

VOLUSIA COUNTY, FLORIDA



MULTI-JURISDICTIONAL LOCAL MITIGATION STRATEGY

**PREPARED BY THE VOLUSIA PREPARES LMS WORKING GROUP
JANUARY 2020**

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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.

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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 the 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 also address macro-level solution. 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

In an effort to reduce the Nation's mounting natural disaster losses, the U.S. Congress passed the Disaster Mitigation Act of 2000 (DMA 2000) in order 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 on 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 newly-created 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 2015, 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 the participating jurisdictions aim to enhance and create policies to address mitigating the impacts of a hazard is such policies do not already 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, Table 2.1 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. Copies of local adoption resolutions are provided in Appendix A. 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 on 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.

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

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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 Risk Assessment builds on available historical data from past hazard occurrences, establishes detailed profiles for each hazard, and culminates in a hazard risk ranking based on conclusions about the frequency of occurrence, spatial extent and potential impact of each hazard. FEMA's HAZUS^{®MH} loss estimation methodology and Mapping for Emergency Management, Parallel Hazard Information System (MEMPHIS) results were also used in evaluating known hazard risks by their relative long-term cost in expected damages. In essence, the information generated through the risk assessment serves a critical function as Volusia County and the participating jurisdictions seek to determine the most appropriate mitigation actions to pursue and implement—enabling it to prioritize and focus its efforts on those hazards of greatest concern and those structures or planning areas facing the greatest risk(s).

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. Information was obtained through the use of detailed survey questionnaires for local officials and an inventory and examination of existing plans, ordinances and relevant documents. The purpose of this assessment is to identify any existing gaps, weaknesses or conflicts in programs or activities that may hinder mitigation efforts, and to identify those activities that should be built upon in establishing a successful and sustainable local hazard mitigation program.

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

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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 2020 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 2020 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

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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 take into account 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 2020 version, was updated and adopted in 2015.

2.3 PREPARING THE 2020 LMS

The 2020 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 during October to December, 2019.

Per the contractual scope of work¹, 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 2020 LMS was prepared using an updated plan outline and incorporated relevant content from the 2015 LMS. The LMS Working Group updated various parts of the 2015 LMS, as exemplified below:

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

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

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- *Plan Outline*
The LMS Working Group did not revise the plan outline that was proposed by the consultant.
- *Hazards*
The LMS Working Group decided to include natural hazards starting with the 2009 LMS update, per DMA 2K requirements. Societal and technical hazards occurrences have not varied over the past five years, and 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.). This practice has been continued for the 2020 LMS.
- *Hazards Identification Scoring (for reference)*
In 2014, prior to this plan update, each jurisdiction reviewed the hazards scores that were included in the 2009 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 2020 update cycle. Article III Section A, Goal 2 and Section 8.5 were amended.
- *Vulnerability Assessment*
The Vulnerability Assessment was updated using HAZUS and MEMPHIS data, as well as the most recent local parcel data (October 2019) for GIS analysis. Hazard maps, hazards exposure and loss estimates were also included. 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. The consultant provided a proposed system that was reviewed and modified by the LMS Working Group. 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.

Additionally, in 2009, a Capability Assessment was prepared, which was not included in the 2005 LMS. This assessment remains and has been updated for the 2020 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 Kickoff Meetings (2) for the general public
- Developed the Vulnerability Assessment
- Developed the Capability Assessment

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- Conducted two Mitigation Strategy Workshops with the Volusia Prepares LMS Working Group and invited the general public to attend. The first meeting focused on the plan outline and data collection process and the second focused on review of the first draft of the updated 2020 plan.
- Developed the Mitigation Strategy
- Developed a new tracking and scoring system 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

In order 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 out to over 125 city managers, business owners, chambers of commerce, agencies, non-profits, emergency managers and other county LMS coordinators.

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 September 2019, 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 as required for the risk assessment portion of the Plan.
- Help complete the local 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.

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- 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 2020 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.

Table 2.1 lists the members of the Volusia County Prepares LMS Working Group who were responsible for participating in the development of the Plan.

TABLE 2.1: Volusia County Prepares LMS Working Group		
NAME	JURISDICTION	Email
Ray Parkhurst	American Red Cross	Ray.parkhurst@redcross.org
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Hank Baker	Ponce Inlet	hbaker@ponce-inlet.org

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TABLE 2.1: Volusia County Prepares LMS Working Group

NAME	JURISDICTION	Email
Ami Pierce	Ponce Inlet	apierce@ponce-inlet.org
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Aubrie Austin	Volusia County Emergency Management	alaustin@volusia.org
Jill Hemmerlein	Volusia County Emergency Management	jhemmerlein@volusia.org
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Denise Hutchinson	Women's Council of Realtors	denisehutchinson@adamscameron.com

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.

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.

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Volusia Prepares Kickoff Meeting

September 11, 2019

The Kickoff Meeting was held at the Volusia County Lifeguard Headquarters and Administration Center 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. Discussions focused the key objectives, project tasks, schedule and staffing. The LMS Working Group was asked to identify additional stakeholders, new plans, data and studies to incorporate into the LMS update. The LMS Working Group was also presented with a proposed plan outline. Each jurisdiction was asked to update their Hazards Identification (Comparison of Jurisdictional Relative Risk from 2014 LMS). See Appendix D for more information.

Public Meetings

October 29, 2019

Two public meetings were held to inform the public of the planning process and the overall scope of the 2020 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 member needs and recommendations for the plan. This day was also utilized to submit a draft to all County and jurisdictional representatives. See Appendix D for more information.

Volusia Prepares Meeting #2

December 11, 2019

The next Local Mitigation Strategy Meeting was held at the Volusia County Lifeguard Headquarters and Administration Center. The purpose of this meeting was to show the jurisdictions the draft plan and obtain comments. See Appendix D for more information.

2.6 INVOLVING THE PUBLIC AND IDENTIFIED STAKEHOLDERS

The public and community stakeholders were invited to two “Public Meetings” (October 29, 2019) during the LMS planning process (see Appendix D), and were also invited to the Volusia Prepares meetings conducted on September 11th and December 11th. 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 would have been received by emails, at meetings, or by contacting the LMS Coordinator. In addition, the LMS was also placed on the Volusia County Emergency Management’s Website: <http://www.volusia.org/emergency/>.

As listed in Table 2.1, the LMS Working Group includes representation from various stakeholders in the community, in addition to the participating jurisdictions’ local government staff.

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**

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 **Figure 3.1**. The participating jurisdictions in this plan include Daytona Beach, Daytona Beach Shores, DeBary, Del and 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 County¹. 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 62 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 49 inches.

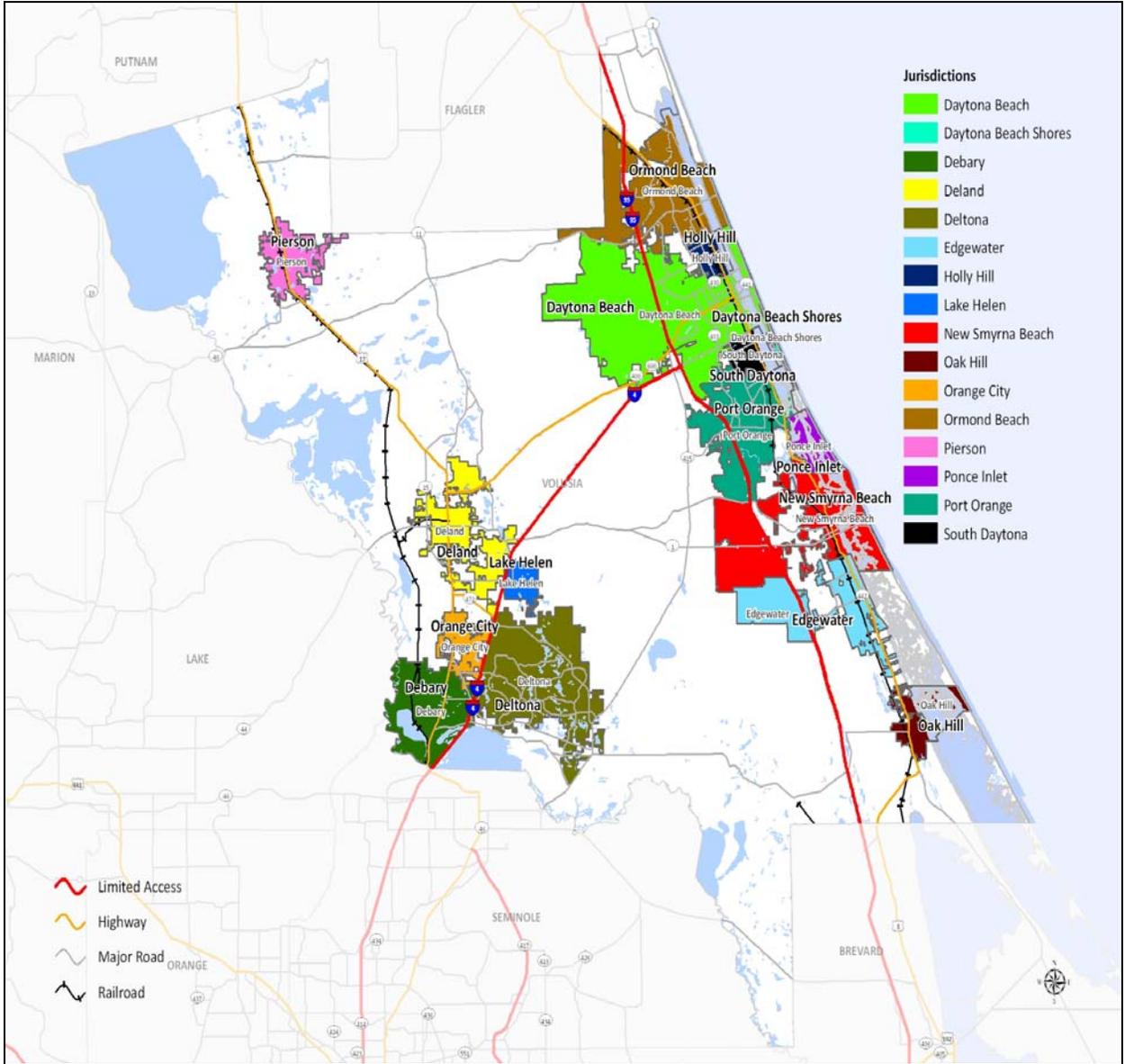
The dominant surface water resources in Volusia County are Mosquito Lagoon, Lake George (37,884 acres), Lake Monroe (5,423 acres), and Lake Harney (3,210 acres)². There are many other water areas throughout the County, which are fed by numerous creeks, bayous and other minor tributaries.

¹ <http://www.freshfromflorida.com>

² Volusia County Comprehensive Plan, Figure 1-2 Legend for Water Bodies

SECTION 3: COMMUNITY PROFILE

FIGURE 3.1: Volusia County Study Area Map



Source: Volusia County GIS

3.2 POPULATION AND DEMOGRAPHICS

According to the U.S. Census Bureau, the 2017 estimated population of Volusia County was 518,660. This represents a 4.9 percent increase from 2010, when the population was 494,593, and a slightly lower change compared to the State percent change of 12.3 percent. **Table 3.1** provides the 2010 populations of the cities and unincorporated areas within Volusia County along with the 2017 population estimates as provided by the U.S. Census Bureau. In addition, **Figure 3.2** shows the population distribution by block group in Volusia County.

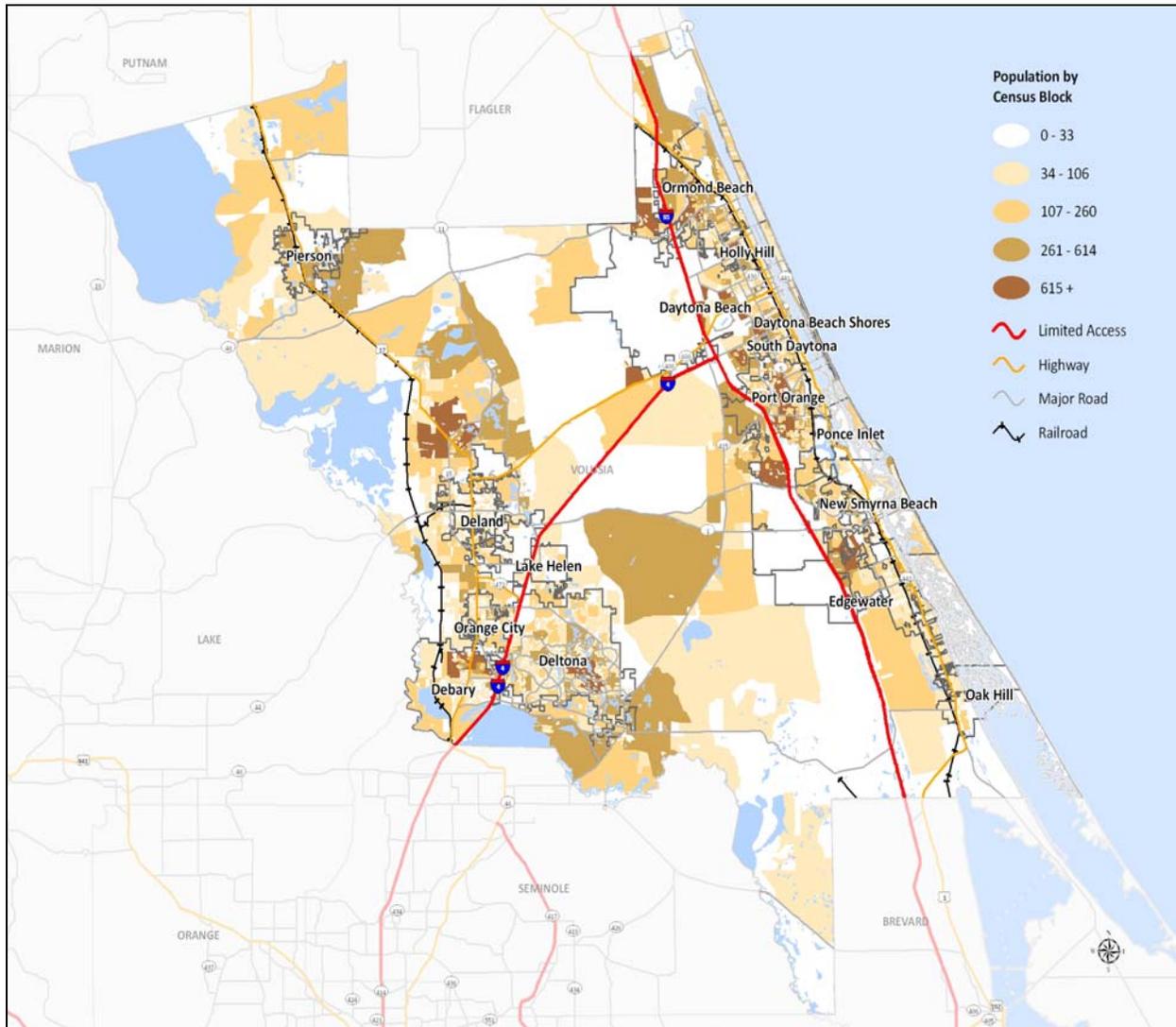
TABLE 3.1: Population of Cities and Unincorporated Areas in Volusia County

JURISDICTION	2010 POPULATION	2017 POPULATION ESTIMATE
Daytona Beach	61,005	68,055
Daytona Beach Shores	4,247	4,514
DeBary	19,320	20,784
DeLand	27,031	32,506
Deltona	85,182	90,746
Edgewater	20,750	22,399
Holly Hill	11,659	12,218
Lake Helen	2,624	2,780
New Smyrna Beach	19,537	26,470
Oak Hill	1,792	2,127
Orange City	10,599	11,697
Ormond Beach	38,137	42,816
Pierson	1,736	1,883
Ponce Inlet	3,032	3,241
Port Orange	56,048	63,203
South Daytona	12,252	12,936
Unincorporated	119,642	119,805

Source: U.S. Census Bureau & American Community Survey (2017)

SECTION 3: COMMUNITY PROFILE

Figure 3.2: Population of Cities and Unincorporated Areas in Volusia County



Source: U.S. Census Bureau (2010)

According to the 2017 U.S. Census American Community Survey, the median age for the County was 46.4 years. This is slightly higher than the Florida median age of 41.8 years of age. It is estimated that 20.4 percent of the County's population is made up of persons that are 65 years old and over, which is expectedly higher than the State figure of 17.4 percent.

The racial mix in Volusia County is predominately white, but has other populations. White persons make up 82.5 percent of the County's population. Black or African American persons accounted for 10.5 percent of the Volusia County population, less than the state percentage of 16.0 percent. Asians comprised 1.5 percent of the population compared to the State's 3.4 percent. People of two or more races comprised 2.1 percent of the population in the County.

3.3 HOUSING, INFRASTRUCTURE, AND LAND USE

3.3.1 Housing

According to the Census Bureau's 2013-2017 American Community Survey, there are 258,019 housing units in Volusia County. Of these structures, 69.1 percent are single-unit and 22.2 percent are multi-unit. The remaining 8.7 percent are mobile homes or other types of housing. The median value of owner-occupied housing units was \$149,900, compared to the \$178,700 average in Florida and the \$193,500 national average.

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.

SECTION 3: COMMUNITY PROFILE

3.3.3 Land Use

Table 3.2 shows the remaining vacant residential, vacant commercial and vacant industrial land available for development in Volusia County as of 2019.

JURISDICTION	VACANT RESIDENTIAL	VACANT COMMERCIAL	VACANT INDUSTRIAL
Daytona Beach	1,174 Acres	1,353 Acres	139 Acres
Daytona Beach Shores	10 Acres	23 Acres	0 Acres
DeBary	612 Acres	182 Acres	2 Acres
DeLand	764 Acres	358 Acres	121 Acres
Deltona	1,322 Acres	592 Acres	243 Acres
Edgewater	150 Acres	37 Acres	188 Acres
Holly Hill	114 Acres	81 Acres	34 Acres
Lake Helen	673 Acres	99 Acres	8 Acres
New Smyrna Beach	938 Acres	812 Acres	57 Acres
Oak Hill	0 Acres	0 Acres	0 Acres
Orange City	323 Acres	845 Acres	113 Acres
Ormond Beach	579 Acres	652 Acres	71 Acres
Pierson	558 Acres	42 Acres	0 Acres
Ponce Inlet	94 Acres	14 Acres	0 Acres
Port Orange	491 Acres	553 Acres	30 Acres
South Daytona	58 Acres	116 Acres	23 Acres
Unincorporated Area	30,352 Acres	1,164 Acres	290 Acres

Source: Volusia County Property Appraiser, Department of Revenue Land Use Codes (2019)

3.4 EMPLOYMENT AND INDUSTRY

Volusia County began as prosperous steamboat landing town in the early 1800s. Today, employment is based largely in the public sector. According to the 2017 American Community Survey, the civilian labor force in Volusia County is approximately 212,016. The top employers are Volusia County Schools, Halifax Health and Volusia County Government.

From an industry perspective, Volusia County has a high number of retail trade employees (29,620), construction employees (17,464) and professional, scientific and technical service employees (22,876)³. These figures reflect the high proportion of people working in the construction, education, and tourism industries.

In 2017, the estimated median household income for Volusia County was \$43,838, less than the State and U.S. medians of \$50,883 and \$57,652, respectively.

³ American Community Survey 2013-17

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 (**Table 3.3**).

TABLE 3.3: 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

Source: U.S. Census Bureau, 2013-2017 ACS

Currently, one major development planned in unincorporated Volusia County is scheduled. The Farmton Local Plan property is a development of regional impact (DRI) located south of Edgewater and west of I-95 to the Brevard County Line. It is approximately 47,000 acres, of which more than 30,000 acres are protected by conservation easements and covenants. The plan established two future land use designations; Green Key and Sustainable Development Area (SDA) with a maximum development potential of 23,100 dwelling units and 4,700,000 square feet of nonresidential building area. The plan became effective on March 29, 2012⁴.

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/>

⁴ Volusia County Growth and Resource Management

SECTION 4 – HAZARD IDENTIFICATION

This section is the first of three sections that assess the risk of Volusia County and the participating jurisdictions to natural 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 amount of damages that could occur in the County as a result 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 hazards¹ 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 a number of 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.

Table 4.1 lists the full range of natural hazards initially identified for consideration in the Plan and provides a brief description for each. This table includes thirteen individual hazards categorized by the following types: atmospheric, hydrologic, geologic, and other. Some of these hazards are considered to be interrelated or cascading (i.e., hurricanes can cause flooding, storm surge and tornadoes), but for preliminary hazard identification purposes these distinct hazards are broken out separately. It should also be noted that some hazards, such as drought or winter storms may impact a large area yet cause little damage, while other hazards, such as a tornado, may impact a small area yet cause extensive damage.

TABLE 4.1: Descriptions of the Full Range of Initially Identified Hazards

HAZARD	DESCRIPTION
ATMOSPHERIC	
Hail	A hail event is caused by any storm that produces hailstones that fall to the ground; usually used when the amount or size of the hail is considered significant. Hail is formed when updrafts in thunderstorms carry raindrops in to parts of the atmosphere where the temperatures are below freezing.

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.

SECTION 4: HAZARD IDENTIFICATION

TABLE 4.1: Descriptions of the Full Range of Initially Identified Hazards

HAZARD	DESCRIPTION
Hurricane and Tropical Storm Wind	Hurricanes and tropical storms are classified as cyclones and defined as any closed circulation developing around a low-pressure center in which the winds rotate counter-clockwise 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. The majority of 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.
Lightning	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.
Severe Winter Storm	Severe winter storms 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.
Thunderstorm	Thunderstorms are caused by air masses of varying temperatures meeting in the atmosphere. Rapidly rising warm moist air fuels the formation of thunderstorms. Thunderstorms may occur singularly, in lines, or in clusters. 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.
HYDROLOGIC	
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 position or horizontal displacement of a shoreline over a period of time. It is generally associated with episodic events such as hurricanes and tropical storms, nor’easters, storm surge and coastal flooding but may also be caused by human activities that alter sediment transport. Construction of shoreline protection structures can mitigate the

SECTION 4: HAZARD IDENTIFICATION

TABLE 4.1: Descriptions of the Full Range of Initially Identified Hazards

HAZARD	DESCRIPTION
	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, high winds, and low humidity can worsen drought conditions and also make areas more susceptible to wildfire. Human demands and actions have the ability to hasten or mitigate drought-related impacts on local communities.
Flood	The accumulation of water within a water body which results in the overflow of excess water onto adjacent lands, usually floodplains. The floodplain is the land adjoining the channel of a river, stream ocean, lake or other watercourse or water body that is susceptible to flooding. Most floods fall into the following three categories: riverine, coastal, or shallow flooding (which includes sheet flow, ponding, and urban drainage).
Storm Surge	A 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 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	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.
GEOLOGIC	
Sinkhole	Sinkholes are formed when the underlying limestone or other rock type collapses, resulting in a depression. Limestone is soluble in natural water, causing the collapse.
Tsunami	A series of waves generated by an undersea disturbance such as an earthquake. The speed of a tsunami traveling away from its source can range from up to 500 miles per hour in deep water to approximately 20 to 30 miles per hour in shallower areas near coastlines. Wave amplitudes in deep water are typically less than one meter; they are often barely detectable to the human eye. However, as they approach shore, they slow in shallower water, basically causing the waves from behind to effectively "pile up", and wave heights to increase dramatically. As opposed to typical waves which crash at the shoreline, tsunamis bring with them a continuously flowing 'wall of water'.
OTHER	
Wildfire	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

SECTION 4: HAZARD IDENTIFICATION

TABLE 4.1: Descriptions of the Full Range of Initially Identified Hazards

HAZARD	DESCRIPTION
	human factors. 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 wildfire is lightning.
Civil Disturbance ***	Civil disturbances can occur due to socio-economic, political or other reasons. These types of events typically occur in public places, including court houses or town civic spaces.
Coastal Oil Spill ***	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.
Terrorism ***	Terrorism includes any attempt to attack, cripple or damage public goods, public infrastructure or citizens on a large scale.
Mass Migration ***	Mass-migration occurs when persons of one geographic area move in large numbers to another geographic location.
HazMat ***	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.
Agro-terrorism ***	Agro-Terrorism includes any attempt to maliciously destroy or harm the agricultural industry, the secondary effects of which can be disease, famine and massive economic loss.
Public Health Emergencies ***	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.
Cyber Attack ***	Cyber-attacks include the use of electronic devices to attack, cripple or damage information systems held by governmental or private institutions, as well as individual citizens.
Agricultural Infestation	Agricultural infestations include disease and other malfunctions in biological entities resulting in viruses and other bacteria that pose a threat to human life and safety.
NOT INCLUDED	
Earthquake	Earthquakes are not included in this analysis due to their very low frequency in Central Florida and Volusia County. Earthquakes do not occur in Florida, but rather off the Gulf of Mexico or in the Caribbean.

***** SPECIAL NOTE:** The following “man-made” hazards are analyzed in terms of the vulnerability they pose to the Volusia County community and the potential mitigation activities that can be implemented within [Section 7, Capability Assessment](#); [Section 9, Mitigation Action Plan](#); [Appendix H, HIRA Consequences](#), and; [Appendix J, Consequences by Hazard](#). These hazards are not analyzed for their vulnerability to the community within the Vulnerability Assessment (Section 6) of this document, as that section is limited to the hazards that can be analyzed utilizing Geographic Information Systems (GIS) on a county-wide basis.

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:

- ▶ **Atmospheric**
 - Hail
 - Hurricane and Tropical Storm
 - Lightning
 - Severe Winter Storm
 - Thunderstorm
 - Tornado
- ▶ **Hydrologic**
 - Coastal Erosion
 - Drought
 - Flood
 - Storm Surge
 - Sea Level Rise
- ▶ **Geologic**
 - Sinkhole
 - Tsunami
- ▶ **Societal, Ecological and Technological**
 - Wildfire
 - Cyber Attack
 - Civil Disturbance
 - Coastal Oil Spill
 - Terrorism
 - Mass Migration
 - HazMat
 - Agro-terrorism
 - Public Health Emergencies
 - Agricultural Infestation

SECTION 5: HAZARD PROFILES

Each hazard profile described in this section includes a general description of the hazard, its location and extent, notable historical occurrences and the probability of future occurrences. It also includes specific items noted by members of the Local Mitigation Strategy Working Group (LMS Working Group) as it relates to unique historical or anecdotal hazard information for Volusia County or a particular jurisdiction. 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 (**Table 5.1**).

TABLE 5.1: 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

SECTION 5: HAZARD PROFILES

Hurricane Irma	09/04/17	3385
Hurricane Michael	10/07/18	3405
Hurricane Dorian	08/28/19	3420

Source: Federal Emergency Management Agency

Volusia County Emergency Management has had 52 significant disaster events that resulted in the activation of their Emergency Operations Center. There were 73 percent that were natural hazard events, underscoring that natural hazards pose a very high risk to Volusia County. **Table 5.2** lists these events by type, area of impact, EOC activation level, the estimated number of parcels (properties) that were damaged and loss estimates.

TABLE 5.2: Significant Activation Events

Date of Event	Type of Event	Area of Event	EOC Level Activation	Damage Estimate	
				# Parcels	Dollars
3/13/1993	Wind Storm	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	Wind Storm	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	Wind Storm	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	Wind Storm	SR 415 Area	Level 1 (Mon)	8	9,100
1/9/1999	Wind Storm	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	Wind Storm	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
9/4/2002	T.S. Edouard	County-Wide	Level 2 (Part)	N/A	N/A

SECTION 5: HAZARD PROFILES

TABLE 5.2: Significant Activation Events

Date of Event	Type of Event	Area of Event	EOC Level Activation	Damage Estimate	
				# Parcels	Dollars
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 Rain Storm	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	
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

SECTION 5: HAZARD PROFILES

TABLE 5.2: Significant Activation Events

Date of Event	Type of Event	Area of Event	EOC Level Activation	Damage Estimate	
				# Parcels	Dollars
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)	TBD	TBD
Totals----->				40,320	1,706,110,346

Source: Volusia County Emergency Management Division (Revised 10/16/2019)

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

ATMOSPHERIC HAZARDS

5.2 HAIL

5.2.1 Background

Hail frequently accompanies thunderstorms and has potential to cause substantial damage. Early in the developmental stages of a hail, ice crystals form within a low-pressure front due to the rapid rising 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 sphere 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.

5.2.2 Location and Spatial Extent

Hail is often produced during a thunderstorm event which has no geographic limitations to the area it affects. Therefore, it is assumed that all of Volusia County is uniformly at risk to a hail event. Impacts typically include downed power lines and trees and damage to vehicles and mobile homes. Hail is a form of solid precipitation consisting of balls or irregular lumps of ice .5 millimeters or larger that form during certain thunderstorm conditions. 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.

5.2.3 Historical Occurrences

According to the National Climatic Data Center, there have been 131 recorded hail events in Volusia County since 1983, as shown in **Table 5.3**¹. Hail has caused a total of \$231,092 in property damage, but has not resulted in any injuries or deaths. Hail sizes for these events range from 1.00 inches to 2.75 inches in diameter. The locations of historically recorded hail events are shown in **Figure 5.1**. The emergency management officials from the Volusia County jurisdictions determined that only hail that was greater than one inch in diameter was to be listed in **Table 5.3**.

¹ A Hail event that affects several jurisdictions on the same day is classified as a single event.

SECTION 5: HAZARD PROFILES

TABLE 5.3: Historical Hail Impacts

LOCATION	DATE	MAGNITUDE (inches)	DEATHS/ INJURIES	PROPERTY DAMAGE (2009 dollars)	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
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 downed. 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

SECTION 5: HAZARD PROFILES

TABLE 5.3: Historical Hail Impacts

LOCATION	DATE	MAGNITUDE (inches)	DEATHS/ INJURIES	PROPERTY DAMAGE (2009 dollars)	DESCRIPTION
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
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 size 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	
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.

SECTION 5: HAZARD PROFILES

TABLE 5.3: Historical Hail Impacts

LOCATION	DATE	MAGNITUDE (inches)	DEATHS/ INJURIES	PROPERTY DAMAGE (2009 dollars)	DESCRIPTION
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 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

SECTION 5: HAZARD PROFILES

TABLE 5.3: Historical Hail Impacts

LOCATION	DATE	MAGNITUDE (inches)	DEATHS/ INJURIES	PROPERTY DAMAGE (2009 dollars)	DESCRIPTION
					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 Glencoe	5/17/2012	0.75 (DeLand) 0.88 (Osteen) 1.75 (Glencoe)	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 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 and
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

SECTION 5: HAZARD PROFILES

TABLE 5.3: Historical Hail Impacts

LOCATION	DATE	MAGNITUDE (inches)	DEATHS/ INJURIES	PROPERTY DAMAGE (2009 dollars)	DESCRIPTION
					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 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 breezes 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 an 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,

SECTION 5: HAZARD PROFILES

TABLE 5.3: Historical Hail Impacts

LOCATION	DATE	MAGNITUDE (inches)	DEATHS/ INJURIES	PROPERTY DAMAGE (2009 dollars)	DESCRIPTION
					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 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 the conditions for showers and thunderstorms to develop. One thunderstorm in eastern Volusia County interacted with the sea breeze front. This storm quickly became severe

SECTION 5: HAZARD PROFILES

TABLE 5.3: Historical Hail Impacts

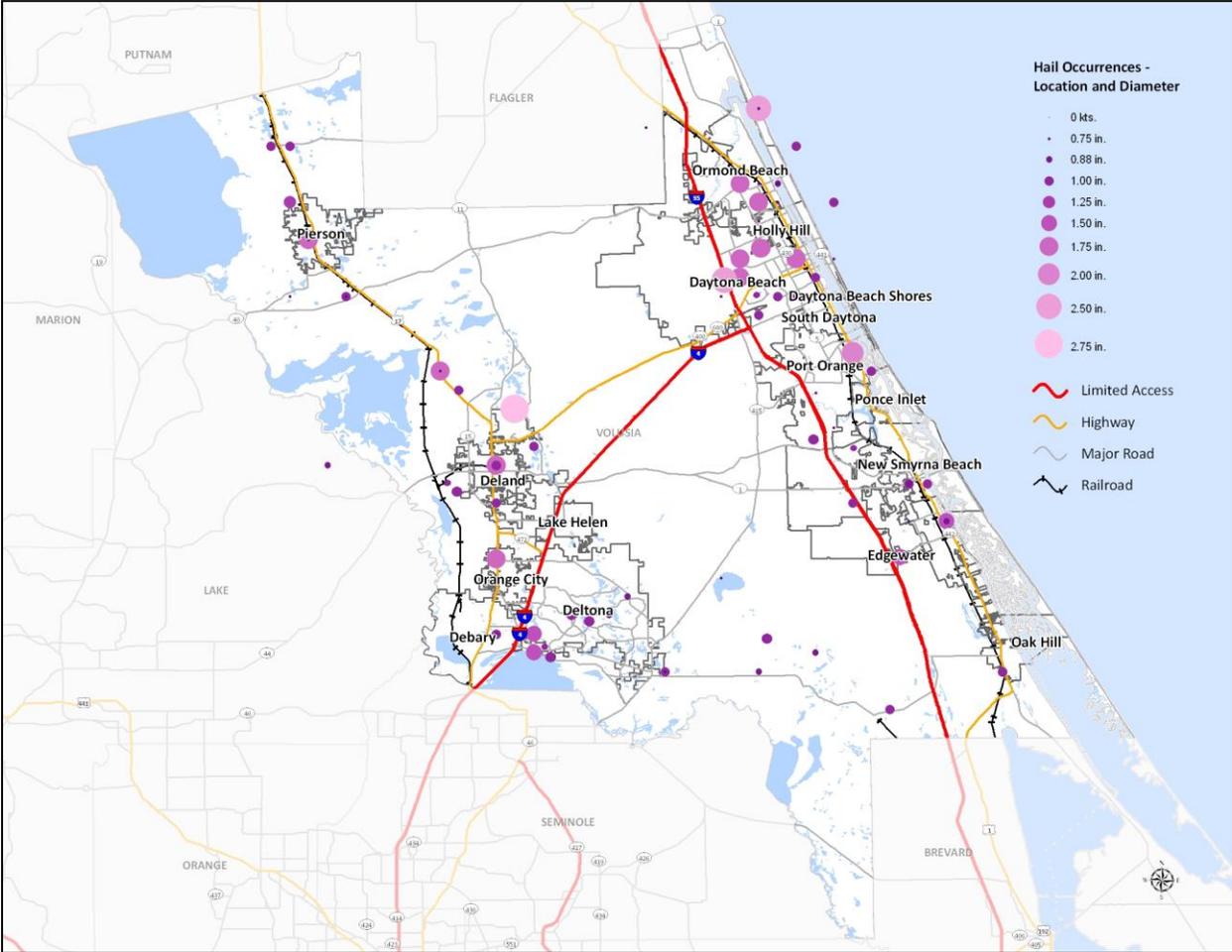
LOCATION	DATE	MAGNITUDE (inches)	DEATHS/ INJURIES	PROPERTY DAMAGE (2009 dollars)	DESCRIPTION
					as it moved very slowly southward over New Smyrna Beach and Edgewater and several reports of hail were received in these areas.

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: HAZARD PROFILES

FIGURE 5.1: Locations of Historical Hail Events in Volusia County



Source: National Climatic Data Center

5.2.4 Probability of Future Occurrences

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.

5.3 HURRICANE AND TROPICAL STORM

5.3.1 Background

Hurricanes and tropical storms are classified as cyclones and defined as any closed circulation developing around a low-pressure center in which the winds rotate counter-clockwise 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. The majority of 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 in 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 (**Table 5.4**), which rates hurricane intensity on a scale of 1 to 5, with 5 being the most intense².

TABLE 5.4: 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

² Although a tropical storm is not part of the Saffir-Simpson Scale, it is listed here for comparative purposes.

SECTION 5: HAZARD PROFILES

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. 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. **Table 5.5** 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.

TABLE 5.5: 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

5.3.2 Location and Spatial Extent

Hurricanes and tropical storms threaten the entire Atlantic and Gulf seaboard of the United States. Coastal areas are directly exposed to the brunt of a land-falling storm, but its impact is often felt hundreds of miles inland. Volusia County is susceptible to all of the hazards wrought by hurricanes and tropical storms. 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 storm surge, wave action, coastal erosion and tidal flooding³. 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 systems in terms of strength in Volusia County is fairly consistent when reviewing historical data. Storms to hit the county are primarily in the Tropical Storm to Category 1 range, with winds seldom exceeding 95 miles per hour. Winds have exceeded 100 miles per hour (Category 2 range) just three times since 1960 in Volusia County.

5.3.3 Historical Occurrences

According to NOAA historical storm track records, 94 hurricane or tropical storm tracks have passed within 75 miles of Volusia County since 1850.⁴ This includes: zero (0) Category 5 hurricanes; three (3) Category 4 hurricanes; eight (8) Category 3 hurricanes; nine (9) Category 2 hurricanes; twenty-three (23) Category 1 hurricanes; and fifty-one (51) tropical storms. Of the recorded storm events, 25 had tracks that traversed directly through Volusia County. **Table 5.6** 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. **Figure 5.3** shows the track of each recorded storm in relation to Volusia County and eastern Florida.

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.

TABLE 5.6: Historical Storm Tracks within 75 Miles of Volusia County (1850–2019)

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

³ Distinct hazard area locations for flooding, storm surge, and coastal erosion are discussed elsewhere in this section.

⁴ These storm track statistics do not include tropical depressions or extratropical storms. Though these related hazard events are less severe in intensity, they may indeed cause significant local impact in terms of rainfall and high winds.

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TABLE 5.6: Historical Storm Tracks within 75 Miles of Volusia County (1850–2019)

DATE OF OCCURRENCE	STORM NAME	MAXIMUM WIND SPEED (MPH)	STORM CATEGORY
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
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

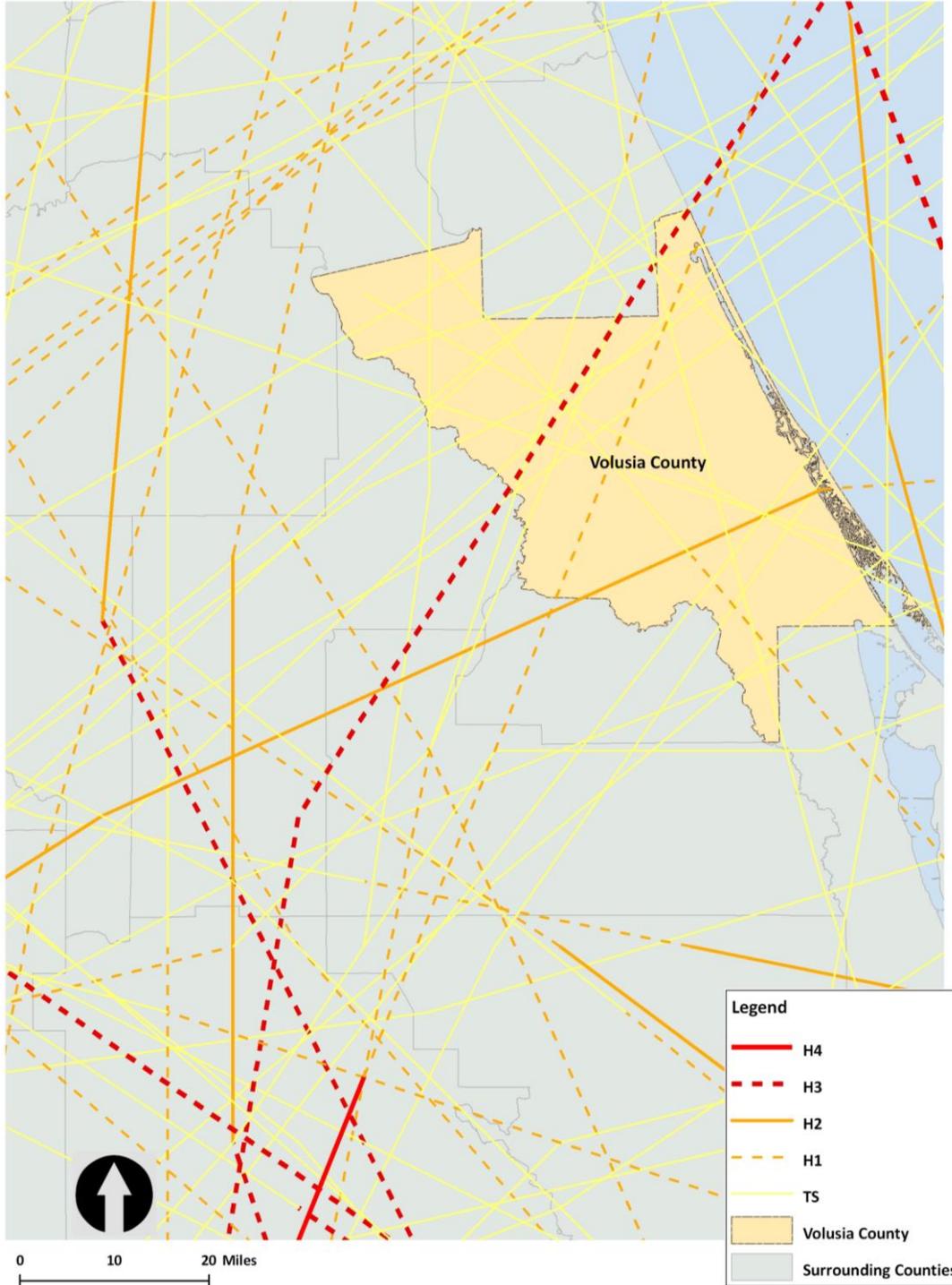
Source: National Climatic Data Center

***NOTE: ALL HISTORICAL OCCURRENCES IN THIS REPORT ARE THE MOST RECENT AS DOCUMENTED BY THE NATIONAL CLIMATIC DATA CENTER. PLEASE NOTE THAT THESE OCCURRENCES ALSO SERVE AS HISTORICAL DATA FOR STORM SURGE OCCURRENCES. ***

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FIGURE 5.2: Historical Storm Tracks within 75 Miles of Volusia County

Source: National Oceanic and Atmospheric Administration



SECTION 5: HAZARD PROFILES

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 from 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 millions in of the state of Florida. An estimated 700,000 costumers 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 damages 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 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. Wide spread 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

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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 the Volusia County off shore 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 the 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 it 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.

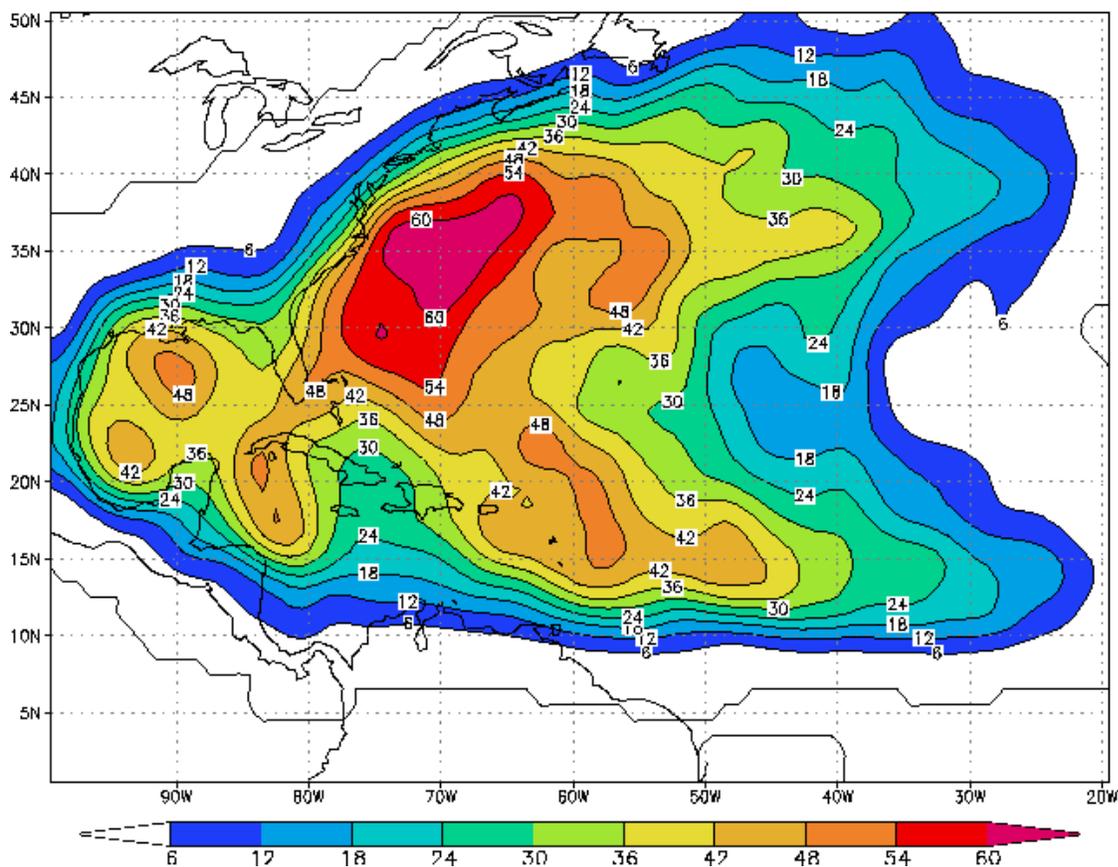
Hurricane Dorian, 2019: On September 1, Dorian reached Category 5 intensity, with maximum sustained winds of 185 mph, and a maximum central pressure of 910 mb (26.87 inHg) while making landfall in Elbow Cay, Bahamas. Dorian made another landfall on Grand Bahama several hours later. The ridge of high 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 on the next day. On the morning of September 3, Dorian began to move slowly towards the north-northwest.

5.3.4 Probability of Future Occurrences

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

Figure 5.3 shows for any particular 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.

FIGURE 5.3: 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). **Table 5.7** profiles the average potential peak gust wind speeds for each jurisdiction that can be expected in Volusia County during a hurricane event for various return periods according to FEMA's HAZUS-MH®.

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TABLE 5.7: Average Peak Gust Wind Speeds (MPH) vs. Return Period

JURISDICTION	10-YEAR	20-YEAR	50-YEAR	100-YEAR	200-YEAR	500-YEAR	1,000-YEAR
Daytona Beach	70.9	84.2	100.0	110.7	120.2	130.9	138.7
Daytona Beach Shores	71.8	85.4	101.4	112.3	121.7	132.4	140.3
DeBary	69.4	82.3	97.6	107.6	116.5	125.8	132.6
DeLand	69.0	81.8	97.0	107.2	116.0	125.7	132.0
Deltona	69.8	82.6	98.2	108.6	117.6	126.9	133.9
Edgewater	71.9	85.6	101.7	112.2	121.5	131.5	138.9
Holly Hill	70.7	84.2	99.7	110.2	119.9	130.8	138.7
Lake Helen	69.6	82.7	97.9	108.3	117.4	126.7	133.6
New Smyrna Beach	72.0	85.7	101.9	112.4	121.8	131.8	139.4
Oak Hill	73.1	87.0	103.7	114.0	123.4	133.7	140.7
Orange City	69.2	82.1	97.3	107.4	116.3	125.7	132.4
Ormond Beach	70.5	84.0	99.5	110.2	119.8	130.6	138.4
Pierson	67.5	80.2	95.2	105.0	113.4	123.5	130.2
Ponce Inlet	71.8	85.5	101.6	112.3	121.7	132.0	140.0
Port Orange	71.2	84.7	100.5	111.4	120.7	131.0	138.9
South Daytona	71.2	84.7	100.6	111.4	120.7	131.3	139.2
Unincorporated	70.3	83.6	99.1	109.6	118.8	128.9	136.2

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

5.4 LIGHTNING

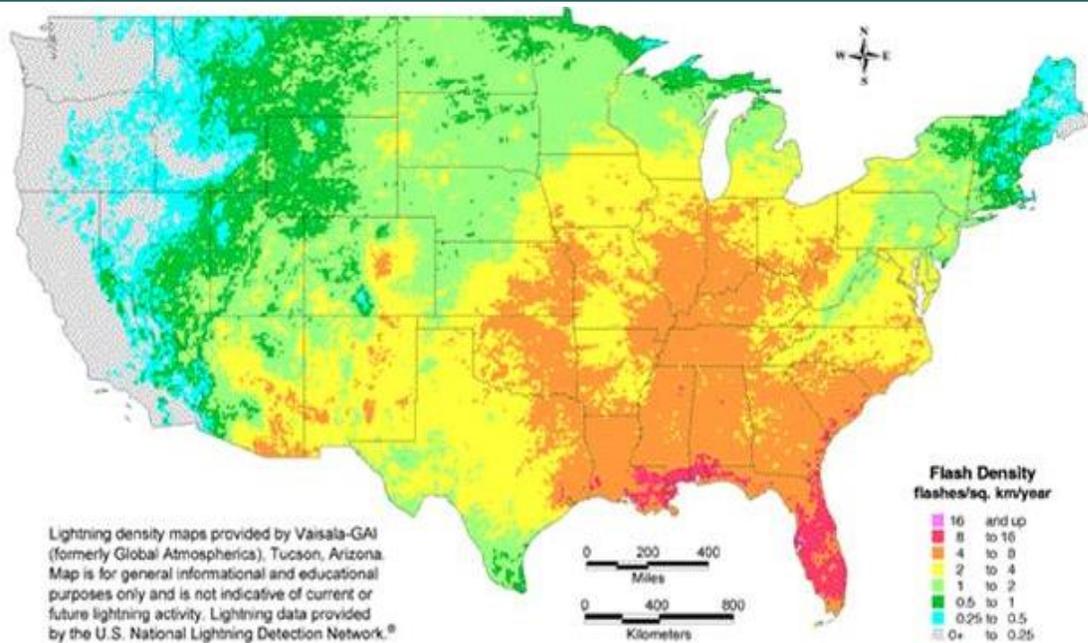
5.4.1 Background

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 the 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 is injured and 80 people are killed in the United States each year by lightning. Direct lightning strikes also have the ability to cause significant damage to buildings, critical facilities, and infrastructure. Lightning is also responsible for igniting wildfires that can result in widespread damages to property before firefighters have the ability to contain and suppress the resultant fire⁵.

Volusia County is located in a region of the country that is particularly susceptible to lightning. **Figure 5.4** shows a lightning flash density map for the years 1996-2000 based upon data provided by Vaisala’s U.S. National Lightning Detection Network (NLDN®).

FIGURE 5.5: Lightning Flash Density in the United States



Source: Vaisala U.S. National Lightning Detection Network

⁵Wildfires are discussed in Section 5.14.

5.4.2 Location and Spatial Extent

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.

5.4.3 Historical Occurrences

According to the National Climatic Data Center, there have been a total of 11 recorded lightning events in Volusia County since 2010 that resulted in \$475,000 in damages, as listed in **Table 5.8**. However, these are only the lightning events that have been reported to NCDC. According to the 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. **Table 5.8** is merely a sample of the lightning strikes that have occurred in the county.

TABLE 5.8: Historical Lightning Occurrences

LOCATION	DATE	DEATHS/ INJURIES	PROPERTY DAMAGE (2009 dollars)	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 destroyed two condominiums.
New Smyrna Beach	6/19/1996	0/0	\$100,077	Fire started by lightning severely damaged a house.

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TABLE 5.8: Historical Lightning Occurrences

LOCATION	DATE	DEATHS/ INJURIES	PROPERTY DAMAGE (2009 dollars)	DESCRIPTION
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.
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 downed 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

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TABLE 5.8: Historical Lightning Occurrences

LOCATION	DATE	DEATHS/ INJURIES	PROPERTY DAMAGE (2009 dollars)	DESCRIPTION
				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 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	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.
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.
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,

SECTION 5: HAZARD PROFILES

TABLE 5.8: Historical Lightning Occurrences

LOCATION	DATE	DEATHS/ INJURIES	PROPERTY DAMAGE (2009 dollars)	DESCRIPTION
				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.
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.

Source: National Climatic Data Center

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

5.4.4 Probability of Future Occurrences

The probability of occurrence for future lightning events in Volusia County is high. According to NOAA, Volusia County is located 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. 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.

5.5 SEVERE WINTER STORM

5.5.1 Background

A winter storm can range from a moderate snow over a period of a few hours to blizzard conditions with blinding wind-driven snow that lasts for several days. It may include snow, sleet, freezing rain, or a mix of these wintry forms of precipitation. Some winter storms might be large enough to affect several states, while others might affect only localized areas. Occasionally, heavy snow might also cause significant property damages, such as roof collapses on older buildings. All winter storm events have the potential to present dangerous conditions to Volusia County. Larger snowfalls pose a greater risk, reducing visibility due to blowing snow and making driving conditions treacherous. A heavy snow event is defined by the National Weather Service as an accumulation of 4 or more inches in 12 hours or less. A blizzard is the most severe form of winter storm. It combines low temperatures, heavy snow, and winds of 35 miles per hour or more, which reduces visibility to a quarter mile or less for at least three hours. Winter storms are often accompanied by sleet, freezing rain, or an ice storm.

Sleet is defined as partially frozen raindrops or refrozen snowflakes that form into small ice-pellets before reaching the ground. They typically bounce when they hit the ground and do not stick to the surface. However, it does accumulate like snow, posing similar problems and has the potential to accumulate into a layer of ice on surfaces. Freezing rain, conversely, usually sticks to the ground, creating a sheet of ice on the roadways and other surfaces. All of the winter storm elements – snow, low temperatures, sleet, ice, etc- have the potential to cause significant hazard to a community. Even small accumulations can down power lines and trees limbs and create hazardous driving conditions. Severe winter storms affect the entire county uniformly, as these are typically not localized events in Florida.

5.5.2 Location and Spatial Extent

Nearly the entire continental United States is susceptible to winter storms, but the degree of exposure typically depends on the normal expected severity of local winter weather. Volusia County, being in the southern portion of the nation, rarely experiences winter weather 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. However, there were two severe winter storms that killed many of the orange groves in the 80's. 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.

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

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experience mild winters can be hit with a major extreme cold winter event. Winter storms can result in ice, localized flooding, closed highways, and blocked roads, downed power lines and hypothermia.

There is a low probability that Volusia County 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 is more likely to experience freezing temperatures for much shorter durations of time. More specifically, temperatures tend to dip below the freezing threshold during night time from the months of November to February.

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 night time. 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. Although temperatures dipped to freezing levels during this event, highs in the 50's were reported in Volusia and throughout Central Florida during the day time.

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. These temperatures can be experienced in the future in Volusia County, Florida.

5.5.3 Historical Occurrences

Despite the rare chance of winter storm occurrence, one snow event was reported in 2008 according to 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. According to an Emergency Operations Management Volusia County 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. Also, in 1899, a rare blizzard struck the state of Florida, inundating much of the state in up to one-foot of snow. There are no official historic occurrences of this hazard on the National Climatic Data Center web database.

5.5.4 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.

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.

5.6 Thunderstorm

5.6.1 Background

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 damage⁶.

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.

