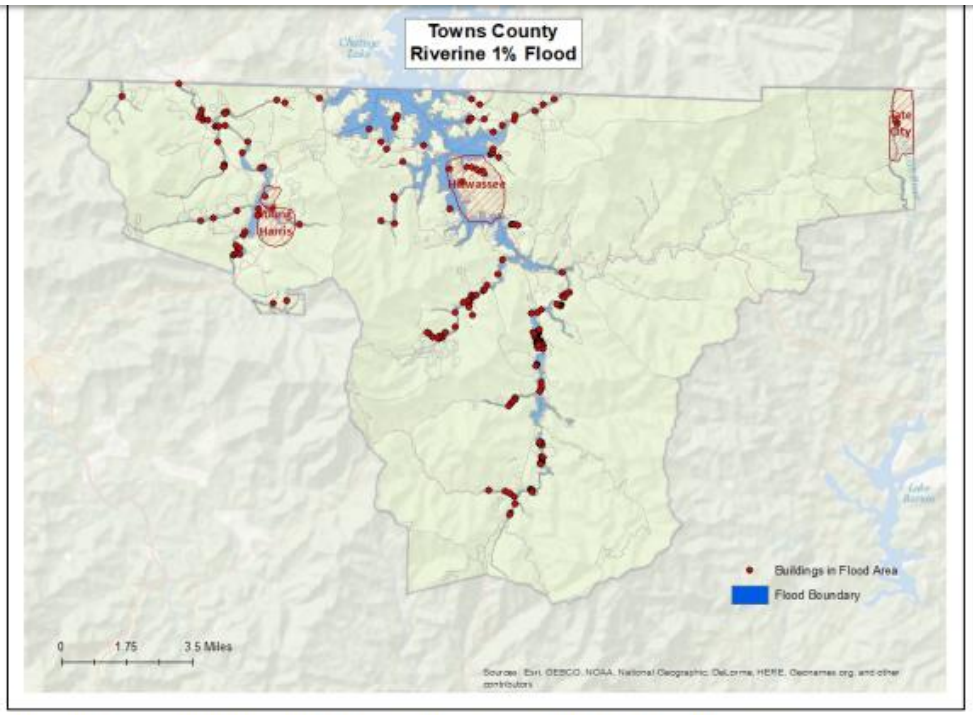

Figure 7: Towns County Damaged Buildings in Riverine Floodplain (1% Flood)

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 facilities that were subject to damage in the Towns County riverine 1% probability floodplain.

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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 147 households might be displaced due to the flood. Displacement includes households evacuated within or very near to the inundated area. Displaced households represent 440 individuals, of which 78 may require short term publicly provided shelter. The results are mapped in Figure 8.

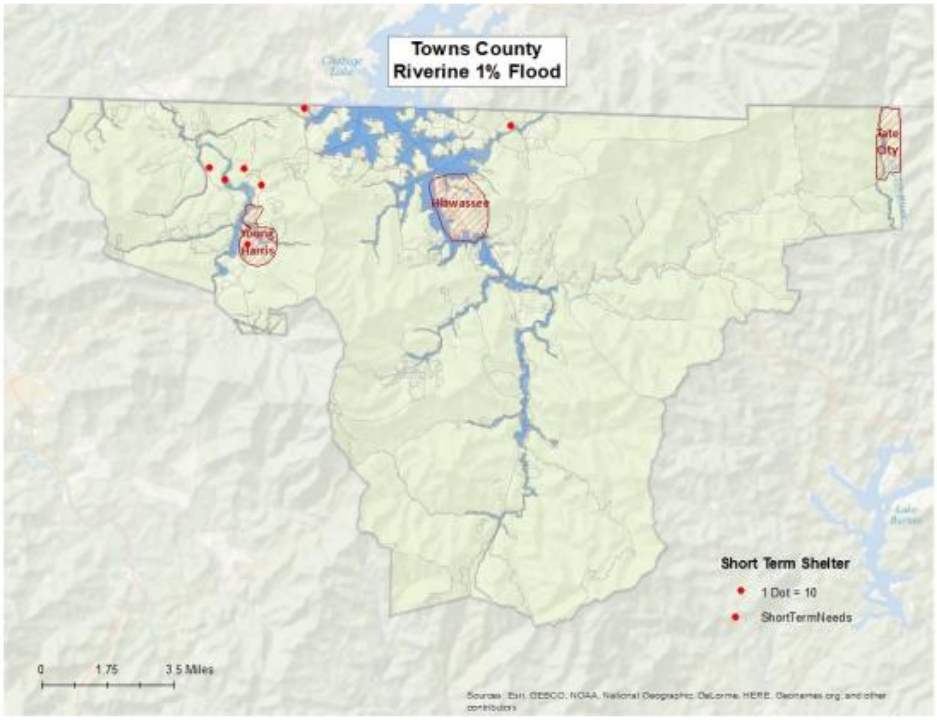

Figure 8: Riverine 1% Estimated Flood Shelter Requirements

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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 11,174 tons of debris might be generated: 1) Finishes- 3,305 tons; 2) Structural – 3,807 tons; and 3) Foundations- 4,062 tons. The results are mapped in Figure 9.

