STATE OF FLORIDA

DIVISION OF EMERGENCY MANAGEMENT

Ron DeSantis
Governor

Kevin Guthrie
Executive Director

June 23, 2025

Clint Mecham, Director
Volusia County Emergency Management
3825 Tiger Bay Road
Daytona Beach, FL 32124

Re: Volusia County Local Hazard Mitigation Plan Approved Pending Adoption

Dear Director Mecham,

This is to confirm that we have completed a State review of the Volusia County Local Mitigation Strategy (LMS) update for compliance with the federal hazard mitigation planning standards contained in 44 CFR 201.6(b)-(d). Based on our review and comments, Volusia County developed and submitted all the necessary plan revisions and our staff has reviewed and approved these revisions. We have determined that the Volusia County LMS plan is compliant with federal standards, subject to formal community adoption, for the jurisdictions below:

Volusia County, Unincorporated
City of Daytona Beach
City of Daytona Beach Shores
City of DeBary
City of DeLand
City of Deltona
City of Edgewater
City of Holly Hill
City of Lake Helen
City of New Smyrna Beach
City of Oak Hill
City Orange City
City of Ormond Beach
Town of Pierson
Town of Ponce Inlet
City of Port Orange
City of South Daytona
Volusia County School District
Advent Health
Daytona Beach International Airport

Upon submittal of a copy of all participating jurisdictions' documentation of their adoption resolutions to our office, we will send all necessary documentation to the Federal Emergency Management Agency (FEMA) who will issue formal approval of the Volusia County LMS.

If you have any questions regarding this matter, please contact your LMS Liaison Evan Jenkins at Evan.Jenkins@em.myflorida.com or 850-443-4280.

Respectfully,

Kristin Lentz Digitally signed by Kristin Lentz
Date: 2025.06.25 14:36:01 -04'00'

Laura Dhuwe,

Bureau Chief, Mitigation
State Hazard Mitigation Officer

LD/ej

Attachments: MEMORADUM: State approval of LMS plans under Program Administration by States (PAS)

cc: FEMA Region IV, Mitigation Division – Risk Analysis Branch

VOLUSIA COUNTY, FLORIDA

MULTI-JURISDICTIONAL LOCAL MITIGATION STRATEGY

PREPARED BY THE ECFRPC
AND THE VOLUSIA PREPARES LMS WORKING GROUP
JANUARY 2025

SECTION 1 – INTRODUCTION

This section of the Plan provides a general introduction to the Volusia County Multi-Jurisdictional Local Mitigation Strategy (LMS). It consists of the following five subsections:

- **Background**
- **Purpose**
- **Scope**
- **Authority**
- **Summary of Plan Contents**

1.1 BACKGROUND

Natural hazards, such as hurricanes, floods and tornadoes, are a part of the world around us. Their occurrence is natural and inevitable, and there is little we can do to control their force and intensity. We must consider these hazards to be legitimate and significant threats to human life, safety and property.

Volusia County, Florida is vulnerable to a wide range of natural hazards, including hurricanes and tropical storms, flooding, tornadoes and wildfires. These hazards threaten the life and safety of county residents and have the potential to damage or destroy both public and private property and disrupt the local economy and overall quality of life of individuals who live, work and vacation in the community.

While the threat from hazardous events may never be fully eliminated, there is much we can do to lessen their potential impact upon our community and our citizens. By minimizing the impact of hazards upon our built environment, we can prevent such events from resulting in disasters. The concept and practice of reducing risks to people and property from known hazards is generally referred to as *hazard mitigation*.

FEMA Definition of Hazard Mitigation:
"Any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards."

Hazard mitigation techniques include both structural measures, such as strengthening or protecting buildings and infrastructure from the destructive forces of potential hazards and non-structural measures, such as the adoption of sound land use policies and the creation of public awareness programs. It is widely accepted that the most effective mitigation measures are implemented at the local government level, where decisions on the regulation and control of development are ultimately made. A comprehensive mitigation approach addresses hazard vulnerabilities that exist today and in the foreseeable future. Therefore, it is essential that projected patterns of future development are evaluated and considered in terms of how that growth will increase or decrease a community's overall hazard vulnerability.

As a community formulates a comprehensive strategy to hazard mitigation, a key component is to develop, adopt and update a Local Mitigation Strategy. An LMS/hazard mitigation plan establishes a broad

community vision and guiding principles for reducing hazard risk and further proposes specific mitigation actions to eliminate or reduce identified vulnerabilities. Each of the jurisdictions has adopted the LMS by resolution (**Appendix A**).

The Volusia County Multi-Jurisdictional Local Mitigation Strategy has evolved over the years, as more thoroughly described in Section 2: Planning Process. The Volusia Prepares LMS Working Group (LMS Working Group) has developed Bylaws and Operating Procedures (**Appendix B**) to formalize the LMS update process and working group. The Plan documents and represents the County's and participating local jurisdictions' sustained efforts to incorporate hazard mitigation principles and practices into the routine government activities and functions of Volusia County and its participating jurisdictions and partners. This includes documenting the goals and objectives that Volusia County deems necessary to protect people and property from hazards. At its most inner core, the Plan recommends specific actions to combat hazard vulnerability and protect its residents from losses to those hazards that pose the greatest risk. Actions go beyond recommending micro-level solutions such as elevation, retrofitting and acquisition projects, and address macro-level solutions. Examples of macro-level actions that contribute to reducing the future vulnerability of Volusia County include local policies on community growth and development, incentives for natural resource protection and public awareness and outreach activities. Finally, the Plan is a living document, with implementation, evaluation and update procedures included to help achieve meaningful objectives and successful outcomes over time.

1.1.1 Disaster Mitigation Act of 2000

To reduce the Nation's mounting natural disaster losses, the U.S. Congress passed the Disaster Mitigation Act of 2000 (DMA 2000) to amend the Robert T. Stafford Disaster Relief and Emergency Assistance Act. Section 322 of DMA 2000 emphasizes the need for state and local government entities to closely coordinate mitigation planning activities and makes the development of a hazard mitigation plan a specific eligibility requirement for any local government applying for federal mitigation grant funds. These funds include the Hazard Mitigation Grant Program (HMGP) and the Pre-Disaster Mitigation (PDM) program, both of which are administered by the Federal Emergency Management Agency (FEMA) under the Department of Homeland Security. Communities with an adopted and federally approved hazard mitigation plan thereby become pre-positioned and are more apt to receive available mitigation funds before and after the next disaster strikes.

The Volusia County Multi-Jurisdictional LMS has been prepared in coordination with FEMA Region IV and the Florida Division of Emergency Management to ensure that the Plan meets all applicable DMA 2000 and state requirements. A *Local Mitigation Plan Review Crosswalk*, found in **Appendix C**, provides a summary of federal and state minimum standards and notes the location where each requirement is met within the Plan.

1.2 PURPOSE

The purpose of the Volusia County Multi-Jurisdictional LMS is to:

- **Provide a comprehensive update to the *Volusia County Local Hazard Mitigation Plan*, as previously amended in 2020, that is compliant with federal and state requirements.**
  - This Plan is intended to assist participating jurisdictions to comply with requirements in order to expedite the response and recovery process. In addition, compliance is often required to obtain state and federal funding for pre-disaster mitigation projects and post-disaster situations. This Plan allows participating jurisdictions to quickly assemble the necessary grant application materials when seeking funding.

- **Provide a methodical, substantive approach to mitigation planning.**
  - The use of a methodical approach ensures that each step in the planning process builds upon the last, resulting in a high level of assurance that proposed mitigation actions have a valid basis.

- **Enhance public awareness and understanding of hazard mitigation planning.**
  - Engaging the public in the local mitigation planning process shapes the goals, objectives and policies in this Plan. Further, it provides a method for educating the public on how to protect themselves from the impacts of hazards.

- **Create a decision tool for management.**
  - This plan provides local managers, leaders and officials with the tools needed to reduce vulnerabilities to future hazard events.

- **Enhance local policies for hazard mitigation capability.**
  - The Capability Assessment found in Section 7 outlines the policies in Volusia County and the participating jurisdictions to reduce hazard vulnerability. Volusia County's participating jurisdictions aim to enhance and create policies to address mitigating the impacts of a hazard if such policies do not exist.

- **Assure inter-jurisdictional coordination of mitigation-related programming.**
  - By creating a Multi-Jurisdictional plan, this Plan ensures coordination of mitigation activities. This ensures that mitigation actions proposed or implemented by one jurisdiction will be compatible with the actions pursued by another.

- **Provide jurisdiction-specific hazard mitigation vulnerability assessments and actions.**
  - The vulnerability of each jurisdiction will be outlaid in the Vulnerability Assessment. Further, each jurisdiction, based on its vulnerability, will have actions to address hazard vulnerability.

1.3 SCOPE

The focus of the Volusia County Multi-Jurisdictional LMS is on those hazards deemed to be "high" or "moderate" risk as determined through a detailed hazard risk assessment conducted for Volusia County. Other hazards that pose a "low" or "negligible" risk will continue to be evaluated during future updates to the Plan, but they may not be fully addressed until they are determined to be of high or moderate risk. This enables Volusia County and its participating jurisdictions to prioritize mitigation actions based on those hazards which are understood to present the greatest risk to lives and property.

The geographic scope (i.e., the planning area) for the Plan includes all areas within the unincorporated jurisdiction of Volusia County and the participating incorporated municipalities: Daytona Beach, Daytona Beach Shores, DeBary, DeLand, Deltona, Edgewater, Holly Hill, Lake Helen, New Smyrna Beach, Oak Hill, Orange City, Ormond Beach, Pierson, Ponce Inlet, Port Orange and South Daytona. In addition, other entities, such as the Volusia County School District, Halifax Medical Center, various Advent Health locations, American Red Cross and the Daytona Beach International Airport participated in the planning process. See Section 2 for a full list of participating entities.

1.4 AUTHORITY

The Volusia County Multi-Jurisdictional LMS has been developed in accordance with current state and federal rules and regulations governing local hazard mitigation plans and has been adopted by Volusia County and its participating jurisdictions and partners in accordance with standard local procedures. The Plan shall be routinely monitored and revised to maintain compliance with the following provisions, rules and legislation:

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

1.5 SUMMARY OF PLAN CONTENTS

The contents of this Plan are designed and organized to be as reader-friendly and functional as possible. While significant background information is included in the processes used and studies completed (i.e., risk assessment, capability assessment), this information is separated from the more meaningful planning outcomes or actions (i.e., mitigation strategy, mitigation action plans).

Section 2: ***Planning Process***, provides a complete narrative description of the process used to prepare the Plan. This includes the identification of who was involved, who participated on the planning team, and how the public and other stakeholders were involved. It also includes a detailed summary for each of the key meetings held along with any associated outcomes.

SECTION 1: INTRODUCTION

The ***Community Profile***, located in Section 3, describes the general makeup of Volusia County, including prevalent geographic, demographic and economic characteristics. In addition, building characteristics and land use patterns are discussed. This baseline information provides a snapshot of the planning area and thereby assists local officials recognize those social, environmental and economic factors that ultimately play a role in determining community vulnerability to hazards.

The Risk Assessment is presented in three sections: Section 4: ***Hazard Identification***; Section 5: ***Hazard Profiles***; and Section 6: ***Vulnerability Assessment***. Together, these sections serve to identify, analyze and assess the overall risk posed to Volusia County and the participating jurisdictions from hazards. The risk assessment also attempts to define any hazard risks that may uniquely or exclusively affect specific areas of Volusia County or its participating jurisdictions and partners.

The ***Capability Assessment***, found in Section 7, provides a detailed analysis of the capacity in Volusia County and the participating jurisdictions to implement meaningful mitigation strategies and identifies existing opportunities to increase and enhance that capacity. Specific capabilities addressed in this section include planning and regulatory capability, staff and organizational (administrative) capability, technical capability, fiscal capability and political capability.

The ***Community Profile***, ***Risk Assessment*** and ***Capability Assessment*** collectively serve as a basis for determining the goals for the Volusia County Multi-Jurisdictional LMS, each contributing to the development, adoption and implementation of a meaningful and manageable *Mitigation Strategy* that is based on accurate background information.

The ***Mitigation Strategy***, found in Section 8, consists of broad countywide goal statements as well as an analysis of hazard mitigation techniques for Volusia County and its participating jurisdictions and partners to consider in reducing hazard vulnerabilities. The Strategy provides the foundation for a detailed ***Mitigation Action Plan***, found in Section 9, which links specific mitigation actions for each County department or agency to locally assigned implementation mechanisms and target completion dates. Together, these sections are designed to make the Plan both strategic (through the identification of long-term goals) but also functional through the identification of short-term and immediate actions that will guide day-to-day decision-making and project implementation.

In addition to the identification and prioritization of possible mitigation projects, emphasis is placed on the use of program and policy alternatives to help make Volusia County and the participating jurisdictions less vulnerable to the damaging forces of hazards while improving the economic, social and environmental health of the community. The concept of multi-objective planning was emphasized throughout the planning process, particularly in identifying ways to link, where possible, hazard mitigation policies and programs with complimentary community goals related to disaster recovery, housing, economic development, recreational opportunities, transportation improvements, environmental quality, land development and public health and safety.

Section 10: ***Plan Maintenance Procedures*** includes the measures that Volusia County and the participating jurisdictions will take to ensure the Plan's continuous long-term implementation. The procedures also include the manner in which the Plan will be regularly evaluated and updated to remain a current and meaningful planning document.

SECTION 2 – PLANNING PROCESS

44 CFR Requirement

44 CFR Part 201.6(c)(1): The plan shall include documentation of the planning process used to develop the plan, including how it was prepared, who was involved in the process and how the public was involved.

This section describes the planning process undertaken by Volusia County in the development of the 2025 Multi-jurisdictional Local Mitigation Strategy. It consists of the following six subsections:

- **Overview of Hazard Mitigation Planning**
- **History of Hazard Mitigation Planning in Volusia County**
- **Preparing the 2025 Plan**
- **The Volusia Prepares Local Mitigation Strategy Working Group**
- **Community Meetings and Workshops**
- **Involving the Public and Identified Stakeholders**

2.1 OVERVIEW OF HAZARD MITIGATION PLANNING

Local hazard mitigation planning is the process of organizing community resources, identifying and assessing hazard risks and determining how to best minimize or manage those risks. This process results in a hazard mitigation plan that identifies specific mitigation actions, each designed to achieve both short-term planning objectives and a long-term community vision.

To ensure the functionality of a hazard mitigation plan, responsibility is assigned for each proposed mitigation action to a specific individual, department or agency along with a schedule or target completion date for its implementation. Plan maintenance procedures are established for the routine monitoring of implementation progress, as well as the evaluation and enhancement of the mitigation plan itself. These plan maintenance procedures ensure that the plan remains a current, dynamic and effective planning document over time that becomes integrated into the routine local decision-making process.

Mitigation planning offers many benefits, including:

- **Saving lives and property**
- **Saving money**
- **Speeding recovery following disasters**
- **Reducing future vulnerability through wise development and post-disaster recovery and reconstruction**
- **Expediting the receipt of pre-disaster and post-disaster grant funding**
- **Demonstrating a firm commitment to improving community health and safety**

Typically, mitigation planning is described as having the potential to produce long-term and recurring benefits by breaking the repetitive cycle of disaster loss. A core assumption of hazard mitigation is that

the investments made before a hazard event will significantly reduce the demand for post-disaster assistance by lessening the need for emergency response, repair, recovery and reconstruction. Furthermore, mitigation practices will enable local residents, businesses and industries to re-establish themselves in the wake of a disaster, getting the community economy back on track sooner and with less interruption.

The benefits of mitigation planning go beyond solely reducing hazard vulnerability. Measures such as the acquisition or regulation of land in known hazard areas can help achieve multiple community goals, such as preserving open space, maintaining environmental health and enhancing recreational opportunities. Thus, it is vitally important that any local mitigation planning process be integrated with other concurrent local planning efforts, and any proposed mitigation strategies must consider other existing community goals or initiatives that will help complement or hinder their future implementation.

2.2 HISTORY OF HAZARD MITIGATION PLANNING IN VOLUSIA COUNTY

Volusia County's hazard mitigation planning efforts began in 1997 with the formation of the Volusia Prepares Committee. The committee developed the first LMS in 1999 (adopted 2000), as part of the Florida Department of Community Affairs LMS Initiative. The previous version of the LMS, prior to the 2025 version, was updated and adopted in 2020.

2.3 PREPARING THE 2025 LMS

The 2025 LMS update was prepared by the East Central Florida Regional Planning Council with assistance from Volusia County Emergency Management Staff. The LMS Update process was led by Volusia County Emergency Management Plans Coordinator Aubrie Austin. The LMS plan was updated from June 2024 to January 2025.

Per the contractual scope of work[1], the consultant team utilized the mitigation planning process recommended by FEMA (Publication Series 386) and recommendations provided by Florida Division of Emergency Management mitigation planning staff. A Local Mitigation Plan Crosswalk, found in Appendix C, provides a detailed summary of FEMA's current minimum standards of acceptability for compliance with the DMA 2000 and notes the location of where each requirement is met within the Plan. These standards are based upon FEMA's Interim Final Rule as published in the Federal Register on February 26, 2002, in Part 201 of the 44 Code of Federal Regulations.

The 2025 LMS was prepared using an updated plan outline and incorporated relevant content from the 2020 LMS. The LMS Working Group updated various parts of the 2020 LMS, as exemplified below:

- *Stakeholders*
  The LMS Working Group identified additional stakeholders that would like to participate in the LMS update process. These stakeholders were invited to subsequent meetings.

- *Plan Outline*
  The LMS Working Group did not revise the plan outline that was proposed by the consultant.

[1] A copy of the negotiated contractual scope of work between Volusia County and ECFRPC is available through Volusia County upon request.

- *Hazards*
  The LMS Working Group decided to include natural hazards starting with the 2009 LMS update, per DMA 2K requirements. Additional manmade and technical hazards occurrences have been included because the rise in occurrences over past years. Many of these hazards are addressed through other emergency preparedness and response plans (e.g., Comprehensive Emergency Management Plan, Emergency Response Plan, Emergency Action Plan, etc.), but cascading impacts have increased the need for mitigation.

- *Hazards Identification Scoring (for reference)*
  In 2024, prior to this plan update, each jurisdiction reviewed the hazards scores that were included in the 2020 LMS (Comparison of Jurisdictional Relative Risk) and modified the scores for each hazard to reflect changes in the impacted area; probability of occurrence; and affects to the built and natural environment and economy.

- *Goals and Objectives*
  The LMS Working Group reviewed the goals and objectives as part of the 2025 update cycle. Through a series of meetings at the beginning of the update process, all goals and objectives were assessed, combined, and/or updated to better reflect the changing needs of the county.

- *Vulnerability Assessment*
  The Vulnerability Assessment was updated using property appraiser data, Resilient Florida Statute Guidelines, and NOAA/USACE predications, as well as the most recent local parcel data (October 2024) for GIS analysis. Hazard maps, hazards exposure and loss estimates were included when appropriate. See Sections 4, 5 and 6 for further information.

- *Hazard Mitigation Initiatives*
  The LMS Working Group decided to continue to use the Excel-based mitigation initiative status and scoring system. See Section 9 for further information.

- *LMS Working Group Bylaws and Operating Procedures (for reference)*
  The LMS Working Group updated the Bylaws and Operating Procedures in 2014 with the facilitated assistance from the consultant with changes made since the 2009 LMS update.

- *Capability Assessment*
  In 2009, a Capability Assessment was prepared, which was not included in the 2005 LMS. This assessment was updated for the 2020 LMS. A survey was conducted among the participating jurisdictions to update the 2025 LMS.

The process used to update this LMS included:

- Conducted the Preliminary Meeting with Volusia County Emergency Management to establish planning process, roles, responsibilities, etc. in preparation for the Kickoff Meeting.
- Conducted the Kickoff Meeting with the Volusia Prepares LMS Working Group
- Offered engagement opportunities for the general public

- Implemented the Vulnerability Assessment produced by the East Central Florida Regional Planning Council (ECFRPC)
- Updated the Capability Assessment
- Conducted Mitigation Strategy Meetings with the Volusia Prepares LMS Working Group and invited the general public to attend. The meetings focused on the plan outline and data collection process, as well as a review of the first draft of the updated 2025 plan.
- Developed the Mitigation Strategy with the LMS Working Group
- Updated the scores for the Mitigation Initiatives
- Updated the Mitigation Initiatives status and scoring of potential projects
- Updated the LMS Plan Maintenance process

Each of these planning steps resulted in critical work products and outcomes that collectively make up the Plan. These elements have been included as separate sections of the Plan (further described in Section 1: Introduction).

The jurisdictions will consider using content from the LMS into other planning initiatives.

2.4 VOLUSIA PREPARES LOCAL MITIGATION STRATEGY WORKING GROUP

To guide the development of this Plan, Volusia County reconvened its Volusia Prepares LMS Working Group that was created under past planning efforts. Since the previous update, some changes have been made to the LMS working group in terms of personnel. The LMS Working Group includes representatives of various public, private and non-profit organizations throughout the county. The LMS Working Group represents a community-based planning team made up of local government officials and other key stakeholders identified to serve as critical partners in the planning process.

Opportunities were provided for all Volusia County jurisdictions, agencies, businesses, academia and other interested parties to participate in the LMS update process. All Volusia Prepares information is emailed to city managers, business owners, chambers of commerce, agencies, non-profits, emergency managers and other county partners.

Several non-profits (e.g., American Red Cross, Volusia Interfaiths/Agencies Networking in Disaster and United Cerebral Palsy) have participated in the LMS update process and have approved initiatives in the LMS. There is a Volusia Prepares Business group that has developed a Business Operations Center and emergency business database. They've also held several business planning workshops.

Beginning in June 2024, the LMS Working Group members engaged in regular discussions as well as local meetings and planning workshops to discuss and complete tasks associated with preparing the Plan. This working group coordinated together on all aspects of plan preparation and provided valuable input to the process. In addition to regular meetings, committee members routinely communicated and were kept informed through an e-mail distribution list and Internet Web site.

Specifically, the tasks assigned to the LMS Working Group members included:

- Participate in LMS update meetings and workshops.
- Provide best available data.

- Help complete the Capability Assessment Survey and provide copies of any mitigation or hazard-related documents for review and incorporation into the Plan.
- Support the development of the Mitigation Strategy, including the design and adoption of community goal statements.
- Help design and propose appropriate mitigation actions for their department/agency for incorporation into the Mitigation Action Plan. Provide a status update and assign a priority score to existing Mitigation Actions.
- Review and provide timely comments on all study findings and draft plan deliverables.
- Support the adoption of the 2025 Volusia County Multi-Jurisdictional Local Mitigation Strategy by all participating jurisdictions.

In addition to these tasks, the Volusia Prepares LMS Working Group consists of a subcommittee responsible for the integration of the County's Program for Public Information (PPI) report into the workflow of the Volusia Prepares Working Group. This includes the creation of an annual report that reviews the status and applicability of the plan.

Section 2 Table 1 lists the members of the Volusia County Prepares LMS Working Group who were responsible for participating in the development of the Plan.

Section 2 Table 1: Volusia County Prepares LMS Working Group

NAME	AGENCY / JURISDICTION	EMAIL	TITLE
Justin Barton	Daytona Beach	bartonjustin@codb.us	Engineer
Angie Sehenuk	Daytona Beach	sehenukangie@codb.us	Engineer
Lori Irwin	Daytona Beach Shores	lirwin@cityofdbs.org	Finance Director
Amy Long	DeBary	awilliamson@debary.org	Public Works Director
David Hamstra	DeBary	david@PegasusEngineering.net	Engineering Consultant
Mike Grebosz	DeLand	greboszm@deland.org	Assistant City Manager
Kieu Moses	DeLand	mosesk@deland.org	Special Projects Coordinator
Jonathan Jacob	DeLand	jacobj@deland.org	Imaging Specialist
Sue Houle	Deltona	shoule@deltonafl.gov	Logistics Manager
Bill Snyder	Deltona	bsnyder@deltonafl.gov	City Fire Chief
Tyna Lynn Hilton	Edgewater	thilton@cityofedgewater.org	Environmental Services Administrator
Sandy Camp	Edgewater	scamp@cityofedgewater.org	Grants Administrator
Steve Juengst	Holly Hill	sjuengst@hollyhillfl.org	Deputy Public Works Director
Jim Gleason	Lake Helen	jgleason@lakehelen.org	City Administrator
David Hamstra	New Smyrna Beach	david@pegasusengineering.net	Engineering Consultant
Kyle Fegley	New Smyrna Beach	kfegley@cityofnsb.com	City Engineer
Mark Bell	Oak Hill	publicworks@oakhillfl.gov	Public Works Director
John Peters	Orange City	jpeters@orangecityfl.gov	Engineering Services Director

NAME	AGENCY / JURISDICTION	EMAIL	TITLE
Joseph Ruiz	Orange City	jruiz@orangecityfl.gov	Development Services Deputy Director
Ronnie Long	Orange City	rlong@orangecityfl.gov	Fire Chief
Loretta Moisio	Ormond Beach	Loretta.Moisio@ormondbeach.org	Grants Coordinator
Robin Gawel	Ormond Beach	Robin.Gawel@ormondbeach.org	Senior Planner
Yvonne Braddock	Pierson	townclerk@townofpierson.org	City Clerk
Hank Baker	Ponce Inlet	hbaker@ponce-inlet.org	Building Official
Ami Pierce	Ponce Inlet	apierce@ponce-inlet.org	Office Manager Building & Permit
Valerie Duhl	Port Orange	vduhl@port-orange.org	Community Development Engineer
Marget Tomlinson	Port Orange	mtomlinson@port-orange.org	Construction & Engineering Manager
Becky Witte	South Daytona	bwitte@southdaytona.org	Deputy City Clerk
James Gillis Jr	South Daytona	lgillis@southdaytona.org	City Manager
Josh McEnany	South Daytona	jmcenany@southdaytona.org	Economic Development Director
Jessica Fentress	Volusia County Coastal Division	jfentress@volusia.org	Coastal Division Director
Niles Cyzycki	Volusia County Coastal Division	NCyzycki@volusia.org	Coastal Division Activity Project Manager
Corry Brown	Volusia County Community Assistance	cabrown@volusia.org	Community Assistance Operations Manager
Aubrie Austin	Volusia County Emergency Management	alaustin@volusia.org	Emergency Management Operations Coordinator
Yolanda Buckles	Volusia County Emergency Management	ybuckles@volusia.org	Emergency Management Planner II
Suzie Darby	Volusia County Emergency Services	sdarby@volusia.org	Emergency Services Operations Manager
Samantha West	Volusia County Environmental Management	swest@volusia.org	Sustainability & Resiliency Manager
Jeff Alberts	Volusia County Fire Dept.	jalberts@volusia.org	Fire Department Deputy Fire Chief
Nancy Church	Volusia County GIS	nchurch@volusia.org	GIS Project Leader
Jill Hemmerlein	Volusia County Growth and Resource Management	jhemmerlein@volusia.org	CRS Coordinator
Arden Fontaine	Volusia County Public Works	afontaine@volusia.org	Public Works Deputy Director
David Linkinhoker	Volusia County Recovery and Resiliency	dlinkinhoker@volusia.org	Recovery and Resiliency Projects Coordinator
Chris William	Volusia County Recovery and Resiliency	crwilliams@volusia.org	Recovery and Resiliency Activity Projects Manager
Ron Young	Volusia County School Board	Reyoung@volusia.k12.fl.us	School Board Director Planning & Construction
Michael Ulrich	Volusia County Water Resources and Utilities	Mulrich@volusia.org	Water Resources and Utilities Director
Michael Poinatowski	Advent Health	Michael.poinatowski@adventhealth.com	Emergency Manager
Pat White	Aptim	Patricia.white@aptim.com	Planner

NAME	AGENCY / JURISDICTION	EMAIL	TITLE
Karen Feaster	Daytona Beach International Airport	kfeaster@volusia.org	Airport Director
McKenna Korzeniewski	East Central Florida Regional Planning Council	MKorzeniewski@ecfrpc.org	Resilience Planner II
Michelle Cechowski	East Central Florida Regional Planning Council	mcechowski@ecfrpc.org	Director of Emergency Preparedness
Austin Beeghly	FDEM	Austin.Beeghly@em.myflorida.com	Regional Response Coordinator
Elizabeth Caison	FDEM	Elizabeth.Caison@em.myflorida.com	Regional Recovery Coordinator
Stephen Civitelli	Florida Health Department - Volusia	Stephen.Civitelli@flhealth.gov	Director
Tim MacHardy	Mosquito Control	Tmachardy@volusia.org	Activity Project Manager
Cammie Dewey	St. Johns River WMD	cdewey@sjrwmd.com	Strategic Planning Basin Coordinator
Jim Cannon	St. Johns River WMD	Jcannon@sjrwmd.com	Intergovernmental Coordinator
Jim Peterson	St. Johns River WMD	JPeterson@sjrwmd.com	Strategic Planning Basin Coordinator
Mike McMunigle	St. Johns River WMD	MJMcMuni@sjrwmd.com	Strategic Planning Basin Coordinator

2.5 COMMUNITY MEETINGS AND WORKSHOPS

The preparation of this Plan required a series of meetings and workshops for facilitating discussion, gaining consensus and initiating data collection efforts with local government staff, community officials and other identified stakeholders. More importantly, the meetings and workshops prompted continuous input and feedback from relevant participants throughout the drafting stages of the Plan. Below is a summary of the key meetings and community workshops held during the development of the plan update.

In many cases, routine discussions and additional meetings were held by local staff to accomplish planning tasks specific to their department or agency, such as the approval of specific mitigation actions for their jurisdiction, department or agency to undertake and include in the Mitigation Action Plan. Preplanning efforts began in January 2024. The LMS Working Group was notified in the first quarter meeting that the LMS update was this year, and their participation was vital to the plan's success.

The following is a summary of the meetings that occurred during the LMS update planning process. Meeting invitations, agendas, minutes and rosters are provided in Appendix D.

Volusia Prepares Kickoff Meeting

June 21, 2024

The Kickoff Meeting was held at the Volusia Emergency Operations Center, 3825 Tiger Bay Road and was attended by the LMS Working Group. The primary purpose of the meeting was to explain the proposed planning process in detail, describe individual roles and responsibilities and begin initial data collection efforts. The LMS Working Group was asked to identify additional stakeholders, new plans, data and studies to incorporate into the LMS update.

Public Kickoff Meeting

September 20, 2024

The Working Group's Quarter 3 Meeting was open to the public. This meeting was held at the Volusia County Emergency Operations Center. The goal was to begin the public engagement process. The objective was to inform the Working Group and the public on the progress made up to that point and to discuss any updates needed to the priority project list.

Public Engagement Meetings

November 25 and 26, 2024

Two public meetings were held to inform the public of the planning process and the overall scope of the 2025 Volusia County Local Mitigation Strategy. Maps and a draft plan were provided and general items within the plan were discussed. Special attention was given to community members' needs and recommendations for the plan.

Volusia Prepares Meeting #2 and Conclusion Meeting for Public

December 13, 2024

The next Local Mitigation Strategy Meeting was held at the Volusia County Emergency Operations Center, 3825 Tiger Bay Road. The purpose of this meeting was to inform the jurisdictions and the public on the plan update and obtain comments and feedback.

The final opportunity for public comment will take place at the County Council meeting when the plan is presented for formal adoption. Upcoming community outreach efforts will focus on including the concepts of mitigation in current public information activities, and to make the public aware of this planning process, its goals and objectives, and opportunities for public input at every possible occasion.

2.6 INVOLVING THE PUBLIC AND IDENTIFIED STAKEHOLDERS

A press release was issued from Volusia County Community Information, by the Volusia County Public Information Officer, to invite the public to participate in the LMS development and provide comments on the LMS. The press release included background information about the LMS process, the agenda topics, date, time and location information. Public feedback was accepted by emails, in meetings, in surveys, or by contacting the LMS Coordinator. In addition, the LMS was also placed on the Volusia County Emergency Management's Website.

The public and community stakeholders were invited to "Public Meetings" during the LMS planning process (see Appendix D). These meetings were hosted at two different public library locations to reach different parts of the community. Additionally, they were hosted at different times of the day, one evening and one morning, to accommodate various residents.

The public was also invited to the Volusia Prepares meetings conducted on September 20th and December 13th at the Volusia County EOC.

VCEM engaged community leaders from low-income and underserved communities to request input on the risks and hazards over the 5-year planning period. The survey was distributed to these partners as a way to report local experiences of hazard events (see Appendix D).

SECTION 3 – COMMUNITY PROFILE

This section of the Plan provides an overview of Volusia County, Florida. It consists of the following five subsections:

- **Geography and the Environment**
- **Population and Demographics**
- **Housing, Infrastructure and Land Use**
- **Employment and Industry**
- **Development Trends**

A variety of resources were used to obtain reliable data and information about the community's profile and demographics. To develop this plan, sources such as the U.S. Census, BEBR reports, and Volusia County Property Appraiser information, were utilized.

3.1 GEOGRAPHY AND THE ENVIRONMENT

Volusia County was established in 1854 as a prosperous steamboat landing area. It lies on the central coast of eastern Florida and is comprised of 1,103 square miles of land and 329 square miles of water (bounded to the north and south by the coastal counties of Flagler and Brevard). Several counties border Volusia County to the west including Putnam, Marion, Lake and Seminole. The County is located approximately 40 miles from Orlando, 95 miles from Jacksonville and 105 miles from Tampa, Florida.

There are 16 incorporated areas within Volusia County, of which Deltona is the largest in terms of population. An orientation map of the Volusia County study area is provided as **Section 3 Figure 1**. The participating jurisdictions in this plan include Daytona Beach, Daytona Beach Shores, DeBary, Deland Deltona, Edgewater, Holly Hill, Lake Helen, New Smyrna Beach, Oak Hill, Orange City, Ormond Beach, Pierson, Ponce Inlet, Port Orange, South Daytona, and the unincorporated area of Volusia County.

Forest land accounts for approximately 56 percent of the land area in Volusia County[1]. There is an abundance of public land in Volusia County. For example, the northern portion of the county, abutting Flagler County, is located in the North Peninsula State Recreation Area. In addition, the southern coastal portion of the county, adjacent to Brevard County, is part of the Canaveral National Seashore.

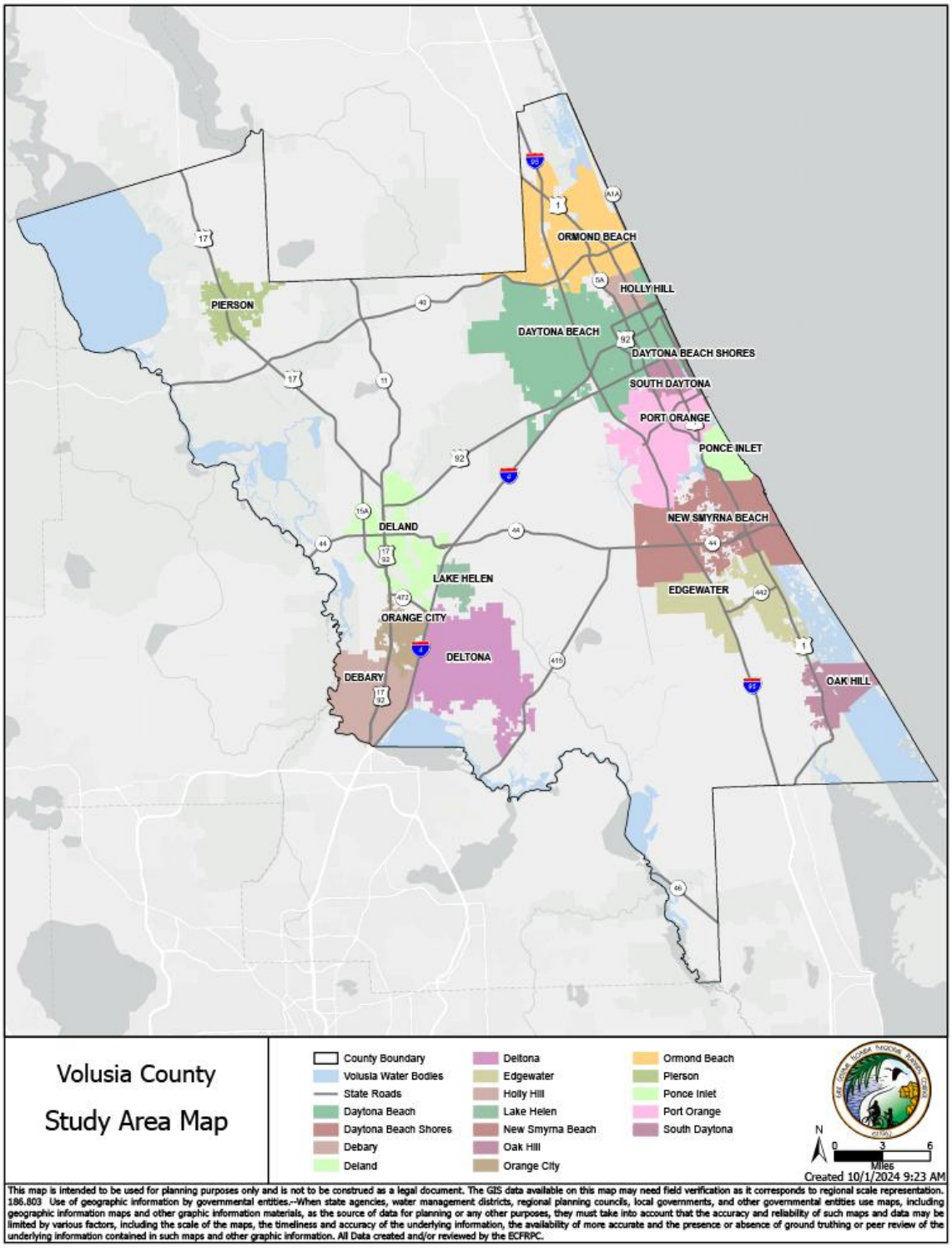
The climate in Volusia County is considered sub-tropical with generally warm, humid temperatures year-round. The average winter temperature is 61 degrees Fahrenheit. The average summer temperature is 81 degrees Fahrenheit, though it typically exceeds 90 degrees Fahrenheit in the months of June, July, and August. The average annual precipitation is 53.83 inches.

The dominant surface water resources in Volusia County are Mosquito Lagoon, Lake George (37,884 acres), Lake Monroe (5,423 acres), and Lake Harney (3,210 acres)[2]. Additionally, the Halifax River and

[1] http://www.freshfromflorida.com
[2] Volusia County Comprehensive Plan, Figure 1-2 Legend for Water Bodies

Indian River Lagoon are major waterways. There are many other water areas throughout the County, which are fed by numerous creeks, bayous and other minor tributaries.

Section 3: Figure 1: Volusia County Study Area Map



Source: Volusia County GIS, ECFRPC GIS

3.2 POPULATION AND DEMOGRAPHICS

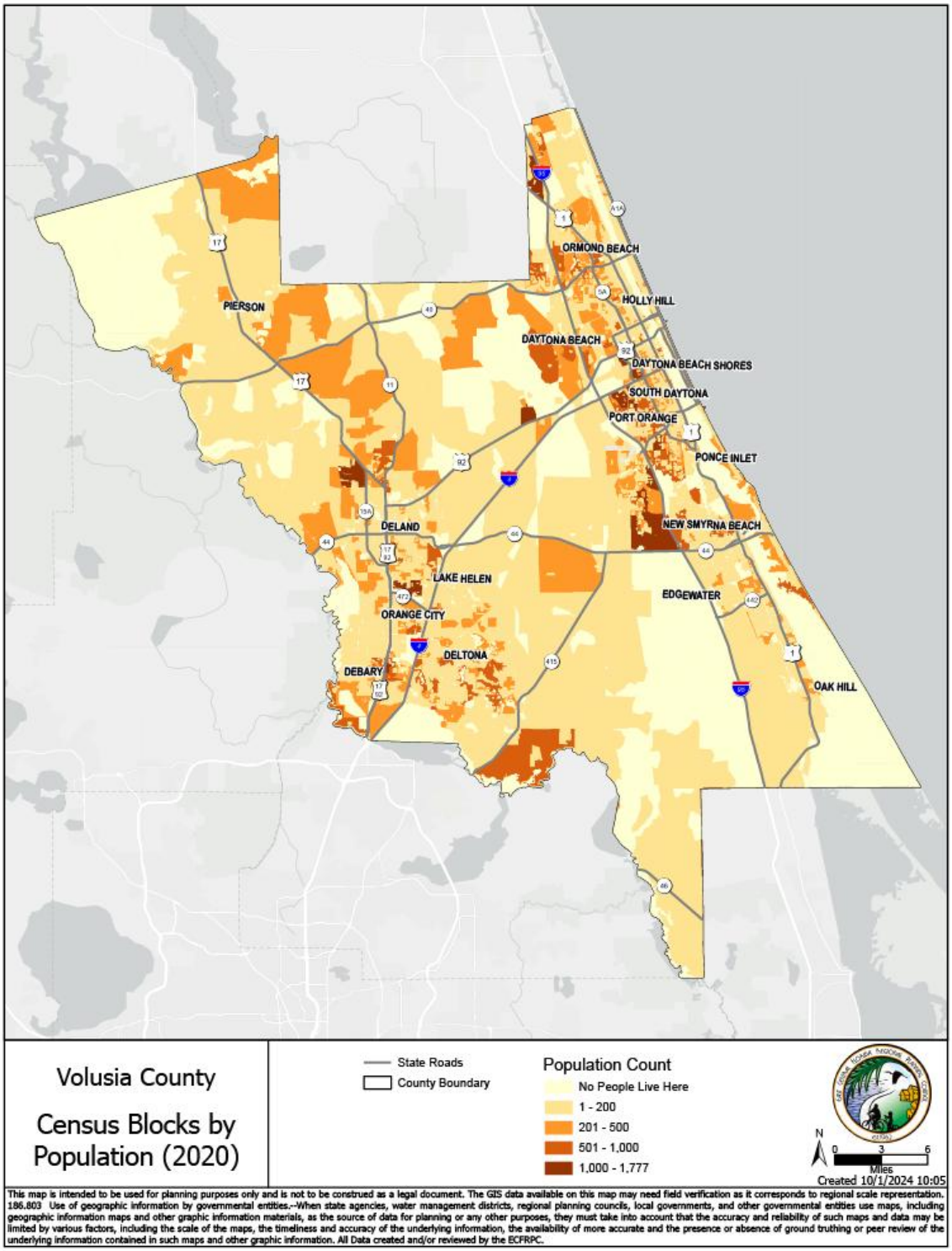
According to the U.S. Census Bureau, the 2023 estimated population of Volusia County was 590,357. This represents a 6.7 percent increase from 2020, when the population was 553,537. **Section 3: Table 1** provides the 2020 populations of the cities and unincorporated areas within Volusia County, along with the 2023 population estimates as provided by the U.S. Census Bureau. In addition, **Section 3: Figure 2** shows the population distribution in Volusia County.

Section 3: Table 1: Population of Cities and Unincorporated Areas in Volusia County[3]

JURISDICTION	2020 POPULATION	2023 POPULATION ESTIMATE
Daytona Beach	71,586	82,485
Daytona Beach Shores	5,120	5,194
DeBary	22,255	23,209
DeLand	37,786	43,009
Deltona	93,701	98,739
Edgewater	23,111	23,636
Holly Hill	12,970	13,075
Lake Helen	2,843	2,964
New Smyrna Beach	30,210	32,655
Oak Hill	2,011	2,128
Orange City	12,631	14,928
Ormond Beach	43,070	44,277
Pierson	1,540	1,558
Ponce Inlet	3,365	3,450
Port Orange	62,619	65,966
South Daytona	12,852	13,781
Unincorporated	115,867	119,303

[3] U.S. Census Bureau, Population Division (May 2024) & University of Florida Bureau of Economic and Business Research (January 2024). https://bebr.ufl.edu/wp-content/uploads/2024/01/projections_2024.pdf

Section 3: Figure 2: Population of Cities and Unincorporated Areas in Volusia County



Source: U.S. Census Bureau (2020)

According to the 2022 U.S. Census American Community Survey, the median age for the County was 46.6 years. This is higher than the Florida median age of 42.7 years of age. It is estimated that 25.4 percent of the County's population is made up of persons that are 65 years old and over, which is higher than the State figure of 21.6 percent.

The racial mix in Volusia County is predominately white, but has other populations. White persons make up 70.4 percent of the County's population. Black or African American persons accounted for 10.1 percent of the Volusia County population, less than the state percentage of 15.0 percent. Asians comprised 2.0 percent of the population compared to the state's 2.9 percent. People of two or more races comprise 7.6 percent of the population in the County.

According to the Census American Community Survey, in 2022 there were 2.7 people per household. There were 2.32 people per household according to the 2010 U.S. Census.

Section 3: Table 2: Average Number of Persons Per Household

JURISDICTION	AVERAGE NUMBER OF PERSONS PER HOUSEHOLD
Daytona Beach	2.7
Daytona Beach Shores	2.2
DeBary	2.7
DeLand	2.9
Deltona	3.2
Edgewater	2.6
Holly Hill	2.5
Lake Helen	2.5
New Smyrna Beach	2.4
Oak Hill	1.7
Orange City	2.6
Ormond Beach	2.5
Pierson	2.9
Ponce Inlet	2.1
Port Orange	2.6
South Daytona	2.7
Unincorporated	2.8

Source: U.S. Census Bureau

3.3 HOUSING, INFRASTRUCTURE, AND LAND USE

3.3.1 Housing

According to the Census Bureau's 2022 American Community Survey, there are 273,835 housing units in Volusia County. Of these structures, 68.8 percent are single-unit and 22.7 percent are multi-unit. The remaining 8.5 percent are mobile homes or other types of housing. The median value of owner-occupied housing units was $251,400, compared to the $178,700 state average and the $193,500 national average.[4]

3.3.2 Infrastructure

Infrastructure is categorized in this Plan as Transportation and Utilities, as these elements are vital in a disaster event, both for evacuation and for response and recovery efforts. Volusia County is endowed with multi-modes of transportation and has several utility providers.

Transportation

Volusia County has several transportation options whether traveling by automobile, rail, or air. There are two federal interstates which run through the County: Interstate 95 runs north to south along the coast, and Interstate 4 runs northeast, connecting the County to Orlando, and merging with I-95 near Daytona Beach. There are also four federal highways (U.S. 1, U.S. 17, U.S. 40 and U.S. 92). There are also four major railway transportation providers (Amtrak, CSX, Florida East Coast Railway, and SunRail), and a number of regional airports. The major area airport is Daytona Beach International Airport. In addition, Port Canaveral, a deep-water port, and one of the busiest cruise ports in the world, is located about 70 miles south of Volusia County in Brevard County.

Utilities

Florida Power and Light, Duke Energy, City of New Smyrna Beach Utilities Commission, and Clay Electric Cooperative serve the electricity needs in Volusia County. The natural gas suppliers are Florida Public Utilities and TECO People's Gas. Water and sewer services are provided by a number of different sources including Volusia County Utilities, North Peninsula Utilities Corporation, and municipal governments.

3.3.3 Land Use

[4] https://data.census.gov/table/ACSDP5Y2022.DP04?g=050XX00US12127&d=ACS%205-Year%20Estimates%20Data%20Profiles

Section 3: Table 2 shows the current vacant commercial, industrial, institutional, other, and residential land in Volusia County as of 2024 rounded up to the nearest whole numbers.

Section 3: Table 3: Vacant Land in Acres Throughout Volusia County

JURISDICTION	VACANT COMMERCIAL	VACANT INDUSTRIAL	VACANT INSTITUTIONAL	VACANT OTHER	VACANT RESIDENTIAL
Daytona Beach	1488	241	95	6830	817
Daytona Beach Shores	25	0.5	0.7	137	10
DeBary	298	46	-	739	491
DeLand	447	127	30	2084	676
Deltona	576	152	9	1691	1165
Edgewater	464	220	2	1360	518
Holly Hill	67	31	0.6	45	96
Lake Helen	100	-	7	185	631
New Smyrna Beach	654	150	15	2978	626
Oak Hill	143	-	3	796	479
Orange City	827	91	0.8	259	236
Ormond Beach	651	63	5	2947	628
Pierson	65	-	0.8	900	745
Ponce Inlet	17	-	4	221	67
Port Orange	514	42	130	2127	311
South Daytona	125	9	1	73	39
Unincorporated Area	1735	333	41	6305	40339

Source: Volusia County Property Appraiser, ECFRPC

3.4 EMPLOYMENT AND INDUSTRY

Volusia County began as a prosperous steamboat landing town in the early 1800s. Today, employment is based largely in the public sector. According to the 2022 American Community Survey, the civilian labor force in Volusia County is approximately 255,301. The top employers are Volusia County Schools, and the local hospital systems.

From an industry perspective, the main economic sources for the county are educational services, and health care and social assistance (21.7%); Retail trade (13.6%); Professional, scientific, and management, and administrative and waste management services (12.4%); and Arts, entertainment, and recreation, and accommodation and food services (11.5%).[5]

In 2022, the estimated median household income for Volusia County was $64,601, less than the State at $72,200 and U.S. medians of $80,610.[6]

[5] https://data.census.gov/table/ACSDP5Y2022.DP03?g=050XX00US12127&d=ACS%205-Year%20Estimates%20Data%20Profiles

[6] https://fred.stlouisfed.org/series/MHIFL12127A052NCEN

3.5 DEVELOPMENT TRENDS

Volusia County experienced substantial growth between 2000 and 2005 followed by a sharp decline in growth between 2009 and 2012, as indicated by U.S. Census residential building permit data. Growth has generally rebounded since 2013.

Section 3: Table 4: Annual Residential Building Permit Data, Volusia County

YEAR	TOTAL RESIDENTIAL UNITS	YEAR OVER YEAR CHANGE
2000	3,147	---
2001	5,112	+ 1,965
2002	4,171	-941
2003	5,112	+ 941
2004	4,920	- 192
2005	5,186	+ 266
2006	2,961	- 2,225
2007	1,577	- 1,384
2008	1,053	- 524
2009	600	- 453
2010	653	+ 53
2011	539	- 114
2012	760	+ 221
2013	1,307	+ 547
2014	1,205	- 102
2015	987	- 218
2016	1,077	+ 90
2017	1,496	+ 419
2018	1,598	+ 102
2019	1,928	+ 105
2020	2,035	+ 107
2021	2,759	+724
2022	3,519	+ 760
2023	3,232	-287
2024	2,574	-658

Source: U.S. Census Bureau, 2013-2017 ACS; Volusia County Connect Permits[7]

For a list of new developments in Volusia County please visit the Land Development section of the Volusia County Growth and Resource Management Department website at the following link: http://www.volusia.org/services/growth-and-resource-management/planning-and-development/land-development/

[7] https://connectlivepermits.org/citizenportal/app/public-search on 12/18/2024

SECTION 4 – HAZARD IDENTIFICATION

This section is the first of three sections that assess the risk of Volusia County and the participating jurisdictions to hazards. This section identifies a wide range of hazards that could potentially impact the County. Section 5: ***Hazard Profiles*** provides more detailed information about how the identified hazards specifically impact the County and participating jurisdictions. Section 6: ***Vulnerability Assessment*** provides detailed analyses results that indicate the number of damages that could occur in the County because of the identified hazards. Together, these sections serve to identify, analyze and assess the overall risk posed to Volusia County and the participating jurisdictions from hazards. The risk assessment also attempts to define any hazard risks that may uniquely or exclusively affect specific areas of Volusia County or its participating jurisdictions and partners.

Volusia County and the participating jurisdictions are vulnerable to a wide range of natural hazards[1] that threaten life and property. Upon a review of the full range of natural hazards suggested under FEMA planning guidance, Volusia County and the participating jurisdictions have identified several hazards that are to be addressed in this Multi-Jurisdictional LMS. These hazards were identified through an extensive process that utilized input from the Local Mitigation Strategy Working Group (LMS Working Group) members, research of past disaster declarations in the County, a review of previous hazard mitigation plans in the County, and a review of the current Florida Hazard Mitigation Plan. Readily available online information from reputable sources such as federal and state agencies was also evaluated to supplement information from these key sources.

Section 4: Table 1 lists the full range of natural hazards initially identified for consideration in the Plan and provides a brief description for each. This table includes seventeen (17) individual hazards categorized by the following types: natural, technological, and manmade. Some of these hazards are interrelated or cascading (i.e., hurricanes can cause flooding, storm surge and tornadoes). It should also be noted that some hazards, such as extreme temperature may impact a large area yet cause little damage, while other hazards, such as tornadoes, may impact a small area yet cause extensive damage.

Section 4: Table 1: Descriptions of the Full Range of Initially Identified Hazards

HAZARD	DESCRIPTION
Natural	
Agriculture	Agriculture includes Infestations, Invasive Species, and Diseases Infestation or disease in agriculture is when biological entities such as insects, rodents, bacteria or viruses significantly increase in a given area, affecting crops to the point where human and animal health is threatened, valuable crops may be damaged or significant environmental resources may be lost.
Coastal Erosion	Landward displacement of a shoreline caused by the forces of waves and currents define coastal erosion. Coastal erosion is measured as the rate of change in the

[1] FEMA's current regulations and interim guidance under the Disaster Mitigation Act of 2000 (DMA 2000) require, at a minimum, an evaluation of a full range of natural hazards. An evaluation of human-caused hazards (e.g., technological hazards, terrorism, etc.) is encouraged, though not required, for plan approval. Volusia County has focused solely on natural hazards at this time. Incorporation of human-caused hazards may be evaluated in future versions of the plan, as it is a "living document" which will be monitored, evaluated and updated regularly.

HAZARD	DESCRIPTION
	position or horizontal displacement of a shoreline over a period. It is generally associated with episodic events such as hurricanes and tropical storms, nor'easters, storm surges and coastal flooding but may also be caused by human activities that alter sediment transport. Construction of shoreline protection structures can mitigate the hazard but may also exacerbate it under some circumstances.
Drought	A drought is a prolonged period of less than normal precipitation such that the lack of water causes a serious hydrologic imbalance. Common effects of drought include crop failure, water supply shortages, and fish and wildlife mortality. High temperatures, intense winds, and low humidity can worsen drought conditions and make areas more susceptible to wildfire. Human demands and actions can hasten or mitigate drought-related impacts on local communities.
Extreme Temperature	Extreme temperature generally refers to temperatures that are unusually high or low compared to typical weather conditions for a specific location and time of year. However, defining what constitutes "extreme" can be challenging due to context, location, history, and duration. Volusia County defines extreme temperature in two ways. • Extreme cold may include snow, sleet, freezing rain, or a mix of these wintry forms of precipitation. Ice storms occur when moisture falls and freezes immediately upon impact on trees, power lines, communication towers, structures, roads and other hard surfaces. Winter storms and ice storms can down trees, cause widespread power outages, damage property, and cause fatalities and injuries to human life. • Extreme heat is defined as temperatures that hover 9 degrees or more above the average high temperature of 90°F for the region and last for 3 or more consecutive days. Humid or muggy conditions, which add to the discomfort of high temperatures, occur when a "dome" of high atmospheric pressure traps hazy, damp air near the ground.
Flood	The accumulation of water within a water body results in the overflow of excess water onto adjacent lands, usually floodplains, causing flood or rising waters in various ways. Floods have three categories: riverine, coastal, or shallow flooding (which includes sheet flow, ponding, and urban drainage). A floodplain is the land adjoining the channel of a river, stream ocean, lake or other watercourse or water body that is susceptible to flooding.
Public Health Emergencies	Public health emergencies consist of disease and pandemic outbreaks. They may be accidental, natural, or intentional. Under section 319 of the Public Health Service Act (42 U.S.C § 319), the Secretary of the Department of Health and Human Services (HSS) can declare a public health emergency. This can include medical surges (often from mass casualty events) that require hospitals to act beyond normal capacity.
Rising Coastal Waters	Rising coastal waters is a hazard that refers to unprecedented water levels along the coast, usually leading to inland affects. This hazard encompasses: • Storm surge is a large dome of water often 50 to 100 miles wide and rising anywhere from four to five feet in a Category 1 hurricane up to more than 30 feet in a Category 5 storm. Storm surge heights and associated waves are also dependent upon the shape of the offshore continental shelf (narrow or wide) and the depth of the ocean bottom (bathymetry). A narrow shelf, or one that drops steeply from the shoreline and subsequently produces deep

HAZARD	DESCRIPTION
	water close to the shoreline, tends to produce a lower surge but higher and more powerful storm waves. Storm surge arrives ahead of a storm's actual landfall and the more intense the hurricane is, the sooner the surge arrives. Storm surge can be devastating to coastal regions, causing severe beach erosion and property damage along the immediate coast. • Sea level rise is caused by warming of the earth's climate, the associated thermal expansion of water molecules, and generally impacts coastal, lagoon-adjacent and river-adjacent areas that are hydrologically connected to the ocean. Sea level rise has been observed over the past few decades in Central Florida, including Volusia County. Projections by NOAA and the U.S. Army Corps of Engineers depict varying levels of sea level rise by the year 2100. As part of this plan, sea level rise and sea level rise-plus storm surge are analyzed. • Tsunamis are a wave or series of waves mostly caused by an earthquake or by a large undersea landslide, volcanic eruption or other undersea disturbance. From the area of disturbance, tsunami waves will travel outward in all directions and can originate hundreds or even thousands of miles away from affected coastal areas.
Severe Weather	Severe weather refers to any significant or intense weather conditions that can cause damage, disruption, or pose a threat to safety. It encompasses a range of phenomena that are more extreme than typical weather conditions. Volusia County experiences severe weather in a variety of ways. • A hail event produces hailstones that fall to the ground. Hail forms when updrafts in thunderstorms carry raindrops into parts of the atmosphere where the temperatures are below freezing. • Lightning is a discharge of electrical energy resulting from the buildup of positive and negative charges within a thunderstorm, creating a "bolt" when the buildup of charges becomes strong enough. This flash of light usually occurs within the clouds or between the clouds and the ground. A bolt of lightning can reach temperatures approaching 50,000 degrees Fahrenheit. Lightning rapidly heats the sky as it flashes, but the surrounding air cools following the bolt. This rapid heating and cooling of the surrounding air causes thunder. On average, 73 people are killed each year by lightning strikes in the United States. • Thunderstorms are caused by air masses of varying temperatures meeting in the atmosphere. Rapidly rising warm and moist air fuels the formation of thunderstorms. They can move through an area very quickly or linger for several hours.
Tornado	A tornado is a violently rotating column of air that has contact with the ground and is often visible as a funnel cloud. Its vortex rotates cyclonically with wind speeds ranging from as low as 40 mph to as high as 300 mph. Tornadoes are most often generated by thunderstorm activity when cool, dry air intersects and overrides a layer of warm, moist air forcing the warm air to rise rapidly. The destruction caused by tornadoes ranges from light to catastrophic depending on the intensity, size, and duration of the storm.
Tropical Cyclones	Hurricanes and tropical storms are classified as tropical cyclones and defined as any closed circulation developing around a low-pressure center in which the winds rotate

HAZARD	DESCRIPTION
	counterclockwise in the Northern Hemisphere (or clockwise in the Southern Hemisphere) and with a diameter averaging 10 to 30 miles across. When maximum sustained winds reach or exceed 39 miles per hour, the system is designated a tropical storm, given a name, and is closely monitored by the National Hurricane Center. When sustained winds reach or exceed 74 miles per hour the storm is deemed a hurricane. The primary damaging forces associated with these storms are high-level sustained winds, heavy precipitation and tornadoes. Coastal areas are also vulnerable to the additional forces of storm surge, wind-driven waves and tidal flooding which can be more destructive than cyclone wind. Most hurricanes and tropical storms form in the Atlantic Ocean, Caribbean Sea and Gulf of Mexico during the official Atlantic hurricane season, which extends from June through November.
Wildland Fire	An uncontrolled fire burning in an area of vegetative fuels such as grasslands, brush, or woodlands. Heavier fuels with high continuity, steep slopes, high temperatures, low humidity, low rainfall, and high winds all work to increase risk for people and property located within wildfire hazard areas or along the urban/wildland interface. Wildfires are part of the natural management of forest ecosystems, but most are caused by human factors. Over 80 percent of forest fires started by negligent human behavior such as smoking in wooded areas or improperly extinguishing campfires. The second most common cause for wildfire is lightning.
Manmade	
Civil Disturbance	Events of civil disturbances can be classified as armed violence, riots, protests, and threats against the military or the government. The proper planning and prevention methods aid in the mitigation of such events. For threats of civil disturbance utilizing armed violence, it is likely that a joint jurisdictional management of operations will take effect, coordinated at the county level between the Sheriff's Office, Florida Department of Law Enforcement (FDLE), and the Office of Emergency Management. Civil disturbances can occur due to socio-economic, political or other reasons. These types of events typically occur in public places.
Mass Migration	Mass-migration occurs when persons of one geographic area move in large numbers to another geographic location.
Terrorism	Terrorism includes any attempt to attack, cripple or damage public goods, public infrastructure or citizens on a large scale. Defined in the Code of Federal Regulations as "the unlawful use of force and violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives" (28 C.F.R. Section 0.85). The various forms of terrorism Volusia County may experience come in four forms. • Agro-Terrorism: The deliberate introduction of disease-causing organisms and chemicals into the food supply through agriculture. It could impact the public if crops or agricultural foods contaminated with disease-causing organisms were to enter the food chain. • Cyber Terrorism: Unlawful attacks and threats of attack against computers, networks, and the information stored therein; and used to intimidate or coerce a government or its people in furtherance of political or social objectives.

HAZARD	DESCRIPTION
	• Domestic Terrorism: Violent, criminal acts committed by individuals and/or groups to further ideological goals stemming from domestic influences, such as those of a political, religious, social, racial, or environmental nature. • International Terrorism: Violent, criminal acts committed by individuals and/or groups who are inspired by, or associated with, designated foreign terrorist organizations or nations (state-sponsored).
Technological	
Coastal Oil Spill	An oil spill is the release of liquid petroleum into the environment, typically the ocean, rivers, or lakes. These spills can result from various incidents, including accidents involving oil tankers, offshore drilling rigs, pipelines, storage facilities, or during the extraction process. Oil spills can have severe environmental, economic, and health impacts. While oil spills would primarily affect the Gulf coast of Florida, oil spills can negatively affect tourism and ecological conditions on the Atlantic coast of Florida.
Critical Infrastructure Failure	Public utilities provide critical services such as drinking water, stormwater and wastewater collection/treatment, electric power, transportation, supply chains systems that support food and fuel, and communications. These services contribute to the economic well-being and public health/safety of the communities they serve. A utility service disruption can be a cascading emergency from an event such as a cyber-terrorism or a hurricane. Widespread power outages can occur without warning. Generally warning times will be short in the case of technological failure, such as a fire at a sub-station, traffic accident, human error, or terrorist attack. In cases where a power failure is caused by natural hazards, greater warning time is possible. For example, high wind events such as tornados and hurricanes often cause widespread power failure and are often forecasted before they affect a community so that residents can prepare.
HazMat / Industrial Incident	Hazardous material (HazMat) includes events when liquid, solid or gaseous chemicals that are harmful or fatal to humans or ecological infrastructure disperse into the atmosphere.

SPECIAL NOTE: The plan omits hazards that may be recognized to affect the jurisdiction(s) in the planning area. Rationale is that while some hazards may pose a risk to Volusia County, mitigation investments would not be deemed appropriate or feasible due to the impending need to mitigate more frequent disasters. Hazards, such as sinkholes and earthquakes, were omitted due to low probability, limited recorded impacts, and low economic impact. It is acknowledged that mitigation efforts can duplicate hazard mitigation benefits.

SECTION 5 – HAZARD PROFILES

44 CFR Requirement

44 CFR Part 201.6(c)(2)(i):
The risk assessment shall include a description of the type, location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

5.1 OVERVIEW

This section includes detailed hazard profiles for each of the hazards identified in the previous section as significant enough for further evaluation through the risk assessment in Volusia County. This includes the following hazards:

- **Natural**
  - Agriculture
  - Coastal Erosion
  - Drought
  - Extreme Temperature
  - Flood
  - Public Health Emergencies
  - Rising Coastal Water
  - Severe Weather
  - Tornado
  - Tropical Cyclones
  - Wildland Fire
- **Manmade**
  - Civil Disturbance
  - Mass Migration
  - Terrorism
- **Technological**
  - Coastal Oil Spill
  - Critical Infrastructure Failure
  - HazMat/ Industrial Incident

Each hazard profile described in this section includes a general description of the hazard, its location and extent, notable historical occurrences, the probability of future occurrences, potential impacts, and overall vulnerability. It also includes specific items noted by members of the Local Mitigation Strategy Working Group (LMS Working Group). The probability of future occurrence is expressed as “high” (expected to occur at least every five years), “moderate” (expected to occur at least every 25 years), “low”

(expected to occur at least every 100 years, and "very low" (is possible to occur, despite their being no recorded occurrences).

Major Disaster Declarations

In 1988, the Robert T. Stafford Disaster Relief and Emergency Assistance Act was enacted to support state and local governments when disasters overwhelm local resources. This law, as amended, establishes a process for requesting and obtaining a Presidential Disaster Declaration, defines the type and scope of assistance available from the federal government, and sets the conditions for obtaining that assistance. The Federal Emergency Management Agency (FEMA), now part of the Emergency Preparedness and Response Directorate of the Department of Homeland Security, is tasked with coordinating the response. Since 1965, Volusia County has received numerous presidential disaster declarations for such hazards as hurricanes, tornados, floods and severe freezes (**Section 5: Table 1**).

Section 5: Table 1: Presidential Disaster Declarations

EVENT	DECLARATION DATE	DECLARATION NUMBER
Severe Storms, Tornadoes, and Flooding	05/15/79	586
Tornadoes, Flooding, High Winds & Tides, Freezing	03/13/93	982
Tropical Storm Gordon, Tornadoes, Flooding	11/28/94	1043
Tropical Storm Josephine	10/15/96	1141
Severe Storms, High Winds, Tornadoes, Flooding	02/25/98	1195
Extreme Fire Hazard	07/03/98	1223
Hurricane Floyd	09/22/99	1300
Hurricane Irene	10/28/99	1306
Severe Freeze	02/06/01	159
Hurricane Charlie/Bonnie	08/13/04	1539
Hurricane Frances	09/04/04	1545
Hurricane Ivan	09/15/04	1551
Hurricane Jeanne	09/26/04	1561
Hurricane Katrina Evacuation	09/05/05	3220
Severe Storms, Tornadoes	02/03/07	1679
Severe Storms, Tornadoes, and Flooding	02/08/07	1680
Tropical Storm Fay	08/21/08	3288
Severe Storms, Flooding, Tornadoes, Straight-line Winds	05/27/09	1840
Hurricane Matthew	10/03/16	3377
Hurricane Irma	09/04/17	3385
Hurricane Michael	10/07/18	3405
Hurricane Dorian	08/28/19	3420
Florida Covid-19 Pandemic	03/25/20	4486

Hurricane Sally	09/23/20	4564
Hurricane Ian	09/29/22	4673
Hurricane Nicole	12/13/22	4680
Hurricane Idalia	08/31/23	4734
Hurricane Debby	08/10/24	4806
Hurricane Milton	10/11/2024	4834

Source: Federal Emergency Management Agency

Volusia County Emergency Management has had numerous significant disaster events that resulted in the activation of their Emergency Operations Center. **Section 5 Table 2** lists these events by type, area of impact, EOC activation level, the estimated number of properties that were damaged, and loss estimates.

Section 5: Table 2: Significant Activation Events

Date of Event	Type of Event	Area of Event	EOC Level Activation	Damage Estimate	
				Number of Properties	Dollars
3/13/1993	Windstorm	County-Wide	Level 2 (Part)	1273	16,948,355
5/4/1994	Tornado	Holly Hill	Level 2 (Part)	273	6,680,000
9/6/1994	I-4 Chemical Spill	SW Volusia	Level 1 (Mon)	N/A	N/A
11/17/1994	T.S. Gordon	County-Wide	Level 2 (Part)	658	10,602,924
8/3/1995	Hurricane Erin	Edgewater	Level 3 (Full)	31	65,052
3/11/1996	Windstorm	Daytona Beach	Level 1 (Mon)	8	28,000
7/10/1996	Hurricane Bertha	County-Wide	Level 2 (Part)	N/A	N/A
9/5/1996	Hurricane Fran	County-Wide	Level 2 (Part)	N/A	N/A
10/8/1996	T.S. Josephine	County-Wide	Level 1 (Mon)	193	1,232,343
4/23/1997	Tornado	NSB Peninsula	Level 2 (Part)	79	525,600
7/5/1997	Tornado	Oak Hill	Level 1 (Mon)	6	33,000
11/2/1997	Tornado	NSB Main & Penn	Level 2 (Part)	318	11,070,722
2/2/1998	Windstorm	Bethune Beach	Level 1 (Mon)	1	20,000
2/22/1998	Tornado	Daytona Beach	Level 2 (Part)	616	9,435,553
6/22/1998	Fire Storm "98"	County-Wide	Level 4 (Full)	22	2,126,013
7/28/1998	Tornado	Daytona Beach	Level 1 (Mon)	46	159,000
1/3/1999	Windstorm	SR 415 Area	Level 1 (Mon)	8	9,100
1/9/1999	Windstorm	Daytona Beach	Level 1 (Mon)	11	59,000
9/14/1999	Hurricane Floyd	East Side	Level 1 (Full)	433	18,655,353
10/16/1999	Hurricane Irene	East Side	Level 2 (Part)	185	16,809,266
1/1/2000	Y2K	County-Wide	Level 1 (Full)	N/A	N/A
5/31/2000	Wildfires 2000	County-Wide	Level 2 (Part)	N/A	N/A
9/16/2000	Hurricane Gordon	County-Wide	Level 2 (Part)	N/A	N/A
9/19/2000	Windstorm	DeLand	Level 2 (Part)	18	68,836
3/13/2001	Tornado	Daytona Beach	Level 2 (Part)	172	3,210,995
9/11/2001	Nat'l Terrorism Event	County-Wide	Level 2 (Part)	N/A	N/A
9/14/2001	T.S. Gabrielle	County-Wide	Level 2 (Part)	44	474,135
11/15/2001	Rain Event	East Volusia	Level 2 (Part)	39	561,300
4/18/2002	Amtrak Derailment	Putnam Co.	Level 2 (Part)	N/A	5,000

Date of Event	Type of Event	Area of Event	EOC Level Activation	Damage Estimate	
				Number of Properties	Dollars
9/4/2002	T.S. Edouard	County-Wide	Level 2 (Part)	N/A	N/A
1/13/2003	Water Plant Breach	Debary	Level 2 (Part)	N/A	30,000
7/3/2004	Pepsi 400 Dis Race	Daytona Beach	Level 2 (Part)	N/A	N/A
8/13/2004	Hurricane Charley	County-Wide	Level 1 (Full)	5719	106,900,000
9/4/2004	Hurricane Frances	County-Wide	Level 1 (Full)	26964	393,900,000
9/25/2004	Hurricane Jeanne	County-Wide	Level 1 (Full)	UNK	59,500,000
7/2/2005	Pepsi 400 Dis Race	Daytona Beach	Level 2 (Part)	N/A	N/A
9/8/2005	T.S. Ophelia	County-Wide	Level 2 (Part)	Beach	N/A
10/23/2005	Hurricane Wilma	County-Wide	Level 2 (Part)	3	752,000
2/19/2006	Daytona 500 Race	Daytona Beach	Level 2 (Part)	N/A	N/A
7/1/2006	Pepsi 400 Dis Race	Daytona Beach	Level 2 (Part)	N/A	N/A
8/29/2006	T.S. Ernesto	County- Wide	Level 2 (Part)	N/A	N/A
12/25/2006	Tornado	DeLand-Daytona Bch.	Level 3 (Mon)	210	32,000,000
2/2/2007	Tornado	DeLand-NSB	Level 2 (Part)	771	60,557,921
2/18/2007	Daytona 500 Race	Daytona Beach	Level 2 (Part)	N/A	N/A
5/6/2007	Airport Road Fire	Volusia/Flagler Co.	Level 2 (Part)	N/A	N/A
7/7/2007	Pepsi 400 Dis Race	Daytona Beach	Level 2 (Part)	N/A	N/A
2/17/2008	Daytona 500 Race	Daytona Beach	Level 2 (Part)	N/A	N/A
7/5/2008	Coke 400 Dis Race	Daytona Beach	Level 2 (Part)	N/A	N/A
8/18/2008	T.S. Fay	County-Wide	Level 1 (Full)	240	13,580,016
2/15/2009	Daytona 500 Race	Daytona Beach	Level 2 (Part)	N/A	N/A
5/17/2009	May Rainstorm	County-Wide	Level 2 (Part)	1654	69,516,703
7/7/2009	Coke Zero 400	Daytona Beach	Level 2 (Part)	N/A	N/A
7/24/2009	Port Orange Tornado	Port Orange	Level 3 (Monitor)	175	2,810,661
2/14/2010	Daytona 500 Race	Daytona Beach	Level 2 (Part)	N/A	
7/3/2010	Coke Zero 400	Daytona Beach	Level 2 (Part)	N/A	
2/20/2011	Daytona 500 Race	Daytona Beach	Level 2 (Part)	N/A	
2/28/2011	Iron Horse Fire (17,017 a.)	Volusia County	Level 3 (Monitor)	N/A	
5/26/2011	Volusia Command Fires	Volusia County	Level 3 (Monitor)	N/A	
6/2/2011	Coke Zero 400	Daytona Beach	Level 2 (Part)	N/A	
2/26-28/12	Daytona 500 Race	Daytona Beach	Level 2 (Part)	N/A	
7/7/2012	Coke Zero 400	Daytona Beach	Level 2 (Part)	N/A	
12/11-12/12	Tornado Terra Mar	Edgewater	Level 2 (Part)	N/A	1,692,498
2/24/2013	Daytona 500 Race	Daytona Beach	Level 2 (Part)	N/A	
3/2/2013	Durrance Fire	Ormond Beach	Level 3 (Monitor)	N/A	
6/6/2013	Tropical Storm Andrea	Countywide	Level 3 (Monitor)	N/A	
7/6/2013	Coke Zero 400	Daytona Beach	Level 2 (Part)	N/A	
2/23/2014	Daytona 500 Race	Daytona Beach	Level 2 (Part)	N/A	
7/1/2014	Tropical Storm Arthur	Countywide	Level 3 (Monitor)	N/A	
7/3/2014	T.S. Arthur	Countywide	Level 2 (Part)	N/A	
7/5-6/2014	Coke Zero 400	Daytona Beach	Level 2 (Part)	N/A	

Date of Event	Type of Event	Area of Event	EOC Level Activation	Damage Estimate	
				Number of Properties	Dollars
9/23/2014	No Name Rain Event	Port Orange/ NSB	Level 2 (Part)	150	1,500,000
3/22/2015	Daytona 500 Race	Daytona Beach	Level 2 (Part)	N/A	N/A
5/5/2015	Coke Zero 400	Daytona Beach	Level 2 (Part)	N/A	N/A
8/27-29/2015	T.S. Erika	Daytona Beach	Level 2 (Part)	N/A	N/A
2/21/2016	Daytona 500 Race	Daytona Beach	Level 2 (Part)	N/A	N/A
5/27-30/2016	Country 500	Daytona Beach	Level 2 (Part)	N/A	N/A
6/5-7/2016	T.S. Colin	Daytona Beach	Level 2 (Part)	N/A	N/A
7/2/2016	Coke Zero 400	Daytona Beach	Level 2 (Part)	N/A	N/A
10/6-20/2016	Hurricane Matthew	Countywide	Level 1 (Full)	N/A	493,500,000
2/26/2017	Daytona 500 Race	Daytona Beach	Level 2 (Part)	N/A	N/A
5/26-28/2017	Country 500	Daytona Beach	Level 2 (Part)	N/A	N/A
7/2/2017	Coke Zero 400	Daytona Beach	Level 2 (Part)	N/A	N/A
9/5-22/2017	Hurricane Irma	Countywide	Level 1 (Full)	N/A	371,091,000
2/18/2018	Daytona 500 Race	Daytona Beach	Level 2 (Part)	N/A	N/A
5/25-27/2018	Country 500	Daytona Beach	Level 2 (Part)	N/A	N/A
7/7/2018	Coke Zero 400	Daytona Beach	Level 2 (Part)	N/A	N/A
2/17/2019	Daytona 500 Race	Daytona Beach	Level 2 (Part)	N/A	N/A
7/7/2019	Coke Zero 400	Daytona Beach	Level 2 (Part)	N/A	N/A
9/2/2019	Hurricane Dorian	Countywide	Level 1 (Full)	N/A	2,600,600
2/16/20	Daytona 500 Race	Daytona Beach	Level 2 (Part)	N/A	N/A
8/1/20	Hurricane Isaias	Countywide	Level 2 (Part)	N/A	N/A
8/16/20	Nascar Series	Daytona Beach	Level 2 (Part)	N/A	N/A
8/19/20	Primary Day Tornado	DeLand	Level 2 (Part)	N/A	N/A
8/29/20	Coke Zero 400	Daytona Beach	Level 2 (Part)	N/A	N/A
2/16/21	Daytona 500	Daytona Beach	Level 2 (Part)	N/A	N/A
7/2/21	Hurricane Elsa	Countywide	Level 2 (Part)	N/A	N/A
8/28/21	Coke Zero 400	Daytona Beach	Level 2 (Part)	N/A	N/A
2/20/22	Daytona 500	Daytona Beach	Level 2 (Part)	N/A	N/A
8/28/22	Coke Zero Sugar 400	Daytona Beach	Level 2 (Part)	N/A	N/A
9/28/22	Hurricane Ian	Countywide	Level 1 (Full)	7,051	357,449,754
11/7/22	Hurricane Nicole	Countywide	Level 1 (Full)	615	495,385,828
2/19/23	Daytona 500	Daytona Beach	Level 2 (Part)	N/A	N/A
8/26/23	Coke Zero Sugar 400	Daytona Beach	Level 2 (Part)	N/A	N/A
8/28-8/30/23	Hurricane Idalia	Daytona Beach	Level 2 (Part)	N/A	N/A
1/18-1/19/24	Daytona 500	Daytona Beach	Level 2 (Part)	N/A	N/A
5/8-5/12/24	Rockville	Daytona Beach	Level 2 (Part)	N/A	N/A
8/24/24	Coke Zero Sugar 400	Daytona Beach	Level 2 (Part)	N/A	N/A
9/26/24	Hurricane Helene	Countywide	Level 2 (Part)	N/A	N/A
10/10/24	Hurricane Milton	Countywide	Level 1 (Full)	5,102	267,508,457
			Totals------>	**53,414**	**$2,838,300,446**

Source: Volusia County Emergency Management Division (Revised 1/28/2025)

NOTE: ALL HISTORICAL OCCURRENCES IN THIS REPORT ARE THE MOST RECENT AS DOCUMENTED BY THE NATIONAL CLIMATIC DATA CENTER

NATURAL HAZARDS

5.2 AGRICULTURE

Background

Agriculture includes Infestations, Invasive Species, and Diseases Infestation or disease in agriculture is when biological entities such as insects, rodents, bacteria or viruses significantly increase in a given area, affecting crops to the point where human and animal health is threatened, valuable crops may be damaged, or significant environmental resources may be lost. Examples of common Volusia infestations are caused by mosquitos, citrus greening, southern pine beetle, Florida Dampwood Termites, rats, or noxious plants like Brazilian Pepper Tree, etc.

Cattle diseases like Mad Cow, Hartwater, and hoof-and-mouth and citrus disease like Greening and Canker are of concern to Volusia farmers. Coordination with the University of Florida IFAS and Volusia County Extension is the first step in mitigation planning for agricultural infestations and disease. A notable source of information on the distribution of invasive plants, insects, animals and diseases in Volusia can be found at the Early Detection and Distribution Mapping system website, http://www.eddmaps.org, known as EDDMapS. The EDDMapS web-based mapping system documents invasive species and disease distribution. The site combines data from other databases and organizations as well as volunteer observations to create a national network of invasive species distribution data that is used by scientists, researchers, land managers, landowners, educators, conservationists, ecologists, farmers, foresters, state and national parks. Florida has ecosystems not found in the other 47 contiguous states, and it also has more non-native species than any state other than Hawaii.

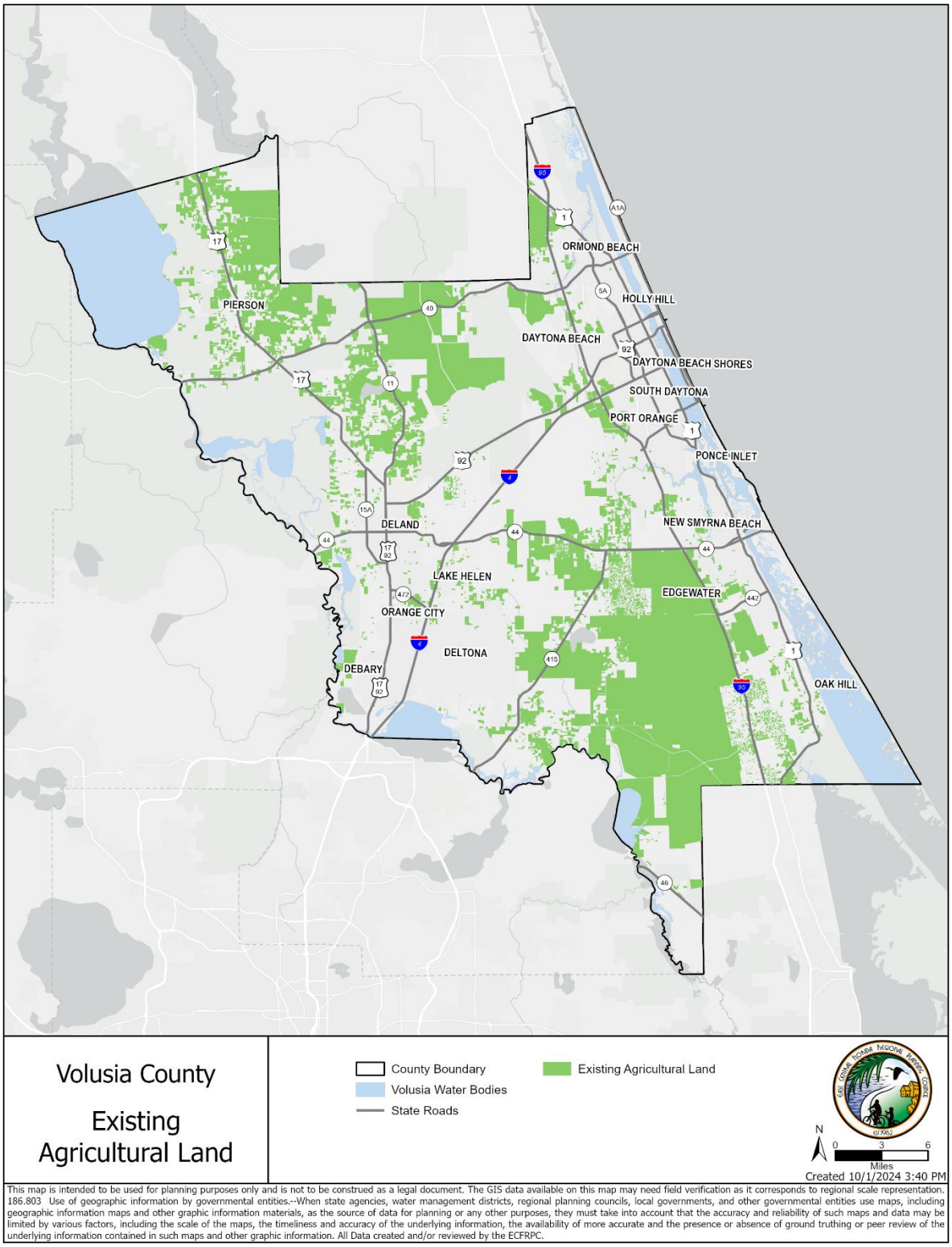
If important natural resources such as mangroves, sea oats, oyster beds, etc. are overrun by invading species, then the county will be more vulnerable to the consequences of all other hazards. With the disappearance of natural barriers, lower impacting hazards will have increasingly stronger impacts on residents, businesses, critical infrastructure and the ability of the County to provide uninterrupted program operations. Faculty members at the University of Florida currently are conducting research and outreach programs to better understand and control these exotic invasive species. Until controls are in place the entire population of Volusia is at risk to the effects of a degrading ecosystem.

Location and Spatial Extent

Agriculture incidents in Volusia County are quite rare and historically have not caused much damage to the community. In 2022, the county had 95,988 acres of farmland. Much of the agricultural land is located in the central western part of Volusia County, including Enterprise and Pierson. The extent encompasses small areas of crops within the county. Since 2022, there has been a 13% decrease in the number of farms that exist within the county. While the direct impacts may be rare, the indirect effects of an incident could be county-wide. From 2020 to 2024, at least 70 acres within the county are infested with non-native species.[1] **Section 5 Figure 1** displays the areas of the county most vulnerable to agricultural incidents based on areas zoned agricultural.

[1]https://www.eddmaps.org/tools/query/?observationDateStart=01/01/2020&observationDateEnd=08/12/2024&eradicationstatus=1,2&country=926&state=92612000&fipscode=92612127&records=current

Section 5: Figure 1: Volusia County Agricultural Land



Source: Volusia County Property Appraiser, ECFRPC

Section 5: Table 3: Farm Overview 2022[2]

	2022	% Change Since 2017
Number of Farms	1,374	-13
Land in Farms (Acres)	95,988	-16
Average Size of Farm (Acres)	70	-4

Historical Occurrences

With its plant-friendly south temperate/subtropical climate, Florida particularly suffers from the introduction and unchecked growth of exotic plants. Almost half (1,180) of the 3,834 plant species found in Florida have arrived here since European occupation. Since plants are the base of the food chain, exotic "takeovers" can jeopardize plant-dependent wildlife and the whole ecosystem. The Florida Exotic Pest Plant Council (FLEPPC) has identified 152 non-native invasive species that are invading and disrupting native plant communities (2011 list). In 2022, that has now increased to 172[3]. EDDMapS notes over 299 separate invasive plants, animal, and insect species found in Volusia County to date. Many of the listed species are distributed throughout the county and are found in natural and disturbed landscapes.

In Florida, at least 60 species of exotic birds have bred in the wild. Despite this fact, the chance of persisting survival of non-indigenous birds is uncertain. Among those species which have survived and thrived as pests are Muscovy ducks, rock doves, European starlings, house sparrows, and monk parakeets. Though troublesome in other respects, some species (such as feral pigs) are important as prey for native predators (Florida panthers) and serve as an attraction for hunters. However, negative impacts from invasive species include habitat destruction, competition with native species, predation, hybridization, disease and parasites.

Florida mammal pests include the Norway rat, roof rat, house mouse and feral pig. Siting of invasive fish in Volusia include Lionfish, and Nile Tilapia. Annually, insect pests cause an estimated $1 billion in damages in Florida, and many of the worst pests are non-indigenous. According to entomologist Dr. John Capinera, 1,218 invading insect species become established in Florida annually. These non-natives arrive by flying, walking, swimming, rafting and by stowing away on cargo (often on infested plants commercially imported).

In 1997 and 1998, Florida's agricultural community was forced to focus time and resources on communicating to the general public about the Mediterranean fruit fly (Medfly) and the control methods used to eradicate the pest when the fly threatened the state's $6.8 million agriculture industry. The Florida Agricultural Extension is a partnership between the University of Florida Institute of Food and Agricultural Sciences (IFAS), the United States Department of Agriculture (USDA) and county governments in Florida to provide scientific knowledge and expertise to the public through educational programs. Volusia County has cattle farms, citrus orchards, ferneries, and other agricultural enterprises that are vulnerable to infestations and disease. Information on these infestations and diseases is available at http://www.volusia.org/services/community-services/extension/.

[2]Source: 2022 Census of Agriculture County Profile
https://www.nass.usda.gov/Publications/AgCensus/2022/Online_Resources/County_Profiles/Florida/cp12127.pdf

[3]Source: https://www.floridainvasives.org/plant-list/2023-invasive-plant-species/

Probability of Future Occurrences

Agricultural threats will continue to pose a threat to Volusia County for years to come, but the probability remains low for catastrophic farming impacts. Agriculture does remain a threat because although the number of farms has decreased since 2017, the market value of products sold increased by 47% and farm related income by 116%.

5.3 COASTAL EROSION

Background

Coastal erosion is a hazard defined as the wearing away of land and loss of beach, shoreline, or dune material and is measured as the rate of change in the position or horizontal (landward) displacement of a shoreline over a period of time. Short-term erosion typically results from episodic natural events such as hurricanes and storm surge, windstorms and flooding hazards, but may be exacerbated by human activities such as boat wakes, removal of dune and vegetative buffers, shoreline hardening and dredging. Long-term erosion is a function of multi-year impacts such as wave action, sea level rise, sediment loss, subsidence and climate change. Climatic trends can change a beach from naturally accreting to eroding due to increased episodic erosion events caused by waves from an above-average number of storms and high tides, or the long-term effects of fluctuations in sea level.

Natural recovery from erosion can take years, often decades. If a beach or dune system does not recover quickly enough naturally, coastal and upland property may be exposed to further damage in subsequent coastal erosion and flooding events. Human actions to supplement natural coastal recovery, such as beach nourishment, dune stabilization and shoreline protection structures (e.g., sea walls, groins, jetties, etc.) can mitigate the hazard of coastal erosion, but may also exacerbate it under some circumstances.

Death and injury are not typically associated with coastal erosion; however, it can cause the destruction of buildings and infrastructure and represents a major threat to the local economies of coastal communities that rely on the financial benefits of recreational beaches.

Location and Spatial Extent

All coastal areas in Volusia County are susceptible to coastal erosion. The jurisdictions most vulnerable are displayed in **Section 5 Figure 2**. Using Florida Department of Environment (FDEP) field data beginning in 1972, it is clear that Volusia County shorelines are moving due to erosion, accretion, and beach nourishment projects[4]. Further, in July 2023, FDEP released a *Critically Eroded Beaches in Florida* report that identifies four critically eroded beach areas (27.2miles), two non-critically eroded beach area (2 miles) and one critically eroded inlet shoreline area (0.6 mile) in Volusia County.

A 16.6-mile segment of beach (R51 – R143) along Ormond Beach, Daytona Beach, Daytona Beach Shores, Wilbur By The Sea and the Town of Ponce Inlet is critically eroded, threatening development and recreational interests, as well as sea turtle nesting areas where the dry sand beach has become very narrow. Most of this segment is armored with seawalls.

Due to the erosional impacts of Hurricane Ian and Nicole in 2022, there is a 0.9-mile segment of a noncritically eroded beach within the Town of Ponce Inlet between R143 to R148.2 and no structures are threatened. The north shoreline (0.6-mile) of Ponce de Leon Inlet is critically eroded and threatens recreational interests at the county park. The 8.4 miles of beaches (R160.8 – R207.8) south of Ponce de Leon Inlet within New Smyrna Beach and Bethune Beach are critically eroded. Private development and recreational interests, as well as sea turtle nesting habitats, are threatened. Much of New Smyrna Beach

[4] Foster, Emmet and Jenny Cheng. Shoreline Beach Change Estimates, Volusia County, 2000. Office of Beaches and Coastal Systems, Florida Department of Environmental Protection; Beaches and Shores Research Center, Florida State University.

is armored with seawalls, with Bethune Beach protected by a boulder rock revetment. The New Smyrna Beach area has received inlet sand transfer material from dredging within Ponce de Leon Inlet and additional material from dredging the Atlantic Intracoastal Waterway. A 1.1-mile segment of the Canaveral National Seashore (R207.8 – R214) south of Bethune Beach is also non-critically eroded without any threatened interests at this time.[5]

The beach ridge in Volusia County ranges from 300 – 3,000 feet in width. A majority of the county, ranging approximately from Ormond Beach to Bethune Beach, has fine-grained quartz sand. Sand in areas north and south of this area consist of a shell-quartz mixture and have steeper slopes than the central county. The southernmost mile of shoreline in Volusia County makes up part of the Canaveral National Seashore Park, while the northernmost area is part of the North Peninsula State Recreation Area.

Historical Occurrences

Erosion events typically are part of other hazard events (e.g., storm surge and hurricanes) and the monetary damage for the erosion alone is unknown.

Section 5: Table 4: Historical Coastal Erosion Impacts

LOCATION	DATE	DEATHS/ INJURIES	PROPERTY DAMAGE	DESCRIPTION
Volusia County	9/14/1999	0/0	$56,444,488 (2009 dollars)	Hurricane Floyd caused significant beach erosion in Volusia County. Of the property damage estimates, over $13 million was attributed to beach erosion.
St. Lucie and Volusia Counties	10/14/1999	0/0	$68,539,735 (2009 dollars)	Hurricane Irene caused beach loss of four to ten feet in the affected areas with damage in the millions.
Brevard and Volusia Counties	9/04/2001	0/0	$6,333,850 (2009 dollars)	Storm tide from a tropical storm reached two feet above normal, causing significant beach erosion.
St. Lucie and Volusia Counties	9/25/2004	0/0	$440,408,221 (2009 dollars)	Severe beach erosion was reported from Hurricane Jeanne, a category 3 storm.
Volusia County	8/21/2008	0/0	Unknown	New Smyrna Beach experienced a loss of 50 feet of new sand due to wind gust of over 45 MPH from Tropical Storm Fay. Even Orange and Seminole counties experienced riverine erosion along the St. Johns River.
St. Johns, Flagler, Volusia and Brevard Counties	10/6/16	0/0	$15.8 million	Under executive authority, Governor Rick Scott announced on January 27, 2017, that emergency funding of $15.8 million would be made available for emergency beach and dune repairs in response to the damage caused by Hurricane Matthew. The emergency funding was intended for

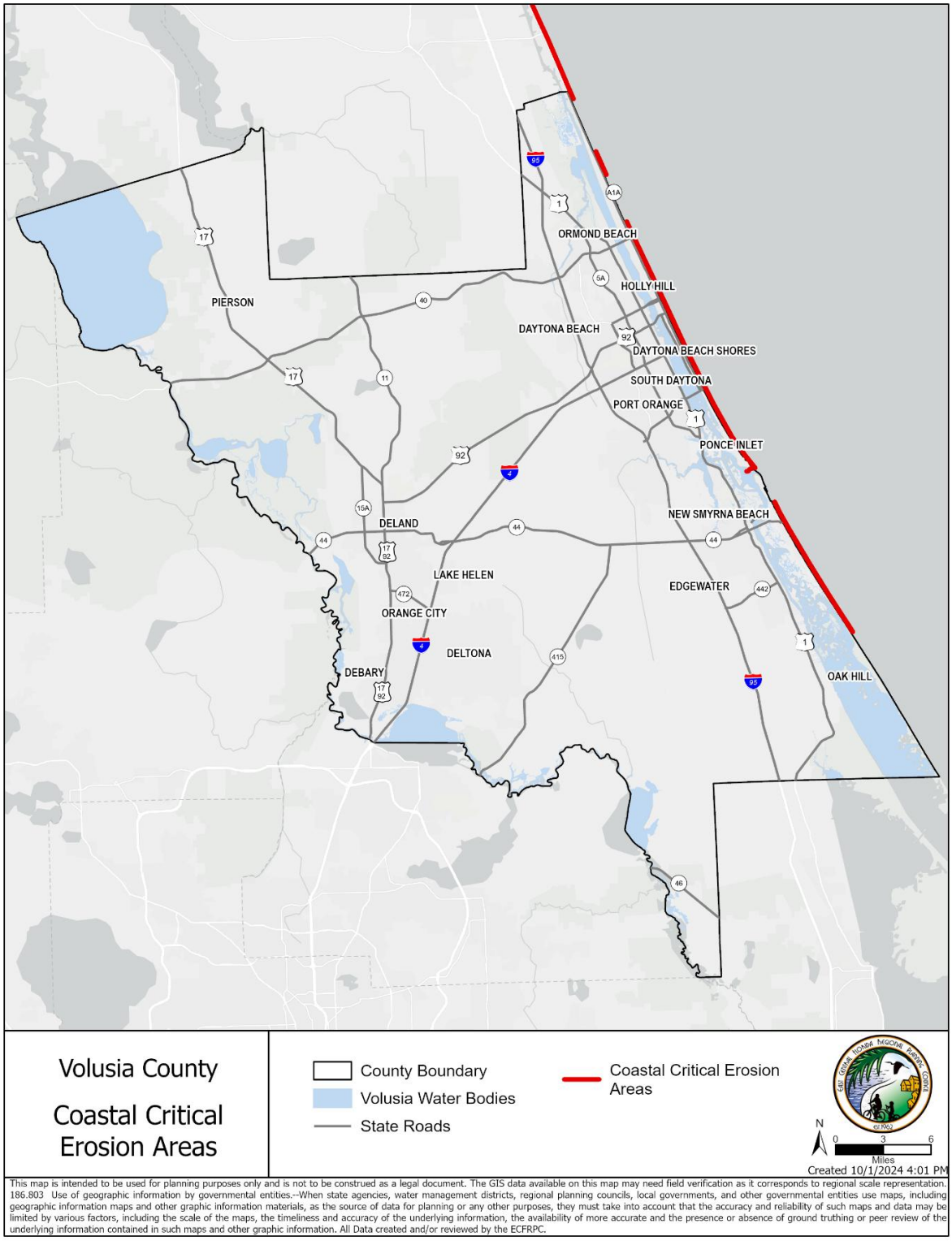
[5] Critically Eroded Beaches in Florida Office of Resilience and Coastal Protection Florida Department of Environmental Protection July 2023

LOCATION	DATE	DEATHS/ INJURIES	PROPERTY DAMAGE	DESCRIPTION
				immediate use to address critically eroded beaches where there was an imminent threat to beachfront structures, such as roadways, homes and businesses.
Volusia County	September-November 2022	0/0	Unknown	Several structures either partially or fully collapsed into the ocean throughout Volusia County. Elsewhere, significant damage was noted to dunes, beach access crossovers, seawalls, piers, and boardwalks, many of which were already in a weakened state due to Hurricane Ian. Numerous structures, including homes, condominiums, and hotels were deemed unsafe and required additional analysis by engineers as well as county and state officials. Elevated water levels along the intracoastal waters resulted in damage to numerous boat docks and marinas throughout the county.

Source: National Climatic Data Center

The severity of coastal erosion is typically measured through a quantitative assessment of annual shoreline change for a given beach cross-section of profile (feet or meters per year) over a long period of time. Erosion rates vary as a function of shoreline type and are influenced primarily by episodic events but can be used in land use and hazard management to define areas of critical concern.

Section 5: Figure 2: Critical Erosion Areas in Volusia County



Source: Florida Department of Environmental Protection, Division of Beaches and Coastal Systems, 2024

Probability of Future Occurrences

The probability of the continuing occurrence of coastal erosion in the coastal areas of Volusia County is high. Florida's Bureau of Beaches and Coastal Systems estimates an average of a one-foot loss annually for Volusia County in stable or accretionary areas. The area between Ormond Beach and Daytona Beach Shores are eroding at a rate between zero and 0.5 feet annually, according to a 2000 study. Northern areas of the county, including the North Peninsula State Recreation Area, lose between 0.5 and 1.5 feet annually. Areas south of Ormond Beach to Daytona Beach Shores stretch have lower expected erosion rates due to extensive armoring (e.g., beach walls and revetments). However, natural erosion is occurring southward from South of Ponce de Leon Inlet. Loss rates are as high as 1.5 feet per year and decrease heading in a southerly direction. The damaging impacts of coastal erosion are lessened through continuous (and costly) beach nourishment and structural shoreline protection measures. However, it is likely that the impacts of coastal erosion will increase in severity due to future episodic storm events.

The Local Mitigation Strategy recognizes that with a changing climate, there is a potential for an increasing risk of environmental impacts and that future mitigation and adaptation strategies related to this hazard should be considered.

5.4 DROUGHT

Background

Drought is a normal part of virtually all climatic regions, including areas with high and low average rainfall. Drought is the consequence of a natural reduction in the amount of precipitation expected over an extended period of time, usually a season or more in length. High temperatures, high winds, and low humidity can exacerbate drought conditions. In addition, human actions and demands for water resources can hasten drought-related impacts. Droughts are typically classified into one of four types[6]:

- **Meteorological:** The degree of dryness or departure of actual precipitation from an expected average or normal amount based on monthly, seasonal, or annual time scales.
- **Hydrologic:** The effects of precipitation shortfalls on stream flows and reservoir, lake, and groundwater levels.
- **Agricultural:** Soil moisture deficiencies relative to water demands of plant life, usually crops.
- **Socioeconomic:** The effect of demands for water exceeding the supply as a result of a weather-related supply shortfall.

Droughts are slow-onset hazards, but over time can have very damaging effects to crops, municipal water supplies, recreational uses, and wildlife. If droughts extend over a number of years, the direct and indirect economic impact can be significant. The National Weather Service alerts are displayed in **Section 5 Figure 2**.

Location and Spatial Extent

The Palmer Drought Severity Index (PDSI) is based on observed drought conditions and range from -0.5 (incipient dry spell) to -4.0 (extreme drought). Evident in **Section 5: Figure 3,** the Palmer Drought Severity Index Summary Map for the United States, droughts affect most areas of the United States but are less severe in the Eastern United States.

Drought typically covers a large area and cannot be confined to any geographic or political boundaries; thus, Volusia County and all its jurisdictions are equally susceptible. According to the Palmer Drought Severity Index, Florida has a relatively low risk for drought hazard. However, local areas may experience much more severe and/or frequent drought events than what is represented on the Palmer Drought Severity Index map. Further, it is assumed that Volusia County would be uniformly exposed to drought, making the spatial extent potentially widespread. During long periods of drought, disruption in the water cycle can have potentially damaging effects, including substantial crop loss in the northwestern portion of the county. Periods of drought can exacerbate the ignition of wildfires that can damage the natural and built environment, as has occurred before in Volusia County.

As of October 2019, the Keech Byran Drought Index (KBDI) for Volusia is in the less than 300 to 301-400 range, a relatively low score on a scale that measures up to from 0 (wet) to 800 (arid conditions). The score rose to as high as 582 in April 2013.

One of the most severe cases of drought in Florida occurred from October 2010 until June of 2012 in which a major portion of the state displayed D3 (Drought Extreme) conditions. During this extensive period, the two-month period of April and May of 2012, showed the highest level of drought concern with portions of the state under a D-4 Drought Exceptional condition (The National Drought Mitigation Center, 2014).

[6] Multi-Hazard Identification and Risk Assessment: A Cornerstone of the National Mitigation Strategy, FEMA

Thus, Volusia County can experience the full array of drought conditions, from D0 to D4. NOAA describes D4 events as having "extensive and widespread crop and pasture losses, fire risk, shortages of water in reservoirs, stream and wells that yield water emergencies. D4 can loosely be likened to a "once-in-a-generation" type of drought noted by the second percentile, or a 1 in 50-year drought.

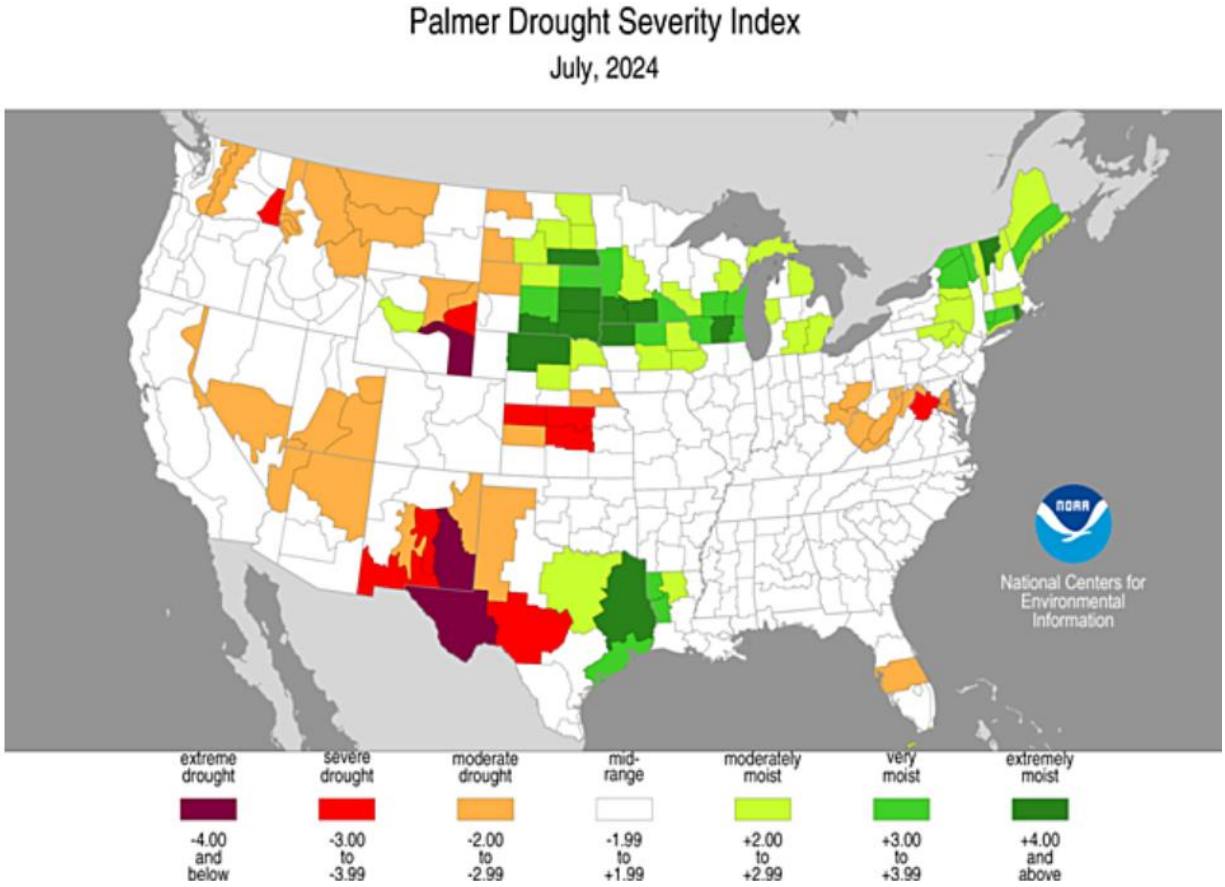
Section 5: Figure 2: Drought Monitor Intensities

National Weather Service Alerts	
Alert	Criteria
D0 Abnormally Dry	Going into drought: short-term dryness slowing planting, growth of crops or pastures. Coming out of drought: some lingering water deficits; pastures or crops not fully recovered.
D1 Moderate Drought	Some damage to crops, pastures, streams, reservoirs, or wells low, some water shortages developing or imminent, and voluntary water-use restrictions requested.
D2 Severe Drought	Crop or pasture losses are likely, water shortages common and water restrictions imposed.
D3 Extreme Drought	Major crop and pasture losses with widespread water shortages or restrictions.
D4 Exceptional Drought	Exceptional and widespread crop and pasture loss, shortages of water in reservoirs, streams, and wells creating water emergencies.

Source: National Weather Service

Source: National Weather Service

Section 5: Figure 3: Palmer Drought Severity Index Summary Map for the United States



Source: NOAA (Note: This map updates frequently. This is only a snapshot in time and not a long-term trend or view)[7]

Historical Occurrences

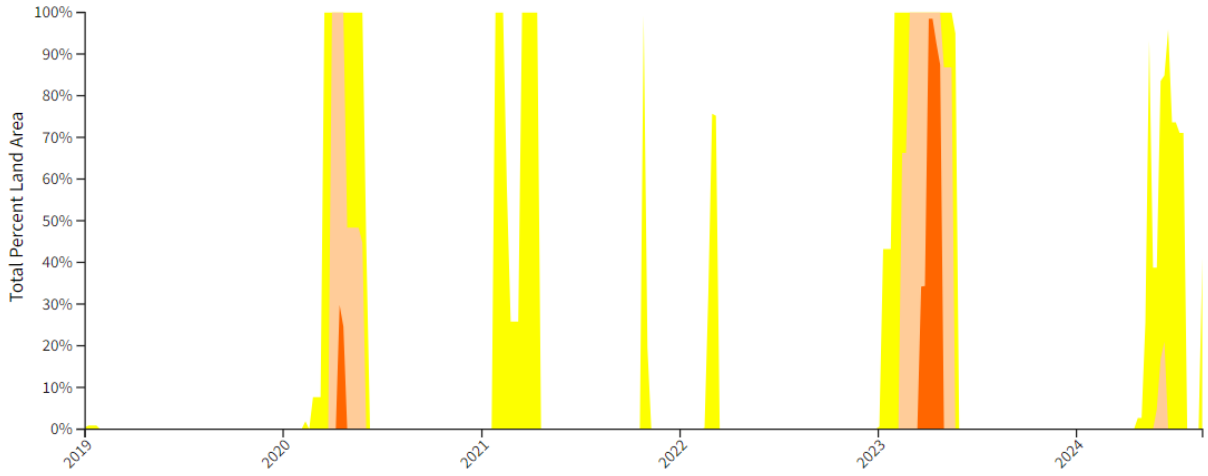
Secondary research was conducted to determine the historical drought occurrences in Volusia County. Volusia County is part of the St. Johns River Water Management District, which monitors well levels throughout its jurisdiction. The Keetch Bryam Drought Index is a numerical scale (0-800) that measures the amount of moisture in the soil. A zero indicates wet, full saturation conditions while an 800 represents extreme drought conditions. It is often used to assess the danger of wildfires but is also an indication of drought. Therefore, it is reported where information is available. The following highlights some of the events from the years.

1981: Drought conditions were reported throughout Southern Florida. Three firefighters narrowly escaped injury while fighting drought-related wildfire. Officials from St. Johns River Water Management District ordered a mandatory 15 percent reduction in water use for public water supply, industrial, commercial and self-supplied users[8].

[7] https://www.ncei.noaa.gov/access/monitoring/historical-palmers/maps/psi/202301-202407
[8] "Winds, Dry Weather Worsen Central Florida Fires. Ocala Star-Banner. Associated Press. July 1, 1981.

- **1985:** A short, six-month drought was reported in Volusia County. In addition to sparking wildfires, it led to a water warning calling for voluntary water usage restrictions[9]. On June 20, 1985, the water warning was expanded throughout St. Johns Water Management District. Volusia County had been placed under warning months earlier[10]. On August 14, the warning was lifted as counties were able to meet usage demands due to recent rainfall.
- **1998:** Volusia County reported a Drought Index reading of 700. Wildfires were abundant throughout the County. This year was reported as having the driest conditions in 50 years. The drought did not officially end until 2002[11].
- **January 1999:** Volusia County reported a Drought Index of 500.
- **May 2000:** The May Drought Index was reported at 432 – 570. By early 2001 the Drought Index average for Volusia County was 601.
- **February 2001:** During this drought, drought index D4 covered 39.08% of Florida.
- **April 2006 – August 2008:** This prolonged drought covered much of the state in D2 and D3 conditions.
- **October 2010 – June 2012:** This prolonged drought covered much of the state in D1 and D2 conditions. D3 conditions peaked in June 2012, covering more than 80% of the state.
- **Spring 2024:** Volusia County was in a drought nearly the entire first quarter of the year, reaching D2 conditions as shown in **Section 5 Figure 4**. [12]

Section 5: Figure 4: Drought Conditions for Volusia County



Source: NOAA

Probability of Future Occurrences

It is assumed that all of Volusia County is uniformly exposed to a drought event. As with any location, some areas of the county may be affected more severely than others during a drought. Given the

[9] "Fires Still Rage in Volusia County." Evening Independent. Associated Press.
[10] "St. John's Water District Expands Warning Area." Gainesville Sun. Associated Press. June 20, 1985.
[11] NAVARRO, MIREYA. "Thousands Flee Florida Homes as Fires Surge." July 2, 1998. Section A, page 1, New York Times.
[12] https://www.drought.gov/states/florida/county/volusia

frequency of previous events, warm temperatures, and average rainfall, the probability of future drought events is high.

In partnership with County and municipal staff and the St. Johns River Water Management District, a contingency plan is in place to restrict water use across the county in an effort assist with water conservation efforts during periods of drought. Some direct impacts related to drought include reduced crop production, increased fire hazards, reduced water levels at major lakes and rivers, damage to fish habitat, and income loss for the agriculture industry.

The Local Mitigation Strategy recognizes that with a changing climate, there is a potential for an increasing risk of environmental impacts and that future mitigation and adaptation strategies related to this hazard should be considered.

5.5 EXTREME TEMPERATURES

Background

Extreme temperature generally refers to temperatures that are unusually high or low compared to typical weather conditions for a specific location and time of year. However, defining what constitutes "extreme" can be challenging due to context, location, history, and duration. Volusia County defines extreme temperature in two ways.

- **Extreme cold** may include snow, sleet, freezing rain, or a mix of these wintry forms of precipitation. A winter storm can range from moderate snow over a period of a few hours to blizzard conditions with blinding wind-driven snow that lasts for several days. Ice storms occur when moisture falls and freezes immediately upon impact on trees, power lines, communication towers, structures, roads and other hard surfaces. Winter storms and ice storms can bring down trees, cause widespread power outages, damage property, and cause fatalities and injuries to human life. All winter storm events have the potential to present dangerous conditions to Volusia County.
- **Extreme heat** is defined as temperatures that hover 9 degrees or more above the average high temperature of 90°F for the region and last for 3 or more consecutive days. Humid or muggy conditions, which add to the discomfort of high temperatures, occur when a "dome" of high atmospheric pressure traps hazy, damp air near the ground.

Location and Spatial Extent

The entirety of Volusia County and its jurisdictions are susceptible to extreme temperatures. Volusia County, being in the southern portion of the nation, rarely experiences extreme cold events, and thus has a much lower risk than more northern areas of the country. Typically, there have not been many winter storms that have caused damage in Volusia County. Volusia County does succumb more frequently to extreme heat events.

A severe winter storm occurs when the surface air temperature is expected to be 32°F or below over a widespread area for at least 3 or more consecutive days (this is the minimum extent of a severe winter storm). Use of the term is usually restricted to aversive situations or occasions when wind or other conditions prevent frost. "Killing" may be used during the growing season when the temperature is expected to be low enough for a sufficient duration to kill all but the hardiest herbaceous crops. Extreme cold can immobilize an entire region. Even areas, such as Volusia County, that normally experience mild winters can be hit with a major extreme cold winter event. Winter storms can result in ice, localized flooding, closed highways, blocked roads, downed power lines and hypothermia.

There is a low probability that Volusia County and its jurisdictions will experience 72 consecutive hours of temperatures below 32°F on an annual basis. However, outlier storms (such as the Great Blizzard of 1899) have been observed within Volusia County and are often the result of arctic activity that affects the entire North American continent. These events are of low probability on an annual basis but can occur.

Volusia County and its jurisdictions are more likely to experience freezing temperatures for much shorter durations of time. More specifically, temperatures tend to dip below the freezing threshold during nighttime from the months of November to February.

The extent of extreme heat is determined as 3 -10 consecutive days of 99°F or higher and at least 50% of the County would be impacted during an event. Trends show increasing temperatures for longer durations. This puts the entire county and its residents at much greater risk of extreme heat events.

Historical Occurrences

Temperatures within Volusia County, Florida were recorded as low as 6 degrees Fahrenheit in December 1962, according to the National Oceanographic and Atmospheric Administration. Temperatures dropped to 6 degrees for five consecutive days, although the temperature did not sustain at this level continuously. According to a previous Volusia County Emergency Operations Management manager, there were also two severe winter freezes in the mid to late 80's. These events killed many orange groves in Volusia County and around the state. There were no reports of death, injuries, or property damage as a result of the winter weather.

Despite the rare chance of winter storm occurrence, one snow event was reported in 2008 according to NOAA National Climatic Data Center (NCDC). On January 3, 2008, cold breezes off the Atlantic produced brief snow flurries along the coast of Volusia County. On January 9, 2010, sleet was reported in Volusia County.