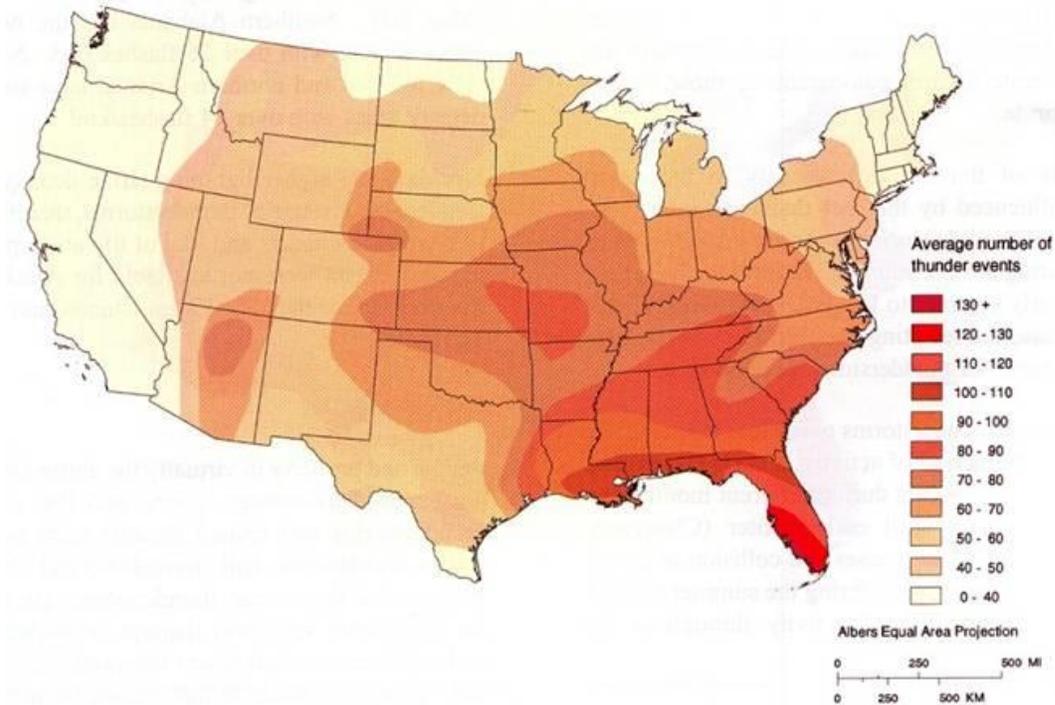
Three conditions need to occur for a thunderstorm to form. First, it needs moisture to form clouds and rain. Second, it needs unstable air, such as warm air that can rise rapidly (this often referred to as the “engine” of the storm). Finally, thunderstorms need lift, which comes in the form of cold or warm fronts, sea breezes, mountains, or the sun’s heat. When these conditions occur, air masses of varying temperatures meet, and a 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 has the ability to 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). Please reference the table that depicts thunderstorm days per year for a scope on the annual average number of thunderstorm events per year. This table depicts the relatively high risk that Florida faces as compared to the rest of the United States. Lightning incidence within Central Florida is among the heaviest in the world; the only other comparable areas include tropical areas of Africa in terms of lightning strike density. Please reference the lightning map within this report.

The National Weather Service collected data for thunder events and lightning strike density for the 30-year period from 1948 to 1977. A series of maps were generated showing the annual average thunder event duration, the annual average number of thunder events and the mean annual density of lightning strikes. **Figure 5.5** illustrates thunderstorm hazard severity based on the annual average number of thunder events from 1948 to 1977. Volusia County falls into the range of an average of 110 – 120 thunderstorm events annually.

⁶ Lightning and Hail are discussed in detail as separate hazards in this section.

Figure 5.5: Average Annual Number of Thunder Events



Source: Federal Emergency Management Agency

5.6.2 Location and Spatial Extent

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 (**Figure 5.5**). Further, while thunderstorms can occur in all regions of the United States, they are most common in the central and southern states because atmospheric conditions in those regions are favorable for generating these powerful storms. Therefore, it is assumed that Volusia County would be uniformly exposed to these hazards and that the spatial 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.

5.6.3 Historical Occurrences

According to the National Climatic Data Center, Volusia County has experienced approximately 195 thunderstorm events since 1950. Further, 34 of these thunderstorm events resulted in property damage totaling over \$2.5 million. **Table 5.9** 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 in this section.) In addition to property damage, these severe thunderstorm events resulted in two injuries and over \$70,000 in crop damage.

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TABLE 5.9: Historical Thunderstorm Occurrences Resulting in Property Damage

LOCATION	DATE	TYPE	DEATHS/ INJURIES	PROPERTY DAMAGE (2009 Dollars)	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.
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 sun rooms, 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	0/0	\$27,318	Thunderstorm winds downed power lines and power transformers in Deltona. downed

SECTION 5: HAZARD PROFILES

TABLE 5.9: Historical Thunderstorm Occurrences Resulting in Property Damage

LOCATION	DATE	TYPE	DEATHS/ INJURIES	PROPERTY DAMAGE (2009 Dollars)	DESCRIPTION
		Winds			trees
Daytona Beach 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 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	10/9/2008	Thunderstorm Winds	0/0	\$0	A north moving warm front produced widespread thunderstorms across central Florida.
Holly Hill	10/9/2008	Thunderstorm Winds	0/0	\$0	A north moving warm front produced widespread thunderstorms across central Florida.
Osteen	10/9/2008	Thunderstorm Winds	0/0	\$0	A north moving warm front produced widespread thunderstorms across central Florida.
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

SECTION 5: HAZARD PROFILES

TABLE 5.9: Historical Thunderstorm Occurrences Resulting in Property Damage

LOCATION	DATE	TYPE	DEATHS/ INJURIES	PROPERTY DAMAGE (2009 Dollars)	DESCRIPTION
					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 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,

SECTION 5: HAZARD PROFILES

TABLE 5.9: Historical Thunderstorm Occurrences Resulting in Property Damage

LOCATION	DATE	TYPE	DEATHS/ INJURIES	PROPERTY DAMAGE (2009 Dollars)	DESCRIPTION
					producing dime to quarter sized hail and winds of 50 to 60 mph.
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 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.

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TABLE 5.9: Historical Thunderstorm Occurrences Resulting in Property Damage

LOCATION	DATE	TYPE	DEATHS/ INJURIES	PROPERTY DAMAGE (2009 Dollars)	DESCRIPTION
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.
Daytona 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.

SECTION 5: HAZARD PROFILES

TABLE 5.9: Historical Thunderstorm Occurrences Resulting in Property Damage

LOCATION	DATE	TYPE	DEATHS/ INJURIES	PROPERTY DAMAGE (2009 Dollars)	DESCRIPTION
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.
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 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 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 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

SECTION 5: HAZARD PROFILES

TABLE 5.9: Historical Thunderstorm Occurrences Resulting in Property Damage

LOCATION	DATE	TYPE	DEATHS/ INJURIES	PROPERTY DAMAGE (2009 Dollars)	DESCRIPTION
					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 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.

Source: National Climatic Data Center

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

5.6.4 Probability of Future Occurrences

Thunderstorms are frequent in Volusia County. During the summer, Volusia County experiences a thunderstorm 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.

5.7 TORNADO

5.7.1 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 are capable of causing 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 (**Table 5.10**). However, tornado magnitudes prior to 2005 were classified using the traditional version of the Fujita Scale (**Table 5.11**).

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.

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TABLE 5.10: 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.

Source: National Weather Service

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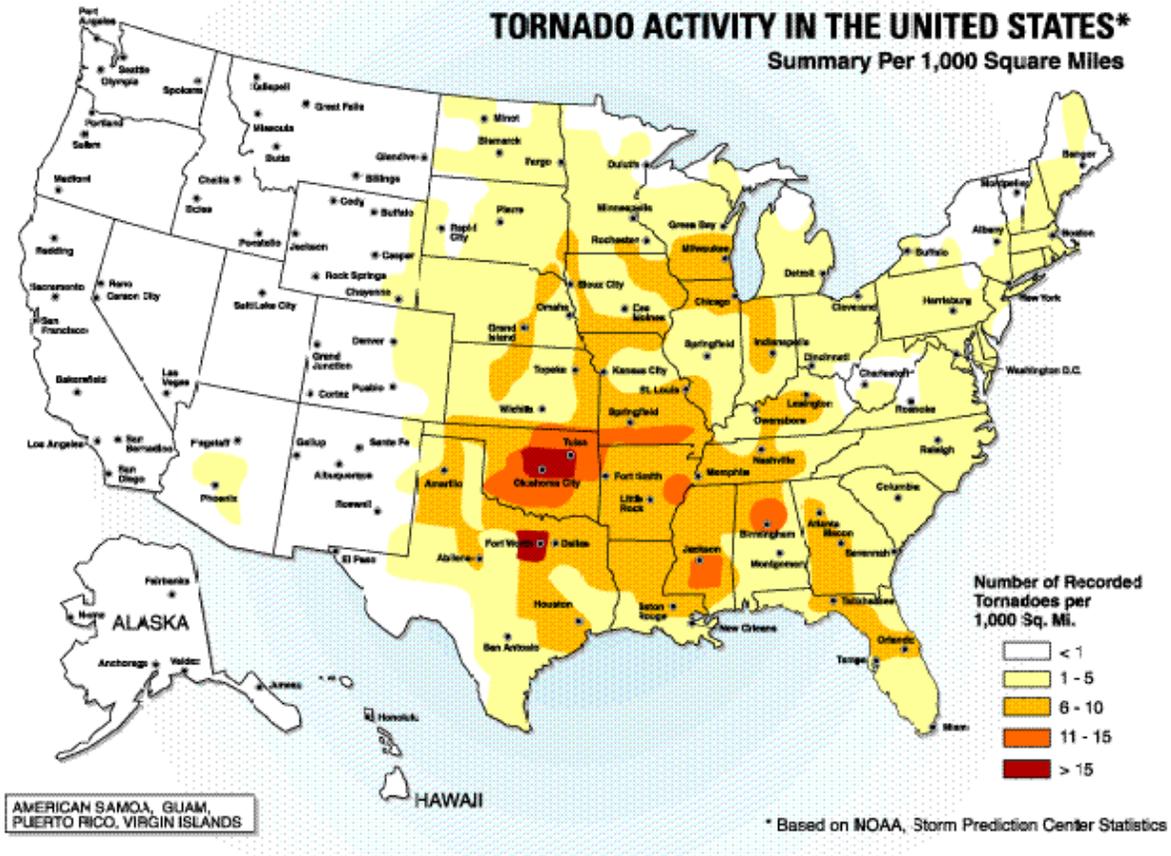
TABLE 5.11: The Fujita Scale (Effective Prior to 2005)

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). **Figure 5.6** shows tornado activity in the United States based on the number of recorded tornadoes per 1,000 square miles.

FIGURE 5.6: Tornado Activity in the United States



Source: Federal Emergency Management Agency

5.7.2 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 is uniformly exposed to this hazard. 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.

5.7.3 Historical Occurrences

According to the National Climatic Data Center, there have been a total of 88 recorded tornado events in Volusia County since 1953. Each of these events occurred in the Volusia County study area as listed in **Table 5.12**. Two deaths, 151 injuries, and nearly \$205 million in property resulted from these events.

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The magnitude of these tornadoes ranged from F0 to F3 in intensity, with approximate locations for each shown in **Figure 5.7**.

TABLE 5.12: Historical Tornado Impacts

LOCATION	DATE	MAGNITUDE	DEATHS/ INJURIES	PROPERTY DAMAGE (2009 DOLLARS)	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
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

SECTION 5: HAZARD PROFILES

TABLE 5.12: Historical Tornado Impacts

LOCATION	DATE	MAGNITUDE	DEATHS/ INJURIES	PROPERTY DAMAGE (2009 DOLLARS)	DESCRIPTION
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
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
Pierson	4/23/1997	F0	0/0	\$83,856	

SECTION 5: HAZARD PROFILES

TABLE 5.12: Historical Tornado Impacts

LOCATION	DATE	MAGNITUDE	DEATHS/ INJURIES	PROPERTY DAMAGE (2009 DOLLARS)	DESCRIPTION
Port Orange	4/23/1997	F0	0/0	\$167,713	alone.
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 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 hospitalization. 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

SECTION 5: HAZARD PROFILES

TABLE 5.12: Historical Tornado Impacts

LOCATION	DATE	MAGNITUDE	DEATHS/ INJURIES	PROPERTY DAMAGE (2009 DOLLARS)	DESCRIPTION
Osteen	2/23/1998	F3	1/0	\$1,376,170	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.
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.
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 (Airport)	12/25/2006	F2	0/6	\$54,636,350	The same system that caused five 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

SECTION 5: HAZARD PROFILES

TABLE 5.12: Historical Tornado Impacts

LOCATION	DATE	MAGNITUDE	DEATHS/ INJURIES	PROPERTY DAMAGE (2009 DOLLARS)	DESCRIPTION
					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	
Lake George	7/7/2007	F0	0/0	\$31,827	Tornado-force winds caused damage to a restaurant and apartment complex.
Port Orange	7/24/2009	F0	0/1		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.
Ormond Beach	7/24/2009	F0	0/0		
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 wooded area, farther inland over southern Volusia County.

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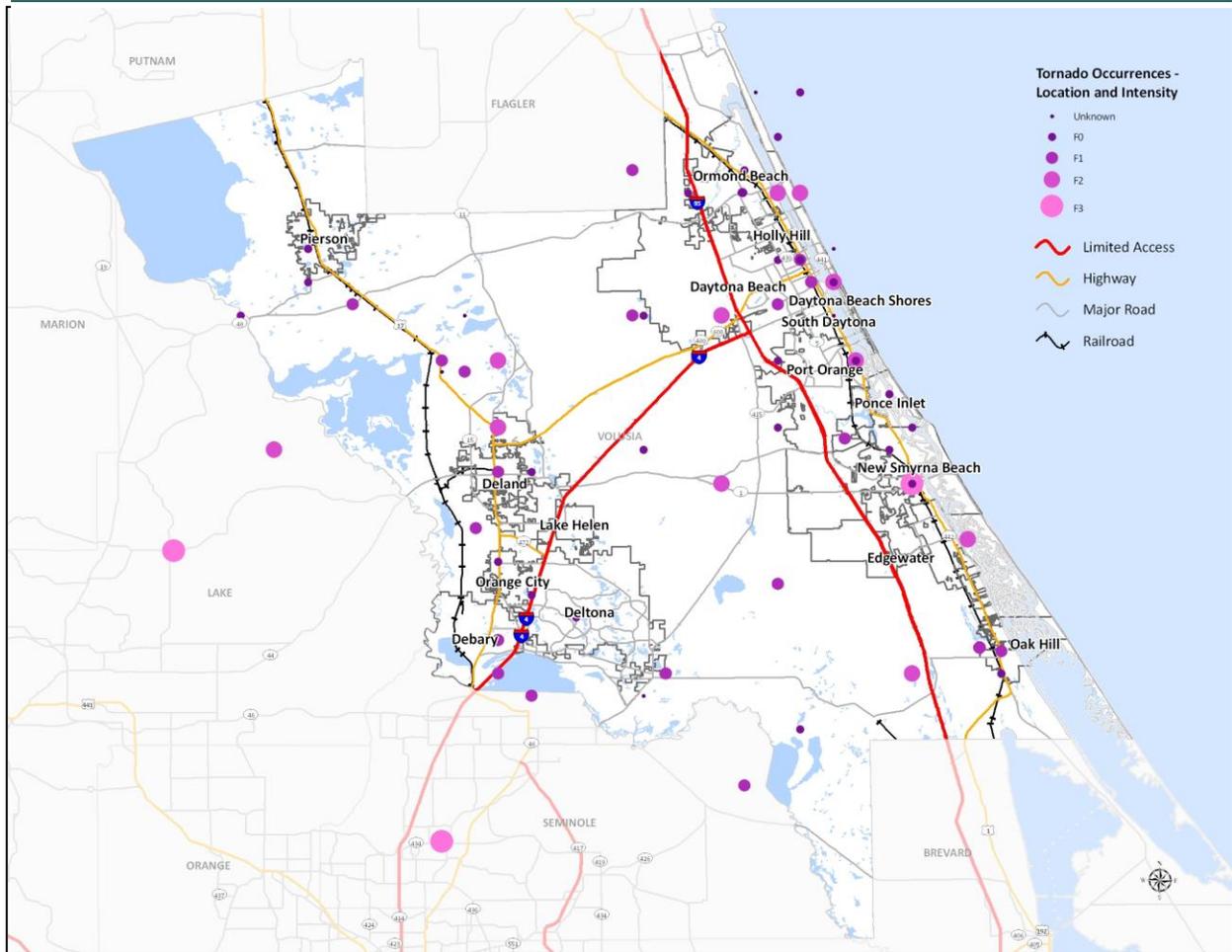
TABLE 5.12: Historical Tornado Impacts

LOCATION	DATE	MAGNITUDE	DEATHS/ INJURIES	PROPERTY DAMAGE (2009 DOLLARS)	DESCRIPTION
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	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.
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 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.

Source: National Climatic Data Center

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

FIGURE 5.7: Locations of Historical Tornado Events in Volusia County



Source: National Oceanic and Atmospheric Administration

5.7.4 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 events annually. While the majority 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 a minor tornado can cause substantial damage. In conclusion, tornadoes pose a significant threat to lives and property in Volusia County.

HYDROLOGIC HAZARDS

5.8 COASTAL EROSION

5.8.1 Background

Coastal erosion is a hydrologic 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 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.

5.8.2 Location and Spatial Extent

All coastal areas in Volusia County are susceptible to coastal erosion. Using Florida Department of Environment field data beginning in 1972, it is clear that Volusia County shorelines are moving due to erosion, accretion, and beach nourishment projects⁷. Further, nearly half of the 47 miles of shoreline in Volusia County are classified as critically eroded.

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.

⁷ 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.

5.8.3 Historical Occurrences

According to the National Climatic Data Center, there have been five events with reported coastal erosion impacts in Volusia County since 1998, as shown in **Table 5.13**. Because the erosion events were part of other hazard events (e.g., storm surge and hurricanes), the monetary damage for the erosion alone is unknown.

TABLE 5.13: Historical Coastal Erosion Impacts

LOCATION	DATE	DEATHS/ INJURIES	PROPERTY DAMAGE (2009 dollars)	DESCRIPTION
Volusia County	9/14/1999	0/0	\$56,444,488	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	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	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	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.

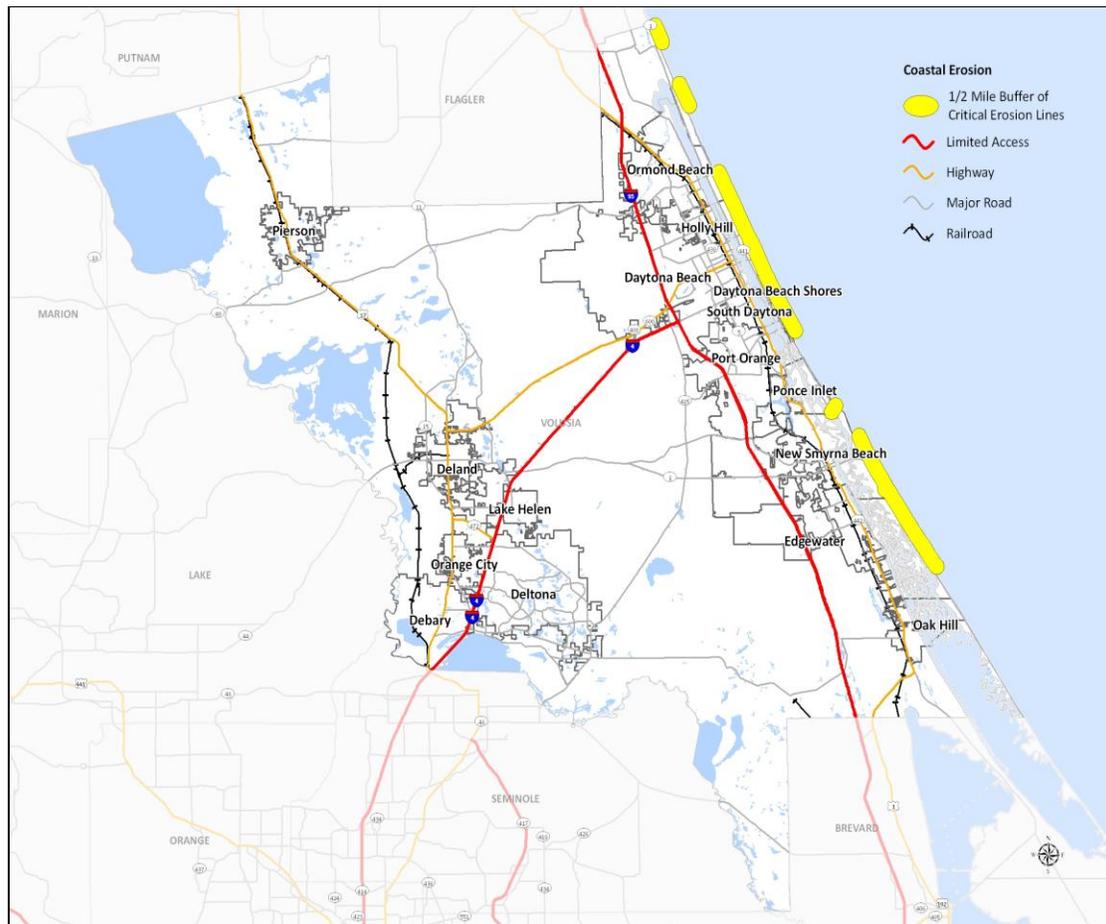
Source: National Climatic Data Center (Most Recent Data Compiled on Online Database; October 2019)

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.

According to the Florida Bureau of Beaches and Coastal Systems, a division within the Florida Department of Environmental Protection, there are 4 critically eroded beaches in Volusia County, totaling over 22 miles of beachfront⁸. These areas are highlighted in **Figure 5.8**. A critical beach erosion area is defined as an area where natural or human processes has caused or contributed to the erosion or recession of the beach or dune system (Florida Bureau of Beaches and Coastal Systems). The largest contiguous area of critically eroded beach is an 11 mile stretch between Ormond Beach and Daytona Beach Shores. This area is threatening recreation and development opportunities in the area. There are also 8 miles of critically eroded beachfront between New Smyrna Beach and Bethune Beach. In addition, there are two segments of critically eroded beach in northern Volusia that threaten State Road A1A.

⁸ Office of Beaches and Coastal Systems, Florida Department of Environmental Protection, 2009.

FIGURE 5.8: Critical Erosion Areas in Volusia County



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

5.8.4 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 the 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 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 from hail and that future mitigation and adaptation strategies related to this hazard should be considered.

5.9 DROUGHT

5.9.1 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 types⁹:

- ▶ **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.

5.9.2 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 **Figure 5.9**, 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. According to the Palmer Drought Severity Index (Figure 5.9), Florida has the 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, a 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

⁹ Multi-Hazard Identification and Risk Assessment: A Cornerstone of the National Mitigation Strategy, FEMA

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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). 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.

Drought Monitor Intensities

Scale	Severity
D0	Abnormally Dry
D1	Drought- Moderate
D2	Drought- Severe
D3	Drought- Extreme
D4	Drought- Exceptional

Source: NOAA

Drought Duration

U.S. Drought Monitor Classification Scheme

S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)

L = Long-Term, typically more than 6 months (e.g. hydrology, ecology)

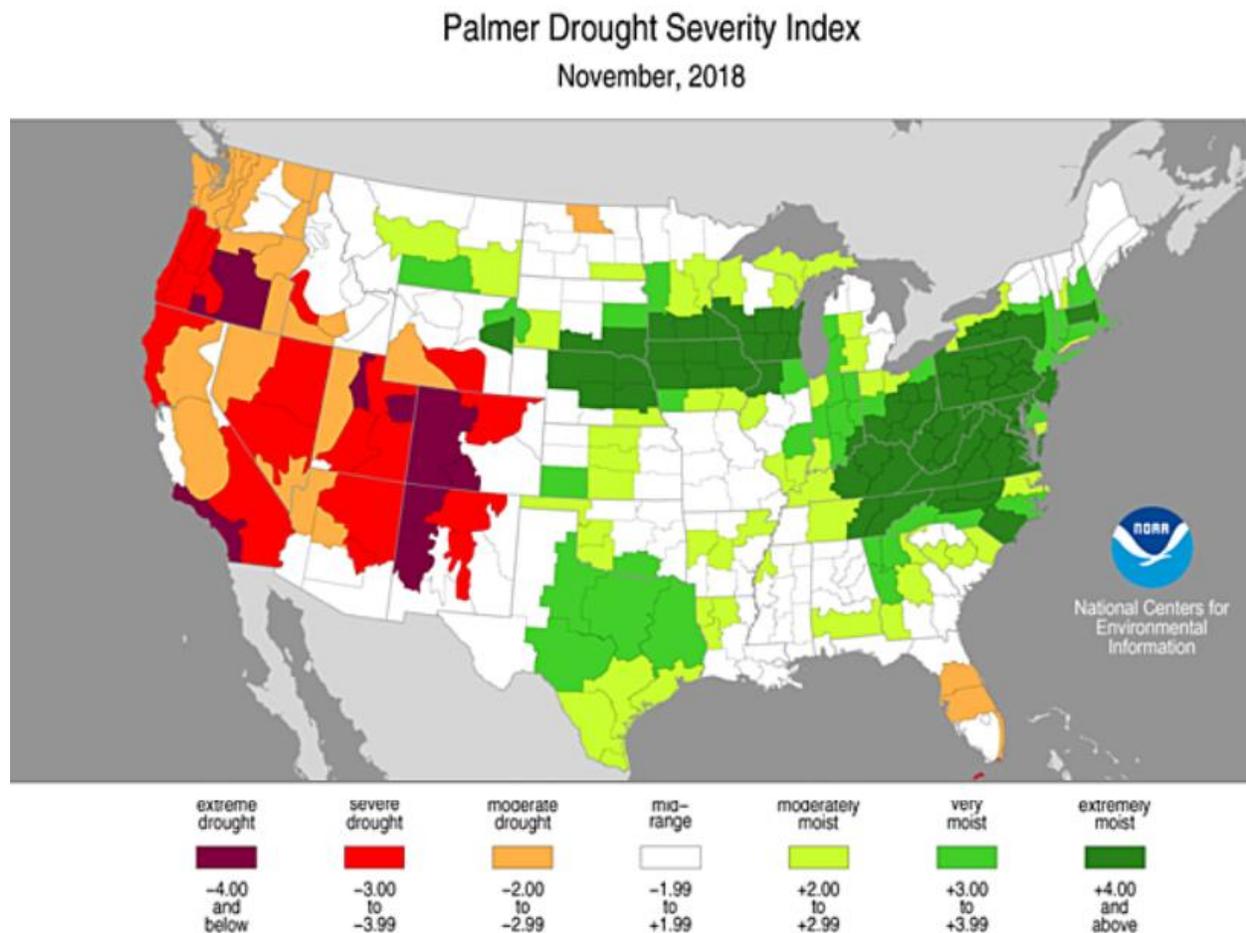
**Both of these have been observed in Florida. In the late 1990's, a long term drought effected Central Florida, while the most recent drought (2010-2012) was also a long term drought.*

Drought Impacts: A drought is noted as a period of unusual dry weather that persists long enough to cause serious problems such as crop damage and/or water supply shortages. There are four basic approaches to measuring drought (Wilhite, 1985):

- Meteorological- defined usually on the basis of the degree of dryness (in comparison to some “normal” or average amount) and the duration of the dry period.
- Agricultural-drought to agricultural impacts, focusing on precipitation shortages, differences between actual and potential evapotranspiration, soil water deficits, reduced groundwater or reservoir levels.
- Hydrological- associated with the effects of periods of precipitation (including snowfall) shortfalls on surface or subsurface water supply (i.e., streamflow, reservoir and lake levels, groundwater).
- Socioeconomic-associated with the supply and demand of some economic good with elements of meteorological, hydrological, and agricultural drought.

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 hazard, reduced water levels at major lakes and rivers, damage to fish habitat, and income loss for the agriculture industry. These impacts have been recorded as a result of historic events including the extreme drought conditions of 2010-2012.

Figure 5.9: 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)

5.9.3 Historical Occurrences

Secondary research was conducted to determine the historical drought occurrences in Volusia County. It was determined that general drought conditions were present throughout Florida in 1981, 1985, 1998-1999, and 2001. 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 highlight some of the events from the aforementioned years.

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1981: Drought conditions were reported throughout Southern Florida. Three firefighters narrowly escaped injury while fighting a 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 users¹⁰.

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 restrictions¹¹. On June 20, 1985, the water warning was expanded throughout St. Johns Water Management District. Volusia County had been placed under the warning months earlier¹². 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 2002¹³.

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.

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

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

¹⁰ “Winds, Dry Weather Worsen Central Florida Fires. Ocala Star-Banner. Associated Press. July 1, 1981.

¹¹ “Fires Still Rage in Volusia County.” Evening Independent. Associated Press.

¹² “St. John’s Water District Expands Warning Area.” Gainesville Sun. Associated Press. June 20, 1985.

¹³ NAVARRO, MIREYA. “Thousands Flee Florida Homes as Fires Surge.” July 2, 1998. Section A, page 1, New York Times.

5.10 FLOOD

5.10.1 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 a flooding event 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 storms¹⁴. 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.



Maytown Road experienced extreme flooding during the 2009 Volusia County rain storms

¹⁴ While briefly mentioned here, coastal flooding is more thoroughly addressed under the “storm surge” 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 the flood that is large enough to cover them. For example, the 100-year floodplain represents a 1 percent annual chance of flood. The frequency of flood events, such as the 1 percent annual chance flood, is determined by plotting a graph of the size of all known floods for an area and determining how often floods of a particular size occur. Another way of expressing the flood frequency is 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 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 interval.

5.10.2 Location and Spatial Extent

Many areas of Volusia County are susceptible to riverine and urban (stormwater) flooding, and its coastal areas are also very susceptible to tidal and coastal flooding due to coastal storm events including storm surge.¹⁵ **Figure 5.10** 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 This includes 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 topology (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 up 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.

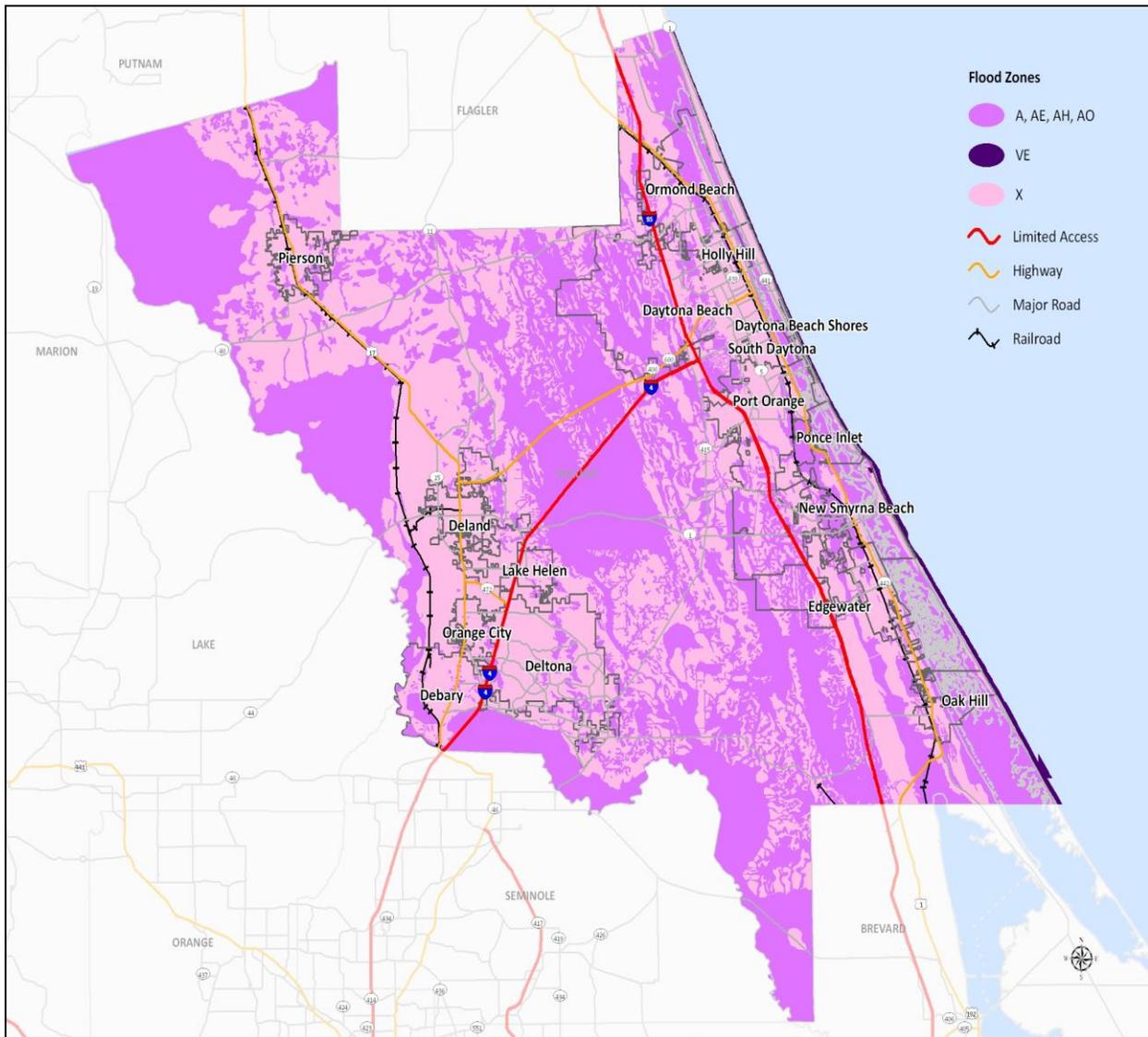
There are a number of areas that are disproportionately affected to flooding, including areas adjacent to the St. Johns River (Maytown to Enterprise).

5.10.3 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.

FIGURE 5.10: Special Flood Hazard Areas in Volusia County



Source: Federal Emergency Management Agency --- NOTE: More detailed maps can be found in Appendix I (FMP).

5.10.3 Historical Occurrences

According to the National Climatic Data Center, there have been 17 reported flood events in Volusia County since 1994. According to the data as shown in **Table 5.14**, there was over \$20 million in property damage (not including recorded agricultural losses) during this period.

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TABLE 5.14: Historical Flood Impacts in Volusia County

LOCATION	DATE	TYPE	DEATHS/ INJURIES	PROPERTY DAMAGE (2009 dollars)	DESCRIPTION
Peninsular	9/15/1994	Flooding	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.
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 the Lake Harney Gage. Many homes were flooded near Stone Island.

SECTION 5: HAZARD PROFILES

TABLE 5.14: Historical Flood Impacts in Volusia County

LOCATION	DATE	TYPE	DEATHS/ INJURIES	PROPERTY DAMAGE (2009 dollars)	DESCRIPTION
Countywide	8/21/2008	Flash Flood	0/0	\$13,400,000	As Tropical Storm Fay drifted north in the Volusia County off shore waters, hours of torrential rain fell across southern Volusia county. Close to 200 homes were flooded. Damage was near \$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 totals 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 impassible 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 was 3.65 million dollars. No injuries reported.
Holly Hill	9/24/2014	Flash Flood	0/0	\$3,090,000	Same as above.
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.

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 emergency management officials from the Volusia County jurisdictions, another significant flood event occurred during the Memorial Day Weekend in May 2009 that was not included in the NCDL database. This event caused high rains and four feet of storm surge. There was between approximately \$68 million in damages 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.

5.10.4 Historical Summary of Insured Flood Losses

All jurisdictions in Volusia County participate in the National Flood Insurance Program (NFIP). **Table 5.15** 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.

TABLE 5.15: NFIP Policy and Claim Information (May 2017)		
JURISDICTION	NUMBER OF LOSSES REPORTED	TOTAL PAYMENTS
Daytona Beach	89	\$308,481
Daytona Beach Shores	6	\$11,034
DeBary	17	\$908,328
DeLand	102	\$922,557
Deltona	46	\$329,749
Edgewater	29	\$28,202
Holly Hill	17	\$257,169
Lake Helen	0	\$0
New Smyrna Beach	344	\$2,381,837
Oak Hill	10	\$9,024
Orange City	6	\$6,080
Ormond Beach	380	\$4,541,159
Pierson	1	\$8,834
Ponce Inlet	9	\$83,301
Port Orange	66	\$873,252
South Daytona	11	\$79,940
Volusia County	201	\$3,615,828
TOTAL	1,334	\$14,364,775

Source: V.C.E.M. (125155 Historical Claims Spreadsheet) (May 2017)

5.10.5 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 July 2018), there are 77 repetitive loss properties located in Volusia County. Without mitigation, these properties will likely continue to experience flood losses. In 2012, the Biggert Waters Flood Insurance Reform Act eliminated the RFC program. **Table 5.16** provides summary information about repetitive loss properties in Volusia County.

SECTION 5: HAZARD PROFILES

JURISDICTION	NUMBER OF RL PROPERTIES	
	TOTAL	LOSSES BY LAND USE
Daytona Beach	2	2 RESIDENTIAL
Daytona Beach Shores	0	NONE
DeBary	0	NONE
DeLand	10	10 RESIDENTIAL
Deltona	0	NONE
Edgewater	1	1 RESIDENTIAL
Holly Hill	1	1 RESIDENTIAL
Lake Helen	0	NONE
New Smyrna Beach	18	18 RESIDENTIAL
Oak Hill	0	NONE
Orange City	0	NONE
Ormond Beach	24	24 RESIDENTIAL
Pierson	0	NONE
Ponce Inlet	0	NONE
Port Orange	4	4 RESIDENTIAL
South Daytona	2	2 RESIDENTIAL
Volusia County	13	13 RESIDENTIAL
TOTAL	77	77 RESIDENTIAL

Source: V.C.E.M, Volusia County I.T.

5.10.6 Probability of Future Occurrences

Flood events will remain a frequent occurrence in Volusia County, and future probability of 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.

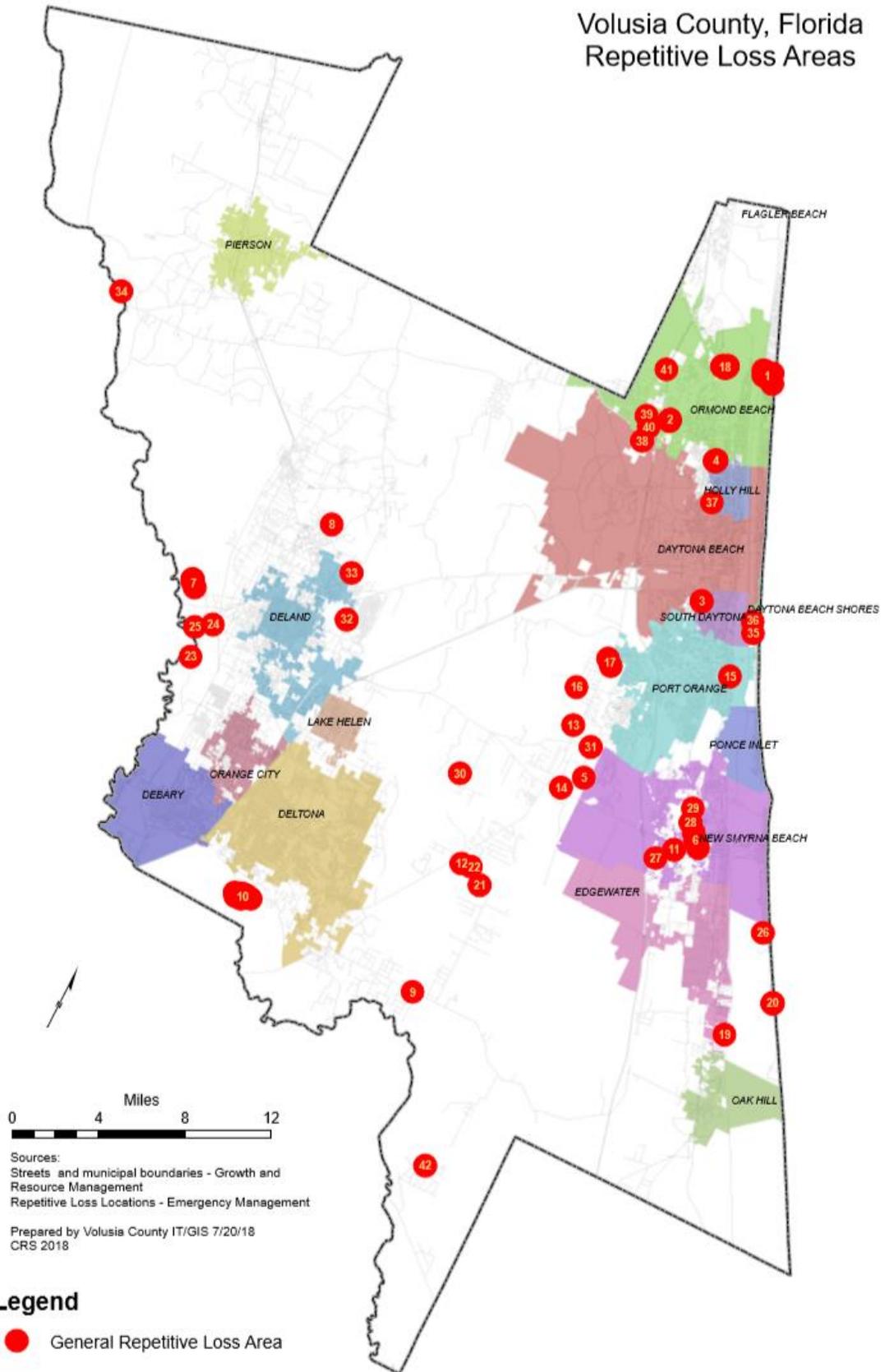
Anticipated sea level rise will increase the probability and intensity of future tidal flooding. Rising sea level over time will decrease the return period (increasing the frequency) of significant flood events. For example; sea level rise of 1 foot over a typical project analysis period (50 years) may cause a flood event currently of annual probability 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 sand beaches that act as protective buffers against flood events.

SECTION 5: HAZARD PROFILES

There are repetitive loss properties within 9 of the 16 jurisdictions within Volusia County. This includes 77 total properties. 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 the Daytona Beach, New Smyrna Beach and Ormond Beach areas. The western side of the county also has a number of repetitive loss properties, most notably the cluster within the Stone Island residential area in the southwestern portion of the county. Table 5.16 analyzes the Repetitive properties by jurisdiction. Data collected showed that the majority of properties have not undergone mitigation efforts; however, there is insufficient data to measure an actual percentage for the entire county. Preliminary findings show, with a high degree of confidence, that the percent of repetitive loss properties that have been mitigated is well-below the 50% level.

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**Volusia County, Florida
Repetitive Loss Areas**



5.11 STORM SURGE

5.11.1 Background

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 overwash, 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.

A storm surge is often described as a wave that has outrun its generating source and become a long period swell. It is often recognized as a large dome of water that may be 50 to 100 miles wide and generally rising anywhere from four to five feet in a Category 1 hurricane to over 20 feet in a Category 5 storm. The storm surge arrives ahead of the storm center's actual landfall and the more intense the storm is, the sooner the surge arrives. Water rise can be very rapid, posing a serious threat to those who have not yet evacuated flood-prone areas. The surge is always highest in the right-front quadrant of the direction in which the storm is moving. As the storm approaches shore, the greatest storm surge will be to the north of the low-pressure system or hurricane eye. Such a surge of high water topped by waves driven by hurricane force winds can be devastating to coastal regions, causing severe beach erosion and property damage along the immediate shoreline.

Storm surge heights and associated waves are dependent on not only the storm's intensity but also 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 water close to the shoreline, tends to produce a lower surge but higher and more powerful storm waves. The storms that generate the largest coastal storm surges can develop year-round, but they are most frequent from late summer to early spring.

5.11.2 Location and Spatial Extent

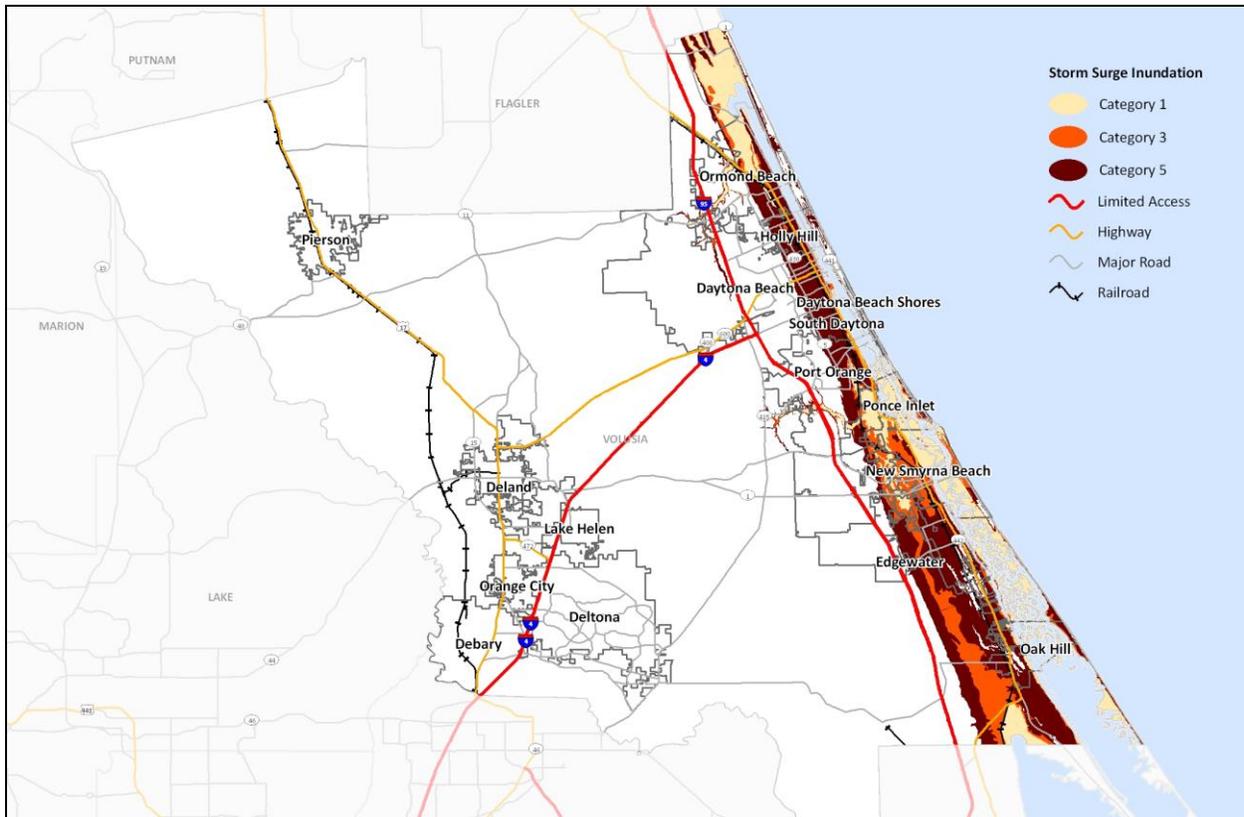
Many areas in Volusia County are subject to potential storm surge inundation. **Figure 5.11** illustrates hurricane storm surge inundation zones for Volusia County derived from geo-referenced SLOSH (Sea, Lake and Overland Surge from Hurricanes) data produced by the USACE in coordination with NOAA. SLOSH is a modeling tool used to estimate storm surge for coastal areas resulting from historical, hypothetical or predicted hurricanes taking into account maximum expected levels for pressure, size, forward speed, track and winds. Therefore, the SLOSH data is best used for defining the potential maximum surge associated with various storm intensities for any particular location.

As shown in the figure, all of Volusia County's coastal areas are at high risk to 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

SECTION 5: HAZARD PROFILES

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.

FIGURE 5.11: Storm Surge Inundation Zones in Volusia County



Source: National Oceanic and Atmospheric Administration – Note: More detailed map available in next section of the report. See Table 5.4 on page 5.15 for information regarding storm surge extents, in feet.

Ranges include:

- Tropical Storm: 0-2 feet
- Category 1: 3-5 feet
- Category 2: 6-8 feet
- Category 3: 9-12 feet
- Category 4: 13-18 feet
- Category 5: 19 or more feet.

5.11.3 Historical Occurrences

Volusia County has experienced storm surge events associated with hurricanes, nor'easters and tropical storms. Please reference the **Hurricane Historical Occurrences** listing for more information. Water can rise to exceptional levels during hurricane, storm surge, flash flood and thunderstorm conditions. Water levels from storm surge have historically risen up 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.

5.11.4 Probability of Future Occurrences

There is a high probability that Volusia County will continue to experience storm surge associated with large tropical storms, hurricanes and squalls combined with high tides, based on the frequency of past tropical cyclones. As noted in the preceding section (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 tidal flooding 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 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.

5.12 SEA LEVEL RISE

5.12.1 Background

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 assessed in depth by Volusia County Emergency Management as well as numerous municipalities in Volusia County through the development of the East Central Florida Regional Resiliency Action Plan and the East Central Florida Regional Resiliency Collaborative. As part of these efforts, municipalities have held discussions, workshops and meetings to determine consistencies in modeling of sea level rise (including adoption of the "high" NOAA curve as a standard bearer for risk analyses), methods of mitigation including green and gray infrastructure, and other items. These conversations are still ongoing.

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.

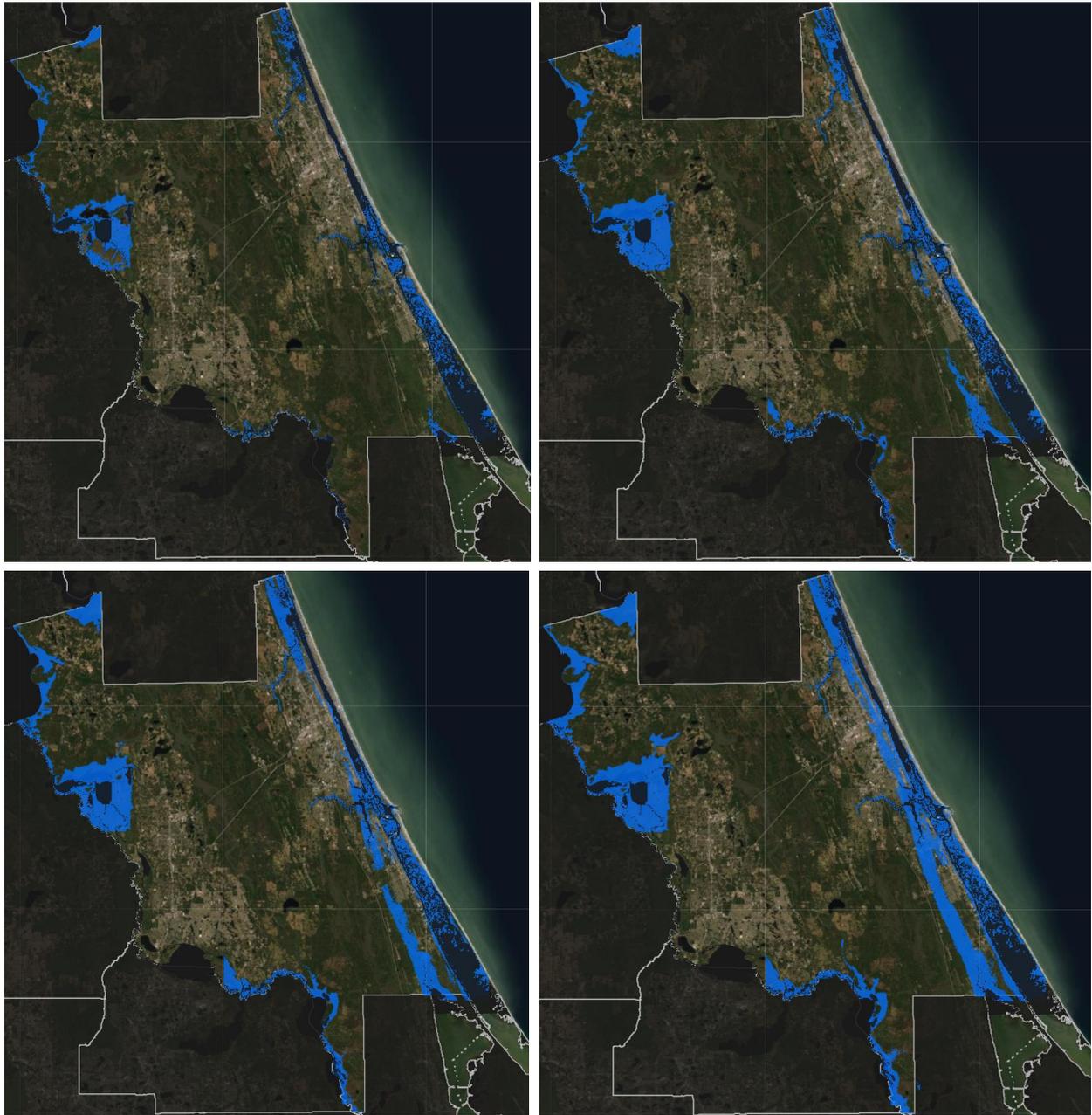
5.12.2 Location and Spatial Extent

The map on the following page depicts 1, 3, 5 and 7-feet of sea level rise overlaid with Volusia County. These levels of sea level rise are within the general range of the sea level rise curves provided by the U.S. Army Corps of Engineers and the National Oceanographic and Atmospheric Administration in section 5.12.4. This data was developed by the Tampa Bay Regional Planning Council and the East Central Florida Regional Planning Council in 2019, with peer review by the University of Florida GeoPlan Center.

In Volusia County, areas susceptible to sea level rise include areas 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.

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FIGURE 5.12.1: Sea Level Rise Extents in Volusia County (1 ft, 3 ft, 5 ft, 7 ft)



Top Left: 1 Foot

Top Right: 3 Feet

Bottom Left: 5 Feet

Bottom Right: 7 Feet

5.12.3 Historical Occurrences

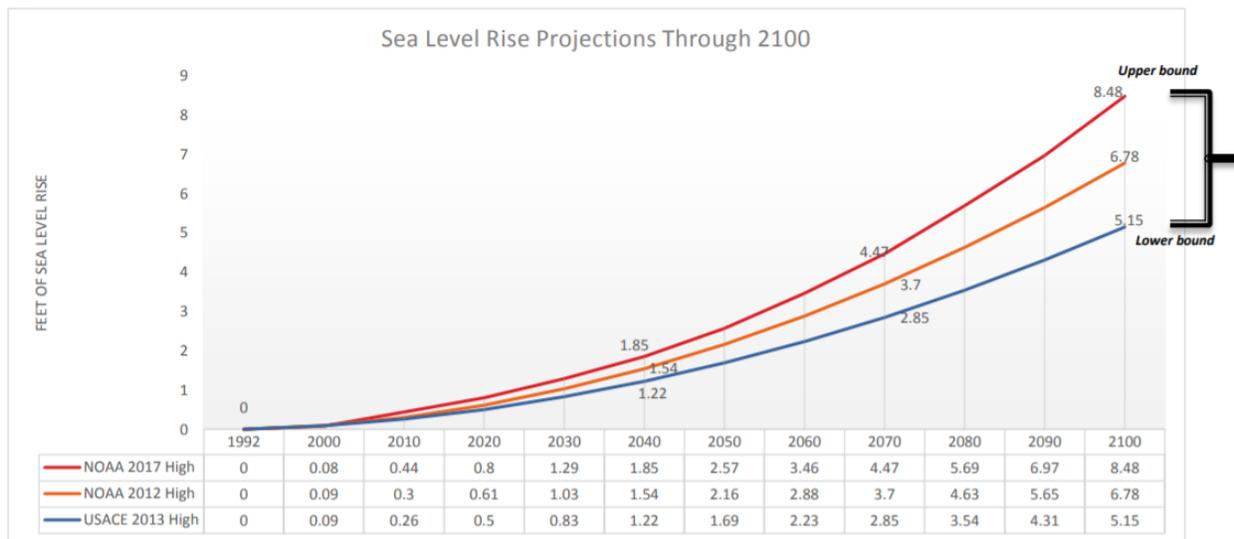
Historical occurrences of sea level rise are not easy to measure due to a lack of data existing from the early 20th Century as well as the time period of two epochs (38 years) needed to calculate the mean impacts of sea level rise, by location. As data collection and monitoring improve, the ability for 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.

