Dade County, Georgia

Hazard Mitigation Plan 2020

Including the City of Trenton

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Chapter 1
Introduction

1.1 Purpose

The Disaster Mitigation Act of 2000 has helped to bring attention to the need for successful hazard mitigation planning throughout the United States. Section 322 of the Act emphasizes the importance of comprehensive multi-hazard planning at the local level, both natural and technological, and the necessity of effective coordination between State and local entities to promote an integrated, comprehensive approach to mitigation planning. The Hazard Mitigation Planning and Hazard Mitigation Grant Program (HMGP) interim final rule published on February 26, 2002, identifies these new local mitigation planning requirements. According to this rule, state and local governments are required to develop, submit, and obtain FEMA approval of a hazard mitigation plan (HMP). Completion of an HMP that meets the new Federal requirements will increase access to funds for local governments and allow them to remain eligible for Stafford Act assistance.

The HMP becomes part of the foundation for emergency management planning, exercises, training, preparedness and mitigation within the County. Such a plan sets the stage for long-term disaster resistance through identification of actions that will, over time, reduce the exposure of people and property to identifiable hazards. This plan provides an overview of the hazards that threaten the County, and what safeguards have been implemented, or may need to considered for implementation in the future.

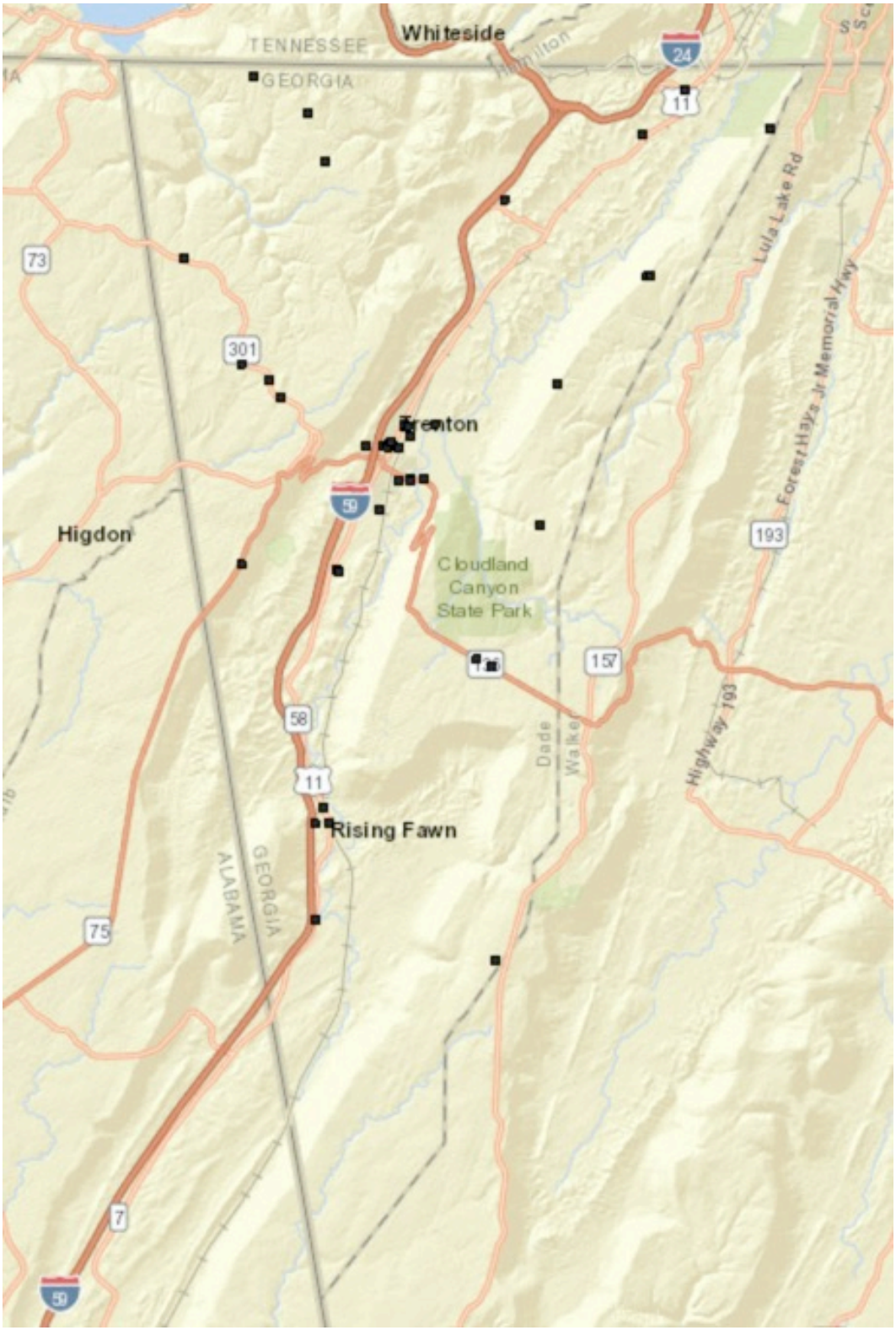
Hazards, for purposes of this plan, have been divided into two basic categories: natural and technological. Natural hazards include all hazards that are not caused either directly or indirectly by man and are frequently related to weather events, such as tornados and winter storms. Technological hazards include hazards that are directly or indirectly caused by man, including hazardous materials spills and weapons of mass destruction (WMD) events, although terrorism is not the particular focus of this Plan. This Plan also makes some recommendations that transcend this classification of natural and technological hazards. In other words, some of the recommendations contained within this Plan apply to many or all hazards. This is commonly referred to as an "all-hazards approach". Most hazards throughout the United States could happen anytime and anywhere. However, the main focus of this plan is on those hazards that are most likely to affect Dade County and the City of Trenton in the future.

1.2 Organization of the Plan

The Hazard Mitigation Plan (HMP) consists of four main components: 1) the narrative plan, 2) the Hazard History Database, 3) the Hazard Frequency Table, and 4) a Critical Facilities Database. The narrative plan itself is the main component of the HMP. This part of the Plan includes an overview of the planning process, a summary of the County's hazard history, hazard frequency projections, a detailed discussion of proposed mitigation measures, and a description of how future reviews and updates to the Plan will be handled. The Hazard History Database is attached as a Microsoft Excel spreadsheet and includes relevant information on past hazards within the County. The Hazard Frequency Table is derived from the hazard history and provides frequency-related statistics for each discussed hazard. This table is also attached as a Microsoft Excel spreadsheet. Finally, the Critical Facilities Database is an online tool developed in part by UGA for GEMA that contains detailed information on critical facilities within the County. Critical facilities for the purposes of this plan are those facilities that are among the most important within a specific jurisdiction with regard to the security and welfare of the persons and property within that jurisdiction. Typical critical facilities include hospitals, fire stations, police stations, critical records storage locations, etc. These facilities should be given special consideration during mitigation planning. For instance, a critical facility should not be located in a floodplain if at all possible. Using the critical facilities information, including GPS coordinates and replacement values, along with different hazard maps from GEMA, this database becomes a valuable planning tool that can be used by Counties to help estimate losses and assess vulnerabilities. This interactive Critical Facilities Database will also help to integrate mitigation planning into their other planning processes.

The map on the following page displays the location of critical facilities within Dade County and the City of Trenton. These facilities may be viewed in much greater detail within the Critical Facilities Database. Access to this database is limited and can only be viewed with the permission of the EMA Director due to the sensitive nature of some of the information.

Dade County Critical Facilities Map



City of Trenton Critical Facilities Map

A risk assessment, which is composed of elements from each of the four main HMP components, provides the factual basis for all mitigation activities proposed within this Plan.

Inventory of Critical Facilities: Critical facilities are defined as facilities that provide essential products and services to the public. Many of these facilities are government buildings that provide a multitude of services to the public, including most public safety disciplines such as emergency management, fire, police, and EMS. Other government buildings/facilities commonly classified as critical facilities are water distribution systems, wastewater treatment facilities, public works, public schools, administrative services, and post offices. For the purposes of this Plan, critical facilities have been identified by the HMPC and important information gathered for each one. This information is located in the Critical Facilities Database (Appendix A).

Hazard Identification: During the planning process, a hazard history was created based on available records from the past fifty years. This hazard history includes the natural and technological hazards that are most likely to affect the County. Unfortunately, record keeping was not as accurate or detailed decades ago as it is now. Therefore, the most useful information relating to these hazard events is found within the last ten to fifteen years. This fact is obvious upon review of the Hazard History Database (Appendix B), and the Hazard Frequency Table (Appendix C).

Profile of Hazard Events: Each hazard identified was analyzed to determine likely causes and characteristics, and what portions of the County's population and infrastructure were most affected. However, each of the hazards discussed in this Plan has the potential to negatively impact any given point within the County. A profile of each hazard discussed in this plan is provided in Chapter 2.

Vulnerability Assessment: This step is accomplished with the Critical Facilities Database by comparing GEMA hazard maps with the inventory of affected critical facilities, other buildings, and population exposed to each hazard (see Worksheets 3a).

Estimating Losses: Using the best available data, this step involved estimating structural and other financial losses resulting from a specific hazard. This is also accomplished to some degree using the Critical Facilities Database. Describing vulnerability in terms of dollar amounts provides the County with a rough framework to estimate the potential effects of hazards on the built environment.

Based on information gathered, the Plan identifies some specific mitigation goals, objectives, and actions to reduce exposure or impact from hazards that have the most impact on each community. A framework for Plan implementation and maintenance is also presented within this document.

Planning grant funds from the Federal Emergency Management Agency, administered by GEMA, funded the HMP. The HMP was developed by the HMPC, with technical assistance from GEMA and North Georgia Consulting Group.

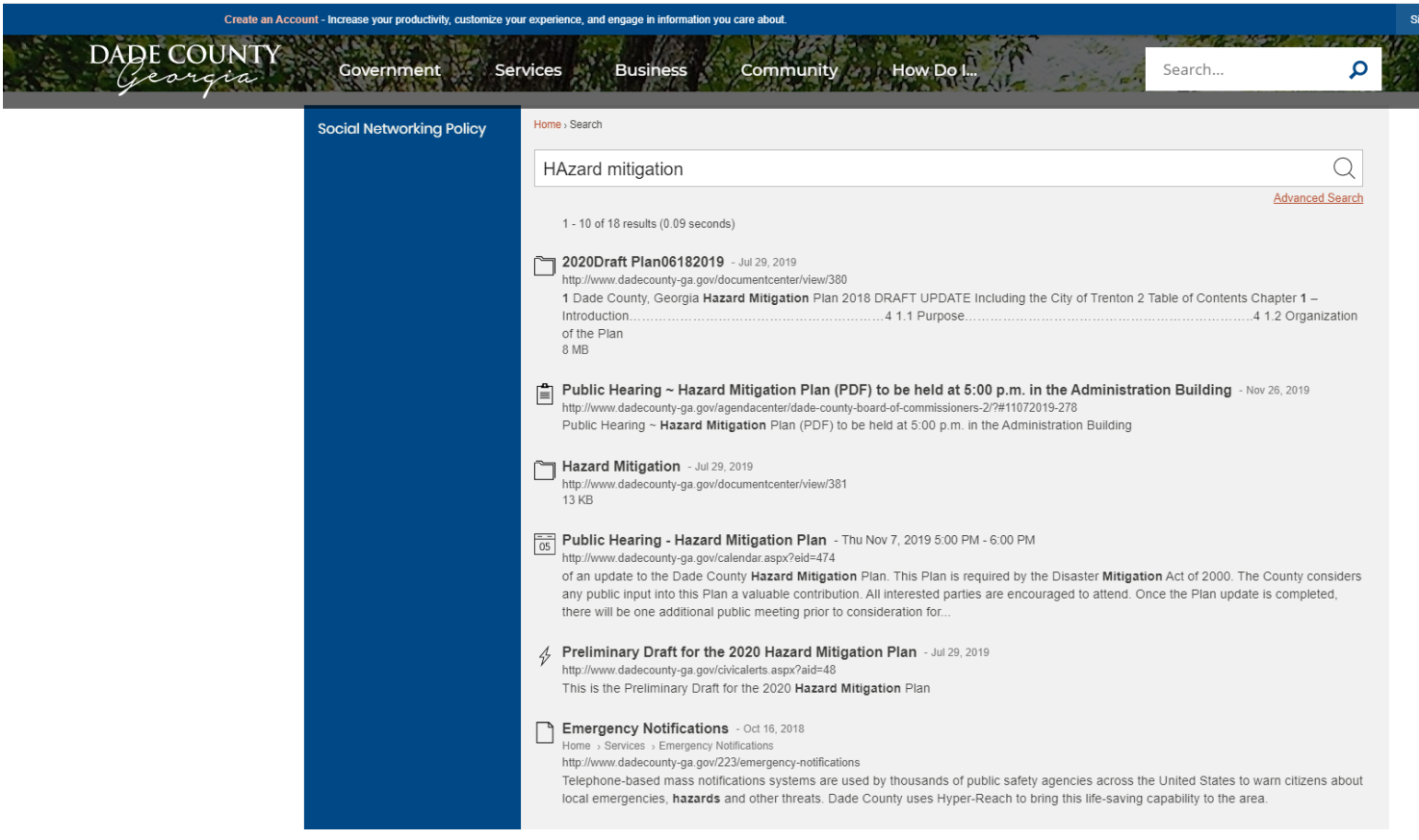
1.3 Participants in Planning Process

This Hazard Mitigation Plan (HMP) is designed to protect both the unincorporated areas of the County as well as the City of Trenton. Though the County facilitated this planning process, the City of Trenton provided critical input into the process. Without this mutual cooperation, the Plan would not exist in its present comprehensive form. Note: Please keep in mind that throughout this Plan, the term "county" refers to all of Dade County, including the City of Trenton.

The process for updating Dade County's Hazard Mitigation Plan can be found in the Federal Emergency Management Association's (FEMA) Hazard Mitigation Planning's "How To" Guides. According to "Getting Started: Building Support for Mitigation Planning;" the suggested process for preparing a Hazard Mitigation Plan is to 1) Organize resources and identify stakeholders and those holding technical expertise; 2) Access risks to the community; 3) Develop a Mitigation Plan and lastly; 4) Implement and Monitor that plan once it is adopted. (FEMA 386-1)

The Dade County Hazard Mitigation Planning Committee (HMPC) is made up of a variety of members. The Chairman of the HMPC is Dade County EMA Director David Ashburn. The Chairman's responsibilities include all decisions relating to the overall direction of the Plan, retrieval of data from various departments, and serving as a central point of contact for all matters relating to the Plan. These responsibilities are shared with the Vice-Chairman of the HMPC, Dade County Deputy EMA Director Curtis Creekmur. The consultant, NGCG, is responsible for facilitation of HMPC meetings, integration of updated data into the Plan, grant administration, and other administrative functions. Local government officials including County and City employees, representatives from Georgia Forestry and Georgia Dept of Public Health represented the HMPC. Representatives for utilities and local businesses were also extended an invitation to participate. Potential participants were invited either verbally or by email, depending upon the participant. Some representatives provided important data requested by the HMPC without attending HMPC meetings. This diverse group provided valuable input into the planning process including identifying hazards and developing important mitigation measures to be considered in the future.

The entire HMPC met several times over the course of this planning process. These meetings occurred on August 22, 2018, June 12, 2019, and November 7, 2019. Other meetings were held throughout this planning process at various times between two or more HMPC members in order to accomplish smaller tasks. Two public meetings relating to this Plan are required by FEMA: one during the drafting stages of the Plan, and one after the final version of the Plan is completed. The first of these two meetings occurred on November 7, 2019 during the drafting stages of the Plan. Once necessary revisions were made to the Plan, a second public meeting was held on TBD where it was adopted by Dade County. A copy of the adoption resolution is included in the Appendices. Prior to adoption at the final public meeting, the public was provided with an additional opportunity to review and comment on the Plan. This final version was then submitted to GEMA and FEMA for review and approval. All public meetings were advertised in the local newspaper and the draft Plan update was posted on the Dade County website as shown below.


Create an Account - Increase your productivity, customize your experience, and engage in information you care about.
DADE COUNTY Georgia
Government
Services
Business
Community
How Do I...
Search...
Social Networking Policy
Home › Search
HAzard mitigation
Advanced Search
1 - 10 of 18 results (0.09 seconds)
2020Draft Plan06182019 - Jul 29, 2019
http://www.dadecounty-ga.gov/documentcenter/view/380
1 Dade County, Georgia Hazard Mitigation Plan 2018 DRAFT UPDATE Including the City of Trenton 2 Table of Contents Chapter 1 – Introduction.....4 1.1 Purpose.....4 1.2 Organization of the Plan
8 MB
Public Hearing ~ Hazard Mitigation Plan (PDF) to be held at 5:00 p.m. in the Administration Building - Nov 26, 2019
http://www.dadecounty-ga.gov/agendacenter/dade-county-board-of-commissioners-2/?#11072019-278
Public Hearing ~ Hazard Mitigation Plan (PDF) to be held at 5:00 p.m. in the Administration Building
Hazard Mitigation - Jul 29, 2019
http://www.dadecounty-ga.gov/documentcenter/view/381
13 KB
Public Hearing - Hazard Mitigation Plan - Thu Nov 7, 2019 5:00 PM - 6:00 PM
http://www.dadecounty-ga.gov/calendar.aspx?eid=474
of an update to the Dade County Hazard Mitigation Plan. This Plan is required by the Disaster Mitigation Act of 2000. The County considers any public input into this Plan a valuable contribution. All interested parties are encouraged to attend. Once the Plan update is completed, there will be one additional public meeting prior to consideration for...
Preliminary Draft for the 2020 Hazard Mitigation Plan - Jul 29, 2019
http://www.dadecounty-ga.gov/civicalerts.aspx?aid=48
This is the Preliminary Draft for the 2020 Hazard Mitigation Plan
Emergency Notifications - Oct 16, 2018
Home › Services › Emergency Notifications
http://www.dadecounty-ga.gov/223/emergency-notifications
Telephone-based mass notifications systems are used by thousands of public safety agencies across the United States to warn citizens about local emergencies, hazards and other threats. Dade County uses Hyper-Reach to bring this life-saving capability to the area.

DADE COUNTY
Georgia
JUST AROUND THE CORNER

Dade County Public Meeting Notice

Dade County Board of Commissioners will hold a public meeting on November 7, 2019 at 5:00 p.m. inside the Commissioners Meeting Room located at the Dade County Administrative Building, 71 Case Avenue, Room 259, Trenton, Georgia 30752 to review and discuss a draft of an update to the Dade County Hazard Mitigation Plan. This Plan is required by the Disaster Mitigation Act of 2000. The County considers any public input into this Plan a valuable contribution. All interested parties are encouraged to attend. Once the Plan update is completed, there will be one additional public meeting prior to consideration for adoption by the Board of Commissioners.

The Plan is the result of a community-wide effort put forth over the past several months utilizing FEMA's Hazard Mitigation Plan "How To" Guides to aid in laying out the planning process described above. Stakeholders and persons with technical expertise were identified early in the process. Full participation was provided by Dade County and the City of Trenton. Each jurisdiction had representatives on the Hazard Mitigation Planning Committee and provided critical data to the HMPC for consideration.

The public involvement elements of this Plan were determined by the HMPC to have remained effective and were approved for use in the current Plan update. Those elements are as follows:

1) Invite members of the public to be involved in the Plan update process.
2) Provide two public meetings, one being in the drafting stages and a second prior to Plan adoption, to allow for additional public comment.
3) Publish a draft of the Plan update on the County website to allow additional exposure to public.
4) Consider all public feedback and consider any necessary changes to the Plan update.

HMPC members are listed alphabetically in the following table:

Name	Jurisdiction/Dept	Title/Position/Specialty
Steve Beaudoin	City of Trenton Police Dept	Chief of Police
Hugh Blevins	Building Maintenance & Inspections	Supervisor
Stephen Bonteroe	Dade County Soil & Water Conservation	Soil Conservationist
Alex Case	Dade County EMA	Director
Paula Duvall	Dade County Tax Assessor's Office	Chief Tax Assessor
Daniel Jones	Dade County 911	Assistant Director
Jerry Kyzer	City of Trenton Fire Dept	Fire Chief
Billy Massengale	Dade County Public Works	Public Works Director
Dewayne Moore	City of Trenton	Utilities Director
Ansel Smith	City of Trenton Building Inspections	Assistant Chief Building Inspector
Christy Smith	City of Trenton Police Dept	Chief of Police

Various County and City departments, schools, and others participated in conversations with the EMA Director that directly contributed to the development of this Plan. Due to limited resources within the County and City, attendance at HMPC meetings for many was not an option. Nevertheless, their direct input was utilized by the HMPC to develop this Plan.

The Plan was posted on the county's website during the planning process. This was done to allow the general public, including other nearby communities, as well as other agencies to review and comment on the Plan utilizing the contact information provided on the website. Neighboring jurisdictions were also sent a draft copy of the Plan and asked to provide feedback or comments as they saw fit (see Appendix D). To date, no feedback has been received from those jurisdictions or from the general public.

1.4 HRV summary/Mitigation goals

Dade County has experienced a number of hazard events throughout its history, most resulting in fairly localized damage. Flooding, tornados, winter storms, wildfire, severe thunderstorms (including hail and lightning), earthquakes, dam failure and hazardous materials to varying degrees represent known threats to Dade County. The Dade County HMPC used information gathered throughout this planning process to identify mitigation goals and objectives as well as some recommended mitigation actions. Each potential mitigation measure identifies an organization or agency responsible for initiating the necessary action, as well as potential resources, which may include grant programs and human resources. An estimated timeline is also provided for each mitigation action.

1.5 Multi-Jurisdictional Special Considerations

The City of Trenton was an active participants and equal partner in the current planning process, as well as the previous planning process. As an active part of the HMPC, the City contributed significantly to the identification of mitigation goals and objectives and potential mitigation measures contained within the HMP.

Participation in Mitigation Plan

Jurisdiction	*2020 Plan*	*2014 Plan*
Dade County	✓	✓
City of Trenton	✓	✓

1.6 Adoption, Implementation, Monitoring, Evaluation

Upon completion of the Plan, it will be forwarded to GEMA for initial review. GEMA will then forward the Plan to FEMA for final review and approval. Once final FEMA approval has been received, Dade County and the City of Trenton will be responsible for initiating the appropriate courses of action related to this Plan. Actions taken may be in coordination with one another or may be pursued separately. The Plan maintenance section of this document details the formal process that will ensure that the Dade County HMP remains an active and relevant document. The HMP maintenance process includes monitoring and evaluating the Plan annually, and producing a complete Plan revision every five years. Additionally,

procedures will ensure public participation throughout the plan maintenance process. This Plan will be considered for integration into various existing plans and programs, including the Dade County Comprehensive Plan at its next scheduled update. Mitigation actions within the HMP may be used by the County and City as one of many tools to better protect the people and property of Dade County and the City of Trenton. Dade County and the City of Trenton are each individually responsible for the processes necessary to formally adopt this Plan.

Adoption Status

Jurisdiction	***Date of Adoption***
Dade County	**Upon GEMA & FEMA Approval**
City of Trenton	**Upon GEMA & FEMA Approval**

1.7 Review and Incorporation

The HMPC recognized the need to integrate other plans, codes, regulations, procedures and programs into this Hazard Mitigation Plan (HMP). Dade County did not have the opportunity to incorporate the original HMP's strategy into other planning mechanisms, but will now ensure that during the planning process for new and updated local planning documents such as a comprehensive plan or Local Emergency Operations Plan, the EMA Director will provide a copy of the HMP to the appropriate parties, so incorporation will be considered in future updates. All goals and strategies of new and updated local planning documents should be consistent with, and support the goals of, the HMP and not contribute to increased hazards in the affected jurisdiction(s).

Record of Review

Existing planning mechanisms	Reviewed? (Yes/No)	Method of use in Hazard Mitigation Plan
Comprehensive Plan (multi-jurisdictional)	Yes	Development trends
Local Emergency Operations Plan	Yes	Identifying hazards; Assessing vulnerabilities
Storm Water Management / Flood Damage Protection Ordinance	Yes	Mitigation strategies
Building and Zoning Codes and Ordinances	Yes	Development trends; Future growth
Mutual Aid Agreements	Yes	Assessing vulnerabilities

State Hazard Mitigation Plan	Yes	Risk assessment
Land Use Maps	Yes	Assessing vulnerabilities; Development trends; Future growth
Critical Facilities Maps	Yes	Locations
Community Wildfire Protection Plan	Yes	Mitigation strategies

As set forth in the plan maintenance section of this plan (Section 6.4), the Hazard Mitigation Planning Committee will meet during the plan approval anniversary date of every year to complete a review of the Hazard Mitigation Plan. It is during this review process that the mitigation strategy and other information contained within the Hazard Mitigation Plan are considered for incorporation into other planning mechanisms as appropriate. Opportunities to integrate the requirements of this HMP into other local planning mechanisms will continue to be identified through future meetings of the HMPC on an annual basis. The primary means for integrating mitigation strategies into other local planning mechanisms will be through the revision, update and implementation of each jurisdiction's individual action plans that require specific planning and administrative tasks (e.g., plan amendments and ordinance revisions).

During the planning process for new and updated local planning documents such as a comprehensive plan or Local Emergency Operations Plan, the EMA Director will provide a copy of the HMP to the appropriate parties. It will be recommended that all goals and strategies of new and updated local planning documents be consistent with, and support the goals of, the HMP and will not contribute to increased hazards in the affected jurisdiction(s).

Although it is recognized that there are many benefits to integrating components of this plan into other local planning mechanisms, and that components are actively integrated into other planning mechanisms when appropriate, the development and maintenance of this stand-alone HMP is deemed by the committee to be the most effective method to ensure implementation of local hazard mitigation actions at this time. Therefore, the review and incorporation efforts made in this update and the last, which consisted of a simple review of the documents listed in the chart above by various members of the HMPC, are considered successful by the HMPC and will likely be utilized in future updates.

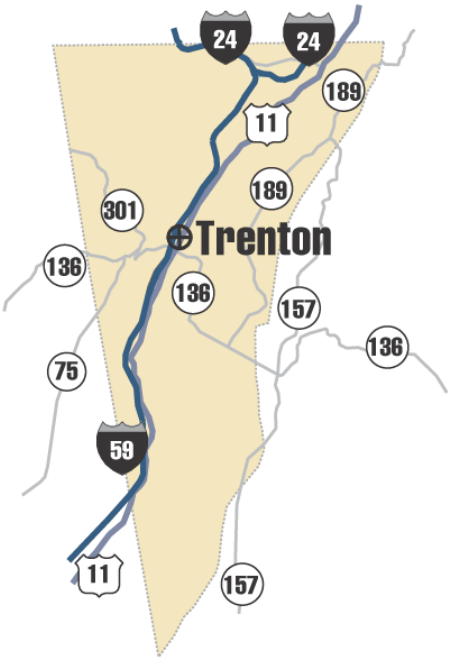
The County's EMA is committed to incorporating hazard mitigation planning into its Local Emergency Operations Plan and other public emergency management activities. As the EMA Director becomes aware of updates to other County or City plans, codes, regulations, procedures and programs, the Director will continue to look for opportunities to include hazard mitigation into these mechanisms.

1.8 Scope of Updates

The changes made to the HMP in this updated version are summarized in the following table.

Chapter or Section	Chapter or Section Description	Changes this Update
1.2	Organization of the Plan	Descriptions
1.3	Participants in Planning Process	Data
1.5	Multi-Jurisdictional Special Considerations	Data
1.6	Adoption, Implementation, Monitoring, Evaluation	Descriptions, Data
1.7	Review and Incorporation	Descriptions, Data
1.8	Scope of Updates	Descriptions, Data
1.9	Brief County Overview	Descriptions, Data
2	Introduction	Descriptions, Data
2.1	Severe Thunderstorm	Descriptions, Data, Visual Aids
2.2	Winter Storm	Descriptions, Data, Visual Aids
2.3	Flooding	Descriptions, Data, Visual Aids
2.4	Tornado	Descriptions, Data, Visual Aids
2.5	Wildfire	Descriptions, Data, Visual Aids
2.6	Drought	Descriptions, Data, Visual Aids
2.7	Earthquake	Descriptions, Data, Visual Aids
3.1	Hazardous Materials Rel.	Descriptions, Data, Visual Aids
3.2	Dam Failure	Descriptions, Data, Visual Aids
4	Land Use & Dev. Trends	Descriptions, Data, Visual Aids
5	Hazard Mitigation Goals Objectives & Actions	Descriptions, Data
6.1	Action Plan Implementation	Descriptions
6.2	Evaluation	Descriptions
6.3	Multi-Jurisdictional Strategy & Considerations	Descriptions
6.4	Plan Update & Maintenance	Descriptions, Data
7.2	References	Data
App. A	Critical Facilities Database	Data, Visual Aids
App. B	Hazard History Database	Data
App. C	Hazard Frequency Table	Data
App. D	Other Planning Documents	Descriptions, Data, Visual Aids

1.9 Brief County Overview



County Formed: December 25, 1837

County Seat: Trenton

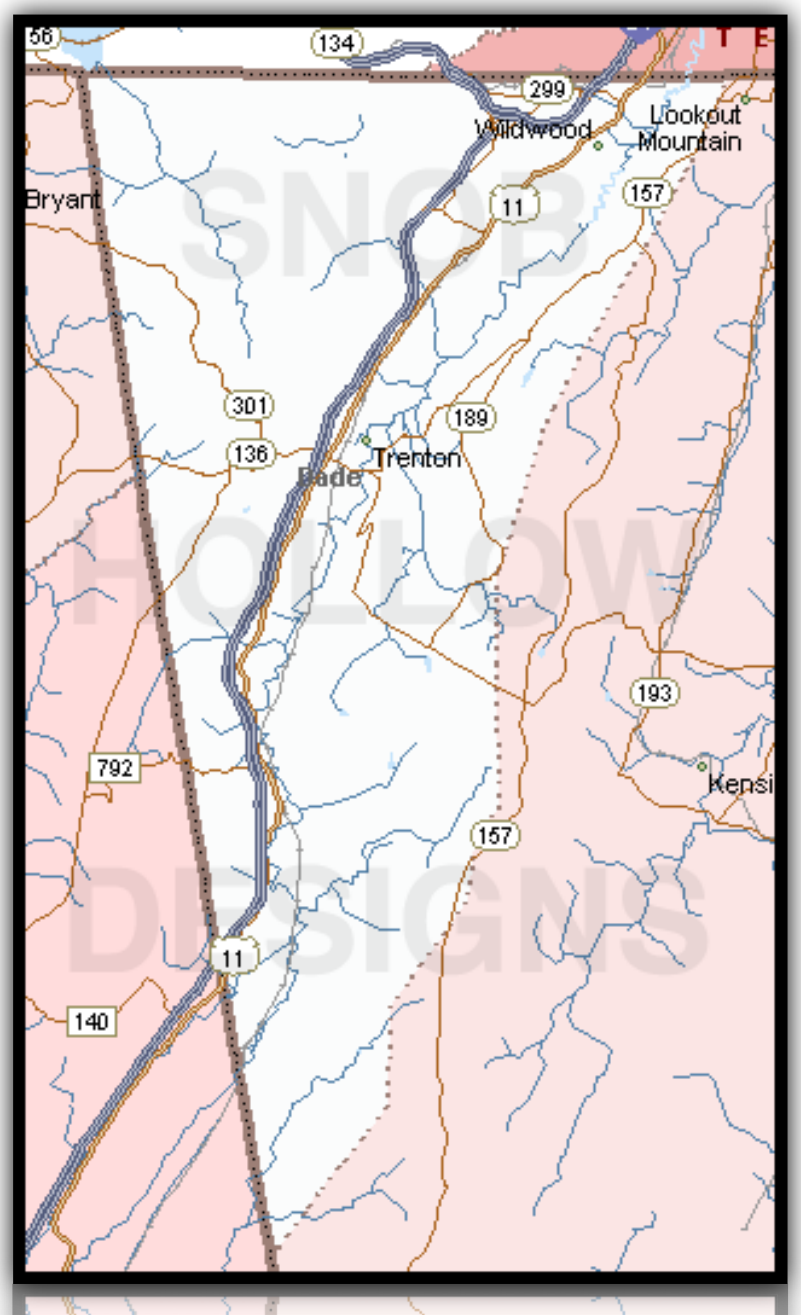
Incorporated Cities: Trenton

U.S. Census Bureau Estimated Population:

Dade County: 16,226 (2018)

City of Trenton: 2,151 (2018)

Total Area: 174 square miles



Historical Facts

Dade County, in Georgia's extreme northwestern corner, was established in 1837, a year before the federal government began removing the original inhabitants, the Cherokee Indians. Carved from western Walker County, it was the 91st county created in the state.

Dade County was named for a Virginian, Major Francis Langhorne Dade, who was killed in 1835 while fighting the Seminoles. Trenton, the county seat, was named after the city in New Jersey.

Located on the "Backside of Lookout Mountain," Dade County was for many years unknown to most Georgians. Until a long-delayed state highway over the mountain was completed in 1948, the only reliable route to the county by automobile was through Alabama or Tennessee. For this reason, the county was known as "The Independent State of Dade."

Points of Interest

The 2,120-acre Cloudland Canyon State Park is located in Dade County. Encompassing a deep gorge cut by Sitton Gulch Creek, the park has several ridges and valleys for hiking and camping.

In the late 1890s Dade County built a new courthouse, jail, and library in downtown Trenton. The old courthouse, a 1926 brick structure listed on the National Register of Historic Places, still stands at the center of the town square.

Interstate 59 bisects the county, passing through a scenic valley between the Lookout Mountain and Sand Mountain plateaus.

Annual Events

Several annual events highlight life in Dade County. Dade County Days, held each May in Trenton, feature "down home" food, crafts, and entertainment. The New Salem Mountain Festival is held each May and October, and features hand-made arts and crafts, as well as music and dancing.

Trenton joins The World's Longest Yard Sale each August. It's a sale like no other — nearly 700 miles of yard sales, antiques dealers, flea markets, garage sales, church bazaars and barn sales. The event starts in Gadsden, AL and follows the Lookout Mountain Parkway and U.S. 127 Corridor to Hudson, MI.

Typical goods include everything from antiques, collectibles, furniture, dishwares, fresh garden produce, homemade jams and jellies, food vendors, live entertainment and so much more. Combined, the Lookout Mountain Parkway and the 127 Corridor have had as many as 5,000 vendors lined along the 675 mile scenic yard sale route in past years and future weekends promise to be even bigger. The sale always starts on the first Thursday in August and continues through Sunday.

Chapter 2
Local Natural Hazard, Risk and Vulnerability (HRV) Summary

The Dade County Hazard Mitigation Planning Committee (HMPC) identified seven natural hazards the County is vulnerable to based upon available data including scientific evidence, known past events, and future probability estimates. As a result of this planning process, which included an analysis of the risks associated with probable frequency and impact of each hazard, the HMPC determined that each of these natural hazards pose a threat significant enough to address within this Plan. These include severe thunderstorm (including hail & lightning), winter storms, flooding, tornados, wildfire, drought, and earthquakes. For this plan update, the HMPC reviewed the natural hazards listed in the 2014 Georgia Hazard Mitigation Strategy Standard Plan Update to assess the applicability of these hazards to Dade County and the City of Trenton (See Table 2.1). Each of these natural hazards is addressed in this chapter of the Plan. An explanation and results of the vulnerability assessment are found in Tables 2-1 and 2-2.

Table 2.1 – Hazards Terminology Differences

Hazards Identified in 2011 Georgia State Plan	Equivalent/Associated Hazards Identified in the 2015 Dade County Plan	Difference
Tornadoes	Tornados	Grammatical only.
Wind	Severe Thunderstorms	HMPC views as an associated hazard.
Severe Weather	Severe Thunderstorms	Difference in terminology.
Hailstorm	Severe Thunderstorms	HMPC views as an associated hazard.
Lightning	Severe Thunderstorms	HMPC views as an associated hazard.
Tropical Cyclonic Events	Severe Thunderstorms Flooding	Due to the County's inland location, not directly viewed as a threat. Tropical weather has limited effects within the County and is generally considered in terms of Severe Thunderstorms and Flooding, associated hazards.
Inland Flooding	Flooding	Difference in terminology.
Earthquake	Earthquake	None
Severe Winter Storms	Winter Storms	Difference in terminology.
Wildfire	Wildfire	None
Drought	Drought	None

Table 2.2 – Vulnerability Assessment *(see Keys below)*

HAZARD	Dade	Trenton
Severe Thunderstorms (includes lightning & hail)		
Frequency	EX	EX
Severity	EX	EX
Probability	EX	EX
Tornados		
Frequency	H	H
Severity	EX	EX
Probability	H	H
Flooding		
Frequency	H	H
Severity	EX	EX
Probability	H	H
Winter Storms		
Frequency	H	H
Severity	H	H
Probability	H	H
Drought		
Frequency	M	VL
Severity	M	L
Probability	M	VL
Wildfire		
Frequency	M	VL
Severity	M	VL
Probability	M	VL
Earthquake		
Frequency	M	M
Severity	H	H
Probability	EX	EX

Key for Table 2.2 – Vulnerability Assessment Frequency and Probability Definitions

NA = Not applicable; not a hazard to the jurisdiction
VL = Very low risk/occurrence
L = Low risk; little damage potential (for example, minor damage to less than 5% of the jurisdiction)
M = Medium risk; moderate damage potential (for example, causing partial damage to 5-15% of the jurisdiction, infrequent occurrence)
H = High risk; significant risk/major damage potential (for example, destructive, damage to more than 15% of the jurisdiction, regular occurrence)
EX = Extensive risk/probability/impact

Key for Table 2.2 – Vulnerability Assessment Severity Definitions

	Low	Medium	High	Extensive
Tropical Cyclonic Events		*(See Wind & Inland Flooding)*		
Wind – Wind Speed	38 MPH	39–50 MPH	50-73 MPH	73–91 MPH
Severe Thunderstorm		*(See Wind & Inland Flooding)*		
Tornado - Magnitude	< EF3	EF3	EF4	EF5
Inland Flooding - Water depth	3" or less	3 – 8"	8-12"	12"+
Severe Winter Storms – Ice/ Sleet	½" or less	½ – 4"	4-7"	7"+
Severe Winter Storms - Snow	1" or less	1-6"	6-12"	12"+
Drought – Duration	1 year	1 – 2 years	2-5 years	5+ years
Wildfire - # of Acres	<50	50-110	110-200	200+
Earthquake - Magnitude	1-2	3	4	5+

2.1 Severe Thunderstorms (including Hail & Lightning)

A. Hazard Identification – A Severe Thunderstorm is defined as a thunderstorm producing wind at or above 58 mph and/or hail measuring one inch in diameter or larger. This threshold is met by approximately 10% of all thunderstorms. These storms can strike any time of year, but similar to tornados, are most frequent in the spring and summer months. They are nature's way of providing badly needed rainfall, dispersing excessive atmospheric heat buildup and cleansing the air of harmful pollutants. Not only can severe thunderstorms produce injury and damage from violent straight-line winds, hail, and lightning, but these storms can produce tornados very rapidly and without warning. Note: For the purposes of this Plan, severe thunderstorms that result from tropical storms and hurricanes are also included in this section.

The most damaging phenomena associated with thunderstorms, excluding tornado activity, are thunderstorm winds. These winds are generally short in duration involving straight-line winds and/or gusts in excess of 50 mph. However, these winds can gust to more than 100 miles an hour, overturning trailers, un-roofing homes, and toppling trees and power lines. Such winds tend to affect areas of the County with significant tree stands, as well as areas with exposed property, infrastructure, and above-ground utilities. Resulting damage often includes power outages, transportation and economic disruptions, and significant property damage. Severe thunderstorms can ultimately leave a population with injuries and loss of life. Thunderstorms produce two types of wind. Tornados are characterized by rotational winds. The other more predominant winds from a thunderstorm, downbursts, are small areas of rapidly descending air beneath a thunderstorm that strike the ground

producing isolated areas of significant damage. Every thunderstorm produces a downburst. The typical downburst consists of only a 25 mph gusty breeze, accompanied by a temperature drop of as much as 20 degrees within a few minutes. However, severe downburst winds can reach from 58 to 100 mph, or more, significantly increasing the potential for damage to structures. Downbursts develop quickly with little or no advance warning and come from thunderstorms whose radar signatures appear non-severe. There is no sure method of detecting these events, but atmospheric conditions have been identified which favor the development of downbursts. Severe downburst winds have been measured in excess of 120 miles per hour, or the equivalent of an EF2 tornado, on the Enhanced Fujita Scale. Such winds have the potential to produce both a loud "roaring" sound and the widespread damage typical of a tornado. This is why downbursts are often mistaken for tornados.

Hail can also be a destructive aspect of severe thunderstorms. Hail causes more monetary loss than any other type of thunderstorm-spawned severe weather. Annually, the United States suffers about one billion dollars in crop damage from hail. Storms that produce hailstones only the size of a dime can produce dents in the tops of vehicles, damage roofs, break windows and cause significant injury or even death. Unfortunately hail can be much larger than a dime and can fall at speeds in excess of 100 mph. Hailstones are created when strong rising currents of air called updrafts carry water droplets high into the upper reaches of thunderstorms where they freeze. These frozen water droplets fall back toward the earth in downdrafts. In their descent, these frozen droplets bump into and coalesce with unfrozen water droplets and are then carried back up high within the storm where they refreeze into larger frozen drops. This cycle may repeat itself several times until the frozen water droplets become so large and heavy that the updraft can no longer support their weight. Eventually, the frozen water droplets fall back to earth as hailstones.

Finally, one of the most frightening aspects of thunderstorms is lightning. Lightning kills nearly one hundred people every year in the United States and injures hundreds of others. A possible contributing reason for this is that lightning victims frequently are struck before or just after the occurrence of precipitation at their location. Many people apparently feel safe from lightning when they are not experiencing rain. Lightning tends to travel the path of least resistance and often seeks out tall or metal objects. With lightning however, it's all relative. A 'tall' object can be an office tower, a home, or a child standing on a soccer field. Lightning can and does strike just about any object in its path. Some of the most dangerous and intense lightning may occur with severe thunderstorms during the summer months, when outdoor activities are at their peak.

B. Hazard Profile – Severe thunderstorms, hail, and lightning are serious threats to the residents of Dade County. Over the course of a year, the County experiences dozens of thunderstorms, with about one in ten being severe. Severe thunderstorms occur more frequently than any other natural hazard event within Dade County. Most of these storms include lightning and/or hail. There have been dozens of severe thunderstorm events within Dade County over the past fifty years according to available documentation. It is very likely this is a low estimate due to poor record keeping in decades past. It is clear from information collected that more accurate record keeping related to severe thunderstorms developed over the past two decades, with even more detailed information available for the past ten years.

Most of the available information relating to severe thunderstorms, hail, and lightning occurrences within Dade County fails to describe damage estimates in great detail. However, with each thunderstorm event it is likely there are unreported costs related to infrastructure and utilities repair and public safety costs, at a minimum. Severe thunderstorms have occurred in all parts of the day and night within Dade County. They have also taken place in every single month of the year.

The tables below contain information on two of the costliest thunderstorm wind events on record for Dade County. The first storm occurred on April 27, 2011 and hit the north central and northwest portions of the County, as well as areas just southwest of Trenton the hardest. The storm caused estimated property damage of $500,000 and wind gusts of approximately 61 knots. This is the same day as the infamous tornado outbreak of 2011. The second storm occurred on June 18, 2011 and damaged many areas in the northern half of Dade County. The storm caused estimated property damage of $500,000 and wind gusts of approximately 65 knots.

Storm Events Database

Prev / Search Results / Next

Event Details:

Event	**Thunderstorm Wind**
Magnitude	**61 kts.**
State	**GEORGIA**
County/Area	**DADE**
WFO	**FFC**
Report Source	**Emergency Manager**
NCEI Data Source	**CSV**
Begin Date	**2011-04-27 13:30 EST-5**
Begin Location	**2SW TRENTON**
Begin Lat/Lon	**34.8495/-85.5249**
End Date	**2011-04-27 13:35 EST-5**
End Location	**0SW HOOKER**
End Lat/Lon	**34.98/-85.42**
Deaths Direct/Indirect	**0/0** (fatality details below, when available...)
Injuries Direct/Indirect	**0/0**
Property Damage	**500.00K**
Crop Damage	**0.00K**

Episode Narrative	**A highly diffluent, deep upper trough, centered across Texas, took on a negative tilt and began to rotate northeast during this period. A strong maritime-Pacific (mP) cold front accompanied the upper trough through the mid-south into the southeast from the early morning hours of the 27th to the early morning hours of the 28th. An intense low-level jet with winds in excess of 70 knots was noted in advance of this system and tracked across the mid-south early on the 27th, across north Alabama and north Georgia into the early morning hours of the 28th. West-southwest winds aloft were highly diffluent and near 200 mph across this same region. The strong low-level jet brought unseasonably, warm, moist Gulf air northward in advance of the mP cold front. Dewpoints in the 70s and maximum temperatures in the 80s combined with the extremely strong low-level and upper jets to create an almost perfect environment for severe thunderstorms and large devastating tornadoes. Indeed, the tornado outbreak that affected much of the eastern U.S., but particularly the south central and southeastern U.S. during this period, was unprecedented and likely the largest recorded in U.S. history. The tornado outbreak that accompanied this combination of weather features has been termed the 2011 Super Outbreak, an outbreak even worse than the 1994 and 1974 super tornado outbreaks across the eastern U.S. The outbreak affected the South Central, Southeast, Midwest, and even the usually less tornado prone Northeastern United States. Over 330 tornadoes were reported during this outbreak which began on April 25th and continued into the 28th affecting 21 states from Texas to New York. Even isolated tornadoes were noted in Canada. Nearly 350 people died from these tornadoes, of which over 230 of these were in Alabama alone. Four tornadoes on April 27th in Alabama and Mississippi were ranked EF5, the highest tornado damage rating on the Enhanced Fujita Scale. On average, there is only one EF5 tornado per year in the entire U.S.** **Widespread and destructive tornadoes occurred on each day of the outbreak, but April 27th was clearly one of the most prolific and destructive tornado days in U.S. history, probably only surpassed by the Tri-State outbreak of 1925 and the Tupelo-Gainesville outbreak of 1936. The 24-hour period from 8 am April 27th to 8 a.m. April 28th is listed by the National Oceanic and Atmospheric Administration (NOAA) as the fourth deadliest tornado outbreak in U.S. history, with the 24 hours commencing April 28th at 8 a.m. as the fifth deadliest tornado day in U.S. history. It has also been determined to be the costliest tornado outbreaks and one of the costliest natural disasters in the U.S., even after adjustments for inflation, with total damages estimated to exceed $10 billion.** **Georgia was heavily impacted by this tornado outbreak, especially the northwest part of the state which bore the brunt of the massive supercell thunderstorms producing killer tornadoes that tracked east-northeast from northern Alabama during the late evening. All together, there were 15 tornadoes affecting 28 counties within the Peachtree City, Georgia 96-county warning area (CWA) of North and Central Georgia. All of these occurred within a 24-hour period commencing at 8 am April 27th. One of these tornadoes was rated an EF4, the first EF4 tornado in Georgia since the Palm Sunday outbreak in 1994. In addition, there were also four EF3 tornadoes. Fifteen tornado-related deaths were observed in north and central Georgia, the most tornado-related deaths within the Peachtree City, Georgia forecast area since its inception in 1994. The previous highest tornado-related death total was 12 on March 20, 1998, when a tornado struck Gainesville, Georgia. Finally, it should be noted that while the most significant period of severe weather during this outbreak for Georgia was from the afternoon of the 27th through the early morning hours of the 28th, there was an initial round of severe weather across northwest Georgia early on the 27th as a decaying line of severe thunderstorms moved into the region from northeast Alabama. Widespread wind damage and even a few brief weaker tornadoes accompanied this system into the northwest counties of the state.**
Event Narrative	**The Dade County Emergency Management Director reported that over 50 trees were down in the north central and northwest part of the county, especially along Georgia Highway 299. Numerous trees were also down just southwest of Trenton with extensive damage along North Woods Lane. This was the same neighborhood to be struck by an EF1 tornado at 840 am EDT and an EF3 tornado later the same day. This neighborhood was literally devastated by these multiple events tracking over the same area.**

Storm Events Database

Event Details:

Event	**Thunderstorm Wind**
Magnitude	**65 kts.**
State	**GEORGIA**
County/Area	**DADE**
WFO	**FFC**
Report Source	**Emergency Manager**
NCEI Data Source	**CSV**
Begin Date	**2011-06-18 15:05 EST-5**
Begin Location	**0ESE COLE CITY**
Begin Lat/Lon	**34.95/-85.57**
End Date	**2011-06-18 15:17 EST-5**
End Location	**4SE TRENTON**
End Lat/Lon	**34.8291/-85.4501**
Deaths Direct/Indirect	**0/0** (fatality details below, when available...)
Injuries Direct/Indirect	**0/0**
Property Damage	**500.00K**
Crop Damage	**0.00K**
Episode Narrative	**A series of strong short waves were moving across the U.S. These short waves were ejecting from a large upper trough in the western U.S. These vigorous short waves encountered a hot, moist, unstable air mass across the U.S. However, dry mid-level atmosphere air and west to west-northwest flow aloft promoted the development of organized lines of thunderstorms, which produced extensive strong outflow boundaries supporting wind gusts of 50 to 60 mph, even greater in some cases. During the afternoon of the 18th, such thunderstorm gust fronts affected northwest Georgia in particular with widespread damaging wind gusts, likely in excess of 70 mph, blowing down hundreds of trees, dozens of power lines, and causing damage to some structures. This area of thunderstorms progressed southeast toward Atlanta, before dissipating during the mid-evening. Considerable wind damage was noted in the northern and northwestern suburbs of Atlanta from this activity.**
Event Narrative	**The Dade County Emergency Management Director and amateur radio operators reported extensive and widespread wind damage across the northern half of Dade county from an apparent microburst or widespread area of damaging thunderstorm outflow boundary winds. The most extensive damage was noted in the 9000 block of Scenic Highway, northeast of Trenton. The most significant damage extended from West Brow to Burkhalter Gap where hundreds of trees were either blown over or uprooted and dozens of power lines were also blown down or affected by downed trees. Portions of Lookout Mountain Scenic Highway were blocked from dozen of large downed trees. Two homes in West Brow completely lost their roofs as they were lifted off the structures. In the 9000 block of Scenic Highway, the roof of one home was blown downstream several hundred feet and wrapped around adjacent trees. The deck of the home was completely lifted off its foundation and turned on its side. A nearby chicken farm also sustained damage, including the loss of a number of poultry. The other home was located in the 8000 block of Scenic Highway and was completely destroyed when its roof was lifted off the structure and thrown across the road. One of the downed trees on Scenic Highway landed on a vehicle, but no injuries were reported from this incident. There were also a number of trees down in the northwest part of the county as well. Several trees were down on Interstate-59, northwest of Trenton. Widespread power outages were noted across the northern part of the county.**

The table below contains information on the costliest hail event on record for Dade County. It occurred March 19, 2018 and had estimated property damage of $5,000. Hail was reported to have been as large as 1.0 inches in diameter.