However, freezing temperatures are not likely to persist for more than 24 hours at a time. In most circumstances, temperatures will only dip below freezing for a small number of hours during the nighttime. A number of these events were reported in Volusia County in the 2014- and 2015-time frame, one of the most recent and severe being the 'polar vortex' super storm on January 6th and 7th, 2014. The early months of 2025 brought freezing temperatures across the state. Volusia County opened cold weather shelters and issued numerous freeze and cold weather advisories for residents.

According to scientists at NASA's Goddard Institute for Space Studies (GISS) in New York, July 2023 was hotter than any other month in the global temperature record. Temperatures above 95F occur most often in June, July, August, and occasionally in May and September.

Probability of Future Occurrences

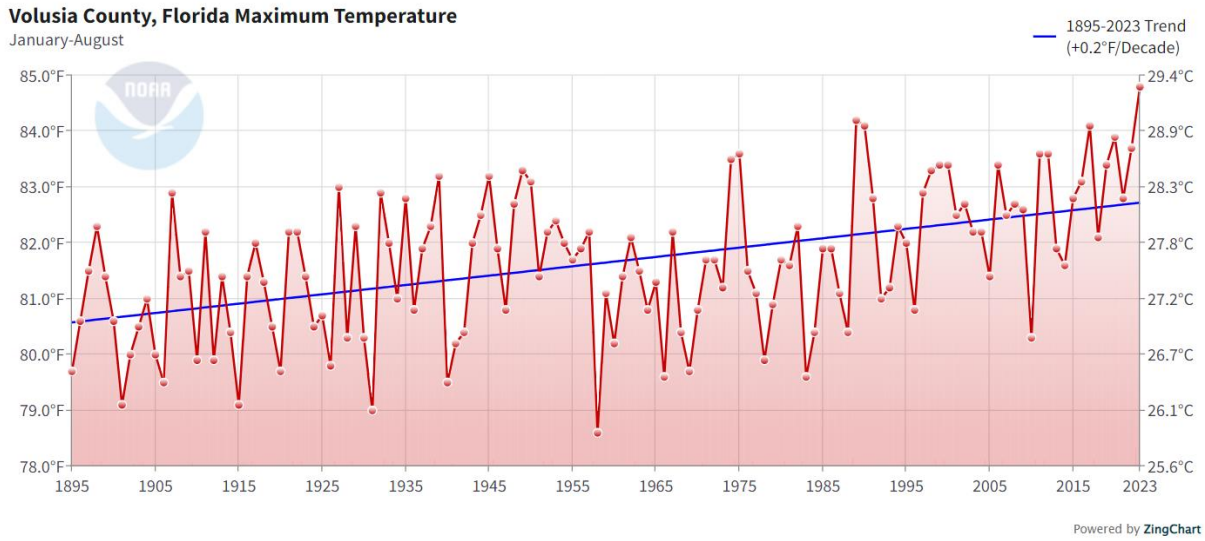
There is a low probability of future winter storm occurrences in Volusia County; however, outlier storms such as the 1899 Blizzard can occur with an extremely low probability. Winter storm events will remain an infrequent occurrence in Volusia County. Given the average winter temperature of 61.5 degrees Fahrenheit, it is highly unlikely that a winter event beyond light snow will occur.

It is assumed that Volusia County experiences extreme heat periodically and will continue to do so. The average temperature and number of consecutive days of extreme heat are likely to increase, bringing new challenges to human health and infrastructure. The historical county maximum temperature in January through August in 1895 was 79.7 degrees, whereas the current day maximum temperature is 84.8 degrees.[13] Based on the data produced by NOAA shown in **Section 5: Figure 5**, extreme heat trends are increasing.

[13]Source: NOAA National Centers for Environmental information, Climate at a Glance: County Time Series, published August 2024, retrieved on August 13, 2024, from https://www.ncei.noaa.gov/access/monitoring/climate-at-a-glance/county/time-series

Future impacts throughout Volusia County could include damage to crops, nurseries and tree farms (e.g., Pierson is the fern capital of the world), and other vegetation; sleet could increase the number of vehicular accidents); and the increased use of alternate heating sources in homes could cause potential structural fires. Also, agriculture may be disproportionately affected.

Section 5: Figure 5: Florida Maximum Annual Temperature Since 1895



The Local Mitigation Strategy recognizes that with a changing climate, there is a potential for an increasing risk of environmental impacts and that future mitigation and adaptation strategies related to this hazard should be considered.

5.6 FLOOD

Background

Flooding is the most frequent and costly natural hazard in the United States, a hazard that has caused more than 10,000 deaths since 1900. Nearly 90 percent of presidential disaster declarations result from natural events where flooding was a major component.

Floods generally result from excessive precipitation and can be classified under two categories: general floods, precipitation over a given river basin for a long period of time along with storm-induced wave or tidal action; and flash floods, the product of heavy localized precipitation in a short time period over a given location. The severity of flooding events is typically determined by a combination of several major factors, including stream and river basin topography and physiography; precipitation and weather patterns; recent soil moisture conditions; and the degree of vegetative clearing and impervious surface.

- A **general flood** is usually a long-term event that may last for several days. The primary types of general flooding include riverine, coastal, and urban flooding. Riverine flooding is a function of excessive precipitation levels and water runoff volumes within the watershed of a stream or river. Coastal flooding is typically a result of storm surge, wind-driven waves and heavy rainfall produced by hurricanes, tropical storms and other large coastal storms[14]. Urban flooding occurs where manmade development has obstructed the natural flow of water and decreased the ability of natural groundcover to absorb and retain surface water runoff.

- Most **flash flooding** is caused by slow-moving thunderstorms in a local area or by heavy rains associated with hurricanes and tropical storms. However, flash flooding events may also occur from a dam or levee failure within minutes or hours of heavy amounts of rainfall, or from a sudden release of water held by a retention basin or other stormwater control facility. Although flash flooding occurs most often along mountain streams, it is also common in urbanized areas where much of the ground is covered by impervious surfaces.

Section 5: Figure 6: Flood Waters Covering Streets

Maytown Road experienced extreme flooding during the 2009 Volusia County rainstorms

[14] While briefly mentioned here, coastal flooding is more thoroughly addressed under the "rising coastal water" hazard.

The periodic flooding of lands adjacent to rivers, streams and shorelines (land known as floodplain) is a natural and inevitable occurrence that can be expected to take place based upon established recurrence intervals. Floodplains are designated by the frequency of floods that is large enough to cover them. There are two ways to determine the frequency of flood events

1. By plotting a graph of the size of all known floods for an area and determining how often floods of a particular size occur, and
2. the chance of occurrence in a given year, which is the percentage of the probability of flooding each year.

For example, the 1 percent annual chance flood refers to an area in the 100-year floodplain and has a 1 percent chance of occurring in any given year. Similarly, the 0.2 percent flood covers the 500-year floodplain and has a 0.2 percent chance of occurring in any given year. The recurrence interval of a flood is defined as the average time interval, in years, expected between a flood event of a particular magnitude and an equal or larger flood. Flood magnitude increases with increasing recurrence intervals.

Location and Spatial Extent

All areas of Volusia County are susceptible to riverine and urban (stormwater) flooding, and its coastal communities are also very susceptible to tidal and coastal flooding due to coastal storm events including storm surge.[15] **Section 5: Figure 8** illustrates the location and extent of currently mapped Special Flood Hazard Areas for Volusia County based on best available FEMA Digital Flood Insurance Rate Map (DFIRM) data.[16] As displayed in the image, the hazard differs across the county. The differences include Zones A/AE (100-year floodplain), Zone VE (100-year coastal flood zones, associated with wave action) and Zone X (500-year floodplain). It is important to note that while FEMA digital flood data is recognized as best available data for planning purposes, it does not always reflect the most accurate and up-to-date flood risk. Impacts have included flooding of hundreds of homes, schools, and roads, including the blockage of I-95 in Ormond Beach during a 2004 flash flood. Flooding and flood-related losses sometimes occur outside of delineated “100 year” special flood hazard areas during 500-year storm events or when rain events are exacerbated by strong winds. Changes in topography (and associated water runoff) generally do not impact Volusia County due to its flat terrain.

Water can rise to exceptional levels during hurricane, storm surge, flash flood and thunderstorm conditions. Water levels have historically risen to 6 feet within southwestern Volusia County following one of these events, with increased water heights for coastal communities due to Florida’s semidiurnal tides. Roadway flooding has been seen rising between 1 and 5 feet.

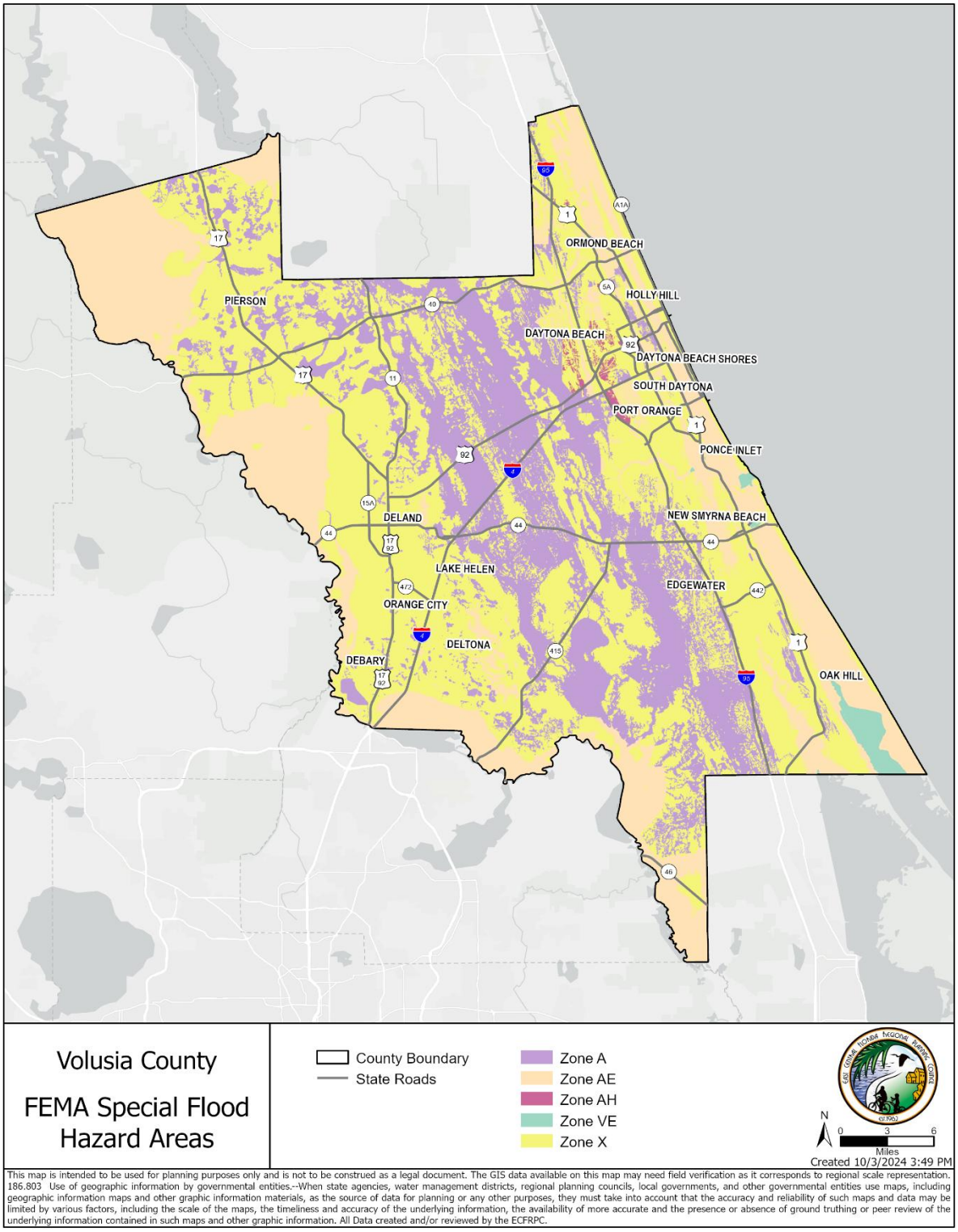
There are a number of areas that are disproportionately affected to flooding, including areas adjacent to the St. Johns River (Maytown to Enterprise).

Probability of Future Occurrences

The Local Mitigation Strategy recognizes that with a changing climate, there is a potential for an increasing risk of environmental impacts from flooding and that future mitigation and adaptation strategies related to this hazard should be considered.

[15] Storm surge is addressed separately within this section.

Section 5: Figure 7: Special Flood Hazard Areas in Volusia County



Source: Federal Emergency Management Agency

Historical Occurrences

According to the National Climatic Data Center, there have been over 20 reported flood events in Volusia County since 1994. According to the data as shown in **Section 5: Table 5**, there was over $20 million in property damage (not including recorded agricultural losses) during this period.

Section 5: Table 5: Historical Flood Impacts in Volusia County

LOCATION	DATE	TYPE	DEATHS/ INJURIES	PROPERTY DAMAGE	DESCRIPTION
Peninsular	9/15/1994	Flood	0/0	$757,242	Two synoptic-scale systems, one tropical and one non-tropical brought heavy rain to most of peninsular Florida the last half of September. Other sections of Florida, particularly northeast and east central, experienced urban flooding which closed roads and flooded schools and homes in Duval County and flooded subdivisions in Flagler, Volusia, St. Johns and Brevard counties.
Countywide	10/11/1994	Flood	0/0	$757,242	Heavy rains across much of northeast Florida caused widespread flooding of roadways and vehicles and minor flooding of schools, businesses and residences. Strong onshore winds caused significant beach erosion and minor coastal flooding along portions of the northeast coast.
Oak Hill	9/19/1999	Flash Flood	0/0	$13,439	Heavy rain of 2 to 4 inches produced flooding in Oak Hill. Two homes had minor flooding.
Edgewater	9/14/2001	Flash Flood	0/0	$316,693	Rainfall from Tropical Storm Gabrielle flooded about 25 homes and apartments in Edgewater and New Smyrna Beach. About 5 homes were flooded along the Tomoka River in Daytona Beach. Roadway and small stream flooding was reported over much of the county.
Ponce Park	11/14/2001	Flash Flood	0/0	$633,385	Showers and thunderstorms dumped over 5 inches of rain in coastal sections of Volusia County. Thirty-five homes in the Ponce Inlet, Daytona Beach and Ormond by the Sea areas received some water damage.
Deltona	8/19/2002	Urban Flood	0/0	$0	Thunderstorms produced street flooding in Deltona.
Ormond Beach	8/8/2004	Flash Flood	0/0	$0	Heavy rain in the morning hours brought 24-hour rain totals to near 7 inches. Widespread street flooding with water in two homes in Ormond Beach was reported. A lane of Interstate 95 was blocked by flood waters.
Countywide	9/5/2004	Flash Flood	0/0	$0	From 10 to 12 inches of rain from the northern rain bands of Hurricane Frances produced widespread flooding of homes, businesses and roads across coastal communities as well as in Deltona, and DeLand.

LOCATION	DATE	TYPE	DEATHS/ INJURIES	PROPERTY DAMAGE	DESCRIPTION
Countywide	9/9/2004	Flood	0/0	$5,564,516	Hurricane Frances produced 6 to 10 inches of heavy rain over much of the middle and upper St. Johns River Basin. Beginning on September 9th, water levels began to reach flood stage on the middle basin mainly around Geneva, and Sanford. Levels continued to rise well above flood stage and began to fall slightly until Hurricane Jeanne followed the same track across the state. Significant flooding followed with a record crest of 10.1 feet being reached at Lake Harney Gage. Many homes were flooded near Stone Island.
Countywide	8/21/2008	Flash Flood	0/0	$13,400,000	As Tropical Storm Fay drifted north in the Volusia County offshore waters, hours of torrential rain fell across southern Volusia County. Close to 200 homes were flooded. The damage was nearly $13 million. Torrential rain from Tropical Storm Fay produced widespread flooding across Brevard and central and southern Volusia counties.
Deltona	5/19/2009	Flood	0/0	$68,600,000	Multiple rounds of heavy rainfall over five days led to several feet of standing water in many areas of eastern Volusia County. Rainfall reached 18 to 28 inches in several coastal areas.
Ormond Beach	5/22/2009	Flash Flood	0/0	N/A	High levels of pre-existing flood waters were exacerbated as two to four inches of additional rainfall occurred in less than three hours. Standing water rose to three feet or higher in several locations. Flood waters entered additional homes. Flash flood damage estimates were included collectively in the five-day flood event from May 19-24.
Isleboro	9/23/2014	Flash Flood	0/0	$562,000	A very moist atmosphere coupled with a series of upper-level disturbances resulted in several persistent rain bands. Significant urban and small stream flooding affected portions of Melbourne/Palm Bay and Lake Mary/Winter Park. Flash flooding resulted in rapid water accumulation in New Smyrna Beach and from Holly Hill to Daytona Beach to Port Orange, where numerous roadways became impassable and over 100 homes sustained damage from the rising flood waters. Rainfall totals during the 24-hour period of greatest impact reached 6-12 inches. Flood damage estimates within Volusia County were 3.65 million dollars. No injuries reported.
Holly Hill	9/24/2014	Flash Flood	0/0	$3,090,000	Same as above.

LOCATION	DATE	TYPE	DEATHS/ INJURIES	PROPERTY DAMAGE	DESCRIPTION
Ormond-by-the-Sea	10/6/2016	Flood	0/0	$0	Associated with Hurricane Matthew (see Hurricanes)
Seville	9/10/2017	Flood	0/0	$0	Associated with Hurricane Irma. (see Hurricanes)
Ormond-by-the-Sea	11/23/2017	Flood	0/0	$0	A strong thunderstorm embedded within a rain area ahead of a cold front intensified as it traveled quickly northeast across Volusia County. Mobile homes were damaged well inland in DeLand, then over 30 minutes later, the storm damaged mobile homes in Daytona Beach.
Daytona Beach	11/5/2021	Flood	0/0	$500,000	A very slow-moving front produced persistent heavy rains across a portion of Volusia County. The total of twenty-four-hour rain totals were 6-10 inches, however most of the rain fell in less than 12 hours, impacting Daytona Beach and Port Orange. As much as 5-6 inches accumulated between 1500 and 1800 LST. Numerous roadways were flooded, with as much as 1-2 feet of standing water in some localized areas, resulting in road closures.
Volusia County	9/28/2022	Flood	4/0	$3,400,000	Rainfall totals averaging between 10 to 16 inches, with locally higher amounts of up to 20 inches were reported particularly in the coastal part of the county, resulting in widespread residential, street, urban, and poor drainage flooding. A county damage assessment indicated 3554 structures affected, 2602 with minor damage, 645 with major damage, and 48 destroyed, mainly due to widespread and historic flooding. The combined effects of Hurricane Ian led to a total estimated damage of approximately $340M.

LOCATION	DATE	TYPE	DEATHS/ INJURIES	PROPERTY DAMAGE	DESCRIPTION
Volusia County	11/08/2022	Flood	0/0	$0	Rainfall totals of 3-6 inches, which fell between 0700EST on the 8th and 1500EST on the 10th led to generally nuisance type to minor street flooding across portions of Volusia County. The St. Johns River at Astor, which was already in moderate flood stage due to the remnant effects of Hurricane Ian, experienced water level rises as early as the 8th due to increasing north to northeast winds impeding the river's flow. Renewed flooding was reported along numerous streets and communities along the river in Astor. At DeLand, already in minor flood stage, river gauges recorded a rise into moderate flood stage on the 9th.
West Holly Hill	9/30/2023	Flood	0/0	$0	Volusia County Fire Rescue reported flooding of several areas in Ormond Beach due to excessive rainfall.
Ormond Beach	9/30/2023	Flood	0/0	$0	Heavy rainfall led to flooding in Ormond Beach in Volusia County.
Volusia County	10/10/2024	Flood	0/0	$240,000,000	Volusia County Emergency Management reported significant urban, street, and low-lying flooding as a result of 6 to 12 inches of rain in association with Hurricane Milton. A period of very heavy rainfall rates associated with the core of the storm led to flash flooding during the overnight period (Oct 9 - 10). The heavy rain that fell as a result of the storm also led to a long-term river flood event along the St. Johns with the river near Geneva entering major flood on Oct 14, peaking at 10.15 feet on Oct 15. At DeLand, the river rapidly rose to major flood stage on Oct 11, peaking at 5.49 ft on Oct. 14. Downstream at Astor, the river was already in a minor flood stage at the beginning of the event and quickly rose to major the morning of Oct 10, peaking at 4.81 ft on Oct 12, a new record for the site.

Source: National Climatic Data Center[17]

NOTE: ALL HISTORICAL OCCURRENCES IN THIS REPORT ARE THE MOST RECENT AS DOCUMENTED BY THE NATIONAL CLIMATIC DATA CENTER

According to the emergency management officials from the Volusia County jurisdictions, another significant flood occurred during the Memorial Day Weekend in May 2009 that was not included in the

[17]https://www.ncdc.noaa.gov/stormevents/listevents.jsp?eventType=%28Z%29+Flood&beginDate_mm=05&beginDate_dd=01&beginDate_yyyy=2017&endDate_mm=05&endDate_dd=31&endDate_yyyy=2024&county=VOLUSIA%3A127&hailfilter=0.00&tornfilter=0&windfilter=000&sort=DT&submitbutton=Search&statefips=12%2CFLORIDA

NCDC database. This event caused high rains and four feet of storm surge. There was approximately $68 million in damage along the coastline from Ormond Beach to New Smyrna Beach. Approximately 1,000, infrastructure and various critical facilities were damaged. Daytona Beach, alone, had approximately 650 damaged homes.

Historical Summary of Insured Flood Losses

All jurisdictions in Volusia County participate in the National Flood Insurance Program (NFIP). **Section 5: Table 6** provides flood insurance policy and claim summary information for each of the participating jurisdictions. The reported losses include both inland (freshwater) and coastal flooding events. It should be emphasized that these numbers include only those losses to structures that were insured through the NFIP policies, and for losses in which claims were sought and received. It is likely that many additional instances of flood losses in Volusia County were either uninsured, denied claims payment, or not reported.

Section 5: Table 6: NFIP Policy and Claim Information

JURISDICTION	TOTAL CLAIMS SINCE 1978	TOTAL PAID SINCE 1978
Daytona Beach	1,701	$81,477,671
Daytona Beach Shores	175	$3,778,724
DeBary	108	$4,846,401
DeLand	19	$363,712
Deltona	125	$3,178,258
Edgewater	252	$7,528,013
Holly Hill	400	$10,505,116
Lake Helen	3	$14,481
New Smyrna Beach	1,229	$50,878,748
Oak Hill	18	$554,185
Orange City	19	$946,274
Ormond Beach	768	$11,608,018
Pierson	1	$8,834
Ponce Inlet	255	$7,965,454
Port Orange	1,451	$62,222,337
South Daytona	1,088	$54,614,519
Volusia County	2,391	$68,055,722
TOTAL	**10,003**	**$368,546,467**

Source: Volusia County Growth Management, FEMA (as of 01/27/2025)

Repetitive Loss Properties

FEMA defines a repetitive loss property as any insurable building for which two or more claims of more than $1,000 were paid by the NFIP within any rolling 10-year period, since 1978. A repetitive loss property may or may not be currently insured by the NFIP. Currently there are over 122,000 repetitive loss properties nationwide.

According to Volusia County repetitive loss property records (as of January 2025), there are over 1,000 repetitive loss properties located in Volusia County. Without mitigation, these properties will likely continue to experience flood losses. **Section 5: Figure 8** displays the general location of RL properties.

Section 5: Table 7: Repetitive Loss Properties Information

JURISDICTION	NUMBER OF RL PROPERTIES		
	TOTAL	NUMBER OF PROPERTIES BY LAND USE (Data provided by jurisdictions in 2025)	LOSSES BY LAND USE (Data provided by jurisdictions in 2020 LMS update)
Daytona Beach	235	-	2 RESIDENTIAL
Daytona Beach Shores	9	-	NONE
DeBary	4	-	NONE
DeLand	2	-	10 RESIDENTIAL
Deltona	10	-	NONE
Edgewater	24	-	1 RESIDENTIAL
Holly Hill	72	17 RESIDENTIAL	1 RESIDENTIAL
Lake Helen	5	5 RESIDENTIAL	NONE
New Smyrna Beach	90	-	18 RESIDENTIAL
Oak Hill	0	-	NONE
Orange City	45	39 RESIDENTIAL, 6 COMMERCIAL	NONE
Ormond Beach	46	-	24 RESIDENTIAL
Pierson	0	-	NONE
Ponce Inlet	15	-	NONE
Port Orange	296	286 RESIDENTIAL, 4 COMMERCIAL, 6 GOVERNMENTAL	4 RESIDENTIAL
South Daytona	258	-	2 RESIDENTIAL
Volusia County	461	-	13 RESIDENTIAL

Source: Individual jurisdictions, FEMA

Not all jurisdictions have severe repetitive loss properties. Those that have them identified for the 2025 update are:

- Port Orange, 50 Residential

Probability of Future Occurrences

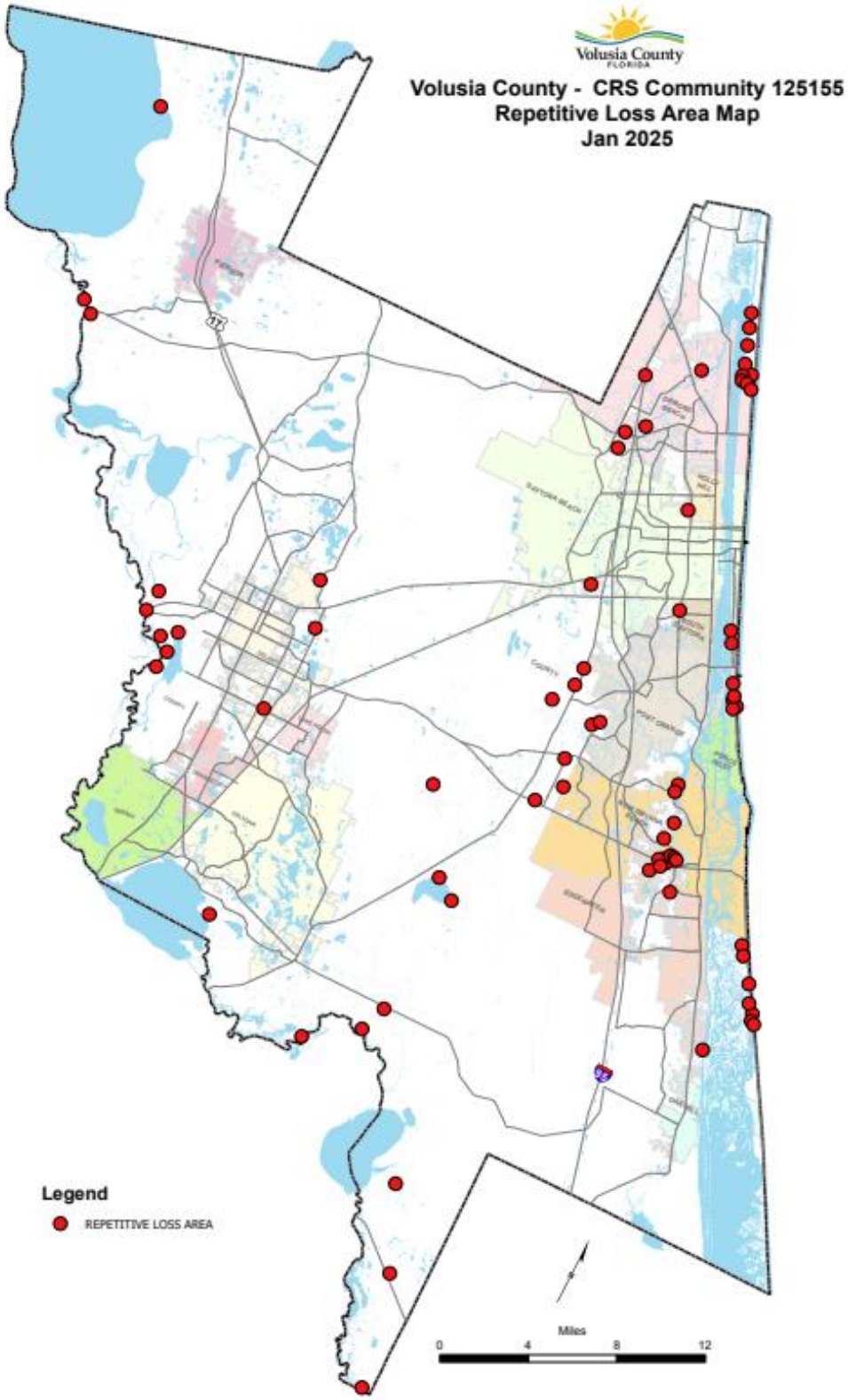
Flood events will remain a frequent occurrence in Volusia County, and the probability of future occurrences is high. The probability of future flood events based on magnitude and according to best

available data is illustrated in Figure 5.10, which indicates those areas susceptible to the 1 percent annual chance flood (100-year floodplain); the 1 percent annual chance flood with wave action (100-year coastal floodplain); and the 0.2 percent annual chance flood (500-year floodplain). Further, as described in other hazard profiles, it is highly likely that Volusia County will continue to experience inland and coastal flooding associated with large tropical storms, hurricanes and storm surge events.

Anticipated sea level rise will increase the probability and intensity of future tidal flooding. Rising sea level over time will decrease the return period (increasing the frequency) of significant flood events. For example, sea level rise of 1 foot over a typical project analysis period (50 years) may cause a flood event currently of annual probability of 2 percent (50-year flood) to become an event of 10 percent annual probability (10-year flood). This rise in sea level will increase the probability of the loss of coastal wetlands and erosion of sandy beaches that act as protective buffers against flood events.

There are repetitive loss properties within 13 of the 16 jurisdictions within Volusia County. This includes 1,280 properties in total. Countywide distribution of repetitive loss properties is somewhat weighted to the east, as a majority of the repetitive loss properties in the county are in Port Orange, South Daytona, and Daytona Beach. The western side of the county also has several repetitive loss properties, most notably the cluster within the Stone Island residential area in the southwestern portion of the county. Data collected showed that many properties have not undergone mitigation efforts; however, there is insufficient data to measure an actual percentage for the entire county.

Section 5: Figure 8: Repetitive Loss Areas in Volusia County



Source: Volusia County GIS

5.8 PUBLIC HEALTH EMERGENCY

Background

Public heath emergencies may be accidental, natural, or intentional. Under section 319 of the Public Health Service Act (42 U.S.C § 319), the Secretary of the Department of Health and Human Services (HSS) can declare a public health emergency.

Public health is the science and art of preventing disease, prolonging life, and promoting health through organized efforts and informed choices of society, organizations, the public, private communities, and individuals. According to the Centers for Disease Control and Prevention (CDC), disease outbreaks are identified by the occurrence of more cases of disease(s) than normally expected within a specific place, or among a group of people over a specified period of time. Potential health threats come from an increasing range of health hazards, including infectious diseases, HazMat incidents, food contamination, and threats associated with climate change including extreme weather events. Public health emergencies include medical surges (often from mass casualty events) that require hospitals to act beyond normal capacity. Pandemics are included in this category.

Location and Spatial Extent

All Volusia County residents face risks associated with public health emergencies. Risk factors, including income, gender, age, migration, health/nutritional status, displacement, and unplanned urbanization, increase people's exposure and vulnerability to these threats and hazards.

All Volusia County residents are at risk of public health emergencies such as pandemic influenza, pneumonic plague, epidemic, food contamination, etc. Youth (under 18) and the elderly (over 65) are especially vulnerable as their immune systems are more susceptible. Risks may also be increased in people of any age who have other serious health problems — such as heart or lung conditions, weakened immune systems, obesity, or diabetes. This is similar to what is seen with respiratory illnesses, such as the flu (influenza) and COVID-19.

Historical Occurrences

In 2016 and 2017 the Zika Virus cases were on the rise and led to several birth defects. In October of 2022, Dengue was reported in a Volusia County resident. In June 2023, four cases of Malaria were reported, treated, and recovered in Sarasota, Florida. Although rare, there have also been cases of West Nile Virus that led to encephalitis in the County.

Then in March 2020, the first cases of COVID-19 were reported in Florida. On March 11, 2020, the World Health Organization (WHO) officially declared COVID-19 a pandemic. By April, the governor had declared an executive order to restrict activities within the state unless deemed essential. The pandemic was declared over in May 2023, but continues to impact Florida's population through the time this plan was published.

Probability of Future Occurrences

Public health emergencies are expected to increase. Volusia County and the surrounding areas bring many tourists, which can be a contributor to the spread of health concerns or diseases. Although international

travel is a contributing factor, climate change and a growing population will continue to influence public health.

5.9 RISING COASTAL WATERS

Background

Rising coastal waters is a hazard that refers to unprecedented water levels along the coast, usually leading to inland affects. This hazard encompasses:

- **Storm Surge**: Storm surge occurs when the water level of a tidally influenced body of water increases above the normal astronomical high tide and is most common in conjunction with coastal storms with massive low-pressure systems with cyclonic flows such as hurricanes, tropical storms and nor'easters. The low barometric pressure associated with these storms causes the water surface to rise, and storms making landfall during peak tides have surge heights and more extensive flood inundation limits. Storm surges will inundate coastal floodplains by dune over wash, tidal elevation rise in inland bays and harbors, and backwater flooding through coastal river mouths. The duration of a storm is the most influential factor affecting the severity and impact of storm surges.
- **Sea Level Rise (SLR)**: Sea level rise is caused by warming of the earth's climate, the associated thermal expansion of water molecules, and generally impacts coastal, lagoon-adjacent and river-adjacent areas that are hydrologically connected to the ocean.
- **Tsunami**: In the open ocean, tsunami waves travel at speeds of up to 600 miles per hour but are too small to be observed, and the time between wave crests may be five to 90 minutes. As the waves approach shallow coastal waters, they slow down and may rise to several feet or, in rare cases, tens of feet. Although the waves slow down as they reach shallow water, the energy remains constant and when tsunami waves crash into the shoreline they may be as high as 100 feet. The first wave is almost never the largest; successive waves may be spaced tens of minutes apart and continue arriving for many hours. The coastal areas at greatest risk are less than 50 feet above sea level and within one mile of the shoreline. Tsunamis can cause great loss of life and property damage where they come ashore, and most tsunami deaths are the result of drowning. Associated risks include water pollution, damaged gas lines, and flooding.

Location and Spatial Extent

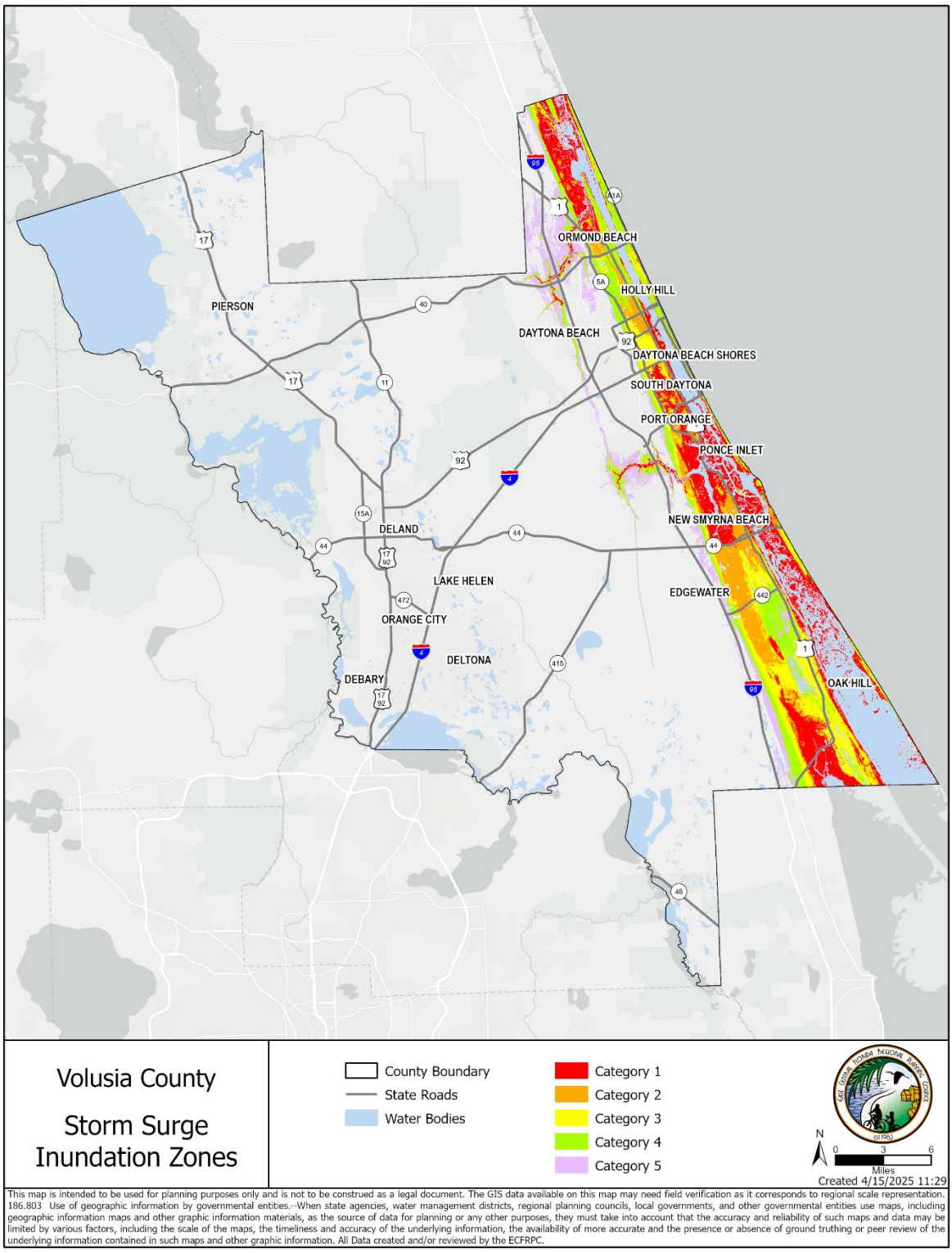
All of Volusia County and its jurisdictions are subject to rising coastal water inundation. Municipalities such as Ormond Beach, Holly Hill, Daytona Beach, Daytona Beach Shores, South Daytona, Port Orange, Ponce Inlet, New Smyrna Beach, Edgewater, and Oak Hill are most susceptible to rising coastal waters given their proximity to the coast.

- **Storm Surge**: As shown in **Section 5 Figure 9**, the entire east side of Volusia County is at high risk of storm surge inundation in addition to most riverine floodplains along major rivers in southern portions of the area. While areas not located immediately along the coast or major rivers may not be directly impacted by storm surge inundation except in extreme storm events, they might experience flooding caused by storm surge and extremely high tides that affect the drainage of areas further inland.
- **Sea Level Rise**: In Volusia County, areas susceptible to sea level rise include jurisdictions in close proximity to the Atlantic Ocean, the Indian River Lagoon, the Halifax River, the St. Johns River, and smaller riverine systems that provide hydro connectivity into the interior of the County. The extent of sea level rise would go beyond coastal communities, like Ormond Beach and New Smyrna Beach. Inland communities along waterways, such Astor and Eustis, will be impacted

during periods of high-water inundation since the water systems will be over capacity and exiting the system at slower rates.

- **Tsunami**: Tsunami activity is a greater risk along the Pacific Rim states (Washington, Oregon, California, Alaska, and Hawaii), but is still possible along the East Coast of the United States. In fact, as many as 40 tsunami or tsunami-like events have been reported along the East Coast since the early 1600s. Additionally, models and methodologies do not currently exist to accurately assess the tsunami hazard as it would relate to an inland community along the East Coast. The potential location and extent of the tsunami hazard for Volusia County is similar and slightly more extensive than the established flood hazard area. A tsunami event could cover all of Volusia County based on severity. However, the coastal jurisdictions are most at risk. The areas of Volusia County most at risk of a tsunami hazard are similar to those of storm surge and sea level rise. A tsunami's extent could go beyond the coastal areas, although they are at the greatest risk. High velocity waves that could cause severe catastrophic damage to structures and infrastructure. Its extent could result in massive amounts of vegetative and construction debris, boats would be washed ashore, impacted buildings could collapse, trees could be uprooted, above ground power poles and lines could collapse, and underground utilities could be unearthed and destroyed.

Section 5: Figure 9: Current Day Storm Surge Predications Based on Hurricane Category



Source: ECFRPC, NOAA

Historical Occurrences

Volusia County has experienced numerous rising water events associated with hurricanes, nor'easters and tropical storms. Water can rise to exceptional levels during hurricanes, storm surge, flash flood and thunderstorm conditions.

- **Storm Surge**: Water levels from storm surge have historically risen to 6 feet within Volusia County following one of these events, with increased water heights for coastal communities due to Florida's semidiurnal tides. Roadway flooding has been seen rising between 1 and 5 feet. Hurricane Nicole in 2022 produced an impactful storm surge along a large portion of the east coast of Florida, battering beaches with elevated water levels and wave action. Florida was previously hit by Hurricane Ian in late September which caused beach erosion along the east coast and freshwater flooding from rainfall in rivers and canals. The impact of Ian likely left the area more vulnerable to storm surge from Nicole. Additionally, Nicole's large wind field and its initial subtropical characteristics increased the potential for widespread wave and storm surge impacts. Port Orange, South Daytona, Ormond Beach, and Daytona Beach were most impacted during Hurricane Nicole, however most of this was from the tides increasing and influencing the intracoastal waterways. Please refer to the Hurricane Historical Occurrences listing for more information.
- **Sea Level Rise**: Sea level rise is currently impacting south and central Florida, with nearshore, high-tide flooding becoming a more frequent sea level rise-associated hazard in some locations. Historical occurrences of sea level rise are not easy to measure due to a lack of data existing from the early 20th Century as well as the time period of two epochs (38 years) needed to calculate the mean impacts of sea level rise, by location. As data collection and monitoring improve, the ability for the County to track historical occurrences will improve. One indicator of sea level rise is the frequency or nearshore, high tide flood events, also known as nuisance flooding. In 2016, a NOAA study found that nuisance flooding frequency was increasing to the north and south of Volusia County (in Mayport, FL; Fernandina Beach, FL; and Key West, FL). It is expected that these events will continue to increase in frequency in the future.
- **Tsunami**: In August 2008, a qualitative tsunami hazard assessment prepared by NOAA and USGS indicated that the U.S. Atlantic coast has a very low tsunami risk[18]. This qualitative assessment was based on National Geophysical Data Center (NGDC) and United States Geological Survey (USGS) databases. Specifically, Atlantic coast tsunami vulnerability was deemed very low based on very low wave runup, low tsunami hazard frequency, and no reported fatalities. Although an East Coast tsunami would be rare, two offshore areas are currently under investigation according to a 2002 National Geophysical Data Center report. One area of interest consists of large cracks northeast of Cape Hatteras, North Carolina that could foretell the early stages of an underwater landslide resulting in a tsunami. The other area of interest consists of submarine canyons approximately 150 kilometers from Atlantic City, New Jersey. Significant factors for consideration regarding these areas are recent discoveries along the East Coast that demonstrate the existence of pressurized hydrates and pressurized water layers on the continental shelf. This has produced speculation among the scientific community on possible triggers that could cause sudden and perhaps violent releases of compressed material that could factor into landslide events and the resulting tsunami waves. Although different from a tsunami, a rogue wave is relatively large (i.e., larger in height than a tsunami) and spontaneous ocean waves can cause similar impacts. On July

[18] NOAA and USGS. 2008. *U.S. States and Territories National Tsunami Hazard Assessment: Historical Record and Sources for Waves.* August 2008.

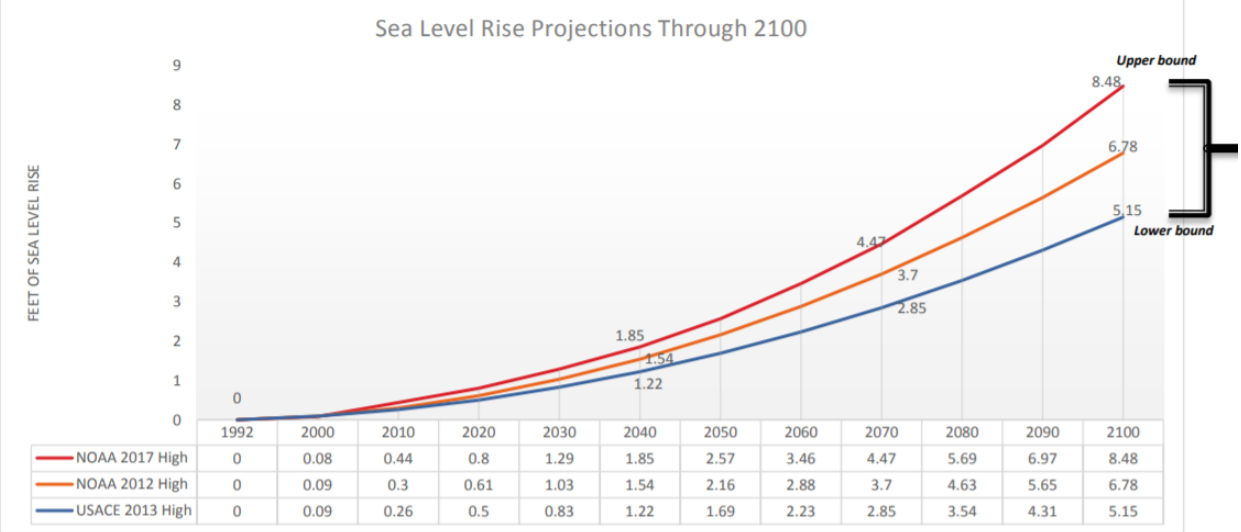
3, 1992, a 27-mile-long, 18-foot rogue wave came onshore between Ormond Beach to New Smyrna Beach, centered at Daytona Beach. Sailboats crashed ashore, 200 cars were damaged and approximately 75 people were injured resulting in two hospitalizations. It is theorized that an underwater landslide caused the rogue wave, potentially categorizing this wave as a type of tsunami, or it was the result of a squall line.

Probability of Future Occurrences

There is a high probability that Volusia County will continue to experience rising coastal water associated with large tropical storms, hurricanes and squalls combined with high tides, based on the frequency of tropical cyclones as shown in **Section 5 Figure 11 and 12.**

As noted in previous sections (under Flood), anticipated sea level rise will increase the probability and intensity of future storm surge events. This rise in sea level will increase the probability and intensity of rising coastal water events but will also contribute to the loss of coastal wetlands and erosion of sand beaches that act as protective buffers against storm surge events. The National Oceanic and Atmospheric Administration (NOAA) and the U.S. Army Corps of Engineers have published numerous "sea level rise curves" that project the future impacts of sea level rise, in feet. The following sea level rise curves are being used to assess the potential impacts of sea level rise by municipalities in Volusia County.

Section 5: Figure 10: Sea Level Rise Projections

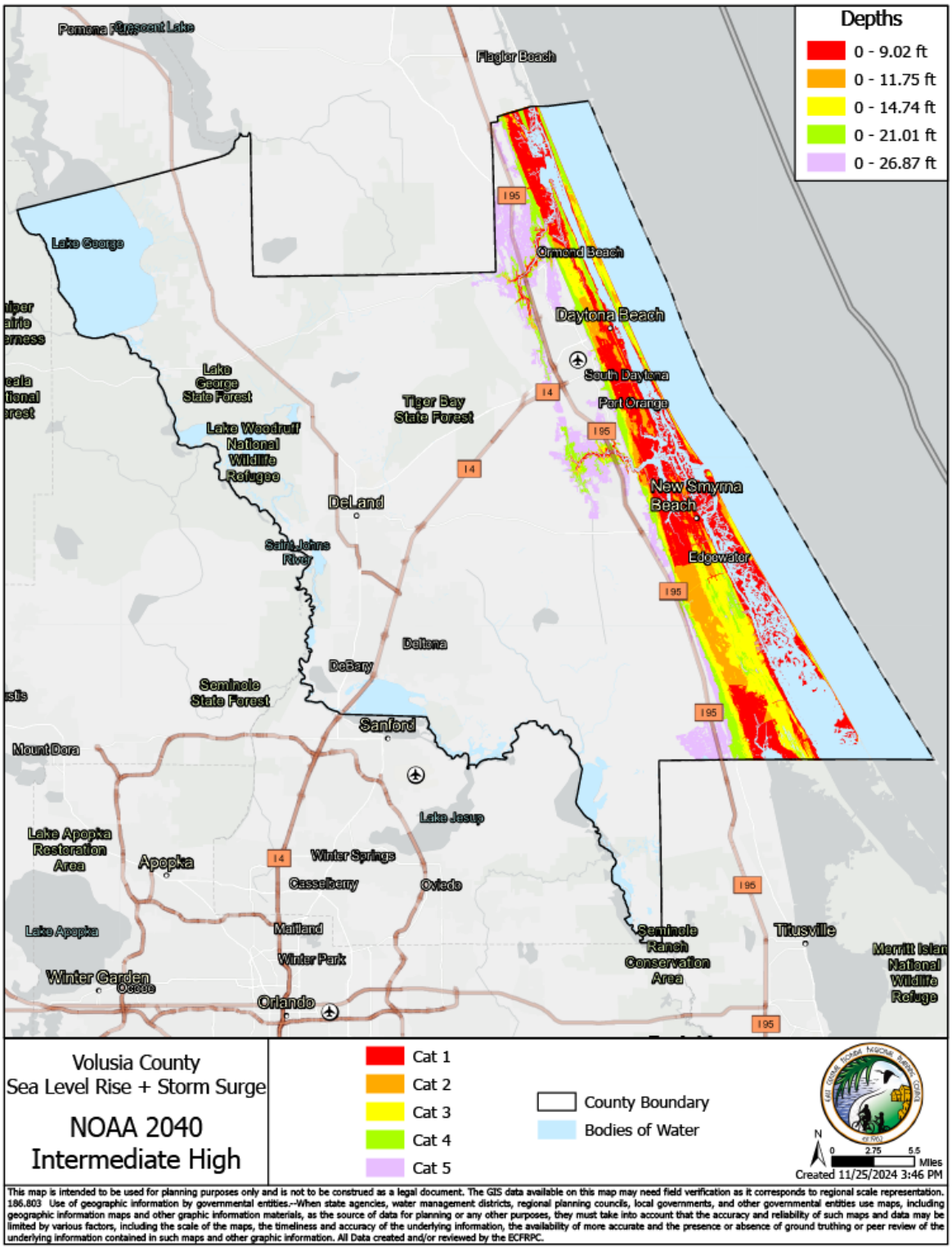


	1992	2000	2010	2020	2030	2040	2050	2060	2070	2080	2090	2100
NOAA 2017 High	0	0.08	0.44	0.8	1.29	1.85	2.57	3.46	4.47	5.69	6.97	8.48
NOAA 2012 High	0	0.09	0.3	0.61	1.03	1.54	2.16	2.88	3.7	4.63	5.65	6.78
USACE 2013 High	0	0.09	0.26	0.5	0.83	1.22	1.69	2.23	2.85	3.54	4.31	5.15

The probability of a future tsunami event affecting Volusia County is very low, as indicated in the 2008 NOAA-USGS tsunami hazards assessment. However, the consequences of even a moderate tsunami striking Volusia County would devastate lives, development, and the ability of the county to function.

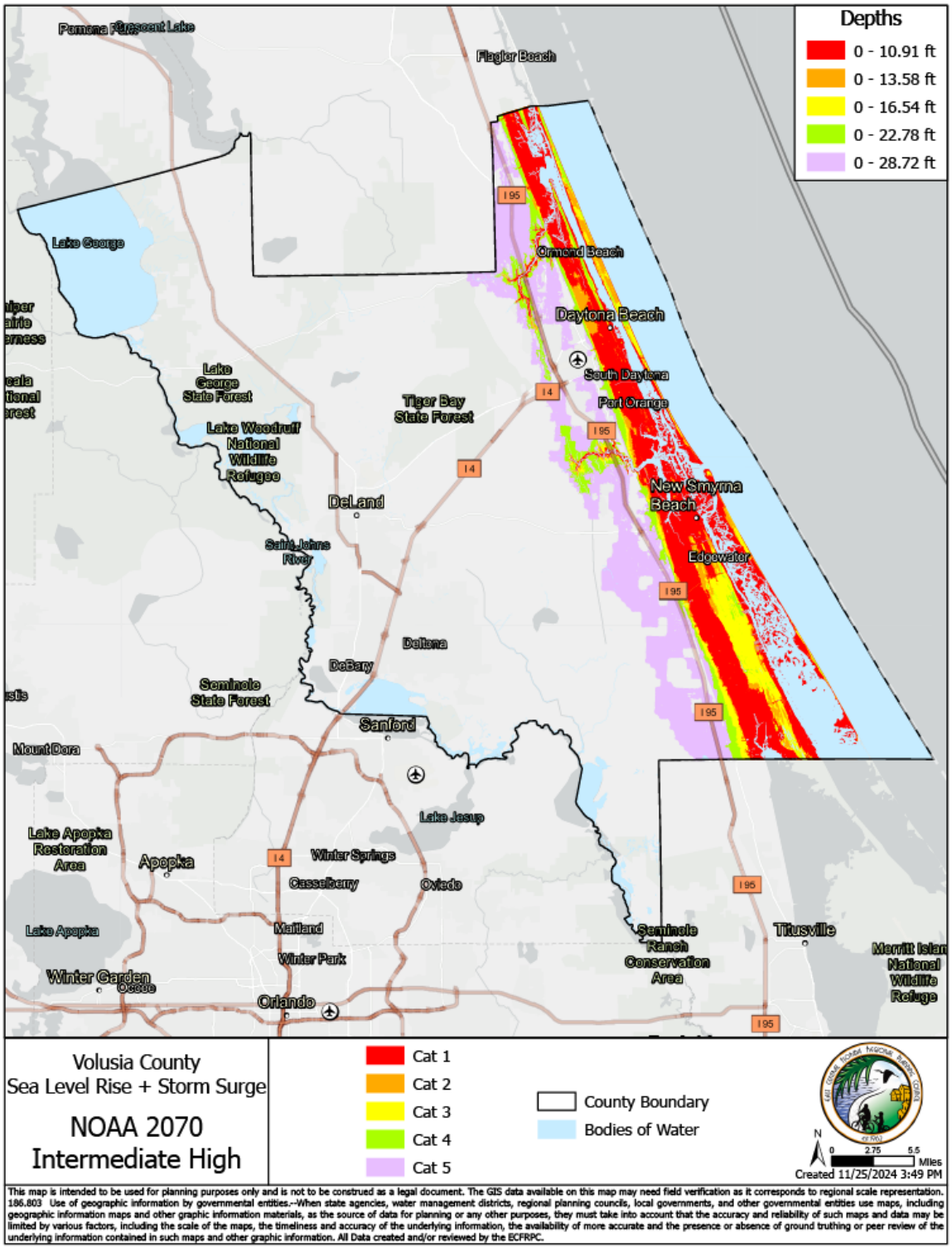
The Local Mitigation Strategy recognizes that with a changing climate, there is a potential for an increasing risk of environmental impacts and that future mitigation and adaptation strategies related to this hazard should be considered. The figures below represent the NOAA intermediate high projection for rising coastal waters in 2040 and 2070 with storm surge.

Section 5: Figure 11: 2040 Intermediate High Storm Surge



Source: ECFRPC, Volusia County Vulnerability Assessment

Section 5: Figure 12: 2070 Intermediate High Storm Surge



Source: ECFRPC, Volusia County Vulnerability Assessment

5.10 SEVERE WEATHER

Background

Severe weather refers to any significant or intense weather conditions that can cause damage, disruption, or pose a threat to safety. It encompasses a range of phenomena that are more extreme than typical weather conditions. Volusia County experiences severe weather in a variety of ways.

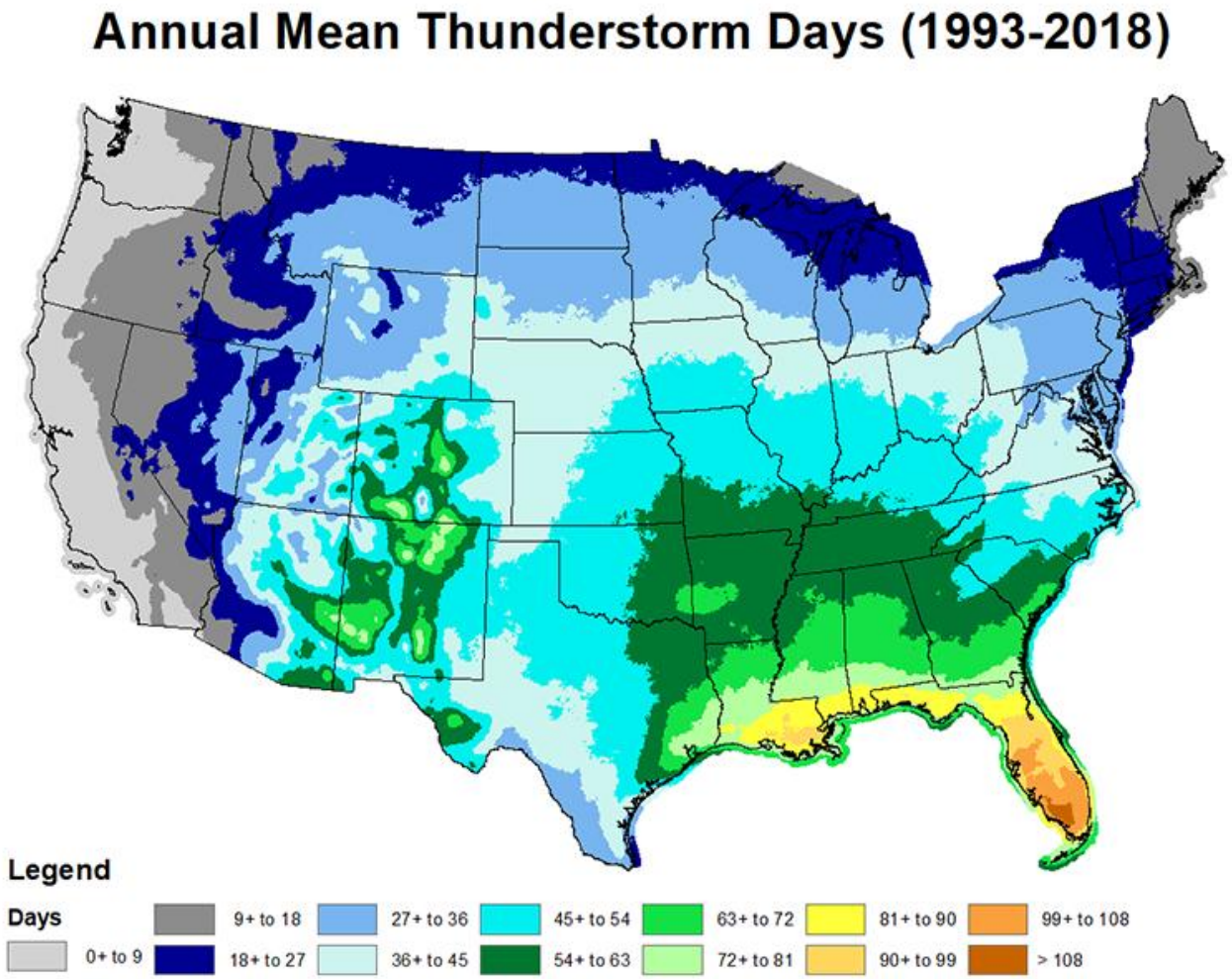
- **Hail** frequently accompanies thunderstorms and has potential to cause substantial damage. Early in the developmental stages of hail, ice crystals form within a low-pressure front due to the rapid rise of warm air into the upper atmosphere and the subsequent cooling of the air mass. Frozen droplets gradually accumulate on the ice crystals until they develop sufficient weight to fall as precipitation. Hail precipitation falls in spheres or irregularly shaped masses greater than 0.75 inches in diameter. The size of hailstones is a direct function of the size and severity of the storm. High velocity updraft winds are required to keep hail in suspension in thunderclouds. The strength of the updraft is a function of the intensity of heating at the Earth's surface. Higher temperature gradients relative to elevation above the surface result in increased suspension time and hailstone size.
- **Lightning** is a discharge of electrical energy resulting from the buildup of positive and negative charges within a thunderstorm, creating a "bolt" when the buildup of charges becomes strong enough. This flash of light usually occurs within the clouds or between the clouds and the ground. A bolt of lightning can reach temperatures approaching 50,000 degrees Fahrenheit. Lightning rapidly heats the sky as it flashes but the surrounding air cools following the bolt. This rapid heating and cooling of the surrounding air causes thunder which often accompanies lightning strikes. While most often affiliated with severe thunderstorms, lightning often strikes outside of heavy rain and might occur as far as 10 miles away from any rainfall.
    - According to FEMA, an average of 300 people are injured and 80 people are killed in the United States each year by lightning. Direct lightning strikes also can cause significant damage to buildings, critical facilities, and infrastructure. Lightning is also responsible for igniting wildfires that can result in widespread damage to property before firefighters have the ability to contain and suppress the resultant fire[19].
- **Thunderstorms** are common throughout Florida and occur throughout the year. Although thunderstorms generally affect a small area, they are very dangerous given their ability to produce accompanying hazards including high winds, hail, and lightning which all may cause serious injury or death, in addition to property damage[20].
    - According to the National Weather Service, more than 100,000 thunderstorms occur each year, though only about 10 percent of these storms are classified as "severe." A severe thunderstorm occurs when the storm produces one of three elements: 1) Hail of three-quarters of an inch; 2) Tornado; 3) Winds of at least 58 miles per hour.
    - Three conditions need to occur for a thunderstorm to form. First, it needs moisture to form clouds and rain. Second, it needs unstable air, such as warm air that can rise rapidly (this often referred to as the "engine" of the storm). Finally, thunderstorms need lift, which comes in the form of cold or warm fronts, sea breezes, mountains, or the sun's heat. When these conditions occur, air masses of varying temperatures meet, and a

[19]Wildfires are discussed in Section 5.14.
[20] Lightning and Hail are discussed in detail as separate hazards in this section.

thunderstorm is formed. These storm events can occur singularly, in lines, or in clusters. Further, they can move through an area very quickly or linger for several hours.

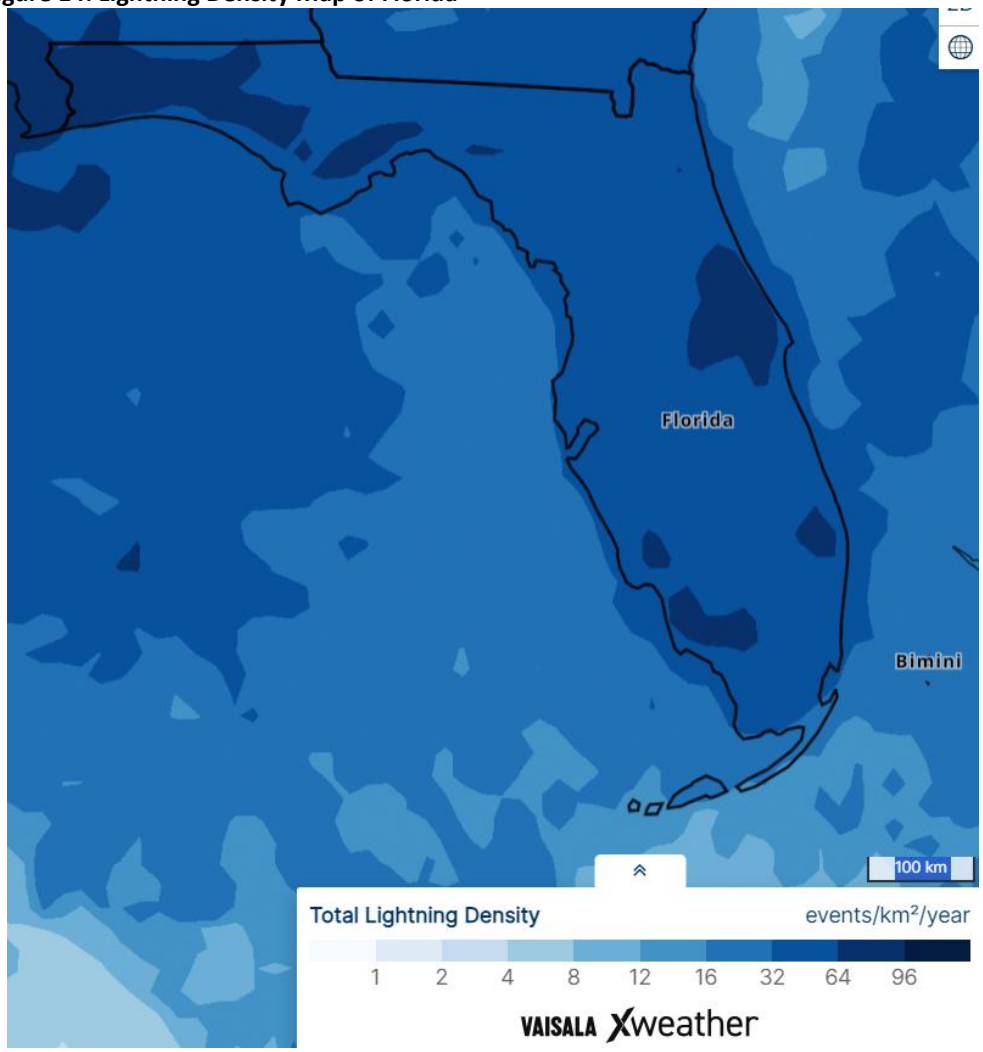
Severe weather can affect all jurisdictions within Volusia County and their duration can span from localized events (less than 10 minutes locally) to hours-long events (primarily in the case of hurricanes or large tropical systems).

Section 5: Figure 13: Average Annual Number of Thunder Events



Source: NOAA.

Section 5: Figure 14: Lightning Density Map of Florida



Source: Vaisala U.S. National Lightning Detection Network 2024. https://interactive-lightning-map.vaisala.com/

Location and Spatial Extent

Severe storms are common and impact the entirety of Volusia County. Volusia County and its jurisdictions are in a region of the country that is particularly susceptible to these types of events.

Hail is often produced during a thunderstorm event which has no geographic limitations on the area it affects. Therefore, it is assumed that all of Volusia County is uniformly at risk to hail events. Impacts typically include downed power lines and trees and damage to vehicles and mobile homes. In terms of extent for Volusia County, tennis ball-sized hail (2.5-inch diameter based on NOAA hail conversions) has been observed on many occasions within Volusia County and is a probable occurrence on an annual basis. Larger hail conditions are less likely, but possible. The Local Mitigation Strategy recognizes that with a changing climate, there is a potential for an increasing risk of environmental impacts from hail and that future mitigation and adaptation strategies related to this hazard should be considered.

Lightning occurs randomly and is, therefore, impossible to predict where it will strike. It is assumed that all of Volusia County is uniformly exposed to lightning which strikes in very small, specific geographic areas. Impacts from lightning have included deaths and injuries, damage to electrical systems, and fires that have destroyed residential and commercial property. The most threatening and common type of lightning is cloud-to-ground lightning, where the extent of the threat causes lightning to make contact with whatever object is below. **Section 5 Figure 14** displays the spatial extent of the hazard.

Severe thunderstorms and their related hazardous elements (including lightning, hail, and straight-line winds) are not confined to any geographical boundaries and typically are widespread events. Thunderstorms can occur in all regions of the United States, but they are most common in the central and southern states because atmospheric conditions in those regions are favorable for generating these powerful storms as shown in **Section 5 Figure 13**. Therefore, it is assumed that Volusia County would be uniformly exposed to these hazards and that the extent of that impact would potentially be large. The extent of thunderstorm severity varies on an event-by-event-basis and is generally subject to the atmospheric conditions present at the time. While light thunderstorms are more common in frequency, severe thunderstorms (with associated Severe Thunderstorm Warnings) which include the added impacts of lightning and (more rarely) hail occur several times per year in Volusia County. The extent of severe thunderstorms are watches and warnings. A Severe Thunderstorm Watch is issued when severe thunderstorms are possible in and near the watch area. It does not mean that they will occur. It only means they are possible. A Severe Thunderstorm Warning is issued when severe thunderstorms are occurring or are imminent in the warning area.

Historical Occurrences

According to the National Climatic Data Center, there have been numerous recorded hail events in Volusia County as shown in **Section 5: Table 8**[21]. Hail sizes for these events range from 1.00 inches to 2.75 inches in diameter. The emergency management officials from the Volusia County jurisdiction determined that only hail that was greater than one inch in diameter was to be listed.

Section 5: Table 8: Historical Hail Impacts

LOCATION	DATE	MAGNITUDE (inches)	DEATHS/ INJURIES	PROPERTY DAMAGE	DESCRIPTION
Volusia County	8/16/1963	1.00	0/0	$0	Not Available
Volusia County	2/7/1971	2.75	0/0	$0	Not Available
Volusia County	3/13/1971	1.75	0/0	$0	Not Available
Volusia County	5/29/1971	1.75	0/0	$0	Not Available
Volusia County	4/4/1973	1.00	0/0	$0	Not Available
Volusia County	6/10/1975	1.75	0/0	$0	Not Available
Volusia County	5/12/1976	1.50	0/0	$0	Not Available
Volusia County	4/18/1978	1.00	0/0	$0	Not Available
Volusia County	4/8/1982	1.50	0/0	$0	Not Available
Volusia County	4/29/1982	1.75	0/0	$0	Not Available

[21] A Hail event that affects several jurisdictions on the same day is classified as a single event.

LOCATION	DATE	MAGNITUDE (inches)	DEATHS/ INJURIES	PROPERTY DAMAGE	DESCRIPTION
Volusia County	6/8/1985	1.00	0/0	$0	Not Available
Volusia County	6/18/1987	1.75	0/0	$0	Not Available
Volusia County	5/24/1988	1.50	0/0	$0	Not Available
Volusia County	2/21/1989	1.00	0/0	$0	Not Available
Volusia County	3/23/1989	1.25	0/0	$0	Not Available
Volusia County	5/1/1989	1.00	0/0	$0	Not Available
Volusia County	6/26/1990	1.00	0/0	$0	Not Available
Volusia County	5/2/1992	1.00	0/0	$0	Not Available
Edgewater	1/11/1993	1.50	0/0	$77,700	Strong downburst winds damaged 9 mobile homes. Most had aluminum awnings, carports, and family rooms ripped away. Trees and power lines were down. Up to golf ball-sized hail also fell.
Daytona Beach	3/31/1993	1.75	0/0	$0	Golf ball-sized hail fell at the Daytona Beach Airport.
Daytona Beach	6/19/1995	2.50	0/0	$36,809	Severe thunderstorms blew down dozens of trees in Deltona and produced one inch-diameter hail.
Daytona Beach	3/28/1996	1.75	0/0	$0	Strong downburst winds blew down trees destroyed a pool screen and produced two and one-half-inch-diameter hail in the Spruce Creek Village.
Barberville	6/15/1996	1.00	0/0	$0	Hail the size of quarters fell in Barberville, while quarter-sized hail fell in DeBary.
DeBary	6/15/1996	1.00	0/0	$0	
Daytona Beach	8/25/1996	1.00	0/0	$0	Not Available
Deltona	7/7/1997	1.00	0/0	$0	Not Available
DeBary	8/13/1997	1.00	0/0	$0	Not Available
Deltona	2/28/1998	1.00	0/0	$0	Not Available

LOCATION	DATE	MAGNITUDE (inches)	DEATHS/ INJURIES	PROPERTY DAMAGE	DESCRIPTION
DeLand	3/20/1998	1.25	0/0	$0	Not Available
New Smyrna Beach	3/20/1998	1.00	0/0	$0	
Daytona Beach	6/25/1998	1.75	0/0	$0	Not Available
Port Orange	1/9/1999	1.00	0/0	$4,032	A few mobile homes were damaged by falling trees and quarter-sized hail in Port Orange.
Pierson	5/6/1999	1.75	0/0	$0	Not Available
Orange City	5/9/1999	1.75	0/0	$0	Not Available
Oak Hill	4/15/2000	1.00	0/0	$0	Not Available
DeLand	9/19/2000	1.75	0/0	$0	Not Available
Oak Hill	3/29/2001	1.00	0/0	$0	Not Available
DeLand	3/31/2001	1.00	0/0	$0	Not Available
New Smyrna Beach	8/21/2001	1.00	0/0	$0	Not Available
Deltona	3/19/2003	1.00	0/0	$0	Not Available
DeLand	4/25/2003	1.00	0/0	$0	Not Available
DeLand	7/18/2003	1.00	0/0	$0	Not Available
Oak Hill	7/21/2003	1.00	0/0	$0	Not Available
DeLand	10/7/2003	1.00	0/0	$0	Not Available
Port Orange	7/8/2004	2.00	0/0	$0	Not Available
Maytown	10/19/2004	1.00	0/0	$0	Not Available
Seville	3/25/2005	1.00	0/0	$0	Not Available
Daytona Beach	5/4/2005	1.75	0/0	$112,551	Not Available
Holly Hill	6/28/2006	1.75	0/0	$0	Not Available
DeLand	7/17/2006	1.00	0/0	$0	Not Available
Glencoe	3/7/2008	1.00	0/0	$0	A cold front moving across central Florida produced a line of thunderstorms that moved southeast across the area. One inch hail was reported in Port Orange. Quarter size hail was reported at Interstate 95 and Highway SR44, near Glencoe, and in Daytona Beach. The public reported nickel size hail in Deltona.
Port Orange	3/7/2008	1.00	0/0	$0	
Daytona Beach	3/7/2008	1.00	0/0	$0	

LOCATION	DATE	MAGNITUDE (inches)	DEATHS/ INJURIES	PROPERTY DAMAGE	DESCRIPTION
Seville	7/5/2008	1.00	0/0	$0	Quarter-sized hail was reported. A sea breeze thunderstorm produced hail and wind gusts in interior parts of E.C.F.
Seville	6/13/2009	1.00	0/0	$0	Numerous strong storms developed over east central Florida, with a few strengthening to severe levels and producing wind damage and large hail.
DeLeon Springs	3/31/2009	1.00	0/0	$0	A northward-lifting warm front combined with active sea breeze boundaries within an unstable atmosphere produced several severe thunderstorms with nickel to quarter sized hail and localized severe winds.
Ponce Park	2/22/2010	1.00	0/0	$0	Isolated thunderstorms developed in an unstable environment well ahead of a cold front. One of the storms became strong and produced small hail as it moved east out of the Ocala National Forest. The storm strengthened as it approached the coast, producing large hail on the barrier island east of central Daytona Beach.
Harbor Point	5/13/2011	1.00	0/0	$0	The collision of the east and west coast sea breezes formed a broken line of thunderstorms across East Central Florida. A couple of these pulse storms became severe in Orange and Volusia Counties.
Ormond by the Sea	3/31/2011	1.00	0/0	$0	A pre-frontal squall line moved rapidly across central Florida, bringing strong to severe thunderstorms with large hail and funnel clouds.
Glencoe	5/17/2012	1.75	0/0	$0	The east coast sea breeze formed in the early afternoon and

LOCATION	DATE	MAGNITUDE (inches)	DEATHS/ INJURIES	PROPERTY DAMAGE	DESCRIPTION
					propagated inland, eventually colliding with the west coast sea breeze over the central peninsula. Storms moved to the east and northeast and produced large hail over Brevard and Volusia Counties.
Deltona	4/20/2012	1.75	0/0	$0	Several severe thunderstorms occurred as low to mid-level southwest winds brought a warm and very moist air mass into east central Florida. Much cooler and drier air above this moisture laden air allowed for vigorous storm development which acted to produce severe wind gusts and hail in many of the thunderstorms that developed.
Barberville	4/20/2012	1.25	0/0	$0	Several severe thunderstorms occurred as low to mid-level southwest winds brought a warm and very moist air mass into east central Florida. Much cooler and drier air above this moisture laden air allowed for vigorous storm development which acted to produce severe wind gusts and hail in many of the thunderstorms that developed.
DeBary	4/20/2012	1.00	0/0	$0	Several severe thunderstorms occurred as low to mid-level southwest winds brought a warm and very moist air mass into east central Florida. Much cooler and drier air above this moisture laden air allowed for vigorous storm development which acted to produce severe wind gusts and hail in many of the thunderstorms that developed.
DeLand Osteen	5/17/2012	0.75 (DeLand) 0.88 (Osteen)	0/0	$0	The east coast sea breeze formed in the early afternoon and

LOCATION	DATE	MAGNITUDE (inches)	DEATHS/ INJURIES	PROPERTY DAMAGE	DESCRIPTION
Glencoe		1.75 (Glencoe)			propagated inland, eventually colliding with the west coast sea breeze over the central peninsula. Storms moved to the ENE, producing large hail over Volusia County.
Daytona Airport	6/24/2014	0.88	0/0	$0	A thunderstorm developed rapidly along the east coast sea breeze over coastal Volusia County.
DeLeon Springs	6/26/2014	0.88	0/0	$0	A weather spotter observed hail up to nickel size in De Leon Springs as a strong thunderstorm affected the area.
Deltona	5/20/2015	1.00	0/0	$0	Strong thunderstorms developed over the mainland and became severe as they interacted with the east coast sea breeze over central Volusia and eastern Seminole County. Large hail, up to quarter-sized, was reported across sections of Deltona and Oviedo.
DeLeon Springs	7/6/2015	0.75	0/0	$0	Thunderstorms developed along the west coast sea breeze and became strong as they approached Volusia County, producing small hail and some minor tree damage in De Leon Springs.
DeLeon Springs	7/6/2016	1.00	0/0	$0	An isolated thunderstorm quickly became severe and hail up to quarter size as it moved slowly southeast across Deleon Springs.
Enterprise	2/15/2017	0.88	0/0	$0	Scattered thunderstorms developed ahead of a strong cold front, bringing small hail to Enterprise in Volusia County.
Harbor Point New Smyrna Beach Enterprise	6/1/2017	1.00 – 1.25	0/0	$0	A sea breeze collision produced a severe thunderstorm over east central Volusia County during the late afternoon. Several reports of quarter to half dollar sized hail

LOCATION	DATE	MAGNITUDE (inches)	DEATHS/ INJURIES	PROPERTY DAMAGE	DESCRIPTION
					were received from Port Orange to New Smyrna Beach.
Enterprise	7/20/2017	1.00	0/0	$0	A collision of the east and west coast sea breeze over the interior of Central Florida produced two severe thunderstorms that resulted in quarter-sized hail in Orange and Volusia Counties. A funnel cloud was also reported in Osceola County.
Ormond Beach DeLeon Springs Daytona Beach Holly Hill	3/20/2018	1.00 – 2.00	0/0	$0	A deepening mid-level trough and associated strong cold front moved across north/central Florida. Conditions ahead and along the cold front were favorable for severe thunderstorms as 80-90 knot jet maxima produced sufficient upper level divergence. These conditions produced an enhanced risk of severe weather, sparking several rounds of severe thunderstorms, which affected Volusia, Seminole, Orange, Brevard and Okeechobee Counties.
New Smyrna Beach	4/9/2019	0.88	0/0	$0	An area of low pressure and a weak cold front moved across central Florida sparking numerous showers and thunderstorms across the area. Deep moisture was in place across the area, and instability had increased through the day due to daytime heating. The instability, combined with lift associated with the approaching cold front and cold temperatures in the middle part of the atmosphere, allowed a few thunderstorms to become severe. In Volusia County, a strong storm produced nickel sized hail. In Seminole County, damaging winds caused numerous trees to be uprooted. In Brevard County, a

LOCATION	DATE	MAGNITUDE (inches)	DEATHS/ INJURIES	PROPERTY DAMAGE	DESCRIPTION
					severe thunderstorm produced a strong wind gust at the Cape.
Deltona	5/4/2019	0.75 – 1.00	0/0	$0	An area of high pressure located over the central Atlantic was the dominant feature affecting weather over central Florida. This led to west to southwest winds at the surface that pushed deep moisture from the Gulf across the area. Hot daytime temperatures, and cold temperatures in the middle atmosphere provided the necessary ingredients for strong to severe thunderstorms to develop. These storms developed along the sea breezes and outflow boundaries that were produced. One thunderstorm became severe in southwestern Volusia County where it produced hail and damaging winds.
Glencoe Hucomer	5/31/2019	0.88 – 1.00	0/0	$0	The Atlantic high-pressure ridge located south of Florida resulted in southwest winds across central Florida. This pushed deep moisture over the area, and when combined with daytime heating and cold temperatures in the middle atmosphere provided conditions for showers and thunderstorms to develop. One thunderstorm in eastern Volusia County interacted with the sea breeze front. This storm quickly became severe as it moved very slowly southward over New Smyrna Beach and Edgewater, and several reports of hail were received in these areas.
Cassadaga	5/21/2020	1.00	0/0	$0	The public reported quarter sized hail near the intersection of

LOCATION	DATE	MAGNITUDE (inches)	DEATHS/ INJURIES	PROPERTY DAMAGE	DESCRIPTION
					Courtland Boulevard and Lockwood Boulevard in Deltona.
Orange City Deltona	8/9/2020	1.00-1.75	0/0	$0	Afternoon thunderstorms that developed along the sea breeze collision became severe, producing large hail in Volusia County, and damaging winds in Volusia and Orange Counties.
Blake	8/18/2020	1.00	0/0	$0	Numerous thunderstorms developed along the outflow boundary and sea breeze collisions. These storms produced two tornadoes in western Volusia County, including a rare August EF-2. In addition, other thunderstorms produced strong winds and hail along the Volusia and Brevard County coasts.
West Holly Hill Daytona Beach Daytona Beach Shores South Daytona Ponce Inlet Blake	3/6/2021	0.75-1.50	0/0	$0	Daytona International Speedway Emergency Management reported half dollar sized hail west of Interstate 95 near LPGA Boulevard. They also reported small hail had accumulated on the ground and was 4 to 5 inches deep in some spots.
Ormond by the Sea	4/18/2021	1.00	0/0	$0	An isolated severe thunderstorm developed over Flagler County near a stationary front. The storm moved quickly southeast along the Flagler-Volusia County line and produced large hail just south of the county line, in Ormond Beach.
New Smyrna Beach Coronado Beach	3/16/2022	1.75	0/0	$0	Numerous afternoon thunderstorms developed across east-central Florida, with several becoming severe. These severe storms produced large hail in Brevard, Seminole, and Volusia County, with wind damage to trees also occurring in Volusia County.

LOCATION	DATE	MAGNITUDE (inches)	DEATHS/ INJURIES	PROPERTY DAMAGE	DESCRIPTION
Orange City DeLand	5/21/2022	1.00-1.25	0/0	$0	Numerous afternoon thunderstorms developed across east-central Florida as the east coast sea breeze moved inland from the coast and eventually collided with the west coast sea breeze. Many storms became severe and produced quarter to half dollar sized hail over parts of Seminole, Volusia, and Lake Counties.
Cassadaga	6/6/2022	1.00	0/0	$0	Numerous severe thunderstorms developed across east-central Florida along the east coast sea breeze, and along the main sea breeze collision. Many storms became severe over Seminole and Volusia Counties where hail and wind damage occurred. Then, as storms moved offshore, they produced severe wind gusts along the coast in Brevard, Indian River, and Martin Counties. One storm produced an EF-0 tornado in Saint Lucie County west of Fort Pierce.
Lake Helen	5/18/2023	1.00	0/0	$0	Strong storms produced severe hail near Lake Helen in Volusia County.

Source: National Climatic Data Center

NOTE: ALL HISTORICAL OCCURRENCES IN THIS REPORT ARE THE MOST RECENT AS DOCUMENTED BY THE NATIONAL CLIMATIC DATA CENTER

According to the National Climatic Data Center, there have been recorded lightning events in Volusia County as listed in **Section 5: Table 9**. However, these are only the lightning events that have been reported to NCDC. According to emergency managers from various Volusia County jurisdictions thousands of lightning strikes occur each day during the summer afternoon thunderstorms. For example, in 1997 the Port Orange Police Department was struck by lightning twice in a two-week period, each time knocking out the 911 consoles. In addition, during September 2007, there was a lightning event that occurred in Port Orange causing damages totaling $310,000 to a property which had an appraisal value of $350,000 and another which occurred in August 2009, in DeBary causing damages of $500,000 to a church which had burned to the ground. Volusia has the second greatest number of lightning strikes in Florida, behind the Tampa Bay area. The corridor between I-75 and I-95 in the North Central Florida area experiences a high number of lightning strikes.

Section 5: Table 9: Historical Lightning Occurrences

LOCATION	DATE	DEATHS/ INJURIES	PROPERTY DAMAGE	DESCRIPTION
Holly Hill	7/23/1994	0/1	$0	A 17-year-old male riding a bike was hospitalized with burns to his chest after lightning struck the boy.
New Smyrna Beach	9/18/1994	1/1	$0	A fast-moving thunderstorm, which had produced rain for only a few minutes, produced the flash which struck the victims directly. One death and one injury resulted.
New Smyrna Beach	6/24/1995	0/1	$0	A lifeguard on top of a high observation tower was struck and injured by lightning.
Ormond Beach	6/28/1995	0/1	$0	A woman was injured by lightning while talking on a telephone in her home.
Daytona Beach	9/23/1995	1/1	$0	Two men were struck by a lone lightning bolt. Both men were hospitalized in critical condition. One of the two died three days later.
DeBary	6/15/1996	0/0	$285,935	Fires started by lightning destroying two condominiums.
New Smyrna Beach	6/19/1996	0/0	$100,077	Fire started by lightning severely damaged a house.
Edgewater	8/20/1997	0/1	$0	Lightning knocked a plumber unconscious while he was under a mobile home.
New Smyrna Beach	8/3/1999	0/0	$4,032	A Volusia County Sheriff's Office horse was killed by lightning while standing under a tree.
Daytona Beach	7/4/2002	0/0	$24,597	Lightning started a fire that damaged an apartment building in Daytona Beach.
Daytona Beach	7/4/2002	0/8	$0	Eight spectators were struck and injured by lightning at Daytona Beach International Speedway. Two of the victims were hospitalized. Six were treated and released at the scene.

LOCATION	DATE	DEATHS/ INJURIES	PROPERTY DAMAGE	DESCRIPTION
Port Orange	8/3/2002	1/0	$0	A 62-year-old man was killed by lightning outside his home.
Edgewater	8/20/2002	0/0	$18,448	Lightning started a fire that damaged a carpet store in Edgewater.
Oak Hill	7/21/2003	0/0	$35,822	Fire started by lightning destroyed a mobile home.
Deltona	8/25/2003	0/0	$298,513	Fire from a lightning strike destroyed a church in Deltona.
Port Orange	9/14/2003	0/0	$298,513	Lightning struck a warehouse in Port Orange.
Daytona Beach	6/3/2004	0/2	$0	Two spectators suffered minor injuries from a lightning strike at Daytona Beach International Speedway.
Pierson	7/7/2004	0/2	$0	Two convenience store workers were briefly hospitalized after being injured by a lightning strike while working in the store kitchen.
Edgewater	5/24/2005	0/1	$0	A 27-year-old man was seriously injured by lightning while in a wooded area near Edgewater.
DeLand	7/29/2005	0/0	$0	Lightning strikes down trees and power lines in DeLand.
DeBary	5/26/2006	0/1	$0	A woman carrying a child outside was struck by lightning. The child was uninjured. The woman was transported to a hospital in critical condition.
Deltona	6/25/2007	0/0	$26,523	Lightning heavily damaged a home in Deltona.
Ponce Park	9/12/2007	0/2	$0	A small boat was struck by lightning in the Halifax River, resulting in minor injuries for two people.
DeBary	7/16/2008	0/0	$4,120	Lightning ignited a barn fire near DeBary.
DeBary	7/16/2008	0/0	$500,000	A lightning strike from an intense thunderstorm started a fire with burned a church to the ground.
Holly Hill	7/24/2009	0/1	$0	Sea breeze boundaries collided over coastal Volusia County, resulting in the rapid development of a severe storm near Ormond Beach. This cell then back-built south-southwest along a boundary during the late afternoon, producing a complex of strong to severe cells farther inland. A waterspout developed within the initial severe cell offshore of Ormond Beach and moved onto the beach as a tornado, reaching the adjacent backyard of several homes just beyond the beach. This vortex meandered

LOCATION	DATE	DEATHS/ INJURIES	PROPERTY DAMAGE	DESCRIPTION
				south along the beach and near-shore Atlantic waters for about ten minutes. Early in the evening, another tornado (EF-0) developed inland over Port Orange and damaged 150 mobile homes before lifting.
Daytona Beach and South Peninsula	8/05/2009	0/1	$0	Strong thunderstorms produced frequent cloud to ground lightning strikes across Volusia County. Two individuals were injured by lightning strikes in separate incidents about 30 minutes apart within Daytona Beach and South Peninsula.
DeBary	8/20/2009	0/0	$4,000	Sea breeze thunderstorms produced lightning across central Florida. Lightning ignited a barn fire near DeBary.
Blake	6/9/2015	0/1	$0	Lightning associated with thunderstorms developing along the east coast sea breeze injured a boy fishing in the water at Daytona Beach Shores.
Harbor Point	6/26/2015	1/0	$0	Thunderstorms developed over northern Volusia County along the east coast sea breeze. Lightning struck and killed a 25-year-old male in Port Orange as he worked outdoors.
Blake	6/24/2016	1/2	$0	Lightning from a thunderstorm located about 4 miles to the north struck a woman walking at waters edge on Daytona Beach Shores, resulting in a fatality.
Ponce Park	8/14/2016	0/1	$0	A severe thunderstorm produced wind damage to trees and structures in Lake County during the middle of the afternoon. About an hour later, another storm produced lightning which injured a man on a Volusia County beach.
Ellison Acres	1/7/2017	0/1	$0	A line of strong thunderstorms moved quickly east across Volusia County early in the morning, crossing Ponce Inlet prior to sunrise. A fisherman on the north jetty was injured when lightning struck his fishing pole.
Ormond by the Sea	7/22/2017	0/1	$0	Lightning struck close to a woman standing in shallow water in Ormond by the Sea, resulting in injuries.
Maytown	8/5/2017	0/0	$200,000	An afternoon thunderstorm produced a lightning strike that hit a house in Oak Hill. The house caught fire and suffered extensive damage. No injuries or fatalities were reported.

LOCATION	DATE	DEATHS/ INJURIES	PROPERTY DAMAGE	DESCRIPTION
Ellison Acres	6/14/2018	0/3	$0	Numerous showers and thunderstorms developed along the collision of the east and west coast sea breeze in eastern Orange and eastern Seminole County. One storm became strong and produced penny-sized hail just east of Geneva. Then, as these storms pushed east towards the coast, one storm produced a lightning strike that injured three people that were near the edge of the boardwalk in New Smyrna Beach.
Harbor Point	6/21/2018	0/0	$275,000	This storm produced a severe wind gust in Melbourne Beach. In Port Orange, a home was destroyed after being struck by lightning and catching fire.
DeLand	8/28/2018	0/1	$0	A woman standing in a parking lot in DeLand was struck and seriously injured by a lightning strike.
Ormond Beach	6/9/2019	1/0	$0	A motorcyclist was killed when he was struck by lightning while on Interstate 95 in Volusia County.
Mission City	7/19/2022	1/1	$0	Lightning struck and injured two people at two different locations in New Smyrna Beach. A 27-year-old man was seriously injured and transported to a local hospital, where he later died from his injuries. A 66-year-old man suffered minor injuries after lightning struck nearby.
Deltona	5/22/2023	1/0	$0	Lightning struck and killed a 24-year-old man while he was working on a roof in Volusia County, causing him to fall off of the roof.

Source: National Climatic Data Center

NOTE: ALL HISTORICAL OCCURRENCES IN THIS REPORT ARE THE MOST RECENT AS DOCUMENTED BY THE NATIONAL CLIMATIC DATA CENTER

Section 5: Table 10 shows historic thunderstorm events, including thunderstorm winds and high winds, which resulted in property damage in Volusia County. (Other windstorms, such as tornadoes and hurricanes, are addressed separately.)

Section 5: Table 10: Historical Thunderstorm Occurrences Resulting in Property Damage

LOCATION	DATE	TYPE	DEATHS/ INJURIES	PROPERTY DAMAGE	DESCRIPTION
Pierson	3/27/2000	Thunderstorm Winds	0/0	$19,572	Severe thunderstorm winds blew down trees on a house near Pierson.
Deltona	7/26/2000	Thunderstorm Winds	0/1	$15,657	Thunderstorm winds blew down power lines and trees in the Deltona Area. One woman was injured when a tree fell on her car as she was driving in Deltona.
Orange City	9/03/2000	Thunderstorm Winds	0/0	$39,143	Thunderstorm winds blew down numerous trees and power lines in Orange City. Falling trees damaged six residences.
Emporia	9/04/2000	Thunderstorm Winds	0/0	$13,048	Thunderstorm winds blew down a large shed cover at a fern nursery.
Daytona Beach	3/13/2001	Thunderstorm Winds	0/1	$38,003	Strong microburst winds hit the barrier island in Daytona Beach destroying a large tent and a beach tollbooth. One person was injured.
Daytona Beach	6/16/2001	Thunderstorm Winds	0/0	$19,002	Thunderstorm winds blew a 50-foot section off the roof of a restaurant in Daytona Beach.
New Smyrna Beach	8/21/2001	Thunderstorm Winds	0/0	$20,268	Thunderstorm winds swept across the New Smyrna Beach Airport overturning a small plane and damaging six others.
DeBary	8/05/2002	Thunderstorm Winds	0/0	$12,299	Thunderstorm winds blew down trees on a mobile home in Debary.
Deltona	3/07/2003	Thunderstorm Winds	0/0	$1,194	Thunderstorm winds blew down numerous trees and power lines in Deltona.
Deltona	3/19/2003	Thunderstorm Winds	0/0	$119,405	Strong thunderstorm winds swept across the Deltona area blowing down dozens of trees that damaged houses and vehicles.

LOCATION	DATE	TYPE	DEATHS/ INJURIES	PROPERTY DAMAGE	DESCRIPTION
Holly Hill	7/12/2003	Thunderstorm Winds	0/0	$21,493	Thunderstorm winds destroyed a large gas station roof awning in Holly Hill.
Osteen	4/08/2004	Thunderstorm Winds	0/0	$255,040	Thunderstorm winds produced widespread damage to a mobile home community southwest of Osteen. Many of the homes had damage to attached sunrooms, awnings and sheds. About 15 trees were blown down. The event was accompanied by a large amount of small hail.
Port Orange	6/16/2005	Thunderstorm Winds	0/0	$45,020	Thunderstorm winds overturned a mobile home and damaged two others east of Port Orange.
Daytona Beach	6/17/2005	Thunderstorm Winds	0/0	$11,255	Thunderstorm winds blew down a large tree which damaged a truck.
Deltona	5/28/2006	Thunderstorm Winds	0/0	$27,318	Thunderstorm winds downed power lines and power transformers in Deltona. downed trees
Daytona Beach International Airport	7/15/2007	Thunderstorm Winds	0/0	$21,218	Thunderstorm winds peeled back part of a roof on an apartment complex on the barrier island. A band of thunderstorms moved from central Florida to the coast and Lake Okeechobee producing hail, strong winds and funnel clouds.
DeLand	4/03/2008	Thunderstorm Winds	0/0	$1,030	Thunderstorm winds blew down large tree branches that took out power lines in DeLand. Afternoon pulse thunderstorms produced wind damage in DeLand.
Edgewater	4/05/2008	Thunderstorm Winds	0/0	$8,240	Thunderstorm winds blew down trees and power lines in Edgewater. A pre-frontal squall line produced widespread wind damage and hail across central Florida.
New Smyrna Beach	4/05/2008	Thunderstorm Winds	0/0	$12,360	Thunderstorm winds blew down trees and power lines in New Smyrna Beach. A pre-frontal squall line produced widespread wind damage and hail across central Florida.
Ormond Beach	6/19/2008	Thunderstorm Winds	0/0	$2,060	Ormond Beach dispatch reported trees down on power lines at Nova

LOCATION	DATE	TYPE	DEATHS/ INJURIES	PROPERTY DAMAGE	DESCRIPTION
					Road. The daily east coast sea breeze pushed inland and produced thunderstorms over coastal sections of Central Florida.
Fatio	6/21/2008	Thunderstorm Winds	0/0	$5,150	Law enforcement reported three trees down across County Road 42. The daily east coast sea breeze pushed inland and produced thunderstorms over coastal and interior sections of Central Florida.
Beresford	6/21/2008	Thunderstorm Winds	0/0	$1,030	Law enforcement reported a large tree down across State Road 44. The daily east coast sea breeze pushed inland and produced thunderstorms over coastal and interior sections of Central Florida.
DeBary, Holly Hill, Osteen, and Daytona Beach	10/9/2008	Thunderstorm Winds	0/0	$0	A north moving warm front produced widespread thunderstorms across central Florida.
Orange City	4/14/2009	Thunderstorm Winds	0/0	$0	A squall line well ahead of a cold front produced numerous thunderstorms with damaging straight-line winds, large hail and a brief, weak tornado. Several Line Echo Wave Pattern (LEWP) features were apparent on radar with rotating comma head signatures.
Harbor Point	6/18/2009	Thunderstorm Winds	0/0	$0	Numerous strong storms impacted central Florida ahead of a stalled frontal boundary far to the north. Local sea breeze interactions combined with a large-scale outflow boundary propagating to the region prompted the storm development. Many storms produced small hail and wind gusts 45-55 mph, with two storms strengthening to severe levels and resulting in damaging wind gusts.
DeLand	6/13/2009	Thunderstorm Winds	0/0	$0	Numerous strong storms developed over east central Florida, with a few strengthening to severe levels and producing wind damage and large hail.
DeLand	3/31/2009	Thunderstorm Winds	0/0	$0	A northward-lifting warm front combined with active sea breeze

LOCATION	DATE	TYPE	DEATHS/ INJURIES	PROPERTY DAMAGE	DESCRIPTION
					boundaries within an unstable atmosphere produced several severe thunderstorms with nickel to quarter sized hail and localized severe winds.
Lake Harney	8/3/2009	Thunderstorm Winds	0/0	$0	Thunderstorms along the east coast sea breeze boundary progressed inland and intensified to produce minor wind damage and a funnel cloud.
DeLand	1/21/2010	Thunderstorm Winds	0/0	$0	Numerous strong thunderstorms moved across the county, well ahead of a cold front during the late afternoon and evening. One of the storms became severe and produced localized wind damage. A funnel cloud was also observed by the Daytona Beach Airport (KDAB) weather observer.
Ormond Beach	6/3/2010	Thunderstorm Winds	0/0	$0	Numerous strong thunderstorms lifted northeast across east-central Florida from mid-afternoon through early evening. Two of the storms became severe and produced damaging winds which downed several trees and large limbs within Orange and Volusia Counties.
DeLand	8/22/2010	Thunderstorm Winds	0/0	$0	Saturated grounds from previous rains, along with recent heavy rain and 30 mph wind gusts from a thunderstorm passing 30 minutes earlier, caused a large pine tree to topple as a vehicle was traveling beneath, resulting in a fatality.
Ormond Beach	4/5/2011	Thunderstorm Winds	0/0	$0	A pre-frontal squall line crossed central Florida during the morning and early afternoon. A few of the storms became strong to severe and produced high winds and a funnel cloud, primarily across Volusia and Brevard Counties.
Volusia County	6/17/2011	Thunderstorm Winds	0/0	$0	Numerous strong to severe storms formed along the east coast sea breeze across the central Florida interior and Volusia County, producing dime to quarter sized hail and winds of 50 to 60 mph.

LOCATION	DATE	TYPE	DEATHS/ INJURIES	PROPERTY DAMAGE	DESCRIPTION
Volusia County	3/30/2011	Thunderstorm Winds	0/0	$0	A rare Florida derecho affected the region during the late afternoon and early evening, well ahead of a strong cold front. The rapidly moving squall line, contained multiple bow echoes as it moved across the central portion of Florida at 60 mph.
DeBary	3/30/2011	Thunderstorm Winds	0/0	$0	A rare Florida derecho affected the region during the late afternoon and early evening, well ahead of a strong cold front. The rapidly moving squall line, contained multiple bow echoes as it moved across the central portion of Florida at 60 mph.
DeBary	3/30/2011	Thunderstorm Winds	0/0	$0	A rare Florida derecho affected the region during the late afternoon and early evening, well ahead of a strong cold front. The rapidly moving squall line, contained multiple bow echoes as it moved across the central portion of Florida at 60 mph.
Deltona	3/30/2011	Thunderstorm Winds	0/0	$0	A rare Florida derecho affected the region during the late afternoon and early evening, well ahead of a strong cold front. The rapidly moving squall line, contained multiple bow echoes as it moved across the central portion of Florida at 60 mph.
DeLand	8/13/2011	Thunderstorm Winds	0/0	$5,000	An isolated severe thunderstorm developed along a boundary collision in central Volusia County and produced wind damage.
Glencoe	5/17/2012	Thunderstorm Winds	0/0	$0	The east coast sea breeze formed in the early afternoon and propagated inland, eventually colliding with the west coast sea breeze over the central peninsula. Storms moved to the east and northeast and produced large hail over Brevard and Volusia Counties.
Oak Hill	8/8/2012	Thunderstorm Winds	0/0	$0	A line of storms developed along the west coast sea breeze and intensified as it interacted with the

LOCATION	DATE	TYPE	DEATHS/ INJURIES	PROPERTY DAMAGE	DESCRIPTION
					east coast sea breeze. One of the storms in this line became severe near Haulover Canal.
Volusia County	6/30/2013	Thunderstorm Winds	0/0	$0	Deep southwesterly flow led to the development of several strong to severe thunderstorms, which moved from the Orlando area to the coast of Volusia and Brevard Counties. Peak winds gusts reached 66 mph in Orlando. Thunderstorm winds also peeled back part of a roof from a home in Port Orange.
Volusia County	9/11/2013	Thunderstorm Winds	0/0	$10,000	An isolated heavy shower moved onshore from the Atlantic late at night and produced wind damage to the upper story of an apartment complex.
Deltona	12/15/2013	Thunderstorm Winds	0/0	$1,000	A broken line of showers and thunderstorms moved rapidly southeast across Volusia County. Two cells along the line caused minor wind damage to trees, but no structural damage. Part of a tree fell onto powerlines and a vehicle in Deltona, and tree limbs temporarily blocked a road in Osteen.
Coronado Beach	02/12/2014	Thunderstorm Winds	0/0	$0	A squall line developed out ahead of a cold front over the eastern Gulf of Mexico. Thunderstorms within the squall line produced damaging winds and large hail (although hail was not reported in Volusia County)
Daytona Beach	04/01/2014	Thunderstorm Winds	0/0	$0	A broken line of showers moved northeast across Volusia and Brevard Counties. A severe thunderstorm developed near the northern edge of the line and caused localized wind damage near Daytona Beach International Airport and Embry-Riddle Aeronautical University Campus.
Cassadaga Lake Helen	6/10/2014	Thunderstorm Winds	0/0	$5,000	Thunderstorms developed over the interior and produced locally damaging winds along with quarter sized hail.

LOCATION	DATE	TYPE	DEATHS/ INJURIES	PROPERTY DAMAGE	DESCRIPTION
Daytona Beach International Airport	6/24/2014	Thunderstorm Winds	0/0	$0	A thunderstorm developed rapidly along the east coast sea breeze over coastal Volusia County and produced severe wind gusts and hail up to nickel size at Daytona Beach Airport.
DeLeon Springs	7/14/2014	Thunderstorm Winds	0/0	$0	Strong thunderstorms moved into western Volusia County and interacted with the east coast sea breeze.
Coronado Beach	7/25/2014	Thunderstorm Winds	0/0	$245,000	An EF-1 tornado touched down within a rural airpark and affected adjacent neighborhoods. Several buildings and small planes were damaged at the airpark, and many trees were damaged or uprooted within the adjacent neighborhood as the tornado tracked northeast. The thunderstorm which produced the tornado was also responsible for wind damage to a fence and the roof of an apartment building on the barrier island in New Smyrna Beach.
Orange City	6/1/2015	Thunderstorm Winds	0/0	$0	Several strong to severe thunderstorms developed along the east coast sea breeze as it pushed inland to the Interstate 4 corridor during the afternoon and interacted with other outflow boundaries. Large hail, up to golf ball sized was reported across DeBary, Sanford, Lake Mary, Altamonte Springs and Oakland. Strong winds also felled numerous trees and large tree branches leading to damage to homes and cars in DeBary, Astatula, and Lake Mary.
Lake Helen	3/24/2016	Thunderstorm Winds	0/0	$2,000	An upper-level weather disturbance, together with a very unstable airmass and mesoscale boundaries resulted in numerous strong thunderstorms across the central Florida peninsula. Two of the storms produced large hail, from quarter to golf ball size.

LOCATION	DATE	TYPE	DEATHS/ INJURIES	PROPERTY DAMAGE	DESCRIPTION
Edgewater	9/13/2016	Thunderstorm Winds	0/0	$5,000	A tropical disturbance, with a well-defined surface circulation, moved onshore near Vero Beach during the early morning hours, then lifted northward along the coast to Volusia County (and beyond) through the evening. By late evening, the system was upgraded to Tropical Storm Julia, as it approached Jacksonville. A rain band associated with the system spawned an EF-0 tornado in southern Brevard County during the early afternoon, resulting in damage to a few residences. Other passing rain bands produced strong wind gusts along the coast of Brevard and Volusia Counties, one of which resulted in damage to a home in Edgewater. A funnel cloud was also sighted in Lake County.
Hucomer	9/29/2016	Thunderstorm Winds	0/0	$0	A thunderstorm became severe over southeast Volusia County and produced damage to several trees and powerlines in the town of Edgewater.
New Smyrna Beach Fatio	1/22/2017	Thunderstorm Winds	0/0	$0	An unusually strong jet stream aided development of an intense squall line which moved rapidly across east central Florida during the evening of January 22. Several thunderstorms developed ahead of the main squall line and became severe, as well as other storms within the squall line itself. Reports of quarter sized hail, wind gusts over 60 mph and funnel clouds were received. A localized area of tree damage also occurred.
DeLand Municipal Airport Holly Hill	11/23/2017	Thunderstorm Winds	0/0	$50,000	A strong thunderstorm embedded within a rain area ahead of a cold front intensified as it traveled quickly northeast across Volusia County. Mobile homes were damaged well inland in DeLand, then over 30 minutes later, the storm damaged mobile homes in

LOCATION	DATE	TYPE	DEATHS/ INJURIES	PROPERTY DAMAGE	DESCRIPTION
					Daytona Beach. Rain totals reached five to seven inches in a short period of time from Ormond-by-the-Sea to Holly Hill. High levels of standing water and some impassible roadways occurred.
DeLand Municipal Airport Allandale	4/15/2018	Thunderstorm Winds	0/0	$0	The Storm Prediction Center had designated a slight change of severe weather for all of east central Florida. A high amplitude shortwave over the Mississippi River Valley quickly moved south across the Florida peninsula during the afternoon and evening hours. A cold front associated with the intensifying trough was also observed crossing the Florida peninsula. Ahead of the cold front moderate thermodynamic instability with 700mb temperatures between -7 to -8 degrees Celsius, and 500mb between -9 to -10 degrees Celsius, resulting in lapse rates of 6-6.5 C/km. 90 knot winds atop a hot streak over the north central Gulf of Mexico created resulting flow from the southwest. Numerous showers and thunderstorms developed along the cold front, eventually forming a line that crossed across all of east central Florida.
Ormond Beach	7/22/2018	Thunderstorm Winds	1/1	$0	One person was killed, and another injured in Ormond Beach when winds from a non-severe thunderstorm knocked over a large, mostly dead tree onto them.
Deltona	5/4/2019	Thunderstorm Winds	0/0	$0	An area of high pressure located over the central Atlantic was the dominant feature affecting weather over central Florida. This led to west to southwest winds at the surface that pushed deep moisture from the Gulf across the area. Hot daytime temperatures, and cold temperatures in the middle atmosphere provided the necessary

LOCATION	DATE	TYPE	DEATHS/ INJURIES	PROPERTY DAMAGE	DESCRIPTION
					ingredients for strong to severe thunderstorms to develop.
DeLand	6/9/2019	Thunderstorm Winds	0/0	$0	Rich moist air was moving across the Florida peninsula as the area was sandwiched between the Atlantic high pressure to the south and a low-pressure system over the eastern half of the U.S. This combination of weather systems provided substantial energy in the atmosphere, that when combined with daytime heating and southwest winds at the surface led to the development of numerous strong thunderstorms across east central Florida. As these storms pushed across the peninsula they produced and interacted with many outflow boundaries and the east coast sea breeze. Several storms became severe as they moved over Seminole and Volusia Counties, where wind damage was reported. Also, a motorcyclist was killed when he was struck by lightning while on Interstate 95 in Volusia County.
Daytona Beach	09/18/2019	Thunderstorm Wind	0/0	$0	A strong storm came onshore in Volusia County and quickly became severe over Daytona Beach. Observations of 50 knot or greater winds occurred at three separate, but close by locations.
Fatio	04/20/2020	Thunderstorm Wind	0/0	$0	As a broken line of severe thunderstorms moved through Seminole County, one storm produced a brief waterspout/tornado on and near Lake Jesup. A second thunderstorm produced damaging winds in Volusia County, while a third thunderstorm produced damaging winds and hail in Martin County.
Cassadaga	05/28/2020	Thunderstorm Wind	0/0	$0	Scattered strong to severe storms moved across Lake and Volusia counties producing minor wind damage and small hail.

LOCATION	DATE	TYPE	DEATHS/ INJURIES	PROPERTY DAMAGE	DESCRIPTION
Daytona Beach	06/06/2020	Thunderstorm Wind	0/0	$5,000	A National Weather Service damage survey confirmed straight-line winds estimated at 55-65 mph impacted the Daytona Flea and Farmers Market in Daytona Beach. Damage consisted of the removal of a large portion of a corrugated roof, with metal roofing peeled back on several adjacent buildings. Roof debris was blown downwind 100 yards onto adjacent portions of Interstate 95, causing the roadway to be closed for several hours. No other damage was noted in the area and there were no injuries or fatalities.
DeBary	08/09/2020	Thunderstorm Wind	0/0	$0	Afternoon thunderstorms that developed along the sea breeze collision became severe, producing large hail in Volusia County, and damaging winds in Volusia and Orange Counties.
Coronado Beach	08/18/2020	Thunderstorm Wind	0/0	$0	Numerous thunderstorms developed along the outflow boundary and sea breeze collisions. These storms produced two tornadoes in western Volusia County, including a rare August EF-2. In addition, other thunderstorms produced strong winds and hail along the Volusia and Brevard County coasts.
DeLand	08/20/2020	Thunderstorm Wind	0/0	$0	A thunderstorm became severe as it moved north through DeLand where it caused damage to planes and hangers at the airport, as well as nearby homes.
Samsula	10/28/2021	Thunderstorm Wind	0/0	$1,000	Numerous thunderstorms were moving across Volusia County, where one storm became strong and produced localized wind damage in New Smyrna Beach.
DeLand	03/01/2022	Thunderstorm Wind	0/0	$10,000	A strong thunderstorm that moved through DeLand in Volusia County produced minor wind damage that resulted in old trees falling into several power lines.

LOCATION	DATE	TYPE	DEATHS/ INJURIES	PROPERTY DAMAGE	DESCRIPTION
Samsula	03/16/2022	Thunderstorm Wind	0/0	$0	Numerous afternoon thunderstorms developed across east-central Florida, with several becoming severe. These severe storms produced large hail in Brevard, Seminole, and Volusia County, with wind damage to trees also occurring in Volusia County.
Edgewater	07/19/2022	Thunderstorm Wind	0/0	$3,000	Strong thunderstorms that developed along the sea breeze collision moved east and offshore of Volusia County. One storm became severe where it produced wind damage in Edgewater.
Orange City	08/17/2022	Thunderstorm Wind	0/0	$4,000	A thunderstorm became severe in western Volusia County where it produced tree and powerline damage in Orange City.

Source: National Climatic Data Center

NOTE: ALL HISTORICAL OCCURRENCES IN THIS REPORT ARE THE MOST RECENT AS DOCUMENTED BY THE NATIONAL CLIMATIC DATA CENTER

Probability of Future Occurrences

Severe weather events will continue to have high occurrences in the future. Based on the frequency of hail events in the past, the probability of future hail occurrences in Volusia County is high. Over the past 45 years, Volusia County has been impacted by two or more hail events per year. It can be expected that future hail events will continue to cause minor to severe damage to property and vehicles throughout Volusia County.

The probability of occurrence for future lightning events in Volusia County is high. According to NOAA, Volusia County is in an area of the country that experiences 8-16 lightning flashes per square kilometer per year (approximately 20,224 to 40,448 flashes countywide per year). Given this regular frequency of occurrence, it can be expected that future lightning events will continue to threaten life and property throughout Volusia County.

Thunderstorms are frequent in Volusia County. During the summer, Volusia County experiences thunderstorms nearly every afternoon. They will undoubtedly continue to occur, thereby threatening the lives, safety, and property in Volusia County. Therefore, the probability of future occurrences is high.

The Local Mitigation Strategy recognizes that with a changing climate, there is a potential for an increasing risk of environmental impacts from thunderstorms and that future mitigation and adaptation strategies related to this hazard should be considered.

5.11 TORNADO

Background

A tornado is a violent windstorm characterized by a twisting, funnel-shaped cloud extending to the ground. Tornadoes are most often generated by thunderstorm activity (but sometimes result from hurricanes and other tropical storms) when cool, dry air intersects and overrides a layer of warm, moist air forcing the warm air to rise rapidly. The damage caused by a tornado is a result of the high wind velocity and wind-blown debris, also accompanied by lightning or large hail. According to the National Weather Service, tornado wind speeds normally range from 40 to more than 300 miles per hour and are a few yards wide. The most violent tornadoes have rotating winds of 250 miles per hour or more and can cause extreme destruction, carving a path over a mile wide and several miles long and turning normally harmless objects into deadly missiles.

Over 800 tornadoes are reported nationwide annually, resulting in an average of 80 deaths and 1,500 injuries (NOAA, 2007). They are more likely to occur during the months of March through May and can occur at any time of day but are likely to form in the late afternoon and early evening. Further, the tornadoes associated with tropical cyclones are most frequent in September and October when the incidence of tropical storm systems is greatest. The destruction caused by tornadoes ranges from light to inconceivable depending on the intensity, size and duration of the storm. Typically, tornadoes cause the greatest damage to structures of light construction, including residential dwellings (particularly mobile homes). The magnitude of tornadic activity is reported using the Enhanced Fujita Scale. However, tornado magnitudes prior to 2005 were classified using the traditional version of the Fujita Scale.

Section 5: Table 11: Enhanced Fujita Scale for Tornadoes (Effective 2005 and after)

F-SCALE NUMBER	INTENSITY	WIND SPEED (MPH)	TYPE OF DAMAGE DONE
F0	GALE	65–85	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages to sign boards.
F1	MODERATE	86–110	Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.
F2	SIGNIFICANT	111–135	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
F3	SEVERE	136–165	Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted.
F4	DEVASTATING	166–200	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
F5	INCREDIBLE	Over 200	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 re-enforced concrete structures badly damaged.