5.12.4 Probability of Future Occurrences

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.

Figure 5.12.2



GEOLOGIC HAZARDS

5.13 SINKHOLE

5.13.1 Background

Sinkholes are a natural and common geologic feature in areas with underlying limestone and other rock types that are soluble in natural water. Most limestone is porous, allowing the acidic water of rain to percolate through their strata, dissolving some limestone and carrying it away in solution. Over time, this persistent erosional process can create extensive underground voids and drainage systems in much of the carbonate rocks. Collapse of overlying sediments into the underground cavities produces sinkholes.

The three general types of sinkholes are: subsidence, solution, and collapse. *Subsidence sinkholes* form gradually where the overburden (the sediments and water that rest on the limestone) is thin and only a veneer of sediments is overlying the limestone. *Solution sinkholes* form where no overburden is present and the limestone is exposed at land surface. *Collapse sinkholes* are most common in areas where the overburden is thick, but the confining layer is breached or absent. Collapse sinkholes can form with little warning and leave behind a deep, steep-sided hole. Sinkholes occur in many shapes, from steep-walled holes to bowl or cone shaped depressions. Sinkholes are dramatic because the land generally stays intact for a while until the underground spaces get too big. If there is not enough support for the land above the spaces, then a sudden collapse of the land surface can occur. Under natural conditions, sinkholes form slowly and expand gradually. However, human activities such as dredging, constructing reservoirs, diverting surface water and pumping groundwater can accelerate the rate of sinkhole expansions, resulting in the abrupt formation of collapse sinkholes.

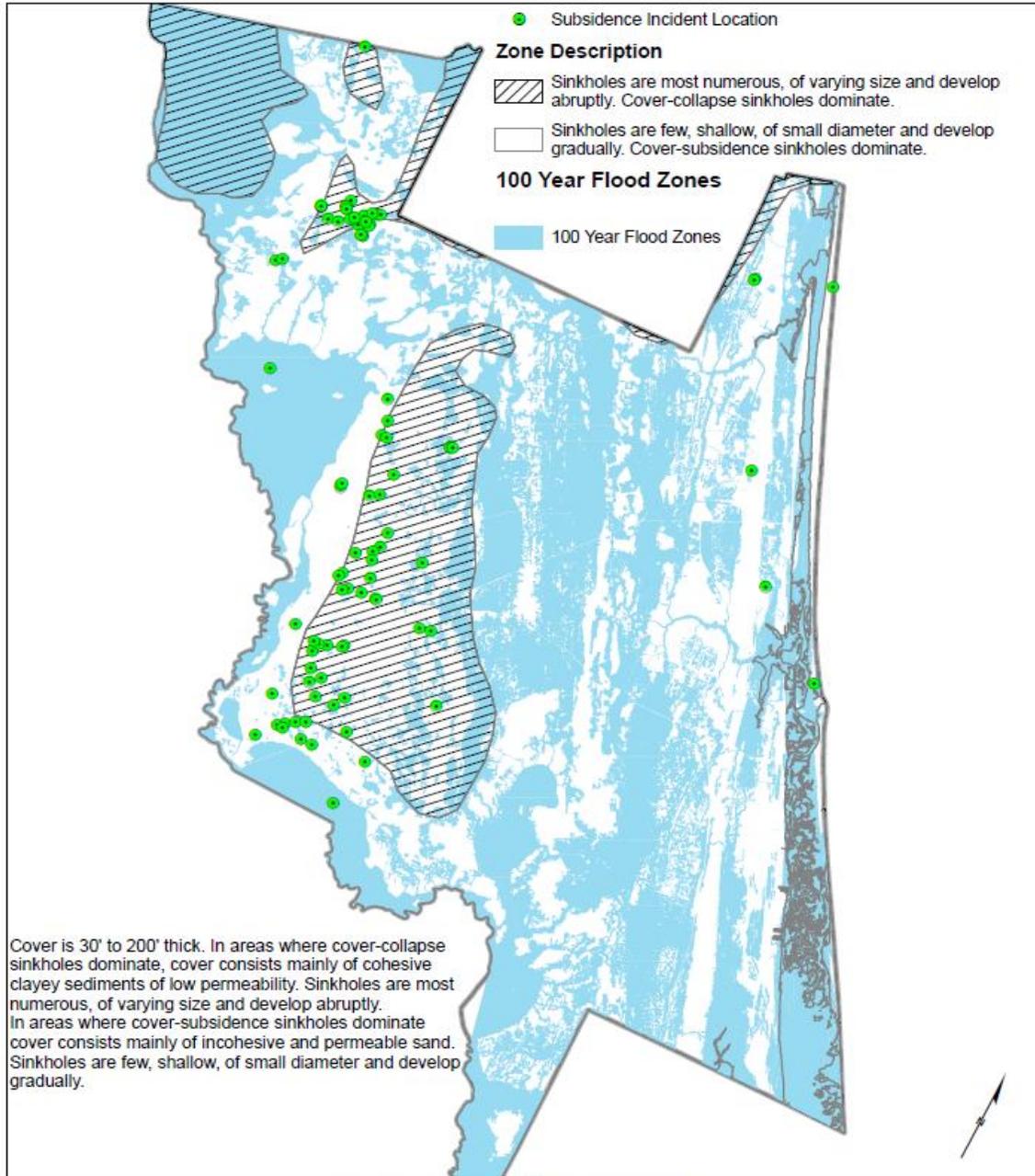
Although a sinkhole can form without warning, specific signs can signal potential development:

- Slumping or falling fence posts, trees or foundations;
- Sudden formation of small ponds;
- Wilting vegetation;
- Discolored well water; and/or
- Structural cracks in walls, floors.

Sinkhole formation is exacerbated by urbanization. Development increases water usage, alters drainage pathways, overloads the ground surface and redistributes soil. According to FEMA, the number of human-induced sinkholes has doubled since 1930 and insurance claims for damages as a result of sinkholes has increased 1,200 percent from 1987 to 1991, costing nearly \$100 million.

5.13.2 Location and Spatial Extent

Sinkholes are typically localized occurrences that cannot be mapped to any specific geographic boundaries. The map below (figure 5.13.1) depicts sinkhole locations within Volusia County, Florida. Cities and towns most impacted by sinkholes include Deltona, Orange City, DeBary, DeLand, and Pierson.



**Volusia County, Florida
Subsidence Incidents / Sinkholes - January 1973 to January 2013**

Source: Subsidence Data - FL Geological Survey, October 2014; Sinkhole Zone Data - FL DEP, 2010; Flood Zone Data - FEMA Feb 2014.
Prepared by Volusia County IT/GIS March 24, 2015

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The American Society of Civil Engineers measured a number of Florida sinkholes and concluded that their sample had average depth of 3.4 meters (11.2 feet). This figure is geographically relevant to Volusia County; however, the breadth of size of sinkholes can vary widely depending on the context of the earth subsurface. Sinkholes can be relatively shallow (less than two meters) or extremely deep (tens of meters), and therefore can have extremely large or small diameters, ranging in size from one-to-two meters to tens of meters.

5.13.3 Historical Occurrences

There were 80 sinkholes in Volusia County between 1973 and 2005. **Figure 5.12** shows the location of these sinkholes. Seventy-eight of these sinkholes were located in the Volusia County study area as shown in **Table 5.17**, as reported to the NCDC. In 2004 there was a major sinkhole that occurred in DeLand. In December 2004, a sinkhole devoured a 160-foot area, swallowing all four lanes of Howland Boulevard, cracked the walls of a nearby home and caused the evacuation of 20 homes. It was estimated that it would take 1 million cubic yards of dirt to fill the hole. In 2005, a 250 foot by 150-foot sinkhole opened in Volusia County, and sinkholes with depths as great as 50 feet have been observed within the County. These conditions can be expected in the future within Volusia County

Please reference the sinkhole portion of section 6 for a map depicting all historical sinkhole locations in East Central Florida.

TABLE 5.17: Historical Sinkholes in Volusia County

LOCATION	DATE	SIZE (feet)			DETAILS
		Length	Width	Depth	
Pierson	12/12/1973	60.00	60.00	0.00	There are many small lakes in the area. The sinkhole was adjacent.
Pierson	12/13/1973	100.00	100.00	40.00	Depth varies from 20' to 40'. It happened during pumping for freeze protection.
Pierson	12/17/1973	10.00	10.00	2.00	None
Pierson	12/15/1975	25.00	25.00	20.00	It happened during pumping for freeze protection.
Pierson	1/10/1976	3.00	3.00	1.00	It happened during pumping for freeze protection.
Pierson	12/1/1976	15.00	15.00	0.00	None
Pierson	1/15/1977	0.00	0.00	0.00	None
Pierson	1/19/1977	30.00	30.00	12.00	Near other small sinks and lakes.
Orange City	4/10/1977	70.00	70.00	50.00	Near 501
Pierson	1/3/1979	39.00	32.00	0.00	None
Pierson	1/9/1979	22.00	27.00	7.00	None
Pierson	1/9/1979	19.00	16.00	3.00	None

SECTION 5: HAZARD PROFILES

TABLE 5.17: Historical Sinkholes in Volusia County

LOCATION	DATE	SIZE (feet)			DETAILS
		Length	Width	Depth	
DeLand	4/17/1979	6.00	6.00	10.00	None
DeLand	1979	9.00	9.00	4.00	None
DeLand	7/16/1981	13.00	13.00	18.00	None
DeLand	10/27/1981	3.00	3.00	8.00	None
Pierson	12/15/1981	50.00	50.00	20.00	A sink also occurred here in 1973.
Orange City	1/9/1982	2.00	2.00	2.00	None
Debary	4/9/1982	20.00	20.00	15.00	None
DeLand	4/11/1982	7.25	6.50	3.33	None
DeLand	4/14/1982	3.00	3.00	1.00	Occurred at the national guard armory.
Lake Helen	7/25/1982	4.00	3.00	3.00	None
Orange City	10/4/1982	12.00	12.00	6.00	None
Holly Hills	4/7/1983	20.00	0.00	15.00	None
New Smyrna Beach	5/28/1983	5.00	0.00	7.00	There are multiple holes in the area varying from 1 to 5 feet in diameter and 2 to 7 feet deep.
Pierson	12/26/1983	130.00	100.00	35.00	None
Pierson	12/26/1983	50.00	50.00	35.00	Very cold at this time, pumping for freeze protection.
Pierson	12/26/1983	10.00	10.00	0.33	Very cold at this time, pumping for freeze protection.
Pierson	12/26/1983	15.00	15.00	0.60	Very cold at this time, pumping for freeze protection.
Pierson	12/26/1983	25.00	25.00	20.00	Very cold at this time, pumping for freeze protection. Occurred next to a fernery.
Orange City	4/24/1984	7.00	7.00	6.00	Approximately 200 yards from ST 17-92, in the center of the west bound lane.
Seville	1/21/1985	60.00	60.00	25.00	Many wells in the area went dry. Sink in the northeast corner of Crystal Lake which has been dry for months. Six days later, the sink was filled with water, but no rain. Heavy freeze protection pumping at this time.
Pierson	1/21/1985	20.00	20.00	3.00	Six Sinks in the area. Heavy freeze protection pumping at this time.
Pierson	1/21/1985	10.50	12.75	4.00	Six Sinks in the area. Heavy freeze

SECTION 5: HAZARD PROFILES

TABLE 5.17: Historical Sinkholes in Volusia County

LOCATION	DATE	SIZE (feet)			DETAILS
		Length	Width	Depth	
					protection pumping at this time.
Pierson	1/21/1985	62.00	62.00	15.00	Six Sinks in the area. Heavy freeze protection pumping at this time.
Pierson	1/21/1985	53.00	50.00	12.00	Six Sinks in the area. Heavy freeze protection pumping at this time.
Pierson	1/21/1985	20.00	26.00	2.00	Six Sinks in the area. Heavy freeze protection pumping at this time.
Orange City	10/13/1985	35.00	25.00	0.13	Settlement causing cracks and distortion to house. The sink is completely under the house. Cement pressure grouting will be performed Jammal and Associates report.
Pierson	1/29/1986	23.20	21.70	7.00	Near other sinkholes.
DeLand	2/1/1986	5.00	4.00	4.50	This sinkhole is on the slope of Lake Louise.
Port Orange	4/3/1987	10.00	10.00	1.00	None
Orange City	5/19/1987	95.00	95.00	1.00	Reactivation of ancient sink.
Pierson	5/27/1987	48.00	28.00	10.00	Sinkhole on divide between stone pond and unnamed pond. .
Pierson	5/29/1987	0.00	0.00	3.00	None
DeLand	9/1/1987	5.50	6.50	11.00	A backhoe operator drove up to the edge of the area and it suddenly collapsed.
DeLand	3/17/1989	13.00	13.00	10.00	S.R. 11 – The sink is in the right of way on the west side of the highway.
Orange City	10/31/1991	22.00	22.00	20.00	1910 Clara Ave, residence.
Orange City	3/7/1993	130.00	130.00	35.00	825 & 835 Lansdowne Ave.
Orange City	3/7/1993	15.00	15.00	1.00	560 Marilea Ct.
Orange City	5/8/1994	50.00	50.00	25.00	581 Sparkman Ave
Orange City	8/29/1994	5.00	5.00	1.50	I-4 at the Saxon Boulevard Ramp
DeLand	8/24/1995	10.00	8.00	5.00	Sinkhole is in backyard.
DeLand	1/10/1996	5.00	5.00	2.00	Located at Old Reynolds Road.
DeLand	1/10/1996	50.00	50.00	11.00	Located at Old Reynolds Road.
Deltona	10/12/1996	0.00	0.00	0.00	Located at a residence.
DeLand	8/30/1998	18.00	18.00	5.00	U.S. HWY 17/92 in DeLand located on the east side of the highway in bank driveway.

SECTION 5: HAZARD PROFILES

TABLE 5.17: Historical Sinkholes in Volusia County

LOCATION	DATE	SIZE (feet)			DETAILS
		Length	Width	Depth	
Debary	5/26/2000	0.00	0.00	0.00	148 MARSELLA Road in a Debary housing subdivision. One home deemed unsafe and two have structural damage.
Lake Helen	6/14/2000	1.00	1.00	3.00	Located on west Main Street under a home; it is not causing structural damage.
DeLand	7/21/2000	25.00	25.00	15.00	The sinkhole is located under a home that is under construction. No structural damage to home.
Orange City	8/26/2000	3.00	3.00	3.00	Sinkhole is still growing; 20 feet from structure.
Orange City	9/22/2000	2.00	2.00	10.00	Sinkhole is 6 feet from structure. No structural damage on private property.
Sanford	9/28/2000	5.00	5.00	3.00	DEBARY. STATION 28+35, Located 5 feet right of Benson Junction Road.
Debary	10/17/2000	2.00	2.00	6.00	Located on private property.
Pierson	12/21/2000	50.00	50.00	15.00	Located on Shaw Lake Road between Turner Road and Hilsenbeck Road. Ten feet from South side of the road. . .
Pierson	12/21/2000	30.00	35.00	35.00	A portion of Shaw Lake Road was barricaded due to sinkhole impact.
DeLand	12/29/2000	35.00	35.00	3.00	A sinkhole occurred 50 feet from structure but structure is stable at this time.
DeLand	3/22/2001	6.00	4.00	5.00	Sinkhole was located in the road. A garbage truck hit it. It is now being repaired.
DeLand	4/30/2001	20.00	20.00	3.00	Sink occurred on private property near a retention pond.
Debary	7/18/2001	4.00	4.00	2.00	Sink on private property.
Welaka	10/15/2001	7.00	7.00	1.50	U.S. 17 North of Seville going southbound.
Orange City	8/25/2002	3.00	3.00	0.00	Closed one land of road to repair sink in right of way.
Orange City	9/30/2002	6.00	6.00	2.00	Sinkhole in intersection.
Orange City	1/15/2003	5.00	5.00	0.50	Half inch pavement dip.
DeLand	6/2/2004	15.00	15.00	8.00	Sinkhole in the road. No damage or injuries occurred.
DeLand	9/8/2004	4.00	4.00	2.50	Sinkhole on private property; no damage.

SECTION 5: HAZARD PROFILES

TABLE 5.17: Historical Sinkholes in Volusia County

LOCATION	DATE	SIZE (feet)			DETAILS
		Length	Width	Depth	
DeLand	9/29/2004	25.00	25.00	20.00	Sinkhole on private property. The hole is partly under the garage. The owner was advised not to stay in the home until the sinkhole is fixed.
Deltona	12/18/2004	225	175	50	Destroyed 4-lanes of Howland Blvd.; largest sinkhole on record for Volusia County
Orange City	1/9/2005	250.00	150.00	0.00	Sinkhole damaged 2 homes beyond repair and is also impacting road.
Osteen	8/17/2005	4.00	2.00	2.00	Sinkhole on private property.
Lake Dias	8/17/2005	4.00	4.00	3.00	None

Source: National Climatic Data Center (data not available from this source after-2005)

Volusia County Geographic Information Systems (GIS) has compiled a listing of all sinkholes that have occurred since August 17, 2005. The listing is provided below:

Reference #	Date	Longitude	Latitude	County	City	Trigger
79-544	8/26/08	-81.321	28.8988	VOLUSIA	DeBary	Unknown
79-545	8/27/08	-81.2517	28.8975	VOLUSIA	Deltona	Unknown
79-546	10/2/08	-81.0583	29.206	VOLUSIA	Daytona Beach	Unknown
79-547	10/9/08	-81.2271	28.8838	VOLUSIA	Deltona	Unknown
79-044	10/13/08	-81.2665	28.9198	VOLUSIA	Deltona	Excessive Rainfall
79-548	7/2/11	-81.07076	29.3563	VOLUSIA	Ormond Beach	Unknown
79-549	1/24/13	-81.338	29.10877	VOLUSIA	DeLeon Springs	Drought or Low Water Table

5.13.4 Probability of Future Occurrences

There is a high probability of future sinkhole occurrences in Volusia County. The county averages 2.5 sinkholes annually, according to the historic data. Activities that increase the risk of sinkhole are ground-water pumping, construction and development practices, and breakages in water lines, though they can also occur due to natural or geological factors. 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.



5.13 TSUNAMI

5.14.1 Background

The word tsunami is Japanese and means “harbor wave.” A tsunami is a wave or series of waves most commonly 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.

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.

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.

Although an East Coast tsunami would be rare, two off-shore 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 of 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 with regard to these areas are recent discoveries along the East Coast that demonstrate the existence of pressurized hydrates and pressurized water layers in 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.

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 risk¹⁷. 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.

¹⁷ NOAA and USGS. 2008. *U.S. States and Territories National Tsunami Hazard Assessment: Historical Record and Sources for Waves*. August 2008.

5.14.2 Location and Spatial Extent

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 or any part of Volusia County. However, the coastal areas are most at risk.

Figure 5.13 indicates the areas in Volusia County most at risk to a tsunami hazard based on the location of the 500 year tsunami inundation zone based on MEMPHIS data. The coastal areas are at the greatest risk to high velocity waves that could cause severe to catastrophic damage to structures and infrastructure. Specifically, massive amounts of vegetative and construction debris would result, 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. Tsunami size is a function of the intensity of an underlying earthquake (see the Richter scale, below), as well as factors specific to the shape (or bathymetry) where the seismic activity occurs. For example, the “Boxing Day” tsunami that struck southern Asia in 2004 was located on an elongated ridge within the deep Indian Ocean. The elongation of the ridge considerably increased the linear mileage of coastline that were struck by the tsunami within the northeastern hemisphere and inflicted more damage on some coastlines than others. Below is a figure depicting the Richter Scale.

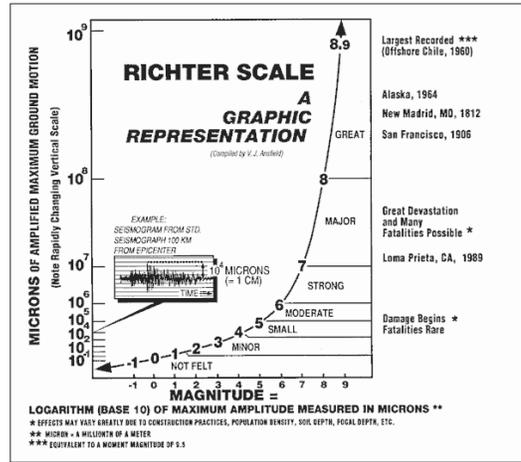
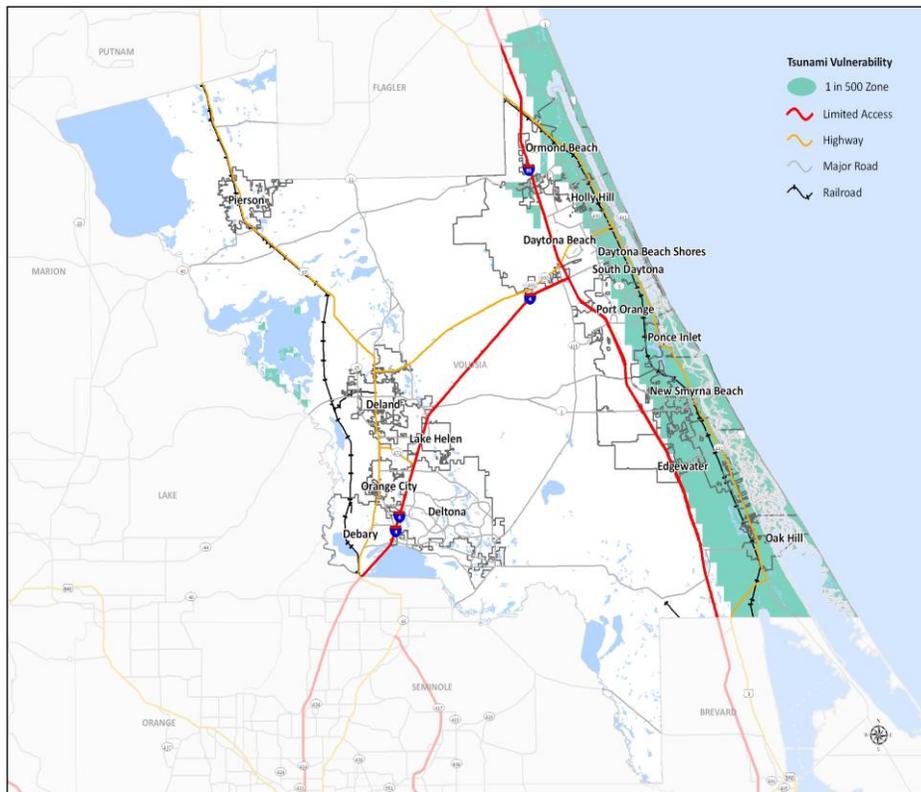


Image: Richter Scale Graphic Representation

FIGURE 5.14: Tsunami Vulnerability Areas



5.14.3 Historical Occurrences

Historical records do not indicate any past significant tsunami occurrences for Volusia County, and such an event is generally considered possible but unlikely. However, the potential for tsunami impacts along the entire Eastern United States coast does exist as evidenced by other recorded tsunami occurrences in the area.

Although different from a tsunami, a rogue wave is a relatively large (i.e., larger in height than a tsunami) and spontaneous ocean wave that can cause similar impacts. On July 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.

5.14.4 Probability of Future Occurrences

The probability of a future tsunami event affecting Volusia County is considered to be very low, as indicated in the 2008 NOAA-USGS tsunami hazards assessment. However, the consequences of even a moderate tsunami striking Volusia County would be devastating to 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 from tornadoes and that future mitigation and adaptation strategies related to this hazard should be considered.

OTHER HAZARDS

5.15 WILDFIRE

5.15.1 Background

A wildfire is any fire occurring in a wildland area (i.e. grassland forest, brush land) except for fire under prescription.¹⁸ Wildfires 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 wildfire 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 wildfires 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 along to consumers through higher prices. In 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

¹⁸ Prescription burning, or “controlled burn,” undertaken by land management agencies is the process of igniting fires under selected conditions, in accordance with strict parameters.

5.15.3 Historical Occurrences

According to the Florida Division of Forestry, Florida experiences an average of 3,060 wildfires annually, burning nearly 154,000 acres¹⁹. 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. **Table 5.18** lists the number of reported wildfire occurrences in Volusia County between the years 2001 and 2018.

TABLE 5.18: 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 Marshall Report

It should also be noted that 1998 was a particularly significant year for wildfires 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 a number of 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.

The largest fire recorded in Volusia County over the last five years 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 2,500 acres of land and affected local weather conditions by increasing cloud coverage. In 2012, a number of smaller fires affected the DeLand and DeBary areas of Volusia County.

¹⁹ Average information based on information between January 2000 and August 2009.

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.

5.15.4 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. This vulnerability analysis includes two maps (Wildfire Level of Concern, Wildfire Risk) that depict geographic risk points for fire hazards.

Based on the fire risk maps located in this report, the following acreage of the county is located within areas deemed as “high risk” and “very high risk” and could be vulnerable to fire. In terms of approximate burnable acreage within the county, these figures represent the areas at highest risk for a large fire outbreak.

- **High Risk: 4,272,081 acres**
- **Very High Risk: 1,672,519 acres**

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.

5.16 SOCIETAL, ECOLOGICAL AND TECHNOLOGICAL HAZARDS

5.16.1 Background

There are several hazards that are not a natural function of the Earth's atmosphere and climate within Volusia County, Florida, and these include technological and societal hazards. The environmental, economic and societal implications of the following societal and technological hazards are covered in Appendix H (HIRA Consequences) and Appendix J (Consequences by Hazard) of this report.

- **Cyber Attack**
Cyber-attacks include the use of electronic devices to attack, cripple or damage information systems held by governmental or private institutions, as well as individual citizens.
- **Civil Disturbance**
Civil disturbances can occur due to socio-economic, political or other reasons. These types of events typically occur in public places, including court houses or town civic spaces.
- **Coastal Oil Spill**
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.
- **Terrorism**
Terrorism includes any attempt to attack, cripple or damage public goods, public infrastructure or citizens on a large scale.
- **Mass Migration**
Mass-migration occurs when persons of one geographic area move in large numbers to another geographic location.
- **HazMat**
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.
- **Agro-Terrorism**
Agro-Terrorism includes any attempt to maliciously destroy or harm the agricultural industry, the secondary effects of which can be disease, famine and massive economic loss.
- **Public Health Emergencies**
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.
- **Agricultural Infestations**
Agricultural 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.

SECTION 5: HAZARD PROFILES

Volusia County has 140,205 acres of land with an “Agricultural” land use designation. In 1997 and 1998, Florida’s agricultural community was forced to focus time and resources 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/>.

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, land owners, 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.

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). EDDMapS notes 299 separate invasive plant, 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.

SECTION 5: HAZARD PROFILES

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 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).

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. The probability of invasive species continuing to impact Volusia County is considered likely, occurring once a year or more.

5.17 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.

5.17.1 Hazard Risk Scoring

In order to provide a comprehensive assessment of each hazard in each jurisdiction, the hazards were scored based on a number of vulnerability factors including area impacted, health and safety of the population, property, environment, and economic vulnerability. Each of these factors has been assigned a number between one and five, based on risk, with five being the greatest. The values then were summed and multiplied by the probability of occurrence factor, which is also a 1 to 5 scale. The resulting value is a risk rating for each hazard within a specific jurisdiction. **Table 5.19** provides the top three hazard vulnerabilities for each participating jurisdiction within Volusia County. A complete list of hazards for each jurisdiction as well as the score for each hazard and vulnerability factor can be found in **Appendix F**. Further, the Vulnerability Assessment (Section 6) also provides information on hazard vulnerability at the jurisdictional level.

TABLE 5.19: Snapshot of Hazard Risk Ranking

	Hazard Risk Ranking		
	First	Second	Third
Daytona Beach	High Winds	Hail	Storm Surge, Tsunami
Daytona Beach Shores	All-Natural Hazards	Flooding	Storm Surge, Tsunami
DeBary	Flooding	High Winds	Lightning
DeLand	High Wind	Hail	Severe Winter Storm
Deltona	Lightning	Severe Winter Storm	Drought
Edgewater	Thunderstorm	Severe Winter Storm	Drought
Holly Hill	High Winds	All-Natural Hazards	Lightning
Lake Helen	High Winds	Flooding	Drought
New Smyrna Beach	High Winds	Flood	Storm Surge
Oak Hill	Flooding	Flooding	Wildfire
Orange City	Lightning	High Winds	Drought
Ormond Beach	High Winds	Flooding	Storm Surge
Pierson	Wildfire	Wind	Drought
Ponce Inlet	High Winds	Storm Surge/Tsunami	Flooding

TABLE 5.19: Snapshot of Hazard Risk Ranking

	Hazard Risk Ranking		
	First	Second	Third
Port Orange	High Winds	Lightning	Severe Winter Storm
South Daytona	Flooding	Storm Surge, Tsunami	All-Natural Hazards
Unincorporated	High Winds	Flooding	Wildfire

5.17.2 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 (**Table 5.20**). For 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 plan updates.

Three risk categories – high risk, moderate risk, and low risk, were developed for each hazard in order to establish a baseline relative risk assessment. The following scoring system was developed in order to score hazards.

Hazard Score = **Frequency of Hazard** x **Community Cost of Hazard**

Point System:

- Frequency of Hazard > 10 Times Per Year: 30
- Frequency of Hazard > 1 Time Per Year, < 10 Times Per Year: 10
- Frequency of Hazard < 1 Time Per Year: 5
- Frequency of Hazard < 1 Time Per 10 Years: 1

- General Cost Per Occurrence > \$10,000,000: 20
- General Cost Per Occurrence \$500,000 - \$10,000,000: 10
- General Cost Per Hazard Occurrence \$100,000 - \$500,000: 5
- General Cost Per Hazard Occurrence < \$100,000: 2

SECTION 5: HAZARD PROFILES

Hazard Point Matrix

Hazard	Frequency	Cost Severity	Total Score
Hurricane/Tropical Storm	5	20	100
Wildfire	10	10	100
Storm Surge	5	20	100
Flooding	30	2	60
Lightning	30	2	60
Thunderstorm	30	2	60
Erosion	5	10	50
Tornado	5	10	50
Drought	5	10	50
Sinkhole	10	2	20
Hail	10	2	20
Severe Winter Storm	1	20	20
Tsunami	1	20	20
Sea Level Rise	N/A	N/A	N/A

*Sea level rise does not fit the same hazard classification standard at this time. Impacts will be more measurable in future years as new water level and losses data is collected and aggregated.

TABLE 5.20: Conclusions on Hazard Risk for Volusia County (Natural Hazards)

HIGH RISK (51 Points or More)	Hurricane and Tropical Storm (High Winds) Flooding Lightning Thunderstorm Wildfire Storm Surge
MODERATE RISK (25 to 50 Points)	Drought Tornado Erosion
LOW RISK (Less than 25 points)	Hail Severe Winter Storm Sinkhole Tsunami

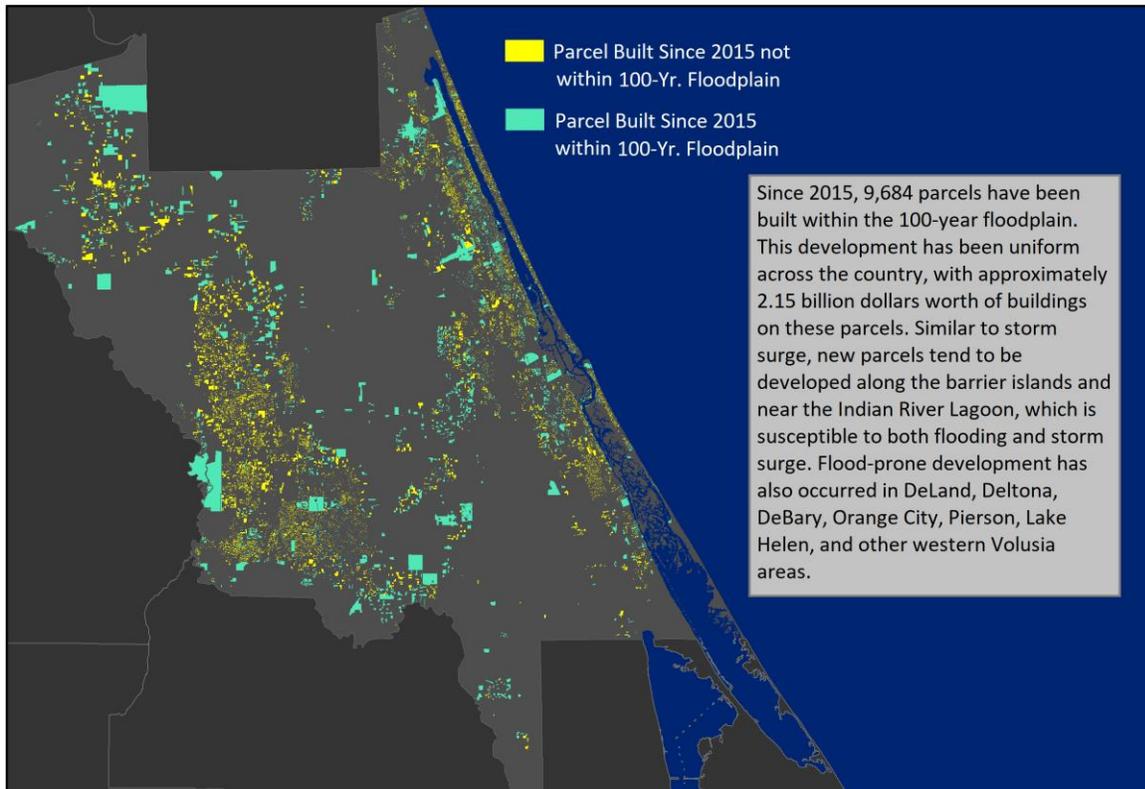
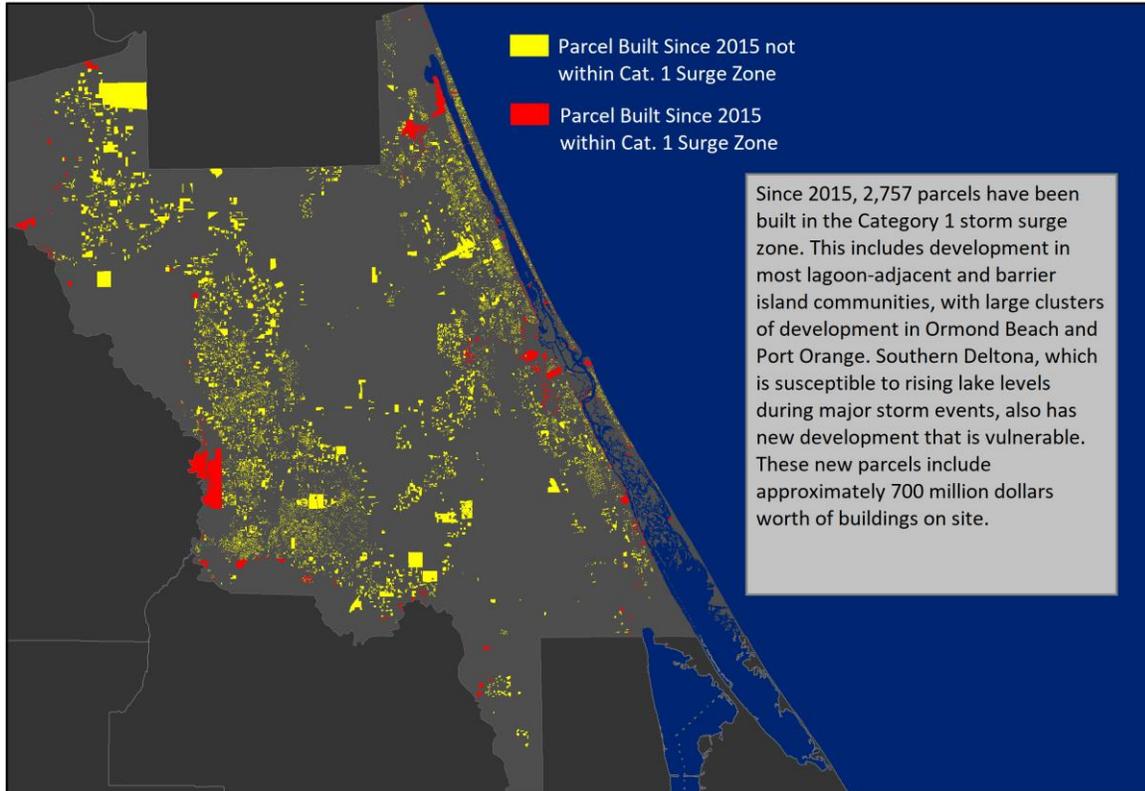
5.18 DEVELOPMENT SINCE 2015 (LAST LMS SUBMITTAL)

The map on the next page shows development in Volusia County from 2015 to 2019 with exposure to flood zones and the category 1 storm surge zone. Overall, development in the county has been fairly uniform and spread across the County.

The eastern portion of the county is susceptible to more hazards than the western portion, in general. Areas such as Ormond Beach, Daytona Beach, Holly Hill, South Daytona, Ponce Inlet and New Smyrna Beach have experienced growth since 2015, much of it along the barrier islands to the east of the Indian River Lagoon. These areas are susceptible to hurricanes, storm surge, and sea level rise. The western portion of the county has also experienced growth. Deltona, DeBary, DeLand and Orange City are typically more susceptible to sinkholes.

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

FIGURE 5.15: Development, 2015-2019



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 amount 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 identified 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 vulnerability assessment, and is organized by hazard as listed below.

- ▶ **Atmospheric**
 - Hail
 - Hurricane and Tropical Storm
 - Lightning
 - Severe Winter Storm
 - Thunderstorm
 - Tornado
- ▶ **Hydrologic**
 - Coastal Erosion
 - Drought
 - Flood
 - Storm Surge
 - Sea Level Rise
- ▶ **Geologic**
 - Sinkhole

- Tsunami
- ▶ **Other**
 - Wildfire
 - Sea Level Rise

6.2 ASSESSMENT METHODOLOGY

This vulnerability assessment was conducted utilizing two distinct methodologies: (1) a Geographic Information System (GIS)-based analysis; and (2) applying a statistical risk assessment approach. 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 hazard listed above.

A GIS-based analysis was conducted for seven hazards:

- Hurricane and Tropical Storm
- Riverine Flood
- Coastal Flood (Storm Surge)
- Sea Level Rise
- Coastal Erosion
- Tsunami
- Sinkhole
- Wildfire

A statistical risk assessment approach was used to analyze six hazards:

- Hail
- Thunderstorm
- Lightning
- Tornado
- Severe Winter Storm
- Drought

6.2 GIS-Based Analysis

For the GIS-based assessment, digital data was collected from local, state and national sources. ESRI® ArcGIS™ 10.6 was used to assess risk utilizing digital data including local tax records for individual parcels and georeferenced point locations for critical facilities. Using these data layers, risk was assessed by estimating the assessed building value associated with parcels determined to be located in identified hazard areas. HAZUS-MH was also used to model hurricane force winds and estimate potential losses. To estimate population in hazard areas, Census 2010 population data by census block was obtained from HAZUS-MH and census blocks intersecting with hazard areas were used to determine exposed population counts.

Census 2010 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

SECTION 6: VULNERABILITY ASSESSMENT

level (e.g., county or city). Jurisdictional level population estimates cannot be used to accurately conduct GIS analyses to determine how much of the county and its population is exposed to various hazards based on geographic location (i.e., census block or tract level). 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 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. These hazards included flood, storm surge, dam failure, wildfire and technological hazards. A more specific description of the GIS-based analysis for each particular hazard is provided under the vulnerability assessment section of each respective hazard.

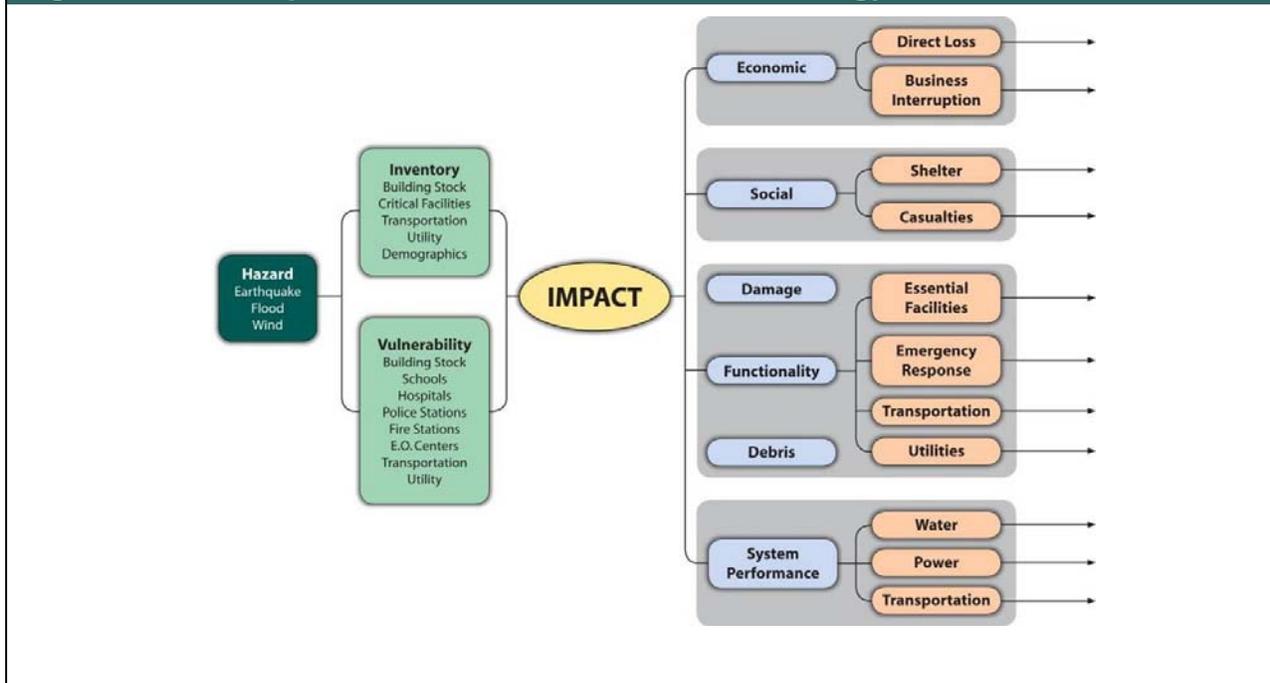
HAZUS-MH

HAZUS-MH is FEMA's standardized loss estimation software program built upon an integrated GIS platform (**Figure 6.1**) to conduct analysis at a regional level (i.e., not on a structure-by-structure basis). The HAZUS-MH risk assessment methodology is parametric, in that distinct hazard and inventory parameters (e.g., wind speed and building types) were modeled using the HAZUS-MH software to determine the impact (i.e., damages and losses) on the built environment. This risk assessment applied HAZUS-MH to produce countywide profiles and estimate losses for three hazards at the jurisdictional level. At the time this analysis was completed, HAZUS-MH



MR-3 was used to estimate potential losses from hurricane winds, coastal flood, and earthquake using HAZUS-MH default building stock inventory data. The results of the HAZUS-MH model analysis include annualized loss estimates for each participating jurisdiction in Volusia County so that potential loss values may be compared to one another throughout Volusia County. In generating loss estimates through HAZUS-MH, some data normalization was necessary to account for recognized differences between actual assessed building values as provided by Volusia County and estimated replacement building value data as provided within HAZUS-MH. In order to account for the difference between modeled and actual values, the ratio of estimated losses produced by HAZUS-MH as compared to total HAZUS-MH building inventory was used to estimate percent damage. The percent damage ratio was then applied to the local assessed values of each jurisdiction to estimate potential losses and loss ratios in Volusia County for this analysis. The 2019 parcel values were used to generate annualized losses.

Figure 6.1: Conceptual Model of HAZUS-MH Methodology



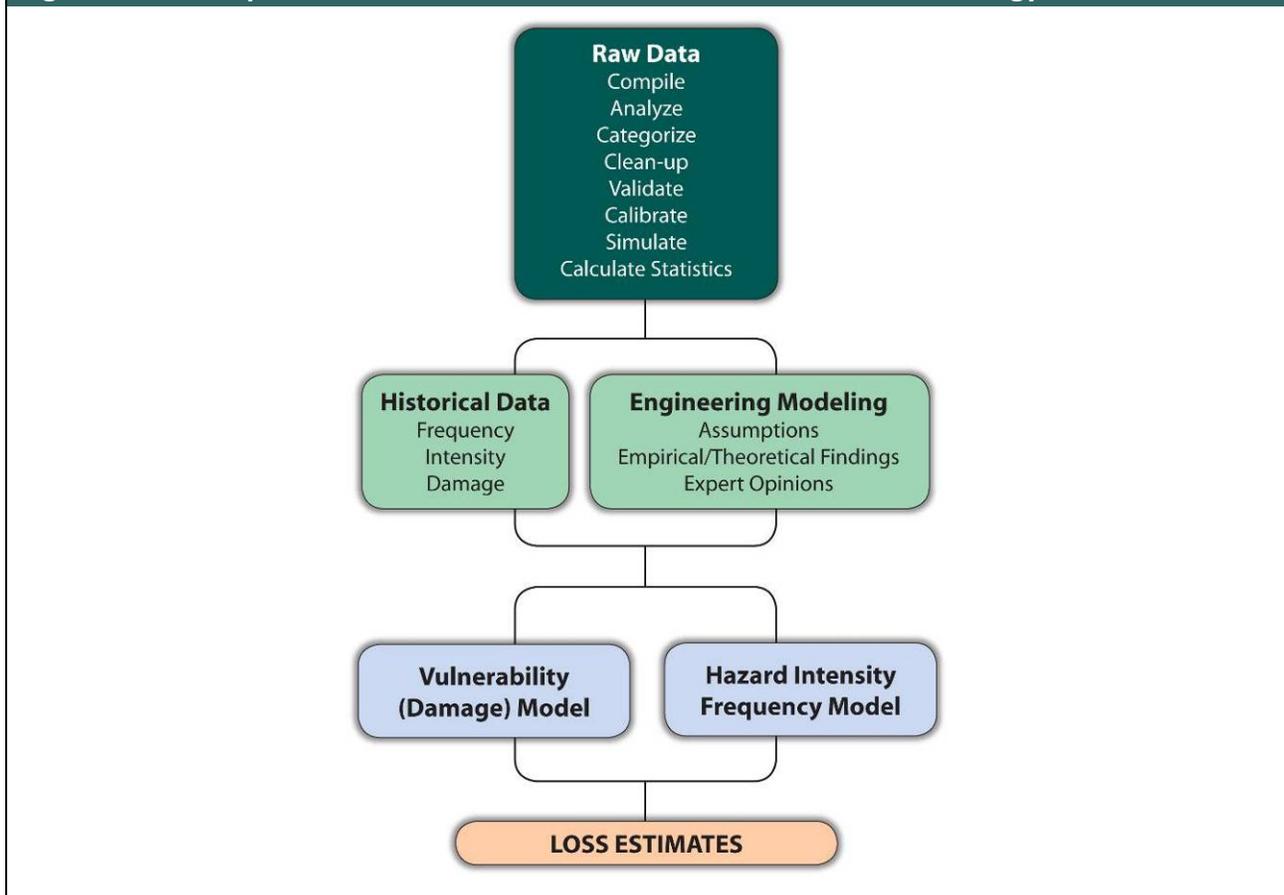
6.3 Statistical Risk Assessment Methodology

The statistical risk assessment approach was applied to analyze hazards of concern that were outside the scope of HAZUS-MH and the GIS-based risk assessment. This methodology uses a statistical approach and mathematical modeling of risk to predict a hazard's frequency of occurrence and estimated impacts based on recorded or historic damage information. This methodology was used to assess risk to the extreme temperatures, hail, tornado, winter storm and drought hazards. Available historical data for each hazard was used and statistical evaluations were performed. The general steps used in the statistical risk assessment methodology are summarized below:

1. Compile data from local, state and national sources, as well as literature;
2. Clean up data, including removal of duplicate records and update losses to account for inflation;
3. Identify patterns in frequency, intensity, vulnerability and loss
4. Statistically and probabilistically extrapolate the patterns; and
5. Produce meaningful results, including the development of annualized loss estimates.

Figure 6.2 illustrates a conceptual model of the statistical risk assessment methodology as applied to the Volusia County area.

Figure 6.2: Conceptual Model of the Statistical Risk Assessment Methodology



The vulnerability assessment findings are presented in terms of potential annualized losses, wherever possible. In general, presenting results in the annualized form is useful in three ways:

1. This approach accounts for the contribution of potential losses from all future disasters;
2. Annualized results for different hazards are readily comparable, thus easier to rank; and
3. The use of annualized losses is the most objective approach for evaluating mitigation alternatives.

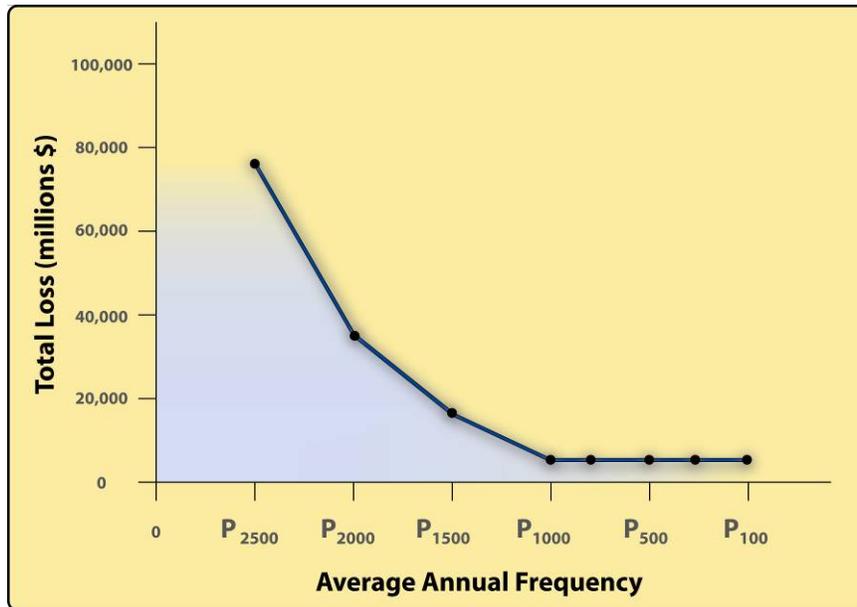
Annualized losses for the hazards where the parametric approach was utilized were computed in a three-step process:

1. Compute/estimate losses for a number of scenario events with different return periods [e.g., 10-year, 100-year, 200-year, 500-year, etc.];
2. Approximate the Probability versus Loss Curve through curve fitting; and
3. Calculate the area under the fitted curve to obtain annualized losses.

SECTION 6: VULNERABILITY ASSESSMENT

This approach is illustrated graphically in **Figure 6.3**. For other hazards where the statistical approach was used, the computations are based primarily on the observed historical losses.

Figure 6.3: Graphical Representation of the Annualized Loss Methodology



The economic loss results are presented here using two interrelated risk indicators: Annualized Loss and Annualized Loss Ratio. The Annualized Loss is the estimated long-term weighted average value of losses to property in any single year in a specified geographic area (i.e., municipal jurisdiction). The Annualized Loss Ratio expresses estimated annualized loss normalized by assessed building value.

The estimated Annualized Loss (AL) addresses the key idea of risk: the probability of the loss occurring in the study area (largely a function of building construction type and quality). By annualizing estimated losses, the AL factors in historic patterns of frequent smaller events with infrequent but larger events to provide a balanced presentation of the risk. The Annualized Loss Ratio (ALR) represents the AL as a fraction of the assessed value of the local inventory. This ratio is calculated using the following formula:

$$\text{ALR} = \text{Annualized Losses} / \text{Total Exposure}$$

The ALR gauges the relationship between average annualized loss and assessed values. This ratio can be used as a measure of vulnerability in the areas and since it is normalized by assessed value, it can be directly compared across different geographic units such as metropolitan areas, counties or municipalities.

Loss estimates provided in this vulnerability assessment are based on best available data, and the methodologies applied result in an approximation of risk. These estimates should be used to understand relative risk from hazards and potential losses. Uncertainties are inherent in any loss estimation

methodology, arising in part from incomplete scientific knowledge concerning natural hazards and their effects on the built environment. Uncertainties also result from approximations and simplifications that are necessary for a comprehensive analysis (e.g., incomplete inventories, demographics or economic parameters).

Findings for each hazard are detailed in the hazard-by-hazard vulnerability assessment that follows.

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 all improved properties in unincorporated areas according to local parcel data provided by Volusia County. The information has been expressed in terms of the number of parcels, number of buildings, and total assessed value of improvements (buildings and accessory structures) that may be exposed to the identified hazards.
2. **Critical Facilities:** Includes Volusia County's emergency operations centers, fire stations, police stations, schools and hospitals.
3. **Critical Infrastructure:** Includes primary roads and active railroads.

Improved Property

Table 6.1 lists the number of parcels with improved property (i.e., structures) and the total assessed value of improvements¹ for unincorporated Volusia County and the incorporated areas (study area of vulnerability assessment). The study area is depicted in **Figure 6.4**. The population by census block has been illustrated in lieu of the parcels, which would not be meaningful at the countywide scale map. The population by census block is illustrated to show where populations are concentrated in the study region. According to the U.S. Census American Community Survey (2014-17), there were 2.36 people per household. There were 2.32 people per household according to the 2010 U.S. Census.

¹ Total assessed values for improvements is based on 2019 Volusia County tax assessor records (noted in table as 'Building Value')

SECTION 6: VULNERABILITY ASSESSMENT

TABLE 6.1: Volusia County Improved Property

JURISDICTION	TOTAL ESTIMATED NUMBER OF IMPROVED PARCELS/CONDOS	TOTAL IMPROVED VALUE OF IMPROVED PARCELS/CONDOS
Daytona Beach	20,804	5,036,150,652
Daytona B. Shores	670	235,084,140
DeBary	8,835	1,458,448,319
De Land	11,557	2,429,373,658
Deltona	33,997	4,758,973,858
Edgewater	9,899	1,342,087,145
Holly Hill	4,665	565,510,613
Lake Helen	1,151	140,464,924
New Smyrna Beach	13,775	2,761,841,839
Oak Hill	1,105	117,259,007
Orange City	3,210	784,734,035
Ormond Beach	17,146	3,485,721,297
Pierson	665	79,895,417
Ponce Inlet	1,248	321,498,032
Port Orange	22,101	4,016,512,204
South Daytona	4,810	630,136,924
Unincorporated	73,959	11,005,217,616
TOTAL	187,054	39,168,909,680

Source: Volusia County Property Appraiser Data (2019)

SECTION 6: VULNERABILITY ASSESSMENT

Critical Facilities

Table 6.2 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 located 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.

Please note that the numbers within this critical facility listing do not include lift stations, wastewater facilities or sewage treatment facilities. Information on those facilities can be found within Appendix E and the Volusia County Floodplain Management Plan, within Appendix I, by jurisdiction.