Prev / Search Results

Storm Events Database

Event Details:

Event	**Hail**
Magnitude	**1.00 in.**
State	**GEORGIA**
County/Area	**DADE**
WFO	**FFC**
Report Source	**Emergency Manager**
NCEI Data Source	**CSV**
Begin Date	**2018-03-19 20:25 EST-5**
Begin Location	**2NW AVANS**
Begin Lat/Lon	**34.9012/-85.551**
End Date	**2018-03-19 20:45 EST-5**
End Location	**1NE AVANS**
End Lat/Lon	**34.8898/-85.5215**
Deaths Direct/Indirect	**0/0** (fatality details below, when available...)
Injuries Direct/Indirect	**0/0**
Property Damage	**5.00K**
Crop Damage	
Episode Narrative	**Widespread severe thunderstorms broke out across central and north Georgia during the evening hours of March 19th, through the early morning hours of the 20th as a warm front lifted north across the region ahead of a strong storm system developing across the lower Mississippi Valley.**
Event Narrative	**The Dade County Emergency Manager reported quarter size hail along Saddle Club and Brow Roads.**

The table below contains information on the costliest lightning event on record for Dade County. The storm occurred on June 11, 2003 and had estimated property damage at $25,000 due largely to a housefire in Trenton.

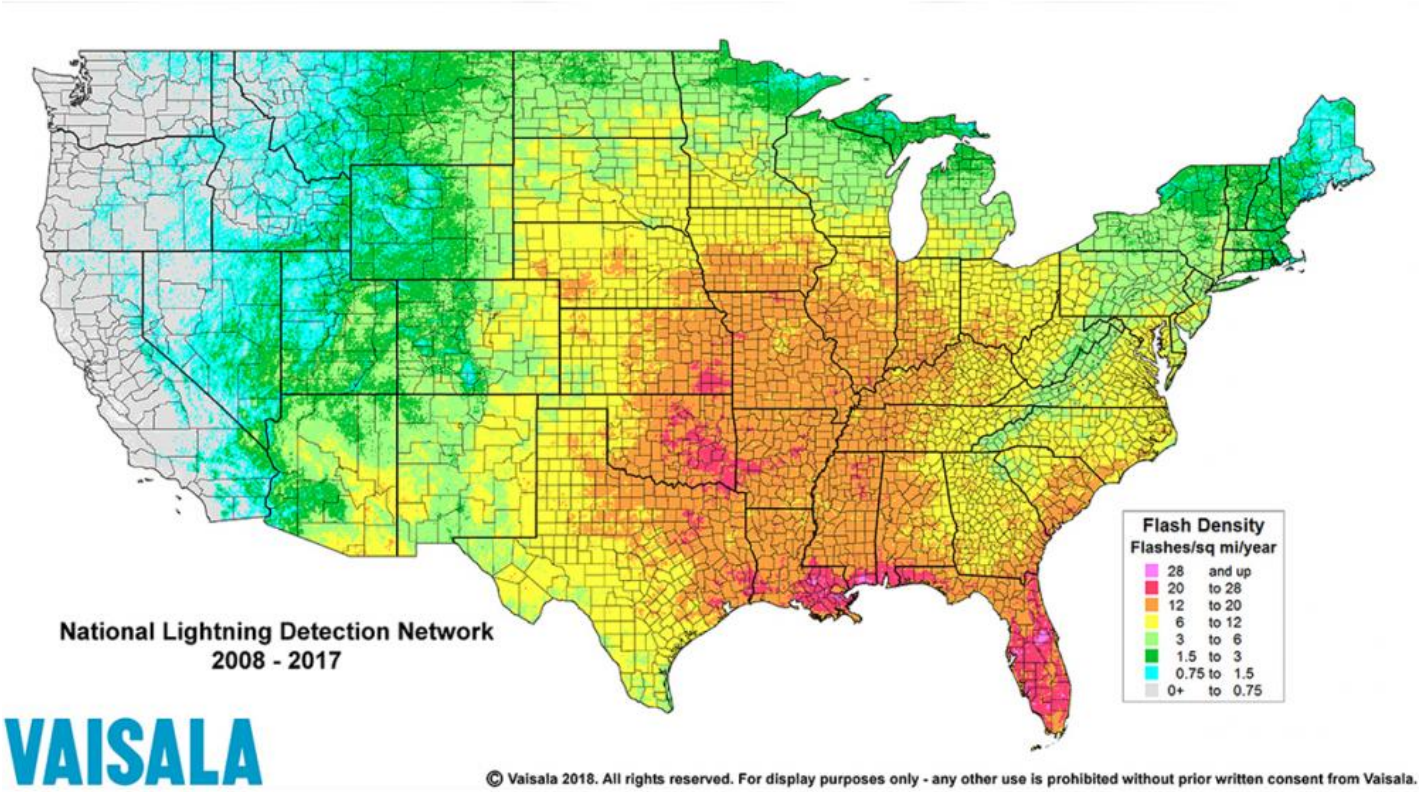
Prev / Search Results / Next

Storm Events Database

Event Details:

Event	**Lightning**
State	**GEORGIA**
County/Area	**DADE**
WFO	**FFC**
Report Source	**EMERGENCY MANAGER**
NCEI Data Source	**PDS**
Begin Date	**2003-06-11 16:50 EST**
End Date	**2003-06-11 16:50 EST**
End Location	**TRENTON**
Deaths Direct/Indirect	**0/0** (fatality details below, when available...)
Injuries Direct/Indirect	**0/0**
Property Damage	**25K**
Crop Damage	
Event Narrative	**The Dade county 911 center reported that a house was set on fire by lightning.**

The National Lightning Detection Network Map below shows lightning flash density by county. From 2008 to 2017, Dade County averaged between 6 and 12 flashes per square mile per year.



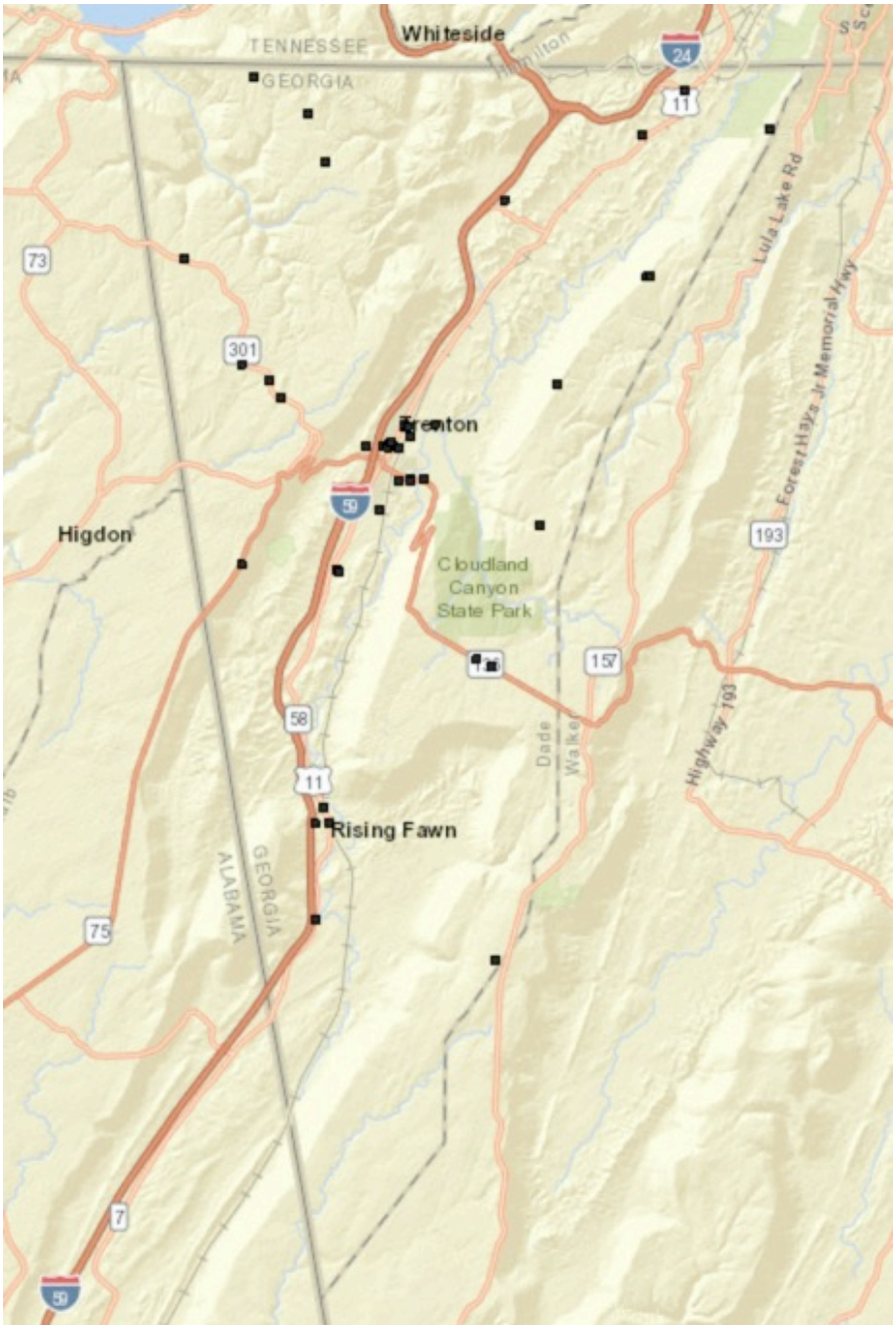
The Dade County HMPC utilized data from the National Climatic Data Center, the National Weather Service, numerous weather-related news articles and various online resources in researching severe thunderstorms and their impact on the County. With most of the County's recorded severe thunderstorm events, only basic information was available. It is also likely that some severe thunderstorm events have gone unrecorded. Therefore, any conclusions reached based upon available information on severe thunderstorms within Dade County should be treated as the minimal possible threat.

NCDC records show that 151 severe thunderstorms occurred within the County over the past fifty years, which equates to a 302% annual frequency based upon reported events. Over the past twenty years that frequency has nearly doubled. It would appear that severe thunderstorm activity has increased over time within the County. This may be the case or it may simply be that record keeping and technology have improved significantly over the course of time, reflecting the higher numbers. It may also be a combination of these two factors. The following chart provides annual frequency of reported events over the past five, ten, twenty, and fifty-year periods. The most recent five-year period, covering the span of time since the last update to this Plan, is highlighted in gold.

Dade County – Severe Thunderstorm Frequency including Hail & Lightning (based on Reported Events)				
Time Period	**5yrs (2016-2020)**	**10yrs (2011-2020)**	**20yrs (2001-2020)**	**50yrs (1971-2020)**
Number of Reported Events	**20**	**50**	**109**	**151**
Frequency Average per Year	**4.0**	**5.0**	**5.45**	**3.02**
Frequency Percent per Year	**400%**	**500%**	**545%**	**302%**

C. Assets Exposed to Hazard – In evaluating assets that are susceptible to severe thunderstorms, hail, and lightning, the committee determined that, since this hazard is not spatially defined, all public and private property is susceptible to severe thunderstorms, including all critical facilities. The following map identifies critical facilities located within the hazard area, which in the case of severe thunderstorms, includes the entire County.

Dade County Critical Facilities Map (GEMA)



D. Estimate of Potential Losses – Most of the available information relating to severe thunderstorms, hail, and lightning occurrences within Dade County fails to describe damage estimates in great detail. However, with each thunderstorm event it is likely there are unreported costs related to infrastructure and utilities repair and public safety costs, at a minimum. Much private property damage also goes unreported. Severe thunderstorms have occurred in all parts of the day and night within Dade County. They have also taken place in every single month of the year. Since this is a non-spatially defined hazard, it can obviously impact all portions of Dade County and the City of Trenton. Additional loss estimate information may be found in Appendix A, the Critical Facilities Database, and Appendix D, for each jurisdiction.

E. Multi-Jurisdictional Concerns – Any portion of Dade County can be negatively impacted by severe thunderstorms, hail, and lightning. Therefore, any mitigation steps taken related to these weather events will be pursued on a countywide basis and include the City of Trenton.

F. Hazard Summary – Overall, severe thunderstorm, hail, and lightning events pose one of the greatest threats to Dade County in terms of property damage, injuries and loss of life. These weather events represent the most frequently occurring natural hazard within Dade County and have a great potential to negatively impact the County each year. Based on the frequency of this hazard, as well as its ability to negatively impact any part of the County, the HMPC recommends that the mitigation measures identified in this plan for severe thunderstorm, hail, and lightning be aggressively pursued. Specific mitigation actions related to these weather events are identified in Chapter 5.

2.2 Winter Storms

A. Hazard Identification – The Dade County HMPC researched historical data from the National Climatic Data Center, The National Weather Service, as well as information from past newspaper articles and various online resources relating to winter storms in Dade County. Winter storms bring the threat of freezing rain, ice, sleet, snow and the associated dangers. A heavy accumulation of ice, especially when accompanied by high winds, devastates trees and power lines. Such storms make highway travel or any outdoor activity extremely hazardous due to falling trees, ice, and other debris.

B. Hazard Profile – Although winter storms occur relatively infrequently, they have the potential to wreak havoc on the community when they do strike. Winter storms within Dade County typically cause damage to power lines, trees, buildings, structures, and bridges, to varying degrees. In addition, trees, power lines, and structures weighed down by snow and ice become very dangerous to person and property.

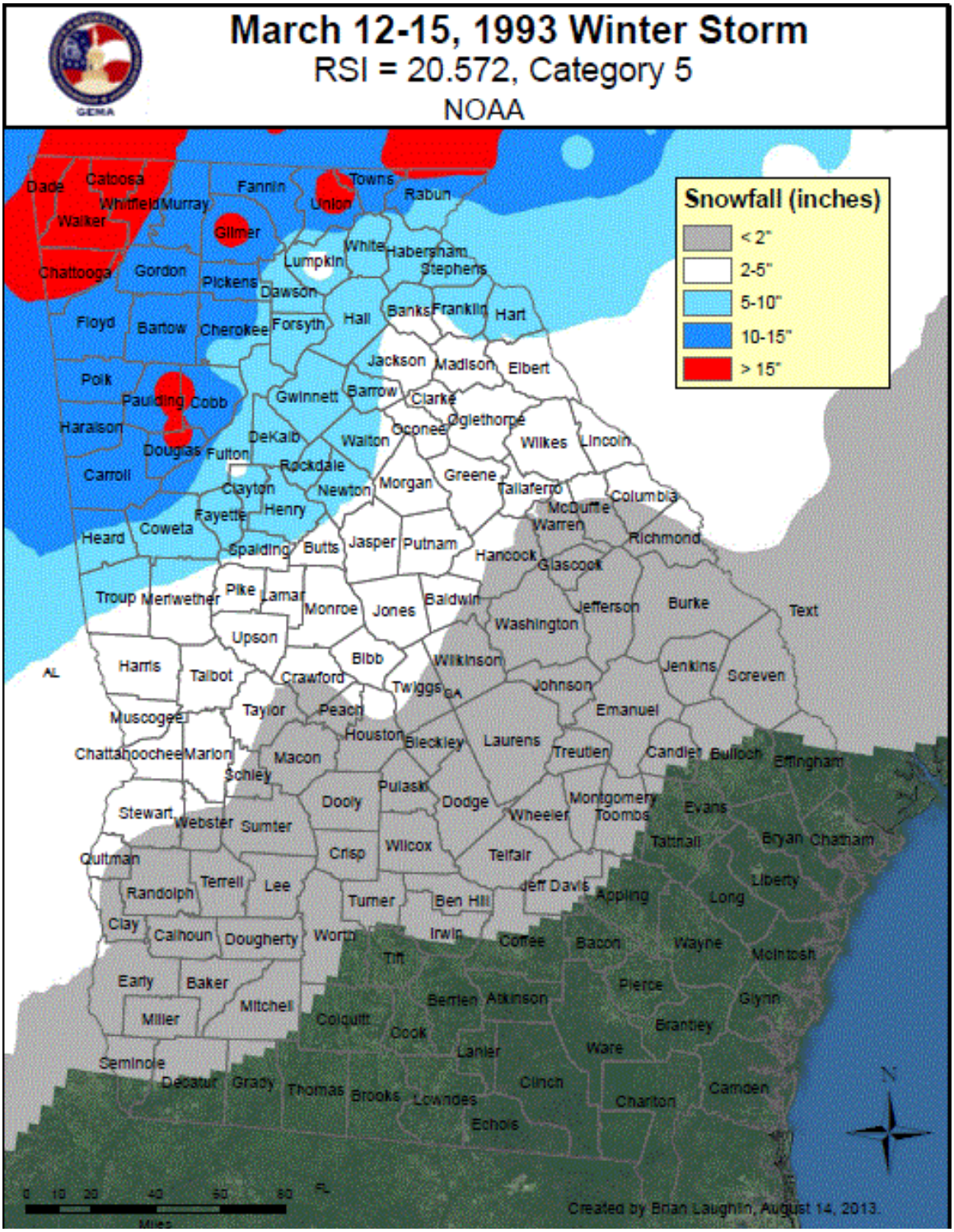
NCDC records show that 54 winter storms occurred within the County over the past fifty years, which equates to a 108% annual frequency based upon reported events. However, winter storm events were obviously underreported during the first few decades of the fifty-year history since reported events only go back as far as 1996. It may be best to place higher consideration on the more consistent 5, 10 and 20-year histories when considering the threat that winter storm events present to the County. The following chart provides annual frequency of reported events over the past five, ten, twenty, and fifty-year periods.

The most recent five-year period, covering the span of time since the last update to this Plan, is highlighted in gold.

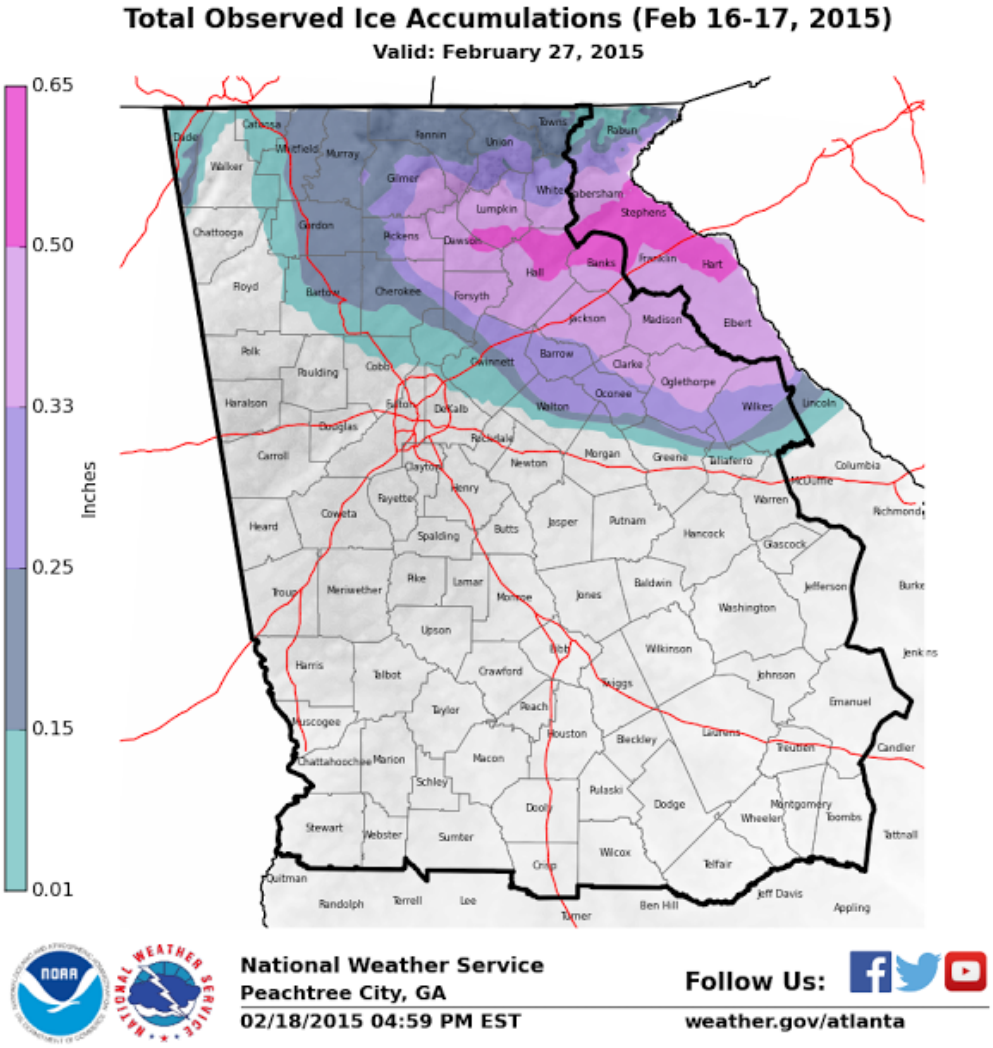
Dade County – Winter Storm Frequency (based on Reported Events)				
Time Period	**5yrs (2016-2020)**	**10yrs (2011-2020)**	**20yrs (2001-2020)**	**50yrs (1971-2020)**
Number of Reported Events	**4**	**15**	**41**	**54**
Frequency Average per Year	**0.80**	**1.5**	**2.05**	**1.08**
Frequency Percent per Year	**80%**	**150%**	**205%**	**108%**

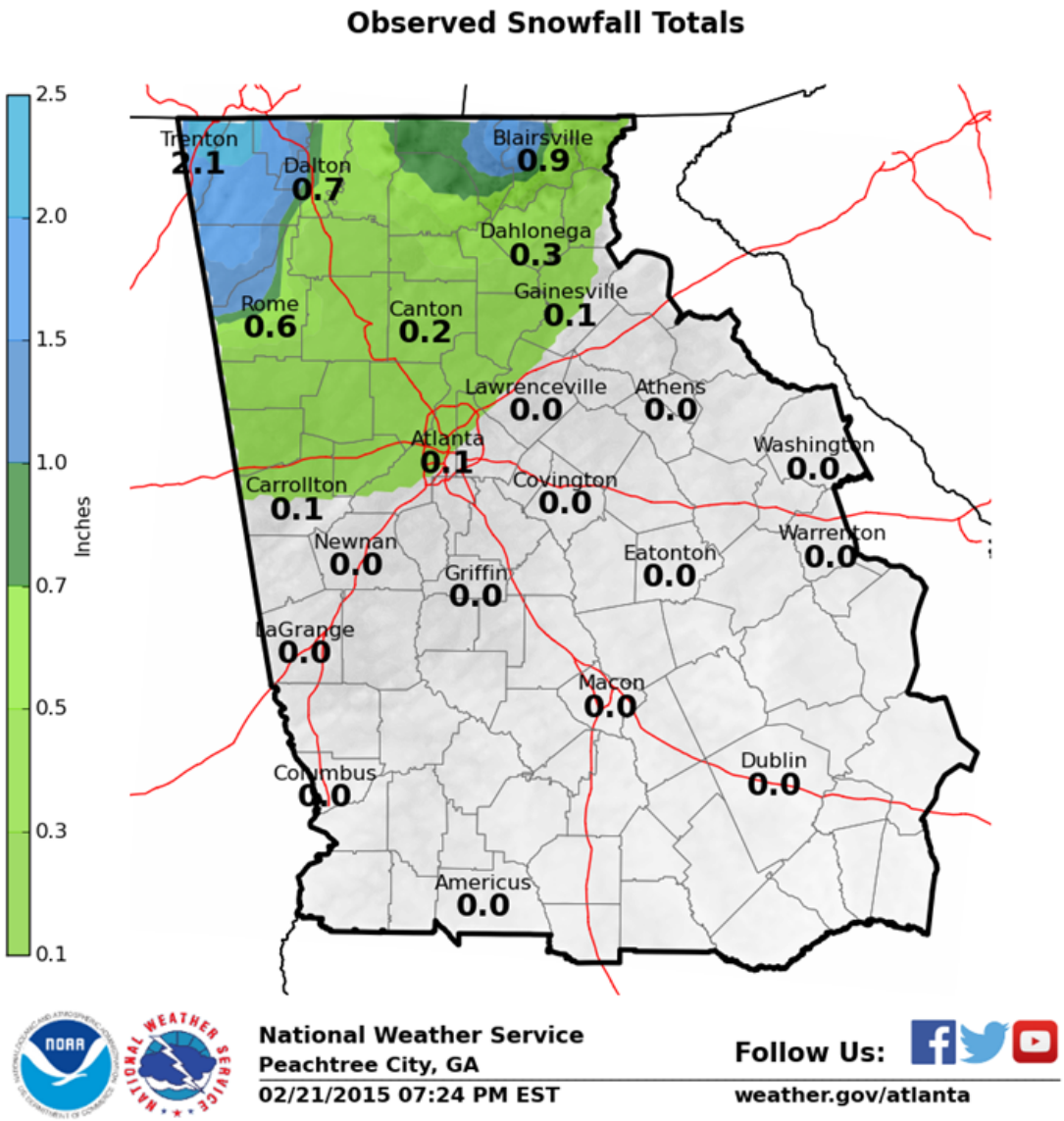
March 13, 1993 "Storm of the Century"

On Wednesday, March 10, 1993, Atlanta's high was 75 degrees, while other parts of the state hit the 80s. But by Friday, forecasters at the National Weather Service were sounding ominous warnings of overnight blizzard conditions as a hurricane-like storm churned out of Florida into Georgia. The "Storm of the Century" as it became known hit metro Atlanta on Saturday, March 13, 1993. The snow began falling early that morning and by the time it had tapered off nearly three feet had fallen across parts of extreme north Georgia, with Dade County receiving over 15 inches in some locations. Fifteen people were killed in Georgia, while the death toll across the U.S., Canada and Cuba hit 310. The storm paralyzed metro Atlanta and north Georgia for days, the heavy snowfall closing interstates from Atlanta northward. Saturday's blizzard conditions subsided somewhat by late in the day but were followed by bitter cold, with temperatures plummeting into the teens on Sunday. The following Monday, hundreds if not thousands of motorists were still stranded on snow-packed I-75 through northwest Georgia. National Guardsmen in four-wheel drive vehicles made their way up the interstate, handing out bags of fruit to stranded motorists. The weight of all that snow took its toll on the carpet industry in northwest Georgia, where the roofs of numerous large carpet mills and warehouses collapsed. Over 10 million utility customers lost power as the storm developed into a fierce Nor'easter as it skirted the Atlantic coast northward. In Georgia, more than a half-million Georgia Power customers were without electricity, some for as long as two weeks.

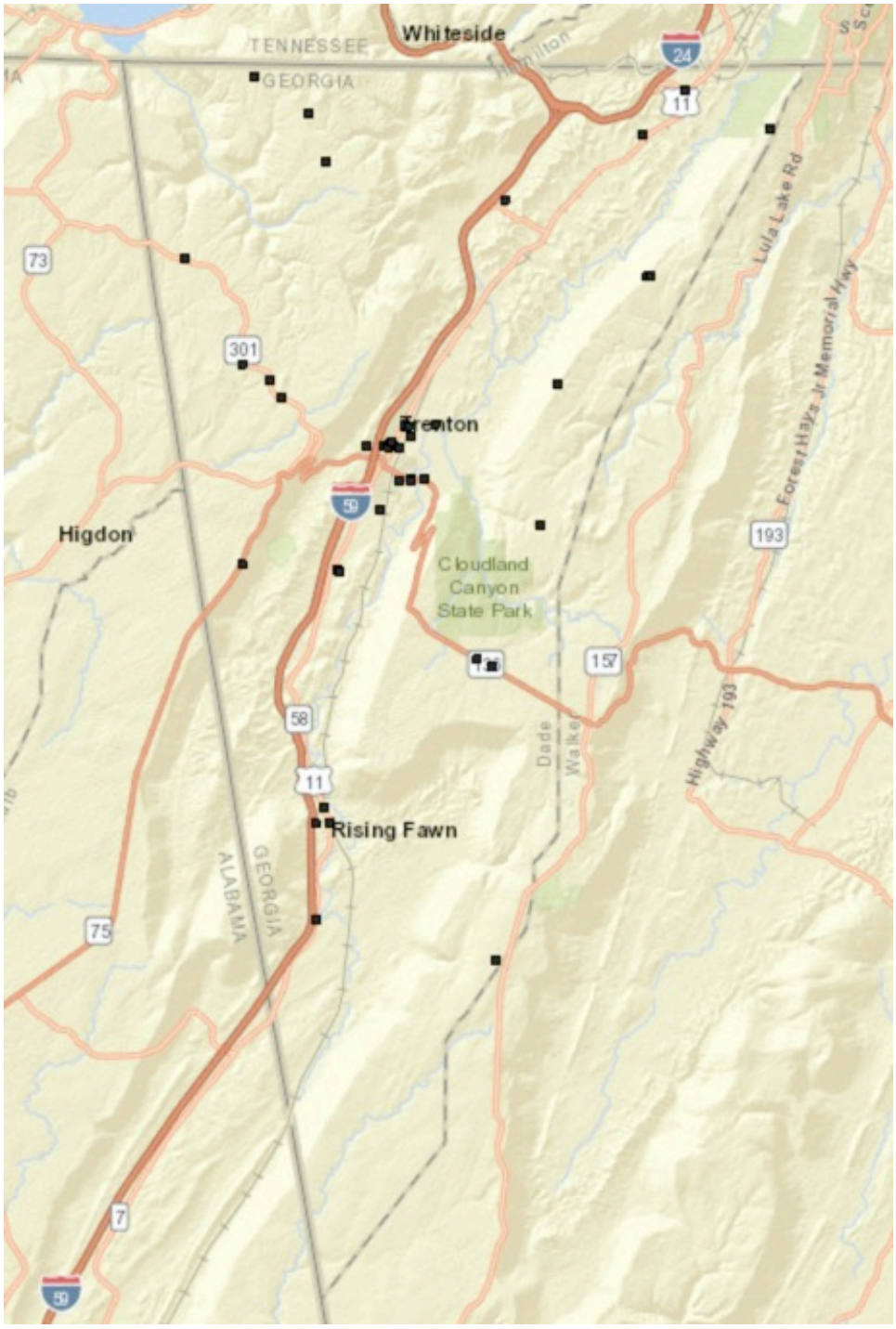

March 12-15, 1993 Winter Storm
RSI = 20.572, Category 5
NOAA
Snowfall (inches)
< 2"
2-5"
5-10"
10-15"
> 15"
Dade
Catoosa
Whitfield
Murray
Walker
Fannin
Towns
Union
Rabun
Gilmer
White
Habersham
Stephens
Lumpkin
Chattooga
Gordon
Pickens
Dawson
Floyd
Bartow
Cherokee
Forsyth
Hall
Banks
Franklin
Hart
Jackson
Madison
Elbert
Polk
Paulding
Cobb
Gwinnett
Barrow
Clarke
Haralson
Douglas
Fulton
DeKalb
Oconee
Oglethorpe
Walton
Wilkes
Lincoln
Carroll
Rockdale
Clayton
Newton
Morgan
Greene
Taliaferro
Columbia
McDuffie
Warren
Fayette
Henry
Coweta
Heard
Spalding
Butts
Jasper
Putnam
Hancock
Glascock
Richmond
Troup
Meriwether
Pike
Lamar
Monroe
Jones
Baldwin
Jefferson
Burke
Text
Washington
Upson
Harris
Talbot
Crawford
Bibb
Wilkinson
Jenkins
Screven
AL
Twiggs
GA
Johnson
Taylor
Peach
Emanuel
Muscogee
Houston
Bleckley
Laurens
Treutlen
Candler
Bulloch
Effingham
Chattahoochee
Marion
Macon
Schley
Pulaski
Dooly
Dodge
Montgomery
Evans
Stewart
Webster
Sumter
Wheeler
Toombs
Tattnall
Bryan
Chatham
Quitman
Crisp
Wilcox
Telfair
Terrell
Lee
Randolph
Turner
Ben Hill
Jeff Davis
Appling
Liberty
Long
Clay
Calhoun
Dougherty
Worth
Irwin
Coffee
Bacon
Wayne
McIntosh
Tift
Early
Baker
Pierce
Berrien
Atkinson
Glynn
Mitchell
Miller
Colquitt
Cook
Brantley
Lanier
Ware
Seminole
Decatur
Grady
Thomas
Brooks
Lowndes
Clinch
Charlton
Camden
Echols
FL
0 10 20 40 60 80
Miles
N
Created by Brian Laughlin, August 14, 2013.

The latest winter storm to affect Dade County occurred in mid-February of 2015. A strong cold front pushed across Georgia by the morning of February 15th, bringing in plenty of below freezing temperatures to north Georgia. As a low-pressure system approached the area from the west on February 16th, warmer temperatures surged northward, bringing much of the area above freezing. However, temperatures at the surface across parts of north and northeast Georgia hovered at or below freezing as the rainfall increased, thanks to a wedge of cold air. Freezing rain continued for these areas into the early morning hours of February 17th before coming to an end. Freezing rain totals reached over 1/2" in some areas, leading to widespread tree and power line damage. By the morning of February 17th, more than 200,000 customers were without power, generally for the northeast Atlanta metro area and points north and east. The following maps shows ice accumulations and snowfall totals in Dade County and surrounding areas.




Observed Snowfall Totals
Inches
2.5
2.0
1.5
1.0
0.7
0.5
0.3
0.1
Trenton 2.1
Dalton 0.7
Blairsville 0.9
Dahlonega 0.3
Gainesville 0.1
Rome 0.6
Canton 0.2
Lawrenceville 0.0
Athens 0.0
Atlanta 0.1
Washington 0.0
Carrollton 0.1
Covington 0.0
Warrenton 0.0
Newnan 0.0
Eatonton 0.0
Griffin 0.0
LaGrange 0.0
Macon 0.0
Columbus 0.0
Dublin 0.0
Americus 0.0
National Weather Service
Peachtree City, GA
02/21/2015 07:24 PM EST
Follow Us:
weather.gov/atlanta

C. Assets Exposed to Hazard - In evaluating assets that may potentially be impacted by the effects of winter storms, the HMPC determined that all critical facilities, public and private property, are susceptible. The map on the following page identifies critical facilities located within the hazard area which, in the case of winter storms, includes the entire County.



D. Estimate of Potential Losses – Most of the available information relating to winter storms within Dade County fails to describe damage estimates in great detail. However, with each winter storm event it is likely there are unreported costs related to infrastructure and utilities repair and public safety costs, at a minimum. Much private property damage also goes unreported. Since this is a non-spatially defined hazard, it can obviously impact all portions of Dade County and the City of Trenton. Additional loss estimate information may be found in Appendix A, the Critical Facilities Database, and Appendix D, for each jurisdiction.

E. Multi-Jurisdictional Concerns – Any portion of Dade County can be negatively impacted by winter storms. Therefore, any mitigation steps taken related to winter storms will be pursued on a countywide basis and include the City of Trenton.

F. Hazard Summary – Winter storms, unlike other natural hazards, typically afford communities some advance warning. The National Weather Service issues winter storm warnings and advisories as these storms approach. Unfortunately, even with advance warning, some of the most destructive winter storms have occurred in the Southern United States, where buildings, infrastructure, crops, and livestock are not well-equipped for severe winter conditions. Motorists, not accustomed to driving in snow and icy conditions, pose an additional danger on roads and highways. The Dade County HMPC recognized the potential threats of winter storms and identified specific mitigation actions. These actions are detailed in Chapter 5.

2.3 Flooding

A. Hazard Identification: The National Weather Service (NWS) defines the term "Flood" as follows: An overflow of water onto normally dry land. The inundation of a normally dry area caused by rising water in an existing waterway, such as a river, stream, or drainage ditch. Ponding of water at or near the point where the rain fell. Flooding is a longer term event than flash flooding: it may last days or weeks. The NWS defines the term "Flash Flood" as follows: A flood caused by heavy or excessive rainfall in a short period of time, generally less than six hours. Flash floods are usually characterized by raging torrents after heavy rains that rip through river beds, urban streets, or mountain canyons sweeping everything before them. They can occur within minutes or a few hours of excessive rainfall. They can also occur even if no rain has fallen, for instance after a levee or dam has failed, or after a sudden release of water by a debris or ice jam.

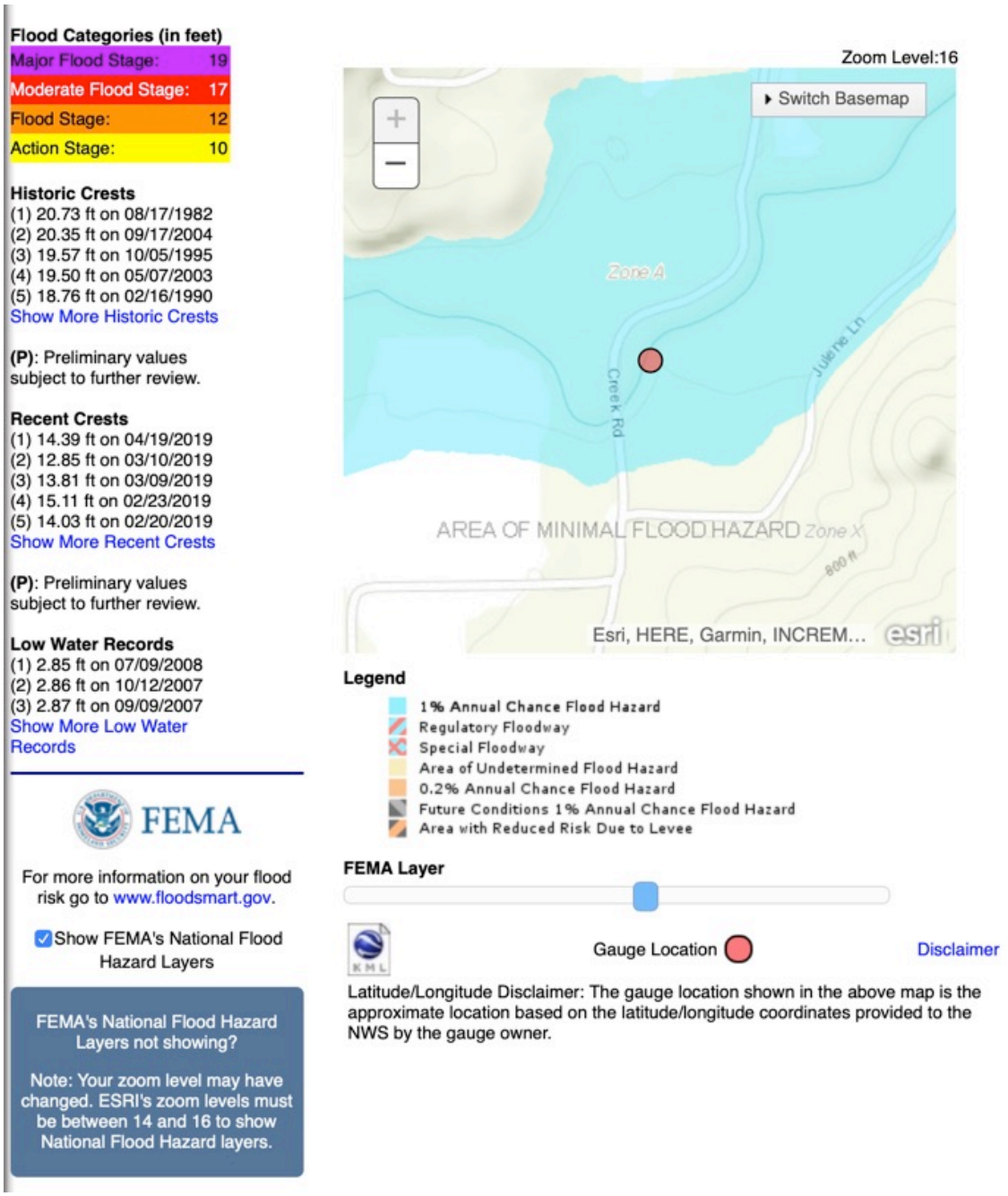
The vulnerability of a river or stream to flooding depends upon several variables. Among these are topography, ground saturation, rainfall intensity and duration, soil types, drainage, drainage patterns of streams, and vegetative cover. A large amount of rainfall over a short time span can result in flash flood conditions. Nationally, the total number of flash flood deaths has exceeded tornado fatalities during the last several decades. Two factors seem to be responsible for this: public apathy regarding the flash flood threat and increased urbanization. A small amount of rain can also result in floods in locations where the soil is saturated from a previous wet period or if the rain is concentrated in an area of impermeable surfaces such as large parking lots, paved roadways, etc. Topography and

ground cover are also contributing factors for floods in that water runoff is greater in areas with steep slopes and little or no vegetation.

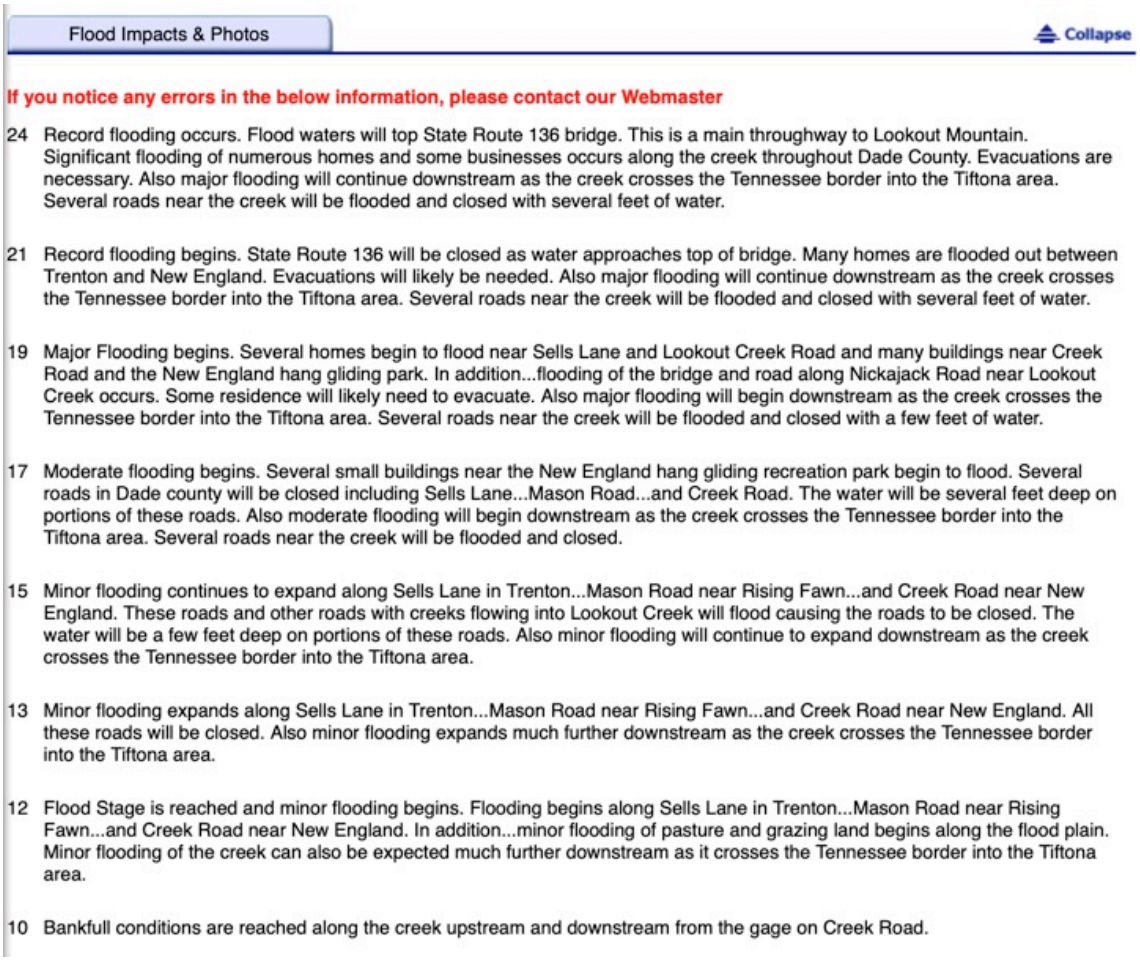
B. Hazard Profile: The Dade County HMPC researched flood information on Dade County for the past fifty years, with most information coming from the National Climatic Data Center. What was found was that flooding has caused moderate to severe damage on numerous occasions. Flood events on record in Dade County are usually associated with areas in the vicinity of Sunset Drive, Canyon Park Subdivision, Gulch Creek, Gulch Rd, Piney Rd, Saddle Club Rd, Cherokee Trail, Poplar Springs Rd, Mason Rd, Lookout Lake Dam, Lookout Creek, Lookout Valley near Wildwood, Fawn Dawn Rd, Creek Rd, and the City of Trenton sewer system.

The information on the following four pages provides more detail on the extent of flooding within Dade County and the City of Trenton.

1) Below is a graphic illustrating the single flood gauge located within Dade County at this time. It is located on the Lookout Creek at New England. The record historic crest at this location was 20.73ft on August 17, 1982, with another recent flood level crest of 14.39ft on April 19, 2019.



2) Additional flood extent information for Dade County and the City of Trenton is described below. This particular information was sourced from the National Weather Service's "Advanced Hydrologic Prediction Service" website.



Flood Impacts & Photos — Collapse

If you notice any errors in the below information, please contact our Webmaster

24 Record flooding occurs. Flood waters will top State Route 136 bridge. This is a main throughway to Lookout Mountain. Significant flooding of numerous homes and some businesses occurs along the creek throughout Dade County. Evacuations are necessary. Also major flooding will continue downstream as the creek crosses the Tennessee border into the Tiftona area. Several roads near the creek will be flooded and closed with several feet of water.

21 Record flooding begins. State Route 136 will be closed as water approaches top of bridge. Many homes are flooded out between Trenton and New England. Evacuations will likely be needed. Also major flooding will continue downstream as the creek crosses the Tennessee border into the Tiftona area. Several roads near the creek will be flooded and closed with several feet of water.

19 Major Flooding begins. Several homes begin to flood near Sells Lane and Lookout Creek Road and many buildings near Creek Road and the New England hang gliding park. In addition...flooding of the bridge and road along Nickajack Road near Lookout Creek occurs. Some residence will likely need to evacuate. Also major flooding will begin downstream as the creek crosses the Tennessee border into the Tiftona area. Several roads near the creek will be flooded and closed with a few feet of water.