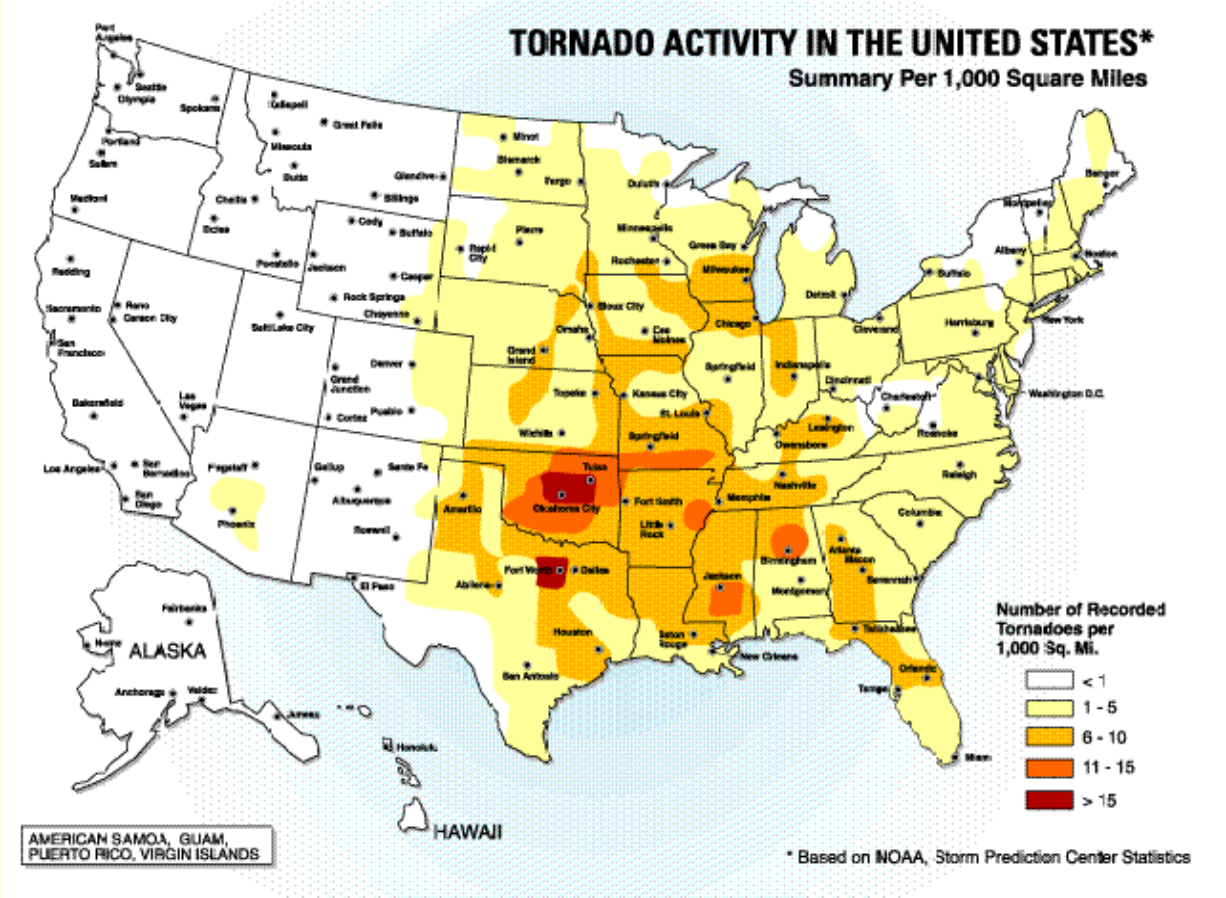
Section 5: Table 12: The Fujita Scale (Effective Prior to 2005)

F-SCALE NUMBER	INTENSITY	WIND SPEED (MPH)	TYPE OF DAMAGE DONE
F0	GALE	40–72	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages to sign boards.
F1	MODERATE	73–112	Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.
F2	SIGNIFICANT	113–157	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
F3	SEVERE	158–207	Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted.
F4	DEVASTATING	208–260	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown, and large missiles generated.
F5	INCREDIBLE	261–318	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 re-enforced concrete structures badly damaged.
F6	INCONCEIVABLE	319–379	These winds are very unlikely. The small area of damage they might produce would probably not be recognizable along with the mess produced by F4 and F5 wind that would surround the F6 winds. Missiles, such as cars and refrigerators would do serious secondary damage that could not be directly identified as F6 damage. If this level is ever achieved, evidence for it might only be found in some manner of ground swirl pattern, for it may never be identifiable through engineering studies.

Source: National Weather Service

According to the NOAA Storm Prediction Center (SPC), the highest concentration of tornadoes in the United States has been in Oklahoma, Texas, Kansas and Florida. Although the Great Plains region of the Central United States does favor the development of the largest and most dangerous tornadoes (earning the designation of “tornado alley”), Florida experiences the greatest number of tornadoes per square mile of all U.S. states (SPC, 2002). **Section 5: Figure 15** shows tornado activity in the United States based on the number of recorded tornadoes per 1,000 square miles.

Section 5: Figure 15: U.S. Tornado Activity



Source: Federal Emergency Management Agency

Location and Spatial Extent

Based on historic data, tornadoes occur throughout the state of Florida at a rate of 1-10 confirmed touchdowns per 1,000 square miles. Florida tornadoes typically impact a relatively small area; however, events are completely random, and it is not possible to predict specific areas that are more susceptible to a tornado strike over time. Therefore, it is assumed that all of Volusia County and its jurisdictions are uniformly exposed to this hazard. **Section 5 Figure 16** displays were where the hazard has been identified.

April, May, and June are considered the peak months for Florida tornadoes. A review of historical data shows that tornadoes within Volusia County are typically in the F0, F1 and, more rarely, the F2 range. F3 and F4 tornadoes are very rare, with three occurring since 1950. The county has never experienced a F5 tornado on record.

Historical Occurrences

According to the National Climatic Data Center, these events occurred in the Volusia County study area as listed in **Section 5: Table 13**.

Section 5: Table 13: Historical Tornado Impacts

LOCATION	DATE	MAGNITUDE	DEATHS/ INJURIES	PROPERTY DAMAGE	DESCRIPTION
Volusia County	5/8/1950	F1	0/0	$27,851	Not Available
Volusia County	7/12/1959	unknown	0/0	$0	Not Available
Volusia County	10/12/1959	unknown	0/0	$0	Not Available
Volusia County	7/14/1960	unknown	0/0	$0	Not Available
Volusia County	7/19/1960	unknown	0/0	$0	Not Available
Volusia County	8/29/1961	F2	0/0	$188,115	Not Available
Volusia County	7/7/1963	F1	0/0	$21,995	Not Available
Volusia County	8/9/1963	unknown	0/0	$0	Not Available
Volusia County	1/12/1964	F0	0/0	$21,772	Not Available
Volusia County	8/28/1964	unknown	0/0	$0	Not Available
Volusia County	8/30/1968	F2	0/0	$160,999	Not Available
Volusia County	7/22/1969	unknown	0/0	$18,329	Not Available
Volusia County	10/2/1969	unknown	0/0	$0	Not Available
Volusia County	7/17/1970	F0	0/0	$0	Not Available
Volusia County	8/27/1971	F2	0/1	$16,624	Not Available
Volusia County	5/20/1972	F2	0/0	$134,368	Not Available
Volusia County	6/19/1972	F1	0/0	$134,368	Not Available
Volusia County	8/22/1972	F2	0/0	$134,368	Not Available
Volusia County	4/11/1975	F0	0/0	$12,504	Not Available
Volusia County	4/14/1975	F0	0/0	$0	Not Available
Volusia County	5/15/1975	F0	0/0	$104,204	Not Available

LOCATION	DATE	MAGNITUDE	DEATHS/ INJURIES	PROPERTY DAMAGE	DESCRIPTION
Volusia County	8/9/1975	F0	0/0	$12,504	Not Available
Volusia County	5/22/1976	F0	0/0	$987,344	Not Available
Volusia County	5/23/1976	F0	0/0	$0	Not Available
Volusia County	7/3/1976	F0	0/0	$11,848	Not Available
Volusia County	4/18/1978	F1	0/0	$861,249	Not Available
Volusia County	6/9/1978	F0	0/0	$10,335	Not Available
Volusia County	7/27/1978	F0	0/0	$0	Not Available
Volusia County	8/13/1978	F1	0/1	$86,125	Not Available
Volusia County	9/4/1978	F0	0/0	$10,335	Not Available
Volusia County	9/22/1978	F0	0/0	$0	Not Available
Volusia County	9/27/1978	F0	0/0	$0	Not Available
Volusia County	1/24/1979	unknown	0/0	$77,363	Not Available
Volusia County	5/5/1979	F1	0/0	$773,633	Not Available
Volusia County	5/8/1979	F1	0/6	$7,736,328	Not Available
Volusia County	9/3/1979	F2	0/0	$1,624,629	Not Available
Volusia County	9/29/1979	F0	0/0	$0	Not Available
Volusia County	3/7/1982	F1	0/0	$25,000	Not Available
Volusia County	6/17/1982	F1	0/0	$253,000	Not Available
Volusia County	4/15/1983	F1	0/0	$6,765	Not Available
Volusia County	4/23/1983	F1	0/0	$56,375	Not Available
Volusia County	11/20/1983	F2	0/0	$5,637,514	Not Available
Volusia County	4/14/1984	F0	0/0	$53,991	Not Available

LOCATION	DATE	MAGNITUDE	DEATHS/ INJURIES	PROPERTY DAMAGE	DESCRIPTION
Volusia County	6/27/1984	F1	0/0	$5,399,069	Not Available
Volusia County	2/8/1986	F0	0/0	$51,206	Not Available
Volusia County	3/14/1986	F1	0/1	$51,206	Not Available
Volusia County	1/21/1988	F1	0/0	$474,030	Not Available
Volusia County	5/11/1988	F0	0/0	$0	Not Available
Volusia County	11/9/1990	F0	0/3	$5155	Not Available
Edgewater	10/7/1996	F2	0/0	$3,431,216	In Edgewater, a 400-yard-wide F2 tornado touched down near I-95. The smaller F0 tornadoes in Pierson, Deltona, and Daytona Beach Shores caused minor in the affected areas, including blowing out 12 windows in Daytona Beach Shores.
Pierson	10/7/1996	F0	0/0	$0	
Deltona	10/7/1996	F0	0/0	$0	
Daytona Beach Shores	10/7/1996	F0	0/0	$7,148	
New Smyrna Beach	4/23/1997	F0	0/0	$0	The F0 tornado downed trees and damaged dozens of homes, including 20 in New Smyrna Beach alone.
Pierson	4/23/1997	F0	0/0	$83,856	
Port Orange	4/23/1997	F0	0/0	$167,713	
New Smyrna Beach	4/23/1997	F0	0/0	$349,402	
Oak Hill	7/5/1997	F0	0/0	$41,928	The brief touchdown damaged 2 houses and 8 mobile homes.
New Smyrna Beach	11/2/1997	F3	0/32	$19,566,485	A rapidly intensifying tornado initially touched down in New Smyrna Beach about 1 mile west of U.S. Highway 1 between Enterprise and Wayne Avenues. The tornado moved east northeast at about 50 mph damaging several homes and downing trees and power lines. It lifted just west of Highway 1 after passing Chisholm Elementary School. The tornado then struck New

LOCATION	DATE	MAGNITUDE	DEATHS/ INJURIES	PROPERTY DAMAGE	DESCRIPTION
					Smyrna Beach High School producing Fujita Scale F1 damage. As the tornado intensified to a strong F3 category, it passed through the Venetian Villas subdivision and the Diamond Head Condominiums. A number of large well-built homes were destroyed. Many of the units in the 10 story Diamond Head Condominiums received major damage as high winds blew out exterior glass walls and blew furniture into the adjoining Indian River Lagoon. The tornado then crossed the Intracoastal Waterway and passed over the barrier island between Robinson Road and East Street where a number of large well-built homes were almost completely destroyed. The tornado then moved over the Atlantic Ocean. In all 32 people were injured, six requiring hospitalizations. Thirty-one homes were destroyed and 290 were damaged. Damage estimates were near 14 million dollars.
Emporia	2/16/1998	F0	0/0	$111,808	Sixteen mobile homes were damaged, and one was destroyed.
Daytona Beach	2/22/1998	F2	1/3	$5,504,681	This tornado cell caused extensive damage and two deaths throughout Volusia County. In Daytona Beach one person was killed and three others were injured while in a mobile home. In Osteen, a man staying in a recreational vehicle was killed.
Osteen	2/23/1998	F3	1/0	$1,376,170	
Oak Hill	2/23/1998	F2	0/0	$688,085	
Port Orange	7/28/1998	F0	0/0	$137,617	Thirty-three mobile homes were damaged with this F0 tornado.
New Smyrna Beach	9/17/2000	F0	0/0	$13,048	This tornado caused minor damage including power outages and downed signs and trees.
Daytona Beach	3/13/2001	F1	0/5	$6,333,850	This F1 damaged over 100 houses and dozens of vehicles, many due to fallen trees. Five people were injured.

LOCATION	DATE	MAGNITUDE	DEATHS/ INJURIES	PROPERTY DAMAGE	DESCRIPTION
New Smyrna Beach	9/14/2001	F0	0/0	$70,939	This tornado was a result of a rainstorm associated with Tropical Storm Gabriel. Twelve mobile homes were damaged and three were destroyed.
Daytona Beach	8/8/2004	F0	0/0	$0	A waterspout came ashore, blowing branches from trees.
South Daytona	8/13/2004	F1	0/0	$0	This tornado cell was associated with Hurricane Charley. It caused minor damage to homes, commercial buildings, and trees.
Daytona Beach Shores	8/13/2004	F0	0/1	$0	
DeLand	12/25/2006	F2	0/5	$2,731,818	An F2 tornado touched down just west of North Stone Street in DeLand and moved northeast crossing Highway 17. It moved across the Fernwood mobile home community and continued northeast over Meadowlea Estates mobile home community. It lifted just north of Carter Road. Fifty-two residences were destroyed and 162 were damaged. Five people were seriously injured.
Daytona Beach International Airport	12/25/2006	F2	0/6	$54,636,350	The same system that caused fived injuries and damaged 162 homes in DeLand touched down at Daytona Beach International, destroying 40 Embry Riddle University aircraft and the two-story administration building. East of Embry Riddle Aeronautical University, 48 apartments units were destroyed and 200 were damaged.
Beresford	2/2/2007	F3	0/42	$55,166,800	The tornado that killed 13 people in Lake County moved east across the St. Johns River, crossed into Volusia county at Lake Beresford and moved across DeLand as an F3 tornado. It was still moving east northeast at 50 MPH as it damaged 277 and destroyed 106 residences in the DeLand area. There were no fatalities in Volusia County but 42 people were injured.
New Smyrna Beach (Airport)	2/2/2007	F1	0/0	$6,365,400	

LOCATION	DATE	MAGNITUDE	DEATHS/ INJURIES	PROPERTY DAMAGE	DESCRIPTION
Lake George	7/7/2007	F0	0/0	$31,827	Tornado-force winds caused damage to a restaurant and apartment complex.
Port Orange and Ormond Beach	7/24/2009	F0	0/1	$ 2,500,000	This tornado was caused by a sea breeze merger, when winds from both coasts meet and cause the rotation. Although it was classified as the mildest of twisters, it caused damage to 163 homes in Port Orange. Of these, seven were totally destroyed, eight had major damage, and twenty-six had moderate damage. The same system produced a waterspout that came ashore in Ormond Beach, destroying a catamaran.
Edgewater	8/7/2010	F0	0/0	$58,000	A waterspout formed within a thunderstorm over the intracoastal river, then moved onshore the adjacent barrier island in New Smyrna Beach and produced minor damage as it crossed to the Atlantic coast.
Edgewater	8/11/2010	F0	0/0	$5,000	Scattered thunderstorms trained northward near the Florida east-central coast, within a strong southerly flow due in part to the presence of Tropical Depression Five remnants near the central Gulf coast. Around mid-day, a waterspout developed over the intracoastal river and moved onshore the mainland in Edgewater, producing minor damage. Several hours later, another storm developed rotation and produced a brief touchdown in a

LOCATION	DATE	MAGNITUDE	DEATHS/ INJURIES	PROPERTY DAMAGE	DESCRIPTION
					wooded area, farther inland over southern Volusia County.
Glencoe	8/11/2010	F0	0/0	$0	Scattered thunderstorms trained northward near the Florida east-central coast, within a strong southerly flow due in part to the presence of Tropical Depression Five remnants near the central Gulf coast. Around mid-day, a waterspout developed over the intracoastal river and moved onshore the mainland in Edgewater, producing minor damage. Several hours later, another storm developed rotation and produced a brief touchdown in a wooded area, farther inland over southern Volusia County.
Volusia County	12/10/2012	F0	0/0	$1,000	Very moist southwest winds developed across east-central Florida well in advance of a cold front and associated upper level disturbance. Strong daytime heating, combined with moderate low-level wind shear, resulted in numerous strong storms, two of which produced tornadoes. The first tornado began as a waterspout over Lake Apopka, then crossed the northeast shore of the lake and remained on the ground for a short distance. Although the waterspout/tornado affected a rural area, several citizens witnessed the event. The second tornado impacted a mobile home park and adjacent wooded area in Edgewater, then became a waterspout as it crossed the intracoastal river, before moving across the barrier island as a tornado. Significant damage occurred at the mobile home park, with only minor damage on the barrier island. Several funnel clouds were also observed.
Volusia County	12/10/2012	F1	0/2	$1.7 Million	
Edgewater	7/25/2014	F0	N/A	N/A	A tornado struck down in Edgewater at Park Avenue and Wildwood Drive near Massey Air Park at 4:30pm, causing damage to several hangars

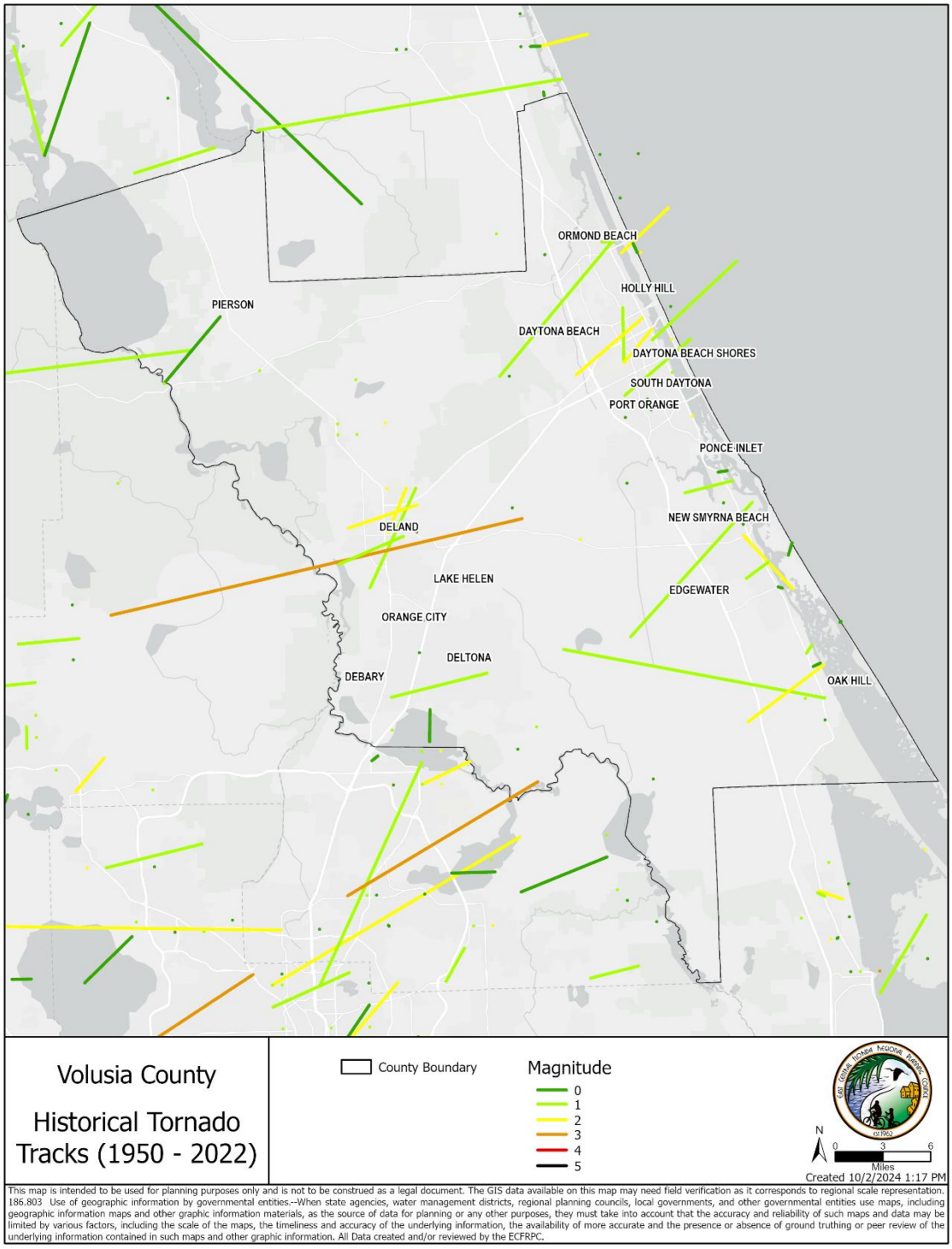
LOCATION	DATE	MAGNITUDE	DEATHS/ INJURIES	PROPERTY DAMAGE	DESCRIPTION
					and planes. Winds reached 65 to 85 mph.
Ormond Beach	9/10/2017	F1	0/0	$0	Associated with Hurricane Irma.
Ariel	6/9/2018	F0	0/0	$10,000	After storms developed over Orlando, they pushed east towards the southeastern Volusia County coastline. One storm managed to produce a very weak, short-lived tornado (land spout) in Oak Hill.
Beresford	01/04/2020	EF1	0/0	$25,000	A severe thunderstorm moving across central Florida produced two tornadoes, one in Okahumpka in Lake County, then another in DeLand in Volusia County.
Enterprise	06/06/2020	EF0	0/0	$0	A waterspout that came onshore and developed into a tornado. Based on this report, along with only minor damage to trees near the lakefront, peak winds were estimated between 45 and 55 mph.
DeLand	08/18/2020	EF2	1/0	$8,010,339	The tornado generally tracked east-northeast across the city resulting in many downed medium to large tree branches, downed power lines, and numerous large trees being uprooted, which led to many local and major roadways being blocked. Many homes and vehicles suffered moderate to major damage as large tree branches or entire trees fell on them. There were 163 damaged structures, with 49 sustaining minor damage, 40 sustaining major damage, and 5 that were destroyed.
Orange City	08/18/2020	EF0	0/0	$40,000	The tornado tracked along a 0.1 mile long path, with maximum winds estimated between 65-75 mph. The tornado had a maximum width of approximately 70 yards.
Isleboro	08/02/2021	EF0	0/0	$0	Based on information provided by the Volusia County Sheriffs Office, a short-lived tornado touched down just west of U.S. Highway 1, near the

LOCATION	DATE	MAGNITUDE	DEATHS/ INJURIES	PROPERTY DAMAGE	DESCRIPTION
					intersection of Sleepy Hollow Road, in New Smyrna Beach. Peak winds are estimated around 55-65 mph.
Coronado Beach	07/22/2023	EF0	0/0	$0	Thunderstorms produced a landspout tornado in Volusia County and a severe wind gust in Brevard County.

Source: National Climatic Data Center

NOTE: ALL HISTORICAL OCCURRENCES IN THIS REPORT ARE THE MOST RECENT AS DOCUMENTED BY THE NATIONAL CLIMATIC DATA CENTER

Section 5: Figure 16: Locations of Historical Tornado Events in Volusia County



Source: National Oceanic and Atmospheric Administration

Probability of Future Occurrences

The probability of a future tornado affecting Volusia County is high. According to historical records, Volusia County experiences, on average, more than one (1.2) confirmed tornado event annually. While many of these events are small in terms of size, intensity and duration, a greater number of stronger storms (i.e., F2 and F3 tornadoes) have been reported in the past decade. Further, even minor tornadoes can cause substantial damage. In conclusion, tornadoes pose a significant threat to lives and property in Volusia County.

The Local Mitigation Strategy recognizes that with a changing climate, there is a potential for an increasing risk of environmental impacts from tornadoes and that future mitigation and adaptation strategies related to this hazard should be considered.

5. TROPICAL CYCLONES

Background

Hurricanes and tropical storms are classified as tropical cyclones and defined as any closed circulation developing around a low-pressure center in which the winds rotate counterclockwise in the Northern Hemisphere (or clockwise in the Southern Hemisphere) and whose diameter averages 10 to 30 miles across. A tropical cyclone refers to any such circulation that develops over tropical waters. Tropical cyclones act as a "safety-valve," limiting the continued build-up of heat and energy in tropical regions by maintaining the atmospheric heat and moisture balance between the tropics and the pole-ward latitudes. The primary damaging forces associated with hurricanes and tropical storms are high-level sustained winds, heavy precipitation, and tornadoes. Coastal areas are also vulnerable to the additional forces of storm surge, wind-driven waves and tidal flooding which can be more destructive than cyclone wind.

The key energy source for a tropical cyclone is the release of latent heat from the condensation of warm water. Their formation requires a low-pressure disturbance, warm sea surface temperature, rotational force from the spinning of the earth and the absence of wind shear in the lowest 50,000 feet of the atmosphere. Many hurricanes and tropical storms form in the Atlantic Ocean, Caribbean Sea, and Gulf of Mexico during the official Atlantic hurricane season, which encompasses the months of June through November. The peak of the Atlantic hurricane season is early to mid-September, and the average number of storms that reach hurricane intensity per year in this basin is about six.

As an incipient hurricane develops, barometric pressure (measured in millibars or inches) at its center falls and winds increase. If the atmospheric and oceanic conditions are favorable, it can intensify into a tropical depression. When maximum sustained winds reach or exceed 39 miles per hour, the system is designated a tropical storm, given a name, and is closely monitored by the National Hurricane Center in Miami, Florida. When sustained winds reach or exceed 74 miles per hour the storm is deemed a hurricane. Hurricane intensity is further classified by the Saffir-Simpson Scale (**Section 5: Table 14**), which rates hurricane intensity on a scale of 1 to 5, with 5 being the most intense[22].

Section 5: Table 14: Saffir-Simpson Scale

CATEGORY	MAXIMUM SUSTAINED WIND SPEED (MPH)	MINIMUM SURFACE PRESSURE (MILLIBARS)	STORM SURGE (FEET)
Tropical Storm	39–73	n/a	0–2
1	74–95	Greater than 980	3–5
2	96–110	979–965	6–8
3	111–129	964–945	9–12
4	130–156	944–920	13–18
5	157 +	Less than 920	19+

Source: National Hurricane Center

The Saffir-Simpson Scale categorizes hurricane intensity linearly based upon maximum sustained winds, barometric pressure and storm surge potential, which are combined to estimate potential damage.

[22] Although a tropical storm is not part of the Saffir-Simpson Scale, it is listed here for comparative purposes.

Categories 3, 4, and 5 are classified "major" hurricanes. Hurricanes within this range comprise only 20 percent of total tropical cyclone landfalls, but they account for over 70 percent of the damage in the United States. **Section 5: Table 15** describes the damage that could be expected for a tropical storm and each category of hurricane. Damage during hurricanes may also result from spawned tornadoes, storm surge and inland flooding associated with heavy rainfall that usually accompanies these storms.

Section 5: Table 15: Hurricane Damage Classifications

STORM CATEGORY	DAMAGE LEVEL	WIND SPEED	DESCRIPTION OF DAMAGES	PHOTO EXAMPLE
Tropical Storm	MINOR	39-73 mph	Breaks twigs and branches off trees, damages signboards, and windows may break.	
1	MINIMAL	74-95 mph	No real damage to building structures. Damage primarily to unanchored mobile homes, shrubbery, and trees. Also, some coastal flooding and minor pier damage.	
2	MODERATE	96-110 mph	Some roofing material, door, and window damage. Considerable damage to vegetation, mobile homes, etc. Flooding damages piers and small craft in unprotected moorings may break their moorings.	
3	EXTENSIVE	111-129 mph	Some structural damage to small residences and utility buildings, with a minor amount of curtainwall failures. Mobile homes are destroyed. Flooding near the coast destroys smaller structures, with larger structures damaged by floating debris. Terrain may be flooded well inland.	
4	EXTREME	130-156 mph	More extensive curtainwall failures with some complete roof structure failure on small residences. Major erosion of beach areas. Terrain may be flooded well inland.	
5	CATASTROPHIC	157+ mph	Complete roof failure on many residences and industrial buildings. Some complete building failures with small utility buildings blown over or away. Flooding causes major damage to lower floors of all structures near the shoreline. Massive evacuation of residential areas may be required.	

Sources: National Hurricane Center; Federal Emergency Management Agency,
Tropical Storm Photo: FEMA/George Armstrong; Other Photos: PBS&J Photo Library

Location and Spatial Extent

Tropical cyclones threaten the entire Atlantic and Gulf seaboard of the United States. Coastal jurisdictions are directly exposed to the brunt of a land-falling storm due to where the hazards occur, but its impact is often felt hundreds of miles inland. Volusia County is susceptible to all the hazards wrought by hurricanes and tropical storms as shown **Section 5 Figure 17**. All areas throughout the county are susceptible to the accompanying hazard effects including extreme wind, flooding, and tornadoes. In addition, the coastal areas of the county are extremely susceptible to the added effects of rising coastal water (storm surge and others), wave action, coastal erosion and tidal flooding[23]. This includes the cities and towns of Ormond Beach, Holly Hill, Daytona Beach, South Daytona, Daytona Beach Shores, Port Orange, Ponce Inlet, New Smyrna Beach, Edgewater and Oak Hill.

The extent of tropical cyclones in terms of strength in Volusia County is consistent when reviewing historical data. Storms hitting the county are primarily in the Tropical Storm to Category 1 range, with winds seldom exceeding 95 miles per hour. A hurricane of any size could impact the entire county.

Historical Occurrences

Section 5: Table 16 provides for each event the date of occurrence, name (if applicable), maximum wind speed (as recorded within 100 miles of Volusia County) and Category of the storm based on the Saffir-Simpson Scale.

The Local Mitigation Strategy recognizes that with a changing climate, there is a potential for an increasing risk of environmental impacts from hurricanes that future mitigation and adaptation strategies related to this hazard should be considered.

[23] Distinct hazard area locations for flooding, rising coastal water, and coastal erosion are discussed elsewhere in this section.

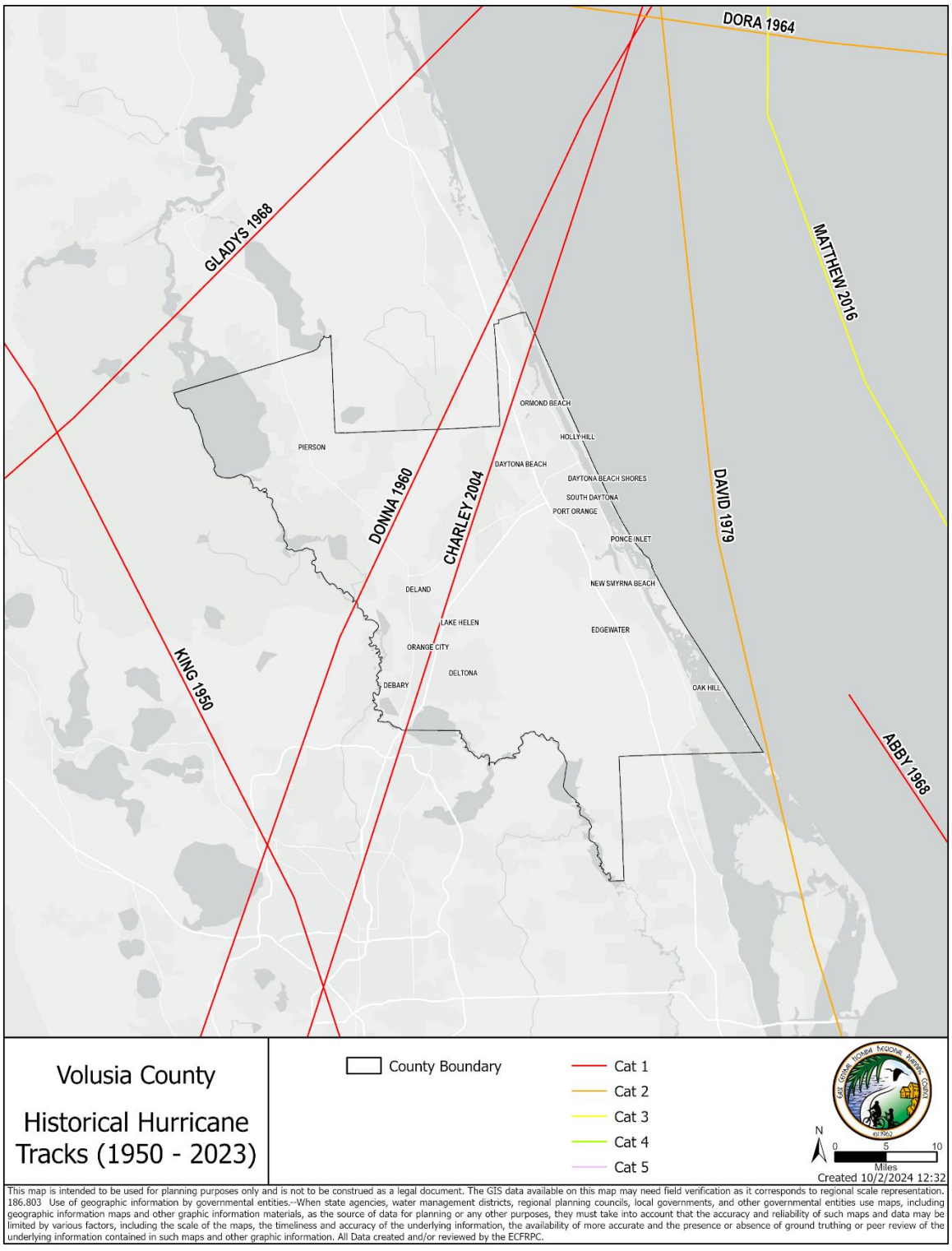
Section 5: Table 16: Historical Storm Tracks within 75 Miles of Volusia County

DATE OF OCCURRENCE	STORM NAME	MAXIMUM WIND SPEED (MPH)	STORM CATEGORY
10/20/1941	Not Named	35	Tropical Storm
10/19/1944	Not Named	65	Category 1 Hurricane
06/24/1945	Not Named	80	Category 1 Hurricane
09/16/1945	Not Named	110	Category 1 Hurricane
10/08/1946	Not Named	40	Tropical Storm
11/02/1946	Not Named	35	Tropical Storm
09/23/1947	Not Named	50	Tropical Storm
08/27/1946	Not Named	130	Category 4 Hurricane
09/06/1950	EASY	85	Category 2 Hurricane
10/18/1950	KING	75	Category 1 Hurricane
10/09/1953	HAZEL	55	Tropical Storm
09/11/1960	DONNA	105	Category 3 Hurricane
08/27/1964	CLEO	75	Category 1 Hurricane
09/10/1964	DORA	100	Category 3 Hurricane
06/04/1968	ABBY	55	Tropical Storm
10/19/1968	GLADYS	70	Category 1 Hurricane
8/20/1976	DOTTIE	45	Tropical Storm
09/03/1979	DAVID	85	Category 2 Hurricane
09/04/1979	DAVID	85	Category 2 Hurricane
08/19/1981	DENNIS	40	Tropical Storm
08/25/1983	BARRY	40	Tropical Storm
09/10/1984	DIANA	60	Tropical Storm
09/28/1984	ISIDORE	45	Tropical Storm
07/24/1985	BOB	60	Tropical Storm
10/10/1985	ISABEL	45	Tropical Storm
08/28/1988	CHRIS	40	Tropical Storm
11/23/1988	KEITH	55	Tropical Storm
11/17/1994	GORDON	55	Tropical Storm
08/02/1995	ERIN	75	Category 1 Hurricane
08/24/1995	JERRY	35	Tropical Storm
10/16/1999	IRENE	65	Category 1 Hurricane
09/14/2001	GABRIELLE	60	Tropical Storm
08/13/2004	CHARLEY	125	Category 4 Hurricane
09/05/2004	FRANCES	80	Category 1 Hurricane
09/26/2004	JEANNE	95	Category 2 Hurricane
10/05/2005	TAMMY	45	Tropical Storm
08/21/2008	FAY	45	Tropical Storm
10/26/2012	SANDY	43	Tropical Storm

DATE OF OCCURRENCE	STORM NAME	MAXIMUM WIND SPEED (MPH)	STORM CATEGORY
06/06/2016	COLIN	45	Tropical Storm
10/06/2016	MATTHEW	84	Category 1 Hurricane
09/10/2016	IRMA	68	Category 1 Hurricane
09/02/2019	DORIAN	45	Tropical Storm
08/03/2020	ISAIAS	69	Tropical Storm
11/12/2020	ETA	50	Tropical Storm
09/29/2022	IAN	69	Tropical Storm
11/10/2022	NICOLE	75	Category 1 Hurricane
08/30/2023	IDALIA	35	Tropical Storm
10/10/2024	MILTON	76	Tropical Storm

Source: National Climatic Data Center & NOAA

Section 5: Figure 17: Historical Storm Tracks within 75 Miles of Volusia County



Source: National Oceanic and Atmospheric Administration

Some of the notable tropical cyclone events that occurred in Volusia County within the last two decades are described below:

Tropical Storm Gordon, 1994: Tropical Storm Gordon made landfall in South Florida on November 13, 1994. Gordon caused a total of 8 deaths, 43 injuries, and $400 million in damages ($605,793,853; 2009 dollars). It affected a number of Florida Counties, including Dade and Brevard, but Volusia was hit especially hard. Volusia County experienced $500,000 in both agricultural and property damage. Single-family, multi-family, and mobile home structures (a total of 1236 units) reported flood damage and losses were estimated at over $26 million.

Hurricane Floyd, 1999: On September 15, 1999, the center of Hurricane Floyd passed about 115 statute miles off the coast of Central Florida, causing substantial damage to the coastal counties of Brevard and Volusia. Winds gusts near 70 miles per hour were reported in both counties. In total, Floyd caused over $61 million in property damage, but there were no reports of deaths or injuries ($81,978,899; 2009 dollars). Over $42 million in damages were reported in Volusia County, $10 million of which was attributed directly to coastal erosion. In addition, over 300 homes were damaged by wind and trees.

Hurricane Irene, 1999: Hurricane Irene reached hurricane status over the Florida Straits and the calm of the center moved over Key West on October 15, 1999. Most of the hurricane force winds were confined to the east of Irene's center over the lower to middle Keys. As Hurricane Irene moved across Southeast Florida, it brought tropical storm conditions with sustained winds between 39 and 73 miles per hour. Hurricane Irene caused considerable damage in South Florida due to flooding. In some residential areas, flooding lasted for a week, displacing several hundred people and isolating thousands more. Volusia County estimated that damages to approximately 185 properties; totaling more than $16.8 million. The total losses (agricultural and property) were estimated near $800 million in of the state of Florida. An estimated 700,000 customers lost electricity. There were eight indirect deaths reported in Florida.

Hurricane Charley, 2004: Hurricane Charley produced wind gusts over 80 miles per hour as it traversed Volusia County on August 13, 2004. The storm caused over $106 million in property damage in Volusia County. In addition, two fatalities were attributed to Hurricane Charley. Widespread power outages, roadway flooding, and fallen trees also occurred. A strong F1 tornado also touched down in South Daytona Beach contributing to the total damage from the event.

Hurricane Frances, 2004: Hurricane Frances, a Category 2 storm, made landfall on September 4, 2004, in Martin County, Florida. As it moved north, Volusia County experienced a hurricane force wind for several hours. Daytona Beach International Airport recorded wind gusts of 94 miles per hour. In addition to wind impacts, over 13 inches of rain fell in Volusia County which caused substantial flooding. Wind and flooding impacts resulted in damages of over $390 million within Volusia County. Total damage estimates for all impacted counties include over $4.8 billion for property damage and $93.2 million for crop damage. Despite widespread and severe damage, no deaths or injuries were reported.

Hurricane Jeanne, 2004: Hurricane Jeanne made landfall on the east coast of Florida on September 26, 2004, with winds estimated at 120 mph. Widespread rainfall of up to eight inches accompanied Hurricane Jeanne as it moved across eastern, central and northern Florida. A narrower band of 11 to 13 inches was observed in the vicinity of the eye wall track over Osceola, Broward and Indian River counties of east central Florida. A storm surge of approximately four feet above normal astronomical tide levels was measured at Trident Pier at Port Canaveral, Florida about an hour after landfall. Storm surge flooding of

up to six feet above normal tides likely occurred along the Florida east coast from the vicinity of Melbourne southward to Ft. Pierce. Damages were estimated to be over $59 million in Volusia County. The American Insurances Service Group reported that Frances caused a total of $4.11 billion in Florida. There were three direct deaths reported in Florida, with total deaths exceeding 3,000.

Tropical Storm Fay, 2008: Moving over Key West, Tropical Storm Fay made its first Florida landfall on August 18, 2008. As the tropical storm drifted north in Volusia County offshore waters, hours of heavy rain fell across southern Volusia County. Tropical Storm Fay's primary impact was inland flooding. Rainfall amounts ranged from three to five inches over Miami-Dade and Broward counties and seven to 10 inches over northern Collier, Hendry and Glades counties near the center path of Fay. Storm surges were relatively minimal for this tropical storm. In Florida, wind damage was confined to mostly downed trees and power lines, plus minor roof damage to homes. Homes, personal property and motor vehicles were the primary damage losses in the United States. Volusia County reported damages in excess of $13.5 million. The total damage estimate, compiled by Property Claim Services, is $245 million, including $195 million in Florida. Flood damage losses reported by the National Flood insurance Program were about $36 million.

Tropical Storm Sandy, 2012: A New Smyrna Beach mesonet site (XNSB) recorded sustained north winds of 43 mph and other spotter reports confirmed tropical storm winds along the immediate coast of Volusia County. Gusts of 50-55 mph occurred, especially during passing squalls. Hurricane Sandy moved slowly northwest, parallel to the Florida Coast, approximately 200-250 miles offshore.

Hurricane Matthew, 2016: Matthew paralleled the Florida coast, remaining just offshore as a Category 3 hurricane. The eye reached its closest point of approach to land, only 25 miles east of Cape Canaveral near 0800LST on October 7, and was 35 miles east of Daytona Beach around 1100LST, as it continued moving northwest, just offshore the northeast Florida coast. Hurricane force winds (sustained or frequent gusts) affected coastal areas from Vero Beach northward, extending inland across the mainland portions of Brevard and Volusia Counties, with tropical storm force winds experienced across much of the remainder of east-central Florida.

Hurricane Irma, 2017: Hurricane Irma made a northerly turn toward Florida on Sunday, September 10. Hurricane Irma had maximum sustained winds of 185 MPH at its peak in the Atlantic Ocean, which maintained for over 35 hours, making it one of the strongest storms on record in the Atlantic basin. Making its second continental U.S. landfall, Irma slowly weakened as it continued north northwestward across north Florida and southwest Georgia through Monday September 11.

Hurricane Dorian, 2019: On September 1, Dorian reached Category 5 intensity, with maximum sustained winds of 185 mph, and a maximum central pressure of 910 mb (26.87 inHg) while making landfall in Elbow Cay, Bahamas. Dorian made another landfall on Grand Bahama several hours later. The ridge of high-pressure steering Dorian westward collapsed on September 2, causing Dorian to stall just north of Grand Bahama for about a day. It is the strongest known system to impact the Bahamas. A combination of cold-water upwelling and an eyewall replacement cycle weakened Dorian to a Category 2 hurricane the next day. On the morning of September 3, Dorian began to move slowly towards the north-northwest.

Hurricane Ian, 2022: After making landfall as a major hurricane in southwest Florida near Cayo Costa, Ian crossed the peninsula and into east central Florida (southern Osceola County) as a Category 1 Hurricane with estimated maximum sustained winds of 75 mph. The system was downgraded to a tropical storm shortly thereafter and emerged into the Atlantic Ocean near Cape Canaveral. Ian's slow movement and

large wind field led to a long period of tropical storm force winds across all east central Florida, as well as hurricane force gusts in squalls and historic rainfall and flooding across parts of the area. Widespread rainfall totals of 4 to 8 inches were reported throughout the area, with a corridor of 10 to 20 inches across Osceola, Orange, Seminole, Volusia, and northern Brevard counties. The maximum observed rainfall total was 21.09 inches in Spruce Creek, Volusia County. The St. Johns River experienced historic rises with record crests set at Astor, DeLand, Sanford, and Lake Harney in the days and weeks following Ian's heavy rainfall. A tornado briefly touched down and crossed US-192 in rural Brevard County with no damage to structures reported. Persistent onshore flow before and during the storm led to water level rises (storm surge) of 1-3 feet along east central Florida, bringing moderate to severe beach erosion, with the most significant effects noted in Volusia County. Collectively, the effects of Hurricane Ian led to 15 storm-related fatalities (6 direct and 9 indirect) and between $800-900M in property damage across east central Florida.

Hurricane Nicole, 2022: Hurricane Nicole made landfall near Vero Beach, Florida as a Category 1 Hurricane on Thursday, November 10, 2023, with estimated maximum sustained winds of 75 mph. The system was originally classified as a subtropical storm after forming several hundred miles east of the Bahamas before it gained tropical characteristics as it approached Grand Bahama and Abaco Island. The interplay between Nicole and an expansive area of high pressure over the eastern United States produced a large wind field of tropical storm force over the western Atlantic, with a long northeast fetch that stretched over 1000 miles. These onshore winds generated very large seas more than 30 feet offshore, which over multiple unusually high tide cycles led to moderate to severe beach erosion across east central Florida. Damage to coastal structures was extensive, particularly across Volusia County where an already weakened shoreline due to Hurricane Ian succumbed to the long-duration high surf event.

Hurricane Helene, 2024: Volusia County began experiencing impacts from Hurricane Helene overnight on September 25 as the storm advanced closer to the Big Bend area. Hurricane Helene’s closest approach to Volusia County occurred on the afternoon of September 26. Volusia County experienced 0.5 to 1.5 inches of rain and wind gusts between 45 to 55 mph. There were no injuries, fatalities, or evacuations and damage consisted of fallen trees and powerlines. Throughout Hurricane Helene, Volusia County had tornado watches, tornado warnings, and wind advisories.

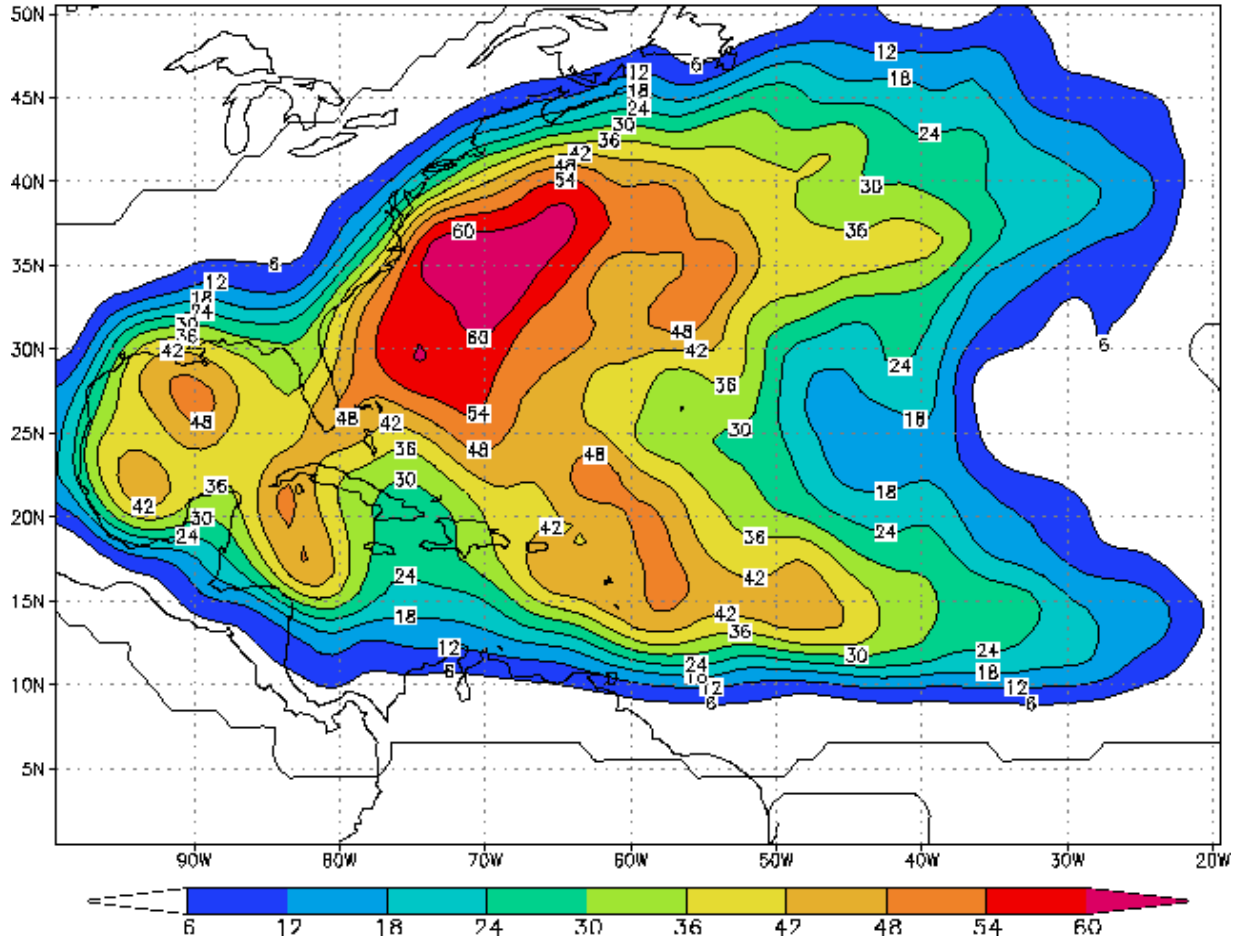
Hurricane Milton, 2024: Volusia County began experiencing impacts from Hurricane Milton on Wednesday, October 09 as the storm advanced closer to the west coast and approached landfall. Hurricane Milton’s closest approach to Volusia County occurred overnight from October 09 to October 10. Volusia County experienced 7 to 17 inches of rain and wind gusts between 50 and 99 mph with one observation near Ponce Inlet recorded at 99 mph. The St. John’s River entered major flood stage at both Astor and DeLand. There were two direct fatalities and two indirect fatalities due to Milton. Damage consisted of downed trees, powerlines, and flooding with many public, residential, and commercial property damages. Throughout Hurricane Milton, Volusia County had tropical storm warnings, hurricane watches, hurricane warnings, tornado watches, tornado warnings, flood watches, flood warnings, and wind advisories

Probability of Future Occurrences

The probability of future hurricanes and tropical storm events for Volusia County is high. According to NOAA statistical data, Volusia County is in an area with an annual probability of a named storm between 36 and 42 percent.

Section 5 Figure 18 below shows for any location what the chance is that a tropical storm or hurricane will affect the area sometime during the Atlantic hurricane season. This illustration was created by NOAA's Hurricane Research Division using data from 1944 to 1999 and counting hits when a storm or hurricane was within approximately 100 miles (165 km) of each location.

Section 5: Figure 18: Empirical Probability of a Named Hurricane or Tropical Storm



Source: National Oceanic and Atmospheric Administration

The probability of storm occurrences will vary significantly based on the return interval for different categories of magnitude. The probability of less intense storms (lower return periods) is higher than more intense storms (higher return periods). The Local Mitigation Strategy recognizes that with a changing climate, there is a potential for an increasing risk of environmental impacts from tropical cyclones and that future mitigation and adaptation strategies related to this hazard should be considered.

5.12 WILDLAND FIRE

Background

A wildfire is any fire occurring in a wildland area (i.e. grassland forest, brush land) except for fire under prescription.[24] Wildland fires are part of the natural management of forest ecosystems but may also be caused by human factors. Nationally, over 80 percent of forest fires are started by negligent human behavior such as smoking in wooded areas or improperly extinguishing campfires. The second most common cause for wildland fire is lightning.

There are three classes of wildland fires: surface, ground and crown fire. A surface fire is the most common of these three classes and burns along the floor of a forest, moving slowly and killing or damaging trees. A ground fire (muck fire) is usually started by lightning or human carelessness and burns on or below the forest floor. Crown fires spread rapidly by wind and move quickly by jumping along the tops of trees. Wildland fires are usually signaled by dense smoke that fills the area for miles around.

Wildfire probability depends on local weather conditions, outdoor activities such as camping, debris burning, and construction, and the degree of public cooperation with fire prevention measures. Drought conditions and other natural hazards (such as tornadoes, hurricanes, etc.) increase the probability of wildland fire by producing fuel in both urban and rural settings. Forest damage from hurricanes and tornadoes may also block interior access roads and fire breaks; pull down overhead power lines, or damage pavement and underground utilities.

Many individual homes and cabins, subdivisions, resorts, recreational areas, organizational camps, businesses and industries are located within high wildfire hazard areas. Further, the increasing demand for outdoor recreation places more people in wild lands during holidays, weekends and vacation periods. Unfortunately, wildland residents and visitors are rarely educated or prepared for wildfire events that can sweep through the brush and timber and destroy property within minutes.

Wildfires can result in severe economic losses as well. Businesses that depend on timber, such as paper mills and lumber companies, often experience losses that are passed on to consumers through higher prices. In some cases, this has resulted in the loss of jobs. The high cost of responding to and recovering from wildfires can deplete state resources and increase insurance rates. The economic impact of wildfires can also be felt in the tourism industry if roads and tourist attractions are closed due to health and safety concerns.

State and local governments can impose fire safety regulations on home sites and developments to help curb wildfire. Land treatment measures such as fire access roads, water storage, helipads, safety zones, buffers, firebreaks, fuel breaks and fuel management can be designed as part of an overall fire defense system to aid in fire control. Fuel management, prescribed burning, and cooperative land management planning can also be encouraged to reduce fire hazards.

[24] Prescription burning, or “controlled burn,” undertaken by land management agencies is the process of igniting fires under selected conditions, in accordance with strict parameters.

Location and Spatial Extent

Volusia County and its jurisdictions are not uniformly exposed to wildland fire risk. Although the county typically receives a high amount of precipitation each year (around 50 inches), there is a risk of wildfire due to the hot, dry summer months. Further, drought and drought-like conditions may occur which could increase the probability of wildfire occurrence.

The wildfire potential for Volusia County is shown in **Section 5: Figure 19**. All areas of the county may be susceptible to wildfire, and the wildland-urban interface is an area of concern as more property may be at risk of fire damage in these areas. This hazard occurs in the southern, western, and central parts of the county most likely; although, there are pockets of wildland fire locations dispersed across the county.

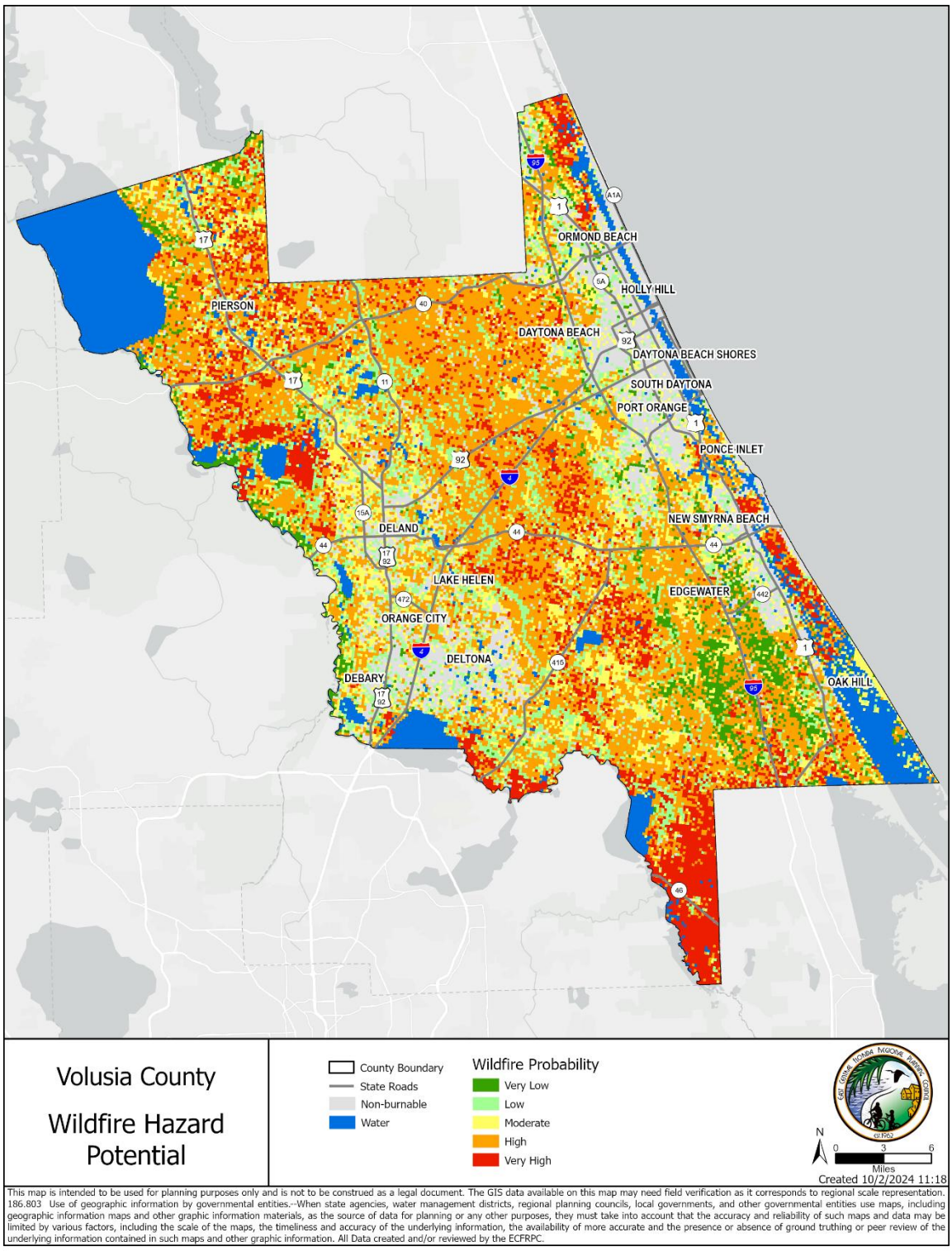
The extent of fire weather can be determined in two ways. A Fire Weather Watch is issued to alert fire officials and firefighters of potentially dangerous fire weather conditions within the next 24 to 36 hours. They are issued when the following three criteria are met:

1. Surface relative humidity (RH) less than 30 % for VA and MD; RH less than or equal to 25% for WV AND
2. Sustained surface wind of 20 MPH or greater AND
3. 10-hour fuel moisture less than 8% for VA; less than or equal to 8% for MD and WV

A Red Flag Warning is issued to alert fire officials and firefighters of potentially dangerous fire weather conditions within the next 12 to 24 hours. They are issued when the following three criteria are met:

1. Surface relative humidity (RH) less than 30 % for VA and MD; RH less than or equal to 25% for WV AND
2. Sustained surface wind of 20 MPH or greater AND
3. 10-hour fuel moisture less than 8% for VA; less than or equal to 8% for MD and WV

Section 5: Figure 19: Wildland Fire Risk in Volusia County



Source: U.S. Forest Service

Historical Occurrences

According to the Florida Division of Forestry, Florida experiences an average of 3,060 wildfires annually, burning nearly 154,000 acres[25]. The most common cause of Florida wildfire events is lightning which ignited over 700 fires annually between 2000 and 2009. Volusia County experienced 1,306 fires that burned over 22,600 acres between January 2000 and August 2009. Lightning caused nearly half of these fires. **Section 5: Table 17** lists the number of reported wildfire occurrences in Volusia County between the years 2001 and 2018.

Section 5: Table 17: Historical Wildfire Occurrences in Volusia County (2001-2018)

YEAR	2001	2002	2003	2004	2005	2006	2007	2008	2009	Annual Average
# of Fires	116	31	71	145	64	213	195	121	127	120
Acres Burned	383	371	2,011	746	198	5,037	1,826	1,482	8,839	2,321
YEAR	2010	2011	2012	2013	2014	2015	2016	2017	2018	Annual Average
# of Fires	128	237	208	104	74	104	174	132	TBD	145
Acres Burned	672	8,952	3,832	1,404	626	788	1,421	1,150	TBD	2,355

Source: Florida State Fire Marshal Report

It should also be noted that 1998 was a particularly significant year for wildland fires in Volusia County. That year, drought conditions were prevalent throughout the County. A total of 233 wildfires were reported, the largest single cause being lightning. In all, over 163,000 acres were burned. The fires threatened 29,000 homes and hindered travel as wildfires jumped highways. However, after weeks of burning, just six houses, one mobile home, and two businesses were destroyed, totaling $2.1 million ($2,889,598; 2009 dollars). Timber, conversely, took the brunt of the damage with losses of over $60 million ($85,570,222; 2009 dollars). No fatalities or civilian injuries were reported but ten firefighters did have minor injuries.

These events have had devastating impacts on Volusia County. Homes and businesses have been damaged or destroyed, causing economic and social hardship, while several agricultural resources (such as timber, as described above) have been lost in these events. Families and vulnerable populations can be displaced temporarily or permanently by these events, while businesses can be lost forever. Human life is also at great risk to fires, as fires can quickly consume buildings and prevent escape. Smoke inhalation is a common cause of death due to fire, rather than the fire itself. Updating and enforcing building codes can help prevent fire disasters.

One of the largest fires recorded in Volusia County over the last decade was the Iron Horse Fire, which occurred in 2011 in southeastern Volusia County. Approximately 17,000 acres burned during this event, and a full Fire Operations Center (FOC) activation was executed. One mobile home, three outbuildings and three camp structures were destroyed, while 140 total structures were threatened. Interstate 95 was completely shut down due to smoke limiting driver visibility (intermittently over a two-day period), and a firefighter was injured during the event. Also, in 2011, the Maytown Road Fire burned approximately

[25] Average information based on information between January 2000 and August 2009.

2,500 acres of land and affected local weather conditions by increasing cloud coverage. In 2012, several smaller fires affected the DeLand and DeBary areas of Volusia County.

In March 2013, the Durrance Road Fire destroyed 1,100 acres and forced evacuations of unincorporated areas of Volusia County near the Flagler County line west of Interstate 95. Approximately 300 homes were evacuated during this event. Interstate 95 from US1 to SR40 was shut down due to smoke.

Probability of Future Occurrences

There is a high probability of future wildfire events in Volusia County, especially during drought cycles and abnormally dry conditions, based on prior occurrence. Volusia County experienced nearly 130 wildfires per year from 2000 – 2008. As development continues to grow, there is an increasing chance for wildfires to reach the urban interface. This will increase the probability of economic loss and fatalities.

The Local Mitigation Strategy recognizes that with a changing climate, there is a potential for an increasing risk of environmental impacts from wildfire and that future mitigation and adaptation strategies related to this hazard should be considered.

MANMADE HAZARDS

5.13 CIVIL DISTURBANCE

Background

Civil disturbances can occur due to socio-economic, political or other reasons. Events of civil disturbances can be classified as armed violence, riots, protests, and threats against the military or the government. The proper planning and prevention methods aid in the mitigation of such events. For threats of civil disturbance utilizing armed violence, it is likely that joint jurisdictional management of operations will take effect, coordinated at the county level between the Sheriff's Office, Florida Department of Law Enforcement (FDLE), and the Office of Emergency Management. These types of events typically occur in public places.

According to FEMA, civil disturbance is an activity such as a demonstration, riot, or strike that disrupts a community, and requires intervention to maintain public safety and order. Most protestors are law abiding citizens who intend their protest to be nonviolent. However, sometimes these situations become highly emotional and tense and can turn a peaceful crowd into a violent riot. Most crowds are orderly, nonviolent, and do not cause problems for authorities, but there are three types of crowds that can create a civil disturbance:

- **Public Disorder**: the basic breach of civic order, meaning the crowd tends to disrupt the normal flow of operations around them, such as traffic
- **Public Disturbance**: a demonstration that is designed to cause turmoil and disruption. These crowds chant, yell, and sing to voice collective opinions
- **Riot**: when a disturbance turns violent. The crowd suddenly becomes a mob that violently expresses itself by destroying property, assaulting others, and creating an extremely volatile environment

Location and Spatial Extent

Civil disturbances tend to occur in urban areas but can occur anywhere. These types of events typically occur in public gathering places, including court houses or civic spaces. While the spatial extent of the hazard would be 25% or less, civil disturbances could have county-wide effects.

Historical Occurrences

Civil Disturbances have been occurring since the beginning of time. There are several examples of civil disturbances in Florida in recent years. Some significant events that have impacted Central Florida and Volusia County through racially charged protests are outlined.

- **2012**: Trayvon Martin's death in Sanford, Florida. There were public protests, school walk outs, and thousands of planned rallies across the nation.
- **2020**: George Floyd's death in Minneapolis, Minnesota; Breonna Taylor's death in Louisville, Kentucky; Ahmaud Arbery's death in Brunswick, Georgia.
- **2021**: Othal Wallace's arrest for the death of Daytona Beach police officer.

Probability of Future Occurrences

It is likely that occurrences of civil disturbance will continue in the future. There have been several in Florida in previous years and protesting is a fundamental right protected by the US Constitution; therefore, civil disturbances will continue into the future.

5.14 MASS MIGRATION

Background

Mass-migration occurs when people of one geographic area move in large numbers to another geographic location. According to United States Code Title 8, Chapter 12 (8 U.S.C. § 1101), the definition of mass migration is a migration of undocumented aliens that is of such magnitude and duration that it poses a threat to the national security of the United States.

This usually refers to an event, or series of events, that may take place over the course of several years or even decades. The event could be economic, social, or political in nature but it is something that causes a mass exodus.

Location and Spatial Extent

There are no particular geographic areas in Volusia County with a more ideal jurisdiction for this hazard to take effect. Volusia County contains the intersection of the state's two busiest highway systems, I-95 and Interstate 4 (I-4). Because Volusia County is the intersection of these two major state transportation networks, people traveling from any direction of the state might travel to or through the area as refugees. The county also contains State Road A1A (SR A1A) which runs north and south through the entire county. Florida's proximity to the Caribbean basin makes it a vulnerable point of entry for a massive influx of refugees entering the United States. The spatial extent of this hazard would affect less than 25% of the geographical area.

Historical Occurrences

The United States has often been seen as a golden refuge for many immigrants, especially those in poor economic circumstances. Major policy changes can be a driving cause for mass migration. Since 1995, the "wet-foot, dry-foot" policy has allowed Cubans who reach American soil a fast-tracked path to citizenship. The policy was reversed by Former President Barak Obama in 2016, making the Cuban immigration process the same as any other immigrant. President Donald Trump's first administration took a strict stance on immigration, leading many Cubans to flock to America before he took office. The U.S. recorded increased Cuban Refugees from 2015 and 2016. According to the US Coast Guard, 7,358 Cubans tried to enter the U.S. illegally in the 2015-2016 fiscal year and were intercepted. Meanwhile 50,082 Cubans managed to enter (38,310 illegally and 11,772 with visas) in that same period.

Section 5: Table 18: Mass Migration Occurrences

Year	Description
2010	January – Operation Haiti Relief after an earthquake brought displaced and some injured people through Orlando Sanford International Airport.
2017	Hurricane Maria – mass migration of evacuees from the island of Puerto Rico to the Central Florida area after the hurricane. Over 250 families resettled in Seminole County and over 6,500 in Central Florida.
2024	March of 2024, overwhelming gang violence and the overthrow of the Haitian government caused mass evacuations of American citizens from Haiti back to the United States.

While Florida typically has a fast-growing population, many local municipalities are facing pressures from the booming population moving legally from other parts of the country in recent years. In the post-World War II era after 1946, Florida's percentage increase in population each year fluctuated but has always been positive. Between 2010 and 2020, national growth dipped from 0.9% to 0.5% each year while Florida's increases ranged from 1.0% to 2.0%. In 2022, Florida's growth was nearing 1.9%, not high compared to past gains but still the fastest among the states.

Probability of Future Occurrences

It is possible that any Florida county could be impacted by refugees and migrants. Florida is in proximity to islands such as Cuba, Puerto Rico, Dominican Republic and Haiti, and the Gulf Coast is within proximity of Mexico. Mass migration can also occur domestically due to an impending hazard causing large groups of citizens to head north or inland to other counties to evacuate. The probability of a migration influx in Florida is perceived to be high, and planning must be done to ensure safety and security. As political unrest and large-scale natural disasters continue to increase within the Caribbean and South American regions, people will continue to migrate throughout Florida.

The overall vulnerability of mass migration and repatriation in Volusia County and its jurisdictions is low. While lack of housing and community resources could be a concern with mass migration, due to the low probability and lack of physical impacts, Volusia County is not extremely vulnerable to this hazard. Each jurisdiction is equally vulnerable to this possibility.

5.15 TERRORISM

Background

Terrorism includes any attempt to attack, cripple or damage public goods, public infrastructure or citizens on a large scale. Volusia County should be prepared for a terrorist-related event that could occur with or without notice. Since terrorism can take many different forms, including weapons of mass destruction, and be directed at many kinds of targets, it poses some very complex, technical problems in planning and response. **Section 5: Table 19** displays the types of terrorism Volusia County is susceptible to.

Section 5: Table 19: Types of Possible Terrorism

Types of Terrorism	Description
Agro-Terrorism	The deliberate introduction of disease-causing organisms and chemicals into the food supply through agriculture. It could impact the public if crops or agricultural foods contaminated with disease-causing organisms were to enter the food chain. The secondary effects of which can be disease, famine and massive economic loss.
Cyber Terrorism	Unlawful attacks and threats of attack against computers, networks, and the information stored therein; and used to intimidate or coerce a government or its people in furtherance of political or social objectives.
Domestic Terrorism	Violent, criminal acts committed by individuals and/or groups to further ideological goals stemming from domestic influences, such as those of a political, religious, social, racial, or environmental nature.
International Terrorism	Violent, criminal acts committed by individuals and/or groups who are inspired by, or associated with, designated foreign terrorist organizations or nations (state-sponsored).

Location and Spatial Extent

Violent events can happen at any time at any place. Terrorism can be targeted at large gatherings, such as concerts or shopping malls, as has been seen in previous occurrences across the country. Event centers like the Daytona Beach Speedway and the Daytona Beach Ocean Center are indicated locations. But because terrorism thrives on fear, places such as community spaces, civic buildings, or historical monuments need additional precautions. A terrorist attack would most likely be very localized and isolated and impact less than 25% of the geographic area of the County, however effects could be county-wide.

Historical Occurrences

The nation as a whole has been affected by various acts of terrorism. Cyber terrorism is becoming an increasing threat, and residents are particularly vulnerable to subtle attacks such as credit card fraud. **Section 5: Table 20** outlines two major acts of terrorism.

Section 5: Table 20: Historical Occurrences of Terrorism

Year	Description
2016	At 2:00 AM on June 12, 2016, an active shooter walked into Pulse Nightclub in Downtown Orlando, FL, and opened fire into the crowd of approximately 300 people. One hundred two (102) people were directly impacted as 49 people were killed and 53 were injured. Another five people had non–gunshot related injuries. The attack began as an active shooter incident, transitioned into a hostage situation, and ended around 5:15 AM. It was one of the deadliest terrorist attacks in the United States since September 11, 2001. With assistance from various agencies and organizations around the area, victims were evacuated and transported.
2023	ABB (a leading technology electrification and automation company that works with public and private organizations) determined that an unauthorized third-party accessed the company's systems. Black Basta ransomware was deployed that shut down business operations. The company was forced to terminate VPN connections with various customers to prevent the spread of the ransomware to other networks.

Probability of Future Occurrences

Any community can be impacted by terrorism. Each year domestic terrorism increases across the country and becomes more deadly. There are no discernable patterns or methods to indicate the probability of future occurrence. Because terrorist attacks can take many forms and include many types of weapons, it is difficult to reduce the county's overall vulnerability to these incidents. First response agencies attempt to reduce vulnerability through prevention tactics and intelligence sharing. No jurisdiction in Volusia County is more vulnerable to attack than another.

TECHNOLOGICAL HAZARDS

5.16 COASTAL OIL SPILL

Background

Coastal oil spills pose a threat to human health and safety and frequently result in significant impacts to natural and cultural resources. Thousands of oil spills occur in U.S. waters each year. Most of these spills are small (e.g., oil spills while refueling ships), but these spills can still cause harm, especially if they happen in sensitive environments, like beaches, mangroves, and wetlands. Large oil spills are major and dangerous disasters. This tends to happen when pipelines break, big oil tanker ships sink, or drilling operations fail. Consequences to ecosystems and economies can be felt for decades following a large oil spill.

An oil spill is the release of liquid petroleum hydrocarbon into the environment, especially marine areas, due to human activity. The term is usually applied to marine oil spills, where oil is released into the ocean or coastal waters, but spills may also occur on land.

Location and Spatial Extent

Oil spills can happen anywhere oil is drilled, transported, or used. While oil spills would primarily affect the Gulf coast of Florida, oil spills can negatively affect tourism and ecological conditions on the Atlantic coast of Florida. The location of these incidents would be located within these large bodies of water.

Historical Occurrences

In 2010, an explosion occurred on the Deepwater Horizon drilling platform in the Gulf of Mexico. The explosion, which killed 11 men, caused the rig to sink and started a catastrophic oil leak from the well. The spill took three months to cap and approximately 134 million gallons of oil spilled into the Gulf, becoming the largest offshore oil spill in U.S. history. The economic impacts to commercial and recreational fishing for the period between 2010–2020 are a loss of roughly 24,000 job-years, $2.1 billion in industry output, $1.1 billion in total value-added or Gross Regional Product, $650 million in labor income, $140 million in state and local tax revenues, and $160 million in federal tax revenues. In addition, The Deepwater Horizon spill resulted in the largest natural resource damage assessment ever undertaken. The parties responsible owed a record-setting settlement with BP Exploration & Production for an unprecedented $5.5 billion Clean Water Act penalty and up to $8.8 billion in natural resource damages.

Although this incident did not happen in Volusia County, it severely impacted the state of Florida because the spill took place off the shore of Louisiana and impacted the Gulf of Mexico which runs along Florida's west coast. The economic condition of the county could be seriously impacted by a coastal oil spill event. During the Deepwater Horizon oil spill, tourism in Volusia County suffered since people thought all of Florida was impacted. In the event of another spill, the charter fishing industry would likely be devastated. If a coastal oil spill were to occur in Volusia County, tourism would greatly decrease, and tax revenue would be severely impacted.

Probability of Future Occurrences

Although there are no documented major oil refineries in the central Florida region, there are thousands in the Gulf of Mexico. The likelihood of a coastal oil spill directly impacting Volusia County is low, but any ships transporting oil in the Atlantic Ocean pose a threat.

5.17 CRITICAL INFRASTRUCTURE FAILURE

Background

Critical infrastructure failures refer to the disruption of public utility services such as drinking water, stormwater and wastewater collection/treatment, electric power, transportation, supply chains systems that support food and fuel, and communications. These services contribute to the economic well-being and public health and safety of the communities they serve. A critical infrastructure failure can occur from a cascading emergency such as terrorism or a hurricane.

Widespread power outages can occur without warning. Generally warning times will be short in the case of technological failure, such as a fire at a sub-station, traffic accident, human error, or terrorist attack. In cases where a power failure is caused by natural hazards, greater warning time is possible. For example, high wind events such as tornados and hurricanes often cause widespread power failure and are often forecasted before they affect a community so that residents can prepare.

The Federal Highway Administration's (FHWA) 2000 Traffic Incident Management Handbook defines a major traffic disturbance as "any non-recurring event that causes a reduction of roadway capacity or an abnormal increase in demand". Under this definition, events such as traffic crashes, disabled vehicles, spilled cargo, highway maintenance, reconstruction projects, and special non-emergency events (e.g., ball games, concerts, or any other event that significantly affects roadway operations) are classified as an incident.

Location and Spatial Extent

All of Volusia County is at risk of critical infrastructure failure as there are numerous facilities throughout the county, making a direct location difficult to identify. Locations could range from traffic light intersections to wastewater facilities. Impacts from disruption could impact more than 50% of the county, but most likely would have county-wide effects. Critical infrastructure failures are usually localized and are usually the result of a natural hazard event involving flooding or high winds, like hurricanes. A major transportation incident would mostly involve a highway or roadway, but the county's airports and proximity to major water systems poses a threat to an incident taking place.

Historical Occurrences

Many critical infrastructure failures resulted as a cascading impact from a natural hazard, such as a hurricane. As recently as October 2024, Hurricane Milton swept through Florida and resulted in more than 3.2 million power losses. 77% of all homes and businesses in the combined Volusia County/Flagler County area, according to newly revised numbers from the Florida Public Service Commission. At least 305,152 customers lost power out of the 395,582 total served in the two-county area.

In May 2024, the strongest geomagnetic storm in twenty years hit Earth causing disruptions to power grids, broadband technology, and GPS satellites in space.

Probability of Future Occurrences

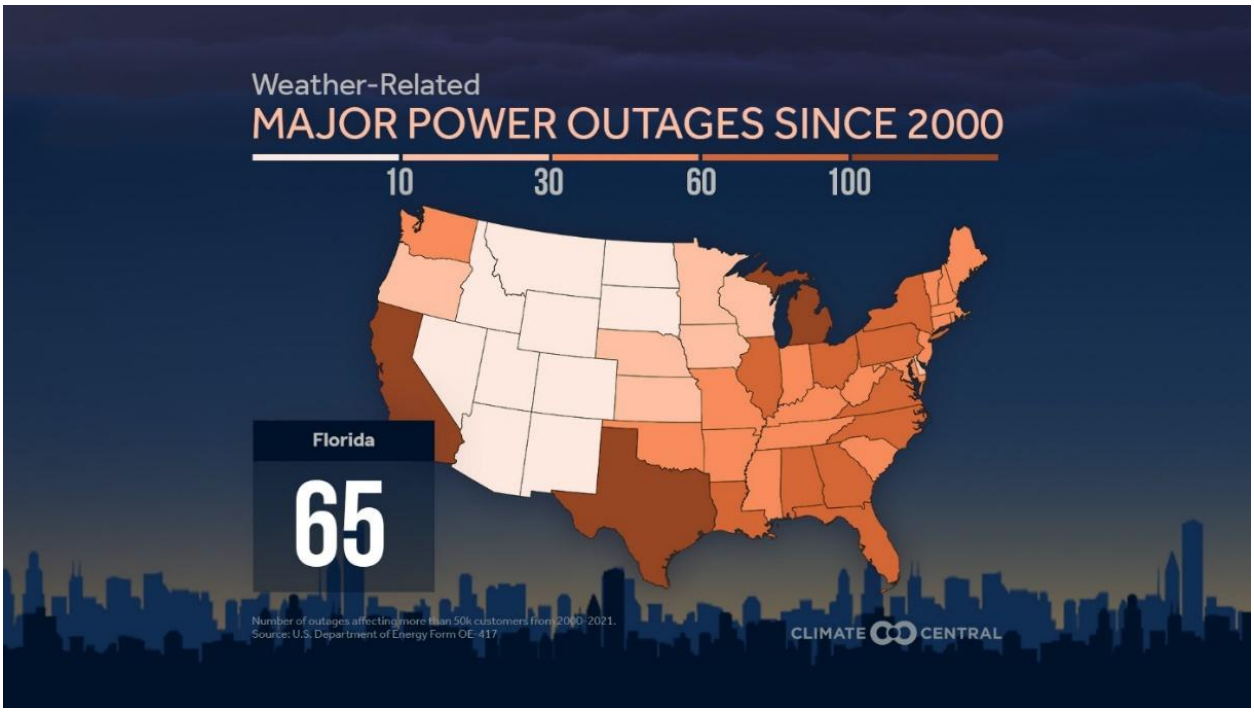
While the probability of future utility service disruption in Volusia County is difficult to predict, past outages indicate that significant failures have and will occur because of natural hazards, technological

failures, and outdated utility infrastructure. As infrastructure ages beyond its intended lifespan, it is likely to become less reliable and lead to higher likelihoods of failure.

In addition, climate change may also impact the probability of utility failure occurrences because of an increase in the frequency and intensity of severe weather events. Storms with high winds will increase the chance that the power-related infrastructure will be impacted. Extreme temperatures are predicted to have an impact as well. During the hot summer months, the potential for power overload will grow as demand for power increases due to air conditioning units having to work harder. Extreme heat can also lead to transformer failures because the electric distribution equipment does not have the opportunity to cool sufficiently between periods of heavy use, leading to blackouts. **Section 5 Figure 20** displays the number of weather-related major power outages since 2000.

The power grid is essential, yet vulnerable. Florida is the third-largest electricity consumer in the nation. Disruptions can be minimized by providing a diverse set of utility service sources. If a particular system fails or is attacked, alternative sources can minimize impacts and provide the support to get operations back to normal.

Section 5: Figure 20: Weather-Related Major Power Outages Since 2000



Source: Climate Central[26]

[26] https://www.climatecentral.org/graphic/surging-weather-related-power-outages?graphicSet=Weather-related+Outages+by+State&location=Florida&lang=en on December 26, 2024

As population continues to rise in the area and the need for transportation increases, accidents will continue to rise. While most are expected to be minor, the possibility of a major event increases. Automobiles pose the most risk, but other examples include:

- **Aviation**: Volusia County has numerous airports throughout the county which present the possibility of traffic disruptions in the event of an aviation-related crash. General aviation aircraft pass over the county en-route to and from Daytona, Orlando, Sanford, Jacksonville, and other small airports located around Volusia County.
- **Marine**: The county is located on the Atlantic Ocean, Halifax River, Indian River Lagoon, and Mosquito Lagoon which provides traffic on water transportation routes. The Tomoka River and other local waterways consists of mostly recreational/sports activities.

5.18 HAZMAT / INDUSTRIAL INCIDENT

Background

Hazardous material (HazMat)/industrial incidents include events when liquid, solid or gaseous chemicals that are harmful or fatal to humans or ecological infrastructure are dispersed. HazMat events occur when liquid, solid, gaseous chemicals, or a combination of all three (which may include dust, fumes, gas, vapor, mist, and smoke)—diffuse into the environment and become harmful or fatal to humans, infrastructure, or ecosystems.

Hazardous waste is dangerous, and can be ignited, corrosive, reactive, or toxic. Paint products, pool chemicals, household cleaners, and pesticides are common examples, but can also include toxic chemicals, fuels, nuclear waste products, biological, chemical, and radiological agents.

Location and Spatial Extent

There are numerous facilities and plants throughout the county that hold hazardous material. This includes residential and commercial swimming pools that keep dangerous chemicals (liquid, powdered, and gas chlorine, acids, etc.). These chemicals are stored in bulk in several retail stores throughout the county. Chemicals are also used in water and wastewater treatment facilities in Volusia County. Additional threats are created by the transportation of hazardous materials on I-95 and other roadways. The Florida East Coast Railway also runs through the eastern part of the county, which transports hazardous materials along Florida's east coast. **Section 5 Figure 21** displays the variety of locations this hazard can occur at, ranging from waterway systems to major traffic corridors.

Any hazardous material accident would have very localized impacts and would account for less than 25% of the county's geographic area.

Historical Occurrences

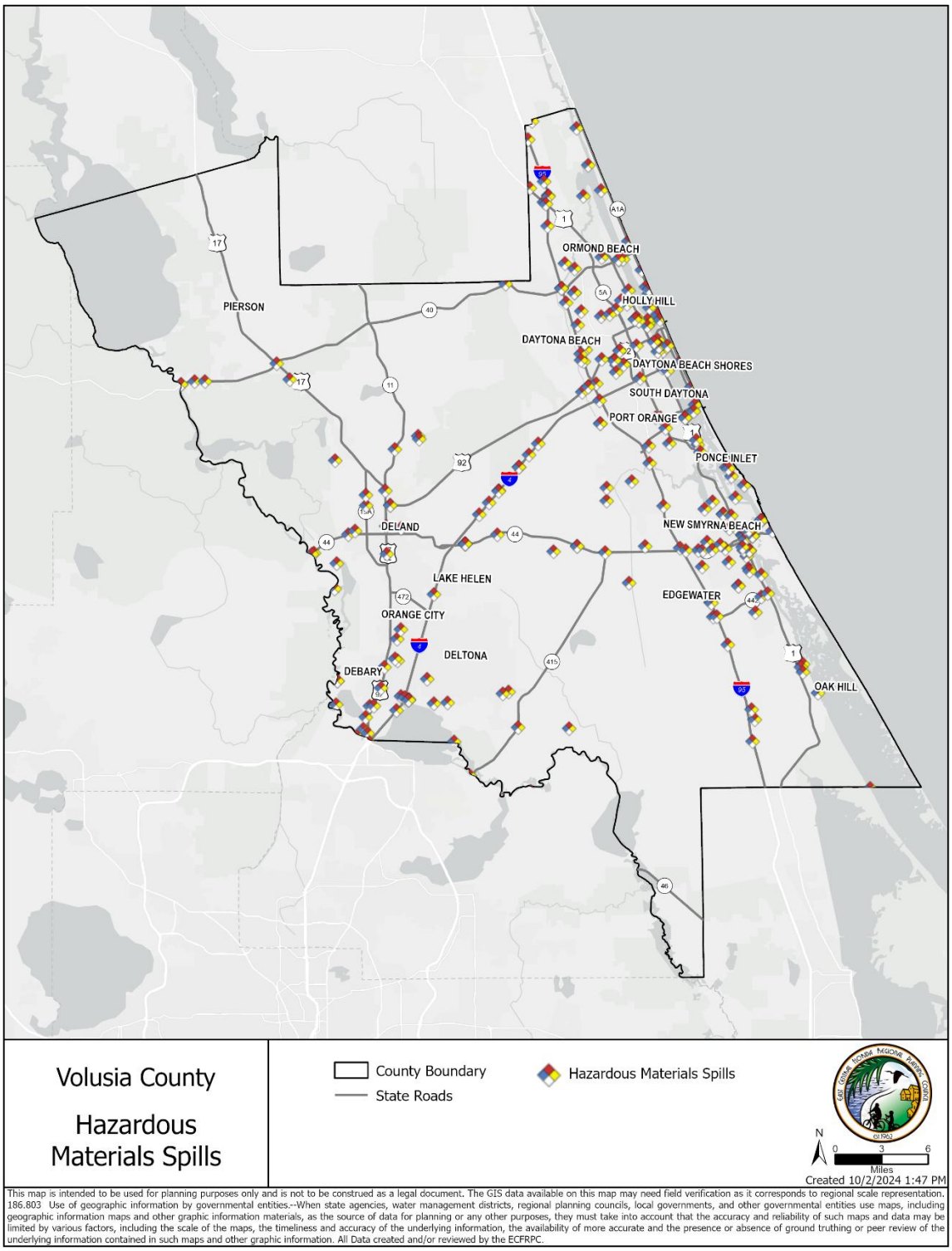
Section 5 Figure 21 displays recent HazMat incidents in the county. In Ormond Beach on September 7th, 2018, a toxic industrial chemical, Sodium Hypochlorite, was accidentally released from an aboveground tank into a nearby storm drain. A city employee reported that 1,484 gallons of 7% chlorine was released and that the drain discharged into the Halifax River. A dechlorinator was added to the storm drain as part of the cleanup effort.

As recently as May 10, 2022, a citizen reported a possible HazMat issue just south of the Granada Bridge. The citizen reported that approximately two-dozen old, abandoned boats were leaking oil and fuel into the Indian River Lagoon and Halifax River. The boats have been abandoned in this location for 3 to 4 years. This was classified as a petroleum spill and oil release, and although major waterways were affected, no cleanup actions were reported.

Probability of Future Occurrences

It is likely that HazMat incidents will continue, whether they are reported or not.

Section 5: Figure 21: Hazardous Spill in County 2019-2024



Source: FDEP

5.18 CONCLUSIONS ON HAZARD RISK

The hazard profiles presented in this section were developed using best available data and result in what may be considered principally a qualitative assessment as recommended by FEMA in its "How-to" guidance document titled *Understanding Your Risks: Identifying Hazards and Estimating Losses* (FEMA Publication 386-2). It relies heavily on historical and anecdotal data, stakeholder input, and professional and experienced judgment regarding observed and/or anticipated hazard impacts. It also carefully considers the findings in other relevant plans, studies and technical reports.

Hazard Risk Scoring

Volusia County threats and hazards are scored using the Calculation and Rating Score Development (CPRI). Frequency (probability), impact (magnitude/severity), warning time, and duration are the main factors used to assign a score to every hazard. To provide a comprehensive assessment of each hazard, the hazards were scored based on several vulnerability factors including area(s) of impact, health and safety of the population, property, environment, and economic vulnerability. Each of these factors, considered magnitude/severity, has been assigned a number between one and four, based on risk, with four being the greatest. The values then were summed and multiplied by the probability of occurrence factor, which is also a one to four scale. Warning time and duration of each hazard are also considered and factored into the scoring. The resulting value is a risk rating for each hazard. **Section 5: Table 21** provides the CPRI scoring categories and rating system. Further, the Vulnerability Assessment (Section 6) also provides information on hazard vulnerability at the jurisdictional level.

CPRI Calculation and Rating Score Development

CPRI = [(Probability X .45) + (Magnitude X .30) + (Warning Time X .15) + (Duration X .10)]

Section 5: Table 21: CPRI Scoring Categories

CPRI CATEGORY	DEGREE OF RISK			ASSIGNED WEIGHTING FACTOR
	LEVEL ID	DECRIPTION	INDEX VALUE	
Frequency (Probability)	Highly Likely	• Common events with a well-documented history of occurrence. • Annual probability is greater than 1.	4	45%
	Likely	• Frequent occurrences with at least two or more documented historical events. • Annual probability is between 1 and 0.1.	3	
	Possible	• Infrequent occurrences with at least one documented or anecdotal historic event. • Annual probability is between 0.1 and 0.01.	2	
	Unlikely	• Rare with no documented history of occurrences or events. • Annual probability of less than 0.01.	1	
Magnitude / Severity	Catastrophic	• Severe property damages (greater than 50% of critical and non-critical facilities and infrastructure). • Injuries or illnesses result in permanent disability and multiple deaths. • Shut down of critical facilities for more than 1 month.	4	30%
	Critical	• Moderate property damages (greater than 25% and less than 50% of critical and non-critical facilities and infrastructure). • Injuries or illnesses result in permanent disability and at least 1 death. • Shut down of critical facilities for more than 1 week and less than 1 month.	3	
	Limited	• Slight property damages (greater than 5% and less than 25% of critical and non-critical facilities and infrastructure). • Injuries or illnesses do not result in permanent disability and there are no deaths. • Moderate quality of life lost. • Shut down of critical facilities for more than 1 day and less than 1 week.	2	
	Negligible	• Negligible property damage (less than 5% of critical and non-critical facilities and infrastructure).	1	

		• Injuries or illnesses are treatable with first aid and there are no deaths. • Negligible quality of life lost. • Shut down of critical facilities for less than 24 hours.		
Warning Time	Less than 6 hours	Self-explanatory.	4	15%
	6 to 12 hours	Self-explanatory.	3	
	12 to 24 hours	Self-explanatory.	2	
	More than 24 hours	Self-explanatory.	1	
Duration	More than 1 week	Self-explanatory.	4	10%
	Less than 1 week	Self-explanatory.	3	
	Less than 1 day	Self-explanatory.	2	
	Less than 6 hours	Self-explanatory.	1	

Final Determinations

The conclusions drawn from the hazard profiling process for Volusia County resulted in the classification of risk for each identified hazard according to three categories: High, Moderate and Low Risk. For the purposes of these classifications, risk is expressed in relative terms according to the estimated impact that a hazard will have on human life and property throughout all of Volusia County. A more quantitative analysis to estimate potential dollar losses for each hazard has been performed separately and is described in the *Vulnerability Assessment* section.

It should be noted that although some hazards are classified below as posing low risk, their occurrence of varying or unprecedented magnitudes is still possible in some cases and their assigned classification will continue to be evaluated during future updates.

Hazard	Probability				Magnitude/Severity				Warning Time				Duration				CPRI Score
	Unlikely	Possibly	Likely	Highly Likely	Negligible	Limited	Critical	Catastrophic	< 6 hours	6 - 12 hours	12 - 24 hours	> 24 hours	< 6 hours	< 24 hours	< 1 week	> 1 week	
NATURAL HAZARDS																	
AGRICULTURE	X				X					X						X	1.6
COASTAL EROSION				X			X					X				X	3.25
DROUGHT			X				X					X			X		2.7
EXTREME TEMPERATURES			X				X					X			X		2.7
FLOOD				X				X				X			X		3.45
PUBLIC HEALTH EMERGENCIES		X				X				X						X	2.35
RISING COASTAL WATER				X				X				X			X		3.75
SEVERE WEATHER				X		X			X				X				3.1
TORNADO			X				X		X				X				2.95
TROPICAL CYCLONES				X				X				X			X		3.45
WILDLAND FIRE			X			X			X						X		2.85
MANMADE HAZARDS																	
CIVIL DISTRUBANCE		X			X					X				X			1.85
MASS MIGRATION		X				X				X						X	2.35
TERRORISM		X					X		X					X			2.6
TECHNOLOGICAL HAZARDS																	
COASTAL OIL SPILL	X					X			X						X		1.95
CRITICAL INFRASTRUCTURE FAILURE		X					X		X						X		2.7
HAZARDOUS MATERIALS / INDUSTRIAL INCIDENT			X				X			X						X	3.1

Section 5: Table 22: Conclusions on Hazard Risk for Volusia County (Natural Hazards)

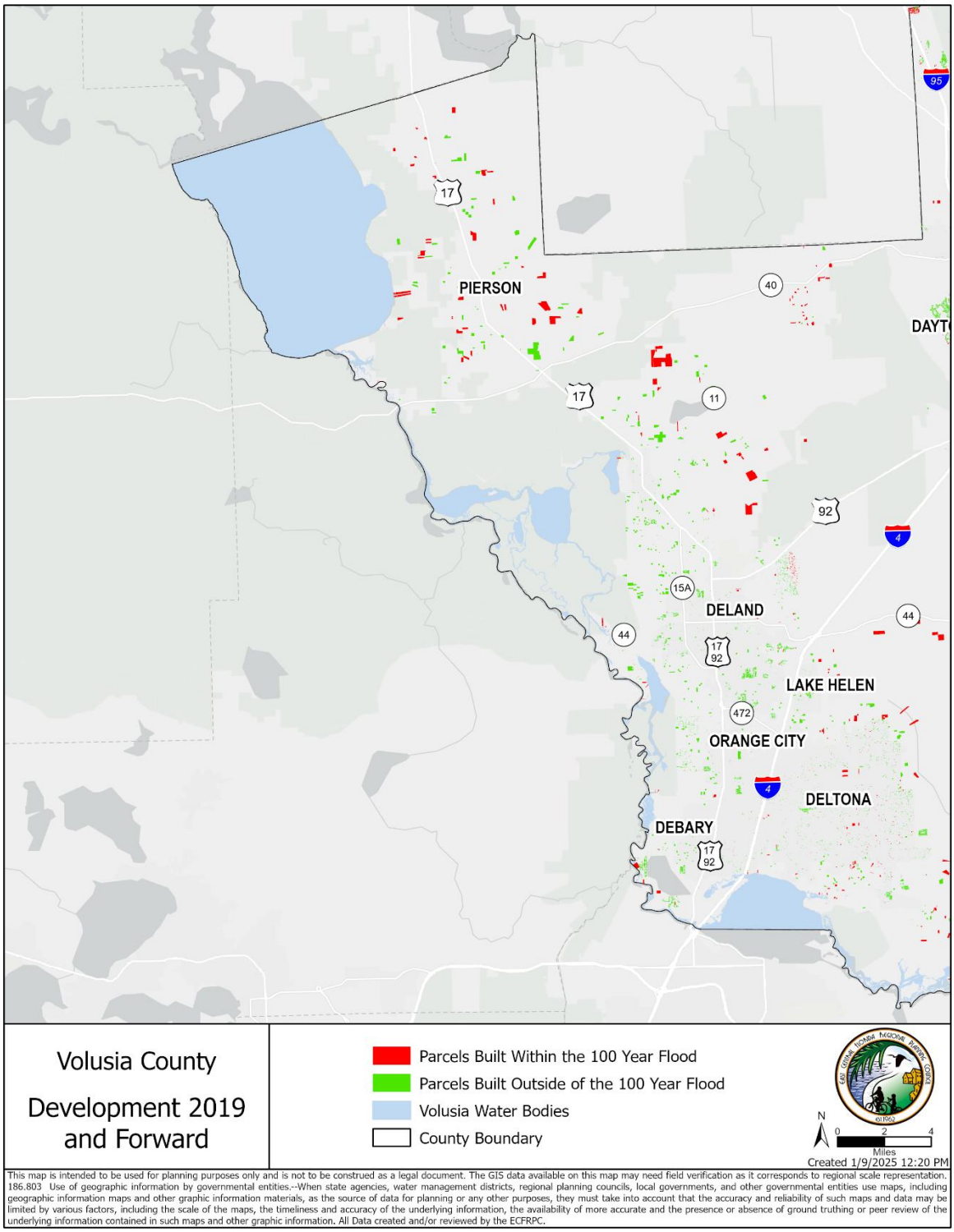
5.19 DEVELOPMENT SINCE 2020 (LAST LMS SUBMITTAL)

The maps on the next page in Section 5 **Figure 22 and Figure 23** shows development in Volusia County from 2019 to 2024 with exposure to the 100-year floodplain. While the eastern portion of the county is susceptible to more hazards than the western portion, the eastern side has seen the largest growth in the number of properties built since 2019. Areas such as Ormond Beach, Daytona Beach, Holly Hill, South Daytona, Ponce Inlet, and New Smyrna Beach have experienced growth since 2020, much of it along the barrier islands to the east of the Halifax River, Indian River Lagoon, and Mosquito Lagoon. These areas are susceptible to tropical cyclones, flooding, and rising coastal waters. The western portion of the county has also experienced growth. Deltona, DeBary, DeLand and Orange City are typically more susceptible to wildland fires and flooding.

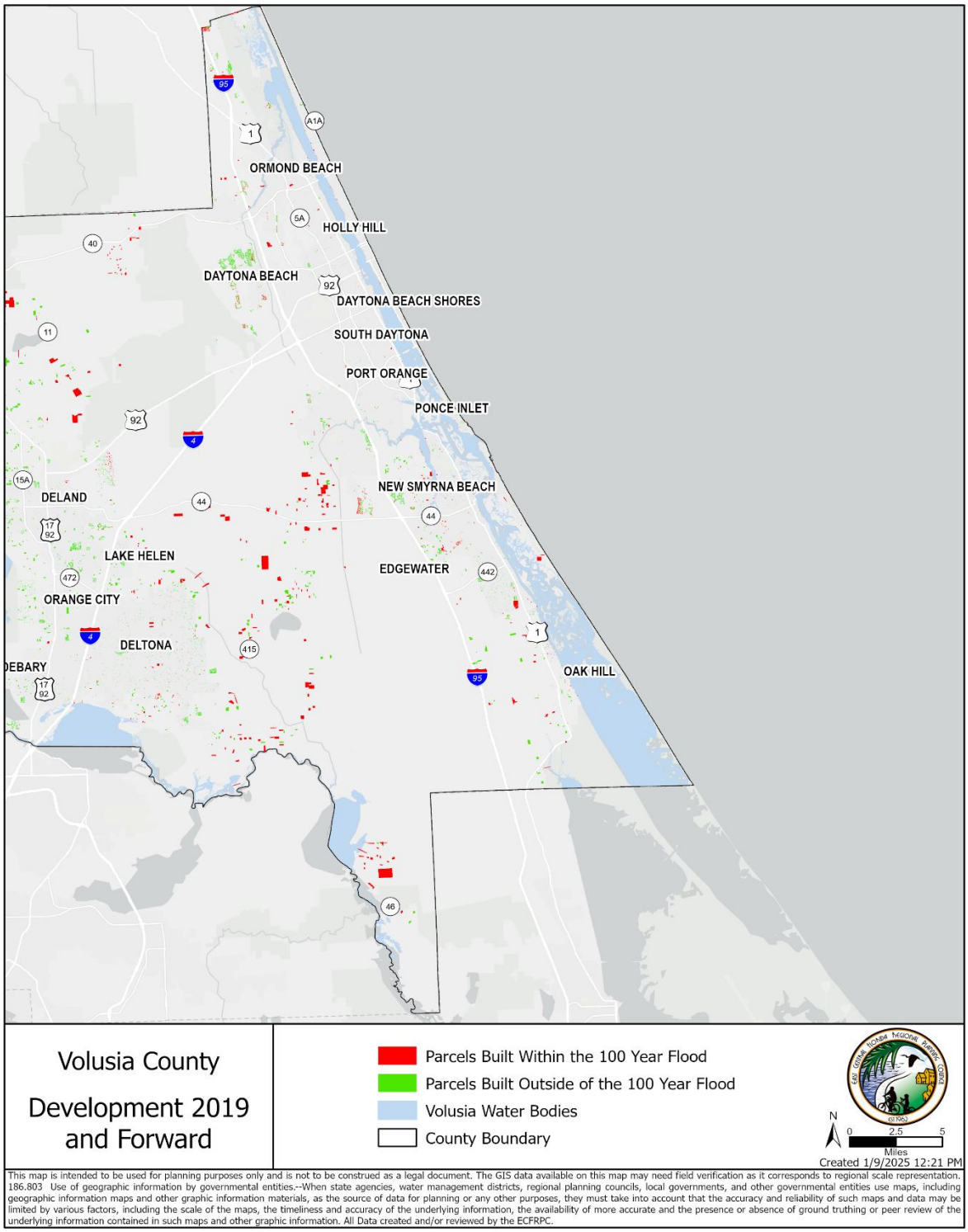
Since 2019, 6,005 properties have been built in the 100-year floodplain countywide. The total county taxable value of these new properties is $1,970,544,855 according to the ECFRPC analysis. The jurisdiction experiencing the most development is New Smyrna Beach. Daytona Beach is a close second.

For more information on recent developments in the hazard zones covered in this report, view the Vulnerability Assessment in Section 6.

Section 5: Figure 22: Development in 100-Year Floodplain since 2019. West Side of Volusia County



Section 5: Figure 23: Development in 100-Year Floodplain since 2019. East Side of Volusia County



Source: FEMA, Volusia County Property Appraiser, ECFRPC

SECTION 6 – VULNERABILITY ASSESSMENT

44 CFR Requirement

44 CFR Part 201.6(c)(2)(ii): The risk assessment shall include a description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. The description shall include an overall summary of each hazard and its impact on the community. The plan should describe vulnerability in terms of: (A) The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas; (B) An estimate of the potential losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate; (C) Providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

6.1 OVERVIEW

This section builds upon the information provided in Section 5: *Hazard Profiles* by identifying and characterizing an inventory of assets in Volusia County and then assessing the potential impact and number of damages that can be expected to be caused by each identified hazard event. The primary objective of the vulnerability assessment is to quantify exposure, and the potential loss estimates for each hazard. In so doing, Volusia County and its participating jurisdictions and partners may better understand their unique risks to identify hazards and be better prepared to evaluate and prioritize specific hazard mitigation actions.

This section begins with an explanation of the methodology applied to complete the hazard vulnerability assessment, followed by a summary description of the asset inventory as compiled for Volusia County. The remainder of this section focuses on the results of the assessment and is organized by hazard as listed below.

- **Natural**
  - Agriculture
  - Coastal Erosion
  - Drought
  - Extreme Temperature
  - Flood
  - Public Health Emergencies
  - Rising Coastal Waters
  - Severe Weather
  - Tornado
  - Tropical Cyclones
  - Wildland Fire
- **Manmade**
  - Civil Disturbance
  - Mass Migration
  - Terrorism

- **Technological**
  - Coastal Oil Spill
  - Critical Infrastructure Failure
  - HazMat/ Industrial Incident

6.2 ASSESSMENT METHODOLOGY

This vulnerability assessment was conducted utilizing three distinct methodologies based on an appropriate analysis of that hazard:

1. Geographic Information System (GIS)-based analysis
2. A qualitative analysis based on the risk to people, property, the environment, government operations, the public, first responders, continuity of operations, facilities and infrastructure, economic conditions, and public confidence in governance.

Each approach provides estimates for the potential impact of hazards by using a common, systematic framework for evaluation, including historical occurrence information. The results of the vulnerability assessment are provided for each identified hazard. The versions of HAZUS used for this assessment were 6.1 and 7.0. All versions of HAZUS are designed to conduct the same analyses for the same purposes.

GIS-Based Analysis

For the GIS-based assessment, digital data was collected from local, state and national sources. ESRI® ArcPro 3.4.0 was used to assess risk utilizing digital data including local tax records for individual properties and georeferenced point locations. Using these data layers, risk was assessed by estimating the assessed building value associated with properties determined to be in identified hazard areas. The critical asset inventory was compiled from FEMA's built-in asset inventory within HAZUS, the ECFRPC's critical asset inventory compiled for FDEP's statewide Resilient Florida Vulnerability Assessment, and additional assets provided by Volusia's jurisdictions. Parcel and land use data was retrieved from Volusia County's GIS Department and Property Appraiser.

To estimate population in hazard areas, Census 2020 population data by census block was obtained from HAZUS 7.0 and census blocks intersecting with hazard areas were used to determine improved property value, land value, building value, assessed value, taxable county value were obtained from Volusia County's Property Appraiser and properties intersecting with hazard areas were used to determine financial exposure and potential financial loss.

Census 2020 data was used for analyses as it is available by census block. There are other population estimates that are provided by reputable sources; however, they are only available at the jurisdiction level (e.g., county or city). When the next decennial census population data is available the county will consider reassessing the populations that are vulnerable to various hazards.

The objective of the GIS-based analysis was to determine the estimated vulnerability of people, buildings and critical facilities to the identified hazards for Volusia County using the best available geospatial data. In so doing, local databases made available through Volusia County such as local tax assessor records, parcel boundaries and critical facilities data were used in combination with digital hazard data. The results

of the analysis provided an estimated number of people, as well as the numbers and values of buildings and critical facilities determined to be potentially at risk to those hazards with delineable geographic hazard boundaries.

Financial exposure of parcels to hazards was assessed by intersecting parcel data to the extent of the hazards. Per the guidance of Volusia County Emergency Management, financial exposure to hazards for parcels with stacked properties was handled in two manners. Hazard analysis regarding wind, wildland fire, and sea level rise was conducted for all properties within a parcel, capturing the financial exposure of each floor within condominiums and other buildings. Hazard analysis regarding storm surge and FEMA flood zones was conducted only for first floor properties.

For storm surge, the data was retrieved from the National Oceanic and Atmospheric Administration's National Hurricane Center. The storm surge data is derived from the Maximum of the Maximum Envelope of High Water (MEOW), or MOM, which provides a worst case snapshot for a particular storm category. Each MOM considers combinations of forward speed, trajectory, and initial tide level. No single hurricane will produce the regional flooding depicted in the MOMs. Instead, the product is intended to capture the worst-case high-water value at a particular location for hurricane evacuation planning. The MOMs are also used to develop the nation's evacuation zones.

For wildland fire risk, the U.S. Forest Service's Wildfire Hazard Probability dataset was used to evaluate the wildfire risk for Volusia's critical assets. The Wildfire Hazard Probability dataset recognizes impervious surfaces as "non-burnable." As the majority of Volusia's critical assets are built on top of paved surfaces, they were marked as non-burnable by the dataset. However, due to the nature of wildfire and its ability to jump onto structures although they may be built upon impervious surfaces, geostatistical methods were employed to interpolate the fire risk for areas originally marked as non-burnable. The raster dataset provided by the U.S. Forest Service was altered to remove cells marked as non-burnable. This altered raster was run through Empirical Bayesian Kriging (EBK) to generate new wildfire risk scores for areas previously categorized as non-burnable. EBK is a geostatistical method utilized for making spatial predictions based upon existing patterns. Using EBK to fill in the gaps of the Wildfire Hazard Probability dataset allowed for a more comprehensive analysis of wildfire risk for the County's critical assets.

For tropical cyclone wind hazards, HAZUS 6.1 was used to run a probabilistic hurricane wind analysis. Probabilistic hurricane analysis is a method of predicting the likelihood of hurricane-related events by using a range of possible outcomes. This method can help to estimate the risk of hurricane damage and inform decision making. Return periods of 10, 20, 50, 100, and 500 were used to analyze peak wind gusts across Volusia County.

6.3 ASSET INVENTORY

An inventory of Volusia County's georeferenced assets was created in order to identify and characterize those properties potentially at risk to the identified hazards. By understanding the type and number of assets that exist and where they are located in relation to known hazard areas, the relative risk and vulnerability for such assets can be assessed. Three categories of assets were created and assessed through GIS analysis, including:

1. Improved Property: Includes properties with improved property (i.e., structures)

2. Critical Assets: Includes Volusia County's emergency operations centers, fire stations, police stations, schools and hospitals. This was derived from the FEMA HAZUS asset inventory and critical assets identified through the Volusia 2024 VA.

3. Transportation Infrastructure: Includes primary roads and active railroads.

Improved Property

Section 6 Table 1 displays total assessed value of improvements for unincorporated Volusia County and the incorporated areas with improved property.

Section 6: Table 1: Total Value of Improved Properties

JURISDICTION	TOTAL IMPROVED VALUE OF IMPROVED PROPERTIES
Daytona Beach	$11,412,838,706.00
Daytona Beach Shores	$2,643,078,172.00
DeBary	$2,829,659,586.00
De Land	$4,555,243,217.00
Deltona	$8,243,140,783.00
Edgewater	$2,478,786,764.00
Holly Hill	$1,108,379,506.00
Lake Helen	$273,588,377.00
New Smyrna Beach	$7,693,963,655.00
Oak Hill	$232,951,847.00
Orange City	$1,439,235,489.00
Ormond Beach	$6,202,742,902.00
Pierson	$145,434,493.00
Ponce Inlet	$1,426,666,290.00
Port Orange	$6,642,257,338.00
South Daytona	$1,215,618,172.00
Unincorporated	$14,307,435,560.00
TOTAL	**$72,851,020,857.00**

Source: Volusia County Property Appraiser Data (2024)

Critical Assets

Section 6 Table 2 lists Volusia County's critical facilities, as identified by each jurisdiction in Volusia County. A full listing of the critical facilities and their exposure to each hazard included in this vulnerability assessment is in **Appendix E**. This information is not available for public distribution as it contains sensitive information. The critical facilities data is on file with Volusia County Emergency Management.

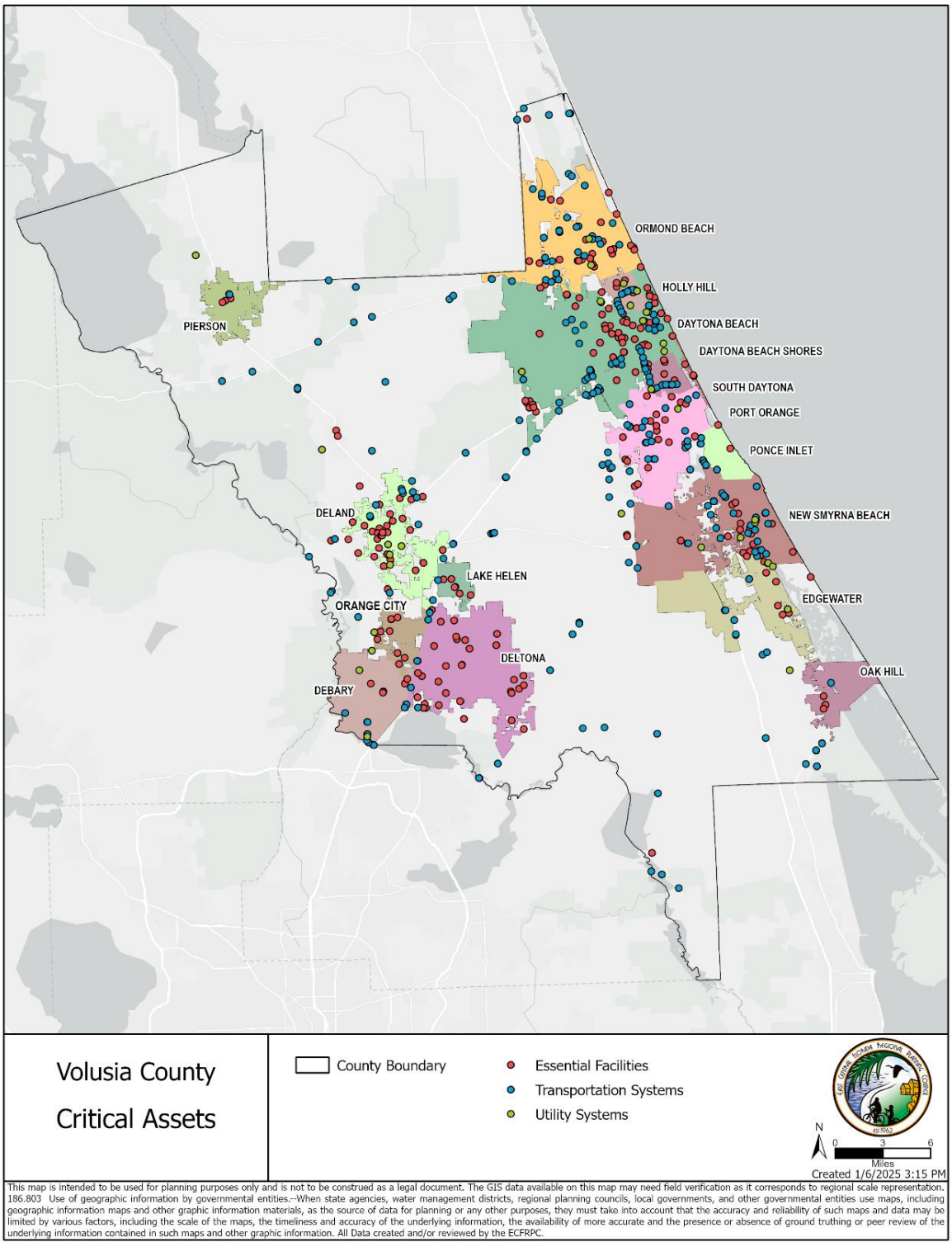
Section 6: Table 2: Number of Critical Facilities

JURISDICTION	Number of Critical Assets
Daytona Beach	74
Daytona Beach Shores	2
DeBary	7
DeLand	47
Deltona	27
Edgewater	14
Holly Hill	10
Lake Helen	6
New Smyrna Beach	28
Oak Hill	4
Orange City	9
Ormond Beach	31
Pierson	4
Ponce Inlet	2
Port Orange	22
South Daytona	6
Unincorporated	578
Multi-Jurisdictional	276
TOTAL	**1,147**

Source: All Jurisdictions (Cities, County), HAZUS

Section 6 Figure 1 illustrates the general locations of the critical facilities and infrastructure according to the current georeferenced point and line locations. Facilities were identified through a combination of jurisdiction-provided data, 2024 Vulnerability Assessments (VA), and HAZUS 7.0 asset inventory.

Section 6: Figure 1: Volusia County Critical Facilities



Source: All Jurisdictions (Cities, County), HAZUS

Transportation Infrastructure

Section 6: Table 3: Transportation Infrastructure

JURISDICTION	Railroad (mi)	Arterial (mi)	Collector (mi)	Interstate (mi)	Local (mi)	Ramp (mi)	Beach Ramp (mi)	Park (mi)
Daytona Beach	4.45	68.4	3.1	4.98	308	6.15	0.92	-
Daytona Beach Shores	-	5.19	1.04	-	5.94	-	0.65	-
DeBary	6.62	8.54	-	0.22	152	0.1	-	1.7
DeLand	0.64	16.94	9.38	-	190.73	0.25	-	-
Deltona	-	21.82	6.58	6.28	451.57	4.53	-	-
Edgewater	4.16	11.58	2.96	1.11	140.82	0.71	-	-
Holly Hill	2.86	6.42	-	-	59.51	-	-	-
Lake Helen	-	0.34	6.17	1.11	31.54	0.62	-	-
New Smyrna Beach	7.77	22.38	3.45	4.7	189.3	1.91	1.58	0.32
Oak Hill	1.2	4.74	1.03	-	25.39	-	-	-
Orange City	-	11.35	0.69	-	70.78	1.14	-	-
Ormond Beach	8.88	22.84	12.68	3.41	236.01	1.29	0.49	-
Pierson	3.07	3.11	3.36	-	27.44	-	-	-
Ponce Inlet	-	-	3.03	-	15.21	-	0.17	0.69
Port Orange	4.97	28.86	1.81	5.79	282.03	1.51	-	0.25
South Daytona	2.75	4.38	1.35	-	53.29	-	-	-
Unincorporated	48.06	188.64	133.22	45.91	1353.43	12.95	0.22	2.17
TOTAL	95.43	425.53	189.85	73.51	3592.99	31.16	4.03	5.13

Source: Volusia County GIS, ECFRPC

6.4 AGRICULTURE

Vulnerability

Agriculture in Volusia County is a sector that encompasses crops, livestock, and environmental resources. This sector is vulnerable to a variety of threats, including infestations, invasive species, and diseases. Infestation or disease in agriculture refers to the significant increase of biological entities such as insects, rodents, bacteria, or viruses in a given area, which can adversely affect crops, threaten human and animal health, damage valuable crops, or lead to the loss of significant environmental resources.