TABLE 6.2: Volusia County “Core” Critical Facilities	
JURISDICTION	Number
Daytona Beach	65
Daytona Beach Shores	8
DeBary	6
DeLand	44
Deltona	17
Edgewater	12
Holly Hill	11
Lake Helen	5
New Smyrna Beach	25
Oak Hill	7
Orange City	18
Ormond Beach	56
Pierson	8
Ponce Inlet	7
Port Orange	52
South Daytona	14
Unincorporated	8
TOTAL	363

Source: All Jurisdictions (Cities, County)

Note: These numbers do not reflect certain types of critical facilities that are additionally listed in the Critical Facility Appendix within this report. Please reference that listing for more information. These numbers only reflect the number of “core” facilities, not including water and sewage treatment plants or state flood facilities.

Specifically, this table identifies 922 out of a total of 1125 total critical facilities identified.

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Infrastructure and Lifelines

Table 6.3 lists Volusia County’s primary roads and railroads.

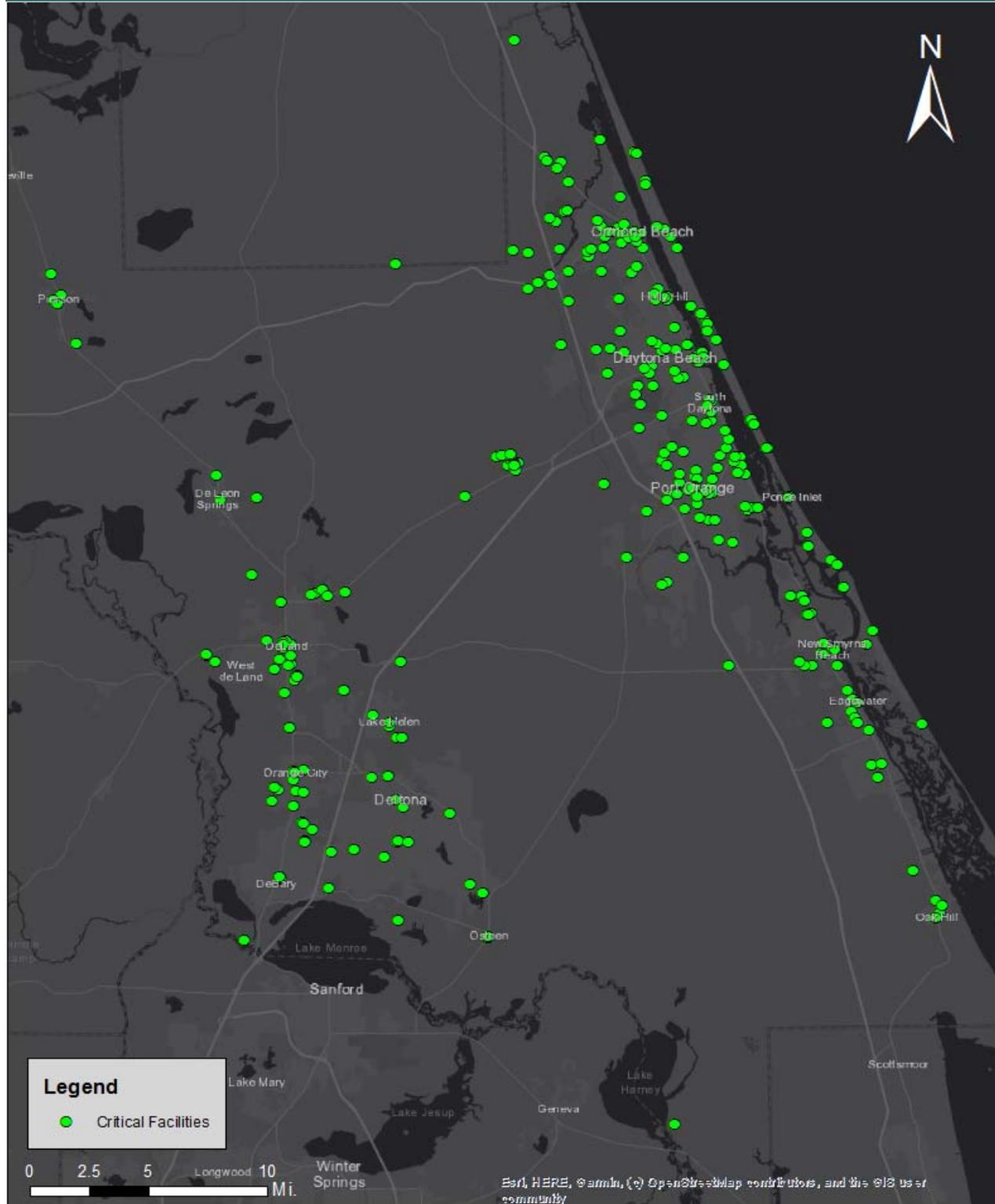
TABLE 6.3: Infrastructure			
JURISDICTION	Limited Access (mi)*	Highway (mi)*	Railroad (mi)**
Daytona Beach	5.02	8.66	3.56
Daytona Beach Shores	-	-	-
DeBary	0.22	5.35	6.87
DeLand	-	7.64	1.18
Deltona	6.28	0.02	-
Edgewater	2.20	7.32	5.41
Holly Hill	-	2.73	2.56
Lake Helen	1.10	-	-
New Smyrna Beach	-	6.30	6.69
Oak Hill	-	2.88	1.93
Orange City	-	4.27	-
Ormond Beach	3.41	5.02	7.89
Pierson	-	3.21	4.03
Ponce Inlet	-	0.27	-
Port Orange	10.61	3.40	4.94
South Daytona	-	2.51	2.36
Unincorporated	62.53	50.84	51.05
TOTAL	91.36	110.42	98.48

Source: Volusia County GIS Department

SECTION 6: VULNERABILITY ASSESSMENT

Figure 6.5 illustrates the general locations of the critical facilities and infrastructure according to currently georeferenced point and line locations. Facilities were provided by each jurisdiction.

FIGURE 6.5: Volusia County Critical Facilities



6.4 HAIL

As it cannot be predicted where hail may fall, all existing and future buildings, facilities and populations in Volusia County are considered to be equally exposed to this hazard and could potentially be impacted. When hail impacts Volusia County and all municipalities, populations are vulnerable to the consequences of damage from hail. Hail can become as big as baseballs or golf balls, damaging structures such as car windows, emergency vehicles, exposed persons and communication systems, but is typically the size of pennies or quarters in Florida. Hail storms can last for a few minutes to hours. It is important to note that only reported hail events have been factored into this vulnerability assessment². If hail strikes a human being it can cause personal injury.

To estimate losses due to hail, the National Climatic Data Center (NCDC) historical hail event loss data for occurrences in the county were used to develop a hail stochastic model. In this model:

- Losses were scaled for inflation;
- Average historic hail damageability was used to generate losses for historical hail events where losses were not reported;
- Expected annualized losses were calculated through a non-linear regression of historical data; and
- Probabilistic losses were scaled to account for would-be losses where no exposure/instrument was present at the time of the event.

Table 6.4 shows total exposure and potential annualized property losses and annualized percent loss ratios resulting from hail for Volusia County. While all of Volusia County’s inventoried assets are equally exposed to hail, any anticipated future damages or losses are expected to be minimal. The graph below describes the common reference names to different sizes of hail. Florida typically experiences pea to half-dollar sized hail.

FIGURE 6.6: Hail Typology

Appearance	Approximate Size in Inches
Pea	0.25 - 0.50 inch
Penny	0.75 inch
Nickel	0.88 inch
Quarter	1.00 inch
Half Dollar	1.25 inch
Walnut/Ping Pong	1.50 inch
Golf ball	1.75 inch
Hen Egg	2.00 inch
Tennis Ball	2.50 inch
Baseball	2.75 inch
Tea Cup	3.00 inch
Grapefruit	4.00 inch
Softball	4.50 inch

²Source: National Climatic Data Center (2014)

It is possible that additional hail events may have occurred since 1950 that were not reported to NCDC and are not accounted for in this analysis.

SECTION 6: VULNERABILITY ASSESSMENT

TABLE 6.4: Total Exposure and Potential Annualized Losses from Hail

JURISDICTION	EXPOSURE (TOTAL IMPROVED VALUE OF PARCELS/CONDOS)	ANNUALIZED LOSSES	ANNUALIZED PERCENT LOSS RATIO
Daytona Beach	5,036,150,652	3,439	0.000%
Daytona B. Shores	235,084,140	0	0.000%
DeBary	1,458,448,319	0	0.000%
DeLand	2,429,373,658	0	0.000%
Deltona	4,758,973,858	0	0.000%
Edgewater	1,342,087,145	1,812	0.000%
Holly Hill	565,510,613	0	0.000%
Lake Helen	140,464,924	0	0.000%
New Smyrna Beach	2,761,841,839	0	0.000%
Oak Hill	117,259,007	0	0.000%
Orange City	784,734,035	0	0.000%
Ormond Beach	3,485,721,297	0	0.000%
Pierson	79,895,417	0	0.000%
Ponce Inlet	321,498,032	0	0.000%
Port Orange	4,016,512,204	109	0.000%
South Daytona	630,136,924	0	0.000%
Unincorporated	11,005,217,616	0	0.000%
TOTAL	\$39,168,909,680	\$5,360	0.000%

Sources: National Climatic Data Center, HAZUS-MH, Volusia County Property Appraiser Data (2019)

Additional Impacts of Hail on Structures and Property

While hail can have effects on populations and can cause injury, hail also has the ability to damage structures. Vulnerable areas of structures include pool screens, windows, and exposed pieces of personal property that are exposed to environmental conditions, such as outdoor décor or automobiles. The size of hail has a direct impact on the scope of the damage that it can incur on a structure. For example, golf ball sized hail (as depicted in Figure 6.6) can completely destroy exposed glass structures, while pea-to-penny-sized hail would have a far lower ability to incur such damage.

There are no specific areas of the county that are at a higher risk to property damage as a result of hail from a geographic perspective. 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 personal property.

6.5 HURRICANE AND TROPICAL STORM

Since hurricanes and tropical storms often impact large areas and cross jurisdictional boundaries, all existing and future buildings, facilities and populations are considered to be exposed to this hazard and could potentially be impacted. All populations may be impacted by these events, but those at the highest risk include the homeless, disabled, elderly and lower income populations. Any persons living on the barrier islands or adjacent to the Intracoastal Waterway system may also be disproportionately impacted. Critical infrastructure such as communication systems and power sources are vulnerable to this event. Hurricanes and tropical storms can cause damage through numerous additional hazards such as flooding, coastal erosion, high winds and precipitation, thus it is difficult to estimate total potential losses from these cumulative effects.

The current HAZUS-MH hurricane model only analyzes hurricane winds and is not capable of modeling and estimating cumulative losses from all hazards associated with hurricanes. Therefore, only hurricane winds are analyzed in this section. Vulnerability to storm surge resulting from hurricanes is addressed individually in a separate section. A probabilistic scenario was created using HAZUS-MH to assess the vulnerability of Volusia County to hurricane winds. Default HAZUS-MH wind speed data and damage functions were used to determine the annual expected loss at the census tract level. **Table 6.5** shows estimated exposure, potential annualized losses for residential and commercial buildings and the annualized percent loss ratio for each jurisdiction in Volusia County. **Table 6.6** corresponds with **Figure 6.6** and depicts 2019 parcel exposure to wind hazard zones.

TABLE 6.5: Total Exposure and Potential Annualized Losses from Hurricane Wind and Tropical Storm

JURISDICTION	Exposure (Total Improved Value of Parcels/Condos)	Residential Building Losses	Commercial Building Losses	Total Annualized Expected Property Losses	Annualized Percent Loss Ratio
Daytona Beach	5,036,150,652	7,213,372	1,318,515	14,134,287	0.33%
Daytona B. Shores	235,084,140	2,179,703	121,975	3,439,875	2.06%
DeBary	1,458,448,319	946,872	82,215	1,509,843	0.12%
DeLand	2,429,373,658	2,103,874	501,695	4,478,977	0.23%
Deltona	4,758,973,858	5,277,335	395,264	8,392,400	0.22%
Edgewater	1,342,087,145	1,817,815	198,429	3,115,697	0.28%
Holly Hill	565,510,613	1,023,774	222,873	2,225,637	0.42%
Lake Helen	140,464,924	219,437	21,569	382,395	0.31%
New Smyrna Beach	2,761,841,839	5774,210	776,789	10,671,867	0.50%
Oak Hill	117,259,007	212,684	25,306	392,471	0.41%
Orange City	784,734,035	899,198	211,544	1,750,025	0.27%
Ormond Beach	3,485,721,297	4,326,416	728,606	8,136,035	0.27%
Pierson	79,895,417	207,197	24,144	364,745	0.46%
Ponce Inlet	321,498,032	1,204,140	87,813	1,926,558	0.60%
Port Orange	4,016,512,204	5,942,167	674,178	10,225,446	0.25%
South Daytona	630,136,924	1,354,248	276,673	2,601,905	0.41%
Unincorporated	11,005,217,616	11,820,330	1,106,914	19,789,660	0.18%
Total	\$39,168,909,680	\$52,522,781	\$6,774,501	\$93,537,825	N/A

Sources: National Climatic Data Center, HAZUS-MH, Volusia County Property Appraiser Data (2019)

SECTION 6: VULNERABILITY ASSESSMENT

TABLE 6.6: 2019 Parcel Exposure to Wind Hazard Zones

Financial Exposure to Hazard Zones – Cumulative Financial Values within Zones						
Hazard Zone	Parcels in Zone	Built Parcels	Land Value	Building Value	Assessed Value	Taxable Value
91-95 mph	44	9	\$4,344,859	\$364,934	\$4,709,793	\$606,995
96-100 mph	136,643	99,756	\$5,169,670,365	\$17,217,266,048	\$22,285,171,648	\$13,974,104,626
101-105 mph	151,347	102,260	\$8,775,404,243	\$21,951,278,698	\$27,140,699,701	\$18,386,669,381

Build-Year Summary of Built Parcels within Hazard Zones – Build Year Breakdown by Hazard Zone						
Hazard Zone	Built Parcels	Built Pre-1970	Built 1970-1979	Built 1980-1989	Built 1990-1999	Built 2000-2019
91-95 mph	9	1	0	1	3	4
96-100 mph	99,756	7,113	7,008	15,981	16,470	53,184
101-105 mph	102,260	18,338	9,902	19,250	12,224	42,546

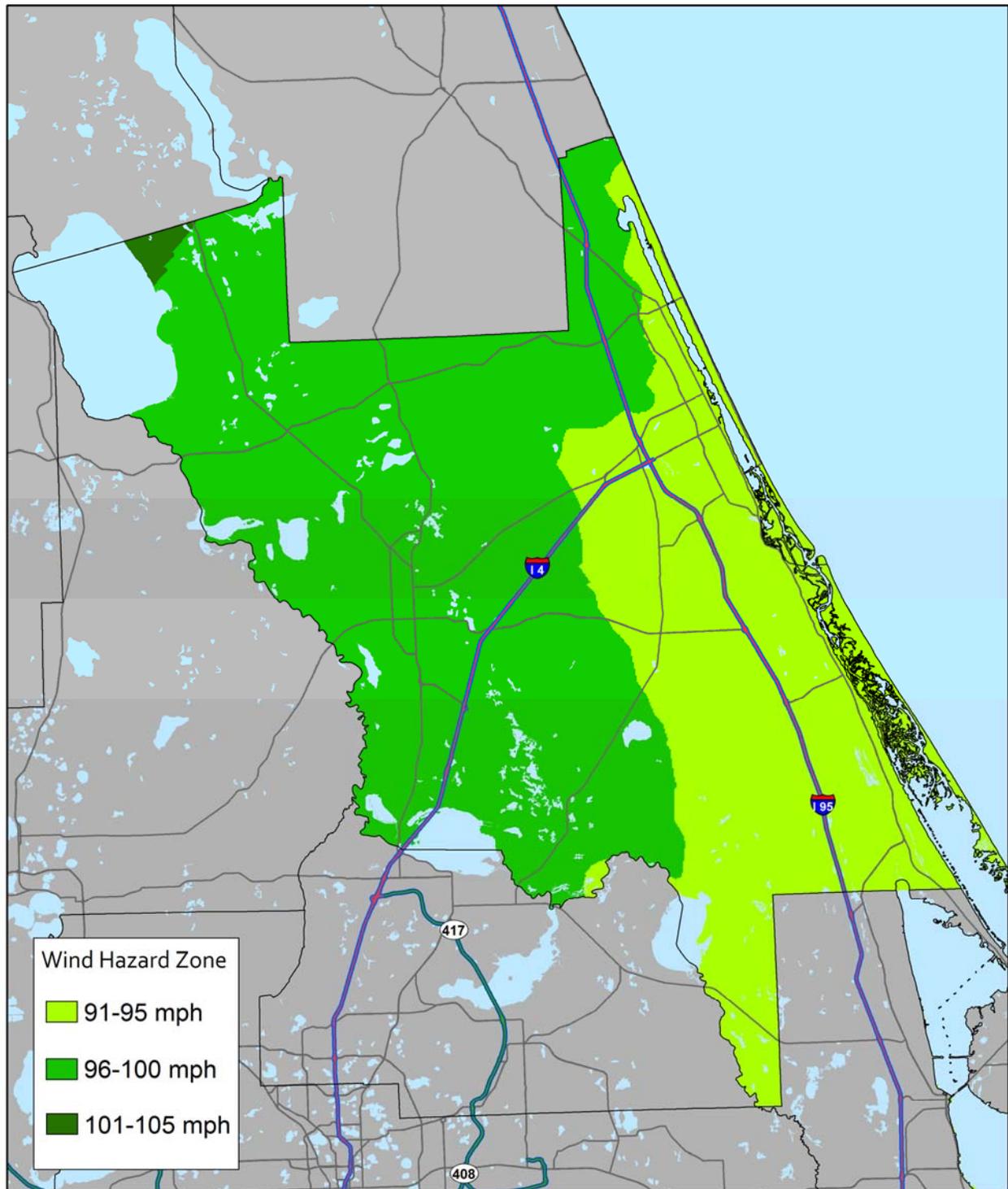
Land Use Summary of Parcels within Hazard Zones – Number of Parcels per Land Use and Hazard Zone						
Hazard Zone	Residential	Commercial	Industrial	Institutional	Conserv./Agri.	Other/Vacant
91-95 mph	0	0	0	1	13	30
96-100 mph	94,104	3,053	1,013	1,286	4,053	33,134
101-105 mph	94,638	4,891	1,564	1,967	3,857	44,430

Sources: HAZUS-MH, Volusia County Property Appraiser Data (2019) – Some parcels were not provided a land use code by VCPAO

Qualitative Assessment of Wind Hazard Zone Vulnerability

Table 6.6 (above) and Figure 7 on the following page depict the likely wind speeds that would be experienced within Volusia County during a hurricane situation. The model utilized takes the average tropical storm that is likely to hit Florida based off of historical data, which places Volusia County in a lower risk zone as compared to areas of the state such as the western panhandle and southeastern Florida. As depicted in the map on the following page, areas of the county that are at highest risk for wind damage are those within close proximity to the Atlantic Ocean or areas closest to the southeastern portion of the county. 151,347 parcels within the county are located within the 101-105 mile per hour hazard zone, representing the largest portion of parcels, while 136,643 parcels in the county are located within the 96-100 mile per hour zone. The build year of these parcels are fairly evenly distributed. However, 21.9% of the parcels within the 101-105 mile per hour zone were built before 1970, which could indicate that these buildings are at a higher risk for property damage. Please reference Appendix E for an entire listing of critical facilities and their corresponding wind hazard zones.

FIGURE 6.7: Wind Hazard Zones



Source: HAZUS-MH

6.6 LIGHTNING

As it cannot be predicted where lightning may strike, all existing and future buildings, facilities and populations in Volusia County are considered to be exposed to this hazard and could potentially be impacted. It is important to note that only reported lightning strikes have been factored into this vulnerability assessment³.

To estimate losses due to lightning, NCDC historical lightning loss data for occurrences in the County were used to develop a lightning stochastic model. In this model:

- Losses were scaled for inflation;
- Average historic lightning damageability was used to generate losses for historical lightning events where losses were not reported;
- Expected annualized losses were calculated through a non-linear regression of historical data; and
- Probabilistic losses were scaled to account for would-be losses where no exposure/instrument was present at the time of the event.

Table 6.7 shows total exposure and potential annualized property losses and percent loss ratios resulting from the lightning hazard for Volusia County. Based on local knowledge, emergency managers in Volusia County are aware that approximately 4,000 lightning strikes occur each week during summer afternoon thunderstorms. Although the annualized losses from lightning in Volusia County are low, the probability and frequency are high. Therefore, it is anticipated that lightning will continue to threaten life and pose property damage throughout the county.

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. This was true in July 2014 during the Coke Zero 400, when hundreds of thousands of tourists were outside and exposed with no coverage for lightning. Communication systems and power sources are among the most vulnerable land uses to this hazard due to their electrical nature. Volusia County has 30 golf courses, along with private and public recreational facilities, the Daytona Beach International Speedway and 2 additional smaller outdoor race tracks, 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.

³ It is possible that additional lightning strikes may have occurred since 1950 that were not reported to NCDC and are not accounted for in this analysis.

SECTION 6: VULNERABILITY ASSESSMENT

TABLE 6.7: Total Exposure and Potential Annualized Losses from Lightning

JURISDICTION	EXPOSURE (TOTAL IMPROVED VALUE OF PARCELS/CONDOS)	ANNUALIZED LOSSES	ANNUALIZED PERCENT LOSS RATIO
Daytona Beach	5,036,150,652	567	0.000%
Daytona Beach Shores	235,084,140	0	0.000%
DeBary	1,458,448,319	6,834	0.000%
DeLand	2,429,373,658	0	0.000%
Deltona	4,758,973,858	7,826	0.000%
Edgewater	1,342,087,145	430	0.000%
Holly Hill	565,510,613	0	0.000%
Lake Helen	140,464,924	0	0.000%
New Smyrna Beach	2,761,841,839	2,568	0.000%
Oak Hill	117,259,007	0	0.000%
Orange City	784,734,035	0	0.000%
Ormond Beach	3,485,721,297	0	0.000%
Pierson	79,895,417	0	0.000%
Ponce Inlet	321,498,032	0	0.000%
Port Orange	4,016,512,204	8,092	0.000%
South Daytona	630,136,924	0	0.000%
Unincorporated	11,005,217,616	0	0.000%
TOTAL	\$39,168,909,680	\$26,316	0.000%

Sources: National Climatic Data Center, HAZUS-MH, Volusia County Property Appraiser Data (2019)

Qualitative Assessment of Lightning Vulnerability

Like hail, lightning does not affect certain geographical areas of the county at higher rates than others. However, certain types of structures, including those with large antennas or those that are taller than the buildings surrounding them, are typically at a higher risk for lightning strikes. In particular, 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.

Secondly, 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 (\$2,429,373,658 worth of improved property value), Lake Helen (\$140,464,924), Orange City (\$784,734,035) and Pierson (\$79,895,417). These areas are generally more rural in nature and have a higher rate of isolated critical facilities and structures.

Beachside structures located near or along the Atlantic Ocean are also at a higher vulnerability to lightning damage. Many utilities are located in these locations. However, 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.

SECTION 6: VULNERABILITY ASSESSMENT

6.7 SEVERE WINTER STORM

Severe winter storms, typically consisting of snow and ice, infrequently occur in Volusia County. Since it cannot be predicted where severe winter storms (as defined in the *Hazard Profiles* section) may occur, all existing and future buildings, facilities and populations are considered to be exposed to this hazard and could potentially be impacted. It is important to note that only reported severe winter storm occurrences have been factored into this vulnerability assessment⁴. Winter storms can last days or weeks, depending on the storm and regional climate norms (El Nino year, etc.). Winter storms in Florida typically last less than one week. To estimate losses due to extreme wind, NCDC historical thunderstorm wind loss data for occurrences in the County were used to develop an extreme wind stochastic model. In this model:

- Losses were obtained and scaled for inflation; Average historic extreme wind damageability was used to generate losses for historical thunderstorm wind events where losses were not reported; Expected annualized losses were calculated through a non-linear regression of historical data; and; Probabilistic losses were scaled to account for would-be losses where no exposure/instrument was present at the time of the event.

Table 6.8 shows total exposure and potential annualized property losses and percent loss ratios resulting from severe winter storm for Volusia County. While all of Volusia County’s inventoried assets are equally exposed to severe winter storm, any anticipated future damages or losses are expected to be minimal. The table below depicts wind chill categories often associated with severe winter storms.

FIGURE 6.9: Wind-Chill Advisory Table

Temperature		Calm	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
Wind	5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63	-63
	10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72	-72
	15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77	-77
	20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81	-81
	25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84	-84
	30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87	-87
	35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89	-89
	40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91	-91
	45	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93	-93
	50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95	-95
	55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97	-97
	60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98	-98
Frostbite Times		30 Mins					10 Mins					5 Mins								
Wind chill is calculated by: $Windchill (^{\circ}F) = 35.74 - 0.6215T - 35.75(V^{0.16}) - 0.4275T(V^{0.16})$ Where: T = Air Temperature (F), V = Wind Speed (mph), ^ = raised to a power (exponential)																				

Source: National Weather Service

⁴ It is possible that additional extreme wind events may have occurred since 1950 that were not reported to NCDC and are not accounted for in this analysis.

SECTION 6: VULNERABILITY ASSESSMENT

TABLE 6.8: Total Exposure/ Potential Annualized Losses from Severe Winter Storm

JURISDICTION	EXPOSURE (TOTAL IMPROVED VALUE OF PARCELS/CONDOS)	ANNUALIZED LOSSES	ANNUALIZED PERCENT LOSS RATIO
Daytona Beach	5,036,150,652	0	0.000%
Daytona Beach Shores	235,084,140	0	0.000%
DeBary	1,458,448,319	0	0.000%
DeLand	2,429,373,658	0	0.000%
Deltona	4,758,973,858	0	0.000%
Edgewater	1,342,087,145	0	0.000%
Holly Hill	565,510,613	0	0.000%
Lake Helen	140,464,924	0	0.000%
New Smyrna Beach	2,761,841,839	0	0.000%
Oak Hill	117,259,007	0	0.000%
Orange City	784,734,035	0	0.000%
Ormond Beach	3,485,721,297	0	0.000%
Pierson	79,895,417	0	0.000%
Ponce Inlet	321,498,032	0	0.000%
Port Orange	4,016,512,204	0	0.000%
South Daytona	630,136,924	0	0.000%
Unincorporated	11,005,217,616	0	0.000%
TOTAL	\$39,168,909,680	\$0	0.000%

Sources: National Climatic Data Center, HAZUS-MH, Volusia County Property Appraiser Data (2019)

Location-Specific Risk

Severe winter storms typically affect entire regions of continents, therefore in the event of a severe winter storm, most of the region would be affected uniformly. However, areas close to the Atlantic Ocean and large regional water bodies could be impacted with a greater magnitude in the event of lake effect wind, sleet or snow conditions. Moreover, areas heavy with agriculture could be at a greater risk from an economic perspective, as these land uses can incur heavy losses when a winter storm strikes. While extremely rare, these types of events have occurred and documented within Volusia County. Winter storms tend to affect transportation infrastructure (such as bridges and boat traffic) in addition to power sources. Moreover, the Town of Pierson is the “Fern Capital of the World” and could incur a large financial loss in the event of a severe winter storm. All populations of Volusia County are vulnerable to severe winter storms despite the rarity of such events. However, the elderly, low income and homeless populations are at a disproportionately higher level of vulnerability to these events.

As stated above, agricultural areas are the most vulnerable areas to severe winter storms. However, damage to critical facilities, businesses and homes can occur as a result of these events. While annualized losses for these events are very hard to measure due to the low probability of these storms, pipe freezes, as well as roof deterioration can occur.

6.8 THUNDERSTORMS

Thunderstorms frequently occur in Volusia County. Since it cannot be predicted where thunderstorms may occur, all existing and future buildings, facilities and populations are considered to be exposed to this hazard and could potentially be impacted. It is important to note that only reported thunderstorm occurrences have been factored into this vulnerability assessment⁵. To estimate losses due to extreme wind, NCDRC historical thunderstorm wind loss data for occurrences in the county were used to develop an extreme wind stochastic model. In this model:

- Losses were obtained and scaled for inflation; Average historic extreme wind damageability was used to generate losses for historical thunderstorm wind events where losses were not reported; Expected annualized losses were calculated through a non-linear regression of historical data; and; Probabilistic losses were scaled to account for would-be losses where no exposure/instrument was present at the time of the event.

Table 6.9 shows total exposure and potential annualized property losses and percent loss ratios resulting from thunderstorms for Volusia County. Although, the annualized losses from thunderstorms in Volusia County are low, the probability and frequency are high. Therefore, it is anticipated that thunderstorms will continue to threaten life and pose property damage throughout the county.

TABLE 6.9: Total Exposure and Potential Annualized Losses from Thunderstorm			
JURISDICTION	EXPOSURE (TOTAL IMPROVED VALUE OF PARCELS/CONDOS)	ANNUALIZED LOSSES	ANNUALIZED % LOSS RATIO
Daytona Beach	5,036,150,652	3,645	0.000%
Daytona Beach Shores	235,084,140	0	0.000%
DeBary	1,458,448,319	290	0.000%
DeLand	2,429,373,658	11,615	0.001%
Deltona	4,758,973,858	5,098	0.000%
Edgewater	1,342,087,145	17,886	0.002%
Holly Hill	565,510,613	530	0.000%
Lake Helen	140,464,924	0	0.000%
New Smyrna Beach	2,761,841,839	1,137	0.000%
Oak Hill	117,259,007	0	0.000%
Orange City	784,734,035	933	0.000%
Ormond Beach	3,485,721,297	1,857	0.000%
Pierson	79,895,417	528	0.001%
Ponce Inlet	321,498,032	0	0.000%
Port Orange	4,016,512,204	1,651	0.000%
South Daytona	630,136,924	1,089	0.000%
Unincorporated	11,005,217,616	48,397	0.000%
TOTAL	\$39,168,909,680	\$94,656	0.000%

Sources: National Climatic Data Center, HAZUS-MH, Volusia County Property Appraiser Data (2019)

SECTION 6: VULNERABILITY ASSESSMENT

Qualitative Assessment of Thunderstorm Vulnerability

Severe weather events such as thunderstorms can impact all areas of Volusia County, depending on the location of the thunderstorm, 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.

While all populations can be impacted by thunderstorms, lack of shelter puts the homeless at highest risk. Spectator's at large outdoor special events and/or recreational areas are highly susceptible to the effects of thunderstorms.

Further details are provided in the profiles for lightning, flooding, hail, wind, winter storms, tornadoes and storm surge all of which highlight the many risks that come about from thunderstorms.

6.9 TORNADO

Historical evidence shows that Volusia County is vulnerable to tornadic activity. This hazard can result from severe thunderstorm activity or may occur during a major tropical storm or hurricane. Since it cannot be predicted where a tornado may touch down, all existing and future buildings, facilities and populations are considered to be exposed to this hazard and could potentially be impacted. It is important to note that only reported tornadoes have been factored into this vulnerability assessment⁶.

While all populations in Volusia County can be impacted, the most vulnerable are homeless, the elderly and those of lower income. Communities such as mobile home parks and manufactured housing parks are the most susceptible to the effects of tornadoes. Volusia County has Depending on location severity, tornadoes can cause social disruption in the form of electrical outages, transportation problems and economic loss. All populations and infrastructure are vulnerable to tornadoes due to the high winds and debris field.

To estimate losses due to tornadoes, NCDRC historical tornado loss data for occurrences in the County were used to develop a tornado stochastic model. In this model:

- Losses were scaled for inflation;
- Average historic tornado damageability was used to generate losses for historical tornadic events where losses were not reported;
- Expected annualized losses were calculated through a non-linear regression of historical data; and
- Probabilistic losses were scaled to account for would-be losses where no exposure/instrument was present at the time of the event.

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 building standards leaving the elderly and low-income populations more at risk.

Table 6.10 shows total exposure and potential annualized property losses and percent loss ratios resulting from the tornado hazard for Volusia County. Although, the annualized losses from tornadoes vary in Volusia County, the probability and frequency are high for tornadic activity is high throughout the County. Therefore, it is anticipated that tornadoes will continue to threaten life and pose property damage throughout the County. **Table 6.11** corresponds with **Figure 6.7** and depicts 2019 parcel exposure to differing proximities of tornadoes from 1950 through 2019.

⁶ It is possible that additional tornado events may have occurred since 1950 that were not reported to NCDRC and are not accounted for in this analysis.

SECTION 6: VULNERABILITY ASSESSMENT

TABLE 6.10: Total Exposure and Potential Annualized Losses from Tornado

JURISDICTION	EXPOSURE (TOTAL IMPROVED VALUE OF PARCELS/CONDOS)	ANNUALIZED LOSSES	ANNUALIZED PERCENT LOSS RATIO
Daytona Beach	5,036,150,652	1,728,704	0.040%
Daytona Beach Shores	235,084,140	183	0.000%
DeBary	1,458,448,319	20,685	0.002%
DeLand	2,429,373,658	194,053	0.010%
Deltona	4,758,973,858	248	0.000%
Edgewater	1,342,087,145	80,017	0.007%
Holly Hill	565,510,613	0	0.000%
Lake Helen	140,464,924	0	0.000%
New Smyrna Beach	2,761,841,839	650,360	0.031%
Oak Hill	117,259,007	17,485	0.018%
Orange City	784,734,035	0	0.000%
Ormond Beach	3,485,721,297	167,120	0.005%
Pierson	79,895,417	2,264	0.003%
Ponce Inlet	321,498,032	326	0.000%
Port Orange	4,016,512,204	37,140	0.001%
South Daytona	630,136,924	398	0.000%
Unincorporated	11,005,217,616	2,331,544	0.021%
TOTAL	\$39,168,909,680	\$5,230,527	0.014%

Sources: National Climatic Data Center, HAZUS-MH, Volusia County Property Appraiser Data (2019)

SECTION 6: VULNERABILITY ASSESSMENT

TABLE 6.11: 2019 Parcel Exposure to Tornado Proximity (Tornado Tracks 1950-2019)

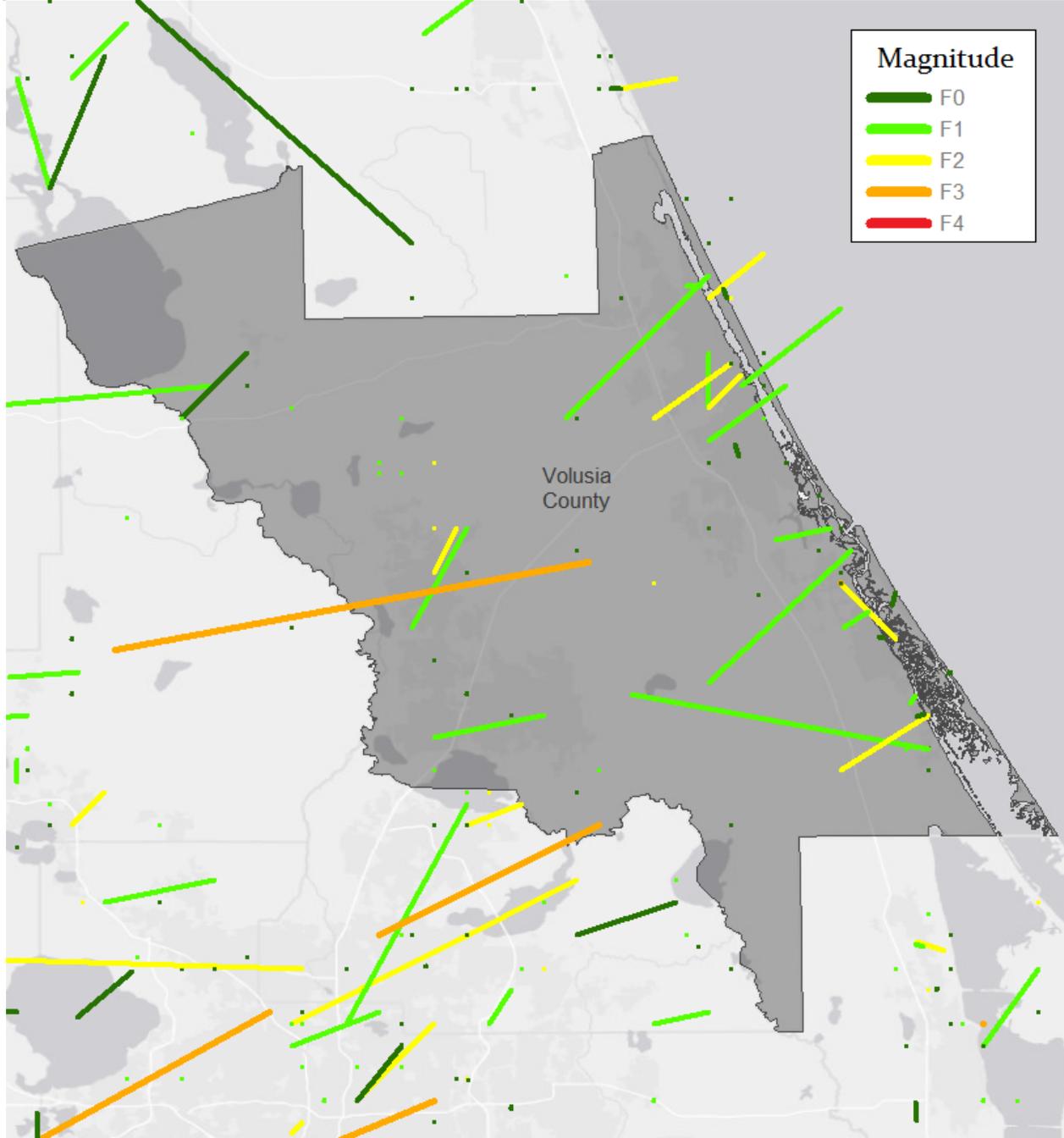
Financial Exposure to Hazard Zones – Cumulative Financial Values within Zones						
Hazard Zone	Parcels in Zone	Built Parcels	Land Value	Building Value	Assessed Value	Taxable Value
<i>Within 0.25 Miles</i>	37,188	27,130	\$2,044,686,478	\$5,727,125,790	\$7,383,095,402	\$4,241,311,092
<i>Between 0.25 and 0.50 Mi.</i>	36,103	26,008	\$1,657,069,001	\$4,686,605,017	\$5,801,733,467	\$3,896,336,101

Build-Year Summary of Built Parcels within Hazard Zones – Build Year Breakdown by Hazard Zone						
Hazard Zone	Built Parcels	Built Pre-1970	Built 1970-1979	Built 1980-1989	Built 1990-1999	Built 2000-2019
<i>Within 0.25 Miles</i>	27,130	5,911	2,904	4,889	2,570	10,856
<i>Between 0.25 and 0.50 Mi.</i>	26,008	5,314	2,297	5,069	2,701	10,627

Land Use Summary of Parcels within Hazard Zones – Number of Parcels Per Land Use						
Hazard Zone	Residential	Commercial	Industrial	Institutional	Conserv./Agri.	Other/Vacant
<i>Within 0.25 Miles</i>	23,836	2,065	356	880	605	9,446
<i>Between 0.25 and 0.50 Mi.</i>	23,351	1,635	363	746	577	9,431

Sources: National Weather Service, Volusia County Property Appraiser Data (2019) – Some parcels were not provided a land use code by VCPAO

FIGURE 6.10: Historic Tornado Tracks (1950-2019)



Source: National Weather Service, NOAA (2019)

SECTION 6: VULNERABILITY ASSESSMENT

Qualitative Assessment of Tornado Vulnerability

Like many other hazards detailed in this report, tornadoes can occur very quickly and do not specifically impact one area of the county higher than another. The sample size taken for the Volusia County area to map tornado paths (as shown on the previous page) only covers a 69-year period, so any delineation of vulnerabilities to specific areas would be unfounded. However, on the statewide scale, trends have been identified and will be described below. Many patterns have emerged in terms of the types of tornadoes that tend to hit Volusia County. There are two primary types of tornado systems that hit.

In Florida, large tornadoes (in the EF-2 to EF-4 range) have typically been concentrated near the central portion of the peninsula (near the Orlando Metropolitan area), moving west-southwest to east-northeast and covering large swaths of land. In the case of a large tornado, the most likely area of Volusia County to be hit initially would be areas in the western portions of the county, specifically those areas that are adjacent to the boundaries with Seminole and Lake County. While warnings for tornado emergencies can be very last-minute, data tends to show that large tornadoes in Florida tend to strike the east coast after tornado activity (or pre-tornado activity) has already been identified across the western and central portions of the peninsula.

The second (and more common) type of tornado to hit Volusia County would be a small tornado, more than likely in the EF-0 to EF-1 range. These storms do not follow large-scale patterns like larger tornadoes in Florida can; thus, warnings for these types of storms can be minimal (or nonexistent) and the locations where these tornadoes strike can have a larger element of randomness. These events tend to unravel quickly and without notice. As stated above, while no clear geographic pattern has emerged for smaller-scale tornadoes in Volusia County, a disproportionate number have hit areas close to the Intracoastal Waterway during the 64-year observation period. Five tornadoes on record have crossed Interstate-95 in Volusia County.

Since strong patterns have not emerged for the most likely event (EF-0 or EF-1 tornado), larger tornadoes can develop over longer periods of time and can affect critical facilities anywhere within the county, as discussed above. 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. As shown in table 6.11, there is a small chance that an individual parcel will be affected by a tornado as compared to the other hazards identified in this report.

Although tornado events are rare, tornadoes can have devastating effects on buildings. Infrastructure can be completely lost in a tornado, so the weighted risk of these events (when comparing the probability of the event with the damage incurred during the event) are very high, if not comparable to the other hazards identified within this report. Older buildings are at higher than normal risk for tornado damage as a result of strict building codes over time. In conclusion, tornadoes present a rare but dangerous threat to the county.

HYDROLOGIC HAZARDS

6.10 COASTAL EROSION

All of the coastal areas in Volusia County are prone to coastal erosion, and nearly half of the 47 miles of shoreline are considered critically eroded. Populations are not explicitly threatened by coastal erosion. However, major economic losses can be incurred to beachfront properties due to coastal erosion. Coastal erosion is typically measured as the annual shoreline change for a given beach cross-section of profile over a long period of time. The NCDP has reported five events involving coastal erosion in Volusia County since 1998. However, these events also include losses from hurricane impacts such as storm surges. The NCDP reported events include losses for jurisdictions outside of Volusia County. As such, it is not possible to determine annualized losses from coastal erosion for the coastal jurisdictions in Volusia County. Coastal erosion exposure was assessed by quantifying the number of people and property that are located within 0.5 miles inland from the shoreline in areas where critical erosion has been documented by the Florida Department of Environmental Protection.

Table 6.12 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. There are currently over 5,000 improved properties that are at risk to coastal erosion in Daytona Beach, Daytona Beach Shores, New Smyrna Beach, Ormond Beach and areas in unincorporated Volusia County. Jurisdictions with critically eroded beaches in Volusia County actively participate in the federal beach nourishment program.

TABLE 6.12: Total Exposure from Coastal Erosion

JURISDICTION	AT-RISK AREAS (within 200 feet of oceanic shoreline)			
	Total Number of Parcels at Risk	Number of Residential Parcels at Risk	Total Value of Buildings at Risk	Population (2017)
Daytona Beach	98	50	\$103,147,299	68,055
Daytona Beach Shores	183	117	\$115,741,404	4,514
New Smyrna Beach	234	200	\$79,120,795	26,470
Ormond Beach	144	117	\$111,599,182	42,816
Ponce Inlet	120	86	\$31,023,351	3,241
Unincorporated	13,497	349	\$2,322,057,635	---

Sources: Volusia County Property Appraiser Data (2019)

Qualitative Assessment of Coastal Erosion Vulnerability

Coastal erosion is a considerable threat to beachfront properties within five jurisdictions of the county alongside unincorporated areas. More than 5,000 parcels are at direct risk for coastal erosion, representing more than \$800 million in property value. Properties at the highest risk are those with low elevations, as wave action and dune-degradation can affect the integrity of the lot foundation. Parcels with lower foundations, or those that have not been mitigated (or raised above base flood elevation) are at higher risk for water damage, loss of personal property, electrical damage, structural collapse and loss of life. The most susceptible cities to coastal erosion within the county are Daytona Beach and New Smyrna Beach, which account for a large percentage of shoreline properties. Moreover, from a financial risk perspective, storm surge presents a unique challenge, as beachfront properties are typically the

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higher-valued properties within the county. The county's Lifeguard Headquarters and Administration Building is located on the beach in Daytona Beach and provides public safety and lifeguard duties to all the beach area. The Ponce Inlet Lighthouse is at risk and has had extensive work done around by the US Army Corps of Engineers to re-nourish the sand and install rock jetties in the inlet area. Beach renourishment was also completed after the 2004 hurricane season all along New Smyrna Beach from a spoil island in the Halifax Intracoastal River.

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

6.11 DROUGHT

Volusia County is uniformly vulnerable to drought. Drought is typically associated with crop damage, and not necessarily the built environment (i.e., improved property). However, research (as noted in the *Hazards Profiles* section) has shown that drought conditions have caused wildfires in 1985, 1988, 1998 and 2009. Droughts can impact the Florida Aquifer, which can affect the supply of water to Volusia County residents. Many residents receive their water from personal wells and the County’s public water supply is also drawn from wells. Drought can cause crop loss, livestock reductions, fish habitat disruption, and can also be associated with the increase of wildfire threat, which in turn places both human and wildlife population at highest risk. Moreover, reduced lake and canal depths can impact boating traffic and access to certain waterways, further reducing property values in these locations. The Lake Beresford area in DeLand has a large tourist draw for fishing and house boat rentals which could be impacted by severe drought conditions. The St. John’s River can be impacted by drought from other areas as far south as Lake Okeechobee because it runs from south to north.

Losses were estimated based on occurrences that were reported to the NCDC⁷. To estimate losses due to extreme drought, NCDC historical drought loss data for occurrences in the County were used to develop an extreme drought stochastic model. In this model:

- Losses were obtained and scaled for inflation;
- Average historic extreme wind damageability was used to generate losses for historical thunderstorm wind events where losses were not reported;
- Expected annualized losses were calculated through a non-linear regression of historical data;
- Probabilistic losses were scaled to account for would-be losses where no exposure/instrument was present at the time of the event.

Table 6.13 shows total exposure and potential annualized property losses and percent loss ratios resulting from drought for Volusia County. Although, the annualized losses are \$0, it should be noted that drought conditions can exacerbate wildfire potential. Wildfire losses are not quantified in this assessment, as drought related (i.e., wildfire) losses are reported separately. Wildfire exposure and losses are provided in this vulnerability assessment as a separate hazard. The probability of drought events in Volusia County is high. The table below depicts drought criteria as determined by the NWS.

Table 6.12: National Weather Service Drought Criteria

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

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TABLE 6.14: Total Exposure and Potential Annualized Losses from Drought

JURISDICTION	EXPOSURE (TOTAL IMPROVED VALUE OF PARCELS/CONDOS)	ANNUALIZED LOSSES	ANNUALIZED PERCENT LOSS RATIO
Daytona Beach	5,036,150,652	0	0.000%
Daytona Beach Shores	235,084,140	0	0.000%
DeBary	1,458,448,319	0	0.000%
DeLand	2,429,373,658	0	0.000%
Deltona	4,758,973,858	0	0.000%
Edgewater	1,342,087,145	0	0.000%
Holly Hill	565,510,613	0	0.000%
Lake Helen	140,464,924	0	0.000%
New Smyrna Beach	2,761,841,839	0	0.000%
Oak Hill	117,259,007	0	0.000%
Orange City	784,734,035	0	0.000%
Ormond Beach	3,485,721,297	0	0.000%
Pierson	79,895,417	0	0.000%
Ponce Inlet	321,498,032	0	0.000%
Port Orange	4,016,512,204	0	0.000%
South Daytona	630,136,924	0	0.000%
Unincorporated	11,005,217,616	0	0.000%
TOTAL	\$39,168,909,680	\$0	0.000%

Sources: National Climatic Data Center, HAZUS-MH, Volusia County Property Appraiser Data (2019)

Qualitative Assessment of Drought Vulnerability

While droughts do not have physical effects on the building stock within the county, many indirect losses can occur to personal property and critical facilities as a result of drought conditions. Thus, annualized losses are not easily identifiable. Agricultural areas are throughout the county but the northwest area including the Town of Pierson is most vulnerable. Losses within the agricultural industry, specifically, can have a trickle-down effect on local businesses (such as tool or heavy machinery companies), resulting in indirect financial losses to businesses and institutions. As a result of the financial losses to individual businesses, residents of Volusia County can lose their jobs, resulting in a net economic loss for the county. Thus, the most realizable losses as a result of a drought are financial – not physical – as is the case with the other hazards identified in this report. The urbanized communities along the coast are less vulnerable economically due to their location and non-agricultural economic base.

A second indirect loss as a result of loss is physical, but comes in the form of a sinkhole. Data suggests that both an excess of rainfall (flooding) and drought conditions can have negative effects on the limestone bed in the state of Florida. Thus, the main physical deterioration as a result of drought conditions to the county’s building stock could come in the form of a sink hole, which is also discussed in this report.

6.12 FLOOD

In order 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). It is recommended that the flood analyses be revised once the 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.

Table 6.14 (on the next page of this document) lists the land uses of properties, the percentage of properties and the property values that are located in the 100-year (A/AE), coastal and 100-year (VE) floodplains. **Table 6.14** corresponds with **Figure 6.8**, which depicts all 100-year flood hazard zones. For a listing and generalized map of all Repetitive Loss Properties within the County and its 16 jurisdictions, please reference the 2020 Floodplain Management Plan attachment (Appendix I). Alongside the Floodplain Management Plan, many repetitive loss properties are listed in the Mitigation Action Plan as part of this report. The table below summarizes types of flooding advisories.

FIGURE 6.11: 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.

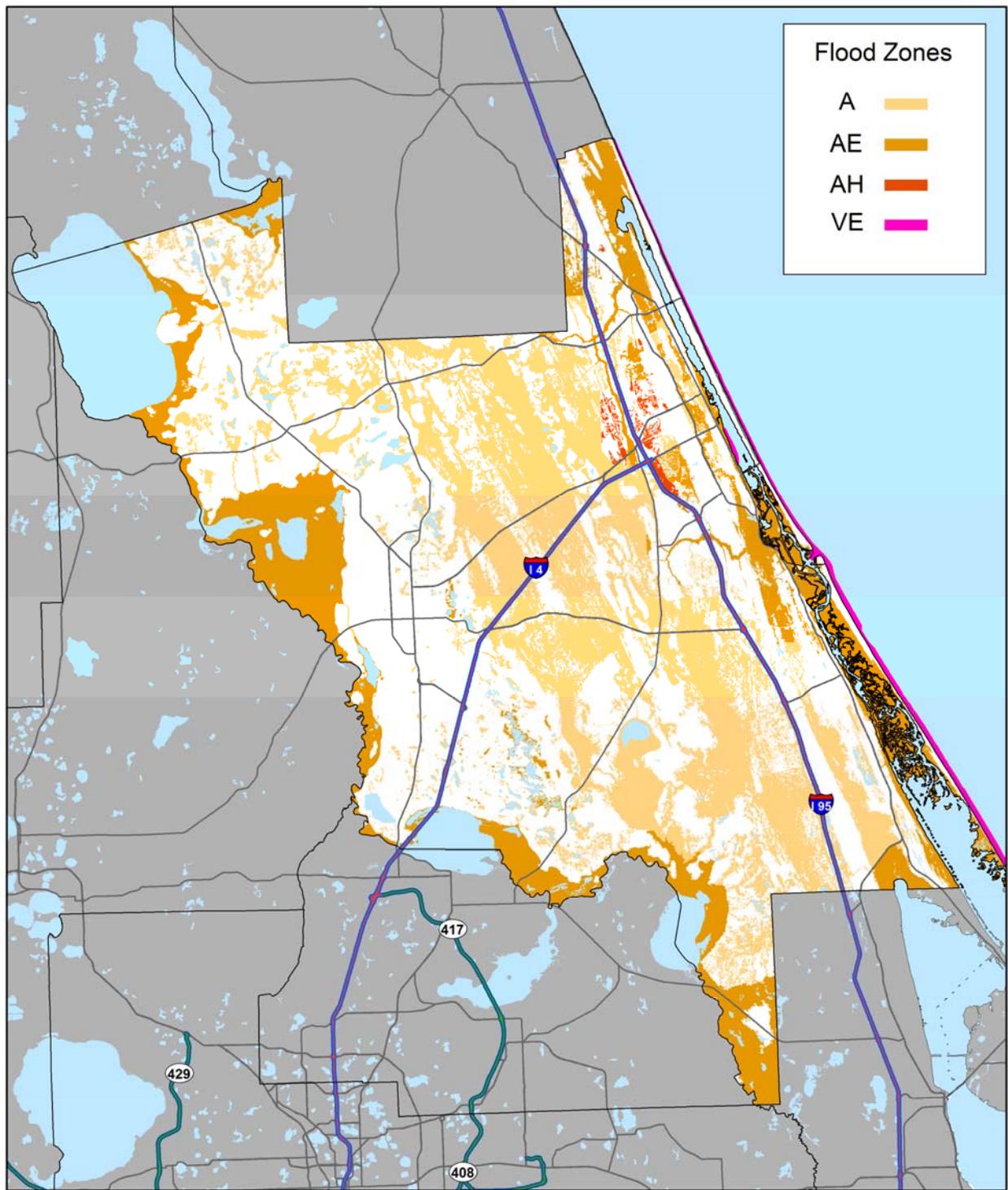
Source: National Weather Service

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TABLE 6.15: Parcel Exposure to Flood Hazard Zones

See Appendix I (Floodplain Management Plan) for a full floodplain analysis. Jurisdictional flood risk is also available in Appendix G.

FIGURE 6.12: Flood Insurance Rate Zones



Source: FEMA

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Qualitative Assessment of Flood Vulnerability

Flooding is among the most prominent of hazards in Volusia County, as a large portion of the county's critical facilities, residences and businesses are located within the 100-year floodplain. The 100-year floodplain includes 89,028 of the county's parcels and a total of 41,928 built structures and condos, totaling close to 10 billion dollars in building value within the hazard zone. Approximately 17.6 billion dollars in assessed value and 12.5 billion dollars in taxable value is located within the 100-year floodplain (all zones) countywide.

Of the almost 42,000 buildings located within the floodplain, approximately 21% were built before 1968, 34% were built between 1968 and 1985 (Growth Management Act), 29% between 1986 and 2001 (Florida Building Code adoption), and 16% of buildings in the floodplain were built since 2002. 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.

Parcels at the highest risk for flooding damage are those with the lowest elevations. While a flood zone can envelope 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 parcels 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.

Structural damage as a result 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.

In terms of the damage incurred to structures as a result of flooding, the same types of damage can be seen as a result of storm surge. The ecological impacts hazard materials debris and accidents to land and waterways would be extensive from all types of flooding. The impacts on agriculture, tourism, and transportation would be extensive.