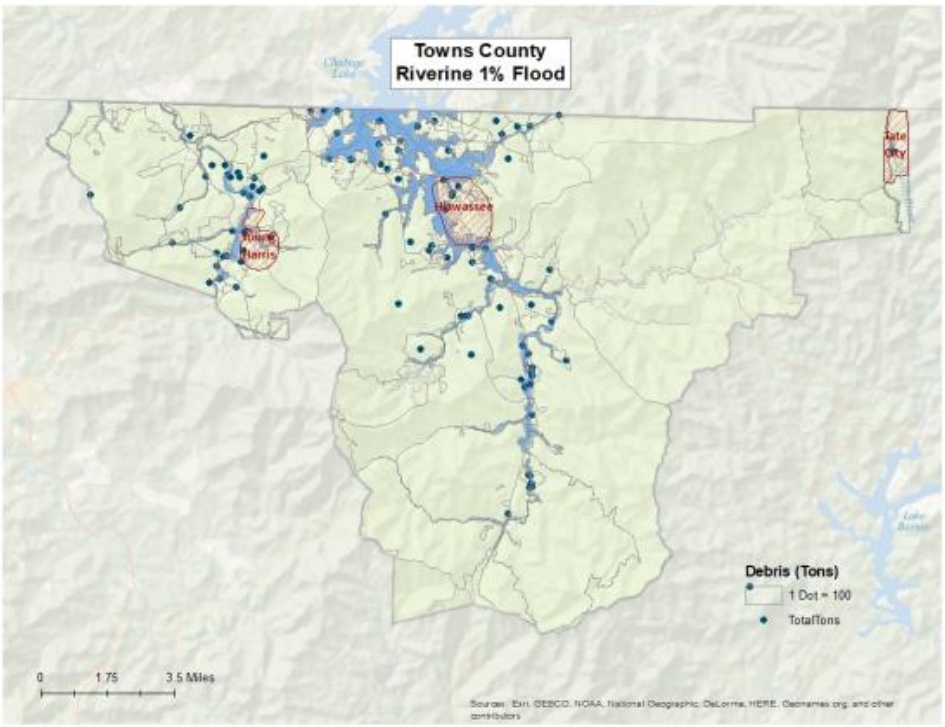

Figure 9: Riverine 1% Flood Debris Weight (Tons)

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 *Gale*	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 Moderate	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 Significant	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 Severe	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 Devastating	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 Incredible	> 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 near Hiawassee. 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 10 describes the zone analysis.

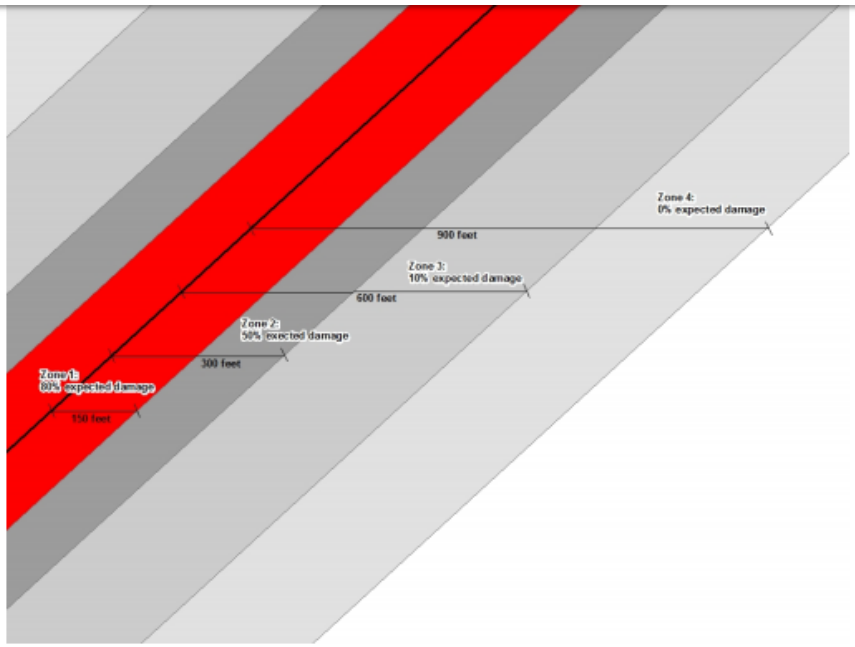

Figure 10: EF Scale Tornado Zones

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 11 and the damage curve buffer zones are shown in Figure 12.