In Volusia County, common agricultural threats include infestations by mosquitoes, citrus greening, southern pine beetle, Florida dampwood termites, rats, and noxious plants like the Brazilian pepper tree. These threats can impact key agricultural crops such as citrus, vegetables, and ornamental plants. For instance, citrus greening, a bacterial disease, severely affects citrus crops, leading to significant economic losses. Similarly, the southern pine beetle can devastate pine forests, impacting timber production, while invasive species like the Brazilian pepper tree can outcompete native plants and disrupt local ecosystems. Livestock in Volusia County, including cattle, poultry, and horses, are also at risk from various diseases. Diseases such as foot-and-mouth disease and avian influenza can spread rapidly, causing substantial harm to livestock and posing a risk to human health. Contaminated water supplies used for irrigation or livestock drinking water can exacerbate these issues, leading to widespread problems for all residents in and near Volusia County.

The overall vulnerability of Volusia County and its jurisdictions to agricultural diseases and pests is low. Although there is not a large percentage of farmland in the county, disease can spread quickly if response is not immediate. The cities of Oak Hill and Pierson and unincorporated parts of Volusia County are most vulnerable to agricultural incidents because this is the largest area of farmland countywide. Climate change may exacerbate agricultural threats via the movement of invasive species. **Section 6: Figure 2** displays the areas of the county with the most vulnerability. The Western and Southern portions of the county are at highest risk.

Impacts

Environmental impacts include ecosystem disruption through the destruction of crops, contamination of soil and water, and displacement of native species by invasive plants. These disruptions can lead to the loss of biodiversity, affecting the region's ecological balance. There are many natural springs located on the west side of the county, such as Blue Springs, DeLeon Springs, Green Springs, and Gemini Springs, that attract tourism and protect native species.

On top of having profound ecological impacts, invasive species cost Floridians over $500 million each year; these costs include monitoring, testing, management, eradication, and restoration efforts. Future conditions may exacerbate the concern. Temperature changes, extended growing seasons, and altered rainfall patterns can support the spread of organisms into new territories. Additionally, as climate zones shift, the natural predators of pests might not migrate at the same rate, potentially leading to an imbalance where pest populations can grow unchecked. The probability of invasive species continuing to impact Volusia County is considered likely, occurring once a year or more. The economic impact of agricultural infestations and diseases in Volusia County can be profound, especially for the South and Western parts of

the county where there is a significant agriculture presence. Financial losses can result from crop destruction, decreased yields, and the costs associated with pest control and disease management. This is particularly relevant for Enterprise and Pierson.

Public health, especially of residents living in proximity to agriculture, is another critical area affected by agricultural threats. Additionally, vector-borne diseases spread by pests like mosquitoes, such as West Nile virus, dengue fever, and Zika virus, pose direct health risks to the public.

Responders dealing with agricultural infestations or disease outbreaks face health risks if exposed to harmful organisms or chemicals. Ensuring the safety of responders requires robust safety protocols, including the use of personal protective equipment (PPE) and decontamination procedures. Despite these risks, the continuity of operations in most sectors is unlikely to be significantly impacted by agricultural infestations or diseases. Essential services and functions can generally continue with minimal interruption. However, ensuring the continuity of operations for emergency response agencies is critical to effectively managing these threats.

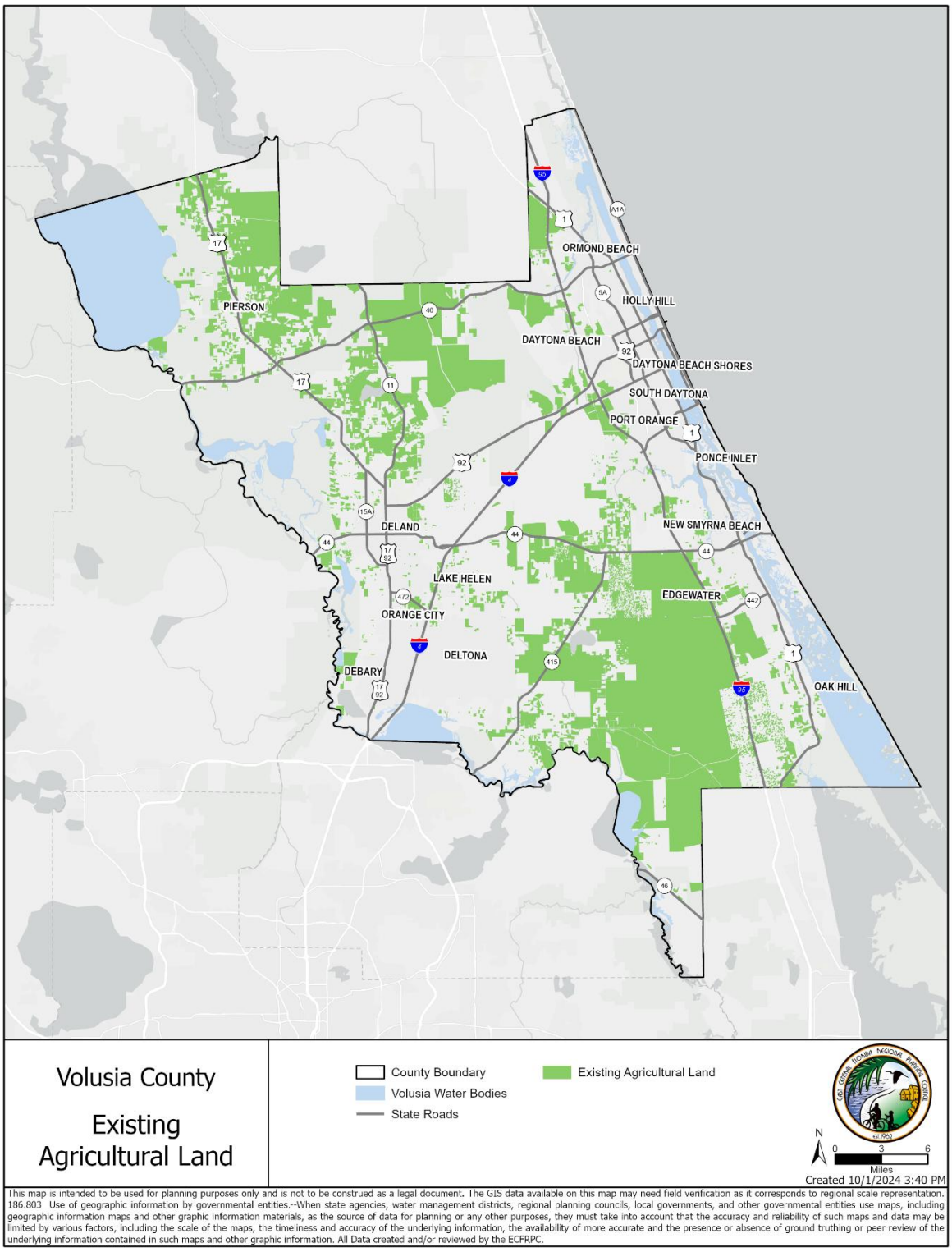
Agricultural infestations and diseases are also unlikely to directly impact property, facilities, or infrastructure in urbanized areas of the county. The primary effects are concentrated on the agricultural lands. To mitigate these risks, it is essential to implement robust surveillance systems to detect and respond to biological threats quickly. Regular monitoring of crops, livestock, and the environment for signs of infestation or diseases is crucial. Education and training programs for farmers, agricultural workers, and first responders are necessary to ensure they can recognize and respond to agricultural threats effectively.

Clear communication channels between local, state, and federal agencies are vital for a coordinated response. This includes mutual aid agreements and support from the Florida Division of Emergency Management (FDEM). Emergency preparedness plans should be developed and regularly updated to include specific protocols for addressing agricultural infestations and diseases, covering containment, decontamination, and recovery processes.

Investing in research to develop resilient crop varieties and livestock breeds that are less susceptible to diseases is also important. Promoting the development of rapid detection technologies for pests and pathogens can enhance the county's ability to respond to agricultural threats. Every jurisdiction must integrate pest management (IPM) practices that can control pest populations using environmentally sustainable methods, such as biological control, habitat manipulation, and resistant crop varieties.

In conclusion, while Volusia County's agricultural sector faces low risks from infestations, invasive species, and diseases, proactive measures can significantly reduce these risks and mitigate their impacts. By enhancing surveillance, improving coordination, and investing in education and research, the county can better protect its agricultural assets and ensure food security. Comprehensive planning and preparedness efforts can minimize the overall public health, environmental, and economic impacts of agricultural threats. Existing land use was derived from parcel data provided by Volusia County GIS as seen in **Section 6 Figure 2**.

Section 6: Figure 2: Existing Agricultural Land in Volusia County



Source: Volusia County Property Appraiser, ECFRPC

6.5 COASTAL EROSION

Vulnerability

Coastal erosion is a significant concern for Volusia County, with all coastal areas prone to this natural process. Nearly half of the county's 47 miles of shoreline are considered critically eroded. While the population is not explicitly threatened by coastal erosion, the economic impact on beachfront properties can be substantial. Coastal erosion is typically measured as the annual shoreline change for a given beach cross-section over a long period.

Coastal erosion poses a considerable threat to beachfront properties within five jurisdictions of the county, as well as unincorporated areas. More than 5,000 properties are at direct risk, representing over $800 million in property value. Properties at the highest risk are those with low elevations, as wave action and dune degradation can compromise the integrity of the lot foundation. Properties with lower foundations, or those not elevated above the base flood elevation, are at higher risk for water damage, loss of personal property, electrical damage, structural collapse, and, in rare instances, loss of life.

Daytona Beach Shores and New Smyrna Beach are particularly vulnerable to coastal erosion due to their extensive shoreline properties. Additionally, storm surge presents a unique financial challenge, as beachfront properties are typically high value. Volusia County has engaged in beach renourishment activities and hardening shorelines with gray infrastructure, such as seawalls, and green infrastructure, such as living shorelines. Continued development along the shorelines and storm surges increasing in intensity and frequency contribute to the vulnerability of the coastal cities in Volusia County.

Impacts

The county's Lifeguard Headquarters and Administration Building, located on the beach in Daytona Beach, provides public safety and lifeguard services to the entire beach area. The Ponce Inlet Lighthouse, another significant site, has undergone extensive work by the U.S. Army Corps of Engineers to re-nourish the sand and install rock jetties to protect the area.

There are two piers with restaurants vulnerable to storm surge, including Joe’s Crab Shack on the Main Street Pier, which is a major tourist attraction in Daytona Beach’s Boardwalk Entertainment Area. The entire shoreline, along with condominiums, residential homes, businesses, and restaurants, can be susceptible to coastal erosion depending on the strength and direction of storms. The North Peninsula State Recreation Area in Ormond-By-The-Sea and the A1A roadway in that area are at higher risk than other county areas, although it remains mostly undeveloped.

Coastal erosion can be a consequence of tropical storms, hurricanes, and nor'easters. Homes and structures built along the coastline may be damaged or even destroyed during these events, with protective dunes potentially obliterated. All property along the coast of Volusia County is at risk, with private property in some areas losing inches or feet of beach each year. Coastal erosion has caused over $400 million in damage.

The environment is highly vulnerable to coastal erosion. Erosion can occur via wind or water, leading to sedimentation in waterways, loss of habitat for coastal ecosystems, and changes in coastal geomorphology. Protective dunes on the shore may be reduced or washed away in hurricanes and high surf, further exacerbating erosion issues.

Responders are not directly impacted by coastal erosion, and the Volusia County Emergency Management Division will not face issues in continuing operations and delivering services due to this hazard. Although coastal erosion does not directly threaten program operations, as the Volusia County Emergency Operations Center is located 20 miles inland, the public faces numerous consequences. Homes can collapse into the ocean, and critical utilities and roadways may be compromised if beaches erode, and water inundates their systems. Coastal erosion also affects many public beaches in Volusia County, leading to the loss of recreational areas and potential destruction of private property and homes. In some rare cases, homes and businesses may fall into the ocean.

The consequences for the environment from coastal erosion are severe. Erosion by wind or water can deplete coastal ecosystems, reduce protective dunes, and cause sand and soil to enter water and sewer systems, leading to public and environmental issues. Coastal erosion is costly, with beach nourishment expenses averaging around $2.00 per cubic yard, placing a financial burden on local economies.
Despite these challenges, public confidence in government should not be significantly impacted by coastal erosion, as rapidly eroding beaches remain a high priority for nourishment efforts.

Coastal erosion also impacts tax revenue as some residents may choose to move away or cannot afford to fix a property after a storm. This can lead to condemned buildings that are unsightly and unsafe.

Section 6 Table 4 provides the number of people and number and value of improved properties that are susceptible to coastal erosion. Coastal erosion is very likely to continue impacting the coastal areas of Volusia County. Jurisdictions with critically eroded beaches in Volusia County actively participate in the federal beach nourishment program.

Section 6: Table 4: Total Exposure from Coastal Erosion for Ocean Shorelines & Lagoons

JURISDICTION	AT-RISK AREAS (within 250 feet of shoreline)		
	Total Number of Properties at Risk	Total Improved Value of Buildings at Risk	Total County Taxable Value
Daytona Beach	3914	$1,573,304,260.00	$1,137,404,025.00
Daytona Beach Shores	522	$317,920,506.00	$263,536,865.00
Edgewater	318	$351,929,936.00	$224,619,720.00
Holly Hill	647	$255,000,654.00	$200,624,664.00
New Smyrna Beach	3947	$2,905,660,684.00	$2,029,296,261.00
Oak Hill	391	$164,494,791.00	$92,141,021.00
Ormond Beach	1362	$1,303,941,624.00	$953,112,793.00
Ponce Inlet	615	$368,335,931.00	$255,695,564.00
Port Orange	777	$377,236,994.00	$230,213,454.00
South Daytona	439	$196,332,861.00	$140,465,685.00
Unincorporated	5080	$2,701,737,784.00	$1,903,028,923.00

Sources: Volusia County Property Appraiser Data (2024), Florida Fish and Wildlife, ECFRPC

6.6 DROUGHT

Vulnerability

Volusia County and its jurisdictions are uniformly vulnerable to drought and overall vulnerability to drought is high. During the dry months of the year, drought can cause serious consequences and have compounding effects. Tactics such as water usage restrictions are implemented to save water. Extreme temperature events are increasing in frequency and intensity deepening vulnerabilities. Volusia County and its jurisdictions have continued to increase in population and the continuous growth is expected to worsen residents' vulnerabilities the water shortages.

Impacts

Typically associated with crop damage rather than damage to the built environment, droughts can have significant secondary effects. Historical data indicate that drought conditions have led to wildfires in the years 1985, 1988, 1998, and 2009. These conditions can impact the Florida Aquifer, affecting the water supply for Volusia County residents, many of whom rely on personal wells or the county's public water supply, which is also drawn from wells.

Drought can lead to substantial crop loss, livestock reductions, and disruption of fish habitats. Furthermore, it is often associated with an increased wildfire threat, placing both human and wildlife populations at heightened risk. The environment is at risk from drought. Vegetation and sensitive ecosystems can suffer without adequate water, and stream flows may be reduced, impacting riparian and riverine ecosystems. Reduced lake and canal depths can impact boating traffic and access to certain waterways, diminishing property values in these locations. Notably, the Lake Beresford area in DeLand, which attracts tourists for fishing and houseboat rentals, could suffer from severe drought conditions. The St. John's River, which runs from south to north, can also be affected by droughts occurring as far south as Lake Okeechobee.

Although droughts do not directly affect the building stock within the county, they can cause numerous indirect losses to personal property and critical facilities. For instance, agricultural areas, especially in the northwest part of the county including the Town of Pierson, are particularly vulnerable. Losses within the agricultural industry can have a cascading effect on local businesses, such as those selling tools or heavy machinery, resulting in indirect financial losses. Consequently, residents may lose jobs, leading to a net economic loss for the county. Therefore, the most significant losses from drought are financial rather than physical, unlike other hazards.

The secondary physical impact of drought is the potential for sinkholes. Both excess rainfall (flooding) and drought conditions can negatively affect Florida's limestone bedrock. Thus, sinkholes represent a primary physical risk to the county's building stock due to drought conditions. The western portion of the county is particularly vulnerable to this because sinkholes happen more commonly than the eastern side of the county. Droughts can also result in increased wildfire activity. For instance, the 1998 drought directly contributed to wildfires that burned over 163,000 acres. Drought can significantly impact the county's economy, with the agricultural and natural resources industries contributing $781 million annually. An extended period of drought could seriously harm this sector.

Public confidence in government is unlikely to be significantly affected by a drought occurrence, as these are common occurrences in Florida. Insurance and assistance programs are widely available to farmers.

The public may not always experience direct consequences of drought, but government-imposed water restrictions may affect residential lawns and gardens. Chapter 50, Article III Minimum Environmental Standards, Division 8 Water Conservation references watering restrictions required for all jurisdictions within Volusia County.

Overall, program operations are not impacted by drought conditions. Responders are generally not impacted by drought, although caution and adequate hydration are necessary during extreme heat. Historically, the Volusia County Emergency Management Division has not faced issues continuing operations and delivering services during droughts events.

While homes, businesses, critical facilities, and infrastructure are generally not significantly impacted by drought and extreme heat, certain hydrologic processes, such as irrigation capacities and tourism-related activities (e.g., lakes and golf courses), can be affected. The St. Johns River Water Management District may restrict lawn irrigation, impacting residences and golf courses. Additionally, wells may reach dangerously low levels.

People are at risk from drought due to its negative effects on agriculture and livestock, which may impact long term food supplies. Farmers are the most directly affected by drought. Property may be at high risk from drought under extreme circumstances. Extended drought periods can significantly impact agricultural products and farmlands, particularly the fern industry in Volusia County, which experienced droughts in 1981, 1985, 1998, 1999, and 2000.

6.7 EXTREME TEMPERATURE

Vulnerability

Overall vulnerability to extreme temperature is medium in Volusia County and its jurisdictions. While property is unlikely to be affected by extreme temperature conditions, unhoused populations are highly vulnerable to extreme heat with approximately 700 unhoused citizens between Flagler and Volusia counties on any given day as of 2024[1]. Extreme temperatures can also pose greater vulnerabilities on outside workers, the elderly, and infant populations. Extreme temperatures would make all of Volusia County and its jurisdictions equally vulnerable.

Agricultural areas are the most vulnerable areas to extreme temperatures. However, damage to critical facilities, businesses and homes can occur as a result of these events. Annualized losses for these events are very hard to measure. Existing fauna and animals are also vulnerable to extreme temperatures with the possibility of migration or fatalities.

Impacts

Extreme temperatures have significant impacts when they occur. Winter storms can range from moderate snow over a few hours to blizzard conditions lasting several days. Ice storms, which occur when moisture falls and freezes upon impact, can cause widespread power outages, bring down trees, damage property, and result in fatalities and injuries. Extreme heat events are more common and pose significant challenges to Volusia County. Extreme heat is defined as temperatures that hover 9 degrees or more above the average high temperature of 90°F for the region and last for three or more consecutive days. These events can lead to widespread impacts:

All existing and future buildings, facilities, and populations in Volusia County are considered to be exposed to extreme temperature. The potential impacts include:

- **Public Risks:** All populations of Volusia County are vulnerable to extreme temperatures. Hypothermia and frostbite or heat illness are significant concerns, especially for vulnerable populations such as the elderly, young children, and the unhoused. Power outages can lead to HVAC failures, increasing the risk of illnesses. Heat exhaustion and heatstroke are serious health concerns, particularly for the elderly, children, outdoor workers, and those with pre-existing health conditions. Increased electricity demand for air conditioning can strain the power grid and lead to outages, leaving residents without cooling during the hottest periods. There is a growing concern for the unhoused population and extreme heat as climate change continues to impact frequency of events.
- **Responders' Risks:** Icy conditions can hinder emergency response, delaying response times. First responders must be prepared for the cold and heat to ensure they have the necessary equipment to operate safely. First responders must take precautions during extreme heat events to avoid heat-related illnesses. Ensuring adequate hydration and monitoring for signs of heat exhaustion and heatstroke are critical.
- **Property and Infrastructure:** Ice can accumulate on power lines, leading to outages that affect homes, businesses, and critical facilities. Burst pipes due to freezing temperatures can lead to

[1] https://www.vfcch.org/#:~:text=There%20are%20over%20600%2C000%20people,in%20Volusia%20and%20Flagler%20Counties.

significant water damage. Winter storms tend to affect transportation infrastructure (such as bridges and boat traffic) in addition to power sources. Consecutive high heat days may overload the electrical grid, also leading to power outages. Prolonged high temperatures can cause roads and bridges to expand and crack, leading to maintenance challenges. Power lines and transformers are also more likely to fail under high demand and heat stress.

- **Environmental Impact:** Wildlife may struggle to find food and shelter, and plants not adapted to extreme temperatures may be damaged or killed. Water bodies can warm, leading to reduced oxygen levels that harm aquatic life. Vegetation can suffer from heat stress, leading to reduced crop yields and increased wildfire risk.
- **Economic Impact:** Agricultural areas, particularly the Town of Pierson known as the "Fern Capital of the World," are vulnerable to severe financial losses. Transportation infrastructure, such as bridges and boat traffic, can also be affected, impacting the economy further. Moreover, areas heavy with agriculture could be at greater risk from an economic perspective, as these land uses can incur heavy losses during extreme temperatures. Extreme heat is associated with drought, thus can severely impact the agricultural sector. The annual economic impact of Volusia County's agriculture and natural resources industries is $781 million. An extended period of heat could seriously impact this.

Consequences for the public from extreme temperatures are the potential loss of power, with the unhoused population being the most affected. Shelters may need to be opened during these events. Public confidence in government is likely to remain stable during such events as they are rare in the county.

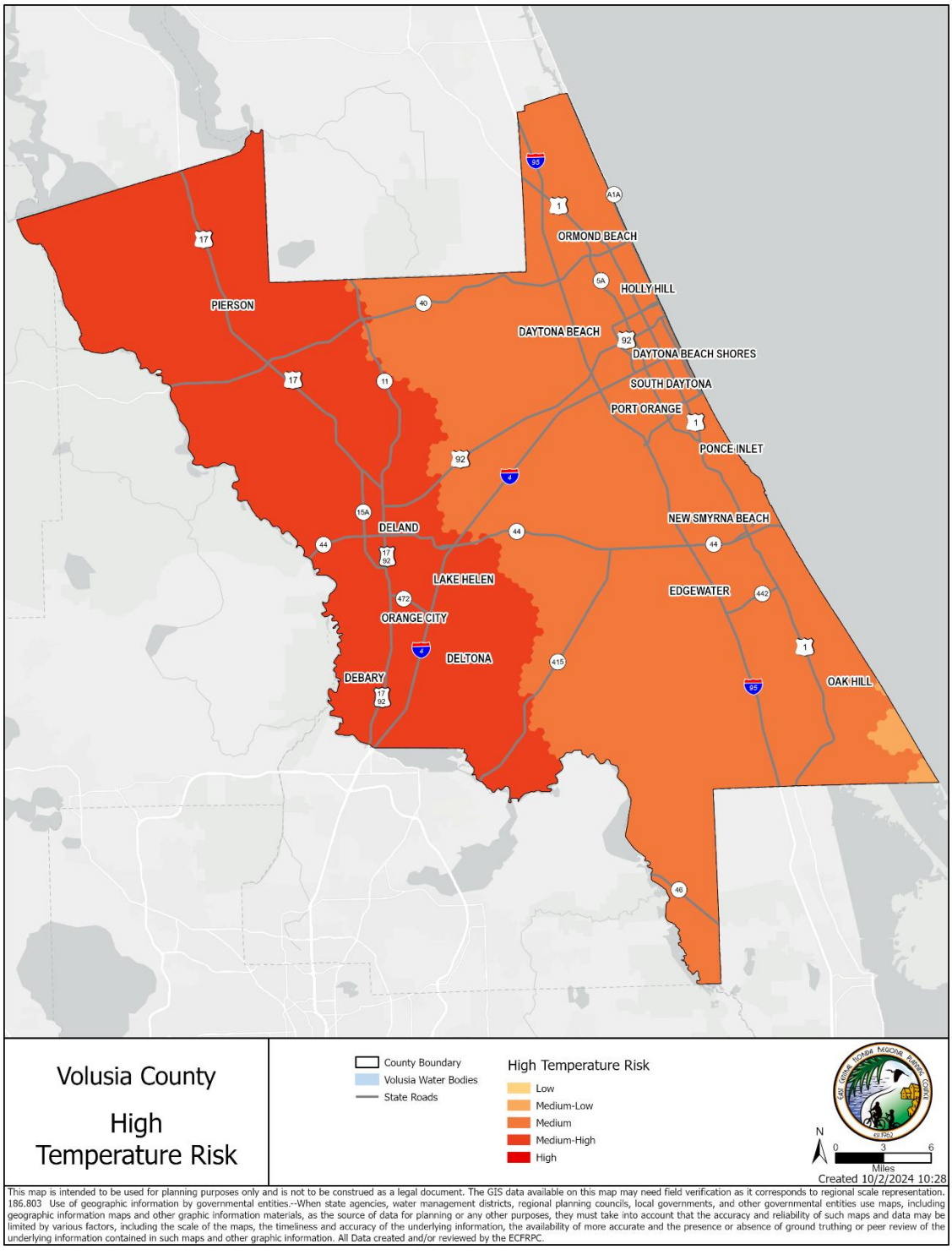
Responders are not expected to be adversely impacted due to the limited duration of extreme temperatures in Volusia County. Government operations are expected to continue during these events, with Volusia County Emergency Management maintaining operations through redundant power, IT, and communication systems.

Consequences of extreme heat on the public are not always direct but include impacts on agriculture and the food supply. Water restrictions may be implemented, affecting residential lawns and gardens.
Responders must exercise caution in extreme heat, ensuring adequate hydration. Historically, Volusia County Emergency Management has not faced significant issues in continuing operations during extreme heat events. Program operations are expected to continue without significant disruptions.

The data used for the extreme high temperature risk map in **Section 6 Figure 3** was derived from the ECFRPC's Resilience Collaborative Risk Assessment. Dr. Christopher Emrich from the University of Central Florida developed this data through the VMAP platform.

Overall, extreme heat poses a more consistent threat to Volusia County compared to extreme cold. While extreme cold events are rare, they can cause significant disruption and damage when they occur. Extreme heat is more common and presents ongoing challenges to public health, infrastructure, and the environment. Both types of extreme temperatures require effective preparedness and response plans to mitigate the impacts on the county's residents, infrastructure, and natural resources.

Section 6: Figure 3: Extreme Heat Risk in Volusia County[2]



[2] https://www.hazardrisk.org/

6.8 FLOOD

Vulnerability

Flooding is one of the most destructive and costly natural hazards, not only in Volusia County but across the United States. FEMA identifies flooding as the most expensive natural hazard in terms of damage, with long-term psychological and economic impacts for affected communities. While all 50 states are at risk for flooding, Volusia County faces unique vulnerabilities due to its geography, environmental systems, and population distribution.

The overall vulnerability to floods in Volusia County and its jurisdictions are high. With several large bodies of water in the county and municipalities including Lake Monroe, Indian River Lagoon, Tomoka River, Halifax River, and the St. John's River; the community is very vulnerable to flooding. Enforcing floodway restrictions and building codes reduces vulnerability; however, with heavy rains caused by severe weather and tropical cyclones, flooding is possible in any jurisdiction of the county.

Flooding in Volusia County typically results from prolonged rainfall, storm surges, or overflow from rivers and streams. Although flash flooding, characterized by rapidly rising water, does not occur in the county, localized flooding can cause significant damage and disruption. An inch of water in a home can cause extensive property damage and standard homeowner's or renter's insurance policies do not cover flood-related losses, making homeowners vulnerable. A separate National Flood Insurance Program (NFIP) policy must be purchased to provide coverage. Unfortunately, many residents without flood insurance may receive little to no assistance in repairing their homes and property following a flood event. The frequency of flooding events has continued to increase and each year the recovery costs rise.

Properties most vulnerable to flooding damage are those with the lowest elevations. While a flood zone can envelop properties at a specified range of elevations, the variability in the elevations within those zones make certain buildings more prone to flooding damage than others. Additionally, structures that are located below the roadway system adjacent to the building (without a bio-swale buffer) are at extreme risk for flooding, as transportation networks are among the first areas to become inundated in a flood situation.

Many critical facilities are located within the 100-year floodplain. Adverse to the results when analyzing properties within each zone on a county level, the majority of critical facilities that are located within a flood zone in Volusia County are located within Flood Zone 'A'. A majority of the critical facility structures located within the 100-year floodplain are located in Volusia County's beach side communities. These include fire stations in New Smyrna Beach, Ponce Inlet, Daytona Beach Shores, Daytona Beach and Ormond Beach. There are hospitals at risk in low lying areas in Orange City and DeLand. Maytown Road in Oak Hill to Osteen/Enterprise is not an evacuation route because of repeated flooding. It is recommended that the County and all jurisdictions within the county enact policies to limit or disallow future development within the 100-year floodplain.

To assess flood risk, a GIS-based analysis was used to estimate exposure to flood events using FEMA's preliminary Digital Flood Insurance Rate Map (DFIRM) data in combination with local tax assessor records. The determination of assessed value at-risk (exposure) was calculated using GIS analysis by summing the total assessed building values for improved properties that were confirmed to be located

within an identified Zone A/AE (100-year floodplain), Zone VE (100-year coastal flood zone, associated with wave action), and Zone X (500-year floodplain). This analysis is parent parcel data. It is recommended that the flood analyses be revised once new flood maps are available. Flooding can impact all populations, primarily those who live, work or recreate anywhere within the county. Flooding can also cause property loss to structures located within the 100-year floodplain.

Section 6 Table 5 lists the number of properties that are in both 100-year (A/AE) flood zone and 500 (X) flood zone, and the total value of the properties in the zones. This includes the entire property, although only a portion of the property may be located within the flood zone. The table corresponds with **Section 6 Figure 5**, which depicts all flood hazard zones. For a listing and generalized map of all Repetitive Loss Properties within the County and its 16 jurisdictions, please reference the 2025 Floodplain Management Plan. The table below summarizes types of flooding advisories.

Section 6: Figure 4: National Weather Service Alerts

Alert	Criteria
Flood Watch	Atmospheric conditions over a large area, varying in size from multiple counties to multiple states, support the development of heavy rain and/or thunderstorms that are capable of producing flooding. A flood watch implies a longer period of relatively lighter rains, adding up to a large amount of rain. Longer-term flooding implies a slower or steadier rise in the water levels of creeks, streams and larger rivers. Roads can also become flooded, but it is usually more gradual, allowing motorists to monitor conditions more closely.
Flood Warning	A Flood Warning is issued by the National Weather Service when heavy rain has been occurring, and flooding is either occurring or will occur within a specified time, usually within 60 minutes.
Flash Flood Watch	Implies a shorter period of heavier rain. Generally, if flooding is expected within six hours of the onset of rain, a Flash Flood Watch is most appropriate. Flash flooding by definition suggests rapidly rising water, such as a surge of water heading rapidly downstream in a creek or small river. It could also be rapidly rising water on roadways, which can cause motorists to become stranded in vehicles, or even worse, washed into creeks and small rivers due to rapid runoff.
Flash Flood Warning	Atmospheric conditions over a large area, varying in size from multiple counties to multiple states, support the development of heavy rain and/or thunderstorms that are capable of producing flash flooding: A Flash Flood Warning is issued by the National Weather Service when heavy rain has been occurring, and flash flooding is either occurring or will occur within a specified time, usually within 60 minutes.
Urban and Small Stream Advisory	Flooding of small streams, streets and low-lying areas, such as railroad underpasses and urban storm drains is occurring.

Source: National Weather Service

Impacts

Flooding can devastate homes and businesses, washing away entire structures or causing irreparable damage. Roads and bridges may be washed out, limiting access to essential services and isolating

communities. In some cases, flooding is a secondary hazard following a hurricane or tropical storm. Critical infrastructure, including utilities, emergency response facilities, and government buildings, is also at risk.

Structural damage because of flooding can result in a loss of electricity, which can cause communication problems throughout the county. Moreover, physical damage due to water can result in the loss of personal property (for business owners and homeowners), while heavy, often expensive equipment located within critical facilities can be damaged.

The Volusia County Emergency Operations Center is not located within an SFHA, but access roads and surrounding areas may be impacted by severe flooding. During extreme flood events, access to the EOC could become difficult. Contingency plans, such as the use of Volusia County Sheriff's Office helicopter assets or all-terrain vehicles, are in place to maintain operations.

Flooding poses a significant risk to Volusia County's sensitive ecosystems. Riverbed erosion caused by floodwaters introduces sediments into waterways, potentially clogging stormwater systems and affecting water quality downstream. Floods can also carry hazardous materials and pollutants into rivers and streams, damaging aquatic habitats and riparian ecosystems. Additionally, nutrient-rich runoff, such as water released from Lake Okeechobee into the Intracoastal Waterway, can lead to algal blooms and oxygen depletion in rivers, causing fish die-offs. Although historical data on environmental impacts specific to Volusia County is limited, these events highlight the need for proactive monitoring and mitigation efforts.

The consequences of flooding on the public can be severe. Floodwater can trap individuals in vehicles or homes, leading to injuries or fatalities. Recovery from a flood is often costly and time-consuming, taking weeks, months, or even years for individuals and communities to fully recover. For uninsured residents, the financial burden can be insurmountable.

Economically, flooding disrupts transportation, agriculture, business continuity, and government services. Agricultural areas, a key component of Volusia County's economy, are particularly vulnerable to flood damage. Historical data shows that between 1994 and 2009, 11 major flood events caused over $100 million in agricultural related damage in the county. The frequency of flooding events has continued to increase and each year the recovery costs rise.

Responders face significant challenges during flood events, including swift water rescues and navigating damaged or obstructed infrastructure. For instance, during Tropical Storm Fay, responders conducted numerous water rescues, highlighting the risks to both citizens and emergency personnel. Despite these challenges, the VCEOC has historically remained operational during flood events. Mutual aid agreements, including the Emergency Management Assistance Compact (EMAC), allow Volusia County to request additional resources and support during significant incidents.

To reduce the impact of flooding and maintain public confidence, Volusia County has implemented several education and mitigation initiatives. In collaboration with FEMA, NOAA, USACE, FDEM, ECFRPC, and the Florida Department of Insurance, the county provides residents with information on flood risks and the importance of flood insurance. During the NFIP mapping process, public outreach efforts invited residents to learn about flood vulnerabilities and mitigation options.

Volusia County Emergency Management has distributed over 5,000 NOAA weather radios to mobile home residents and created social media campaigns to disseminate critical information during flood events. The county has also developed an app for mobile devices.

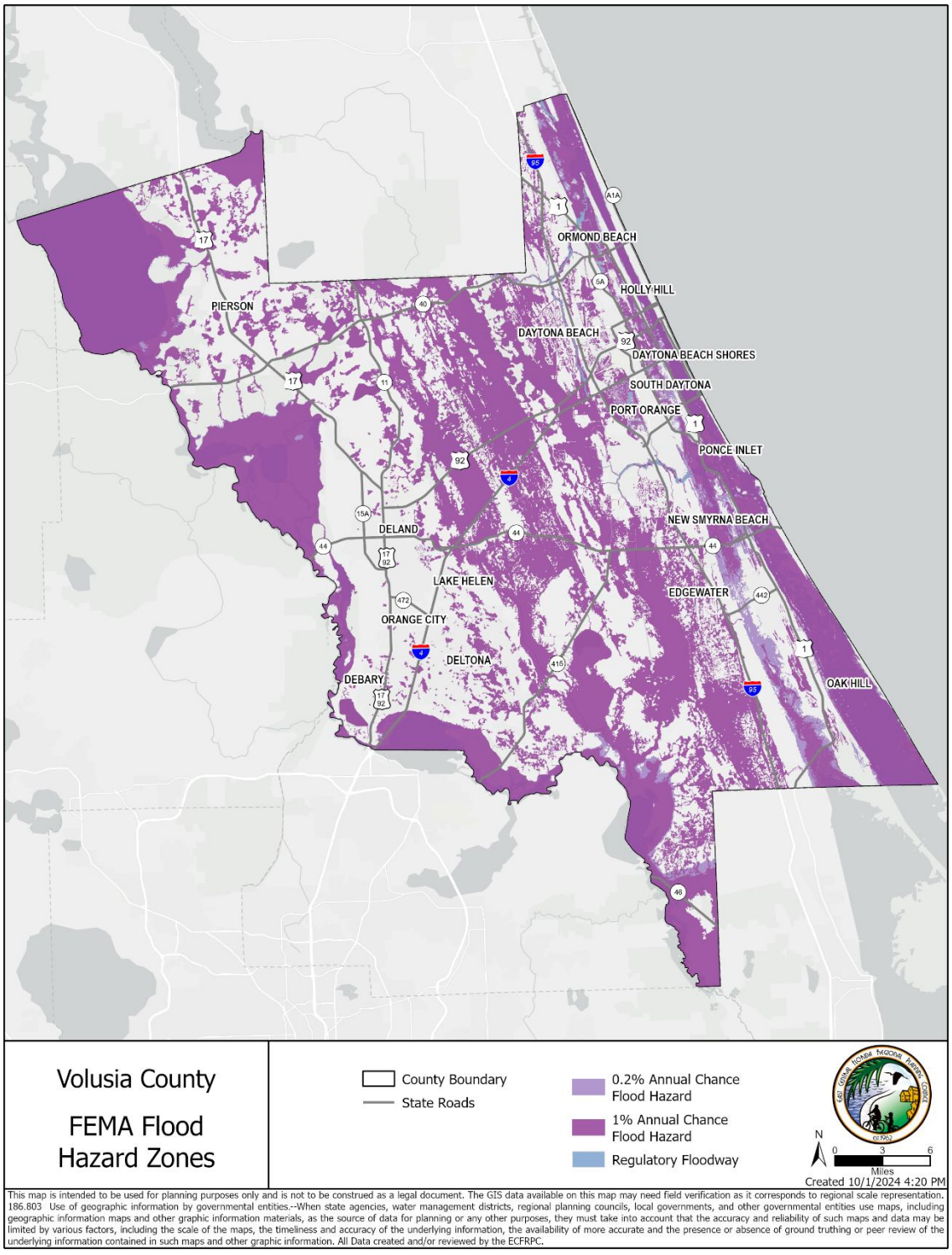
Mitigation activities, combined with education and public awareness campaigns, play a crucial role in reducing the financial and social burden of flooding while fostering community resilience. These efforts ensure that residents and businesses are better prepared to recover quickly and effectively after a flood event.

Section 6: Table 5: Property Exposure to Flood Hazard Zones

Jurisdiction	Number of Properties	Total Improved Value	County Taxable Value
Daytona Beach	13,847	$6,658,435,543	$4,082,706,747
Daytona Beach Shores	507	$437,389,147	$373,912,678
DeBary	1,387	$590,820,327	$340,103,975
DeLand	369	$234,887,960	$120,198,104
Deltona	5,522	$1,545,648,555	$668,644,860
Edgewater	1,564	$690,712,173	$417,012,709
Holly Hill	3,160	$18,630,680	$14,443,385
Lake Helen	288	$755,792,246	$502,823,799
New Smyrna Beach	10,556	$78,324,628	$36,649,988
Oak Hill	891	$5,286,195,924	$3,238,539,783
Orange City	74	$268,013,123	$143,174,110
Ormond Beach	5,093	$254,676,169	$131,349,031
Pierson	163	$2,993,289,460	$2,032,959,092
Ponce Inlet	1,083	$37,715,903	$17,576,761
Port Orange	8,567	$683,896,424	$450,947,795
South Daytona	4,311	$3,029,147,801	$1,859,130,800
Unincorporated	31,415	$1,285,011,052	$765,792,886
TOTAL	**88,797**	**$24,848,587,115**	**$15,195,966,503**

Source: EFCRPC, FEMA, Volusia County Property Appraiser

Section 6: Figure 5: Flood Zones in Volusia County



Source: FEMA

6.10 PUBLIC HEALTH EMERGENCIES

Vulnerability

Public health emergencies encompass a range of incidents, including disease outbreaks, pandemics, and mass casualty events that place extraordinary strain on healthcare systems. These emergencies may arise from natural causes, accidental exposure, or intentional acts, such as bioterrorism. Under Section 319 of the Public Health Service Act (42 U.S.C. § 319), the Secretary of the Department of Health and Human Services (HHS) has the authority to declare a public health emergency, which often prompts hospitals and other healthcare providers to exceed their normal operating capacities.

Volusia County's overall vulnerability to public health emergencies is medium. The people of Volusia County are highly vulnerable to the spread of disease due to the population size and proximity to tourist hotspots with travelers from all over the country and the world. All jurisdictions in the county are similarly vulnerable.

All residents of Volusia County are potentially vulnerable to public health emergencies, though the severity of impact often varies across demographic groups. Particularly at risk are the very young and the elderly, whose immune systems are more susceptible to illness. Volusia County has previously experienced isolated cases of imported malaria and West Nile virus (WNV) encephalitis, though WNV is asymptomatic in 80% of cases. Recent outbreaks of dengue fever (DEN-1) in nearby Martin County underscore the potential for emerging infectious diseases to pose a future threat. Communities with high density are more likely to spread illnesses faster, such as Daytona Beach and Deltona.

Impacts

Although public health emergencies primarily impact human health, agriculture could serve as the source of an outbreak in rare cases, such as with foodborne illnesses or zoonotic diseases transmitted from livestock to humans. The residents with the highest risk for this type of transmission are those in agricultural parts of the county. See Agriculture for further details on vulnerable locations. However, property and infrastructure are not directly at risk in these scenarios.

The environment is unlikely to be directly affected by most public health emergencies, except in cases of bioterrorism or hazardous materials (HAZMAT) incidents, where contamination could impact air, soil, or water quality. For further details on these scenarios, see the HAZMAT/Terrorism sections of this report.

Public health emergencies can disrupt program operations, especially if key personnel become ill or are otherwise unavailable. Historically, Volusia County's Emergency Operations Center has not experienced significant operational disruptions due to public health emergencies. However, in the event of a widespread outbreak or pandemic, reduced staffing levels may necessitate virtual communications or remote work for some personnel. In extreme cases, the county may rely on support from neighboring jurisdictions through the Emergency Management Assistance Compact.

If the primary Volusia County Emergency Operation Center becomes contaminated, operations may shift to an alternate location to maintain continuity. Detailed contingency plans are outlined in the Volusia County Emergency Management (VCEM) Continuity of Operations Plan (COOP).

The consequences of public health emergencies for residents can range from temporary illness to long-term health issues or death, depending on the nature and scale of the event. Overwhelmed healthcare facilities may lead to crowded hospitals, long wait times for treatment, and limited availability of medications or vaccines.

Emergency responders are also at risk during public health emergencies, as they may be exposed to contagious diseases or hazardous substances. To protect themselves, responders may need vaccinations, protective equipment, and training to safely navigate these incidents.

A widespread public health emergency could have significant economic repercussions for Volusia County. High infection rates may reduce workforce availability, leading to interruptions in business operations and consumer spending. Early detection, vaccination programs, and public health interventions are critical for minimizing these economic disruptions. Tourism activities could also be slowed or halted, disrupting the entire county.

Maintaining public confidence in governance is a key component of managing a public health emergency. The Volusia County Health Department plays a vital role in monitoring air and water quality, tracking emerging infectious diseases, and providing educational resources to residents. The department also coordinates hospital preparedness programs and healthcare coalitions to ensure a robust response to public health threats. Through its transparency and preparedness efforts, including online resources and public outreach campaigns, VCHD demonstrates its capacity to protect public health. This proactive approach minimizes the potential for a loss of public confidence during a crisis.

6.11 RISING COASTAL WATERS

Vulnerability

Rising coastal water is a significant hazard for Volusia County, encompassing storm surge, sea level rise, and tsunamis. This combination of immediate, catastrophic threats and long-term challenges has the potential to impact on the county's population, property, environment, economy, and government operations. The risks are particularly acute in coastal and low-lying areas near the Atlantic Ocean, Indian River Lagoon, Halifax River, St. Johns River, and other water-adjacent regions.

The municipalities most at risk are displayed in **Section 6 Table 6** and **Figure 6.** Rising coastal water poses the greatest risk to: Daytona Beach, Daytona Beach Shores, Edgewater, Holly Hill, New Smyrna Beach, Oak Hill, Ormond Beach, Ponce Inlet, Port Orange, south Daytona, and Unincorporated Volusia County due to its geographic proximity to the coast. Continued development along the shoreline also increases vulnerability to rising coastal waters for existing and future residents in these jurisdictions.

Residents in coastal areas of Volusia County face varying levels of risk from rising coastal water events.

- **Storm Surge:** The eastern portion of the county is highly susceptible to storm surge during hurricanes, with the worst-case scenario (Category 5 hurricane) potentially causing inundation almost as far inland as Interstate 95. Vulnerable populations in areas like Ponce Inlet, Daytona Beach Shores, and Ormond Beach face the highest immediate risks.
- **Tsunamis:** Although the U.S. Atlantic coast has a very low tsunami risk, the potential for significant impact exists. Coastal populations could experience rapid inundation, particularly in densely populated areas along the Halifax River and Atlantic coast. Tsunami events would likely allow for a minimum six-hour warning, enabling evacuation of at-risk populations. The most likely scenario for a tsunami in Volusia County would be triggered by a seismic event in Puerto Rico or off the western coast of Africa. Such events can affect populations thousands of miles away.
- **Sea Level Rise:** Sea level rise is currently being studied as a vulnerability to properties located near oceans, and many areas of eastern Volusia County would be inundated with water if sea level rise occurs as modeled by the U.S. Army Corps of Engineers. This long-term hazard poses no immediate threat to life but increases vulnerability to storm surge and coastal flooding over time. Impacts to residents in areas near the Indian River Lagoon, Halifax River, and St. Johns River are expected to escalate between 2040 and 2070.

Impacts

Rising coastal water poses substantial risks to property across Volusia County.

- **Storm Surge:** Coastal and low-lying areas east of Interstate 95, including properties along Spruce Creek and the Tomoka River, are vulnerable to storm surge inundation. Key at-risk locations include:
    - Barrier islands in Daytona Beach Shores and Ponce Inlet, which contain critical facilities like fire stations and city halls.
    - Infrastructure along the Halifax River, Indian River Lagoon, and Mosquito Lagoon, such as bridges (Main Street, Highbridge, Silver Beach, and North Bridge in New Smyrna Beach).
    - Iconic landmarks like the Ponce Inlet Lighthouse and Daytona Beach's Main Street Pier.
- **Tsunamis:** Property impacts would mirror those of a major storm surge, with debris transported inland, structural foundations compromised, and critical infrastructure disrupted.

- **Sea Level Rise:** Long-term property damage is expected in coastal areas adjacent to the Atlantic Ocean, Indian River Lagoon, Halifax River, and St. Johns River. Facilities near water bodies may require relocation, especially those handling hazardous materials. Saltwater intrusion could deteriorate stormwater infrastructure, including outfalls, lift stations, and pump stations, while older structures face heightened risks of damage.

The environmental impacts of rising coastal water in Volusia County are significant and varied.

- **Storm Surge and Tsunamis:** These events can devastate ecosystems, introducing saltwater into sensitive estuaries like the Indian River Lagoon and Halifax River. Saltwater intrusion into aquifers, the county's primary drinking water source, would be particularly harmful. Inundation could also damage dune systems and spread sewage and pollutants into the environment.
- **Sea Level Rise:** Coastal and riverbank ecosystems, including beaches and dune systems, are at risk of long-term degradation. Sensitive habitats, such as those for marine turtles, could face irreversible damage. Saltwater intrusion into stormwater infrastructure may exacerbate environmental harm.

The economic consequences of rising coastal water are profound. **Section 6 Table 7** and **Table 8** display financial exposures.

- **Storm Surge:** Damage to homes, businesses, and tourism infrastructure would result in substantial economic losses. A Category 5 hurricane could result in damages exceeding $1 billion, while impacts on tourism—a cornerstone of the county's economy—would be severe.
- **Sea Level Rise:** Gradual loss of property values, businesses, and community assets such as beaches will weaken the economic foundation of coastal areas. Investments in mitigation can reduce long-term risks but require substantial funding in the near term.
- **Tsunamis:** Like storm surge, tsunamis would devastate tourism, disrupt businesses, and impact the property tax base.

Public confidence in government could be significantly influenced by how rising coastal water events are managed.

- **Storm Surge and Tsunamis:** Delays in recovery or perceived inefficiencies could diminish public trust.
- **Sea Level Rise:** Public dissatisfaction could stem from either perceived inaction or over-investment in mitigation efforts. Balancing proactive measures with economic constraints is critical.

Rising coastal water could strain government operations and continuity.

- **Storm Surge and Tsunamis:** Response and recovery operations could be overwhelmed by the scale of damage, requiring mutual aid from adjacent counties, the state, and FEMA. Program operations may take months to return to normal.
- **Sea Level Rise:** While its effects are gradual, proactive relocation of facilities and infrastructure will be necessary to maintain operational continuity.

Volusia County has taken substantial steps to address these hazards, including participation in:

- The East Central Florida Regional Resiliency Action Plan and Resilience Collaborative.
- Sea level rise studies conducted by the Florida Department of Environmental Protection (FDEP).
- Development of a tsunami response plan and analysis of storm surge vulnerabilities.

These efforts, combined with the county's focus on adaptive strategies, demonstrate a commitment to protecting its residents, economy, and natural resources from the multifaceted threats posed by rising coastal water.

The interconnected challenges of storm surge, sea level rise, and tsunamis necessitate a comprehensive and adaptive approach. By leveraging regional collaboration, scientific research, and proactive planning, Volusia County can mitigate risks and build resilience to safeguard its future against the impacts of rising coastal water.

Storm surge data was obtained from the NOAA National Hurricane Center, which uses the hydrodynamic Sea, Lake, and Overland Surges from Hurricanes (SLOSH) model to simulate storm surges from tropical cyclones. Storm surge composites – Maximum Envelopes of Water (MEOWs) and Maximum of MEOWs (MOMs) – are created to assess and visualize storm surge risk under varying conditions. This analysis used MOMs, which show maximum storm surge heights for each hurricane category.[3]

[3] https://www.nhc.noaa.gov/nationalsurge/?text

Section 6 Table 6 shows the number of properties at risk, per jurisdiction, to Category 1, Category 3 and Category 5 storm surge effects. The table corresponds with **Section 6 Figure 6**, which depicts the storm surge hazard zones.

Section 6: Table 6: Properties at Risk to Category 1/3/5 Storm Surge by Jurisdiction

JURISDICTION	Properties at Risk (Cat. 1)	Properties at Risk (Cat. 3)	Properties at Risk (Cat. 5)
Daytona Beach	2,548	11,700	17,070
Daytona Beach Shores	641	1,113	1,316
DeBary	-	-	-
DeLand	-	-	-
Deltona	-	-	-
Edgewater	666	5,862	12,452
Holly Hill	278	2,654	5,437
Lake Helen	-	-	-
New Smyrna Beach	6,748	13,105	14,273
Oak Hill	620	1,718	1,837
Orange City	-	-	-
Ormond Beach	5,573	5,596	16,156
Pierson	-	-	-
Ponce Inlet	1,252	1,865	2,059
Port Orange	5,197	11,027	15,453
South Daytona	3,905	5,216	5,324
Unincorporated	6,019	12,636	23,323
TOTAL	**29,447**	**72,492**	**114,700**

Sources: NOAA National Hurricane Center, Volusia County Property Appraiser Data (2024)

Section 6: Table 7: Property Financial Exposure to Storm Surge Zones (by Hurricane Category)

Hazard Zone	Properties	Land Value	Building Value	Assessed Value	County Taxable Value
Category 1	29,447	$5,695,379,097	$8,590,261,772	$14,285,640,870	$9,100,097,404
Category 2	47,855	$7,783,692,785	$12,513,410,495	$ 20,297,103,281	$12,707,503,091
Category 3	72,492	$10,040,742,120	$17,391,421,198	$27,432,163,319	$6,992,999,337
Category 4	101,794	$12,625,555,628	$23,968,191,165	$36,593,746,794	$22,494,898,569
Category 5	114,700	$ 13,949,115,459	$27,809,655,741	$41,758,771,201	$25,593,734,627

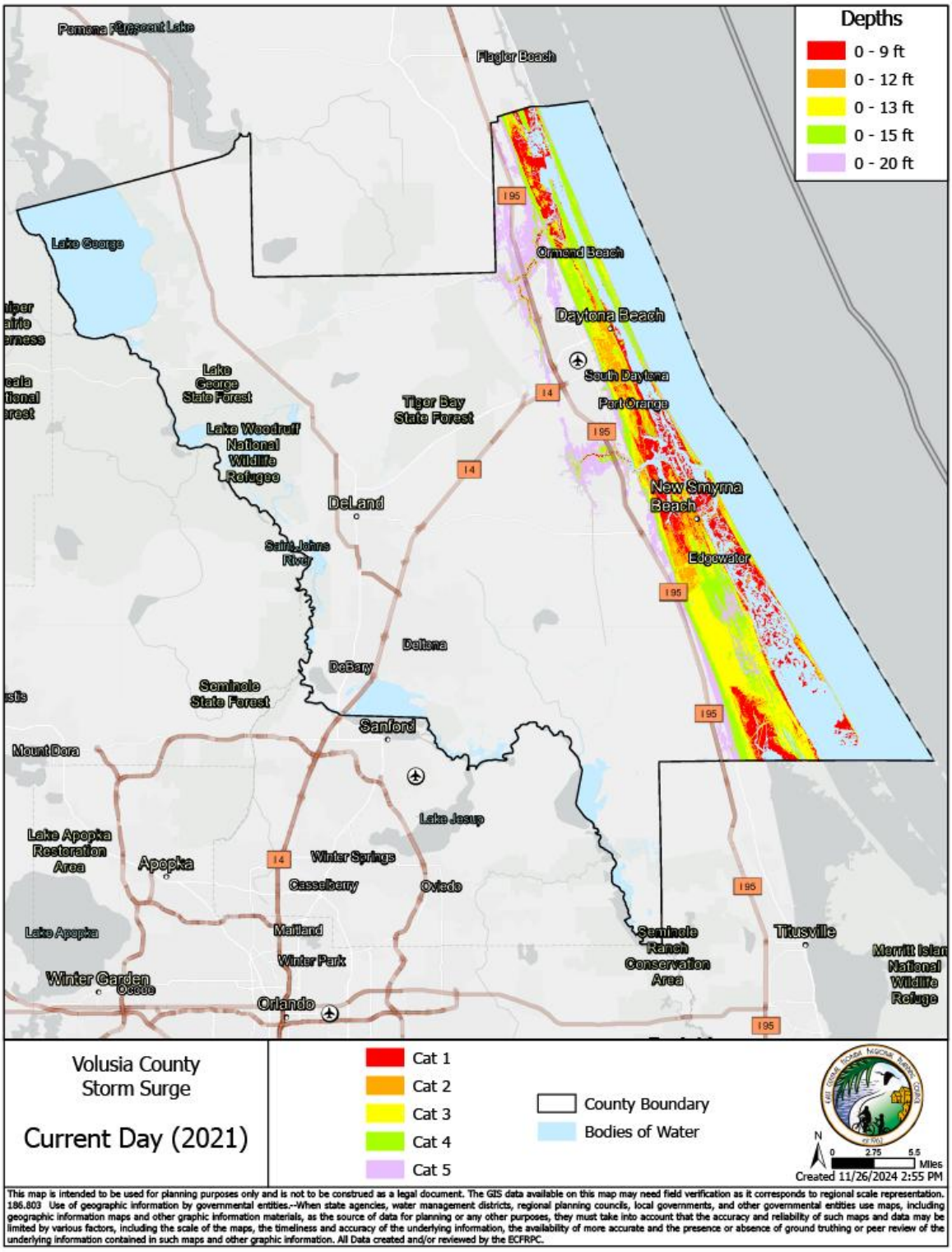
Source: NOAA NHC, Volusia County Property Appraiser Data (2024)

Section 6: Table 8: Property Financial Exposure to Sea Level Rise

Jurisdiction	Properties	Land Value	Building Value	Assessed Value	County Taxable Value
Daytona Beach	1,795	$169,014,252	$629,417,387	$798,431,640	$664,021,379
Daytona Beach Shores	2,506	$111,725,822	$1,035,616,002	$1,147,341,824	$983,518,299
Ormond Beach	635	$145,553,584	$423,703,299	$569,256,883	$484,558,201
Ponce Inlet	337	$63,575,696	$153,180,138	$216,755,834	$183,980,752
Unincorporated	1,857	$129,003,996	$543,256,684	$672,260,680	$524,005,469

Source: ECFRPC, Florida Fish and Wildlife, Volusia County Property Appraiser Data (2024)

Section 6: Figure 6: Current Day Storm Surge



Source: ECFRPC, Volusia County VA

6.12 SEVERE WEATHER

Vulnerability

Severe weather, including hail, lightning, and thunderstorms, is a recurring concern in Volusia County. Each hazard poses unique threats to populations, property, and infrastructure, but come with little to no warning. It encompasses a range of phenomena that are more extreme than typical weather conditions. Severe weather events can impact all areas of Volusia County, depending on the location of the storm, its direction, and its lateral speed across the Earth's lower atmosphere. These events can cause damage to structures, disruption of utilities and surface/air transportation.

Vulnerability to severe weather is medium due to its frequency in nature combined with our ability to monitor and predict when severe weather will impact Volusia County and its jurisdictions. While severe weather can have damaging effects on people and property, widespread awareness and lead time before storms reduces our overall vulnerability to its effects. Vulnerability to severe weather is consistent throughout all jurisdictions.

Hailstorms can occur unpredictably across Volusia County, impacting all buildings, facilities, and populations equally. Hailstones in Florida are typically penny to quarter-sized but can occasionally grow as large as golf balls or baseballs, causing significant damage to property and infrastructure. Vulnerable areas of structures include roofs, windows, and pool screens, as well as exposed personal property like vehicles and outdoor decor. Communication facilities may be at a higher risk of a lightning strike, while school assets such as football stadiums with lighting could also be at an increased level of vulnerability. Structures that are isolated in areas of low tree coverage are at a higher risk for lightning strikes. Jurisdictions within the county where this could be more common include DeLand, Lake Helen, Orange City, and Pierson. These areas are generally more rural in nature and have a higher rate of isolated critical facilities and structures.

In situations where tornadoes are present, hail may have a higher likelihood of being present. Moreover, structures that have partial or full tree coverage could have lessened property damage due to hail as a result of the slowing speed of the hail before impact with property. Severe hail can also damage emergency vehicles and communication systems, disrupting response efforts.

Beachside structures located near or along the Atlantic Ocean are also at a higher vulnerability to lightning damage due to historical occurrences. There are not many critical facilities located along the Atlantic Ocean in Volusia County, as the majority of those facilities are located inland along the barrier islands or are located west of the Intracoastal Waterway. Vulnerable areas for lightning include recreational spaces, golf courses, and the county's 47 miles of Atlantic Ocean beaches, where tourists and residents engaging in outdoor activities face heightened risks. Lightning is a dangerous threat to people in the United States, particularly those who are outside during the summer. The number one area for fatalities due to lightning strikes is open fields, making Volusia County's 47 miles of Atlantic Ocean beach among the most dangerous in the County. This heightens the risk for the tourist population who may be unaware of the imminent danger of quickly approaching tropical systems that emit lightning.

Communication systems and power sources are among the most vulnerable land uses to this hazard due to their electrical nature. Volusia County has approximately 30 golf courses, along with private and public recreational facilities, the Daytona Beach International Speedway and 2 additional smaller outdoor

racetracks, 2 intracoastal waterways traversing the county, school facilities, and parks located throughout the County. Individuals participating in the following recreational activities could be vulnerable to lightning including: golf, football, baseball, soccer, surfing, horseback riding, walking, jogging, tennis, boating, fishing, kite flying, kayaking, paddle boarding, beach activities, picnicking, camping, hiking, gardening, hunting, swimming, basketball, softball, cycling, wind surfing, lacrosse, archery, track and field events, stock car races, outdoor festivals and numerous other outdoor activities. It is estimated that at least 75% of the population participates in at least one of these recreational activities and is thus vulnerable to lightning.

Thunderstorms are frequent throughout the year in Volusia County, often bringing high winds, hail, and lightning. From 2019 to 2024, the county experienced 14 severe thunderstorm events, causing $23,000 in property damage. Downed trees, power outages, and damage to homes and infrastructure are common consequences. Unhoused populations, outdoor event spectators, and those engaging in recreational activities are particularly vulnerable.

Impacts

Lightning can spark structure fires, damage electrical systems, and contribute to wildfire during dry seasons. Critical facilities with tall antennas, isolated structures, or those in rural areas like DeLand, Lake Helen, Orange City, and Pierson are at increased risk of lightning strikes. Beachside properties, including hotels and utilities, are also vulnerable. As it cannot be predicted where lightning may strike, all existing and future buildings, facilities and populations in Volusia County are exposed to this hazard and could potentially be impacted. As the lightning capital of the U.S., Florida experiences a high frequency of lightning strikes, with Volusia County recording approximately 4,000 lightning strikes weekly during summer.

Beachside structures located near or along the Atlantic Ocean are also at a higher vulnerability to lightning damage. Many utilities are in these locations. Most of the buildings located along the beach are hotels, businesses and high-rise condos. There are not many critical facilities located along the Atlantic Ocean in Volusia County, as the majority of those facilities are located inland along the barrier islands or are located west of the Intracoastal Waterway.

Thunderstorms frequently occur in Volusia County. Since it cannot be predicted where thunderstorms may occur, all existing and future buildings, facilities and populations are exposed to this hazard and could potentially be impacted. Thunderstorm winds can disrupt transportation and utilities, while heavy rain may lead to localized flooding. Critical roadways may be blocked by downed trees or power lines, complicating emergency response. Thunderstorms can also exacerbate other hazards, such as hail and lightning, increasing their overall impact on the county.

While severe weather generally has minimal long-term environmental impacts, it can cause immediate issues such as downed vegetation, localized flooding, and occasional wildfires. Economically, damages are often covered by insurance, limiting their broader impact on the local economy.

Volusia County Emergency Management has systems in place to maintain operations during severe weather events. Redundant communication systems, backup power, and a Continuity of Operations Plan (COOP) ensure the county can respond effectively, even in catastrophic scenarios. However, responders

may face challenges such as blocked roads, downed power lines, and unsafe conditions caused by lightning or hail.

Public confidence in government is unlikely to be significantly affected by severe weather events, as Volusia County provides timely information through NOAA weather radios, social media, and the county's website. Recovery efforts for most severe weather events are typically completed within days.

6.13 TORNADO

Vulnerability

Historical evidence confirms that Volusia County is vulnerable to tornadoes, which can result from severe thunderstorms, tropical storms, or hurricanes. These hazards are unpredictable, with no specific area immune from their potential impacts. All buildings, facilities, and populations in Volusia County are considered exposed to tornadoes, regardless of location. Vulnerable populations, such as the unhoused, elderly, and lower-income residents, are particularly at risk, as are those living in mobile home parks and manufactured housing communities. Volusia County has mobile home/manufactured home parks throughout the county, both east and west sides which are equally vulnerable to impacts of tornadoes. Many of the parks are 55 and older only while others have very old mobile homes that are not built to today's standards, leaving the elderly and low-income populations more at risk. Many of these structures, particularly older ones, are not built to current building standards, making them highly susceptible to damage from high winds and flying debris. **Section 6 Table 9** displayed each jurisdiction's number of homes and when the homes were built. Daytona Beach and Unincorporated Volusia have the highest number of homes built pre-1969, making residents of those jurisdictions more vulnerable.

Impacts

While tornadoes are relatively rare in Volusia County compared to other hazards, they can have devastating effects when they occur. The strongest tornado to impact Volusia County was an EF3, capable of leveling well-constructed buildings, uprooting trees, and creating automobile-sized projectiles that can travel for miles. Although large tornadoes are uncommon, their potential for destruction makes them a significant threat to both life and property.

Two primary types of tornadoes typically impact Volusia County. Larger tornadoes, in the EF2 to EF4 range, often form in central Florida near the Orlando metropolitan area and tend to move from the west-southwest to the east-northeast. These tornadoes cover large areas and are more likely to affect the western portions of Volusia County, particularly near its borders with Seminole and Lake Counties. Historical patterns suggest that tornado activity often reaches the eastern coastline after being detected in Central Florida, offering some warning for communities in the storm's path.

Smaller tornadoes, typically in the EF0 to EF1 range, occur more frequently in Volusia County and are less predictable. These tornadoes do not follow consistent geographic patterns, and their touchdowns can appear randomly. Despite this, a disproportionate number of these smaller tornadoes have been observed near the Intracoastal Waterway. Rarely have tornadoes been recorded crossing Interstate 95 in Volusia County, further illustrating the widespread vulnerability of the area to these storms.

The consequences of tornadoes on property, infrastructure, and the environment can be severe. Tornadoes can demolish homes, businesses, and critical facilities, while also disrupting utilities such as power and communication systems. Roads may become impassable due to debris, downed trees or power lines, and complicated emergency response efforts. Older structures are particularly vulnerable, as building codes have become more stringent over time to better withstand high winds. Infrastructure in the western portions of the county faces higher risks from larger tornadoes, which develop over longer periods and allow less time for mitigation or protective measures. Thus, critical facilities at the highest risk for strong tornado damage (and loss of human life) would generally be those located in the western portion of the

county due to the shorter duration of time allowed for mitigation of these properties in the event of an incoming storm.

The environmental impacts of tornadoes vary depending on their intensity. Even weaker EF0 tornadoes can uproot trees and vegetation, while stronger tornadoes can scatter debris over great distances, sometimes miles from the point of origin. This debris can contaminate waterways or cause secondary hazards if it includes hazardous materials from damaged vehicles or storage facilities. Agencies such as Volusia County Environmental Management and the County Health Department would monitor these environmental impacts to mitigate risks.

Emergency response efforts in the aftermath of a tornado are critical but can be challenging. Search and rescue operations may be required in heavily impacted areas, and responders may encounter destroyed communication systems, missing landmarks, and blocked roadways. Power lines and debris present additional hazards, necessitating extreme caution for first responders. Despite these challenges, the Volusia County Emergency Operations Center is fortified to withstand an EF4 tornado, ensuring its continued operation even during severe events. In the unlikely event of direct damage to the VCEOC, alternative plans outlined in the COOP would allow emergency services to continue without significant interruption.

Tornadoes also pose economic risks to the county. While smaller tornado events may only have a localized impact, larger tornado outbreaks can devastate entire communities, crippling local economies and requiring substantial recovery resources. Assistance from the Volusia County Community Organizations Active in Disaster (COAD), including the American Red Cross, would be mobilized to support affected residents and businesses.

Public awareness and preparedness play crucial roles in mitigating the impacts of tornadoes. The county utilizes NOAA weather radios, social media platforms, and premade media materials to disseminate information during and after tornado events. Some communities in Volusia County are equipped with tornado sirens and safe rooms, further enhancing public safety during these hazardous events.

In conclusion, while tornadoes are not as frequent as other hazards in Volusia County, their potential for catastrophic damage makes them a significant concern. All areas and populations within the county are at risk, and continued efforts in preparedness, infrastructure hardening, and public education remain essential to minimizing their impact and ensuring the safety and resilience of the community.

Section 6: Table 9: Year Range of Built Homes for each Municipality

JURISDICTION	Pre- 1969	1970-1979	1980-1989	1990-1999	2000-2024
Daytona Beach	10,816	3,919	4,114	1,090	8,353
Daytona Beach Shores	578	1,257	1,842	1,276	1,637
DeBary	1,562	735	1,577	2,120	3,567
DeLand	2,767	1,114	587	815	8,120
Deltona	2,568	4,325	12,629	6,455	10,181
Edgewater	1,111	1,173	3,517	1,518	2,969
Holly Hill	2,490	600	664	174	834
Lake Helen	399	223	164	414	232
New Smyrna Beach	3,370	3,391	3,506	1,671	7,095
Oak Hill	176	107	183	129	483
Orange City	682	366	588	345	1,251
Ormond Beach	4,318	3,537	3,736	2,029	3,593
Pierson	228	93	91	47	81
Ponce Inlet	88	612	568	739	1,059
Port Orange	1,331	3,984	6,819	3,895	6,585
South Daytona	1,714	1,261	980	449	517
Unincorporated	12,400	8,877	10,243	6,916	13,829

Sources: Volusia County Property Appraiser Data (2024). Some properties were not provided with a land use code by VCPAO.

6.14 TROPICAL CYCLONE

Vulnerability

Tropical cyclones, encompassing hurricanes and tropical storms, pose significant risks to Volusia County. The overall vulnerability of tropical cyclones is high within all jurisdictions of Volusia County. The possibility of harm to humans, high property damage, and potential infrastructure losses all combine to make tropical cyclones one of the highest threat hazards. Volusia County is vulnerable to tropical cyclones to a similar level in all jurisdictions because of the spatial extent of a hurricane or tropical storm. The LMS works to protect critical infrastructure and residents in order to reduce the vulnerability of the community.

These events often affect large areas and cross jurisdictional boundaries, exposing all existing and future buildings, facilities, and populations to potential impacts. Volusia County has a lower risk compared to other areas of the state such as the western panhandle and southeastern Florida.

The county's coastal region, home to over 45% of the population, is particularly vulnerable. Vulnerable populations, including the unhoused, disabled, elderly, and lower-income residents, face heightened risks during these events. Additionally, residents living on the barrier islands or adjacent to the Intracoastal Waterway system are particularly susceptible due to their proximity to storm surge zones and areas prone to flooding.

Impacts

Critical infrastructure, including communication systems and power sources, is vulnerable to tropical cyclones. These storms bring a combination of high winds, flooding, coastal erosion, and heavy precipitation, making it challenging to estimate total potential losses. Historical data suggest that Volusia County is at a relatively lower risk for direct impacts compared to areas like the western Florida Panhandle or southeastern Florida. However, regions closer to the Atlantic Ocean or in the southeastern part of the county face the highest risk of wind damage.

This area also drives much of the county's tourism, which faces significant disruption during tropical cyclone events. One of Volusia County's most significant hurricane seasons on record occurred in 2004, with Hurricanes Charley, Frances, and Jeanne causing back-to-back impacts. While Charley was the only storm to bring hurricane-force winds to the county, the cumulative effects of these storms caused extensive damage to homes, infrastructure, and the environment. Over 40% of homes sustained damage, and the total economic losses exceeded $560 million. Annualized losses to residential buildings in the county are estimated at over $280 million, with an additional $70 million in annualized losses for non-residential structures.

Beyond high winds, tropical cyclones bring cascading hazards, including inland flooding, tornadoes, storm surge, and severe beach erosion. These hazards significantly impact on the environment, causing downed trees, eroded coastal dunes, and loss of animal habitat, like sea turtle nesting areas. Additionally, debris and hazardous materials may wash into waterways, further harming sensitive ecosystems. The monetary cost of erosion alone is challenging to calculate as it often occurs alongside other impacts. Agencies such as Volusia County Environmental Management and the County Health Department play vital roles in monitoring and mitigating environmental consequences.

Program operations and emergency response efforts can be strained during a major tropical cyclone, particularly a Category 3 or higher hurricane. While routine operations generally continue during tropical depressions or weaker storms, a direct hit from a significant hurricane could severely disrupt county functions. In such cases, Volusia County may require assistance from neighboring counties, the state, or FEMA through mutual aid agreements like the Emergency Management Assistance Compact (EMAC). Recovery may take months or even years to return operations to pre-storm levels, depending on the storm's severity.

The public faces numerous challenges during and after tropical cyclones, including injuries, fatalities, destruction of homes and businesses, and prolonged disruptions to essential services like water, power, and sewage. Recovery is often costly, time-consuming, and emotionally taxing for affected residents, even with insurance or disaster assistance. These events can have lasting psychological impacts, especially on those who experience repeated storm impacts. All residents are vulnerable.

Responders face extreme challenges in tropical cyclone events. Downed trees, power lines, damaged infrastructure, and impassable roads complicate rescue and recovery efforts. Critical facilities such as the EOC, fire stations, hospitals, and government buildings may also sustain damage, limiting their functionality. Responders must operate with heightened awareness of their risks, especially in hazardous conditions caused by the storm.

The economic consequences of tropical cyclones are substantial. The 2004 hurricane season remains the costliest disaster in Volusia County's history, with damages to tourism alone amounting to millions of dollars per day. Recovery from a single major hurricane can take years, with long-term financial impacts on the county and affected communities.

To mitigate these risks and maintain public confidence, the Volusia County Emergency Management has implemented various preparedness and public awareness initiatives. These include a video disaster preparedness guide, behavioral surveys following hurricane evacuations, public presentations, and an annual media campaign in collaboration with local outlets like the Daytona Beach News Journal. During hurricane events, the Public Information Office (PIO) uses pre-prepared materials and social media campaigns to provide timely updates. Year-round preparedness information is also disseminated through the county's weekly video magazine broadcast on WDSC.

Through these efforts, Volusia County Emergency Management aims to ensure residents are informed and confident in the county's ability to respond to and recover from tropical cyclones. These storms remain a significant threat to Volusia County, necessitating ongoing vigilance and community resilience to minimize the impacts.

Section 6: Tables 10-14 display individual municipalities vulnerability and potential financial impacts. **Section 6: Figures 7-11** display the jurisdictions most vulnerable to tropical cyclone wind.

Section 6: Table 10:Total Exposure and Potential Losses from Tropical Storm 10 Year Wind Event

JURISDICTION	Category Storm	Total Properties Impacted	Total Improved Value	Total County Taxable Value
Daytona Beach	Tropical Storm (10 Year Wind)	30,119	$12,633,494,317	$7,749,648,103
Daytona Beach Shores	Tropical Storm (10 Year Wind)	1,996	$882,003,599	$738,195,556
DeBary	Tropical Storm (10 Year Wind)	10,711	$3,435,586,766	$1,891,223,406
DeLand	Tropical Storm (10 Year Wind)	14,334	$4,967,030,224	$2,807,390,723
Deltona	Tropical Storm (10 Year Wind)	38,625	$10,394,231,629	$4,998,200,319
Edgewater	Tropical Storm (10 Year Wind)	15	$29,363,698	$1,306,086
Holly Hill	Tropical Storm (10 Year Wind)	5,918	$1,396,507,074	$940,757,855
Lake Helen	Tropical Storm (10 Year Wind)	1,611	$380,061,877	$187,817,740
New Smyrna Beach	Tropical Storm (10 Year Wind)	4,550	$1,792,674,363	$1,085,721,035
Oak Hill	Tropical Storm (10 Year Wind)	NA	NA	NA
Orange City	Tropical Storm (10 Year Wind)	4,152	$1,804,174,621	$1,132,329,161
Ormond Beach	Tropical Storm (10 Year Wind)	19,640	$8,159,700,002	$5,171,008,626
Pierson	Tropical Storm (10 Year Wind)	998	$201,935,655	$75,064,369
Ponce Inlet	Tropical Storm (10 Year Wind)	2	$1,602,240	$-
Port Orange	Tropical Storm (10 Year Wind)	21,960	$8,081,425,788	$4,806,901,213
South Daytona	Tropical Storm (10 Year Wind)	5,744	$1,603,899,506	$995,389,225
Unincorporated	Tropical Storm (10 Year Wind)	58,314	$17,039,658,509	$8,978,042,429
Total		**218,689**	**$72,803,349,868**	**$41,558,995,846**

Section 6: Table 11: Total Exposure and Potential Losses from Category 1 Hurricane 10 Year Wind Event

JURISDICTION	Category Storm	Total Properties Impacted	Total Improved Value	Total County Taxable Value
Daytona Beach	Category 1 (10 Year Wind)	92	$53,804,064	$27,475,696
Daytona Beach Shores	Category 1 (10 Year Wind)	5,068	$2,030,402,176	$1,648,277,480
Edgewater	Category 1 (10 Year Wind)	11,391	$3,194,704,166	$1,760,195,467
New Smyrna Beach	Category 1 (10 Year Wind)	14,973	$8,240,653,427	$5,484,596,621
Oak Hill	Category 1 (10 Year Wind)	1,508	$347,201,180	$174,501,154
Ponce Inlet	Category 1 (10 Year Wind)	3,501	$1,905,167,040	$1,371,503,690
Port Orange	Category 1 (10 Year Wind)	2,149	$540,957,713	$331,306,371
Unincorporated	Category 1 (10 Year Wind)	9,540	$3,814,506,610	$2,446,202,323
Total		**106,536**	**$37,167,054,885**	**$22,222,101,231**

Section 6: Table 12: Total Exposure and Potential Losses from Category 1 Hurricane 100 Year Wind Event

JURISDICTION	Category Storm	Total Properties Impacted	Total Improved Value	Total County Taxable Value
Pierson	Category 1 (100 Year Wind)	998	$201,935,655	$75,064,369
Unincorporated	Category 1 (100 Year Wind)	4,667	$1,091,440,399	$461,913,478
Total		**5,665**	**$1,293,376,054**	**$536,977,847**

Section 6: Table 13: Total Exposure and Potential Losses from Category 2 Hurricane 100 Year Wind Event

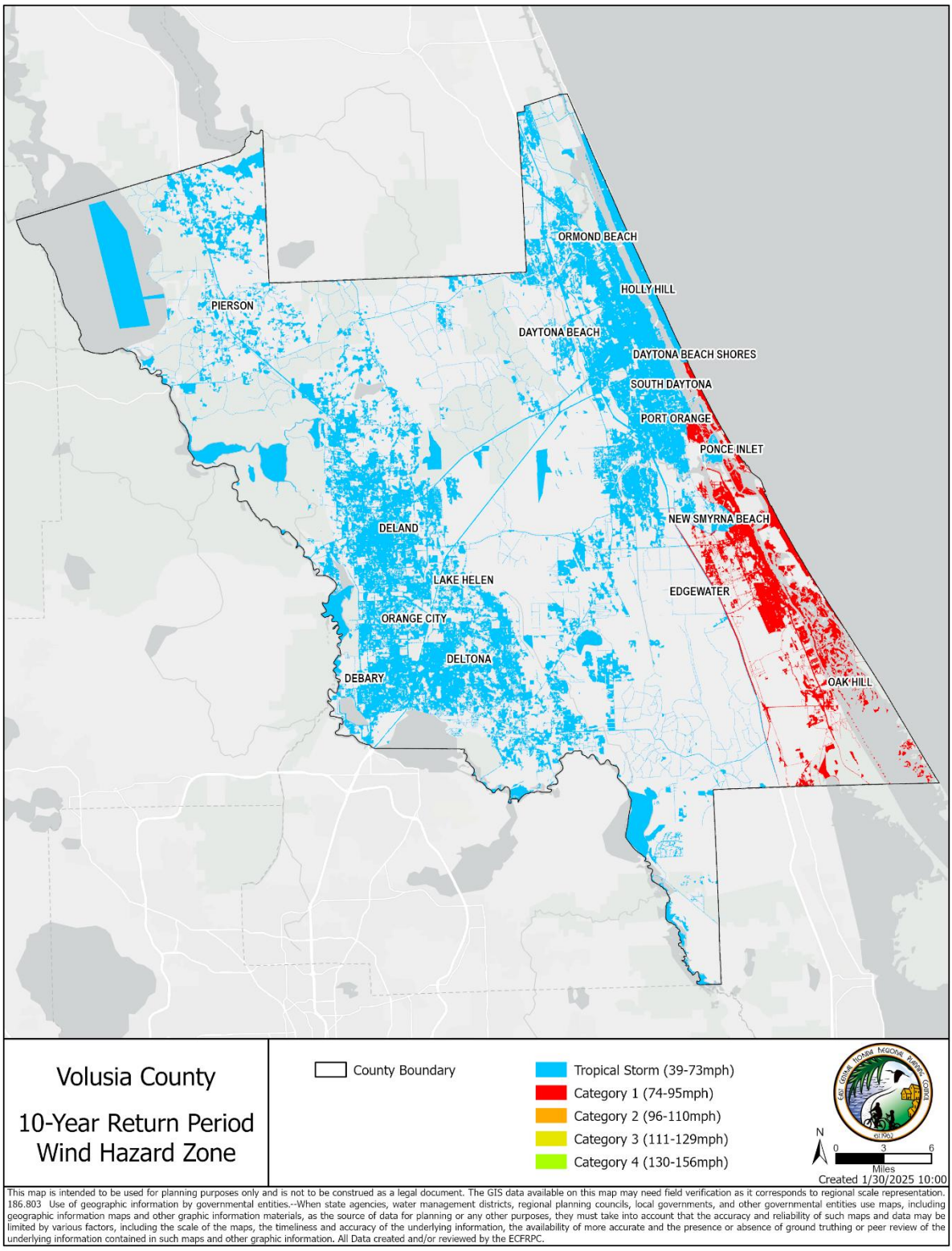
JURISDICTION	Category Storm	Total Properties Impacted	Total Improved Value	Total County Taxable Value
Daytona Beach	Category 2 (100 Year Wind)	30,211	$12,687,298,381	$7,777,123,799
Daytona Beach Shores	Category 2 (100 Year Wind)	5,384	$2,255,645,845	$1,818,525,882
DeBary	Category 2 (100 Year Wind)	10,711	$3,435,586,766	$1,891,223,406
DeLand	Category 2 (100 Year Wind)	14,334	$4,967,030,224	$2,807,390,723
Deltona	Category 2 (100 Year Wind)	38,625	$10,394,231,629	$4,998,200,319
Holly Hill	Category 2 (100 Year Wind)	5,918	$1,396,507,074	$940,757,855
Lake Helen	Category 2 (100 Year Wind)	1,611	$380,061,877	$187,817,740
New Smyrna Beach	Category 2 (100 Year Wind)	3,955	$1,230,060,289	$707,080,447
Orange City	Category 2 (100 Year Wind)	4,152	$1,804,174,621	$1,132,329,161
Ormond Beach	Category 2 (100 Year Wind)	19,640	$8,159,700,002	$5,171,008,626
Ponce Inlet	Category 2 (100 Year Wind)	2	$1,602,240	$-
Port Orange	Category 2 (100 Year Wind)	23,962	$8,585,291,721	$5,109,672,839
South Daytona	Category 2 (100 Year Wind)	5,744	$1,603,899,506	$995,389,225
Unincorporated	Category 2 (100 Year Wind)	48,474	$14,257,690,656	$7,695,806,165
Total		**218,388**	**$72,452,156,885**	**$41,769,304,034**

Section 6: Table 14: Total Exposure and Potential Losses from Category 3 Hurricane 100 Year Wind Event

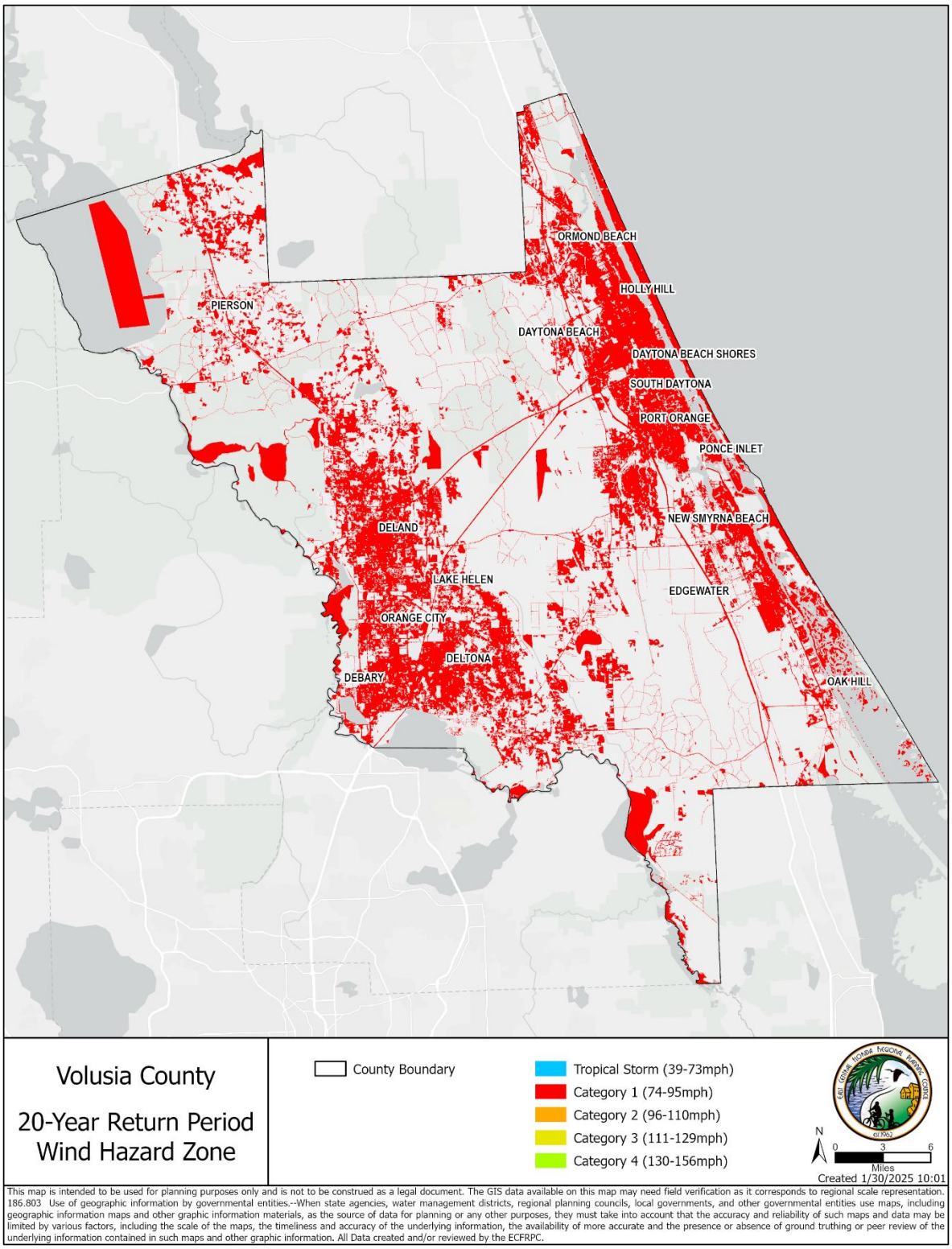
JURISDICTION	Category Storm	Total Properties Impacted	Total Improved Value	Total County Taxable Value
Daytona Beach Shores	Category 3 (100 Year Wind)	1,680	$656,759,930	$567,947,154
Edgewater	Category 3 (100 Year Wind)	11,406	$3,224,067,864	$1,761,501,553
New Smyrna Beach	Category 3 (100 Year Wind)	15,568	$8,803,267,501	$5,863,237,209
Oak Hill	Category 3 (100 Year Wind)	1,508	$347,201,180	$174,501,154
Ponce Inlet	Category 3 (100 Year Wind)	3,501	$1,905,167,040	$1,371,503,690
Port Orange	Category 3 (100 Year Wind)	147	$37,091,780	$28,534,745
Unincorporated	Category 3 (100 Year Wind)	14,713	$5,505,034,064	$3,266,525,109
Total		**96,997**	**$34,736,280,015**	**$20,729,556,779**

Sources: FDEM, HAZUS, Volusia County Property Appraiser Data (2024)

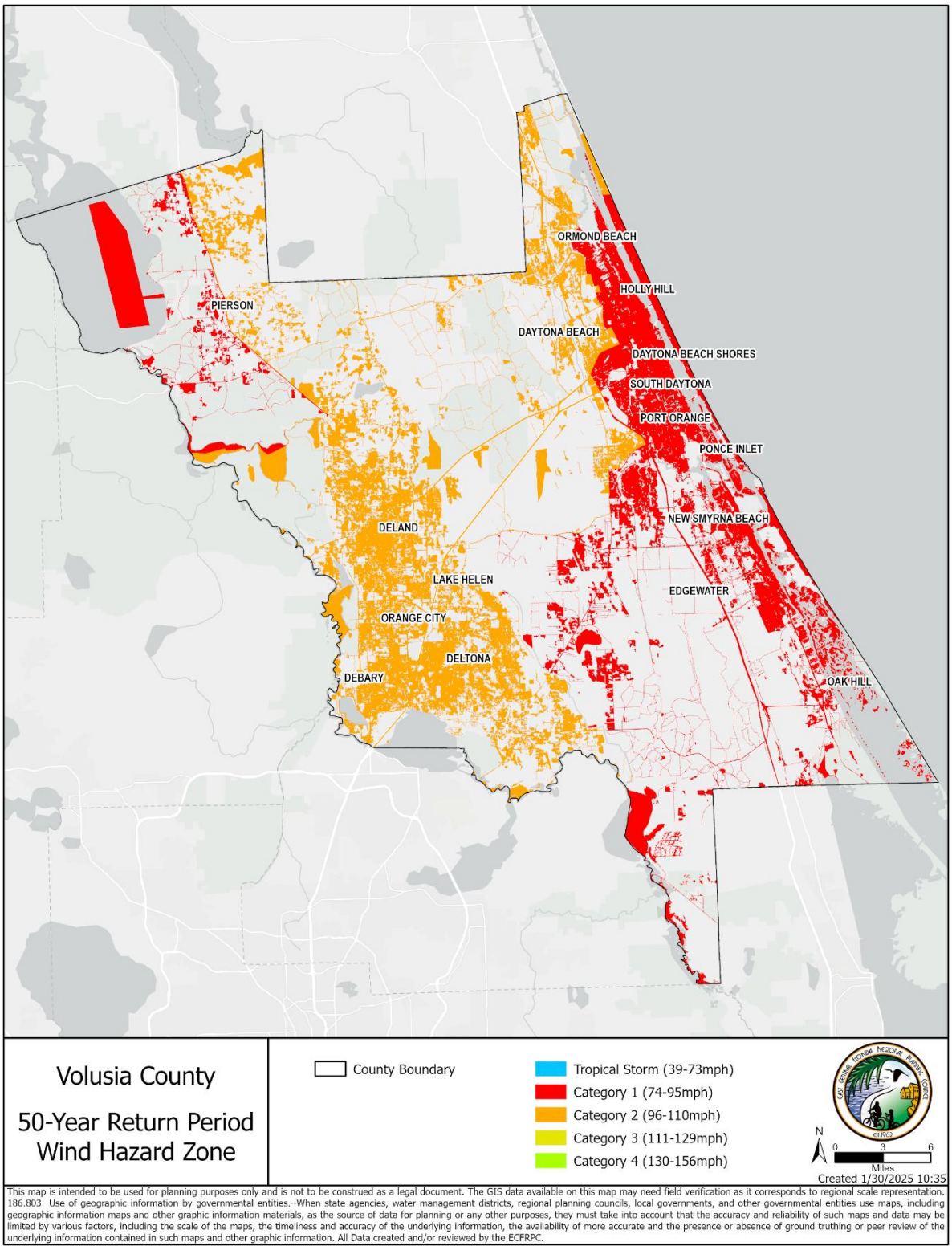
Section 6: Figure 7: Wind Hazard Zones 10-Year Event



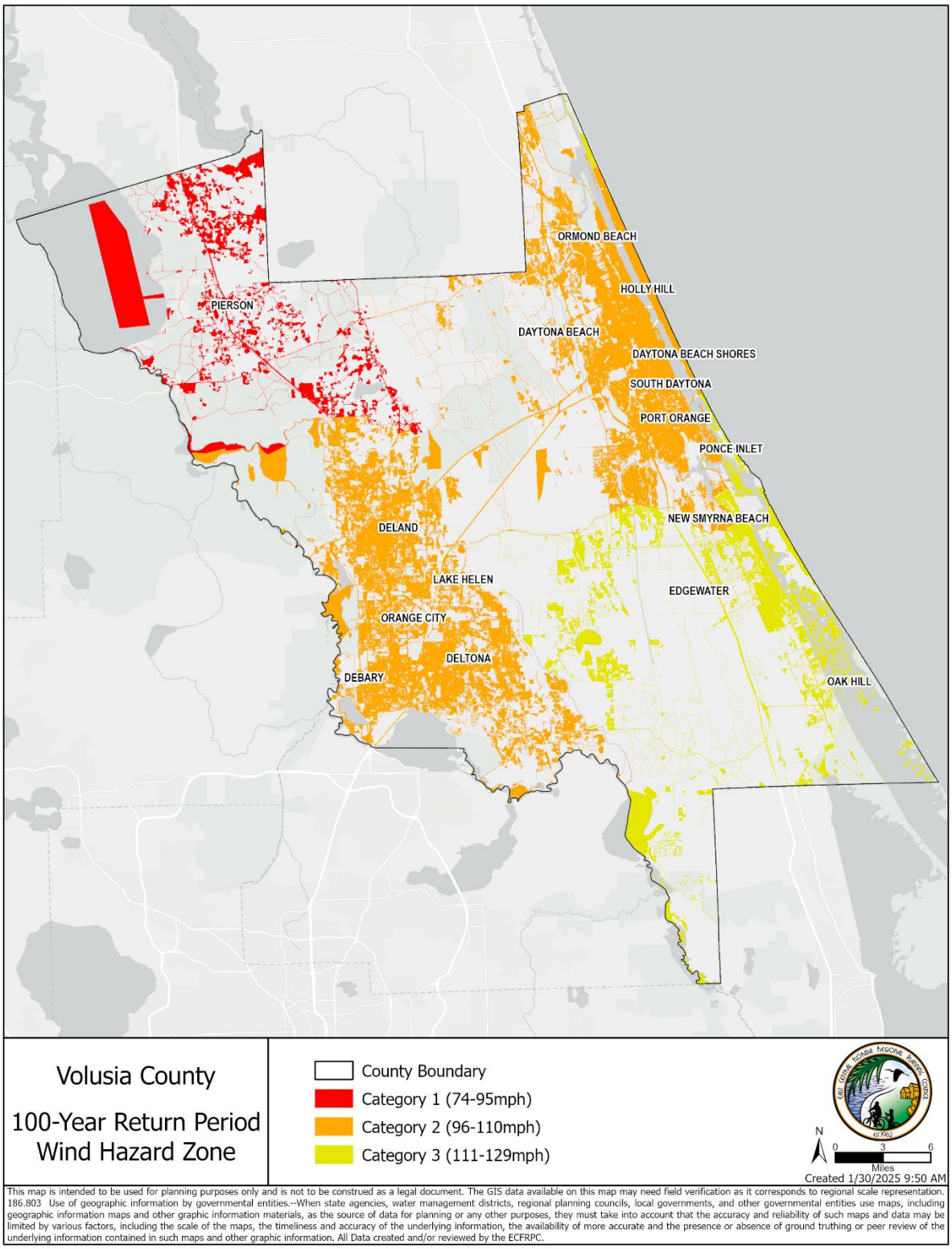
Section 6: Figure 8: Wind Hazard Zones 20-Year Event



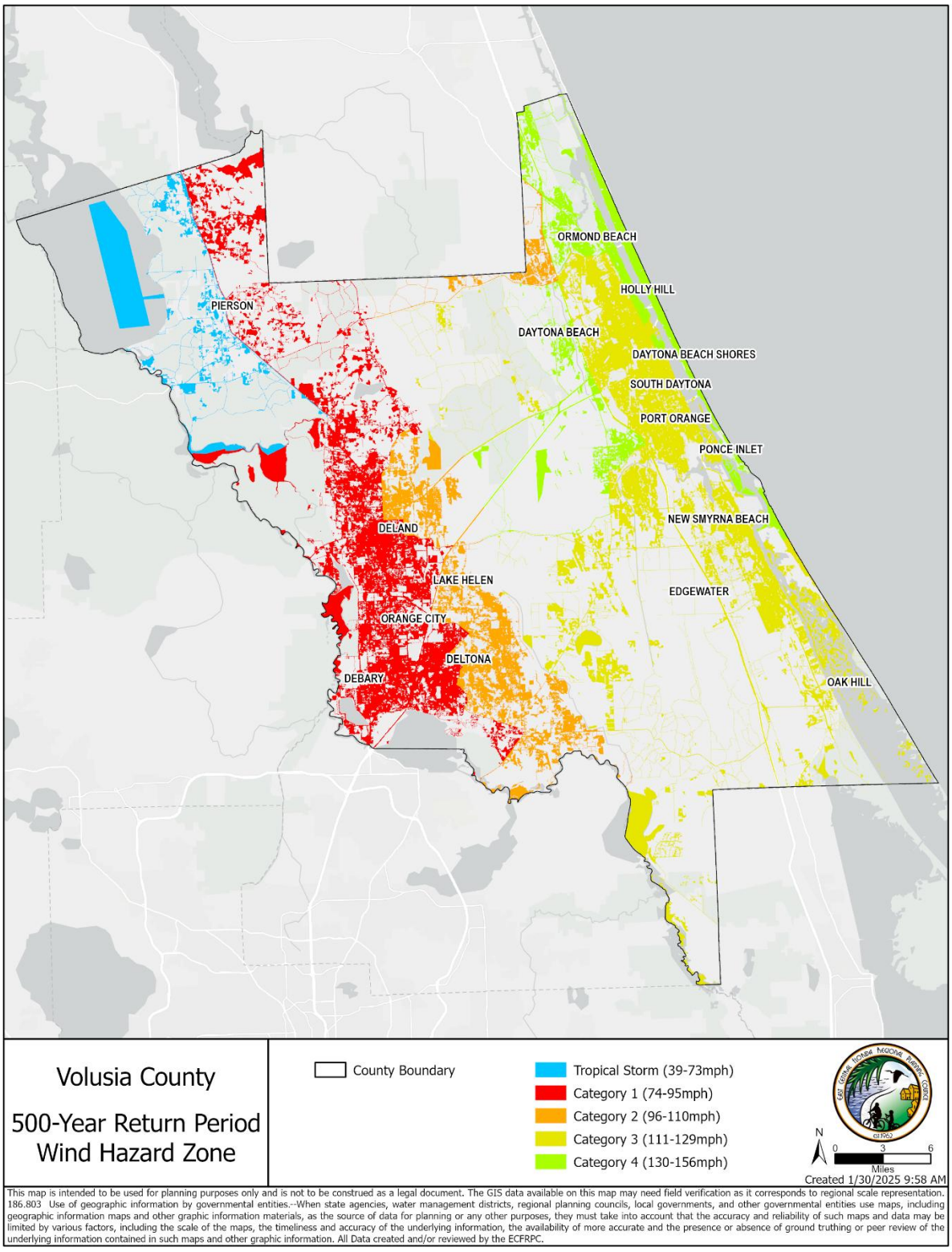
Section 6: Figure 9: Wind Hazard Zones 50-Year Event



Section 6: Figure 10: Wind Hazard Zones 100-Year Event



Section 6: Figure 11: Wind Hazard Zones 500-Year Event



6.15 WILDLAND FIRE

Vulnerability

Overall vulnerability to wildland fires is medium. Wildland fires can happen quickly and cause widespread damage. Volusia County faces a uniform risk of wildland fires, particularly during hot, dry summer months and periods of drought. Wildland fires most frequently affect wooded areas with low population densities, posing a heightened threat to rural areas. Although large population centers generally have lower risk, wildland fires can still cause significant damage to structures and critical infrastructure and pose serious health hazards, including injuries and fatalities from smoke inhalation.

The build year of a property is a critical metric in assessing wildland fire vulnerability due to the evolution of building codes over time. Modern codes restrict the use of flammable materials and promote mitigation strategies, reducing the risk for newer structures. While Volusia County has an older building stock overall, properties within fire hazard zones tend to be newer compared to those vulnerable to other hazards. Areas such as Ormond Beach's rural regions along SR 40 west of I-95 are particularly susceptible, with heavily wooded single-family subdivisions like Timber Creek, Hunters Ridge, Breakaway Trails, and Plantation Pines being at heightened risk.

In terms of land use, low-density residential properties dominate the fire hazard zones. Agricultural areas and extensive woodlands throughout the county also contribute significantly to the overall vulnerability. Wildland fires can spread through two primary mechanisms: burning ashes from tree lines that can “jump” across roadways or other barriers, and the less visible but equally dangerous underground energy transfer, where fires spread beneath the surface. This heightens the danger for residents in isolated rural areas surrounded by dense vegetation.

Impacts

The public faces direct consequences when wildland fires impact homes or businesses. Fires can destroy property, disrupt utility services, and limit access to roadways. Smoke and ash also contribute to air pollution, exacerbating health risks, particularly for vulnerable populations.

Responders face significant challenges during wildland fire events. The unpredictable and dynamic nature of fires, driven by changing wind and environmental conditions, requires substantial resources and strategic planning. Smoke inhalation poses health risks to emergency personnel, emphasizing the importance of protective measures during response efforts.

While wildland fires are a natural part of the ecosystem, they can severely impact the environment. Beyond damaging native vegetation and wildlife habitats, wildfires contribute to air and water pollution. Smoke and ash can contaminate waterways, while the loss of tree cover can exacerbate soil erosion. Volusia County Fire Services and the Health Department actively monitor and address air and water quality concerns during wildfire events.

Despite these challenges, Volusia County Emergency Management anticipates no significant disruptions to operations or service delivery during a wildland fire. The county's COOP ensures uninterrupted emergency management functions even in the event of a direct impact on the Emergency Operations Center.

Economically, wildland fires in Volusia County tend to have localized impacts. However, larger fires that are difficult to control may disrupt events or industries critical to the county's economy. For example, smoke from past wildland fires led to the postponement of the Coke Zero race. Small, rural communities are particularly vulnerable, as fire could devastate local economies. Recovery efforts would rely on organizations such as the County Community Organizations Active in Disaster and the American Red Cross.

Public confidence in government typically remains stable during wildfire events, supported by Volusia County's preparedness and outreach efforts. The county maintains premade media materials and actively uses social media and NOAA weather radios to provide timely updates. The success of past wildfire responses, such as the 1998 fires where 29,000 homes were at risk but only six homes, one mobile home, and two businesses were lost, continues to bolster public confidence.

While wildland fires pose a persistent hazard in Volusia County, ongoing mitigation efforts, strategic response plans, and public outreach programs aim to reduce risks and strengthen resilience for residents and communities.

Section 6 Table 15 lists the number of properties and the property values that are in the high, moderate, and low-risk wildfire zones for each jurisdiction. The table depicts exposure to different fire hazard zones utilizing 2024 property data.

Section 6: Table 15: Financial Exposure to Hazard Zones – Cumulative Financial Values within Zones

Fire Class	Jurisdiction	Properties in Zone	Improved Value	County Taxable Value
High	Daytona Beach	3,960	$1,621,910,972	$1,100,871,625
High	DeBary	595	$123,696,392	$71,260,689
High	DeLand	1,996	$557,354,485	$315,406,868
High	Deltona	4,860	$1,360,101,355	$614,732,256
High	Edgewater	218	$78,888,888	$63,852,351
High	Flagler Beach	87	$18,630,680	$14,443,385
High	Lake Helen	41	$5,131,605	$3,953,680
High	New Smyrna Beach	3,791	$2,390,211,297	$1,658,049,388
High	Oak Hill	81	$25,793,217	$17,252,942
High	Orange City	453	$176,845,248	$88,972,631
High	Ormond Beach	731	$312,658,433	$189,904,269
High	Pierson	449	$64,216,525	$26,878,577
High	Ponce Inlet	231	$155,549,724	$96,787,982
High	Port Orange	799	$230,558,080	$144,915,655
High	Unincorporated - Northeast	1,335	$540,111,625	$278,077,559
High	Unincorporated - Silver Sands	706	$417,407,739	$296,803,246
High	Unincorporated - Southeast	5,963	$521,456,019	$188,861,028
High	Unincorporated - Westside	11,761	$2,225,133,609	$969,991,162
Moderate	Daytona Beach	31,147	$12,533,260,053	$7,919,658,941
Moderate	Daytona Beach Shores	2,893	$1,350,116,182	$1,103,966,152
Moderate	DeBary	9,920	$3,241,368,607	$1,798,776,829
Moderate	DeLand	14,393	$4,828,128,637	$2,923,508,334
Moderate	Deltona	30,375	$8,169,433,604	$4,035,835,045
Moderate	Edgewater	8,964	$2,519,384,642	$1,420,329,636
Moderate	Holly Hill	5,800	$1,361,329,064	$918,257,259
Moderate	Lake Helen	1,689	$393,647,375	$194,327,113
Moderate	New Smyrna Beach	15,921	$7,558,573,110	$4,981,167,216
Moderate	Oak Hill	1,263	$297,652,301	$162,899,267
Moderate	Orange City	3,354	$1,236,228,469	$839,929,754
Moderate	Ormond Beach	14,772	$5,778,695,551	$3,582,902,957
Moderate	Pierson	810	$154,118,140	$56,040,892
Moderate	Ponce Inlet	2,989	$1,655,563,637	$1,191,977,161
Moderate	Port Orange	22,399	$7,791,882,881	$4,649,882,613
Moderate	South Daytona	5,762	$1,608,002,471	$998,519,879
Moderate	Unincorporated - Northeast	15,536	$5,227,758,862	$3,244,407,793

Moderate	Unincorporated - Silver Sands	2,745	$1,713,146,335	$1,309,887,634
Moderate	Unincorporated - Southeast	9,184	$1,758,930,289	$841,658,194
Moderate	Unincorporated - Westside	35,298	$7,479,184,708	$3,593,309,755
Low	Daytona Beach	747	$530,545,157	$238,590,165
Low	Daytona Beach Shores	4,172	$1,562,586,675	$1,282,789,651
Low	DeBary	1,339	$373,434,741	$232,160,537
Low	DeLand	1,141	$377,415,088	$145,436,734
Low	Deltona	4,876	$1,147,809,284	$548,445,778
Low	Edgewater	3,306	$831,842,929	$433,342,933
Low	Holly Hill	180	$42,526,903	$27,647,622
Low	New Smyrna Beach	2,813	$1,061,141,079	$612,135,406
Low	Oak Hill	493	$95,609,757	$34,729,020
Low	Orange City	954	$525,873,104	$297,400,216
Low	Ormond Beach	5,421	$2,372,164,665	$1,609,183,009
Low	Pierson	22	$2,644,082	$1,590,126
Low	Ponce Inlet	378	$137,595,600	$106,466,095
Low	Port Orange	2,151	$976,911,461	$611,499,955
Low	Unincorporated - Northeast	3,010	$1,067,953,541	$659,959,894
Low	Unincorporated - Southeast	2,681	$991,431,484	$637,550,426
Low	Unincorporated - Westside	1,457	$252,536,634	$124,140,462

Source: ECFRPC, Volusia County Property Appraiser Data (2024), U.S. Forest Service. Some properties were not provided with a land use code by VCPAO.

6.16 CIVIL DISTURBANCE

Vulnerability

The overall vulnerability of civil disturbances in Volusia County is low as there is no major political critical infrastructure like those of Tallahassee. While moderate human impact is possible, civil disorder can spread quickly and disrupt the public's confidence in the jurisdictions' governance. There are no major civil disturbances recorded, but all jurisdictions of Volusia County are vulnerable to civil disorder. The infrastructure most vulnerable is those around municipal buildings. The City of DeLand is most vulnerable due to the municipal complex hosting many of the county-wide departments.

Impacts

Civil disturbances, while relatively rare, pose a potential risk to public safety, property, and the overall perception of stability in Volusia County. These events typically arise from social, political, or economic grievances and can escalate quickly, resulting in harm to individuals, damage to property, and disruptions to community operations.

The public is the most directly affected by civil disturbances, particularly individuals in the immediate vicinity of the event. Bystanders may be injured or, in severe cases, killed during such incidents. The risk is heightened during large gatherings, such as major NASCAR events, Biketoberfest, or Bike Week, when Volusia County hosts hundreds of thousands of visitors. These annual events spread throughout the county, but are concentrated in cities such as Daytona Beach, Daytona Beach Shores, and Ormond Beach. Civil disturbances during these events could lead to mass casualties, panic, and chaos, straining local emergency response systems.

Private and public properties are at significant risk during civil disturbances. Rioters may engage in vandalism, looting, or arson, causing extensive damage. The financial toll of such actions can reach hundreds of thousands of dollars, disrupting businesses, displacing residents, and burdening local governments with costly repairs. Florida's history includes seven major riots, such as the 1980 and 1982 Miami riots and the 1996 St. Petersburg riots, which highlight the potential for widespread property destruction.

The environment may experience moderate consequences from civil disturbances. Fires resulting from arson can release toxic gases, fumes, and fluids into the air, soil, and water, posing risks to human health and local ecosystems. Additionally, burned vehicles and structures can leave behind hazardous debris that require specialized cleanup and disposal efforts.

Volusia County's program operations are not expected to be significantly disrupted by a civil disturbance. The Volusia County Emergency Operations Center (VCEOC) is a secure facility, designed to maintain continuity of operations even during extreme events. In the event of a large-scale disturbance, mutual aid agreements with neighboring counties can provide additional resources to manage the situation.

Responders face unique challenges during civil disturbances. They must navigate highly volatile situations where they may be targeted by individuals instigating violence. The risk of injury or death is real, requiring responders to exercise extreme caution and rely on specialized training to de-escalate tensions while ensuring public safety.

The impact of civil disturbances on property and infrastructure can be substantial. Homes, businesses, and critical facilities, such as government buildings and transportation hubs, may be damaged or destroyed. Streets may become blocked or impassable, complicating response efforts and further exacerbating the situation.

The economic fallout from a civil disturbance can be severe. Damaged homes and businesses require costly repairs, and disruptions to local commerce may reduce tax revenue. If civil disturbances occur during major tourist events, the county's reputation as a safe destination may suffer, deterring future visitors and negatively impacting the local economy. Businesses reliant on tourism could face prolonged downturns, compounding financial losses.

Public confidence in government can be adversely affected by civil disturbance, particularly if the response is perceived as slow or inadequate. Effective and timely action by law enforcement and emergency management is critical to maintaining trust. Volusia County must demonstrate its capacity to manage such events to reassure residents and visitors that their safety is a priority.

Civil disturbances pose a range of risks, from direct harm to individuals and property to broader economic and social consequences. By leveraging secure facilities like the Volusia County Emergency Operations Center, mutual aid agreements, and specialized training for responders, Volusia County is prepared to address these challenges. Proactive communication and decisive action during a disturbance are essential to mitigating impacts and maintaining public trust.

6.17 MASS MIGRATION

Vulnerability

The overall vulnerability of mass migration in Volusia County and its jurisdictions is low. While lack of affordable housing and community resources could be a concern with mass migration, due to the low probability and lack of physical impacts, Volusia County is not very vulnerable to this hazard. While it is possible people migrating to the county may choose a more urban area to move to such as Daytona Beach, each jurisdiction is equally vulnerable to this possibility.

Impacts

The citizens of Volusia County face minimal direct risk from a mass migration event. However, an influx of migrants, whether due to political upheaval, natural disasters, or humanitarian crises in neighboring regions or countries, could present logistical and social challenges. The likelihood of such an event remains low, but the county must remain prepared to manage a sudden increase in population to ensure the safety and well-being of all residents, including the migrants themselves.

Property within Volusia County would not be directly at risk from a mass migration event. Migrants arriving in the county are unlikely to cause physical damage to homes, businesses, or infrastructure. However, depending on the scale of the event, temporary facilities such as shelters, processing centers, or housing accommodations may need to be established, potentially requiring the repurposing of public spaces or other properties. Additionally, there may be a strain on available affordable housing, spiking up rent prices for existing residents.

The environment would experience minimal impact from a mass migration event. Temporary facilities and increased resource use may place localized stress on certain systems, such as water and waste management, but these effects would likely be short-term and manageable with proper planning and resources. Environmental risks could be mitigated through coordinated efforts to ensure that shelter locations and services are established in environmentally sustainable ways.

Programming operations within the county would also experience minimal disruption. Volusia County Emergency Management Department and other relevant agencies have contingency plans in place to address scenarios involving a sudden population influx. Should the situation exceed local resources, mutual aid agreements with adjacent counties and support from state and federal agencies would ensure that operations continue with minimal interruption.

The public is unlikely to experience significant, direct consequences from a mass migration event, though there may be concerns or perceptions about how the government is managing the situation. With effective communication and transparent planning, the direct impacts on the daily lives of Volusia County residents would remain minimal.

Responding to the event would play a critical role in managing a mass migration event. Law enforcement, public health, and emergency management personnel would be responsible for organizing, processing, screening, and housing the migrant population. Although the physical and mental demands on responders may increase during such an event, their training and preparedness would help ensure the situation is managed effectively and humanely.

The county's economy is unlikely to be significantly impacted by a mass migration event. Migrants are typically transient and may not remain in the county for an extended period. Temporary costs associated with shelter, food, and medical services would likely be covered by state or federal aid. Long-term economic impacts would depend on whether migrants integrate into the local population and contribute to the economy or if the county becomes a hub for repeated migration events.

Public confidence in government could be affected by a mass migration event, particularly if the public perceives that the government is unprepared or inefficient in managing the situation. Delays in organizing processing, screening, or housing for migrants could lead to frustration among residents. To mitigate these risks, Volusia County would need to maintain open and consistent communication with the public, emphasizing its plans and progress in addressing the situation and ensuring that public safety and order are upheld.

Continuity of operations for the county government would not be significantly impacted by a mass migration event. In a larger-scale scenario, mutual aid from surrounding counties, as well as state and federal resources, would provide additional support. The Volusia County Emergency Operations Center would coordinate these efforts to ensure that essential services continue without interruption.

Overall, the consequences of a mass migration event for property, facilities, and infrastructure in Volusia County would be minimal. Temporary strains on resources and systems may occur, but with proper planning and coordination, these challenges would be manageable. The county's proactive approach to emergency management ensures that any potential impacts from a mass migration event are addressed efficiently and effectively, preserving the safety and well-being of all individuals in the community.

6.18 TERRORISM

Vulnerability

Terrorism remains a persistent and evolving threat, with a wide array of potential impacts ranging from physical destruction and loss of life to disruptions of critical services and public confidence. In Volusia County, these risks are particularly relevant due to its high-profile events, significant agricultural sector, and increasing reliance on digital infrastructure. This assessment examines the vulnerabilities and consequences of various forms of terrorism, including agroterrorism, cyber terrorism, and conventional attacks.

Overall vulnerability to a terrorist attack is moderate within Volusia County and its jurisdictions. Human and property impacts could be severe and widespread depending on the nature of the attack. Because terrorist attacks can take many forms and include many types of weapons, it is difficult to reduce the county's overall vulnerability to these incidents. First response agencies attempt to reduce vulnerability through prevention tactics and intelligence sharing. No jurisdiction in Volusia County is more vulnerable to attack than another.

Impacts

The public faces significant risks in the event of a terrorist attack. Volusia County is home to numerous mass gatherings, such as NASCAR events at Daytona International Speedway, which attract over 100,000 spectators, as well as Bike Week and Biketoberfest, which draw an estimated 500,000 participants annually. These events represent potential targets for terrorism due to their large crowds and national visibility.

The consequences of an attack at such an event could include:

- Serious injuries and fatalities.
- Long-term psychological impacts, including post-traumatic stress disorder (PTSD) and heightened public anxiety about future events.
- Economic impacts due to decreased attendance at events and diminished tourism.

Agroterrorism presents another unique threat to public health. Contamination of agricultural products could introduce pathogens into the food supply, leading to widespread illness and potential fatalities. Such an event would not only harm individuals directly but could also undermine trust in food safety systems.