17 Moderate flooding begins. Several small buildings near the New England hang gliding recreation park begin to flood. Several roads in Dade county will be closed including Sells Lane...Mason Road...and Creek Road. The water will be several feet deep on portions of these roads. Also moderate flooding will begin downstream as the creek crosses the Tennessee border into the Tiftona area. Several roads near the creek will be flooded and closed.

15 Minor flooding continues to expand along Sells Lane in Trenton...Mason Road near Rising Fawn...and Creek Road near New England. These roads and other roads with creeks flowing into Lookout Creek will flood causing the roads to be closed. The water will be a few feet deep on portions of these roads. Also minor flooding will continue to expand downstream as the creek crosses the Tennessee border into the Tiftona area.

13 Minor flooding expands along Sells Lane in Trenton...Mason Road near Rising Fawn...and Creek Road near New England. All these roads will be closed. Also minor flooding expands much further downstream as the creek crosses the Tennessee border into the Tiftona area.

12 Flood Stage is reached and minor flooding begins. Flooding begins along Sells Lane in Trenton...Mason Road near Rising Fawn...and Creek Road near New England. In addition...minor flooding of pasture and grazing land begins along the flood plain. Minor flooding of the creek can also be expected much further downstream as it crosses the Tennessee border into the Tiftona area.

10 Bankfull conditions are reached along the creek upstream and downstream from the gage on Creek Road.

3) Flooding extent information for Dade County has been provided by the County Executive/Chairman for Dade County in the letter below.

Administrative Building
71 Case Avenue • P.O. Box 370
Trenton, Georgia 30752-0370

Phone 706-657-4625
Fax 706-657-5116
www.dadecounty-ga.gov

September 7, 2021

Board of Commissioners
Dade County, Georgia

Ted Rumley, Chairman & County Executive

FEMA

PO Box 10055

Hyattsville, MD 20782-8055

Flooding Areas within Dade County:

To Whom It May Concern,

This letter is provide locations of flooding location within Dade County to meet the requirement of FEMA on our new Hazard Mitigation Plan. The best of our knowledge of all the history of events with in our county we have several location that has had flooded during minor to major flood stage from the USGS/NOAA water level gage of Lookout Creek. This happens within our county when Lookout Creek that runs through our valley from South to North into the Tennessee River in Chattanooga TN reaches a moderate to major flood stage of 14ft to 19ft from the flood gage. We will have up to five roads that go under water during different times of flood stages; they are 1350 Creek Road, Block Range of 674 to 1725 Sells Ln, Intersection of Lookout Creek Rd and Cherokee Trail, 400 block and 3800 block Mason Road.

This is the only issues we see during flood event within Dade County. If you have any questions please give our office a call.

Sincerely,

Ted Rumley

County Executive/Chairman

4) Flooding extent information for the City of Trenton has been provided by the Mayor of Trenton in the letter below. The data from the single river gauge discussed in the letter indicate a flood level of 17 feet or more on 11 occasions over the past 41 years, which would equate to a 27% annual frequency during that time period at this particular location.

Joseph A. Case
Mayor

Russanna Jenkins
City Clerk

City of Trenton

Your City for Family Living

Commissioners
Kirk Forshee
Lucretia Houts
Terry Powell
Monda Wooten

September 7, 2021

FEMA

PO Box 10055

Hyattsville, MD 20782-8055

Flooding Areas with the City of Trenton:

To Whom It May Concern,

This letter is provide locations of flooding location within our city to meet the requirement of FEMA on our new Hazard Mitigation Plan. The best of our knowledge of all the history of events with in our county we have several location that has had flooded during minor to major flood stage from the USGS/NOAA water level gage of Lookout Creek. This happens within our county and city from the Lookout Creek that runs through our valley from South to North into the Tennessee River in Chattanooga TN. When it reaches a moderate to major flood stage of 17ft to 19ft we see some flooding in the area of 202 Sunset Drive where Town Creek run through that area to Lookout Creek.

This is the only issues we see during flood event within the city of Trenton. If you have any questions please give our office a call.

Sincerely,

Joseph A. Case

Mayor

PO Box 518 • 12882 North Main Street • Trenton, Georgia 30752 • 706-657-4167
trentonga.gov

NCDC records show that 21 flood events occurred within the County over the past fifty years, which equates to a 42% annual frequency based upon reported events. However, flooding events were obviously underreported during the first few decades of the fifty-year history since reported events for the twenty-year history also equal 21, equating to a 105% annual frequency. Therefore it may be best to focus more on the more consistent 5, 10, and 20-year histories when considering the threat that flooding presents to the County.

The following chart provides annual frequency of reported events over the past five, ten, twenty, and fifty-year periods. The most recent five-year period, covering the span of time since the last update to this Plan, is highlighted in gold. Flooding data is not broken down by jurisdiction.

Dade County – Flooding Frequency (based on Reported Events)				
Time Period	**5yrs (2016-2020)**	**10yrs (2011-2020)**	**20yrs (2001-2020)**	**50yrs (1971-2020)**
Number of Reported Events	**2**	**12**	**21**	**21**
Frequency Average per Year	**0.4**	**1.2**	**1.05**	**0.42**
Frequency Percent per Year	**40%**	**120%**	**105%**	**42%**

Dade County (CID No. 130246) and the City of Trenton (CID No. 130063) each participate in the National Flood Insurance Program (NFIP) and follow the Program guidelines to ensure future development is carried out in the best interests of the public. Dade County has participated since 1989, and the City of Trenton since 1979. According to NFIP guidelines, each participating jurisdiction has executed a Flood Damage Prevention Ordinance. Dade County first executed such an ordinance in 1973, and has updated it over the years. The purpose of this ordinance is to minimize the loss of human life and health as well as to minimize public and private property losses due to flood conditions. The ordinance requires that potential flood damage be evaluated at the time of initial construction of structures, facilities and utilities, and that certain uses be restricted or prohibited based on this County evaluation. The ordinance also requires that potential homebuyers be notified that property is located in a flood area. In addition, all construction must adhere to the Georgia State Minimum Standard Codes (Uniform Codes Act) and the International Building Code (current edition). The minimum standards established by these codes provide reasonable protection to persons and property within structures that comply with the regulations for most natural hazards.2

Currently, Dade County and the City of Trenton have numerous projects they have developed within this Plan to mitigate flooding concerns. These include 1) changing the structure of Lookout Lake Dam to meet Georgia Safe Dams Category II requirements, 2) City of Trenton storm drain/sewer mapping system, 3) Town Creek at Sunset Drive – flooding mitigation acquisition project, 4) Town Creek at Sunset Drive – flooding mitigation construction project, 5) Mason Rd flooding mitigation project, 6) Creek Rd at New England Rd flooding mitigation project, 7) Creek Rd at Sarah's Chapel intersection

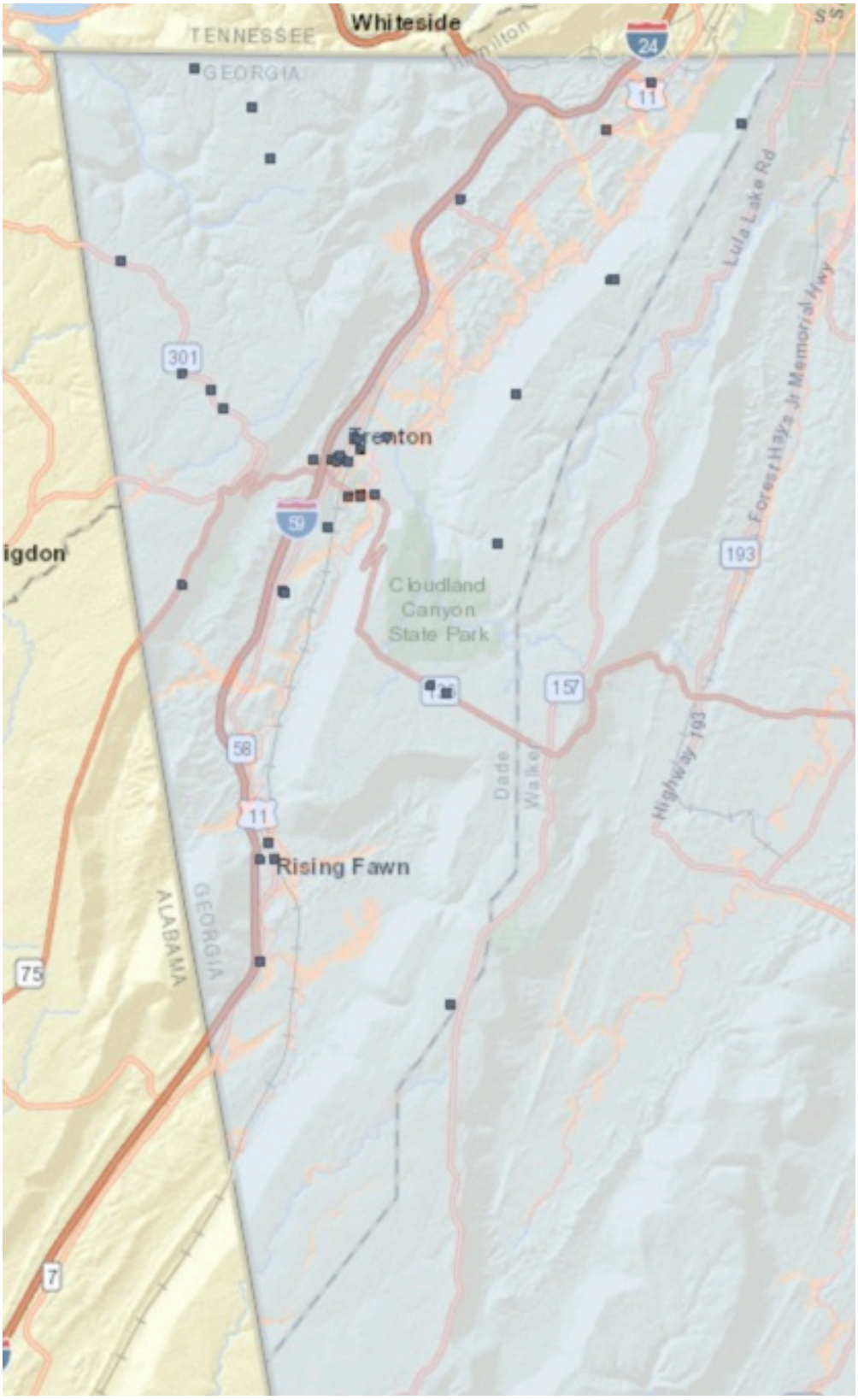
flooding mitigation project, and 8) construction of a new reservoir along Sells Lane. See the Mitigation Actions Chart in Chapter 5 for more detailed information on these projects.

According to the National Flood Insurance Reform Act, a repetitive loss structure is defined as "…a building covered by a contract for flood insurance that has incurred flood-related damages on two occasions during a 10-year period ending on the date of the event for which a second claim is made, in which the cost of repairing the flood damage, on the average, equaled or exceeded 25 percent of the market value of the building at the time of each such flood event." **As of December 31, 2020, there is one official residential "repetitive loss structure" on file for Dade County.** *Specific addresses for repetitive loss structures cannot be included in this Plan, but a current list of these structures may be viewed in GMIS by authorized individuals, as determined by the EMA Director.*

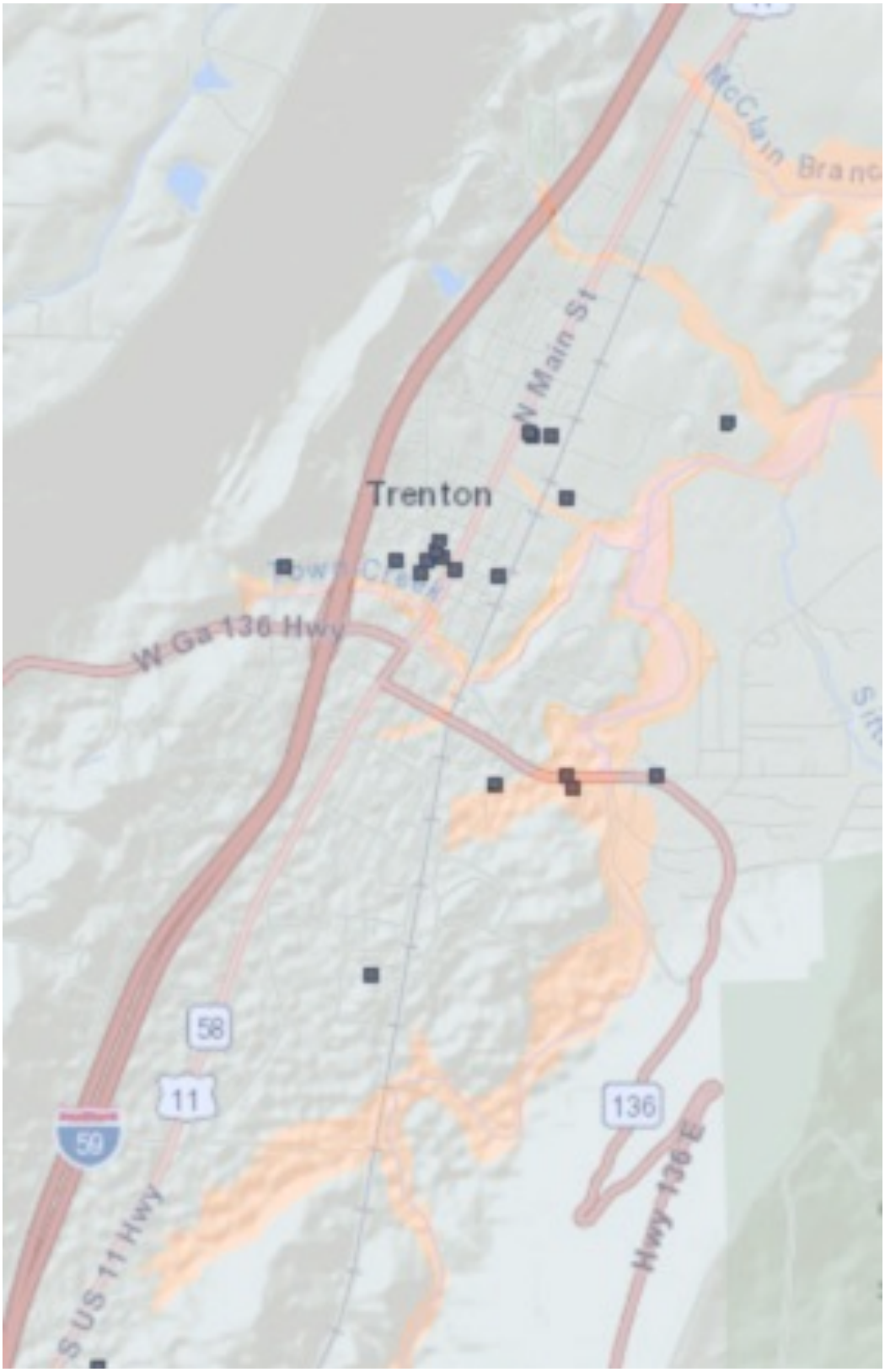
C. Assets Exposed to Hazard – In evaluating assets that may potentially be impacted by the effects of flooding, the HMPC determined that, although all critical facilities, public and private property are potentially susceptible to flooding, structures located within the vicinity of Sunset Drive, Canyon Park Subdivision, Gulch Creek, Gulch Rd, Piney Rd, Saddle Club Rd, Cherokee Trail, Poplar Springs Rd, Mason Rd, Lookout Lake Dam, Lookout Creek, Lookout Valley near Wildwood, Fawn Dawn Rd, Creek Rd, and the City of Trenton sewer system are the most susceptible.

The maps that follow identify the locations of critical facilities in relationship to the known flooding hazard areas.

Dade County


TENNESSEE
Whiteside
GEORGIA
24
11
Lula Lake Rd
Forest Hays Jr Memorial Hwy
301
59
193
Cloudland
Canyon
State Park
157
58
11
Rising Fawn
Dade
Walker
Highway 193
ALABAMA
GEORGIA
75
7

City of Trenton



D. Estimate of Potential Losses – Most of the available information relating to flooding within Dade County fails to describe damage estimates in great detail. However, with each flooding event it is likely there are unreported costs related to infrastructure and utilities repair and public safety costs, at a minimum. Much private property damage also goes unreported. Most losses are associated with the flooding of Lookout Creek, which splits Dade County in half from north to south. Lookout Creek also runs through the eastern portions of the City of Trenton and historically has negatively impacted the City of Trenton sewer system, thought cost estimates are not available. Additional loss estimate information may be found in Appendix A, the Critical Facilities Database, and Appendix D, for each jurisdiction.

E. Multi-Jurisdictional Concerns – Any portion of Dade County can potentially be impacted by flooding, however, the areas most prone to flooding have historically been those areas located in the vicinity of Sunset Drive, Canyon Park Subdivision, Gulch Creek, Gulch Rd, Piney Rd, Saddle Club Rd, Cherokee Trail, Poplar Springs Rd, Mason Rd, Lookout Lake Dam, Lookout Creek, Lookout Valley near Wildwood, Fawn Dawn Rd, Creek Rd, and the City of Trenton sewer system. Any mitigation steps taken related to flooding will be pursued on a countywide basis and include the City of Trenton. According to the available flood maps, the areas of highest concern are located in and around the areas near Lookout Creek running from northeast to southwest and essentially splitting the County in half.

F. Hazard Summary – Severe flooding has the potential to inflict significant damage within Dade County. Mitigation of flood damage requires the community to have knowledge of flood-prone areas, including roads, bridges, bodies of water, and critical facilities, as well as the location of the County's designated shelters. The Dade County HMPC identified flooding as a hazard requiring mitigation measures and identified specific mitigation goals, objectives and action items they deemed necessary to lessen the impact of flooding. These findings are found in Chapter 5.

2.4 Tornados

A. Hazard Identification – A tornado is a dark, funnel-shaped cloud containing violently rotating air that develops below a heavy cumulonimbus cloud mass and extends toward the earth. The funnel twists about, rises and falls, and where it reaches the earth causes great destruction. The diameter of a tornado varies from a few feet to a mile; the rotating winds attain velocities of 200 to 300 mph, and the updraft at the center may reach 200 mph. A tornado is usually accompanied by thunder, lightning, heavy rain, and a loud "freight train" noise. In comparison with a hurricane, a tornado covers a much smaller area but can be just as violent and destructive. The atmospheric conditions required for the formation of a tornado include great thermal instability, high humidity, and the convergence of warm, moist air at low levels with cooler, drier air aloft. A tornado travels in a generally northeasterly direction with a speed of 20 to 40 mph. The length of a tornado's path along the ground varies from less than one mile to several hundred.

The Fujita Scale was the standard scale in the United States for rating the severity of a tornado as measured by the damage it causes from 1971 to 2007 (see table below).

The Fujita Scale of Tornado Intensity

F-Scale Number	Intensity Phrase	Wind Speed	Type of Damage Done
F0	Gale tornado	40-72 mph	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages sign boards.
F1	Moderate tornado	73-112 mph	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.
F2	Significant tornado	113-157 mph	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
F3	Severe tornado	158-206 mph	Roof and some walls torn off well constructed houses; trains overturned; most trees in forest uprooted
F4	Devastating tornado	207-260 mph	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
F5	Incredible tornado	261-318 mph	Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles fly through the air in excess of 100 meters; trees debarked; steel reinforced concrete structures badly damaged.

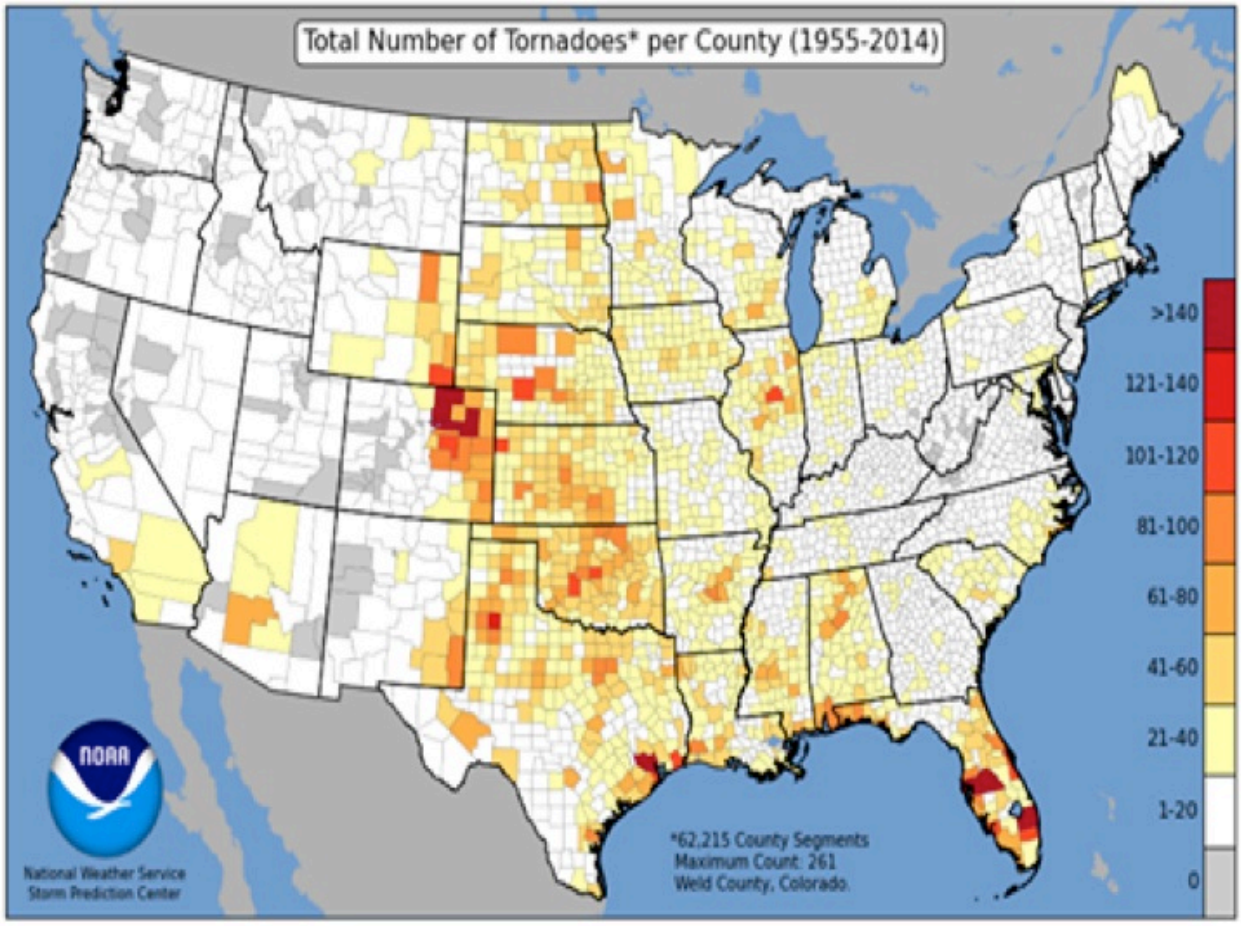
The Enhanced Fujita (EF) Scale for Tornado Damage is an update to the original Fujita Scale by a team of meteorologists and wind engineers that was implemented in the United States in 2007. The EF Scale is still a set of wind estimates (not measurements) based on damage. It uses three-second gusts estimated at the point of damage based on a judgment of 8 levels of damage to 28 indicators. These estimates vary with height and exposure. The three-second gust is not the same wind as in standard surface observations. Standard measurements are taken by weather stations in open exposures, using a directly measured, "one-minute mile" speed.

Levels of the Enhanced Fujita scale

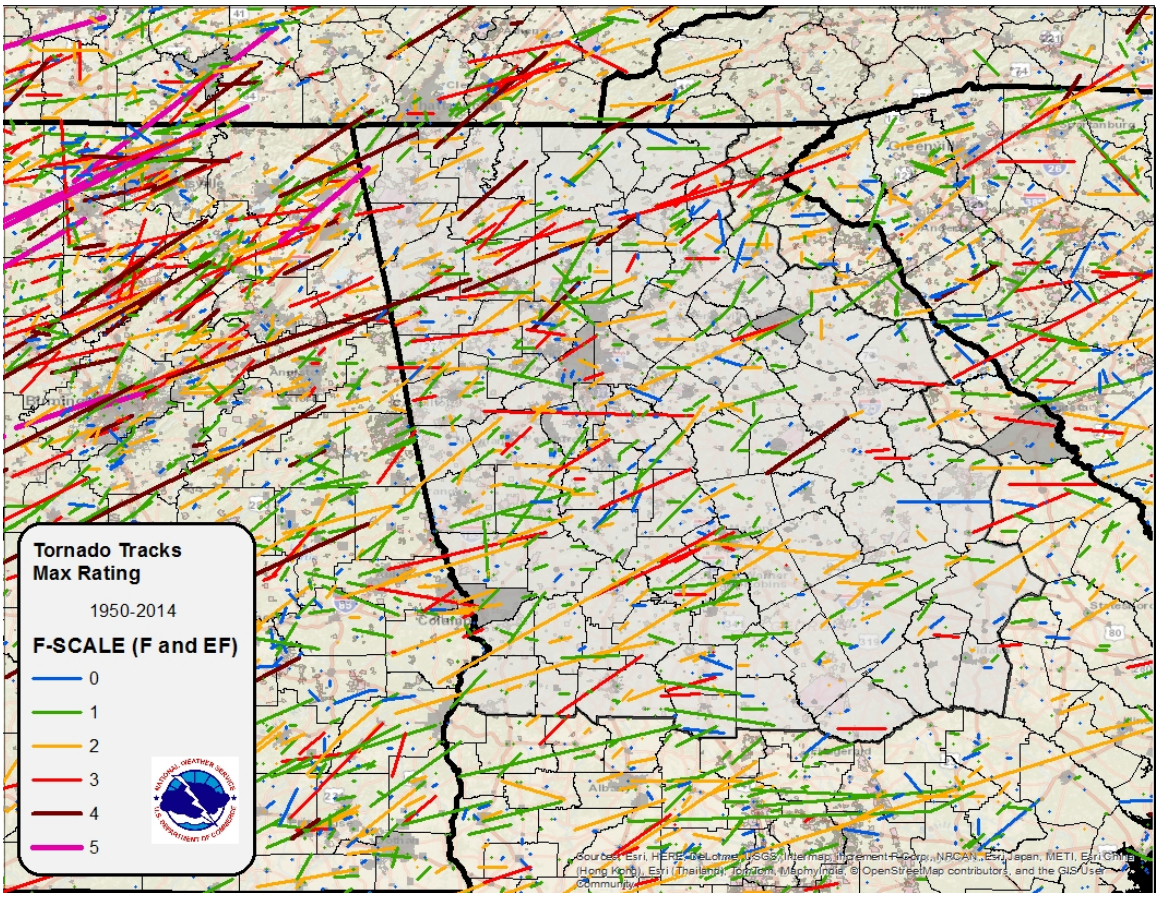
Grade, damage and windspeeds

Source: Fema

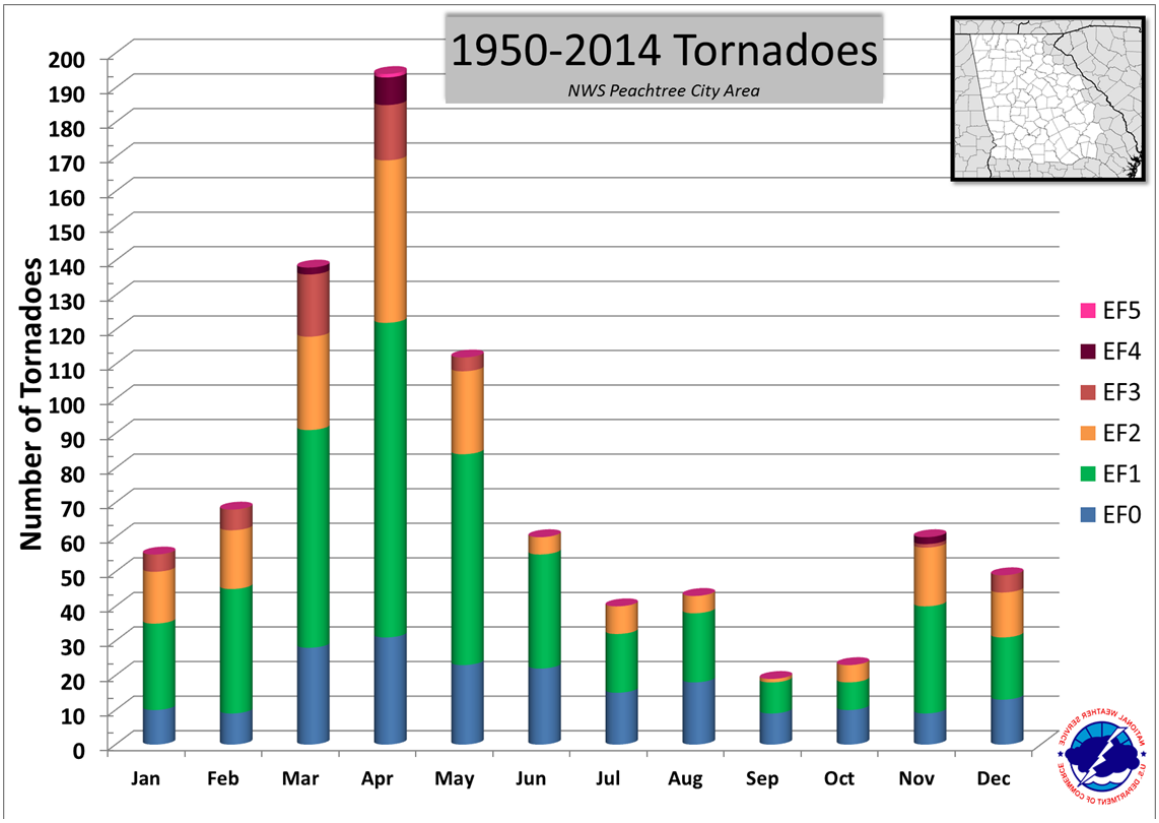
The NOAA map below represents the total number of tornados per county from 1955 to 2014. This is the latest version of this NOAA Map. Dade County averaged 1 to 20 during this time period.



The following NOAA maps represent the United States severe report database (tornadoes 1950-2014) converted into shapefile (.shp) file format along with a Geographic Information System (GIS) database. In other words, these maps show the estimated paths and intensities of recorded tornados over this time period. Although this 64-year time period does not match up exactly with the 50-year timeline reviewed within this Plan, the map remains a valuable visual aid by providing a regional perspective on historical tornado activity.



Tornados are considered to be the most unpredictable and destructive of weather events in Georgia, even though they are not the most frequently occurring natural hazard within Dade County. Tornado season in Georgia is ordinarily said to run from March through August, with the peak activity being in April. However, tornados can strike at any time of the year when certain atmospheric conditions are met, including during the coldest months of the year. See the National Weather Service graph below, which covers the NWS Peachtree City Area of Georgia.



B. Hazard Profile – All areas within Dade County are vulnerable to the threat of a tornado. There is simply no method to determine exactly when or where a tornado will occur. The Dade County Hazard Mitigation Planning Committee (HMPC) reviewed historical data from the Georgia Tornado Database, the National Climatic Data Center, and various online resources in researching the past effects of tornados within the County. With most of the County's recorded tornado events, only basic information was available. It is also possible that some tornados within the past 50 years have gone undetected, particularly in the earlier decades. Therefore, any conclusions reached based upon available information on tornados within Dade County should be treated as the minimal possible threat.

In the Peachtree City County Warning Area (CWA), which includes Dade County, the average number of tornado days per year is six, according to the National Weather Service. While tornados have been reported in all months of the year, most occur in the months of March, April, and May. During this "tornado season" the most likely time of occurrence is from mid-afternoon through early evening. Tornado intensities of EF2 or greater are involved in 37% of the events when the data is broken down into a county-by-county basis. These strong tornados are more likely to occur during the month of April than in any other month.

The most devastating tornado to impact Dade County in the past 50 years was the EF3 tornado that occurred on April 27, 2011. See the NCDC information on the following three pages.

Storm Events Database

Prev / Search Results / Next

Event Details:

Event	**Tornado**
-- Scale	**EF3**
-- Length	**9.52 Miles**
-- Width	**1056 Yards**
State	**GEORGIA**
County/Area	**DADE**
WFO	**FFC**
Report Source	**NWS Storm Survey**
NCEI Data Source	**CSV**
Begin Date	**2011-04-27 16:35 EST-5**
Begin Location	**2WSW GASS**
Begin Lat/Lon	**34.8431/-85.5799**
End Date	**2011-04-27 16:45 EST-5**
End Location	**2S WEST BROW**
End Lat/Lon	**34.8924/-85.423**
Deaths Direct/Indirect	**2/0** (fatality details below, when available...)
Injuries Direct/Indirect	**25/0**
Property Damage	**20.00M**
Crop Damage	**0.00K**

Episode Narrative	**A highly diffluent, deep upper trough, centered across Texas, took on a negative tilt and began to rotate northeast during this period. A strong maritime-Pacific (mP) cold front accompanied the upper trough through the mid-south into the southeast from the early morning hours of the 27th to the early morning hours of the 28th. An intense low-level jet with winds in excess of 70 knots was noted in advance of this system and tracked across the mid-south early on the 27th, across north Alabama and north Georgia into the early morning hours of the 28th. West-southwest winds aloft were highly diffluent and near 200 mph across this same region. The strong low-level jet brought unseasonably, warm, moist Gulf air northward in advance of the mP cold front. Dewpoints in the 70s and maximum temperatures in the 80s combined with the extremely strong low-level and upper jets to create an almost perfect environment for severe thunderstorms and large devastating tornadoes. Indeed, the tornado outbreak that affected much of the eastern U.S., but particularly the south central and southeastern U.S. during this period, was unprecedented and likely the largest recorded in U.S. history. The tornado outbreak that accompanied this combination of weather features has been termed the 2011 Super Outbreak, an outbreak even worse than the 1994 and 1974 super tornado outbreaks across the eastern U.S. The outbreak affected the South Central, Southeast, Midwest, and even the usually less tornado prone Northeastern United States. Over 330 tornadoes were reported during this outbreak which began on April 25th and continued into the 28th affecting 21 states from Texas to New York. Even isolated tornadoes were noted in Canada. Nearly 350 people died from these tornadoes, of which over 230 of these were in Alabama alone. Four tornadoes on April 27th in Alabama and Mississippi were ranked EF5, the highest tornado damage rating on the Enhanced Fujita Scale. On average, there is only one EF5 tornado per year in the entire U.S.** **Widespread and destructive tornadoes occurred on each day of the outbreak, but April 27th was clearly one of the most prolific and destructive tornado days in U.S. history, probably only surpassed by the Tri-State outbreak of 1925 and the Tupelo-Gainesville outbreak of 1936. The 24-hour period from 8 am April 27th to 8 a.m. April 28th is listed by the National Oceanic and Atmospheric Administration (NOAA) as the fourth deadliest tornado outbreak in U.S. history, with the 24 hours commencing April 28th at 8 a.m. as the fifth deadliest tornado day in U.S. history. It has also been determined to be the costliest tornado outbreaks and one of the costliest natural disasters in the U.S., even after adjustments for inflation, with total damages estimated to exceed $10 billion.** **Georgia was heavily impacted by this tornado outbreak, especially the northwest part of the state which bore the brunt of the massive supercell thunderstorms producing killer tornadoes that tracked east-northeast from northern Alabama during the late evening. All together, there were 15 tornadoes affecting 28 counties within the Peachtree City, Georgia 96-county warning area (CWA) of North and Central Georgia. All of these occurred within a 24-hour period commencing at 8 am April 27th. One of these tornadoes was rated an EF4, the first EF4 tornado in Georgia since the Palm Sunday outbreak in 1994. In addition, there were also four EF3 tornadoes. Fifteen tornado-related deaths were observed in north and central Georgia, the most tornado-related deaths within the Peachtree City, Georgia forecast area since its inception in 1994. The previous highest tornado-related death total was 12 on March 20, 1998, when a tornado struck Gainesville, Georgia.** **Finally, it should be noted that while the most significant period of severe weather during this outbreak for Georgia was from the afternoon of the 27th through the early morning hours of the 28th, there was an initial round of severe weather across northwest Georgia early on the 27th as a decaying line of severe thunderstorms moved into the region from northeast Alabama. Widespread wind damage and even a few brief weaker tornadoes accompanied this system into the northwest counties of the state.**

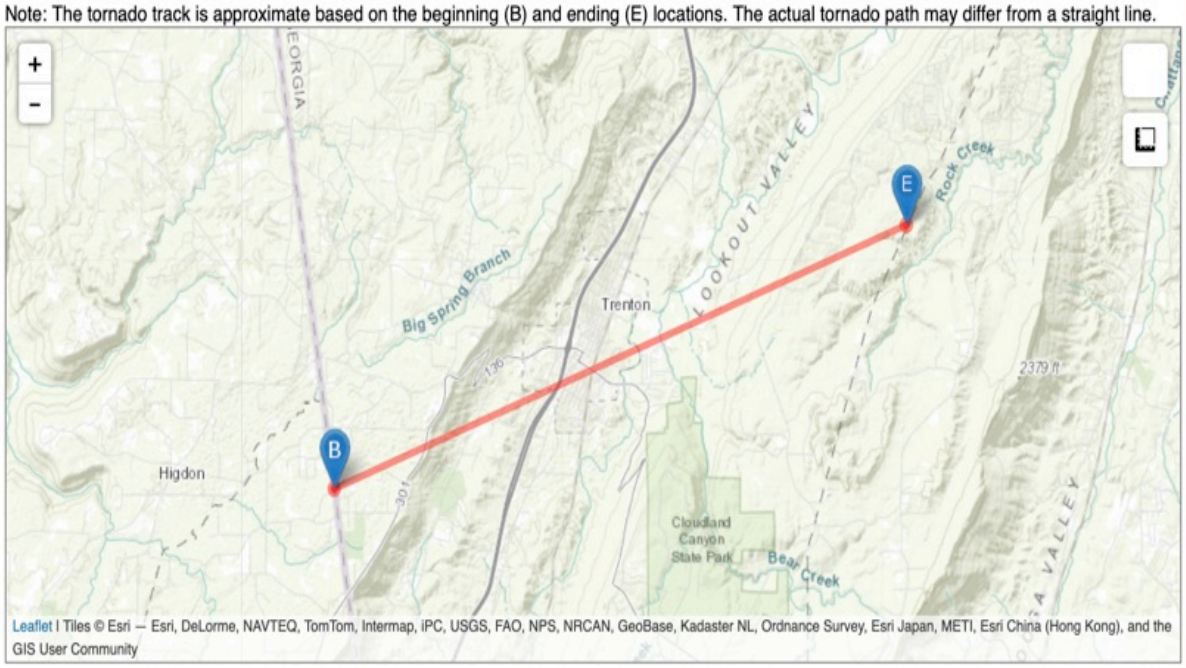
Event Narrative	**A damage survey conducted by the National Weather Service Forecast Office in Peachtree City confirmed that an EF3 tornado, which originated in DeKalb county, Alabama, continued on an east-northeast track into and across central Dade county, Georgia and further east-northeast into Walker county before lifting just west of Fort Oglethorpe. The tornado path length within Dade county, Georgia was approximately 9.5 miles, while the path length within Georgia was 18 miles long. The tornado was determined, within Georgia, to have a maximum path width of 0.6 mile and maximum winds of 150 mph. The tornado tracked directly across the county seat of Dade county, namely Trenton. Trenton is also the largest city in Dade county. Portions of Trenton, especially the southern part of the city, were literally destroyed. Dozens of homes were completely destroyed. Eighteen more homes suffered major damage. Literally tens of thousands of trees were blown down, uprooted, or splintered. Some of the worst devastation was observed in the Black Valley Road area, including the Middleton Estates subdivision and along U.S. Highway 11 and Georgia Highway 136. Considerable damage was also noted to apartments and several commercial buildings as well. The Edgewood Townhouses and Village Green Apartments suffered extensive damage. Among commercial structures sustaining damages were the Moore and Ryan Funeral Home along with an Ingles Grocery Store. Two fatalities and 25 injuries occurred as a result of this tornado, mostly in Trenton.** **[04/27-04/28/11: Tornado #2, County #1-2, EF2, Dade-Walker, 2011:011].**

Event Fatality Details:

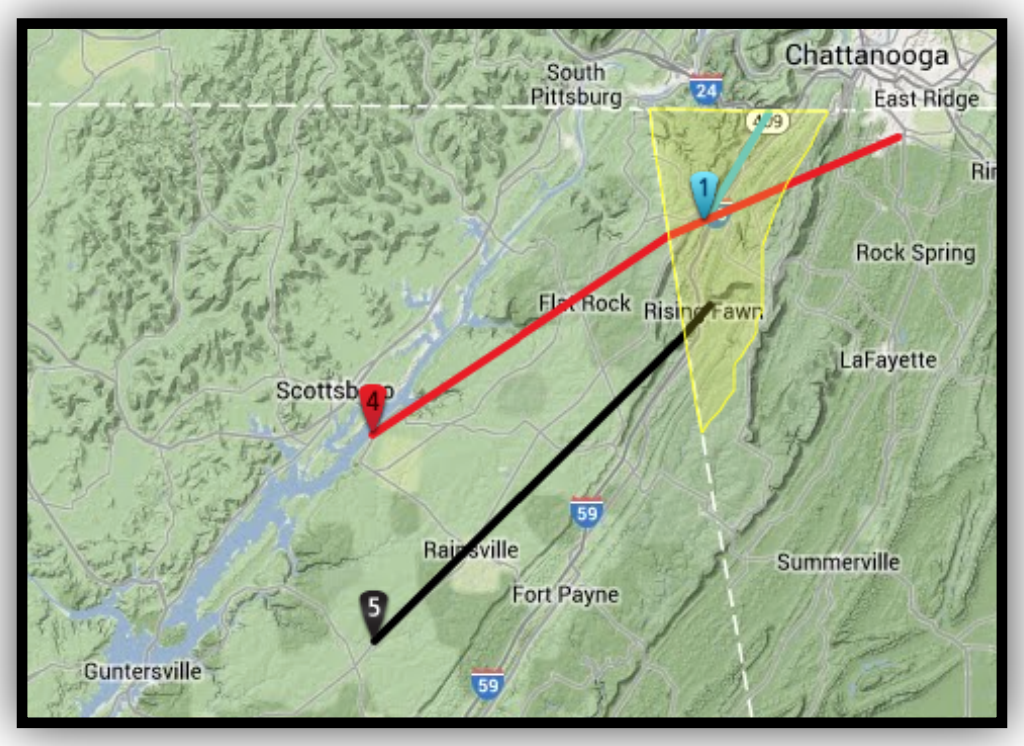
Type	Age	Gender	Fatality Location
Death (Direct)	49	Male	Permanent Home
Death (Direct)	47	Male	Permanent Home

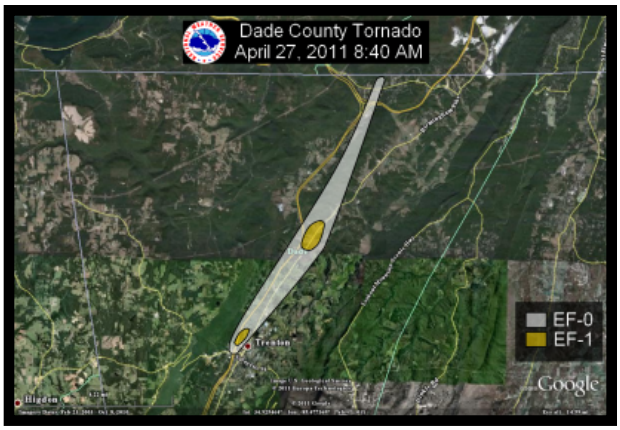
Event Map:

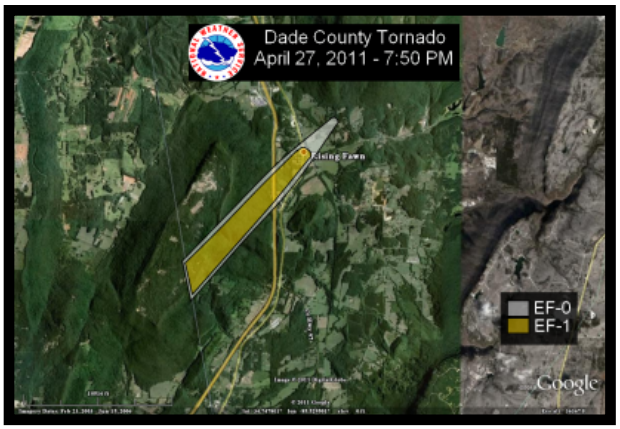
Note: The tornado track is approximate based on the beginning (B) and ending (E) locations. The actual tornado path may differ from a straight line.



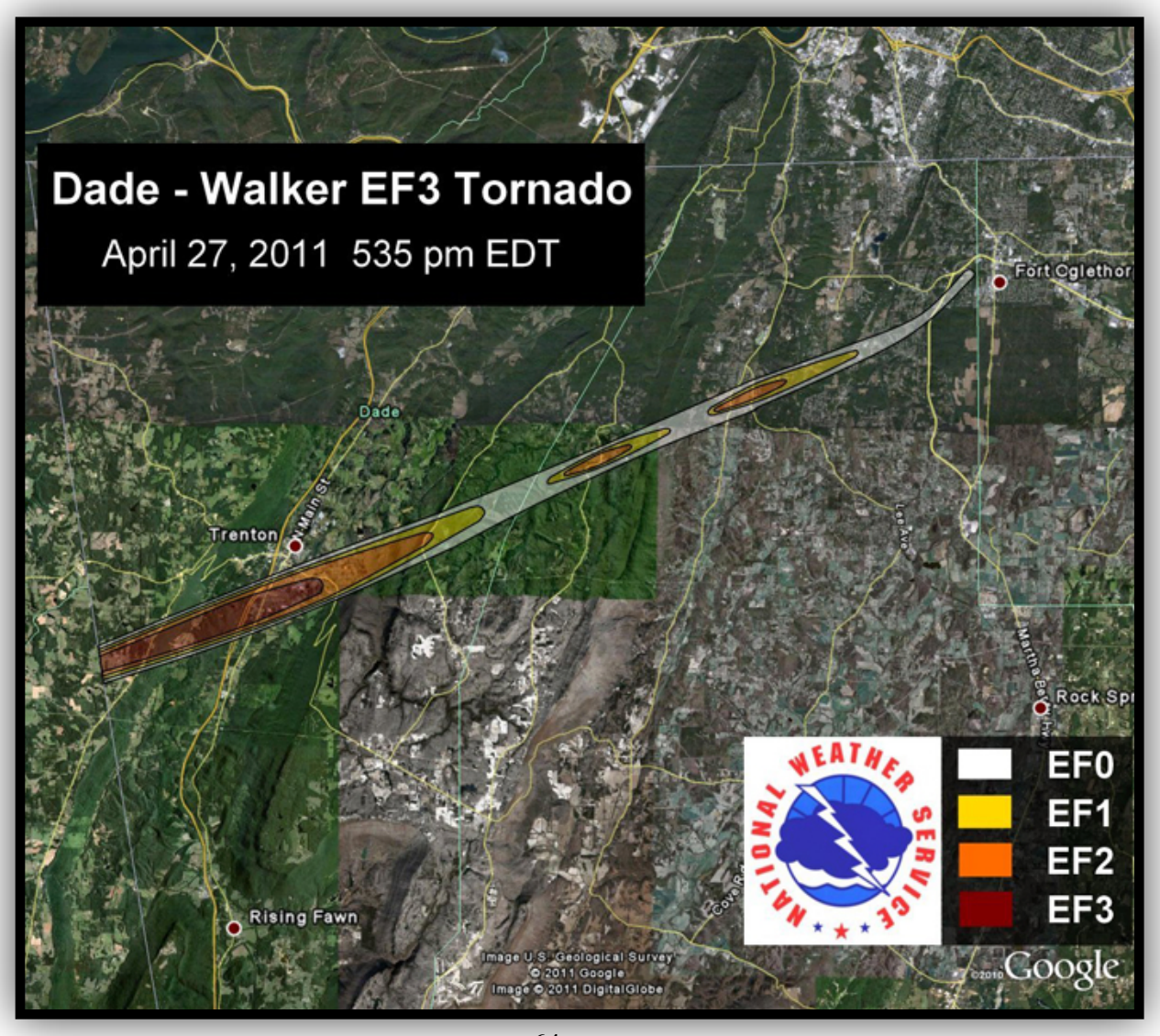
There were a total of three tornados that struck Dade County on April 27, 2011. The first was around 8:40 a.m. and the last subsiding by dark.