6.13 STORM SURGE

The storm surge assessment was conducted by identifying the people and property that are located in storm surge inundation zones using data provided by Volusia County⁸. Storm surge affects the east side of the county, generally populations located east of Interstate 95. Storm surge can cause extensive property loss to businesses and homes; can inundate transportation networks with water and can cause long term economic losses related to tourism. The ecological impacts on turtle and bird nesting, hazard materials debris and accidents to land and waterways would be extensive from all types of storm surge.

Tables 6.16 shows the number of buildings at risk, per jurisdiction, to Category 1, Category 3 and Category 5 storm surge effects. Table **6.16** corresponds with **Figure 6.9**, which depicts the storm surge hazard zones.

TABLE 6.16: Buildings at Risk to Category 1/3/5 Storm Surge by Jurisdiction

JURISDICTION	Buildings at Risk (Cat. 1)	Buildings at Risk (Cat. 3)	Buildings at Risk (Cat. 5)
Daytona Beach	1,081	10,116	12,306
Daytona B. Shores	111	548	665
DeBary	238	239	241
DeLand	0	0	0
Deltona	1	1	1
Edgewater	314	8,802	9,827
Holly Hill	167	4,195	4,640
Lake Helen	0	0	0
New Smyrna Beach	2,263	10,444	11,088
Oak Hill	453	1,020	1,093
Orange City	0	0	0
Ormond Beach	769	7,886	11,603
Pierson	0	0	0
Ponce Inlet	306	1,055	1,243
Port Orange	1,342	9,718	12,972
South Daytona	409	4,700	4,768
Unincorporated	3,463	11,933	15,654
TOTAL	10,917	70,657	86,101

Sources: FDEM (Surge), Volusia County Property Appraiser Data (2019)

⁸ Volusia County provided surge inundation zones for Categories 1, 3 and 5.

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TABLE 6.17: 2019 Parcel Exposure to Storm Surge Zones (by Hurricane Category)

Financial Exposure to Hazard Zones – Cumulative Financial Values within Zones						
Hazard Zone	Parcels in Zone	Built Parcels	Land Value	Building Value	Assessed Value	Taxable Value
Category 1	26,337	10,917	\$2,711,061,720	\$4,338,463,514	\$5,331,582,636	\$3,667,858,006
Category 2	57,284	31,835	\$4,391,308,643	\$8,475,200,736	\$10,272,441,228	\$7,008,481,539
Category 3	107,718	70,657	\$6,686,854,536	\$14,899,182,728	\$18,206,662,848	\$12,566,071,580
Category 4	121,092	81,635	\$7,358,068,271	\$16,833,023,268	\$20,716,856,348	\$14,330,268,535
Category 5	126,823	86,101	\$7,744,552,787	\$17,896,568,700	\$22,146,262,234	\$15,248,981,591

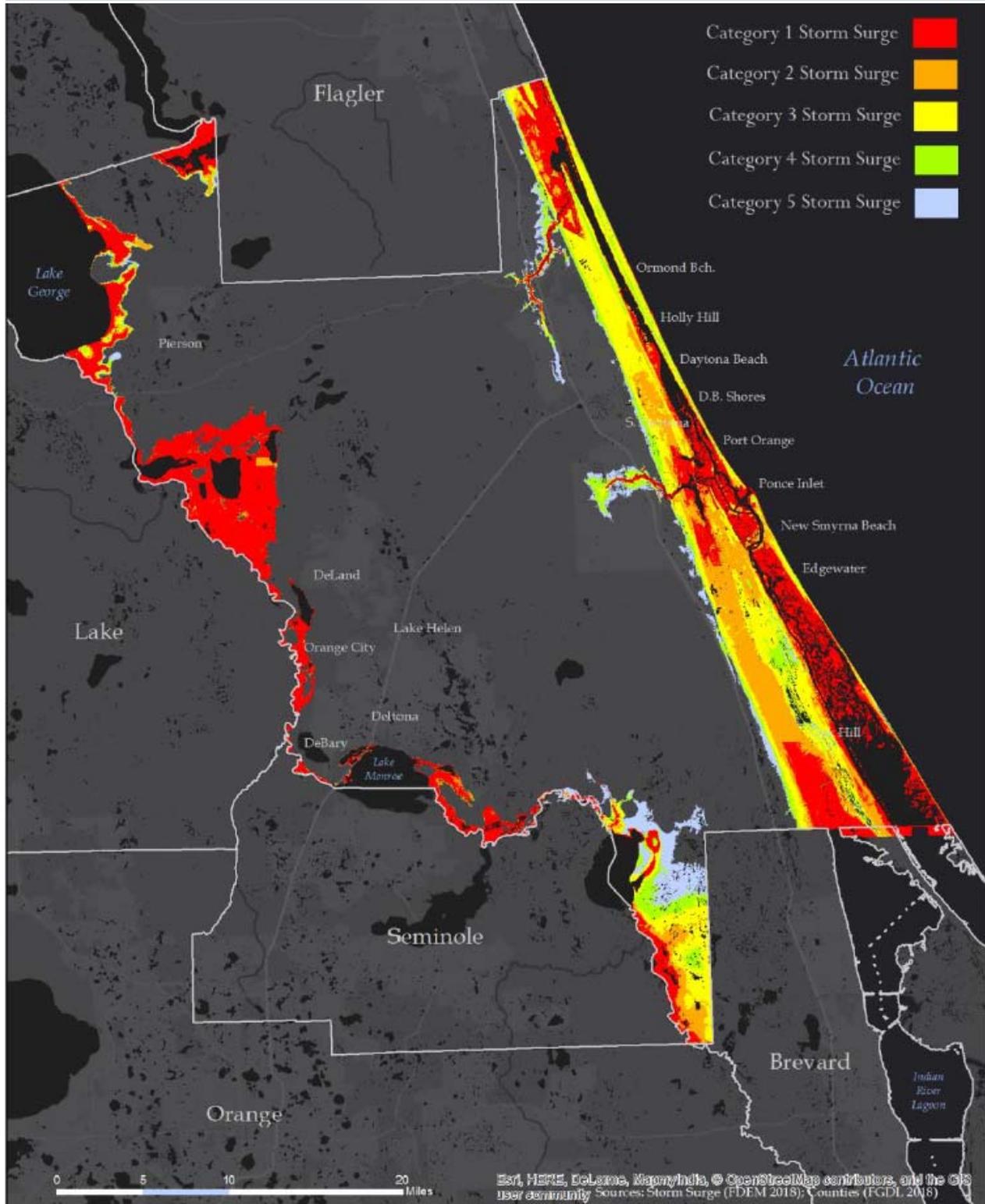
Build-Year Summary of Built Parcels within Hazard Zones – Build Year Breakdown by Hazard Zone						
Hazard Zone	Built Parcels	Built Pre-1970	Built 1970-1979	Built 1980-1989	Built 1990-1999	Built 2000-2019
Category 1	10,917	1,686	1,311	1,940	1,459	4,521
Category 2	31,835	4,924	3,982	6,190	3,959	12,780
Category 3	70,657	14,429	8,083	13,174	7,720	27,251
Category 4	81,635	16,707	9,036	15,372	9,208	31,312
Category 5	86,101	17,066	9,590	16,123	10,034	33,288

Land Use Summary of Parcels within Hazard Zones – Number of Parcels Per Land Use						
Hazard Zone	Residential	Commercial	Industrial	Institutional	Conserv./Agri.	Other/Vacant
Category 1	9,737	625	244	298	573	14,860
Category 2	28,892	1,781	697	647	935	24,332
Category 3	64,383	3,908	1,387	1,507	1,161	35,372
Category 4	74,916	4,327	1,459	1,647	1,270	37,473
Category 5	79,096	4,422	1,606	1,750	1,477	38,472

Sources: FDEM 2017 Surge, Volusia County Property Appraiser Data (2019) – Some parcels were not provided a land use code by VCPAO
 Note: All Storm Surge Zones are cumulative (ex: Category 3 zone includes Zone 1, Zone 2 and Zone 3 parcels)

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FIGURE 6.13: Storm Surge Zones by Category



Source: FDEM Storm Surge (2017)

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Qualitative Assessment of Storm Surge Vulnerability

As shown in Figure 6.13 on the previous page of this report, the eastern portion of Volusia County is susceptible to storm surge conditions. In the worst-case scenario (a Category 5 Hurricane), the storm surge would be seen almost as far inland as Interstate 95. Western Volusia County is not susceptible to storm surge risk.

The eastern portion of the county contains single and multi-family housing, businesses, restaurants, hotels, tourist attractions, cemeteries, along with critical facilities and utility and transportation infrastructure that is vulnerable to storm surge.

Spruce Creek, located in central Volusia County, connects to Ponce Inlet and the Intracoastal Waterway and could possibly incur storm surge inundation to properties west of Interstate 95. Similar to this situation, the Tomoka River, located in northern Volusia County, could cause inundation to lands west of Interstate 95 in the Daytona Beach, Holly Hill and Ormond Beach areas.

Critical facilities, businesses and homes can expect to see losses due to storm surge damage that would be comparable in nature to losses due to flooding. Water entering homes can have devastating impacts on personal property (including expensive equipment in critical facilities) and can also cause loss of life. Depending on the elevation of a structure, storm surge can also affect beachfront parcels with damage comparable to that seen with coastal erosion. Lot foundations can be compromised in these situations, creating an incredibly unstable situation and the possibility for loss of life.

A total of 167 'core' critical facilities are located within the Category 1 through 5 storm surge hazard zones (46% of all facilities). A total of 4 are located in the Category 1 zone, 43 (total) are located in the Category 2 zone, 123 (total) are located in the Category 3 zone, 162 (total) are located in the Category 4 zone and 167 (total) are located in the Category 5 zone. The critical facilities at highest risk for damage include those located east of the Intracoastal Waterway or those located in close proximity to the Spruce Creek or Tomoka River. There are fire stations and city halls located on the barrier island in Ponce Inlet and Daytona Beach Shores that must be evacuated and are susceptible to storm surge. The county's Lifeguard Headquarters and Administration Building is located on the beach in Daytona Beach and provides public safety and lifeguard duties to all the beach area. Daytona Beach Fire Department has a fire station on Beach Street directly on the Halifax River which is susceptible. All low-rise bridges along the Halifax Intracoastal River would be susceptible to storm surge including Highbridge, Main Street, Silver Beach, and the North Bridge in New Smyrna Beach while the bases of the 4 high rise bridges could also be at risk. The Ponce Inlet Lighthouse is at risk and has had extensive work done around by the US Army Corps of Engineers to re-nourish the sand and install rock jetties in the inlet area. There are two piers with restaurants that are susceptible to storm surge with Joe's Crab Shack on the Main Street Pier being a major tourist draw to the Boardwalk Entertainment Area of Daytona Beach.

126,823 parcels within the county are located within a Storm Surge Zone, representing more than 15 billion dollars in taxable property value. If a category 5 storm were to hit the county – based on these figures – total losses to the county could surpass one billion. The category 5 storm surge zone also includes 86,101 parcels with built structures, 17,066 of which were built before 1970. The disproportionately older stock of buildings heightens the risk for storm surge-induced damage in Volusia County. The impact on the tourism industry would be significant throughout the county in a category 5 hurricane scenario.

GEOLOGIC HAZARDS

6.14 SINKHOLE

Based on historic incidents, the unincorporated areas of Volusia County have been vulnerable to sinkhole hazards, with 78 occurring in the study region between 1973 and 2005. Per the *Hazards Profiles* section, most of the county is at a low to very low risk from sinkholes. However, there is an area within the unincorporated western part of the county that is at medium risk to sinkhole hazards. FDEP data was used to determine the number of people and improved properties that are susceptible to sinkhole hazards. Sinkholes are quite rare from a national perspective, and the East Central Florida Region and Volusia County are at a much higher risk than most other areas of the country. These occur in Florida largely due to the presence of limestone and water beneath Florida's surface, which can sometimes create a vacuum effect and envelope entire structures and plots of land. All structures, utilities, systems and populations are equally vulnerable.

The table below depicts the types of sinkholes. All three of these sinkhole types are common in Florida.

FIGURE 6.14: Sink Hole Types

Sinkhole Types	
Category	Criteria
Collapse Sinkholes	Collapse sinkholes are the most dramatic of the three sinkhole types; they form with little warning and leave behind a deep, steeply sided hole. Collapse occurs because of the weakening of the rock of the aquifer by erosion and is often triggered by changes in water levels in the Floridan aquifer.
Subsidence Sinkholes	The progression of a subsidence sinkhole is shown below. Rainwater percolates through overlying sediments and reaches the limestone, dissolving the rock and gradually weakening its structural integrity. Gradually subsiding sinkholes commonly form where slow dissolution takes place, mostly along joints in the limestone. These sinkholes tend to form naturally and are not greatly affected by human activities.
Solution Sinkholes	Solution sinkholes form where the overburden is absent and the limestone is exposed at land surface. This type of sinkhole usually forms as a bowl-shaped depression with the slope of its sides determined by the rate of subsidence relative to the rate of erosion of the walls of the depression from surface runoff. Surface runoff may also carry sand and clay particles into the depression, which may form a relatively impermeable seal in the bottom. A marsh or lake forms when water is ponded because infiltration is restricted by the clayey seal. The gently rolling hills and shallow depressions typical of solution-subsidence topography are common over large parts of Florida

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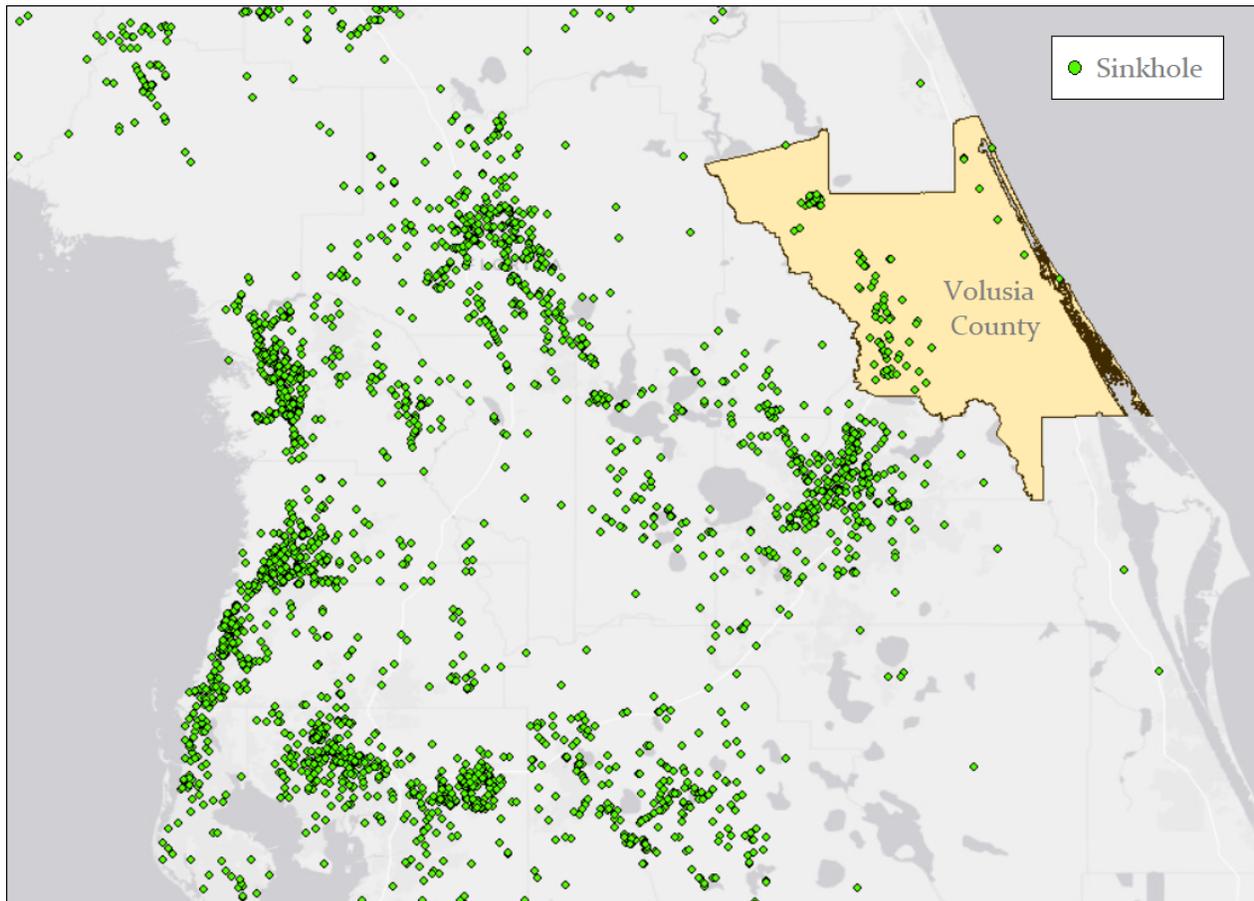
Qualitative Assessment of Sinkhole Vulnerability

The following map depicts sustenance reports in Florida that have been reported to the Florida Department of Environmental protection. This data is relevant for the state of Florida as of October 21, 2019 and depicts the statewide scale as opposed to the county scale for a reference of where Volusia County stands from a regional-risk perspective. It is important to note that Florida is at heightened risk for sinkholes relative to other areas of North America.

From a spatial risk perspective, the map below clearly shows that the western and southwestern portions of Volusia County are at a heightened risk for sinkholes and sustenance issues. The communities of DeBary, DeLand, Deltona, Orange City, Lake Helen, Stone Island and DeLeon Springs are specifically at heightened risk. Agricultural use of water impacts the risk of sinkholes by depleting the underground source of water. No particular population is at more risk than others from sinkholes. Critical infrastructure at risk in this area includes Florida Hospital in Orange City and DeLand. Interstate 4 through the west side of the county is at risk as well as Howland Blvd in Deltona are main thoroughfares and evacuation routes. Sinkholes can have completely devastating effects on homes, businesses and critical facilities, often resulting in the complete loss of the structure. In contrast to hazards such as tornadoes that strike quickly and can completely destroy structures, sink holes tend to develop slowly and grow over time. Thus, loss of personal property (or non-fixture property) can be greatly reduced in the event of a sinkhole. However, sinkholes can open suddenly, which can cause loss of life and personal property.

Documented Sinkholes (2019)

Source: Florida Department of Environmental Protection



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6.15 TSUNAMI

Although, historically there have been no occurrences of tsunamis in Volusia County, the potential exists. The likelihood is low, but the consequences would be catastrophic. The worst-case scenario for Volusia County would be a 3-foot wave that could reach as far as 300 feet inland, meaning that properties and populations within this zone would be affected more severely.

Table 6.17 lists the improved property values that are located in the tsunami inundation zone, based on Volusia County GIS data. There were several gaps in the data that excluded the barrier islands along the shoreline. These areas appeared to be susceptible to tsunami inundation and/or potential inhabitability due to infrastructure loss in low lying areas. To be conservative, the analysis was performed by accounting for these barrier island areas as well.

TABLE 6.18: Volusia County Improved Property at Risk to Tsunami

JURISDICTION	Approximate Value of Improved Parcels/Condos at Risk*
Daytona Beach	2,319,787,186
Daytona B. Shores	166,793,077
DeBary	0
DeLand	0
Deltona	0
Edgewater	0
Holly Hill	0
Lake Helen	0
New Smyrna Beach	1,855,126,270
Oak Hill	0
Orange City	0
Ormond Beach	2,084,953,901
Pierson	0
Ponce Inlet	321,497,424
Port Orange	1,840,551,899
South Daytona	628,731,068
Unincorporated	3,168,225,110
TOTAL	\$12,385,665,935

Source: Volusia County Property Appraiser Data 2019*

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Qualitative Assessment of Tsunami Vulnerability

Table 6.18 on the previous page shows that a large portion of beachside Volusia County's population is at risk of being affected by a tsunami. While these events are extremely rare, it is important to note that more than 100,000 individuals would be at risk for this type of hazard.

Tsunamis can cause incredible loss of life and often strike without warning in the developing world. However, Volusia County would more than likely have a public warning announced and have several hours notice. However, even in lieu of a warning, evacuation of citizens located to the east of the Intracoastal Waterway could be a tough endeavor due to the lack of transportation infrastructure connecting it to the west of the waterway. Warning signs of an impending tsunami include a retreating shoreline or large, visible waves offshore, which could increase the number of casualties as a result of human intrigue. The large tourist presence in Volusia County is another compounding risk element that must be dealt with, as these individuals are less likely to know how to react to such an event.

Daytona Beach, Port Orange, New Smyrna Beach and Ormond Beach have the highest risk of loss in the future as a result of a tsunami, while the western portion of the county has no risk. The most-likely scenario for a tsunami in Volusia County would be triggered by a seismic event in Puerto Rico or off of the western coast of Africa. Such events can affect populations thousands of miles away.

OTHER HAZARDS

6.16 WILDFIRE

Volusia County is uniformly exposed to wildfire risk, especially during the hot dry summer months and drought conditions. HAZUS data was used to determine the number of people and improved properties that are susceptible to medium and high wildfire risk. The HAZUS wildfire potential risk map accounts for the mode of fuel types to determine the risk category. Each fuel model was assigned a code (i.e. “low”, “medium”, or “high”) based on the fires spreading potential during a climatologically “dry” year. The fuel models indicate the ability of a fire to start and spread in the given terrain type, and are used as the input to the Fire Potential Index as well as fire spreading models. Wildfires in Volusia County and most of its municipality’s impact wooded areas with low population density but do pose more of a risk to rural areas. Wildfires generally do not pose high risks to large population centers. Fires can have devastating effects on structures and can cause injuries and death due to smoke inhalation. Buildings, infrastructure, critical facilities and housing for vulnerable populations have some impact by wildfires.

Table 6.18 lists the number of properties, the percentage of properties and the property values that are located in the medium and high-risk wildfire zones. **Table 6.19** depicts exposure to different fire hazard zones utilizing 2014 parcel data. This analysis was not re-performed in 2019. See the table on the following page for additional information on fire risk.

TABLE 6.19: Volusia County Improved Property at Risk to Wildfire

JURISDICTION	# of Improved Parcels/Condos at Risk	% of Improved Parcels at Risk	Value of Improved Parcels at Risk
Daytona Beach	2,879	15.35%	367,774,772
Daytona B. Shores	1	0.19%	1,037,664
DeBary	3,739	44.72%	276,138,817
DeLand	2,383	27.78%	168,960,593
Deltona	6,487	19.52%	307,332,505
Edgewater	1,264	13.51%	76,200,531
Holly Hill	597	13.16%	48,418,783
Lake Helen	333	30.30%	22,918,827
New Smyrna Beach	2,939	26.54%	286,927,290
Oak Hill	397	44.71%	17,313,018
Orange City	419	15.72%	81,685,892
Ormond Beach	4,861	31.30%	470,274,680
Pierson	361	61.19%	17,946,371
Ponce Inlet	355	32.21%	53,468,430
Port Orange	5,554	27.19%	434,378,041
South Daytona	643	14.12%	44,228,607
Unincorporated	18,659	40.76%	1,492,034,741
TOTAL	51,871	27.73%	\$4,167,039,562

Source: Volusia County Property Appraiser Data (2014), HAZUS-MH; see next page for analysis using 2019 parcel data

SECTION 6: VULNERABILITY ASSESSMENT

TABLE 6.19: 2019 Parcel Exposure to Fire Hazard Zones

Financial Exposure to Hazard Zones – Cumulative Financial Values within Zones						
Hazard Zone	Parcels in Zone	Built Parcels	Land Value	Building Value	Assessed Value	Taxable Value
Very High Risk	124,271	104,426	\$4,844,779,396	\$16,550,254,199	\$20,902,299,006	\$13,440,592,313
High Risk	57,662	41,083	\$13,440,592,313	\$8,753,064,108	\$11,683,167,016	\$7,845,468,152
Low Risk	105,868	56,455	\$5,941,223,508	\$13,851,144,023	\$16,817,455,128	\$11,056,579,326

Build-Year Summary of Built Parcels within Hazard Zones – Build Year Breakdown by Hazard Zone						
Hazard Zone	Built Parcels	Built Pre-1970	Built 1970-1979	Built 1980-1989	Built 1990-1999	Built 2000-2019
Very High Risk	104,426	11,786	10,174	22,092	15,782	44,592
High Risk	41,083	974	1,549	5,051	8,211	25,298
Low Risk	56,455	12,692	5,184	8,072	4,699	25,808

Land Use Summary of Parcels within Hazard Zones – Number of Parcels Per Land Use						
Hazard Zone	Residential	Commercial	Industrial	Institutional	Conserv./Agri.	Other/Vacant
Very High Risk	99,842	3,437	744	1,157	621	18,470
High Risk	38,971	845	492	510	2,579	14,265
Low Risk	49,870	3,662	1,307	1,540	4,703	44,786

Sources: HAZUS-MH, Volusia County Property Appraiser Data (2019) – Some parcels were not provided a land use code by VCPAO

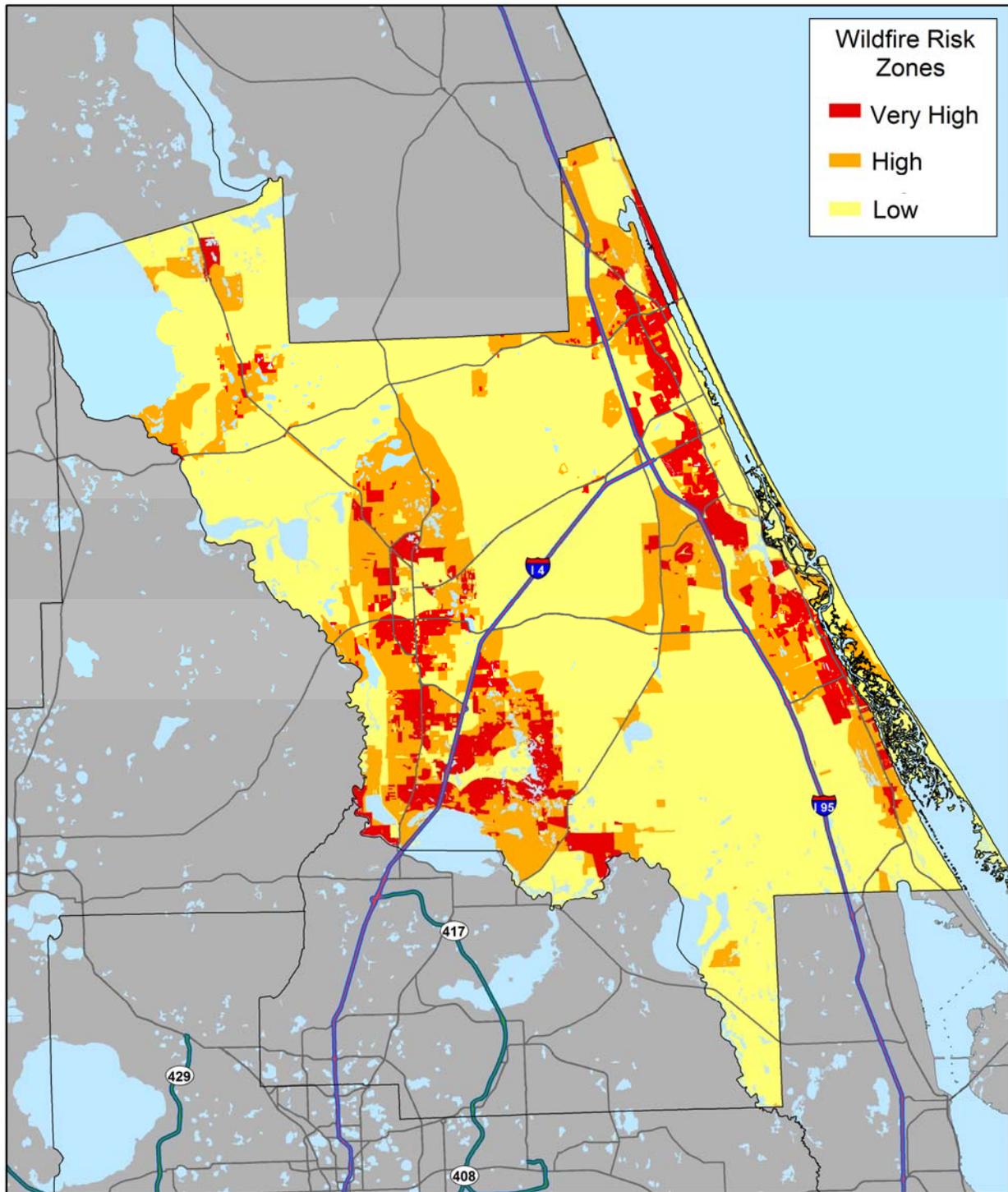
The table shown below depicts the different types of fire warnings that have been identified by the National Weather Service (NWS).

FIGURE 6.15: Fire Advisory Types

Alert	Criteria
Fire Weather Watch	Conditions are favorable for red flag conditions in and close to the watch area in the next 12 to 48 hours.
Red Flag Warning	is issued for weather events which may result in extreme fire behavior that will occur within 24 hours. Red Flag criteria occurs whenever a geographical area has been in a dry spell for a week or two, or for a shorter period, and the National Fire Danger Rating System (NFDRS) is high to extreme and if there is a sustained wind average 15 mph or greater, a relative humidity less than or equal to 25 percent, and a temperature of greater than 75 degrees F.

Source: National Weather Service

FIGURE 6.16: Fire Hazard Zones



Source: HAZUS-MH

SECTION 6: VULNERABILITY ASSESSMENT

Qualitative Assessment of Fire/Wildfire Vulnerability

Table 6.19 shows that a large portion of Volusia County is susceptible to fires. 124,271 parcels within the county are located within the 'Very High Risk' zone, accounting for a total of 104,426 parcels with structures. An additional 57,662 parcels within the county are located within the 'High Risk' zone, accounting for a total of 41,083 parcels with structures that are threatened by fire.

The build year of a parcel is extremely important (perhaps the most important) metric to look at when analyzing risk as a result of fires. This is due to the adoption of building codes over time. Building codes can limit the types of materials utilized on buildings, along with other mitigating strategies, therefore reducing the risk for newer structures within the county. While the county has an older building stock, the parcels that are at risk for fire within the county are generally newer as compared to the parcels vulnerable to other hazards. The Ormond Beach rural area along SR 40 west of I-95 is a very susceptible area with many heavily wooded single-family subdivisions such as Timber Creek, Hunters Ridge, Breakaway Trails, and Plantation Pines.

In terms of land use, the majority of the parcels within the fire hazard zones are low density residential. More than 236,000 low density residential parcels are located within the 'High' and 'Very High' risk zones. More than 15,000 businesses are located within the 'High' and 'Very High' risk zones.

In addition to structures susceptible to fire, many areas of Volusia County are agricultural, while there are also many wood lands within the county. These areas are extremely susceptible to wildfires. Wildfires can spread in two ways: Burning ashes from tree lines can 'jump' across roadways or other barriers, widening the scope of the fire event. The second method of wildfire spread is less visible, as wildfires have the ability to transfer energy underground, making for an invisible spread of the wildfire. Often times, the fire does not have to be actively 'burning' for a spread to occur. This incredibly heightens the risk for residents living in isolated rural areas surrounded by trees.

6.17 SEA LEVEL RISE

Sea level rise, caused by changes in the Earth's climate, is a phenomenon resulting from a consistent change in the Earth's surface temperature that leads to changes in climatic patterns which ultimately alters weather patterns - including atmospheric and hydrologic impacts – and leads to sea level rise.

The greatest impacts from climate change on sea level rise include storm surge and coastal flooding. Sea level rise and climate change also affect atmospheric and hydrologic patterns which in turn impact other hazards like inland flood (increased rainfall periods), drought (decreased rainfall periods), and wildfire (exacerbated by vegetative fuel growth in periods of higher rainfall and then burn risk in drier periods). During the last century, sea level has risen approximately 6-9 inches worldwide and 9 inches along the coast of East Central Florida.

The United States Environmental Protection Agency (EPA) has been analyzing the causes, effects and possible responses to sea level rise. EPA's 1995 report, *The Probability of Sea Level Rise*, estimates that if humanity continues to emit greenhouse gases into the atmosphere, mean sea level could raise 1-2 feet in the next century and 5 feet over the next 150-300 years.

Volusia County, the River-to-Sea Transportation Planning Organization, and numerous jurisdictions within Volusia County have studied the potential effects of sea level rise since the 2014 version of the Local Mitigation Strategy (LMS) was released. In addition to jurisdiction-specific analyses, a "Regional Resiliency Action Plan" was drafted by the East Central Florida Regional Planning Council dealing with resiliency strategies on the jurisdictional and agency-levels.

Moreover, the Florida Department of Environmental Protection awarded Volusia County a grant to study the effects of sea level rise in addition to storm surge as part of a 2019-2020 project. The information contained in the FDEP-Volusia County report (to be released after the publication of the 2020 LMS) will be formatted identically to the LMS in order for planners and emergency managers to adequately compare the two documents. This document will be available in addition to the LMS upon request from Volusia County Emergency Management.

Table 6.21 on the following page depicts countywide exposure to sea level rise levels determined by the National Oceanographic and Atmospheric Administration (NOAA) "high curve" for years 2040, 2070 and 2100. These time horizons and curves have been utilized in previous studies within Volusia County at the jurisdictional, transportation agency and county levels.

SECTION 6: VULNERABILITY ASSESSMENT

TABLE 6.21: 2019 Parcel Exposure to Sea Level Rise Inundation Levels

Financial Exposure to Hazard Zones – Cumulative Financial Values within Zones						
Hazard Zone	Parcels in Zone	Built Parcels	Land Value	Building Value	Assessed Value	Taxable Value
NOAA “High Curve”, 2040	14,953	6,791	\$2,086,271,815	\$2,394,658,188	\$3,835,511,832	\$2,581,169,654
NOAA “High Curve”, 2070	31,053	14,977	\$2,962,080,894	\$4,771,631,295	\$6,199,938,559	\$4,241,498,179
NOAA “High Curve”, 2100	79,120	48,561	\$5,249,071,011	\$11,060,771,690	\$13,421,963,554	\$9,189,623,999

Build-Year Summary of Built Parcels within Hazard Zones – Build Year Breakdown by Hazard Zone						
Hazard Zone	Built Parcels	Built Pre-1970	Built 1970-1979	Built 1980-1989	Built 1990-1999	Built 2000-2019
NOAA “High Curve”, 2040	6,791	911	802	1,224	970	2,884
NOAA “High Curve”, 2070	14,977	2,205	1,890	2,789	1,945	6,148
NOAA “High Curve”, 2100	48,561	8,849	6,170	9,123	5,463	18,956

Land Use Summary of Parcels within Hazard Zones – Number of Parcels Per Land Use						
Hazard Zone	Residential	Commercial	Industrial	Institutional	Conserv./Agri.	Other
NOAA “High Curve”, 2040	6,130	242	221	241	390	7,729
NOAA “High Curve”, 2070	13,420	811	415	441	722	15,244
NOAA “High Curve”, 2100	43,547	2,869	1,214	1,309	1,057	29,124

Sources: NOAA, UF GeoPlan Center, Volusia County Property Appraiser Data (2019) – Some parcels were not provided a land use code by VCPAO

Qualitative Assessment of Sea Level Rise Vulnerability

Sea level rise is currently being studied as a threat 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. For this study, NOAA “high curve” data for 2040, 2070 and 2100 was utilized to study the amount of property value, the types of properties and build-year of properties located in each inundation zone.

Combined Impacts of Sea Level Rise and Hurricanes over the Long Term

The LMS project team also modeled sea level rise impacts on future hurricanes. This information was published following the completion of this report and can be requested from Volusia County Emergency Management.

6.18 CONCLUSIONS ON HAZARD VULNERABILITY

The results of this vulnerability assessment are useful in at least three ways:

- Improving our understanding of the risk associated with the natural hazards in Volusia County through better understanding of the complexities and dynamics of risk, how levels of risk can be measured and compared, and the myriad of factors that influence risk. An understanding of these relationships is critical in making balanced and informed decisions on managing risk.
- Providing a baseline for policy development and comparison of mitigation alternatives. The data used for this analysis presents a current profile of risk in Volusia County. Future updates will enable comparison of the changes in risk over time. Baselines of this type can support the objective analysis of policy and program options for risk reduction in the region.
- Comparing the risk among the natural hazards addressed. The ability to quantify the risk to all these hazards relative to one another helps in a balanced, multi-hazard approach to risk management at each level of governing authority. This ranking provides a systematic framework to compare and prioritize the very disparate natural hazards that are present in Volusia County. This final step in the risk assessment provides the necessary information for local officials to craft a mitigation strategy to focus resources on only those hazards that pose the most threat to the county.

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**
- ▶ **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 a 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. Coupled with the *Risk Assessment*, 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

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.

SECTION 7: CAPABILITY ASSESSMENT

applicable local government officials, requested information on a variety of “capability indicators” such as existing 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 develop 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.

Table 7.1 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

TABLE 7.1: 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	Capital Improvements 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	Fire Code	National Flood Insurance Program	NFIP Community Rating System
Daytona Beach	X	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	X	X
DeBary	X	X	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	X	X	X	X	X
Deltona	X	X	X	X	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	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	X
Lake Helen	X	X	X	X	X	X	X	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	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	X	
Orange City	X	X	X	X	X	X	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	X	
Ponce Inlet	X	X	X	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	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	X
Volusia County	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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The project team developed the Local Mitigation Strategy with numerous resources, including existing plans, technical information and mapping software.

ESRI ArcGIS software was used to develop vulnerability profiles for the hazards covered in 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.

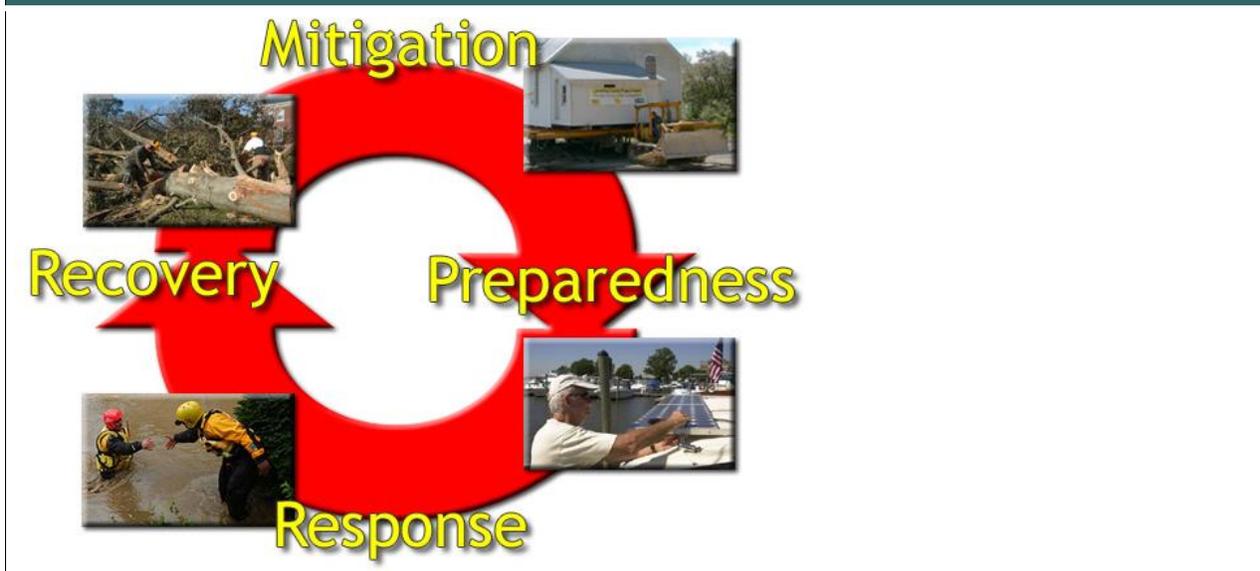
Technical plans were also reviewed for consistency with the Local Mitigation Strategy. This primarily included the county's Integrated Floodplain Management Plan, which was reviewed and updated alongside the 2020 LMS. The data collection, data analysis and risk profile methodologies used for the Local Mitigation Strategy and the Floodplain Management Plan are identical. The additional plans listed on the previous page, 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. In reality, each phase is interconnected with hazard mitigation as **Figure 7.1** 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.

FIGURE 7.1: The Four 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 and 2014. The plan is currently undergoing a revision that will be completed in January 2020.

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.

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- Survey results indicate that 12 of the jurisdictions have their own disaster recovery plan. 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.

- Results indicate that 15 of jurisdictions in Volusia County have a continuity of operations plan in place. 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

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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.

- There are 10 jurisdictions that have a historic preservation plan.

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.

- All of the participating jurisdictions have a zoning ordinance.

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

- There are 16 jurisdictions that have a subdivision ordinance.

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.

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.

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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. **Table 7.2** lists the BCEGS ratings for the jurisdictions in the region.

TABLE 7.2: BCEGS Ratings in the Region

JURISDICTION	BCEGS RESIDENTIAL RATING	BCEGS COMMERCIAL RATING	YEAR LAST RATED
Daytona Beach	4	3	
Daytona Beach Shores			
DeBary			
DeLand			
Deltona			
Edgewater			
Holly Hill			
Lake Helen	4	4	2000
New Smyrna Beach			
Oak Hill			
Orange City			
Ormond Beach	3	3	2004
Pierson			
Ponce Inlet			
Port Orange			
South Daytona			
Volusia County			

Source: Jurisdictions

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.

7.3.4 Floodplain Management

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 hazard risk, regulate construction practices and set flood insurance rates. FIRMs are an important source of information to educate residents, government officials and the private sector about the likelihood of flooding in their community.

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 shown in **Table 7.3**. 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 10 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 jurisdictions
- Complying with NFIP through County/Municipal Floodplain Ordinances (exceed CFR-44)
- Compliance with Florida Building Code

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TABLE 7.3: 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

Source: FEMA

TABLE 7.4: CRS Participation in Volusia County (as of 5/1/2019)

JURISDICTION	CRS CLASSIFICATION	DISCOUNT FOR SFHA
Daytona Beach	6	20%
Daytona Beach Shores	5	25%
DeBary	NA	NA
DeLand	NA	NA
Deltona	9	5%
Edgewater	7	15%
Holly Hill	6	20%
Lake Helen	NA	NA
New Smyrna Beach	7	15%
Oak Hill	NA	NA
Orange City	NA	NA
Ormond Beach	6	20%
Pierson	NA	NA
Ponce Inlet	5	25%
Port Orange	5	25%
South Daytona	6	20%
Volusia County	5	25%

Source: Volusia County Emergency Management and FEMA

SECTION 7: CAPABILITY ASSESSMENT

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 identifying specific actions to address flooding problems within a jurisdiction.

- All jurisdictions have a floodplain management plan, located within the County FMP.

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.

- There are 16 jurisdictions that have a stormwater management plan as of 2019.

7.4 CONCLUSIONS OF THE CAPABILITY ASSESSMENT

The capability of Volusia County and the participating jurisdictions varies greatly from jurisdiction to jurisdiction. **Table 7.5** lists the total number of jurisdictions that have plans, ordinances and programs in place or under development.

TABLE 7.5: 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	15
Stormwater Management Plan	16
Natural Resource Protection Plan	13
Flood Response Plan	13
Emergency Operations Plan	17
Continuity of Operations Plan	15
Evacuation Plan	16
Disaster Recovery Plan	12
Capital Improvements Plan	17
Economic Development Plan	14
Historic Preservation Plan	10
Floodplain Ordinance (or Flood Damage Prevention Ordinance)	17
Zoning Ordinance	17
Subdivision Ordinance	16
Unified Development Ordinance	12
Post-disaster Redevelopment / Reconstruction Ordinance	8
Building Code	17
Fire Code	17
National Flood Insurance Program	16
NFIP Community Rating System	11

The *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

SECTION 7: CAPABILITY ASSESSMENT

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 hazard risk is considered to be 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 in order 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 twitter 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).

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 Mitigation Strategy 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).

SECTION 8: MITIGATION STRATEGY

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 Mitigation Strategy is the selection and prioritization of specific mitigation actions, referred to as Hazard Mitigation Initiatives, for Volusia County and participating jurisdictions (provided separately in Section 9: *Mitigation Action Plan*). 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 of the Hazard Mitigation Plan.

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 **Table 8.1**.

SECTION 8: MITIGATION STRATEGY

TABLE 8.1: 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.		
Consistency 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 can not 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 2020 plan update, the LMS Working Group used the goal listing updated and developed as part of the 2014 plan update. As a result of the 2014 review, the LMS Working Group recommended that the existing goals (**Table 8.2**) remain the same. Additional goals were developed by jurisdictions as part of the Floodplain Management Plan (Appendix I). 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 resistant” future.

TABLE 8.2: Mitigation Goals

GOAL 1: LOCAL GOVERNMENT WILL HAVE THE CAPABILITY TO DEVELOP, IMPLEMENT AND MAINTAIN EFFECTIVE MITIGATION PROGRAMS

Objective 1: Data and information needed for defining hazards, risk areas, and vulnerabilities in the community will be obtained.

Objective 2: The capability to effectively utilize available data and information related to mitigation planning and program development will be available.

Objective 3: The effectiveness of mitigation initiatives implemented in the community will be measured and documented.

Objective 4: Up-to-date technical skills in mitigation planning and programming will be available for the community.

Objective 5: There will be a program to derive mitigation “lessons learned” from each significant disaster event occurring in or near the community.

GOAL 2: ALL SECTORS OF THE COMMUNITY WILL WORK TOGETHER CONTINUOUSLY TOWARD BUILDING A DISASTER-RESILIENT COMMUNITY

Objective 1: A business continuity and recovery program will be established and implemented in the community.

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Objective 2: Local agencies and organizations will establish specific interagency agreements for the development and implementation of mitigation-related projects and programs.

Objective 3: Local elected governing bodies will promulgate the local mitigation plan and support community mitigation programming.

Objective 4: Outreach programs to gain participation in mitigation programs by business, industry, institutions and community groups will be developed and implemented.

Objective 5: The community will be periodically updated regarding local efforts in mitigation planning and programming.

Objective 6: The community's public and private sector organizations will partner to promote hazard mitigation programming throughout the community.

GOAL 3: THE COMMUNITY WILL HAVE THE CAPABILITY TO INITIATE AND SUSTAIN EMERGENCY RESPONSE OPERATIONS DURING AND AFTER A DISASTER

Objective 1: Designated evacuation routes will be relocated, retrofitted, or modified to remain open before, during and after disaster.

Objective 2: Designated evacuation shelters will be retrofitted or relocated to ensure their operability during and after disaster events.

Objective 3: Emergency services organizations will have the capability to detect emergency situations and promptly initiate emergency response operations.

Objective 4: Local emergency services facilities will be retrofitted or relocated to withstand the structural impacts of disasters.

Objective 5: Response capabilities will be available to protect visitors, special needs individuals, and the homeless from a disaster's health and safety impacts.

Objective 6: Shelters or structures for vehicles and equipment needed for emergency services operation will be retrofitted or relocated to withstand disaster impacts.

Objective 7: Utility and communications systems supporting emergency services operations will be retrofitted or relocated to withstand the impacts of disasters.

Objective 8: Vehicle access routes to key health care facilities will be protected from blockage as a result of a disaster.

GOAL 4: THE CONTINUITY OF LOCAL GOVERNMENT OPERATIONS WILL NOT BE SIGNIFICANTLY DISRUPTED BY DISASTERS

Objective 1: Buildings and facilities used for the routine operations of government will be retrofitted or relocated to withstand the impacts of disasters.

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Objective 2: Community redevelopment plans will be prepared to guide decision-making and resource allocation by local government in the aftermath of a disaster.

Objective 3: Important local government records and documents will be protected from the impacts of disasters.

Objective 4: Plans and programs will be available to assist local government employees in retrofitting or relocating their homes to ensure their availability during a disaster.

Objective 5: Plans will be developed, and resources identified, to facilitate reestablishing local government operations after a disaster.

Objective 6: Redundant equipment, facilities, and/or supplies will be obtained to facilitate reestablishing local government operations after a disaster.

GOAL 5: THE THREAT OF DISASTERS TO THE HEALTH, SAFETY AND WELFARE OF THE COMMUNITY'S RESIDENTS AND VISITORS WILL BE MINIMIZED

Objective 1: Adequate systems for notifying the public at risk and providing emergency instruction during a disaster will be available in all identified hazard areas.

Objective 2: Effective structural measures will be developed to protect residential areas from the physical impacts of disasters.

Objective 3: Facilities in the community posing an extra health or safety risk when damaged or disrupted will be made less vulnerable to the impacts of a disaster.

Objective 4: Public and private medical and health care facilities in the community will be retrofitted or relocated to withstand the impacts of disasters.

Objective 5: Residential structures will be removed or relocated from defined hazard areas.

Objective 6: Residential structures will be retrofitted to withstand the physical impacts of disasters.

Objective 7: Safety devices on transportation networks will not fail because of a disaster.

Objective 8: Structures, facilities and systems serving visitors to the community will be prepared to meet their immediate health and safety needs.

Objective 9: There will be adequate resources, equipment and supplies to meet victims' health and safety needs after a disaster.

GOAL 6: THE POLICIES AND REGULATIONS OF LOCAL GOVERNMENT WILL SUPPORT EFFECTIVE HAZARD MITIGATION PROGRAMMING THROUGHOUT THE COMMUNITY

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Objective 1: All reconstruction or rehabilitation of local government facilities will incorporate techniques to minimize the physical or operational vulnerability to disasters.

Objective 2: Land use policies, plans and regulations will discourage or prohibit inappropriate location of structures or infrastructure components in areas of higher risk.

Objective 3: Local government will ensure that hazard mitigation needs and programs are given appropriate emphasis in resource allocation and decision-making.

Objective 4: Local governments will establish and enforce building and land development codes that are effective in addressing the hazards threatening the community.

Objective 5: Local governments will protect high hazard natural areas from new or continuing development.

Objective 6: Local jurisdictions will participate fully in the National Flood Insurance Program and the associated Community Rating System.

Objective 7: New local government facilities will be located outside of hazard areas and/or will be designed to not be vulnerable to the impacts of such hazards.

Objective 8: Reconstruction and rehabilitation of structures and utilities in the community will incorporate appropriate hazard mitigation techniques.

Objective 9: Regulations will be established and enforced to ensure that public and private property maintenance is consistent with minimizing vulnerabilities to disaster.

GOAL 7: RESIDENTS OF THE COMMUNITY WILL HAVE HOMES, INSTITUTIONS AND PLACES OF EMPLOYMENT THAT ARE LESS VULNERABLE TO DISASTERS

Objective 1: Economic incentive programs for the general public, businesses and industry to implement structural and non-structural mitigation measures will be established.

Objective 2: Local government will support key employers in the community in the implementation of mitigation measures for their facilities and systems.

Objective 3: Programs for removal, relocation or retrofitting of vulnerable structures and utilities in hazard areas will be established and implemented.

Objective 4: The vulnerability to disasters of schools, libraries, museums, and other institutions important to the daily lives of the community will be minimized.

GOAL 8: THE ECONOMIC VITALITY OF THE COMMUNITY WILL BE ENHANCED BY THE MITIGATION STRATEGY, PRE- AND POST-DISASTER RECOVERY PLANNING

Objective 1: Components of the infrastructure needed by the community's businesses and industries will be protected from the impacts of disaster.

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Objective 2: Local government emergency response and disaster recovery plans will appropriately consider the needs of key employers in the community.

Objective 3: Local government will encourage community businesses and industries to make their facilities and operations disaster resistant.

Objective 4: Local government will establish programs, facilities and resources to support business resumption activities by impacted local businesses and industry.

Objective 5: Local government will implement programs to address public perceptions of community condition and functioning in the aftermath of a disaster.

Objective 6: Local government will strive to diversify the employment base of the community.

GOAL 9: THE AVAILABILITY AND FUNCTIONING OF THE COMMUNITY'S INFRASTRUCTURE WILL BE MINIMALLY DISRUPTED BY A DISASTER

Objective 1: Local governments will encourage hazard mitigation programming by private sector organizations owning or operating key community utilities.

Objective 2: Routine maintenance of the community's infrastructure will be done to minimize the potential for system failure because of or during a disaster.

Objective 3: Sources of energy normally used by the community will not be unwarrantedly vulnerable to the impacts of a disaster.

Objective 4: The telecommunications systems and facilities serving the community will not be unwarrantedly vulnerable to the impacts of a disaster.

Objective 5: Transportation facilities and systems serving the community will be constructed and/or retrofitted to minimize the potential for disruption during a disaster.

Objective 6: Water and sewer services in the community will not fail because of a disaster.

GOAL 10: MEMBERS OF THE COMMUNITY WILL UNDERSTAND THE HAZARDS THREATENING LOCAL AREAS AND THE TECHNIQUES TO MINIMIZE VULNERABILITY TO THOSE HAZARDS

Objective 1: All interested individuals will be encouraged to participate in hazard mitigation planning and training activities.

Objective 2: Education programs in risk communication and hazard mitigation will be established and implemented.

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Objective 3: Managers of public facilities will be knowledgeable in hazard mitigation techniques and the components of the community's mitigation plan.

Objective 4: Technical training in mitigation planning and programming will be given to appropriate local government employees.

Objective 5: The owners and operators of businesses and industries in the community will be knowledgeable in appropriate hazard mitigation techniques.

Objective 6: The public living or working in defined hazard areas will be aware of that fact, understand their vulnerability and know appropriate mitigation techniques

Objective 7: The public will have facilitated access to information needed to understand their vulnerability to disasters and effective mitigation techniques

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 local Mitigation Strategy for Volusia County, a wide range of activities were considered in order 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

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- ▶ 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., windproofing, 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:

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- ▶ 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 the findings of the *Capability Assessment* and *Risk Assessment*. 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 (**Table 8.3**) to make certain they addressed, at a minimum, those hazards posing the greatest threat.

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TABLE 8.3: Mitigation Techniques Matrix for Volusia County

MITIGATION TECHNIQUE	HIGH RISK HAZARDS			
	FLOOD	HURRICANE AND TROPICAL STORM	STORM SURGE	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 (as determined by through the *Risk Assessment*) with 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.

8.5 MITIGATION SUCCESS STORIES

Completed mitigation projects in any community represent a proactive approach to reducing vulnerability. It can often be difficult to convince a community to use funds for an imminent disaster when no danger is present and local, state, and federal funding sources pose a competitive application process. However, the payoff for these proactive actions can be immense. Mitigation helps to avert loss of life and injury, reduce damage to public and private property, lessen expenditure of resources and exposure to risk for first responders, reduce costs of disaster response and recovery, accelerate recovery of communities and businesses affected by disasters, and enhance community resiliency¹. Many of the

¹ “Recommendations for an Effective National Mitigation Effort.” National Emergency Management Association (NEMA), 2009.

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jurisdictions in Volusia County have completed mitigation projects that reduced vulnerability. A total of 50 facility hardening projects, 39 flood protection projects, 20 storm water and drainage projects and 27 generator projects have been completed as part of this process (a total of 136 projects). Other specific mitigation project and initiative examples are profiled below, by jurisdiction.

Daytona Beach

The City of Daytona Beach City Hall is a critical facility that houses many of the City's emergency response personnel. It is a central point of information for its residents and a place where many critical decisions are made. The City received HMGP funds after the 2004 hurricanes and those grant funds were used to install hurricane resistant impact glass through the entire facility. This critical facility won't need to be evacuated for minor hurricanes and the contents now have protection against wind events.

The City used HMGP funds from the 2004 hurricanes to retrofit all the doors and windows at the Public Works complex which is also a critical facility. This facility was hardened and upgraded with impact glass and hurricane rated doors. This facility is the main location for the Public Works response personnel handling road repairs, signs, vehicle maintenance, debris removal, garbage pick up, etc.