Property, facilities, and infrastructure are all at risk in a terrorist event. A physical attack involving explosives, arson, or a dirty bomb could result in:

- Extensive damage to buildings and critical infrastructure, including transportation networks, energy facilities, and communication systems.
- Severe financial losses for private businesses and public institutions.
- Long-term closures of impacted facilities, potentially disrupting essential services.

In agroterrorism scenarios, farms and processing facilities could suffer catastrophic losses if disease-causing agents spread among crops or livestock. The costs of containment, eradication, and recovery could be significant, particularly for Volusia County's $781 million agricultural industry.

The environment could suffer both immediate and long-term damage depending on the type of terrorist event:

- **Dirty Bombs and Explosions**: Contamination of air, soil, and water with hazardous materials could render areas uninhabitable for years, requiring costly cleanup efforts.
- **Arson and Large-Scale Fires**: Toxic smoke and fumes could impact air quality, while firefighting runoff could contaminate waterways.
- **Agroterrorism**: Introduction of pathogens or chemicals into agricultural systems could damage ecosystems and potentially spread beyond the initial target area.

Terrorism can severely impact the economy in several ways:

- **Tourism Declines**: Volusia County relies heavily on tourism revenue, particularly from its internationally recognized events. A major attack would likely deter visitors, leading to substantial financial losses for local businesses.
- **Agricultural Losses**: Agroterrorism could devastate the local economy by damaging crops and livestock, disrupting supply chains, and necessitating extensive containment measures.
- **Cyber Terrorism**: If key industries, such as banking, utilities, or retail, were targeted, there could be cascading economic effects due to loss of revenue and reduced consumer confidence.

Cyber terrorism involves the use of digital means to disrupt critical infrastructure, steal sensitive information, or sow chaos. Potential impacts on Volusia County include:

- **Public Impacts**: Extended power outages could lead to food spoilage, loss of refrigeration-dependent medication, and disruptions to life-saving medical devices like oxygen concentrators.
- **Economic Impacts**: Businesses relying on e-commerce or digital payment systems could face significant losses. Additionally, interruptions to public services, such as water or electricity, could result in substantial recovery costs.
- **Public Confidence**: Cyber terrorism targeting essential systems (e.g., water treatment, healthcare, or emergency communication networks) could erode trust in government, particularly if recovery efforts are perceived as slow or ineffective.

While cyber terrorism typically does not cause direct harm to the environment, indirect consequences—such as industrial accidents triggered by compromised control systems—remain a concern.

Public confidence in government could be significantly impacted by any form of terrorism. Perceptions of inadequate preparation, delayed response, or insufficient recovery efforts can erode trust in public institutions. This risk is particularly pronounced in:

- Large-scale attacks, such as those involving mass casualties or significant property damage.
- Agroterrorism incidents that highlight vulnerabilities in the food supply chain.
- Cyber terrorism events that disrupt daily life and expose weaknesses in critical infrastructure.

A proactive and transparent public affairs strategy is essential to maintaining confidence during and after a terrorist event. Efforts should focus on clear communication, visible leadership, and timely updates on response and recovery efforts.

Responders face heightened risks in terrorist events. Physical attacks may involve secondary explosive devices or hazardous conditions, while agroterrorism and cyber terrorism may expose responders to novel threats, such as contaminated materials or compromised communication systems. Ensuring responder safety requires:

- Access to specialized training and equipment.
- Clear protocols for identifying and mitigating risks in dynamic and dangerous environments.
- Coordination with mutual aid partners and state-level resources.

Continuity of operations for Volusia County is generally robust due to the secure design of the Volusia County Emergency Operations Center. However, certain scenarios could present challenges:

- **Direct Attack on VCEOC**: Although unlikely, a direct attack could necessitate a temporary relocation to the alternate EOC.
- **Cyber Terrorism**: Disruptions to digital systems could temporarily affect access to information or communication channels. However, redundancies and mutual aid agreements are in place to minimize these effects.

Terrorism represents a complex and multifaceted threat to Volusia County, with the potential to impact public safety, property, the environment, and the economy. While the likelihood of an event is difficult to predict, ongoing investments in preparedness, training, and public awareness are essential for mitigating risks and ensuring resilience. Whether facing agroterrorism, cyber terrorism, or a conventional attack, Volusia County is committed to protecting its residents, preserving its resources, and maintaining public trust.

6.19 COASTAL OIL SPILL

Vulnerability

A coastal oil spill could significantly impact public health, particularly for individuals with pre-existing respiratory conditions. Exposure to fumes and airborne contaminants near the coastline may exacerbate these issues, prompting the Volusia County Health Department and Environmental Management to closely monitor air, water, sediment, and waste generated during cleanup operations. Although these efforts would mitigate health risks to the public, some localized impacts are inevitable for those in proximity to the affected areas. The most vulnerable areas are along major waterways that support transport ships, such as Ormond Beach, Holly Hill, Daytona Beach Shoes, Ponce Inlet, and New Smyrna Beach.

Impacts

While property is not typically at direct risk from an oil spill, contamination of docks, boats, and other coastal facilities is possible if the spill enters waterways such as the Ponce de Leon Inlet. This could require extensive cleaning and decontamination efforts to restore usability and prevent further environmental harm.

The environment, however, faces the greatest risk in the event of a coastal oil spill. Sensitive ecosystems, including turtle nesting sites, estuaries, and nearshore marine habitats, could suffer long-lasting damage. Sand and sediment along the beaches would be heavily contaminated, requiring labor-intensive cleanup and rehabilitation to restore the natural environment. The ecological consequences of an oil spill could linger for years, disrupting the delicate balance of marine and coastal ecosystems.

Although program applications within the county are not likely to be adversely affected by a coastal oil spill, responders tasked with addressing the spill face considerable challenges. The use of personal protective equipment (PPE) is essential to prevent exposure to hazardous materials, and the physically demanding nature of cleanup operations adds an additional layer of complexity. Coordination between local, state, and federal agencies will be critical to ensure the safety and effectiveness of the response effort.

Continuity of operations within Volusia County would remain largely intact, as the spill's direct effects are unlikely to extend beyond the immediate coastal zone. However, economic and social disruptions could strain government resources and necessitate long-term recovery planning. The economic ramifications of a coastal oil spill would be severe. Tourism—a cornerstone of Volusia County's economy—would likely grind to a halt as visitors avoid beaches perceived to be contaminated. The charter fishing industry, another vital economic sector, would be devastated as fish stocks and marine habitats are impacted. Many businesses along the coastline may face permanent closure due to prolonged loss of revenue, and the county's tax base could shrink significantly, compounding the financial strain on recovery efforts.

Public confidence in government would also be tested during a coastal oil spill event. The protracted nature of cleanup and environmental restoration, which could take months or even years, would likely frustrate residents and stakeholders. Effective communication from the Volusia County Public Information Office (PIO) would be essential to maintaining public trust. By providing consistent updates and demonstrating transparent collaboration between government agencies and private industry, officials could reassure the public that every effort is being made to address the spill and restore the county's natural and economic resources.

In conclusion, while a coastal oil spill may have minimal immediate effects on most residents and infrastructure, the long-term environmental, economic, and public confidence impacts could be profound. Preparing for such an event through detailed planning, interagency coordination, and robust public communication strategies will be vital to mitigating its consequences.

6.20 CRITICAL INFRASTRUCTURE FAILURE

Vulnerability

Critical infrastructure failure refers to the disruption of essential services such as drinking water, stormwater and wastewater systems, electric power, transportation, supply chains for food and fuel, and communication networks. These systems are vital to maintaining public health, safety, and economic stability. Failures in these systems are often caused by cascading emergencies like natural disasters, such as hurricanes or floods, or man-made events, including terrorism and cyberattacks. In urbanized areas of Volusia County, where the population is highly dependent on these systems, disruptions have the potential to affect more than half of the population, with the most severe cases resulting in widespread county-wide impacts. Those most vulnerable are Deltona, Port Orange, Daytona Beach, and Ormond Beach. The risks are further exacerbated by climate change, which is increasing the frequency and intensity of extreme weather events.

The overall vulnerability of Volusia County and its jurisdictions to critical infrastructure disruption is medium. Because critical infrastructure failure can be caused by many different forces, it is one of the hazards with the highest vulnerability. Severe weather, tropical cyclones, tornadoes, and geomagnetic storms are just some examples of harmful incidents that may cause a disruption.

The power grid is among the most critical and vulnerable pieces of infrastructure in Volusia County. Utility substations and transmission lines near coastal and urban areas, such as Daytona Beach, Deltona, and Ormond Beach, are particularly at risk. High winds and storm surges associated with hurricanes can lead to widespread power outages, while aging infrastructure is susceptible to overheating during peak demand periods in the hot summer months. Water and wastewater systems are similarly vulnerable, particularly those located in flood-prone areas like the St. Johns River Basin. Flooding from severe storms can disrupt water treatment operations, resulting in water contamination or sewage overflows. Rising sea levels pose a long-term threat to coastal water facilities.

Impacts

Transportation systems in Volusia County are also at significant risk. Major highways like I-95 and I-4, along with bridges, railroads, and the Daytona Beach International Airport, could be disrupted by extreme weather events such as high winds and flooding. Proximity to water systems, including the Halifax River, Indian River Lagoon, Mosquito Lagoon, and the Intracoastal Waterway, increases the vulnerability of transportation infrastructure to storm surges. Similarly, communication networks, including cellular towers, fiber optic lines, and data centers in urban hubs, are susceptible to physical damage from hurricanes and flooding, as well as cyberattacks.

Environmental impacts from critical infrastructure failures can be severe. Disruptions to wastewater facilities may result in untreated sewage spills, contaminating rivers, lakes, and coastal waterways, which can harm aquatic ecosystems and degrade water quality. Stormwater management systems may also fail during prolonged power outages, leading to localized flooding and habitat destruction. Additionally, increased reliance on backup generators during power outages can contribute to air pollution.

The economic consequences of critical infrastructure failures are significant. Prolonged outages can result in the closure of businesses, disrupt tourism, and interrupt supply chains, with Daytona Beach's event-driven economy particularly susceptible. Repairing damaged infrastructure can cost millions, placing a

strain on local budgets. Furthermore, frequent failures may lead to increased insurance premiums for businesses and residents alike.

Social impacts are equally concerning. Interruptions in water treatment can lead to the spread of waterborne diseases, while power outages during extreme heat can exacerbate heat-related illnesses. Transportation failures may isolate communities, preventing access to essential services such as medical care. Vulnerable populations, including the elderly, disabled, and low-income residents, are disproportionately affected by such disruptions, further exacerbating existing social inequities.
Emergency managers and first responders face significant challenges during critical infrastructure failures. Damage to roadways and communication systems can delay response times and hinder coordination efforts. Prolonged failures often require an extended deployment of resources, potentially overloading emergency services. Responders are also at risk of exposure to hazardous environments, such as contaminated water and extreme heat, while working to restore infrastructure and assist affected residents. Community outreach efforts are essential to educate residents about emergency preparedness and available resources, thereby enhancing overall resilience to infrastructure failures.

6.21 HAZMAT / INDUSTRIAL INCIDENT

Vulnerability

The citizens of Volusia County face daily risks from hazardous materials (HAZMAT) due to the presence of both fixed and mobile sources. These include industrial facilities, railroads, highways, and even potential intentional uses such as terrorism. With two major interstate highways, two significant rivers, and two railroads running through the county, HAZMAT incidents are a constant possibility. While most of these involve minor petroleum spills or sewage discharges, the potential exists for far more severe events. Overall vulnerability of hazardous materials incidents is low in Volusia County and its jurisdictions. Citizens may encounter risks from hazardous materials at schools, in their homes, on roadways, through their food supply, or at public venues such as stadiums and other large gathering spaces. While the spatial extent of these incidents would likely be low, the impact on humans could be substantial. The consequences of a hazardous material incident could range from illness and injury to death, with the most severe incidents—such as radiological releases or large-scale explosions—possibly leading to the displacement of residents for extended periods until cleanup is complete. Having major bodies of water such as Tomoka River, Halifax River, Indian River Lagoon, Mosquito Lagoon, and the St. Johns River also leaves room for vulnerability because some hazardous materials may be spread through the waterways.

Property in Volusia County is highly vulnerable to hazardous materials incidents. Chemical spills, explosions, or acts of bioterrorism could devastate individual homes, businesses, and critical infrastructure. Structural damage from explosions or corrosive chemical exposure can leave properties uninhabitable or in need of significant repair. Hazardous materials may also erode or corrode infrastructure such as roads, bridges, and pipelines, further compounding recovery challenges. Even in less catastrophic cases, incidents such as traffic accidents involving hazardous materials can result in destruction of vehicles, roadways, and signage.

Impacts

The environment is particularly susceptible to the harmful effects of hazardous materials, whether the release is accidental, intentional, or natural. These materials can rapidly spread through air, water, and the food supply, contaminating ecosystems and threatening both human and wildlife populations. Sensitive habitats, such as wetlands and coastal areas, could be irreparably damaged. Cleanup efforts can take days, weeks, months, or even years, and in some cases, environmental recovery may never fully restore the original ecosystem balance.

While the Volusia County Emergency Operations Center itself is not located near major hazardous materials facilities, its operations could be impacted in extreme cases. For instance, in the event of significant structural damage or service disruptions, staff may need to relocate to its alternate site as outlined in the Volusia County Emergency Management Department COOP. Despite these risks, the county's environmental management teams, in coordination with Fire Services HAZMAT units, are prepared to respond to large-scale incidents.

Volusia County has a HazMat team available to respond. Responders are at the forefront of mitigating the impacts of HAZMAT incidents. Specialized teams, including HAZMAT, Radiological Material (RMAT), and Explosive Ordnance Disposal (EOD) units, are trained and equipped to manage these complex situations. Protective gear and specialized equipment are vital to ensure their safety as they identify hazardous materials, mitigate risks, and oversee cleanup efforts. Despite their training, responders remain at risk due

to the unpredictable nature of these incidents and the potential for secondary hazards such as fires or explosions.

The economic consequences of a HAZMAT incident in Volusia County could vary widely depending on the scale of the event. While smaller incidents may disrupt transportation or local industries temporarily, larger events—such as a chemical facility disaster or a radiological release—could result in long-term economic strain. The BP oil spill in 2011, which cost approximately $40 billion to address, serves as an extreme example of the potential financial toll of such events. Even less catastrophic incidents can lead to costly disruptions if key transportation routes or industries are forced to shut down.

Public confidence in the local government may also be tested by a HAZMAT incident. Smaller, localized events are unlikely to affect the public's trust, as these are relatively common and manageable occurrences. However, a large-scale chemical or radiological release, or an incident involving terrorism, could erode public confidence in the government's ability to protect its citizens. In such cases, the Volusia County leadership must prepare to launch a robust public information campaign through its website and social media channels, ensuring transparent communication and providing timely updates on the response and recovery efforts.

In conclusion, while Volusia County is prepared to handle the frequent minor HAZMAT incidents that occur, the potential for a large-scale event remains a significant concern. Proactive planning, coordinated response efforts, and clear communication are essential to mitigating the risks and consequences of hazardous materials incidents on the public, property, environment, and economy.

6.18 CONCLUSIONS ON HAZARD VULNERABILITY

Volusia County is vulnerable to a wide array of hazards spanning natural, manmade, and technological categories, each presenting unique risks and requiring tailored mitigation and preparedness strategies. Assessing vulnerabilities across these diverse hazards is essential to building a safer, more resilient community.

- **Improved Understanding for All Hazards:**
  Analyzing vulnerabilities provides a clearer picture of who and what is at risk for each hazard type. For example:
  - **Natural Hazards:** Understanding flood-prone areas and vulnerable coastal regions allows for targeted mitigation like enhanced stormwater management, improved floodplain regulations, and strengthened coastal infrastructure. Similarly, identifying populations at risk from extreme temperatures or public health emergencies helps tailor outreach and response efforts.
  - **Manmade Hazards:** Civil disturbances, mass migration, and terrorism require assessments of social dynamics, key facilities, and potential response bottlenecks. For example, mapping critical facilities and public spaces allows emergency managers to better plan for security, evacuation, and resource allocation.
  - **Technological Hazards:** Evaluating risks from coastal oil spills, hazardous materials incidents, and industrial accidents ensures that high-risk areas, particularly those near industrial zones or transportation corridors, are prioritized for safety inspections and emergency planning.

By improving understanding across these hazard categories, Volusia County can enhance risk awareness among stakeholders and better align resources to the most pressing needs.

- **Baseline for Policy Development and Strategic Planning:**
  A comprehensive vulnerability assessment serves as the foundation for creating effective policies and mitigation plans. For instance:
  - For **rising coastal waters and coastal erosion**, the assessment may inform zoning policies that restrict development in highly vulnerable areas or incentivize green infrastructure solutions to stabilize shorelines.
  - For **drought and agriculture**, policies that promote sustainable water use and crop diversification can be informed by understanding long-term climate trends and agricultural vulnerabilities.
  - For **technological hazards**, findings can influence regulations to enhance safety standards for industrial facilities or mandate periodic safety drills for oil transport and hazardous materials handling.

These informed policies can reduce risks, improve land-use decisions, and foster greater resilience in the face of evolving threats.

- **Risk Comparison for Balanced Mitigation Efforts:**
  Assessing vulnerabilities across all hazard types enables the county to compare risks and prioritize mitigation measures. For example:

  - Coastal and flood-prone areas might see investments in seawalls or elevating infrastructure, while inland areas might benefit from improved wildfire prevention strategies and drought-resistant infrastructure.
  - **Public health emergencies**, such as pandemics, might require investments in healthcare infrastructure, while terrorism or civil disturbance risks may necessitate enhanced security measures and community engagement initiatives.

This comparative approach ensures that resources are allocated equitably and effectively, allowing the county to address both high-impact, high-frequency hazards like severe weather and tropical cyclones, as well as lower-probability but potentially devastating events like terrorism or industrial incidents.

- **Enhancing Emergency Management Capabilities:**
  Vulnerability assessments also identify gaps in current capabilities, enabling targeted improvements. For example:
  - Understanding response times and challenges in rural areas supports enhancements in wildland fire management and tornado response strategies.
  - Identifying critical infrastructure at risk of failure ensures redundancy and continuity planning for essential services.
  - Highlighting social vulnerabilities, such as lower-income or elderly populations, support targeted outreach, evacuation planning, and sheltering options.

By strengthening emergency management capabilities, Volusia County can reduce disaster impacts, speed recovery, and build public confidence in its resilience strategies.

In summary, assessing vulnerabilities across Volusia County's full hazard profile is a cornerstone of effective disaster mitigation. It provides clarity on risks, informs strategic policy development, and supports equitable resource allocation. These efforts are critical to ensure the county's ability to withstand, adapt to, and recover from a wide range of threats, safeguarding the well-being of its residents and the environment.

SECTION 7 – CAPABILITY ASSESSMENT

This section of the Plan discusses the capability of Volusia County and the participating municipal jurisdictions to implement hazard mitigation activities. It consists of the following four subsections:

- **What is a Capability Assessment?**
- **Conducting the Capability Assessment**
- **Capability Assessment Findings**
- **Public Capability Assessment**
- **Existing County-Wide Efforts**
- **Conclusions of the Capability Assessment**

7.1 WHAT IS A CAPABILITY ASSESSMENT?

The purpose of conducting a capability assessment is to determine the ability of a local jurisdiction to implement a comprehensive mitigation strategy, and to identify potential opportunities for establishing or enhancing specific mitigation policies, programs or projects.[1] As in any planning process, it is important to try to establish which goals, objectives and/or actions are feasible, based on an understanding of the organizational capacity of those agencies or departments tasked with their implementation. A capability assessment helps to determine which mitigation actions are practical and likely to be implemented over time, given the local government's planning and regulatory framework. This capability assessment also highlights the positive mitigation measures already in place, or being implemented at the local government level, which should continue to be supported and enhanced through future mitigation efforts.

The capability assessment completed for Volusia County and its jurisdictions serves as a critical planning step and an integral part of the foundation for designing an effective multi-jurisdictional hazard mitigation strategy. The *Capability Assessment* helps identify and target meaningful mitigation actions for incorporation in the *Mitigation Strategy* portion of the Hazard Mitigation Plan. It helps establish the goals and objectives for the Volusia County Region to pursue under this Plan and ensures that those goals and objectives are realistically achievable under given local conditions.

7.2 CONDUCTING THE CAPABILITY ASSESSMENT

In order to facilitate the inventory and analysis of local government capabilities throughout Volusia County, a detailed *Capability Assessment Survey*[2] was distributed to Volusia County staff and to staff from participating local municipal jurisdictions. The survey questionnaire, which was completed by applicable local government officials, requested information on a variety of "capability indicators" such as existing

[1] While the Interim Final Rule for implementing the Disaster Mitigation Act of 2000 does not require a local capability assessment to be completed for local hazard mitigation plans, it is a critical step to develop a mitigation strategy that meets the needs of each jurisdiction while taking into account their own unique abilities. The Rule does state that a community's mitigation strategy should be "based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools" (44 CFR, Part 201.6(c)(3)).

[2] The *Capability Assessment Survey* instrument used to assess county and municipal capabilities is available through Volusia County upon request.

local plans, policies, programs or ordinances that contribute to and/or hinder the community's ability to implement hazard mitigation actions.

At a minimum these survey results provide an inventory of existing local plans, ordinances, programs and resources in place or under development in addition to their overall effect on hazard loss reduction. The survey instrument thereby not only helps accurately assess each jurisdiction's degree of local capability, but also serves as a good source of introspection for those jurisdictions wishing to improve their capability. The identification of opportunities and specific actions to be proposed as part of the community's mitigation strategy often develops as an outcome of completing a capability assessment.

7.3 CAPABILITY ASSESSMENT FINDINGS

The findings of the capability assessment are summarized in this Plan to provide insight into the capacity of Volusia County and the participating jurisdictions to implement hazard mitigation activities. All information is based upon the responses provided by local government officials to the *Capability Assessment Survey*.

7.3.1 Planning and Regulatory Capability

Planning and regulatory capability is based on the implementation of plans, ordinances and programs that demonstrate a local jurisdiction's commitment to guiding and managing growth, development and redevelopment in a responsible manner while maintaining the general welfare of the community. It includes emergency response and mitigation planning, comprehensive land use planning and transportation planning in addition to the enforcement zoning or subdivision ordinances and building codes that regulate how land is developed, and structures are built, as well as protecting environmental, historic and cultural resources in the community. Although some conflicts can arise, these planning initiatives generally present significant opportunities to integrate hazard mitigation principles and practices into the local decision-making process.

This assessment is designed to provide a general overview of the key planning and regulatory tools or programs in place or under development for Volusia County and the participating jurisdictions, along with their potential effect on loss reduction. This information will help identify opportunities to address existing gaps, weaknesses or conflicts with other initiatives in addition to integrating the implementation of this Plan with existing planning mechanisms, where appropriate.

Section 7: Table 1 provides a summary of the relevant local plans, ordinances and programs already in place or under development for Volusia County and the participating jurisdictions. An (x) mark indicates that the given item is currently in place and being implemented by the local jurisdiction, or that it is currently being developed for future implementation. A more detailed discussion on each jurisdiction's planning and regulatory capability follows, along with the incorporation of additional information based on the narrative comments provided by local officials in response to the survey questionnaire.

Following the inventory of local plans, programs and policies is a description of each element upon which the local jurisdiction's capability score was based.

SECTION 7: CAPABILITY ASSESSMENT

Section 7: Table 1: Relevant Plans, Ordinances and Programs

Jurisdiction	Local Mitigation Strategy	Comprehensive Land Use Plan	Floodplain Management Plan*	Open Space Management Plan	Stormwater Management Plan	Natural Resource Protection Plan	Flood Response Plan	Emergency Operations Plan	Continuity of Operations Plan	Evacuation Plan	Disaster Recovery Plan	Economic Development Plan	Historic Preservation Plan	Floodplain Ordinance (or Flood Damage Prevention Ordinance)	Zoning Ordinance	Subdivision Ordinance	Unified Development Ordinance	Post-disaster Redevelopment /Reconstruction Ordinance	Building Code Effectiveness Grading Schedule (BCEGS)	Fire Code	National Flood Insurance Program	NFIP Community Rating System	Vulnerability Assessment
Daytona Beach	X	X	X		X		X	X		X	X	X	X	X	X	X	X	X		X	X	X	X
Daytona Beach Shores	X	X	X		X			X						X	X				X	X	X	X	X
DeBary	X	X	X	X	X	X	X	X	X		X	X		X	X	X				X	X		
DeLand	X	X	X		X		X	X	X	X	X		X	X	X	X	X	X	X	X	X		
Deltona	X	X	X	X	X		X	X	X	X	X	X	X	X	X		X			X	X		
Edgewater	X	X	X		X		X	X		X		X		X	X					X	X	X	
Holly Hill	X	X	X		X	X		X	X	X	X	X		X	X	X	X			X	X	X	X
Lake Helen	X	X	X		X	X		X		X				X	X	X	X			X	X		
New Smyrna Beach	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X		X	X	X	X	
Oak Hill	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
Orange City	X	X	X	X	X	X		X	X				X	X	X	X				X	X		X
Ormond Beach	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Pierson	X	X	X					X		X				X	X	X				X	X		
Ponce Inlet	X	X	X	X	X	X	X	X	X	X	X		X	X	X				X	X	X	X	X
Port Orange	X	X	X		X			X	X	X		X		X	X	X	X		X	X	X	X	
South Daytona	X	X	X	X	X	X	X	X	X	X	X			X	X	X			X	X	X	X	X
Volusia County	X	X	X			X	X	X	X	X	X	X	X	X	X	X				X	X	X	X

SECTION 7: CAPABILITY ASSESSMENT

The project team at the East Central Florida Regional Planning Council developed the Local Mitigation Strategy with numerous resources, including existing plans, technical information and mapping software.

ESRI ArcGIS software and HAZUS was used to develop vulnerability profiles for the hazards covered throughout this report. Data collection by the project team included municipal critical facilities, stormwater facilities and lift/pump stations, as well as parcel data collected from the Volusia County Property Appraiser. Numerous GIS files were also downloaded from Volusia County I.T. for consideration, research, and use.

Technical plans were also reviewed for consistency with the Local Mitigation Strategy. This primarily included the county's Integrated Floodplain Management Plan, which was reviewed and updated alongside the 2025 LMS. The data collection, data analysis and risk profile methodologies used for the Local Mitigation Strategy and the Floodplain Management Plan are identical. The additional plans listed on the previous page **Section 7: Table 1: Relevant Plans, Ordinances and Programs**, including the Volusia County Continuation of Operations Plan and others, were also reviewed as made available.

Technical information was collected primarily from the Volusia County Emergency Management Department and the National Climatic Data Center, which compiles countywide reports on past hazard events, estimated losses, and other critical information for tracking the County's vulnerabilities.

7.3.2 Emergency Management

Hazard mitigation is widely recognized as one of the four primary phases of emergency management. Other phases include preparedness, response and recovery. Each phase is interconnected with hazard mitigation as **Section 7: Figure 1** suggests. Planning for each phase is a critical part of a comprehensive emergency management program and a key to the successful implementation of hazard mitigation actions. As a result, the *Capability Assessment Survey* asked several questions regarding emergency management plans in order to assess the jurisdiction's willingness to plan and their level of technical planning proficiency.

Section 7: Figure 1: The Phases of Emergency Management

Local Mitigation Strategy (LMS): Also called a hazard mitigation plan, the local mitigation strategy represents a community's blueprint for how it intends to reduce the impact of natural and human-caused hazards on people and the built environment. The essential elements of a local mitigation strategy include a risk assessment, capability assessment, mitigation strategy and the mitigation projects list.

- Volusia County and its jurisdictions developed the first version of their local mitigation strategy in 1999 (adopted 2000) and updated the plan in 2009,2014, and 2019. The plan is currently undergoing a revision that will be completed in January 2025.

Disaster Recovery Plan: A disaster recovery plan serves to guide the physical, social, environmental and economic recovery and reconstruction process following a disaster. In many instances, hazard mitigation principles and practices are incorporated into local disaster recovery plans with the intent of capitalizing on opportunities to break the cycle of repetitive disaster losses.

- A potential mitigation action that should be considered is for all participating jurisdictions to develop their own disaster recovery plan that would incorporate mitigation opportunities into the disaster recovery process.

Emergency Operations Plan: An emergency operations plan outlines responsibility and the means by which resources are deployed to respond to an emergency or disaster. Many communities choose to update their emergency operations plan before events occur to better prepare for future disasters. This is an example of hazard mitigation.

- Volusia County Emergency Management maintains the emergency operations plan that also covers their respective jurisdictions. In general, emergency operations planning has been determined to have a moderate effect on loss reduction, as its emphasis focuses on preparedness and response operations rather than hazard mitigation activities.

Continuity of Operation Plan: A continuity of operations plan establishes a chain of command line of succession, and plans for backup or alternate emergency response resources in case of an extreme emergency. Developing a continuity of operation plan is an example of hazard mitigation.

- Each of the other jurisdictions is encouraged to consider preparing their own continuity of operations plans as a possible mitigation action for inclusion this Plan.

7.3.3 General Planning

The implementation of hazard mitigation activities should involve agencies and individuals beyond the emergency management profession. Other stakeholders may include local planners, public works officials, economic development specialists and others. Because in many instances, concurrent local planning efforts help achieve or complement hazard mitigation goals, even though they are not specifically designed as such, the *Capability Assessment Survey* asked questions regarding each jurisdiction's general planning capabilities and the degree to which hazard mitigation is integrated into other ongoing planning efforts.

Comprehensive Land Use Plan: A comprehensive land use plan establishes the overall vision for a community and serves as a guide for future governmental decision making. Typically, a comprehensive plan is comprised of a summary of current and expected demographic conditions, land use, transportation elements and community facilities. Given the broad nature of the plan and its regulatory standing in many communities, the integration of hazard mitigation measures into the comprehensive plan can greatly enhance the likelihood of achieving risk reduction goals, objectives and actions.

- All jurisdictions within the region have a comprehensive land use plan as required by state law.

Capital Improvements Plan: A capital improvements plan guides the scheduling of spending for public improvement projects. A capital improvements plan can serve as an important mechanism to guide future development away from identified hazard areas. Limiting public spending in hazardous areas is one of the most effective long-term mitigation actions available to local governments.

- Volusia County has a Capital Improvements Element (CIE) that is part of the Comprehensive Plan. The Capital Improvement Plan should be considered a local funding source for mitigation projects recommended as part of the Local Mitigation Strategy and the implementation of those actions will help to reduce disaster damages.

Historic Preservation Plan: A historic preservation plan is intended to preserve historic structures or districts within a community. An often overlooked aspect of the historic preservation plan is the assessment of buildings and sites located in areas subject to natural hazards to include the identification of the most effective way to reduce future damages.[3] This may involve retrofitting or relocation techniques that account for the need to protect buildings that do not meet current building standards or are within a historic district that cannot easily be relocated out of harms way.

Zoning Ordinances: Zoning dictates the means by which land use is controlled by a local government. As part of a community's police power, zoning is used to protect the public health, safety and welfare of those within a given jurisdiction. A zoning ordinance is the mechanism through which zoning is implemented. Since zoning regulations enable municipal governments to limit the type and density of development, it can serve as a powerful tool, especially when applied in identified hazard areas.

Subdivision Ordinances: A subdivision ordinance is generally intended to regulate the development of housing, commercial and industrial uses, including associated public infrastructure, as land is subdivided into buildable lots for sale or future development. Subdivision design that accounts for natural hazards can dramatically reduce the exposure of future development.[4]

Building Codes, Permitting and Inspections: Building Codes regulate construction standards. In many communities' permits must be issued and inspections of work must take place for new construction. Decisions regarding the adoption of building codes (that account for hazard risk), the type of permitting process required both before and after a disaster, and the enforcement of inspection protocols all affect the level of hazard risk faced by a community. All Volusia County jurisdictions have adopted and enforce the Florida Building Code.

The adoption and enforcement of building codes by local jurisdictions is routinely assessed through the Building Code Effectiveness Grading Schedule (BCEGS) program developed by the Insurance Services Office, Inc. (ISO).[5] Under the BCEGS program, ISO assesses the building codes and enforcement of these codes in a particular community, with special emphasis on mitigation of losses from natural hazards. The results of BCEGS assessments are routinely provided to ISO's member private insurance companies, which in turn may offer ratings credits for new buildings constructed in communities with strong BCEGS classifications. The concept behind this is that communities with well-enforced, up-to-date codes should have fewer losses, and insurance rates can reflect that in these communities.

In conducting the assessment ISO collects information related to personnel qualifications and continuing education, as well as the number of inspections performed per day. This type of information, combined with local building codes, is used to determine a grade for that jurisdiction. The grades range from 1 to 10, with the lower grade being more ideal. A BCEGS grade of 1 represents exemplary commitment to building code enforcement, and a grade of 10 indicates less than minimum recognized protection. **Section**

[3] See Protecting the Past from Natural Disasters. 1989. Nelson, Carl. National Trust for Historic Preservation: Washington D.C.
[4] For additional information regarding the use of subdivision regulations in reducing flood hazard risk, see Subdivision Design in Flood Hazard Areas. 1997. Morris, Marya. Planning Advisory Service Report Number 473. American Planning Association: Washington D.C.
[5] Participation in BCEGS is voluntary and may be declined by local governments if they do not wish to have their local building codes evaluated.

7: Table 3 lists the BCEGS ratings for the jurisdictions within Volusia County that identified their rating to the planning team.

Section 7: Table 2: BCEGS Ratings in the Region

JURISDICTION	BCEGS RESIDENTIAL RATING	BCEGS COMMERCIAL RATING	YEAR LAST RATED
Daytona Beach	NA	3	NA
Daytona Beach Shores	3	3	NA
Lake Helen	4	4	2000
New Smyrna Beach	4	3	2023
Ormond Beach	3	3	2004
Ponce Inlet	4	3	NA
Port Orange	4	3	2020
South Daytona	3	2	2021

Source: Jurisdictions

7.3.4 Floodplain Management and National Flood Insurance Program (NFIP)

Flooding represents the greatest natural hazard facing the nation. At the same time the tools available to reduce the impacts associated with flooding are among the most developed when compared to other hazard-specific mitigation techniques. In addition to approaches that cut across hazards such as education, outreach, and the training of local officials, the *National Flood Insurance Program* (NFIP) contains specific regulatory measures that enable government officials to determine where and how growth occurs relative to flood hazards. Participation in the NFIP is voluntary for local governments; however, program participation is strongly encouraged by FEMA as a first step for implementing and sustaining an effective hazard mitigation program. It is therefore used as part of this assessment as a key indicator for measuring local capability.

In order for a county or municipality to participate in the NFIP they must adopt a local flood damage prevention ordinance which requires jurisdictions to follow established minimum building standards in the floodplain. These standards require that all new buildings and substantial improvements to existing buildings will be protected from damage by a 100-year flood event, and that new development in the floodplain will not exacerbate existing flood problems or increase damage to other properties.

A key service provided by the NFIP is the mapping of identified flood hazard areas. Once completed, the Flood Insurance Rate Maps (FIRMs) are used to assess flood risk, regulate construction practices and set flood insurance rates.[6] FIRMs are an important source of information to educate residents, government officials and the private sector about the likelihood of flooding in their community. The most recent adopted map is shown in **Section 7: Figure 2**.

[6] https://www.volusia.org/services/public-protection/emergency-management/types-of-disasters/floods/flood-maps.stml

The adoption of the NFIP and local flood damage prevention ordinance for each jurisdiction can be found in each land development municipal Code of Ordinances and/or Land Development Code. The following list identifies each participating jurisdiction adoption of NFIP standards:

- Daytona Beach
  - Daytona Beach, FL, Code of Ordinances § 7-4 (2014).
- Daytona Beach Shores
  - Daytona Beach Shores, FL, Code of Ordinances Appendix G, Chapter 10, Article I, Section 10-1 (2013).
- DeBary
  - DeBary, FL, Code of Ordinances Chapter 14, Article II, Division 1, Section 14-33 (2014).
- DeLand
  - DeLand, FL, Code of Ordinances Chapter 11, Article VI, Section 33-61 (2013).
- Deltona
  - Deltona, FL, Code of Ordinances Chapter 90, Article I (2014).
- Edgewater
  - Edgewater, FL, Code of Ordinances Chapter 7, Article I, Section 7 (2014).
- Holly Hill
  - Holly Hill, FL, Code of Ordinances Chapter 94, Article II (2013).
- Lake Helen
  - Lake Helen, FL Code of Ordinances Part I, Article 10 (2021).
- New Smyrna Beach
  - New Smyrna Beach, FL, Part II Code of Ordinances Chapter 26, Article VIII (2014).
- Oak Hill
  - Oak Hill, FL, Code of Ordinances Chapter 24, Article VII (2013).
- Orange City
  - Orange City, FL, Code of Ordinances Chapter 5, Article I, Section 5.2 (2009).
- Ormond Beach
  - Ormond Beach, FL, Land Development Code Chapter 3, Article II, Section 3-20 (2013).
- Pierson
  - Pierson, FL, Code of Ordinances Chapter 9, Article IV, Division 2, Section 9-162 (2014).
- Ponce Inlet
  - Ponce Inlet, FL, Code of Ordinances Part IV, Chapter VI (2017).
- Port Orange
  - Port Orange, FL. Land Development Code Chapter 8, Article I, Section 1 (2014).
- South Daytona
  - South Daytona, FL, Land Development Code Section VII, Section 7.2 (2017).
- Volusia County
  - Volusia County, FL Code of Ordinances Chapter 72, Article III, Division 7 (2013).

Volusia County Government has several mutual aid agreements with public works departments throughout the county, as well as a Memorandum of Understanding (MOU) between Volusia County and all jurisdictions within the county (adopted in 2014). Local municipalities and the county can also apply for assistance on the federal level. The county refers to the Emergency

Management Assistance Compact. The county and many municipalities participate in the CRS (Community Rating System) to lower mitigation costs for residents.

Volusia Prepares is a multi-jurisdictional, public-private partnership that maintains a comprehensive, county-wide local mitigation strategy and acts as the Hazard Mitigation Representative. Other county and municipal agencies perform routine mitigation-related functions, including but not limited to the following:

- Considering hazard mitigation issues in the county's comprehensive plan and land development code.
- Enforcement of the county's flood plain ordinance.
- Issuance of building permits and enforcing building codes.
- Conducting fire inspections.
- Conducting public information and education programs related to hazard mitigation.

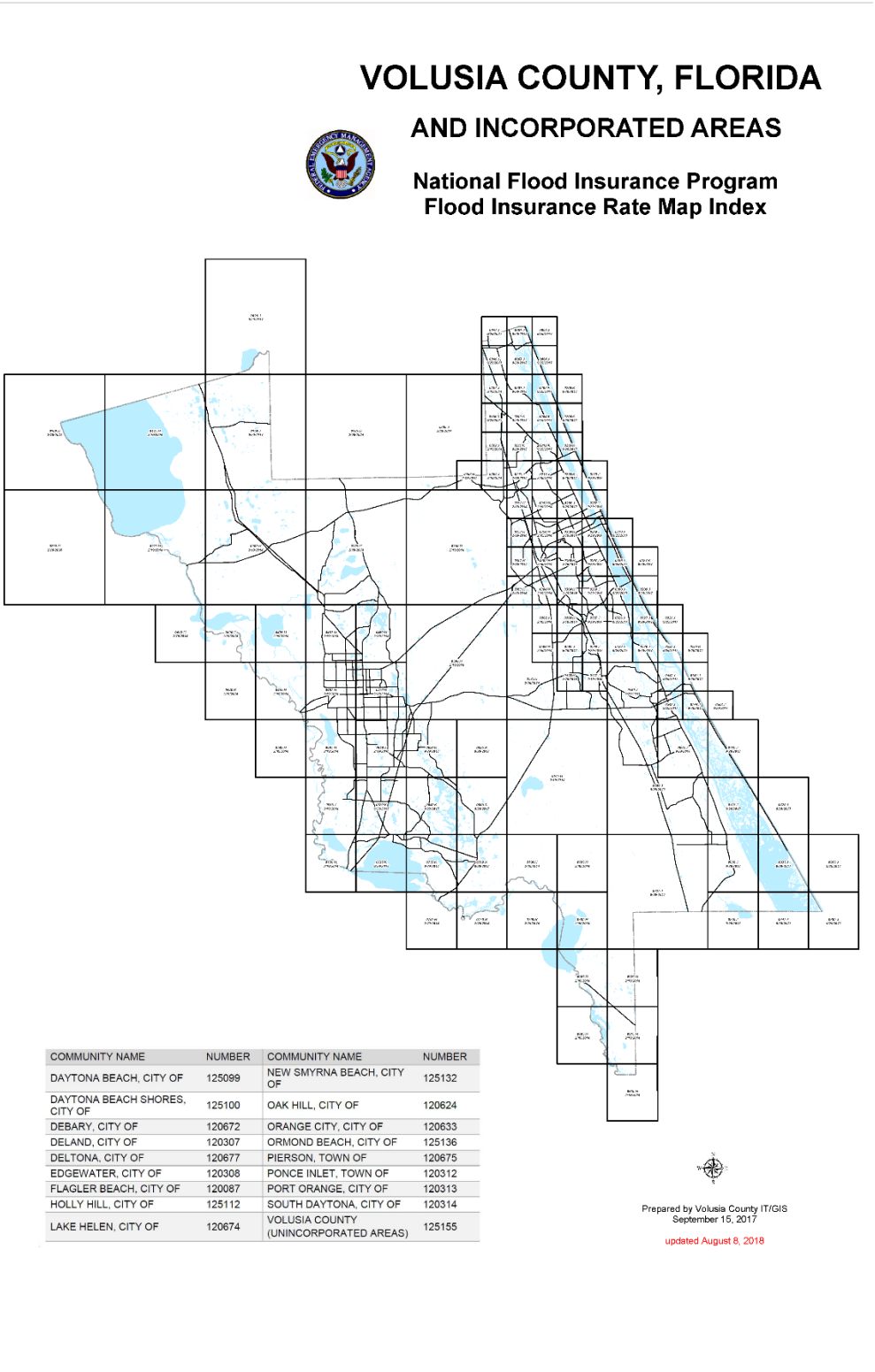
In the post-disaster time frame, the Planning Committee may be requested by the Chair of the Steering Committee to form one or more teams to identify the mitigation opportunities and needs highlighted by the experience with the event. The Chair will request the assistance of the County Emergency Management Division in identifying such individuals and notifying them of the upcoming assessment process. This post-event assessment process will also be utilized, when applicable, to evaluate the effectiveness in mitigation initiatives in place. At a minimum, representatives from the impacted local jurisdictions will be represented on such teams, as will personnel from the County Emergency Management Division serving as Volusia Prepares support staff.

The Emergency Management Division coordinates with the CRS Coordinator, the Growth and Resource Management Department and the Property Appraisers Office to identify substantially damaged structures in SFHAs throughout the entire county and its jurisdictions. Once an incident occurs the Property Appraisers Office will send out teams to conduct the initial assessment of damaged areas and structures. The Property Appraisers Office will work with the municipalities and generate a list of the damaged structures, destroyed, major, minor, and affected, and provide to the Emergency Management Division to disseminate to the state and Emergency Management Partners. The Growth and Resource Management Department will then send out teams to take pictures, leave door hangers, identify if structures are substantially damaged, and mail out letters to the owners of the substantially damaged structures in the SFHAs, to come in for permits. A database will be created after each incident of the substantially damaged structures. The substantially damaged structures in a SFHA database will be shared with the Emergency Management Division. Within 45 days of the incident, the CRS Coordinator will facilitate a meeting with all participating community CRS coordinators and/or floodplain managers from the municipalities to discuss the substantially damaged structures in SFHAs within their jurisdictions. To maintain awareness for mitigation projects, the Emergency Management Division compares mitigation projects to the substantially damaged in a SFHA database.

Support Agencies responsible for implementation and enforcement of local floodplain management regulations to regulate and permit development in SFHAs:

- Sheriff's Office
- Property Appraiser
- Growth & Resource Management
- Public Works
- Accounting Services
- Budget and Administration Services
- Purchasing Department
- Community Services
- Emergency Services Department
- Municipalities

Section 7: Figure 2: FEMA DFIRM Panel Map. Last updated August 8, 2018[7]



[7] https://volusiacountyfl.maps.arcgis.com/apps/instant/basic/index.html?appid=a12bb2c92372450ca1712a0651815b5f

An additional indicator of floodplain management capability is the active participation of local jurisdictions in the *Community Rating System* (CRS). The CRS is an incentive-based program that encourages counties and municipalities to undertake defined flood mitigation activities that go beyond the minimum requirements of the NFIP, adding extra local measures to provide protection from flooding. All of the 18 creditable CRS mitigation activities are assigned a range of point values. As points are accumulated and reach identified thresholds, communities can apply for an improved CRS class. Class ratings, which run from 10 to 1, are tied to flood insurance premium reductions. As class ratings improve (the lower the number the better), the percent reduction in flood insurance premiums for NFIP policyholders in that community increases.

Community participation in the CRS is voluntary. Any community that is in full compliance with the rules and regulations of the NFIP may apply to FEMA for a CRS classification better than class 10. The CRS application process has been greatly simplified over the past several years, based on community comments intended to make the CRS more user friendly, and extensive technical assistance available for communities who request it.

Volusia County and its 16 jurisdictions are all participants in the National Flood Insurance Program (NFIP) and many jurisdictions participate in the Community Rating System (CRS). Compliance with the NFIP is maintained through:

- Jurisdiction participation in the Volusia Prepares Working Group (quarterly)
- Quarterly submittal of Mitigation Initiatives by jurisdiction
- Complying with NFIP through County/Municipal Floodplain Ordinances (exceed CFR-44)
- Compliance with Florida Building Code

Section 7: Table 3: CRS Premium Discounts, By Class

CRS CLASS	PREMIUM REDUCTION
1	45%
2	40%
3	35%
4	30%
5	25%
6	20%
7	15%
8	10%
9	5%
10	None

Section 7: Table 4: CRS Participation in Volusia County (as of 11/15/2024)

JURISDICTION	CRS CLASSIFICATION	DISCOUNT FOR SFHA
Daytona Beach	5	25%
Daytona Beach Shores	5	25%
DeBary	NA	NA
DeLand	NA	NA
Deltona	9	5%
Edgewater	7	15%
Holly Hill	8	10%
Lake Helen	NA	NA
New Smyrna Beach	5	15%
Oak Hill	NA	NA
Orange City	NA	NA
Ormond Beach	5	25%
Pierson	NA	NA
Ponce Inlet	5	25%
Port Orange	5	25%
South Daytona	7	15%
Volusia County	5	25%

Floodplain Management Plan: A floodplain management plan (or a flood mitigation plan) provides a framework for action regarding the corrective and preventative measures put in place to reduce flood-related impacts. Floodplain management plans are similar to hazard mitigation plans except for the fact that they focus solely on flood hazards and identify specific actions to address flooding problems within a jurisdiction.

- All jurisdictions have a floodplain management plan, located within the County Floodplain Management Plan.

Stormwater Management Plan: A stormwater management plan is designed to address flooding associated with stormwater runoff. The stormwater management plan is typically focused on design and construction measures intended to reduce the impact of minor urban flooding. Stormwater management plans are an excellent way for local governments to regulate stormwater flow within the jurisdiction and to prevent future stormwater problems.

7.3.5 Gaps and Capability Improvements

Small jurisdictions within Volusia County do not have the necessary resources to expand operations beyond what is needed for day-to-day operations. These municipalities rely on support from the County to develop plans and execute necessary safety measures, particularly in times of disaster. Municipalities such as DeBary, Oak Hill, and Pierson fall into this category. These communities often resort to the County's policies to guide their own.

Municipalities such as Daytona Beach, Deltona, New Smyrna Beach, and Ormond Beach have numerous policies in place to support hazard mitigation efforts as described throughout this report. Cities such as DeLand, Edgewater, and Port Orange have more than half of policies listed that support mitigation, but still face serious, ongoing damage from hazards, particularly flooding. Policy gaps and continued development increase the vulnerability to hazards within these jurisdictions.

It is recommended within the next five years that each jurisdiction reviews the existing policies for relevance, adopts additional policies mentioned in this document, and reassess developed or developing areas that are considered high risk as identified in Vulnerability Assessments. If a jurisdiction has not completed a Vulnerability Assessment, this can be accomplished through the Resilient Florida Grant Program.[8] Additionally, within the next five years, all municipalities are encouraged to participate in all LMS quarterly meetings and engage in county-wide resilience working groups to improve their capabilities to respond, mitigate, and recover from disasters.

[8] https://floridadep.gov/rcp/resilient-florida-program/content/resilient-florida-grants

7.4 PUBLIC CAPABILITY ASSESSMENT

As described in Section 2 of the plan, the public engagement sessions and surveys provided insight into residents' capabilities to respond and recover from disasters. The feedback received provides an opportunity for stakeholders to be involved in the planning process.

Residents from the community were invited to the LMS Working Group quarterly meetings, and two public engagement sessions. All residents were encouraged to speak on hazard concerns witnessed in the past five years to provide insight into Volusia County Emergency Management on individual and community level capabilities. The main concern of the public was about hurricane and flooding damage. Key takeaways from the public engagement sessions were:

- Flood mitigation efforts are ad hoc and there is no sole department or person overseeing mitigation efforts.
- There is no true definition of success or metrics on how to measure mitigation efforts to ensure they are working as intended.
- Maintenance and pre-storm preparations do not meet the public's needs for safety and security.
- Local building codes, zoning, and construction practices should be reevaluated to safeguard public confidence.

Additionally, the homeowner surveys collected information on the public's capabilities to respond and recover from disasters. There were 136 responses to this survey. Key takeaways were:

- 82% responded yes to noticing an increase in flood events.
- 49% responded yes to having flood insurance on their property.
- 56% responded no to implementing individual mitigation measures on their property.
- Of the 29% of those who have implemented individual mitigation measures on their property, 29% were landscaping/drainage improvements and 10% installed flood barriers.
- 51% have not implemented individual mitigation measures on their property due to financial setbacks and 20% claimed perceived difficulty.

7.5 EXISTING COUNTY-WIDE EFFORTS

Volusia County has invested resources into various plans and studies prior to this plan's update that contribute towards hazard mitigation and resilience. These plans and studies were reviewed during the update of this plan and discussed during LMS Working Group quarterly meetings by the various stakeholders and departments that completed them. Examples include:

- 2012 Volusia County Sustainability Action Plan
- 2017 Resilient Volusia County Phase 1
- 2018 East Central Florida Regional Resilience Collaborative
- 2019 East Central Florida Regional Resiliency Action Plan (RRAP)
- 2020 Planning for the Financial, Socio-Economic and Infrastructure-Related Effects of Sea Level Rise on Future Hurricane Storm Surge Intensity Report
- 2021 Resilient Volusia County Phase 2- Adaptation Action Areas Report
- 2023 Enhanced State Hazard Mitigation Plan
- 2024 East Central Florida Regional Risk Assessment
- Florida Statewide Regional Evacuation Study Program Regional Hazard Analysis
- Numerous vulnerability assessments throughout cities and county
- Numerous basin studies throughout cities and county

7.6 CONCLUSIONS OF THE CAPABILITY ASSESSMENT

The capability of Volusia County and the participating jurisdictions varies greatly from jurisdiction to jurisdiction. **Table 7.6** lists the total number of jurisdictions that have plans, ordinances and programs in place or under development.

Section 7: Table 5: Relevant Plans, Ordinances and Programs

Plan, Ordinance or Program	Total Number of Jurisdictions
Local Mitigation Strategy	17
Comprehensive Land Use Plan	17
Floodplain Management Plan	17
Open Space Management Plan	8
Stormwater Management Plan	15
Natural Resource Protection Plan	10
Flood Response Plan	11
Emergency Operations Plan	17
Continuity of Operations Plan	11
Evacuation Plan	14
Disaster Recovery Plan	11
Capital Improvements Plan	17
Economic Development Plan	11
Historic Preservation Plan	8
Floodplain Ordinance (or Flood Damage Prevention Ordinance)	17
Zoning Ordinance	17
Subdivision Ordinance	13
Unified Development Ordinance	9
Post-disaster Redevelopment / Reconstruction Ordinance	4
Building Code	17
Fire Code	17
National Flood Insurance Program	17
NFIP Community Rating System	11

Capability *Assessment* and *Risk Assessment* serve as the foundation for a meaningful hazard mitigation strategy. During the process of identifying the goals and mitigation actions each jurisdiction must consider not only their level of hazard risk but also their existing capability to minimize or eliminate that risk.

In jurisdictions where the overall risk of hazard is high, specific mitigation actions that account for these conditions should be considered. This may include less costly actions such as minor ordinance revisions or public awareness activities. If necessary, specific capabilities may need to be improved to better address recurring threats. Similarly, in cases where the hazard vulnerability is low, more emphasis can be placed on actions that may impact future vulnerability, such as guiding development away from known hazard areas using various regulatory measures.

Use of Social Media and Other Media for Warning and Loss Prevention

Volusia County Emergency Management uses its X, formally known as Twitter, and Facebook account to provide warning to residents about incoming storms and other natural hazards. In unison with social media, the County Public Information Officer and Emergency Manager stay in communication with local television stations as well as national television stations such as The Weather Channel before, during and after storm and natural hazard events). Coordination with media sources often includes tips for residents for property mitigation (such as sandbagging) and tips for residents to stay safe after a storm (including staying away from downed power lines and standing water).

As of 2024, Volusia County Emergency Management launched an app focused on public outreach on emergency preparedness. This app sends out push notifications and public safety messages in real-time. The app provides information on topics such as state of emergencies, current events, weather conditions, sheltering, and disaster assistance.

SECTION 8 – MITIGATION STRATEGY

This section of the Plan provides the blueprint for Volusia County and the participating jurisdictions to become less vulnerable to its identified hazards. It is based on general consensus of the Volusia Prepares LMS Working Group (LMS Working Group) and the findings and conclusions of the *Capability Assessment* and *Risk Assessment*. It consists of the following five subsections:

- **Introduction**
- **Mitigation Goals**
- **Identification and Analysis of Mitigation Techniques**
- **Selection of Mitigation Techniques for Volusia County**
- **Mitigation Success Stories**
- **Plan Update Requirement**

8.1 INTRODUCTION

The intent of the Local Mitigation Strategy is to provide Volusia County and the participating jurisdictions with the goals that will serve as guiding principles for future mitigation policy and project administration, along with an analysis of mitigation techniques deemed available to meet those goals and reduce the impact of identified hazards. It is designed to be comprehensive, strategic and functional in nature:

- In being comprehensive, the development of the strategy includes a thorough review of all hazards and identifies extensive mitigation measures intended to not only reduce the future impacts of high-risk hazards, but also to assist the County and participating jurisdictions achieve compatible economic, environmental and social goals.

- In being strategic, the development of the strategy ensures that all policies and projects proposed for implementation are consistent with pre-identified, long-term planning goals.

- In being functional, each proposed mitigation action is linked to established priorities and assigned to specific departments or individuals responsible for their implementation with target completion deadlines. When necessary, funding sources are identified that can be used to assist in project implementation.

The first step in designing the LMS includes the identification of countywide mitigation goals. Mitigation goals represent broad statements that are achieved through the implementation of more specific, action-oriented objectives. These actions include both hazard mitigation policies (such as the regulation of land in known hazard areas through a local ordinance), and hazard mitigation projects that seek to address specifically targeted hazard risks (such as the acquisition and relocation of a repetitive loss structure).

The second step involves the identification, consideration and analysis of available mitigation measures to help achieve the identified mitigation goals. This is a long-term, continuous process, sustained through the development and maintenance of this Plan. Alternative mitigation measures will continue to be

considered as future mitigation opportunities become identified, as data and technology improve, as mitigation funding becomes available, and as this Plan is maintained over time.

The third and last step in designing the LMS is the selection and prioritization of specific mitigation actions, referred to as Hazard Mitigation Initiatives, for Volusia County and participating jurisdictions. The Mitigation Action Plan (MAP) represents an unambiguous and functional plan for action and is considered to be the most essential outcome of the mitigation planning process.

The MAP includes a prioritized listing of proposed hazard mitigation actions (policies and projects) for Volusia County and its participating jurisdictions and partners to carry out with accompanying information such as those departments or individuals assigned responsibility for their implementation, potential funding sources and an estimated target date for completion, serving as an important tool for monitoring success or progress over time. The cohesive collection of actions listed in the MAP can also serve as an easily understood menu of mitigation policies and projects for those local decision makers who want to quickly review the recommendations and proposed actions.

In preparing the Mitigation Action Plan for Volusia County, the LMS Working Group considered the overall hazard risk and capability to mitigate the effects of hazards as determined through the risk and capability assessment process, in addition to meeting the adopted countywide mitigation goals and unique needs of the community. Prioritizing the proposed mitigation actions was based on the following 11 factors:

- Population Benefited
- Health and Safety Considerations
- Environmental Impact
- Consistency with Other Plans and Programs
- Reduces Risk of Future Property Damage
- Supports Essential or Critical Services
- Probability of Receiving Funding for Implementation
- Feasibility of Implementation
- Community Rating System
- Repetitive Loss Mitigation
- Benefit Cost Ratio (to be conducted prior to submitting a project for grant consideration)

The mitigation initiative scoring system is provided in **Section 8: Table 1**.

Section 8: Table 1: Mitigation Initiative Scoring System

Prioritization Criteria	Scoring				
Population Benefited	**4** - Project will benefit a multi-jurisdictional area.	**3** - Project will benefit a jurisdictional area.	**2** - Project will benefit less than 100% of a jurisdiction (i.e., neighborhood).		
Health and Safety Considerations *Add 1 point for projects that benefit a multi-jurisdictional area.	**4** - Project would benefit 75% or more of the population.	**3** - Project would benefit 50-74% of the population.	**2** - Project would benefit 25-49%of the population.	**1** - Project would benefit less than 25% of the population.	
Environmental Impact	**1** - Project improves the environment.	**0** - Risk to the environment is undetermined.	**(-1)** - Project poses risk to the environment.		
Consistence with other Plans and Programs	**4** - Project is incorporated into the LMS, CEMP and Comprehensive Plan, and supports the National Flood Insurance Program (i.e., for flood related projects).	**3** - Project is incorporated into at least two of these plans.	**2 -** Project is incorporated into at least one of these plans.	**1** - Project is consistent with other local standards, aside from LMS, CEMP and Comprehensive Plan.	
Reduces Risk of Future Property Damage	**4 -** Mitigates a hazard of high frequency or risk.	**3 -** Mitigates a hazard of moderate frequency or risk.	**2 -**Mitigates a hazard of low frequency or risk.	**1 -** Mitigates a hazard of very low frequency or risk.	
Supports Essential or Critical Services	**5** - Project will ensure continuity of operations for essential infrastructure or services.	**3** - Project will support infrastructure or services with loss/damage history.	**1** - Project will support infrastructure or services without loss/damage history.	**0** - Project's operation will have no impact on community infrastructure or services if disrupted.	
Probability of Receiving Funding for Implementation	**4** - Limited funding potential exists.	**3** -Potential funding sources are other state or federal grants or similar funding sources.	**2** - Potential funding is readily available through emergency preparedness or mitigation funding sources.	**0** - Potential funding is readily available through local funding sources (e.g., budgeting, capital improvements).	
Feasibility of Implementation	**4** - Project would be relatively easy to implement in one year.	**3** - Project would be easy to implement in three years.	**2** - Project would be easy to implement in five years.	**0** - Project would be difficult to implement.	
Community Rating System	**4** - Project supports all four elements of CRS flood-related activities (public information, mapping and regulations, damage reduction and flood preparedness).	**3** - Project supports three CRS elements.	**2** - Project supports two CRS elements.	**1** - Project supports one CRS element.	**0** - Project does not support any CRS element.
Repetitive Loss Mitigation	**4** - Project protects 50% or more of Repetitive Loss (RL) structures.	**2** - Project protects less than 50% of RL structures.	**0** - Project does not protect a RL structure.		
Benefit Cost Ratio	**5** - Project has a Benefit Cost Ratio (BCR) of "1" or higher, using FEMA approved software.	**3** - Project has a BCR of less than "1" using FEMA approved software.	**0** - The BCR cannot be determined.		

8.2 MITIGATION GOALS

44 CFR Requirement

44 CFR Part 201.6(c)(3)(i):
The mitigation strategy shall include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

For the 2025 plan update, the LMS Working Group used the goal listing updated and developed as part of the 2020 plan update. Each of the following goal statements represent a broad target for Volusia County and its participating jurisdictions and partners to achieve through the implementation of its more detailed Mitigation Action Plan provided in Section 9: *Mitigation Action Plan*. They are intended to reflect the unique needs and wishes of the communities of Volusia County to have a more "disaster resilient" future.

Section 8: Table 2: LMS Working Group Mitigation Goals

GOAL 1: Strengthen effective hazard mitigation programming through policies, regulations, and technology through local government collaborations.
***Objective 1*:** Develop a mechanism to track mitigation projects for active reporting among jurisdictions.
***Objective 2*:** Support the efforts of each jurisdictions' Community Rating Systems program.
***Objective 3*:** Review, develop and enforce policies, plans and regulations to discourage or prohibit inappropriate location of structures or infrastructure components in high-risk areas.
***Objective 4*:** Leverage available information and data from sources, such as individual vulnerability assessments, the Regional Resilience Action Plan, and Adaption Action Areas to further mitigation efforts.
***Objective 5*:** Seek funding to implement and further existing forecasting technology.
***Objective 6*:** Strengthen surveying strategies before and after a disaster for more comprehensive damage assessments.
GOAL 2: Local government will endeavor to have resilient critical infrastructure that supports operations before, during, and after disasters.
Objective 1: Educate local partners on the need for financial planning to reduce risk and recover critical infrastructure quickly after a disaster.
Objective 2: Implement adaptation strategies and encourage routine maintenance of critical infrastructure through physical and geological enhancements using available technology.
***Objective 3*:** Evaluate utility, telecommunications, and information technology systems with external agency partners to determine potential mitigation opportunities.
***Objective 4*:** Assess transportation routes, systems, and infrastructure to identify potential relocation, retrofit, or modification opportunities to ensure safe passage before, during and after disaster events.
***Objective 5*:** Prioritize the functions of emergency service operations and their facilities.
Objective 6: Annually seek opportunities and apply for funding to expand future shelter capacity and for existing shelter retrofits.

GOAL 3: Encourage economic sustainability within the community.

Objective 1: Local government will encourage businesses and industries to make employment facilities and operations more disaster resilient.

Objective 2: Develop partnerships to enhance communication between private sector businesses and local governments.

Objective 3: Offer training to local businesses and professional organizations on all hazard preparedness.

Objective 4: Review the needs of key supply chain demands in the community by establishing programs, facilities or resources to support business continuity.

GOAL 4: Enhance the whole community's understanding of the hazards and the techniques used to minimize vulnerability.

Objective 1: Provide information through outreach activities to further the public's understanding of local hazards and residential vulnerabilities.

Objective 2: Inform tourists on the hazard risks and preparedness.

Objective 3: Collaborate with private sector associations and businesses to further disaster preparedness and business continuity.

Objective 4: Encourage each jurisdiction to participate in trainings and exercises and share resources with one another.

8.3 IDENTIFICATION AND ANALYSIS OF MITIGATION TECHNIQUES

44 CFR Requirement

44 CFR Part 201.6(c)(3)(ii):
The mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effect of each hazard, with particular emphasis on new and existing buildings and infrastructure.

In formulating the LMS for Volusia County, a wide range of activities were considered to help achieve the established mitigation goals in addition to addressing any specific and targeted hazard concerns. These activities were discussed by the LMS Working Group at meetings held over the course of plan development. In general, all activities considered by the LMS Working Group can be classified under one of the following six (6) broad categories of mitigation techniques.

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

- Planning and zoning
- Building codes
- Open space preservation
- Floodplain regulations
- Stormwater management regulations
- Drainage system maintenance
- Capital improvements programming
- Riverine / fault zone setbacks

2. Property Protection
Property protection measures involve the modification of existing buildings and structures to help them better withstand the forces of a hazard, or removal of the structures from hazardous locations. Examples include:

- Acquisition
- Relocation
- Building elevation
- Critical facilities protection
- Retrofitting (e.g., wind proofing, floodproofing, seismic design techniques, etc.)
- Safe rooms, shutters, shatter-resistant glass
- Insurance

3. Natural Resource Protection

Natural resource protection activities reduce the impact of natural hazards by preserving or restoring natural areas and their protective functions. Such areas include floodplains, wetlands, steep slopes and sand dunes. Parks, recreation or conservation agencies and organizations often implement these protective measures. Examples include:

- Floodplain protection
- Watershed management
- Riparian buffers
- Forest and vegetation management (e.g., fire resistant landscaping, fuel breaks, etc.)
- Erosion and sediment control
- Wetland preservation and restoration
- Habitat preservation
- Slope stabilization

4. Structural Projects

Structural mitigation projects are intended to lessen the impact of a hazard by modifying the environmental natural progression of the hazard event through construction. They are usually designed by engineers and managed or maintained by public works staff. Examples include:

- Reservoirs
- Dams / levees / dikes / floodwalls
- Diversions / detention / retention
- Channel modification
- Storm sewers

5. Emergency Services

Although not typically considered a “mitigation” technique, emergency service measures do minimize the impact of a hazard event on people and property. These commonly are actions taken immediately prior to, during, or in response to a hazard event. Examples include:

- Warning systems
- Evacuation planning and management
- Emergency response training and exercises
- Sandbagging for flood protection
- Installing temporary shutters for wind protection

6. Public Education and Awareness

Public education and awareness activities are used to advise residents, elected officials, business owners, potential property buyers, and visitors about hazards, hazardous areas, and mitigation techniques they can use to protect themselves and their property. Examples of measures to educate and inform the public include:

- Outreach projects
- Speaker series / demonstration events

- Hazard map information
- Real estate disclosure
- Library materials
- School children educational programs
- Hazard expositions

8.4 SELECTION OF MITIGATION TECHNIQUES FOR VOLUSIA COUNTY

In order to determine the most appropriate mitigation techniques for Volusia County, the LMS Working Group thoroughly reviewed and considered collective findings of various community assessments. Other considerations included each individual mitigation action's effect on overall risk to life and property, health and safety, the environment, plan consistency, its ease of implementation and general cost-effectiveness, and funding availability (if necessary).

FEMA guidance for meeting the planning requirements of the Disaster Mitigation Act of 2000 specifies that local governments should prioritize their mitigation actions based on the level of risk a hazard poses to life and property. In response to this requirement, the LMS Working Group used and completed a Mitigation Techniques Matrix (**Section 8: Table 3**) to make certain they addressed, at a minimum, those hazards posing the greatest threat.

Section 8: Table 3: Mitigation Techniques Matrix for Volusia County

MITIGATION TECHNIQUE	HIGH RISK HAZARDS			
	FLOOD	TROPICAL CYCLONES	RISING COASTAL WATERS	TORNADO
Prevention	✓	✓	✓	✓
Property Protection	✓	✓	✓	✓
Natural Resource Protection	✓	✓	✓	
Structural Projects	✓	✓	✓	✓
Emergency Services	✓	✓	✓	✓
Public Education & Awareness	✓	✓	✓	✓

The Mitigation Techniques Matrix provides the LMS Working Group with the opportunity to cross-reference each of the priority high risk hazards, the aforementioned comprehensive range available mitigation techniques, including prevention; property protection; natural resource protection; structural projects; emergency services; and public education and awareness. However, it is important to note that Volusia County's Mitigation Action Plan includes an array of actions targeting multiple hazards and is not necessarily limited to only those classified as high risk.

Additional mitigation strategies range from:

- Seawalls
- Breakwaters
- Habitat restoration
- Beach renourishment
- Living Shorelines
- Elevating major roadways
- Raising vulnerable structures
- Water pump systems
- Underground utilities
- Permeable pavement
- Low impact development
- Floodproofing structures
- Rain gardens
- Increase density standards
- Land acquisition
- Public Outreach and Education

8.5 PLAN REVISIONS

Because of FEMA requirements for plan updates, the Mitigation Action Plan was reviewed by each agency responsible identified for implementing the action. For each action, an update on the implementation status (completed, deleted, or deferred) was provided and milestones achieved or impediments to implementation of the actions were identified to adjust the project list as necessary.

The current goals and objectives were updated and refined through a series of virtual and in-person meetings in 2024. All members of the Volusia Prepares Working Group were invited to participate in the meetings outside the quarterly meetings. All feedback was evaluated and incorporated into the outlined goals and objectives.

Flooding, rising coastal waters, and tropical cyclones were the top concerns for the LMS Volusia Prepares Working Group and residents throughout Volusia County. These hazards are complex issues with multiple contributing factors, often specific to a given site. Effective mitigation requires accurate data collection and analysis to identify areas that have experienced repeated damage. Prioritization should be given to these locations, followed by those that have been damaged most recently, ensuring that resources are allocated efficiently to address the most impacted areas first. Given the constraints of available resources, it is essential to focus on areas where mitigation efforts will have the greatest impact.

Public concerns regarding such hazards have frequently attributed the issue to new development. While development can be a contributing factor in certain locations—such as Venetian Bay in New Smyrna Beach, Old Dixie Highway in Ormond Beach, the west side of Daytona Beach, and new miscellaneous subdivisions throughout the county—these hazards are typically the result of a combination of factors. Addressing existing challenges requires a site-specific approach that considers a broad range of contributing causes and solutions.

SECTION 9 – MITIGATION ACTION PLAN

44 CFR Requirement

44 CFR Part 201.6(c)(3)(iii): The mitigation strategy shall include an action plan describing how the actions identified in paragraph (c)(2)(ii) of this section will be prioritized, implemented, and administered by the local jurisdiction.

This section includes the listing of the mitigation actions proposed by Volusia County and its participating jurisdictions and partners. It has been designed to achieve the mitigation goals and objectives established in Section 8: Mitigation Strategy and will be maintained on a regular basis according to the plan maintenance procedures established in Section 10: Plan Maintenance Procedures.

As described in the previous section, the Mitigation Action Plan, or MAP, represents an unambiguous and functional plan for action. Each proposed mitigation action has been identified as an effective measure (policy or project) to reduce hazard vulnerability for Volusia County.

Most importantly, implementation mechanisms are provided for each action, including the designation of a lead agency or department responsible for implementing the action. Specific information regarding project cost and timeframe for its completion is on file with Volusia County Emergency Management. These implementation mechanisms ensure that Volusia County Local Mitigation Strategy remains a functional document that can be monitored for progress over time.

SECTION 9: MITIGATION ACTION PLAN

Section 9: Table 1: Key Elements of the Mitigation Action Plan

Priority	Indicates whether the action is a "low" priority, "moderate" priority or "high" priority based on the established prioritization criteria: Low = <10; Moderate = 11-24; High = 25+
Jurisdiction	Identifies the geographic location where the initiative is located.
Responsible Organization	Identifies the local agency, department or organization that is best suited to implement the proposed action, project or initiative.
Hazard(s)	Lists the hazard(s) the proposed action is designed to mitigate against.
Mitigation Technique Category	It indicates the mitigation technique that the proposed action is designed to help achieve. Categories include E = Emergency Services; P = Prevention; PE = Public Education; PP = Property Protection; S = Structural
Initiative	Identifies a specific action that, if accomplished, will reduce vulnerability and risk in the impact area. Actions may be in the form of local policies (i.e., regulatory or incentive-based measures), programs or structural mitigation projects and should be consistent with any pre-identified mitigation goals and objectives. An identification number is provided. The county has additional information on files for each initiative (e.g., location, damage history, specific mitigation measure, estimated cost, etc.)
Funding	If applicable, it indicates how the cost to complete the action will be funded. For example, funds may be provided from existing operating budgets or general funds, a previously established contingency fund, a cost-sharing federal or state grant program, etc. The default funding source for initiatives within this listing is the Hazard Mitigation Grant Program (HMGP). Outside of the HMGP, funding sources for these projects are typically determined on the local level for "proactive" projects that do not need a disaster declaration to be funded. However, most of the projects on this listing do not have a set funding source, which defaults the project to HMGP. If identified, specific funding sources will be attributed to initiatives.
Approved by LMS Working Group	Identifies the date when the initiative was approved by the LMS Working Group
Completion Date	Indicates when the action was completed. Remember that some actions will require only a minimal amount of time, while others may require a long-term or continuous effort. Projects are "deferred" or "terminated" from list listing at the discretion of the jurisdiction that is implementing those changes. When initiatives are deferred or deleted on the jurisdictional level, countywide representatives are notified via the LMS Working Group (or Volusia Prepares), and the countywide initiative listing is updated at that time.
Status	The status indicators for each initiative is as follows: • C = Current • D = Deferred ****See notes under "Completion Date" above**** • N = New • T = Terminated ****See notes under "Completion Date" above**** • U = Updated • CF = Completed with other funding • W = Withdrew • L = Looking for other funding

Each mitigation initiative has been scored by the responsible jurisdiction. The scoring system is included in Section 8: Mitigation Strategy.

Prioritizing the proposed mitigation actions was based on the following 11 factors:

- Population Benefited
- Health and Safety Considerations
- Environmental Impact
- Consistency with Other Plans and Programs
- Reduces Risk of Future Property Damage
- Supports Essential or Critical Services
- Probability of Receiving Funding for Implementation
- Feasibility of Implementation
- Community Rating System
- Repetitive Loss Mitigation
- Benefit Cost Ratio (to be conducted prior to submitting a project for grant consideration)

Each mitigation initiative was scored on 10 of these 11 factors. The jurisdictions have not run an official benefit cost analysis (BCA) for the initiatives at this time. The jurisdictions did include a general BCA in the mitigation initiative application that was submitted to Volusia County Emergency Management. However, the BCA will be run for the initiatives following a disaster to factor in all known damage costs.

The mitigation initiatives are not listed in exact priority order, though each has been assigned a priority level of “low”, “moderate”, or “high”.

All mitigation initiatives included in the Action Plan that propose to reduce flood hazard vulnerability advance the intent of the National Flood Insurance Program (NFIP), as they will meet the current local floodplain regulations adopted by the jurisdictions as required by the NFIP. Two of the scoring factors used to determine the priority of the actions specifically address the intent of the NFIP and the Community Rating System (CRS). These two factors consider whether the initiative supports elements of the CRS and reduces repetitive flood losses.

Volusia County is highly committed to reducing flood losses in support of the NFIP and has predominantly used local funding to implement these projects. Examples of these initiatives include acquiring and relocating repetitive loss structures, relocating critical facilities from the 100-year floodplain, floodproofing equipment at water treatment plants, performing drainage improvement projects and creating new topographic maps based on newly collected Light Detection and Ranging (LiDAR) data. Approximately half of open disaster mitigation initiatives support flood hazard vulnerability reduction.

The open mitigation initiatives are listed in the Action Plan in **Section 9: Table 2** If a mitigation initiative does not have a status indicator, it is considered “open.

In 2019, the East Central Florida Regional Planning Council and Volusia County Emergency Management mapped the locations of all mitigation projects, by type, as part of a project with the Florida Department of Environmental Protection. These maps are available upon request.

Section 9: Table 2: Mitigation Action Plan: Open Mitigation Initiatives by Jurisdiction (as of 1/28/2025)

Project #	Priority	Jurisdiction	Responsible Organization	Hazard(s)	Mitigation Technique Category	Initiative	Funding	Est. Cost	Approved by LMS Working Group	Anticipated Completion Date	Status
VOL-0546	Ian (2)	Ormond Beach	Public Works	Flood	P PP S	VOL -0546 Fleming Avenue Pump Station Central Park Flood Mitigation	HMGP	$12,561,200.00	10/3/2019	12/31/2028	C
VOL-0555	Ian (10)	Holly Hill	Public Works	Flood	P PP	VOL- 0555 Lift Station #21 Refurbishment	HMGP	$516,000.00	10/3/2019	12/31/2028	C
VOL-0560		Volusia County	VCEM	Riverine Surge	P PP S	VOL-0560 Elevate and retrofit flood prone home	FMA		10/3/2019	1/1/2024	T
VOL-0561		Volusia County	VCEM	Riverine Surge	P PP S	VOL-0561 Elevate and retrofit flood prone home	FMA		10/3/2019	1/1/2024	T
VOL-0562		FL Hospital DeLand	EM Coordinator	All Hazard	P PP S	VOL-0562 Upgrade Windows	HMGP		9/12/2018	1/1/2023	T
VOL-0563	63	Holly Hill	Public Works	Flood	P PP S	VOL-563 Elevation fo home at 318 Riverside Dr.	HMGP	$379,500.00	9/12/2018	1/1/2023	C
VOL-0564		DeLand	Risk Management	All Hazard	P PP S	VOL- 564 Generator Power for sheltering	HMGP		3/20/2019	1/1/2024	CF
VOL-0565		Volusia County	VCEM	Flood	P PP S	VOL- 0565 Elevate and Retrofit home at 1036 Shockney Dr Ormond Beach	FMA		10/3/2019	1/1/2024	T
VOL-0566		Volusia County	VCEM	Flood	P PP S	VOL- 0566 Elevate and Retrofit home at 6411 River Road New Smyrna Beach	FMA		10/3/2019	1/1/2024	T
VOL-0567		Volusia County	VCEM	Flood	P PP S	VOL- 0567 Elevate and Retrofit home at 364 Seminole Dr Ormond Beach	FMA		10/3/2019	1/1/2024	T

Project #	Priority	Jurisdiction	Responsible Organization	Hazard(s)	Mitigation Technique Category	Initiative	Funding	Est. Cost	Approved by LMS Working Group	Anticipated Completion Date	Status
VOL-0568		Volusia County	Coastal Division	Flood Surge	P PP	VOL- 0568 ISB Public Restroom demolition and rebuild at higher elevation	HMGP		3/31/2020	4/1/2025	T
VOL-0569		Volusia County	Coastal Division	Flood Surge	P PP	VOL- 0569 Bethune Beach Public Restroom demolition and rebuild at higher elevation	HMGP		3/31/2020	4/1/2025	T
VOL-0570		Volusia County	Coastal Division	Flood Surge	P PP	VOL-0570 Silver Beach public Restroom demolition and rebuild at higher elevation	HMGP		3/31/2020	4/1/2025	T
VOL-0571	64	Volusia County	Fire Services	All Hazard	P PP ES	VOL-0571 Replacement Generator for Volusia County Fire Station 21	HMGP	$70,377.00	3/31/2020	4/1/2025	C
VOL-0572		Volusia County	Fire Services	All Hazard	P PP S ES	VOL-0572 Relocation and new construction of Station 44 (132 N. Fountain Dr. Pierson)	HMGP	$4,092,105.00	3/31/2020	4/1/2025	T
VOL-0573		Volusia County	Fire Services	All Hazard	P PP S ES	VOL-0573 Increased Hurricane Rating of Bay Doors at DBIA Fire Station 17	HMGP	$630,000.00	9/30/2020	10/1/2025	T
VOL-0574		Volusia County	Fire Services	All Hazard	P PP S ES	VOL-0574 Replacement generator for Volusia County Fire Rescue Fire Station 11 located at: 1580 Derbyshire Road, Holly Hill, FL 32117	HMGP	$42,551.00	9/30/2020	10/1/2025	T
VOL-0575		Volusia County	Beach Safety	Flood Surge	P PP S	VOL-0575 Ponce de Leon Inlet North Jetty Deck Extension	HMGP		12/9/2020	12/10/2025	T

Project #	Priority	Jurisdiction	Responsible Organization	Hazard(s)	Mitigation Technique Category	Initiative	Funding	Est. Cost	Approved by LMS Working Group	Anticipated Completion Date	Status
VOL-0576	65	DeLand	Risk Management	Flood	P	VOL-0576 City Hall Basin Area Improvements, The City of DeLand is seeking funding to construct a dedicated drainage infrastructure system to remedy the localized flooding	HMGP	$4,279,952.00	3/31/2021	12/31/2026	C
VOL-0577	66	DeLand	Risk Management	Flood Wind	PP	VOL-0577 Sanborn Center Hurricane Shutters	HMGP	$78,061.14	3/31/2021	12/31/2026	C
VOL-0578		Deltona	Fire	Flood Wind	P S ES	VOL-0578 Safe Rooms / Emergency Operations Center (EOC) / Fire Department Training Facility.	HMGP		3/31/2021	12/31/2026	T
VOL- 0579	67	Ormond Beach	Public Works	Flood	PP P	VOL-0579 John Anderson Drive Drainage Improvements	HMGP	$230,000.00	3/31/2021	12/31/2026	C
VOL-0580	68	South Daytona	Public Works	All Hazard	P PP S	VOL-0580 City Hall Complex Generator	HMGP	$420,000.00	3/31/2021	12/31/2026	C
VOL-0581	COVID (1)	Volusia County	EM	All Hazard	P PP S	VOL-0581 Residential elevation project of 356 Seminole Drive	HMGP	$221,280.00	3/31/2021	12/31/2026	C
VOL-0583	COVID (2)	Volusia County	Fire	All Hazard	P PP S ES	VOL-0583 Infrastructure Retrofit & Safe Room of Station 42	HMGP	$3,800,000.00	3/31/2021	12/31/2026	C
VOL-0584	COVID (3)	Volusia County	Fire	All Hazard	P PP S ES	VOL-0584 Infrastructure Retrofit & Safe Room of Station 34	HMGP	$ -	3/31/2021	12/31/2026	T
VOL-0585		Volusia County	Public Works	Flood	P PP S	VOL-0585 North Beach Street - Grade Raise & Culvert additions	HMGP		3/31/2021	12/31/2026	T

Project #	Priority	Jurisdiction	Responsible Organization	Hazard(s)	Mitigation Technique Category	Initiative	Funding	Est. Cost	Approved by LMS Working Group	Anticipated Completion Date	Status
VOL-0586		Volusia County	Fire Rescue	All Hazard	P S ES	VOL - 0586 Indian Lake Emergency Services Project	BRIC	$ -	9/6/2022	12/31/2027	T
VOL-0587	Ian (5)	Deltona	City Manager's Office	Flood	P PP S ES	VOL-0587 Elkcam Blvd	HMGP	$8,000,000.00	3/10/2023	12/31/2028	C
VOL-0588		Deltona	City Manager's Office	Flood	P PP S ES	VOL-0588 Tulsa Drive	HMGP		3/10/2023	12/31/2028	T
VOL-0589	Ian (17)	Deltona	City Manager's Office	Flood	P PP S ES	VOL-0589 Catalina	HMGP	$2,250,000.00	3/10/2023	12/31/2028	C
VOL-0590		Deltona	City Manager's Office	Flood	P PP S ES	VOL-0590 East Brook	HMGP		3/10/2023	12/31/2028	T
VOL-0591		Deltona	City Manager's Office	Flood	P PP S ES	VOL-0591 Windsor Lake	HMGP		3/10/2023	12/31/2028	T
VOL-0592		Deltona	City Manager's Office	Flood	P PP S ES	VOL-0592 Lake Dupont	HMGP		3/10/2023	12/31/2028	T
VOL-0593		Deltona	City Manager's Office	Flood	P PP S ES	VOL-0593 Lake Angela	HMGP		3/10/2023	12/31/2028	T
VOL-0594	Ian (7), Nicole (1)	Orange City	City Manager's Office	Flood	P PP S ES	VOL- 0594 Graves Ave	HMGP	$3,541,800.00	3/10/2023	12/31/2028	C
VOL-0595		Orange City	City Manager's Office	Flood	P PP S ES	VOL-0595 Mill Lake	HMGP	$800,000.00	3/10/2023	12/31/2028	L
VOL-0596	Ian (19)	Holly Hill	Public Works	Flood	PP P	VOL-0596 Lift Station #7	HMGP	$100,000.00	3/10/2023	12/31/2028	C
VOL-0597		Holly Hill	Public Works	Flood	PP P	VOL-0597 Lift Station #11	HMGP		3/10/2023	12/31/2028	T
VOL-0598		Holly Hill	Public Works	Flood	PP P	VOL-0598 Lift Station # 14	HMGP		3/10/2023	12/31/2028	T
VOL-0599		Holly Hill	Public Works	Flood	PP P	VOL-0599 Lift Station # 16	HMGP		3/10/2023	12/31/2028	T
VOL-0600	69	New Smyrna Beach	Engineering	Flood	PP P	VOL-0600 4 Residential Demolitions	HMGP	$1,400,000.00	3/10/2023	12/31/2028	C
VOL-0601	Ian (6)	New Smyrna Beach	Engineering	Flood	PP P	VOL-0601 16 Residential Elevations	HMGP	$4,800,000.00	3/10/2023	12/31/2028	C

Project #	Priority	Jurisdiction	Responsible Organization	Hazard(s)	Mitigation Technique Category	Initiative	Funding	Est. Cost	Approved by LMS Working Group	Anticipated Completion Date	Status
VOL-0602	Ian (16)	New Smyrna Beach	Engineering	Flood	PP P	VOL-0602 9 Residential Elevations	HMGP	$2,900,000.00	3/10/2023	12/31/2028	C
VOL-0603	70	South Daytona	Public Works	Flood	PP P	VOL-0603 Facility retrofit	HMGP		3/10/2023	12/31/2028	T
VOL-0604	Ian (9)	South Daytona	Public Works	Flood	PP P	VOL-0604 Lift Stations	HMGP	$1,350,000.00	3/10/2023	12/31/2028	C
VOL-0605	71	South Daytona	Public Works	Flood	PP P	VOL-0605 Lift stations upgrades	HMGP	$225,000.00	3/10/2023	12/31/2028	C
VOL-0606	Ian (18), Nicole (26)	South Daytona	Public Works	Flood	PP P	VOL-0606 Storm water stations	HMGP	$385,000.00	3/10/2023	12/31/2028	C
VOL-0607		South Daytona	Public Works	Flood	PP P	VOL-0607 Safe Room	HMGP		3/10/2023	12/31/2028	T
VOL-0608	Ian (22)	Volusia County	Emergency Management	Flood	PP P	VOL-0608 Coleman Residential Elevation	HMGP	$135,000.00	3/10/2023	12/31/2028	C
VOL-0609	Ian (24), Nicole (3)	Volusia County	Emergency Management	Flood	PP P	VOL-0609 Blackburn Residential Elevation	HMGP	$278,520.00	3/10/2023	12/31/2028	C
VOL-0610	Ian (3)	Port Orange	Public Works	Flood	PP P	VOL-0610 20 houses/10 Mobile Homes elevation	HMGP	$9,000,000.00	3/10/2023	12/31/2028	C
VOL-0611	Ian (14)	Volusia County	Fire Services	All Hazard	PP P	VOL-0611 Station 15 Generator	HMGP	$130,000.00	3/10/2023	12/31/2028	C
VOL-0612	Nicole (2)	Volusia County	Fire Services	All Hazard	PP P	VOL-0612 Station 35 Generator	HMGP	$70,000.00	3/10/2023	12/31/2028	C
VOL-0613	Ian (1)	Edgewater	Environmental Services	Flood Surge	P PP S ES	VOL-0613 Wastewater Treatment Plant Expansion and Flood-proofing	HMGP	$15,000,000.00	3/10/2023	12/31/2028	C
VOL-0614	72	Ormond Beach	City Engineer	Flood	P PP S ES	VOL-0614 Flood Control Pump Station on Fleming Avenue	HMGP	$12,561,200.00	3/10/2023	12/31/2028	C
VOL-0615	73	Ormond Beach	City Manager's Office	All Hazard	PP P	VOL-0615 Acquisition 293 Melrose Ave	FMA	$384,516.00	3/10/2023	12/31/2028	C

Project #	Priority	Jurisdiction	Responsible Organization	Hazard(s)	Mitigation Technique Category	Initiative	Funding	Est. Cost	Approved by LMS Working Group	Anticipated Completion Date	Status
VOL-0616	74	Ormond Beach	City Manager's Office	All Hazard	PP P	VOL-0616 Elevation and Retrofit 320 Sanchez Ave	FMA	$380,628.00	3/10/2023	12/31/2028	C
VOL-0617	75	Ormond Beach	City Manager's Office	All Hazard	PP P	VOL-0617 Elevation and Retrofit 363 Putnam Ave	FMA	$301,494.00	3/10/2023	12/31/2028	C
VOL-0618	76	Ormond Beach	City Manager's Office	All Hazard	PP P	VOL-0618 Elevation and Retrofit 364 Putnam Ave	FMA	$204,480.00	3/10/2023	12/31/2028	C
VOL-0619	77	Ormond Beach	City Manager's Office	All Hazard	PP P	VOL-0619 Elevation and Retrofit 520 West Street	FMA	$280,000.00	3/10/2023	12/31/2028	C
VOL-0620	78	Ponce Inlet	City Manager's Office	All Hazard	P PP S ES	VOL-0620 Generator Public Works Facility	HMGP	$40,000.00	3/11/2023	12/31/2028	C
VOL-0621	Ian (15)	Ponce Inlet	City Manager's Office	All Hazard	P PP S ES	VOL-0621 Generator Standby Power for Community Center	HMGP	$70,000.00	3/11/2023	12/31/2028	C
VOL-0622	79	Ponce Inlet	City Manager's Office	All Hazard	P PP S ES	VOL-0622 Generator Replacement Standby Power for Fire Station	HMGP	$70,000.00	3/11/2023	12/31/2028	C
VOL-0623	80	Volusia County	Emergency Management	All Hazard	P PP S ES	VOL-0623 Multiroom Expansion/Saferoom for the EOC	HMGP	$4,032,630.00	3/11/2023	12/31/2028	C
VOL-0624		Volusia County	Emergency Management	Flood	PP P	VOL-0624 Elevation 1092 Peninsula Drive	HMGP		3/15/2023	12/31/2028	T
VOL-0625	Ian (12)	Volusia County	Emergency Management	Flood	PP P	VOL-0625 Acquisition 241 Cherokee Drive	HMGP	$300,000.00	3/15/2023	12/31/2028	C
VOL-0626	Ian (21)	Ormond Beach	Fire Rescue	All Hazard	PP P	VOL-0626 Generator Fire Stations 92 and 93	HMGP	$250,000.00	3/15/2023	12/31/2028	C
VOL-0627		Volusia County	Emergency Management	Flood	PP P	VOL-0627 225 Brandy Court Elevation	HMGP		3/16/2023	12/31/2028	T

Project #	Priority	Jurisdiction	Responsible Organization	Hazard(s)	Mitigation Technique Category	Initiative	Funding	Est. Cost	Approved by LMS Working Group	Anticipated Completion Date	Status
VOL-0628	Ian (11)	Daytona Beach	City Manager's Office	All Hazard	PP P	VOL-0628 Generators for Lift Stations at 1808 Mason Ave, 647 Shady Place, 507 N. Clyde Morris Blvd, 510 Ora Street, 433 Auburn Drive, 1317 Avenue, 310 Yorktown Drive	HMGP	$1,550,000.00	3/16/2023	12/31/2028	C
VOL-0629		Daytona Beach	City Manager's Office	All Hazard	PP P	VOL-0629 Generator for Lift Station at 647 Shady Place	HMGP		3/16/2023	12/31/2028	T
VOL-0630		Daytona Beach	City Manager's Office	All Hazard	PP P	VOL-0630 Generator for Lift Station at 507 N. Clyde Morris Blvd.	HMGP		3/16/2023	12/31/2028	T
VOL-0631		Daytona Beach	City Manager's Office	All Hazard	PP P	VOL-0631 Generator for Lift Station at 510 Ora Street	HMGP		3/16/2023	12/31/2028	T
VOL-0632		Daytona Beach	City Manager's Office	All Hazard	PP P	VOL-0632 Generator for Lift Station at 433 Auburn Drive	HMGP		3/16/2023	12/31/2028	T
VOL-0633		Daytona Beach	City Manager's Office	All Hazard	PP P	VOL-0633 Generator for Lift Station at 1317 Avenue D	HMGP		3/16/2023	12/31/2028	T
VOL-0634		Daytona Beach	City Manager's Office	All Hazard	PP P	VOL-0634 Generator for Lift Station at310 Yorktown Drive	HMGP		3/16/2023	12/31/2028	T
VOL-0635	Ian (8)	DAB Shores	Finance Department	All Hazard	P PP S ES	VOL-0634 Multipurpose Saferoom	HMGP	$3,997,770.00	3/17/2023	12/31/2028	C
VOL-0636	Ian (23)	DAB Shores	Finance Department	All Hazard	P PP S ES	VOL-0636 Generator for Community Center	HMGP	$120,000.00	3/17/2023	12/31/2028	C
VOL- 0637											

Project #	Priority	Jurisdiction	Responsible Organization	Hazard(s)	Mitigation Technique Category	Initiative	Funding	Est. Cost	Approved by LMS Working Group	Anticipated Completion Date	Status
VOL- 0638											
VOL- 0639		Volusia County	Public Works/Utilities Priority 1	Flood	P PP S	Two (2) By-Pass Pumps and Slipline 5,225 linear feet of Sanitary Sewer Pipes for Stone Island	HMGP	$426,950.00	3/17/2023	12/31/2028	W
VOL- 0640	Ian (25)	Volusia County	Public Works/Utilities	Flood	P PP S	Slipline 20,800 linear feet of Sanitary Sewer Pipes within the Southwest Service Area (DeBary)	HMGP	$891,240.00	3/17/2023	12/31/2028	C
VOL- 0641	Ian (20)	Volusia County	Public Works/Utilities	Flood	P PP S	Six (6) Permanent Sanitary Sewer Emergency Bypass Pumping Systems	HMGP	$495,000.00	3/17/2023	12/31/2028	C
VOL- 0642											
VOL- 0643											
VOL- 0644	Ian (13)	Town of Pierson	Town Clerk	All hazards	P PP S	Two (2) Generators for New EOC Command Center (Administrative Offices & Cafeteria Building)	HMGP	$160,000.00	3/17/2023	12/31/2028	C
VOL- 0645	Ian (4)	Port Orange	Public Works	Flood	P PP	Demolition and Reconstruction of 4 Flood-Prone Homes	HMGP	$1,048,204.00	3/17/2023	12/31/2028	C
VOL- 0646	Ian (26)	Deltona	City Manager's Office	All Hazards	P PP	Centro Internacional De La Familia Generator	HMGP	$450,000.00	3/17/2023	12/31/2028	C
VOL- 0647	Nicole (5)	Port Orange	Public Works	Flood	P PP	Elevation of 9 Flood-Prone Homes	HMGP	$2,890,736.00	3/17/2023	12/31/2028	C
VOL- 0648	Nicole (6)	Port Orange	Public Works	Flood	P PP	Acquisition of 7 Flood-Prone Homes	HMGP	$2,883,705.00	3/17/2023	12/31/2028	C

Project #	Priority	Jurisdiction	Responsible Organization	Hazard(s)	Mitigation Technique Category	Initiative	Funding	Est. Cost	Approved by LMS Working Group	Anticipated Completion Date	Status
VOL- 0649	Nicole (34)	Port Orange	Public Works	Flood	P PP	Demolition and Reconstruction of 1 Flood-Prone Home	HMGP	$198,795.00	3/17/2023	12/31/2028	C
VOL- 0650	Nicole (7)	Port Orange	Public Works	Flood	P PP	Elevation of 5 Flood-Prone Homes	HMGP	$2,352,111.00	3/17/2023	12/31/2028	C
VOL- 0651	Nicole (10)	New Smyrna Beach	Engineering Department	Flood	P PP	Elevation of 5 Flood-Prone Homes	HMGP	$1,463,589.00	3/17/2023	12/31/2028	C
VOL- 0652	Nicole (33)	New Smyrna Beach	Engineering Department	Flood	P PP	Demolition and Reconstruction of 1 Flood-Prone Home	HMGP	$455,891.00	3/17/2023	12/31/2028	C
VOL- 0653	Nicole (15)	Deltona	City Manager's Office	Flood	P PP	Elevation of 2560 West Tulsa Drive	HMGP	$378,530.00	3/17/2023	12/31/2028	C
VOL- 0654	Nicole (9)	Deltona	City Manager's Office	All Hazards	P PP ES	City Hall Permanent Generator	HMGP	$1,500,000.00	3/17/2023	12/31/2028	C
VOL- 0655	Nicole (8)	Deltona	City Manager's Office	Flood	P PP	Elevation of 6 Flood-Prone Homes	HMGP	$2,252,066.00	3/17/2023	12/31/2028	C
VOL- 0656	Nicole (32)	Deltona	City Manager's Office	Flood	P PP	Demolition and Reconstruction of 2890 Blackburn Avenue	HMGP	$536,008.00	3/17/2023	12/31/2028	C
VOL- 0657	Nicole (25)	Orange City	Public Works	Flood	P PP	Mill Lake Stormwater Pump Station Improvements	HMGP	$800,000.00	3/17/2023	12/31/2028	C
VOL- 0658	Nicole (11)	Daytona Beach Shores	Public Works	Flood	P PP	Generators of Lift Stations #7, #9, and #10	HMGP	$532,380.00	3/17/2023	12/31/2028	C
VOL- 0659	Nicole (22)	Daytona Beach Shores	Executive Department	All Hazards	P PP	Hurricane Shutters for City Hall	HMGP	$100,000.00	3/17/2023	12/31/2028	C
VOL- 0660	Nicole (4)	Daytona Beach	Public Works	All Hazards	P PP	Permanent Generators for 14 Sanitary Lift Stations	HMGP	$2,987,250.00	3/17/2023	12/31/2028	C
VOL- 0661	Nicole (31)	Edgewater	Environmental Services	Flood	P PP	Rehabilitation of Lift Station #4	HMGP	$400,000.00	3/17/2023	12/31/2028	C

Project #	Priority	Jurisdiction	Responsible Organization	Hazard(s)	Mitigation Technique Category	Initiative	Funding	Est. Cost	Approved by LMS Working Group	Anticipated Completion Date	Status
VOL- 0662	Nicole (12)	Edgewater	Environmental Services	Flood	P PP	Elevation of 103 Carlson Cove	HMGP	$ 688,500.00	3/17/2023	12/31/2028	C
VOL- 0663											
VOL- 0664	Nicole (20)	Holly Hill	Public Works	Flood	P PP	Bypass Pump for Lift Station #11	HMGP	$125,000.00	3/17/2023	12/31/2028	C
VOL-0665	Nicole (21)	Holly Hill	Public Works	Flood	P PP	Bypass Pump for Lift Station #14	HMGP	$125,000.00	3/17/2023	12/31/2028	C
VOL- 0666	Nicole (23)	Holly Hill	Public Works	Flood	P PP	Bypass Pump for Lift Station #16	HMGP	$100,000.00	3/17/2023	12/31/2028	C
VOL- 0667	Nicole (35)	Ormond Beach	Public Works	Flood	P PP	Elevate 40 Sandalwood Lane 1 Flood-Prone Home	HMGP	$551,224.00	3/17/2023	12/31/2028	C
VOL- 0668	Nicole (11)	South Daytona	Public Works	Flood	P PP	Sanitary Sewer Lining in Flood Prone Areas	HMGP	$750,000.00	3/17/2023	12/31/2028	C
VOL- 0669	Nicole (27)	South Daytona	Public Works	Flood	P PP	Stormwater Lining in Flood Prone Areas	HMGP	$750,000.00	3/17/2023	12/31/2028	C
VOL-0670	Nicole (19)	Volusia County	Emergency Management	Flood	P PP	Elevation of 465 Palm Avenue	HMGP	$157,000.00	3/17/2023	12/31/2028	C
VOL-0671	Nicole (14)	Volusia County	Emergency Management	Flood	P PP	Elevation of 1048 Shockney Drive	HMGP	$418,060.00	3/17/2023	12/31/2028	C
VOL-0672	Nicole (30)	Volusia County	Emergency Management	Flood	P PP S	Demolition and Reconstruction of 1052 Shockney Drive	HMGP	$400,532.00	3/17/2023	12/31/2028	C
VOL-0673	Nicole (18)	Volusia County	Emergency Management	Flood	P PP	Elevation of 1092 Peninsula Drove	HMGP	$250,000.00	3/17/2023	12/31/2028	C
VOL-0674	Nicole (24)	Volusia County	Emergency Management	Flood	P PP	Elevation of 1100 Mary Avenue	HMGP	$245,980.00	3/17/2023	12/31/2028	C
VOL-0675	Nicole (16)	Volusia County	Emergency Management	Flood	P PP	Elevation of 225 Brandy Court	HMGP	$318,000.00	3/17/2023	12/31/2028	C
VOL-0676	Nicole (17)	Volusia County	Emergency Management	Flood	P PP	Elevation of 1013 Shockney Drive	HMGP	$272,403.00	3/17/2023	12/31/2028	C

Project #	Priority	Jurisdiction	Responsible Organization	Hazard(s)	Mitigation Technique Category	Initiative	Funding	Est. Cost	Approved by LMS Working Group	Anticipated Completion Date	Status
VOL-0677	Nicole (29)	Edgewater	Environmental Services	Flood	P PP	Rehabilitation of 5 Lift Station with Emergency Bypass Pumps	HMGP	$525,000.00	3/17/2023	12/31/2028	C
VOL-0678	Nicole (28)	Volusia County	Emergency Management	Flood	P PP	Demolition and Reconstruction of 457 Palm Avenue	HMGP	$552,500.00	3/17/2023	12/31/2028	C
VOL-0679	Idalia (12)	South Daytona	Public Works	Flood	P PP	Reed Canal Stormwater Control Facility Expansion, Flood Risk Reduction	HMGP	$4,000,000.00	3/1/2024	3/1/2029	C
VOL-0680	Idalia (10)	South Daytona	Public Works	Flood	P PP	Lantern Park Stormwater Ponds, Flood Risk Reduction	HMGP	$3,500,000.00	3/1/2024	3/1/2029	C
VOL-0681	Idalia (11)	South Daytona	Public Works	Flood	P PP	Melodie Park Stormwater Pond, Flood Risk Reduction	HMGP	$3,500,000.00	3/1/2024	3/1/2029	C
VOL-0682	Idalia (6)	South Daytona	Public Works	Flood	P PP	Park of Honor Stormwater Pond, Flood Risk Reduction	HMGP	$1,000,000.00	3/1/2024	3/1/2029	C
VOL-0683	Idalia (13)	South Daytona	Public Works	Flood	P PP	Pike and Bishop Court Stormwater Improvements, Flood Risk Reduction	HMGP	$4,250,000.00	31/2024	3/1/2029	C
VOL-0684	Idalia (9)	South Daytona	Public Works	Flood	P PP	Reed Canal Park Pond Expansion, Flood Risk Reduction	HMGP	$2,000,000.00	3/1/2024	3/1/2029	C
VOL-0685	Idalia (14)	South Daytona	Public Works	Flood	P PP	Stevens Canal Bank Stabilization, Flood Risk Reduction	HMGP	$6,500,000.00	3/1/2024	3/1/2029	C
VOL-0686	Idalia (5)	South Daytona	Public Works	Flood	P PP	Stormwater pipelining project within the Golfview Subdivision	HMGP	$750,000.00	3/1/2024	3/1/2029	C

Project #	Priority	Jurisdiction	Responsible Organization	Hazard(s)	Mitigation Technique Category	Initiative	Funding	Est. Cost	Approved by LMS Working Group	Anticipated Completion Date	Status
VOL -0687	Idalia (2)	Deltona	City Manager's Office	Flood	P PP	Acquisition and Demolition of 3101 Riverhead Drive	HMGP	$405,143.00	3/1/2024	3/1/2029	C
VOL -0688	Idalia	Deltona	City Manager's Office Flood			East Brook Drainage Improvements	HMGP	$917,804.00	3/1/2024	3/1/2029	T
VOL-0689	Idalia (4)	Edgewater	Environmental Services	Flood	P PP	City of Edgewater, Rehabilitation of Lift Stations #12, #23, #24, #46, #59 with Emergency Bypass Pumps	HMGP	$650,000.00	3/1/2024	3/1/2029	C
VOL-0690	Idalia (3)	New Smyrna Beach	Engineering	Flood	P PP	Elevation of 2 Flood Prone Homes	HMGP	$515,661.00	3/1/2024	3/1/2029	C
VOL-0691	Idalia (7)	New Smyrna Beach	Engineering	Flood	P PP	Elevate 1 Flood-Prone Home	HMGP	$683,958.00	3/1/2024	3/1/2029	C
VOL-0692	Idalia	New Smyrna Beach	Engineering	Flood		New Smyrna Beach Fire Station #53 Generator	HMGP	$ 682,000.00	3/1/2024	3/1/2029	T
VOL-0693	Idalia (8)	Port Orange	Public Works	Flood	P PP	Acquire and Demolish 3 Single Family Residence Homes	HMGP	$1,348,360.00	3/1/2024	3/1/2029	C
VOL-0694	Idalia (1)	Volusia County	Fire Services	All Hazards	P PP	Generator for Fire Station #41	HMGP	$130,000.00	3/1/2024	3/1/2029	C
VOL-0695	Idalia (15)	Daytona Beach Shores	Public Works	Flood	P PP	Sewer Improvements and Retrofit North of Dunlawton Ave.	HMGP	$4,628,000.00	3/1/2024	3/1/2029	C
VOL -0696	Idalia (16)	City of Oak Hill	Public Works	Flood	P PP	175 N US Hwy 1 improvements	HMGP	$2,903,765.00	3/1/2024	3/1/2029	C
VOL-0697	Idalia (17)	City of Oak Hill	Public Works	Flood	P PP	Ariel Canal improvements	HMGP	$3,560,819.00	3/1/2024	3/1/2029	C
VOL-0698	Idalia (18)	City of Oak Hill	Public Works	Flood	P PP	Bills Hills Canal Improvements	HMGP	$10,198,906.00	3/1/2024	3/1/2029	C

Project #	Priority	Jurisdiction	Responsible Organization	Hazard(s)	Mitigation Technique Category	Initiative	Funding	Est. Cost	Approved by LMS Working Group	Anticipated Completion Date	Status
VOL-0699	Idalia (19)	City of Oak Hill	Public Works	Flood	P PP	Turnbull Hammock Improvements	HMGP	$2,039,374.00	3/1/2024	3/1/2029	C
VOL-0700	Idalia (20)	City of Oak Hill	Public Works	Flood	P PP	Cummings Street Improvements	HMGP	$1,328,299.00	3/1/2024	3/1/2029	C
VOL-0701	Idalia	Volusia County	Coastal Division	Flood	P PP	Dunlawton Restroom and Vehicular Beach Access Ramp Resiliency	HMGP	$ 2,500,000.00	3/1/2024	3/1/2029	T
VOL-0702	Idalia (21)	Volusia County	Emergency Management	Flood	P PP	Retreat and Relocation of Silver Beach Restroom Building	HMGP	$450,000.00	3/1/2024	3/1/2029	C
VOL-0703	Idalia (22)	Volusia County	Emergency Management	Flood	P PP	Elevation - 449 Palm Ave, Ormond Beach	HMGP	$438,000.00	3/1/2024	3/1/2029	C
VOL-0704	Idalia (23)	Volusia County	Emergency Management	Flood	P PP	Acquisition – 1035 S. Glencoe Rd., New Smyrna Beach	HMGP	$700,000.00	3/1/2024	3/1/2029	C
VOL-0705		Edgewater	Environmental Services	Flood	P PP	Rehabilitation of Lift Station #13, #14, #15, #16 with Emergency Bypass Pumps		$850,000.00	12/13/2024	12/13/2029	C
VOL-0706		Edgewater	Environmental Services	Flood	P PP	Rehabilitation of Lift Station #19, #26, #30, #38 with Emergency Bypass Pumps		$850,000.00	12/13/2024	12/13/2029	C
VOL-0707		Edgewater	Environmental Services	Flood	P PP	Rehabilitation of Lift Station #40, #42, #51 with Emergency Bypass Pumps		$635,000.00	12/13/2024	12/13/2029	C
VOL-0708		South Daytona	Public Works	Flood	P PP	South Daytona Oriole Lane/Kenilworth Avenue Pond		$ 2,500,000.00	12/13/2024	12/13/2029	C

Project #	Priority	Jurisdiction	Responsible Organization	Hazard(s)	Mitigation Technique Category	Initiative	Funding	Est. Cost	Approved by LMS Working Group	Anticipated Completion Date	Status
VOL-0709		South Daytona	Public Works	Flood	P PP	South Daytona Green Street/Brian Avenue Pond		$ 2,500,000.00	12/13/2024	12/13/2029	C

Source: Volusia County Emergency Management

SECTION 10 – PLAN MAINTENANCE PROCEDURES

44 CFR Requirement

44 CFR Part201.6(c)(4)(i):
The plan shall include a plan maintenance process that includes a section describing the method and schedule of monitoring, evaluating and updating the mitigation plan within a five-year cycle.

44 CFR Part 201.6(c)(4)(ii):
The plan maintenance process shall include a process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.

This section of the Plan discusses how the Mitigation Strategy and Mitigation Action Plan will be implemented and how the LMS will be evaluated and enhanced over time. This section also discusses how the public will continue to be involved in a sustained hazard mitigation planning process. It consists of the following three subsections:

- **Implementation**
- **Monitoring, Evaluation and Enhancement**
- **Continued Public Involvement**

10.1 IMPLEMENTATION

Each agency, department or other partners participating under the Volusia County Multi-Jurisdictional LMS is responsible for implementing specific mitigation actions as prescribed in the Mitigation Action Plan. Every proposed action listed in the Mitigation Action Plan is assigned to a specific "lead" agency or department in order to assign responsibility and accountability and increase the likelihood of subsequent implementation.

In addition to the assignment of a local lead department or agency, an implementation time period or a specific implementation date has been assigned in order to assess whether actions are being implemented in a timely fashion. Volusia County and its participating jurisdictions and partners will seek outside funding sources to implement mitigation projects in both the pre-disaster and post-disaster environments. When applicable, potential funding sources have been identified for proposed actions listed in the Mitigation Action Plan.

Volusia County will integrate this Mitigation Plan into relevant County government decision making processes or mechanisms. This includes integrating the Mitigation Plan requirements into other local planning documents, processes or mechanisms, such as comprehensive or capital improvement plans, when appropriate. Members of the LMS Working Group will ensure that the goals and strategies of new and updated local planning documents for their agencies or departments are consistent and do not conflict with the goals and actions of the LMS and will not contribute to increased hazard vulnerability in the County.

Opportunities to integrate the requirements of this Plan into other local planning mechanisms shall continue to be identified through future meetings of the LMS Working Group and through the five-year review process described herein. Although it is recognized that there are many possible benefits to integrating components of this Plan into other local planning mechanisms, the development and maintenance of this stand-alone Mitigation Plan is deemed by the Volusia County LMS Working Group to be the most effective and appropriate method to implement local hazard mitigation actions at this time.

10.2 MONITORING, EVALUATION AND ENHANCEMENT

Periodic revisions and updates of the LMS are required to ensure that the goals of the Plan are kept current and account for potential changes in hazard vulnerability and mitigation priorities. In addition, revisions may be necessary to ensure that the Plan is in full compliance with applicable federal and state regulations. Periodic evaluation of the Plan will also ensure that specific mitigation actions are being reviewed and carried out according to the Mitigation Action Plan.

The Volusia County LMS Working Group will continue to meet at least annually and following any disaster events warranting a reexamination of the mitigation actions being implemented or proposed for future implementation. This will ensure that the Plan is continuously updated to reflect changing conditions and needs within Volusia County. If determined appropriate or as requested, an annual report on the Plan will be developed and presented to the Volusia County Council in order to report progress on the actions identified in the Plan and to provide information on the latest legislative requirements and/or changes to those requirements.

10.2.1 Five (5) Year Plan Review

The Plan will be thoroughly reviewed by the LMS Working Group every five years to determine whether there have been any significant changes in Volusia County that may, in turn, necessitate changes in the types of mitigation actions proposed. New development in identified hazard areas, increased exposure to hazards, the increase or decrease in capability to address hazards, and changes to federal or state legislation are examples of factors that may affect the necessary content of the Plan.

The plan review provides Volusia County officials with an opportunity to evaluate those actions that have been successful and to explore the possibility of documenting potential losses avoided due to the implementation of specific mitigation measures. The plan review also provides the opportunity to address mitigation actions that may not have been successfully implemented as assigned. Volusia County Emergency Management Services department will be responsible for reconvening the LMS Working Group and conducting the five-year review.

During the five-year plan review process, the following questions will be considered as criteria for assessing the effectiveness and appropriateness of the Plan:

- Do the goals address current and expected conditions?
- Has the nature or magnitude of risks changed?
- Are the current resources appropriate for implementing the Plan?
- Are there implementation problems, such as technical, political, legal or coordination issues with other agencies?

- Have the outcomes occurred as expected?
- Did the County and participating agencies and other partners participate in the plan implementation process as assigned?

Following the five-year review, any revisions deemed necessary will be summarized and implemented according to the reporting procedures and plan amendment process outlined herein. Upon completion of the review and update/amendment process, the Volusia County LMS will be submitted to the State Hazard Mitigation Officer at the Florida Division of Emergency Management (FDEM) for final review and approval in coordination with the Federal Emergency Management Agency (FEMA).

5-Year Update Summary
Review Group Lead as of 2024: Aubrie Austin, Volusia County Emergency Management
Review Group Name: Volusia Prepares Working Group (see members in Section 2).
Interim LMS Review: LMS can be reviewed or commented on at any quarterly Volusia Prepares Meeting
2030 Review Date: The Volusia Prepares group will begin review no less than 365 days before the 2030-35 plan submittal date. This will ensure ample time to hire a contractor to complete the plan with all necessary community and municipal outreach completed.
Review Forum: Volusia Prepares Working Group Meetings (Quarterly)

10.2.2 Disaster Declaration

Following a disaster declaration, the Volusia County LMS will be revised as necessary to reflect lessons learned, or to address specific issues and circumstances arising from the event. It will be the responsibility of the Volusia County Emergency Management Services department to reconvene the LMS Working Group and ensure the appropriate stakeholders are invited to participate in the plan revision and update process following declared disaster events.

10.2.3 Reporting Procedures

The results of the five-year review will be summarized by the LMS Working Group in a report that will include an evaluation of the effectiveness of the Plan and any required or recommended changes or amendments. The report will also include an evaluation of implementation progress for each of the proposed mitigation actions, identifying reasons for delays or obstacles to their completion along with recommended strategies to overcome them.

10.2.4 Plan Amendment Process

Upon the initiation of the amendment process, Volusia County and its participating jurisdictions and partners will forward information on the proposed change(s) to all interested parties including, but not limited to, all directly affected County departments, residents, and businesses. Information will also be forwarded to the Florida Division of Emergency Management. This information will be disseminated in order to seek input on the proposed amendment(s) for not less than a 45-day review and comment period.

At the end of the 45-day review and comment period, the proposed amendment(s) and all comments will be forwarded to the LMS Working Group for final consideration. The committee will review the proposed

amendments along with the comments received from other parties, and, if acceptable, the committee will submit a recommendation for the approval and adoption of changes to the Plan to the Volusia County Council within 60 days.
In determining whether to recommend approval or denial of a Plan amendment request, the following factors will be considered by the LMS Working Group:

- There are errors, inaccuracies or omissions made in the identification of issues or needs in the Plan;
- New issues or needs have been identified which are not adequately addressed in the Plan;
- There has been a change in information, data, or assumptions from those on which the Plan is based.

Upon receiving the recommendation from the LMS Working Group and prior to adoption of the Plan, the County will hold a public hearing if deemed necessary. The Volusia County Council will review the recommendation from the LMS Working Group (including the factors listed above) and any oral or written comments received at the public hearing. Following that review, the County Council will take one of the following actions:

- Adopt the proposed amendments as presented
- Adopt the proposed amendments with modifications
- Refer to the amendments request back to the LMS Working Group for further revision, or
- Defer the amendment request back to the LMS Working Group for further consideration and/or additional hearings

10.2.5 Plan Integration

It is recommended that the findings from the LMS be integrated into individual jurisdictional plans to demonstrate the commitment to reducing hazard risk. Individual jurisdictions have been utilizing these findings in a variety of ways, such as identifying high risk areas through vulnerability assessments and incorporating the LMS project list into jurisdictional capital improvement plans.