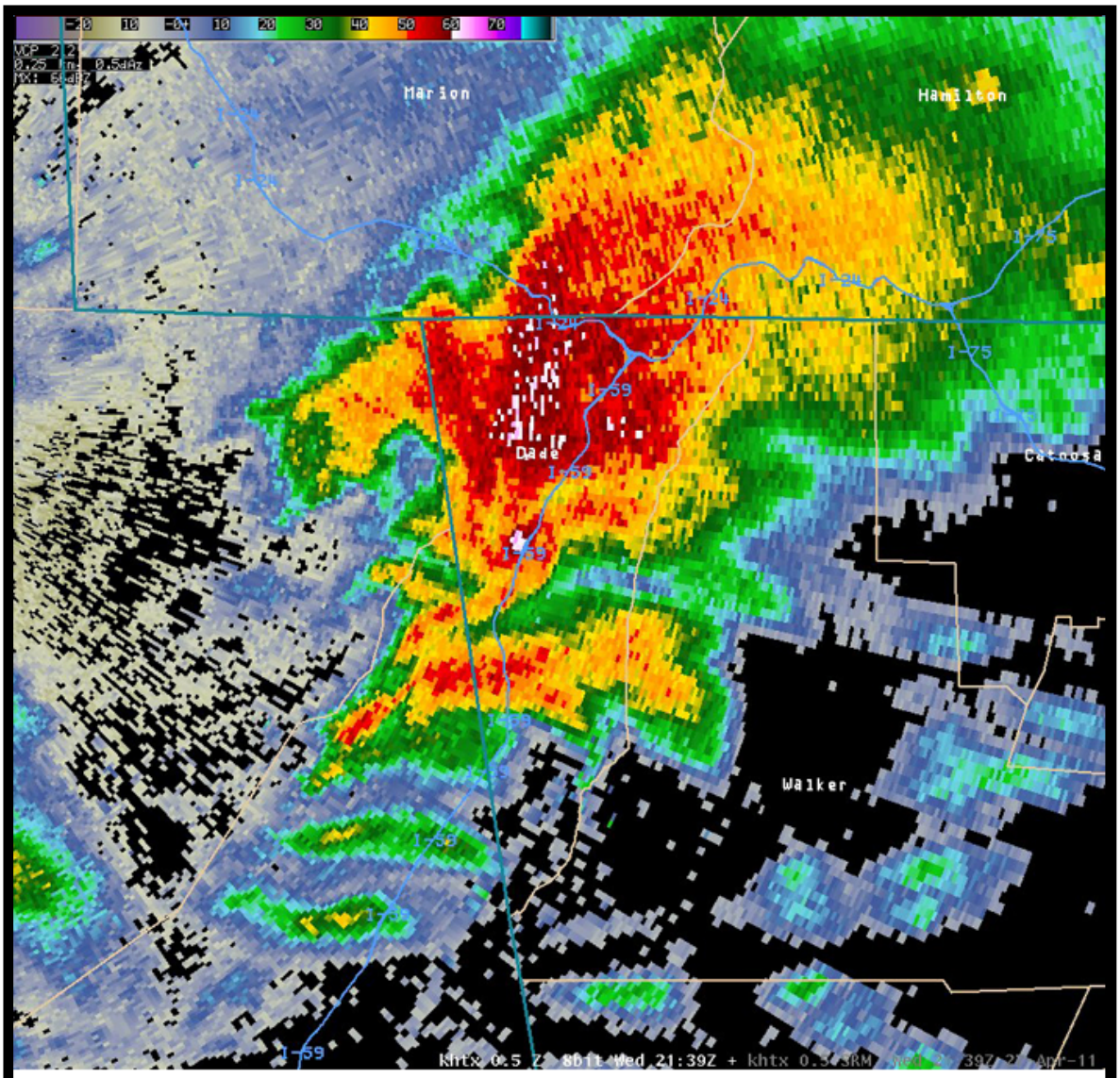






Of the three tornados, the EF3 tornado entering the County at approximately 5:35pm was by far the most intense and destructive. The following image shows the reflectivity of that tornado.

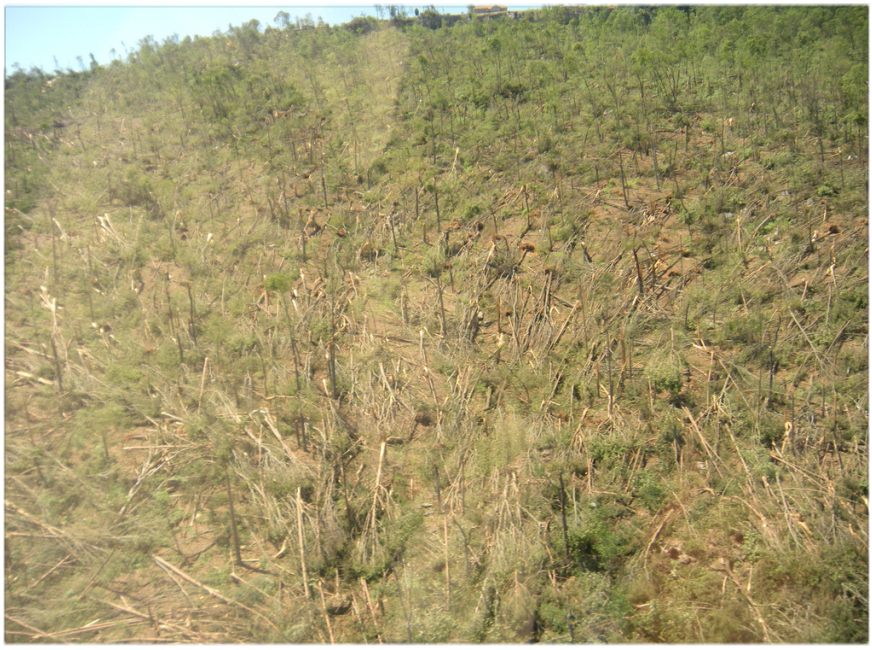




Reflectivity image of tornado in Dade County.

Image ID: wea01540, NOAA's National Weather Service (NWS) Collection
Location: Georgia, Northwest
Photo Date: 2011 April 27
Credit: NOAA/NWS/Atlanta National Weather Service Forecast Office

The storms moved along and then down Sand Mountain, into the valley and across I-59, destroying entire neighborhoods just south of downtown Trenton before they moved up Lookout Mountain.



Among the worst hit were houses in the Back Valley Road area, including the Middleton Estates subdivision on the east side. On the west side, some houses were destroyed, while others were spared or only partially damaged. Along Highway 11, Moore Funeral Home on the corner of 136 East and the Edgewood Townhouses apartment complex were heavily damaged. Individual houses along the Highway were also leveled, and in the Edgewood and Glenbrook neighborhoods the tornadoes spared some dwellings and obliterated others.

The Village Green units were totally destroyed.

The Bank of Dade facility on Highway 136 West lost the top of its drive-through.

Dade Elementary School lost part of its roof in the morning that day while children were still in attendance.

In all there were two fatalities and dozens of injuries within Dade County from the tornado outbreak in April 2011.

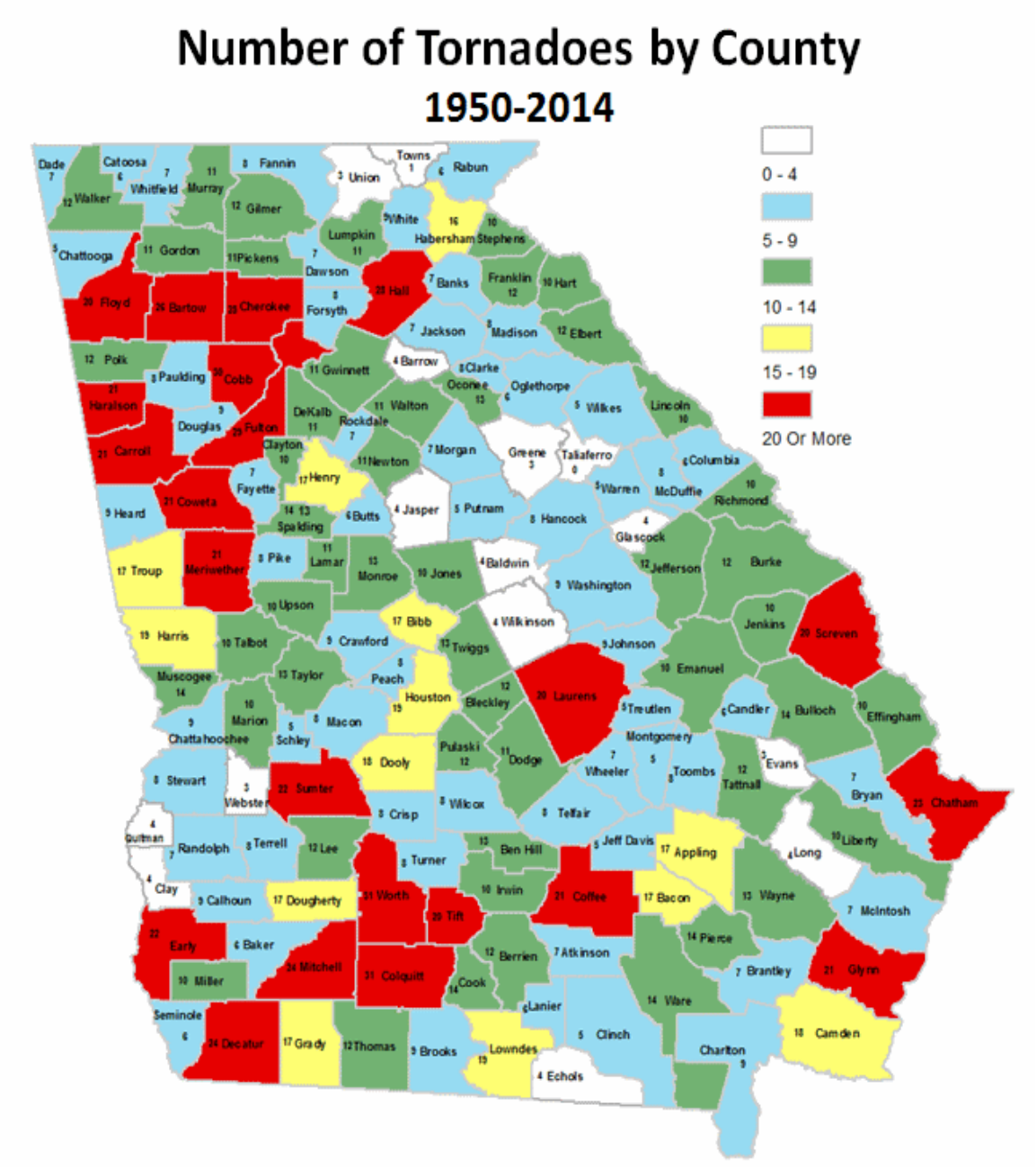
A closer look at the April 27, 2011 tornados may also reveal an unfortunate phenomena. The National Weather Service maps of the tornados that struck the two communities of Trenton and Ringgold that day show them reaching peak strength when adjacent to higher terrain. It is certainly possible that topography, such as that located throughout Dade County and northwest Georgia, actually increases tornado intensity in some cases.

National Climatic Data Center (NCDC) and other records show that nine tornados occurred within the County over the past fifty years, which equates to a 18% annual frequency of reported events. Over the past twenty years that frequency has increased considerably. It would appear that severe thunderstorm activity has increased over time within the County. This may be the case or it may simply be that record keeping and technology have improved significantly over the course of time, reflecting the higher numbers. It may also be a combination of these two factors. The following chart provides annual frequency of reported events over the past five, ten, twenty, and fifty-year periods. The most recent five-year period, covering the span of time since the last update to this Plan, is highlighted in gold.

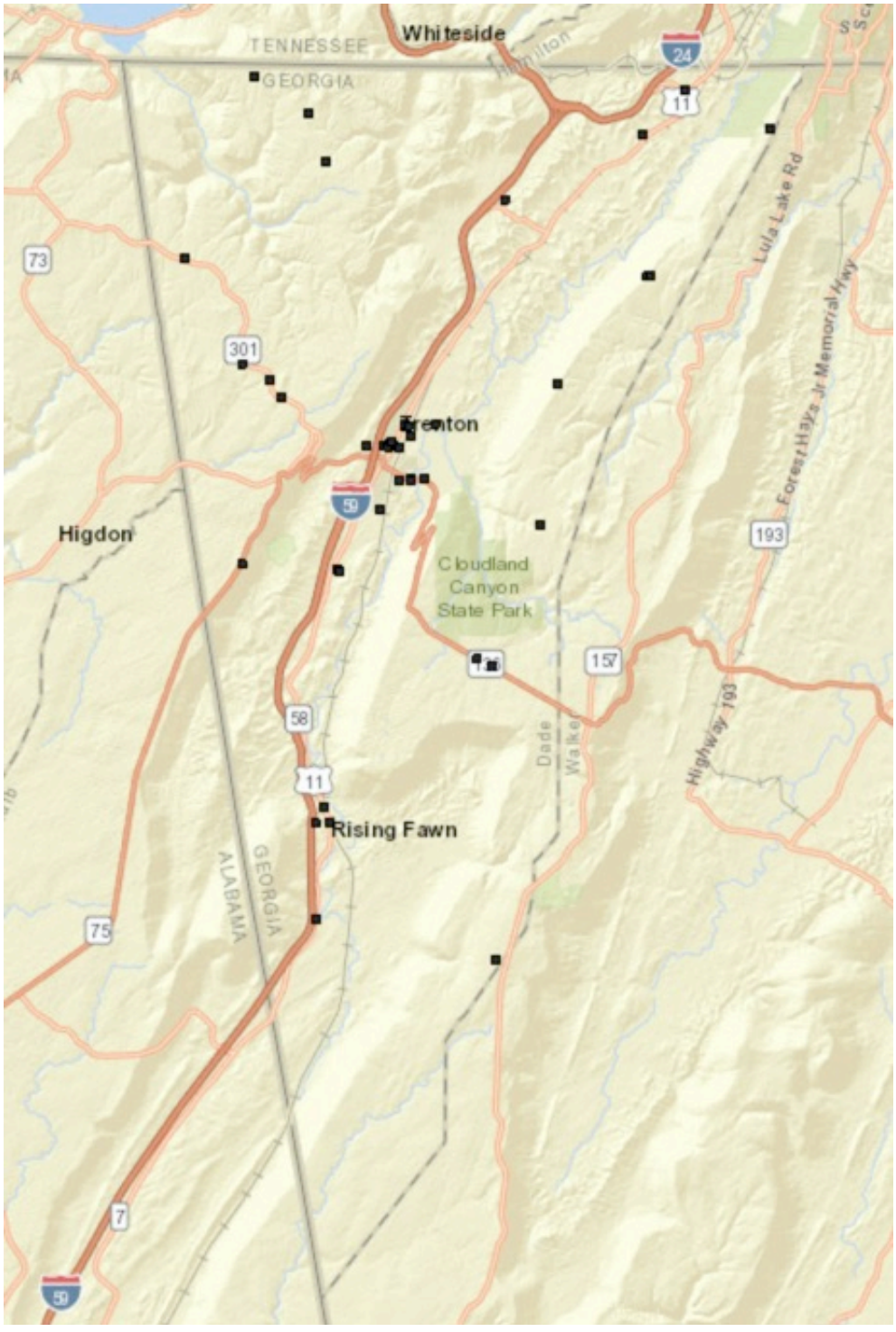
Dade County – Tornado Frequency (based on Reported Events)				
Time Period	**5yrs (2016-2020)**	**10yrs (2011-2020)**	**20yrs (2001-2020)**	**50yrs (1971-2020)**
Number of Reported Events	**1**	**5**	**7**	**9**
Frequency Average per Year	**0.20**	**0.50**	**0.35**	**0.18**
Frequency Percent per Year	**20%**	**50%**	**35%**	**18%**

The National Weather Service statewide map on the following page shows seven Dade County tornados on record from the specific time period of 1950 to 2014. However, a total of nine tornados have actually been recorded over the past fifty years (1971-2020). See the Hazard History Database (Appendix B) for information on all tornados recorded in the NCDC Database.

The most recent version of this National Weather Service map below covers the period from 1950-2014. It demonstrates historic tornado activity of the County in relationship to surrounding counties, and the entire state.

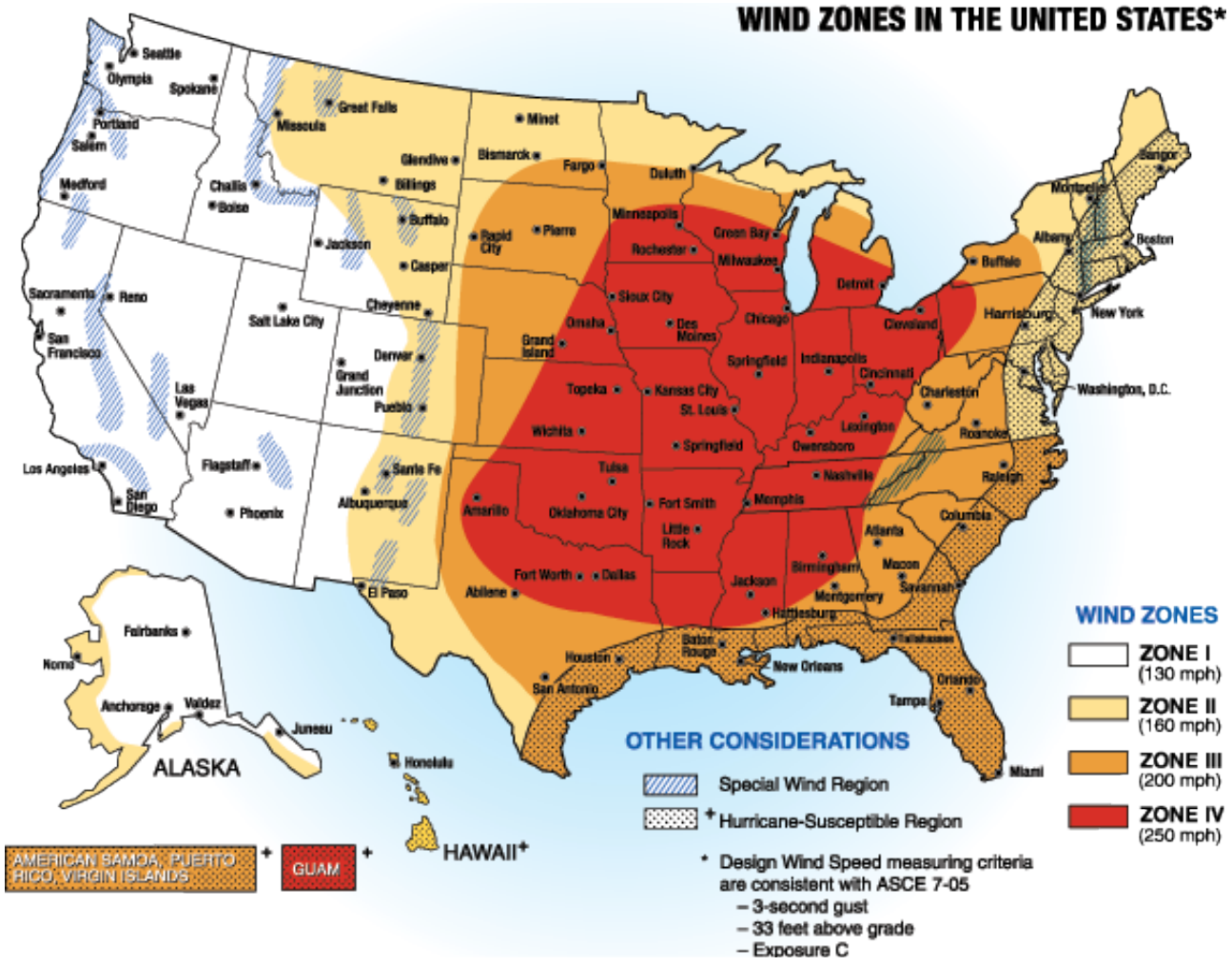


C. Assets Exposed to Hazard - Tornados are unpredictable and are indiscriminate as to when or where they strike. In evaluating assets that may potentially be impacted by the effects of tornados, the HMPC determined that all critical facilities, public and private property, are susceptible. The map below identifies critical facilities located within the hazard area which, in the case of tornados, includes the entire County.

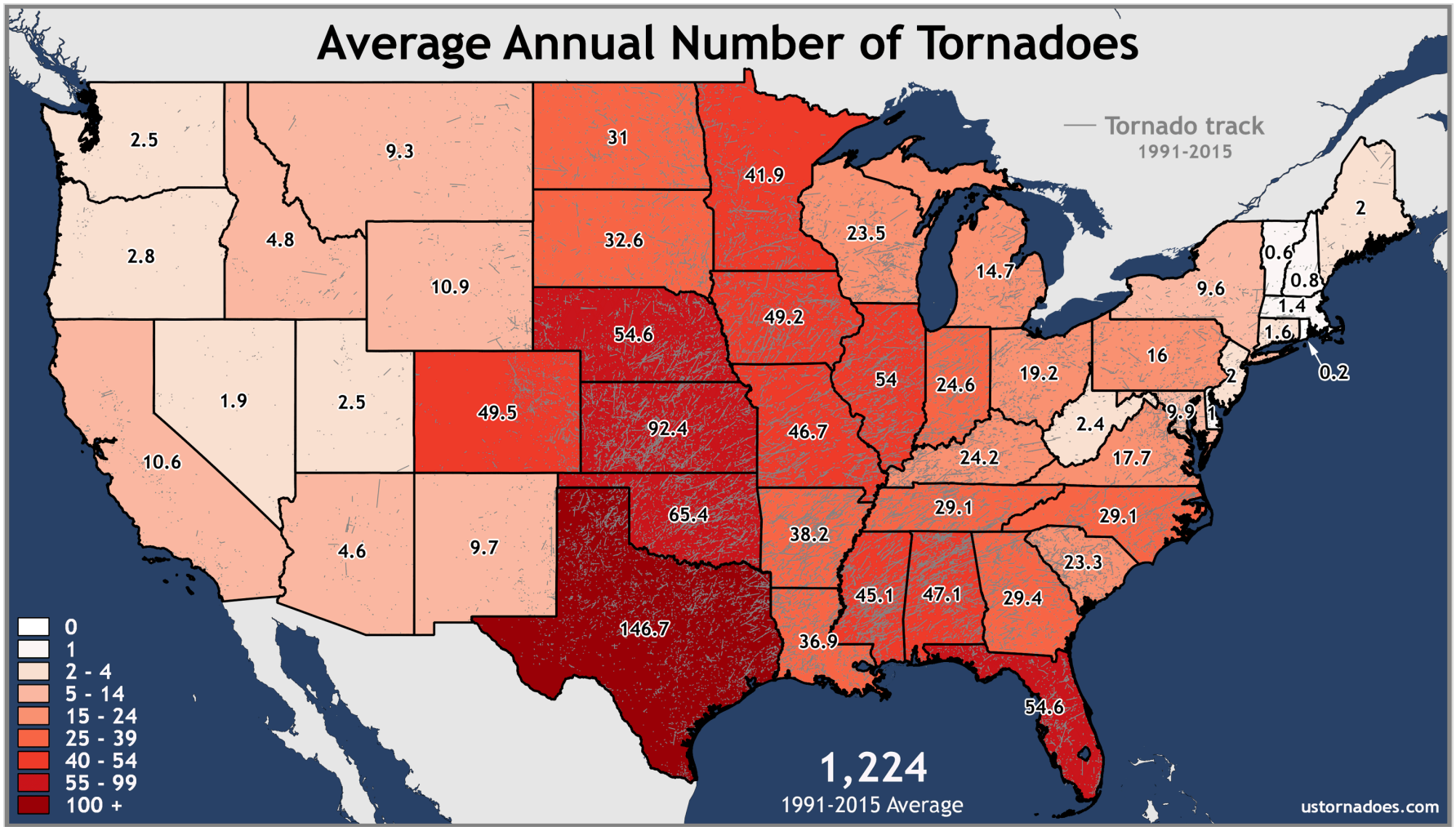


D. Estimate of Potential Losses – Reported damage estimates for tornados within Dade County have ranged from a low of $5,000 in 2015 to a record high $20 million in 2011. Due to the unpredictable nature of tornados, the potential losses could easily rise above this range in the future. In addition, with each tornado event it is likely there are unreported costs related to infrastructure and utilities repair and public safety costs, at a minimum. Much private property damage also goes unreported. Tornados have occurred in all parts of the day and night within Dade County. They have also taken place in spring, fall, and winter. Since this is a non-spatially defined hazard, it can impact all portions of Dade County and the City of Trenton. Additional loss estimate information may be found in Appendix A, the Critical Facilities Database, and Appendix D, for each jurisdiction.

Dade County is located in wind zone IV, which is associated with 250-mph design wind speeds as determined by the American Society of Civil Engineers (ASCE). Construction must adhere to the Georgia State Minimum Standard Codes (Uniform Codes Act). The minimum standards established by these codes provide reasonable protection from most natural hazards. See the following 2005 ASCE wind zone map.



The following map from USTornadoes.com was derived from National Weather Service data and shows the impact of recorded tornadoes from 1991 to 2015 by State.



E. Multi-Jurisdictional Concerns - All of Dade County and the City of Trenton have the same design wind speed of 250 mph as determined by the American Society of Civil Engineers (ASCE). Since no part of the County is immune from tornados, any mitigation steps taken related to tornados should be undertaken on a countywide basis, including the City of Trenton.

F. Hazard Summary – Dade County has one of the highest exposures to tornados in extreme northwest Georgia based upon its history. Should a tornado strike dense residential areas or critical facilities, significant damage and loss of life could occur. Due to the destructive power of tornados it is essential that the mitigation measures identified in this plan receive full consideration. Specific mitigation recommendations related to tornados are identified in Chapter 5.

2.5 Wildfire

A. Hazard Identification – The Dade County HMPC utilized data from the Georgia Forestry Commission in researching wildfires and their impact on the County.

A wildfire is defined as an uncontrolled fire occurring in any natural vegetation. For a wildfire to occur, there must be available oxygen, a supply of fuel, and enough heat to kindle the fuel. Often, these fires are begun by combustion and heat from surface and ground fires and can quickly develop into a major conflagration. A large wildfire may crown, which means it may spread rapidly through the topmost branches of the trees before involving undergrowth or the forest floor. As a result, violent blowups are common in forest fires, and on rare occasion they may assume the characteristics of a firestorm. A firestorm is a violent convection caused by a continuous area of intense fire and characterized by destructively violent surface indrafts. Sometimes it is accompanied by tornado-like whirls that develop as hot air from the burning fuel rises. Such a fire is beyond human intervention and subsides only upon the consumption of everything combustible in the locality. No records were found of such an event ever occurring within Dade County, but this potential danger should be considered when planning mitigation efforts.

The threat of wildfire varies with weather conditions: drought, heat, and wind participate in drying out the timber or other fuel, making it easier to ignite. Once a fire is burning, drought, heat, and wind all increase its intensity. Topography also affects wildfire, which spreads quickly uphill and slowly downhill. Dried grass, leaves, and light branches are considered flash fuels; they ignite readily, and fire spreads quickly in them, often generating enough heat to ignite heavier fuels such as tree trunks, heavy limbs, and the

matted duff of the forest floor. Such fuels, ordinarily slow to kindle, are difficult to extinguish. Green fuels (growing vegetation) are not considered flammable, but an intense fire can dry out leaves and needles quickly enough to allow ready ignition. Green fuels sometimes carry a special danger: evergreens, such as pine, cedar, fir, and spruce, contain flammable oils that burst into flames when heated sufficiently by the searing drafts of a wildfire.

Tools for fighting wildfires range from the standard equipment of fire departments to portable pumps, tank trucks, and earth-moving equipment. Firefighting forces specially trained to deal with wildfire are maintained by local, state and federal entities including the Dade County Fire Department, Georgia Forestry, and U.S. Forest Service. These trained firefighters may attack a fire directly by spraying water, beating out flames, and removing vegetation at the edge of the fire to contain it behind a fire line. When the very edge is too hot to approach a fire line is built at a safe distance, sometimes using strip burning or backfire to eliminate fuel in the path of the uncontrolled fire or to change the fire's direction or slow its progress. Backfiring is used only as a last resort.

The control of wildfires has developed into an independent and complex science costing approximately $100 million annually in the United States. Because of the extremely rapid spreading and customary inaccessibility of fires once started, the chief aim of this work is prevention. However, despite the use of modern techniques (e.g., radio communications, rapid helicopter transport, and new types of chemical firefighting apparatus) more than 10 million acres of forest are still burned annually. Of these fires, about two thirds are started accidentally by people, almost one quarter are of incendiary origin, and more than 10% are due to lightning.

B. Hazard Profile – Wildfires are a significant threat to Dade County due to the vast tracts of undeveloped lands. Typically, wildfires are smaller and do not cause widespread damage. That was not the case in 2016.

The year 2016 was an infamous year for Dade County with regard to wildfires. Numerous wildfires occurred during the year due in part to the regional drought that was in full force. The most significant wildfire locations during there year were the following locations:

The Tatum Gulf wildfires covered approximately 3,200 acres. This was a Federally declared emergency.

The Fox Mountain wildfires covered approximately 2,800 acres. This was also a Federally declared emergency.

Other non-declared wildfires during 2016 were located at Creek Rd, Brow Rd, Scenic Hwy, and Milton Estates.

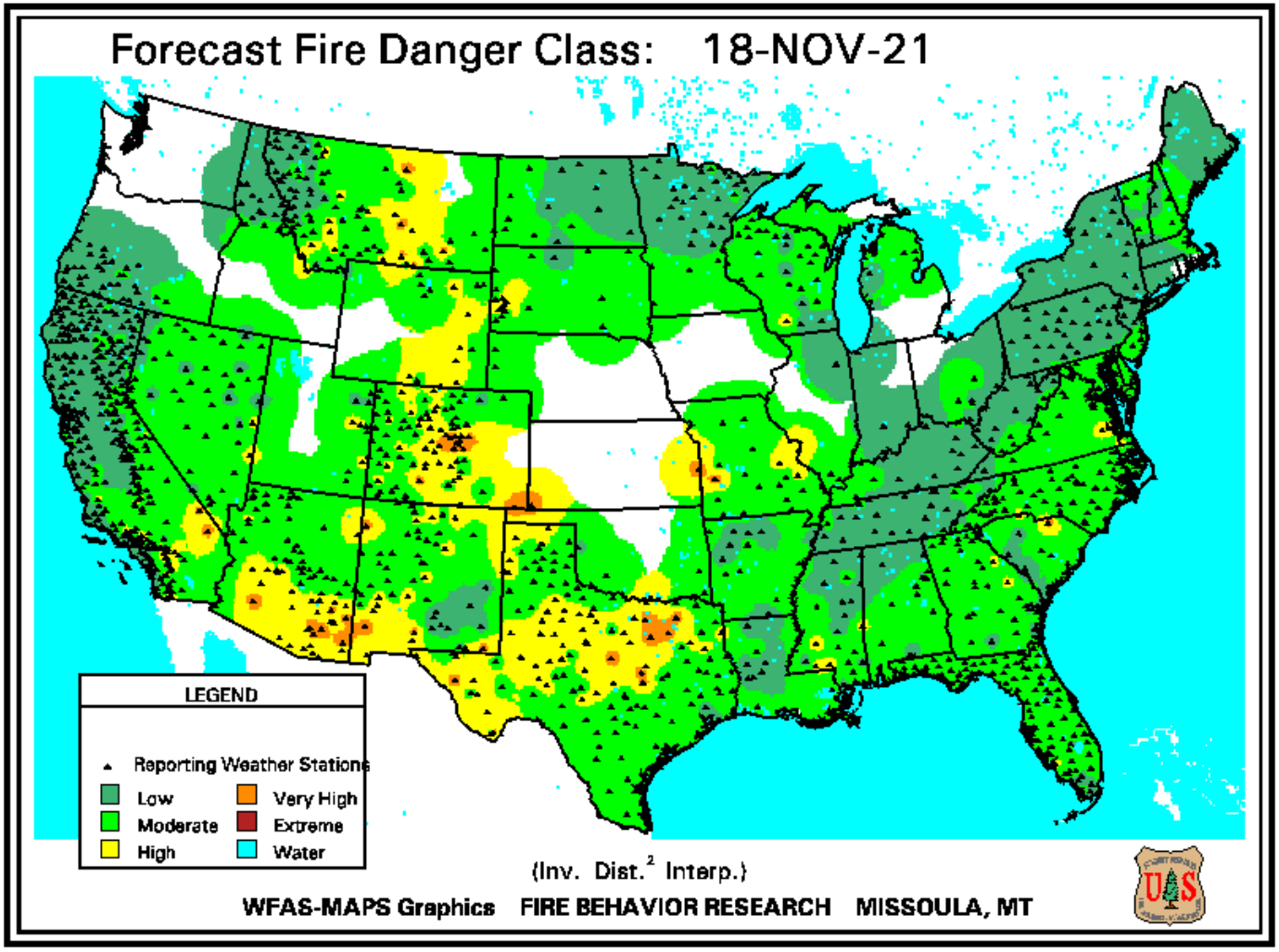
GFC records show that 4,021 wildfires occurred within the County over the past fifty years, which equates to a 8,042% annual frequency based upon reported events. However, that frequency has dropped to 4,700% in the most recent five-year period. It would appear that wildfire activity has decreased significantly over time within the County. It is also likely that reporting requirements have changed over the decades resulting in fewer reported events. It may also be a combination of these two factors. The following chart provides annual frequency of reported events over the past five, ten, twenty, and fifty-year periods. The most recent five-year period, covering the span of time since the last update to this Plan, is highlighted in gold.

Dade County – Wildfire (occurrences) (based on Reported Events)				
Time Period	**5yrs (2016-2020)**	**10yrs (2011-2020)**	**20yrs (2001-2020)**	**50yrs (1971-2020)**
Number of Reported Events	**235**	**473**	**995**	**4021**
Frequency Average per Year	**47**	**47.3**	**49.75**	**80.42**
Frequency Percent per Year	**4700%**	**4730%**	**4975%**	**8042%**

GFC records also include the amount of acreage burned each year. As with the number of occurrences, the amount of acreage burned per year has significantly decreased over the fifty-year period.

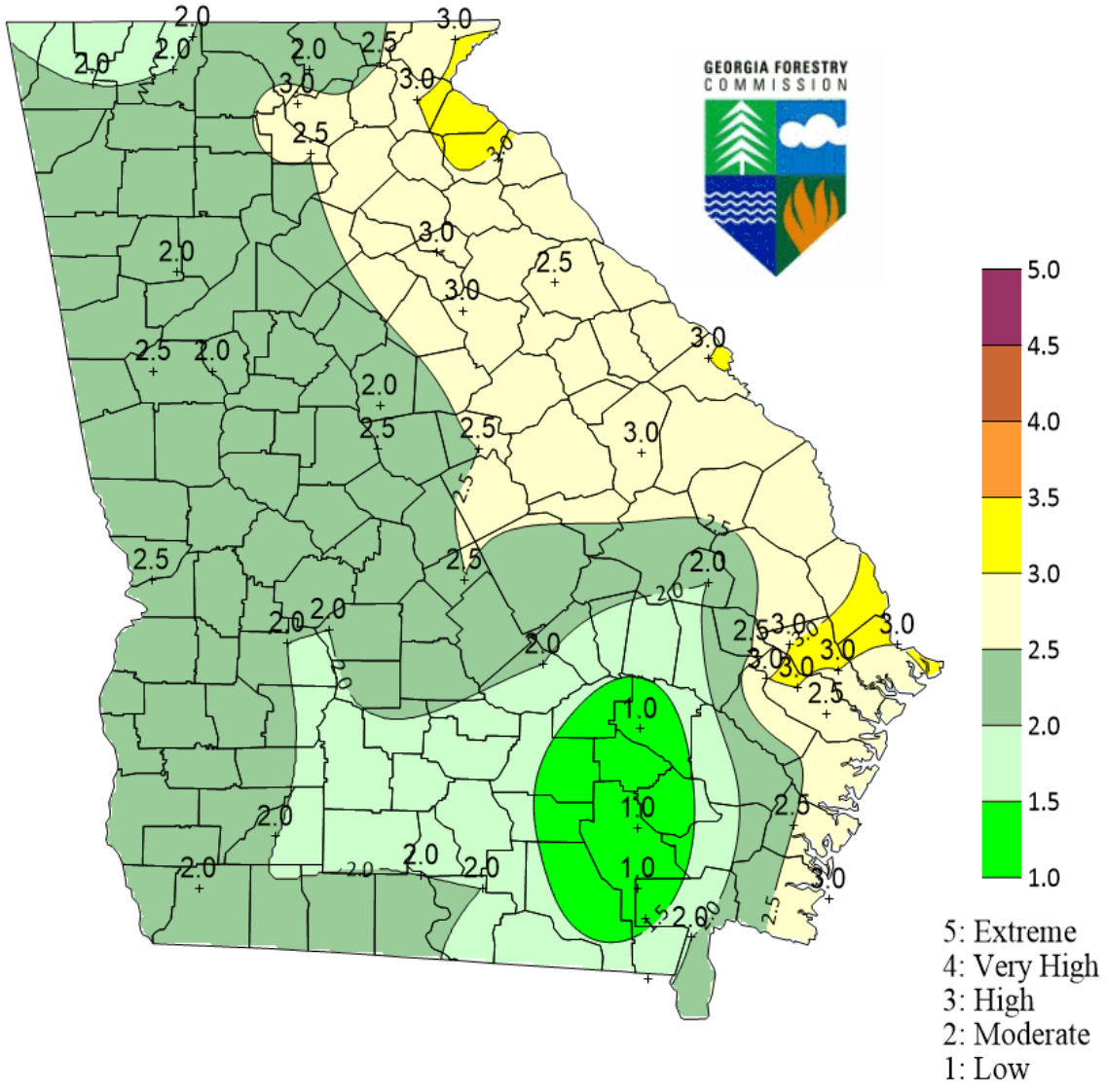
Dade County – Wildfire (acreage) (based on Reported Events)				
Time Period	**5yrs (2016-2020)**	**10yrs (2011-2020)**	**20yrs (2001-2020)**	**50yrs (1971-2020)**
Amount of Acreage Burned	**8202.86**	**15184.23**	**20478.94**	**32140.19**
Quantity Average per Year	**1640.58**	**1518.42**	**1023.95**	**642.81**

At of November 18, 2021, Dade County's threat of wildfire was classified as "moderate". However, this status can change from week to week. See map below.



The GFC Forecast Fire Danger Map below forecasts the fire danger threat on a daily basis. As of November 17, 2021, Dade County's fire danger level was considered "moderate".

Forecast Fire Danger for Tomorrow
Produced at November 17, 2021 130pm EST



C. Assets Exposed to Hazard – In evaluating assets that are susceptible to wildfire, the committee determined that all public and private property is susceptible to wildfire, including all critical facilities.

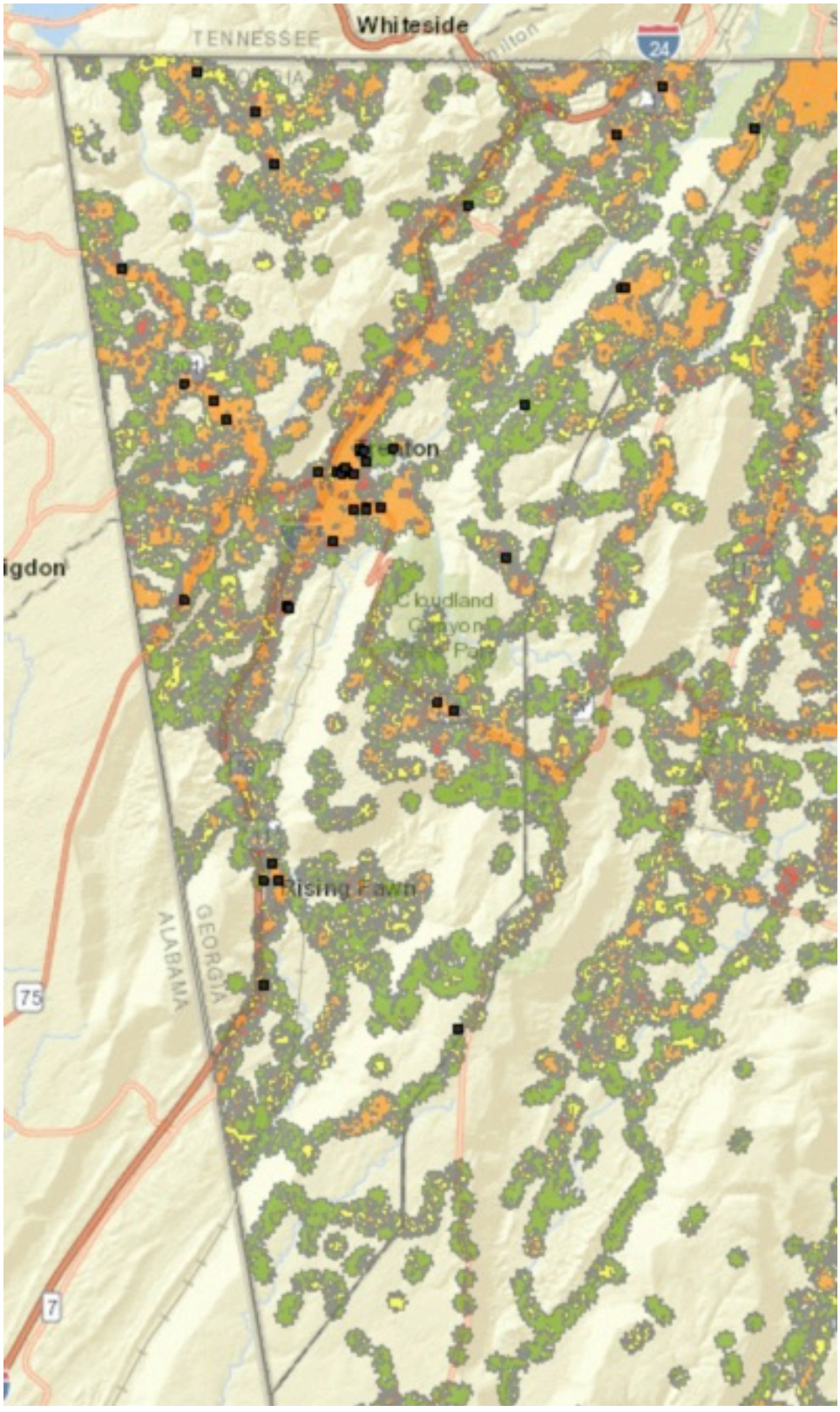
The Wildland Fire Risk maps on the following pages display the wildfire risk potential for Dade County and the City of Trenton, including locations of critical facilities within the hazard areas. Most portions of the County and City have been classified under Wildfire Threat Categories 0, 1 or 2, among the lowest threats on a scale of 0 to 4. However, numerous small areas near and to the north of Trenton are classified under Wildfire Threat Category 3 (Moderate Threat) or Wildfire Threat Category 4 (High Threat).

The following key applies to each of the maps.

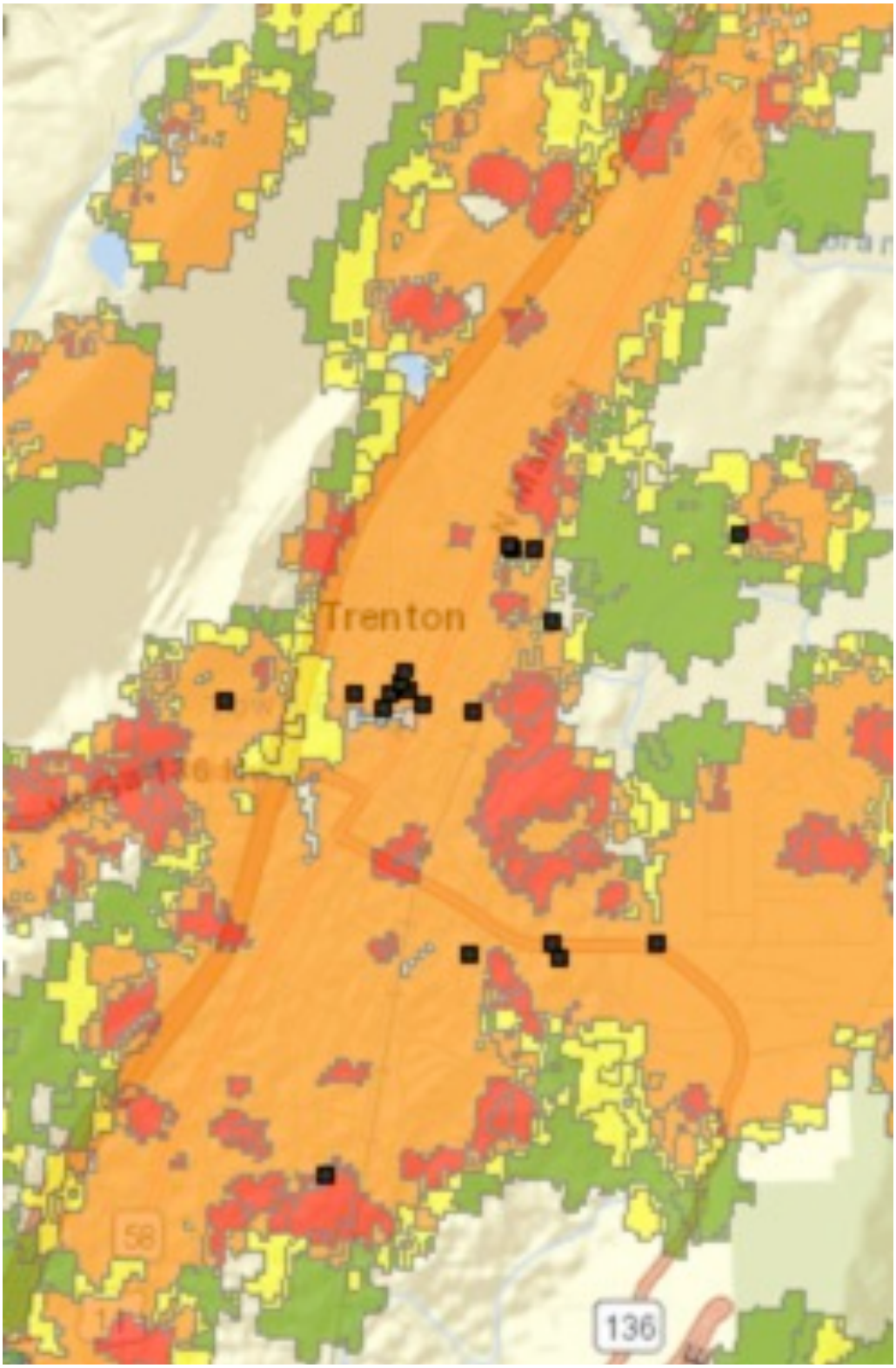
	Wildfire Threat Category	Description
	0	LOWEST THREAT: includes areas with no houses, areas with bodies of water, agricultural areas, and/or cities
	1	VERY LOW THREAT
	2	LOW THREAT
	3	MODERATE THREAT
	4	HIGH THREAT
	*	ALL OTHER VALUES

The Wildfire Risk Layer was based on the USDA Forest Service, RMRS Fire Sciences Laboratory "Wildland Fire Risk to Flammable Structures, V 1.0" map. Although this data was not intended for use at a detail greater than state-wide analysis, it has been included as the best available data on wildfire risk. The scores are based on the risk value from the original layer. The horizontal positional accuracy is unknown for this layer.

Dade County:


Whiteside
TENNESSEE
24
Cloudland
Canyon
Rising Fawn
ALABAMA
GEORGIA
75
7

City of Trenton



The SouthWRAP Fire Intensity Scale map and related discussion on the following pages display a detailed wildfire risk potential for Dade County and the City of Trenton. This information is included in the current Southern Wildfire Risk Assessment Summary Report for Dade County as developed by the Southern Group of State Foresters.

Description

Characteristic Fire Intensity Scale (FIS) specifically identifies areas where significant fuel hazards and associated dangerous fire behavior potential exist based on a weighted average of four percentile weather categories. Similar to the Richter scale for earthquakes, FIS provides a standard scale to measure potential wildfire intensity. FIS consist of 5 classes where the order of magnitude between classes is ten-fold. The minimum class, Class 1, represents very low wildfire intensities and the maximum class, Class 5, represents very high wildfire intensities. Refer to descriptions below.

Class 1, Very Low:

Very small, discontinuous flames, usually less than 1 foot in length; very low rate of spread; no spotting. Fires are typically easy to suppress by firefighters with basic training and non-specialized equipment.

Class 2, Low:

Small flames, usually less than two feet long; small amount of very short range spotting possible. Fires are easy to suppress by trained firefighters with protective equipment and specialized tools.

Class 3, Moderate:

Flames up to 8 feet in length; short-range spotting is possible. Trained firefighters will find these fires difficult to suppress without support from aircraft or engines, but dozer and plows are generally effective. Increasing potential for harm or damage to life and property.

Class 4, High:

Large Flames, up to 30 feet in length; short-range spotting common; medium range spotting possible. Direct attack by trained firefighters, engines, and dozers is generally ineffective, indirect attack may be effective. Significant potential for harm or damage to life and property.