DeBary

West Side Emergency Flood Management System (\$8.5 million project cost): After the 2004 hurricanes (Charley, Frances and Jeanne) caused massive structural flooding throughout the City primarily due to overtopping of landlocked lakes, the City of DeBary's West Side Emergency Flood Management System project was implemented in an effort to further reduce the hydraulic load on the existing central and east side flood control systems. With 75% federal funding provided by FEMA via the Hazard Mitigation Grant Program, combined with additional funding provided by FDOT and the City of DeBary, construction of the first 6 phases of the west side system was completed in 2010, including permanent pump stations installed at Lake Susan, the DeBary Golf and Country Club (DGCC) entrance pond and Quail Lake, with approximately 0.6 miles of 18-inch diameter force main installed between Lake Susan and the DGCC entrance pond and approximately 4.6 miles of 36-inch diameter force main installed between the DGCC entrance pond and the City's Regional Stormwater Storage Facility (RSSF). A former borrow pit located immediately east of Konomac Lake and the railroad was acquired to serve as the City's RSSF and accept the discharge from the west side system service area that encompasses approximately 1,151 acres.

Lakeside Gravity Outfall System (\$650K project cost): After receiving over 20-inches of rainfall during Tropical Storm Fay in August 2008, seventeen (17) mobile homes, a community center, and twenty-two (22) duplex homes experienced significant flooding which impacted a total of 61 homeowners. With FEMA assistance via the Hazard Mitigation Grant Program, several overflow systems were constructed to serve the Lakeside community within the DeBary Golf and Country Club, Kings Lake, Kings Lake wetland and within the Terra Alta manufactured home community. This project included construction of an emergency pump connection, stormwater force main, concrete overflow weirs, drainage inlets, storm pipes, flow control devices (sluice gates), and a groundwater seepage control system (drainage inlets, underdrain pipe and rock media) as well as the modification of existing water control structures, as necessary. Stormwater runoff from this project was designed to discharge into an existing stormwater pond where the West Side Emergency Flood Management System will ultimately pump the water to the City's Regional Stormwater Storage Facility.

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9-Home Buy-Out Project (\$2.1 million project cost): After Tropical Storm Fay down poured over 20-inches of rainfall in southwest Volusia County in August 2008, nine (9) structures within the City of DeBary that had experienced significant structural flooding were targeted for acquisition and demolition. The City of DeBary was able to implement this project with FEMA's financial assistance via the Flood Mitigation Assistance grant program. Parcels where flood-impacted home structures once existed were converted into open space and will remain in that state in perpetuity.

Pine Valley Court Home Buy-Out Project (\$250K project cost): This property experienced considerable structural flooding after severe storm events that prompted the City of DeBary to purchase the affected property in 2009 and demolish it soon thereafter while keeping the parcel as open space in perpetuity. This project was possible due to FEMA's financial contribution via the Flood Mitigation Assistance Program.

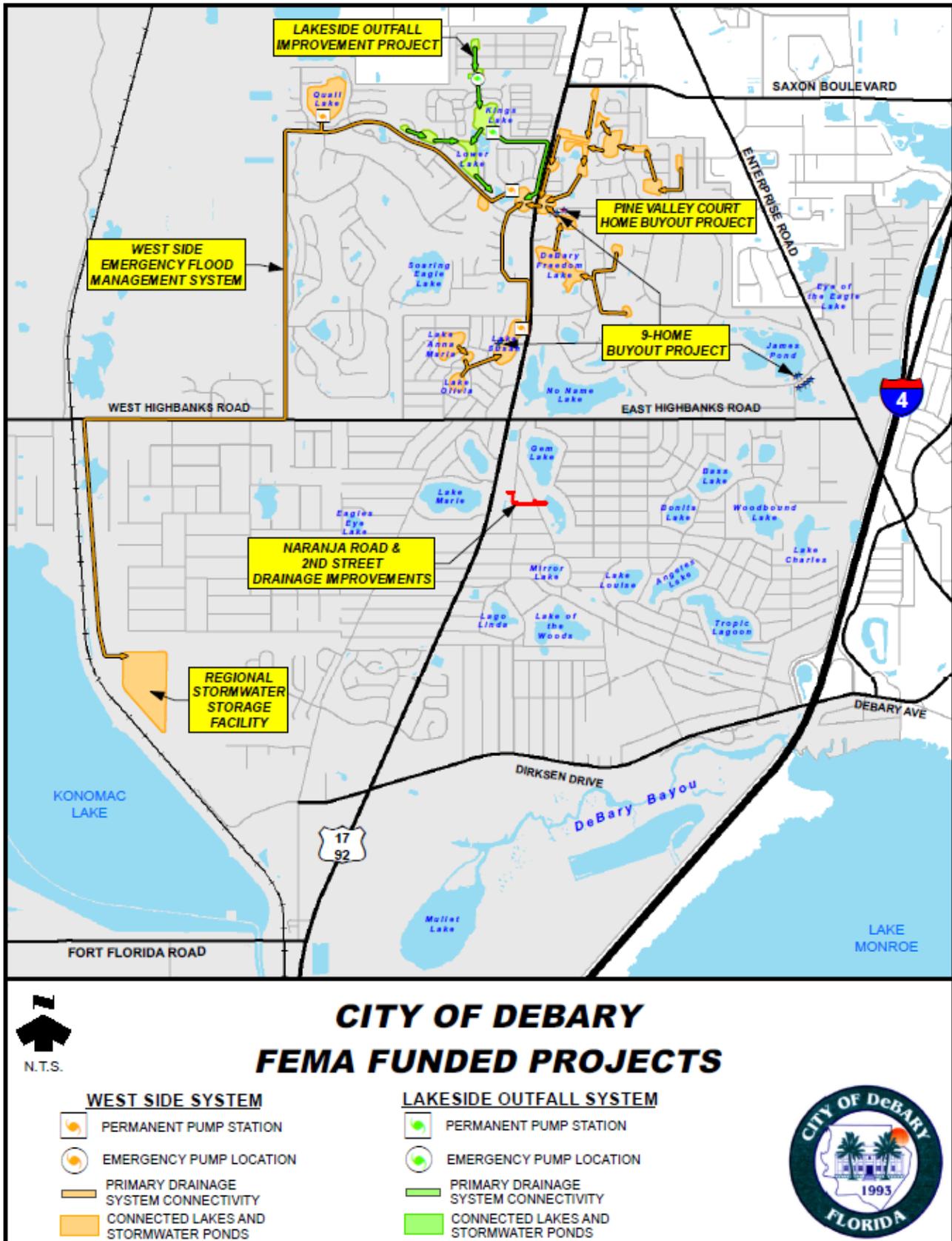
Naranja Road and 2nd Street Drainage Improvements (\$225K project cost): The 2004 hurricanes (Charley, Frances and Jeanne), Tropical Storm Fay in August 2008 and the Gulf Gale storm in May 2009 caused significant flooding in the vicinity of Naranja Road, 2nd Street and Alicante Road. The homes located at 46 and 48 Naranja Road experienced substantial flood damage, and the structure foundation and concrete slab of the home at 49 Alicante Road experienced substantial erosion and undermining as well as the rear deck of 53 Alicante Road. FEMA funding was secured via a Hazard Mitigation Grant Program grant application for the construction of a new drainage system including an overflow structure for the depressional area near 46 and 48 Naranja Road connected to storm pipes and structures along Naranja Road, 2nd Street and Alicante Road. The system was designed to discharge to Half Moon Lake in the vicinity of 49 and 53 Alicante Road. DeBary's mitigation projects are pictured on the next page of this report.

Regional Success Stories

Jurisdictions in Volusia County took part in a number of cross-jurisdictional projects that aimed to improve resiliency in the County. One example is the East Central Florida Resiliency Action Plan, which was developed by the East Central Florida Regional Planning Council with direction and collaboration from all jurisdictions in Volusia and Brevard counties. This plan developed best practices for hazard mitigation (including maintenance of the Mitigation Plan), provided clear data to cities on multiple hazards, such as sea level rise, and developed mock timeframes for cities to potentially follow in order to improve their mitigation efforts and overall resiliency. DeLand, Deltona, Orange City, New Smyrna Beach, the River to Sea TPO, Oak Hill and Lake Helen have adopted this plan. Following the adoption of the Regional Resiliency Action Plan, the East Central Florida Regional Resiliency Collaborative was established to increase resiliency and sustainability in the east central Florida Region. The cities of DeLand, Deltona, Lake Helen, New Smyrna Beach, Oak Hill, Orange City, Ormond Beach and Ponce Inlet have become partners of the collaborative.

Finally, in 2019 and 2020, all jurisdictions in the county took part in a project with the Florida Department of Environmental Protection and the East Central Florida Regional Planning Council to assess risk to critical facilities and projects included in the Mitigation Plan to sea level rise, storm surge, and the combined effects of storm surge and sea level rise. On February 7th, 2020, from 1:00 PM to 4:30 PM, all cities in the county got together for a workshop to view their mitigation projects and critical facilities alongside these hazard zones. Vulnerabilities were discussed, as was the LMS priority project ranking system. A full plan will be completed in April with input from cities incorporated.

SECTION 8: MITIGATION STRATEGY



SECTION 8: MITIGATION STRATEGY

Edgewater

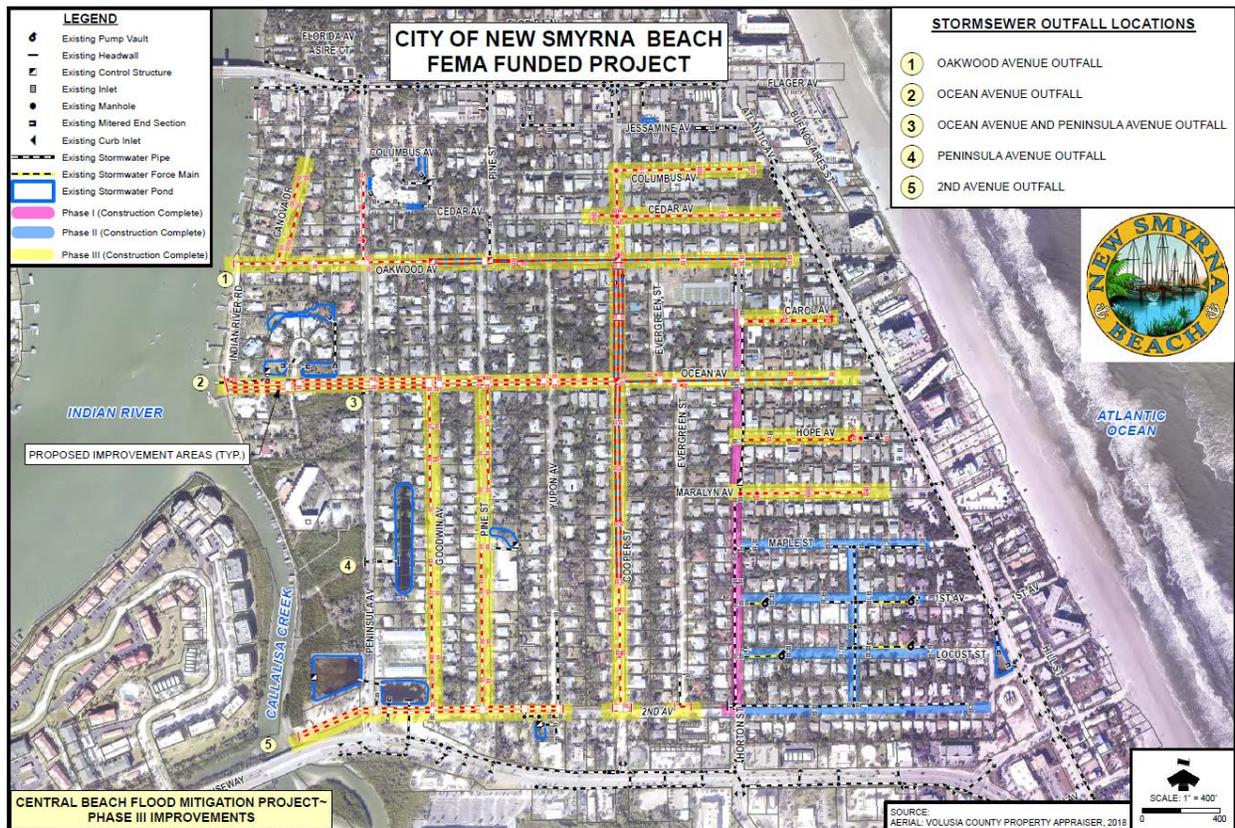
The City of Edgewater has demonstrated a proactive operation by embarking on mitigation projects using city and grant funds to prevent further damage or loss of public and private properties.

- ▶ The City purchased a repetitive loss home on West Pine Bluff, demolished it and constructed a retention pond to eliminate flooding in the neighborhood.
- ▶ City owned facilities were improved to be more storm resistant using city and grant funds.
- ▶ Stormwater pipe was lined in the Wildwood Subdivision to prevent the continual flooding using city funds.
- ▶ The Environmental Services Department Stormwater Division provides continual maintenance to all canals, swales, and retention points to eliminate problems with the stormwater system throughout the city.
- ▶ Seagrass was planted along the riverbank at Kennedy Park to eliminate erosion of shoreline.

New Smyrna Beach

Central Beach Flood Mitigation Improvements (\$5.0 million project cost): During November of 2001, the Central Beach area experienced significant structural and roadway flooding due to several factors ranging from approximately 9.5-inches of rainfall and high tides to reduction in flood storage and increased impervious area due to in-fill development over the years. Phases I and II were constructed by 2004 and in 2005 the City implemented Phase III with financial assistance from FEMA via the Flood Mitigation Assistance Program. Specifically, the proposed Phase III stormwater conveyance improvements included upgrades to the existing stormwater management systems and construction of new storm sewer systems to provide adequate flood protection for the residences within the Central Beach 206-acre watershed. The improvements are located within the rights-of-way of the following twelve (12) roads: Columbus Avenue, Cedar Avenue, Oakwood Avenue, Carol Avenue, Ocean Avenue, Hope Avenue, Maralyn Avenue, Canova Drive, Goodwin Avenue, South Pine Street, Cooper Street, and 2nd Avenue. In addition to the conveyance system upgrades (storm sewer pipes, drainage inlets, and pumps), exfiltration systems were implemented within segments of the Cooper Street, Oakwood Avenue and Ocean Avenue rights-of-way in order to provide a water quality benefit to the Indian River.

SECTION 8: MITIGATION STRATEGY



Since the implementation and completion of this multi-faceted project, no homeowners have reported flooding to their properties in the Laurel Creek Basin mitigated area

Ormond Beach

During the period of May 17-24, 2009, the City of Ormond Beach experienced a storm event that resulted in many areas of the City receiving approximately 27 inches of rainfall. There was significant flooding of homes and streets primarily in the Laurel Creek drainage basin area. In June 2009, the City Commission authorized a stormwater study to be performed by its stormwater consultant to determine what improvements could be made to prevent future flooding incidences from occurring. The Study recommended a two-phase approach and the City using primarily HMGP funding completed: Phase 1: the interconnection of the Central Park lakes 1-5 to Laurel Creek, reconstruction of Hand Avenue, installation of a new drainage system to reduce flooding frequency; and Phase 2: implementation of a system to drawdown more rapidly during extreme events using a pump station with an associated treatment pond and force main to the Halifax River. Also, Continuous Monitoring and Adaptive Control (CMAC) Technology was installed to control the lake levels.

South Daytona

After Tropical Storm Gordon, the City of South Daytona set an aggressive course to eliminate the flooding of homes. To achieve this, South Daytona increased stormwater utility fees to fund many of the needed improvements to protect residents and their homes and made major changes to the building standards. While the system is not perfect, the number of homes with storm water damage in the most recent storm dropped from 300 homes during Gordon to 16. This reflects an 80 percent reduction in homes flooded.

8.6 PLAN UPDATE REQUIREMENT

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. These updates have been provided in Section 9: *Mitigation Action Plan*.

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 are 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.

The LMS “Volusia Prepares” working group did not alter the priority ranking system since the 2015 plan update. Future consideration will be given to the potential impacts of sea level rise and storm surge, but those amendments have not been finalized. Initial conversation on updating the priority ranking system occurred on February 9th, 2020 at the FDEP Volusia County Project Meeting (previously referred to in this report).

Table 9.1 describes the key elements of the Mitigation Action Plan.

SECTION 9: MITIGATION ACTION PLAN

Table 9.1: 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	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 file for each initiative (e.g., location, damage history, specific mitigation measure, estimated cost, etc.)
Funding	If applicable, 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	<p>The status indicators for each initiative is as follows:</p> <ul style="list-style-type: none"> • C = Current • D = Deferred <i>***See notes under “Completion Date” above***</i> • N = New • T = Terminated <i>***See notes under “Completion Date” above***</i> • U = Updated

SECTION 9: MITIGATION ACTION PLAN

Each mitigation initiative has been scored by the responsible jurisdiction. The scoring system is included in Section 8: Mitigation Strategy (Table 8.1).

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”. Once the BCA is run, a numerical priority will be assigned.

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 half support flood hazard vulnerability reduction.

The open mitigation initiatives are listed in the Action Plan in **Table 9.2**. If a mitigation initiative does not have a status indicator, it is considered “open”. A live listing of mitigation projects can be found via the online link in Appendix F.

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: MITIGATION ACTION PLAN

Table 9.2: Mitigation Action Plan: Open Mitigation Initiatives by Jurisdiction (as of 10/21/2019)

Status: *C = Current*

Category: *P = Prevention; PP = Property Protection; S = Structural; ES = Emergency Services; PE = Education*

Priority	Jurisdiction	Responsible Organization	Hazard(s)	Mitigation Technique Category	Initiative	Funding	Approved by LMS Working Group	Original Anticipated Completion	Status
	Ormond Beach	City Engineer	Flood	S	VOL-0452 Flooding control pump on Fleming Ave., which will discharge into the Halifax River.	HMGP	3/30/2015	1/1/2016	C
	South Daytona	Community Development	Flood	P	VOL-0453 Purchase a vacant parcel of land and install a stormwater retention pond to help recent flooding.	HMGP	10/13/2015	1/1/2016	C
	Holly Hill	Public Works	Multi	PP	VOL-0457 Hurricane Shutters and City Hall Annex	HMGP	9/11/2013	1/1/2016	C
	Deltona	Public Works	Flood		VOL-0460 Exmore Avenue Stormwater Improvements	HMGP FMA	6/13/2014	1/1/2016	C
	Deltona	Public Works	Flood		VOL-0461 Lamplighter Section Line Stormwater Improvements	HMGP FMA	6/14/2014	1/1/2016	C
	Deltona	Public Works	Flood		VOL-0463 Montebello Avenue Stormwater Improvements	HMGP FMA	6/16/2014	1/1/2016	C
	Deltona	Public Works	Flood		VOL-0464 Picasso Avenue Stormwater Improvements	HMGP FMA	6/17/2014	1/1/2016	C
	Deltona	Public Works	Flood		VOL-0465 Tune Avenue Stormwater Improvements	HMGP FMA	6/18/2014	1/1/2016	C
	Deltona	Public Works	Flood		VOL-0466 Zinnia Avenue Stormwater Improvements	HMGP FMA	6/19/2014	1/1/2016	C

SECTION 9: MITIGATION ACTION PLAN

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Priority	Jurisdiction	Responsible Organization	Hazard(s)	Mitigation Technique Category	Initiative	Funding	Approved by LMS Working Group	Original Anticipated Completion	Status
	New Smyrna Beach	Fire	Flood		VOL-0467 Isleboro subdivision storm water management	HMGP	3/11/2015	1/1/2016	C
	Ormond Beach	Engineering	Flood	P	VOL-0468 772 N Beach St convert property into a stormwater storage site to aid in the prevention of flooding.	FMA	8/14/2015	1/1/2016	C
	South Daytona	Public Works	Flood	P	VOL-0469 Construction of stormwater management system adjacent to City Hall. This will help emergency vehicles have more access to the road during minor storm events.	HMGP	8/14/2015	1/1/2016	C
33	Ormond Beach	Public Works	Flood	PP P	VOL-0472 Wilmette Avenue Stormwater Pump Station - install permanent pump station Laurel Creek	HMGP	12/14/2016	Jan-21	C
33	Ormond Beach	Public Works	All Hazard	PP ES	VOL-0473 Ormond Beach Lift Station backup - purchase 4 pumps	HMGP	12/14/2016	Jan-21	C
21	Holly Hill	Public Works	Flood	PP	VOL-0474 Cordova Drainage Basin Improvements Phase I	HMGP	12/14/2016	Jan-21	C
40	FL Hospital	EM Coordinator	All Hazard	PP ES	VOL-0475 Emergency power upgrade for hospital critical infrastructure sustainability during power outages at FL Hospital Memorial Medical Center	HMGP	12/14/2016	Jan-21	C
40	FL Hospital	EM Coordinator	All Hazard	ES	VOL-0476 Emergency power upgrade for hospital critical infrastructure sustainability during power outages at FL Hospital Oceanside	HMGP	12/14/2016	Jan-21	C

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Priority	Jurisdiction	Responsible Organization	Hazard(s)	Mitigation Technique Category	Initiative	Funding	Approved by LMS Working Group	Original Anticipated Completion	Status
23	FL Hospital NSB	EM Coordinator	Wind	P PP S ES	VOL-0477 The entire hospital roof replacement to bring it up to Miami Dade Wind Code	HMGP	12/14/2016	Jan-21	C
23	FL Hospital NSB	EM Coordinator	Wind	P PP S ES	VOL-0478 Building sealing and wet glazing windows (GP_2) to mitigate the loss of any future hospital services and bring facility to Miami Dade Code	HMGP	12/14/2016	Jan-21	C
23	FL Hospital NSB	EM Coordinator	Wind	P PP S ES	VOL-0479 Electrical infrastructure for Chiller and Life Safety redundancy	HMGP	12/14/2016	Jan-21	C
38	Port Orange	Public Works	Flood	P PP S	VOL-0480 White Place and Riverside Drive drainage improvements	HMGP	12/14/2016	Jan-21	C
32	Port Orange	Public Works	Flood	P PP S	VOL-0481 Tumblebrook Drive (Sweetwater Hills) stormwater improvements (201409)	HMGP	12/14/2016	Jan-21	C
34	Port Orange	Public Works	Flood	P PP S	VOL-0482 Southwinds Stormwater Pond Outfall Retrofit (201441)	HMGP	12/14/2016	Jan-21	C
38	Port Orange	Public Works	Flood	P PP S	VOL-0483 Pipe replacement (201647) replace pipe with reinforced concrete pipe to improve stormwater conveyance to reduce potential for flooding	HMGP	12/14/2016	Jan-21	C
39	Port Orange	Public Works	Flood	P PP S	VOL-0484 Storm drain pipe lining (180202)	HMGP	12/14/2016	Jan-21	C

SECTION 9: MITIGATION ACTION PLAN

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Priority	Jurisdiction	Responsible Organization	Hazard(s)	Mitigation Technique Category	Initiative	Funding	Approved by LMS Working Group	Original Anticipated Completion	Status
24	Edgewater	Public Works	Flood Surge Wind	P PP S NS	VOL-485 - Generators for City of Edgewater lift stations (4)	HMGP	12/14/2016	Jan-21	C
23	Edgewater	Public Works	All Hazard	NS ES	VOL-0486 Portable Generators - Traffic Signals (7)	HMGP	12/14/2016	Jan-21	C
22	Edgewater	Public Works	All Hazard	NS ES	VOL-0487 - Edgewater Code House generator	HMGP	12/14/2016	Jan-21	C
22	Edgewater	Public Works	Wind	PP	VOL-0488 Impact windows for YMCA facility - critical facility for shelter	HMGP	12/14/2016	Jan-21	C
22	Edgewater	Public Works	Wind	PP	VOL-0489 - Impact windows for City of Edgewater Wastewater Administration Building	HMGP	12/14/2016	Jan-21	C
22	Edgewater	Public Works	Wind	PP	VOL-0490 - Impact windows for City of Edgewater Parks & Recreation Office Building	HMGP	12/14/2016	Jan-21	C
22	Edgewater	Public Works	Wind	PP	VOL-0491 - Impact windows City of Edgewater Fire Station #57	HMGP	12/14/2016	Jan-21	C
22	Edgewater	Public Works	Wind	PP	VOL-0492 Impact windows for City of Edgewater Fire Hall - houses emergency personnel during a disaster event	HMGP	12/14/2016	Jan-21	C
22	Edgewater	Public Works	Wind	PP	VOL-0493 Impact windows Code House - houses emergency personnel during a disaster event	HMGP	12/14/2016	Jan-21	C

SECTION 9: MITIGATION ACTION PLAN

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Priority	Jurisdiction	Responsible Organization	Hazard(s)	Mitigation Technique Category	Initiative	Funding	Approved by LMS Working Group	Original Anticipated Completion	Status
22	Edgewater	Public Works	Wind	PP	VOL-0494-Revised Harden Edgewater Wasterwater Treatment Plant 500 W. Ocean Avenue, Edgewater with safe harbor room	HMGP	12/14/2016	Jan-21	C
22	Edgewater	Public Works	Wind	PP	VOL-0495 Harden Edgewater Wasterwater Treatment Plant/EOC, 3315 SR 442, Edgewater with safe harbor room	HMGP	12/14/2016	Jan-21	C
21	Edgewater	Public Works	All Hazard	NS ES	VOL-0496 - Edgewater City Hall generator - purchase & installation	HMGP	12/14/2016	Jan-21	C
21	Edgewater	Public Works	All Hazard	NS ES	VOL-0497 - Water Treatment Plant/EOC Generator replacement	HMGP	12/14/2016	Jan-21	C
20	Edgewater	Public Works	Flood	P PP S NS	VOL-0498 - Acquire & demolish repetitive flood loss home at 405 Hart Avenue	HMGP FMA	12/14/2016	Jan-21	C
20	Edgewater	Public Works	Flood Surge Wind	P PP S	VOL-0499 - Menard May Park Erosion Project shoreline stabilization. Timber pier replacement, fishing pier lighting, & upland retaining wall.	HMGP	12/14/2016	Jan-21	C
33	Halifax Health	Halifax Health	All Hazard	P PP S NS ES	VOL-0500 - Data Center hardening @ Daytona Beach campus	HMGP	1/25/2017	Jan-21	C
34	Halifax Health	Halifax Health	All Hazard	P PP NS ES	VOL-0502 Replacement of 3 (1960 Diesel) Emergency power generators and transfer switches	HMGP	1/25/2017	Jan-21	C
34	Halifax Health	Halifax Health	All Hazard	P PP NS ES	VOL-0503 Emergency power for HVAC equipment at Port Orange Hospital facility	HMGP	1/25/2017	Jan-21	C

SECTION 9: MITIGATION ACTION PLAN

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Priority	Jurisdiction	Responsible Organization	Hazard(s)	Mitigation Technique Category	Initiative	Funding	Approved by LMS Working Group	Original Anticipated Completion	Status
21	Lake Helen	Lake Helen	All Hazard	PP NS	VOL-0504 City of Lake Helen Virginia Drive Sub-base stabilization and repaving.	HMGP	1/25/2017	Jan-21	C
24	Lake Helen	Lake Helen	Flood	NS	VOL-0505 City of Lake Helen Ohio stormwater culvert	HMGP	1/25/2017	Jan-21	C
27	Lake Helen	Lake Helen	Flood Wind	PP	VOL-0506 City of Lake Helen Police Dept/EOC flood and wind prevention by sealing for water and protecting doors & windows	HMGP	1/25/2017	Jan-21	C
33	Holly Hill	Holly Hill	Flood Surge	PP S	VOL-0507 Drainage improvements - installation of 29 duckbill valves along outfalls to Halifax River	HMGP	1/25/2017	Jan-21	C
31	Holly Hill	Holly Hill	Flood Surge	PP	VOL-0508 - Shutters for City Hall	HMGP	1/25/2017	Jan-21	C
34	Ormond Beach	Ormond Beach	All Hazard	ES	VOL-0509 Ormond Beach Emergency Operations Center - build Community Center that will be used as EOC in disaster	HMGP	1/25/2017	Jan-21	C
28	DeLand	DeLand	All Hazard	PP NS ES	VOL-0510 Standby generator power for Sanborn Center which is used for meal prep for 1st responders in disaster	HMGP	1/25/2017	Jan-21	C
33	South Daytona	South Daytona	All Hazard	ES	VOL-0511 permanent generator for the Piggotte Center - critical facility during disasters	HMGP	2/6/2017	Jan-21	C
38	Ormond Beach	Ormond Beach	Flood	P PP NS	VOL-0512 Fleming Avenue Stormwater improvements	HMGP	2/6/2017	Jan-21	C

SECTION 9: MITIGATION ACTION PLAN

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Priority	Jurisdiction	Responsible Organization	Hazard(s)	Mitigation Technique Category	Initiative	Funding	Approved by LMS Working Group	Original Anticipated Completion	Status
34	Holly Hill	Holly Hill	Wind	ES	VOL-0513 Hurricane rated bay doors at the Fire Station (4 bay doors)	HMGP	2/6/2017	Jan-21	C
32	Volusia County	Public Works	Flood	P PP S	VOL-0514 Rio Way Regional Retention Pond	HMGP	2/6/2017	Jan-21	C
35	Port Orange	Public Works	All Hazard	ES	VOL-0515 Backup generators for Fire Stations 71 and Fire Station 73	HMGP	2/6/2017	Jan-21	C
28	School Board	School Board	All Hazard	NS ES PE	VOL-0516 Provide emergency generators for 9 shelter locations	HMGP	2/6/2017	Jan-21	C
28	School Board	School Board	All Hazard	NS ES PE	VOL-0517 Upgrade 6 shelter locations - provide emergency generator connections and air quality improvements	HMGP	2/6/2017	Jan-21	C
28	School Board	School Board	All Hazard	NS ES PE	VOL-0518 Upgrade 3 shelter locations - provide emergency generators connections and air quality improvements	HMGP	2/6/2017	Jan-21	C
38	Port Orange	Public Works	Flood	P S PP	VOL-0519 Virginia and Monroe Street Drainage Improvement	HMGP	5/26/2017	Jan-21	C
20	Lake Helen	Lake Helen	Flood, Wind	ES	VOL-0520 City of Lake Helen Pre-Disaster Mitigation Proposal	HMGP	9/26/2017	Jan-21	C
39	Ormond Beach	Ormond Beach	Flood	P PP NS	VOL-0521 Woodrige Drive Drainage Improvements	HMGP	12/13/2017	Jan-21	C

SECTION 9: MITIGATION ACTION PLAN

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Status: *C = Current*

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Priority	Jurisdiction	Responsible Organization	Hazard(s)	Mitigation Technique Category	Initiative	Funding	Approved by LMS Working Group	Original Anticipated Completion	Status
28	Volusia County	Emergency Management (VC)	All Hazard	P PP S	VOL-0522 1048 Shockney Drive Elevation & Retrofit	HMGP	12/13/2017	Jan-21	C
28	Volusia County	Emergency Management (VC)	All Hazard	P PP S	VOL-0523 1013 Shockney Drive Elevation & Retrofit	HMGP	12/13/2017	Jan-21	C
28	Volusia County	Emergency Management (VC)	All Hazard	P PP S	VOL-0524 988 Shockney Drive Elevation & Retrofit	HMGP	12/13/2017	Jan-21	C
28	Volusia County	Emergency Management (VC)	All Hazard	P PP S	VOL-0525 356 Seminole Drive Elevation & Retrofit	HMGP	12/13/2017	Jan-21	C
28	Volusia County	Emergency Management (VC)	All Hazard	P PP S	VOL-0526 Cherokee Road Elevation & Retrofit	HMGP	12/13/2017	Jan-21	C
28	Volusia County	Emergency Management (VC)	All Hazard	P PP S	VOL-0527190 Flamingo Drive Elevation & Retrofit	HMGP	12/13/2017	Jan-21	C
28	Volusia County	Emergency Management (VC)	All Hazard	P PP S	VOL-0528 241 Cherokee Road Elevation & Retrofit	HMGP	12/13/2017	Jan-21	C
28	Volusia County	Emergency Management (VC)	All Hazard	P PP S	VOL-0529 1052 Shockney Drive Elevation & Retrofit	HMGP	12/13/2017	Jan-21	C
29	Holly Hill	Public Works	Flood	P	VOL-0530 Drainage Improvements South Espanola Avenue	HMGP	12/13/2017	Jan-21	C

SECTION 9: MITIGATION ACTION PLAN

Table 9.2: Mitigation Action Plan: Open Mitigation Initiatives by Jurisdiction (as of 10/21/2019)

Status: *C = Current*

Category: *P = Prevention; PP = Property Protection; S = Structural; ES = Emergency Services; PE = Education*

Priority	Jurisdiction	Responsible Organization	Hazard(s)	Mitigation Technique Category	Initiative	Funding	Approved by LMS Working Group	Original Anticipated Completion	Status
25	Deltona	City of Deltona	All Hazard	PP S ES	VOL-0531 Hardening Critical Facilities in Deltona: Station 64	Retrofit Public/Historic Structures	12/13/2017	Jan-21	C
25	Deltona	City of Deltona	All Hazard	PP S ES	VOL-0532 Hardening Critical Facilities in Deltona: Deltona Water	Retrofit Public/Historic Structures	12/13/2017	Jan-21	C
25	Deltona	City of Deltona	All Hazard	PP S ES	VOL-0533 Hardening Critical Facilities in Deltona: Public Works	Retrofit Public/Historic Structures	12/13/2017	Jan-21	C
37	Halifax Health	Halifax Health	Flood Surge Wind	P PP	VOL-0534 Hardening of Hospice Critical Care Site at Port Orange Beach Care Center 2nd Floor	HMGP	12/13/2017	Jan-21	C
37	Halifax Health	Halifax Health	Flood Surge Wind	P PP	VOL-0535 Hardening of Hospice Critical Care Site at Ormond Beach Care Center	HMGP	12/13/2017	Jan-21	C

SECTION 9: MITIGATION ACTION PLAN

Table 9.2: Mitigation Action Plan: Open Mitigation Initiatives by Jurisdiction (as of 10/21/2019)

Status: *C = Current*

Category: *P = Prevention; PP = Property Protection; S = Structural; ES = Emergency Services; PE = Education*

Priority	Jurisdiction	Responsible Organization	Hazard(s)	Mitigation Technique Category	Initiative	Funding	Approved by LMS Working Group	Original Anticipated Completion	Status
37	Halifax Health	Halifax Health	Flood Surge Wind	P PP	VOL-0536 Hardening of Hospice Critical Care Site at Southeast Volusia Care Center	HMGP	12/13/2017	Jan-21	C
37	Halifax Health	Halifax Health	Flood Surge Wind	P PP	VOL-0537 Hardening of Hospice Critical Care Site at West Volusia Care Center	HMGP	12/13/2017	Jan-21	C
24	Deltona	City of Deltona	Wind	P PP ES	VOL-0538 Retrofit roof of City Hall	HMGP	12/13/2017	Jan-21	C
26	Holly Hill	City of Holly Hill	Wind	P PP ES	VOL-0539 Hardening of Sica Hall Community Center- Special needs post disaster shelter	HMGP	12/13/2017	Jan-23	C
28	Ormond Beach	City of Ormond Beach	Flood	P PP S	VOL-0540 Elevate and retrofit flood damaged home- 520 W St. Ormond Beach, FL	HMGP	12/13/2017	Jan-23	C
32	Port Orange	City of Port Orange	Flood	P PP NS	VOL-0541 Howes Street drainage improvements	HMGP	4/16/2018	Jan-23	C
24	Edgewater	City of Edgewater	Flood Surge Wind	P PP S ES	VOL-0542 Improvement #1 to 50 lift stations in Edgewater	HMGP	4/16/2018	Jan-23	C
24	Edgewater	City of Edgewater	Flood Surge Wind	P PP S ES	VOL-0543 Improvement #2 to 50 lift stations in Edgewater	HMGP	4/16/2018	Jan-23	C
24	Edgewater	City of Edgewater	Flood Surge Wind	P PP S ES	VOL-0544 Improvement #3 to 50 lift stations in Edgewater	HMGP	4/16/2018	Jan-23	C

SECTION 9: MITIGATION ACTION PLAN

Table 9.2: Mitigation Action Plan: Open Mitigation Initiatives by Jurisdiction (as of 10/21/2019)

Status: *C = Current*

Category: *P = Prevention; PP = Property Protection; S = Structural; ES = Emergency Services; PE = Education*

Priority	Jurisdiction	Responsible Organization	Hazard(s)	Mitigation Technique Category	Initiative	Funding	Approved by LMS Working Group	Original Anticipated Completion	Status
29	Holly Hill	City of Holly Hill	Surge	P ES NS	VOL-0545 Generator for Sica Hall	HMGP	4/16/2018	Jan-23	C
34	Ormond Beach	City of Ormond Beach	Flood	P PP ES	VOL-0546 Strickland Creek flood protection	HMGP	4/16/2018	Jan-23	C
31	Ormond Beach	City of Ormond Beach	Flood	P PP	VOL-0547 Drainage improvements	HMGP	4/16/2018	Jan-23	C
33	Ormond Beach	City of Ormond Beach	Wind	P PP ES PE	VOL-0548 Hardening Critical Facilities in Ormond Beach: City Hall, Police Dept, Fleet Ops, Public Works, and Art Center	HMGP	4/16/2018	Jan-23	C
28	New Smyrna Beach	City of New Smyrna Beach	Flood	P PP S	VOL-0549 Elevation of flood- prone homes	HMGP	4/16/2018	Jan-23	C
28	New Smyrna Beach	City of New Smyrna Beach	Flood	P PP S	VOL-0549 Elevation of flood- prone homes	HMGP	4/16/2018	Jan-23	C
28	New Smyrna Beach	City of New Smyrna Beach	Flood	P PP S	VOL-0551 Acquisition and Demolition of Flood Prone Homes	HMGP	4/16/2018	Jan-23	C
26	South Daytona	City of South Daytona	Flood	P PP S	VOL-0552 Elevation of flood- prone home	HMGP	4/16/2018	Jan-23	C
	Holly Hill	City of Holly Hill	Flood	P PP S ES	VOL- 0553 Lift Station #9 Refurbishment	HMGP	6/20/2018	Jan-23	C

SECTION 9: MITIGATION ACTION PLAN

Table 9.2: Mitigation Action Plan: Open Mitigation Initiatives by Jurisdiction (as of 10/21/2019)

Status: *C = Current*

Category: *P = Prevention; PP = Property Protection; S = Structural; ES = Emergency Services; PE = Education*

Priority	Jurisdiction	Responsible Organization	Hazard(s)	Mitigation Technique Category	Initiative	Funding	Approved by LMS Working Group	Original Anticipated Completion	Status
	Holly Hill	City of Holly Hill	Flood	P PP S ES	VOL-0554 Lift Station # 19 Refurbishment	HMGP	6/20/2018	Jan-23	C
	Holly Hill	City of Holly Hill	Flood	P PP S ES	VOL-0555 Lift Station #21 Refurbishment	HMGP	6/20/20118	Jan-23	C
	Ormond Beach	City of Ormond Beach	Flood	P PP S	VOL-0556 Elevation of Flood- prone home	HMGP	6/20/2018	Jan-23	C
	FL Hospital MMC	Florida Hospital Memorial Medical Center	All Hazard	P PP S ES	VOL-0557 Emergency Power Upgrade	HMGP	9/12/2018	Jan-23	C
	Ormond Beach	City of Ormond Beach	Flood Surge	P PP S	VOL-0558 Acquire and Demolish Flood-prone home	FMA	9/12/2018	Jan-23	C
	FL Hospital DeLand	Florida Hospital DeLand	All Hazard	P PP S	VOL-559 Roof Repair and Strengthen	HMGP	9/12/2018	Jan-23	C
	Volusia County	VCEM	Riverine Surge	P PP S	VOL-0560 Elevate and retrofit flood prone home	FMA	10/3/2019	Jan-24	C
	Volusia County	VCEM	Riverine Surge	P PP S	VOL-0561 Elevate and retrofit flood prone home	FMA	10/3/2019	Jan-24	C
	FL Hospital DeLand	Florida Hospital DeLand	All Hazard	P PP S	VOL-0562 Upgrade Windows	HMGP	9/12/2018	Jan-23	C

SECTION 9: MITIGATION ACTION PLAN

Table 9.2: Mitigation Action Plan: Open Mitigation Initiatives by Jurisdiction (as of 10/21/2019)

Status: *C = Current*

Category: *P = Prevention; PP = Property Protection; S = Structural; ES = Emergency Services; PE = Education*

Priority	Jurisdiction	Responsible Organization	Hazard(s)	Mitigation Technique Category	Initiative	Funding	Approved by LMS Working Group	Original Anticipated Completion	Status
	Holly Hill	The City of Holly Hill	Flood	P PP S	VOL-563 Elevation of home at 318 Riverside Dr.	HMGP	9/12/2018	Jan-23	C
	DeLand	City of DeLand	All Hazard	P PP S	VOL- 564 Generator Power for sheltering	HMGP	3/20/2019	Jan-24	C
	Volusia County	VCEM	Flood	P PP S	VOL- 0565 Elevate and Retrofit home at 1036 Shockney Dr Ormond Beach	FMA	10/3/2019	Jan-24	C
	Volusia County	VCEM	Flood	P PP S	VOL- 0566 Elevate and Retrofit home at 6411 River Road New Smyrna Beach	FMA	10/3/2019	Jan-24	C
	Volusia County	VCEM	Flood	P PP S	VOL- 0567 Elevate and Retrofit home at 364 Seminole Dr Ormond Beach	FMA	10/3/2019	Jan-24	C

SECTION 9: MITIGATION ACTION PLAN

Completed, Deleted and Deferred Projects Since the 2015 Update

The following mitigation projects were completed, deleted or deferred since the 2015 LMS update:

Table 9.3: Mitigation Action Plan: Completed, Deleted and Deferred Mitigation Initiatives by Jurisdiction (as of 10/21/2019)

Priority	Jurisdiction	Responsible Organization	Hazard(s)	Mitigation Technique Category	Initiative	Funding	Approved by LMS Working Group	Original Anticipated Completion	Status
	Deltona	Public Works	Flood		VOL-0458 Blackburn Avenue and Eldridge Street stormwater improvements	HMGP FMA	6/11/2014	1/1/2016	Completed
	Deltona	Public Works	Flood		VOL-0459 Brickell Drive stormwater improvements	HMGP FMA	6/12/2014	1/1/2016	Completed
	Deltona	Public Works	Flood		VOL-0462 Leland Drive stormwater improvements	HMGP FMA	6/15/2014	1/1/2016	Completed
35	Halifax Health	EM Coordinator	All Hazard	P PP NS ES	VOL-0501 Addition of 800-ton chiller at main campus – initiative cancelled, per FDEM not an eligible project	HMGP	N/A	N/A	Terminated due to funding issues (not eligible).

SECTION 10 – PLAN MAINTENANCE PROCEDURES

44 CFR Requirement

44 CFR Part 201.6(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 environments¹. When applicable, potential funding sources have been identified for proposed actions listed in the Mitigation Action Plan.

Volusia County and all Jurisdictions will integrate this Mitigation Plan into relevant County Government Jurisdictional 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

¹ A listing of key federal hazard mitigation funding sources can be found in the *Guide to Funding and Technical Assistance Programs*, provided as a separate annex to this Plan.

SECTION 10: PLAN MAINTENANCE PROCEDURES

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 Local Mitigation Strategy Coordinator and the Local Mitigation Strategy Working Group is responsible for reviewing the LMS plan on an annual basis in January to ensure information is correct, updates are made as needed, and to analyze any disasters from the previous year. The LMS Committee will meet at least annually. 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:

SECTION 10: PLAN MAINTENANCE PROCEDURES

- ▶ 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 3/6/2020: Aubrie Austin, Volusia County Emergency Management

Review Group Name: Volusia Prepares Working Group (see members on pages 2.5 and 2.6)

Interim LMS Review: LMS can be reviewed or commented on at any quarterly Volusia Prepares Meeting

2025 Review Date: The Volusia Prepares group will begin review no less than 365 days before the 2024-25 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

SECTION 10: PLAN MAINTENANCE PROCEDURES

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 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

10.3 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:

SECTION 10: PLAN MAINTENANCE PROCEDURES

- ▶ 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

APPENDIX A: PLAN ADOPTIONS

This portion of the report compiles Resolutions of Adoption from member jurisdictions of Volusia County approving the 2020 LMS plan update.

RESOLUTION NO. 2020-03

A RESOLUTION OF THE CITY OF DAYTONA BEACH SHORES, VOLUSIA COUNTY, FLORIDA IN SUPPORT OF THE 2020 VOLUSIA COUNTY LOCAL MITIGATION STRATEGY PLAN; ADOPTING THE PLAN INCLUDING THE FLOOD WARNING PLAN – APPENDIX K; PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, Article VIII, Section 2, *Constitution of the State of Florida*, authorizes the City of Daytona Beach Shores to exercise any power for municipal purposes except as otherwise provided by law; and

WHEREAS, coastal and riverine flooding are significant threats to the safety of residents of Volusia County and its municipalities; and

WHEREAS, the City Council of the City of Daytona Beach Shores recognizes the importance of reducing vulnerabilities to flood events for the overall good and welfare of the community; and

WHEREAS, City of Daytona Beach Shores has been an active participant in “Volusia Prepares” and its Local Mitigation Strategy Working Group, which has established a comprehensive, coordinated planning process involving the county and its municipalities, as well as other public and private sector organizations, to eliminate or decrease these vulnerabilities; and

WHEREAS, Daytona Beach Shores representatives and staff have identified, justified and prioritized a number of proposed projects and programs needed to mitigate the vulnerabilities of unincorporated areas of Volusia County to the impacts of future flood events; and

WHEREAS, the National Flood Insurance Program (NFIP) provides federally subsidized flood insurance in communities that regulate development in floodplains; and

WHEREAS, the National Flood Insurance Program Community Rating System (CRS) rates the various community floodplain management programs and reduces flood insurance premiums in those communities that meet Community Rating System Program requirements; and

WHEREAS, the proposed projects and programs are undertaken to reduce the potential for personal and property losses in flood-prone areas and ensure the lowest possible flood insurance premiums for residents; and

WHEREAS, the adoption of the 2020 Volusia County Integrated Floodplain Management Plan and its integration into the Local Mitigation Strategy is intended to support this effort; and

WHEREAS, the formal adoption of the Plan by the local governing body is a requirement of the Community Rating System Program;

NOW, THEREFORE, BE IT RESOLVED THAT THE CITY COUNCIL OF THE CITY OF DAYTONA BEACH SHORES, FLORIDA, AS FOLLOWS:

SECTION ONE. FINDINGS.

1. The City Council of the City of Daytona Beach Shores hereby accepts and approves of its designated portion of the Volusia County Integrated Floodplain Management Plan.
2. The City Council of the City of Daytona Beach Shores accepts and endorses the mitigation goals and objectives established by Volusia Prepares for the countywide Plan, and the anticipated schedule for the next updating of the strategy.
3. The City Council of the City of Daytona Beach Shores finds that the proposed flood mitigation projects and programs included in the Plan by other jurisdictions and organizations are acceptable, that they will not adversely affect the City or its neighborhoods, and that they do not conflict with or duplicate the flood mitigation proposals made by the City itself.
4. Relevant City Staff are requested and instructed to pursue available funding opportunities for implementation of the proposals designated therein.
5. The agencies and organizations within the City of Daytona Beach Shores will, upon receipt of such funding or other necessary resources, seek to implement the proposals contained in the City's individual section of the Plan.
6. The City Council of the City of Daytona Beach Shores will continue to participate in the updating and expansion of the Volusia County Integrated Floodplain Management Plan in the years ahead.
7. The City Council of the City of Daytona Beach Shores will further seek to encourage the businesses, industries and community groups operating within Daytona Beach Shores to also participate in the updating and expansion of the Volusia County Integrated Floodplain Management Plan in the years ahead.

SECTION TWO. SAVINGS. The prior actions of the City of Daytona Beach Shores relating to the local mitigation strategy and floodplain management are hereby ratified and affirmed.

SECTION THREE: CONFLICTS. All resolutions or parts thereof in conflict with this Resolution are hereby repealed to the extent of such conflict.

SECTION FOUR. SEVERABILITY. If any section, subsection, sentence, clause, phrase, or portion of this Resolution, or application hereof, is for any reason held invalid or unconstitutional by any court of competent jurisdiction, such portion or application shall be deemed a separate, distinct, and independent provision and such holding shall not affect the validity of the remaining portions thereof.

SECTION FIVE. EFFECTIVE DATE. This Resolution shall take effect immediately upon its adoption.

APPENDIX A: PLAN ADOPTIONS

CITY OF DAYTONA BEACH SHORES, FLORIDA

By: Nancy Miller
Mayor, Nancy Miller

ATTEST:

By: Michael T. Booker
Michael T. Booker, City Manager

Ch Schwab
Cheri Schwab, City Clerk

APPROVED AS TO FORM AND LEGALITY:

By: Raymond J. Branch
Raymond J. Branch, City Attorney

Passed and adopted on first reading this 26 day of May, 2020.

Posted this 27 day of May, 2020.

RESOLUTION NO. 2020-219

A RESOLUTION IN SUPPORT OF THE 2020 VOLUSIA COUNTY LOCAL MITIGATION STRATEGY PLAN; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, areas of the City of Daytona Beach are vulnerable to the human and economic costs of natural, technological, and societal disasters; and

WHEREAS, the City Commission of The City of Daytona Beach realizes the importance of reducing or eliminating those vulnerabilities for the overall good and welfare of the community; and

WHEREAS, The City of Daytona Beach has been an active participant in Volusia Prepares, the Local Mitigation Strategy working group, which has established a comprehensive, coordinated planning process involving the county and its municipalities, as well as other public and private sector organizations, to eliminate or decrease these vulnerabilities; and

WHEREAS, The City of Daytona Beach representatives and staff have reviewed the information provided by or for other participating jurisdictions and organizations, including the projects and programs they have proposed for incorporation into the Volusia County Local Mitigation Plan; and

WHEREAS, these proposed projects and programs have been incorporated into the current edition of the Volusia County Local Mitigation Plan, that has been prepared and issued for consideration and implementation by the communities and jurisdictions of Volusia County.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF DAYTONA BEACH, FLORIDA:

SECTION 1. The City Commission hereby accepts and approves of its designated portion of the Volusia County Local Mitigation Plan.

SECTION 2. The City Commission hereby accepts and endorses the mitigation goals and objectives established by Volusia Prepares for the Volusia County Local Mitigation Plan, and the anticipated schedule for the next updating of the plan.

SECTION 3. The City Commission hereby finds that the proposed mitigation projects and programs included in the Volusia County Local Mitigation Plan by other jurisdictions and organizations are acceptable, that they will not adversely affect the county or its neighborhoods, and that they do not conflict with or duplicate the mitigation proposals made by the county itself.

SECTION 4. The agency personnel of The City of Daytona Beach are requested and instructed to pursue available funding opportunities for implementation of the proposals designated in the Volusia County Local Mitigation Plan.

SECTION 5. The agencies and organizations within The City of Daytona Beach will, upon receipt of such funding or other necessary resources, seek to implement the proposals contained in the City's individual section of the Volusia County Local Mitigation Plan.

SECTION 6. The City of Daytona Beach will continue to participate in the updating and expansion of the Volusia County Local Mitigation Plan in the years ahead.

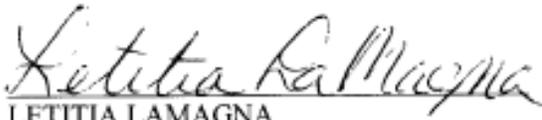
SECTION 7. The City of Daytona Beach will further seek to encourage the businesses, industries and community groups operating within the City of Daytona Beach to also participate in the updating and expansion of the Volusia County Local Mitigation Plan in the years ahead.

SECTION 8. The City Manager or his designee is hereby authorized to serve as the official representative and spokesperson for The City of Daytona Beach, regarding the activities and decisions of Volusia Prepares.

SECTION 9. This Resolution shall take effect immediately upon its adoption.


DERRICK L. HENRY
Mayor

ATTEST:


LETITIA LAMAGNA
City Clerk

Adopted: August 5, 2020

RESOLUTION 2020-19

**A RESOLUTION OF THE CITY OF DEBARY, FLORIDA; ADOPTING
THE VOLUSIA COUNTY LOCAL MITIGATION; PROVIDING AN
EFFECTIVE DATE**

Whereas, areas of the City of DeBary are vulnerable to the human and economic costs of natural, technological, and societal disasters, and

Whereas, the City of DeBary City Council realizes the importance of reducing or eliminating those vulnerabilities for the overall good and welfare of the community, and

Whereas, the City of DeBary has been an active participant in Volusia Prepares, the Local Mitigation Strategy working group, which has established a comprehensive, coordinated planning process involving the county and its municipalities, as well as other public and private sector organizations, to eliminate or decrease these vulnerabilities, and

Whereas, the City of DeBary representatives and staff have identified, justified and prioritized a number of proposed projects and programs needed to mitigate the vulnerabilities of unincorporated areas of Volusia County to the impacts of future disasters, and

Whereas, City of DeBary representatives and staff have reviewed the information provided by or for other participating jurisdictions and organizations, including the projects and programs they have proposed for incorporation into the Volusia County Local Mitigation Plan, and

Whereas, these proposed projects and programs have been incorporated into the current edition of the Volusia County Local Mitigation Plan that has been prepared and issued for consideration and implementation by the communities and jurisdictions of Volusia County,

Now therefore, be it resolved that,

- 1) The City of DeBary hereby accepts and approves of its designated portion of the Volusia County Local Mitigation Plan
- 2) The City of DeBary accepts and endorses the mitigation goals and objectives established by Volusia Prepares for the countywide plan, and the anticipated schedule for the next updating of the plan
- 3) The City of DeBary finds that the proposed mitigation projects and programs included in the plan by other jurisdictions and organizations are acceptable, that they will not adversely affect the county or its neighborhoods, and they do not conflict with or duplicate the mitigation proposals made by the county itself.
- 4) The agency personnel of the City of DeBary are requested and instructed to pursue available funding opportunities for implementation of the proposals designated therein,

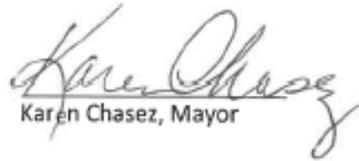
APPENDIX A: PLAN ADOPTIONS

- 5) The agencies and organizations within the City of DeBary will, upon receipt of such funding or other necessary resources, seek to implement the proposals contained in the county's individual section of the strategy, and
- 6) The City of DeBary will continue to participate in the updating and expansion of the Volusia County Local Mitigation Plan in the years ahead, and
- 7) The City of DeBary will further seek to encourage the businesses, industries and community groups operating within DeBary to also participate in the updating and expansion of the Volusia County Local Mitigation Plan in the years ahead.

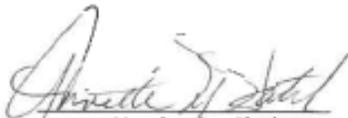
This Resolution shall take effect immediately upon its adoption.

ADOPTED BY the City Council of the City of DeBary, Florida this 1st day of July, 2020.