There are opportunities for Volusia County and its jurisdictions to integrate the LMS into more specific plans. There are various reasons why hazards have profound impacts on the community. Potential causes of hazards that have been identified by members of the community include, but are not limited to:

- Inadequate maintenance of storm drains, lift stations, and canals
- Insufficient maintenance of stormwater retention and detention systems
- Encroachment upon or reduction of conservation areas
- Loss of vegetation and tree cover
- Increased impervious surface coverage, such as new residential dwellings and parking lots
- Severe rain events occurring on already saturated ground (e.g., Hurricanes Milton and Ian)
- Severe coastal erosion due to stronger and more frequent storm events
- Inadequate or antiquated stormwater retention and detention infrastructure in development
- Outdated or poorly designed stormwater conveyance systems
- Impacts from climate change, such as sea level rise

These concerns are multifaceted and require that findings of the LMS be integrated into existing plans in each participating jurisdiction. To provide the most effective hazard mitigation for Volusia County and its jurisdictions, local plans should address these concerns and dedicate resources to solving them.

Several measures are currently under consideration to reduce hazard risk in Volusia County and its jurisdictions. In 2023, Volusia County's Environmental and Natural Resources Advisory Committee (ENRAC) recommended a hybrid approach to Low Impact Development (LID); however, implementation was restricted due to Florida SB 250. With that limitation no longer in place, adopting mandatory LID and Green Infrastructure practices could provide effective hazard mitigation solutions. Updates to individual jurisdictions' stormwater ordinances are also forthcoming for review and potential approval. Additional mitigation strategies include infrastructure retrofits to improve stormwater management and strategic land-use planning to assess the suitability of future development.

Addressing hazard mitigation requires collaboration among policymakers, engineers, planners, and resilience experts. Local governments, alongside regional partners such as the East Central Florida Regional Planning Council, have access to technical expertise and data-driven recommendations to guide decision-making. It is critical to assess and implement these expert recommendations to enhance community resilience and reduce future hazard impacts. See Section 8 for further details on mitigation strategies.

10.3 CONTINUED PUBLIC INVOLVEMENT

44 CFR Requirement

44 CFR Part 201.6(c)(4)(iii):
The plan maintenance process shall include a discussion on how the community will continue public participation in the plan maintenance process

Public participation is an integral component to the mitigation planning process and will continue to be essential as this Plan evolves over time. As described above, significant changes or amendments to the Plan shall require a public hearing prior to any adoption procedures.

Other efforts to involve the public in the maintenance, evaluation and revision process will be made as necessary. These efforts may include:

- Advertising meetings of the LMS Working Group in local newspapers, public bulletin boards and/or County office buildings
- Designating willing and voluntary citizens and private sector representatives as official members of the LMS Working Group
- Utilizing local media to update the public of any maintenance and/or periodic review activities taking place
- Utilizing the Volusia County website to advertise any maintenance and/or periodic review activities taking place, and
- Keeping copies of the Plan in public libraries
- Continuing to engage the Program for Public Information

APPENDIX A: PLAN ADOPTIONS

This portion of the report compiles Resolutions of Adoption from member jurisdictions of Volusia County approving the 2025 LMS plan update.

APPENDIX A: PLAN ADOPTIONS

DAYTONA BEACH

DAYTONA BEACH SHORES

APPENDIX A: PLAN ADOPTIONS

DEBARY

APPENDIX A: PLAN ADOPTIONS

DELAND

DELTONA

EDGEWATER

HOLLY HILL

APPENDIX A: PLAN ADOPTIONS

LAKE HELEN

NEW SMYRNA BEACH

OAK HILL

APPENDIX A: PLAN ADOPTIONS

ORANGE CITY

APPENDIX A: PLAN ADOPTIONS

ORMOND BEACH

APPENDIX A: PLAN ADOPTIONS

PIERSON

PONCE INLET

APPENDIX A: PLAN ADOPTIONS

PORT ORANGE

SOUTH DAYTONA

APPENDIX A: PLAN ADOPTIONS

UNINCORPORATED

APPENDIX B: BYLAWS OF "VOLUSIA PREPARES"

Bylaws of "Volusia Prepares"
The Volusia County Local Mitigation Strategy Steering Committee

ARTICLE I: PURPOSES OF THE TASK FORCE

The purpose of the Volusia County Local Mitigation Strategy Task Force, otherwise known as "Volusia Prepares", is to decrease the vulnerability of the citizens, governments, businesses and institutions of Volusia County to the future human, economic and environmental costs of natural, technological, and societal disasters. The Task Force will develop, monitor, implement, and maintain a comprehensive plan for hazard mitigation which will be intended to accomplish this purpose.

ARTICLE II: MEMBERSHIP

Participation in Volusia Prepares is voluntary by all entities. Membership in Volusia Prepares is open to all jurisdictions, organizations and individuals supporting its purposes

ARTICLE III: ORGANIZATIONAL STRUCTURE

The organizational structure of Volusia Prepares shall consist of a Steering Committee and subcommittees as deemed necessary by the Steering Committee.

A. The Steering Committee

Volusia Prepares shall be guided by a Steering Committee consisting of designated representatives of the following:

- One representative from the government of Volusia County and each participating incorporated municipality,
- One representative from organizations and associations representing key business, industry, and community interest groups of Volusia County, and
- Other such individuals appointed by a majority vote of the Steering Committee.

Members of the Steering Committee will be designated by formal appointment or other action to serve as the official representative and spokesperson for the jurisdiction or organization regarding the activities and decisions of Volusia Prepares. To maintain good standing, members of the Steering Committee must not have more than two unexcused absences from meetings during the course of a year. Three or more unexcused absences during the course of one calendar year may result in HMGP grant funding ineligibility for those jurisdiction(s) during the next Presidentially declared disaster.

B. Subcommittees

Volusia Prepares may have permanent and/or temporary subcommittees as deemed necessary by the Steering Committee. Membership in the subcommittees is not restricted. There are no requirements for individuals to maintain good standing as members of a permanent or temporary subcommittee.

C. Program Staff

The Volusia County Emergency Management Division, or other agency as so designated by the Steering Committee, will serve as the program staff for Volusia Prepares, and assist in the coordination and support of Volusia Prepares activities.

ARTICLE IV: OFFICERS

Any member in good standing of the Steering Committee is eligible for election as an officer. The Steering Committee will have a chair elected by a majority vote of a quorum of the members. The Steering Committee will also elect by majority vote a vice chair. Representatives of both local government and any participating private sector organizations will be eligible for election as an officer. Each will serve a term of one year, and be eligible for re-election for an unlimited number of terms. The chair and vice chair of the Steering Committee are also considered to be chair and vice chair of Volusia Prepares.

The chair of the Steering Committee will preside at each meeting of the Steering Committee, as well as establish temporary subcommittees and assign personnel to them. The vice chair will fulfill the duties and responsibilities of the chair in his or her absence.

The chair of each permanent or temporary subcommittee will be designated from the members in good standing of the Steering Committee by its chair, and will serve at the pleasure of the chair of the Steering Committee.

ARTICLE V: RESPONSIBILITIES

A. Steering Committee

The Steering Committee will be responsible for oversight and coordination of all actions and decisions by the Task Force, and is solely responsible for formal actions in the name of Volusia Prepares, including the release of reports, development of resolutions, issuance of position papers, and similar activities. The Steering Committee makes assignments to the subcommittees, coordinates their work, and takes action on their recommendations. Their goal is to make Volusia County disaster resistant by preventing or reducing the personal and economic loss from natural or man-made hazards through a partnership between government, businesses, organizations, associations, and citizens.

Objectives:

1. Keep the Volusia County Local Mitigation Strategy (LMS) document current (incorporating new projects, objectives, and goals).
2. Develop and maintain overall policies and procedures and integrate priorities of mitigation efforts.
3. Facilitate comprehensive effectiveness by coordinating with subcommittees.
4. Vote on proposed action plans and initiatives.
5. Develop a strategy to constantly identify and recruit new partners.
6. Develop a systematic method to share knowledge and market the need for being disaster resistant.
7. Promote accomplishments to elected officials and community.

B. Subcommittees

If established by the Steering Committee, subcommittees will have responsibilities as assigned by the Steering Committee members.

C. Program Staff

Technical, clerical and other types of support activities to the Steering Committee and subcommittees will be provided through the Volusia County Emergency Management Division or other agency or organizational staff as designated by the Steering Committee. The Steering Committee will also designate an agency of Volusia County to serve as the legal representative and agent of Volusia Prepares, and to be empowered under County statutes to accept and disburse funds, enter into contracts, hire staff, and take such other actions as necessary in support of, or for the benefit of, the Task Force. Other jurisdictions and organizations may also provide such services on a voluntary basis upon request of the chair of the Steering Committee.

ARTICLE VI: ACTIONS BY THE TASK FORCE

A. Authority for Actions

Only the Steering Committee has the authority to take final actions in the name of Volusia Prepares. Actions by subcommittees or program staff are not considered as final until affirmed by action of the Steering Committee.

B. Meetings, Voting and Quorum

Meetings of the Steering Committee and its subcommittees will be conducted in accord with Robert's Rules of Order, if and when deemed necessary by chair of the meeting. Regular meetings of the Steering Committee will be scheduled at least quarterly with a minimum of 10 working days' notice. Subcommittees will meet at least quarterly prior to Steering Committee meetings, or more frequently as deemed necessary, at the discretion of their chairperson.

All final actions and decisions made in the name of Volusia Prepares will be by affirmative vote of a quorum of the Steering Committee. A quorum shall be 50 percent of the members of the Steering Committee in good standing at the time of the vote. Each member of the Steering Committee will have one vote. Voting by proxy, written or otherwise, is permitted.

C. Special Votes

Special votes may be taken under emergency situations or when there are other extenuating circumstances as determined by the chair and/or vice chair of the Steering Committee. Special votes may be made by telephone, email, webinar, or any electronic means, or first class mail, and shall be in accord with all applicable quorum rules for such actions.

D. Public Hearings

When required by statute or the policies of Volusia County, or when deemed necessary by the Steering Committee, a public hearing regarding actions under consideration for implementation by Volusia Prepares will be held.

E. Documentation of Actions

All meetings and other forms of action by the Steering Committee and permanent subcommittees (if established) will be documented and made available for inspection by the public.

ARTICLE VII: ADOPTION OF AMENDMENTS AND CHANGES TO THE BYLAWS AND *"VOLUSIA PREPARES"* LOCAL MITIGATION STRATEGY DOCUMENT

The Bylaws of Volusia Prepares and the *"Volusia Prepares"* Local Mitigation Strategy document may be adopted and/or amended by a two-thirds majority vote of the members in good standing of the Steering Committee at any time. All proposed changes to the bylaws and *"Volusia Prepares"* Local Mitigation Strategy document will be provided to each member of the Steering Committee prior to voting on the proposed changes. Routine changes, additions, deletions, and deferment of mitigation initiatives and any other changes to the document may be made at any time by majority vote. Voting may be by telephone, email, webinar, or any electronic means, or first class mail. A 45-day public review and comment period shall apply to the five-year FEMA required update of the *"Volusia Prepares"* LMS Document.

ARTICLE VIII: DISSOLUTION OF THE TASK FORCE

The Task Force may be dissolved by affirmative vote of 100% of the members in good standing of the Steering Committee at the time of the vote, by order of a court of competent jurisdiction, and/or by instruction of the Volusia County governing body. At the time of dissolution, all remaining documents, records, equipment and supplies belonging to the Task Force will be transferred to Volusia County for disposition.

2023 Florida Local Mitigation Strategy (LMS) Crosswalk

DESCRIPTION:

The Florida Local Mitigation Strategy (LMS) Crosswalk is informed by the FEMA Local Mitigation Planning Policy Guide (effective April 19, 2023). Each requirement listed below is a required Element of the FEMA Policy Guide. There is a difference in formatting when comparing the FL Crosswalk with FEMA's Policy Guide Elements. This is to prevent the possibility of skipping various components of each FEMA requirement. You will notice the specific FEMA requirement is listed in parenthesis next to each FL Crosswalk Element (e.g., P1 in the FL Crosswalk is equivalent to FEMA Element A1-a). As such, multiple FL Crosswalk Elements may correspond to the same FEMA Element.

INSTRUCTIONS:

Enter the requested information in each field below:
1) In the FL Crosswalk Tab, please identify the "Location in Plan" using the corresponding page numbers for each requirement.
2) In the Jurisdiction Checklist Tab, please add each of the "participating" jurisdictions.

*Please do not edit the following sections: *Met, Not Met, Reviewer Comments*. If revisions are required, the State reviewer will put revisions in the Required Revisions section. As revisions are made, please feel free to add comments about the revisions in the same section. **Do not remove any State comments.**
*Additionally, a Project List Template can be found in a separate tab below.

Jurisdiction:	Volusia County	**Title of Plan:**	Volusia County Multi-Jurisdictional Local Mitigation Strategy
Local Point of Contact:	Yolanda Buckles	**Address:**	3825 Tiger Bay Rd., Suite 102, Daytona Beach, FL 32124
Title:	Volusia Prepares Coordinator	**Email:**	ybuckles@volusia.org
Agency:	Volusia County Emergency Management	**Phone Number:**	386-254-1500

State Reviewers:	**Evan Jenkins, Angie Odell**
Date Received by FDEM:	**2/17/2025**
Date Plan Not Approved:	**3/11/2025**
Date Plan APA:	
Date Plan Approved:	

Planning Process (FEMA Element A)		Location in Plan	Met	Not Met	Reviewer Comments	Required Revisions
P1 (A1-a)	The plan must document the current planning process.	Section 2.3-2.6 Pg. 8 - 13	x		The planning process was documentent well.	
P2 (A1-b)	The plan must list the jurisdiction(s) in the current plan that will seek approval.	Section 1.3, Section 2.4 (Table 2.1) Pg. 5	x		The list of unincorporated jurisdiction of Volusia County and participating incorporated municipalities.	
P3 (A1-b)	The plan must list the representative from **each jurisdiction** that will seek approval and how they participated in the planning process. (At a minimum, it must identify the jurisdiction represented and the person's agency and title within the jurisdiction.)	Section 2.4 (Table 2.1) Pg, 10 - 11		x		**Needs particiapnts on the LMSWG agency and title within the juridiction.**
P4 (A2)	The plan must provide documentation of an opportunity for stakeholders to be involved in the current planning process. Documentation of this opportunity must identify how **each of the stakeholders** (see below) were presented with this opportunity, as applicable.	Sections 2.4; 2.5; Appendix D Pg. 10 - 14, Pg. 367	x		All Volusia County Jurisdiction and its stakeholders were given oportunities to participant in the LMS planning process.	
P5 (A3)	The plan must document how the public had an opportunity to be involved in the current planning process and what that participation entailed, including how underserved communities and vulnerable populations within the planning area were provided an opportunity to be involved.	Section 2.6; Section 7.4 Pg. 14, Pg, 233 Pg. 367-419	x		VCEM engaged community leaders from low-income and underserved communitiees to request input on risk and hazards *Appendix D Pg, 367-419 shows the responses from the surveys.*	
P6 (A4)	The plan must document what existing plans, studies, reports and technical information were reviewed and how they were incorporated, if appropriate, into the development/update of the plan.	Section 3; Section 6; Section 7.3.; Table 7.1; Section 7.5	x			
P7 (A4)	For jurisdictions with structures for which National Flood Insurance Program (NFIP) coverage is available, regulatory flood mapping products are required to be incorporated, if applicable. Participants may use other jurisdiction-specific materials, including non-regulatory flood mapping products, that improve upon NFIP regulatory flood mapping products.	Section 5.6; Section 6.8 Pg. 227 - 229	x		Volusia County FIRM map is on Pg. 229 and the Jurisdictions that have adopted the NFIP are on Pg. 227	

FEMA Guidance Notes:

Document means to provide factual evidence for how the participants developed/updated the plan. Documentation may include narrative descriptions, copies of meeting minutes, sign-in sheets, or newspaper articles. Examples of documentation of public involvement/feedback may include, but are not limited to, narratives, materials from open meetings, screenshots of social media postings and/or interactive websites with drafts for public review and comment, questionnaires or surveys through utility bills, etc.

Involvement means being engaged and actively participating in the development of the plan; providing input and directly providing, affecting or editing plan content as the representative of the participating jurisdiction(s) or organization.

Stakeholders include local and regional agencies involved in hazard mitigation activities; agencies that have the authority to regulate development; neighboring communities; representatives of business, academia, and other private organizations; representatives of nonprofit organizations.

An opportunity to be involved in the planning process means that these stakeholders are invited to be engaged or are asked to provide information or input to inform the plan's content.

Public Participation: The opportunity must occur during the plan's development, meaning prior to the plan's submission for formal review. In addition, the plan must document how public feedback was included throughout the planning process.

Examples for P6: state hazard mitigation plan; local plans (such as comprehensive/master/general land use, economic development, capital improvement, affordable housing, resource management, resilience, climate, etc.); and hazard-specific reports and plans (such as Community Wildfire Protection Plans).

Reviewer Notes
P2/P3. Ensure the list of participating jurisdictions is consistent throughout the Plan and listed fully on the Jurisdiction Checklist tab. Consider adding special districts, state agencies, WMDs, universities, and other eligible entities - any group that will have a project on the project list and apply for HMA grants. Note that if jurisdictions do not participate in the planning process but want to adopt/apply for grants later on, there are additional steps they will need to complete - it is best for them to be included from the beginning. P4. The specific entities may be defined by each jurisdiction based on the unique characteristics of the local government, including special districts. The purpose of inviting input is to integrate natural hazard risk reduction across all community systems, as well as encourage implementation of mitigation actions. Discuss how organizations that provide support to underserved communities and vulnerable populations were given the opportunity to be involved. **Community Lifelines:** Safety and Security; Food, Hydration, Shelter; Health and Medical; Energy; Communications; Transportation; Hazardous Materials; Water Systems P5. Include information about how underserved communities and vulnerable populations were provided an opportunity to be involved in the planning process. P6. Element may be met with a narrative of resources utilized (including bullet list) and citations used throughout or a bibliography. See examples in FEMA Guidance Notes section. Gaps and limitations may be addressed as actions in the mitigation strategy, in particular for items that require additional assistance. P7. Regulatory flood maps are required to be in the Plan. This may be best located in the Risk Assessment section, however, it must be somewhere in the Plan.

Risk Assessment (FEMA Element B)		Location in Plan	Met	Not Met	Reviewer Comments	Required Revisions
R1 (B1-a)	The plan must include a **description** of all natural hazards that can affect the jurisdiction(s) in the planning area and their assets, such as dams, located outside of the planning area.	Section 5 Pg. 38-112	x		The Plan has the descriptions of the hazards	
R2 (B1-a)	The plan must provide rationale for the omission of any natural hazards that are commonly recognized to affect the jurisdiction(s) in the planning area.	Section 4 Pg. 28		x		**The plan omits hazards but, doesn't designate which ones were omittted. State which hazards were omitted within the plan, the rationale is there.**
R3 (B1-b)	The plan must include information on **location** for each identified hazard.	Section 5 Pg. 38-131		x		Indicate where the identified hazards are within the jurisdiction and not just uniformly exposed to . ***For example is it Volusia County and its Jurisdictions.*** If the Juridictions and the County differ than expand on where hazard occurs in those areas.
R4 (B1-c)	The plan must provide the **extent** of the hazards that can affect the planning area.	Section 5 Pg. 38-131		x		Rising Coastal Waters - Sea Level Rise & Tsunamis; Severe Weather - all; Wildland Fire Advisories can be used, what constitutes as a wildfire?
R5 (B1-d)	The plan must include information on **previous occurrences** for each hazard that affects the planning area. At a minimum, this includes any state and federal major disaster declarations for the planning area since the last update.	Section 5 Pg. 38-131		x		What were the previous occurences for Volusia County and its Jurisdiction within a five or ten year span. **Some of the hazard profile the occurences from 1895 - 2023**
R6 (B1-e)	The plan must include the **probability** of future events for the identified hazards that can affect the planning area.	Section 5 Pg. 38-131		x	p 43 - talks about hail in erosion p 48 - winter storms in drough 51 - hail in extreme temp 69 - hurricanes in rising waters - double sentence in probability for sea level rise	**How did you determine high or low probabilities for the hazards?**
R7 (B1-f)	For multi-jurisdictional plans, when hazard risks differ across the planning area and between participating jurisdictions, the plan must specify the unique and varied risk information for each applicable jurisdiction and their assets outside the planning area.	Section 6; Appendix E; Appendix F	x			
R8 (B2-b)	The plan must describe the potential **impacts** on each participating jurisdiction and its identified assets.	Section 6 Pg. 40-131	x			
R9 (B2-a)	The plan must describe the **overall vulnerability** of each participant to the identified hazards.	Section 6; Appendix E; Appendix F	x			
R10 (B2-a)	For plan updates, the risk assessment must meet Element E1-a (Changes in Development).	Section 3.5; Section 5.19; Section 7	x		*Very well detailed on how the population and land use development have changed the risks* p 18 - has population increasing over planning cycle p 24 - permit data over 24 yrs p 150 - changes in development	
R11 (B2-c)	The plan must address repetitively flooded NFIP-insured structures by including the estimated numbers and types (residential, commercial, institutional, etc.) of repetitive/severe repetitive loss properties for **each jurisdiction**.	Section 5.6 Pg. 59		x		**Missing Severe Repetitive Loss data. Need the types of structures for repetitive loss data.**

FEMA Guidance Notes:

Description means to provide a narrative description or definition.

Location is defined as the unique geographic boundaries within the planning area, or assets that may be affected by the identified hazard. If maps are used, provide sufficient detail and scale to clearly identify the hazard locations within and/or affecting assets owned by the participating jurisdiction(s). If narrative descriptions are used, the must contain enough detail to clearly identify the area(s) that will be affected by the hazard.

Extent is defined as the range of anticipated intensities of the identified hazards. Extent is most commonly expressed using various scientific scales. When using scales, the plan must document how the scale applies to each jurisdiction.

Previous Occurrences should include an emphasis on significant events, as determined by the community.

Probability can be defined as historical frequencies, statistical probabilities, hazard probability maps and/or general descriptors. It must include the effects of future conditions, including climate change (e.g., long-term weather patterns, average temperature and sea levels), on the type, location, and range of anticipated intensities of identified hazards.

Impacts are the consequences of effects of each hazard on the identified assets. The narrative must include the **effects of climate change**, changes in population patterns, and changes in land use and development. Gaps and limitations may be addressed as actions in the mitigation strategy, in particular for items that require additional assistance.

Vulnerability is the description of which assets, including structures, systems, populations and other assets, are at risk from the identified hazards. The description must include current and future assets (including people) and the risk that makes them susceptible to damage from the identified hazards.

Assets are, but not limited to, people (underserved communities and socially vulnerable populations); structures (facilities, lifelines, critical infrastructure); systems (networks and capabilities); natural, historic, and cultural resources; activities that have value to the community.

Changes in development means recent development, potential development, or conditions that may affect the risks and vulnerabilities of the jurisdictions or shifts in the needs of underserved communities or gaps in social equity. This can also include changes in local policies, standards, codes, regulations, land use regulations and other conditions.

Reviewer Notes

Jurisdictional risk should be discussed throughout the risk assessment. If variations in extent, probability, impact, vulnerability, etc., are seen throughout the planning area (county and municipalities) then this must be discussed.

R1/R2. Commonly recognized hazards include those found in the State Hazard Mitigation Plan. Identify all the types of hazards that can occur, e.g., the different types of flood hazards (flash, riverine, storm surge, debris flows, ice jams, dam/levee failure, etc.)

R3. Maps may be helpful to meet location, however, provide a more detailed narrative when showing jurisdictional risk. Identify locations/jurisdictions throughout the planning area that are more at risk to the hazard.

R4. Scale or metric must be included in the Plan for each hazard. Look for explanations of how extent differs across jurisdictions as applicable.

R5. If there were no occurrences since the previous update, it must be stated.

R6. General descriptors must have a scale explaining the metrics (e.g., low, medium, high). Probability must include the effects of future conditions, including climate change (e.g., long-term weather patterns, average temperature and sea levels), on the type, location, and range of anticipated intensities of identified hazards.

R8. The discussion of impacts should differ or be separate from the vulnerability analysis. Impacts are the consequence of the hazard on the assets found within the planning area (people, property, critical infrastructure, natural resources, etc.). Discussion must include the **effects of climate change, changes in populations patterns, and changes in land use/development.**

R9. Vulnerability should explain **why** each participant (jurisdiction) is vulnerable to the hazards. This should include a discussion of current and future assets, including people and vulnerable populations.

R11. Repetitive loss data should include RL and SRL data and should include the **estimated numbers** and **types** of structure for each jurisdiction.

Mitigation Strategy (FEMA Element C)		Location in Plan	Met	Not Met	Reviewer Comments	Required Revisions
S1 (C1-a)	The plan must describe how the existing authorities, policies, programs, funding, and resources of **each participant** are available to support the mitigation strategy. This must include a discussion of the existing building codes and land use and development ordinances or regulations. Capabilities may be described in a table or narrative.	Section 7; Table 7.1 Pg, 219-232	x		Pg, 219-230 Details the capabilities method used for Vousia County and and the table on pg. 221 shows relevant capabilties for each participating jurisdiction.	
S2 (C1-b)	The plan must describe the ability of **each participant** to expand on and improve the capabilities described in the plan (see S1).	Section 7; Table 7.1 Pg. 231	x		Pg. 231 - 232 highlights the gaps and capabilities that Volusia County need to improve on.	
S3 (C2-a)	The plan must describe participation in the NFIP for **each participant**, as applicable, in accordance with NFIP regulatory requirements (see reviewer notes).	Section 5.6; Section 7		x	S3.1 - p227 and S3.2 P 229.	**S3.3 - p 227 - how do they regulate, this needs to be expanded upon instead of saying to refer to code for further info** **S3.4 - p 227 - states who for the county is the POC, but must be stated for all participants** **S3.5 - p 228 - stating that the county is building an SOP is not sufficient for the county, but it also needs to be defined for all of the jurisdictions**
S4 (C3-a)	The plan must include **goals** to reduce the risk of the identified hazards.	Section 8 Pg. 241 - 242	x		The Section 8: Table 2 shows the LMSWG Mitigation Goals and Objectives	
S5 (C4-a)	The mitigation strategy must include an analysis of a comprehensive range of actions or projects that the participants considered to specifically address vulnerabilities identified in the risk assessment.	Section 8.3; Section 8.4 Pg. 245	x			
S6 (C4-b)	**Each plan participant** must identify one or more mitigation actions the participant(s) intends to implement for each hazard addressed in the risk assessment.	Section 9 Pg. 251 - 264	x		In Section 9 of the Mitigation Action Plan - Identified one or more projects to be implemented to address the hazads in the risk assessment	
S7 (C5-a)	The plan must describe the criteria used for prioritizing the implementation of the actions. The criteria must include an emphasis on the extent to which benefits are maximized, in relation to the associated costs of the action.	Table 8.1; Section 9 Pg. 239, 251-264	x		Pg. 239 described the prioritized method for mitigation initiatives for the plan	
S8 (C5-b)	The action plan must identify who is responsible for administering each action, along with the action's potential funding sources and expected time frames for completion.	Section 9; Table 9.2 Pg. 251 - 264	X			

FEMA Guidance Notes:

Discussion means a narrative or other materials that provide context on a section of the plan. Describing current capabilities provides a rationale for which mitigation projects can be undertaken to address the vulnerabilities identified in the Risk Assessment.

For C1-b: If participants do not have the ability or authority to expand and/or improve their capabilities, the plan must describe the lack of ability or authority.

For C2-a: The following information must be provided for each participant: adoption of NFIP minimum floodplain management criteria via local regulation; adoption of the latest effective Flood Insurance Rate Map (if applicable); Implementation and enforcement of local floodplain management regulations to regulate and permit development in SFHAs; appointment of a designee or agency to implement the addressed commitments and requirements of the NFIP; and description of how participants implement the substantial improvement/substantial damage provisions of their floodplain management regulations after an event. Simply stating "The community will continue to comply with the NFIP" is not sufficient to meet the requirement.

Goals are broad, long-term policy and vision statements that explain what is to be achieved by implementing the mitigation strategy. The goals must be consistent with the hazards identified in the plan. Goals may be presented as general statements applying to more than one hazard, or they may be itemized to each of the identified hazards.

A mitigation action is a measure, project, plan, or activity proposed to reduce current and future vulnerabilities described in the risk assessment. These actions must be achievable and demonstrate how the mitigation activities reduce the risks identified in the risk assessment.

Analyzing a comprehensive range means considering mitigation alternatives spanning all types of solutions. These may include local plan and regulations, structure and infrastructure projects, natural systems protection, and education and awareness programs.

For C4-a: Actions considered must emphasize reducing risk to existing buildings, structures and infrastructure, as well as limiting risk to new development and redevelopment. The range of actions considered should include mitigation actions that benefit underserved communities and socially vulnerable populations.

For C5-b: The plan must identify applicable potential funding sources, with details beyond generic terms such as "federal," "state" and/or "local." The plan must provide the **position, office, department, or agency** responsible for implementing/administrating the identified mitigation actions.

Reviewer Notes
S1. Capabilities must be discussed for each participating jurisdiction. Gaps and lack of capability should be discussed as applicable. S2. Describe the ability of each participating jurisdiction to expand and improve capability throughout the next planning cycle (5-years). S3. The following information must be provided for each participant. **1.** Adoption of NFIP minimum floodplain management criteria via local regulation. **2.** Adoption of the latest effective Flood Insurance Rate Map (FIRM), if applicable. **3.** Implementation and enforcement of local floodplain management regulations to regulate and permit development in SFHAs. **4.** Appointment of a designee or agency to implement the addressed commitments and requirements of the NFIP. **5.** Description of how participants implement the substantial improvement/substantial damage provisions of their floodplain management regulations after an event. S5. The range of actions considered should include mitigation actions that benefit underserved communities and socially vulnerable populations. Actions must be clearly linked to the vulnerabilities and impacts identified in the risk assessment. S6. Each participating jurisdiction should have a project on the project list. If this is not possible due to lack of capability, consider adding multi-jurisdictional projects, county-wide projects (such as planning/education), or something similar. If that is not feasible, include a narrative for the lack of capability within the Plan. S8. Include the **position/office/department/agency** responsible for implementing the projects, potential funding sources, and a timeframe for completion. Generic terms should be avoided or defined (e.g., short-term, medium-term, and long-term).

Plan Maintenance (FEMA Element D)		Location in Plan	Met	Not Met	Reviewer Comments	Required Revisions
M1 (D1-a)	The plan must describe how the participant(s) will continue to seek public participation after the plan has been approved and during the plan's implementation, monitoring, and evaluation.	Section 10.3 Pg. 266		x		**How would you continue to seek public participation? Would you continue to engage with community leaders in low-income and vulnerable areas to particpate in the annual meeting or after any disaster event warranting re-examination?**
M2 (D2-a)	The plan must identify how, when and by whom the plan will be tracked for implementation over its five-year cycle (**monitoring**).	Section 10.2 Pg. 266-267		x		**Who is responsible for Monitoring? For example: If all the Volusia County and its jurisdiction are under the LMS for tracking *monitoring* would; the chair person of the LMS group have authority?**
M3 (D2-b)	The plan must identify how, when and by whom the plan will be assessed for effectiveness at achieving its stated purpose and goals (**evaluating**).	Section 10.2 Pg. 266-267		x		**Who is responsible for Evaluating? For example: If all the Volusia County and its jurisdiction are under the LMS for tracking *evaluating* would; the chair person of the LMS group have authority?**
M4 (D2-c)	The plan must identify how, when and by whom the plan will be reviewed and revised at least once every five years (**updating**).	Section 10.2 Pg. 266-267		x		**Who is responsible for Updaing? For example: If all the Volusia County and its jurisdiction are under the LMS for**
M5 (D3-a)	The plan must describe the community's process to **integrate** the plan's data, information, and hazard mitigation goals and actions into other **planning mechanisms**.			x		**What is the process for all jurisdictions for integrating the plans data?**
M6 (D3-c)	A multi-jurisdictional plan must describe **each participant's** individual process for integrating information from the mitigation strategy into their identified planning mechanisms.			x		**What is the process for all jurisdictions to integrate information from the mitigation strategy into their identified planning mechanisms?**
M7 (D3-b)	The plan must identify the local planning mechanisms where hazard mitigation information/actions may be integrated. The identified list of planning mechanisms must be applicable to the plan participant(s) and not contradict the identified capabilities.	Pg. 220-232	x		The plan did a thorough description identifing the local planning capabilities that were integrated.	

FEMA Guidance Notes:

For D1-a: The plan may contain a narrative description or an itemized list of steps, demonstrating the prescribed method that will be followed to obtain future public participation.
Monitoring means tracking the implementation of the plan over time. For example, monitoring may include a system for tracking the status of the identified hazard mitigation actions.
Evaluating means assessing the effectiveness of the plan at achieving its stated purpose and goals.
Updating means reviewing and revising the plan at least once every five years.
Integrate means to include hazard mitigation principles, vulnerability information and mitigation actions into other existing community planning to leverage activities that have co-benefits, reduce risk and increase resilience.
Planning mechanisms refer to the governance structures used to manage local land use development and community decision-making.
For a multi-jurisdictional integration plan, this element may be met with a general narrative description if the process is applicable to each of the plan participants; however, any participant who cannot apply the same process as other plan participants must include their unique process for integration.

Reviewer Notes

M1. Examples of continued public involvement could include periodic presentations on the plan's progress to elected officials, schools or other community groups, annual questionnaires or surveys, public meetings, postings on social media, and interactive websites.

M2/M3/M4. Discuss **who, when, and how** the plan will be **monitored, evaluated, and updated** (five-year update). Can be narrative or itemized list of steps demonstrating the prescribed method that will be followed to monitor the plan after plan approval and during the plan's implementation.

M5. We are looking for the **process** of how each participating jurisdiction integrates information from the LMS Plan into other planning mechanisms (e.g., CEMP, Comprehensive Plan, codes and regulations, hazard plans, resiliency plans, etc.).

M6. Is the process identified in M5 applicable to all participating jurisdictions? This element may be met with a general narrative description if the process is applicable to each of the plan participants; however, any participant who cannot apply the same process as other plan participants must include their unique process for integration.

M7. Related to M5, what are the planning mechanisms that information from the LMS Plan may be incorporated into? A narrative or bullet list will suffice. List planning mechanisms from each jurisdiction along with county plans.

Plan Update (FEMA Element E)		Location in Plan	Met	Not Met	Reviewer Comments	Required Revisions
U1 (E1-a)	The plan must describe changes in development that have occurred in hazard-prone areas and how they have increased or decreased the vulnerability of **each jurisdiction** since the previous plan was approved.	Section 5.19	x		*Very well detailed on how the population and land use development have changed the risks* p 18 - has population increasing over planning cycle p 24 - permit data over 24 yrs p 150 - changes in development	
U2 (E2-a)	The plan must describe how it was revised due to a change in priorities for **each jurisdiction**.	Section 8.5 Pg. 247	x		The plan descibes the revsions that were made from the previous plan.	
U3 (E2-b)	The plan must describe the status of all hazard mitigation actions in the previous plan by identifying whether they have been completed or not, for each jurisdiction.	Initiative List Pg. 251 - 258	x		p 249 gives reasoning	
U4 (E2-c)	The updated plan must explain how the jurisdiction(s) integrated information from the mitigation plan into other planning mechanisms, as a demonstration of progress in local hazard mitigation efforts. If information from the previous plan was not integrated into other planning mechanisms, this must be stated.			x		**M5 and M6 helps meet this requirement for U-4**

FEMA Guidance Notes:
Changes in development means recent development, potential development, or conditions that may affect the risks and vulnerabilities of the jurisdictions or shifts in the needs of underserved communities or gaps in social equity. This can also include changes in local policies, standards, codes, regulations, land use regulations and other conditions. If no development changes affected the jurisdiction's overall vulnerability, this must be stated with the plan.
Description of Priorities: A description of priorities is defined by the participant(s). If the participant(s) has no change in priorities since the last approval of the mitigation plan, this must be stated. This can be a narrative or with detailed statements in appropriate sections of the plan.
Actions: For actions that are not complete, the plan must state whether the action is no longer relevant or will be included in the updated action plan.

Reviewer Notes

U1. This element is also linked to Element R10 in the risk assessment section. Make sure to discuss change in vulnerability (positive, negative, or none) to hazards from changes in development that has occurred over the last five years (planning cycle).

U2. How was the plan revised and was it due to a change in priority? Examples include new leadership, recent hazard events, input from the public, etc. We are usually referencing the goals and objectives, risk assessment, mitigation strategy, project prioritization method, or similar sections of the plan when looking for this information.

U3. Include information about completed, deleted, or deferred projects from the previous version of the plan.

U4. This element is related to M5 and M7. To meet U4, discuss if any integration of information from the LMS into other planning mechanisms has occurred since the previous update, such as a recent update of the CEMP or in the jurisdictions' codes and ordinances. Think of integration within all participating jurisdictions.

Plan Adoption (FEMA Element F)		Location in Plan	Met	Not Met	Reviewer Comments	
A1 (F1-a)	The jurisdiction must provide documentation of plan adoption, usually a resolution by the governing body or other authority, to receive approval.	Appendix A				
A2 (F2-a)	To receive approval, the participants must adopt the plan and provide documentation that the adoption has occurred.	Appendix A				

FEMA Guidance Notes:
Jurisdiction Adoption: **At least one** adoption resolution should be transmitted through the State to FEMA for the LMS Plan to be officially approved. The remaining resolutions may be transmitted as they are completed.
Documentation may be provided in the form of meeting minutes, resolutions, signed letter or any other method to demonstrate that official adoption by the participant has occurred.
Participants that submit their adoption documentation separately from the other multi-jurisdictional plan participants will not receive a new expiration date.
Participating jurisdictions that adopt the plan **more than one year** after Approvable Pending Adoption (APA) status has been issued must either: Validate that their information in the plan remains current with respect to both the risk assessment and their mitigation strategy OR Make the necessary updates before submitting the adoption resolution to FEMA.

Reviewer Notes

Ideally, all jurisidictions will formally adopt the Approved Pending Adoption (APA) plan before the current expiration date. This will depend on State review time and required revisions. Jurisdictions must adopt the LMS Plan within one year of APA status. Beyond one year, jurisdictions will need to validate the accurracy of their information within the Plan in order to receive FEMA approval.

High Hazard Potential Dams (FEMA Element G) *Eligibility Requirement for HHPD Grant Program*		Location in Plan	Met	Not Met	Reviewer Comments	Required Revisions
D1 (HHPD1-a)	The plan must describe how the local government worked with the local dam owners and/or the state dam safety agency (FDEP).	N/A				
D2 (HHPD1-b)	The plan incorporates information shared by the state and/or local dam owners.	N/A				
D3 (HHPD2-a)	The plan describes the **risks and vulnerabilities** to and from HHPDs (included in risk assessment).	N/A				
D4 (HHPD2-b)	The plan documents the limitations and describes how to address deficiencies (in the risk assessment).	N/A				
D5 (HHPD3-a)	The plan addresses how to reduce vulnerabilities to and from HHPDs as part of its own goals or with other long-term strategies. The plan does not need to include a goal specific to HHPDs alone.	N/A				
D6 (HHPD3-b)	The plan links proposed actions to reduce long-term vulnerabilities that are consistent with its goals.	N/A				
D7 (HHPD4-a)	The plan must describe **specific actions** to address HHPDs (project list).	N/A				
D8 (HHPD4-b)	The plan describes the criteria used to prioritize actions related to HHPDs.	N/A				
D9 (HHPD4-c)	The plan identifies the position, office, department or agency responsible for implementing and administering the action to mitigate hazards to or from HHPDs.	N/A				

FEMA Guidance Notes:

Note: Ensure sensitive and/or personally identifiable information is protected.

Information shared by the state and/or local dam owners includes: inundation maps, EAP, Floodplain Plans, dam breach modeling software, as well as more detailed studies.

Risk and vulnerabilities can include potential cascading impacts of storms, wildfires, etc. on dams that may affect upstream and downstream flooding; potential significant economic, environmental or social impacts, as well as multi-jurisdictional impacts, from a dam incident; location and size of populations at risk, and potential impacts to institutions and critical infrastructure/facilities/lifelines; and/or methodology and/or assumptions for risk data and inundation modeling.

Specific actions include rehabilitating/removing dams; adopting and enforcing land use ordinances in inundation zones; elevating structures in inundation zones; and/or adding flood protection, such as berms, floodwalls or floodproofing, in inundation zones.

Reviewer Notes
These elements are optional, but are an eligibility requirement of the Rehabilitation of High Hazard Potential Dam Grant Program. Consider including this information in your LMS Plan if you have **high** hazard or **significant** hazard dams in the planning area. If there are any gaps or limititations, this should be discussed as applicable.

MULTI-JURISDICTION SUMMARY SHEET

INSTRUCTIONS: For multi-jurisdictional plans, this Summary Spreadsheet lists each participating jurisdiction, and outlines whether they met each required Element. As jurisdictions adopt the approved plan, Column H will be filled out. This Summary Sheet does not imply that a jurisdiction-specific mitigation plan be developed for each jurisdiction, instead **simply fill in the names and type of each jurisdiction (columns B and C)** participating in the Plan.

MULTI-JURISDICTIONAL SUMMARY SHEET							
#	Jurisdiction Name	Type of Jurisdiction (school board, non-profit, special district, city, town, etc.)	Requirements Met (Y/N)				
			A. Planning Process	B. Hazard Identification & Risk Assessment	C. Mitigation Strategy	D. Plan Review, Evaluation & Implementation	E. Plan Adoption
1	County		X	Y	Y	Y	
2	Daytona Beach		Y	Y	Y	Y	
3	Daytona Beach Shores		Y	Y	Y	Y	
4	DeBary		Y	Y	Y	Y	
5	DeLand		Y	Y	Y	Y	
6	Deltona		Y	Y	Y	Y	
7	Edgewater		Y	Y	Y	Y	
8	Holly Hill		Y	Y	Y	Y	
9	Lake Helen		Y	Y	Y	Y	
10	New Smyrna Beach		Y	Y	Y	Y	
11	Oak Hill		Y	Y	Y	Y	
12	Orange City		Y	Y	Y	Y	
13	Ormond Beach		Y	Y	Y	Y	
14	Pierson		Y	Y	Y	Y	
15	Ponce Inlet		Y	Y	Y	Y	
16	Port Orange		Y	Y	Y	Y	
17	South Daytona		Y	Y	Y	Y	
18	School District		Y	Y			
19	Advent Health		Y	Y			
20	Daytona Beach Airport		Y	Y			

This Hazard Review Checklist will be filled out by the FDEM State Reviewers during their review.

HAZARD REVIEW CHECKLIST

Hazard Name	Description of Hazard	Location	Extent	Previous Occurrences (Updated)	Probability	Impacts	Effects of Climate Change	Overall Vulnerability	Jurisdictional Risk Assessment *(Y/N)*
Coastal Erosion	39	39 - names specific areas of the beach	43 - defined by the erosion rate	40-41 - description of historical	43 - Probability defined when you are talking about Loss rates	164 - 166	164 - 166	164 - 166	Y
Drought	44	44	45 - Drought monitor intensities	46-47	47 - high	167 - 168	167 - 168	167 - 168	Y
Cold	49	49 - What areas in Volusia would be impacted by the hazard?	49 - surface air for 3 or more days	50	49-50 - low	169 - 171	169 - 171	169 - 171	Y
Heat	49	49 171 High temp risk map	50 - 3-10 days 99+	None - What was the previous occurrence within the last 5 years?	50 - low	169 - 171	169 - 171	169 - 171	Y
Flood	52	p 54 - FIRM map 176 - FEMA Hazard Zones	53 - defines floodplains 173 - Advisories	55-58	60 - high	172 - 176	172 - 176	172 - 176	Y

Storm Surge	65	67 - storm surge map	65	68	69 - high Double sentence about sea level rise increase	179 - 184	179 - 184	179 - 184	Y
Sea Level Rise	65	65	66 - no extent	68 - nothing since 2016, state so	69 - low	179 - 184	179 - 184	179 - 184	Y
Tsnuamis	65	66	66 - no extent	68 - nothing since 2008 - state so	69 - low	179 - 184	179 - 184	179 - 184	Y
Hail	72	74 - entirety of county - Could this be Volusia County and its Jurisdictions?	what are the advisories?	76 - 83	100 - high	185 - 187	74 185 - 187	185 - 187	Y
Lightning	72	75	what are the advisories?	84 - 87	100 - high	186 - 187	74 185 - 188	186 - 187	Y
Thunderstorms	72	75	what are the advisories?	88 - 99	100 - high	187 - 187	74 185 - 189	187 - 187	Y
Tornado	101	103 - uniformly exposed	101	103 - 114	116 - high	188 - 190	116 188 - 190	188 - 190	Y
Tropical Cyclones	117	119 - emphasis on coastal areas	117	120 - 121	126 - high	191 - 199	191 - 199	191 - 199	Y
Wildland Fire	127	128 - uniformly exposed, WUI map	what constitutes as a wildfire?	130 - nothing after 2018, state so	131 - high	127 in the background has good impacts 200 - 203	200 - 203	201 - 203	Y

APPENDIX D: MEETING INFORMATION

Meeting Information

This section of the Volusia Local Mitigation Strategy includes documentation (agendas, sign-in sheets, other items) for the meetings held as part of the planning process. The planning team held four meetings, which are summarized below:

- **Public Kickoff Meeting**
  - September 20, 2024
  - The Working Group's Quarter 3 Meeting was open to the public. This meeting was held at the Volusia County Emergency Operations Center, 3825 Tiger Bay Road. The goal was to begin the public engagement process. The objective was to inform the Working Group and the public on the progress made up to that point and to discuss any updates needed to the priority project list.

- **Public Engagement Meetings**
  - November 25 and 26, 2024
  - Two public meetings were held to inform the public of the planning process and the overall scope of the 2025 Volusia County Local Mitigation Strategy. Maps and a draft plan were provided and general items within the plan were discussed. Special attention was given to community members' needs and recommendations for the plan.

- **Volusia Prepares Meeting and Conclusion Meeting for Public**
  - December 13, 2024
  - The next Local Mitigation Strategy Meeting was held at the Volusia County Emergency Operations Center, 3825 Tiger Bay Road. The purpose of this meeting was to show the jurisdictions and the public the draft plan and obtain comments and feedback.

Documentation for these meetings is found on the following pages of this appendix, including:

- Sign-In Sheets
- Agendas
- Press Releases
- Presentation Slides

From: Yolanda Buckles <YBuckles@volusia.org>
Sent: Tuesday, September 17, 2024 3:58 PM
To: Adam Thornton; Angie Sehenuka; Arden Fontaine; Aubrie Austin; Austin Beeghly; Barton, Justin (BartonJustin@CODB.US); Becky Witte; Benjamin Bartlett; Bobbie King; Boyer, Chris (cjboyer@volusia.k12.fl.us); Cammie Dewey; Michelle Cechowski; Constance Bentley; Corry Brown; Cruz, Stewart (scruz@cityofdbs.org); Dan Lugo; Elizabeth Caison; Fegley, Kyle (KFegley@cityofnsb.com); Grebosz, Mike (Greboszm@deland.org); Hamstra, David (david@pegasusengineering.net); Hank Baker; Hilton, Tyna Lynn (thilton@CITYOFEDGEWATER.ORG); Houle, Sue (shoule@deltonafl.gov); Irwin, Lory (lirwin@cityofdbs.org); J Gleason; Jeff Alberts; Jerome Adams; Jessica Fentress; Jill Hemmerlein; Jim Cannon; Jim Peterson; John Widick; Jonathan McKinney; Juengst, Steven (sjuengst@hollyhillfl.org); Karen Feaster; Long, Ronnie (OC); Margaret Tomlinson; Mark Bell; Michael Ulrich; Mike McMunigle; Miller, Jeff (jmiller@hollyhillfl.org); Moisio, Loretta (moisio@ormondbeach.org); Moses, Kieu (mosesk@deland.org); Nancy Church; Randy Coslow; Robert Falk; Robin Gawel - City of Ormond Beach (Robin.Gawel@ormondbeach.org); Saavedra, Leylah (leylah@pegasusengineering.net); Sandy Camp; Smith, Hardy (SmithHardy@CODB.US); Tiffany Islam; Tim MacHardy; Vandemark, Shawn (svandemark@cityofnsb.com); Waller, David (WallerDavid@CODB.US); White, Pat (pmwhite404@gmail.com); Yolanda Buckles; Young, Ronald E. (reyoung@volusia.k12.fl.us)
Cc: McKenna Korzeniewski
Subject: Volusia Prepares (LMS) Quarterly Meeting
Attachments: 09.20.2024 LMS Meeting Agenda.pdf; 06.21.2024 LMS Meeting Minutes.pdf

Good Afternoon Everyone,

This is a friendly reminder about the upcoming Volusia Prepares (LMS) quarterly meeting, scheduled for this Friday, September 20th, at 9:00 AM at the Emergency Operations Center.

Please find the meeting agenda and minutes from our last quarterly meeting attached.

If you have any questions or need further information, feel free to reach out

Best Wishes,
Yolanda

Yolanda Buckles, FPEM
Planner II
Volusia County Emergency Management
3825 Tiger Bay Rd., Suite 102
Daytona Beach, FL 32124
386.254.1500 ext 11027

From: McKenna Korzeniewski <MKorzeniewski@ecfrpc.org>
Sent: Tuesday, January 28, 2025 3:30 PM
To: Brenda Defoe-Surprenant
Subject: Fw: LMS Quarterly Meeting
Attachments: 10.13.2024 LMS Meeting Agenda.pdf; 09.20.2024 LMS Meeting Minutes.pdf

McKenna Korzeniewski
Resilience Planner II
East Central Florida Regional Planning Council
455 N Garland Ave. Orlando FL 32801
407-245-0300
mkorzeniewski@ecfrpc.org
www.ecfrpc.org

From: Yolanda Buckles <YBuckles@volusia.org>
Sent: Monday, December 9, 2024 1:19 PM
To: Adam Thornton <athornton@southdaytona.org>; Angie Sehenuka <sehenuka@codb.us>; Arden Fontaine <AFontaine@volusia.org>; Aubrie Austin <ALAustin@volusia.org>; Austin Beeghly <Austin.Beeghly@em.myflorida.com>; Barton, Justin (BartonJustin@CODB.US) <BartonJustin@CODB.US>; SD - Becky Witte <bwitte@southdaytona.org>; Benjamin Bartlett <BBartlett@volusia.org>; Bobbie King <BGKing@volusia.org>; Boyer, Chris (cjboyer@volusia.k12.fl.us) <cjboyer@volusia.k12.fl.us>; Cammie Dewey <cdewey@sjrwmd.com>; Michelle Cechowski <mcechowski@ecfrpc.org>; Corry Brown <CABrown@volusia.org>; Cruz, Stewart (scruz@cityofdbs.org) <scruz@cityofdbs.org>; Dan Lugo <dlugo@orangecityfl.gov>; Elizabeth Caison <Elizabeth.Caison@em.myflorida.com>; Fegley, Kyle (KFegley@cityofnsb.com) <KFegley@cityofnsb.com>; DL Asst CM - Grebosz, Mike <greboszm@deland.org>; Hamstra, David (david@pegasusengineering.net) <david@pegasusengineering.net>; Hank Baker <hbaker@ponce-inlet.org>; Hilton, Tyna Lynn (thilton@CITYOFEDGEWATER.ORG) <thilton@CITYOFEDGEWATER.ORG>; Houle, Sue (shoule@deltonafl.gov) <shoule@deltonafl.gov>; Irwin, Lory (lirwin@cityofdbs.org) <lirwin@cityofdbs.org>; LH - Administrator Jim Gleason <jgleason@lakehelen.org>; Jeff Alberts <JAlberts@volusia.org>; OH Manager - Jerome Adams <AdamsJ@oakhillfl.gov>; Jessica Fentress <jfentress@volusia.org>; Jill Hemmerlein <JHemmerlein@volusia.org>; SJRWMD - James Cannon <jcannon@sjrwmd.com>; Jim Peterson <JPeterson@sjrwmd.com>; John Widick <jawidick@volusia.k12.fl.us>; Juengst, Steven (sjuengst@hollyhillfl.org) <sjuengst@hollyhillfl.org>; Karen Feaster <KFeaster@flydab.com>; Kelly Steffens <KSteffens@flaglercounty.gov>; Kim Flaherty <flahertykimberly@codb.us>; OC FD - Ronnie Long <rlong@orangecityfl.gov>; Margaret Tomlinson <mtomlinson@port-orange.org>; Mark Bell <publicworks@oakhillfl.gov>; Michael Ulrich <MUlrich@volusia.org>; Mike McMunigle <MJMcMuni@sjrwmd.com>; Miller, Jeff (jmiller@hollyhillfl.org) <jmiller@hollyhillfl.org>; Moisio, Loretta (moisio@ormondbeach.org) <moisio@ormondbeach.org>; Moses, Kieu (mosesk@deland.org) <mosesk@deland.org>; Nancy Church

<NChurch@volusia.org>; Olivia Thomas <OThomas@volusia.org>; Robert Falk <RFalk@volusia.org>; Robin Gawel - City of Ormond Beach (Robin.Gawel@ormondbeach.org) <Robin.Gawel@ormondbeach.org>; Saavedra, Leylah (leylah@pegasusengineering.net) <leylah@pegasusengineering.net>; Sandy Camp <scamp@CITYOFEDGEWATER.ORG>; Smith, Hardy (SmithHardy@CODB.US) <SmithHardy@CODB.US>; Stephen Cousins <scousins@deltonafl.gov>; Tim MacHardy <TMacHardy@volusia.org>; NSB - Shawn VanDeMark <svandemark@cityofnsb.com>; Waller, David (WallerDavid@CODB.US) <WallerDavid@CODB.US>; White, Pat (pmwhite404@gmail.com) <pmwhite404@gmail.com>; Yolanda Buckles <YBuckles@volusia.org>; Young, Ronald E. (reyoung@volusia.k12.fl.us) <reyoung@volusia.k12.fl.us>
Subject: LMS Quarterly Meeting

Good Afternoon All:

This is a friendly reminder that our quarterly LMS meeting is scheduled for this Friday, December 13th, at 9:00 AM at the EOC.

Attached, you will find the agenda for the meeting, as well as the minutes from the September 20th meeting for your review.

If you have any questions, please don't hesitate to reach out.

Best Wishes,
Yolanda

Yolanda Buckles, FPEM
Planner II
Volusia County Emergency Management
3825 Tiger Bay Rd., Suite 102
Daytona Beach, FL 32124
386.254.1500 ext 11027

AGENDA
Local Mitigation Working Group Meeting
September 20, 2024, 9:00 AM
Program Coordinator: Yolanda Buckles
EOC – Ops Room
3825 Tiger Bay Rd. Ste. 102, Daytona Beach, FL 32124

- Welcome/Introductions
- Approval of meeting minutes from June 21, 2024
- Update of Hurricane Ian, Hurricane Nicole and Hurricane Idalia HMGP initiatives
- Update on any 2023 FMA initiatives
- Present any new initiatives to be added to the LMS Initiative List
- 2025-2030 Local Mitigation Strategy (LMS) Public Kickoff
- Training Plan
- Open Discussion

Next Quarterly Meeting will be December 13

AGENDA
Local Mitigation Working Group Meeting
December 13, 2024, 9:00 AM
Program Coordinator: Yolanda Buckles
EOC – Ops Room
3825 Tiger Bay Rd. Ste. 102, Daytona Beach, FL 32124

- Welcome/Introductions
- Approval of meeting minutes of September 20, 2024
- Update of Hurricane Ian, Hurricane Nicole and Hurricane Idalia HMGP initiatives
- Update on any 2023 FMA initiatives
- Present any new initiatives to be added to the LMS Initiative List
- 2025-2030 Local Mitigation Strategy (LMS) Update
- Open Discussion

Next Quarterly Meeting to be determined

2025-2030 LOCAL MITIGATION STRATEGY PUBLIC KICKOFF

Volusia County Emergency Management and the East Central Florida Regional Planning Council

September 20, 2024

Images: Volusia County Emergency Management Logo and East Central Florida Regional Planning Council Logo

Overview of LMS & FMP

- Local Mitigation Strategy (LMS) is a 5-year plan that anticipates damage and disruption that could result from a disaster and then determines how best to eliminate or at least reduce this damage.
  - Focuses on most relevant hazards
- The Floodplain Management Plan (FMP) is a plan that supports the National Flood Insurance Program to: identify known flood problem areas, establish goals, objectives, and implementation programs, and support the reduction in flood insurance costs.

LMS & FMP- Goals & Objectives

- LMS Working Group
  - Updated LMS goals and objectives have been updated through Working Group meetings
  - FMP goals and objectives have been updated based on conversations in these meetings
  - Awaiting feedback from Working Group: requested no later than **Sept. 30**

LMS Updated Goals

Strengthen	GOAL 1: Strengthen effective hazard mitigation programming through policies, regulations, and technology through local government collaborations.
Endeavor	GOAL 2: Local government will endeavor to have resilient critical infrastructure that supports operations before, during, and after disasters.
Encourage	GOAL 3: Encourage economic sustainability within the community.
Enhance	GOAL 4: Enhance the whole community's understanding of the hazards and the techniques used to minimize vulnerability.

Individual Jurisdictional Goals & Objectives within the FMP

Each municipality has a section within the FMP stating goals and objectives to be worked towards in the next five years

Working Group: feedback and updates to those goals **Sept 30**

Additional Plan Updates

- Broad overview of the section updates:
  - Community profile has been updated to include most recent census data
  - Hazards have been refined to include additional risks and broaden the scope of disasters
  - Hazard profiles have been updated to include recent occurrences within the past 5 years
  - Vulnerability assessment is being conducted in partnership with Volusia County's Environmental Management
  - Capability assessment will be using information collected from surveys

- Mitigation plan and strategies will mainly consist of the Quarter 3 priority list
- AI data and maps are being updated currently
- Public meetings are October 7 & 8
  - Daytona Beach Library and Deland Library

THANK YOU!

Please join us for a deeper dive into the draft in October!

LOCAL MITIGATION STRATEGY QUARTER 4 MEETING

Prepared by the East Central Florida Regional Planning Council with Volusia County Emergency Management

Friday, December 13, 2024

Images: Volusia County Emergency Management Logo and East Central Florida Regional Planning Council Logo

Overview of LMS & FMP

- Local Mitigation Strategy (LMS) is a 5-year plan that anticipates damage from a disaster to determine how to eliminate or reduce damage.
  - All hazards
  - Whole community
- The Floodplain Management Plan (FMP) is a plan that supports the National Flood Insurance Program to: identify known flood problem areas, establish goals, implement programs, and reduce flood insurance costs.

Identified Natural Hazards in LMS

- Agriculture
- Coastal Erosion
- Drought
- Extreme Temperature (heat & cold)
- Flood
- Tropical Cyclones
- Public Health Emergencies
- Rising Coastal Waters (storm surge, sea level rise, & tsunamis)
- Severe Weather (hail, lightning, & thunderstorms)
- Tornado
- Wildland Fire

Identified Manmade/Technological Hazards in LMS

- Civil Disturbance
- Mass Migration
- Terrorism
- Coastal Oil Spill
- Critical Infrastructure Failure
- HazMat/Industrial Incident

LMS Example Projects

- Generators
- Home elevations
- Basin Improvements
- Hardening lift stations
- Sewer improvements

Survey Results Overview

- Public Survey for residents: 136
- HOA: 4
- Local businesses: 6

Public Survey

- 50% have lived in home for 10+ years
- 61% are very concerned about flooding in their home (83 people)
- 39% had flooding in 2022; 25% had flooding in 2024
- 82% of residents have noticed an increase in duration and frequency

HOA Survey

- 75% believe property owners are very concerned about flooding
- All have noticed an increase in flooding
- Communities represented: DeBary, Deland, Port Orange, Unincorporated Volusia

Business Survey

- 50% are NOT concerned about flooding
- 33% of participants have flooded
- Financial impacts of concern: loss of business, days, employees unable to work, profit loss, property damage

Additional Public Feedback

- Public comments brought up in two outreach sessions will be consolidated and incorporated into the LMS
  - November 25 and 26, 2024
- Additional comments taken today

THANK YOU!

Volusia Prepares - Working Group Quarterly Meeting

Jurisdiction	Representative	Phone Number	Email Address	LMS
Daytona Beach	Justin Barton	386-671-8807	BartonJustin@CODB.us	
	Michael Smith	386-671-8871	smithmike@CODB.us	
Daytona Beach Shores	Lori Irwin	386-763-5328	lirwin@cityofdbs.org	
DeBary	Amy Long	386-601-0207	along@debary.org	
	~~David Hamstra~~	407-992-9160	david@PegasusEngineering.net	
DeLand	Kieu Moses	386-626-7112	mossesk@deland.org	
	Jonathan Jacob	386-626-7097	jacobj@deland.org	
Deltona	Sue Houle	386-878-8163	shoule@deltonafl.gov	
	Bill Snyder	386-575-6902	bsnyder@deltonafl.gov	
	DAVID HAMSTRA			
Edgewater	Sandy Camp	386-424-2400	Scamp@cityofedgewater.org	
	TynaLynn Hilton	386 424 2400 x406	thilton@cityofedgewatee.org	
Holly Hill	Steve Juengst	386-248-9463	sjuengst@hollyhillfl.org	
	Jeff Miller	386-248-9488	jmiller@hollyhillfl.org	

Volusia Prepares - Working Group Quarterly Meeting

Jurisdiction	Representative	Phone Number	Email Address	LMS
Lake Helen	Jim Gleason		jgleason@lakehelen.org	[signature]
New Smyrna Beach	Kyle Fegley	386-410-2811	kfegley@cityofnsb.com	[signature]
	David Hamstra	407-992-9160	david@PegasusEngineering.net	
Oak Hill				
Orange City	Ronnie Long	386-775-5460	rlong@orangecityfl.gov	
	Joe Ruiz	386-775-5415	jruiz@orangecityfl.gov	
	John Peters	386-775-7525	jpeters@orangecityfl.gov	[signature]
Ormond Beach	Loretta Moisio	386-676-3315	moisio@ormonbeach.org	[signature]
	Robin Gawel	386-676-3343	Robin.Gawel@ormondbeach.org	[signature]
Pierson				
Ponce Inlet	Ami Pierce	386-236-2186	apierce@ponce-inlet.org	
	Hank Baker		hbaker@ponce-inlet.org	[signature]
Port Orange	Marget Tomlinson	386-506-5563	mtomlinson@port-orange.org	
	Donna Weber	386-5065564	dweber@port-orange.org	[signature]

Valerie Dahl 3865065664 vdahl@port-orange.org [signature]

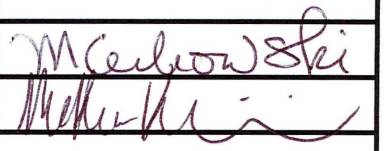
Volusia Prepares - Working Group Quarterly Meeting

Jurisdiction	Representative	Phone Number	Email Address	LMS
South Daytona	Josh McEnany	386-322-3000	jmcenany@southdaytona.org	
	James Gillis Jr	386-322-3000	lgillis@southdaytona.org	
	Becky Witte	386-322-3000	bwitte@southdaytona.org	
Volusia County Departments				
Emergency Mgmt	Aubrie Austin	386-254-1500	alaustin@volusia.org	
	Yolanda Buckles	386-254-1500	ybuckles@volusia.org	
Coastal Division	Jessica Fentress	386-248-8072	jfentress@volusia.org	
	Niles Cyzycki	386-248-8072	NCyzycki@volusia.org	
	Olivia Thomas		othomas@volusia.org	
Fire Services	Jeff Alberts	386-736-5940	jalberts@volusia.org	
Public Works	Arden Fontaine	386-736-5965	afontaine@volusia.org	
Water Resources and Utilities	Michael Ulrich	386-943-7027	Mulrich@volusia.org	
GIS	Nancy Church	386-736-5922	nchurch@volusia.org	
Emergency Services	Suzie Darby	386-822-5037	sdarby@volusia.org	
Community Assistance	Corry Brown	386-736-5955	cabrown@voluisa.org	

Volusia Prepares - Working Group Quarterly Meeting

Jurisdiction	Representative	Phone Number	Email Address	LMS
DB Airport	Karen Feaster	386-248-8030	kfeaster@volusia.org	
Growth and Resource Management CRS Coord.	Jill Hemmerlein	386-736-5959	Jhemmerlein@volusia.org	
Environmental Management	Samantha West	386-736-5927	swest@volusia.org	
Mosquito Control	Tim MacHardy	386-424-2920	Tmachardy@volusia.org	
VC Health Department	Georgianne Cherry	386-281-2272	Georgianne.Cherry@flhealth.gov	
VC School Board	Ron Young	386-822-6630	Reyoung@volusia.k12.fl.us	
	Emergency Management Community Partners			
Advent Health	Mike Poinatowski	386-316-1120	michael.poinatowski@adventhealth.com	
FDEM	Austin Beeghly	850-559-7459	Austin.Beeghly@em.myflorida.com	
	Elizabeth Caison	850-524-0225	Elizabeth.Caison@em.myflorida.com	
Aptim	Pat White	386-299-7774	Patricia.white@aptim.com	
Halifax Health				

Volusia Prepares - Working Group Quarterly Meeting

Jurisdiction	Representative	Phone Number	Email Address	LMS
SJRWMD	James Cannon	321-473-1341	jcannon@sjrwmd.com	
	Cammie Dewey		cdewey@sjrwmd.com	
	Mike McMunigle		MJMcMuni@sjrwmd.com	
	Jim Peterson		JPeterson@sjrwmd.com	
ECFRPC	Michelle Ceckowski	407-402-3761	mcechowski@ecfrpc.org	
	McKenna Korzeniewski		MKorzeniewski@ecfrpc.org	

Volusia Prepares - Working Group Quarterly Meeting

Jurisdiction	Representative	Phone Number	Email Address	LMS
Recovery & Resiliency	Dave Linkinhoker	386-801-7773	dlinkinhoker@volusia.org	
Vol. Co. Council	Matt Reinhart	386-507-4004	mreinhart@volusia.org	
Recovery & Resiliency	Chris Williams	386 747-9224	cwilliams@volusia.org	

Volusia Prepares - Working Group Quarterly Meeting

Jurisdiction	Representative	Phone Number	Email Address	LMS
Daytona Beach	Justin Barton	386-671-8807	BartonJustin@CODB.us	
	Michael Smith	386-671-8871	smithmike@CODB.us	
	Aaron Spencer	386-671-4021	SpencerAaron@dbfd.us	
Daytona Beach Shores	Lori Irwin	386-763-5328	lirwin@cityofdbs.org	
DeBary	Amy Long	386-601-0207	along@debary.org	
DeLand	Kieu Moses	386-626-7112	mossesk@deland.org	
	Jonathan Jacob	386-626-7097	jacobj@deland.org	
	Mike Gresbosz	386-626-7110	Greboszm@deland.org	
Deltona	Sue Houle	386-878-8163	shoule@deltonafl.gov	
	Bill Snyder	386-575-6902	bsnyder@deltonafl.gov	
	David Hamstra	407-992-9160	david@PegasusEngineering.net	
Edgewater	Sandy Camp	386-424-2400	Scamp@cityofedgewater.org	
	Tyna Lynn Hilton	386-424-2400	thilton@cityofedgewater.org	
Holly Hill	Steve Juengst	386-248-9463	sjuengst@hollyhillfl.org	SJ
	Jeff Miller	386-248-9488	jmiller@hollyhillfl.org	

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Lake Helen	Jim Gleason		jgleason@lakehelen.org	
New Smyrna Beach	Kyle Fegley	386-410-2811	kfegley@cityofnsb.com	
	David Hamstra	407-992-9160	david@PegasusEngineering.net	
	Jesse Meyers	386-410-2812	jmeyers@cityofnsb.com	
Oak Hill				
Orange City	Ronnie Long	386-775-5460	rlong@orangecityfl.gov	
	Joe Ruiz	386-775-5415	jruiz@orangecityfl.gov	
	John Peters	386-775-7525	jpeters@orangecityfl.gov	
Ormond Beach	Loretta Moisio	386-676-3315	moisio@ormonbeach.org	
	Robin Gawel	386-676-3343	Robin.Gawel@ormondbeach.org	
Pierson				
Ponce Inlet	Ami Pierce	386-236-2186	apierce@ponce-inlet.org	Bailey
	Hank Baker		hbaker@ponce-inlet.org	
Port Orange	Marget Tomlinson	386-506-5563	mtomlinson@port-orange.org	
	Valerie Duhl	386-506-5664	vduhl@port-orange.org	

Volusia Prepares - Working Group Quarterly Meeting

Jurisdiction	Representative	Phone Number	Email Address	LMS
	Debra Weher	386-506-5560	dweher@port-orange.org	
South Daytona	Josh McEnany	386-322-3000	jmcenany@southdaytona.org	
	James Gillis Jr	386-322-3000	lgillis@southdaytona.org	
	Becky Witte	386-322-3000	bwitte@southdaytona.org	
Volusia County Departments				
Emergency Mgmt	Aubrie Austin	386-254-1500	alaustin@volusia.org	
	Yolanda Buckles	386-254-1500	ybuckles@volusia.org	
	CLINT MECHAM	386-254-1500	cmecham@volusia.org	
Coastal Division	Jessica Fentress	386-248-8072	jfentress@volusia.org	
	Niles Cyzycki	386-248-8072	NCyzycki@volusia.org	
	Olivia Thomas		othomas@volusia.org	
Community Assistance	Corry Brown	386-736-5955	cabrown@voluisa.org	
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Environmental Management	Samantha West	386-736-5927	swest@volusia.org	

Volusia Prepares - Working Group Quarterly Meeting

Fire Services	Jeff Alberts	386-736-5940	jalberts@volusia.org	
GIS	Nancy Church	386-736-5922	nchurch@volusia.org	
Growth and Resource Management CRS Coord.	Jill Hemmerlein	386-736-5959	Jhemmerlein@volusia.org	
Mosquito Control	Tim MacHardy	386-424-2920	Tmachardy@volusia.org	
Public Works	Arden Fontaine	386-736-5965	afontaine@volusia.org	
Recovery & Resiliency	David Linkinhoker	386-882-7773	DLinkinhoker@volusia.org	
	Chris Williams	386-747-9221	CRWilliams@volusia.org	Chris Williams
	Melissa DeWall	386-882-7709		Melisse DeWall
Water Resources and Utilities	Michael Ulrich	386-943-7027	Mulrich@volusia.org	
	Emergency Management Community Partners			
Advent Health	Mike Poinatowski	386-316-1120	michael.poinatowski@adventhealth.com	
Aptim	Pat White	386-299-7774	Patricia.white@aptim.com	

Volusia Prepares - Working Group Quarterly Meeting

ECFRPC	Michelle Ceckowski	407-402-3761	mcechowski@ecfrpc.org	
	McKenna Korzeniewski		MKorzeniewski@ecfrpc.org	
FDEM	Elizabeth Caison	850-524-0225	Elizabeth.Caison@em.myflorida.com	
Halifax Health				
SJRWMD	James Cannon	321-473-1341	jcannon@sjrwmd.com	
	Cammie Dewey		cdewey@sjrwmd.com	
	Mike McMunigle		MJMcMuni@sjrwmd.com	
	Jim Peterson		JPeterson@sjrwmd.com	
VC Health Department	Stephen Civitelli	386-274-0799	Stephen.Civitelli@flhealth.gov	
VC School Board	Ron Young	386-822-6630	Reyoung@volusia.k12.fl.us	
Transform 386	Dave Lukinhoker	386-882-7777	dlukinhoker@volusia.org	
Ashleigh Elkins				

Volusia Prepares - Working Group Quarterly Meeting

Jurisdiction	Representative	Phone Number	Email Address	LMS
FAITH org.	Mary McLaughl	386 761 9834	mary mcteenwis@gmail	
[redacted]				
Sugar Forest Comm.	Lori Becker	386 299 4425	Lorbecker@aol.com	
Parametrics	Pat White	386 299 7774	pmwhite4040@gmail.com	
VCEM	CLAY Ervin	386 822 5013	cervin@volusia.org	
[illegible]	Tim Smith	386-423-8948		
[illegible]	Deb Ulmer	386-747-6094	llc.dulmer@gmail.com	
	Mary Berg	386-690-5485		
South Daytona	Les Ellis	386-	bwitte@	
S. Daytona	Becky Witte	322-3014	Southdaytona.org	

2025-2030 LOCAL MITIGATION STRATEGY AND FLOODPLAIN MANAGEMENT PLAN PUBLIC MEETINGS

Prepared by the East Central Florida Regional Planning Council with Volusia County Emergency Management

November 25 & 26, 2024

Images: Volusia County Emergency Management Logo and East Central Florida Regional Planning Council Logo

History

- Volusia County's hazard mitigation planning efforts began in 1997 with the formation of the Volusia Prepares Committee
- First LMS in 1999 (adopted 2000), as part of the Florida Department of Community Affairs LMS Initiative
- The previous version of the LMS, prior to this 2025 version, was updated and adopted in 2020

Overview of LMS & FMP

- Local Mitigation Strategy (LMS) is a 5-year plan that anticipates damage from a disaster to determine how to eliminate or reduce damage.
  - All hazards
  - Whole community
- The Floodplain Management Plan (FMP) is a plan that supports the National Flood Insurance Program to: identify known flood problem areas, establish goals, implement programs, and reduce flood insurance costs.

LMS Updated Goals

Strengthen	GOAL 1: Strengthen effective hazard mitigation programming through policies, regulations, and technology through local government collaborations.
Endeavor	GOAL 2: Local government will endeavor to have resilient critical infrastructure that supports operations before, during, and after disasters.
Encourage	GOAL 3: Encourage economic sustainability within the community.
Enhance	GOAL 4: Enhance the whole community's understanding of the hazards and the techniques used to minimize vulnerability.

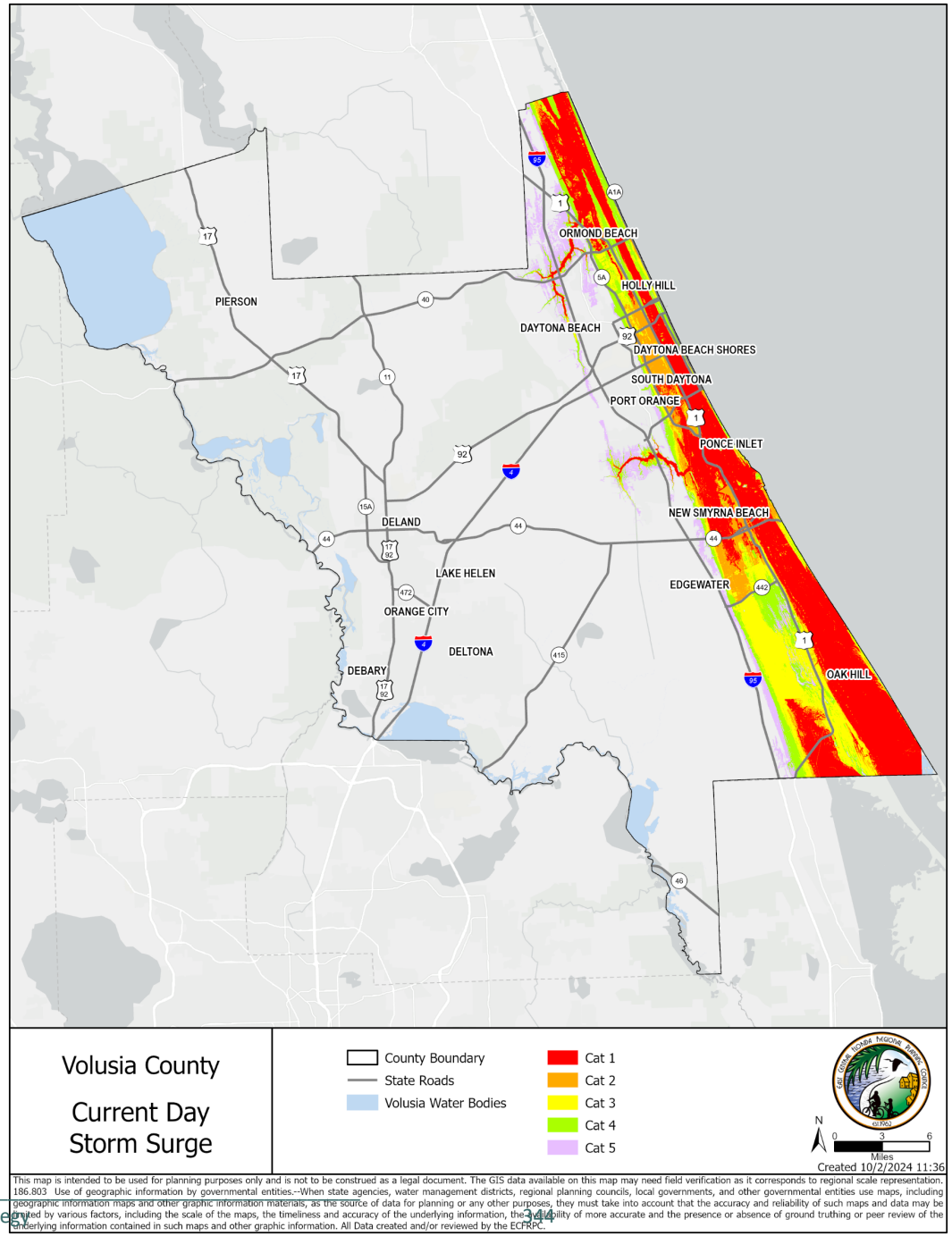
LMS & FMP- Project Lists

- Create a Master Initiatives List
- Makes county eligible for the Hazard Mitigation Grant Program (HMGP) funding through Florida's Division of Emergency Management (FDEM) and FEMA
- Grant funds are intended to bring mitigation projects to fruition that would end up on a wish list otherwise.

Community Profile

- Age (2022):
  - Median age for the County was **46.6 years**
  - State median age of **42.7 years** of age
  - Roughly 25% of residents in Volusia are over 65
- Housing (2022):
  - Median value of owner-occupied housing units was **$251,400**
  - **$178,700** average in Florida
  - **$193,500** national average

Image of current day storm surge impacting Volusia County. This map is organized by hurricane category using the SLOSH model (Sea, Lake, and Overland Surges from Hurricanes model is a computer program that estimates storm surge heights caused by tropical cyclones). This map has been approved by FDEM.



Overview of Required Updates

- Community profile has been updated to include most recent census data
- Hazards have been refined to include additional risks and broaden the scope of disasters
- Hazard profiles have been updated to include recent occurrences within the past 5 years
- Vulnerability assessment is being conducted in partnership with Volusia County's Environmental Management and information from the County's Property Appraiser

Overview of Required Updates (Continued)

- Capability assessment will use information collected from surveys
- Mitigation plan and strategies will consist of the Quarter 3 & 4 priority list
- All data and maps are being updated currently

We Need You!

- Public participation is vital to the success of the LMS/FMP
- Understanding individual homeowners' capabilities to withstand and respond to disasters is crucial for county to understand the **NEEDS** of the whole community

Survey QR Codes

Neighborhood Association Survey for Volusia Residents

Local Business Survey for Volusia County Business Owners

Floodplain Management Public Survey for Volusia County

Images: Three Photos of Survey QR Codes to Scan with Cell Phone

THANK YOU!

Questions?

LMS/FMP Public Meeting

Tuesday, November 26, 2024

Daytona Public Library

NAME	AFFILIATION	EMAIL	PHONE
Diane Fowle			386-295-2663
MARY E HAZZARD			267-450-1680
TRACI ANDERSON			386-677-0257
Dot Senne		dotsenne@aol.com	3862952920
George Carter			
Marcella Carter			
Hank Becker			236-2188
Patrick Senne		pat.senne@colliersengg.com	386-274-8679
HEATHER BLANCK		heather.blanck@gmail.com	386-214-7209
Mike McDowell			
Beverly FANT	West Winds condo 1750/1800 So Palmetto	B FANT 8880@gmail	386-846-5864
John J. Nicholson	Resident		386-265-8190
Javier Benavente	resident CODB	javibene@msn.com	
Lori Becker	Port OR Resident	Lorbecker	386 299 4425
Monica Paris	Comm Zone 1 CODB	parismonica@codb.us	386-214-3822
Sonya Bell Bell	homeowner	rbell2rus@gmail	386-589 3422
Daniel & Sherri Tippin	homeowner	SZLegal@AOL.com	386-290-4054
Jeff Cahill	Home owner	jefcahill@Hotmail.com	3864519822
Catherine Pante	Homeowner		386-566-3699
Jenny Nazak	Daytona Beach Permaculture Guild	jnazak@yahoo.com	512-619-5363
Nic Mostert	NSB	MOSTERTM@hotmail.com	386-212-
Tom Peacock	ME	TOMMAINLAND55@aol	1260
Peter Sigmann	Sierra Club	peter@sigmann.net	3862815627
Susanne Oden	MANY	sueodence@hotmail.com	4077602304
Jill Hemmerlein	GRM	hemmerleen@gmail.com	
McKenna Korzeniewski	ECFRPC	mkorzeniewski@ecfrpc.org	

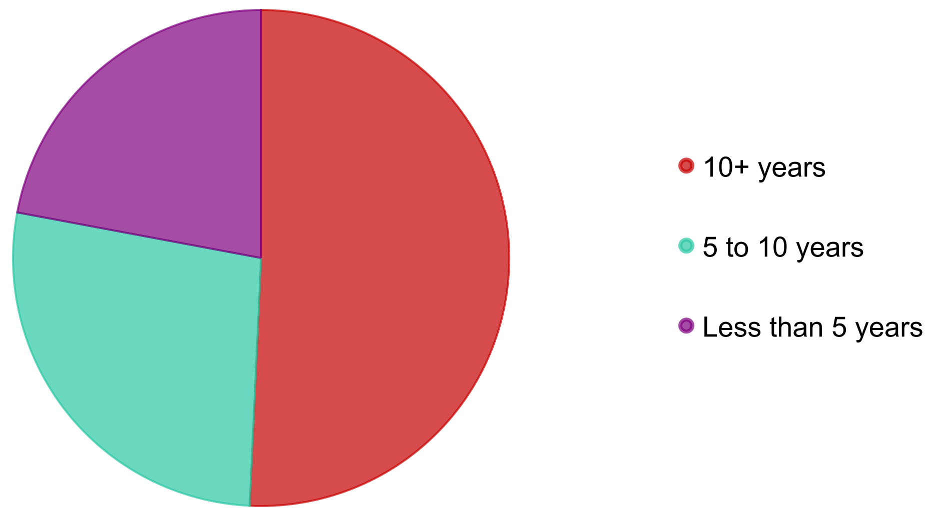
LMS/FMP Public Meeting

Monday, November 25, 2024
Deland Public Library

NAME	AFFILIATION	EMAIL	PHONE
McKenna Korczewski	ECFRPC	MKorczewski@ecfrpc.org	
JOHN BONDUR	JohnKnox/Mag	JKBONDUR@COMCAST.NET	
DALE ARRINGTON	City of Orange City	darrington@orangecityflo.gov	
Terri Ellis		TLJOHO AOL.com	330 252-7323
Phyllis Wilcox	City of Deltona	Pwilcox@DeltonaFL.Gov	
Glenn Whitcomb	City of Deltona	gwhitcomb@deltonafl.gov	
DAVID WILL	NSB	DLWill1507@gmail	386-689-72 14
Wendy Arnder	ENRAC	Warnder1@stetson.edu	417-353-0084
JOE DUBAC	NSB	jdubac@snet.net	860-460-6128
DAVID LINKINHOKER	Recovery & Resil.	d.linkinhoker@volusia	386-882-7773
Melissa DeWall	Recovery + Resiliency	mdewall@volusia.org	386-882-7709
Stephanie Bryson	Deland Museum	brysonwestover@gmail.com	386.479.1666
Jon Cheney	HOA	jcheney61@icloud.com	386 848 6650
Yolanda Buckles	VCEM	ybucklese volusia.org	386 254 1500
Kurja Wilkes		Kurjawilkes@gmail.	847-420-2973

Floodplain Management Public Survey for Volusia County

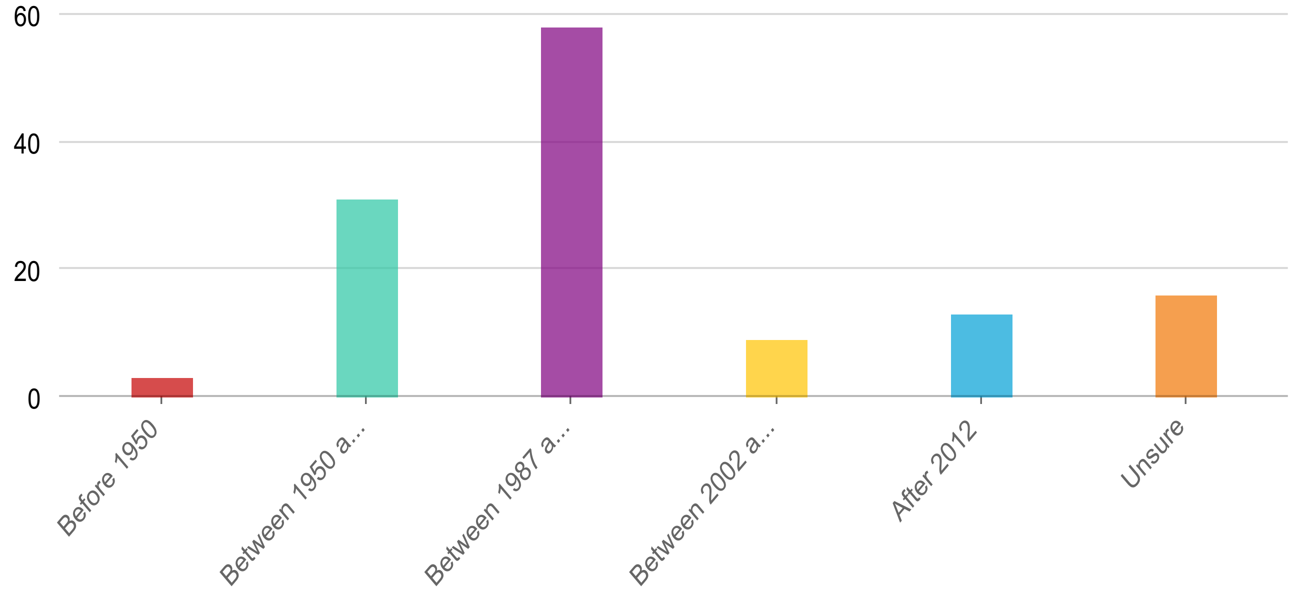
How long have you lived in your current residence?



Answers	Count	Percentage
10+ years	69	50.74%
5 to 10 years	37	27.21%
Less than 5 years	30	22.06%

Answered: 136 Skipped: 0

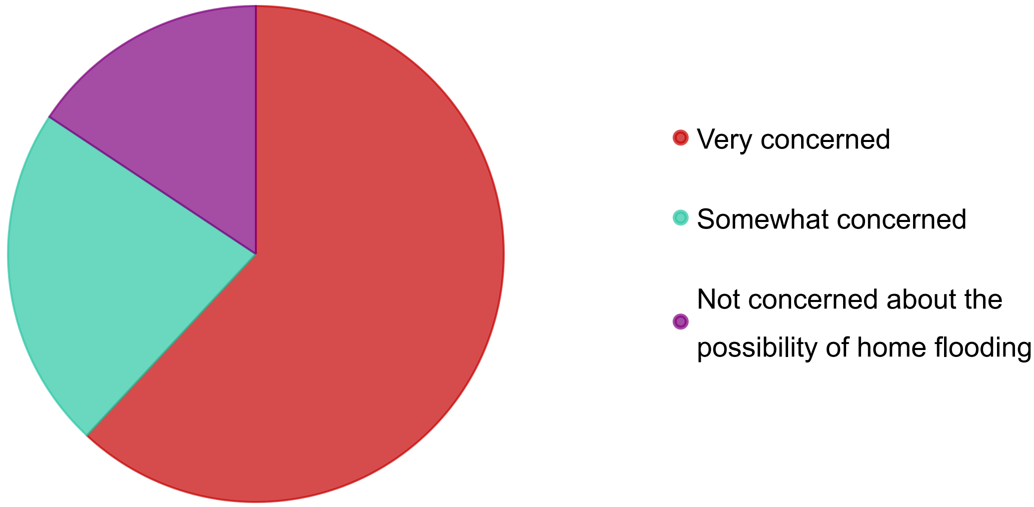
What year was your home built?



Answers	Count	Percentage
Before 1950	3	2.21%
Between 1950 and 1968	31	22.79%
Between 1987 and 2001	58	42.65%
Between 2002 and 2012	9	6.62%
After 2012	13	9.56%
Unsure	16	11.76%

Answered: 130 Skipped: 6

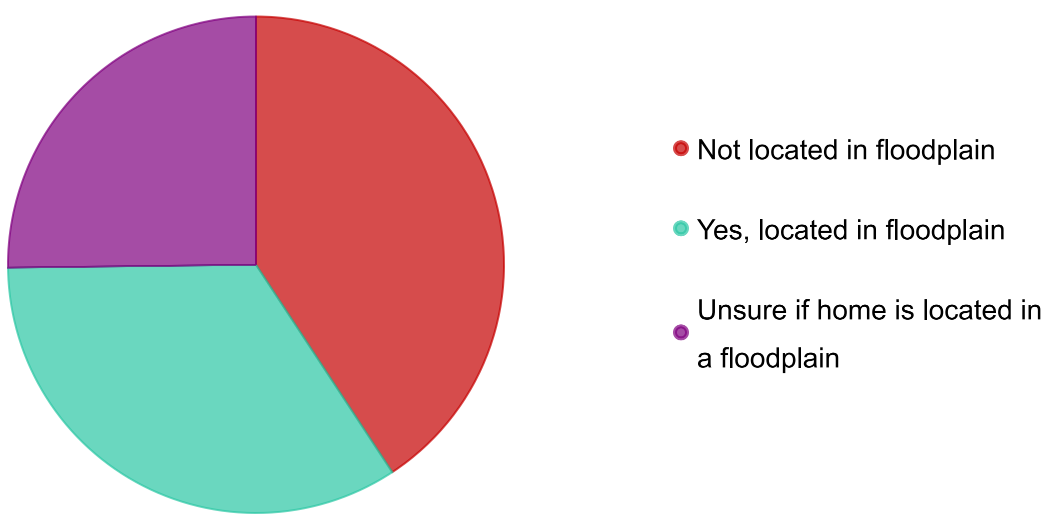
How concerned are you about the possibility of your home flooding?



Answers	Count	Percentage
Very concerned	83	61.03%
Somewhat concerned	30	22.06%
Not concerned about the possibility of home flooding	21	15.44%

Answered: 134 Skipped: 2

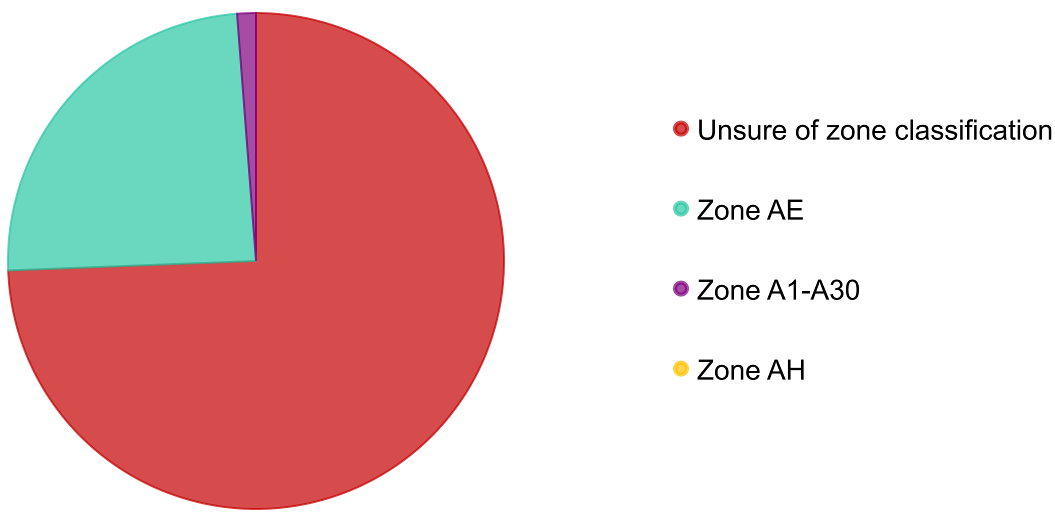
Is your home located within a Flood hazard zone (floodplain)?



Answers	Count	Percentage
Not located in floodplain	55	40.44%
Yes, located in floodplain	46	33.82%
Unsure if home is located in a floodplain	34	25%

Answered: 135 Skipped: 1

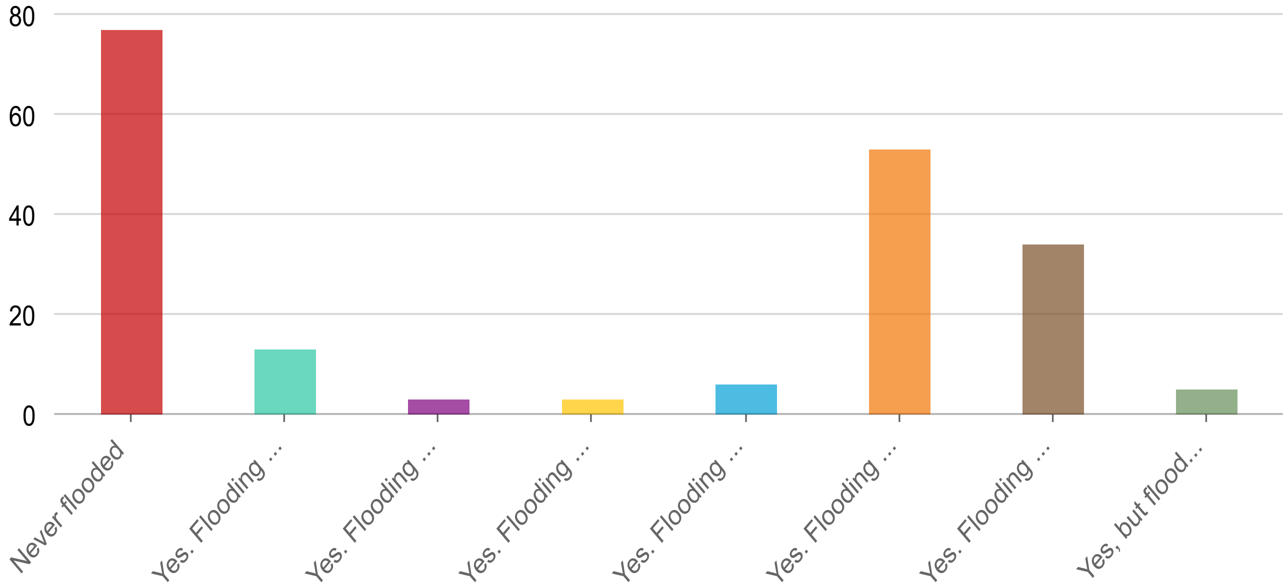
If located within a floodplain, which zone?



Answers	Count	Percentage
Unsure of zone classification	61	44.85%
Zone AE	20	14.71%
Zone A1-A30	1	0.74%
Zone AH	0	0%

Answered: 82 Skipped: 54

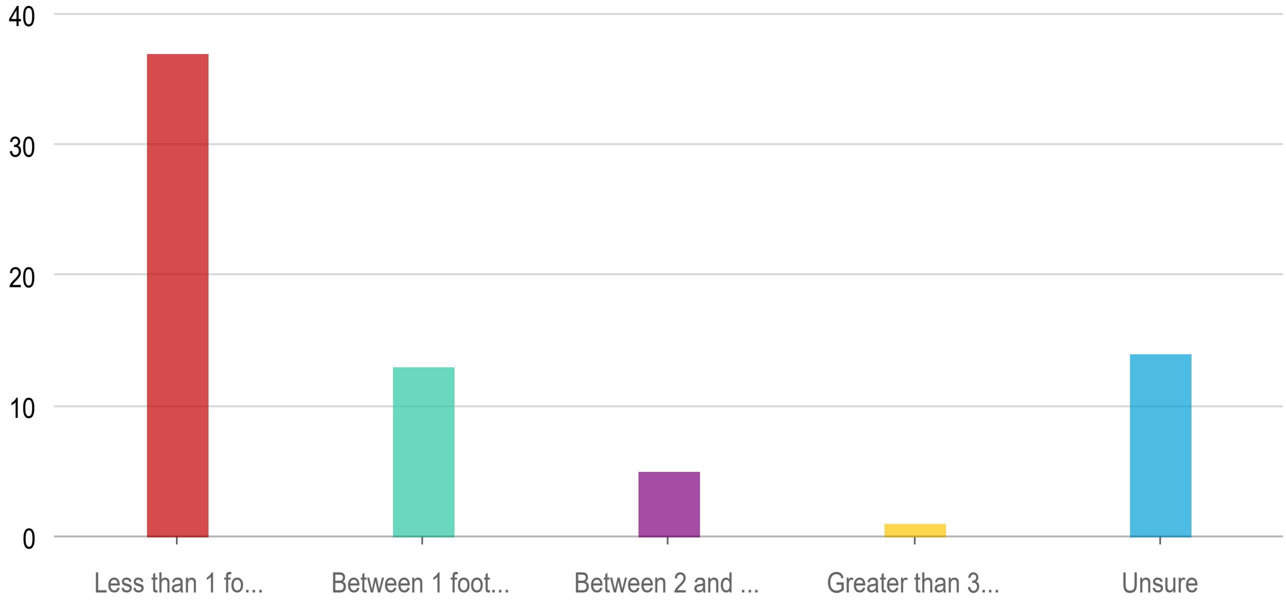
Has your home (to your knowledge) ever flooded due to natural causes?



Answers	Count	Percentage
Never flooded	77	56.62%
Yes. Flooding occurred between 2000-2009.	13	9.56%
Yes. Flooding occurred between 2010 and 2012.	3	2.21%
Yes. Flooding occurred between 2013 and 2016.	3	2.21%
Yes. Flooding occurred in 2017.	6	4.41%
Yes. Flooding occurred in 2022.	53	38.97%
Yes. Flooding occurred in 2024.	34	25%
Yes, but flooding has occurred in years not listed.	5	3.68%

Answered: 133 Skipped: 3

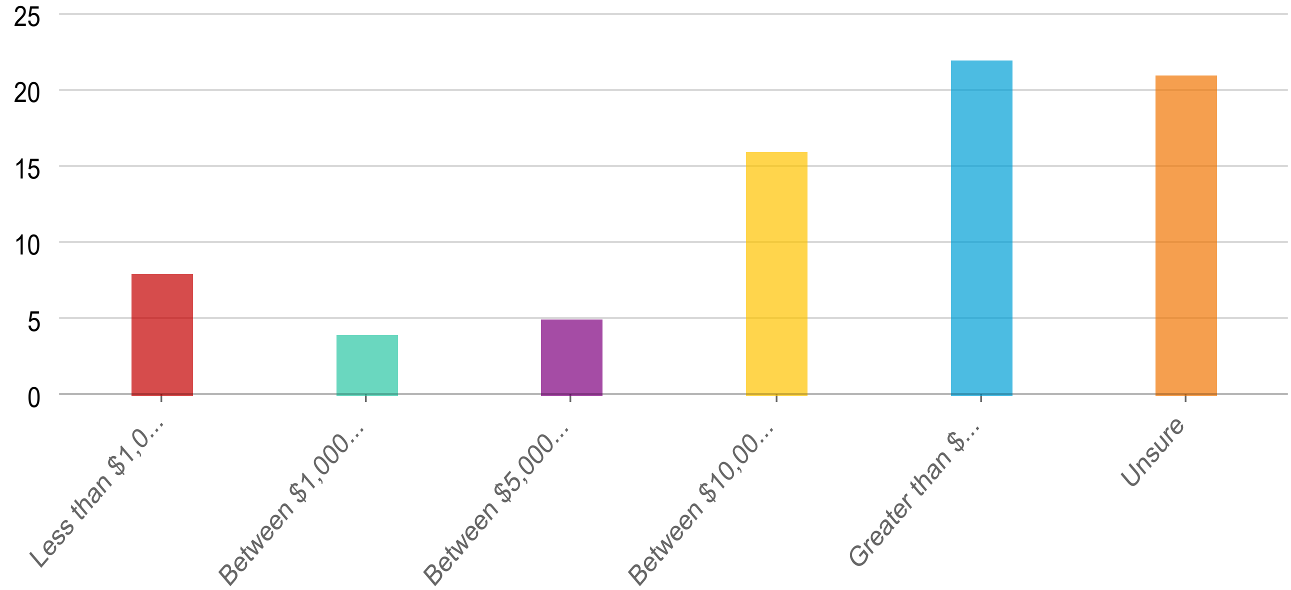
What depth was the water in your home during the last flooding event noted i…



Answers	Count	Percentage
Less than 1 foot	37	27.21%
Between 1 foot and 2 feet	13	9.56%
Between 2 and 3 feet	5	3.68%
Greater than 3 feet	1	0.74%
Unsure	14	10.29%

Answered: 70 Skipped: 66

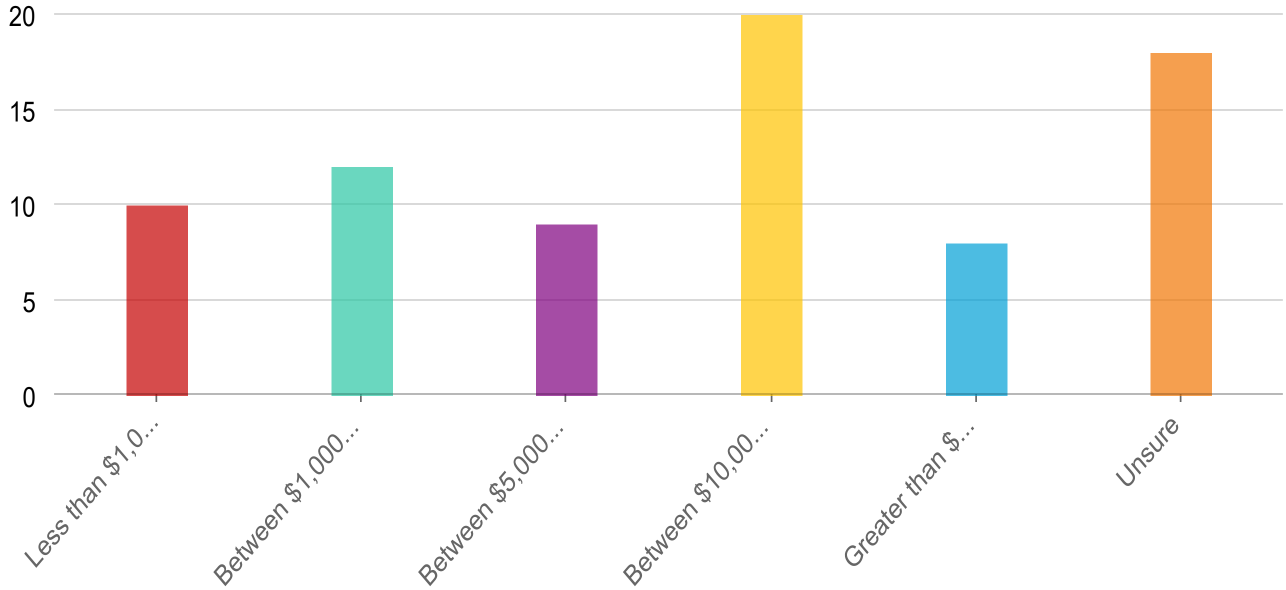
What was the approximate dollar value of structural damages to your home…



Answers	Count	Percentage
Less than $1,000	8	5.88%
Between $1,000 and $4,999	4	2.94%
Between $5,000 and $9,999	5	3.68%
Between $10,000 and $49,999	16	11.76%
Greater than $50,000	22	16.18%
Unsure	21	15.44%

Answered: 76 Skipped: 60

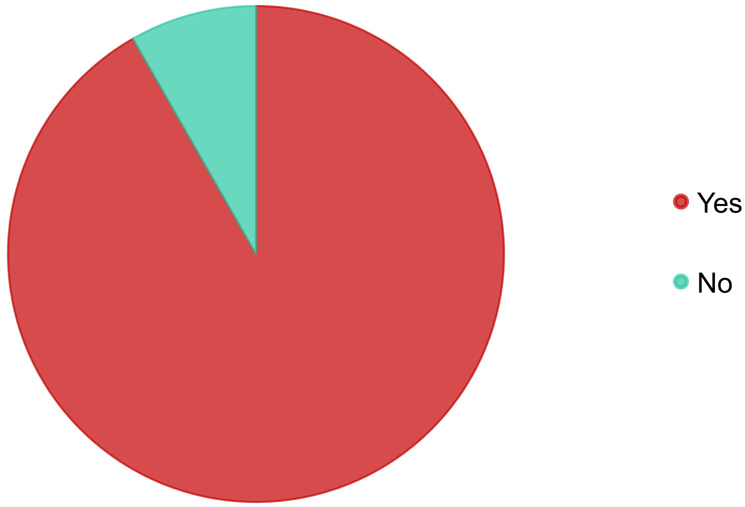
What was the approximate dollar value of all personal items lost during the la…



Answers	Count	Percentage
Less than $1,000	10	7.35%
Between $1,000 and $4,999	12	8.82%
Between $5,000 and $9,999	9	6.62%
Between $10,000 and $49,999	20	14.71%
Greater than $50,000	8	5.88%
Unsure	18	13.24%

Answered: 77 Skipped: 59

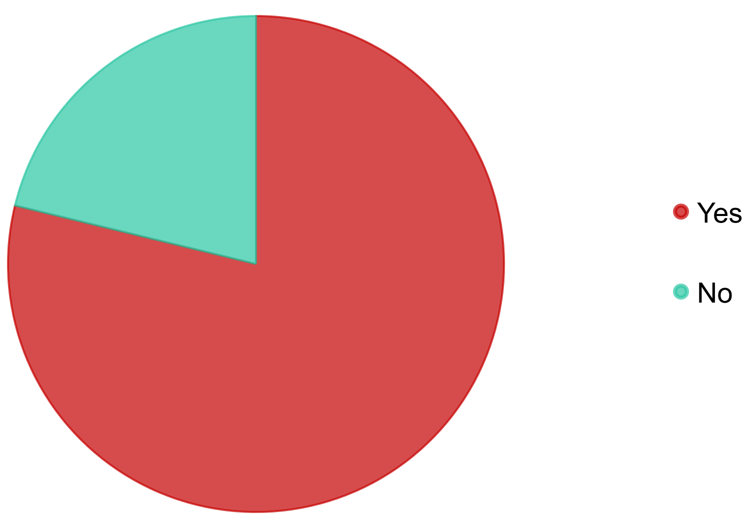
Have you noticed an increase in the duration and frequency of these flood…



Answers	Count	Percentage
Yes	111	81.62%
No	10	7.35%

Answered: 121 Skipped: 15

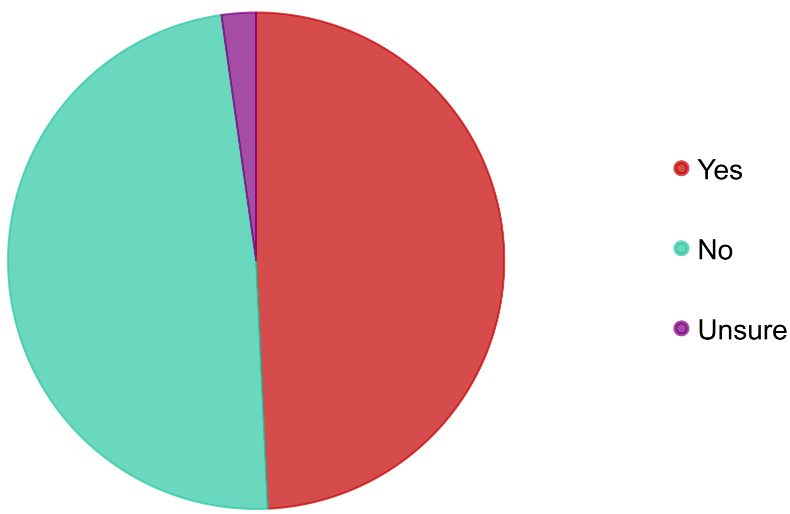
Has local roadway flooding (in your neighborhood) directly impacted access …



Answers	Count	Percentage
Yes	104	76.47%
No	28	20.59%

Answered: 132 Skipped: 4

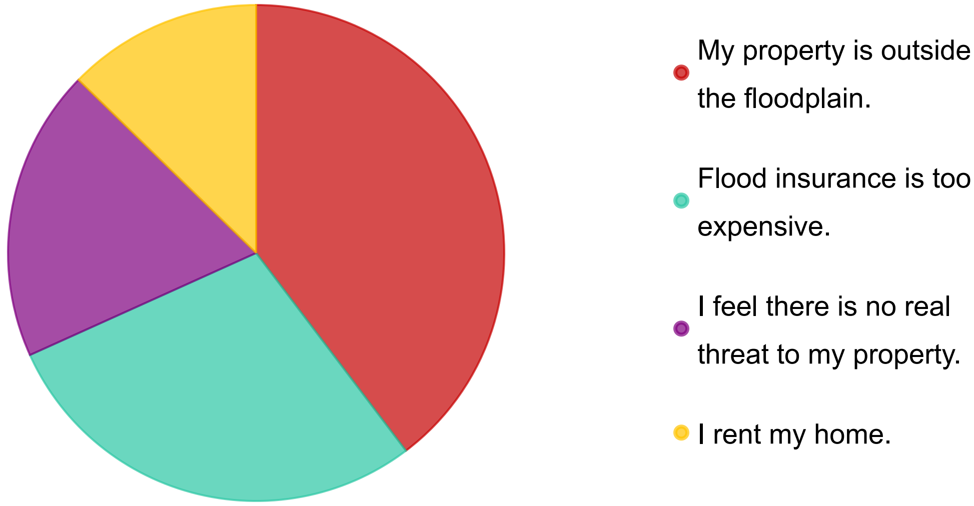
Do you currently have flood insurance for your property?



Answers	Count	Percentage
Yes	66	48.53%
No	65	47.79%
Unsure	3	2.21%

Answered: 134 Skipped: 2

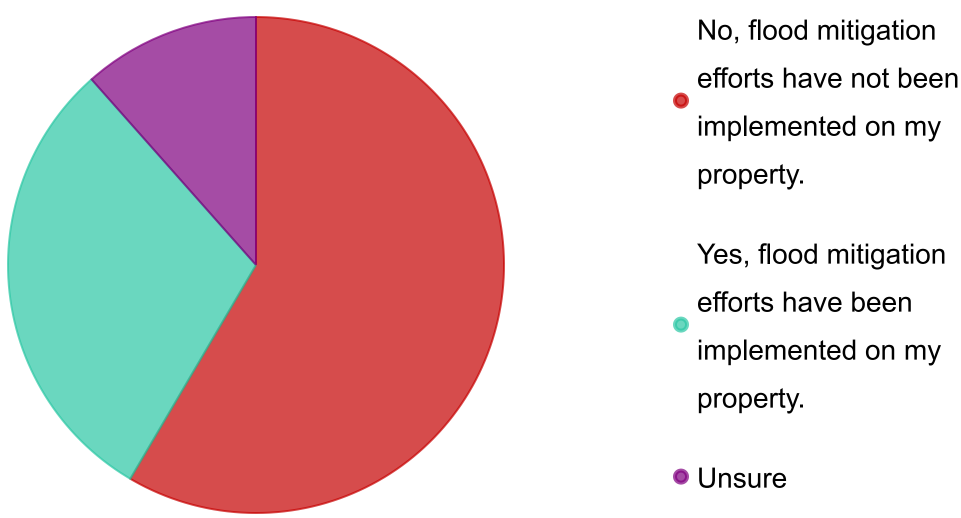
If you do not have flood insurance, which of the following best describes you…



Answers	Count	Percentage
My property is outside the floodplain.	25	18.38%
Flood insurance is too expensive.	18	13.24%
I feel there is no real threat to my property.	12	8.82%
I rent my home.	8	5.88%

Answered: 63 Skipped: 73

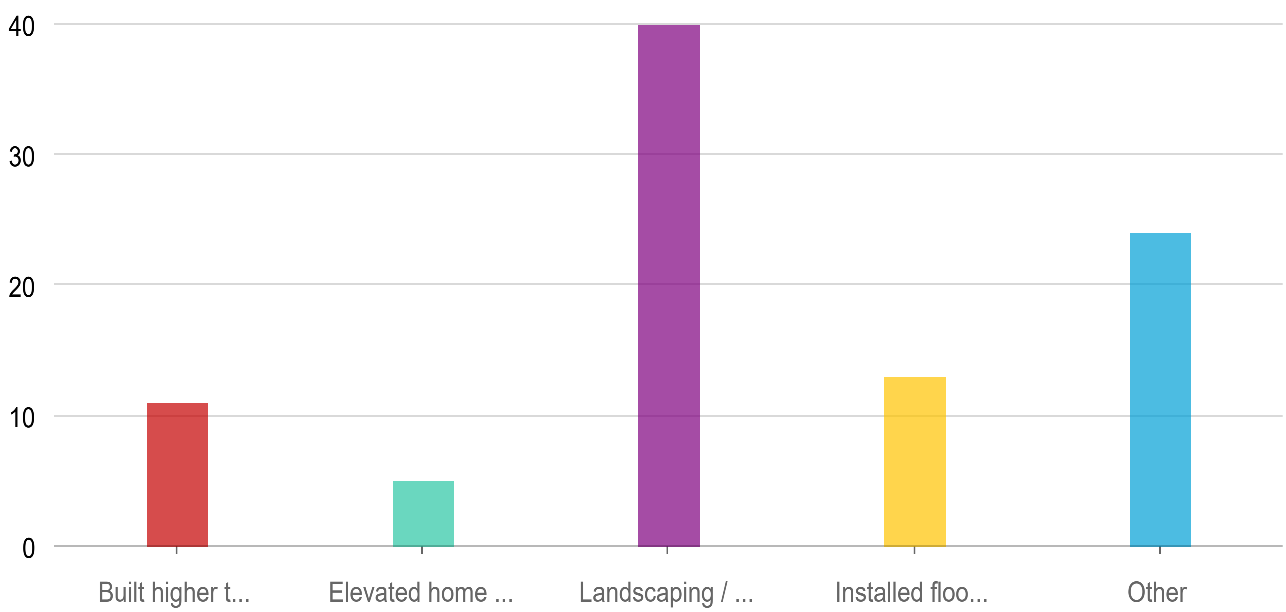
Have any flood mitigation efforts been implemented to your property?



Answers	Count	Percentage
No, flood mitigation efforts have not been implemented on my property.	76	55.88%
Yes, flood mitigation efforts have been implemented on my property.	39	28.68%
Unsure	15	11.03%

Answered: 130 Skipped: 6

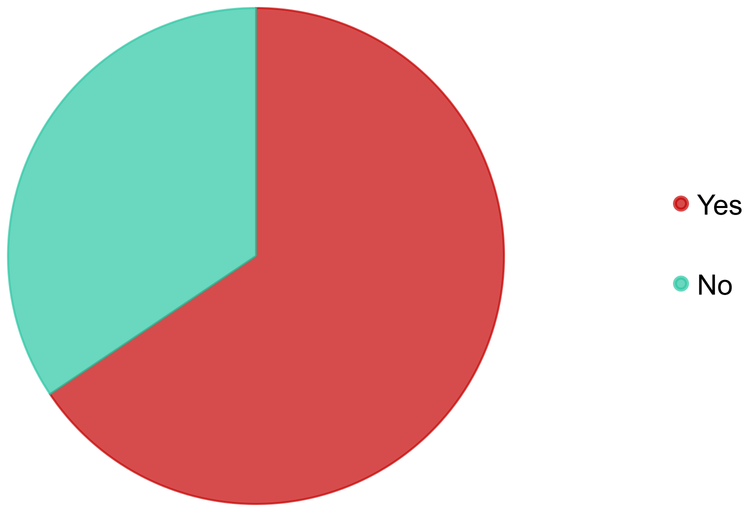
Which type of mitigation efforts have been conducted on your property?