Class 5, Very High:

Very large flames up to 150 feet in length; profuse short-range spotting, frequent long-range spotting; strong fire-induced winds. Indirect attack marginally effective at the head of the fire. Great potential for harm or damage to life and property.

For all Southern states, except Texas, this dataset was derived from updated fuels and canopy data as part of the 2010 SWRA Update Project recently completed in May 2014. For Texas, the 2010 Texas risk update data is portrayed.

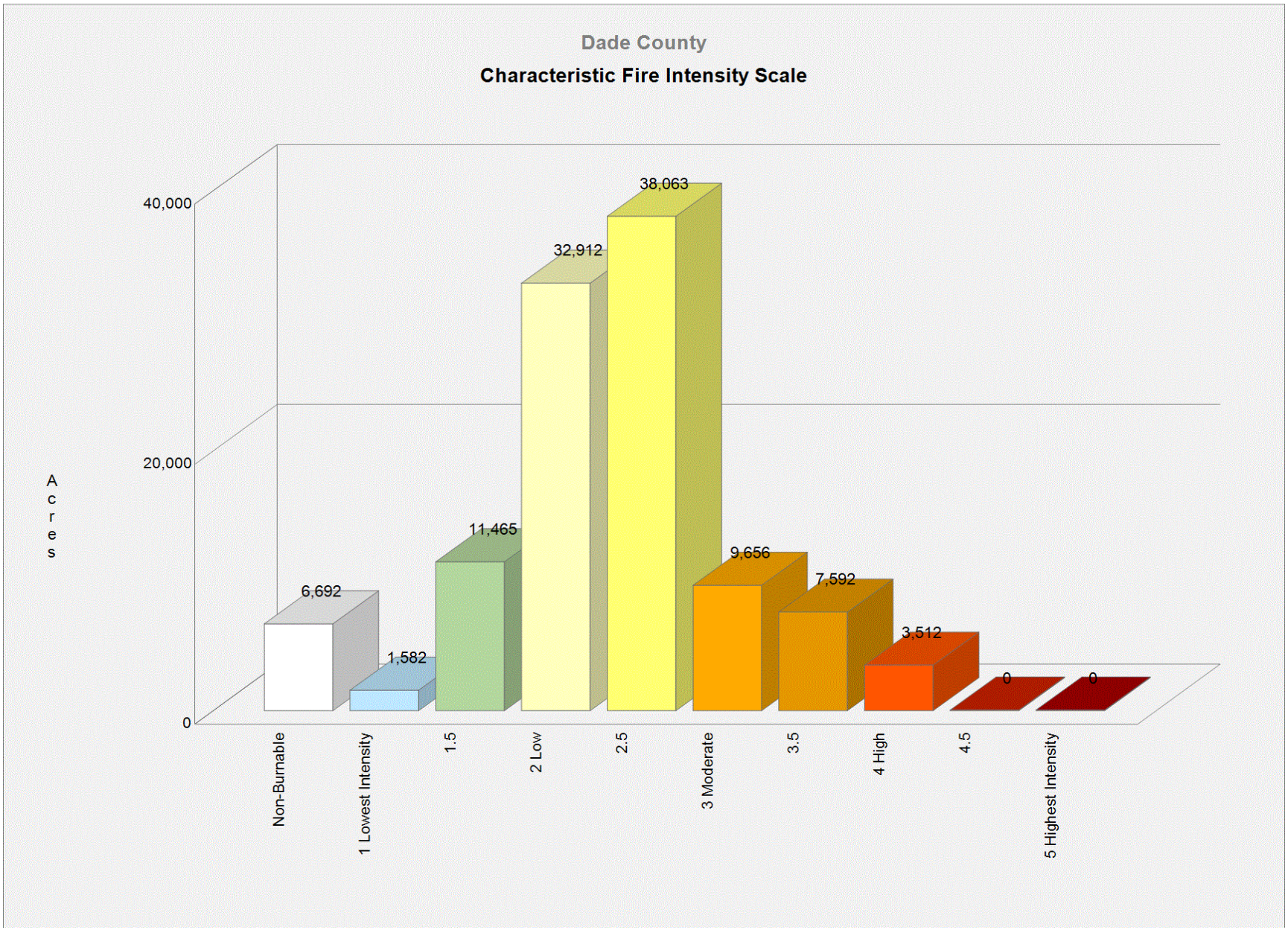
To aid in viewing on the map, FIS is presented in 1/2 class increments. Please consult the SouthWRAP User Manual for a more detailed description of the FIS class descriptions.

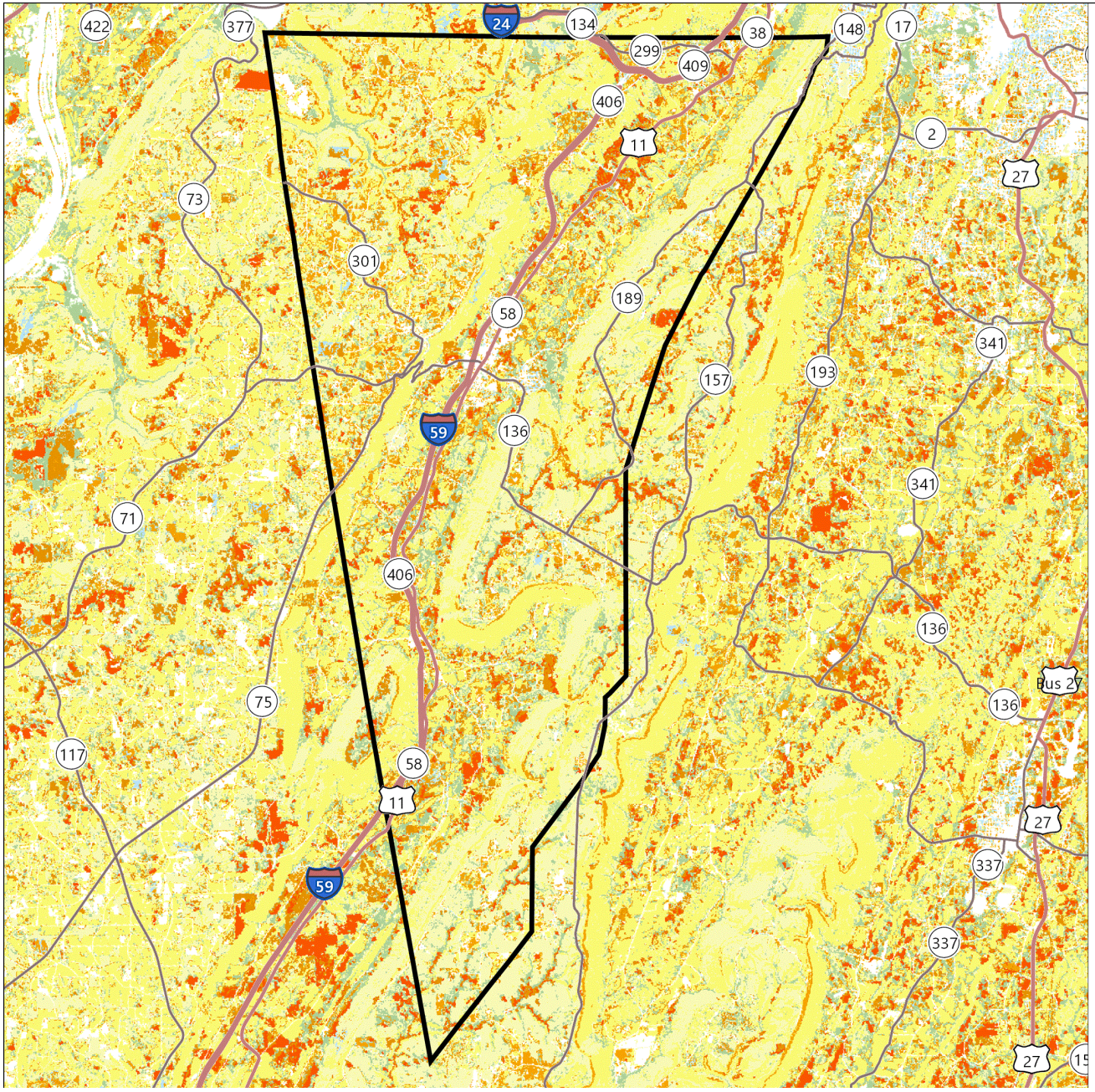
Since all areas in the South have fire intensity scale calculated consistently, it allows for comparison and ordination of areas across the entire region.

Fire intensity scale is a fire behavior output, which is influenced by three environmental factors - fuels, weather, and topography. Weather is by far the most dynamic variable as it changes frequently. To account for this variability, four percentile weather categories were created from historical weather observations to represent low, moderate, high, and extreme weather days for each weather influence zone in the South. A weather influence zone is an area where, for analysis purposes, the weather on any given day is considered uniform.

The fire intensity scale map is derived at a 30-meter resolution. This scale of data was chosen to be consistent with the accuracy of the primary surface fuels dataset used in the assessment. While not appropriate for site specific analysis, it is appropriate for regional, county or local planning efforts.

Class	Acres	Percent
Non-Burnable	6,692	6.0 %
1 Lowest Intensity	1,582	1.4 %
1.5	11,465	10.3 %
2 Low	32,912	29.5 %
2.5	38,063	34.1 %
3 Moderate	9,656	8.7 %
3.5	7,592	6.8 %
4 High	3,512	3.2 %
4.5	0	0.0 %
5 Highest Intensity	0	0.0 %
Total	111,474	100.0 %


Dade County
Characteristic Fire Intensity Scale
Acres
40,000
20,000
0
6,692
1,582
11,465
32,912
38,063
9,656
7,592
3,512
0
0
Non-Burnable
1 Lowest Intensity
1.5
2 Low
2.5
3 Moderate
3.5
4 High
4.5
5 Highest Intensity



Dade County

Fire Intensity Scale

- 1 - Lowest Intensity
- 1.5
- 2 - Low
- 2.5
- 3 - Moderate
- 3.5
- 4 - High
- 4.5
- 5 - Highest Intensity

5.47 mi
11738.9 m

N

SOUTHERN GROUP OF STATE FORESTERS

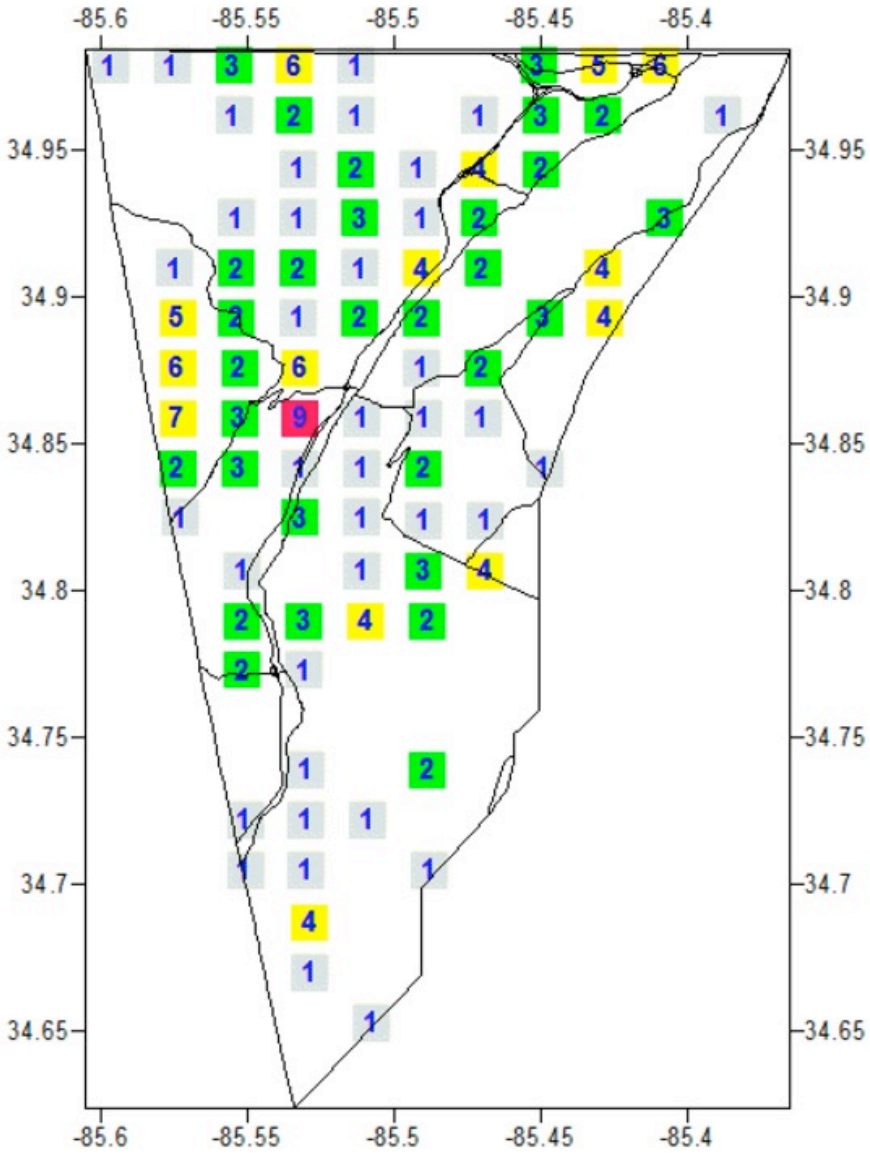
Southern Wildfire Risk Assessment
https://southernwildfirerisk.com/

The following information and maps are contained within the current Community Wildfire Protection Plan (CWPP) for Dade County updated August 2018.

Fire activity in Dade County has been consistent with historical trends in past years. The County has always had a problem with large incendiary fires especially in remote areas along the state lines with Tennessee and Alabama. The higher statewide average size during FY 2017 was influenced by the large fires that occurred in Northern Georgia, of which a large percentage of the acreage burned that year was in Dade County. The following table outlines fire activity from 2013 through 2017. As can be seen the average size is consistently larger than the statewide average. This can largely be attributed to a few large fires each year in remote areas that require hand suppression. The map that follows shows fire occurrences within Dade County from 2012 through 2016.

Fiscal Year	Number of Fires in Dade County	Number of Fires Statewide Average	Acres burned in Dade County	Average Size	Statewide Average Size
2017	74	38	5,802.95	78.42	11.60
2016	33	15	147.67	4.47	4.13
2015	42	20	319.34	7.60	4.50
2014	68	21	1,774.53	26.10	5.02
2013	26	26	412.63	15.87	4.75

Fire Occurrence Map for Dade County for Fiscal Year 2012-2016

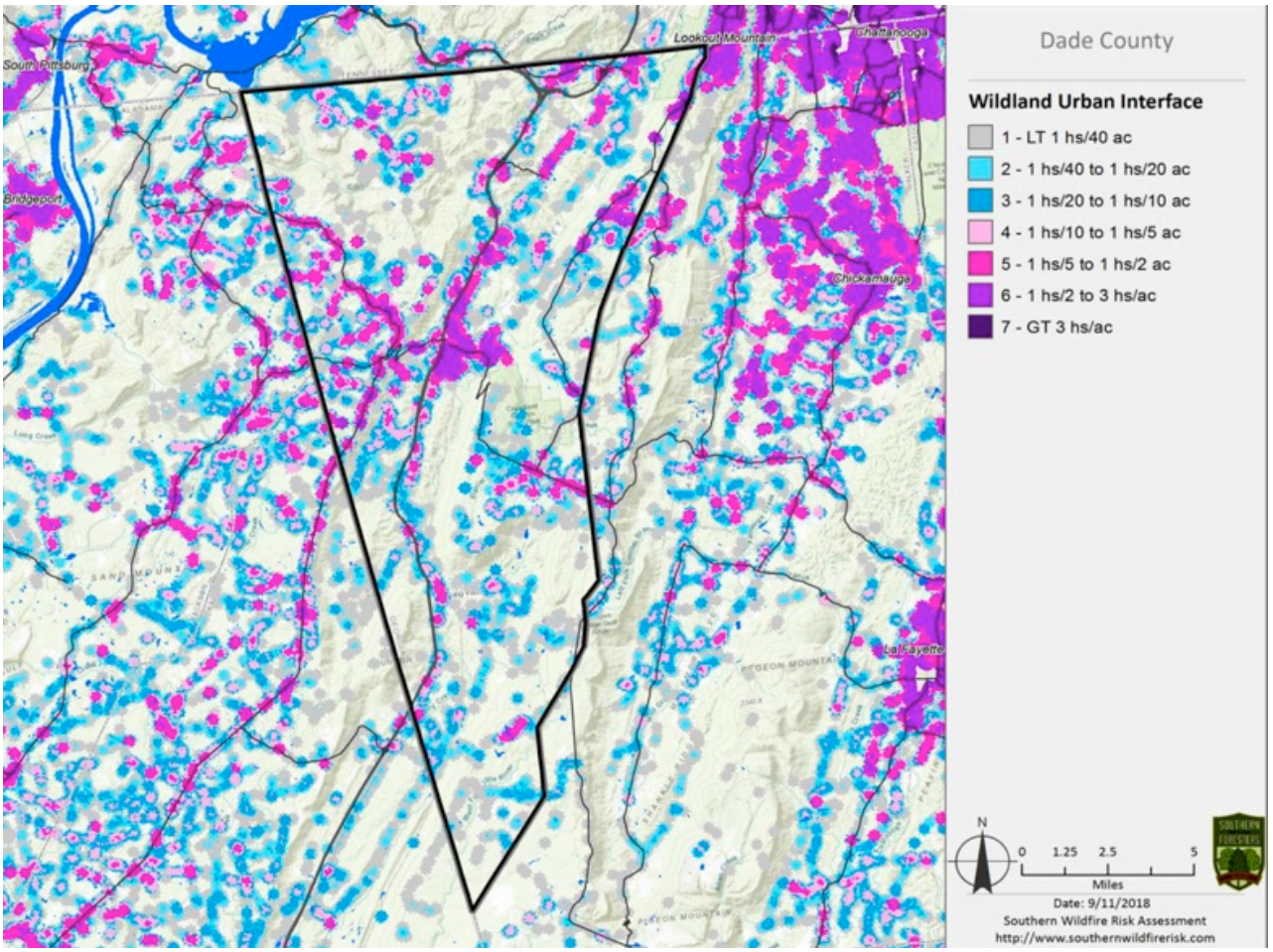


GEORGIA FORESTRY COMMISSION

1 to 2
2 to 4
4 to 8
8 to 15
15 to 50

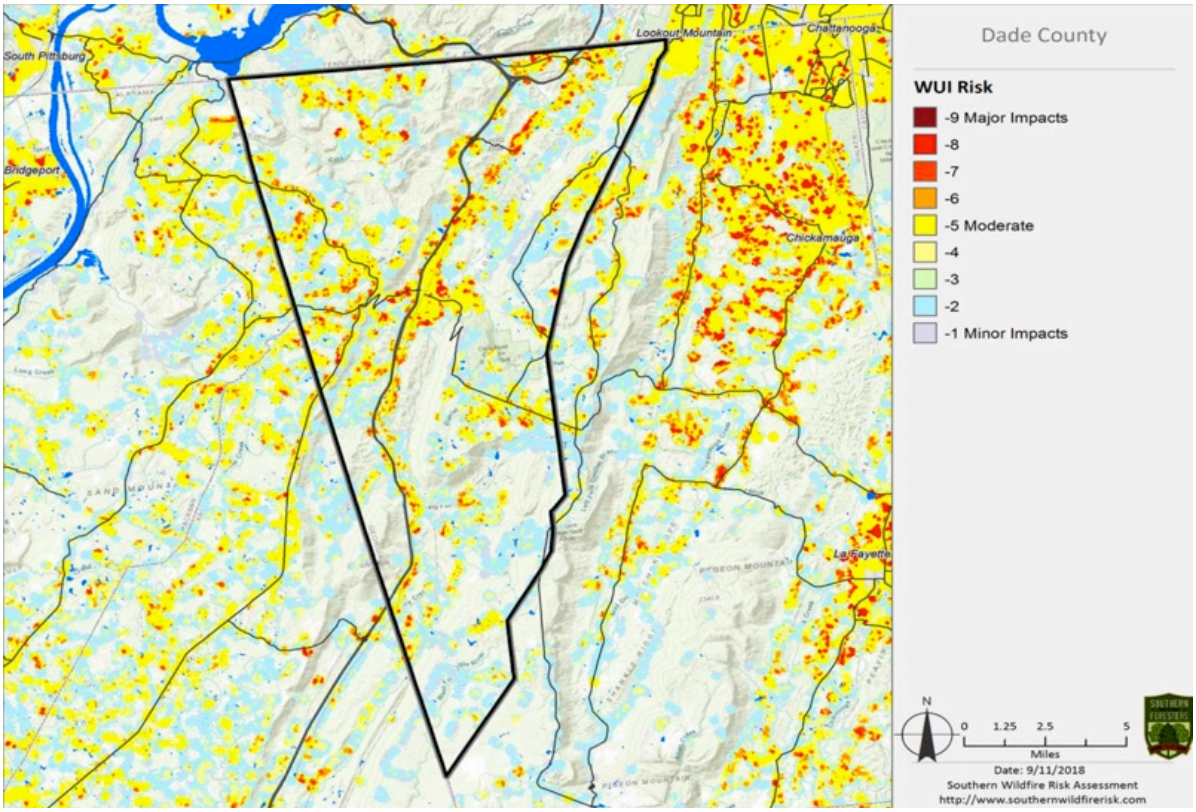
GEORGIA FORESTRY COMMISSION

Wildland Urban Interface (WUI) Map

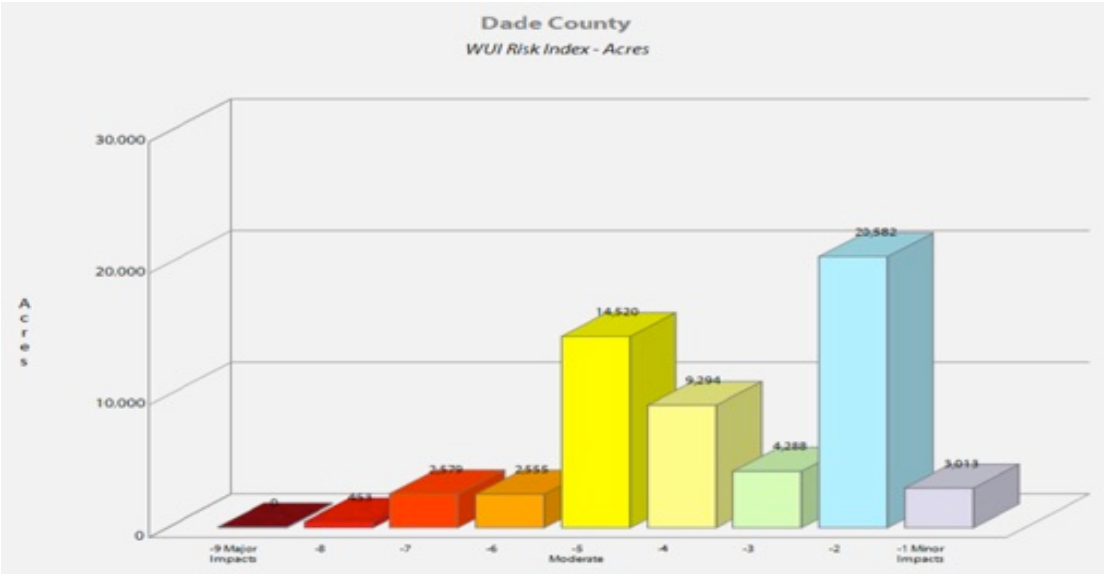


WUI is described as the area where structures and other human improvements meet and intermingle with undeveloped wildland or vegetative fuels. Population growth within the WUI substantially increases the risk from wildfire. For the Dade County project area, it is estimated that 16,525 people or 100 percent of the total project area population (16,573) live within the WUI. The Wildland Urban Interface (WUI) layer reflects housing density depicting where humans and their structures meet or intermix with wildland fuels.

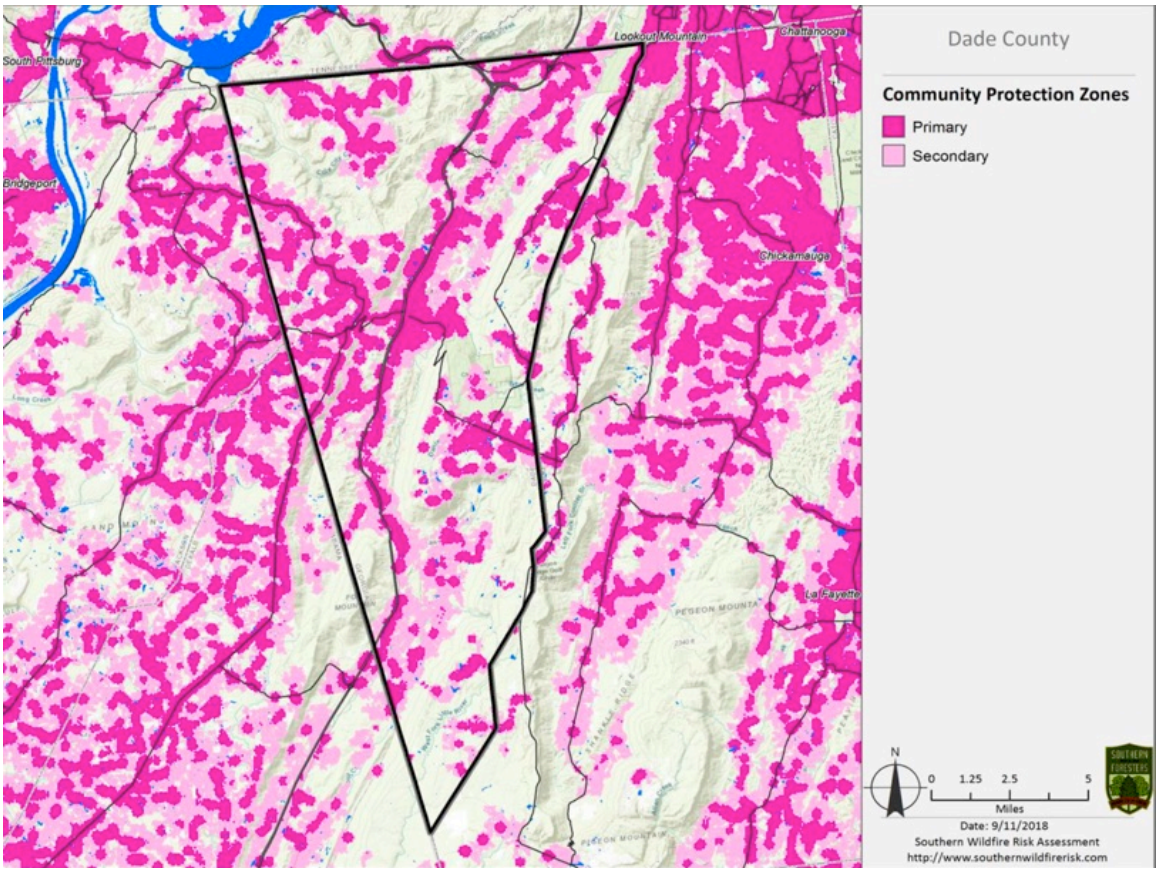
WUI Risk Index Map



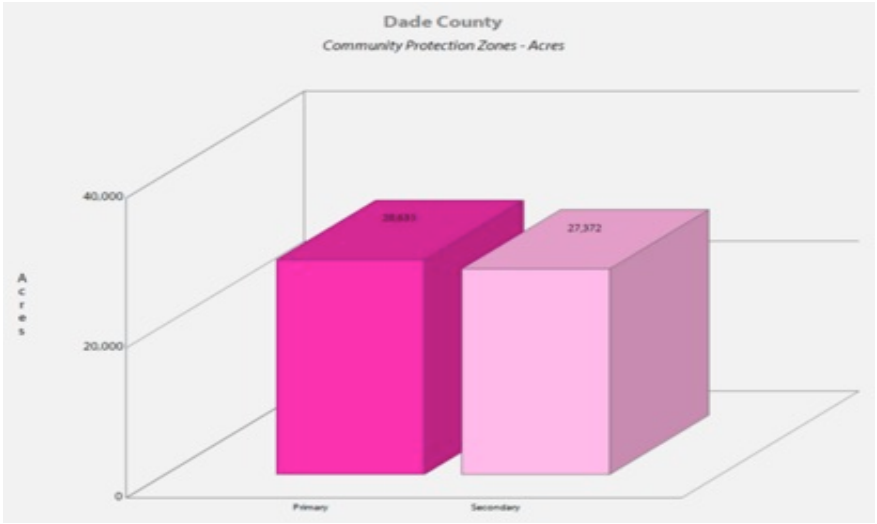
The Wildland Urban Interface (WUI) Risk Index layer is a rating of the potential impact of a wildfire on people and their homes. The key input, WUI, reflects housing density (houses per acre) consistent with Federal Register National standards. The location of people living in the Wildland Urban Interface and rural areas is key information for defining potential wildfire impacts to people and homes.



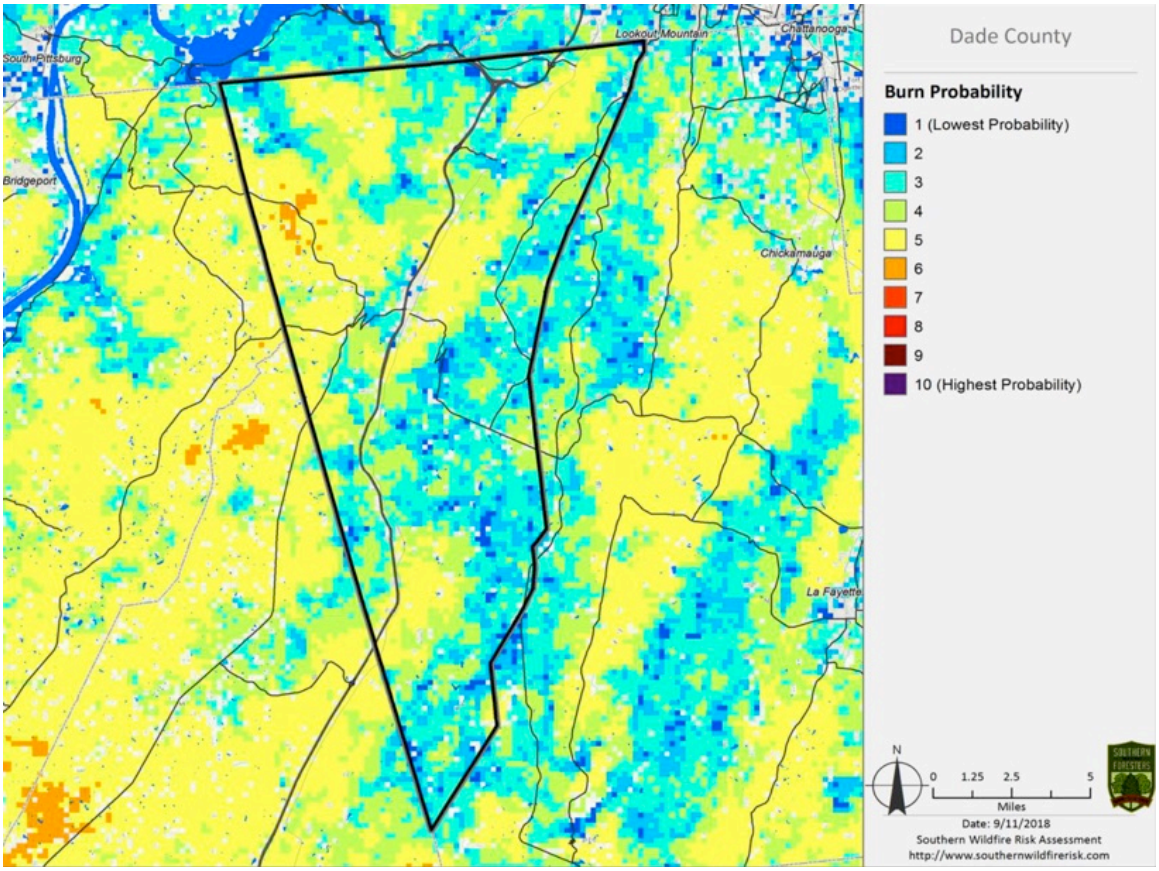
Community Protection Zones (CPZ) Map



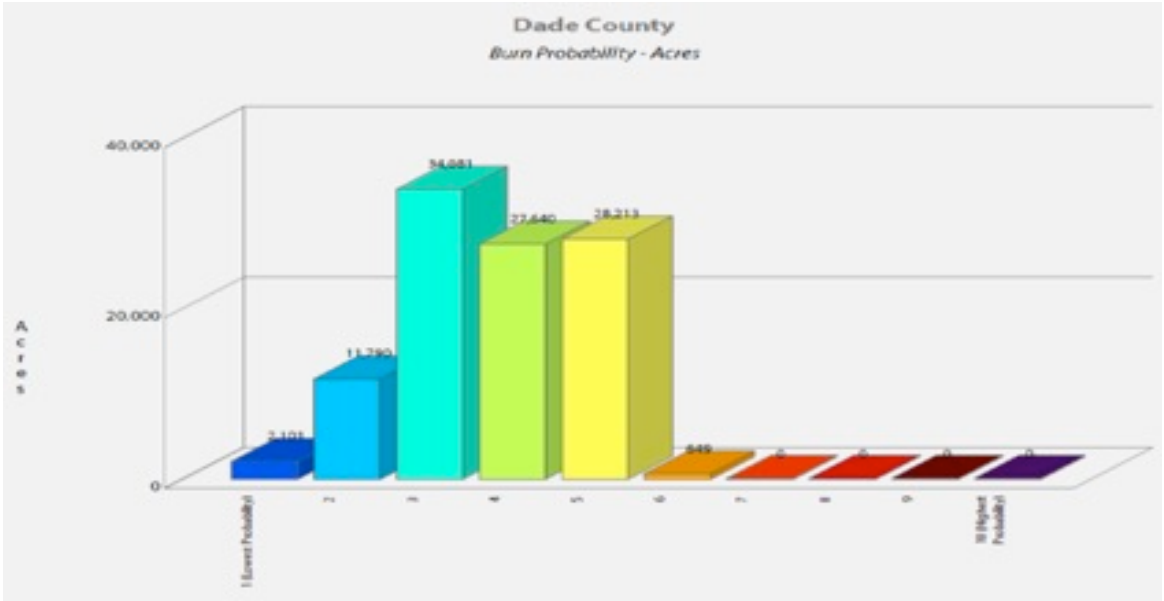
Community Protection Zones (CPZ) represent those areas considered highest priority for mitigation planning activities. CPZs are based on an analysis of the Where People Live housing density data and surrounding fire behavior potential. Rate of Spread data is used to determine the areas of concern around populated areas that are within a 2-hour fire spread distance. This is referred to as the Secondary CPZ.



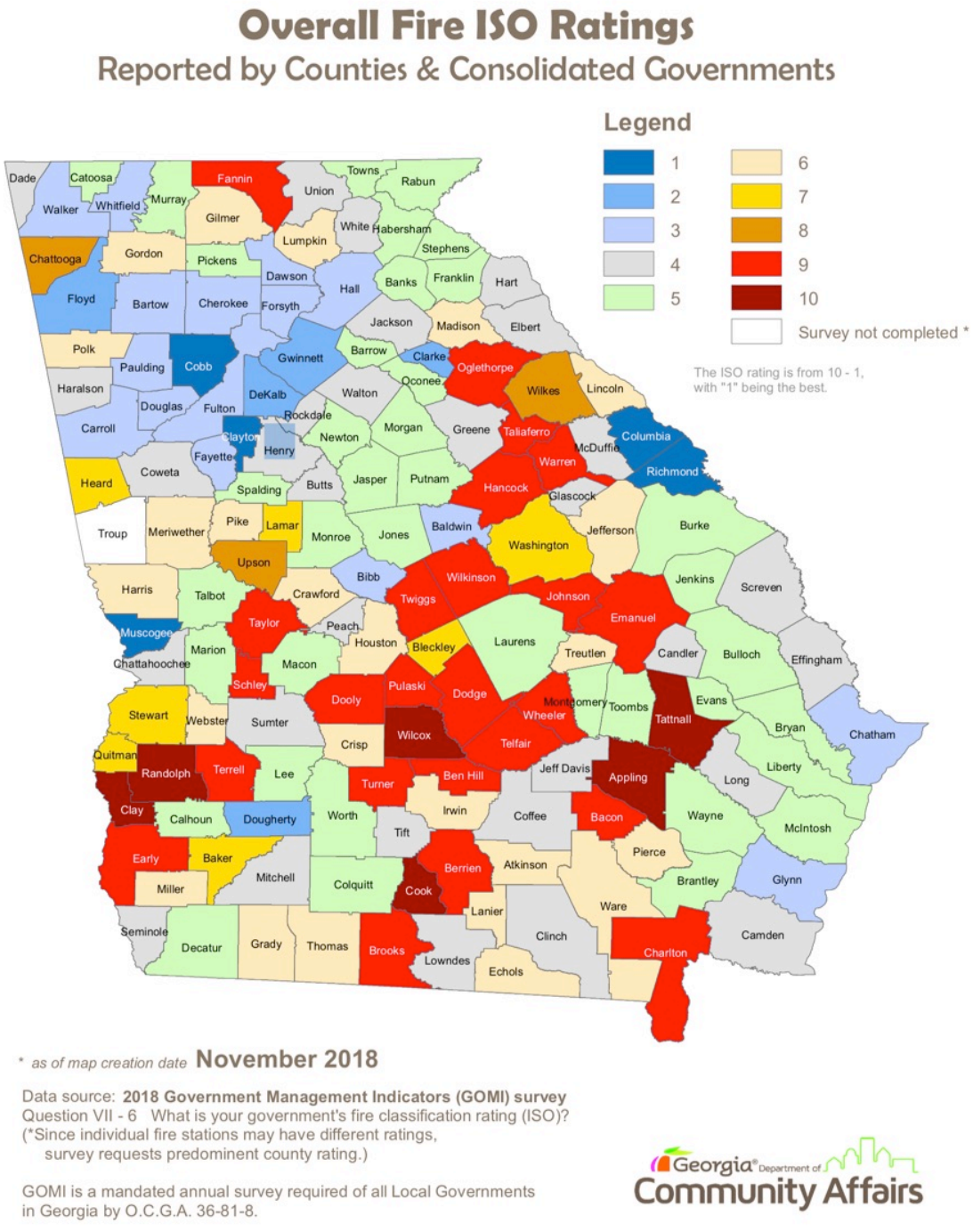
Burn Probability Map



The Burn Probability (BP) layer depicts the probability of an area burning given current landscape conditions, percentile weather, historical ignition patterns and historical fire prevention and suppression efforts.



Dade County continues its efforts to reduce exposure to wildfire. After the latest review by the Insurance Services Office (ISO), the County's ISO rating is 4. See map below.



D. Estimate of Potential Losses – In most of the documented cases of wildfire within Dade County, relatively little information on damages, in terms of dollars, was available. The potential commercial value of the land lost to wildfire cannot be accurately calculated, other than replacement costs of structures and infrastructure. With regard to the land itself, aside from the loss of timber and recreation, the damage is essentially inestimable in terms of land rendered useless by ensuing soil erosion, elimination of wildlife cover and forage, and the loss of water reserves collected by a healthy forest. Additional loss estimate information may be found in Appendix A, the Critical Facilities Database, and Appendix D, for each jurisdiction.

E. Multi-Jurisdictional Concerns – Any portion of Dade County has to potential to be impacted by wildfire. One reason for this is the common interface between urban developments and the forest. Most portions of the County and the City are located within Wildfire Threat Categories 1 through 2, which are considered "low" threat categories. However, some areas north and west of the City of Trenton appear particularly vulnerable to wildfire. Any steps taken to mitigate the effects of wildfire should be undertaken on a countywide basis and include the City of Trenton.

F. Hazard Summary – Wildfires pose a serious threat to Dade County in terms of property damage, as well as injuries and loss of life. Wildfires are one of the most frequently occurring natural hazards within the County each year. Based on the frequency of this hazard, as well as its ability to inflict devastation most anywhere in the County, the mitigation measures identified in this plan should be aggressively pursued. Specific mitigation actions related to wildfire are identified in Chapter 5.

2.6 Drought

A. Hazard Identification –The term "drought" has various meanings, depending upon context. To a farmer, a drought is a period of moisture deficiency that affects the crops under cultivation (even two weeks without rainfall can stress many crops during certain periods of the growing cycle). To a water manager, a drought is a deficiency in water supply that affects water availability and water quality. To a meteorologist, a drought is a prolonged period when precipitation is less than normal. To a hydrologist, a drought is an extended period of decreased precipitation and streamflow.

Drought is a normal, recurrent feature of climate. It occurs almost everywhere, although its features vary from region to region. Droughts in Georgia historically have severely affected municipal and industrial water supplies, agriculture (including both livestock and crops), stream water quality, recreation at major reservoirs, hydropower generation, navigation, and forest resources. Drought is also a key factor in wildfire development by making natural fuels (grass, brush, trees, dead vegetation) more fire prone.

In Georgia, droughts have been documented at U.S. Geological Survey (USGS) streamflow gaging stations since the 1890\s. From 1910 to 1940, about 20 streamflow gaging stations were in operation. Since the early 1950s through the late 1980s, about 100 streamflow gaging stations were in operation. Currently, the USGS streamflow gaging network consists of more than 135 continuous-recording gages. Groundwater levels are currently monitored at 165 wells equipped with continuous recorders.

Note: When researching drought, one term that is frequently used is *recurrence interval*. The recurrence interval is the average time between droughts of a given severity. For instance, in a drought with a 25-year recurrence interval the low streamflows occur, on average, once every 25 years.

B. Hazard Profile – The Dade County HMPC reviewed historical data from the National Oceanic and Atmospheric Administration (NOAA), the National Climatic Data Center (NCDC), the U.S. Geological Survey (USGS), the Georgia Department of Natural Resources (GA DNR) and the Georgia Forestry Commission (GFC) in researching drought events of the County and the State. Most historical information related to drought within this Plan has been derived from USGS streamflow data and NOAA precipitation data. Due to the nature of drought to affect large areas of the State simultaneously and the availability of only very limited County-specific drought information, the threat of drought is looked at within this Plan from a statewide perspective. Similarly, due to limited month-by-month information on drought, this hazard will be quantified on an annual basis (either there was a drought or there was not for any given year within the State). These guidelines are also used in Appendix B and Appendix C with regard to historical hazard information.

In the State of Georgia significant drought events, as identified by USGS, NOAA and other sources, have occurred in 23 of the last 50 years. Dade County was affected to varying degrees in each of those years. According to this information, drought conditions were experienced approximately 46% of the time during this 50-year period.

Some of the most extreme droughts to affect the State include the following:

1903-1905: According to the USGS, the 1903 to 1905 drought is "the earliest recorded severe drought in Georgia." In 1904, the U.S. Weather Bureau (today's National Weather Service) reported, "Levels in streams and wells were the lowest in several years. Many localities had to conserve water for stock and machinery and many factories were forced to close or operate at half capacity." When the 1903 drought struck, farm jobs dried up as quickly as the fields. The cities attracted many of these workers who migrated to Atlanta.

1924-1927: The drought that struck from 1924 to 1927 affected a wider area than simply north Georgia, affecting the Coosa River and Altamaha Basin as well at the Chattahoochee River. The U.S. Weather Bureau reported the lowest stream levels ever recorded in north Georgia in July-September of 1925, stating that the drought not only affected agricultural operations, but industrial operations as well. The scarcity of water had a profound influence on industrial and agricultural conditions in Georgia. This may have been the first time Georgia media used the term "Drought of the Century". Combined with the ongoing devastation from the boll weevil and technological advances in agriculture that increased efficiency and thereby reduced the number of farm jobs, migration from rural Georgia to urban Georgia increased significantly. The impact of this drought, plus other natural events, helped send the Georgia economy into a depression well before the rest of the United States.

1930-1935: Although the drought of 1930-1935 had little long term impact on north Georgia, it contributed to the ongoing economic problems throughout the state and the United States as a whole. The USGS reports that the severity of this drought "exceeded a 25-year recurrence interval" in central and southwestern Georgia and affected much of the Country. In extreme northern and southeastern Georgia, the recurrence interval was 10–25 years. This period was also referred to as the "Drought of the Century."

Central Georgia - 1936

1938-1944: Many of the same areas that suffered during the 1930 to 1935 drought endured severe drought again from 1938 to 1944. The drought of 1938-1944 struck the upper Coosa River basin and the Chattahoochee River basin. According to USGS the recurrence interval exceeded 50 years in those areas. In extreme northern and southwestern Georgia, the drought had recurrence intervals of 10–25 years. It was this drought that convinced politicians to move towards massive hydroelectric projects that would supply power and keep water available to constituents throughout long dry spells. One of the key supporters of hydroelectric power in the United States was Senator Richard B. Russell, member of the Senate Appropriations Committee. The first such dam in the State, Allatoona, was begun in 1941 and completed after World War II.

1950-1957: A large statewide drought lasted from 1950 to 1957. Most streamflows had recurrence intervals exceeding 25 years according to USGS. The catastrophic drought devastated crops by 1954. This event also earned the title as "Drought of the Century." This drought was most severe in southern Georgia, with most streamflows having recurrence intervals exceeding 25 years. In northeastern Georgia, the drought severity also exceeded the 25-year recurrence interval. The low rainfall affected the length of time it took to fill Lake Lanier for the first time since its creation in 1950 and completion in 1956. In northwestern Georgia, the recurrence interval of the drought was between 10 and 25 years.

1976-1978: According to USGS, beginning in 1976, the weather over southwest Georgia turned towards a persistent pattern of late-summer drought including parts of the Chattahoochee Valley.

1980-1982: The 1980 to 1982 drought resulted in the lowest streamflows since 1954 in most areas, and the lowest streamflows since 1925 in others. Recurrence intervals of 10–25 years were common in most of Georgia. Pool levels at four major reservoirs receded to the lowest levels since first filling. Groundwater levels in many observation wells were lower than previously observed. Nearly continuous declines were recorded in some wells for as long as 20 consecutive months, and water levels remained below previous record lows for as long as nine consecutive months.

1985-1989: Many North Georgia residents remember the drought of 1985 to 1989 that saw Lake Lanier reach its lowest levels since it was filled in 1950. Streamflows touched the lows reached during the 1925 drought. Water-supply shortages occurred in Georgia in 1986. Shortages first occurred in a few Atlanta metropolitan systems, primarily because of large demand and small reservoir storage. As the drought continued, other systems in the southern part of the metropolitan area also had water-supply problems, as did several municipalities in northern and central Georgia. During 1986, the U.S. Army Corps of Engineers significantly decreased the release of water from Lake Lanier, but reservoir levels continued to recede to about 2 feet above the record minimum lake level. Ground-water levels in northern Georgia were significantly less than normal during the 1985 to 1989 drought, and shortages in ground-water supplies from domestic wells occurred in the northern one-third of the State.

1998-2003: From 1998 until 2003, with a brief respite in 2000-2001, North Georgia suffered through a historic drought. The term "historic," in this instance, is used by weathermen to describe a drought of unusually long duration, one of the three measures of a drought. While the regional impact of a long-term drought is massive, in North Georgia's case, the drought's effect was mitigated, simply because of technology, mostly the dams built by the Corps of Engineers and others. Earlier droughts, however, did not have the benefit of these dams and had a "historic" impact on North Georgia. Shortages of surface-water supplies similar to those during 1986 occurred in the 1998 to 2003 drought. Water shortages during the summer of 2000 prompted the Georgia Department of Natural Resources to institute statewide restrictions on outdoor water use.

2006-2009: Beginning in late 2006 another drought struck north Georgia, on the heels of the earlier 5-year drought. River levels plummeted, causing lakes to fill up more slowly when water was released. Georgia politicians battled against the Army Corps of Engineers' continuous flow requirement for Lake Lanier due to the looming water shortages. The Georgia Environmental Protection Division (EPD) declared a level four drought response across the northern third of Georgia, including Dade County, which prohibits most types of outdoor residential water use effective immediately.

Lake Lanier and Lake Allatoona 2007 (L to R)

Lake Hartwell 2008

2011-2012: For two years beginning in 2011, the County was impacted once again by a relatively short, but severe drought.

2016-2017: The most recent drought began in 2016 and ended in 2017.

Agricultural crop damage during periods of drought is difficult to estimate. Water supplies, industries, power generation, agriculture, forests, wetlands, stream water quality, navigation, and recreation for the State of Georgia have been severely impacted over time. Because of the extremely unpredictable nature of drought (to include duration), reliably calculating a recurrence interval is difficult. The Hazard Frequency Table in Appendix C analyzes historical data from the past fifty years to provide a general idea of the frequency of drought within the State.