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%

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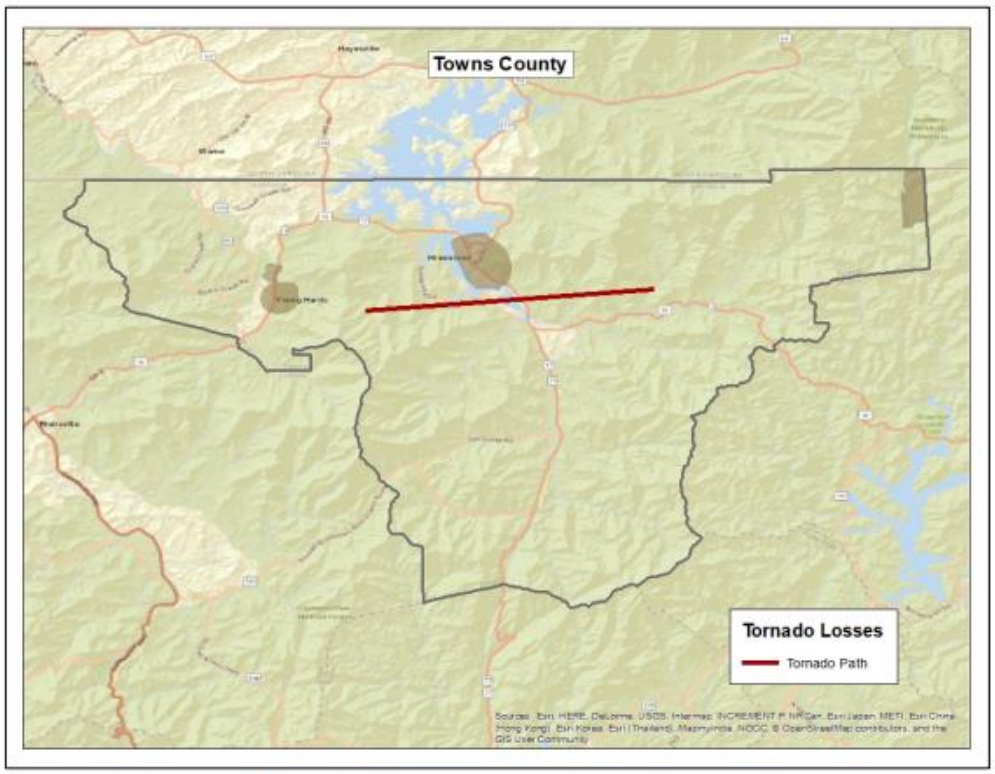

Figure 11: Hypothetical EF3 Tornado Path in Towns County

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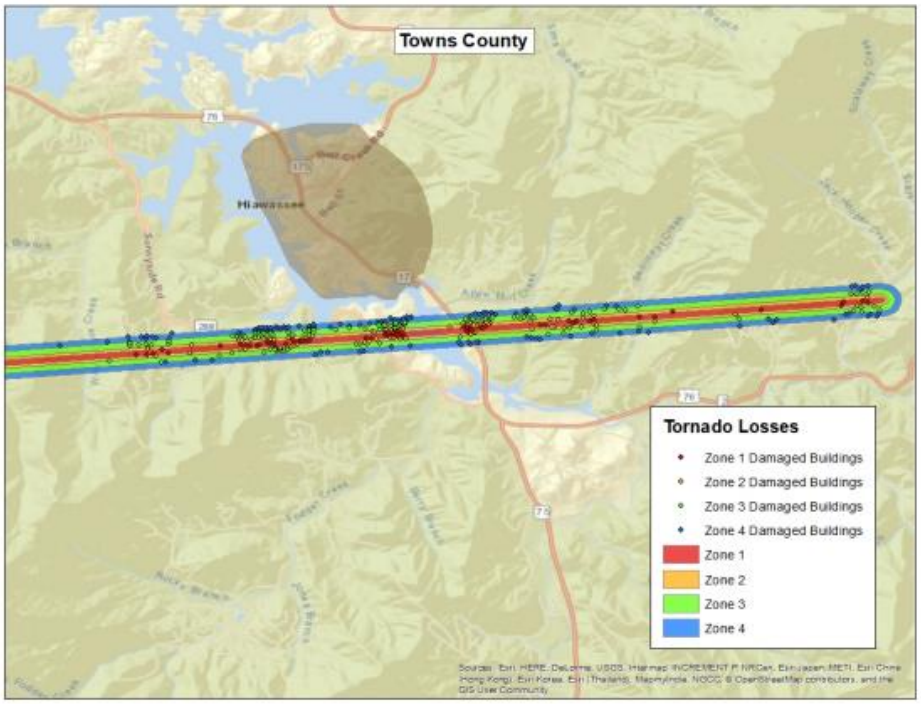