City Council
City of DeBary, Florida


Karen Chasez, Mayor

ATTEST:


Annette Hatch, City Clerk

RESOLUTION NO. 2020 - 32

**A RESOLUTION OF THE CITY COMMISSION OF DELAND, FLORIDA,
SUPPORTING THE VOLUSIA COUNTY LOCAL MITIGATION PLAN;
PROVIDING FOR SEVERABILITY AND AN EFFECTIVE DATE.**

WHEREAS, areas of the City of DeLand are vulnerable to the human and economic costs of natural, technological and societal disasters; and

WHEREAS, the City of DeLand governing body realizes the importance of reducing or eliminating those vulnerabilities for the overall good and welfare of the community; and

WHEREAS, the City of DeLand has been an active participant in Volusia Prepares, the Local Mitigation Strategy working group, which has established a comprehensive, coordinated planning process involving the county and its municipalities, as well as other public and private sector organizations, to eliminate or decrease these vulnerabilities; and

WHEREAS, the City of DeLand representatives and staff have identified, justified and prioritized a number of proposed projects and programs needed to mitigate the vulnerabilities of unincorporated areas of Volusia County to the impacts of future disasters; and

WHEREAS, the City of DeLand representatives and staff have reviewed the information provided by or for other participating jurisdictions and organizations, including the projects and programs they have proposed for incorporation into the Volusia County Local Mitigation Plan; and

WHEREAS, these proposed projects and programs have been incorporated into the current edition of the Volusia County Local Mitigation Plan that has been prepared and issued for consideration and implementation by the communities and jurisdictions of Volusia County.

NOW THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION OF DELAND, FLORIDA:

Section 1. The City of DeLand hereby accepts and approves of its designated portion of the Volusia County Local Mitigation Plan.

Section 2. The City of DeLand accepts and endorses the mitigation goals and objectives established by Volusia Prepares for the countywide plan, and the anticipated schedule for the next updating of the plan.

Section 3. The City of DeLand finds that the proposed mitigation projects and programs included in the plan by other jurisdictions and organizations are acceptable, that they will not adversely affect the county or its neighborhoods, and that they do not conflict with or duplicate the mitigation proposals made by the county itself.

APPENDIX A: PLAN ADOPTIONS

Section 4. The agency personnel of the City of DeLand are requested and instructed to pursue available funding opportunities for implementation of the proposals designated therein.

Section 5. The agencies and organizations within the City of DeLand will, upon receipt of such funding or other necessary resources, seek to implement the proposals contained in the county's individual section of the strategy.

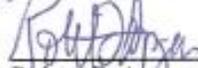
Section 6. The City of DeLand will continue to participate in the updating and expansion of the Volusia County Local Mitigation Plan in the years ahead.

Section 7. The City of DeLand will further seek to encourage the businesses, industries and community groups operating within the City of DeLand to also participate in the updating and expansion of the Volusia County Local Mitigation Plan in the years ahead.

Section 8. If any section, sentence, clause or phrase of this Resolution is held to be invalid or unconstitutional by any court of competent jurisdiction, that holding shall in no way affect the remaining portions of this Resolution.

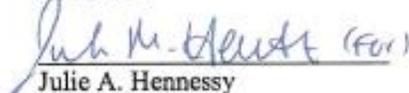
Section 9. This Resolution shall become effective immediately upon its adoption.

PASSED AND DULY ADOPTED this 4th day of May, 2020.



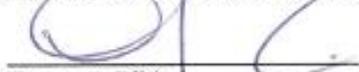
Robert F. Apgar
Mayor-Commissioner

ATTEST:



Julie A. Hennessy
City Clerk – Auditor

APPROVED AS TO FORM AND LEGALITY:



Darren J. Elkind
City Attorney

Certified

RESOLUTION NO. 2020-40

A RESOLUTION OF THE CITY COMMISSION OF THE CITY OF DELTONA, FLORIDA, RELATING TO THE ADOPTION OF VOLUSIA COUNTY LOCAL MITIGATION STRATEGY; ADOPTING THE VOLUSIA COUNTY MITIGATION STRATEGY PURSUANT TO SECTION 322 "MITIGATION PLANNING" OF THE ROBERT T STAFFORD DISASTER RELIEF AND EMERGENCY ASSISTANCE ACT; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, areas of the City of Deltona are vulnerable to the human and economic costs of natural, technological and societal disasters, and

WHEREAS, the City of Deltona governing body realizes the importance of reducing or eliminating those vulnerabilities for the overall good and welfare of the community, and

WHEREAS, the City of Deltona has been an active participant in Volusia Prepares, the Local Mitigation Strategy working group, which has established a comprehensive, coordinated planning process involving the county and its municipalities, as well as other public and private sector organizations, to eliminate or decrease these vulnerabilities, and

WHEREAS, City of Deltona representatives and staff have identified, justified and prioritized a number of proposed projects and programs needed to mitigate the vulnerabilities of unincorporated areas of Volusia County to the impacts of future disasters, and

WHEREAS, City of Deltona representatives and staff have reviewed the information provided by or for other participating jurisdictions and organizations, including the projects and programs they have proposed for incorporation into the Volusia County Local Mitigation Plan, and

WHEREAS, these proposed projects and programs have been incorporated into the current edition of the Volusia County Local Mitigation Plan that has been prepared and issued for consideration and implementation by the communities and jurisdictions of Volusia County,

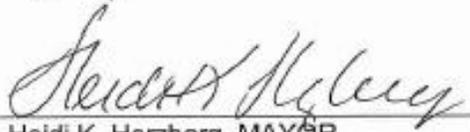
Certified

City of Deltona, Florida
Resolution No. 2020-40
Page 2 of 3

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF DELTONA, FLORIDA:

1. The City of Deltona hereby accepts and approves of its designated portion of the Volusia County Local Mitigation Plan,
2. The City of Deltona accepts and endorses the mitigation goals and objectives established by Volusia Prepares for the countywide plan, and the anticipated schedule for the next updating of the plan,
3. The City of Deltona finds that the proposed mitigation projects and programs included in the plan by other jurisdictions and organizations are acceptable, that they will not adversely affect the county or its neighborhoods, and that they do not conflict with or duplicate the mitigation proposals made by the county itself,
4. The agency personnel of the City of Deltona are requested and instructed to pursue available funding opportunities for implementation of the proposals designated therein,
5. The agencies and organizations within the City of Deltona will, upon receipt of such funding or other necessary resources, seek to implement the proposals contained in the county's individual section of the strategy, and
6. The City of Deltona will continue to participate in the updating and expansion of the Volusia County Local Mitigation Plan in the years ahead, and
7. The City of Deltona will further seek to encourage businesses, industries and community groups operating within the City of Deltona to also participate in the updating and expansion of the Volusia County Local Mitigation Plan in the years ahead.

PASSED AND ADOPTED BY THE CITY COMMISSION OF THE CITY OF DELTONA, FLORIDA, THIS 20th DAY OF July, 2020.

BY: 
Heidi K. Herzberg, MAYOR

APPENDIX A: PLAN ADOPTIONS

Certified

City of Deltona, Florida
 Resolution No. 2020-40
 Page 3 of 3

ATTEST:



 Joyce Raftery, CMC, MMC, CITY CLERK

Approved as to form and legality
 for use and reliance of the City of
 Deltona, Florida



 CITY ATTORNEY

NAME	YES	NO
AVILA-VAZQUEZ	<input checked="" type="checkbox"/>	<input type="checkbox"/>
BRADFORD	<input checked="" type="checkbox"/>	<input type="checkbox"/>
KING	<input checked="" type="checkbox"/>	<input type="checkbox"/>
McFALL <i>McCool</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
NABICHT	<input checked="" type="checkbox"/>	<input type="checkbox"/>
RAMOS	<input checked="" type="checkbox"/>	<input type="checkbox"/>
HERZBERG	<input checked="" type="checkbox"/>	<input type="checkbox"/>

STATE OF FLORIDA
 COUNTY OF VOLUSIA
 This is to certify that the foregoing is a true and
 correct copy of Resolution No. 2020-40
 witness my hand and official Seal this 21st day of
July 2020

 Joyce Raftery, CMC, MMC
 City Clerk, City of Deltona Florida

RESOLUTION NO. 2020-R-18

A RESOLUTION OF THE CITY OF EDGEWATER, FLORIDA; SUPPORTING THE VOLUSIA COUNTY LOCAL MITIGATION PLAN 2020; DIRECTING THE CITY CLERK TO TRANSMIT A CERTIFIED COPY OF THIS RESOLUTION TO THE COUNTY OF VOLUSIA; PROVIDING FOR CONFLICTING PROVISIONS, AN EFFECTIVE DATE, AND ADOPTION.

WHEREAS, areas of the City of Edgewater are vulnerable to the human and economic costs of natural, technological and societal disasters; and

WHEREAS, the City of Edgewater's governing body realizes the importance of reducing or eliminating those vulnerabilities for the overall good and welfare of our community; and

WHEREAS, the City of Edgewater has been an active participant in Volusia Prepares, the Local Mitigation Strategy working group, which has established a comprehensive, coordinated planning process involving the county and its municipalities, as well as other public and private sector organizations, to eliminate or decrease these vulnerabilities; and

WHEREAS, the City of Edgewater's representatives and staff have identified, justified and prioritized a number of proposed projects and programs needed to mitigate the vulnerabilities of unincorporated areas of Volusia County to the impacts of future disasters; and

WHEREAS, the City of Edgewater's representatives and staff have reviewed the information provided by or for other participating jurisdictions and organizations, including the projects and programs they have proposed for incorporation into the Volusia County Local Mitigation Plan; and

WHEREAS, these proposed projects and programs have been incorporated into the current edition of the Volusia County Local Mitigation Plan that has been prepared and issued for consideration and implementation by the communities and jurisdictions of Volusia County.

NOW, THEREFORE, BE IT RESOLVED by the People of the City of Edgewater, Florida:

Section 1. The City of Edgewater hereby accepts and approves of its designation portion of the Volusia County Local Mitigation Plan.

Section 2. The City of Edgewater accepts and endorses the mitigation goals and objectives established by Volusia Prepares for the countywide plan, and the anticipated schedule for the next updating of the plan.

Section 3. The City of Edgewater finds that the proposed mitigation projects and programs included in the plan by other jurisdictions and organizations are acceptable, that they

APPENDIX A: PLAN ADOPTIONS

will not adversely affect the county or its neighborhoods, and that they do not conflict with or duplicate the mitigation proposals made by the county itself.

Section 4. The agency personnel of the City of Edgewater are requested and instructed to pursue available funding opportunities for implementation of the proposals designated therein.

Section 5. The City Manager or his designee is hereby requested and instructed to pursue available funding opportunities for implementation of the proposals designated therein, subject to the approval of the City Council for application of grants or other contracts offered to provide such funding. Upon the City finding such funding or other resource, the proposals contained in the applicable section of the Plan will be implemented.

Section 6. The City of Edgewater will further seek to encourage the businesses, industries and community groups operating within the City of Edgewater to also participate in the updating and expansion of the Volusia County Local Mitigation Plan in the years ahead.

Section 7. The City Clerk is hereby directed to transmit a certified copy of this Resolution to the County of Volusia.

Section 8. All resolutions or parts of resolutions in conflict herewith are hereby repealed.

Section 9. This resolution shall become effective immediately upon adoption.

After Motion to approve by Councilwoman Power with Second by Councilwoman Yaney, the vote on this resolution on July 6, 2020, was as follows:

	AYE	NAY
Mayor Mike Thomas	<u>✓</u>	_____
Councilwoman Christine Power	<u>✓</u>	_____
Councilwoman Kim Yaney	<u>✓</u>	_____
Councilwoman Megan O’Keefe	<u>Excused</u>	_____
Vice-Mayor Gary Conroy	<u>✓</u>	_____

APPENDIX A: PLAN ADOPTIONS

PASSED AND DULY ADOPTED this 6th day of July, 2020.

ATTEST:


Robin L. Matusick, CMC
City Clerk/Paralegal

**CITY COUNCIL OF THE
CITY OF EDGEWATER, FLORIDA**

By: 
Mike Thomas
Mayor

For the use and reliance only by the City of Edgewater, Florida. Approved as to form and legality by: Aaron R. Wolfe, Esquire
City Attorney
Doran, Sims, Wolfe, Kundid,
Ciocchetti & Yoon

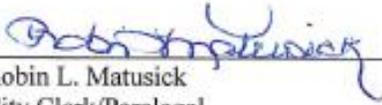
Approved by the City Council of the City of Edgewater at a meeting held on this 6th day of July, 2020 under Agenda Item No. 8 5.



CERTIFICATION

I, Robin L. Matusick, City Clerk/Paralegal of the City of Edgewater Florida, do hereby certify that the attached is a true and Correct Copy of the City of Edgewater's Resolution Number 2020-R-18 as it appears in the public records of the City of Edgewater, Florida.

IN WITNESS WHEREOF, I have set my hand and the seal of the City of Edgewater, Florida, on this 6th day of July, 2020.



Robin L. Matusick
City Clerk/Paralegal



Office of the City Clerk
P.O. Box 100 • Edgewater, FL 32132-0100
(386) 424-2400 Ext. 1101 • Fax (386) 424-2410
www.cityofedgewater.org



STAFF REPORT
CITY OF HOLLY HILL, FLORIDA

City Commission
Resolution

MEETING DATE: May 12, 2020
FROM: Antoine Khoury
SUBJECT: A Resolution of the City Commission of the City of Holly Hill, Florida, Adopting the Updated Volusia County Local Mitigation Strategy; and Providing for Severability; and Providing for an Effective Date.
NUMBER: 2020-R-22
APPLICANT:
PLANNER:

DISCUSSION:

The Volusia County Local Mitigation Strategy is a working group which has established a comprehensive, coordinated planning process involving the County and its municipalities. The LMS, represented by staff throughout municipalities of the County, have identified, justified and prioritized a number of programs needed to mitigate the vulnerabilities as identified by municipalities. The Local Mitigation Strategy is attached to this agenda.

Volusia County is asking that all jurisdictions accept and approve its designated portion of the Volusia County LMS and accept and endorse the mitigation goals and objectives established by Volusia Prepares for the countywide plan.

FISCAL ANALYSIS:

None at this time.

STAFF RECOMMENDATION:

Adopt the Volusia County Local Mitigation Strategy as submitted by staff

COMMISSION GOAL:

Goal #1: Develop and maintain a sound and sustainable financial plan for the city that establishes sufficient reserves for all funds, ensures (whenever possible) that user fees pay for services rendered, provides a realistic capital improvement program, and encourages public/private sector partnerships and intergovernmental partnerships.

Goal #4: Provide proficient public health and safety services in terms of police and fire protection, water, storm water, waste water and solid waste management and disaster

Updated: 5/5/2020 2:03 PM

Page 1

Packet Pg. 551

Resolution 2020-22

Meeting of May 12, 2020

7.2

preparedness with a focus on intergovernmental collaboration, private sector partnerships, and utilization of technologies and proven innovations.

MOTION:

APPROVING AND ACCEPTING THE CITY OF HOLLY HILL'S DESIGNATED PORTIONS OF THE VOLUSIA COUNTY LOCAL MITIGATION STRATEGY PLAN AND ENDORSING THE MITIGATION GOALS AND OBJECTIVES ESTABLISHED BY VOLUSIA PREPARES FOR THE COUNTYWIDE PLAN.

ATTACHMENTS:

- Volusia County LMS 2020 Part I (PDF)
- Volusia County LMS 2020 Part II (PDF)
- Volusia County LMS 2020 Part III (PDF)

Updated: 5/5/2020 2:03 PM

Page 2

Packet Pg. 552

Resolution No. 2020-22

A RESOLUTION OF THE CITY COMMISSION OF THE CITY OF HOLLY HILL, FLORIDA, ADOPTING THE UPDATED VOLUSIA COUNTY LOCAL MITIGATION STRATEGY; AND PROVIDING FOR SEVERABILITY; AND PROVIDING FOR AN EFFECTIVE DATE.

A RESOLUTION OF THE CITY COMMISSION OF THE CITY OF HOLLY HILL, FLORIDA, ADOPTING THE UPDATED VOLUSIA COUNTY LOCAL MITIGATION STRATEGY; AND PROVIDING FOR SEVERABILITY; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, The City of Holly Hill is vulnerable to the human and economic costs of natural, technological and societal disasters as evidenced in the Four (4) Presidential Disaster Declarations since 2016; and

WHEREAS, the City Commission of the City of Holly Hill recognizes the importance of reducing or eliminating those vulnerabilities for the overall good and welfare of the community; and

WHEREAS, The City of Holly Hill has been an active participant in Volusia Prepares, the Local Mitigation Strategy working group, which has established a comprehensive, coordinated planning process involving the County and its municipalities, as well as, other public, private and non-profit sector organizations, to eliminate or decrease these vulnerabilities; and

WHEREAS, Volusia County is asking for all jurisdictions to accept and endorse the Volusia County Local Mitigation Strategy.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF HOLLY HILL, FLORIDA:

SECTION 1. That the City Commission of the City of Holly Hill hereby accepts, approves and endorses the Volusia County Local Mitigation Strategy.

SECTION 2. SEVERABILITY. If any section or portion of a section of this Resolution proves to be invalid, unlawful, or unconstitutional, it shall not be held to invalidate or impair the validity, force, or effect of any other section or part of this Resolution.

SECTION 3. EFFECTIVE DATE. This Resolution shall take effect immediately upon its adoption.

APPROVED AND AUTHENTICATED on this 12th day of MAY, 2020.

APPENDIX A: PLAN ADOPTIONS

**Resolution Number 2020-07
Concerning the Volusia County Local Mitigation Strategy**

WHEREAS, areas of the City of Lake Helen are vulnerable to the human and economic costs of natural, technological and societal disasters, and

WHEREAS, the City Commission of the City of Lake Helen realizes the importance of reducing or eliminating those vulnerabilities for the overall good and welfare of the community, and

WHEREAS, the City of Lake Helen has been an active participant in Volusia Prepares, the Local Mitigation Strategy working group, which has established a comprehensive, coordinated planning process involving the county and its municipalities, as well as other public and private sector organizations, to eliminate or decrease these vulnerabilities, and

WHEREAS, the City of Lake Helen representatives and staff have identified, justified and prioritized a number of proposed projects and programs needed to mitigate the vulnerabilities of unincorporated areas of Volusia County to the impacts of future disasters, and

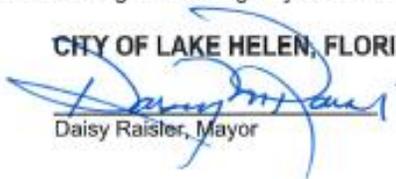
WHEREAS, the City of Lake Helen representatives and staff have reviewed the information provided by or for other participating jurisdictions and organizations, including the projects and programs they have proposed for incorporation into the Volusia County Local Mitigation Plan, and

WHEREAS, these proposed projects and programs have been incorporated into the current edition of the Volusia County Local Mitigation Plan that has been prepared and issued for consideration and implementation by the communities and jurisdictions of Volusia County,

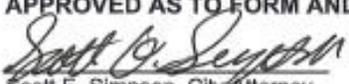
NOW THEREFORE BE IT RESOLVED by the City Commission of the City of Lake Helen, Florida that:

- 1] The City of Lake Helen hereby accepts and approves of its designated portion of the Volusia County Local Mitigation Plan,
- 2] The City of Lake Helen accepts and endorses the mitigation goals and objectives established by Volusia Prepares for the countywide plan, and the anticipated schedule for the next updating of the plan
- 3] The City of Lake Helen finds that the proposed mitigation projects and programs included in the plan by other jurisdictions and organizations are acceptable, that they will not adversely affect the county or its neighborhoods, and that they do not conflict with or duplicate the mitigation proposals made by the county itself.
- 4] The agency personnel of the City of Lake Helen are requested and instructed to pursue available funding opportunities for implementation of the proposals designated therein,
- 5] The agencies and organizations within the City of Lake Helen will, upon receipt of such funding or other necessary resources, seek to implement the proposals contained in the county's individual section of the strategy, and
- 6] The City of Lake Helen will continue to participate in the updating and expansion of the Volusia County Local Mitigation Plan in the years ahead, and
- 7] The City of Lake Helen will further seek to encourage the businesses, industries and community groups operating within the City of Lake Helen to also participate in the updating and expansion of the Volusia County Local Mitigation Plan in the years ahead.

THIS RESOLUTION DULY PASSED AND ADOPTED ON THIS 11TH DAY OF June, 2020 A.D. by the City Commission of the City of Lake Helen, Florida at its Regular Meeting duly assembled.

CITY OF LAKE HELEN, FLORIDA

Daisy Raister, Mayor

ATTEST: 
Becky Witte, City Administrator

APPROVED AS TO FORM AND LEGALITY:

Scott E. Simpson, City Attorney

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RESOLUTION NO. 19-20

**A RESOLUTION OF THE CITY OF NEW SMYRNA BEACH
ACCEPTING AND ADOPTING THE MULTI-JURISDICTIONAL
LOCAL MITIGATION STRATEGY; PROVIDING FOR
CONFLICTING RESOLUTIONS; AND PROVIDING FOR AN
EFFECTIVE DATE.**

WHEREAS, the City of New Smyrna Beach is vulnerable to an array of natural hazards that can cause the loss of life and damages to public and private property; and

WHEREAS, the City of New Smyrna Beach desires to seek ways to mitigate situations that may aggravate such circumstances; and

WHEREAS, the development and implementation of a local mitigation strategy can result in actions that reduce the long-term risk to life and property from natural hazards; and

WHEREAS, it is the intent of the City Commission to protect its citizens and property from the effects of natural hazards by preparing and maintaining a local mitigation strategy; and

WHEREAS, it is also the intent of the City Commission to fulfill its obligation under Section 322: Mitigation Planning, of the Robert T. Stafford Disaster Relief and Emergency Assistance Act to remain eligible to receive certain types of federal assistance in the event of a declared disaster affecting the City of New Smyrna Beach; and

WHEREAS, Volusia County originally facilitated the development of a multi-jurisdictional local mitigation strategy that includes New Smyrna Beach in the year 2000 with input from the appropriate local and state officials; and

WHEREAS, Volusia County facilitated the update of the multi-jurisdictional local mitigation strategy in 2009 that includes the City of New Smyrna Beach with input from the appropriate local and state officials; and

WHEREAS, the Florida Division of Emergency Management and the Federal Emergency Agency have revised the updated local mitigation strategy prepared for the City of New Smyrna Beach for legislative compliance and has approved the plan pending the completion of local adoption procedures.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF NEW SMYRNA BEACH, FLORIDA:

SECTION 1: That the City of New Smyrna Beach hereby accepts and adopts the January 2020 Multi-Jurisdictional Local Mitigation Strategy.

**Res 19-20
Volusia County Local Mitigation Strategy 2020
May 12, 2020**

APPENDIX A: PLAN ADOPTIONS

46 **SECTION 2:** That the City agrees to take such other official action as may be
47 reasonably necessary to carry out the proposed actions of the Plan.

48
49 **SECTION 3:** That all other resolutions or parts thereof that are in conflict with this
50 resolution are hereby rescinded and repealed.

51
52 **SECTION 4:** That this resolution shall take effect immediately upon its final adoption.

53
54
55 **APPROVED AS TO FORM AND CORRECTNESS:**

56
57 *Carrie Avallone*
58 **CARRIE AVALLONE**
59 **City Attorney**

60
61 **DATE:** 5/15/2020

Res 18-20
FDOT Contract No. ASH58
Highway Maintenance Memorandum of Agreement
May 12, 2020

APPENDIX A: PLAN ADOPTIONS

The Within and Foregoing Resolution No. 19-20 as introduced and read before the City Commission of the City of New Smyrna Beach, Florida, at its Regular Meeting held at City Hall in said City on May 12, 2020. Motion was made by Commissioner McGuirk, and seconded by Commissioner Sachs, that said Resolution be adopted.

A roll-call vote of the City Commission on said motion to adopt the Resolution resulted as follows:

MAYOR RUSSELL OWEN	Yes
VICE MAYOR MICHAEL KOLODY	Yes
COMMISSIONER JASON MCGUIRK	Yes
COMMISSIONER RANDY HARTMAN	Yes
COMMISSIONER JACOB D. SACHS	Yes

Whereupon, the Mayor of the City of New Smyrna Beach, Florida, has hereunto set his official signature, duly attested by the City Clerk, and has caused the Official Seal of said City to be hereunto affixed for the purpose of authenticity and as is required by law.


As Mayor of the City of New Smyrna Beach, Florida

(OFFICIAL SEAL)


As City Clerk of the City of New Smyrna Beach, Florida

RESOLUTION NO. 19-20

**Resolution Number 2020-03
Concerning the Volusia County Local Mitigation Strategy**

Whereas, areas of City of Oak Hill are vulnerable to the human and economic costs of natural, technological and societal disasters, and

Whereas, the City of Oak Hill governing body realizes the importance of reducing or eliminating those vulnerabilities for the overall good and welfare of the community, and

Whereas, City of Oak Hill has been an active participant in Volusia Prepares, the Local Mitigation Strategy working group, which has established a comprehensive, coordinated planning process involving the county and its municipalities, as well as other public and private sector organizations, to eliminate or decrease these vulnerabilities, and

Whereas, City of Oak Hill representatives and staff have identified, justified and prioritized a number of proposed projects and programs needed to mitigate the vulnerabilities of unincorporated areas of Volusia County to the impacts of future disasters, and

Whereas, City of Oak Hill representatives and staff have reviewed the information provided by or for other participating jurisdictions and organizations, including the projects and programs they have proposed for incorporation into the Volusia County Local Mitigation Plan, and

Whereas, these proposed projects and programs have been incorporated into the current edition of the Volusia County Local Mitigation Plan that has been prepared and issued for consideration and implementation by the communities and jurisdictions of Volusia County,

Now therefore, be it resolved on this 22nd day of June, 2020 that,

- 1] City of Oak Hill hereby accepts and approves of its designated portion of the Volusia County Local Mitigation Plan,
- 2] City of Oak Hill accepts and endorses the mitigation goals and objectives established by Volusia Prepares for the countywide plan, and the anticipated schedule for the next updating of the plan
- 3] City of Oak Hill finds that the proposed mitigation projects and programs included in the plan by other jurisdictions and organizations are acceptable, that they will not adversely affect the county or its neighborhoods, and that they do not conflict with or duplicate the mitigation proposals made by the county itself.
- 2] The agency personnel of City of Oak Hill are requested and instructed to pursue available funding opportunities for implementation of the proposals designated therein,
- 4] The agencies and organizations within City of Oak Hill will, upon receipt of such funding or other necessary resources, seek to implement the proposals contained in the county's individual section of the strategy, and
- 5] City of Oak Hill will continue to participate in the updating and expansion of the Volusia County Local Mitigation Plan in the years ahead, and
- 6] City of Oak Hill will further seek to encourage the businesses, industries and community groups operating within City of Oak Hill to also participate in the updating and expansion of the Volusia County Local Mitigation Plan in the years ahead.

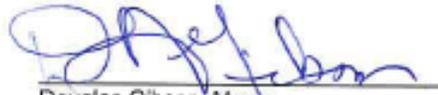
RES 2020-03

APPENDIX A: PLAN ADOPTIONS

It was moved by Vice Mayor Hyatt and seconded by Commissioner Bittle that said Resolution 2020-03, be passed on first reading. A roll call vote of the City Commission on said motion resulted as follows:

Mayor Gibson	<u>YES</u>
Commissioner Lindlau, Seat #2	<u>YES</u>
Vice Mayor Hyatt, Seat #1	<u>YES</u>
Commissioner Bracy, Seat #4	<u>YES</u>
Commissioner Bittle, Seat#3	<u>YES</u>

Passed upon first reading this 22nd day of June, 2020.



Douglas Gibson, Mayor

ATTEST:


Kohn Evans
City Clerk/Administrator

Approved as to form and legality for the use and reliance of the City of Oak Hill, Florida, only.



Scott E. Simpson, City Attorney

RESOLUTION NO. 107-20

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ORANGE CITY, FLORIDA, SUPPORTING AND ADOPTING THE VOLUSIA COUNTY 2020 LOCAL MITIGATION STRATEGY PLAN; PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, areas of Orange City are vulnerable to natural hazards, which pose significant threats to human life, safety, and property; and

WHEREAS, the City recognizes the importance of reducing and eliminating these vulnerabilities for the good and welfare of the community and its residents; and

WHEREAS, the Disaster Relief Act of 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; and

WHEREAS, the City has been an active participant in Volusia Prepares, the Local Mitigation Strategy Working Group, which has established a comprehensive and coordinated planning process involving the county, its municipalities, and other private and public sector organizations who work to lessen the impacts of such hazardous events; and

WHEREAS, the City has reviewed the information provided by Volusia County within the 2020 Local Mitigation Strategy Update that has been prepared and issued for consideration and implementation by the communities and jurisdictions of Volusia County.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF ORANGE CITY, FLORIDA:

SECTION 1. The City of Orange City supports and adopts the updated Volusia County 2020 Local Mitigation Strategy in its entirety, a copy of which is held and available in the Development Services Department. Section 1- Introduction and Section 8- Mitigation Strategy of the LMS is attached as **Exhibit A**;

SECTION 2. The City accepts and endorses the mitigation goals and policies established by Volusia Prepares for the countywide plan;

SECTION 3. That all resolutions or parts of resolutions in conflict herewith be and the same are hereby repealed.

SECTION 4. That this resolution shall take effect immediately upon its adoption by the City Council of the City of Orange City, Florida.

APPENDIX A: PLAN ADOPTIONS

ROLL CALL VOTE AS FOLLOWS (Resolution No. 107-20):

<u> <i>ys</i> </u>	Jim Mahoney	Kelli Marks	<u> <i>ys</i> </u>
<u> <i>ys</i> </u>	O. William Crippen	Martin E. Harper	<u> <i>ys</i> </u>
<u> <i>ys</i> </u>	Jeff Allebach	Bill O'Connor, Vice Mayor	<u> <i>ys</i> </u>
<u> <i>ys</i> </u>	Gary A. Blair, Mayor		

PASSED and ADOPTED this 9 day of June , 2020.

ATTEST:
 Gloria Thomas
Gloria J. Thomas, CMC, City Clerk

AUTHENTICATED:
 Gary A. Blair
Gary A. Blair, Mayor

Approved as to form and legal sufficiency:
 William E. Reischmann, Jr.
William E. Reischmann, Jr., City Attorney

RESOLUTION NO. 2020-45

A RESOLUTION SUPPORTING AND ADOPTING THE UPDATED VOLUSIA COUNTY LOCAL HAZARD MITIGATION PLAN; AND SETTING FORTH AN EFFECTIVE DATE.

WHEREAS, areas of the City of Ormond Beach are vulnerable to the human and economic costs of natural, technological and societal disasters, and

WHEREAS, the City Commission of the City of Ormond Beach, Florida, realizes the importance of reducing or eliminating those vulnerabilities for the overall good and welfare of the community, and

WHEREAS, the City of Ormond Beach actively participates in Volusia Prepares, the Local Mitigation Strategy (LMS) working group, which has established a comprehensive, coordinated planning process involving the county and its municipalities, as well as other public and private sector organizations, to eliminate or decrease these vulnerabilities, and

WHEREAS, the City's professional staff have identified, justified and prioritized a number of proposed projects and programs needed to mitigate the vulnerabilities of areas of Ormond Beach to the impacts of future disasters, and

WHEREAS, the City's professional staff have reviewed the information provided by or for other participating jurisdictions and organizations, including the projects and programs they have proposed for incorporation into the Volusia County Local Mitigation Plan, and

WHEREAS, these proposed projects and programs have been incorporated into the current edition of the Volusia County Local Mitigation Plan that has been prepared and issued

for consideration and implementation by the communities and jurisdictions of Volusia County a copy of said Plan being attached hereto as Exhibit "A" and incorporated herein by reference, now therefore,

BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF ORMOND BEACH, FLORIDA, THAT:

SECTION ONE. The City Commission hereby accepts and approves of its designated portion of the Volusia County Local Mitigation Plan,

SECTION TWO. The City Commission accepts and endorses the mitigation goals and objectives established by Volusia Prepares for the countywide plan, and the anticipated schedule for the next updating of the plan.

SECTION THREE. The City Commission finds that the proposed mitigation projects and programs included in the plan by other jurisdictions and organizations are acceptable, that they will not adversely affect the City or its neighborhoods, and that they do not conflict with or duplicate the mitigation proposals made by the City itself.

SECTION FOUR. The City Manager or her designee is requested and instructed to pursue available funding opportunities for implementation of the proposals designated therein.

SECTION FIVE. The City will, upon receipt of such funding or other necessary resources, seek to implement the proposals contained in the City's individual section of the Plan.

SECTION SIX. The City will continue to participate in the updating and expansion of the Volusia County Local Mitigation Plan in the years ahead.

APPENDIX A: PLAN ADOPTIONS

SECTION SEVEN. The City will further seek to encourage the businesses, industries and community groups operating within Ormond Beach to also participate in the updating and expansion of the Volusia County Local Mitigation Plan in the years ahead.

SECTION EIGHT. This Resolution shall take effect immediately upon its adoption.

APPROVED AND AUTHENTICATED this 12th day of May, 2020.



BILL PARTINGTON
Mayor

ATTEST:


COLBY CILENTO
City Clerk

Resolution Number 2020-03

Concerning the Volusia County Local Mitigation Strategy

Whereas, areas of **Town of Pierson** are vulnerable to the human and economic costs of natural, technological and societal disasters, and

Whereas, the **Town of Pierson's** governing body realizes the importance of reducing or eliminating those vulnerabilities for the overall good and welfare of the community, and

Whereas, The **Town of Pierson** has been an active participant in Volusia Prepares, the Local Mitigation Strategy working group, which has established a comprehensive, coordinated planning process involving the county and its municipalities, as well as other public and private sector organizations, to eliminate or decrease these vulnerabilities, and

Whereas, **Town of Pierson** representatives and staff have identified, justified and prioritized a number of proposed projects and programs needed to mitigate the vulnerabilities of unincorporated areas of Volusia County to the impacts of future disasters, and

Whereas, **Town of Pierson** representatives and staff have reviewed the information provided by or for other participating jurisdictions and organizations, including the projects and programs they have proposed for incorporation into the Volusia County Local Mitigation Plan, and

Whereas, these proposed projects and programs have been incorporated into the current edition of the Volusia County Local Mitigation Plan that has been prepared and issued for consideration and implementation by the communities and jurisdictions of Volusia County,

Now therefore, be it resolved on this 26th day of May 2020 that,

- 1] **Town of Pierson** hereby accepts and approves of its designated portion of the Volusia County Local Mitigation Plan,
- 2] **Town of Pierson** accepts and endorses the mitigation goals and objectives established by Volusia Prepares for the countywide plan, and the anticipated schedule for the next updating of the plan
- 3] **Town of Pierson** finds that the proposed mitigation projects and programs included in the plan by other jurisdictions and organizations are acceptable, that they will not adversely affect the county or its neighborhoods, and that they do not conflict with or duplicate the mitigation proposals made by the county itself.
- 2] The agency personnel of **Town of Pierson** are requested and instructed to pursue available funding opportunities for implementation of the proposals designated therein,
- 4] The agencies and organizations within **Town of Pierson** will, upon receipt of such funding or other necessary resources, seek to implement the proposals contained in the county's individual section of the strategy, and
- 5] **Town of Pierson** will continue to participate in the updating and expansion of the Volusia County Local Mitigation Plan in the years ahead, and
- 6] **Town of Pierson** will further seek to encourage the businesses, industries and community groups operating within **Town of Pierson** to also participate in the updating and expansion of the Volusia County Local Mitigation Plan in the years ahead.

APPENDIX A: PLAN ADOPTIONS

APPENDIX A: PLAN ADOPTIONS

The foregoing Resolution was read before the Town Council of the Town of Pierson, Florida at its meeting held at Pierson Town Hall, on the 26th day of May 2020. It was moved and so carried that said Resolution was duly adopted.

It was moved by Council Member Herbert Bennett and seconded by Council Member Thomas Larrivee said motion resulted as follows:

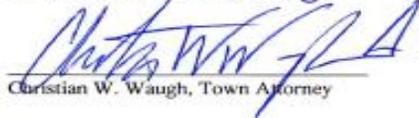
Samuel G.S. Bennett, Chairman	<u> AYE </u>
James T. Peterson, Vice Chairman	<u> AYE </u>
Herbert J. Bennett, Council Member	<u> AYE </u>
Robert F. Greenlund, Council Member	<u> AYE </u>
Thomas R. Larrivee, Council Member	<u> AYE </u>

Be it finally resolved that this **Resolution No. 2020-03** shall be made a part of the permanent records of the Town of Pierson, Florida.

Whereupon the Chairman of the Town Council of the Town of Pierson, Florida has hereunto set his official signature, duly attested by the Town Clerk, and has caused the official seal of said Town to be affixed, at Pierson Town Hall, this 26th day of May 2020 for the purpose of authenticity as is required by law.

ATTEST:


Carmen M. Spelozzi, Town Clerk


Christian W. Waugh, Town Attorney


Samuel G.S. Bennett, Council Chairman



RESOLUTION 2020-06

A RESOLUTION OF THE TOWN COUNCIL OF THE TOWN OF PONCE INLET, VOLUSIA COUNTY, ADOPTING RESOLUTION FOR PARTICIPATION IN THE LOCAL MITIGATION STRATEGY (LMS); PROVIDING FOR SEVERABILITY; PROVIDING FOR CONFLICTING RESOLUTIONS; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, areas of Town of Ponce Inlet are vulnerable to the human and economic costs of natural disasters and,

WHEREAS, the Town of Ponce Inlet's governing body realizes the importance of reducing or eliminating those vulnerabilities for the overall good and welfare of the community, and,

WHEREAS, the Town of Ponce Inlet has been an active participant in Volusia Prepares, the Local Mitigation Strategy working group, which has established a comprehensive, coordinated planning process involving the county and its municipalities, as well as other public and private sector organizations, to decrease or eliminate these vulnerabilities, and

WHEREAS, the Town of Ponce Inlet representatives and staff have identified, justified and prioritized projects and programs needed to mitigate the vulnerabilities of unincorporated areas of Volusia County to the impacts of future disasters, and

WHEREAS, the Town of Ponce Inlet representatives and staff have reviewed the information provided by or for the other participating jurisdictions and organizations, including the projects and programs they have proposed for incorporation into the Volusia County Local Mitigation Plan, and

WHEREAS, these proposed projects and programs have been incorporated into the current edition of the Volusia County Local Mitigation Plan that has been prepared and issued for consideration and implementation by the communities and jurisdictions of Volusia County.

NOW, THEREFORE, BE IT RESOLVED BY THE TOWN COUNCIL OF THE TOWN OF PONCE INLET, VOLUSIA COUNTY, FLORIDA, AS FOLLOWS:

Section 1. Adopting resolution for participation in the local mitigation strategy (LMS):

1. The Town Council of Ponce Inlet hereby accepts and approves of the designated portion of the Volusia County Local Mitigation Plan; and
2. The Town Council of Ponce Inlet accepts and endorses the mitigation goals and objectives established by Volusia Prepares for the countywide plan, and the anticipated schedule for the next updating of the plan. and

APPENDIX A: PLAN ADOPTIONS

3. The Town Council of Ponce Inlet finds that the proposed mitigation projects and programs included in the plan by the other jurisdictions and organizations are acceptable, will not adversely affect the county or its neighborhoods, and do not conflict with or duplicate the mitigation proposals made by the county itself; and

4. The agency personnel of the Town of Ponce Inlet are requested and instructed to pursue available funding opportunities for implementation of the proposals designated therein; and

5. The agencies and organizations within the Town of Ponce Inlet will, upon receipt of such funding or other necessary resources, seek to implement the proposals contained in the county's individual section of the strategy; and

6. The Town of Ponce Inlet will continue to participate in the updating and expansion of the Volusia County Local Mitigation Plan in the years ahead; and

7. The Town of Ponce Inlet will further seek to encourage the businesses, industries and community groups operating within the Town of Ponce Inlet to also participate in the updating and expansion of the Volusia County Local Mitigation Plan in the years ahead.

Section 2. Severability. If any section, subsection, sentence, clause, phrase, or portion of this Resolution, or application hereof, is for any reason held invalid or unconstitutional by any court of competent jurisdiction, such portion or provision in such holding shall not affect the validity of the remaining portions or applications hereof.

Section 3. Conflicting Resolutions. All Resolutions or parts thereof in conflict herewith or contrary hereto are hereby repealed to the extent of such conflict.

Section 4. Effective Date. This Resolution shall take effect immediately upon its adoption.

It was moved by Councilmember Paritsky and seconded by Councilmember Perrone that this Resolution shall be adopted. A roll call vote of the Town Council on said motion resulted as follows:

Mayor Smith, Seat #1	Yes
Councilmember Milano, Seat #2	Yes
Vice-Mayor Hoss, Seat #3	Yes
Councilmember Perrone, Seat #4	Yes
Councilmember Paritsky, Seat #5	Yes

Adopted this 21st day of May, 2020.

APPENDIX A: PLAN ADOPTIONS



Town of Ponce Inlet, Florida

Gary L. Smith
Gary L. Smith, Mayor

ATTEST:

Jeanne Witt
Jeanne Witt, CMC
Town Manager/Town Clerk

RESOLUTION NO. 20-25

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF PORT ORANGE, VOLUSIA COUNTY, FLORIDA, AUTHORIZING SUPPORT FOR THE VOLUSIA COUNTY LOCAL MITIGATION STRATEGY; PROVIDING AN EFFECTIVE DATE.

WHEREAS, areas of the City of Port Orange are vulnerable to the human and economic costs of natural, technological and societal disasters; and

WHEREAS, the City of Port Orange realizes the importance of reducing or eliminating those vulnerabilities for the overall good and welfare of the community; and

WHEREAS, the City of Port Orange has been an active participant in Volusia Prepares, the Local Mitigation Strategy working group, which has established a comprehensive, coordinated planning process involving the county and its municipalities, as well as other public and private sector organizations, to eliminate or decrease these vulnerabilities; and

WHEREAS, City of Port Orange representatives and staff have identified, justified and prioritized a number of proposed projects and programs needed to mitigate the vulnerabilities of areas of Port Orange to the impacts of future disasters; and

WHEREAS, Port Orange representatives and staff have reviewed the information provided by or for other participating jurisdictions and organizations, including the projects and programs they have proposed for incorporation into the Volusia County Local Mitigation Plan; and

(RESO. NO. 20-25)

WHEREAS, these proposed projects and programs have been incorporated into the current edition of the Volusia County Local Mitigation Strategy that has been prepared and issued for consideration and implementation by the communities and jurisdictions of Volusia County.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF PORT ORANGE, VOLUSIA COUNTY, FLORIDA:

Section 1. The City of Port Orange hereby accepts and approves of its designated portion of the Volusia County Local Mitigation Strategy.

Section 2. The City of Port Orange accepts and endorses the mitigation goals and objectives established by Volusia Prepares for the countywide strategy, and the anticipated schedule for the next updating of the strategy.

Section 3. The City of Port Orange finds that the proposed mitigation projects and programs included in the plan by other jurisdictions and organizations are acceptable, that they will not adversely affect the county or its neighborhoods, and that they do not conflict with or duplicates the mitigation proposals made by the City itself.

Section 4. The agency personnel of the City of Port Orange are requested and instructed to pursue available funding opportunities for implementation of the proposals designated therein.

Section 5. The agencies and organizations within the City of Port Orange will, upon receipt of such funding or other necessary resources, seek to implement the proposals contained in the county's individual section of the

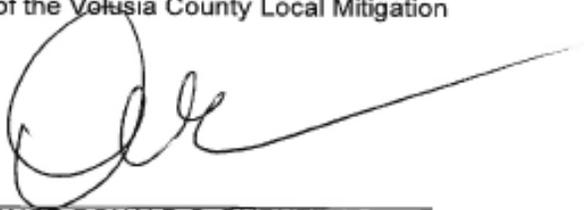
APPENDIX A: PLAN ADOPTIONS

(RESO. NO. 20-25)

strategy.

Section 6. The City of Port Orange will continue to participate in the updating and expansion of the Volusia County Local Mitigation Strategy in the years ahead.

Section 7. The City of Port Orange will further seek to encourage the businesses, industries and community groups operating within Port Orange to also participate in the updating and expansion of the Volusia County Local Mitigation Strategy in the years ahead.



MAYOR DONALD O. BURNETTE

ATTEST:


Robin L. Fenwick, CMC, City Clerk



Adopted on the 16 day of June, 2020.

Reviewed and Approved: 
Matthew J. Jones City Attorney

RESOLUTION NO. 2020-24

A RESOLUTION BY THE CITY COUNCIL OF THE CITY OF SOUTH DAYTONA, FLORIDA AUTHORIZING THE ADOPTION OF THE UPDATED VOLUSIA COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION STRATEGY PLAN; PROVIDING FOR CONFLICTING RESOLUTIONS; PROVIDING FOR SEVERABILITY; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, areas of the City of South Daytona are vulnerable to the human and economic costs of natural, technological, and societal disasters; and

WHEREAS, the City of South Daytona governing body realizes the importance of reducing or eliminating those vulnerabilities for the overall good and welfare of the community; and

WHEREAS, the City of South Daytona has been an active participant in Volusia Prepares, the Local Mitigation Strategy working group, which has established a comprehensive, coordinated planning process involving the county and its municipalities, as well as other public and private sector organizations, to eliminate or decrease these vulnerabilities; and

WHEREAS, the City's professional staff have identified, justified, and prioritized a number of proposed projects and programs needed to mitigate the vulnerabilities of areas of South Daytona to impacts of future disasters; and

WHEREAS, these proposed projects and programs have been incorporated into the current edition of the Volusia County Multi-Jurisdiction Local Mitigation Strategy Plan that has been prepared and issued for consideration and adoption by the communities and jurisdictions of Volusia County; and

WHEREAS, a copy of the Mitigation Action Plan and South Daytona's goals, objectives and initiatives have been attached hereto as Attachment "A" and "B" and incorporated herein by reference; and

WHEREAS, the formal adoption of the Plan by the local governing body is a requirement of the Community Rating System Program.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF SOUTH DAYTONA, VOLUSIA COUNTY, FLORIDA:

Section 1. Description of Actions.

1. The City Council approves of its designated portion of the Volusia County Multi-Jurisdictional Local Mitigation Strategy Plan.
2. The City Council endorses the mitigation goals and objectives established by Volusia Prepares for the countywide plan and the anticipated schedule for the next updating of the plan.

APPENDIX A: PLAN ADOPTIONS

- 3. The City Council finds that the proposed flood mitigation projects and programs included in the Plan by other jurisdictions and organizations are acceptable, they will not adversely affect the City or its neighborhoods, and that they do not conflict with or duplicate the flood mitigation proposals made by the City itself.
- 4. Relevant City staff are requested and instructed to pursue available funding opportunities for implementation of the proposals designated therein.
- 5. The agencies and organizations within the City of South Daytona, upon receipt of such funding or other necessary resources, seek to implement the proposals contained in the City's individual section of the Plan.
- 6. The City Council will continue to participate in the updating and expansion of the Volusia County Integrated Floodplain Management Plan in the years ahead.
- 7. The City Council will further seek to encourage the businesses, industries and community groups operating in South Daytona to also participate in the updating and expansion of the Volusia Integrated Floodplain Management Plan in the years ahead.

Section 2. Repealer. All prior resolutions, if any, which conflict with this resolution are hereby repealed.

Section 3. Severability. If any section, subsection, sentence, clause, phrase or portion of this resolution, or application hereof, is for any reason held invalid or unconstitutional by any Court, such portion or application shall be deemed a separate, distinct, and independent provision, and such holding shall not affect the validity of the remaining portions or application hereof.

Section 4. Effective Date. This resolution shall become effective immediately upon its adoption

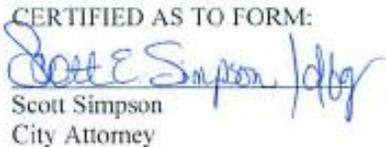
APPROVED AND ADOPTED upon first and final reading at the regular meeting by the City Council of the City of South Daytona, Florida on the 28 day of July, 2020.

SIGNED:

William C. Hall, Mayor

ATTEST:

James L. Gillis, Jr.
City Manager

CERTIFIED AS TO FORM:

Scott Simpson
City Attorney

Resolution No. 2020-23

A Resolution of the School Board of Volusia County, Florida Proclaiming "Concern of the Volusia County Local Mitigation Strategy" for the School District of Volusia County

Whereas, areas of Volusia County Schools are vulnerable to the human and economic costs of natural, technological and societal disasters, and

Whereas, the Volusia County Schools governing body realizes the importance of reducing or eliminating those vulnerabilities for the overall good and welfare of the community, and

Whereas, Volusia County Schools has been an active participant in Volusia Prepares, the Local Mitigation Strategy working group, which has established a comprehensive, coordinated planning process involving the county and its municipalities, as well as other public and private sector organizations, to eliminate or decrease these vulnerabilities, and

Whereas, Volusia County Schools representatives and staff have identified, justified and prioritized a number of proposed projects and programs needed to mitigate the vulnerabilities of unincorporated areas of Volusia County to the impacts of future disasters, and

Whereas, Volusia County Schools representatives and staff have reviewed the information provided by or for other participating jurisdictions and organizations, including the projects and programs they have proposed for incorporation into the Volusia County Local Mitigation Plan, and

Whereas, these proposed projects and programs have been incorporated into the current edition of the Volusia County Local Mitigation Plan that has been prepared and issued for consideration and implementation by the communities and jurisdictions of Volusia County,

NOW, THEREFORE, BE IT RESOLVED BY THE SCHOOL BOARD OF VOLUSIA COUNTY, FLORIDA, IN OFFICIAL SESSION, DULY ASSEMBLED IN DELAND, FLORIDA, THIS 23RD DAY OF JUNE 2020 AS FOLLOWS:

- Section 1. Volusia County Schools hereby accepts and approves of its designated portion of the Volusia County Local Mitigation Plan*
- Section 2. Volusia County Schools accepts and endorses the mitigation goals and objectives established by Volusia Prepares for the countywide plan, and the anticipated schedule for the next updating of the plan*
- Section 3. Volusia County Schools finds that the proposed mitigation projects and programs included in the plan by other jurisdictions and organizations are acceptable, that they will not adversely affect the county or its neighborhoods, and that they do not conflict with or duplicate the mitigation proposals made by the county itself*
- Section 4. The agency personnel of Volusia County Schools are requested and instructed to pursue available funding opportunities for implementation of the proposals designated therein*
- Section 5. The agencies and organizations within Volusia County Schools will, upon receipt of such funding or other necessary resources, seek to implement the proposals contained in the county's individual section of the strategy, and*

APPENDIX A: PLAN ADOPTIONS

Section 6. Volusia County Schools will continue to participate in the updating and expansion of the Volusia County Local Mitigation Plan in the years ahead, and

Section 7. Volusia County Schools will further seek to encourage the businesses, industries and community groups operating within Volusia County to also participate in the updating and expansion of the Volusia County Local Mitigation Plan in the years ahead

*PASSED AND ADOPTED THIS 23RD DAY OF JUNE, 2020
THE SCHOOL BOARD OF VOLUSIA COUNTY, FLORIDA*

Ida D. Wright
Mrs. Ida Wright, Chairman

Linda Cuthbert
Mrs. Linda Cuthbert, Vice Chairman

Carl Persis
Mr. Carl O. Persis

Ruben Colon
Mr. Ruben Colon

Ms. Jamie M. Haynes
Ms. Jamie M. Haynes

Dr. Carmen Balgoin
Dr. Carmen Balgoin

RESOLUTION 2020- 59
RESOLUTION OF THE COUNTY COUNCIL OF VOLUSIA
COUNTY, FLORIDA, RELATING TO THE VOLUSIA COUNTY
LOCAL MITIGATION STRATEGY; PROVIDING AN
EFFECTIVE DATE.

WHEREAS, Volusia County is vulnerable to the human and economic costs of natural, technological and societal disasters, and

WHEREAS, the Volusia County Council recognizes the importance of reducing or eliminating those vulnerabilities for the overall good and welfare of the community, and

WHEREAS, Volusia County has been an active participant in Volusia Prepares, the Local Mitigation Strategy working group, which has established a comprehensive, coordinated planning process involving the county and its municipalities, as well as other public, private and non-profit sector organizations, to eliminate or decrease these vulnerabilities, and

WHEREAS, Volusia County's representatives and staff have identified, justified and prioritized a number of proposed projects and programs needed to mitigate the vulnerabilities of unincorporated areas of Volusia County to the impacts of future disasters, and

WHEREAS, Volusia County's representatives and staff have reviewed the information provided by or for other participating jurisdictions and organizations, including the projects and programs they have proposed for incorporation into the Volusia County Local Mitigation Strategy, and

WHEREAS, these proposed projects and programs have been incorporated into the current edition of the Volusia County Local Mitigation Strategy that has been prepared and issued for consideration and implementation by the communities and jurisdictions of Volusia County.

NOW, THEREFORE, BE IT RESOLVED, BY THE COUNTY COUNCIL OF THE COUNTY OF VOLUSIA, FLORIDA, IN OPEN MEETING DULY ASSEMBLED IN THE THOMAS C. KELLY ADMINISTRATION CENTER, DELAND, FLORIDA THE 19th DAY OF MAY, A.D. 2020, AS FOLLOWS:

SECTION I: The Volusia County Council hereby accepts and approves its designated portion of the Volusia County Local Mitigation Strategy.

SECTION II: The Volusia County Council accepts and endorses the mitigation goals

APPENDIX A: PLAN ADOPTIONS

and objectives established by Volusia Prepares for the countywide strategy, and the anticipated schedule for the next updating of the strategy.

SECTION III: The Volusia County Council finds that the proposed mitigation projects and programs included in the plan by other jurisdictions and organizations are acceptable, that they will not adversely affect the county or its neighborhoods, and that they do not conflict with nor duplicate the mitigation proposals made by the county itself.

SECTION IV: Volusia County personnel are requested and instructed to pursue available funding opportunities for implementation of the proposals designated therein.

SECTION V: All the government and non-profit agencies and organizations within Volusia County are encouraged, upon receipt of funding or other necessary resources, to implement the jurisdiction's proposals contained in the strategy.

SECTION VI: The Volusia County Council will continue to participate in the updating and expansion of the Volusia County Local Mitigation Strategy in the years ahead.

SECTION VII: The Volusia County Council will further seek to encourage the businesses, industries and community groups operating within Volusia County to also participate in the updating and expansion of the Volusia County Local Mitigation Strategy in the years ahead.

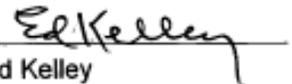
SECTION VIII: This Resolution shall become effective immediately upon its adoption.

DONE AND ORDERED IN OPEN MEETING.

ATTEST:

By: 
George Recktenwald
County Manager

COUNTY COUNCIL
VOLUSIA COUNTY, FLORIDA:

By: 
Ed Kelley
County Chair



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.

APPENDIX B: BYLAWS OF “VOLUSIA PREPARES”

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.

APPENDIX B: BYLAWS OF “VOLUSIA PREPARES”

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.

APPENDIX B: BYLAWS OF "VOLUSIA PREPARES"

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.

APPENDIX C: LOCAL MITIGATION PLAN CROSSWALK

Included below is a link to the Florida Local Mitigation Strategy (LMS) Crosswalk excel document, which incorporates the National Flood Insurance Program's (NFIP) Community Rating System (CRS) into the Local Mitigation Strategy planning process. The information in this document (including all tabs) is subject to state review and can be found at the link below.