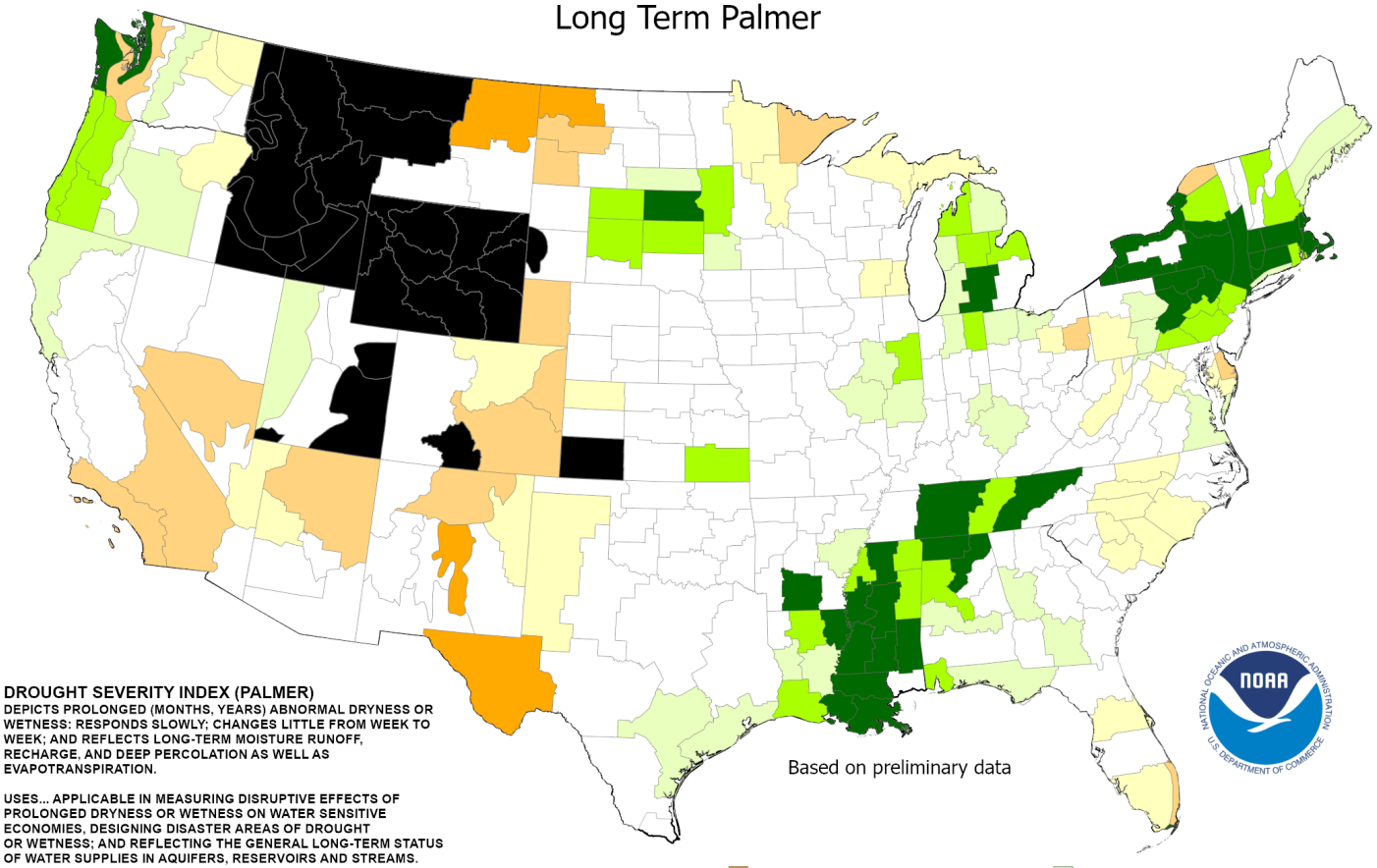
The following three maps represent current and forecasted drought conditions. Each of these maps is updated on a regular basis. Drought conditions can change very rapidly and must be continuously monitored.

The first map is the Palmer Drought Severity Index map which shows current drought conditions nationwide and is updated weekly. According to the map, the County's current drought status, as of November 13, 2021, is "near normal".

The second map, the U.S. Seasonal Drought Outlook, forecasts likely drought conditions through February 28, 2022, which indicates that there are no drought conditions expected in Dade County for this time period.

The third map, U.S. Drought Monitor, indicates that as of November 18, 2021, Dade County is experiencing no drought conditions.

Drought Severity Index by Division
Weekly Value for Period Ending Nov 13, 2021
Long Term Palmer



DROUGHT SEVERITY INDEX (PALMER)

DEPICTS PROLONGED (MONTHS, YEARS) ABNORMAL DRYNESS OR WETNESS: RESPONDS SLOWLY; CHANGES LITTLE FROM WEEK TO WEEK; AND REFLECTS LONG-TERM MOISTURE RUNOFF, RECHARGE, AND DEEP PERCOLATION AS WELL AS EVAPOTRANSPIRATION.

USES... APPLICABLE IN MEASURING DISRUPTIVE EFFECTS OF PROLONGED DRYNESS OR WETNESS ON WATER SENSITIVE ECONOMIES, DESIGNING DISASTER AREAS OF DROUGHT OR WETNESS; AND REFLECTING THE GENERAL LONG-TERM STATUS OF WATER SUPPLIES IN AQUIFERS, RESERVOIRS AND STREAMS.

LIMITATIONS... IS NOT GENERALLY INDICATIVE OF SHORT-TERM (FEW WEEKS) STATUS OF DROUGHT OR WETNESS SUCH AS FREQUENTLY AFFECTS CROPS AND FIELD OPERATIONS (THIS IS INDICATED BY THE CROP MOISTURE INDEX).

Based on preliminary data

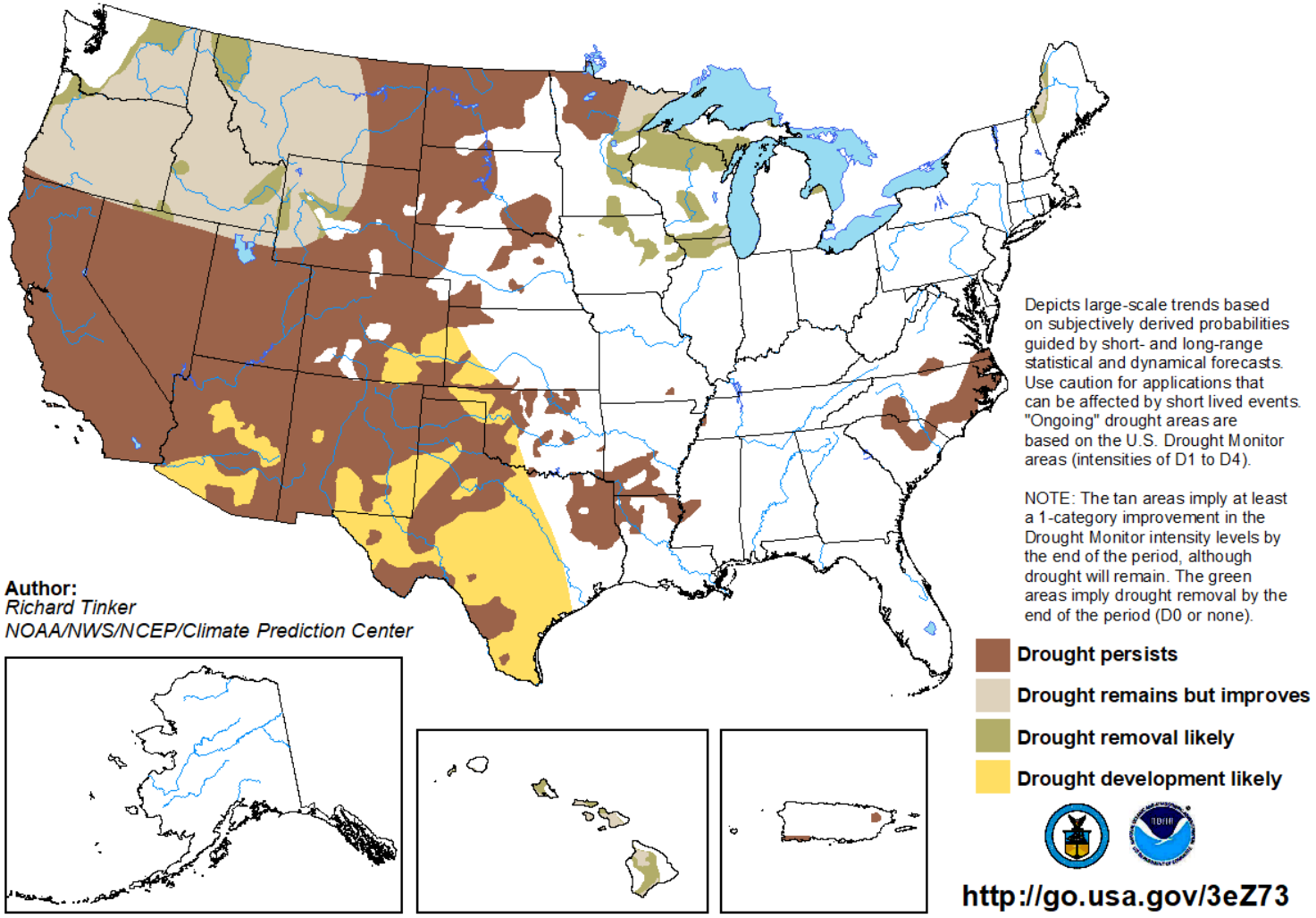
- -4.0 or less (Extreme Drought)
- -3.0 to -3.9 (Severe Drought)
- -2.0 to -2.9 (Moderate Drought)
- --1.9 to +1.9 (Near Normal)
- +2.0 to +2.9 (Unusual Moist Spell)
- +3.0 to +3.9 (Very Moist Spell)
- +4.0 and above (Extremely Moist)
- Missing/Incomplete

U.S. Seasonal Drought Outlook

Valid for November 18, 2021 - February 28, 2022

Released November 18, 2021

Drought Tendency During the Valid Period



Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Use caution for applications that can be affected by short lived events. "Ongoing" drought areas are based on the U.S. Drought Monitor areas (intensities of D1 to D4).

NOTE: The tan areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period, although drought will remain. The green areas imply drought removal by the end of the period (D0 or none).

Drought persists

Drought remains but improves

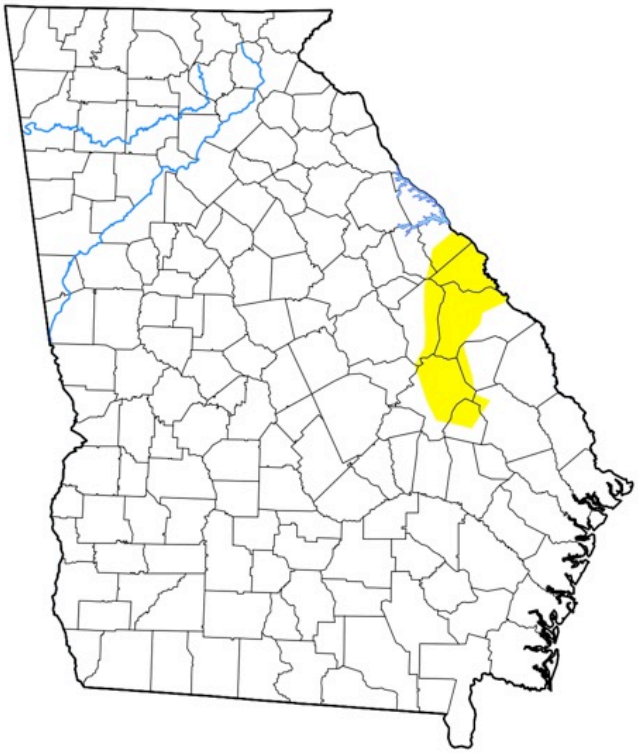
Drought removal likely

Drought development likely

Author:
Richard Tinker
NOAA/NWS/NCEP/Climate Prediction Center

http://go.usa.gov/3eZ73

Georgia



Map released: Thurs. November 18, 2021

Data valid: November 16, 2021 at 7 a.m. EST

Intensity

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

Authors

United States and Puerto Rico Author(s):
Curtis Riganti, National Drought Mitigation Center

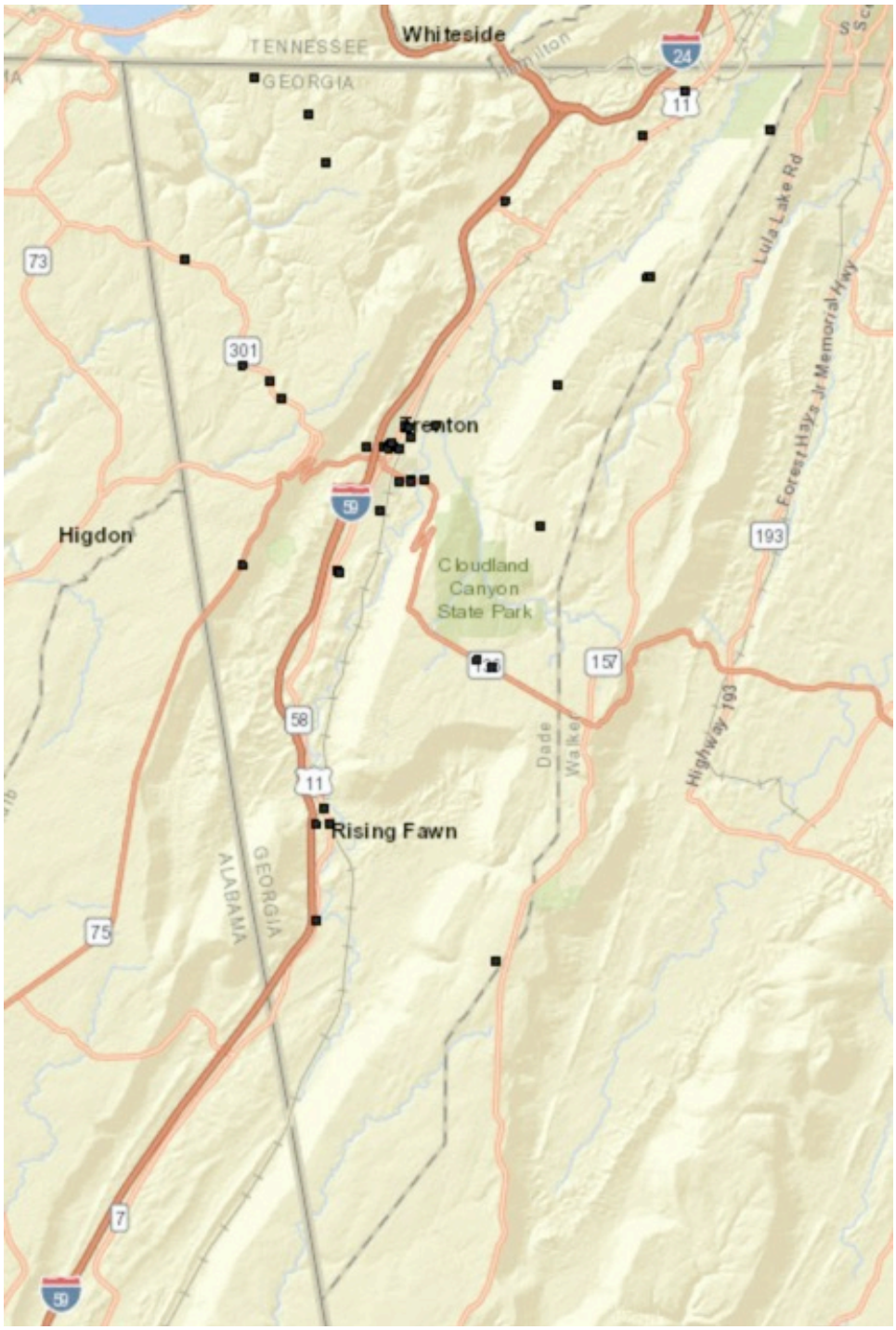
Pacific Islands and Virgin Islands Author(s):
Denise Gutzmer, National Drought Mitigation Center

*The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying **text summary** for forecast statements.*

Available records indicate that drought has occurred within the County in 25 of the past 50 years, which equates to a 50% annual frequency based upon reported events. It would appear that drought events have remained fairly constant over time within the County with some fluctuations up or down. The following chart provides annual frequency of reported events over the past five, ten, twenty, and fifty-year periods. The most recent five-year period, covering the span of time since the last update to this Plan, is highlighted in gold.

Dade County – Drought (based on Reported Events)				
Time Period	**5yrs (2016-2020)**	**10yrs (2011-2020)**	**20yrs (2001-2020)**	**50yrs (1971-2020)**
Number of Reported Events	**2**	**5**	**17**	**25**
Frequency Average per Year	**0.40**	**0.50**	**0.85**	**0.50**
Frequency Percent per Year	**40%**	**50%**	**85%**	**50%**

C. Assets Exposed to Hazard – All public and private property including critical facilities are susceptible to drought since this hazard is not spatially defined. The danger of drought is compounded due to the fact that drought conditions create a heightened risk for wildfire. The map below identifies critical facilities located within the hazard area, which in the case of drought includes all areas within the County and City.

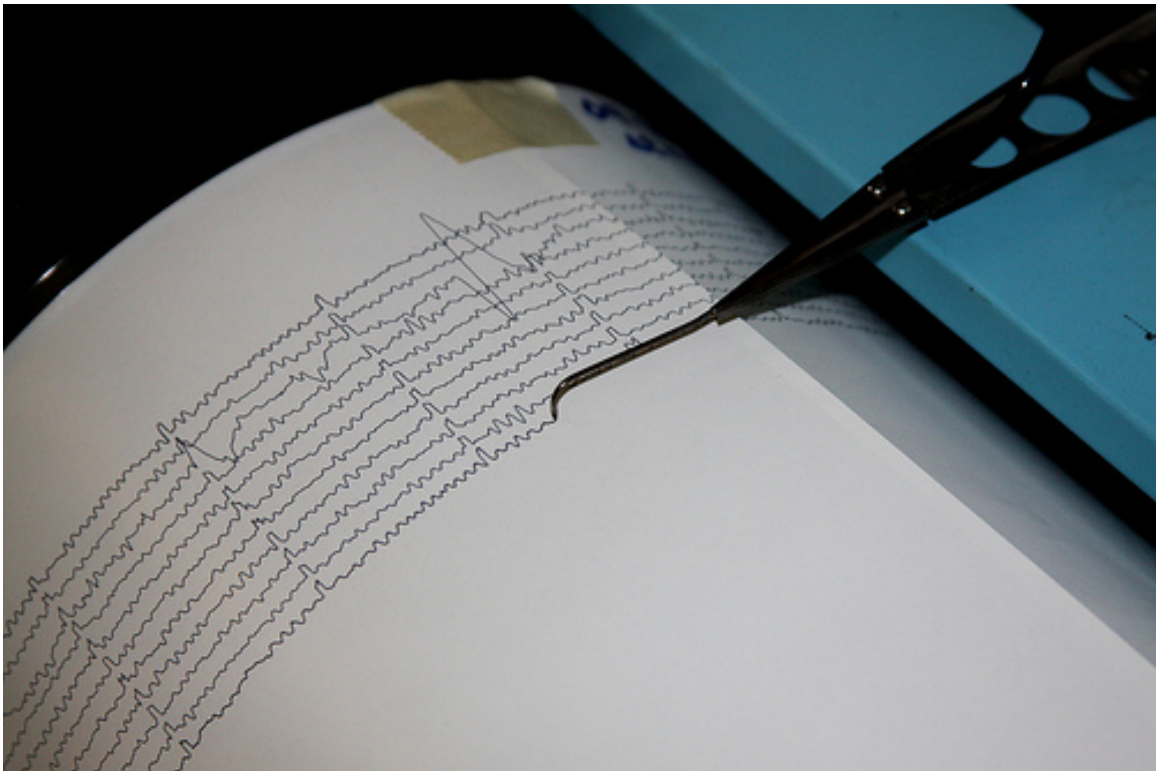


D. Estimate of Potential Losses – No damage to facilities is anticipated as a result of drought conditions, aside from the threat of wildfire. Crop damage cannot be accurately quantified due to several unknown variables: duration of the drought, temperatures during the drought, severity of the drought, rainfall requirements for specific crops and livestock, and the different growing seasons. There may also be financial losses related to water system shortages. Additional loss estimate information may be found in Appendix A, the Critical Facilities Database, and Appendix D, for each jurisdiction.

E. Multi-Jurisdictional Concerns – Agricultural losses associated with drought are more likely to occur in the rural, less concentrated areas of the County. Although the City of Trenton are probably slightly less likely to experience agricultural-related drought losses than the County, they can be financially impacted by water resource-related drought losses as well.

F. Hazard Summary – Unlike other hazard events, drought causes damage slowly. A sustained drought can cause severe economic stress to the agricultural interests of the County and even the entire State or Region. The potential negative effects of sustained drought are numerous. In addition to an increased threat of wildfires, drought can affect water supplies, stream-water quality, water recreation facilities, hydropower generation, as well as agricultural and forest resources. The HMPC realized the limitations associated with mitigation actions for drought, but did identify some basic mitigation measures in Chapter 5.

2.7 Earthquakes



A. Hazard Identification – One of the most frightening and destructive natural hazards is a severe earthquake. An earthquake is a sudden movement of the Earth, caused by the abrupt release of strain that has accumulated over a long time. The forces of plate tectonics shape the Earth as the huge plates that form the Earth's surface slowly move over, under, and past each other. Sometimes the movement is gradual. At other times, the plates are locked together, unable to release the accumulating energy. When the accumulated energy grows strong enough, the plates break free. If the earthquake occurs in a populated area, it may cause many deaths, injuries and extensive property damage.

The goal of earthquake prediction is to give warning of potentially damaging earthquakes early enough to allow appropriate response to the disaster, enabling people to minimize loss of life and property. The U.S. Geological Survey conducts and supports research on the likelihood of future earthquakes. This research includes field, laboratory, and theoretical investigations of earthquake mechanisms and fault zones. A primary goal of earthquake research is to increase the reliability of earthquake probability estimates. Ultimately, scientists would like to be able to specify a high probability for a specific earthquake on a particular fault within a particular year. Scientists estimate earthquake probabilities in two ways: by studying the history of large earthquakes in a specific area and the rate at which strain accumulates in the rock.

Scientists study the past frequency of large earthquakes in order to determine the future likelihood of similar large shocks. For example, if a region has experienced four magnitude 7 or larger earthquakes during 200 years of recorded history, and if these shocks occurred randomly in time, then scientists would assign a 50 percent probability (that is, just as likely to happen as not to happen) to the occurrence of another magnitude 7 or larger quake in the region during the next 50 years. But in many places, the assumption of random occurrence with time may not be true, because when strain is released along one part of the fault system, it may actually increase on another part.

Another way to estimate the likelihood of future earthquakes is to study how fast strain accumulates. When plate movements build the strain in rocks to a critical level, like pulling a rubber band too tight, the rocks will suddenly break and slip to a new position. Scientists measure how much strain accumulates along a fault segment each year, how much time has passed since the last earthquake along the segment, and how much strain was released in the last earthquake. This information is then used to calculate the time required for the accumulating strain to build to the levels that result in an earthquake. This simple model is complicated by the fact that such detailed information about faults is rare. In the United States, only the San Andreas Fault system has adequate records for using this prediction method.

Magnitude and intensity measure different characteristics of earthquakes. Magnitude measures the energy released at the source of the earthquake and is determined from measurements on seismographs. Intensity measures the strength of shaking produced by the earthquake at a certain location and is determined from effects on people, human structures, and the natural environment. The following two tables describe the Abbreviated Modified Mercalli Intensity Scale, and show intensities that are typically observed at locations near the epicenter of earthquakes of different magnitudes.

Magnitude / Intensity Comparison

Magnitude	Typical Maximum Modified Mercalli Intensity
1.0 - 3.0	**I**
3.0 - 3.9	**II - III**
4.0 - 4.9	**IV - V**
5.0 - 5.9	**VI - VII**
6.0 - 6.9	**VII - IX**
7.0 and higher	**VIII** or higher

Abbreviated Modified Mercalli Intensity Scale

I. Not felt except by a very few under especially favorable conditions.

II. Felt only by a few persons at rest, especially on upper floors of buildings.

III. Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.

IV. Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.

V. Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.

VI. Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.

VII. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.

VIII. Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.

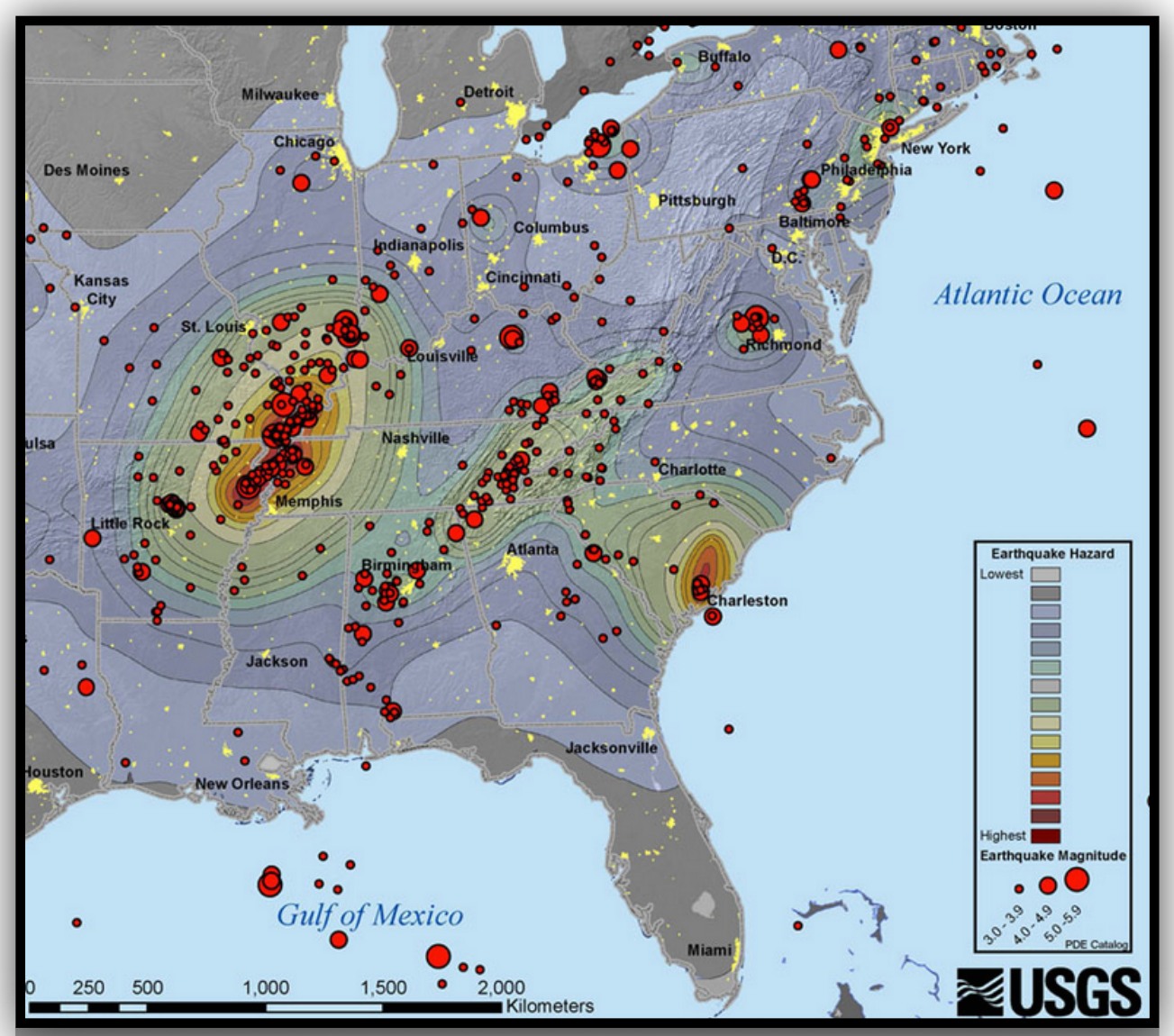
IX. Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.

X. Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.

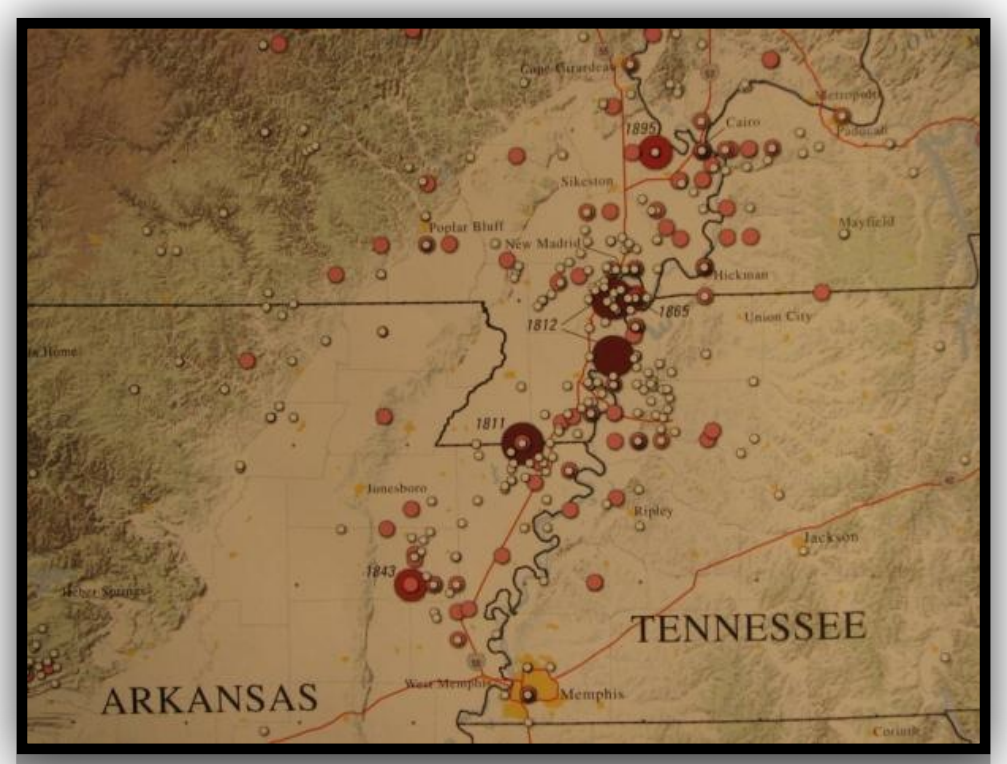
XI. Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.

XII. Damage total. Lines of sight and level are distorted. Objects thrown into the air.

The following USGS map provides a historical view of earthquakes in the Eastern United States.



B. Hazard Profile – The first earthquakes recorded as being felt in Georgia were the great New Madrid earthquakes of 1811-1812 (also known as the Mississippi River Valley earthquakes) centered in northeast Arkansas and New Madrid, Missouri. There were hundreds of earthquakes during the two month period between December 16, 1811 and February 7, 1812. On the basis of the large area of damage (600,000 square kilometers), the widespread area of perceptibility (5,000,000 square kilometers), and the complex physiographic changes that occurred, this series of earthquakes rank as some of the largest in the United States since its settlement by Europeans. The area of strong shaking associated with these shocks is two to three times larger than that of the 1964 Alaska earthquake and 10 times larger than that of the 1906 San Francisco earthquake. The first three major earthquakes occurred in northeast Arkansas on December 16, 1811 (three shocks - Mfa 7.2/MSn 8.5; Mfa 7.0/MSn 8.0; and MSn 8.0). There were six aftershocks on December 16th and 17th alone in the range of M5.5 to M6.3 (Note: aftershocks actually *are* earthquakes). The fourth earthquake occurred in Missouri on January 23, 1812 (Mfa 7.1/MSn 8.4). The fifth earthquake occurred in New Madrid, Missouri on February 7, 1812 (Mfa 7.4/ MSn 8.8). This is the earthquake that created Reelfoot Lake, located in northwest Tennessee. It was reported to have been formed as the Mississippi River flowed backward for 10–24 hours to fill the lake. As a result of this earthquake, the original town of New Madrid now lies under the Mississippi River.



This accounted for a total of five earthquakes of magnitude MSn 8.0 or higher occurring in a period of 54 days. The first earthquake caused only slight damage to man-made structures, mainly because the region was so sparsely populated. However, as the earthquakes continued, they began to open deep cracks in the ground, created landslides on the steeper bluffs and hillsides, large areas of land were uplifted, and sizable sink areas were created. These five main earthquakes, and several aftershocks, were felt over almost all of the eastern United States including the State of Georgia. In Georgia this series of earthquakes was strong enough to have shaken bricks from chimneys and other minor damage.

The great Charleston, South Carolina, earthquake of 1886 killed approximately 60 people. The magnitude 7.3 earthquake is the most damaging earthquake to occur in the Southeast United States and one of the largest historic shocks in Eastern North America. It damaged or destroyed many buildings in the old city of Charleston. Property damage was estimated at $5-$6 million. Structural damage was reported several hundred

kilometers from Charleston including in the State of Georgia. On August 31, 1886 at 9:25 pm, preceded by a low rumble, the shock waves reached Savannah. People had difficulty remaining standing. One woman died of fright as the shaking cracked walls, felled chimneys, and broke windows. Panic at a revival service left two injured and two more were injured in leaping from upper story windows. Several more were injured by falling bricks. Ten buildings in Savannah were damaged beyond repair and at least 240 chimneys damaged. People spent the night outside. At Tybee Island light station the 134 foot

lighthouse was cracked near the middle where the walls were six feet thick, and the one-ton lens moved an inch and a half to the northeast. In Augusta the shaking was the most severe (VIII on the Modified Mercalli scale) in the State. An estimated 1000 chimneys and many buildings were damaged. The business and social life was paralyzed for two days. Brunswick and Darien were affected as well.

June 17, 1872: An earthquake on June 17, 1872 in Milledgeville, GA and had an intensity of at least V on the Modified Mercalli scale, the lowest intensity in which some damage may occur. It was reported as a sharp shock, jarring brick buildings and rattling windows.

November 1, 1875: On November 1, 1875, at 9:55 in the evening, an intensity VI earthquake occurred near the South Carolina border. It was felt from Spartanburg and Columbia, South Carolina, to Atlanta and Macon, Georgia, from Gainesville to Augusta, and generally over an area of 25,000 square miles.

October 18, 1902: A more local event occurred on October 18, 1902, with a sharp shock felt along the east face of Rocky Face Mountain, just west of Dalton, GA with intensity VI and at LaFayette, GA with intensity V. The earthquake was felt over an area of about 1500 square miles including Chattanooga, Tennessee.

January 23, 1903: The Savannah, GA area was shaken with an intensity VI earthquake on January 23, 1903. Centering near Tybee Island, it was felt over an area of 10,000 square miles including Savannah (intensity VI), Augusta (intensity III), Charleston (intensity IV-V), and Columbia (intensity III-IV). Houses were strongly shaken.

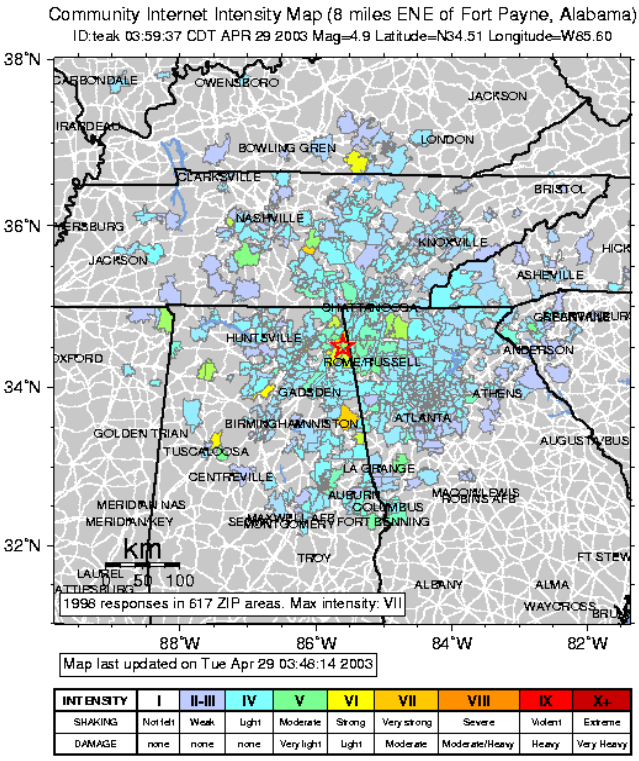
June 20, 1912: Another shock was felt on June 20, 1912, at Savannah with intensity V.

March 5, 1914: According to USGS, Georgia experienced another earthquake on March 5, 1914. Magnitude 4.5.

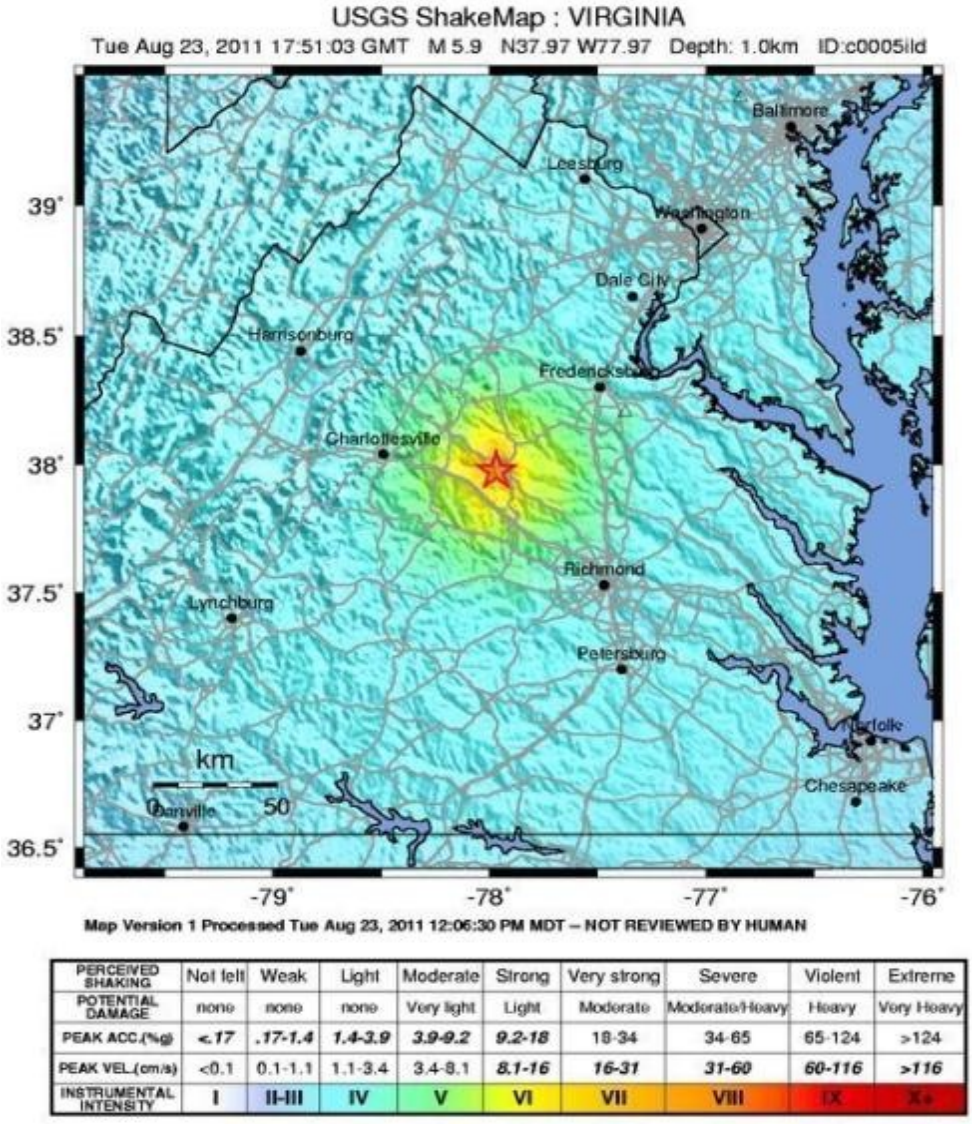
March 5, 1916: On March 5, 1916, an earthquake centered 30 miles southeast of Atlanta was felt over an area of 50,000 square miles, as far as Cherokee County, North Carolina, by several people in Raleigh, and in parts of Alabama and Tennessee.

March 12, 1964: An earthquake of intensity V or over occurred on March 12, 1964, centered near Haddock, GA less than 20 miles northeast of Macon. Intensity V was recorded at Haddock while shaking was felt in four counties over a 400-square-mile area.

April 29, 2003: On April 29, 2003 just before 5:00 a.m. a moderate earthquake, rated 4.9 on the Richter Scale, shook most of the northwest corner of Georgia, south to Atlanta. The epicenter was located in Menlo, GA, about 37 miles south of Chattanooga. See map to right.



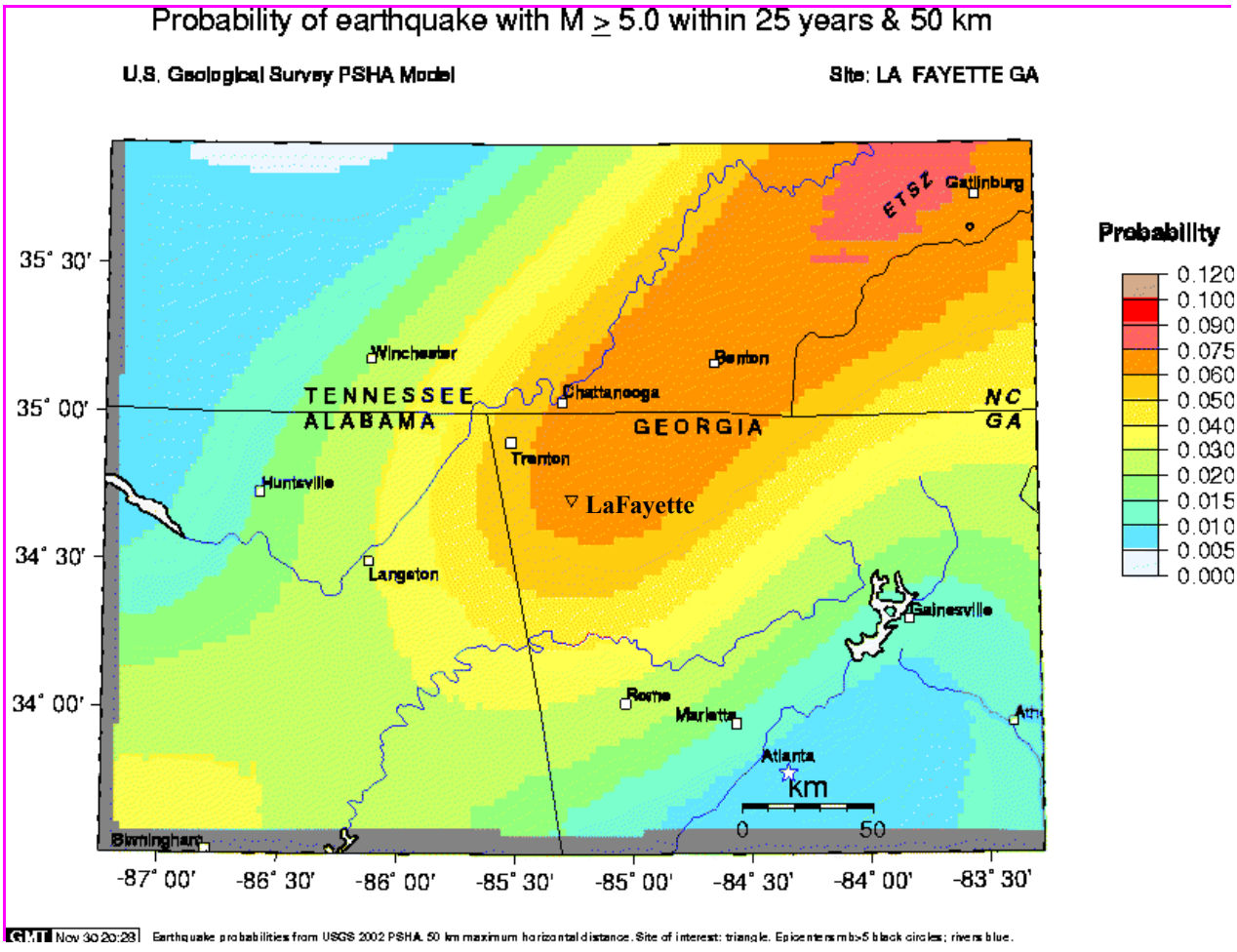
August 23, 2011: On August 23, 2011 at 1:51pm, a 5.8 magnitude earthquake originated near Louisa and Mineral, Virginia. It struck Washington DC (about 100 miles away from epicenter) causing moderate shaking and potentially significant damage. The earthquake was recorded all along the Appalachians, from Georgia to New England. The earthquake was felt so widely because it was a shallow earthquake, and geologic conditions in the eastern U.S. allow the effects of earthquakes to propagate and spread much more efficiently than in the western United States. Only mild movement was felt in Dade County. See map to the right.



PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	*<.17*	*.17-1.4*	*1.4-3.9*	*3.9-9.2*	*9.2-18*	18-34	34-65	65-124	>124
PEAK VEL.(cm/s)	<0.1	0.1-1.1	1.1-3.4	3.4-8.1	*8.1-16*	*16-31*	*31-60*	*60-116*	*>116*
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+

To a large extent, the HMPC was unable to determine which of these earthquakes affected Dade County and, if so, to what degree. Nevertheless, the HMPC has determined that most of the earthquakes documented above would have been strong enough or would have occurred close enough to Dade County to merit consideration. Three of these earthquakes occurred within the 50-year study period and are included in the hazard history of this Plan. The threat of earthquakes in Dade County may be more significant than the documented earthquake history would seem to indicate.

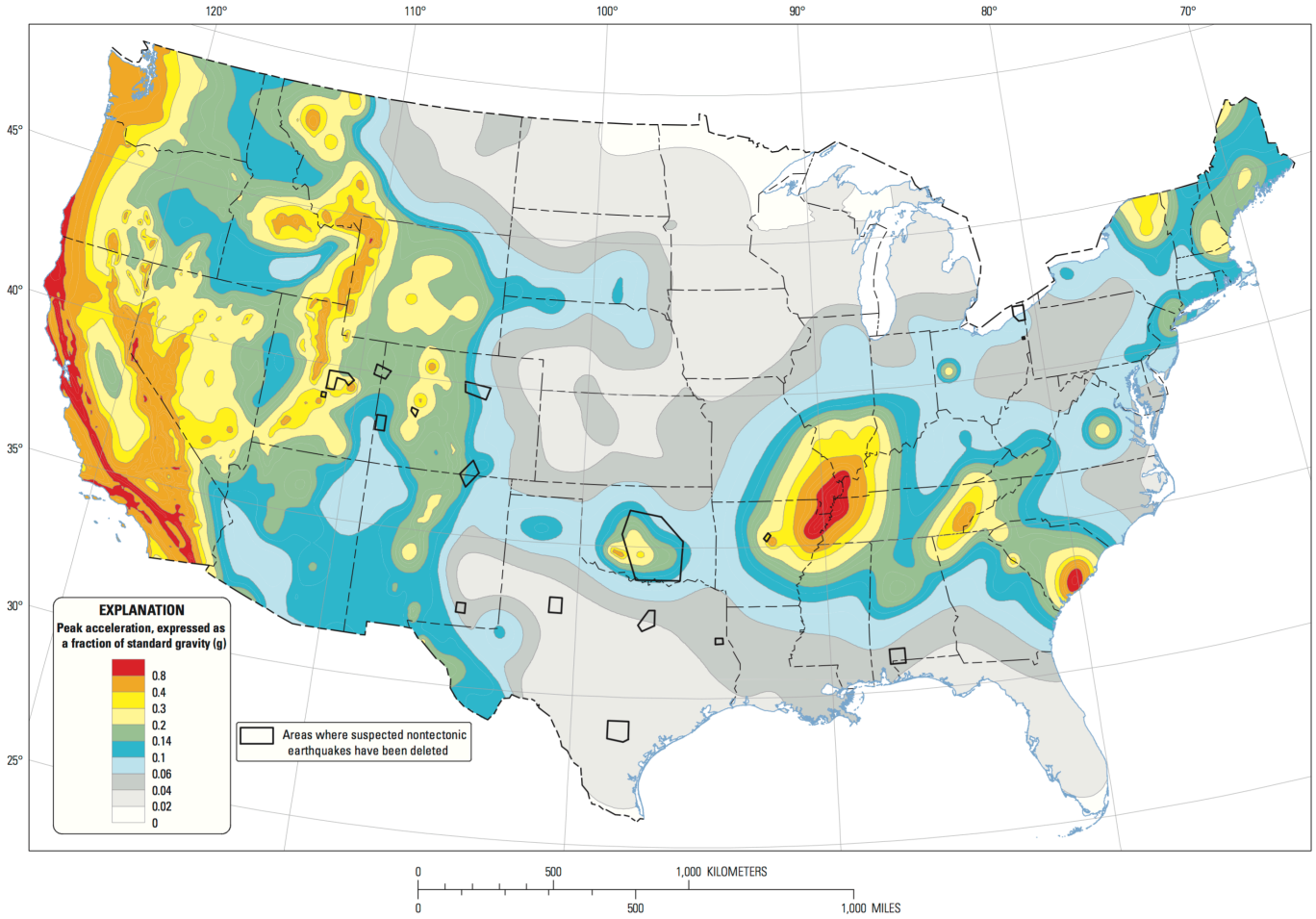
Based on U.S. Geological Survey estimations using the earthquake frequency method described in the section above, the probability of an earthquake of Magnitude 5.0 or more occurring within Dade County over the next 25 years is between 3% and 7.5% (see map below). As discussed above, such predictions are based on limited information, and cannot necessarily be relied upon for their precision. However, they do help demonstrate that the threat of earthquakes cannot be overlooked even in a relatively inactive geographic area such as Dade County.