Answers	Count	Percentage
Built higher than 100 year floodplain	11	8.09%
Elevated home / first floor is parking or access only	5	3.68%
Landscaping / drainage improvements	40	29.41%
Installed flood barriers	13	9.56%
Other	24	17.65%

Answered: 62 Skipped: 74

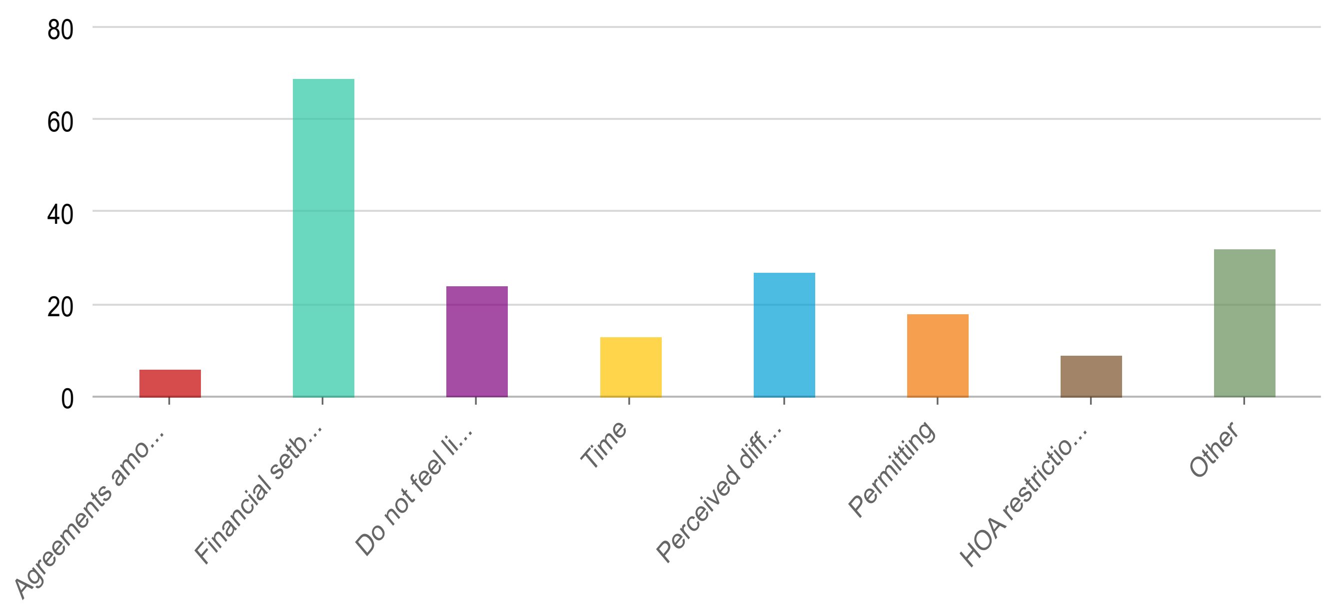
Have you considered implementing flood management strategies on your…



Answers	Count	Percentage
Yes	82	60.29%
No	43	31.62%

Answered: 125 Skipped: 11

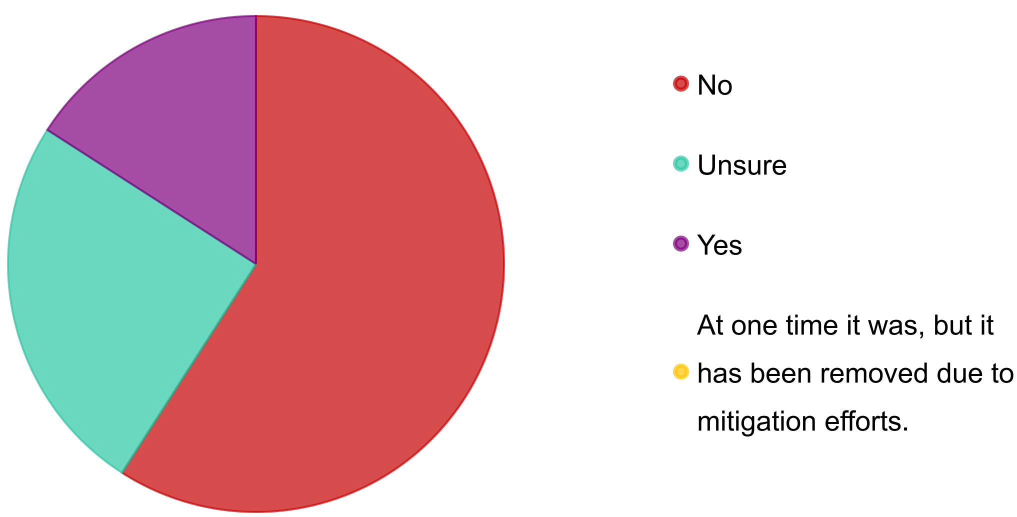
What is your biggest hold-back to implementing mitigation strategies?



Answers	Count	Percentage
Agreements among others in multi-family dwelling	6	4.41%
Financial setback	69	50.74%
Do not feel like it would make an impact	24	17.65%
Time	13	9.56%
Perceived difficulty	27	19.85%
Permitting	18	13.24%
HOA restrictions	9	6.62%
Other	32	23.53%

Answered: 116 Skipped: 20

Is your home currently classified as a repetitive loss property?

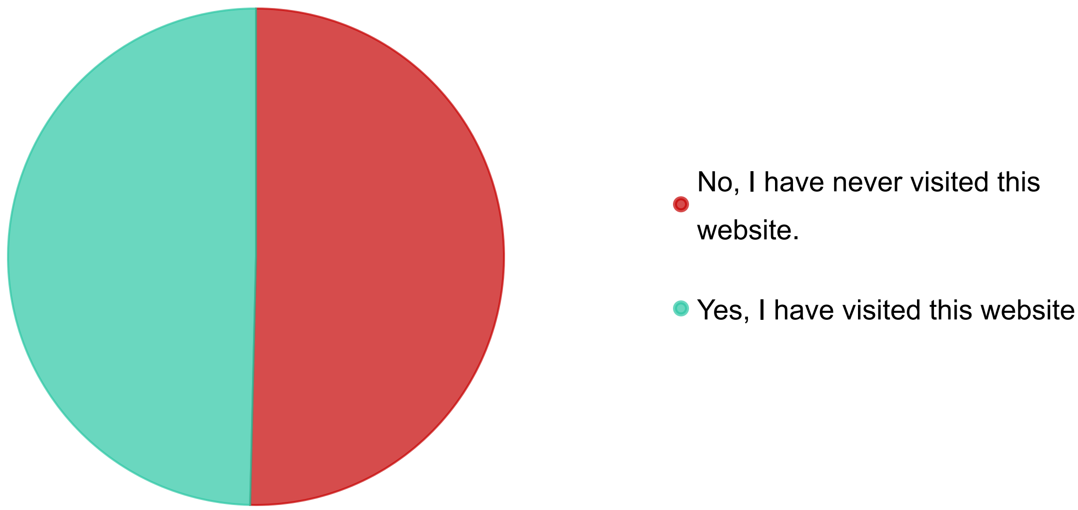


Answers	Count	Percentage
No	78	57.35%
Unsure	33	24.26%

Yes	21	15.44%
At one time it was, but it has been removed due to mitigation e fforts.	0	0%

Answered: 132 Skipped: 4

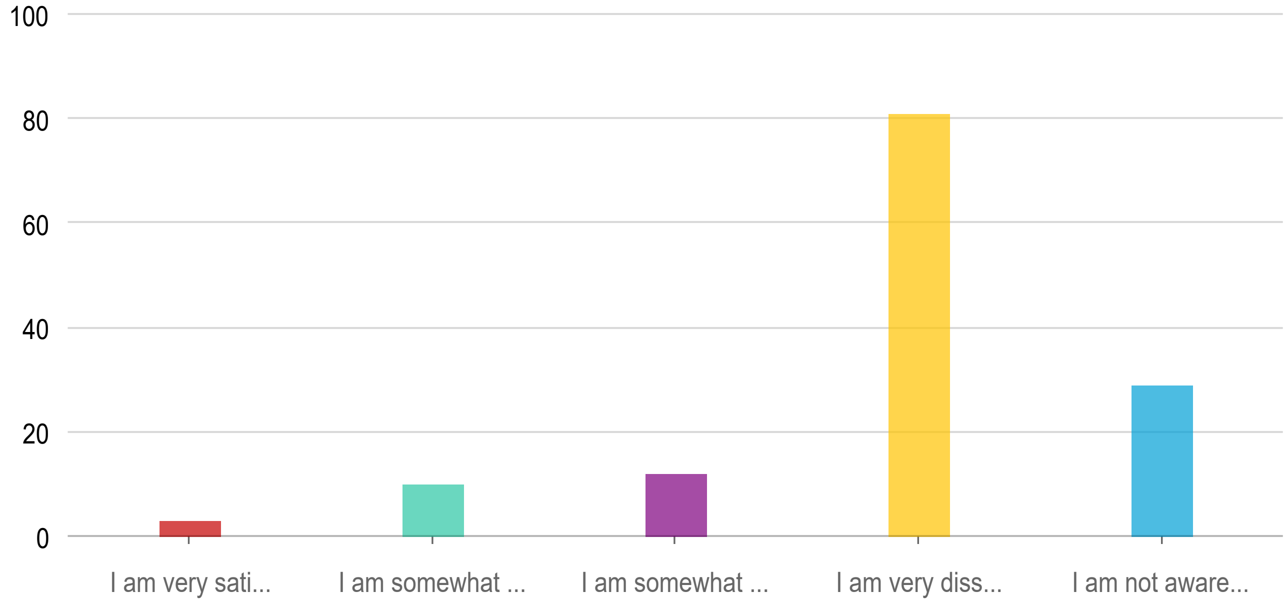
Did you know that you can view the current floodplain and other county wide…



Answers	Count	Percentage
No, I have never visited this website.	67	49.26%
Yes, I have visited this website.	66	48.53%

Answered: 133 Skipped: 3

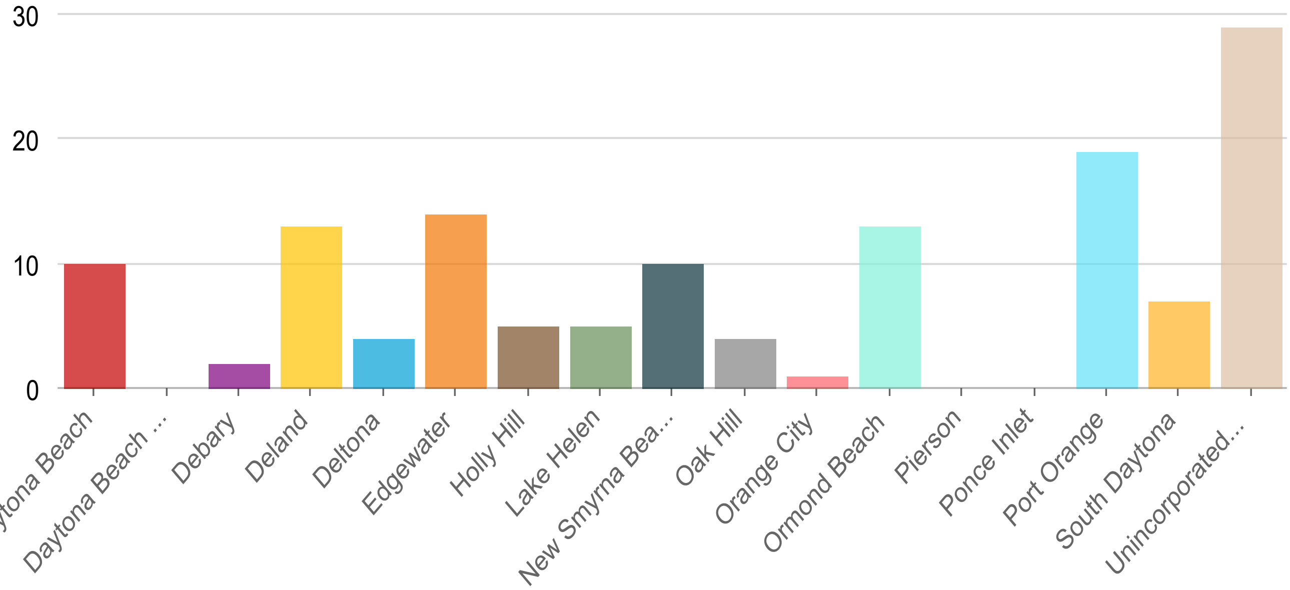
How satisfied are you with how your jurisdiction handles public involvement…



Answers	Count	Percentage
I am very satisfied	3	2.21%
I am somewhat satisfied	10	7.35%
I am somewhat dissatisfied	12	8.82%
I am very dissatisfied	81	59.56%
I am not aware of any public involvement/outreach efforts con cerning flood hazards conducted by my jurisdiction	29	21.32%

Answered: 135 Skipped: 1

Your property is located in which jurisdiction?



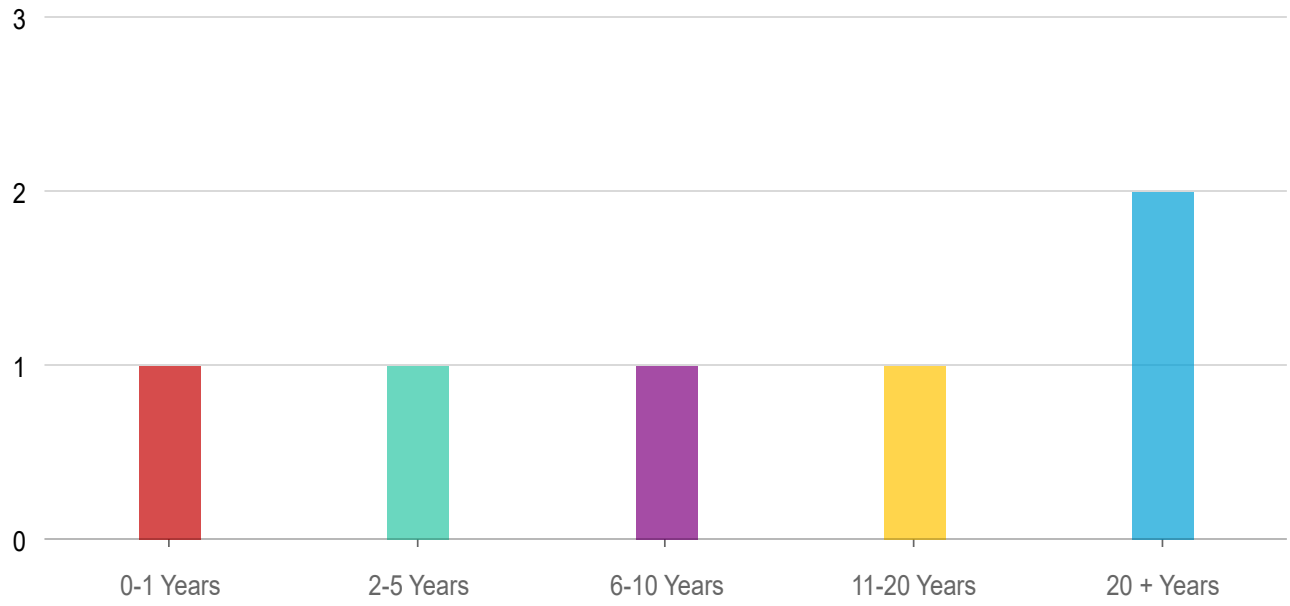
Answers	Count	Percentage
Daytona Beach	10	7.35%
Daytona Beach Shores	0	0%
Debary	2	1.47%
Deland	13	9.56%
Deltona	4	2.94%
Edgewater	14	10.29%
Holly Hill	5	3.68%
Lake Helen	5	3.68%
New Smyrna Beach	10	7.35%
Oak Hill	4	2.94%
Orange City	1	0.74%
Ormond Beach	13	9.56%
Pierson	0	0%
Ponce Inlet	0	0%

Port Orange	19	13.97%
South Daytona	7	5.15%
Unincorporated Volusia County	29	21.32%

Answered: 136 Skipped: 0

Local Business Survey for Volusia County Business Owners

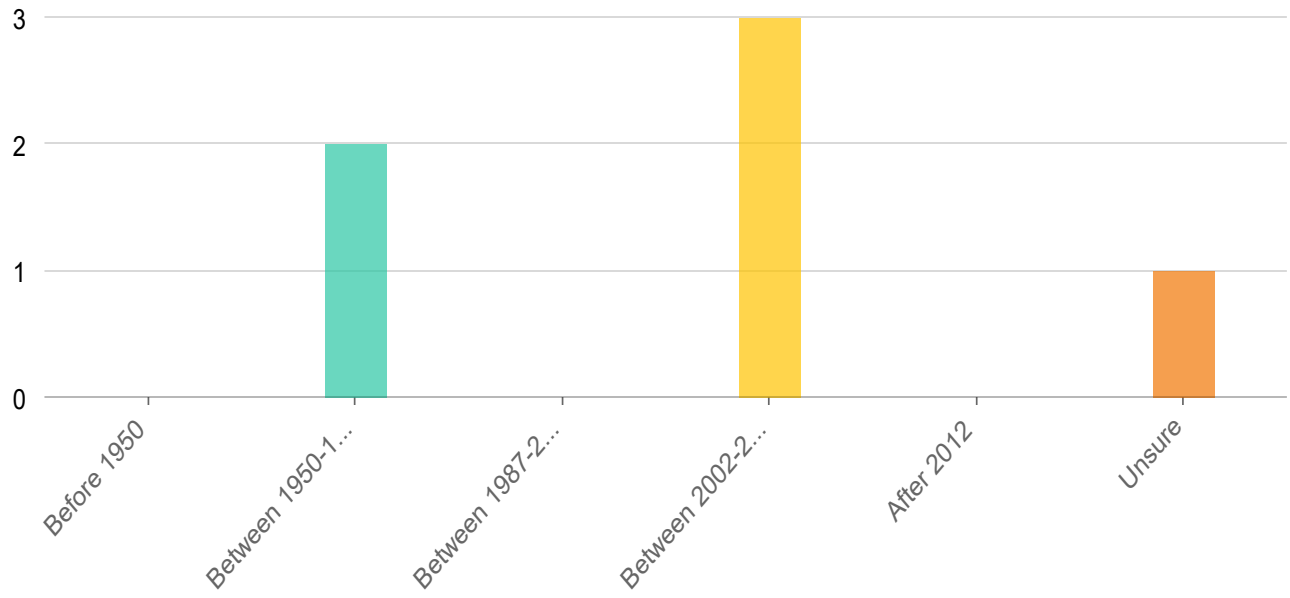
How long have you been in business at your current location?



Answers	Count	Percentage
0-1 Years	1	16.67%
2-5 Years	1	16.67%
6-10 Years	1	16.67%
11-20 Years	1	16.67%
20 + Years	2	33.33%

Answered: 6 Skipped: 0

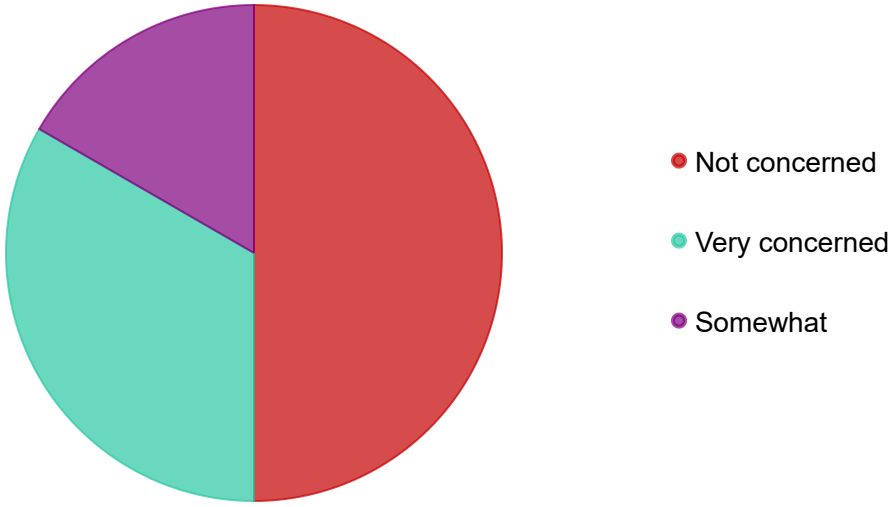
In what year was your building constructed?



Answers	Count	Percentage
Before 1950	0	0%
Between 1950-1986	2	33.33%
Between 1987-2001	0	0%
Between 2002-2012	3	50%
After 2012	0	0%
Unsure	1	16.67%

Answered: 6 Skipped: 0

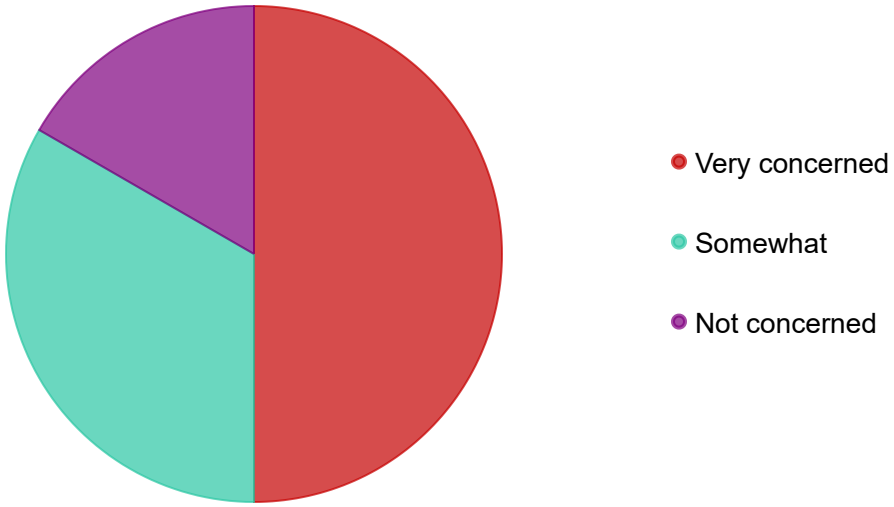
How concerned are you about the possibility of your business being flooded?



Answers	Count	Percentage
Not concerned	3	50%
Very concerned	2	33.33%
Somewhat	1	16.67%

Answered: 6 Skipped: 0

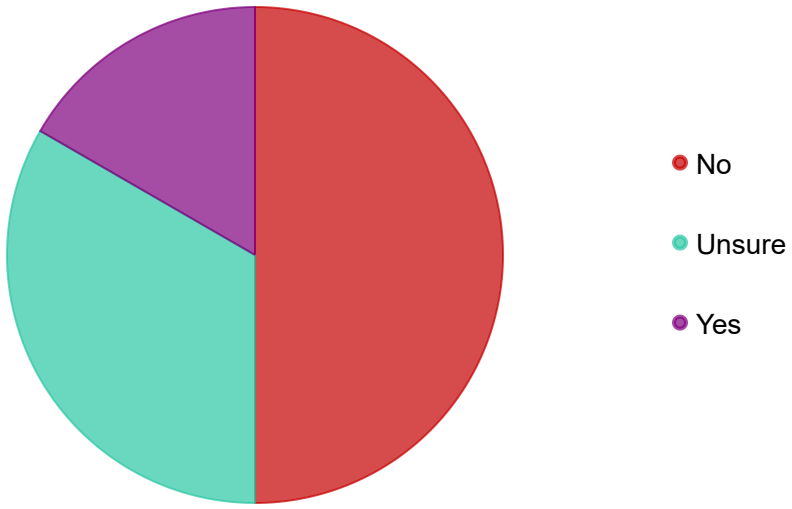
How concerned are you about the possibility of the streets accessing your…



Answers	Count	Percentage
Very concerned	3	50%
Somewhat	2	33.33%
Not concerned	1	16.67%

Answered: 6 Skipped: 0

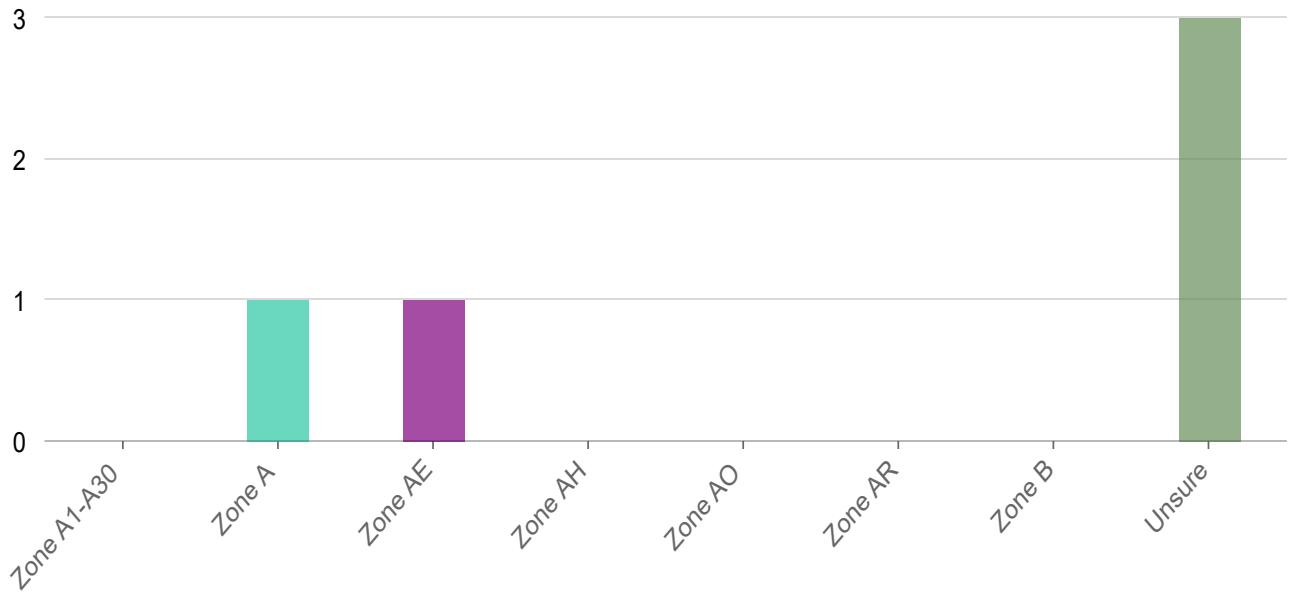
Is your business located within a designated flood hazard zone (floodplain)?



Answers	Count	Percentage
No	3	50%
Unsure	2	33.33%
Yes	1	16.67%

Answered: 6 Skipped: 0

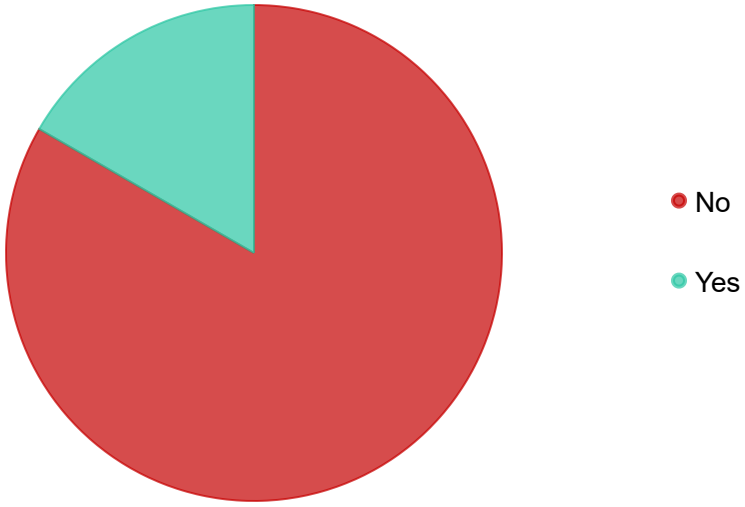
Which zone is your property located in?



Answers	Count	Percentage
Zone A1-A30	0	0%
Zone A	1	16.67%
Zone AE	1	16.67%
Zone AH	0	0%
Zone AO	0	0%
Zone AR	0	0%
Zone B	0	0%
Unsure	3	50%

Answered: 5 Skipped: 1

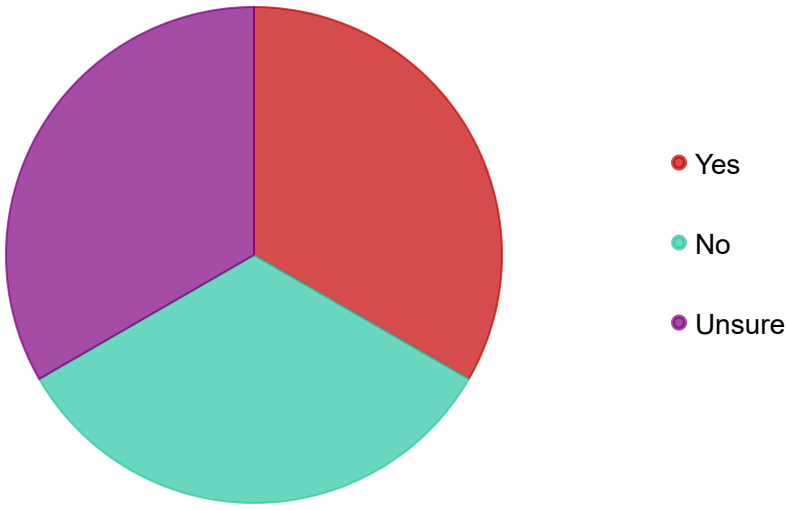
Was being located in a flood zone a concern in locating your business at its…



Answers	Count	Percentage
No	5	83.33%
Yes	1	16.67%

Answered: 6 Skipped: 0

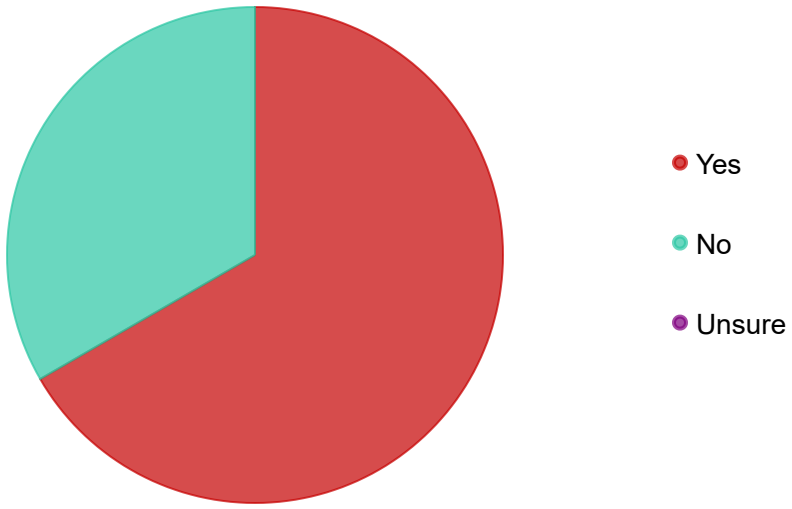
Has your place of business ever flooded due to natural/environmental causes?



Answers	Count	Percentage
Yes	2	33.33%
No	2	33.33%
Unsure	2	33.33%

Answered: 6 Skipped: 0

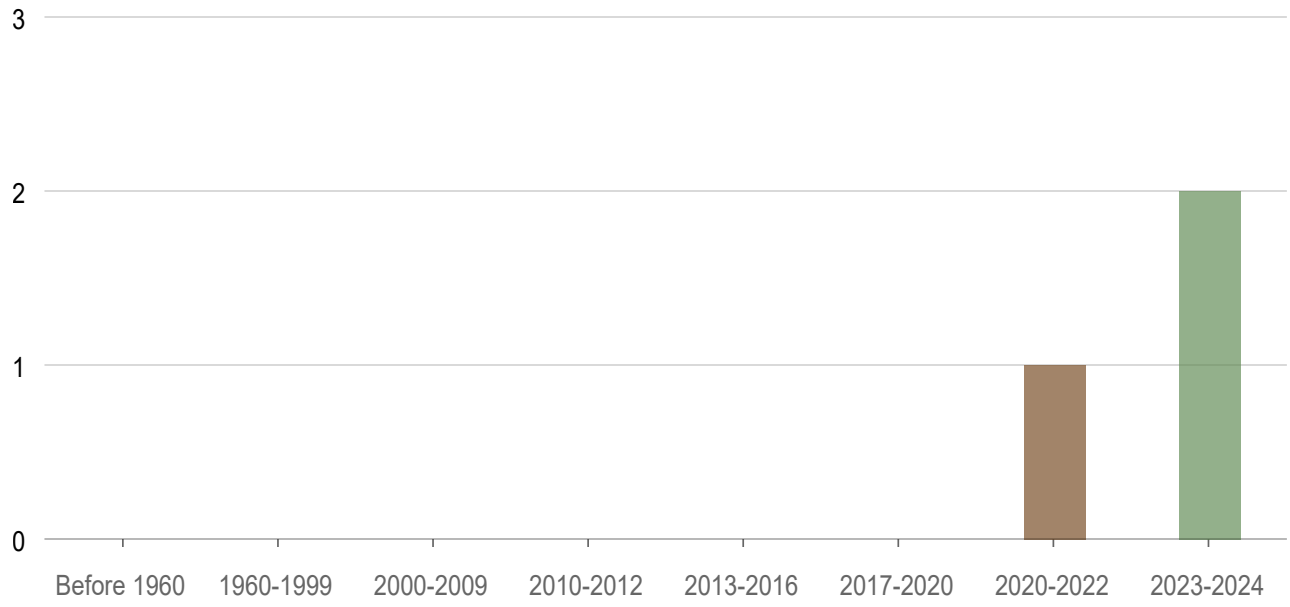
Have you seen an increase in the frequency or duration of flood events?



Answers	Count	Percentage
Yes	4	66.67%
No	2	33.33%
Unsure	0	0%

Answered: 6 Skipped: 0

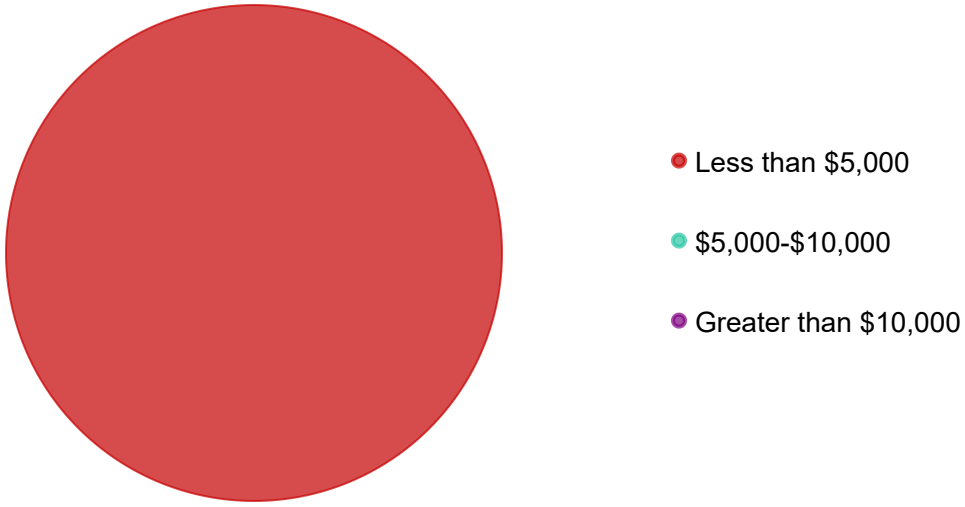
To the best of your knowledge, during which period has your place of business flood?



Answers	Count	Percentage
Before 1960	0	0%
1960-1999	0	0%
2000-2009	0	0%
2010-2012	0	0%
2013-2016	0	0%
2017-2020	0	0%
2020-2022	1	16.67%
2023-2024	2	33.33%

Answered: 2 Skipped: 4

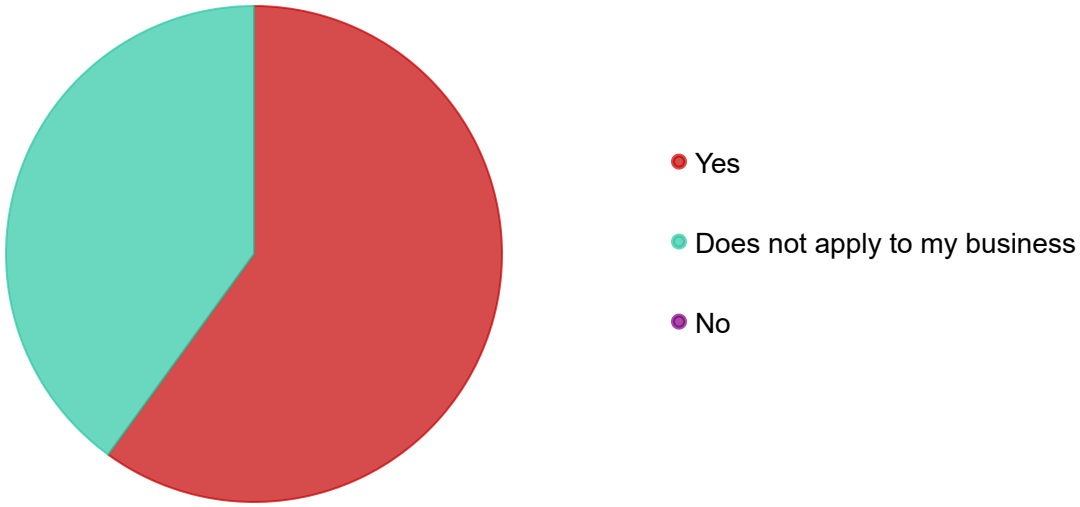
What was the approximate dollar value of all damages and losses to your…



Answers	Count	Percentage
Less than $5,000	4	66.67%
$5,000-$10,000	0	0%
Greater than $10,000	0	0%

Answered: 4 Skipped: 2

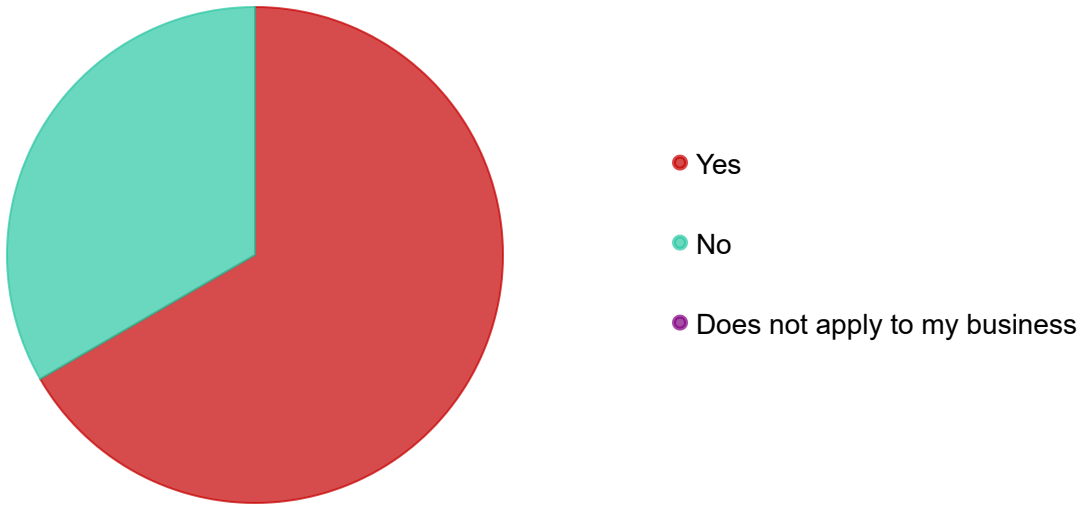
Did your business have flood insurance during time of flood events?



Answers	Count	Percentage
Yes	3	50%
Does not apply to my business	2	33.33%
No	0	0%

Answered: 5 Skipped: 1

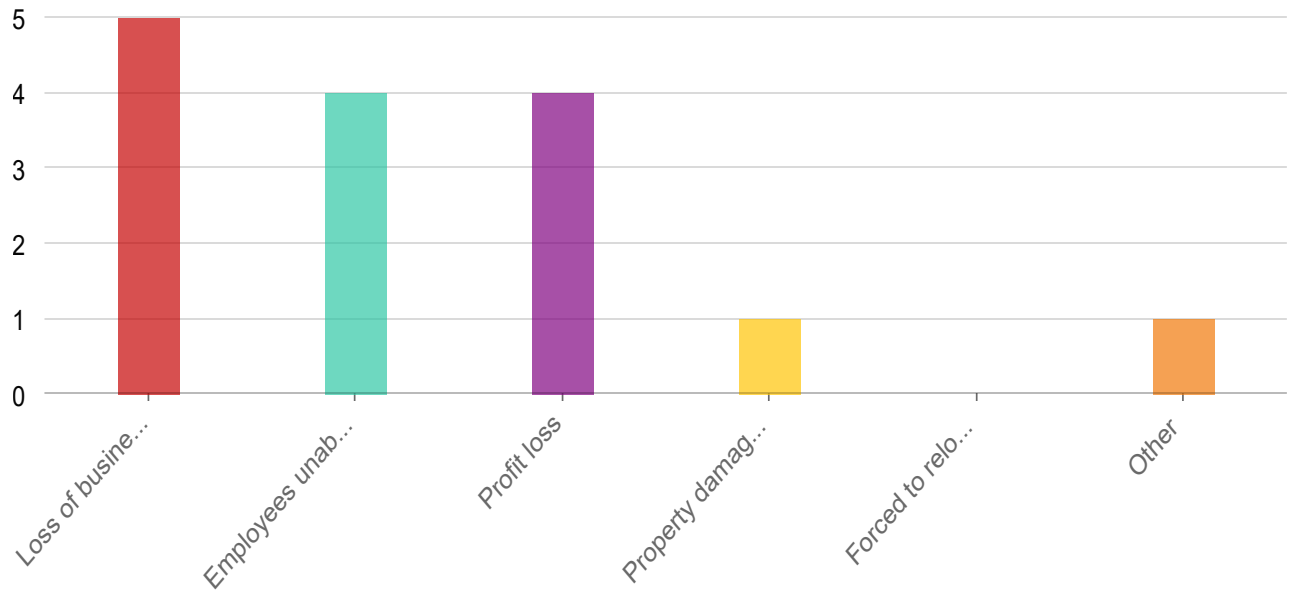
Has roadway flooding ever impacted access to your business?



Answers	Count	Percentage
Yes	4	66.67%
No	2	33.33%
Does not apply to my business	0	0%

Answered: 6 Skipped: 0

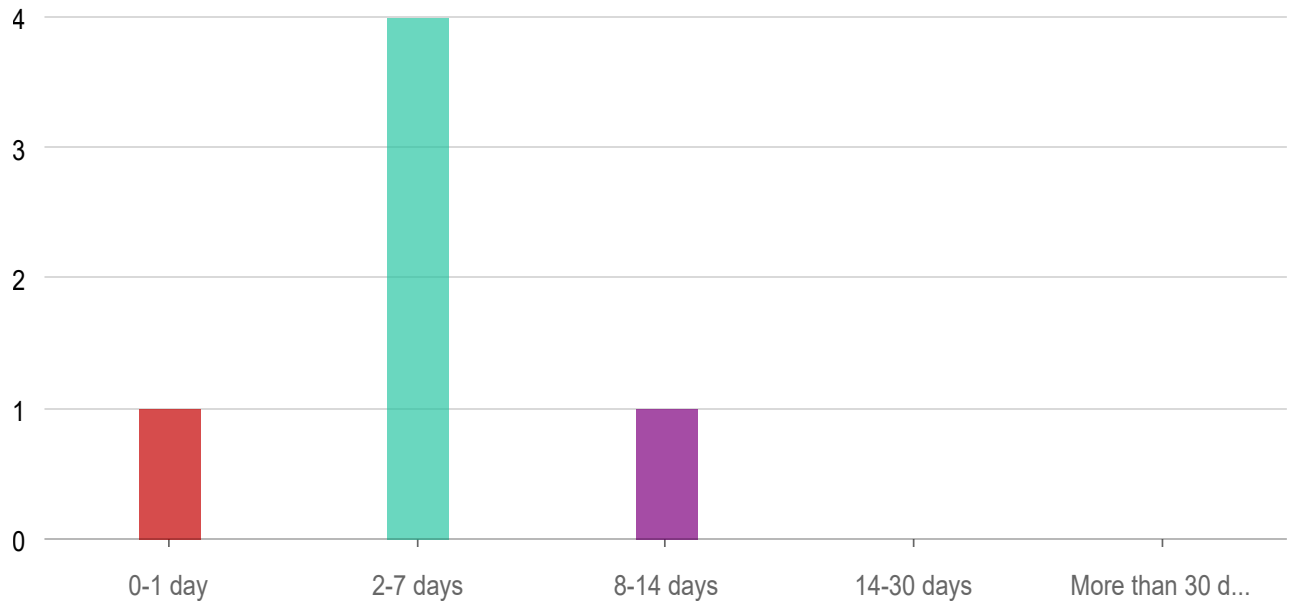
Describe, if any, the economic effect local flooding has on your business?



Answers	Count	Percentage
Loss of business days	5	83.33%
Employees unable to work	4	66.67%
Profit loss	4	66.67%
Property damage	1	16.67%
Forced to relocate	0	0%
Other	1	16.67%

Answered: 6 Skipped: 0

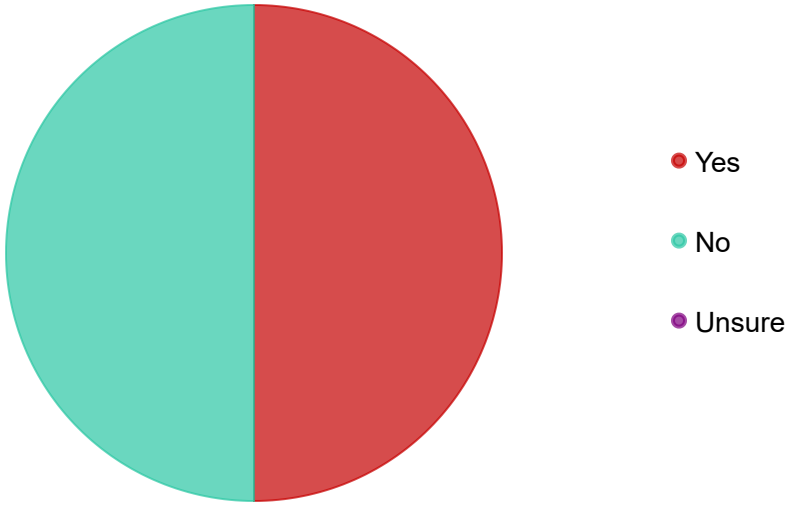
Approximately how many days in the past five years (2019-2024) has your…



Answers	Count	Percentage
0-1 day	1	16.67%
2-7 days	4	66.67%
8-14 days	1	16.67%
14-30 days	0	0%
More than 30 days in the past five years	0	0%

Answered: 6 Skipped: 0

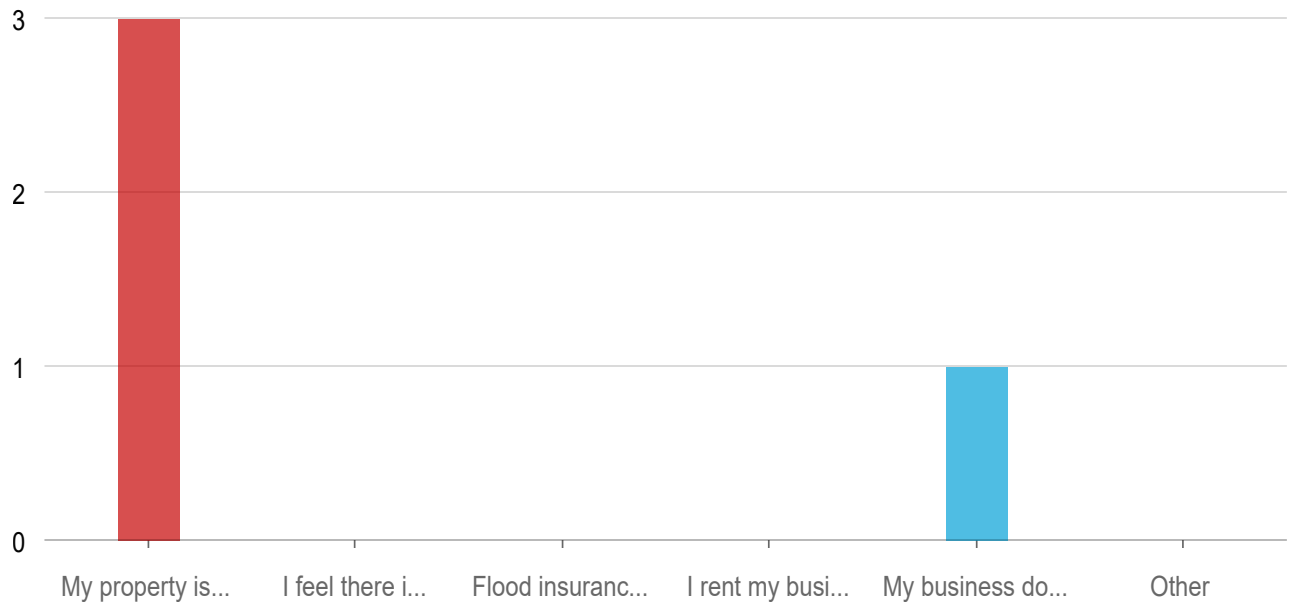
Does your business currently have flood insurance?



Answers	Count	Percentage
Yes	3	50%
No	3	50%
Unsure	0	0%

Answered: 6 Skipped: 0

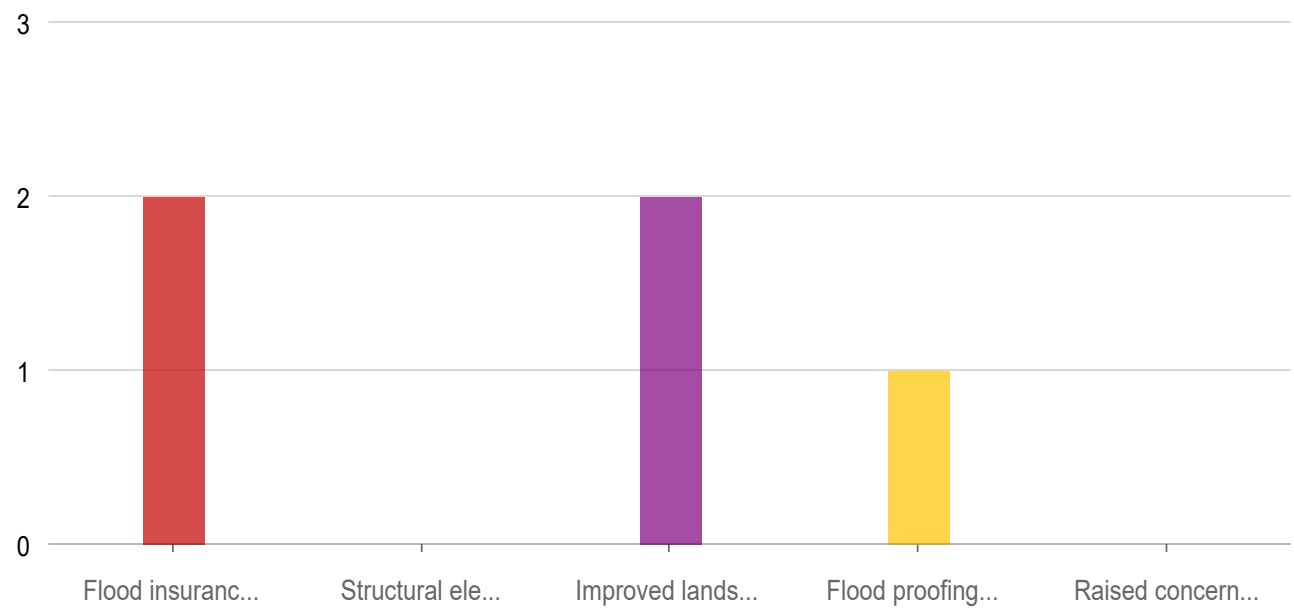
Which statement best describes why you do not have flood insurance?



Answers	Count	Percentage
My property is outside a flood zone	3	50%
I feel there is no real threat	0	0%
Flood insurance is not cost effective	0	0%
I rent my business	0	0%
My business does need flood insurance to operate	1	16.67%
Other	0	0%

Answered: 4 Skipped: 2

If flood mitigation efforts have been implemented on your property, please check all that…

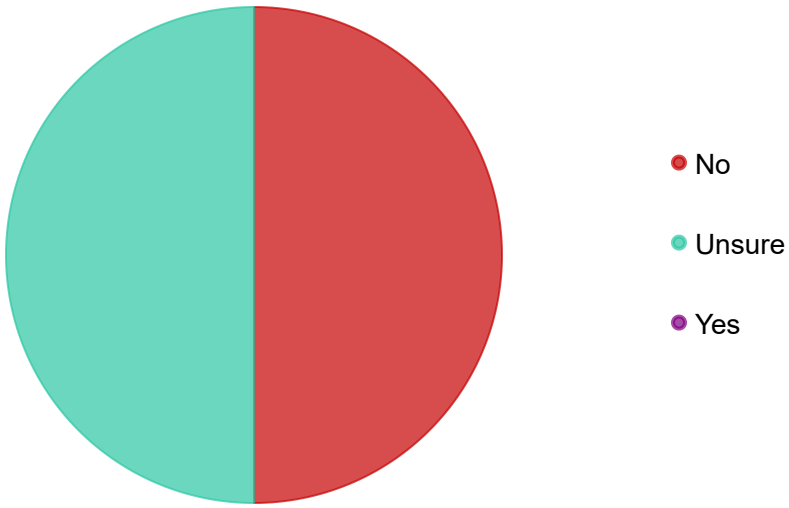


Answers	Count	Percentage
Flood insurance	2	33.33%
Structural elevation	0	0%
Improved landscaping to filter / capture water	2	33.33%
Flood proofing building prior to predicated flood events (sealing, sand bagging, etc.)	1	16.67%

Raised concerns to local business organizations or elected officials	0	0%

Answered: 3 Skipped: 3

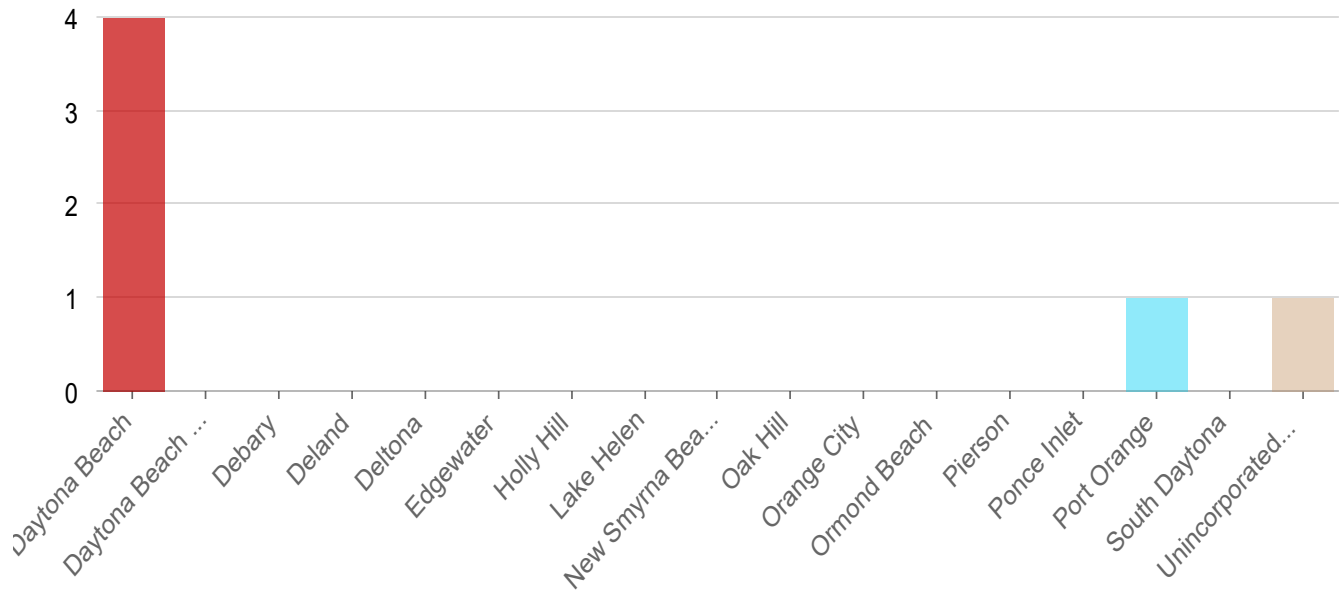
Is your property classified as a repetitive flood loss property?



Answers	Count	Percentage
No	3	50%
Unsure	3	50%
Yes	0	0%

Answered: 6 Skipped: 0

Your property is located in which jurisdiction?

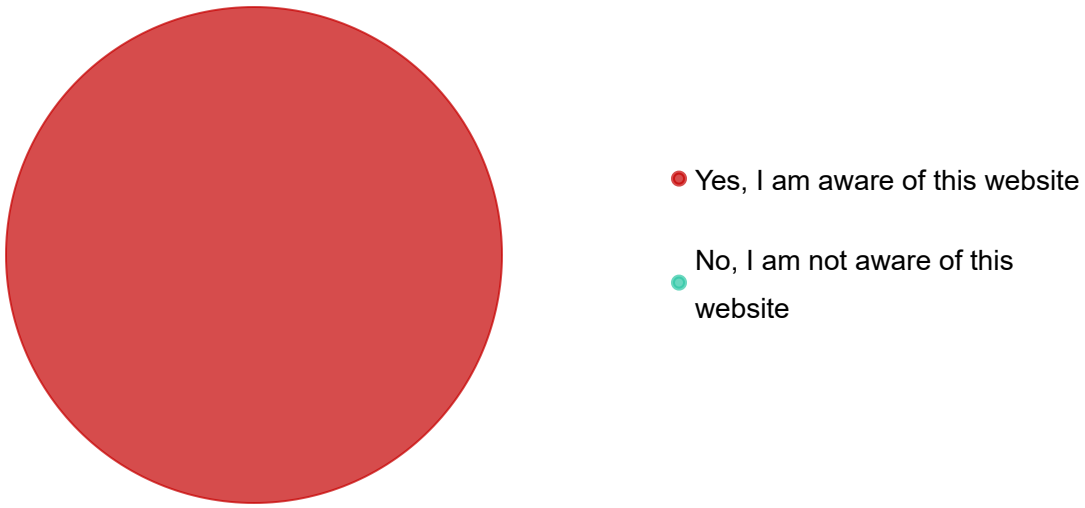


Answers	Count	Percentage
Daytona Beach	4	66.67%
Daytona Beach Shores	0	0%
Debary	0	0%
Deland	0	0%
Deltona	0	0%
Edgewater	0	0%
Holly Hill	0	0%
Lake Helen	0	0%
New Smyrna Beach	0	0%
Oak Hill	0	0%
Orange City	0	0%
Ormond Beach	0	0%
Pierson	0	0%
Ponce Inlet	0	0%

Port Orange	1	16.67%
South Daytona	0	0%
Unincorporated	1	16.67%

Answered: 6 Skipped: 0

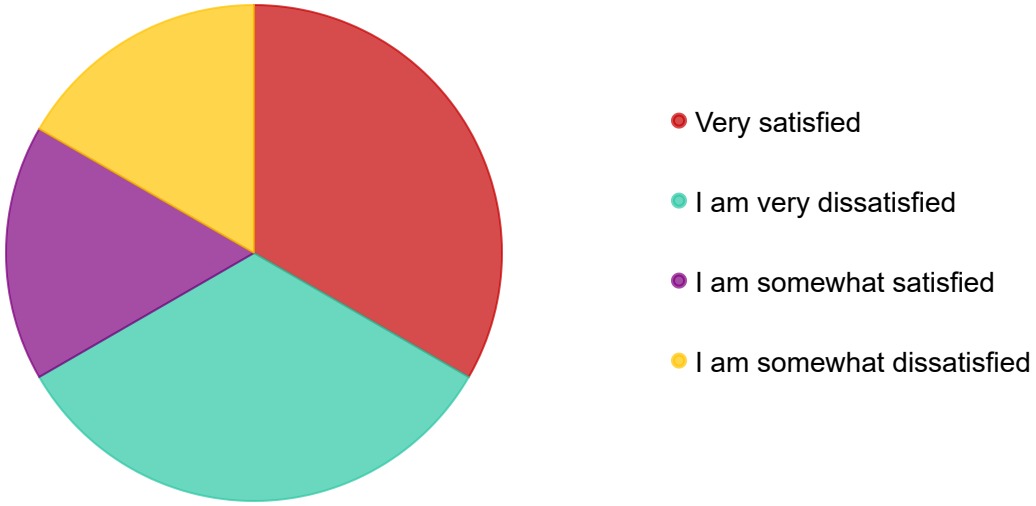
Did you know that you can view the current flood plain and other County-wid…



Answers	Count	Percentage
Yes, I am aware of this website	6	100%
No, I am not aware of this website	0	0%

Answered: 6 Skipped: 0

How satisfied are you with how your jurisdiction handles outreach concernin…

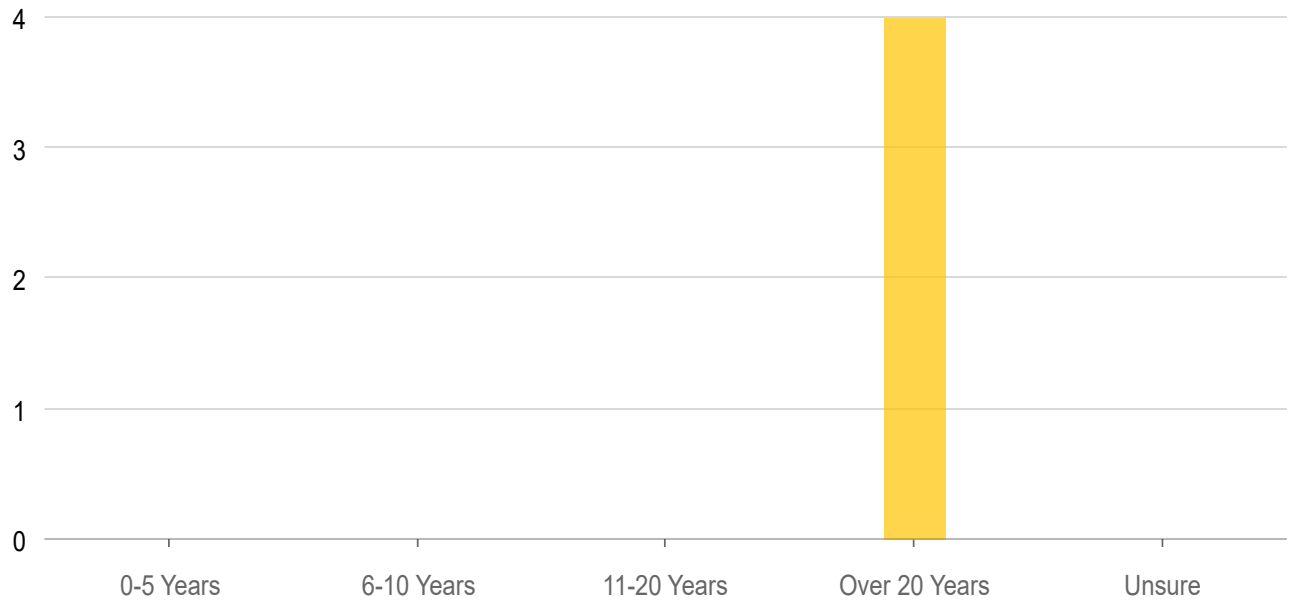


Answers	Count	Percentage
Very satisfied	2	33.33%
I am very dissatisfied	2	33.33%
I am somewhat satisfied	1	16.67%
I am somewhat dissatisfied	1	16.67%

Answered: 6 Skipped: 0

Neighborhood Association Survey for Volusia Residents

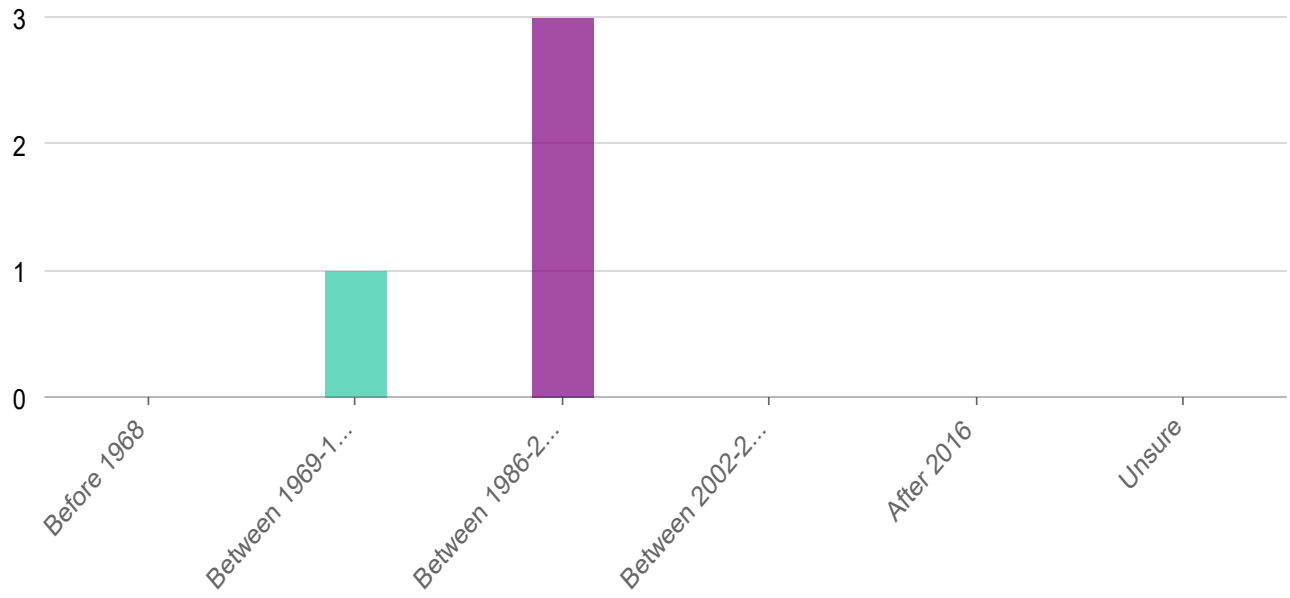
How long has your neighborhood association been active?



Answers	Count	Percentage
0-5 Years	0	0%
6-10 Years	0	0%
11-20 Years	0	0%
Over 20 Years	4	100%
Unsure	0	0%

Answered: 4 Skipped: 0

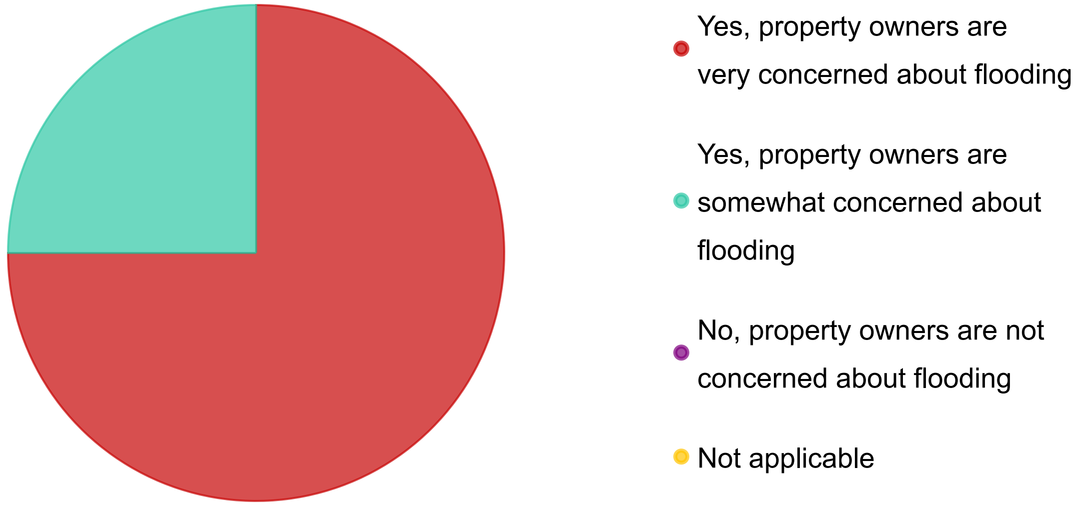
In what year were most of the homes in your coverage area built?



Answers	Count	Percentage
Before 1968	0	0%
Between 1969-1987	1	25%
Between 1986-2001	3	75%
Between 2002-2015	0	0%
After 2016	0	0%
Unsure	0	0%

Answered: 4 Skipped: 0

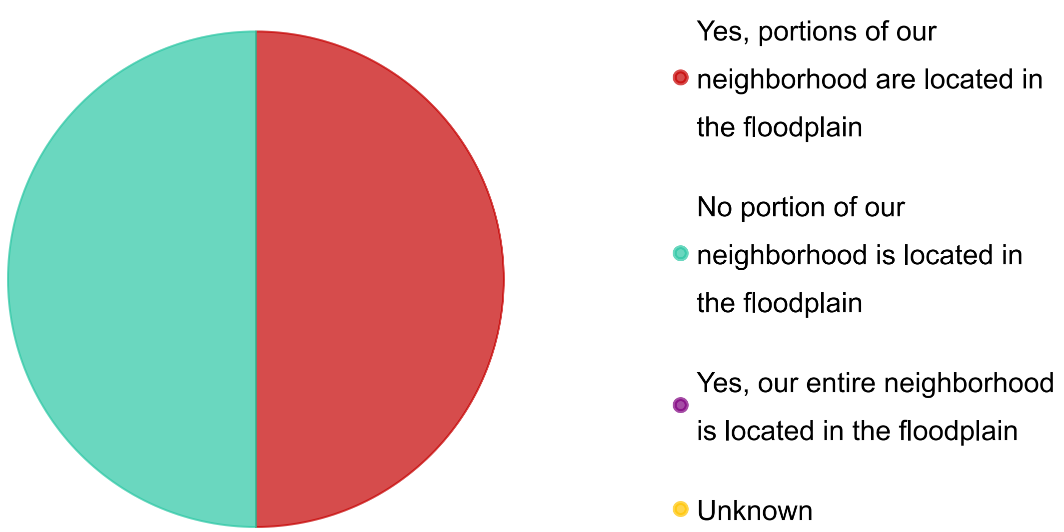
Is flooding a concern for property owners in your association?



Answers	Count	Percentage
Yes, property owners are very concerned about flooding	3	75%
Yes, property owners are somewhat concerned about flooding	1	25%
No, property owners are not concerned about flooding	0	0%
Not applicable	0	0%

Answered: 4 Skipped: 0

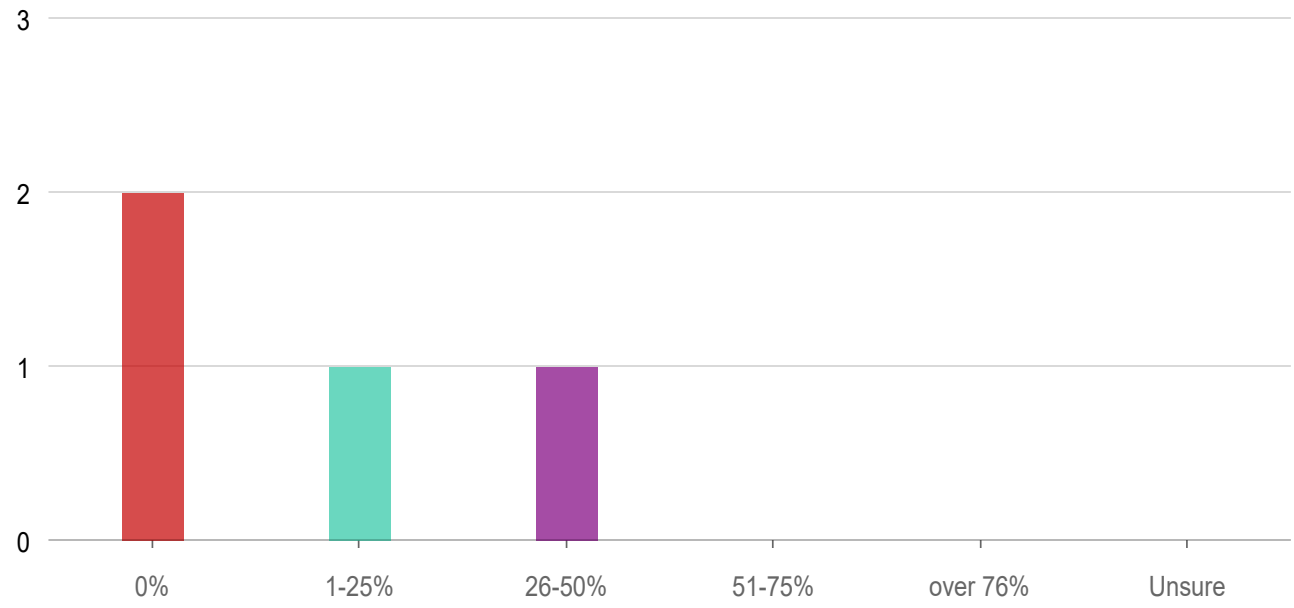
Is your HOA neighborhood located in the floodplain?



Answers	Count	Percentage
Yes, portions of our neighborhood are located in the floodplain	2	50%
No portion of our neighborhood is located in the floodplain	2	50%
Yes, our entire neighborhood is located in the floodplain	0	0%
Unknown	0	0%

Answered: 4 Skipped: 0

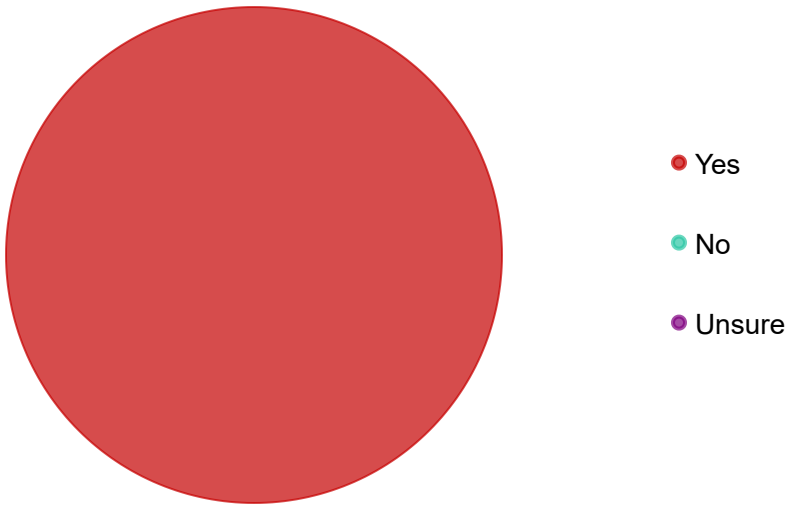
Approximately what percentage of the homes within your association are…



Answers	Count	Percentage
0%	2	50%
1-25%	1	25%
26-50%	1	25%
51-75%	0	0%
over 76%	0	0%
Unsure	0	0%

Answered: 4 Skipped: 0

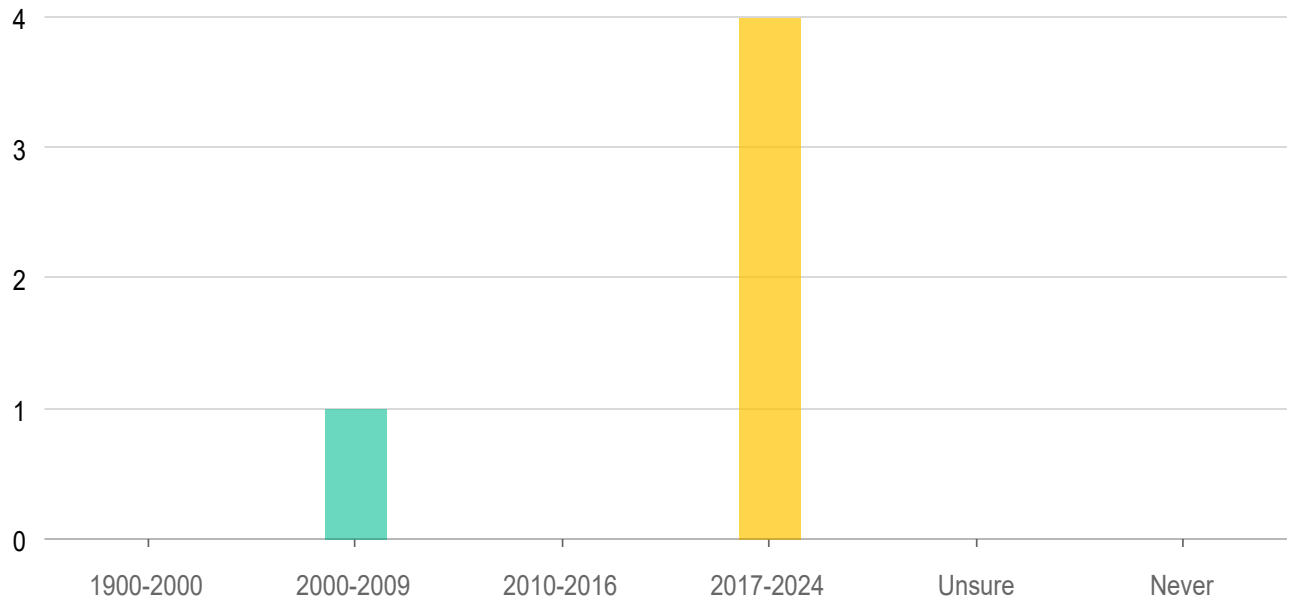
Have homes in your association ever flooded due to natural environmental…



Answers	Count	Percentage
Yes	4	100%
No	0	0%
Unsure	0	0%

Answered: 4 Skipped: 0

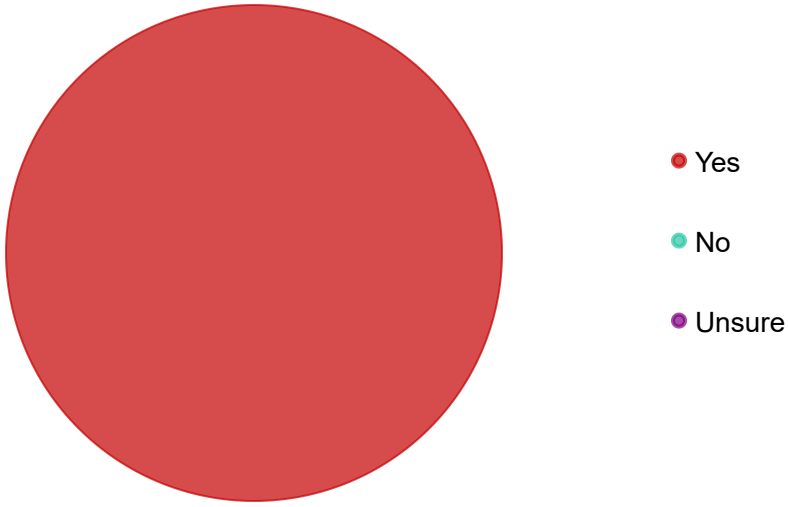
To the best of your knowledge, during which time period did flood occur in your…



Answers	Count	Percentage
1900-2000	0	0%
2000-2009	1	25%
2010-2016	0	0%
2017-2024	4	100%
Unsure	0	0%
Never	0	0%

Answered: 4 Skipped: 0

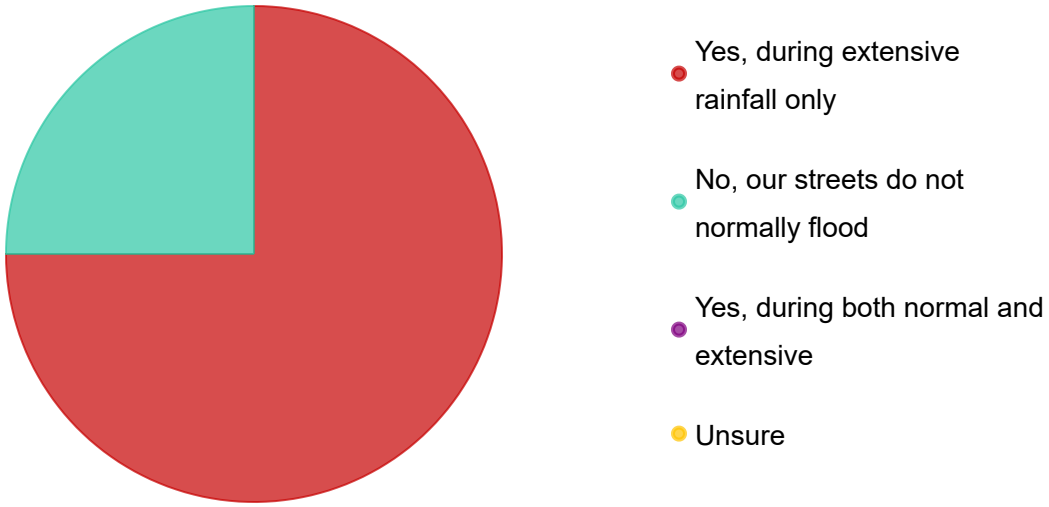
Have you noticed an increase in frequency and duration of home flood events?



Answers	Count	Percentage
Yes	4	100%
No	0	0%
Unsure	0	0%

Answered: 4 Skipped: 0

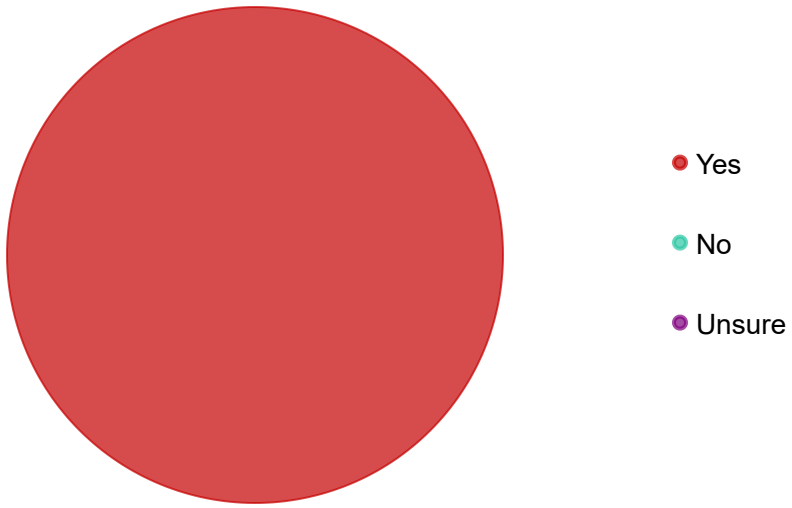
Do the roadways in your neighborhood experience major flooding during…



Answers	Count	Percentage
Yes, during extensive rainfall only	3	75%
No, our streets do not normally flood	1	25%
Yes, during both normal and extensive	0	0%
Unsure	0	0%

Answered: 4 Skipped: 0

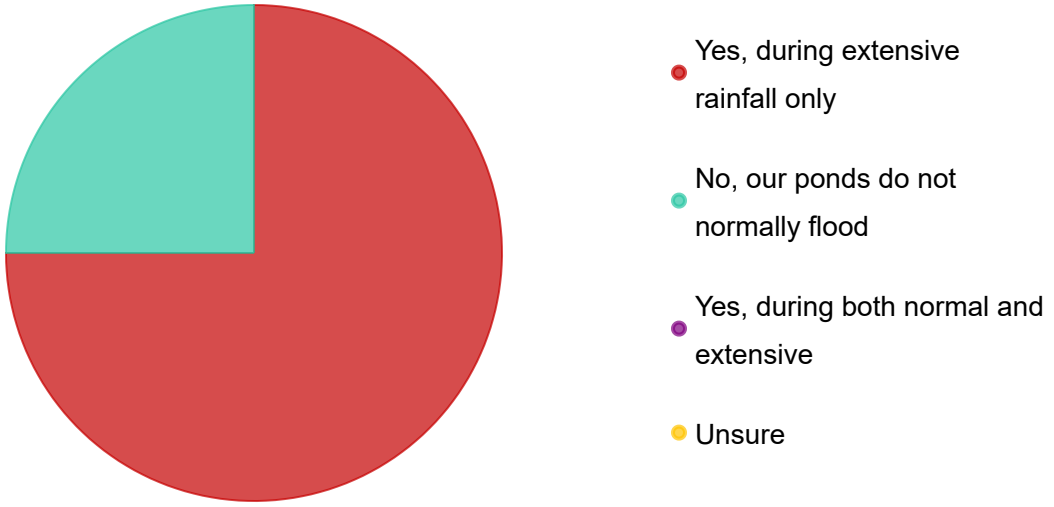
Have you noticed an increase in frequency and duration of roadway flood…



Answers	Count	Percentage
Yes	4	100%
No	0	0%
Unsure	0	0%

Answered: 4 Skipped: 0

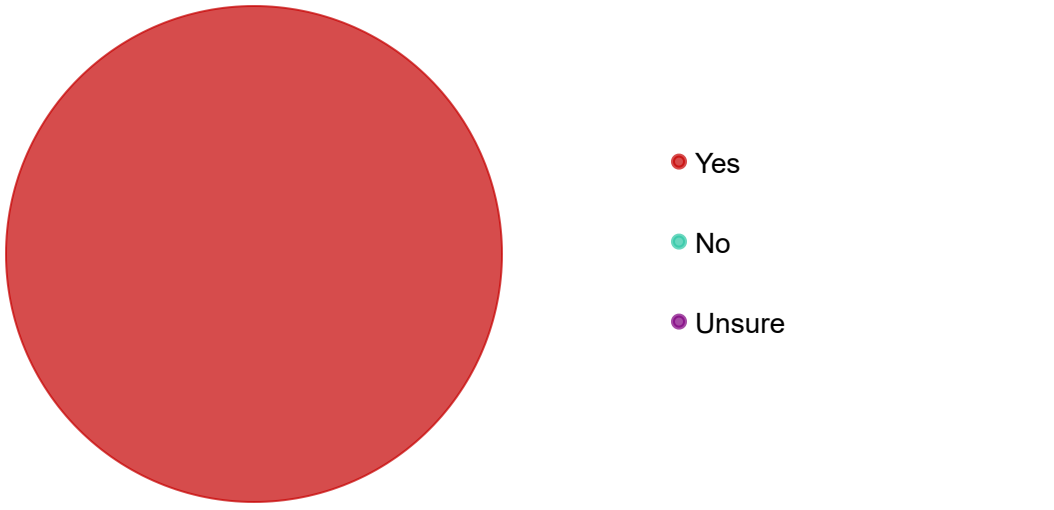
Do retention ponds in your neighborhood flood during normal or extensive…



Answers	Count	Percentage
Yes, during extensive rainfall only	3	75%
No, our ponds do not normally flood	1	25%
Yes, during both normal and extensive	0	0%
Unsure	0	0%

Answered: 4 Skipped: 0

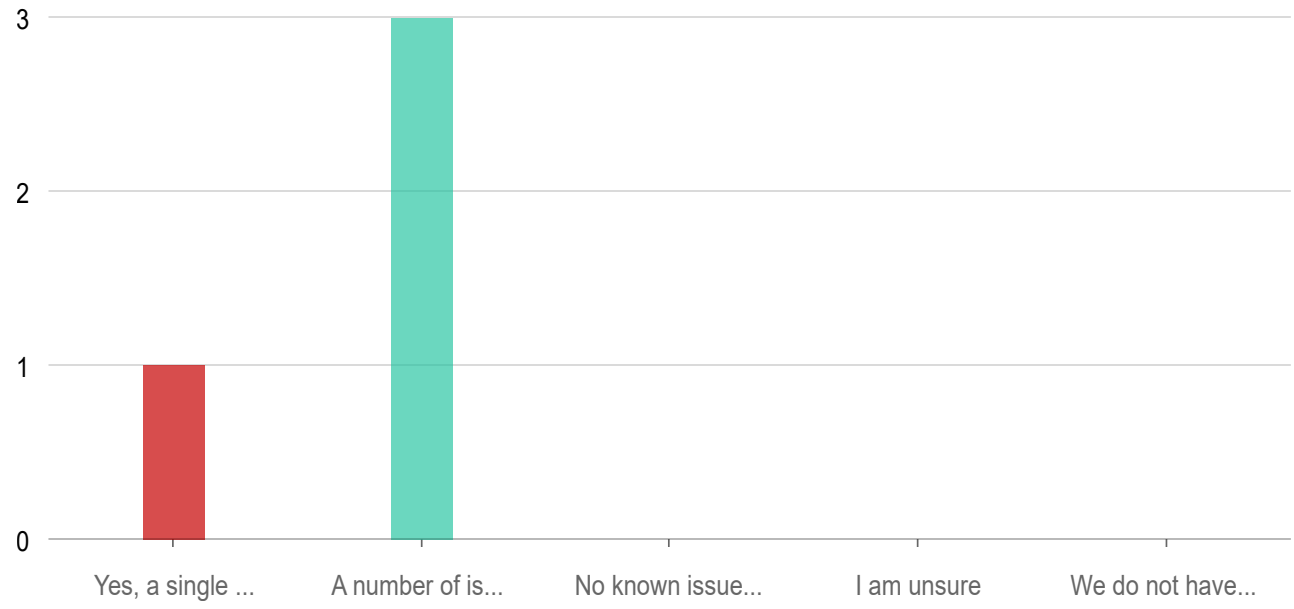
Have you noticed an increase in frequency and duration of pond flood events?



Answers	Count	Percentage
Yes	4	100%
No	0	0%
Unsure	0	0%

Answered: 4 Skipped: 0

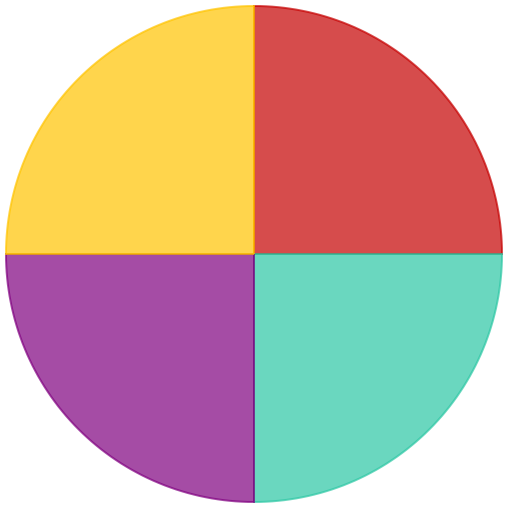
Has a known problem area been identified as the source of most flooding…



Answers	Count	Percentage
Yes, a single issue has been identified as the main contributor to the flooding	1	25%
A number of issues have been identified which contribute to th e flooding	3	75%
No known issues or sources have been identified which contri bute to the flooding	0	0%
I am unsure	0	0%
We do not have flooding issues	0	0%

Answered: 4 Skipped: 0

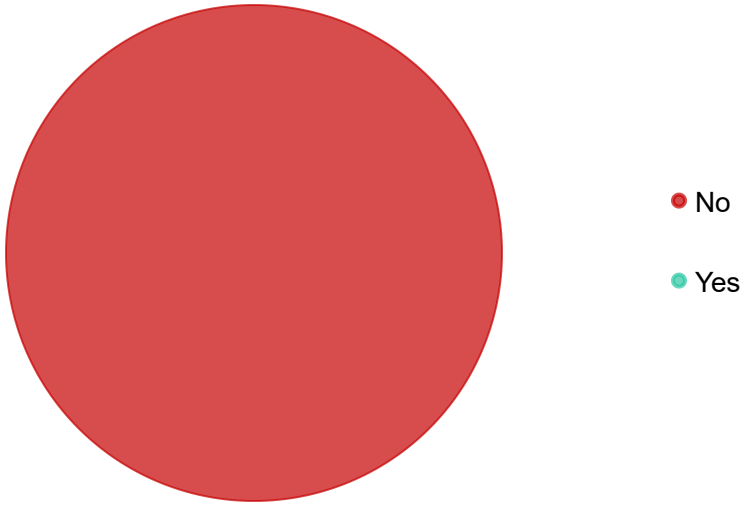
Have homes in your association undergone flood mitigation efforts?



Answers	Count	Percentage
Yes, a majority of homes have undergone flood mitigation efforts	1	25%
Yes, some homes have undergone flood mitigation efforts	1	25%
No homes have undergone flood mitigation efforts	1	25%
Unsure	1	25%

Answered: 4 Skipped: 0

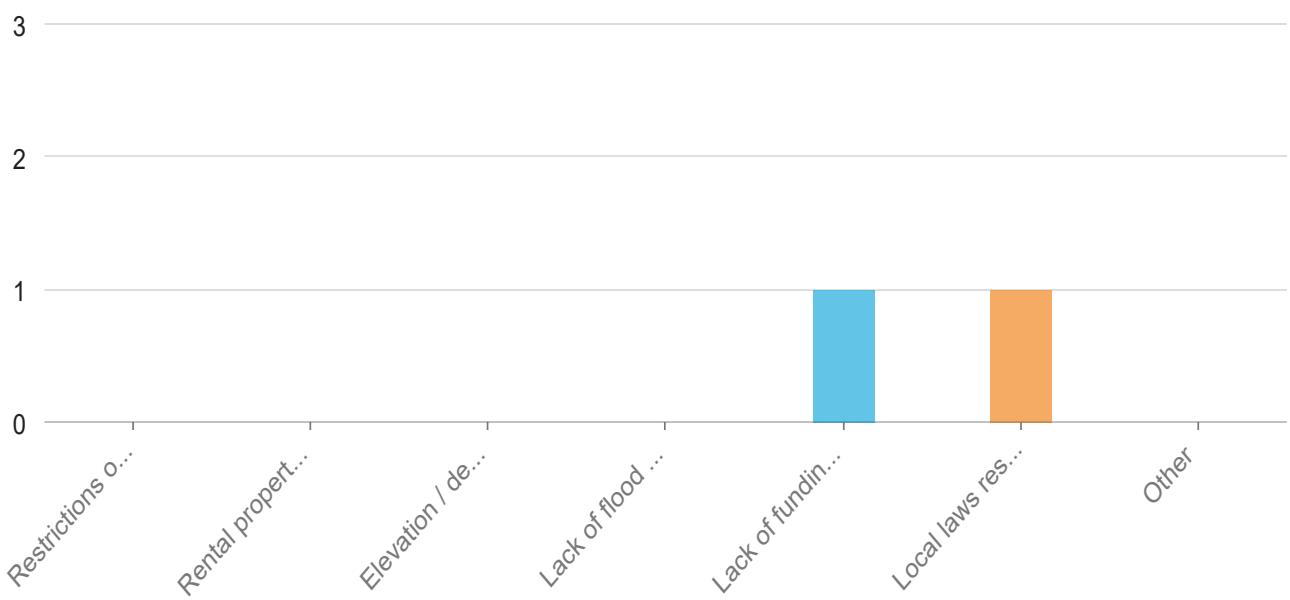
Are there any HOA restrictions to structural improvements that, if removed,…



Answers	Count	Percentage
No	4	100%
Yes	0	0%

Answered: 4 Skipped: 0

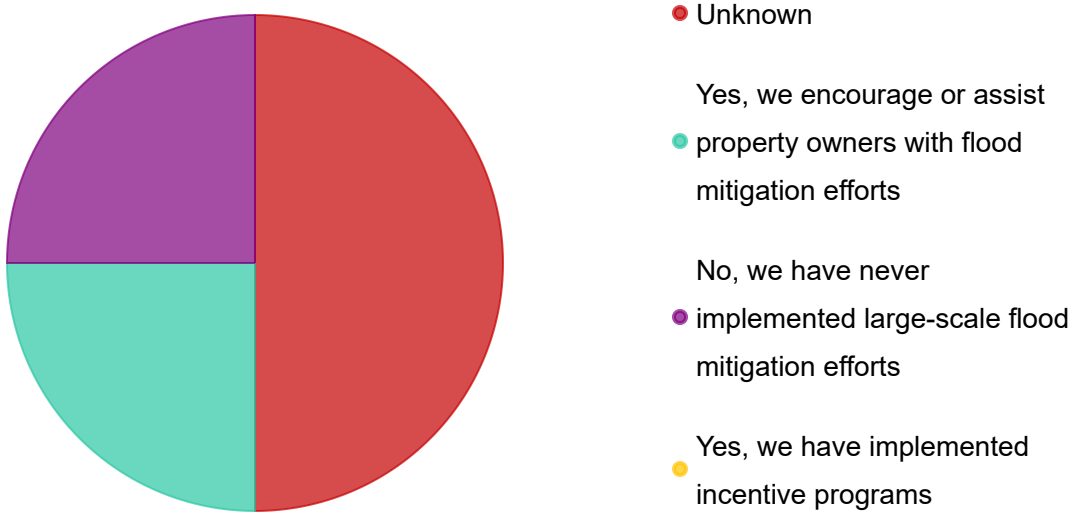
Select the types of restrictions in your HOA that prevent flood mitigation efforts.



Answers	Count	Percentage
Restrictions on landscaping in governing documents	0	0%
Rental properties not properly maintained	0	0%
Elevation / design restrictions	0	0%
Lack of flood insurance coverage	0	0%
Lack of funding for proper infrastructure maintenance	1	25%
Local laws restricting mitigation	1	25%
Other	0	0%

Answered: 1 Skipped: 3

Has your association ever implemented large-scale flood mitigation efforts?

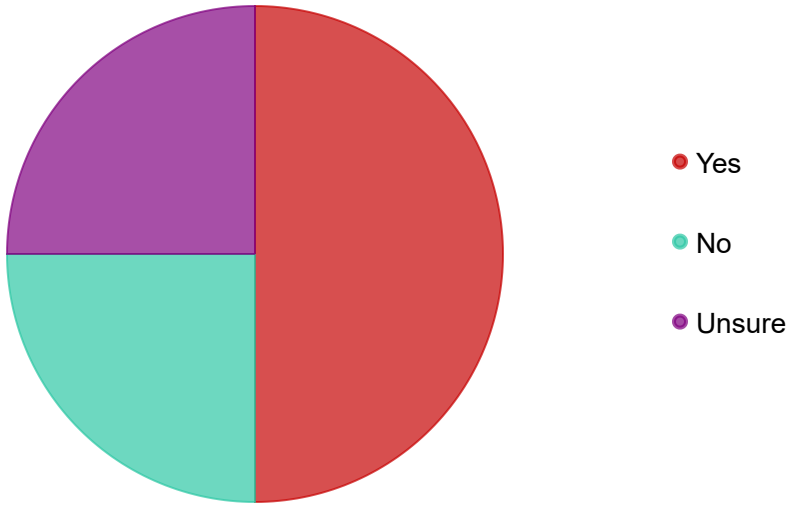


Answers	Count	Percentage
Unknown	2	50%
Yes, we encourage or assist property owners with flood mitigation efforts	1	25%

No, we have never implemented large-scale flood mitigation efforts	1	25%
Yes, we have implemented incentive programs	0	0%

Answered: 4 Skipped: 0

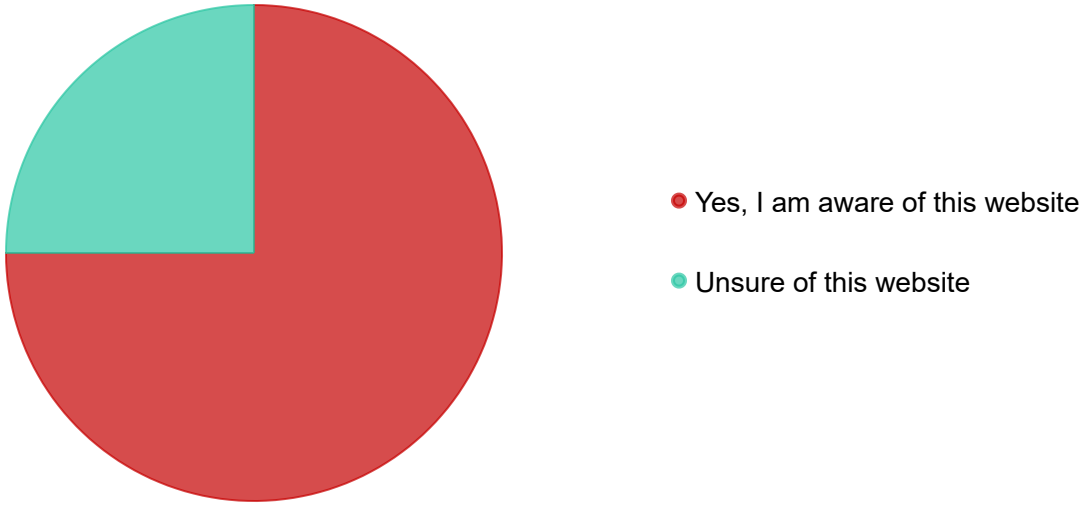
Are there homes in your association area that are classified as Repetitive…



Answers	Count	Percentage
Yes	2	50%
No	1	25%
Unsure	1	25%

Answered: 4 Skipped: 0

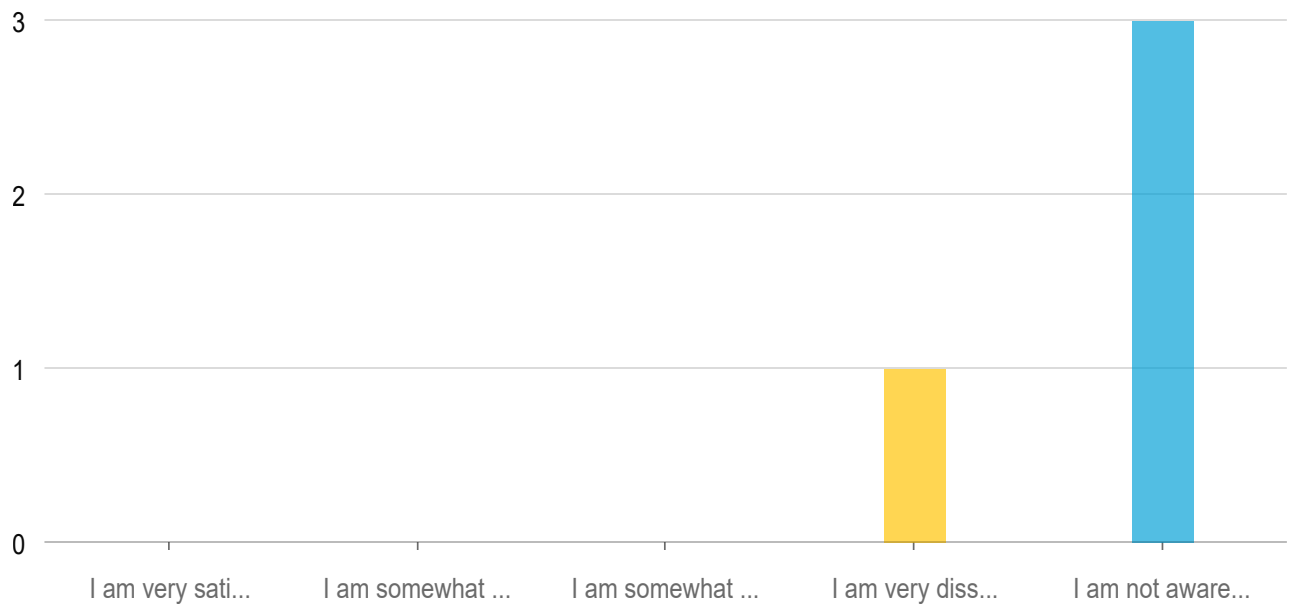
Did you know that you can view the current floodplain and other County-wid…



Answers	Count	Percentage
Yes, I am aware of this website	3	75%
Unsure of this website	1	25%

Answered: 4 Skipped: 0

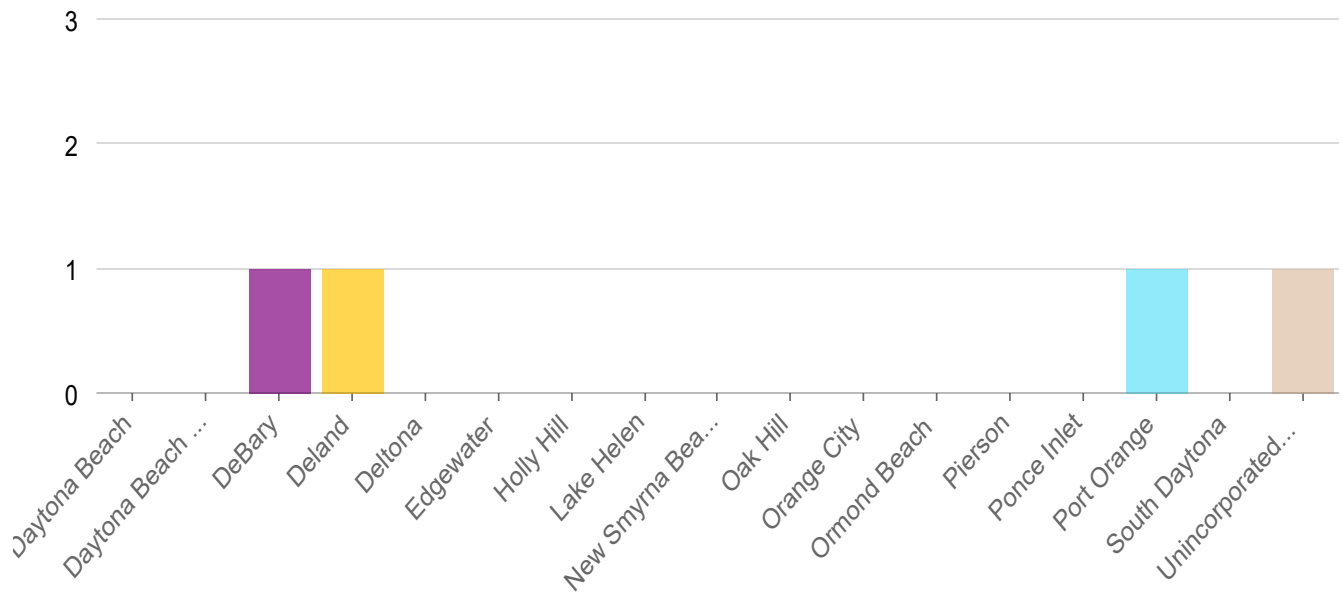
How satisfied are you with how your jurisdiction handles public involvement…



Answers	Count	Percentage
I am very satisfied	0	0%
I am somewhat satisfied	0	0%
I am somewhat dissatisfied	0	0%
I am very dissatisfied	1	25%
I am not aware of any public involvement/outreach efforts concerning flood hazards	3	75%

Answered: 4 Skipped: 0

Which jurisdiction is your HOA community?



Answers	Count	Percentage
Daytona Beach	0	0%
Daytona Beach Shores	0	0%
DeBary	1	25%
Deland	1	25%
Deltona	0	0%

Edgewater	0	0%
Holly Hill	0	0%
Lake Helen	0	0%
New Smyrna Beach	0	0%
Oak Hill	0	0%
Orange City	0	0%
Ormond Beach	0	0%
Pierson	0	0%
Ponce Inlet	0	0%
Port Orange	1	25%
South Daytona	0	0%
Unincorporated Volusia	1	25%

Answered: 4 Skipped: 0

Please provide a range of the number of homes within your community.

The word cloud requires at least 20 answers to show.

Word	Count
69	1
332	1
1568	1
Homesites	1

Answered: 3 Skipped: 1

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

This section of the Local Mitigation Strategy cross-references the locations of all critical facilities within Volusia County and its jurisdictions with environmental layers pertaining to the following hazard layers:

- Storm Surge Threat
- Fire Risk Zone
- Wind Risk
- FEMA Flood Zone

There are over 500 critical facilities identified within Volusia County and its jurisdictions. The critical facilities covered in this report cover the following types of facilities.

- Transportation
- Public Buildings
- Waste Water Systems
- Medical Facilities
- Schools
- Educational Facilities

Also covered in this section are **Water and Sewage Treatment Facilities**.