Figure 12: Modeled EF3 Tornado Damage Buffers in Towns County

EF3 Tornado Building Damages

The analysis estimated that approximately 380 buildings could be damaged, with estimated building losses of $11 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 Towns 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	362	$10,908,302
Commercial	15	$108,233
Industrial	2	$13,649
Religious	1	$0
Total	380	$11,030,183

EF3 Tornado Essential Facility Damage

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

Table 14: Estimated Essential Facilities Damaged

Facility	Amount of Damage
Towns Co. Elementary School	Minor Damage
Towns Co. Comprehensive School	Minor Damage

According to the Georgia Department of Education, Towns County Elementary School's enrollment was approximately 423 students and Towns County Comprehensive School's enrollment was approximately 323 students as of March 2018. 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 Facilities is mapped in Figure 13.

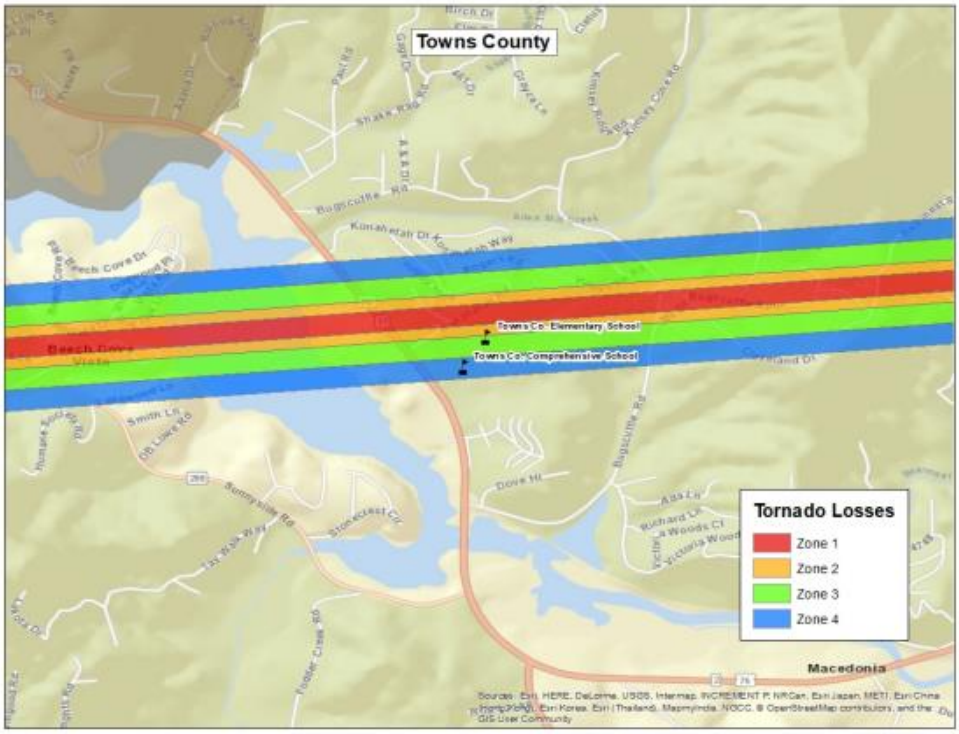

Figure 13: Modeled Essential Facility Damage in Towns County

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Exceptions Report

Hazus Version 2.2 SP1 was used to perform the loss estimates for Towns 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 Towns County.

Updates to the Critical Facility data used in GMIS were provided by Towns County in April 2018. 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 Towns County.

Table 15: Essential Facility Updates

Site Class	Feature Class	Default Replacement Cost	Default Count	Updated Replacement Cost	Updated Count
EF	Care	$21,578,000	5	$15,812,000	4
EF	EOC	$880,000	1	$41,000	1
EF	Fire	$709,000	6	$906,000	7
EF	Police	$197,000	1	$3,203,000	1
EF	School	$20,371,000	3	$20,371,000	3

County Inventory Changes

The GBS records for Towns County were replaced with data derived from parcel and property assessment data obtained from Towns County. The county provided property assessment data was current as of April 2018 and the parcel data current as of April 2018.

General Building Stock Updates

The parcel boundaries and assessor records were obtained from Towns 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 Towns County was 95.7%.

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 Towns County records.

Table 16: Building Inventory Default Adjustment Rates

Type of Adjustment	Building Count	Percentage
Area Unknown	218	2%
Construction Unknown	1,628	18%
Condition Unknown	171	2%
Foundation Unknown	1,682	19%
Year Built Unknown	207	2%
Total Buildings	8,944	9%

Approximately 9% 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 YearBuilt 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 Towns 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 (sqft) multiplied by the Hazus-MH RS Means ($/sqft) 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.