The 2014 U.S. Geological Survey (USGS) National Seismic Hazard Maps, including the one on the following page, display earthquake ground motions for various probability levels across the United States and are applied in seismic provisions of building codes, insurance rate structures, risk assessments, and other public policy. The updated maps represent an assessment of the best available science in earthquake hazards and incorporate new findings on earthquake ground shaking, faults, seismicity, and geodesy. The USGS National Seismic Hazard Mapping Project developed these maps by incorporating information on potential earthquakes and associated ground shaking obtained from interaction in science and engineering workshops involving hundreds of participants, review by several science organizations and State surveys, and advice from expert panels and a Steering Committee. The new probabilistic hazard maps represent an update of the seismic hazard maps; previous versions were developed by Petersen and others (2008) and Frankel and others (2002), using the methodology developed Frankel and others (1996). Algermissen and Perkins (1976) published the first probabilistic seismic hazard map of the United States which was updated in Algermissen and others (1990).

The National Seismic Hazard Maps are derived from seismic hazard curves calculated on a grid of sites across the United States that describe the annual frequency of exceeding a set of ground motions. Data and maps from the 2014 U.S. Geological Survey National Seismic Hazard Mapping Project are available for download below. Maps for available periods (0.2 s, 1 s, PGA) and specified annual frequencies of exceedance can be calculated from the hazard curves. Figures depict probabilistic ground motions with a 2 percent probability of exceedance. Spectral accelerations are calculated for 5 percent damped linear elastic oscillators. All ground motions are calculated for site conditions with Vs30=760 m/s, corresponding to NEHRP B/C site class boundary.

Simplified 2014 Hazard Map (PGA, 2% in 50 years)



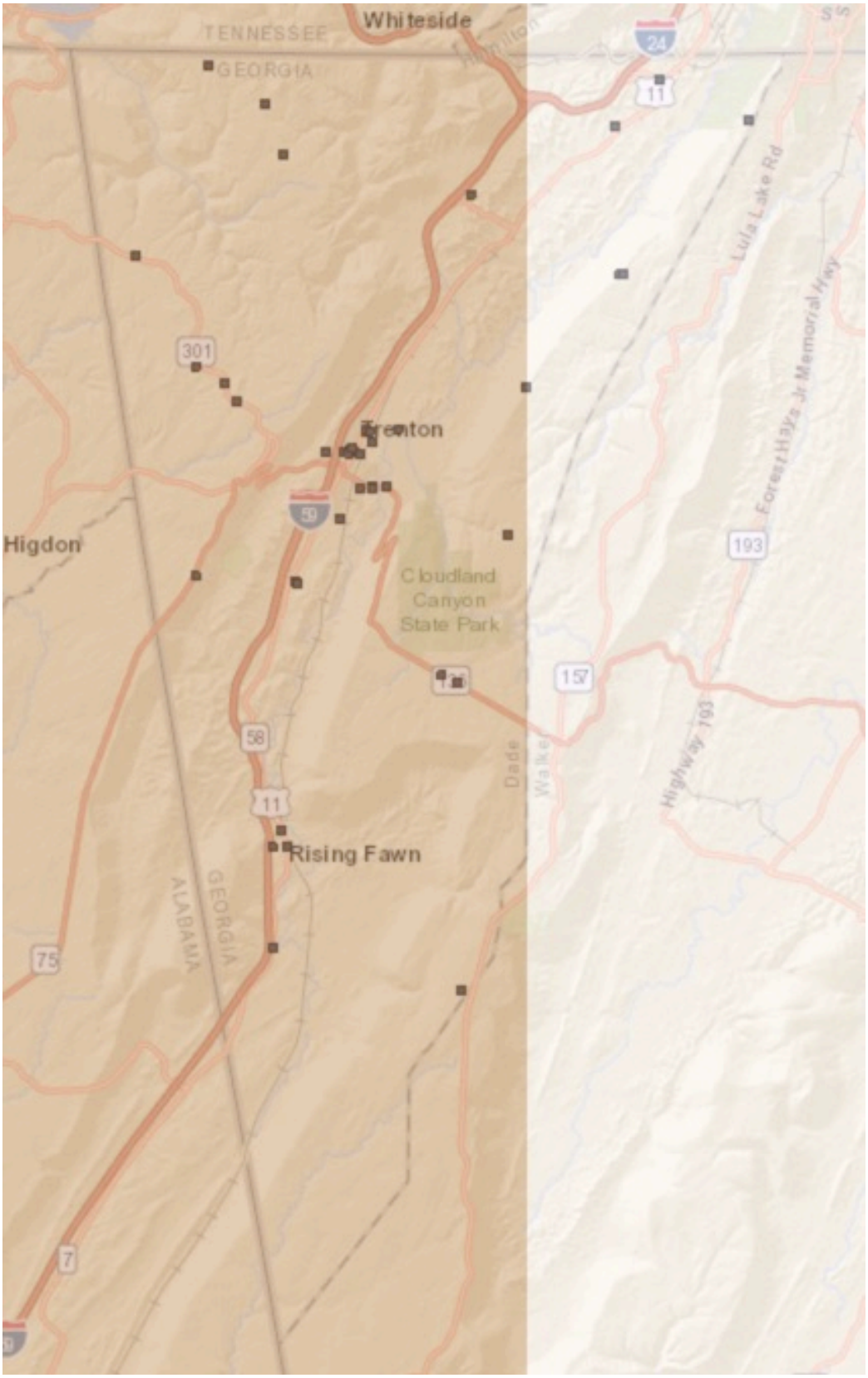
Two-percent probability of exceedance in 50 years map of peak ground acceleration

C. Assets Exposed to Hazard - All structures and facilities within Dade County are susceptible to earthquake damage since they can occur in any portion of the County or City. According to the USGS model below, all areas of Dade County and the City of Trenton are located within Seismic Threat Category 4, "highest threat", with the exception of a small portion of the southwestern corner of the County which is located within Seismic Threat Category 3, "moderate to high threat."

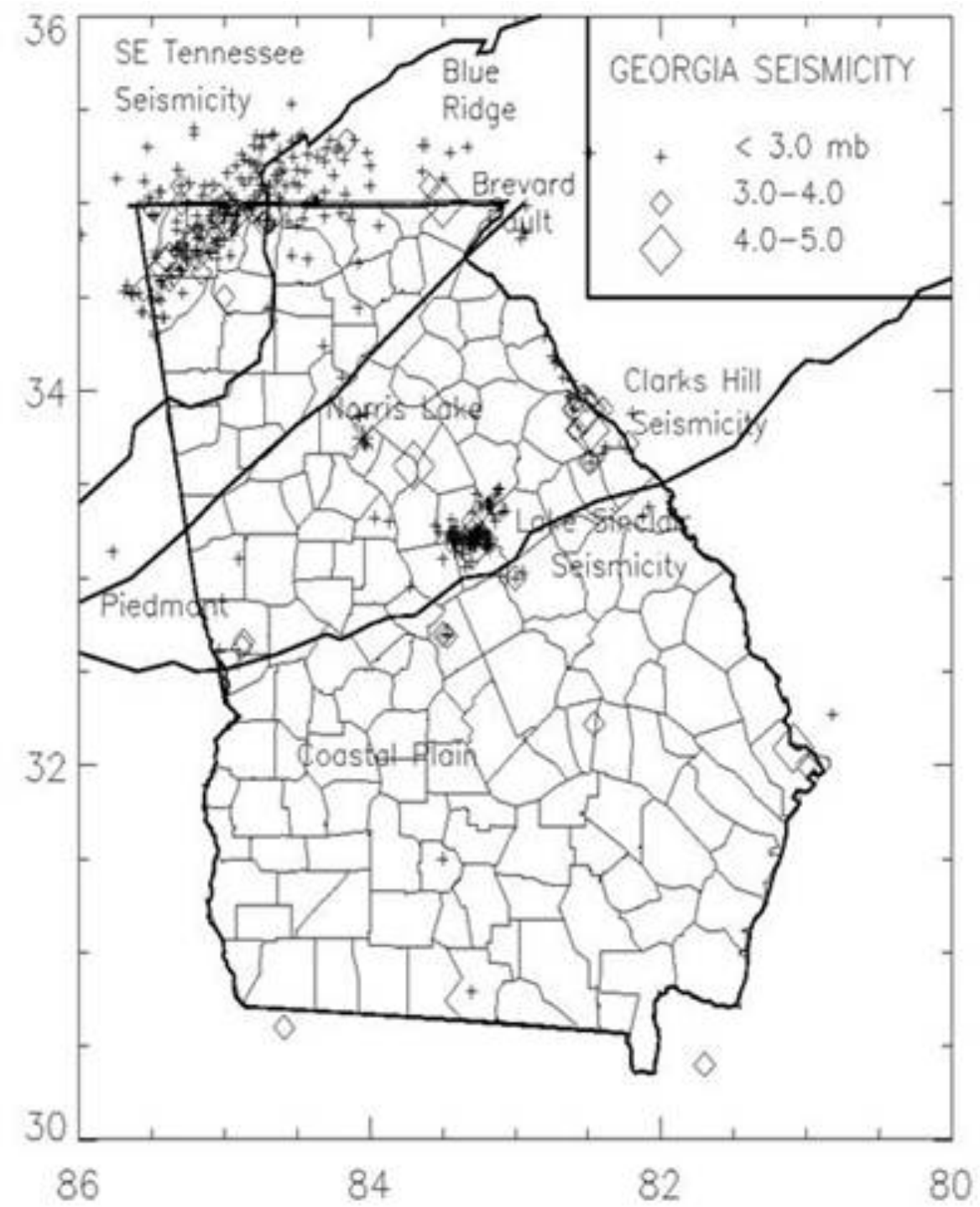
The seismic hazard layer used in the maps that follow is based on the USGS Probabilistic Seismic Hazard Map, showing the percentage of gravity that the area has a 2 percent probability of exceedance in 50 years. The score classification reflects that used by the IRC Seismic Design Categories. The horizontal positional accuracy is unknown for this layer.

	Seismic Threat Category	Original Value	Description
	1	A	0-17% gravity (lowest threat)
	2	B	17-33% gravity (low to moderate threat)
	3	C	33-50% gravity (moderate to high threat)
	4	D1	50-83% gravity (highest threat)
	*	Not applicable	All other values

Dade County


Whiteside
TENNESSEE
GEORGIA
24
11
Lula Lake Rd
Forest Hays Jr Memorial Hwy
301
Trenton
59
Higdon
193
Cloudland
Canyon
State Park
157
58
11
Rising Fawn
Dade
Walker
Highway 193
ALABAMA
GEORGIA
75
7

Georgia has a few large faults, including the Blue Ridge fault. The Blue Ridge fault extends from Alabama through Georgia and into Tennessee. The fault runs across the northwest corner of Georgia. This region of Georgia is the most seismically active in the State. Dade County is located in this active area.



D. Estimate of Potential Losses – Most of the available information relating to earthquakes fails to describe damage estimates in great detail. These events are typically mild to moderate without devastating consequences. Still there can be damage to public and private property just the same. The potential for a major earthquake is always there which could result in extreme devastation. Unfortunately, the local jurisdictions do not have the capabilities to estimate such devastation. Such estimates would have to be outsourced and are not something that can be budgeted for at this time or in the foreseeable future. As with all of the hazards discussed within this plan, there is often private property damage as a result of these events that goes unreported. Since this is a non-spatially defined hazard, it can obviously impact all portions of Dade County and the City of Trenton. Additional loss estimate information may be found in Appendix A, the Critical Facilities Database, and Appendix D, for each jurisdiction.

E. Multi-Jurisdictional Concerns – All of Dade County has the potential to be affected by earthquakes. The threat appears to be no greater within the City of Trenton than it is within the County. Any steps taken to mitigate the effects of earthquake should be undertaken on a countywide basis and include the City of Trenton.

F. Hazard Summary – Scientific understanding of earthquakes is of vital importance to the Nation. As the population increases, expanding urban development and construction works encroach upon areas susceptible to earthquakes. With a greater understanding of the causes and effects of earthquakes, we may be able to reduce damage and loss of life from this destructive phenomenon. The HMPC was limited in its ability to develop mitigation measures associated with earthquakes, but did provide some guidance in Chapter 5.

Chapter 3
Local Technological Hazard, Risk and Vulnerability (HRV) Summary

In accordance with FEMA guidelines, the Dade County Hazard Mitigation Planning Committee (HMPC) also included information relating to technological or "human-caused" hazards into this plan. The term, "technological hazard" refers to incidents resulting from human activities such as the manufacture, transportation, storage, and use of hazardous materials. This plan assumes that hazards resulting from technological sources are accidental, and that their consequences are unintended. Unfortunately, the information relating to technological hazards is much more limited, due largely to the very limited historical data available. This causes a greater level of uncertainty with regard to mitigation measures. However, enough information has been gathered to provide a basic look at technological hazards within Dade County.

The Dade County Hazard Mitigation Planning Committee (HMPC) identified two technological hazards the County is vulnerable to based upon available data including scientific evidence, known past events, and future probability estimates. As a result of this planning process, which included an analysis of the risks associated with probable frequency and impact of each hazard, the HMPC determined that each of these technological hazards pose a threat significant enough to address within this Plan. These include hazardous materials release and dam failure. Each of these technological hazards is addressed in this chapter of the Plan. An explanation and results of the vulnerability assessment are found in Tables 3-1 and 3-2.

Table 3.1 – Hazards Terminology Differences

Hazards Identified in 2008 Georgia State Plan	Equivalent/Associated Hazards Identified in the 2011 Dade County Plan	Difference
Dam Failure	Dam Failure	None

Table 3.2 – Vulnerability Assessment - Technological Hazards *(see Keys below)*

HAZARD	Dade	Trenton
Dam Failure		
Frequency	VL	VL
Severity	H	H
Probability	EX	EX
Hazardous Materials Release		
Frequency	H	H
Severity	EX	EX
Probability	EX	EX

Key for Table 3.2 – Vulnerability Assessment Frequency and Probability Definitions

NA = Not applicable; not a hazard to the jurisdiction
VL = Very low risk/occurrence
L = Low risk; little damage potential (for example, minor damage to less than 5% of the jurisdiction)
M = Medium risk; moderate damage potential (for example, causing partial damage to 5-15% of the jurisdiction, infrequent occurrence)
H = High risk; significant risk/major damage potential (for example, destructive, damage to more than 15% of the jurisdiction, regular occurrence)
EX = Extensive risk/probability/impact

3.1 Hazardous Materials Release

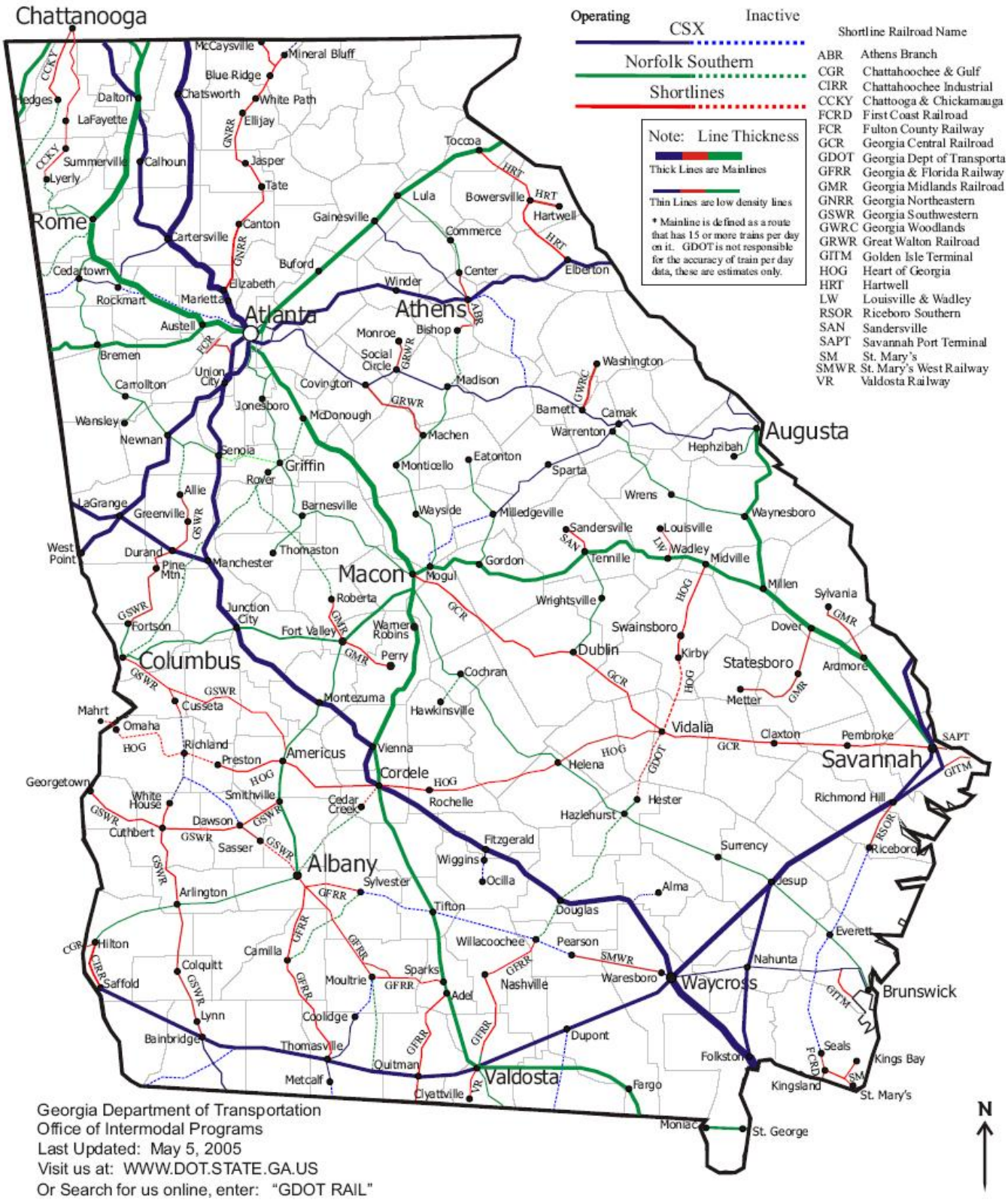
A. Hazard Identification – Hazardous materials (hazmat) refers to any material that, because of its quantity, concentration, or physical or chemical characteristics, may pose a real hazard to human health or the environment if it is released. Hazmat includes flammable and combustible materials, toxic materials, corrosive materials, oxidizers, aerosols, and compressed gases. Specific examples of hazmat are gasoline, bulk fuels, propane, propellants, mercury, asbestos, ammunition, medical waste, sewage, and chemical, biological, radiological, nuclear, and explosive (CBRNE) threat agents. Specific federal and state guidelines exist on transport and shipping hazardous materials. Research institutes, industrial plants, individual households, and government agencies all generate chemical waste. Approximately one percent is classified as hazardous.

A hazmat spill or release occurs when hazardous material or waste gets into the environment in an uncontrolled fashion. Many manufacturing processes use hazardous materials or generate hazardous waste, but a hazardous spill doesn't always come from a chemical plant or a factory. Any substance in the wrong place at the wrong time in too large an amount can cause harm to the environment. The response to a spill depends on the situation. When the emergency response team is notified of a spill, it must quickly decide what sort of danger is likely. Members of the team collect appropriate clothing and equipment and travel to the scene. There they try to contain the spill, sometimes testing a

sample to identify it. If necessary, they decontaminate themselves before leaving the area. Once the material has been identified, other personnel arrive to remove it.

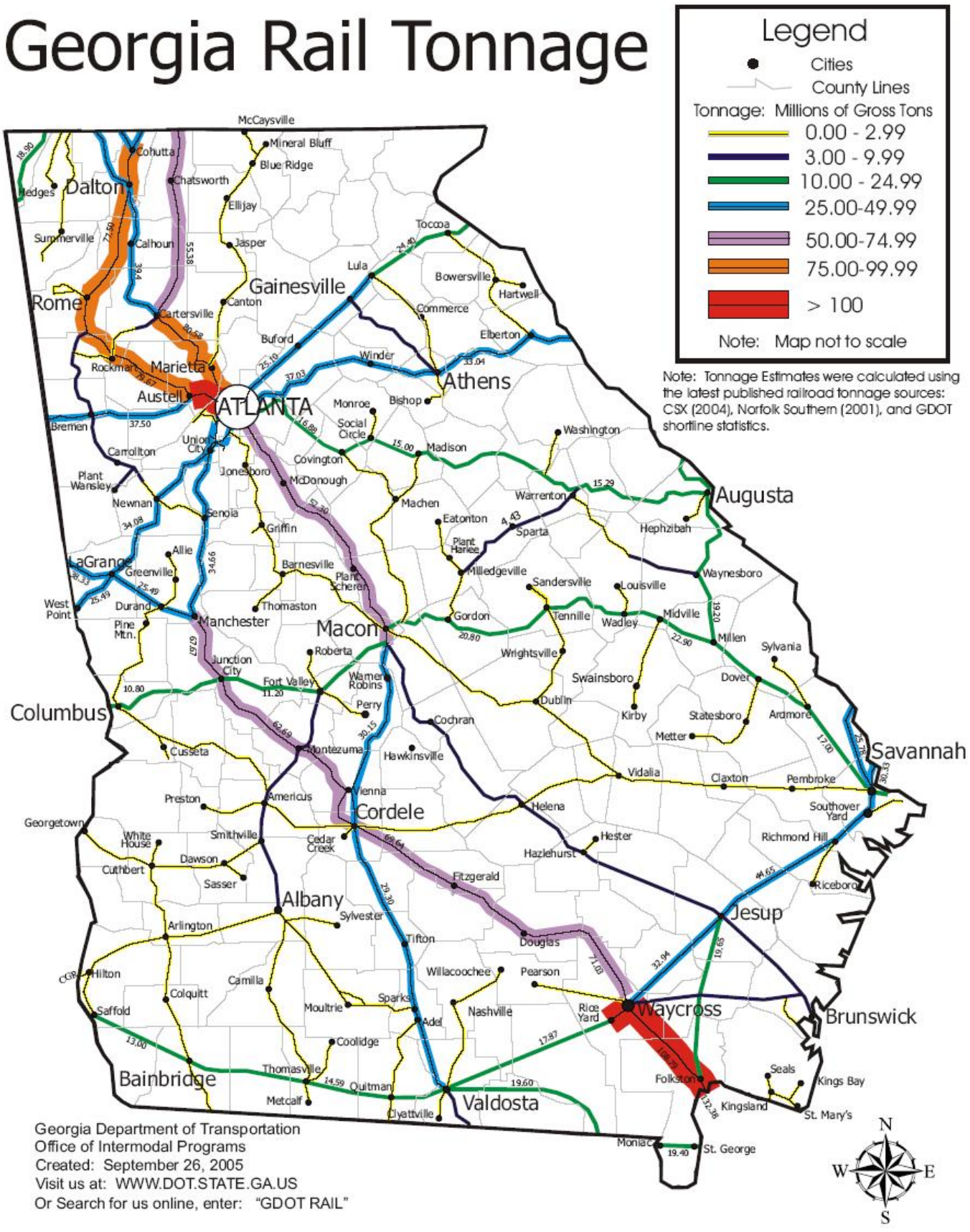
B. Hazard Profile – The Dade County HMPC reviewed historical data from the Environmental Protection Division (EPD) of the Georgia Department of Natural Resources (DNR) and County records in their research involving hazardous materials (hazmat) releases, or hazmat spills, within Dade County. Hazmat spills are usually categorized as either fixed releases, which occur when hazmat is released on the site of a facility or industry that stores or manufactures hazmat, or transportation-related releases, which occur when hazmat is released during transport from one place to another. Both fixed and transportation-related hazmat spills represent tremendous threats to Dade County. The County's industries are one of the main threats with regard to fixed hazmat spills. The County's main highways and railroad lines are the main threats with regard to transportation-related hazmat spills . Railroad lines run through the County, though they do represent a relatively small annual tonnage compared to some other northwest Georgia counties. The primary rail lines are Norfolk Southern lines that have an estimated annual tonnage of between 10 and 25 million gross tons. The Georgia Department of Transportation (GDOT) rail maps on the following two pages provide locations of the rail lines running through Dade County, as well as information relating to tonnage.

Georgia Rail System



Georgia Department of Transportation
Office of Intermodal Programs
Last Updated: May 5, 2005
Visit us at: WWW.DOT.STATE.GA.US
Or Search for us online, enter: "GDOT RAIL"

Georgia Rail Tonnage



Georgia Department of Transportation
Office of Intermodal Programs
Created: September 26, 2005
Visit us at: WWW.DOT.STATE.GA.US
Or Search for us online, enter: "GDOT RAIL"

COX

C. Assets Exposed to Hazard – The environment is especially vulnerable to hazardous materials releases. Such releases are a potential threat to all waterways and bodies of water and all property and persons within any primary highway corridors of Dade County, including US Route 11, Interstates 24 and 59, and State Routes 58, 136, 157, 189, 299, 301, 406, 409, and Norfolk Southern rail lines, due to the fact that certain hazmat releases can create several square miles of contamination. The same holds true of property and persons located in the vicinity of facilities or industries that produce or handle large amounts of hazardous materials.

D. Estimate of Potential Losses - It is difficult to determine potential damage to the environment caused by hazardous materials releases, however, it would involve significant costs related to emergency response, road closings, evacuations, watershed protection, expended man-hours, and cleanup materials and equipment. Corridors for US Route 11, Interstates 24 and 59, and State Routes 58, 136, 157, 189, 299, 301, 406, 409, and Norfolk Southern rail lines are most vulnerable to transportation-related releases. However, such releases can occur in virtually any part of the County accessible by road. Additional loss estimate information may be found in Appendix A, the Critical Facilities Database, and Appendix D, for each jurisdiction.

E. Multi-Jurisdictional Concerns – All of Dade County, including the City of Trenton, is vulnerable to both fixed and transportation-related hazardous materials releases. Both jurisdictions contain numerous commercial and industrial facilities and experience busy state route traffic.

F. Hazard Summary – Hazardous materials releases are one of the most significant threats to Dade County. Unknown quantities and types of hazmat are transported through the County by truck on a daily basis. The main highways of concern are US Route 11, Interstates 24 and 59, and State Routes 58, 136, 157, 189, 299, 301, 406, 409, and Norfolk Southern rail lines. These hazmat shipments pose a great potential threat to all of Dade County. The fact that the County is unable to track these shipments seriously limits the mitigation measures that can be put into place. Fixed hazmat releases are also considered to be a threat to Dade County. Therefore, the Dade County HMPC has identified some specific mitigation actions for hazardous materials releases in Chapter 5.

3.2 Dam Failure

A. Hazard Identification – 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 the stream, or has an impounding capacity at maximum water storage evaluation of 100 acre-feet (equivalent to 100 acres one foot deep) or more. Dams are usually constructed to provide a ready supply of water for drinking, irrigation, recreation and other purposes. They can be made of rock, earth, masonry, or concrete or of combinations of these materials.

Dam failure is a term used to describe the major breach of a dam and subsequent loss of contained water. Dam failure can result in loss of life and damage to structures, roads, utilities, crops, and livestock. Economic losses can also result from a lowered tax base, lack of utility profits, disruption of commerce and governmental services, and extraordinary public expenditures for food relief and protection. National statistics show that overtopping due to inadequate spillway design, debris blockage of spillways, or settlement of the dam crest account for one third of all U.S. dam failures. Foundation defects, including settlement and slope instability, account for another third of all failures. Piping and seepage, and other problems cause the remaining third of national dam failures. This includes internal erosion caused by seepage, seepage and erosion along hydraulic structures, leakage through animal burrows, and cracks in the dam. The increasing age of dams nationwide is a contributing factor to each of the problems above.

B. Hazard Profile – Congress first authorized the US Army Corps of Engineers to inventory dams in the United States with the National Dam Inspection Act (Public Law 92-367) of 1972. The Water Resources Development Act of 1986 (P.L. 99-662) authorized the Corps to maintain and periodically publish an updated National Inventory of Dams (NID), with re-authorization and a dedicated funding source provided under the Water Resources Development Act of 1996 (P.L. 104-3). The Corps also began close collaboration with the Federal Emergency Management Agency (FEMA) and state regulatory offices to obtain more accurate and complete information. The National Dam Safety and Security Act of 2002 (P.L. 107-310) reauthorized the National Dam Safety Program and included the maintenance and update of the NID by the Corps of Engineers.

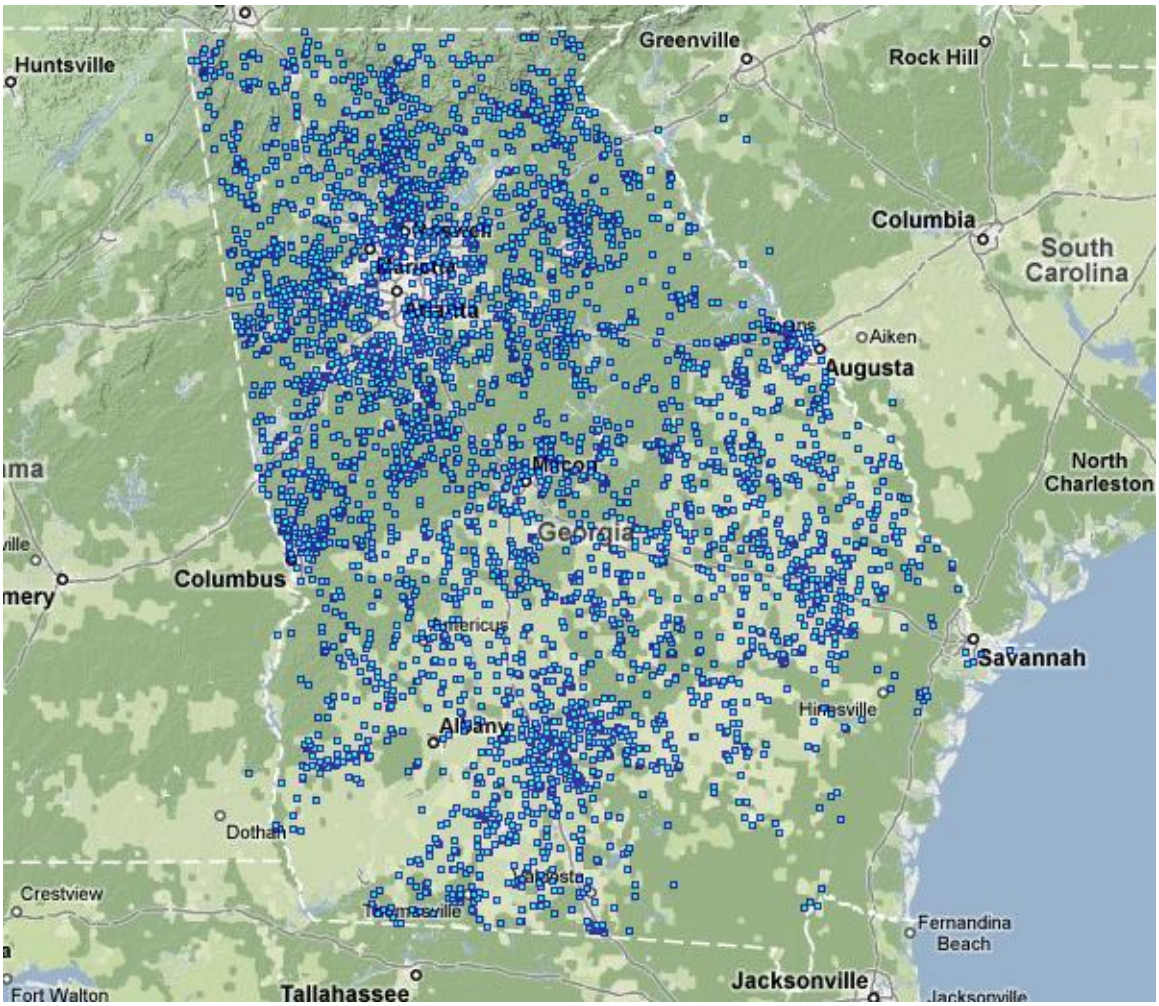
The most recent Dam Safety Act of 2006 reauthorized the maintenance and update of the NID. The NID consists of dams meeting at least one of the following criteria:

1) High hazard classification - loss of one human life is likely if the dam fails,
2) Significant hazard classification - possible loss of human life and likely significant property or environmental destruction,
3) Equal or exceed 25 feet in height and exceed 15 acre-feet in storage,
4) Equal or exceed 50 acre-feet storage and exceed 6 feet in height.

The goal of the NID is to include all dams in the U.S. that meet these criteria, yet in reality, is limited to information that can be gathered and properly interpreted with the given funding. The inventory initially consisted of approximately 45,000 dams, which were gathered from extensive record searches and some feature extraction from aerial imagery. Since continued and methodical updates have been conducted, data collection has been focused on the most reliable data sources, which are the various federal and state government dam construction and regulation offices. In most cases, dams within the NID criteria are regulated (construction permit, inspection, and/or enforcement) by federal or state agencies, who have basic information on the dams within their jurisdiction. Therein lies the biggest challenge, and most of the effort to maintain the NID; periodic collection of dam characteristics from states, territories, and 18 federal offices. Database management software is used by most state agencies to compile and export update information for the NID. With source agencies using such software, the Corps of Engineers receives data that can be parsed and has the proper NID codes. The Corps can then resolve duplicative and conflicting data from the many data sources, which helps obtain the more complete, accurate, and updated NID.

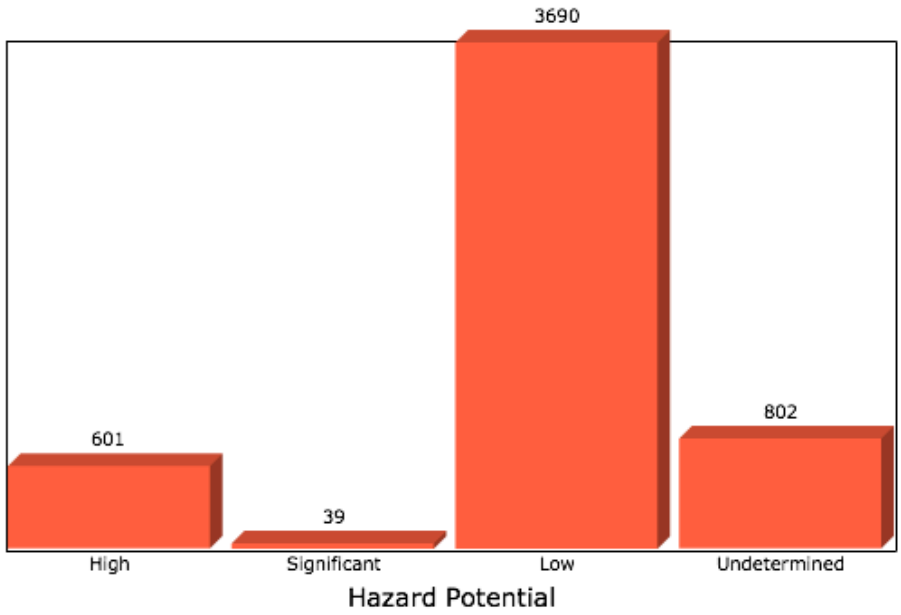
The National Inventory of Dams Map for the State of Georgia is located below and displays the State's current inventory of 5,132 dams.

U.S Army Corps of Engineers National Inventory of Dams

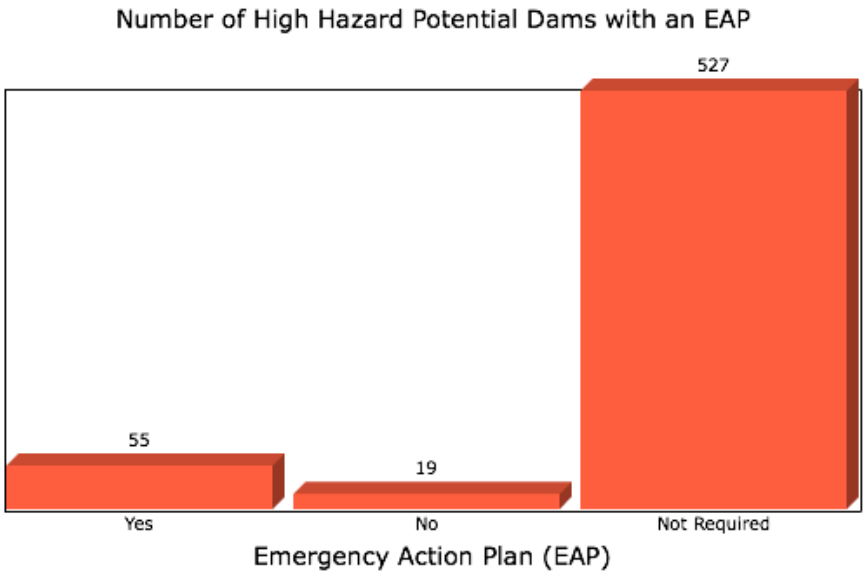


The following US Army Corps of Engineers charts are derived from NID information and present information related to number, hazard potential, type, height, ownership, purpose, and age of Georgia dams.

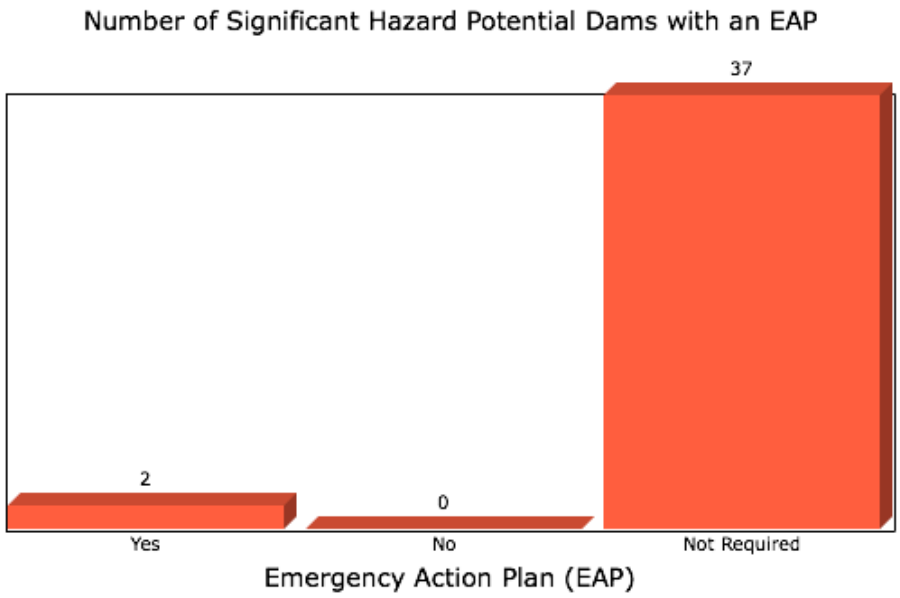
Dams by Hazard Potential



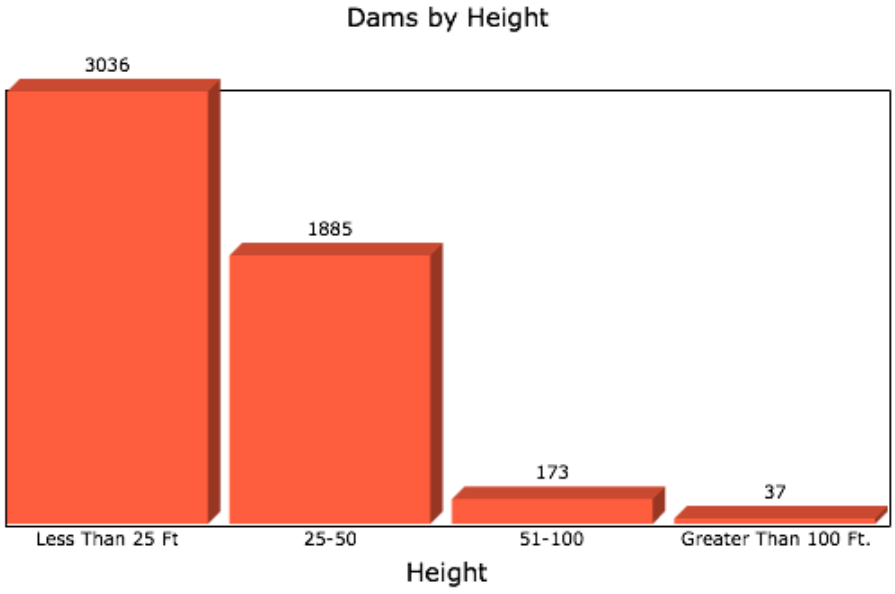
Number of High Hazard Potential Dams with an Emergency Action Plan (EAP)



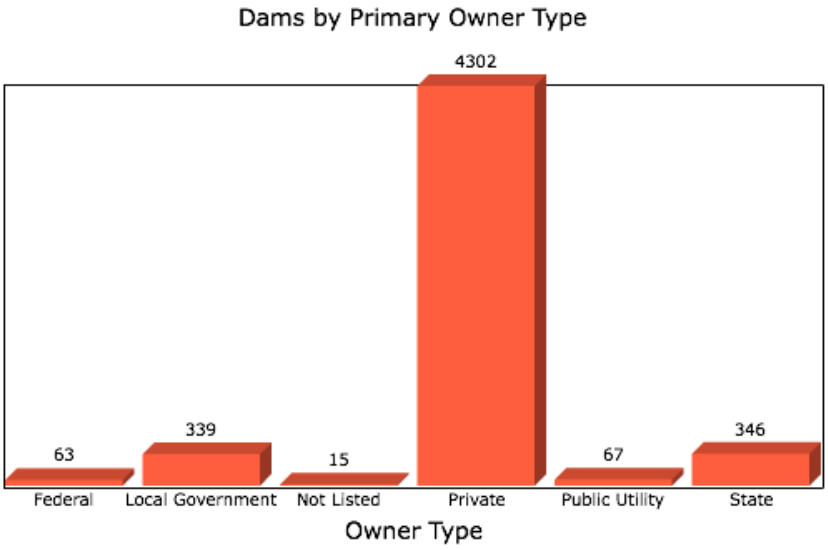
Number of Significant Hazard Potential Dams with an Emergency Action Plan (EAP)



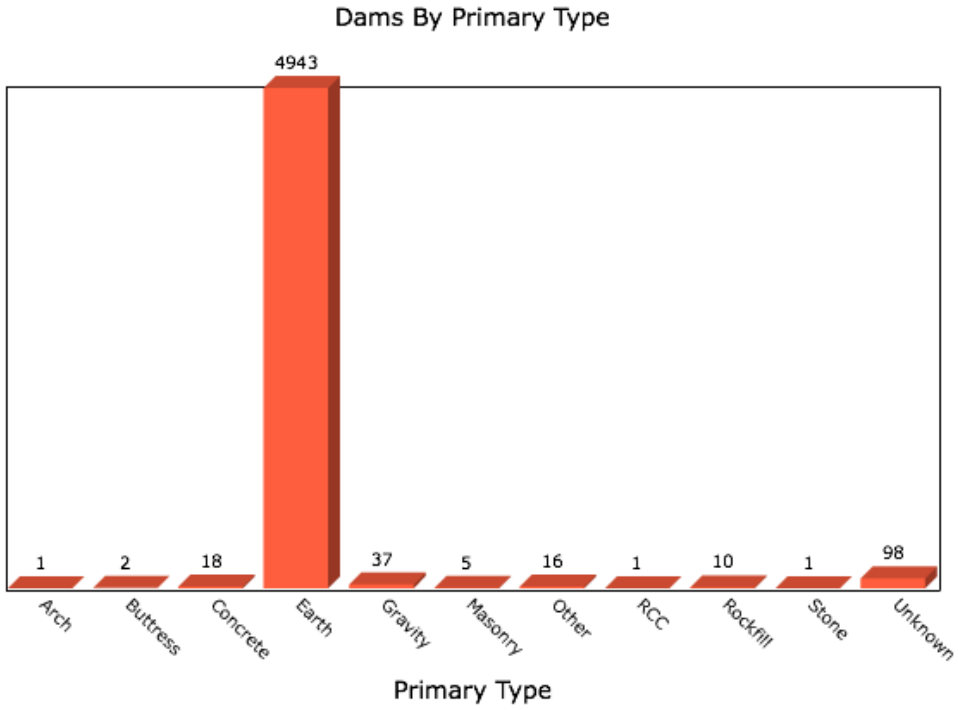
Dams by Height



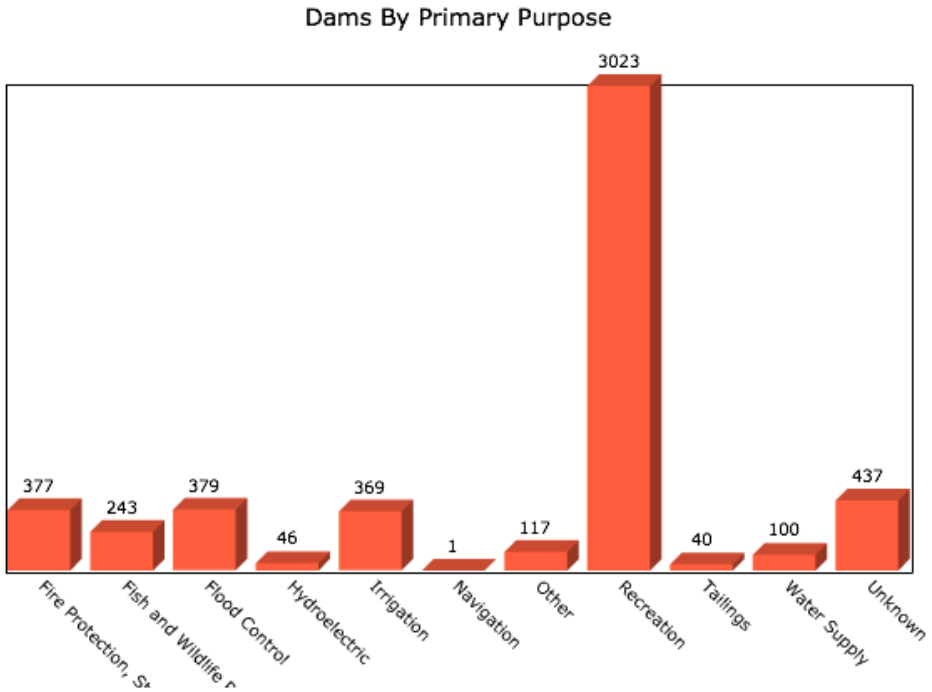
Dams By Primary Owner Type



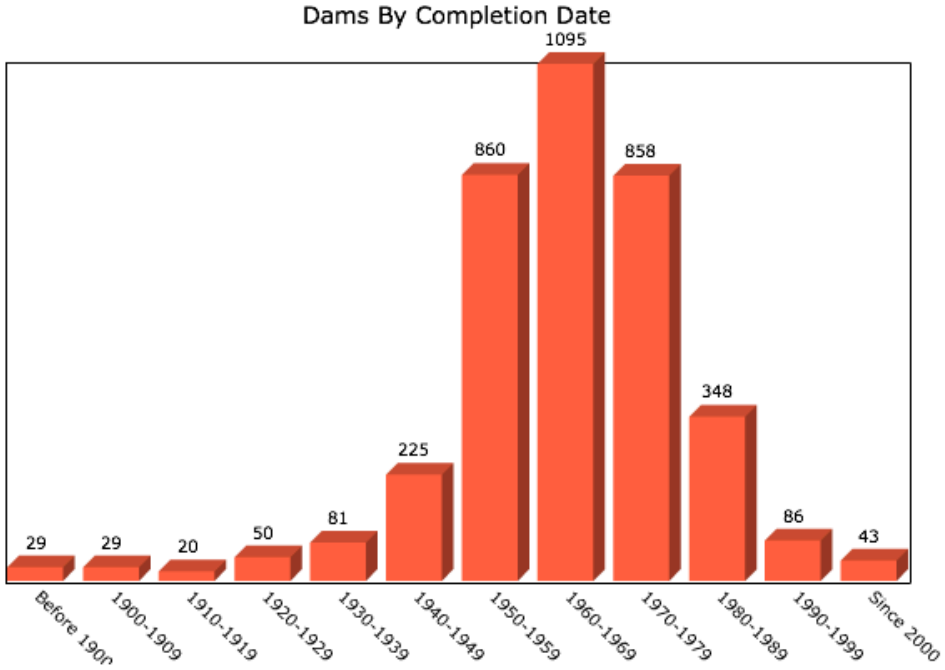
Dams By Primary Type



Dams By Primary Purpose



Dams By Completion Date



As you can see in the last chart above, most Georgia dams were built during the 1950's through the 1970's. This puts the average age of Georgia dams at over 50 years old. The Dade County HMPC reviewed historical data from the Environmental Protection Division (EPD) within the Georgia Department of Natural Resources (DNR) as well as County records in their research involving dam failure within Dade County. Fortunately, Dade County has never experienced a major dam failure. It is possible that some small private dams have been breached at some point in the past, but no records have been found to indicate any type of emergency response related to such a failure, or even that such a failure has taken place. However, the potential for such a disaster does exist, and the appropriate steps must be taken to minimize such risks. The Safe Dams Program helps to accomplish that.