The tables on the following pages depict the critical facilities, by jurisdiction and facility type, that are located within Volusia County, Florida. Each critical facility is cross-referenced with the hazard zones to depict risk for the hazards listed above. This analysis involves numerous sources, such as:

- HAZUS
- National Hurricane Center
- U.S. Forest Service
- FEMA
- American Society of Civil Engineers
- ECFRPC
- Volusia County and Jurisdictions
- FDEP

Table 1: Jurisdictional Summary of Critical Assets

Jurisdiction	Jurisdiction Type	# of Assets	Total Financial Exposure (Assets)	Mean Year Built (Assets)
Volusia County	County	578	$10,940,822,969	1984
Daytona Beach	City	74	$3,407,757,509	1975
Daytona Beach Shores	City	2	$8,741,800	1984
Debary	City	7	$1,481,752,946	1993
DeLand	City	47	$1,077,176,288	1976
DeLeon Springs	Census Designated Place	3	$137,054,550	1984
Deltona	City	27	$431,515,600	1986
Edgewater	City	14	$421,779,479	1979
Holly Hill	City	10	$170,752,230	1978
Lake Helen	City	6	$35,579,280	1987
New Smyrna Beach	City	28	$571,274,878	1975
Oak Hill	City	4	$ 21,068,949	1983
Orange City	City	9	$277,059,730	1985
Ormond Beach	City	31	$314,347,059	1982
Pierson	City	4	$52,222,180	1982
Ponce Inlet	City	2	$ 8,741,800	1993
Port Orange	City	22	$789,670,500	1985
South Daytona	City	6	$33,242,490	1977
Enterprise	Unincorporated Community	2	$10,662,390	1983
Mims	Census Designated Place	1	$1,022,440	1997
Osteen	Unincorporated Community	3	$11,006,700	1989
Multi-Jurisdictional		276	$1,678,394,171	1991

Table 2: Total Asset Type for Entire County

Asset Type	Count
Medical Care Facilities	11
Emergency Operation Centers	2
Fire Stations	56
Police Stations	30
Schools	151
Communication Facilities	24
Electric Power Facilities	3
Waste Water Facilities	11
Potable Water Facilities	1
Natural Gas Pipelines	5
Airport Facilities	6
Airport Runways	14
Bus Facilities	2
Ferry Facilities	2
Railway Bridges	17
Port Facilities	10
Highway Bridges	238
TOTAL	583

Table 3: Critical Asset Hazard Analysis

Asset Name	Latitude	Longitude	Asset Type	Cat1 Surge	Cat3 Surge	Cat5 Surge	Wildfire Risk	Wind Zone	FEMA Flood Zone
Tomoka River	29.262661	-81.117817	Highway Bridges				Low	160 MPH	AE
FECRR - Tymber Crk Rd	29.332914	-81.131025	Highway Bridges				Moderate	160 MPH	
US-1	29.335833	-81.130972	Highway Bridges				Moderate	160 MPH	
Tomoka River	29.305056	-81.094197	Highway Bridges				Moderate	160 MPH	AE
Tomoka River	29.305189	-81.093964	Highway Bridges				Moderate	160 MPH	AE
Tomoka River	29.342186	-81.086317	Highway Bridges				Moderate	160 MPH	AE
I-95	29.403769	-81.155186	Highway Bridges				Moderate	160 MPH	
Canal to Bulow Creek	29.414089	-81.148136	Highway Bridges			X	Moderate	160 MPH	
Drainage Canal	29.353408	-81.102561	Highway Bridges		X	X	High	160 MPH	AE
Canal	29.351153	-81.099392	Highway Bridges				High	160 MPH	AE
Bulow Creek	29.407631	-81.121847	Highway Bridges	X	X	X	High	160 MPH	AE
Intracoastal Waterway	29.408639	-81.100889	Highway Bridges				High	160 MPH	AE
Canal	29.292617	-81.073381	Highway Bridges		X	X	Moderate	160 MPH	
Halifax River IWW	29.287278	-81.051706	Highway Bridges				Moderate	160 MPH	AE
Creek	29.296075	-81.079586	Highway Bridges			X	Moderate	160 MPH	
Misner Creek	29.278219	-81.088442	Highway Bridges			X	Moderate	160 MPH	AE
Misner Branch	29.28155	-81.094747	Highway Bridges			X	Moderate	160 MPH	AE
Canal	29.224494	-81.049611	Highway Bridges			X	Moderate	160 MPH	
Canal	29.234239	-81.054861	Highway Bridges				Moderate	160 MPH	
Canal	29.236108	-81.055147	Highway Bridges		X	X	Moderate	160 MPH	AE

Nova Canal	29.232511	-81.054139	Highway Bridges			X	Moderate	160 MPH	
11th Street Canal	29.243192	-81.047667	Highway Bridges		X	X	Moderate	160 MPH	
LPGA CANAL	29.24215	-81.050194	Highway Bridges			X	Moderate	160 MPH	
11th St. Canal	29.245656	-81.041586	Highway Bridges		X	X	Moderate	160 MPH	X
Halifax Canal	29.245989	-81.036514	Highway Bridges				Moderate	160 MPH	AE
Halifax Canal	29.245978	-81.039303	Highway Bridges				Moderate	160 MPH	
IWW Halifax River	29.230319	-81.021817	Highway Bridges				Moderate	160 MPH	AE
IWW Halifax River	29.231194	-81.022419	Highway Bridges				Moderate	160 MPH	AE
Halifax River	29.223103	-81.017761	Highway Bridges				Moderate	160 MPH	AE
Daytona Canal	29.225331	-81.023261	Highway Bridges	X	X	X	Moderate	160 MPH	AE
Nova Road Canal	29.229269	-81.052314	Highway Bridges			X	Moderate	160 MPH	
Halifax River IWW	29.2158	-81.015967	Highway Bridges				Moderate	160 MPH	AE
Halifax River IWW	29.215739	-81.015789	Highway Bridges				Moderate	160 MPH	AE
Halifax River	29.210689	-81.017531	Highway Bridges				Moderate	160 MPH	AE
Halifax River	29.208672	-81.016683	Highway Bridges				Moderate	160 MPH	AE
Halifax River	29.211125	-81.011131	Highway Bridges				Moderate	160 MPH	AE
Navy Canal	29.192686	-81.033736	Highway Bridges		X	X	Moderate	160 MPH	
Canal	29.189561	-81.031728	Highway Bridges		X	X	Moderate	160 MPH	AE
Nova Canal	29.175464	-81.028194	Highway Bridges		X	X	Moderate	160 MPH	
Canal	29.177661	-81.028544	Highway Bridges		X	X	Moderate	160 MPH	
Canal	29.178703	-81.028653	Highway Bridges		X	X	Moderate	160 MPH	
Canal	29.179275	-81.028781	Highway Bridges		X	X	Moderate	160 MPH	

Nova Canal	29.183861	-81.029692	Highway Bridges		X	X	Moderate	160 MPH	AE
11th Street Canal	29.214928	-81.090986	Highway Bridges				Moderate	160 MPH	
Reed Canal	29.158514	-80.995217	Highway Bridges	X	X	X	Moderate	160 MPH	
Nova Canal	29.170467	-81.025867	Highway Bridges		X	X	Moderate	160 MPH	
Nova Canal	29.173392	-81.027442	Highway Bridges		X	X	Moderate	160 MPH	
Nova Canal	29.166206	-81.023567	Highway Bridges		X	X	Moderate	160 MPH	
Nova Canal	29.160958	-81.022981	Highway Bridges		X	X	Moderate	160 MPH	
Nova Canal	29.154472	-81.019694	Highway Bridges		X	X	Moderate	160 MPH	
Reed Canal	29.1557	-81.016347	Highway Bridges				Moderate	160 MPH	
Reed Canal	29.158181	-81.010253	Highway Bridges	X	X	X	Moderate	160 MPH	
Reed Canal	29.158378	-81.003128	Highway Bridges				Moderate	160 MPH	X
Reed Canal	29.158389	-81.006806	Highway Bridges	X	X	X	Moderate	160 MPH	X
Sweetwater Creek	29.113558	-81.024989	Highway Bridges				Moderate	160 MPH	
SR-421	29.106056	-81.028889	Highway Bridges				Low	160 MPH	
Timothys Ditch	29.120831	-81.045	Highway Bridges				Moderate	160 MPH	
B-19 Canal	29.125742	-81.029497	Highway Bridges				Moderate	160 MPH	AE
B-19 Canal / Trib 1	29.119942	-81.032392	Highway Bridges				Moderate	160 MPH	AE
B19 Canal	29.141583	-81.045	Highway Bridges				Moderate	160 MPH	AE
Halifax Canal Lateral	29.137103	-81.007917	Highway Bridges		X	X	Moderate	160 MPH	
SR-421	29.106111	-81.028333	Highway Bridges				Low	160 MPH	
Sweetwater Branch	29.106889	-81.023111	Highway Bridges			X	Moderate	160 MPH	AE
Spruce Creek N Relief	29.088619	-80.970008	Highway Bridges				High	160 MPH	AE

Spruce Creek N. Relief	29.088697	-80.969739	Highway Bridges				High	160 MPH	AE
Rose Bay	29.103619	-80.972031	Highway Bridges				High	160 MPH	AE
Rose Bay	29.103683	-80.971764	Highway Bridges				High	160 MPH	AE
Cambridge Canal	29.1003	-80.987708	Highway Bridges	X	X	X	Moderate	160 MPH	AE
Rose Bay Canal	29.109186	-80.971406	Highway Bridges				High	160 MPH	X
Halifax River	29.144344	-80.983981	Highway Bridges				Moderate	160 MPH	AE
IWW Halifax River	29.148261	-80.975478	Highway Bridges				Low	160 MPH	AE
Canal	29.115658	-80.987658	Highway Bridges				Moderate	160 MPH	
IWW Indian River	29.038689	-80.906289	Highway Bridges				Moderate	160 MPH	AE
Callalisa Creek	29.029011	-80.903928	Highway Bridges				Moderate	160 MPH	AE
Spruce Creek	29.086339	-80.9687	Highway Bridges				High	160 MPH	AE
Spruce Creek	29.086417	-80.968475	Highway Bridges				High	160 MPH	AE
Spruce Creek S. Relief	29.083894	-80.967119	Highway Bridges				High	160 MPH	AE
Spruce Creek S. Relief	29.084028	-80.967139	Highway Bridges				High	160 MPH	AE
Murray Creek	29.079489	-80.955797	Highway Bridges				Moderate	160 MPH	X
Turnbull Creek	29.051139	-80.959833	Highway Bridges				High	160 MPH	AE
Canal	29.004689	-80.914456	Highway Bridges		X	X	Moderate	160 MPH	
US-1 & FECRR	29.020972	-80.925086	Highway Bridges				Low	160 MPH	X
Berrys Canal	29.028189	-80.921792	Highway Bridges				Moderate	160 MPH	VE
Conners Canal	29.032603	-80.916583	Highway Bridges				Moderate	160 MPH	AE
IWW Indian River	29.023789	-80.917589	Highway Bridges				Moderate	160 MPH	AE
Brando Canal	29.035153	-80.916456	Highway Bridges	X	X	X	Moderate	160 MPH	AE

Yacht Club Cut	29.013222	-80.915181	Highway Bridges				Moderate	160 MPH	AE
Gabordys Canal	29.004806	-80.913889	Highway Bridges		X	X	Moderate	160 MPH	
SR-442	28.950742	-80.95095	Highway Bridges				High	160 MPH	
SR-442	28.950733	-80.950347	Highway Bridges				High	160 MPH	
SR-44	29.012783	-80.988214	Highway Bridges				High	160 MPH	
SR-44	29.012803	-80.987567	Highway Bridges				High	160 MPH	
I-95	29.047581	-81.007042	Highway Bridges				Moderate	160 MPH	
Turnbull Creek	29.016858	-80.953633	Highway Bridges	X	X	X	Low	160 MPH	AE
Turnbull Creek	29.026269	-80.957814	Highway Bridges				Moderate	160 MPH	AE
Spruce Creek	29.090844	-81.021111	Highway Bridges	X	X	X	High	160 MPH	AE
Spruce Creek	29.090833	-81.020278	Highway Bridges	X	X	X	High	160 MPH	AE
Cnl.Trib. to Turnbull Ck	29.038608	-80.963558	Highway Bridges	X	X	X	Low	160 MPH	AE
Trib To Turnbull Creek	29.046825	-80.965906	Highway Bridges	X	X	X	Moderate	160 MPH	AE
FECRR	28.827078	-80.853639	Highway Bridges		X	X	Moderate	160 MPH	
Turnbull Creek	28.820669	-80.859919	Highway Bridges				High	160 MPH	AE
FECRR	28.826839	-80.853689	Highway Bridges				Moderate	160 MPH	
Creek	28.808694	-80.870922	Highway Bridges		X	X	Moderate	160 MPH	
Turnbull Creek	28.820828	-80.860036	Highway Bridges				High	160 MPH	AE
Turnbull Creek (West)	28.909544	-80.913219	Highway Bridges		X	X	Low	160 MPH	
Turnbull Creek (East)	28.911744	-80.908375	Highway Bridges		X	X	Low	160 MPH	X
Cow Creek	28.9281	-80.940461	Highway Bridges				Moderate	160 MPH	
Cow Creek	28.928689	-80.940139	Highway Bridges				Moderate	160 MPH	

Little Cow Creek	28.941747	-80.941694	Highway Bridges			X	Moderate	160 MPH	
Gabordys Canal	29.005364	-80.911592	Highway Bridges	X	X	X	Moderate	160 MPH	AE
Little Tomoka River	29.256597	-81.164317	Highway Bridges				Moderate	150 MPH	AE
Tomoka River	29.254944	-81.123561	Highway Bridges				Moderate	160 MPH	AE
Tomoka River	29.262722	-81.118111	Highway Bridges				Low	160 MPH	AE
I-95	29.273983	-81.121908	Highway Bridges				Moderate	160 MPH	
FECRR - Tymber Crk Rd	29.333122	-81.131311	Highway Bridges				Moderate	160 MPH	
US-1	29.336011	-81.131222	Highway Bridges				Moderate	160 MPH	
SR-40	29.256983	-81.115944	Highway Bridges				Moderate	160 MPH	
Habitat Connectivity	29.258933	-81.185492	Highway Bridges				High	150 MPH	
Groover Creek	29.273889	-81.127936	Highway Bridges			X	Moderate	160 MPH	AE
Groover Creek	29.277219	-81.129528	Highway Bridges			X	High	160 MPH	AE
Trib to Groover Creek	29.295578	-81.130019	Highway Bridges				Moderate	160 MPH	
Little Tomoka River	29.256806	-81.129	Highway Bridges		X	X	Moderate	160 MPH	AE
Tomoka River	29.164197	-81.090756	Highway Bridges				Moderate	160 MPH	AE
Tomoka River	29.164067	-81.090597	Highway Bridges				Moderate	160 MPH	AE
Tyson Creek	29.210111	-81.099703	Highway Bridges				High	160 MPH	
Canal	29.166417	-81.087744	Highway Bridges				Moderate	160 MPH	
Tomoka River	29.254717	-81.123592	Highway Bridges				Moderate	160 MPH	AE
I-95	29.219964	-81.103117	Highway Bridges				Moderate	160 MPH	
Beamers Canal	29.168167	-81.082944	Highway Bridges				Moderate	160 MPH	
US-92	29.171825	-81.084514	Highway Bridges				Moderate	160 MPH	

US-92	29.171997	-81.084339	Highway Bridges				Moderate	160 MPH	
US-92	29.171653	-81.084611	Highway Bridges				Moderate	160 MPH	
US-92	29.172225	-81.084269	Highway Bridges				Moderate	160 MPH	
I-95 & US-92	29.171389	-81.084761	Highway Bridges				Moderate	160 MPH	
Ramp J2	29.173644	-81.085181	Highway Bridges				Moderate	160 MPH	
Ramp J2	29.173194	-81.085569	Highway Bridges				Moderate	160 MPH	
Ramp J2	29.173342	-81.0855	Highway Bridges				Moderate	160 MPH	
Ramp J2	29.173528	-81.085333	Highway Bridges				Moderate	160 MPH	
Tomoka River	29.217208	-81.109453	Highway Bridges			X	Moderate	160 MPH	AE
I-95	29.197983	-81.095794	Highway Bridges				High	160 MPH	
Middle Haw Creek	29.241131	-81.230083	Highway Bridges				High	150 MPH	
Creek	29.129056	-81.1598	Highway Bridges				Moderate	150 MPH	A
Deep Creek	29.100294	-81.216667	Highway Bridges				High	150 MPH	
Habitat Connectivity	29.258772	-81.185397	Highway Bridges				High	150 MPH	
Creek	29.16635	-81.154717	Highway Bridges				High	150 MPH	A
Middle Haw Creek	29.244322	-81.225936	Highway Bridges				High	150 MPH	
I-95	29.155736	-81.075828	Highway Bridges				Moderate	160 MPH	
Tomoka River	29.150333	-81.08725	Highway Bridges				High	160 MPH	A
Tomoka River	29.150778	-81.090194	Highway Bridges				High	160 MPH	AE
Bear Wildlife Crossing	29.077222	-81.175556	Highway Bridges				High	150 MPH	
Cougar Wildlife Crossing	29.100556	-81.153889	Highway Bridges				High	160 MPH	A
Cougar Wildlife Crossing	29.10005	-81.153892	Highway Bridges				High	160 MPH	

Deer WIldlife Crossing	29.111944	-81.142222	Highway Bridges				High	160 MPH	
Deer Wildlife Crossing	29.111944	-81.1425	Highway Bridges				High	160 MPH	
I-4	29.136944	-81.118611	Highway Bridges				Moderate	160 MPH	
I-95	29.155083	-81.075472	Highway Bridges				Moderate	160 MPH	
I-95	29.157258	-81.076758	Highway Bridges				Moderate	160 MPH	
I-4 WB	29.154778	-81.078528	Highway Bridges				Moderate	160 MPH	
Ramp F2 & Ramp H1	29.154056	-81.077583	Highway Bridges				Moderate	160 MPH	
I-4	29.152222	-81.082778	Highway Bridges				High	160 MPH	
I-95	29.167778	-81.082778	Highway Bridges				Moderate	160 MPH	
Timothys Ditch	29.120683	-81.045675	Highway Bridges				Moderate	160 MPH	
Bear Wildlife Crossing	29.0775	-81.175278	Highway Bridges				High	150 MPH	
US 92	29.144431	-81.118278	Highway Bridges				Moderate	160 MPH	
Tributary to Spruce Crk	29.097689	-81.068653	Highway Bridges			X	Moderate	160 MPH	
Miller Creek	29.0729	-81.068144	Highway Bridges				Moderate	160 MPH	
Sweetwater Creek	29.087689	-81.068508	Highway Bridges			X	Moderate	160 MPH	AE
Turkey Creek	29.086411	-81.074531	Highway Bridges			X	Moderate	160 MPH	AE
Trib to Spruce Creek	29.056964	-81.068611	Highway Bridges				Moderate	160 MPH	
I-95	29.122347	-81.047847	Highway Bridges				Moderate	160 MPH	
Cabbage Slough	28.697764	-81.006031	Highway Bridges				Very High	160 MPH	AE
St Johns River Relief	28.7107	-81.022994	Highway Bridges				High	160 MPH	AE
St. Johns River	28.71405	-81.034128	Highway Bridges				Very High	160 MPH	AE

Alamana Canal	28.932317	-81.109975	Highway Bridges				High	160 MPH	A
Lake Ashby Canal	28.942825	-81.102681	Highway Bridges				High	160 MPH	A
Samsula Canal	29.011656	-81.041578	Highway Bridges				High	160 MPH	
Maytown Road	28.832997	-80.912097	Highway Bridges				High	160 MPH	
Maytown Rd.	28.833178	-80.91185	Highway Bridges				High	160 MPH	
Deep Creek	29.026139	-81.192306	Highway Bridges				High	150 MPH	
Deep Creek	29.0265	-81.190167	Highway Bridges				High	150 MPH	
Deep Creek	29.02675	-81.188694	Highway Bridges				High	150 MPH	
Cow Creek	28.839667	-81.024658	Highway Bridges				High	160 MPH	A
Underhill Slough	28.784903	-81.0252	Highway Bridges				High	160 MPH	AE
Lake Ashby Canal	28.846333	-81.079256	Highway Bridges				High	160 MPH	A
Lake Ashby Canal	28.941908	-81.102642	Highway Bridges				Moderate	160 MPH	A
Samsula Canal	28.996711	-81.049592	Highway Bridges				High	160 MPH	
Samsula Canal	28.991608	-81.040933	Highway Bridges				Moderate	160 MPH	A
Spruce Creek	29.090722	-81.026917	Highway Bridges				Moderate	160 MPH	AE
Spruce Creek	29.083944	-81.064972	Highway Bridges			X	Moderate	160 MPH	AE
Spruce Creek	29.050522	-81.046544	Highway Bridges			X	Moderate	160 MPH	
Deep Creek	29.163322	-81.390447	Highway Bridges				Moderate	150 MPH	
Deep Creek	29.20495	-81.367744	Highway Bridges				High	150 MPH	
Canal	29.221953	-81.330042	Highway Bridges				Moderate	150 MPH	
Little Haw Creek	29.226672	-81.311033	Highway Bridges				Moderate	150 MPH	
Lake Dias Creek	29.166775	-81.298972	Highway Bridges				Moderate	150 MPH	
Creek	29.254347	-81.32715	Highway Bridges				Moderate	150 MPH	

Little Haw Swamp	29.260928	-81.355314	Highway Bridges				Moderate	150 MPH	A
Creek	29.170933	-81.468992	Highway Bridges				High	150 MPH	
Creek	29.178719	-81.436931	Highway Bridges				High	150 MPH	
Deep Creek	29.161722	-81.390178	Highway Bridges				Moderate	150 MPH	
Lake Gertie	29.054728	-81.311314	Highway Bridges				Moderate	150 MPH	A
Lake Gertie	29.054539	-81.311325	Highway Bridges				Moderate	150 MPH	A
Little Haw Creek	29.060703	-81.268472	Highway Bridges				Moderate	150 MPH	
Little Haw Creek	29.065597	-81.272511	Highway Bridges				Moderate	150 MPH	
Little Haw Creek	29.075642	-81.273264	Highway Bridges				Moderate	150 MPH	
Blue Lake Equalizer	29.035967	-81.26755	Highway Bridges				High	150 MPH	AE
I-4	29.017717	-81.2317	Highway Bridges				High	150 MPH	A
I-4 EB	29.017419	-81.231947	Highway Bridges				High	150 MPH	
I-4	28.955358	-81.257686	Highway Bridges				High	150 MPH	
I-4	28.966272	-81.254183	Highway Bridges				High	150 MPH	
I-4	28.984611	-81.248364	Highway Bridges				Moderate	150 MPH	
I-4	29.004022	-81.242186	Highway Bridges				Moderate	150 MPH	
St. Johns River	29.008728	-81.382069	Highway Bridges				Moderate	150 MPH	AE
CSX-RR	29.024306	-81.354914	Highway Bridges				High	150 MPH	
US-17/92	28.974142	-81.298989	Highway Bridges				High	150 MPH	
Seaboard Coastline RR	28.952339	-81.332231	Highway Bridges				High	150 MPH	
I-4	28.955133	-81.257722	Highway Bridges				High	150 MPH	
I-4	28.948678	-81.259817	Highway Bridges				High	150 MPH	

FPL Cooling Disch. Canal	28.845317	-81.325806	Highway Bridges				Moderate	150 MPH	
FPL Cooling Intake Canal	28.845314	-81.325397	Highway Bridges				Moderate	150 MPH	
FPL Cooling Disch. Canal	28.856278	-81.325433	Highway Bridges				Moderate	150 MPH	A
FPL Cooling Intake Canal	28.856281	-81.325031	Highway Bridges				Moderate	150 MPH	A
Konomac Canal	28.8651	-81.348075	Highway Bridges				Moderate	150 MPH	
US-17-92 -St Johns River	28.835578	-81.319619	Highway Bridges				High	150 MPH	AE
Deep Creek	28.899928	-81.134083	Highway Bridges				Moderate	160 MPH	A
St. Johns River	28.802664	-81.210281	Highway Bridges				High	150 MPH	AE
St Johns River Relief	28.815553	-81.190525	Highway Bridges				High	150 MPH	AE
Deep Ck. Diversion Cnl	28.846075	-81.101772	Highway Bridges				Moderate	160 MPH	A
Dirksen Drive	28.871614	-81.284528	Highway Bridges				High	150 MPH	
Padgett Creek	28.868778	-81.28595	Highway Bridges				High	150 MPH	
Dirksen Dr	28.871669	-81.284233	Highway Bridges				High	150 MPH	
I-4	28.911256	-81.271783	Highway Bridges				Moderate	150 MPH	
I-4	28.911064	-81.271886	Highway Bridges				Moderate	150 MPH	
I-4	28.887019	-81.279375	Highway Bridges				Moderate	150 MPH	
Padgett Creek	28.8689	-81.286183	Highway Bridges				High	150 MPH	
US-17-92-St Johns River	28.835211	-81.319106	Highway Bridges				High	150 MPH	AE

St. Johns River	28.802764	-81.21045	Highway Bridges				High	150 MPH	AE
St. Johns River Relief	28.815631	-81.190639	Highway Bridges				High	150 MPH	AE
FLORIDA HOSPITAL OCEANSIDE	29.284637	-81.036867	Medical Care Facilities		X	X	Moderate	160 MPH	
SELECT SPECIALTY HOSPITAL - DAYTONA B...	29.242562	-81.107419	Medical Care Facilities				High	160 MPH	
ADVENT HEALTH DAYTONA BEACH	29.24311	-81.107657	Medical Care Facilities				High	160 MPH	
HALIFAX PSYCHIATRIC CENTER-NORTH	29.21402	-81.068593	Medical Care Facilities				Moderate	160 MPH	
HALIFAX HEALTH MEDICAL CENTER	29.202385	-81.054828	Medical Care Facilities				Moderate	160 MPH	
DAYTONA BEACH VETERANS AFFAIRS OUTPAT...	29.206409	-81.061756	Medical Care Facilities				Moderate	160 MPH	
HALIFAX HEALTH MEDICAL CENTER-PORT O...	29.126212	-81.008574	Medical Care Facilities		X	X	Moderate	160 MPH	
ADVENT HEALTH NEW SMYRNA BEACH	29.020291	-80.92186	Medical Care Facilities		X	X	Low	160 MPH	
ADVENT HEALTH DELAND	29.043653	-81.317344	Medical Care Facilities				Moderate	150 MPH	

ADVENT HEALTH FISH MEMORIAL	28.914371	-81.285162	Medical Care Facilities				Low	150 MPH	
HALIFAX HEALTH UF HEALTH MEDICAL CENT...	28.957659	-81.255725	Medical Care Facilities				High	150 MPH	
FLORIDA EAST COAST; ARTIFICIAL PATH	29.304347	-81.095737	Railway Bridges				Low	160 MPH	AE
FLORIDA EAST COAST; CANAL/DITCH	29.313402	-81.10535	Railway Bridges			X	Low	160 MPH	
FLORIDA EAST COAST; CANAL/DITCH	29.293181	-81.079918	Railway Bridges		X	X	Moderate	160 MPH	
FLORIDA EAST COAST; STREAM/RIVER	29.288747	-81.071167	Railway Bridges		X	X	Moderate	160 MPH	AE
FLORIDA EAST COAST; CANAL/DITCH	29.244638	-81.044155	Railway Bridges				Moderate	160 MPH	AE
FLORIDA EAST COAST; REED CANAL	29.158451	-81.000073	Railway Bridges	X	X	X	Moderate	160 MPH	AE
FLORIDA EAST COAST; STREAM/RIVER	29.102114	-80.985322	Railway Bridges	X	X	X	High	160 MPH	
FLORIDA EAST COAST; STREAM/RIVER	29.106569	-80.985671	Railway Bridges				Moderate	160 MPH	AE

FLORIDA EAST COAST; ARTIFICIAL PATH	29.080103	-80.98349	Railway Bridges				Moderate	160 MPH	AE
FLORIDA EAST COAST; ARTIFICIAL PATH	29.050713	-80.959727	Railway Bridges				High	160 MPH	AE
FLORIDA EAST COAST; STREAM/RIVER	29.039559	-80.939592	Railway Bridges		X	X	Moderate	160 MPH	X
FLORIDA EAST COAST; TURNBULL CREEK	28.806058	-80.85946	Railway Bridges				High	160 MPH	X
FLORIDA EAST COAST; STREAM/RIVER	28.999701	-80.916262	Railway Bridges		X	X	Moderate	160 MPH	
FLORIDA EAST COAST; CANAL/DITCH	29.003614	-80.918066	Railway Bridges		X	X	Moderate	160 MPH	AE
FLORIDA EAST COAST; CANAL/DITCH	29.340113	-81.140654	Railway Bridges				Moderate	160 MPH	
CSX TRANSPORTATION; STREAM/RIVER	29.162683	-81.390328	Railway Bridges				Moderate	150 MPH	
CSX TRANSPORTATION; SAINT JOHNS RIVER	28.837797	-81.324658	Railway Bridges				High	150 MPH	
DRMOND BEACH FLA	29.30745	-81.05813	Port Facilities				Moderate	160 MPH	AE

DAYTONA BCH MUN YACHT BASIN	29.21716	-81.01551	Port Facilities				Moderate	160 MPH	AE
NEW SMYRNA BCH MUNICIPAL WHFS	29.03892	-80.90636	Port Facilities				Moderate	160 MPH	AE
SHRIMP DOCKS NEW SMYRNA BCH	29.039188	-80.906138	Port Facilities				Moderate	160 MPH	AE
USCG STATION, PONCE DE LEON INLET, FL	29.063462	-80.914598	Port Facilities				High	160 MPH	AE
OAKHILL FISH DOCK	28.88228	-80.842463	Port Facilities				High	160 MPH	AE
EDGEWATER FLA	29.0016	-80.90653	Port Facilities				Moderate	160 MPH	AE
FLA POWER & LIGHT LAKE MONROE	28.839615	-81.32605	Port Facilities				Moderate	150 MPH	AE
ENTERPRISE FLA	28.86845	-81.272146	Port Facilities				Moderate	150 MPH	
De Land	28.976848	-81.35932	Ferry Facilities				Moderate	150 MPH	AE
Hontoon Island State Park	28.975272	-81.360608	Ferry Facilities				Moderate	150 MPH	AE
DOTS Terminal	29.226	-81.0511	Bus Facilities			X	Moderate	160 MPH	
Greyhound Bus Station	29.2101	-81.023	Bus Facilities		X	X	Moderate	160 MPH	
03147.*A	29.178601	-81.062852	Airport Runways				Moderate	160 MPH	
03147.*A	29.177879	-81.052299	Airport Runways				Low	160 MPH	
03147.*A	29.183276	-81.052683	Airport Runways				Low	160 MPH	

03147.2*A	29.080188	-81.046629	Airport Runways				Low	160 MPH	
03156.*A	29.064757	-81.283058	Airport Runways				Moderate	150 MPH	
03156.*A	29.068662	-81.284259	Airport Runways				Moderate	150 MPH	
03156.2*A	29.104115	-81.314193	Airport Runways				Moderate	150 MPH	
03387.*A	29.054239	-80.947938	Airport Runways		X	X	Moderate	160 MPH	
03387.*A	29.058146	-80.951115	Airport Runways	X	X	X	Moderate	160 MPH	
03387.*A	29.054206	-80.947262	Airport Runways		X	X	Moderate	160 MPH	X
03387.2*A	28.978909	-80.924775	Airport Runways		X	X	Low	160 MPH	
03411.*A	29.301904	-81.114064	Airport Runways			X	Moderate	160 MPH	
03411.*A	29.300314	-81.113512	Airport Runways			X	Moderate	160 MPH	
03443.1*A	29.250036	-81.45934	Airport Runways				High	150 MPH	
ORMOND BEACH MUNI	29.301139	-81.113806	Airport Facilities			X	Moderate	160 MPH	
NEW SMYRNA BEACH MUNI	29.055694	-80.948917	Airport Facilities	X	X	X	Moderate	160 MPH	X
PIERSON MUNI	29.250028	-81.459333	Airport Facilities				High	150 MPH	
ADVENT HEALTH DELAND	29.044631	-81.317839	Airport Facilities				Moderate	150 MPH	
DELAND MUNI-SIDNEY H TAYLOR FIELD	29.067028	-81.28375	Airport Facilities				Moderate	150 MPH	
DAYTONA BEACH INTL	29.179917	-81.058056	Airport Facilities				Low	160 MPH	
HIGHBRIDE PARK	29.40856	-81.09953	Potable Water Facilities	X	X	X	High	160 MPH	AE
PORT ORANGE (DW)	29.136101	-80.994698	Waste Water Systems	X	X	X	Moderate	160 MPH	AE

ORMOND BEACH, CITY OF - ORMOND BEACH ...	29.2936	-81.083099	Waste Water Systems				Moderate	160 MPH	AE
DELAND, CITY OF - WILEY M NASH WRF	29.009001	-81.298103	Waste Water Systems				Low	150 MPH	
VEHICLE MAINTENANCE FACILITY	29.217501	-81.0289	Waste Water Systems		X	X	Moderate	160 MPH	A
KENNEDY PARK IMPROVEMENTS	28.9933	-80.904701	Waste Water Systems	X	X	X	Moderate	160 MPH	AE
EDGEWATER, CITY OF	28.9898	-80.899902	Waste Water Systems				Moderate	160 MPH	AE
LAKE WOODRUFF NATIONAL WILDLIFE REFUGE	29.1061	-81.366097	Waste Water Systems				High	150 MPH	
SMYRNA BEACH, CITY OF - NEW SMYRNA BE...	29.030399	-80.917198	Waste Water Systems				Moderate	160 MPH	VE
KENNEDY SPACE CNTR FEDERAL CRE	28.950501	-80.885597	Waste Water Systems			X	Moderate	160 MPH	
HOLLY HILL, CITY OF (DW)	29.2447	-81.034103	Waste Water Systems				Moderate	160 MPH	AE
DAYTONA BEACH/BETHUNE POINT (D	29.196199	-81.008301	Waste Water Systems	X	X	X	Moderate	160 MPH	X

SANFORD	28.843155	-81.325464	Electric Power Facilities				Moderate	150 MPH	
DEBARY	28.90386	-81.33233	Electric Power Facilities				High	150 MPH	
FIELD STREET	29.017319	-80.932856	Electric Power Facilities		X	X	Moderate	160 MPH	
WYND 1310	28.99943	-81.29812	Communication Facilities				Moderate	150 MPH	
WNDB 1150	29.23526	-81.07172	Communication Facilities				Moderate	160 MPH	
WROD 1340	29.18887	-81.00756	Communication Facilities	X	X	X	Moderate	160 MPH	AE
WNDA 1490	29.01637	-81.2859	Communication Facilities				High	150 MPH	
WNDA 1490	29.01832	-81.29951	Communication Facilities				Moderate	150 MPH	
WSBB 1230	29.03276	-80.91728	Communication Facilities				Moderate	160 MPH	AE
WMFJ 1450	29.22526	-81.02478	Communication Facilities	X	X	X	Moderate	160 MPH	AE
WPUL 1590	29.1547	-81.022	Communication Facilities		X	X	Moderate	160 MPH	
WELE 1380	29.26942	-81.08145	Communication Facilities				Low	160 MPH	
WKRO-FM CH 226	28.89471	-80.88533	Communication Facilities		X	X	Moderate	160 MPH	
WOCL CH 290	28.92138	-81.31895	Communication Facilities				High	150 MPH	
WHOG-FM CH 239	29.23637	-81.07284	Communication Facilities				Moderate	160 MPH	
WJLU CH 209	29.00915	-80.97394	Communication Facilities			X	Moderate	160 MPH	A

WVYB CH 277	29.23637	-81.07284	Communication Facilities				Moderate	160 MPH	
WKTO CH 204	29.04165	-81.05617	Communication Facilities				Moderate	160 MPH	
WAPN CH 218	29.25192	-81.04783	Communication Facilities		X	X	Moderate	160 MPH	AE
WJHM CH 270	28.92138	-81.31895	Communication Facilities				High	150 MPH	
WESH CH 2	28.93832	-81.3159	Communication Facilities				High	150 MPH	
WVEN-TV CH 26	29.28637	-81.4934	Communication Facilities				High	150 MPH	
WCEU CH 15	29.17359	-81.15645	Communication Facilities				High	150 MPH	
WDYB-LP CH 53	29.23165	-81.04172	Communication Facilities		X	X	Moderate	160 MPH	
PINE TRAIL ELEMENTARY SCHOOL	29.275252	-81.114165	Schools				Moderate	160 MPH	
OSCEOLA ELEMENTARY SCHOOL	29.286605	-81.039883	Schools		X	X	Moderate	160 MPH	
ST BRENDAN CATHOLIC SCHOOL	29.315548	-81.053512	Schools			X	Low	160 MPH	
PACE CENTER FOR GIRLS	29.279335	-81.059199	Schools			X	Moderate	160 MPH	
ORMOND BEACH ELEMENTARY SCHOOL	29.283762	-81.057727	Schools			X	Moderate	160 MPH	
ORMOND BEACH	29.308101	-81.070235	Schools			X	Moderate	160 MPH	

MIDDLE SCHOOL									
THE LITTLE ENGINE ACADEMY	29.268103	-81.078258	Schools				Moderate	160 MPH	
DAYTONA COLLEGE	29.27008	-81.080138	Schools				Low	160 MPH	
CHABADESFORMES HEBREW ACADEMY	29.273506	-81.095471	Schools				Moderate	160 MPH	
TEMPLE BETH-EL SCHOOL	29.292892	-81.086449	Schools			X	Moderate	160 MPH	
ACS EDUCATIONAL RESOURCES AND CONSULT...	29.279675	-81.080201	Schools			X	Low	160 MPH	
TOMOKA ELEMENTARY SCHOOL	29.274802	-81.09084	Schools			X	Moderate	160 MPH	
DAVID C. HINSON SR. MIDDLE SCHOOL	29.239699	-81.094684	Schools				High	160 MPH	
REIGN HOMESCHOOLING ACADEMY	29.273596	-81.094289	Schools				Moderate	160 MPH	
DAYTONA STATE COLLEGE - ADVANCED TECH...	29.232026	-81.098931	Schools				High	160 MPH	

HOLLY HILL SCHOOL	29.249336	-81.055414	Schools			X	Moderate	160 MPH	
UBIC ACADEMY	29.252831	-81.055429	Schools			X	Moderate	160 MPH	
INSTALLER INSTITUTE	29.254596	-81.046818	Schools			X	Moderate	160 MPH	
SEABREEZE HIGH SCHOOL	29.266532	-81.02991	Schools		X	X	Moderate	160 MPH	
ORTONA ELEMENTARY SCHOOL	29.24729	-81.02356	Schools			X	Low	160 MPH	
LOURDES ACADEMY	29.2418	-81.02111	Schools			X	Moderate	160 MPH	
RIVERVIEW LEARNING CENTER	29.238417	-81.016584	Schools		X	X	Low	160 MPH	
IMAGINATION STATION TOO MONTESSORI	29.233445	-81.016323	Schools			X	Moderate	160 MPH	
BASILICA SCHOOL OF ST PAUL	29.216946	-81.027161	Schools		X	X	Moderate	160 MPH	
FATHER LOPEZ CATHOLIC HIGH SCHOOL	29.218548	-81.045937	Schools		X	X	Moderate	160 MPH	AE
LIVING FAITH ACADEMY	29.229362	-81.064155	Schools				Moderate	160 MPH	
AMIKIDS VOLUSIA	29.213356	-81.063596	Schools				Moderate	160 MPH	
HALIFAX BEHAVIORAL SERVICES	29.214037	-81.06858	Schools				Moderate	160 MPH	

RICHARD MILBURN ACADEMY	29.217315	-81.049547	Schools			X	Moderate	160 MPH	
EASTER SEALS CHILD DEVELOPMENT CENTER...	29.206916	-81.054454	Schools				Moderate	160 MPH	
UNIVERSITY OF CENTRAL FLORIDA - DAYTO...	29.201995	-81.048576	Schools				Moderate	160 MPH	
DAYTONA STATE COLLEGE	29.202259	-81.051285	Schools				Moderate	160 MPH	
THE CHILES ACADEMY	29.213284	-81.039736	Schools		X	X	Moderate	160 MPH	
PURE IN HEART CHRISTIAN ACAD& PERFORM...	29.210732	-81.020541	Schools	X	X	X	Moderate	160 MPH	AE
DAYTONA STATE COLLEGE - NEWS-JOURNAL ...	29.21517	-81.019609	Schools		X	X	Moderate	160 MPH	
BETHUNE-COOKMAN UNIVERSITY	29.210556	-81.031595	Schools		X	X	Moderate	160 MPH	A
TURIE T. SMALL ELEMENTARY SCHOOL	29.195917	-81.027159	Schools		X	X	Moderate	160 MPH	X
CAMPBELL	29.195004	-81.030466	Schools		X	X	Moderate	160 MPH	

MIDDLE SCHOOL									
MOUNT CALVARY ACADEMY	29.194227	-81.024035	Schools		X	X	Moderate	160 MPH	X
THE CHASE ACADEMY, INC.	29.177731	-81.024847	Schools		X	X	Moderate	160 MPH	AE
PALM TERRACE ELEMENTARY SCHOOL	29.198401	-81.074249	Schools				Moderate	160 MPH	
WESTSIDE ELEMENTARY SCHOOL	29.224138	-81.071315	Schools				Moderate	160 MPH	
HALIFAX ACADEMY	29.189019	-81.081327	Schools				Moderate	160 MPH	
WARNER CHRISTIAN ACADEMY	29.179476	-81.007256	Schools		X	X	Moderate	160 MPH	
INTERNATIONAL ACADEMY	29.162176	-80.997791	Schools		X	X	Moderate	160 MPH	
BLUE JAY ACADEMY	29.17319	-81.025156	Schools		X	X	Moderate	160 MPH	X
SOUTH DAYTONA ELEMENTARY SCHOOL	29.168283	-81.008205	Schools		X	X	Moderate	160 MPH	X
HORIZON ELEMENTARY SCHOOL	29.119404	-81.038035	Schools				Moderate	160 MPH	
HOSPITAL HOMEBOUND	29.14862	-81.026749	Schools				Moderate	160 MPH	

ATLANTIC HIGH SCHOOL	29.148642	-81.026679	Schools				Moderate	160 MPH	
DAYTONA BEACH CHRISTIAN ACADEMY	29.170829	-81.038026	Schools				Moderate	160 MPH	
SUGAR MILL ELEMENTARY SCHOOL	29.147327	-81.001034	Schools		X	X	Moderate	160 MPH	
SILVER SANDS MIDDLE SCHOOL	29.131416	-81.017155	Schools			X	Moderate	160 MPH	
SPRUCE CREEK ELEMENTARY SCHOOL	29.105717	-81.004796	Schools			X	Moderate	160 MPH	
WISE INDEPENDENT PRIVATE SCHOOL SYSTEM	29.110693	-80.977931	Schools		X	X	Moderate	160 MPH	
PORT ORANGE ELEMENTARY SCHOOL	29.142252	-80.991424	Schools		X	X	Moderate	160 MPH	
SWEETWATER ELEMENTARY SCHOOL	29.116328	-81.017421	Schools				Moderate	160 MPH	
SPRUCE CREEK HIGH SCHOOL	29.108707	-81.016027	Schools				Moderate	160 MPH	
R. J. LONGSTREET ELEMENTARY SCHOOL	29.176687	-80.986041	Schools		X	X	Moderate	160 MPH	

CORONADO BEACH ELEMENTARY SCHOOL	29.002761	-80.878685	Schools		X	X	High	160 MPH	
READ-PATTILLO ELEMENTARY SCHOOL	29.010897	-80.919753	Schools		X	X	Moderate	160 MPH	X
SACRED HEART CATHOLIC SCHOOL	29.038981	-80.934583	Schools		X	X	Moderate	160 MPH	
KNIGHT'S CHRISTIAN ACADEMY	29.022958	-80.923193	Schools	X	X	X	Low	160 MPH	X
NEW SMYRNA BEACH HIGH SCHOOL	29.003172	-80.930417	Schools		X	X	Moderate	160 MPH	
NEW SMYRNA BEACH MIDDLE SCHOOL	29.00452	-80.923569	Schools		X	X	Moderate	160 MPH	
CHISHOLM ELEMENTARY SCHOOL	29.030038	-80.932675	Schools		X	X	Low	160 MPH	X
BETHEL CHRISTIAN ACADEMY	29.024306	-80.933056	Schools		X	X	Low	160 MPH	AE
BURNS SCIENCE AND TECHNOLOGY CHARTER	28.862161	-80.848962	Schools				Low	160 MPH	
INDIAN RIVER ELEMEN	28.945576	-80.891184	Schools			X	Moderate	160 MPH	

TARY SCHOOL									
EDGEHOP CHRISTIAN ACADEMY	28.94675	-80.88452	Schools			X	Moderate	160 MPH	
EDGEWATER PUBLIC SCHOOL	28.984204	-80.907127	Schools		X	X	Moderate	160 MPH	
DISCOVERY DAYS INSTITUTE OF LEARNING	28.994507	-80.908779	Schools		X	X	Moderate	160 MPH	
LITTLE EXPLORERS MONTESSORI	29.000404	-80.912488	Schools		X	X	Moderate	160 MPH	
DAYTONA STATE COLLEGE - NEW SMYRNA BE...	28.999955	-80.926968	Schools		X	X	Moderate	160 MPH	
PATHWAYS ELEMENTARY SCHOOL	29.272286	-81.135136	Schools				Moderate	160 MPH	
CALVARY CHRISTIAN ACADEMY	29.257414	-81.118765	Schools			X	High	160 MPH	
CHAMPION ELEMENTARY SCHOOL	29.207816	-81.137	Schools				High	160 MPH	A
THE CHILDRENS HOUSE	29.252387	-81.129993	Schools				Moderate	160 MPH	
RIVERBEND	29.249844	-81.134899	Schools				Moderate	160 MPH	

ACADEMY									
VOLUSIA REGIONAL JUVENILE DETENTION C...	29.136766	-81.142734	Schools				Moderate	160 MPH	
DAYTONA JUVENILE RESIDENTIAL FACILITY	29.136718	-81.142758	Schools				Moderate	160 MPH	
STEWART TREATMENT CENTER	29.144914	-81.152038	Schools				Moderate	150 MPH	
DEPT. OF CORRECTIONS EDUCATIONAL PROGRAM	29.140435	-81.149447	Schools				Moderate	160 MPH	
ROCK CHURCH ACADEMY	29.091007	-81.050648	Schools				High	160 MPH	
SAMSULA ACADEMY	29.022283	-81.050897	Schools				High	160 MPH	
SPACE COAST CHRISTIAN ACADEMY	29.02075	-81.050837	Schools				High	160 MPH	
CYPRESS CREEK ELEMENTARY SCHOOL	29.083122	-81.027195	Schools			X	Moderate	160 MPH	
TLC KIDS CARE	29.089508	-81.048664	Schools			X	High	160 MPH	
CREEKSIDE	29.06639	-81.04165	Schools				Moderate	160 MPH	

MIDDLE SCHOOL									
T. DEWITT TAYLOR MIDDLE-HIGH SCHOOL	29.246292	-81.457942	Schools				High	150 MPH	
PIERSON ELEMENTARY SCHOOL	29.24407	-81.463728	Schools				Moderate	150 MPH	
STETSON BAPTIST CHRISTIAN SCHOOL	29.035795	-81.323928	Schools				Moderate	150 MPH	
LOUISE S. MCINNIS ELEMENTARY SCHOOL	29.123646	-81.350978	Schools				Moderate	150 MPH	
CITRUS GROVE ELEMENTARY SCHOOL	29.03934	-81.33579	Schools				Moderate	150 MPH	
GEORGE W. MARKS ELEMENTARY SCHOOL	29.046084	-81.297041	Schools				High	150 MPH	
BLUE LAKE ELEMENTARY SCHOOL	29.030888	-81.276335	Schools				High	150 MPH	
FREEDOM ELEMENTARY SCHOOL	28.994105	-81.271431	Schools				High	150 MPH	
DAYTONA STATE COLLEGE - DELAND	29.012027	-81.243074	Schools				High	150 MPH	

DELAND MIDDLE SCHOOL	29.00428	-81.297508	Schools				Moderate	150 MPH	
FLORIDA TECHNICAL COLLEGE - DELAND CA...	29.009117	-81.300638	Schools				Low	150 MPH	
ESE RELATED SERVICES	29.030191	-81.308641	Schools				Low	150 MPH	
PK CHILD CARE PROGRAM	29.03016	-81.308493	Schools				Low	150 MPH	
ST BARNABAS EPISCOPAL SCHOOL	29.033073	-81.308361	Schools				Moderate	150 MPH	
CASA MONTESSORI	29.030416	-81.315724	Schools				Moderate	150 MPH	
DELAND HIGH SCHOOL	29.04167	-81.283963	Schools				Moderate	150 MPH	
CHILDREN'S HOUSE MONTESSORI SCHOOL	29.03961	-81.294212	Schools				Moderate	150 MPH	
STETSON UNIVERSITY	29.03532	-81.300598	Schools				Moderate	150 MPH	
ST PETER CATHOLIC SCHOOL	29.028684	-81.309871	Schools				Low	150 MPH	
EDITH I. STARKE ELEMENTARY SCHOOL	29.015022	-81.308979	Schools				Moderate	150 MPH	
T.O.P ACADEMY	29.023427	-81.31071	Schools				Moderate	150 MPH	

WOODWARD AVENUE ELEMENTARY SCHOOL	29.010773	-81.33093	Schools				Moderate	150 MPH	
LIGHTHOUSE CHRISTIAN PREPARATORY ACADEMY	29.023706	-81.340996	Schools				Moderate	150 MPH	
SOUTHWESTERN MIDDLE SCHOOL	29.007525	-81.314277	Schools				Moderate	150 MPH	
RIVER SPRINGS MIDDLE SCHOOL	28.938783	-81.309237	Schools				High	150 MPH	
UNIVERSITY HIGH SCHOOL	28.931841	-81.313005	Schools				Moderate	150 MPH	
MANATEE COVE ELEMENTARY SCHOOL	28.939135	-81.300055	Schools				Moderate	150 MPH	
ORANGE CITY ELEMENTARY SCHOOL	28.951383	-81.291599	Schools				Moderate	150 MPH	
DEBARY ELEMENTARY SCHOOL	28.891186	-81.320685	Schools				Moderate	150 MPH	
HIGHBANKS LEARNING CENTER	28.890781	-81.28507	Schools				Moderate	150 MPH	
THE READING EDGE ACADEMY	28.895049	-81.28271	Schools				Moderate	150 MPH	

SUNRISE ACADEMY	28.908694	-81.291039	Schools				Moderate	150 MPH	
IVY HAWN CHARTER SCHOOL OF THE ARTS	28.977978	-81.230821	Schools				Moderate	150 MPH	
VOLUSIA PINES ELEMENTARY SCHOOL	28.972109	-81.226144	Schools				Moderate	150 MPH	
BLAKE MEMORIAL DAY SCHOOL	28.985447	-81.23439	Schools				Moderate	150 MPH	
SPIRIT ELEMENTARY SCHOOL	28.90587	-81.242265	Schools				Moderate	150 MPH	
DISCOVERY ELEMENTARY SCHOOL	28.89193	-81.250276	Schools				Low	150 MPH	
DELTONA CHRISTIAN SCHOOL	28.881367	-81.242761	Schools				High	150 MPH	
LEGACY SCHOLARS ACADEMY	28.868067	-81.264032	Schools				Moderate	150 MPH	
ENTERPRISE ELEMENTARY SCHOOL	28.871599	-81.265077	Schools				Moderate	150 MPH	
DELTONA MIDDLE SCHOOL	28.877966	-81.272431	Schools				High	150 MPH	
ALDERSGATE ACADEMY	28.868036	-81.266585	Schools				High	150 MPH	

ACADEMY OF CAREER TRAINING - DELTONA ...	28.897291	-81.26743	Schools				Moderate	150 MPH	A
DELTONA LAKES ELEMENTARY SCHOOL	28.921411	-81.217434	Schools				High	150 MPH	
FRIENDSHIP ELEMENTARY SCHOOL	28.93433	-81.188547	Schools				High	150 MPH	
DAYTONA STATE COLLEGE - DELTONA CAMPUS	28.929134	-81.221587	Schools				High	150 MPH	
CENTRAL FELLOWSHIP CHRISTIAN ACADEMY	28.970383	-81.214722	Schools				Moderate	150 MPH	
HERITAGE MIDDLE SCHOOL	28.891873	-81.172056	Schools				High	150 MPH	
SUNRISE ELEMENTARY SCHOOL	28.881496	-81.175491	Schools				High	150 MPH	
GOOD SHEPHERD ACADEMY	28.883624	-81.166778	Schools				High	160 MPH	
FOREST LAKE ELEMENTARY SCHOOL	28.873479	-81.228619	Schools				High	150 MPH	
GATEWAY	28.870378	-81.250386	Schools				Moderate	150 MPH	

CHRISTIAN ACADEMY									
OSTEEN ELEMENTARY SCHOOL	28.854856	-81.175553	Schools				Moderate	150 MPH	
DELTONA HIGH SCHOOL	28.946599	-81.246415	Schools				Moderate	150 MPH	
GALAXY MIDDLE SCHOOL	28.929963	-81.230095	Schools				High	150 MPH	
TIMBERCREST ELEMENTARY SCHOOL	28.932539	-81.231045	Schools				High	150 MPH	
TRINITY CHRISTIAN ACADEMY	28.924473	-81.254251	Schools				Moderate	150 MPH	
PRIDE ELEMENTARY SCHOOL	28.89545	-81.162071	Schools				High	160 MPH	
PINE RIDGE HIGH SCHOOL	28.886829	-81.162	Schools				High	160 MPH	
MAINLAND HIGH SCHOOL	29.197773	-81.050885	Schools				Moderate	160 MPH	
EMBRY-RIDDLE AERONAUTICAL UNIVERSITY-...	29.189219	-81.049481	Schools				Low	160 MPH	
EMBRY-RIDDLE AERONAUTICAL UNIVERSITY-...	29.189241	-81.04955	Schools				Low	160 MPH	
VOLUSIA COUNTY SHERIFFS	29.330169	-81.121731	Police Stations				Moderate	160 MPH	

, DEPARTMENT									
ORMOND BEACH POLICE DEPARTMENT	29.282882	-81.060763	Police Stations			X	Moderate	160 MPH	
HOLLY HILL POLICE DEPARTMENT	29.245118	-81.040025	Police Stations			X	Moderate	160 MPH	
DAYTONA BEACH POLICE DEPARTMENT - SUB...	29.223916	-81.00984	Police Stations			X	Moderate	160 MPH	
VOLUSIA COUNTY SHERIFF'S OFFICE - BEA...	29.218758	-81.003544	Police Stations			X	Moderate	160 MPH	
VOLUSIA COUNTY SHERIFFS, DEPARTMENT	29.215296	-81.023479	Police Stations		X	X	Moderate	160 MPH	
VOLUSIA COUNTY SHERIFFS, DEPARTMENT	29.215451	-81.021655	Police Stations	X	X	X	Moderate	160 MPH	X
VOLUSIA COUNTY SHERIFFS, DEPARTMENT	29.210803	-81.013856	Police Stations		X	X	Moderate	160 MPH	
DAYTONA BEACH POLICE DEPARTMENT - HEA...	29.200853	-81.037924	Police Stations		X	X	Moderate	160 MPH	
SOUTH DAYTONA CITY	29.181315	-81.007999	Police Stations		X	X	Moderate	160 MPH	

POLICE DEPARTMENT									
PORT ORANGE POLICE DEPARTMENT	29.120974	-81.017651	Police Stations				Moderate	160 MPH	
DAYTONA BEACH SHORES DEPARTMENT OF PU...	29.165794	-80.977512	Police Stations			X	Moderate	160 MPH	
PONCE INLET POLICE DEPARTMENT	29.120525	-80.95343	Police Stations	X	X	X	High	160 MPH	
NEW SMYRNA BEACH POLICE DEPARTMENT	29.047528	-80.940733	Police Stations		X	X	Moderate	160 MPH	X
VOLUSIA COUNTY SHERIFF - CIVIL DIVISION	29.025763	-80.921305	Police Stations	X	X	X	Moderate	160 MPH	X
OAK HILL POLICE DEPARTMENT	28.858865	-80.851223	Police Stations			X	Low	160 MPH	
EDGEWATER POLICE DEPARTMENT	28.9929	-80.905274	Police Stations	X	X	X	Moderate	160 MPH	
VOLUSIA COUNTY SHERIFFS' DEPARTMENT	29.14645	-81.148881	Police Stations				High	160 MPH	
VOLUSIA SHERIFFS DEPARTMENT - OPERATI...	29.143009	-81.145737	Police Stations				Moderate	160 MPH	

FLORIDA HIGHWAY PATROL TROOP D - DELAND	29.058843	-81.274394	Police Stations				Moderate	150 MPH	
VOLUSIA COUNTY SHERIFFS' DEPARTMENT - ...	29.060195	-81.286195	Police Stations				Moderate	150 MPH	
VOLUSIA COUNTY SHERIFF'S OFFICE	29.029516	-81.305028	Police Stations				Low	150 MPH	
DE LAND POLICE DEPARTMENT	29.026709	-81.306963	Police Stations				Moderate	150 MPH	
VOLUSIA COUNTY SHERIFFS' DEPARTMENT	29.029247	-81.29975	Police Stations				Low	150 MPH	
VOLUSIA COUNTY SHERIFFS' DEPARTMENT LA...	28.998411	-81.304743	Police Stations				Moderate	150 MPH	
ORANGE CITY POLICE DEPARTMENT	28.949593	-81.298117	Police Stations				Moderate	150 MPH	
VOLUSIA COUNTY SHERIFFS' DEPARTMENT - ...	28.884067	-81.308005	Police Stations				Moderate	150 MPH	
LAKE HELEN POLICE	28.977731	-81.231476	Police Stations				Moderate	150 MPH	

DEPARTMENT									
VOLUSIA COUNTY SHERIFFS' DEPARTMENT - ...	28.906735	-81.225344	Police Stations				Moderate	150 MPH	
VOLUSIA COUNTY SHERIFFS' DEPARTMENT - ...	29.184706	-81.060813	Police Stations				Low	160 MPH	
Volusia County Fire Services Station ...	29.328796	-81.112381	Fire Stations			X	Low	160 MPH	
Volusia County Fire Services Station ...	29.404343	-81.144829	Fire Stations				Moderate	160 MPH	
Volusia County Fire Services Station ...	29.335375	-81.061142	Fire Stations			X	Low	160 MPH	
Ormond Beach Fire Department Station 91	29.282549	-81.036049	Fire Stations		X	X	Moderate	160 MPH	
Ormond Beach Fire Department Station 93	29.290686	-81.068626	Fire Stations		X	X	Moderate	160 MPH	X
Ormond Beach Fire	29.275469	-81.082367	Fire Stations				Low	160 MPH	

Department Station 92									
Volusia County Fire Services Station ...	29.244341	-81.071419	Fire Stations				Moderate	160 MPH	
Holly Hill Fire Rescue Station 96	29.243544	-81.038338	Fire Stations			X	Moderate	160 MPH	
Daytona Beach Fire Department Station 3	29.239725	-81.021317	Fire Stations			X	Moderate	160 MPH	
Daytona Beach Fire Department Station 5	29.216045	-81.045746	Fire Stations		X	X	Moderate	160 MPH	
Daytona Beach Fire Department Station 1	29.208252	-81.01696	Fire Stations	X	X	X	Moderate	160 MPH	X
Daytona Beach Fire Department Station 4	29.210711	-81.067894	Fire Stations				Moderate	160 MPH	
South Daytona Fire Department	29.181292	-81.008041	Fire Stations		X	X	Moderate	160 MPH	
Port Orange Fire Rescue Department St...	29.12542	-81.02359	Fire Stations				Moderate	160 MPH	

Port Orange Fire Rescue Department St...	29.104071	-80.987793	Fire Stations	X	X	X	Moderate	160 MPH	X
Port Orange Fire and Rescue Department	29.140692	-80.986359	Fire Stations	X	X	X	Moderate	160 MPH	
Daytona Beach Fire Department Station 2	29.202818	-80.998535	Fire Stations		X	X	Moderate	160 MPH	
Daytona Beach Shores Department of Pu...	29.166441	-80.97776	Fire Stations			X	Moderate	160 MPH	
Ponce Inlet Fire Rescue Department	29.098698	-80.941292	Fire Stations	X	X	X	Moderate	160 MPH	X
New Smyrna Beach Fire and Rescue Fire...	29.029137	-80.899757	Fire Stations	X	X	X	High	160 MPH	X
Volusia County Fire Services Station ...	28.979507	-80.860939	Fire Stations	X	X	X	Moderate	160 MPH	
New Smyrna Beach Fire and Rescue Fire...	29.049016	-80.93711	Fire Stations		X	X	High	160 MPH	
New Smyrna Beach Fire	29.025545	-80.922874	Fire Stations	X	X	X	Low	160 MPH	X

Department									
Volusia County Fire Services Station ...	29.018578	-80.945824	Fire Stations	X	X	X	Low	160 MPH	X
Volusia County Fire Services Station	28.870298	-80.850899	Fire Stations		X	X	Low	160 MPH	
Edgewater Department of Fire Rescue S...	28.953962	-80.895821	Fire Stations			X	Moderate	160 MPH	
Edgewater Department of Fire Rescue S...	28.975962	-80.897278	Fire Stations			X	Moderate	160 MPH	
Ormond Beach Fire Department Station 94	29.274183	-81.146088	Fire Stations				Moderate	160 MPH	
Volusia County Fire Services Training Center	29.1467	-81.153572	Fire Stations				High	150 MPH	
Port Orange Fire Rescue Department St...	29.111418	-81.052704	Fire Stations				Moderate	160 MPH	
New Smyrna Beach Fire and	29.015745	-80.995117	Fire Stations				High	160 MPH	

Rescue Station									
Volusia County Fire Services Station	28.730654	-81.032677	Fire Stations				High	160 MPH	
Volusia County Fire Services Station ...	29.082958	-81.066414	Fire Stations			X	Moderate	160 MPH	
Port Orange Fire Rescue Department St...	29.068159	-81.038208	Fire Stations				Moderate	160 MPH	
Volusia County Fire Services Station ...	29.242687	-81.466835	Fire Stations				Moderate	150 MPH	
Deland Fire Department Station 82	29.055044	-81.307663	Fire Stations				Moderate	150 MPH	
Volusia County Fire Rescue DeLeon Spr...	29.118317	-81.34951	Fire Stations				Moderate	150 MPH	
Volusia County Fire Services Glenwood...	29.072231	-81.327965	Fire Stations				High	150 MPH	
Volusia County Fire Services Kepler R...	29.061321	-81.26252	Fire Stations				Moderate	150 MPH	
Deland Fire	29.000546	-81.263062	Fire Stations				Moderate	150 MPH	

Department Station 83									
Deland Fire Department Station 81	29.026661	-81.30574	Fire Stations				Moderate	150 MPH	
Volusia County Fire Rescue Saint John...	29.022877	-81.359039	Fire Stations				High	150 MPH	
Volusia County Fire Rescue Spring Lak...	28.977438	-81.301079	Fire Stations				High	150 MPH	
Orange City Fire Department Station 68	28.918688	-81.292389	Fire Stations				Low	150 MPH	
Orange City Fire Department	28.950084	-81.29812	Fire Stations				Moderate	150 MPH	
Volusia County Fire Station 33 Debary	28.883015	-81.308228	Fire Stations				Moderate	150 MPH	
Volusia County Fire Services Station ...	28.985029	-81.242889	Fire Stations				Moderate	150 MPH	
Deltona Fire Rescue Department Statio...	28.900116	-81.271469	Fire Stations				Moderate	150 MPH	

Deltona Fire Rescue Department Statio...	28.879847	-81.174805	Fire Stations				High	150 MPH	
Volusia County Fire Services Station ...	28.846548	-81.16304	Fire Stations				Moderate	160 MPH	
Volusia County Fire Services Station ...	28.857195	-81.2248	Fire Stations				Moderate	150 MPH	
Deltona Fire Rescue Department Station	28.906279	-81.225914	Fire Stations				Moderate	150 MPH	
Deltona City Fire Station 65	28.947231	-81.232574	Fire Stations				Moderate	150 MPH	
Deltona Fire Rescue Department Station	28.923847	-81.189384	Fire Stations				Moderate	150 MPH	
Daytona Beach Fire Department Station 6	29.163551	-81.058022	Fire Stations				Moderate	160 MPH	A
Volusia County Fire Rescue Daytona Be...	29.178478	-81.057175	Fire Stations				Low	160 MPH	
VOLUSIA COUNTY EMERGENCY	29.140482	-81.144876	Emergency Operations Centers				Moderate	160 MPH	

MANAGEMENT									
VOLUSIA COUNTY EOC	29.029469	-81.304948	Emergency Operations Centers				Low	150 MPH	

Table 4: Water and Sewage Hazard Analysis

Asset Name	Asset Type	Asset Owner	Cat 1 Surge	Cat 3 Surge	Cat 5 Surge	Wildfire Risk	Wind Zone	FEMA Flood Zone
Ocean Shore Lift Station	Stormwater Treatment Facilities And Pump Stations	Private			X	Moderate	160mph	
Taxiway Lindy Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County			X	Moderate	160mph	
Ohio Lift Station	Stormwater Treatment Facilities And Pump Stations	Orange City				Moderate	150mph	
Navel Orange Lift Station	Stormwater Treatment Facilities And Pump Stations	Orange City				Moderate	150mph	
Quail View Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	A
Bella Vista Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County		X	X	Moderate	160mph	
H H Birch Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County	X	X	X	High	160mph	AE
Ridgewood Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County			X	Moderate	160mph	
Coleman Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County	X	X	X	Low	160mph	AE

Charles Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County	X	X	X	Moderate	160mph	X
Douglas Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County	X	X	X	Moderate	160mph	AE
Lewis Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County	X	X	X	Moderate	160mph	X
Navajo Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County	X	X	X	Moderate	160mph	X
Golden Bay Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County	X	X	X	Moderate	160mph	X
Fishermans Cove Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County		X	X	Moderate	160mph	
Ariel Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County		X	X	High	160mph	
Ridgewood Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County		X	X	Very High	160mph	
Division Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	
Moonlight Cove Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Low	150mph	

Greenleaf Lift Station	Stormwater Treatment Facilities And Pump Stations	Orange City				Moderate	150mph	
Southlake Lift Station	Stormwater Treatment Facilities And Pump Stations	Orange City				High	150mph	
Industrial Lift Station	Stormwater Treatment Facilities And Pump Stations	Orange City				Moderate	150mph	
Dr Martin Luther King Lift Sta	Stormwater Treatment Facilities And Pump Stations	Volusia County				High	150mph	
Debary Plantation Lift Station	Stormwater Treatment Facilities And Pump Stations	Debary				Low	150mph	A
Quail Hill Lift Station	Stormwater Treatment Facilities And Pump Stations	Debary				Low	150mph	
Charles R Beall Lift Station	Stormwater Treatment Facilities And Pump Stations	Debary				Low	150mph	
Charles R Beall Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Low	150mph	
Charles R Beall Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	
Charles R Beall Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	

Halifax Crossings Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Very High	150mph	
Tullamore Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				High	160mph	
Lazio Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	
Florida Willow Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				High	150mph	
Porter Rye Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				High	150mph	
Terrapin Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Low	150mph	
Kenmare Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	160mph	
Killarney Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County			X	Moderate	160mph	
Peninsula Winds Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County			X	Moderate	160mph	
Barrier Isle Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County			X	Moderate	160mph	

Sandpiper Ridge Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County		X	X	Moderate	160mph	
Pelican Dunes Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County			X	Moderate	160mph	
Ocean Shore Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County			X	Moderate	160mph	
Ocean Shore Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County			X	Moderate	160mph	
Red John Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	160mph	
Plantation Oaks Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County			X		160mph	
Roscommon Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County			X	Moderate	160mph	
Acoma Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County			X	Moderate	160mph	
Speerin Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County			X	Low	160mph	
Carlow Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County			X	Moderate	160mph	A

Acoma Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County			X	Moderate	160mph	
Cessna Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County			X	Moderate	160mph	
Taxiway Lindy Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County			X	Moderate	160mph	
Spruce Creek Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	160mph	
Roscoe Turner Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County			X	Moderate	160mph	
Autumn Leaves Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	160mph	
Forest Edge Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Low	150mph	
Howland Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				High	150mph	
Wolf Pack Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Low	150mph	
Blaney Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	A

Eustace Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	
Volusia Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	
Volusia Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	
Volusia Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	
Terrace Hills Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	
Florence Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Low	150mph	
Kingslake Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Low	150mph	A
Charles R Beall Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	
Debary Plantation Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	
Eagles Estates Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	

Dogwood Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Low	150mph	
Charles R Beall Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	
Highbanks Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	
Legion Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				High	150mph	
Dirksen Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	
Charles R Beall Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Low	150mph	
Charles R Beall Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				High	150mph	
Fairway Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	
Glen Club Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				High	150mph	
Pine Valley Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	A

Pine Meadow Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	
Glen Abbey Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				High	150mph	
Toronto Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Low	150mph	A
Enterprise Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	
Enterprise Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	
Saxon Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	
Enterprise Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	
Enterprise Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Low	150mph	
Enterprise Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	
Grand Plaza Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	

Volusia Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	
Water Oak Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	
Moss Point Cove Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Low	150mph	
Howland Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	
James Pond Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Low	150mph	
Saxon Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Low	150mph	
Normandy Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				High	150mph	
Normandy Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	
Treemonte Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	
Saxon Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Low	150mph	

Verde Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	
Hammock Oak Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Low	150mph	
Charles R Beall Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	
Enterprise Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	
Horseshoe Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				High	150mph	AE
Warrior Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Low	150mph	AE
Arrowhead Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				High	150mph	AE
Kettledrum Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				High	150mph	AE
Stone Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				High	150mph	AE
Howland Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	

Wild Pepper Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	
Dr Martin L King Jr Lift Stati	Stormwater Treatment Facilities And Pump Stations	Volusia County				High	150mph	
Baron Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County			X	Moderate	160mph	
Spurce Creek Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County			X	Very Low	160mph	
Monaghan Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County			X	High	160mph	
Bass Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	AE
Shell Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	
Eustace Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	
Plantation Club Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Low	150mph	A
Leisure Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	

New Hope Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				High	150mph	
Fairlawn Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	
Garfield Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Low	150mph	
Charles R Beall Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				High	150mph	
Charles R Beall Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				High	150mph	
Charles R Beall Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	
Highbanks Lift Station	Stormwater Treatment Facilities And Pump Stations	Debary				Very Low	150mph	A
Charles R Beall Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	
Acoma Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				High	160mph	
Ocean Shore Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County			X	Moderate	160mph	

Rosa Bella Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	
Integra Reserve Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Low	150mph	
Lazio Lift Station	Stormwater Treatment Facilities And Pump Stations	Volusia County				Moderate	150mph	
Four Towns Wwtp	Wastewater Treatment Facilities And Lift Stations	Volusia County				Low	150mph	
Vc/Southwest Regional Wwtf-2	Wastewater Treatment Facilities And Lift Stations	Volusia County				Moderate	150mph	
Vc/Southeast Regional Wwtf-7	Wastewater Treatment Facilities And Lift Stations	Volusia County			X	Low	160mph	
Vc/Halifax Plantation Wwtf-8	Wastewater Treatment Facilities And Lift Stations	Volusia County				Moderate	160mph	
West Volusia Transfer Station	Wastewater Treatment Facilities And Lift Stations	Volusia County				Moderate	150mph	
Vc/Southwest Regional Wwtf-1	Wastewater Treatment Facilities And Lift Stations	Volusia County				Moderate	150mph	
Vc/New Hope Wwtp-20	Wastewater Treatment Facilities And Lift Stations	Volusia County				Very High	150mph	

Vc/Pelican Dunes Wwtp-9	Wastewater Treatment Facilities And Lift Stations	Volusia County			X	Moderate	160mph	
Vc/Pine Island Wwtp-10	Wastewater Treatment Facilities And Lift Stations	Volusia County				Moderate	150mph	AE
Tomoka Landfill Leachate Sprayfield	Wastewater Treatment Facilities And Lift Stations	Volusia County				High	160mph	A
Vc/Halifax Plantation Wtp-8	Drinking Water Facilities					Low	160mph	
Vc/Southwest Wtp-1d	Drinking Water Facilities					Low	150mph	
Vc/Spruce Creek Wtp-15	Drinking Water Facilities				X	Moderate	160mph	
Vc/Southwest Wtp-1a	Drinking Water Facilities					Moderate	150mph	
Vc/Southwest Wtp-1b	Drinking Water Facilities					Moderate	150mph	
Vc/Southwest Wtp-2	Drinking Water Facilities					Moderate	150mph	
Chuck Lennon Park	Drinking Water Facilities					Low	150mph	
Highbridge Park	Drinking Water Facilities		X	X	X	High	160mph	X
Oak Hill Medical Clinic	Drinking Water Facilities			X	X	High	160mph	
Mary Deweese Park	Drinking Water Facilities				X	Moderate	160mph	
Osteen R&B Barn	Drinking Water Facilities					Low	160mph	

Lake Beresford Park	Drinking Water Facilities					High	150mph	
Lake Dias	Drinking Water Facilities					Moderate	150mph	
Nancy Cummings Park	Drinking Water Facilities			X	X	Moderate	160mph	
Green Springs Park	Drinking Water Facilities					High	150mph	
Bill Keller Park	Drinking Water Facilities					Moderate	150mph	A
Vc/Southwest Wtp-1c	Drinking Water Facilities					Moderate	150mph	
Lake Ashby Park	Drinking Water Facilities					High	160mph	
Hester Park / Malloy School	Drinking Water Facilities					Moderate	150mph	
Cassadaga Wtp	Drinking Water Facilities					High	150mph	
Vc/New Hope Wtp-20	Drinking Water Facilities					Moderate	150mph	
Vc/Pine Island Wtp-10	Drinking Water Facilities					Moderate	150mph	
Beck Ranch Wtp	Drinking Water Facilities					Moderate	150mph	
Osteen Civic Center	Drinking Water Facilities					Moderate	160mph	
Shell Harbor Park	Drinking Water Facilities					High	150mph	AE

APPENDIX F: ASSET IDENTIFICATION AND VULNERABILITY PER JURISDICTION

This analysis involves numerous sources, such as:

- HAZUS
- National Hurricane Center
- ECFRPC
- Volusia County and Jurisdictions
- FDEP

JURISDICTION APPENDIX: DAYTONA BEACH

Table 1: Asset Location and Surge Vulnerability - Daytona Beach

Asset Name	Asset Type	Census Tract	Address	Latitude	Longitude	Cat 3 Water Depth (Ft)
Select Specialty Hospital - Daytona B...	Medical Care Facilities	12127080808	301 Memorial Medical Parkway, 11th Floor	29.242562	-81.107419	5
Adventhealth Daytona Beach	Medical Care Facilities	12127080808	301 Memorial Medical Pkwy	29.24311	-81.107657	5
Halifax Psychiatric Center-North	Medical Care Facilities	12127081702	841 Jimmy Ann Dr	29.21402	-81.068593	5
Halifax Health Medical Center	Medical Care Facilities	12127081800	303 N Clyde Morris Blvd	29.202385	-81.054828	5
Daytona Beach Veterans Affairs Outpat...	Medical Care Facilities	12127082303	551 National Health Care Drive	29.206409	-81.061756	5
Volusia County Emergency Management	Emergency Operations Centers	12127083206	49 Keyton Drive	29.140482	-81.144876	5
Daytona Beach Fire Department Station 6	Fire Stations	12127092500	2020 Beville Road	29.163551	-81.058022	5
Volusia County Fire Rescue Daytona Be...	Fire Stations	12127092500	2316 Bellevue Avenue Extension	29.178478	-81.057175	5
Volusia County Fire Services Training...	Fire Stations	12127083206	3889 Tiger Bay Road	29.1467	-81.153572	5
Daytona Beach Fire Department Station 3	Fire Stations	12127081201	945 North Halifax Avenue	29.239725	-81.021317	5
Daytona Beach Fire Department Station 2	Fire Stations	12127082604	126 Botefuhr Avenue	29.202818	-80.998535	5
South Daytona Fire Department	Fire Stations	12127082401	1672 South Ridgewood Avenue	29.181292	-81.008041	5
Volusia County Fire Services Station ...	Fire Stations	12127083211	1979 Taylor Road	29.082958	-81.066414	5

Daytona Beach Fire Department Station 1	Fire Stations	12127082000	301 South Beach Street	29.208252	-81.01696	5
Daytona Beach Fire Department Station 4	Fire Stations	12127082303	1675 Mason Avenue	29.210711	-81.067894	5
Daytona Beach Fire Department Station 5	Fire Stations	12127081600	627 North Nova Road	29.216045	-81.045746	5
Volusia County Sheriff's Office - Bea...	Police Stations	12127081300	515 South Atlantic Avenue	29.218758	-81.003544	5
South Daytona City Police Department	Police Stations	12127082401	1672 South Ridgewood Avenue	29.181315	-81.007999	5
Volusia County Sheriffs Department - ...	Police Stations	12127092500	700 Catalina Drive	29.184706	-81.060813	5
Volusia County Sheriffs Department - ...	Police Stations	12127082000	251 North Ridgewood Avenue	29.215296	-81.023479	5
Volusia County Sheriffs Department - ...	Police Stations	12127082000	250 North Beach Street, Suite 119	29.215451	-81.021655	5
Volusia County Sheriffs Department - ...	Police Stations	12127083206	3825 Tiger Bay Road	29.14645	-81.148881	5
Volusia Sheriffs Department - Operati...	Police Stations	12127083206	1330 Indian Lake Road	29.143009	-81.145737	5
Volusia County Sheriffs Department - ...	Police Stations	12127082000	125 East Orange Avenue	29.210803	-81.013856	5
Daytona Beach Police Department - Sub...	Police Stations	12127081202	510 Harvey Avenue	29.223916	-81.00984	5
Daytona Beach Police Department - Hea...	Police Stations	12127082100	990 Orange Avenue	29.200853	-81.037924	5

The Chiles Academy	Schools	12127081900	868 George W Engram Blvd	29.213284	-81.039736	
Volusia Regional Juvenile Detention C...	Schools	12127083206	3840 Old Deland Rd	29.136766	-81.142734	
Richard Milburn Academy	Schools	12127081800	1031 Mason Ave	29.217315	-81.049547	
Palm Terrace Elementary School	Schools	12127082302	1825 Dunn Ave	29.198401	-81.074249	
Riverview Learning Center	Schools	12127081201	801 N Wild Olive Ave	29.238417	-81.016584	
David C. Hinson Sr. Middle School	Schools	12127080808	1860 N Clyde Morris Blvd	29.239699	-81.094684	
Mainland High School	Schools	12127092500	1255 W International Speedway Blvd	29.197773	-81.050885	
Amikids Volusia	Schools	12127081702	1420 Mason Ave Ste A	29.213356	-81.063596	
Daytona Juvenile Residential Facility	Schools	12127083206	1386 Indian Lake Rd	29.136718	-81.142758	
Seabreeze High School	Schools	12127081101	2700 N Oleander Ave	29.266532	-81.02991	
Turie T. Small Elementary School	Schools	12127082100	800 South St	29.195917	-81.027159	
Campbell Middle School	Schools	12127082100	625 S Keech St	29.195004	-81.030466	
Ortona Elementary School	Schools	12127081102	1265 N Grandview Ave	29.24729	-81.02356	
Stewart Treatment Center	Schools	12127083206	3875 Tiger Bay Rd	29.144914	-81.152038	
Halifax Behavioral Services	Schools	12127081702	841 Jimmy Ann Dr	29.214037	-81.06858	
Dept. Of Corrections Educational Program	Schools	12127083206	1300 Red John Dr	29.140435	-81.149447	
Westside Elementary School	Schools	12127082302	1700 5th St	29.224138	-81.071315	
Easter Seals Child Development Center...	Schools	12127081800	1219 Dunn Ave	29.206916	-81.054454	
R. J. Longstreet	Schools	12127082605	2745 S Peninsula Dr	29.176687	-80.986041	

Elementary School						
Champion Elementary School	Schools	12127083205	921 Tournament Dr	29.207816	-81.137	
Basilica School Of St Paul	Schools	12127081500	317 Mullally St	29.216946	-81.027161	
Halifax Academy	Schools	12127082302	275 N Williamson Blvd	29.189019	-81.081327	
Daytona Beach Christian Academy	Schools	12127082415	1850 S Clyde Morris Blvd	29.170829	-81.038026	
Lourdes Academy	Schools	12127081102	1014 N.Halifax Ave	29.2418	-81.02111	
Father Lopez Catholic High School	Schools	12127081600	3918 Lpga Blvd	29.218548	-81.045937	
Mount Calvary Academy	Schools	12127082100	700 Bellevue Ave	29.194227	-81.024035	
Living Faith Academy	Schools	12127081701	950 Derbyshire Rd	29.229362	-81.064155	
Imagination Station Too Montessori	Schools	12127081201	528 N Peninsula Dr	29.233445	-81.016323	
Pure In Heart Christian Acad& Perform...	Schools	12127082000	121 S Palmetto Ave	29.210732	-81.020541	
Daytona State College - Advanced Tech...	Schools	12127080808	1770 Technology Blvd	29.232026	-81.098931	
Daytona State College - News-Journal ...	Schools	12127082000	221 North Beach St	29.21517	-81.019609	
University Of Central Florida - Dayto...	Schools	12127081800	1200 W. International Speedway Blvd.	29.201995	-81.048576	
Daytona State College	Schools	12127081800	1200 W. International Speedway Blvd.	29.202259	-81.051285	
Embry-Riddle Aeronautical University-...	Schools	12127092500	1 Aerospace Blvd.	29.189219	-81.049481	
Bethune-Cookman University	Schools	12127082000	640 Dr Mary Mcleod Bethune Blvd	29.210556	-81.031595	
Embry-Riddle Aeronautical University-...	Schools	12127092500	1 Aerospace Blvd.	29.189241	-81.04955	

Wesh Ch 2	Communication Facilities	12127090804		28.93832	-81.3159	
Wven-Tv Ch 26	Communication Facilities	12127090102		29.28637	-81.4934	
Wndb 1150	Communication Facilities	12127080805		29.23526	-81.07172	
Wrod 1340	Communication Facilities	12127082201		29.18887	-81.00756	
Wdyb-Lp Ch 53	Communication Facilities	12127080902		29.23165	-81.04172	
Wmfj 1450	Communication Facilities	12127081500		29.22526	-81.02478	
Wjhm Ch 270	Communication Facilities	12127090804		28.92138	-81.31895	
Vehicle Maintenance Facility	Waste Water Facilities	12127081500	412 North Seagrave Avenue	29.217501	-81.0289	
Daytona Beach/Bethune Point (D	Waste Water Facilities	12127082201	1 Shady Place	29.196199	-81.008301	
Dots Terminal	Bus Facilities	1034 N Nova Rd	12127081702	29.226	-81.0511	
Greyhound Bus Station	Bus Facilities	138 S Ridgewood Ave	12127082000	29.2101	-81.023	
Daytona Bch Mun Yacht Basin	Port Facilities	12127081300	Intracoastal Waterway, Jacksonville T...	29.21716	-81.01551	
Total Asset Count:	**74**					

JURISDICTION APPENDIX: DAYTONA BEACH SHORES

Table 2:Asset Location and Surge Vulnerability - Daytona Beach Shores

Asset Name	Asset Type	Census Tract	Address	Latitude	Longitude	Cat 3 Water Depth (Ft)
Daytona Beach Shores Department Of Pu...	Fire Stations	12127082605	3050 South Atlantic Avenue	29.16644	-80.9778	5
Daytona Beach Shores Department Of Pu...	Police Stations	12127082605	3050 South Atlantic Avenue	29.16579	-80.9775	5
Total Asset Count:	**2**					

JURISDICTION APPENDIX: DEBARY

Table 3:Asset Location and Surge Vulnerability - DeBary

Asset Name	Asset Type	Census Tract	Address	Latitude	Longitude	Cat 3 Water Depth (Ft)
Volusia County Fire Station 33 Debary	Fire Stations	12127090905	93 South Charles Richard Beall Boulevard	28.88302	-81.3082	5
Volusia County Sheriffs Department - ...	Police Stations	12127090905	94 South United States Highway 17-92	28.88407	-81.308	5
The Reading Edge Academy	Schools	12127090905	2975 Enterprise Rd	28.89505	-81.2827	
Highbanks Learning Center	Schools	12127090905	336 E Highbanks Rd	28.89078	-81.2851	
Debary Elementary School	Schools	12127090903	88 W Highbanks Rd	28.89119	-81.3207	
Florida Power & Light Co	Electric Power Facilities	12127090904	950 S Hwy 17-92	28.84316	-81.3255	
Duke Energy Florida, Llc	Electric Power Facilities	12127090803	176 West Highbanks Rd.	28.90386	-81.3323	
Total Asset Count:	**7**					

JURISDICTION APPENDIX: DELAND

Table 4: Asset Location and Surge Vulnerability - Deland

Asset Name	Asset Type	Census Tract	Address	Latitude	Longitude	Cat 3 Water Depth (Ft)
Adventhealth Deland	Medical Care Facilities	12127090202	701 W Plymouth Ave	29.04365	-81.3173	5
Volusia County Emergency Operations C...	Emergency Operation Centers	12127090500	123 West Indiana Avenue	29.02947	-81.3049	5
Deland Fire Department Station 81	Fire Stations	12127090500	201 West Howry Avenue	29.02666	-81.3057	5
Deland Fire Department Station 83	Fire Stations	12127090306	1655 East Taylor Road	29.00055	-81.2631	5
Volusia County Fire Services Kepler R...	Fire Stations	12127090305	1885 Kepler Road	29.06132	-81.2625	5
Deland Fire Department Station 82	Fire Stations	12127090202	257 West International Speedway Boule...	29.05504	-81.3077	5
Volusia County Fire Rescue Spring Lak...	Fire Stations	12127090803	2850 Firehouse Road	28.97744	-81.3011	5
Volusia County Fire Services Glenwood...	Fire Stations	12127090204	920 Glenwood Road	29.07223	-81.328	5
Volusia County Fire Rescue Saint John...	Fire Stations	12127090701	2580 West State Highway 44	29.02288	-81.359	5
Volusia County Sheriffs Department - ...	Police Stations	12127090303	951 Singleton Drive	29.0602	-81.2862	5
De Land Police Department	Police Stations	12127090500	219 West Howry Avenue	29.02671	-81.307	5
Volusia County Sheriffs Department La...	Police Stations	12127090702	1706 South Woodland Boulevard	28.99841	-81.3047	5
Volusia County Sheriffs Department - ...	Police Stations	12127090500	101 North Alabama Avenue	29.02925	-81.2998	5

Volusia County Sheriff's Office	Police Stations	12127090500	123 West Indiana Avenue	29.02952	-81.305	
Florida Highway Patrol Troop D - Deland	Police Stations	12127090303	1551 East International Speedway Boul...	29.05884	-81.2744	
Deland Middle School	Schools	12127090307	1400 Aquarius Ave	29.00428	-81.2975	
Citrus Grove Elementary School	Schools	12127090204	729 Hazen Rd	29.03934	-81.3358	
George W. Marks Elementary School	Schools	12127090304	1000 N Garfield Ave	29.04608	-81.297	
Edith I. Starke Elementary School	Schools	12127090600	730 S Parsons Ave	29.01502	-81.309	
Deland High School	Schools	12127090402	800 N Hill Ave	29.04167	-81.284	
Freedom Elementary School	Schools	12127090306	1395 S Blue Lake Ave	28.99411	-81.2714	
Florida Technical College - Deland Ca...	Schools	12127090307	1199 South Woodland Blvd	29.00912	-81.3006	
Lighthouse Christian Preparatory Academy	Schools	12127090701	126 S Ridgewood Ave	29.02371	-81.341	
T.O.P Academy	Schools	12127090600	330 S Thompson Ave	29.02343	-81.3107	
Daytona State College - Deland	Schools	12127090306	1155 County Road 4139	29.01203	-81.2431	
Casa Montessori	Schools	12127090401	217 N Stone St Ste B	29.03042	-81.3157	
St Barnabas Episcopal School	Schools	12127090401	322 W Michigan Ave	29.03307	-81.3084	
Children's House Montessori School	Schools	12127090402	509 E Pennsylvania Ave	29.03961	-81.2942	
St Peter Catholic School	Schools	12127090500	421 W New York Ave	29.02868	-81.3099	
Stetson Baptist Christian School	Schools	12127090202	1025 W Minnesota Ave	29.0358	-81.3239	
Pk Child Care Program	Schools	12127090401	200 N Clara Ave	29.03016	-81.3085	

Southwestern Middle School	Schools	12127090702	605 W New Hampshire Ave	29.00753	-81.3143	
Blue Lake Elementary School	Schools	12127090304	282 N Blue Lake Ave	29.03089	-81.2763	
Ese Related Services	Schools	12127090401	200 N Clara Ave	29.03019	-81.3086	
Woodward Avenue Elementary School	Schools	12127090701	1201 S Woodward Ave	29.01077	-81.3309	
Stetson University	Schools	12127090402	421 N Woodland Blvd	29.03532	-81.3006	
Wynd 1310	Communication Facilities	12127090307		28.99943	-81.2981	
Wocl Ch 290	Communication Facilities	12127090804		28.92138	-81.319	
Wnda 1490	Communication Facilities	12127090600		29.01637	-81.2859	
Wnda 1490	Communication Facilities	12127090600		29.01832	-81.2995	
Deland, City Of - Wiley M Nash Wrf	Waste Water Facilities	12127090307	1032 S Amelia Ave	29.009	-81.2981	
Daytona Beach Intl	Airport Facilities	12127092500	123 W Indiana Ave	29.17992	-81.0581	
Deland Muni-Sidney H Taylor Field	Airport Facilities	12127090303	120 S. Florida Ave.	29.06703	-81.2838	
Advent Health Deland	Airport Facilities	12127090202	701 W Plymouth Ave	29.04463	-81.3178	
Highbride Park	Potable Water Facilities	12127080201	300 E. New Hampshire	29.40856	-81.0995	
Fla Power & Light Lake Monroe	Port Facilities	12127090904	St. Johns River, Fl Jacksonville To L...	28.83962	-81.3261	
Enterprise Fla	Port Facilities	12127091018	St. Johns River, Fl Jacksonville To L...	28.86845	-81.2721	
Total Asset Count:	**47**					

JURISDICTION APPENDIX: DELTONA

Table 5:Asset Location and Surge Vulnerability - Deltona

Asset Name	Asset Type	Census Tract	Address	Latitude	Longitude	Cat 3 Water Depth (Ft)
Halifax Health UF Health Medical Cent...	Medical Care Facilities	12127091001		28.957659	-81.2557	5
Deltona Fire Rescue Department Statio...	Fire Stations	12127091030	1685 Providence Boulevard	28.906279	-81.2259	5
Deltona Fire Rescue Department Statio...	Fire Stations	12127091018	320 Diamond Street	28.900116	-81.2715	5
Deltona Fire Rescue Department Statio...	Fire Stations	12127091025	236 Fort Smith Boulevard	28.879847	-81.1748	5
Deltona Fire Rescue Department Statio...	Fire Stations	12127091036	2146 Howland Boulevard	28.923847	-81.1894	5
Deltona City Fire Station 65	Fire Stations	12127091032	2983 Howland Boulevard	28.947231	-81.2326	5
Volusia County Sheriffs Department - ...	Police Stations	12127091030	16941 Providence Blvd	28.906735	-81.2253	
Deltona Middle School	Schools	12127091018	250 Enterprise Rd	28.877966	-81.2724	
Sunrise Elementary School	Schools	12127091025	3155 Phonetia Dr	28.881496	-81.1755	
Deltona Christian School	Schools	12127091017	1200 Providence Blvd	28.881367	-81.2428	
Trinity Christian Academy	Schools	12127091033	875 Elkcam Blvd	28.924473	-81.2543	
Gateway Christian Academy	Schools	12127091028	950 Doyle Rd	28.870378	-81.2504	
Academy Of Career Training - Deltona ...	Schools	12127091018	1260 Deltona Boulevard	28.897291	-81.2674	
Daytona State College - Deltona Campus	Schools	12127091019	2351 Providence Blvd	28.929134	-81.2216	

Good Shepherd Academy	Schools	12127091025	750 Howland Blvd	28.883624	-81.1668	
Aldersgate Academy	Schools	12127091018	51 Childrens Way	28.868036	-81.2666	
Pine Ridge High School	Schools	12127091035	926 Howland Blvd	28.886829	-81.162	
Spirit Elementary School	Schools	12127091015	1500 Meadowlark Dr	28.90587	-81.2423	
Friendship Elementary School	Schools	12127091019	2746 Fulford St	28.93433	-81.1885	
Heritage Middle School	Schools	12127091025	1001 Parnell Ct	28.891873	-81.1721	
Galaxy Middle School	Schools	12127091032	2400 Eustace Ave	28.929963	-81.2301	
Forest Lake Elementary School	Schools	12127091028	1600 Doyle Rd	28.873479	-81.2286	
Timbercrest Elementary School	Schools	12127091032	2401 Eustace Ave	28.932539	-81.231	
Pride Elementary School	Schools	12127091035	1100 Learning Ln	28.89545	-81.1621	
Discovery Elementary School	Schools	12127091017	975 Abagail Dr	28.89193	-81.2503	
Deltona Lakes Elementary School	Schools	12127091019	2022 Adelia Blvd	28.921411	-81.2174	
Deltona High School	Schools	12127091032	100 Wolf Pack Run	28.946599	-81.2464	
Total Asset Count:	**27**					

JURISDICTION APPENDIX: EDGEWATER

Table 6: Asset Location and Surge Vulnerability - Edgewater

Asset Name	Asset Type	Census Tract	Address	Latitude	Longitude	Cat 3 Water Depth (Ft)
Edgewater Department Of Fire Rescue S...	Fire Station	12127083008	1605 South Ridgewood Avenue	28.97596	-80.8973	5
Edgewater Department Of Fire Rescue S...	Fire Station	12127083006	2628 Hibiscus Drive	28.95396	-80.8958	5
Edgewater Police Department	Police Stations	12127083008	135 East Park Avenue	28.9929	-80.9053	5
Indian River Elementary School	Schools	12127083005	650 Roberts Rd	28.94558	-80.8912	
Edgewater Public School	Schools	12127083008	801 S Old County Rd	28.9842	-80.9071	
Little Explorers Montessori	Schools	12127083008	408 N Ridgewood Ave	29.0004	-80.9125	
Edgehop Christian Academy	Schools	12127083005	3042 S Ridgewood Ave Ste A	28.94675	-80.8845	
Discovery Days Institute Of Learning	Schools	12127083008	227 N Ridgewood Ave	28.99451	-80.9088	
Wkro-Fm Ch 226	Communicatio n Facilities	12127083003	Unknown	28.89471	-80.8853	
Wkto Ch 204	Communicatio n Facilities	12127083209	Unknown	29.04165	-81.0562	
Kennedy Space Cntr Federal Cre	Waste Water Facilities	12127083005	Unknown	28.9505	-80.8856	
Kennedy Park Improvements	Waste Water Facilities	12127083008	103 S Riverside Dr	28.9933	-80.9047	
Edgewater, City Of	Waste Water Facilities	12127082704	500 W Ocean Ave	28.9898	-80.8999	
Edgewater Fla	Port Facilities	12127083008	Intracoastal Waterway, Jacksonville T...	29.0016	-80.9065	
Total Asset Count:	**14**					

JURISDICTION APPENDIX: HOLLY HILL

Table 7: Asset Location and Surge Vulnerability - Holly Hill

Asset Name	Asset Type	Census Tract	Address	Latitude	Longitude	Cat 3 Water Depth (Ft)
Volusia County Fire Services Station ...	Fire Station	12127080805	1580 Derbyshire Road	29.24434	-81.0714	5
Holly Hill Fire Rescue Station 96	Fire Station	12127081002	1030 Daytona Avenue	29.2062	-81.0362	5
Volusia County Sheriffs Department - ...	Police Stations	12127080102	1435 Us Hwy 1, Suite D-3	29.33017	-81.1217	5
Holly Hill Police Department	Police Stations	12127081002	1065 Ridgewood Avenue	29.24512	-81.04	5
Holly Hill School	Schools	12127080901	1500 Center Ave	29.24934	-81.0554	
Ubic Academy	Schools	12127080901	560 Flomich St	29.25283	-81.0554	
Installer Institute	Schools	12127081001	1524 Ridgewood Avenue	29.2546	-81.0468	
Wvyb Ch 277	Communication Facilities	12127080805	Unknown	29.23637	-81.0728	
Wapn Ch 218	Communication Facilities	12127081001	Unknown	29.25192	-81.0478	
Holly Hill, City Of (Dw)	Waste Water Facilities	12127081002	453 Lpga Boulevard	29.2447	-81.0341	
Total Asset Count:	**10**					

JURISDICTION APPENDIX: LAKE HELEN

Table 8: Asset Location and Surge Vulnerability - Lake Helen

Asset Name	Asset Type	Census Tract	Address	Latitude	Longitude	Cat 3 Water Depth (Ft)
Volusia County Fire Services Station ...	Fire Station	12127091001	630 West Main Street	28.98503	-81.2429	5
Lake Helen Police Department	Police Stations	12127091001	493 South Lakeview Drive	28.97773	-81.2315	5
Blake Memorial Day School	Schools	12127091001	134 N Euclid Ave	28.98545	-81.2344	
Volusia Pines Elementary School	Schools	12127091001	500 E Kicklighter Rd	28.97211	-81.2261	
Central Fellowship Christian Academy	Schools	12127091021	626 E Kicklighter Rd	28.97038	-81.2147	
Ivy Hawn Charter School Of The Arts	Schools	12127091001	565 S Lakeview Dr Unit 110	28.97798	-81.2308	
Total Asset Count:	**6**					

JURISDICTION APPENDIX: NEW SMYRNA BEACH

Table 9: Asset Location and Surge Vulnerability - New Smyrna Beach

Asset Name	Asset Type	Census Tract	Address	Latitude	Longitude	Cat 3 Water Depth (Ft)
Adventhealth New Smyrna Beach	Medical Care Facilities	12127082802	401 Palmetto St	29.02029	-80.9219	5
New Smyrna Beach Fire Department	Fire Stations	12127082802	103 Faulkner Street	29.02555	-80.9229	5
Volusia County Fire Services Station ...	Fire Stations	12127082903	1850 Pioneer Trail	29.01858	-80.9458	5
Volusia County Fire Services Station ...	Fire Stations	12127082704	4840 South Atlantic Avenue	28.97951	-80.8609	5
New Smyrna Beach Fire And Rescue Stat...	Fire Stations	12127083209	151 Williamson Boulevard Extension	29.01575	-80.9951	5
New Smyrna Beach Fire And Rescue Fire...	Fire Stations	12127082703	500 East 3rd Avenue	29.02914	-80.8998	5
New Smyrna Beach Fire And Rescue Fire...	Fire Stations	12127082802	1400 North Dixie Freeway	29.04902	-80.9371	5
Volusia County Sheriff - Civil Division	Police Stations	12127082802	101 Canal Street	29.02576	-80.9213	5
New Smyrna Beach Police Department	Police Stations	12127082802	1400 North Dixie Freeway	29.04753	-80.9407	5
Read-Pattillo Elementary School	Schools	12127082802	400 6th St	29.0109	-80.9198	
Chisholm Elementary School	Schools	12127082903	557 Ronnoc Ln	29.03004	-80.9327	
Samsula Academy	Schools	12127083209	248 N Samsula Dr	29.02228	-81.0509	
New Smyrna Beach Middle School	Schools	12127082902	1200 S Myrtle Ave	29.00452	-80.9236	
New Smyrna Beach High School	Schools	12127082902	1015 10th St	29.00317	-80.9304	
Coronado Beach	Schools	12127082705	3550 Michigan Ave	29.00276	-80.8787	

Elementary School						
Sacred Heart Catholic School	Schools	12127082802	1003 Turnbull St	29.03898	-80.9346	
Bethel Christian Academy	Schools	12127082903	312 N Duss St	29.02431	-80.9331	
Space Coast Christian Academy	Schools	12127083209	223 N Samsula Dr	29.02075	-81.0508	
Knight's Christian Academy	Schools	12127082802	310 Douglas St	29.02296	-80.9232	
Daytona State College - New Smyrna Be...	Schools	12127083009	940 10th St	28.99996	-80.927	
WJLU Ch 209	Communication Facilities	12127082902		29.00915	-80.9739	
WCEU Ch 15	Communication Facilities	12127083206		29.17359	-81.1565	
WSBB 1230	Communication Facilities	12127082802		29.03276	-80.9173	
New Smyrna Beach Utili...	Electric Power Facilities	12127082902	1000 Field Street	29.01732	-80.9329	
New Smyrna Beach Muni	Airport Facilities	12127082802	210 Sams Ave	29.05569	-80.9489	
New Smyrna Bch Municipal Whfs	Port Facilities	12127082701	Intracoastal Waterway, Jacksonville T...	29.03892	-80.9064	
Shrimp Docks New Smyrna Bch	Port Facilities	12127082701	Intracoastal Waterway, Jacksonville T...	29.03919	-80.9061	
Uscg Station, Ponce De Leon Inlet, Fl	Port Facilities	12127082701	Intracoastal Waterway, Jacksonville T...	29.06346	-80.9146	
Total Asset Count:	**28**					

JURISDICTION APPENDIX: OAK HILL

Table 10: Asset Location and Surge Vulnerability - Oak Hill

Asset Name	Asset Type	Census Tract	Address	Latitude	Longitude	Cat 3 Water Depth (ft)
Volusia County Fire Services Station ...	Fire Stations	12127083003	213 North US Highway 1	28.8703	-80.8509	5
OAK HILL POLICE DEPARTMENT	Police Stations	12127083003	234 SOUTH UNITED STATES HIGHWAY 1	28.85887	-80.8512	5
BURNS SCIENCE AND TECHNOLOGY CHARTER ...	Schools	12127083003	160 RIDGE RD	28.86216	-80.849	
OAKHILL FISH DOCK	Port Facilities	12127083003	Intracoastal Waterway, Jacksonville t...	28.88228	-80.8425	
TOTAL ASSET COUNT:	**4**					

JURISDICTION APPENDIX: ORANGE CITY

Table 11: Asset Location and Surge Vulnerability - Orange City

Asset Name	Asset Type	Census Tract	Address	Latitude	Longitude	Cat 3 Water Depth (Ft)
Adventhealth Fish Memorial	Medical Care Facilities	12127090806	1055 Saxon Blvd	28.91437	-81.2852	5
Orange City Fire Department	Fire Stations	12127090808	215 North Holly Avenue	28.95008	-81.2981	5
Orange City Fire Department Station 68	Fire Stations	12127090806	743 Harley Strickland Boulevard	28.91869	-81.2924	5
Orange City Police Department	Police Stations	12127090808	207 North Holly Avenue	28.94959	-81.2981	5
River Springs Middle School	Schools	12127090804	900 W Ohio Ave	28.93878	-81.3092	
Orange City Elementary School	Schools	12127090808	555 E University Ave	28.95138	-81.2916	
University High School	Schools	12127090804	1000 W Rhode Island Ave	28.93184	-81.313	
Sunrise Academy	Schools	12127090905	2700 Enterprise Rd Ste A	28.90869	-81.291	
Manatee Cove Elementary School	Schools	12127090804	734 W Ohio Ave	28.93914	-81.3001	
Total Asset Count:	**9**					

JURISDICTION APPENDIX: ORMOND BEACH

Table 12: Asset Location and Surge Vulnerability - Ormond Beach

Asset Name	Asset Type	Census Tract	Address	Latitude	Longitude	Cat 3 Water Depth (Ft)
Volusia County Fire Services Station ...	Fire Stations	12127080102	3935 Old Dixie Highway	29.40434	-81.1448	5
Volusia County Fire Services Station ...	Fire Stations	12127080101	15 Southland Road	29.3288	-81.1124	5
Volusia County Fire Services Station ...	Fire Stations	12127080202	1716 Atlantic Avenue	29.33538	-81.0611	5
Ormond Beach Fire Department Station 92	Fire Stations	12127080803	189 South Nova Road	29.27547	-81.0824	5
Ormond Beach Fire Department Station 94	Fire Stations	12127083203	2300 Airport Road	29.27418	-81.1461	5
Ormond Beach Fire Department Station 93	Fire Stations	12127080600	300 Wilmette Avenue	29.29069	-81.0686	5
Ormond Beach Fire Department Station 91	Fire Stations	12127080500	364 South Atlantic Avenue	29.28255	-81.036	5
Ormond Beach Police Department	Police Stations	12127080600	170 West Granada Boulevard	29.28288	-81.0608	5
Ormond Beach Elementary School	Schools	12127080600	100 Corbin Ave	29.28376	-81.0577	
St Brendan Catholic School	Schools	12127080400	1000 Ocean Shore Blvd	29.31555	-81.0535	
Calvary Christian Academy	Schools	12127083203	1687 W Granada Blvd	29.25741	-81.1188	
Temple Beth-El School	Schools	12127080807	579 N Nova Rd	29.29289	-81.0864	
Riverbend Academy	Schools	12127083205	2080 W Granada Blvd	29.24984	-81.1349	
The Children's House	Schools	12127083205	55 N Washington St	29.25239	-81.13	
Chabad Esformes	Schools	12127080806	1079 W Granada Blvd	29.27351	-81.0955	

Hebrew Academy						
The Little Engine Academy	Schools	12127080803	499 S Nova Rd	29.2681	-81.0783	
Acs Educational Resources And Consult...	Schools	12127080807	53 N Old Kings Rd Ste D	29.27968	-81.0802	
Reign Homeschooling Academy	Schools	12127080808	1060 W Granada Blvd	29.2736	-81.0943	
Ormond Beach Middle School	Schools	12127080700	151 Domicilio Ave	29.3081	-81.0702	
Pace Center For Girls	Schools	12127080600	208 Central Ave	29.27934	-81.0592	
Pathways Elementary School	Schools	12127083203	2100 Airport Rd	29.27229	-81.1351	
Tomoka Elementary School	Schools	12127080808	999 Old Tomoka Rd	29.2748	-81.0908	
Osceola Elementary School	Schools	12127080400	100 Osceola Ave	29.28661	-81.0399	
Pine Trail Elementary School	Schools	12127080101	300 Airport Rd	29.27525	-81.1142	
Daytona College	Schools	12127080803	425 South Nova Road	29.27008	-81.0801	
Wele 1380	Communication Facilities	12127080805	<Null>	29.26942	-81.0815	
Whog-Fm Ch 239	Communication Facilities	12127080805	<Null>	29.23637	-81.0728	
Ormond Beach, City Of - Ormond Beach ...	Waste Water Facilities	12127080807	550 N Orchard St	29.2936	-81.0831	
Ormond Beach Muni	Airport Facilities	12127080101	Po Box 277	29.30114	-81.1138	
Ormond Beach Fla	Port Facilities	12127080400	Intracoastal Waterway, Jacksonville T...	29.30745	-81.0581	
Total Asset Count:	**30**					

JURISDICTION APPENDIX: PIERSON

Table 13: Asset Location and Surge Vulnerability - Pierson

Asset Name	Asset Type	Census Tract	Address	Latitude	Longitude	Cat 3 Water Depth (Ft)
Volusia County Fire Services Station ...	Fire Stations	12127090102	132 North Fountain Drive	29.24269	-81.4668	5
Pierson Elementary School	Schools	12127090102	1 W 1st Ave	29.24407	-81.4637	
T. Dewitt Taylor Middle-High School	Schools	12127090101	100 E Washington Ave	29.24629	-81.4579	
Pierson Muni	Airport Facilities	12127090101	106 North Center Street	29.25003	-81.4593	
Total Asset Count:	**4**					

JURISDICTION APPENDIX: PONCE INLET

Table 14: Asset Location and Surge Vulnerability - Ponce Inlet

Asset Name	Asset Type	Census Tract	Address	Latitude	Longitude	Cat 3 Water Depth (Ft)
Ponce Inlet Fire Rescue Department	Fire Stations	12127082606	4680 South Peninsula Drive	29.0987	-80.9413	5
Ponce Inlet Police Department	Police Stations	12127082606	4301 South Peninsula Drive	29.12053	-80.9534	5
Total Asset Count:	**2**					

JURISDICTION APPENDIX: PORT ORANGE

Table 15: Asset Location and Surge Vulnerability - Port Orange

Asset Name	Asset Type	Census Tract	Address	Latitude	Longitude	Cat 3 Water Depth (Ft)
Halifax Health Medical Center - Port Orange	Medical Care Facilities	12127082506	1041 Dunlawton Ave	29.12621	-81.0086	5
Port Orange Fire Rescue Department St...	Fire Stations	12127082506	1090 City Center Boulevard	29.12542	-81.0236	5
Port Orange Fire Rescue Department St...	Fire Stations	12127083207	1701 Town West Boulevard	29.11142	-81.0527	5
Port Orange Fire And Rescue Departmen...	Fire Stations	12127082511	4200 South Ridgewood Avenue	29.14069	-80.9864	5
Port Orange Fire Rescue Department St...	Fire Stations	12127082509	5839 Trailwood Drive	29.10407	-80.9878	5
Port Orange Fire Rescue Department St...	Fire Stations	12127083211	6701 Airport Road	29.06816	-81.0382	5
Port Orange Police Department	Police Stations	12127082506	1395 Dunlawton Avenue	29.12097	-81.0177	5
Spruce Creek High School	Schools	12127082512	801 Taylor Rd	29.10871	-81.016	
Sugar Mill Elementary School	Schools	12127082503	1101 Charles St	29.14733	-81.001	
Spruce Creek Elementary School	Schools	12127082508	642 Taylor Rd	29.10572	-81.0048	
Horizon Elementary School	Schools	12127082410	4751 Hidden Lake Dr	29.1194	-81.038	
Silver Sands Middle School	Schools	12127082506	1300 Herbert St	29.13142	-81.0172	
Creekside Middle School	Schools	12127083211	6801 Airport Rd	29.06639	-81.0417	
Hospital Homebound	Schools	12127082414	1250 Reed Canal Rd	29.14862	-81.0267	
Cypress Creek Elementary School	Schools	12127083210	6100 S Williamson Blvd	29.08312	-81.0272	

Port Orange Elementary School	Schools	12127082511	402 Dunlawton Ave	29.14225	-80.9914	
Sweetwater Elementary School	Schools	12127082512	5800 Victoria Gardens Blvd	29.11633	-81.0174	
Tlc Kids Care	Schools	12127083210	1835 Taylor Rd	29.08951	-81.0487	
Wise Independent Private School System	Schools	12127082510	250 Poinciana Ave	29.11069	-80.9779	
Rock Church Academy	Schools	12127083207	1818 Taylor Rd	29.09101	-81.0506	
Atlantic High School	Schools	12127082414	1250 Reed Canal Rd	29.14864	-81.0267	
Port Orange (Dw)	Waste Water Facilities	12127082503	817 Oak St	29.1361	-80.9947	
Total Asset Count:	**22**					

JURISDICTION APPENDIX: SOUTH DAYTONA

Table 16: Asset Location and Surge Vulnerability - South Daytona

Asset Name	Asset Type	Census Tract	Address	Latitude	Longitude	Cat 3 Water Depth (Ft)
South Daytona Elementary School	Schools	12127082405	600 Elizabeth Pl	29.16828	-81.0082	
Warner Christian Academy	Schools	12127082401	1730 S Ridgewood Ave	29.17948	-81.0073	
The Chase Academy, Inc.	Schools	12127082202	2400 S Ridgewood Ave Ste 17	29.17773	-81.0248	
Blue Jay Academy	Schools	12127082404	960 Rooster Rd	29.17319	-81.0252	
International Academy	Schools	12127082401	2550 S Ridgewood Ave	29.16218	-80.9978	
WPUL 1590	Communication Facilities	12127082414		29.1547	-81.022	
Total Asset Count:	**6**					

APPENDIX G: HAZARD IDENTIFICATION RISK ANALYSIS (HIRA) CAPABILITY TARGETS

This section of the report details the core capability targets and resource requirements for some natural, man-made, and technological hazards covered in the Local Mitigation Strategy. The tables provided for each hazard are based on the template created as part of the Threat and Hazard Identification and Risk Assessment Guide (Second Edition) created by the U.S. Department of Homeland Security.

The following hazards are covered within this portion of the THIRA analysis:

- Drought
- Extreme Temperatures
- Flood
- HazMat Incident
- Public Health Emergency
- Sea Level Rise
- Severe Weather
- Storm Surge
- Terrorism
- Tornado
- Tropical Cyclone
- Wildland Fire

Drought

Drought	
Context Description	It is the beginning of summer. East central Florida is in a severe drought, as it has not rained in two months in Volusia County. The drought has caused brushfires to start in the western portions of the County. Dehydration-related deaths in the County have reached 10 since January.
Core Capability	
Capability Target	Community Resilience; Prescribed Burns, Long Term Vulnerability Reduction, Mass Care Services, Mass Search/Rescue, Aerial Reconnaissance and GIS Mapping of Fire, Aerial Firefighting Services (Regional, State, Federal), Inter-County Cooperation and Resource Sharing, Operational Communication/ Coordination, Planning, Public/Private Services, Health/Medical Service, Public Info/Warning, Risk Resilience Management, Threat/Hazard Identification, Health/Medical Services, Rapid Medical Air Transport
Resource Requirement	
Resources	**Number Required**

Extreme Temperatures

Extreme Temperatures	
Context Description	It is mid-August and temperatures reach 110 degrees Fahrenheit for five straight days. Students returning to school are beginning to be hospitalized for heat stroke and other heat-related illnesses, and multiple elderly residents have passed away as a result of heat stroke.
Core Capability	
Capability Target	Health/Medical Services; Rapid Medical Air Transport; Mass Care Services; Public Info/Warning Systems; Social Media and Media Outreach; School District Coordination with Schools; Medical Training for School Staff Member(s); Intensive Care Unit; Response for Environmental/Health/Safety; Fatality Management; Coordination with the Federal/State Government; Coordination with the Red Cross
Resource Requirement	
Resources	**Number Required**

Flood

Flooding	
Context Description	A large tropical low has formed off of the coast of Florida and has been held stationary by the presence of a low pressure system moving southward from northern Florida for over three days. An estimated 50% of the parcels within Flood Zone 'A' are affected, 50% of the parcels within Flood Zones 'AH', 'AO' and 'AE' are affected, 75% of the parcels within Flood Zone 'VE' are affected, and 1% of the parcels within Flood Zone X (500-Year Floodplain) are affected. The storm affects the building and assessed values of the parcels hit by an estimated 10%.
Core Capability	
Capability Target	Community Resilience, Critical Transportation, Economic Recovery, Environmental Response, Health and Social Services, Housing, Infrastructure Systems, Long Term Vulnerability Reduction, Mass Care Services, Mass Search/Rescue, Natural and Cultural Resources, On-Scene Security/Protection, Operational Communication/Coordination, Planning, Public/Private Services, Health/Medical Service, Public Info/Warning, Risk Resilience Management, Risk Management Programs, Situational Assessment, Threat/Hazard Identification
Resource Requirement	
Resources	**Number Required**

HazMat Incident

HazMat Incident	
Context Description	A train traveling along the Florida East Coast Railway crashes into Dubious Chemz, a chemical facility located along the Florida East Coast Railway line in unincorporated Volusia County. The train is not carrying hazardous materials, but the impact with the chemical facility triggers a simultaneous release of 26,000 pounds of chlorine stored in the facility into the air. Wind is registered at 5 miles per hour from the east southeast, humidity is 50% and the air temperature is 85 degrees Fahrenheit. The constant chemical leak lasts for exactly one hour, at which point all 26,000 pounds of chlorine have been released.
Core Capability	
Capability Target	Community Resilience, Critical Transportation, Economic Recovery, Response for Environmental/Health/Safety, Fatality Management, Forensics/Attribution, Health/Social Services, Infrastructure Systems, Intelligence/Information Sharing, Interdiction/Disruption, Long Term Vulnerability Reduction, Mass Care Services, Mass Search/Rescue, Natural and Cultural Resources, On-Scene Security and Protection, Operational Communication, Operational Coordination, Planning, Public/Private Services and Response, Health/Medical Services, Public Info/ Warning, Risk Resilience Management, Risk Management Programs, Screen/ Search/ Detect, Situational Assessment, Threat/Hazard Identification
Resource Requirement	
Resources	**Number Required**

Public Health Emergency

Public Health Emergency	
Context Description	An airplane landing at Daytona Municipal Airport carrying 234 passengers becomes overwhelmed by a NLV-like pandemic that sickens 80% of the passenger. After the passengers de-board the plane without a health check, the virus is airborne, has a 20% spread rate (20% of people who come in contact with the infected become infected) and is caught when a person with the sickness comes within 1 foot of a person with the pandemic. Moreover, of the 234 passengers affected with the sickness, those 234 passengers come in contact (or spread the disease) with an average of 7.5 persons per hour. The disease does not inflict casualties until at least 12 to 18 hours after the initial infection period, adding to the number of individuals who can be exposed to the disease from those infected individuals that are still alive.
Core Capability	
Capability Target	Access Control/ID Verification, Community Resilience, Economic Recovery, Response for Environmental/Health/Safety, Fatality Management, Health/Social Services, Intelligence/Information Sharing, Interdiction/ Disruption, Long Term Vulnerability Reduction, Mass Care Services, Mass Search/ Rescue, On-Scene Security and Protection, Operational Communication, Operational Coordination, Physical Protective Measures, Planning, Public/ Private Services and Response, Health/Medical Services, Public Info/ Warning, Risk Resilience Management, Risk Management Programs, Screen/ Search/ Detect, Situational Assessment, Supply Chain Integrity, Threat/Hazard Identification
Resource Requirement	
Resources	**Number Required**

APPENDIX G: HAZARD IDENTIFICATION RISK ANALYSIS (HIRA) CAPABILITY TARGETS

Sea Level Rise

Sea Level Rise	
Context Description	It is the year 2070. A neighborhood located on the barrier islands is beginning to flood frequently due to sea level rise, subsidence and other factors. Property owners are having a hard time selling their properties and the value of the properties is decreasing.
Core Capability	
Capability Target	Pre-Planning as part of the HMGP Program (Demolition, etc.); Sea Level Rise Vulnerability Assessments and Identified Countermeasures; Gray/Green Infrastructure (Sea Walls); Other Protective Measures; Community Resilience; Economic Recovery, Environmental Response, Health and Social Services, Housing, Infrastructure Systems, Long Term Vulnerability Reduction
Resource Requirement	
Resources	**Number Required**

Severe Weather

Severe Weather	
Context Description	A youth sports team is caught in a severe thunderstorm and multiple members of the team are struck by lightning. The sports complex is located in a rural area of west Volusia, not close to any hospital facilities. Some patients need immediate hospital care while others have very minor injuries.
Core Capability	
Capability Target	Health/Medical Services; Rapid Medical Air Transport; Mass Care Services; Mass Search/Rescue; Public Info/Warning Systems; Social Media; National Weather Service Coordination; Regional EMS Support; Inter-Local Agreements for Medical Response; Intensive Care Unit; Medical Specialists
Resource Requirement	
Resources	**Number Required**

Storm Surge

Storm Surge	
Context Description	A Category 3 Hurricane hits Volusia County, affecting a large portion of the county with storm surge damage. An estimated 60% of the parcels within the Category 1 Storm Surge zone are affected, 45% of the parcels within the Category 2 zone are affected, 30% of the parcels within the Category 3 zone are affected, 2% of the parcels within the Category 4 zone are affected and 1% of the parcels within the Category 5 zone are affected.
Core Capability	
Capability Target	Community Resilience, Critical Transportation, Economic Recovery, Environmental Response, Health and Social Services, Housing, Infrastructure Systems, Long Term Vulnerability Reduction, Mass Search/Rescue, Natural and Cultural Resources, On-Scene Security/Protection, Operational Communication/ Coordination, Planning, Public/Private Services, Health/Medical Service, Public Info/Warning, Risk Resilience Management, Risk Management Programs, Situational Assessment, Threat/Hazard Identification
Resource Requirement	
Resources	**Number Required**

Terrorism

Terrorism	
Context Description	A terrorist of unknown domestic or international origin detonates an explosive at the Daytona 500 car race while attendees are exiting the stadium. There are immediate casualties, both fatal and non-fatal, including fatal injuries to the perpetrator. It is unknown whether or not the perpetrator acted alone.
Core Capability	
Capability Target	Federal Coordination of Assets and Intelligence (FBI, CIA); State Coordination of Assets and Intelligence (FDLE); Regional Coordination of Assets and Equipment (CFIX); COOP Planning; Economic Recovery Planning; Mass Care Services; Mass Search/Rescue; On-Scene Law Enforcement Response; Health/Medical Services; Physical Protective Measures; Public Information; Coordination through the Media, Social Media and Law Enforcement; Operational Communication, Operational Coordination
Resource Requirement	
Resources	**Number Required**

Tornado

Tornado	
Context Description	A Category 3 Hurricane spawns several F1 tornadoes near the Ponce Inlet area. 100% of the parcels that are directly hit by the tornado are affected with 100% damage (as a percentage of building value), 50% of the parcels within 1/8 of a mile are affected with 75% damage, 20% of the parcels closer than 1/4 mile but farther than 1/8 mile away are affected with 20% damage, 5% of the parcels closer than 1/2 mile but farther than 1/4 mile away are affected with 2% in damage, and 1% of the parcels father than 1/2 mile away but less than one mile away are affected with minor, variable damage.
Core Capability	
Capability Target	Community Resilience, Economic Recovery, Environmental Response, Health and Social Services, Housing, Infrastructure Systems, Long Term Vulnerability Reduction, Mass Care Services, Mass Search/Rescue, Natural and Cultural Resources, On-Scene Security/Protection, Operational Communication/ Coordination, Planning, Public/Private Services, Health/Medical Service, Public Info/Warning, Risk Resilience Management, Risk Management Programs, Situational Assessment, Threat/Hazard Identification
Resource Requirement	
Resources	**Number Required**

Tropical Cyclone

Tropical Cyclone	
Context Description	A Category 3 Hurricane hits Volusia County from the Atlantic Ocean, affecting a large portion of the county with wind damage. An estimated 60% of the parcels within the 111-115 Wind Zone are affected, while 25% of the parcels within the 106-110 Wind Zone and 10% of the parcels within the 105-110 Wind Zone are affected.
Core Capability	
Capability Target	Community Resilience, Economic Recovery, Environmental Response, Health and Social Services, Housing, Infrastructure Systems, Long Term Vulnerability Reduction, Mass Care Services, Mass Search/Rescue, Natural and Cultural Resources, On-Scene Security/Protection, Operational Communication/ Coordination, Planning, Public/Private Services, Health/Medical Service, Public Info/Warning, Risk Resilience Management, Risk Management Programs, Situational Assessment, Threat/Hazard Identification
Resource Requirement	
Resources	**Number Required**

Wildland Fire

Wildland Fire	
Context Description	A wildfire spawns and spreads within a 'Very High Risk' area within Volusia County. The fire spreads, and as a result, 1% of the parcels within the 'Very High Risk' zone are affected, 0.5% of the parcels within the 'High Risk' zone are affected, 0.25% of the parcels within the 'Low Risk' zone are affected, and 0.1% of the parcels within the 'No Risk' or 'None' zone are affected. The fire affects parcels uniformly across hazard zones.
Core Capability	
Capability Target	Community Resilience, Economic Recovery, Environmental Response, Health and Social Services, Housing, Infrastructure Systems, Long Term Vulnerability Reduction, Mass Care Services, Mass Search/Rescue, Natural and Cultural Resources, On-Scene Security/ Protection, Operational Communication/ Coordination, Planning, Public/Private Services, Health/Medical Service, Public Info/Warning, Risk Resilience Management, Risk Management Programs, Situational Assessment, Threat/Hazard Identification; Prescribed Burns
Resource Requirement	
Resources	**Number Required**