The Georgia Safe Dams Act of 1978 established Georgia's Safe Dams Program following the November 6, 1977 failure of the Kelly Barnes Dam in Toccoa, GA, in which 39 people lost their lives when the breached dam, which held back a 45-acre lake, sent a 30-foot-high wall of water sweeping through Toccoa Falls College. The Environmental Protection Division (EPD) within the Georgia Department of Natural Resources (DNR) is responsible for administering the Program. The purpose of the Program is to *provide for the inspection and permitting of certain dams in order to protect the health, safety, and welfare of all citizens of the state by reducing the risk of failure of such dams.* The Program has two main functions: (1) to inventory and classify dams and (2) to regulate and permit high hazard dams.

The Georgia Stormwater Management Manual provides the definition for a Category I and a Category II dam in the State of Georgia:

- "Category I" means the classification where improper operation or dam failure would result in probable loss of human life. Situations constituting "probable loss of life" are those situations involving frequently occupied structures or facilities, including, but not limited to, residences, commercial and manufacturing facilities, schools and churches.

- "Category II" means the classification where improper operation or dam failure would not expect to result in probable loss of human life.

Structures below the State minimum height and impoundment requirements (25 feet or more in height or an impounding capacity of 100 acre-feet or more) are exempt from regulation by the Georgia Safe Dams Program. The Program checks the flood plain of the dam to determine its hazard classification. Specialized software is used to build a computer model to simulate a dam breach and establish the height of the flood wave in the downstream plain. If the results of the dam breach analysis, also called a flood routing, indicate that a breach of the dam would result in a probable loss of human life, the dam is classified as Category I. As of December 2011, the Program's statewide inventory of dams consisted of 475 Category I dams, 3,410 Category II dams and 1,186 exempt dams. The Program noted that an additional 120 Category II dams needed to be studied for possible reclassification to Category I dams. The Safe Dams Program also approves plans and

specifications for construction and repair of all Category I dams. In addition, Category I dams are continuously monitored for safety by Georgia EPD.

To date, the Safe Dam Program has identified **one Category I dam** within Dade County. This is the Lookout Lake Dam. The additional twenty-eight classified dams within the County are Category II dams (19) or exempt dams (9). There may be a number of unclassified dams within the County as well. The Program requires all Category II dams to be inventoried at least every five years. The Program also offers assistance to local governments in understanding, implementing and maintaining compliance with the National Flood Insurance Program (NFIP).

C. Assets Exposed to Hazard – Areas most vulnerable to the physical damages associated with dam failure within Dade County, though such a risk appears to be relatively low, are the low-lying and downstream areas associated with Lookout Lake Dam. Although physical damages associated with dam failure would be limited to certain areas, the damage to the local economy and problems associated with delivery of water and other utilities could be felt Countywide and include all areas of the County and City.

D. Estimate of Potential Losses - With no record of dam failure for the County or City, there is very little to base loss estimates on. The potential for a dam failure is always there which could result in significant devastation. Unfortunately, the local jurisdictions do not have the capabilities to estimate such devastation. Such estimates would have to be outsourced and are not something that can be budgeted for at this time or in the foreseeable future. Additional loss estimate information may be found in Appendix A, the Critical Facilities Database, and Appendix D, for each jurisdiction.

E. Multi-Jurisdictional Concerns – All of Dade County, including the City of Trenton, is vulnerable to the negative impact of dam failure.

F. Hazard Summary – With one Category I dam located within the County, risks associated with dam failure cannot be ignored. The Dade County HMPC has identified some specific mitigation actions for dam failure in Chapter 5.

Chapter 4
Land Use and Development

After review by the HMPC, it was determined that no significant growth occurred within the past five years that would have significantly impacted the vulnerabilities of Dade County or the City of Trenton. Included within this Chapter is information from the Dade County Comprehensive Plan update.

Quality Community Objectives Assessment for Dade County

This assessment forms an analysis of local ordinances, policies, and organizational strategies intended to create and expand quality growth principles. The County has taken this assessment into account in the visioning process and in development of a list of issues, future development map, future development narrative, and short term work program.

Traditional Neighborhoods

Dade County does not have zoning at this time and does not have a tree-preservation program. Similarly, no beautification program is in place. Walkability of the county is low, both for running errands and for walking or biking to school. Dade County plans to participate in a joint city-county planning committee to address such issues.

Infill Development

Dade County has an inventory of vacant sites, but active promotion of brownfield and grayfield redevelopment is lacking. This is a recognized issue that will be addressed by the Dade Industrial Development Authority, the Joint Development Authority, and Dade Economic Development.

Dade County does not have areas that are planned for nodal development (compacted near intersections rather than spread along a major road.) However, through this plan update, areas suitable for nodal development along I-59 will be highlighted on the future development map.

Sense of Place

If someone dropped from the sky into Dade County, he or she would know immediately that they were in the South, based on our distinct characteristics. To emphasize the uniqueness of Dade County, its natural resources should be protected and highlighted. We do not have ordinances to regulate the aesthetics of development in our highly visible areas. Ordinances to regulate the size and type of signage are only applicable to the interstate. We do not offer a development guidebook that illustrates the type of new development we want in our community. Our community does not have a plan to protect designated farmland. The County plans to participate in a joint land use planning board to address issues of growth management.

Delineation of areas that are important to our history and heritage will be addressed through identification of areas requiring special attention and the future development map.

Transportation Alternatives

Dade County does have public transportation. Dade County and Trenton are participating in Rural Transit service provision discussions. At present, Dade County does not contain strong pedestrian connections, neither requiring connection of new developments to existing developments, nor maintaining existing sidewalks, nor having a sidewalk ordinance.

Efforts are underway to connect greenways in Walker County with the existing Cloudland Canyon trail. The County has participated in the regional bicycle plan. Regional Identity The County is characteristic of the region in terms of architectural styles and heritage. Indian and early settler history, Civil War heritage, and post-Civil War Reconstruction have been heavy influences in this area's culture and architecture. The County is connected to the surrounding region for its economic livelihood through businesses that process local agricultural products, mostly chickens and beef cattle. Our community encourages businesses that create products that draw on our regional heritage. Efforts have been made to develop and promote unique products such as saddles. Dade County participates in the Georgia Department of Economic Development's regional tourism partnership and in the Historic High Country Travel Association, promoting tourism opportunities based on the unique characteristics of our region. We contribute to the region, and draw from the region, as a source of local culture, commerce, entertainment, education.

Heritage Preservation

Heritage preservation, while of concern to many Dade Countians, has not been steadfastly pursued. Steps to promote historic preservation should include designating historic districts, activating an historic preservation commission, and requiring that that new development complements historic development. An effort is underway to preserve the historic courthouse in downtown Trenton as a combined center for the Chamber of Commerce, DDA, Historical Society, Dade Industrial Authority, and museum.

Open Space Preservation

Like heritage preservation, open space preservation is a priority to the county. Although there is no greenspace plan or active preservation of greenspace, land conservation program or a conservation subdivision ordinance, the County plans to work with land owners and buy land as needed to create conservation easements to develop greenway to connect area immediately outside Trenton with Cloudland Canyon. Partnering with Walker County will also connect the existing trail through Cloudland Canyon to Lula Lake Land Trust. The County will work with local landowners to set aside sensitive, scenic land in conservation easements.

Environmental Protection

No comprehensive natural resources inventory has been completed, and steps have not been taken to protect them such as adopting applicable Part V Environmental Ordinances or tree preservation ordinances. A starting point for such inventory may be the areas requiring special attention. Stormwater best management practices for all new development are not required. Local land use measures are not in place to protect the natural resources in our community (steep slope regulations, floodplain or marsh protection, etc. The County plans to build and keep updated a developer's guidebook to inform developers and residents of state, local regulations including erosion, sedimentation control, building codes, other county ordinances to protect sensitive environmental areas including wetlands, floodplains, steep slopes.

Growth Preparedness

Although the county does not have population projections for the next 20 years to be used when making infrastructure decisions, such projections are available through the local Regional Development Center.

No Capital Improvements Program that supports current and future growth is yet in place. Although the county has not designated areas of our community where we would like to see growth, this issue will be addressed through the future development map. These areas are based on the natural resources inventory of our community. The County has clearly understandable guidelines for new development. Citizen–education campaigns are not in place to allow all interested parties to learn about development processes in our community and to make it easy for the public to stay informed about land use issues, zoning decisions, and proposed new development. Public participation has been encouraged in the comprehensive planning process.

Appropriate Businesses

Our economic development organizations have not considered our community's strengths, assets, and weaknesses; no business development strategy has been developed. Also, these organizations have not considered the types of businesses already in our community, and do not have a plan to recruit business/industry that will be compatible. A more diverse jobs base is needed. These issues will be addressed through the work of the Chamber of Commerce, Industrial Development Authority, Dade Economic Development, and the Joint Development Authority. The County does recruit businesses that provide or create sustainable products.

Employment Options

Our economic development program does not have an entrepreneur support program. While the County does have jobs for unskilled labor, those jobs for skilled labor and for professional and managerial jobs are lacking. This will continue to be addressed through

the Chamber of Commerce, Industrial Development Authority, Dade Economic Development, and the Joint Development Authority.

Housing Choices

Housing choices allowed are varied in the County. Dade allows accessory units like garage apartments or mother-in-law units so that people who work in our community can afford to live here, too. Our community has enough housing for each income level (low, moderate, and above-average incomes). We have vacant and developable land available for multifamily housing and this type of housing is allowed. We allow small houses built on small lots (less than 5,000 square feet) in appropriate areas. While we have housing programs that focus on households with special needs, we do not directly support community development corporations building housing for lower income households.

Educational Opportunities

Our community provides work-force training options for our citizens for jobs that are available in our community. Our community has higher education opportunities. However, jobs for college graduates are less available.

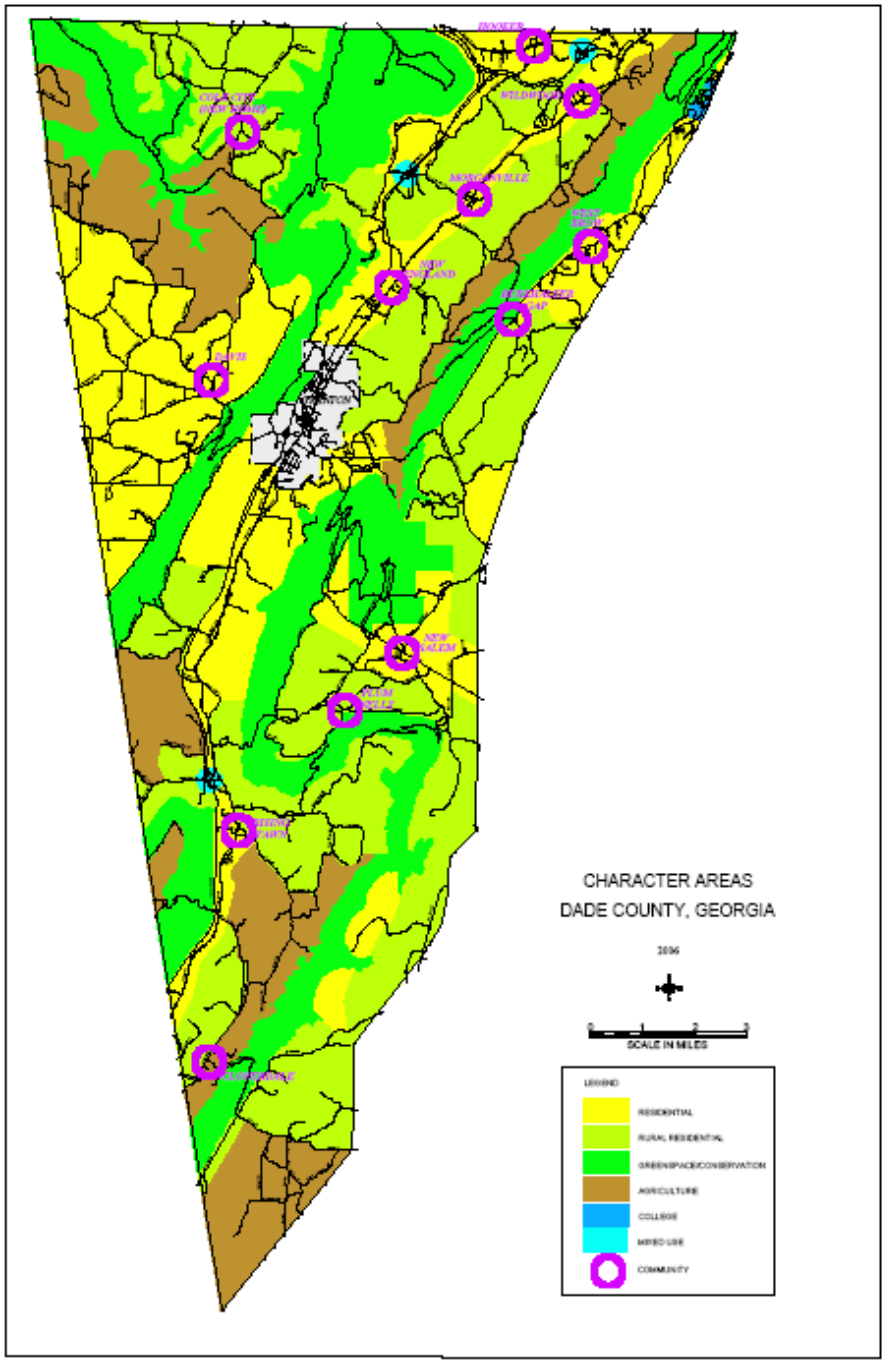
Regional Cooperation

We plan jointly with our cities and county for Comprehensive Planning purposes and are satisfied with our Service Delivery Strategies. We do cooperate with at least one local government to provide or share services (parks and recreation, E911, Emergency Services, Police or Sheriff's Office, schools, water, sewer, other) and are satisfied with our Service Delivery Strategy. We initiate contact and meet regularly with neighboring jurisdictions to maintain contact, build connections, and discuss issues of regional concern.

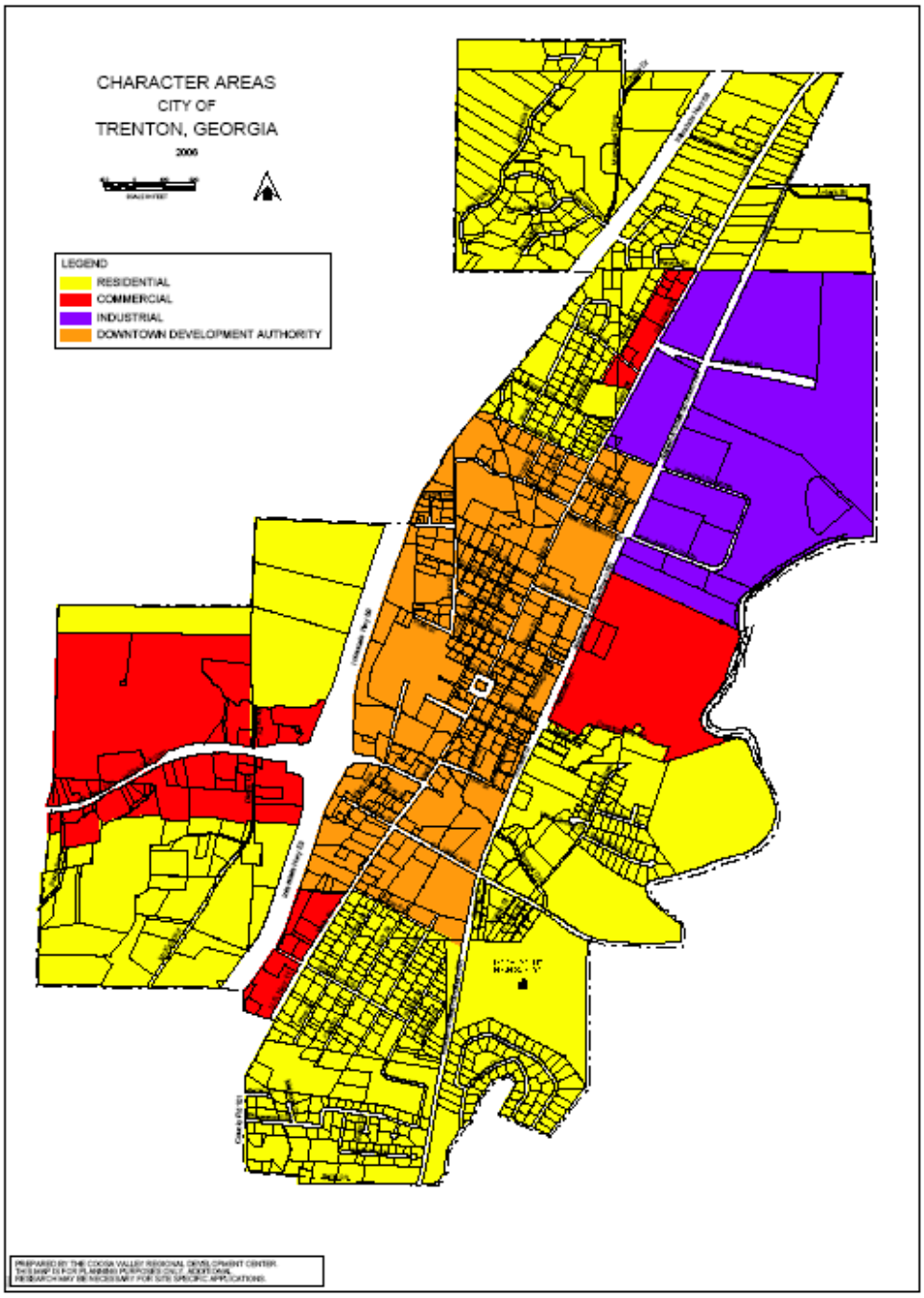
Regional Solutions

We participate in regional economic development and environmental organizations especially regarding water quality and quantity issues. Our community thinks regionally, especially in terms of issues like land use, transportation and housing, understanding that these go beyond local government borders. However, we do not work with other local governments to provide or share all services, such as public transit, libraries, special education, tourism, parks and recreation, emergency response, E-911, homeland security, etc.

Dade County Future Development Map



City of Trenton Future Development Map



Local Capabilities

Local mitigation capabilities are existing authorities, policies, programs and resources that reduce hazard impacts or that could be used to implement hazard mitigation activities. The HMPC reviewed local capabilities and the available information is included in the Local Capabilities Assessment Chart below.

Local Capabilities Assessment Chart

Plan, Code/Ordinance, Tool or Funding Method	In place to address hazard mitigation by following jurisdictions (D = Dade, T = Trenton)	Adequately utilized or enforced to address hazard mitigation	Updated regularly or as required by law	Notes
Comprehensive Plan	D, T	Y	Y	2017-2027
Local Emergency Operations Plan (LEOP)	none	-	-	-
Transportation Plan	D	Y	Y	within EOP for GEM
Community Wildfire Protection Plan (CWPP)	D, T	Y	Y	update in progress
Building Code	D	Y	Y	2018 International Buildin
Site Plan Review	T	Y	Y	
ISO Rating	D	Y	Y	by Fire District: Trenton = 4, Salem = 4-4y, W.Brow = 6-6 = 6-6x, S.Dade = 4-4y, New 4y, Davis = 4-4x
Zoning Ordinance	T	Y	Y	
Subdivision Ordinance	D	Y	Y	Code of Ordinances, Cha
Floodplain Ordinance	D, T	Y	Y	Code of Ordinances, Cha
Planning Commission	T	Y	Y	5 members
Hazard Mitigation Planning Committee (HMPC)	D, T	Y	Y	2018 HMP update in pro
Mutual Aid Agreements	D, T	Y	Y	State and local jurisdict
Mass Notification System	D	Y	Y	HyperReach
Grant Writing	D, T	Y	NA	in-house grant write
CERT Team	D	Y	Y	education & training ong
Public outreach & education programs	D, T	Y	Y	see mitigation actions c
GEMA School Safety Plan	D	Y	Y	Updated 2016
Storm Ready Certification	D, T	Y	Y	
Capital improvement projects	D, T	Y	NA	see mitigation actions cha comprehensive plan
Impact fees	T	NA	NA	for sewer and stormwa
Bonds, taxes, utility fees	D, T	Y	NA	ongoing

Chapter 5
Natural Hazard Mitigation Goals, Objectives, & Actions

When Dade County and the City of Trenton begin any large-scale planning effort, it is imperative that the planning process is driven by a clear set of goals and objectives. Goals and objectives are the foundation of an effective Hazard Mitigation Plan. They address the key problems and opportunities to help establish a framework for identifying risks and developing strategies to mitigate those risks. During the planning process, Dade County's multi-jurisdictional Hazard Mitigation Planning Committee (HMPC) reviewed the previous plan and took into consideration community growth and minor changes that were made to infrastructure in order to evaluate to what extent the previously identified hazards had affected the jurisdictions since the last plan revision. While this information was used to review all of the goals, objectives, and action items from the previous plan for relevance and usability, there were no changes in overall priorities identified at the time of this plan update.

In order to fully understand the hazard mitigation goals, objectives, and actions, it is necessary to clearly define the terms **"goal"**, **"objective"**, and **"action"**:

A **goal** is a broad-based statement of intent that establishes the direction for the Dade County Hazard Mitigation Plan. Goals can essentially be thought of as the desired "outcomes" of successful implementation of the Plan.
An **objective** is the stated "means" of achieving each goal, or the tasks to be executed in the process of achieving goals.
An **action** is a project-specific strategy to mitigate a particular hazard event within the context of the overarching goals and objectives.

While specific mitigation actions are listed later in this chapter, it is important to note that the actions were selected and evaluated in relation to the overarching hazard mitigation goals and objectives of this plan, which are as follows:

Goal #1. Protect life and minimize loss of property damage.

Objective 1-1. Implement mitigation actions that will assist in protecting lives and property by making homes, businesses, public facilities, and infrastructure more resistant to vulnerable hazards.
Objective 1-2. Review existing ordinances, building codes, and safety inspection procedures to help ensure that they employ the most recent and generally acceptable standards for the protection of buildings.
Objective 1-3. Ensure that public and private facilities and infrastructure meet established building codes and enforce the codes to address any deficiencies.
Objective 1-4. Implement mitigation actions that encourage the protection of the environment.

Objective 1-5. Integrate the recommendations of this plan into existing land use plans and capital improvement programs.
Objective 1-6. Build upon past databases to ensure that vulnerable hazards' risks are accurate.

Goal #2. Increase Public Awareness.

Objective 2-1. Develop and implement additional education and outreach programs to increase public awareness of the risks associated with hazards and on specific preparedness activities available.
Objective 2-2. Encourage homeowners and businesses to take preventative actions and purchase hazard insurance.

Goal #3. Encourage Partnerships.

Objective 3-1. Strengthen inter-jurisdictional and inter-agency communication, coordination, and partnerships to foster hazard mitigation actions designed to benefit multiple jurisdictions.
Objective 3-2. Identify and implement ways to engage public agencies with individual citizens, nonprofit organizations, business, and industry to implement mitigation activities more effectively.

Goal #4. Provide for Emergency Services.

Objective 4-1. Where appropriate, coordinate and integrate hazard mitigation actions with existing emergency operations plans.
Objective 4-2. Identify the need for, and acquire, any special emergency services and equipment to enhance response capabilities for specific hazards.
Objective 4-3. Encourage the establishment of policies to help ensure the prioritization and implementation of mitigation actions designed to benefit critical facilities, critical services, and emergency traffic routes.

Format Utilized to Develop Mitigation Actions

The HMPC reviewed each jurisdiction's annual budget, multiyear work programs, and comprehensive plans to determine existing mitigation actions that met the goals and objectives of this Plan. The committee then developed a list of tentative mitigation actions based on committee members' personal knowledge, interviews with other officials of each jurisdiction, and knowledge of successful actions implemented in other communities.

The committee members developed a prioritized list of mitigation actions utilizing the GEMA recommended STAPLEE prioritization methodology, with special emphasis on the following:

1. Cost effectiveness (and when potential federal projects are anticipated, cost-benefit reviews will be conducted prior to application);
2. Comprehensiveness, i.e. addresses a specific goal and objective;
3. Addresses reducing effects of hazards on new and existing buildings and infrastructure;
4. Addresses reducing effects of hazards on critical facilities where necessary; and,
5. Identification of future public buildings and infrastructure (Note: recognizing that the Plan may be modified and evaluated during the monitoring and evaluation period and will definitely be completely updated within the federally mandated five-year approval cycle, future development including future buildings will only include the five-year period from Plan completion).

All rankings were composited to represent the consensus of the HMPC.

Members of the HMPC prioritized the potential mitigation measures identified in this Plan. A list of mitigation goals, objectives and related action items was compiled from the inputs of the HMPC, as well as from others within the community. The subcommittee prioritized the potential mitigation measures based on what they considered most beneficial to the community. Several criteria were established to assist HMPC members in the prioritization of these suggested mitigation actions. Criteria included perceived cost benefit or cost effectiveness, availability of potential funding sources, overall technical feasibility, measurable milestones, multiple objectives, determination of public and political support for the proposed actions, and the STAPLEE method described above. Through this prioritization process, several projects emerged as being a greater priority than others. Some of the projects involved expending considerable amounts of funds to initiate the required actions. Most projects allowed the community to pursue completion of the project using potential grant funding. Still others required no significant financial commitment by the community. All proposed mitigation actions were evaluated to determine the degree to which the County would benefit in relation to the project costs. After review by the HMPC, the prioritized list of mitigation measures, as presented within this Plan, was determined.

This same method of prioritization was utilized for the prior update to this Plan. Additionally, it was reviewed by the HMPC during the current plan update process and approved for continued use due to its effectiveness. No changes were recommended.

Mitigation Actions

Each mitigation action within this Plan is presented by jurisdiction, or in the case of joint actions by multiple jurisdictions, or by independent public bodies (such as School System), or by private nonprofits (such as the Medical Center), in priority order (objective), by best estimate of cost, if applicable, by potential funding source if other than operating budgets, by jurisdiction, department or agency that will administer the action, and by timeframe. Timeframes actually do not begin until funding is fully obtained for any particular project. However, for purposes of demonstration in the mitigation actions chart below, timeframes presume full funding as of 2018. This will obviously not be the case for all projects, but it demonstrates what is possible should funding become available.

Many of the mitigation actions included within this Plan update are carried over from the previous 5-year planning period. Some of these action items were left unchanged while others were revised as needed. This is not uncommon in the more rural counties of North Georgia. It is not a result of failure to review existing mitigation actions carefully or to consider new ones. Rather, it is primarily the result of the unavailability of funding, whether that be general funds, private grants, or public grants. The HMPC selects mitigation actions during the planning process based upon perceived benefit, not based upon likelihood of funding opportunities. To do otherwise would result in a very short list of mitigation actions.

Each mitigation action may be supported by one or more jurisdictions below, as indicated by letters A) through B).

A) Dade County
B) City of Trenton

The City of Trenton has a relatively small population. Due to limited financial and human resources, much support with regard to public safety is provided by Dade County. This includes assistance with emergency management, fire protection, and law enforcement. The City does have some capability, but it is augmented by the County. Therefore, many mitigation actions included on behalf of the County in the Plan are likely to have an indirect benefit for the City of Trenton. The term "All" as used in the mitigation actions chart below under the column "Jurisdictional Participants" refers to all jurisdictions included under this Plan.

Each of the mitigation actions is also designed to mitigate one or more hazards discussed in this Plan. Those specific hazards are listed for each mitigation action at the end of each mitigation action description. The term "All" as used in the mitigation actions chart below under the column "Hazards Addressed" refers to all hazards discussed in this Plan.

Each mitigation action mitigates the effects of hazards on existing structures/infrastructure, future structures/infrastructure, or both, as indicated.

Finally, the status of each mitigation action that follows is indicated by one of the following three status-related terms:

PRELIMINARY – unfunded projects or projects in planning stages.
IN PROGRESS – funded projects that have begun but aren't completed.
ONGOING – continuous projects that are never truly completed; may be funded or unfunded at any given time but are expected to continue unless removed from Plan.

**Note: Mitigation actions that were fully completed or that were deleted since the prior Plan update are not found below, but in Appendix D.*

Priority	Mitigation Action	Hazard	Jurisdictions Involved	Project Implemented by	Project Status	Cost Estimate	Potential Source(s) of Funding	Project Length	Structures & Infrastructure Impacted	Goals and Objectives
1	Change structure of Lookout Lake Dam to meet GA Safe Dams Category II requirements (lower 4ft, remove trees, new spillway, siphoning system, re-earthing portions of dam, new road on top, etc per GA Safe Dams)	Dam Failure, Flooding	A	Dade County Board of Commissioners	Preliminary	$1 million +	Public or private grants; general funds	5 years	Existing	1-1, 1-3, 3-1
2	Provide weather radios to vulnerable populations	All	A	Dade County EMA	Ongoing	$50K	Public or private grants; general funds	2 years	Existing	2-1, 4-2
3	Road maintenance of secondary roads	All	A, B	Dade County Public Works	Ongoing	$450K	Public or private grants; general funds	5 years	Existing	4-2
4	Backup generators at critical facilities	All	A, B	Dade County EMA City of Trenton	Ongoing	$350K per year	Public or private grants; general funds	1 year	Existing	4-2
5	Hazardous Materials Training	Hazmat Release	A, B	Dade County Fire Dept	Ongoing	$25K per year	Public or private grants; general funds	1 year	Existing and Future	2-1
6	City of Trenton Storm Drain / Sewer Mapping System	Flooding	B	City of Trenton Public Works	Preliminary	$100K	Public or private grants; general funds	3 years	Existing and Future	1-1, 1-3
7	Emergency Notification System (HyperReach)	All	A, B	Dade County EMA	Ongoing	$11K per year	Public or private grants; general funds	1 year	Existing and Future	2-1, 4-2
8	Citizen Emergency Response Team (CERT)	All	A, B	Dade County EMA	Ongoing	$20K per year	Public or private grants; general funds	1 year	Existing and Future	2-1, 3-1, 3-2
9	Town Creek at Sunset Drive Flooding Acquisition Project (purchase 3 homes)	Flooding	B	Dade County Public Works	Preliminary	$75K	Public or private grants; general funds	3 years	Existing	1-1, 1-3
10	Town Creek at Sunset Drive Flooding Construction Project (build up road/add culvert)	Flooding		Dade County Public Works	Preliminary	$1 million	Public or private grants; general funds	5 years	Existing	1-1, 1-3

Priority	Mitigation Action	Hazard	Jurisdictions Involved	Project Implemented by	Project Status	Cost Estimate	Potential Source(s) of Funding	Project Length	Structures & Infrastructure Impacted	Goals and Objectives
11	Mason Rd Flooding	Flooding	A	Dade County Public Works	Preliminary	$1 million	Public or private grants; general funds	5 years	Existing	1-1, 1-3
12	Creek Rd Flooding at New England Rd	Flooding	A	Dade County Public Works	Preliminary	$2 million +	Public or private grants; general funds	5 years	Existing	1-1, 1-3
13	Creek Rd at Sarah's Chapel intersection	Flooding	A	Dade County Public Works	Preliminary	$1 million	Public or private grants; general funds	5 years	Existing	1-1, 1-3
14	Create a Weather Spotter Class	All	A, B	Dade County EMA	Preliminary	$1,000 per class	Public or private grants; general funds	5 years	Existing and Future	2-1, 4-2
15	Lightning Protection of critical facilities	Lightning	A, B	Dade County Fire Dept, City of Trenton Public Works	Preliminary	$310K	Public or private grants; general funds	3 years	Existing	1-1, 1-3
16	Drought Action Plan	Drought	A, B	Dade County EMA, City of Trenton Fire Dept	Preliminary	$50K	Public or private grants; general funds	2 years	Existing and Future	1-1, 1-3, 4-1
17	Comprehensive Public Awareness Campaign	All	A, B	Dade County EMA, City of Trenton Fire Dept	Ongoing	$10K per year minimum	Public or private grants; general funds	1 year	Existing and Future	2-1, 2-2, 3-1, 3-2
18	Water Use Education and Awareness Campaign	Drought	A, B	Dade County Soil & Water Conservation	Preliminary	$2,500 per year	Public or private grants; general funds	1 year	Existing	2-1
19	Burn Permits Education and Awareness Campaign	Wildfire	A, B	Dade County Fire Dept, GFC	Preliminary	$2,500 per year	Public or private grants; general funds	1 year	Existing	2-1
20	Critical Facilities Seismic Retrofit	Earthquake	A, B	Dade County Board of Commissioners	Preliminary	$20K per year minimum	Public or private grants; general funds	5 years	Existing	1-1, 1-3
21	Emergency Response and Evacuation Plans	All	A, B	Dade County EMA, City of Trenton Fire Dept	Preliminary	$25K	Public or private grants; general funds	3 years	Existing	3-1, 3-2, 4-1, 4-3

Priority	Mitigation Action	Hazard	Jurisdictions Involved	Project Implemented by	Project Status	Cost Estimate	Potential Source(s) of Funding	Project Length	Structures & Infrastructure Impacted	Goals and Objectives
22	Water Conservation Efforts	Drought	A, B	Dade County Soil & Water Conservation, City of Trenton Utilities Dept	Ongoing	$10K per year	Public or private grants; general funds	1 year	Existing and Future	3-1
23	Cooling / Heating Rooms for vulnerable populations w/backup generators	All	A, B	Dade County EMA	Preliminary	$500K	Public or private grants; general funds	5 years	Existing	4-2
24	Seismic Loss Estimation Study	Earthquake	A, B	Dade County Board of Commissioners	Preliminary	$400K	Public or private grants; general funds	5 years	Existing and Future	1-6
25	Emergency Shelter and Critical Facilities Upgrades (including 20K gallon water facilities and seismic retrofit)	All	A, B	Dade County EMA, City of Trenton Fire Dept	Preliminary	$50K per location minimum	Public or private grants; general funds	5 years	Existing	1-1, 1-2, 1-3, 1-4, 3-1, 4-1, 4-3
26	GEMA School Safety Plan	All	A	Dade County EMA	Ongoing	$25K	Public or private grants; general funds	5 years	Existing	1-1, 1-2, 1-3, 4-1, 4-3
27	Community Wildfire Protection Plan (CWPP)	Wildfire	A, B	Dade County Fire Dept, City of Trenton Fire Dept, GFC	Ongoing	10K per year	Public or private grants; general funds	5 years	Existing and Future	2-1, 3-1, 4-1, 4-3
28	Comprehensive Inspection of Dams not inspected by State of GA	Dam Failure	A	Dade County Public Works	Preliminary	$250K	Public or private grants; general funds	2 years	Existing	1-1, 1-2, 1-3, 1-4
29	Storm Shelters	All	A, B	Dade County EMA	Ongoing	$1 million	Public or private grants; general funds	5 years	Existing and Future	4-2
30	Water Resources Protection from hazmat release	Hazmat release	A	Dade County Soil & Water Conservation & Fire Dept	Preliminary	$75K	Public or private grants; general funds	4 years	Existing and Future	2-1
31	Building Collapse Machinery and Equipment	Earthquake	A, B	Dade County Fire Dept	Preliminary	$1.25 million	Public or private grants; general funds	2 years	Existing and Future	4-2

Priority	Mitigation Action	Hazard	Jurisdictions Involved	Project Implemented by	Project Status	Cost Estimate	Potential Source(s) of Funding	Project Length	Structures & Infrastructure Impacted	Goals and Objectives
32	New Reservoir – 60+ acres along Sells Lane	Drought, Flooding	A	Dade County Board of Commissioners	Preliminary	$5.5 million	Public or private grants; general funds	5 years	Existing and Future	2-1, 3-1
33	Electronic Messaging Signs on Trailers	All	A, B	Dade County Public Works	Preliminary	$40K each	Public or private grants; general funds	2 years	Existing and Future	4-2
34	Outdoor Emergency Notification Sirens at high-use outdoor areas including recreational facilities	All	A, B	Dade County EMA	Preliminary	$30K each	Public or private grants; general funds	2 years	Existing and Future	4-2
35	New EOC/911 Center (storm proof)	All	A	Dade County EMA/911	Preliminary	$3 million	Public or private grants; general funds	5 years	Existing and Future	1-1, 1-3
36	Retrofit existing EOC/911 Center (storm proof)	All	A	Dade County EMA/911	Preliminary	$1 million	Public or private grants; general funds	3 years	Existing and Future	1-1, 1-3
37	Data Backup Facility	All	A, B	Dade County Information Technology, City of Trenton Mayors Office	Preliminary	$800K	Public or private grants; general funds	4 years	Existing and Future	1-1, 1-3
38	Main Water Intake – physical security (cameras, alarms)	All	A	Dade County Public Works	Preliminary	$50K	Public or private grants; general funds	2 years	Existing	1-1, 1-3
39	Wildland firefighting equipment (pump with tank and foam)	Wildfire	A	Dade County Fire Dept	Preliminary	$200K	Public or private grants; general funds	2 years	Existing and Future	4-2
40	New handhelds, mobiles and base stations for public safety communications	All	A, B	Dade County Fire Dept & Sheriffs Office, City of Trenton Police & Fire Depts	Preliminary	$1 million	Public or private grants; general funds	3 years	Existing and Future	4-2

Chapter 6
Executing the Plan

6.1 – Action Plan Implementation

The hazard mitigation planning process was overseen by the Dade County Emergency Management Agency. Once GEMA completes its initial review of this Plan, it will be forwarded to FEMA for final approval. Once final approval is received from FEMA, the Plan will be presented to the Dade County Board of Commissioners and the City of Trenton Council for consideration. Once adopted, the Dade County EMA Director shall assume responsibility for the maintenance of the Plan. It shall be the responsibility of the EMA Director to ensure that this Plan is utilized as a guide for initiating the identified mitigation measures within the community. The EMA Director shall be authorized to convene a committee to review and update this Plan annually. The Plan will also have to be updated and resubmitted once every five years. Through this Plan updating process, the EMA Director shall identify projects that have been successfully undertaken in initiating mitigation measures within the community. These projects shall be noted within the planning document to indicate their completion. Additionally, the committee called together by the EMA Director shall help to identify any new mitigation projects that can be undertaken in the community.

6.2 – Evaluation

As previously stated, the Dade County EMA Director will be responsible for ensuring that this Plan is monitored and updated at least annually, after the occurrence of any major disaster, or more often if deemed necessary. The method of evaluation will consist of utilizing a simple checklist to determine what mitigation actions were undertaken, the completion date of these actions, the cost associated with each completed action , and the perceived level of success. A committee, perhaps with much of the same membership as the existing HMPC, will convene annually in order to accomplish the annual plan review and evaluation. These meetings will provide an opportunity to discuss the progress of the action items and maintain the partnerships that are essential for the sustainability of the HMP. The EMA Director should document the progress of all related meetings, and ensure the results are reported to the Dade County Board of Commissioners at least on an annual basis.

6.3 – Multi-Jurisdictional Strategy and Considerations

As set forth by Georgia House Bill 489, the Emergency Management Agency is the overall implementing agency for projects such as hazard mitigation. Dade County will work in the best interests of the County as well as the City of Trenton. At the start of this planning process, Dade County solicited the participation of the City of Trenton. The City of Trenton have provided a great deal of input for the purposes of this Plan. The City played an instrumental role in the planning process. As a result, a truly multi-jurisdictional plan was created for Dade County and the City of Trenton, with ideas and viewpoints of all participants included.

6.4 – Plan Update and Maintenance

According to the requirements set forth in the Disaster Mitigation Act of 2000, Dade County is required to update and revise the Hazard Mitigation Plan every five years. However, the Hazard Mitigation Planning Committee will meet on the plan approval anniversary date of every year, or within 30 days of said date as determined and scheduled by the EMA Director, to complete a review of the Hazard Mitigation Plan. At each such meeting, the HMPC will review the main facets of the HMP including the vulnerability assessment, critical facilities inventory, and mitigation goals, objectives, and actions.

It is during this review process that the mitigation strategies and other information contained within the Hazard Mitigation Plan are considered for incorporation into other planning mechanisms as appropriate. Opportunities to integrate the requirements of this HMP into other local planning mechanisms will continue to be identified through future meetings of the HMPC on an annual basis.

The HMPC recognizes the need to integrate other plans, codes, regulations, procedures and programs into future Hazard Mitigation Plan (HMP) updates. This plan is multi-jurisdictional; therefore the mechanism for implementation of various mitigation plan items may vary by jurisdiction. This includes reviewing other local planning documents, processes or mechanisms for possible integration with the HMP.

To Be Reviewed in Future Update

Existing planning mechanisms	Method of use in Hazard Mitigation Plan
Comprehensive Plan (multi-jurisdictional)	Development trends
Local Emergency Operations Plan	Identifying hazards; Assessing vulnerabilities
Storm Water Management / Flood Damage Protection Ordinance	Mitigation strategies
Building and Zoning Codes and Ordinances	Development trends; Future growth
Mutual Aid Agreements	Assessing vulnerabilities
State Hazard Mitigation Plan	Risk assessment
Land Use Maps	Assessing vulnerabilities; Development trends; Future growth
Critical Facilities Maps	Locations
Community Wildfire Protection Plan	Mitigation strategies

It will be the responsibility of each participating jurisdiction to determine additional implementation procedures when appropriate.

During the planning process for new and updated local planning documents such as a comprehensive plan or Local Emergency Operations Plan, the EMA Director will provide a copy of the HMP to the appropriate parties. It will be recommended that all goals and strategies of new and updated local planning documents be consistent with, and support the goals of, the HMP and will not contribute to increased hazards in the affected jurisdiction(s).

Although it is recognized that there are many benefits to integrating components of this plan into other local planning mechanisms, and that components are actively integrated into other planning mechanisms when appropriate, the development and maintenance of this stand-alone HMP is deemed by the committee to be the most effective method to ensure implementation of local hazard mitigation actions at this time. Therefore, the review and incorporation efforts made in this update and the last, which consisted of a simple review of the documents listed in the chart above by various members of the HMPC, are considered successful by the HMPC and will likely be utilized in future updates.

The County's EMA is committed to incorporating hazard mitigation planning into its Local Emergency Operations Plan and other public emergency management activities. As the EMA Director becomes aware of updates to other County or City plans, codes, regulations, procedures and programs, the Director will continue to look for opportunities to include hazard mitigation into these mechanisms.

The Dade County HMPC will reconvene not later than the fourth anniversary of the plan approval anniversary date, as determined and scheduled by the EMA Director, to begin planning for the formal Hazard Mitigation Plan revision process. The revision process will include a clear schedule and timeline, and identify any agencies or organizations participating in the plan revision. The committee will review the mitigation goals, objectives and actions to determine their relevance to changing situations within the different jurisdictions, as well as changes in State or Federal policy, and to ensure current and expected conditions are being addressed. The HMPC will also review the prior vulnerability assessments to determine if this information should be updated or modified, given any new available data.

Dade County is dedicated to involving the public directly in reviews and updates of the HMP. During the plan revision process, the committee will conduct, at a minimum, two public hearings during the revision process. These public hearings will provide the public a forum for which they can express their concerns, opinions, or ideas about the Plan. Additionally, if persons from the community express interest in participation in the planning process, they will be provided the opportunity, via meetings, the County website, social media, and/or public forums, to suggest possible mitigation measures for the community. Documentation will be maintained to indicate all efforts at continued public involvement. All relevant information will be forwarded to GEMA and FEMA as a product of the proposed plan revision.

The EMA Director will ensure the revised plan is presented to the governing body of each jurisdiction for formal adoption. In addition, all holders of the HMP will be notified of affected changes. The EMA Director shall submit a revised Hazard Mitigation Plan not later than the five-year anniversary of the most recently updated HMP to the Georgia Emergency Management Agency for review and subsequent submittal to the Federal Emergency Management Agency for ultimate approval.

Once approved by FEMA, copies of the Dade County Hazard Mitigation Plan will be provided by the EMA Director to the appropriate governmental jurisdictions, agencies, and/or departments for review and possible inclusion into plans and programs. The HMP will be distributed by the EMA Director to the appropriate officials to allow them to review the Plan and determine to what extent the Plan should be integrated into, or referenced by, other plans and programs. Limitations may be placed on certain sensitive information by the EMA Director.

Chapter 7
Conclusion

7.1 – Summary

Dade County has gained a great deal of knowledge relating to the County's disaster history and future potential for disaster as a result of the hazard mitigation planning process. This includes an extensive hazard history of recorded hazard events from the past fifty years, a vulnerability assessment, a detailed critical facilities database with valuable information on some of most critical County and City structures, and some valuable ideas from the community abroad concerning measures that should be considered for future hazard mitigation. Community involvement has been at the heart of this effort. Not only did the planning process include the creation of a Hazard Mitigation Planning Committee with representatives from all walks of life, but multiple public hearings were conducted to provide all Dade County citizens with the opportunity to comment on, and offer suggestions concerning potential hazard mitigation measures within the community. Dade County and the City of Trenton each contributed to ensure a broad range of citizens were represented. These efforts have all had the effect of better protecting our Community from the threats of nature and technology. While it would be naïve to believe this Plan provides complete protection to Dade County and its residents, it is the hope of all parties involved in this planning process that the recommended mitigation measures contained within the Plan will provide some level of increased preparedness as well as spur further discussion and planning related to the important subject of Hazard Mitigation for years to come.

7.2 – References

Publications/Documents:
The Disaster Mitigation Act of 2000
Robert T. Stafford Disaster Relief and Emergency Assistance Act
FEMA Pre-Disaster Mitigation *How-to Guides #1, 2, 3, 7*
GEMA Supplements to FEMA Pre-Disaster Mitigation How-to Guides
Georgia Tornado Database 1808 – 2002 (Westbrook)
Earthquake Information Bulletin, Volume 3, Number 6, November-December 1971
Dade County Local Emergency Operation Plan
Dade County Hazard Mitigation Plan

Web Sites:
www.fema.gov (FEMA)
www.usfa.fema.gov (USFA)
www.fs.fed.us (USFS Fire Danger Class)
www.cpc.ncep-noaa.gov (Drought Severity Index)
www.ncdc.noaa.gov (National Climatic Data Center)
http://eqint.cr.usgs.gov (USGS Earthquake Probability Maps)
http://roadsidegeorgia.com/nrhp/Dade (National Register of Historic Places)
www.tornadoproject.com (Tornado Project Online)
www.disastercenter.com (The Disaster Center)
www.gema.state.ga.us (GEMA)
www.gfc.state.ga.us (GFC)
www.georgiadrought.org (Drought in Georgia)
www.Dadega.us (Dade County Official Website)

Other Sources:
American Red Cross
American Society of Civil Engineers
Dade County
City of Trenton
Federal Emergency Management Agency
Georgia Department of Natural Resources
Georgia Emergency Management Agency
Georgia Forestry Commission
Georgia Safe Dams Program
National Climatic Data Center
National Oceanic & Atmospheric Administration
National Weather Service
U.S. Army Corps of Engineers
U.S. Census Bureau
U.S. Fire Administration
U.S. Forest Service
U.S. Geological Survey

Appendices

Appendix A – Critical Facilities Database

Appendix B – Hazard History Database

Appendix C – Hazard Frequency Table

Appendix D – Worksheet 3a Forms

Appendix E – Hazard Risk Analysis (UGA)

Appendix F – GMIS Reports

Appendix G – Other Planning Documents

Appendix H – Glossary