[Link to Crosswalk \(click to view online\)](#)

Link text: <ftp://ftp.ecfrpc.org/Live%20Links/>

Click on "Volusia LMS Crosswalk"

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 three meetings, which are summarized below:

- September 11, 2019: LMS Working Group Meeting #1
 - Open to public
- October 29, 2019: Public Meeting
 - Open to public at two separate locations:
 - Daytona Beach Regional Library
 - DeLand Regional Library
- December 11, 2019: LMS Working Group Meeting #2
 - Open to public

Documentation for these meetings is found on the following pages of this appendix, including:

- Sign-In Sheets
- Agendas
- Public Participation Forms
- Press Releases, Emails Concerning Upcoming Meetings
- Email Distribution List

September 11, 2019: LMS Working Group Meeting #1

Agenda

Volusia Prepares

Local Mitigation Working Group Quarterly Meeting
CRS Users Group Meeting LMS Working Group Members
Aubrie Austin, Program Coordinator
September 11, 2019 9:00 AM

Agenda

- **Welcome/Introductions**
- **Approval of meeting minutes from June 12, 2019**
- **Mitigation initiatives requiring review and adoption:** No new projects submitted
- **Florida Forest Service/Bunnell District:** Local Mitigation Strategy addendum, Julie Allen & Will Raulerson
- **2020 LMS Review:** The LMS 5-year review is coming up in 2020. The East Central Florida Regional Planning council is updating the LMS.
 - ECFRPC discussion
 - Bylaws & goals/objectives review
- **Official vote on sun set date for initiatives**
- **Upcoming training**
 - **G557 Rapid Needs Assessment:** October 30, 2019, 3825 Tiger Bay Rd. Ste. 102, Daytona Beach, FL 32124
 - **AWR Understanding Targeted Cyber Attacks:** November 5, 2019, Tiger Bay Rd. Ste. 102, Daytona Beach, FL 32124
 - **MGT 465 Recovering from Cybersecurity Incidents:** November 6-7, 2019, Tiger Bay Rd. Ste. 102, Daytona Beach, FL 32124

APPENDIX D: MEETING INFORMATION

Sign-In Sheet

Volusia Prepares - Working Group Quarterly Meeting					
Wednesday, September 11, 2019					
Jurisdiction	Representative	Phone	Email Address	LMS	CRS
Advent Health	Mike Poinatowski	386-316-1120	michael.poinatowski@adventhealth.com		
Halifax Hospital	Ashley Fisher	407-454-0730	ashley.fisher@halifax.org		
	Sharon Warriner	386-425-7342	sharon.warriner@halifax.org		
Florida Forest Service	Julie Allen	386-585-6156	Julie.Allen@FreshFromFlorida.com		
Residents					
DB Airport	Karen Feaster		kfeaster@volusia.org		

Volusia Prepares - Working Group Quarterly Meeting					
Wednesday, September 11, 2019					
Jurisdiction	Representative	Phone	Email Address	LMS	CRS
Ormond Beach	Becky Weedo	386-676-3342	weedo@ormondbeach.org		
	Loretta Moio	386-676-3315	moio@ormondbeach.org		
Pierson	Carmen Spelorzi	386-749-2661	carmen@townofpierson.org		
Ponce Inlet	Hank Baker	386-236-2185	hbaker@ponce-inlet.org		
	Ami Pierce	386-236-2186	apierce@ponce-inlet.org		
Port Orange	Amanda Lasecki	386-506-5737	alasecki@port-orange.org		
	Shannon Ball	386-506-5903	sball@port-orange.org		
South Daytona	Patty Rippey	386-322-3016	prippy@southdaytona.org		
VC Health Department	Jeanine Robinson	386-274-0705	jeanine.robinson@flhealth.gov		
VC School Board	John Kraft	386-333-2075	jkraft@volusia.k12.fl.us		
<u>County Departments</u>					
VC Emergency Mgmt	Larry LaHue	386-254-1500	llahue@volusia.org		
	Aubrie Austin	386-254-1500	alaustin@volusia.org		
	Jill Hemmerlein	368-254-1500	jhemmerlein@volusia.org		
VC Fire Services	Kate Lind	386-736-5940	klind@volusia.org		
	Howard Bailey	386-527-1404	hbailey@volusia.org		
VC Public Works	Arden Fontaine		afontaine@volusia.org		
VC GIS	Nancy Church	386-736-5922	nchurch@volusia.org		
VC Public Protection					

APPENDIX D: MEETING INFORMATION

Volusia Prepares - Working Group Quarterly Meeting					
Wednesday, September 11, 2019					
Jurisdiction	Representative	Phone	Email Address	LMS	CRS
<u>Cities</u>					
Daytona Beach	Kimberly Dixon	386-671-8807	dixonkimberly@CODB.us		
	Justin Barton	386-671-8807	BartonJustin@CODB.us		
	Michael Smith	386-871-8871	smithmike@CODB.us		
Daytona Beach Shores	Stewart Cruz	386-843-2404	SCruz@cityofdfs.org		
	Lori Irwin	386-763-5328	lirwin@cityofdfs.org		
DeBary	Alan Williamson	386-601-0208	awilliamson@debary.org		
DeLand	Maria Becker	386-626-7097	beckerm@deland.org		
	Jonathan Jacob	386-626-7097	jacobi@deland.org		
Deltona	Sue Houle	386-878-8163	shoule@deltonafl.gov		
	Bill Snyder	386-575-6902	bsnyder@deltonafl.gov		
	Dean Debose	386-575-6905	ddebose@deltonafl.gov		
Edgewater	Tyna Hilton	386-424-2400	thilton@cityofedgewater.org		
Holly Hill	Steve Juengst	386-248-9463	siuengst@hollyhillfl.org		
Lake Helen	Katie Holmes	386-228-2121	kholmes@lakehelen.com		
New Smyrna Beach	David Hamstra	407-992-9160	david@PegasusEngineering.net		
	Kyle Fegley	386-410-2811	kfegley@cityofnsb.com		
Oak Hill	Amanda Osweiler	386-345-6855	osweilera@oakhill.com		
Orange City	Joseph Ruiz	386-775-5415	jruiz@ourorangecity.com		

* Michelle Cechowski, PJ Smith and Mark Reali attended the meeting on behalf of the ECFRPC.

December 11, 2019: LMS Working Group Meeting #2

Agenda

Volusia Prepares

Local Mitigation Working Group Quarterly Meeting
CRS Users Group Meeting LMS Working Group Members
Aubrie Austin, Program Coordinator
December 11, 2019 9:00 AM

Agenda

- **Welcome/Introductions**
- **Approval of meeting minutes from September 11, 2019**
- **Mitigation initiatives requiring review and adoption:** No new projects submitted
- **2020 LMS Review:** The LMS 5-year review is coming up in 2020. The East Central Florida Regional Planning council will update the committee on the progress of the LMS.
- **ECFRPC surge/sea level rise models for the FDEP project**
- **CDBG- DR Mitigation informational Briefing:** Volusia County Community Assistance
- **Upcoming training**
 - G300: Intermediate Incident Command- January 7-9, 2020
 - AWR 328: All Hazards Preparedness for Animals in Disasters- February 25,2020
 - MGT 448: All Hazards Planning for Animal, Agriculture & Food Related Disasters- February 26,2020
 - G400: Advanced Incident Command- March 3 & 4, 2020
 - MGT 323: Instructor Development Workshop- March 24-26, 2020
- **Open discussion**

APPENDIX D: MEETING INFORMATION

Sign-In Sheet

Volusia Prepares - Working Group Quarterly Meeting					
Wednesday, December 11, 2019					
Jurisdiction	Representative	Phone Number	Email Address	LMS	CRS
<u>Cities</u>					
Daytona Beach	Kimberly Dixon	386-671-8807	dixonkimberly@CODB.us		
	Justin Barton	386-671-8807	BartonJustin@CODB.us	✓	
	Michael Smith	386-871-8871	smithmike@CODB.us		
Daytona Beach Shores	Stewart Cruz	386-843-2404	SCruz@cityofdfs.org		
	Lori Irwin	386-763-5328	linwin@cityofdfs.org	✓	✓
DeBary	Alan Williamson	386-601-0208	awilliamson@debary.org	✓	
	<i>David Hamilton</i>			✓	
DeLand	Maria Becker	386-626-7097	beckerm@deland.org	✓	
	Jonathan Jacob	386-626-7097	jacobj@deland.org		
Deltona	Sue Houle	386-878-8163	shoule@deltonafl.gov	SH	
	Bill Snyder	386-575-6902	bsnyder@deltonafl.gov		
	Dean Debose	386-575-6905	ddebose@deltonafl.gov		
Edgewater	Tyna Hilton	386-424-2400	thilton@cityofedgewater.org		
Holly Hill	Steve Juengst	386-248-9463	sjuengst@hollyhillfl.org	✓	
	<i>Jeff Miller</i>	<i>386 248 9488</i>	<i>jmiller@hollyhillfl.org</i>	✓	✓
Lake Helen	Katie Holmes	386-228-2121	kholmes@lakehelen.com	✓	
New Smyrna Beach	David Hamstra	407-992-9160	david@PegasusEngineering.net	✓	
	Kyle Fegley	386-410-2811	kfegley@cityofnsb.com		
Oak Hill	Amanda Osweiler	386-345-6855	osweilera@oakhill.com	✓	
Orange City	Joseph Ruiz	386-775-5415	jruiz@ourorangecity.com		

APPENDIX D: MEETING INFORMATION

Sign-In Sheet (2 of 3)

Volusia Prepares - Working Group Quarterly Meeting					
Wednesday, Decemehr 11, 2019					
Jurisdiction	Representative	Phone Number	Email Address	LMS	CRS
Ormond Beach	Becky Weedo	386-676-3342	weedo@ormondbeach.org	BW	BW
	Loretta Moio	386-676-3315	moio@ormondbeach.org	LM	LM
Pierson	Carmen Spelozzi	386-749-2661	carmen@townofpierson.org		
Ponce Inlet	Hank Baker	386-236-2185	hbaker@ponce-inlet.org	HB	HB
	Ami Pierce	386-236-2186	apierce@ponce-inlet.org		
Port Orange	Amanda Lasecki	386-506-5737	alasecki@port-orange.org		
	Shannon Ball	386-506-5903	sball@port-orange.org	SB	
South Daytona	Patty Rippey	386-322-3016	prippey@southdaytona.org	PR	PR
VC Health Department	Jeanine Robinson	386-274-0705	jeanine.robinson@flhealth.gov	JR	
	Robert Maglievaz	386-274-0691	RobertMaglievaz@flhealth.gov		
VC School Board	John Kraft	386-333-2075	irkraft@volusia.k12.fl.us	JK	JK
County Departments					
VC Emergency Mgmt	Jill Hemmerlein	386-254-1500	jhemmerlein@volusia.org	JK	
	Aubrie Austin	386-254-1500	alaustin@volusia.org		
	Tom Cisco	386-254-1500	tcisco@volusia.org	TC	
VC Fire Services	Kate Lind	386-736-5940	klind@volusia.org	KL	
	Howard Bailey	386-527-1404	hbailey@volusia.org		
VC Public Works	Arden Fontaine	386-736-5965	afontaine@volusia.org	AF	
VC GIS	Nancy Church	386-736-5922	nchurch@volusia.org		
VC Public Protection					
VC COASTAL DIV. JOE NOLAN 386-547-0122 JNOLAN@VOLUSIA.ORG					

APPENDIX D: MEETING INFORMATION

Sign-In Sheet (3 of 3)

Volusia Prepares - Working Group Quarterly Meeting					
Wednesday, December 11, 2019					
Jurisdiction	Representative	Phone Number	Email Address	LMS	CRS
Advent Health	Mike Poinatowski	386-316-1120	michael.poinatowski@adventhealth.com		
Halifax Hospital	Ashley Fisher	407-454-0730 ✓	ashley.fisher@halifax.org ✓	RF	
	Sharon Warriner	386-425-7342	sharon.warriner@halifax.org	N/A	
Florida Forest Service	Julie Allen	386-585-6156	Julie.Allen@FreshFromFlorida.com		
Residents					
DB Airport	Karen Feaster		kfeaster@volusia.org		
Community Assistance	Corry Brown	386-736-5955	cbrown@volusia.org		
ECFRPC	Mark Reali	407-245-0300	mreali@ecfrpc.org		
ECFRPC	Brandon Gunn	813-966-0674	bgunn@ecfrpc.org		
VC Environmental Mgmt	Megan Martin	386-736-5927	mbmartin@volusia.org	✓	
FDEM	Claudia Baker	850-519-6734	claudia.baker@floridapower.com		
ECFRPC	PJ Smith	407-476-5443	pj.smith@ecfrpc.org	✓	
ECFRPC	Charles Abbatantuono	407-212-0304	abbatantuono@knights.wf.edu	✓	
APTIM	Pat White	386-299-7754	patricia.white@APTIM.com		
ECFRPC	Tara McGue	407-245-0300	tara@ecfrpc.org		

APPENDIX D: MEETING INFORMATION

Outreach Emails for LMS Meetings (9/11/2019 Meeting)

-----Original Message-----

From: Aubrie Austin <alaustin@volusia.org>

Sent: Friday, September 06, 2019 10:42 AM

To: bill.coulson@AHSS.org; JSweeney@cityofdbfs.org; lirwin@cityofdbfs.org; scruz@cityofdbfs.org; thilton@CITYOFEDGEWATER.ORG; kmcneely@cityofflaglerbeach.com; Kyle Fegley <KFegley@cityofnsb.com>; svandemark@cityofnsb.com; Justin Barton <BartonJustin@CODB.US>; Curtis Burkett <burkettcurtis@CODB.US>; DixonK@CODB.US; SmithHardy@CODB.US; WallerDavid@CODB.US; awilliamson@debary.org; beckerm@deland.org; Greboszm@deland.org; Sue Houle <shoule@deltonafl.gov>; smcgrath@deltonafl.gov; Mike Poniatowski <Michael.Poniatowski@fhmmc.org>; lnelson@flaglercounty.org; Jeanine Robinson <Jeanine.Robinson@flhealth.gov>; Robert Maglievaz <robert.maglievaz@flhealth.gov>; Julie Allen <julie.Allen@freshfromflorida.com>; Ashley.Fisher@halifax.org; bob.williams@halifax.org; sharon.warriner@halifax.org; sjuengst@hollyhillfl.org; katie Holmes <kholmes@lakehelen.com>; evansk@oakhillfl.com; osweilera@oakhillfl.com; moisio@ormondbeach.org; Steven.Spraker@ormondbeach.org; Weedo@ormondbeach.org; BMendez@ourorangecity.com; Ronnie Long <rlong@ourorangecity.com>; david@pegasusengineering.net; Leylah Saavedra <leylah@pegasusengineering.net>; Hank Baker <hbaker@ponce-inlet.org>; alasecki@port-orange.org; Sylvester Alison <asyvester@port-orange.org>; jguido@port-orange.org; mmomberger@port-orange.org; Shannon Ball <sball@port-orange.org>; Abby Johnson <ajohnson@sjrwm.com>; prippey@southdaytona.org; carmen@townofpierson.org; Chris Boyer <cjboyer@volusia.k12.fl.us>; Greg Akin <GPAKIN@volusia.k12.fl.us>; reyoung@volusia.k12.fl.us; Arden Fontaine <AFontaine@volusia.org>; Charles Kamine <CKamine@volusia.org>; Eric Gebo <EGebo@volusia.org>; Judy Grim <JGrim@volusia.org>; John Stockham <JStockham@volusia.org>; Karen Feaster <KFeaster@volusia.org>; Michael Ulrich <MUlrich@volusia.org>; Nancy Church <NChurch@volusia.org>; Patricia Bythwood <PBythwood@volusia.org>; Sean Maroney <SMaroney@volusia.org>; Tom Cisco <TCisco@volusia.org>

Cc: Michelle Cechowski <michelle@ecfrpc.org>

Subject: Meeting Next Week

Good Morning Volusia Prepares,

I hope everyone is having a wonderful Friday! Our next meeting is Wednesday, September 11, 2019 @ 9:00 A.M.. This meeting we will have the East Central Florida Regional Planning Council there to discuss the update of the County's LMS. To help with this process I have attached 2 documents that need to be reviewed. I also am in need of the critical facilities in your jurisdiction to ensure the list is up to date in the plan. Please send me your critical facilities list as soon as you can. The deadline is Friday, September 20, 2019. If you have any questions please don't hesitate to ask. We will also have the Florida Forest Service at the meeting to discuss mitigation activities.

Have a Wonderful Day,

Aubrie Austin
Planner II
Volusia County Emergency Management
3825 Tiger Bay Rd. Ste 102
Daytona Beach, FL 32124
(386)-254-1500 ext. 11625
alaustin@volusia.org

APPENDIX D: MEETING INFORMATION

Outreach Emails for LMS Meetings (12/11/2019 Meeting; part 1 of 2)

 Tue 12/10/2019 10:49 AM
Aubrie Austin <alaustin@volusia.org>
Wednesday, December 11, 2019 meeting

To bill.coulson@AHSS.org; JSweeney@cityofdb.com; linwin@cityofdb.com; scruz@cityofdb.com; thilton@CITYOFEDGEWATER.ORG; Kyle Fegley; svandemark@cityofnsb.com; Justin Barton; Curtis Burkett; DixonK@CODB.US; SmithHardy@CODB.US; WallerDavid@CODB.US; awilliamson@debary.org; becker@deland.org; Greboszm@deland.org; Dean Debose; Sue Houle; smcgrath@deltonafl.gov; Mike Poniaowski; Inelson@flaglercounty.org; Jeanine Robinson; Robert Maglievaz; Julie Allen;

Cc Michelle Cechowski; PJ Smith; Tara McCue; Corry Brown

 You replied to this message on 12/10/2019 11:49 AM.

Outlook item

-  121119 Volusia Prepares Agenda.pdf
162 KB
-  09112019 Volusia Prepares LMS meeting summary.pdf
104 KB

[Bing Maps](#) [Suggested Meetings](#) [Action Items](#) + Get more add-ins

Good Morning All,

I hope everyone is having a stress-free December! Tomorrow at 9 A.M. is the last LMS meeting for 2019 and attached is the agenda, along with the meeting minutes from September.

There are a couple of items that I would like to bring to everyone's attention. The first is a project that the Regional Planning Council is working on with FDEP. They will be showing the project and talking about it at the meeting. For a preview the link is provided below. There is a questionnaire attached as well for feedback.

<http://ecfrpc.maps.arcgis.com/apps/webappviewer/index.html?id=4174f376b173413a973103bbfc9a30e6>
User Name: ecfrpc
Password: ecfrpc2015

The next item that will be discussed is the CDBG-MIT, which is in response to Hurricanes Hermine and Matthew. A draft plan has been created and there are 30 days to review it. The link is provided below.

APPENDIX D: MEETING INFORMATION

Outreach Emails for LMS Meetings (12/11/2019 Meeting; part 2 of 2)



Tue 12/10/2019 10:49 AM

Aubrie Austin <alaustin@volusia.org>

Wednesday, December 11, 2019 meeting

To bill.coulson@AHSS.org; JSweeney@cityofdb.org; linwin@cityofdb.org; scruz@cityofdb.org; thilton@CITYOFEDGEWATER.ORG; Kyle Fegley; svandemark@cityofnsb.com; Justin Barton; Curtis Burkett; DixonK@CODB.US; SmithHardy@CODB.US; WallerDavid@CODB.US; awilliamson@debary.org; becker@deland.org; Greboszm@deland.org; Dean Debose; Sue Houle; smcgrath@deltonafl.gov; Mike Poniatoski; Inelson@flaglercounty.org; Jeanine Robinson; Robert Maglievaz; Julie Allen;

Cc Michelle Cechowski; PJ Smith; Tara McCue; Corry Brown

You replied to this message on 12/10/2019 11:49 AM.

- Outlook item
- 121119 Volusia Prepares Agenda.pdf (162 KB)
- 09112019 Volusia Prepares LMS meeting summary.pdf (104 KB)

Bing Maps Suggested Meetings Action Items + Get more add-ins

If I am missing anything please let me know...

Thank you all for participating in the LMS- Volusia Prepares Committee.

Have a Wonderful Day,

Aubrie Austin
Planner II
Volusia County Emergency Management
3825 Tiger Bay Rd. Ste 102
Daytona Beach, FL 32124
(386)-254-1500 ext. 11625
alaustin@volusia.org

APPENDIX D: MEETING INFORMATION

Meeting Outreach Distribution List

To: [Akin, Greg](#)
To: [Allen, Julie](#)
To: [Bailey, Howard](#)
To: [Baker, Claudia](#)
To: [Baker, Hank](#)
To: [Ball, Shannon](#)
To: [Barton, Justin](#)
To: [Becker, Maria](#)
To: [Boyer, Chris](#)
To: [Burkett, Curtis](#)
To: [Bythwood, Patricia](#)
To: [Cechowski, Michelle](#)
To: [Church, Nancy](#)
To: [Cisco, Tom](#)
To: [Coulson, William](#)
To: [Cruz, Stewart](#)
To: [Debose, Dean](#)
To: [Dixon, Kimberly](#)
To: [Evans, Kohn](#)
To: [Feaster, Karen](#)
To: [Fegley, Kyle](#)
To: [Fisher, Ashley](#)
To: [Fontaine, Arden](#)
To: [Gebo, Eric](#)
To: [Grebosz, Mike](#)
To: [Hamstra, David](#)
To: [Hemmerlein, Jill](#)
To: [Hilton, Tyna Lynn](#)
To: [Holmes, katie](#)
To: [Houle, Sue](#)
To: [Hutchinson, Denise](#)
To: [Irwin, Lory](#)
To: [Johnson, Abby](#)
To: [Juengst, Steven](#)
To: [Kamine, Charles](#)
To: [Kraft, John](#)
To: [Lasecki, Amanda](#)
To: [Lind, Kate](#)
To: [Long, Ronnie](#)
To: [Maglievaz, Robert](#)
To: [Maroney, Sean](#)
To: [McGrath, Scott](#)
To: [Mendez, Becky](#)
To: [Moisio, Loretta](#)
To: [Momberger, Margaret](#)
To: [Nelson, Laura](#)
To: [Osweiler, Mandy](#)
To: [Poniatowski, Mike](#)
To: [Rippey, Patty](#)
To: [Robinson, Jeanine](#)
To: [Saavedra, Leylah](#)
To: [Smith, Hardy](#)
To: [Spelorzi, Carmen](#)
To: [Spraker, Steven](#)
To: [Stockham, John](#)
To: [Sweeney, Joanne](#)
To: [Sylvester, Alison](#)
To: [Ulrich, Michael](#)
To: [Vandemark, Shawn](#)
To: [Waller, David](#)
To: [Warriner, Sharon](#)
To: [Weedo, Becky](#)
To: [White, Pat](#)
To: [Williams, Bob](#)
To: [Williamson, Alan](#)
To: [Young, Ronald E.](#)

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:

- Flood Zone
- Fire Risk Zone
- Storm Surge Zone
- Evacuation Zone
- Wind Risk
- Tornadoes (1950-2019)
- Sea Level Rise

There are approximately 363 critical facilities within Volusia County and its jurisdictions. The critical facilities covered in this report cover the following types of facilities.

- Administrative Buildings (non-city hall)
- Airports
- City Halls
- Elderly Care Facilities
- Emergency Operations Center (Volusia County EOC)
- Fire Stations
- Industrial Buildings
- Medical Facilities (clinics not included)
- Police Stations
- Schools and Colleges
- Utilities

Also covered in this section are **Water and Sewage Treatment Facilities**, **State Facilities** within flood zones, and **Lift Stations** as provided by county jurisdictions.

The tables on the following six pages depict the critical facilities, by jurisdiction and facility type, that are located within Volusia County, Florida. Each critical facility is cross-referenced with environmental hazard zones to depict risk for the natural hazards listed above.

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Critical Facilities (Page 1)

Name of Facility	Address	Jurisdiction/Place	Fire Zone	Wind Zone	Surge Zone	Flood Zone
Air Cargo Building	401 INNOVATION WAY	Daytona Beach	Low Risk	101-105	None	
Aluma Shield of Daytona Beach	405 FENTRESS BLVD	Daytona Beach	Low Risk	96-100	None	
Animal Control	1250 INDIAN LAKE RD	Daytona Beach	Low Risk	101-105	None	
Beach Services	145 DUNLAWTON AV	Daytona Beach	Low Risk	101-105	Category 2	VE
Bonner Elementary School (Chiles Academy)	868 GEORGE w ENGRAM Blvd	Daytona Beach	Low Risk	101-105	Category 3	
Branch Jail	1300 RED JOHN DR	Daytona Beach	Low Risk	101-105	None	
Campbell Junior High School	625 S KEECH STREET	Daytona Beach	Low Risk	101-105	Category 3	
Communications Trailer	65 KEYTON DR	Daytona Beach	Low Risk	101-105	None	
Community Services - Veterans Services	1845 HOLSONBACK DR	Daytona Beach	Low Risk	96-100	None	
Correctional Facility	1354 INDIAN LAKE RD	Daytona Beach	Low Risk	101-105	None	
Cypress Street School	925 George W Engram Blvd	Daytona Beach	Low Risk	101-105	Category 3	AE
Daytona Beach 2	126 BOTEFUHR AV	Daytona Beach	Low Risk	101-105	Category 3	
Daytona Beach 4	1675 MASON AV	Daytona Beach	Very High Risk	101-105	None	
Daytona Beach 6	2020 BEVILLE RD	Daytona Beach	High Risk	101-105	None	AE
Daytona Beach 7	2545 LPGABLVD	Daytona Beach	High Risk	96-100	None	
Daytona Beach City Hall	301 S RIDGEWOOD AV	Daytona Beach	Low Risk	101-105	Category 2	
Daytona Beach Fire Station #1	301 BEACH ST	Daytona Beach	Low Risk	101-105	Category 2	
Daytona Beach Fire Station #3	945 N HALIFAX AV	Daytona Beach	Low Risk	101-105	Category 4	
Daytona Beach Fire Station #5	627 N NOVA RD	Daytona Beach	Very High Risk	101-105	Category 3	
Daytona Beach Police Department Beachside Precinct	510 HARVEY ST	Daytona Beach	Low Risk	101-105	Category 3	
Daytona Beach Police Headquarters	129 VALOR BLVD	Daytona Beach	Very High Risk	96-100	None	
Daytona Beach Regional Airport	700 CATALINA DR	Daytona Beach	Low Risk	101-105	None	
Daytona Law Center - Public Defender	442 S BEACH ST	Daytona Beach	Low Risk	101-105	Category 1	
Daytona State College	1200 W INTL SPEEDWAY	Daytona Beach	Low Risk	101-105	None	
Deputy Stephen Saboda Training Center	3901 TIGER BAY RD	Daytona Beach	Low Risk	101-105	None	
Eastside Data Center	49 KEYTON DR	Daytona Beach	Low Risk	101-105	None	
Economic Development	700 CATALINA DR	Daytona Beach	Low Risk	101-105	None	
Embry Riddle Aeronautical University	1 Aerospace Blvd	Daytona Beach	Low Risk	101-105	None	
Emergency Management	3825 TIGER BAY RD	Daytona Beach	Low Risk	101-105	None	
Environmental Lab Health Department	1250 INDIAN LAKE RD	Daytona Beach	Low Risk	101-105	None	
Environmental Lab Trailer	1251 INDIAN LAKE RD	Daytona Beach	Low Risk	101-105	None	
Environmental Management	440 S BEACH ST	Daytona Beach	Low Risk	101-105	Category 2	
EOC Tower Site	49 KEYTON DR	Daytona Beach	Low Risk	101-105	None	
EOC-B	3820 OLD DELAND RD	Daytona Beach	Low Risk	101-105	None	
Facilities Building	3811 TIGER BAY RD	Daytona Beach	Low Risk	101-105	None	
Federal Bureau of Investigation	444 SEABREEZE BLVD STE 300	Daytona Beach	Low Risk	101-105	Category 3	
Fire Training Center 15	3889 TIGER BAY RD	Daytona Beach	Low Risk	101-105	None	
FL National Guard	405 BASIN ST	Daytona Beach	Low Risk	101-105	Category 2	
Fleet Management	1270 INDIAN LAKE RD	Daytona Beach	Low Risk	101-105	None	
FS - Daytona Beach International Airport (DBIA)	2316 BELLEVUE AV	Daytona Beach	Low Risk	101-105	None	
Fuel Site - Indian Lake Road	1336 INDIAN LAKE RD	Daytona Beach	Low Risk	101-105	None	
Halifax 11	1580 DERBYSHIRE RD	Daytona Beach	Very High Risk	96-100	None	
Halifax Health	303 N CLYDE MORRIS BLVD	Daytona Beach	Low Risk	101-105	None	
Health Department	1845 HOLSONBACK RD	Daytona Beach	Low Risk	96-100	None	
Health Department	421 S KEECH ST	Daytona Beach	Low Risk	101-105	Category 3	AE
Health Department	775 HARVEY STRICKLAND BLVD ST 110	Daytona Beach	High Risk	96-100	None	
Humana Hospital	1500 BEVILLE ROAD	Daytona Beach	Low Risk	101-105	None	
IT Telecommunications	49 KEYTON DR	Daytona Beach	Low Risk	101-105	None	
Mainland High School	1255 W INTL SPEEDWAY	Daytona Beach	Low Risk	101-105	None	
Mary Bethune Cookman University	640 Mary McLeod Bethune Blvd	Daytona Beach	Low Risk	101-105	Category 3	A
Medical Examiner	1360 INDIAN LAKE RD	Daytona Beach	Low Risk	101-105	None	

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Critical Facilities (Page 2)

Name of Facility	Address	Jurisdiction/Place	Fire Zone	Wind Zone	Surge Zone	Flood Zone
Ocean Center	101 N ATLANTIC AV	Daytona Beach	Low Risk	101-105	Category 3	
S James Foxman Justice Center	251 N RIDGEWOOD AV	Daytona Beach	Low Risk	101-105	Category 2	
Sheriff - Information Technology	59 KEYTON DR	Daytona Beach	Low Risk	101-105	None	
Sheriff Operations / IT	1330 INDIAN LAKE RD	Daytona Beach	Low Risk	101-105	None	
Sheriff's Communication Center	3825 TIGER BAY RD	Daytona Beach	Low Risk	101-105	None	
SO - Airport Unit	700 CATALINA DR STE 110	Daytona Beach	Low Risk	101-105	None	
Tag & Title Office (West Concourse)	101 N ATLANTIC AV	Daytona Beach	Low Risk	101-105	Category 3	
Tiger Bay State Forest Office	4316 W INTL SPEEDWAY BLVD	Daytona Beach	Low Risk	96-100	None	A
Turie T. Small Elementary School	800 SOUTH STREET	Daytona Beach	Low Risk	101-105	Category 3	AE
Volusia County Beach Patrol	515 S Atlantic Ave	Daytona Beach	Low Risk	101-105	Category 4	
Volusia County Courthouse Annex	125 E ORANGE AV	Daytona Beach	Low Risk	101-105	Category 3	
Votran Bus Terminal / Parking Garage	699 EARL ST	Daytona Beach	Low Risk	101-105	Category 4	
Votran Transfer Plaza - Bus Terminal	207 DR MARY MCLEOD BETHUNE BLVD	Daytona Beach	Low Risk	101-105	Category 3	
Westside Elementary School	1210 JIMMY ANN DRIVE	Daytona Beach	Low Risk	101-105	None	
Community Center	3000 Bellemead Dr	Daytona Beach Shores	Low Risk	101-105	Category 4	
Daytona Beach Shores 77	3050 S ATLANTIC AV	Daytona Beach Shores	Low Risk	101-105	Category 4	
Daytona Beach Shores City Hall	2990 South Atlantic Ave	Daytona Beach Shores	Low Risk	101-105	Category 4	
Daytona Beach Shores Police Department	3050 S ATLANTIC AV	Daytona Beach Shores	Low Risk	101-105	Category 4	
Dunlawton Control Tower	3427 S ATLANTIC AV	Daytona Beach Shores	Low Risk	101-105	Category 1	VE
Public Safety	3050 South Atlantic Ave	Daytona Beach Shores	Low Risk	101-105	Category 4	
Public Works	11 Bellemead Dr	Daytona Beach Shores	Low Risk	101-105	Category 4	
Senior Center	3048 South Atlantic Ave	Daytona Beach Shores	Low Risk	101-105	Category 4	
City of DeBary City Hall	16 Colomba Road	DeBary	Very High Risk	96-100	None	
City of DeBary Town Hall	12 Colomba Road	DeBary	Very High Risk	96-100	None	
District 5 Sheriff's Office	79 S. Charles Richard Beall Blvd	DeBary	Very High Risk	96-100	None	
District 6 A-Debary Substation	79 S CHARLES R BEALL BLVD	DeBary	Very High Risk	96-100	None	
Fire Station 33	75 S. Charles Richard Beall Blvd	DeBary	Very High Risk	96-100	None	
Public Works Facility	199 Barwick Road	DeBary	Very High Risk	96-100	None	
Agriculture Center	3100 E NEW YORK AV	DeLand	High Risk	96-100	None	A
Airport Maintenance Fuel Depot	1777 LANGLEY AV	DeLand	Low Risk	96-100	None	
Airport Maintenance Main Building	1777 LANGLEY AV	DeLand	Low Risk	96-100	None	
Aviation/Special Services	951 SINGLETON DR	DeLand	Low Risk	96-100	None	
Chisholm Center Main Building	520 S CLARA AV	DeLand	Very High Risk	96-100	None	
Community Services - Teal Building	110 W RICH AV	DeLand	Low Risk	96-100	None	
DeLand City Hall	120 S FLORIDA AV	DeLand	Low Risk	96-100	None	
DeLand Civil / Court Services Unit	101 N ALABAMA	DeLand	Low Risk	96-100	None	
DeLand Train Station	2491 OLD NEW YORK AV	DeLand	Low Risk	96-100	None	
District 2	1706 S WOODLAND BLVD	DeLand	Very High Risk	96-100	None	
Env Health Field Office / Admin	121 W RICH AV	DeLand	Low Risk	96-100	None	
Evac Ambulance Station 10	2850 FIREHOUSE RD	DeLand	High Risk	96-100	None	
Evac Ambulance Station 2	1655 E TAYLOR RD	DeLand	Low Risk	96-100	None	
Evac Ambulance Station 5	257 W INTL SPEEDWAY BLVD	DeLand	Low Risk	96-100	None	
Fire Station 81	201 HOWRY AV	DeLand	Low Risk	96-100	None	
Fire Station 82	257 W INTL SPEEDWAY BLVD	DeLand	Low Risk	96-100	None	
Fire Station 83	1655 E TAYLOR RD	DeLand	Low Risk	96-100	None	
FL DOT District 5 Administration Center	719 S WOODLAND BLVD	DeLand	Low Risk	96-100	None	
FL Highway Patrol Troop D District 3	1551 E INTL SPEEDWAY BLVD	DeLand	Low Risk	96-100	None	
FL National Guard - Battery B 1-265	401 S ALABAMA AV	DeLand	Low Risk	96-100	None	
Glenwood 46	920 GLENWOOD RD	DeLand	High Risk	96-100	None	

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Critical Facilities (Page 3)

Name of Facility	Address	Jurisdiction/Place	Fire Zone	Wind Zone	Surge Zone	Flood Zone
Historic Courthouse	125 W NEW YORK AV	DeLand	Very High Risk	96-100	None	
Information Technology	119 W INDIANA AV	DeLand	Very High Risk	96-100	None	
Kepler Ridge 42	1885 N KEPLER RD	DeLand	Very High Risk	96-100	None	
Leigh Matusick Airport Management Center	1000 FLIGHTLINE BLVD	DeLand	Low Risk	96-100	None	
Microcomputers	203 W RICH AV	DeLand	Low Risk	96-100	None	
Parks, Recreation, and Culture	202 N FLORIDA AV	DeLand	Low Risk	96-100	None	
Personnel Suite 62	230 N WOODLAND BLVD	DeLand	Low Risk	96-100	None	
Police Station	219 W HOWRY AV	DeLand	Low Risk	96-100	None	
Public Services Fuel Depot	1112 S GARFIELD AV	DeLand	Very High Risk	96-100	None	
Public Services Mechanics Bay and Sign Shop	1122 S GARFIELD AV	DeLand	Very High Risk	96-100	None	
R&B Barn 1 - NW Complex	2560 W SR 44	DeLand	Low Risk	96-100	None	
Risk Mgmt Suite 250	230 N WOODLAND BLVD	DeLand	Low Risk	96-100	None	
Road & Bridge Sign Shop	300 E NEW HAMPSHIRE AV	DeLand	Very High Risk	96-100	None	
Sanborn Center	751 S ALABAMA AV	DeLand	Low Risk	96-100	None	
So Administration / Central Records	123 W INDIANA AV	DeLand	Low Risk	96-100	None	
Spring Hill Community Resource Center	910 S ADELLE AV	DeLand	Low Risk	96-100	None	
Springs Lakes 32	2850 FIREHOUSE RD	DeLand	High Risk	96-100	None	
St Johns 45	2580 W NEW YORK AV	DeLand	Low Risk	96-100	None	
Stone Street Parks and Recreations Admin Building and Museum	230 N STONE ST	DeLand	Low Risk	96-100	None	
TCK Admin Center - DeLand	123 W INDIANA AV	DeLand	Low Risk	96-100	None	
Volusia County Courthouse	101 N ALABAMA AV	DeLand	Low Risk	96-100	None	
Volusia County Land Acquisition	123 W Indiana Avenue	DeLand	Low Risk	96-100	None	
Windrow Building	1101 S Amelia Ave	DeLand	Very High Risk	96-100	None	
Deleon Springs 41	5007 CENTRAL AV	Deleon Springs	Very High Risk	96-100	None	
Deleon Springs Forestry Station	5458 N US HWY 17	Deleon Springs	High Risk	96-100	None	
Deleon Springs Tower	1276 REYNOLDS RD	Deleon Springs	High Risk	96-100	None	
Community Training (FD)	1362 E LOMBARDY DR	Deltona	Low Risk	96-100	None	
Deltona 65	2983 HOWLAND BLVD	Deltona	High Risk	96-100	None	
Deltona 800 MHz Tower	201 HOWLAND BLVD	Deltona	High Risk	96-100	None	
Deltona City Hall/Municipial Complex	2345 PROVIDENCE BLVD	Deltona	High Risk	96-100	None	
Deltona Water Complex	255 ENTERPRISE RD	Deltona	Low Risk	96-100	None	
District 4 / Civil Daytona	1691 PROVIDENCE BLVD	Deltona	Low Risk	96-100	None	
Evac Ambulance Station 6	1236 SAXON BLVD	Deltona	Low Risk	96-100	None	
Fire Department Logistics Complex	1362 E LOMBARDY DR	Deltona	Low Risk	96-100	None	
Fire Station 61/Administration Building	1685 PROVIDENCE BLVD	Deltona	Low Risk	96-100	None	
Fire Station 62	320 DIAMOND ST	Deltona	Very High Risk	96-100	None	
Fire Station 63	2147 HOWLAND BLVD	Deltona	Very High Risk	96-100	None	
Fire Station 64	236 FT. SMITH BLVD	Deltona	Very High Risk	96-100	None	
Fire Station 65	2983 HOWLAND BLVD	Deltona	High Risk	96-100	None	
Health Department	3151 HOWLAND BLVD	Deltona	High Risk	96-100	None	
Public Works Facility	201 HOWLAND BLVD	Deltona	High Risk	96-100	None	
School Board - Vehicle Maintenance	2101 EUSTACE AV	Deltona	Very High Risk	96-100	None	
Wes Crile Gymnasium	1537 NORBERT TER	Deltona	Low Risk	96-100	None	
800 MHz Tower	135 ARTHUR AV	Edgewater	Very High Risk	101-105	Category 3	
Coronado Paint	308 OLD COUNTY ROAD	Edgewater	Very High Risk	101-105	Category 2	
Discovery Days Inst Of Learning	227 N RIDGEWOOD AVE	Edgewater	Very High Risk	101-105	Category 3	
Edgewater City Hall	104 N RIVERSIDE DR	Edgewater	Very High Risk	101-105	Category 2	
Edgewater Police Department	135 E PARK AVE	Edgewater	Very High Risk	101-105	Category 3	
Edgewater Public School	801 S OLD COUNTY ROAD	Edgewater	Very High Risk	101-105	Category 3	

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Critical Facilities (Page 4)

Name of Facility	Address	Jurisdiction/Place	Fire Zone	Wind Zone	Surge Zone	Flood Zone
Edgewater Station 55	106 RHODE ISLAND ST	Edgewater	Very High Risk	101-105	Category 4	
Edgewater Station 57	2628 HIBISCUS DR	Edgewater	High Risk	101-105	Category 3	
Indian River Elementary School	650 ROBERTS ROAD	Edgewater	Low Risk	101-105	Category 4	
Little Explorers Montessori School	410 N RIDGEWOOD AVE	Edgewater	Very High Risk	101-105	Category 3	
Massey Ranch Airpark	635 AIR PARK ROAD	Edgewater	High Risk	101-105	Category 3	
Southeast Volusia Family YMCA	148 W TURGOT AV	Edgewater	Very High Risk	101-105	Category 3	
Indian Mound 34	1700 ENTERPRISE OSTEEN RD	Enterprise	High Risk	96-100	None	
City Hall Annex	1066 Ridgewood Avenue	Holly Hill	Low Risk	101-105	Category 3	
Daytona Beach General Hospital	1360 Ridgewood Avenue	Holly Hill	Low Risk	101-105	Category 3	
Evac East Side Hub - Ambulance Station 1	112 CARSWELL AV	Holly Hill	Low Risk	101-105	Category 3	
Evac Tower	112 CARSWELL AV	Holly Hill	Low Risk	101-105	Category 3	
Holly Hill 96	1020 DAYTONA AV	Holly Hill	Low Risk	101-105	Category 4	
Holly Hill City Hall	1065 RIDGEWOOD AV	Holly Hill	Low Risk	101-105	Category 4	
Holly Hill Police Department	1065 RIDGEWOOD AV	Holly Hill	Low Risk	101-105	Category 4	
Public Works Yard	453 LPGA BLVD	Holly Hill	Low Risk	101-105	Category 3	
R&B Barn 3 - NE Complex	455 WALKER ST	Holly Hill	Low Risk	101-105	Category 3	AE
SICA Hall	1065 Daytona Avenue	Holly Hill	Low Risk	101-105	Category 3	
YMCA	1046 Daytona Avenue	Holly Hill	Low Risk	101-105	Category 4	
Central Fellowship Christian Academy	E KICKLIGHTER RD	Lake Helen	Very High Risk	96-100	None	
Lake Helen City Hall	327 S LAKEVIEW DR	Lake Helen	Very High Risk	96-100	None	
Lake Helen Police Department	493 SOUTH LAKEVIEW DR	Lake Helen	Low Risk	96-100	None	
Lake Helen Station 35	630 W MAIN ST	Lake Helen	Very High Risk	96-100	None	
Volusia Pines Elementary School	500 E KICKLIGHTER ROAD	Lake Helen	Very High Risk	96-100	None	
Lake Harney 37	740 LAKE HARNEY WOODS BLVD	Mims	Low Risk	101-105	Category 4	
Air Traffic Control Tower	2100 Aero Circle	New Smyrna Beach	Low Risk	101-105	Category 3	
Airport Main Office	602 Skyline Dr	New Smyrna Beach	Low Risk	101-105	Category 2	
Babe James Community Center	201 N MYRTLE AV	New Smyrna Beach	Very High Risk	101-105	Category 2	
Coast Guard Station - Ponce Inlet	2999 N PENINSULA AV	New Smyrna Beach	Low Risk	101-105	Category 2	
Community Services - Veterans Services	717 CANAL ST	New Smyrna Beach	Very High Risk	101-105	Category 2	
District 5 / Civil	101 E CANAL ST	New Smyrna Beach	Low Risk	101-105	Category 2	
Evac Ambulance Station 7	534 N DIXIE FREEWAY	New Smyrna Beach	Very High Risk	101-105	Category 2	
Fire Station 50	1400 State Rd 44	New Smyrna Beach	Very High Risk	101-105	Category 2	
Fire Station 51, Emergency Operations Center	3151 State Rd 44	New Smyrna Beach	Low Risk	101-105	None	
Fire Station 52	500 E. 3rd Ave	New Smyrna Beach	Low Risk	101-105	Category 2	
Fire Station 53	238 Industrial Park Ave	New Smyrna Beach	Low Risk	101-105	Category 3	
Health Department	717 CANAL ST	New Smyrna Beach	Very High Risk	101-105	Category 2	
Lifeguard Station	207 BUENOS AIRES ST	New Smyrna Beach	Low Risk	101-105	Category 3	VE
Live Oak Gym	1000 LIVE OAK ST	New Smyrna Beach	Low Risk	101-105	Category 3	
Maintenance operations facility	124 Industrial Park Ave	New Smyrna Beach	Low Risk	101-105	Category 3	
Mosquito Control	1600 AVIATION CENTER PKWY	New Smyrna Beach				
Mosquito Control	801 SOUTH ST	New Smyrna Beach	Low Risk	101-105	Category 3	
New Smyrna Beach City Hall	210 Sams Ave	New Smyrna Beach	Low Risk	101-105	Category 2	
New Smyrna Beach Police Department	246 Industrial Park Ave	New Smyrna Beach	Low Risk	101-105	Category 3	
New Smyrna Beach Site	121 WALLACE RD	New Smyrna Beach	Very High Risk	101-105	Category 2	AE
New Smyrna Station	291 BUENOS AIRES ST	New Smyrna Beach	Low Risk	101-105	Category 3	VE
R&B Barn 4 - SE Complex	530 N DIXIE FREEWAY	New Smyrna Beach	Very High Risk	101-105	Category 2	
South Beach 21	4840 S ATLANTIC AV	New Smyrna Beach	High Risk	101-105	Category 2	
Turnbull 23	1850 PIONEER TR	New Smyrna Beach	Very High Risk	101-105	Category 2	
Volusia County Courthouse Annex	124 N RIVERSIDE DR	New Smyrna Beach	Low Risk	101-105	Category 2	

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Critical Facilities (Page 5)

Name of Facility	Address	Jurisdiction/Place	Fire Zone	Wind Zone	Surge Zone	Flood Zone
Dalphonse Ranch Airport	3533 IRISH LANE	Oak Hill	High Risk	101-105	Category 3	A
Oak Hill Christian Academy	159 N GAINES STREET	Oak Hill	Very High Risk	101-105	Category 4	
Oak Hill City Hall	234 S US HWY 1	Oak Hill	Very High Risk	101-105	Category 4	
Oak Hill Elementary School	RIDGE ROAD	Oak Hill	Very High Risk	101-105	None	
Oak Hill Police Department / SO	234 S US HWY 1	Oak Hill	Very High Risk	101-105	Category 4	
Oak Hill Public Works	234 S US HWY 1	Oak Hill	Very High Risk	101-105	Category 4	
Oak Hill Station 22	213 N US HWY 1	Oak Hill	Low Risk	101-105	Category 3	
Deltona Memorial	1055 Saxon Blvd	Orange City	Low Risk	96-100	None	
Evac West Side Hub - Old Station 31	1970 S VOLUSIA AV	Orange City	Very High Risk	96-100	None	
Industrial Drive Station	259 INDUSTRIAL DRIVE	Orange City	Very High Risk	96-100	None	
Manatee Cove Elementary School	734 W OHIO AVENUE	Orange City	High Risk	96-100	None	
Orange City City Hall	205 E GRAVES AVE	Orange City	Very High Risk	96-100	None	
Orange City Elementary School	555 E UNIVERSITY AVENUE	Orange City	Low Risk	96-100	None	
Orange City Police Department	225 N HOLLY AVE	Orange City	Low Risk	96-100	None	
Orange City Site	1201 S LEAVITT AV	Orange City	Very High Risk	96-100	None	
Orange City Station 67	215 N HOLLY AV	Orange City	Low Risk	96-100	None	
Orange City Station 68	743 HARLEY STRICKLAND BV	Orange City	High Risk	96-100	None	
Orange City University High School	1000 W RHODE ISLAND AVE	Orange City	High Risk	96-100	None	
Orange City Utilities	426 S VOLUSIA AVENUE	Orange City	Very High Risk	96-100	None	
Property Appraisers Office	113 CANAL ST	Orange City	Low Risk	101-105	Category 2	
Property Appraisers Office	2742 ENTERPRISE RD	Orange City	Low Risk	96-100	None	
River Springs Middle School	900 W OHIO AVENUE	Orange City	High Risk	96-100	None	
Tag & Title Office	2744 ENTERPRISE RD	Orange City	Low Risk	96-100	None	
VCFS Logistics	1970 S VOLUSIA AV	Orange City	Very High Risk	96-100	None	
Wava Hall Senior Center	200 N HOLLY AV	Orange City	Very High Risk	96-100	None	
Avante at Ormond Beach	170 NORTH KINGS RD	Ormond Beach	Very High Risk	96-100	Category 3	
Bet Sefer Heritage School	55 N WASHINGTON ST	Ormond Beach	Very High Risk	101-105	Category 3	
Bridgeview Center	350 S RIDGEWOOD AVE	Ormond Beach	Very High Risk	101-105	Category 5	
Calvary Christian Academy	1687 W GRENADA BLVD	Ormond Beach	Low Risk	96-100	None	
Clare Bridge	240 INTERCHANGE BLVD	Ormond Beach	High Risk	96-100	None	
Coquina Center	170 NORTH CENTER ST	Ormond Beach	Very High Risk	101-105	Category 3	
Crown Castle USA	123 N ORCHARD ST	Ormond Beach	Very High Risk	101-105	Category 3	
District 3	1435 US HWY 1 STE D-3	Ormond Beach	Very High Risk	96-100	None	
Evergreen	720 SANTA ANA AVE	Ormond Beach	Very High Risk	101-105	Category 3	
Florida Production Engineering	2 E TOWER CIR	Ormond Beach	Low Risk	96-100	None	
Golden Abbey	1410 HAND AVE	Ormond Beach	Low Risk	96-100	None	
Grace Academy	1060 W GRENADA BLVD	Ormond Beach	Very High Risk	96-100	None	
Grand Villa of Ormond	535 NORTH NOVA RD	Ormond Beach	Very High Risk	96-100	Category 3	
Hallifax Plantation 16	3935 OLD DIXIE HWY	Ormond Beach	High Risk	96-100	None	
Hallifax Station 13	15 SOUTHLAND RD	Ormond Beach	High Risk	96-100	Category 5	
Hawaiian Tropic (Playtex Mfg)	1190 N US HWY 1	Ormond Beach	Low Risk	96-100	Category 4	
Homac Manufacturing	1 AVIATOR WAY	Ormond Beach	High Risk	96-100	None	
Hudson Tool and Die	1327 US 1 NORTH	Ormond Beach	Very High Risk	96-100	None	
Kozy Korner	605 ORCHARD AVE	Ormond Beach	Very High Risk	101-105	Category 3	
Lowe's	1340 W GRANADA BV	Ormond Beach	High Risk	96-100	None	
NC Control Tower	1665 OCEAN SHORE BLVD	Ormond Beach	No Risk	101-105	Category 3	VE
North Peninsula 14	1716 ATLANTIC AV	Ormond Beach	Very High Risk	101-105	Category 3	
Office Modular - Tomoka State Park	2099 N. Beach Street	Ormond Beach	High Risk	101-105	Category 4	
Ormond Beach City Hall	22 S BEACH ST	Ormond Beach	Very High Risk	101-105	Category 3	

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Critical Facilities (Page 6)

Name of Facility	Address	Jurisdiction/Place	Fire Zone	Wind Zone	Surge Zone	Flood Zone
Ormond Beach Elementary School	100 CORBIN AVENUE	Ormond Beach	Very High Risk	101-105	Category 4	
Ormond Beach Memorial Hospital	305 MEMORIAL MED PWY	Ormond Beach	Low Risk	96-100	None	
Ormond Beach Middle School	151 DOMICILIO AVENUE	Ormond Beach	Very High Risk	101-105	Category 3	
Ormond Beach Municipal Airport	770 AIRPORT ROAD	Ormond Beach	High Risk	96-100	Category 5	
Ormond Beach Police Department	170 W GRANADA BLVD	Ormond Beach	Low Risk	101-105	Category 4	
Ormond Beach Public Works	501 NORTH ORCHARD ST	Ormond Beach	Very High Risk	101-105	Category 3	
Ormond Beach Station 91	364 S ATLANTIC AV	Ormond Beach	Low Risk	101-105	Category 3	
Ormond Beach Station 92	189 S NOVA RD	Ormond Beach	Very High Risk	96-100	None	
Ormond Beach Station 93	300 WILMETTE AVE	Ormond Beach	Low Risk	101-105	Category 3	
Ormond Beach Station 94	2301 AIRPORT RD	Ormond Beach	High Risk	96-100	None	
Ormond Control Tower	301 CARDINAL DR	Ormond Beach	No Risk	101-105	Category 2	VE
Ormond In The Pines	101 CLYDE MORRIS BV	Ormond Beach	Very High Risk	96-100	None	
Ormond Station	301 CARDINAL DR	Ormond Beach	No Risk	101-105	Category 2	VE
Osceola Elementary School	100 OSCEOLA AVENUE	Ormond Beach	Low Risk	101-105	Category 3	
Pace Center For Girls	208 CENTRAL AVENUE	Ormond Beach	Very High Risk	101-105	Category 3	
Pathways Elementary School	2100 AIRPORT ROAD	Ormond Beach	High Risk	96-100	None	
Pine Trail Elementary School	300 AIRPORT ROAD	Ormond Beach	High Risk	96-100	None	
Prestige Gunite	1229 N US HWY 1	Ormond Beach	Very High Risk	96-100	None	
Restroom/Picnic Shelter -Nocorroco-Tomoka	2099 N BEACH STREET	Ormond Beach	High Risk	101-105	Category 4	
Rinker Materials Corporation	350 W GRANADA BLVD	Ormond Beach	Low Risk	101-105	Category 3	AE
Riverbend Academy	2080 W GRENADA BLVD	Ormond Beach	Low Risk	96-100	None	
Seasons By Riviera	515 TOMOKA AVE	Ormond Beach	Very High Risk	101-105	Category 3	
Signature Healthcare	103 CLYDE MORRIS BV	Ormond Beach	Very High Risk	96-100	None	
Southland Suites of Ormond	550 WILMETTE AVE	Ormond Beach	Very High Risk	101-105	Category 3	AE
St Brendan School	1000 OCEAN SHORE BV	Ormond Beach	Very High Risk	101-105	Category 3	
St James Episcopal School	38 S HALIFAX DRIVE	Ormond Beach	Very High Risk	101-105	Category 4	
Sunrise Aviation	740 AIRPORT RD	Ormond Beach	High Risk	96-100	Category 5	
Temple Beth Elementary School	579 N NOVA ROAD	Ormond Beach	High Risk	96-100	Category 4	
Tomoka Elementary School	999 OLD TOMOKA ROAD	Ormond Beach	Very High Risk	96-100	None	
Tymber Creek Utilites	1951 W GRENADA BLVD	Ormond Beach	Very High Risk	96-100	None	
Visitor Program Building - Tomoka Springs	2099 N BEACH STREET	Ormond Beach	High Risk	101-105	Category 4	
Wellington Place By the Sea	1050 OCEAN SHORE BV	Ormond Beach	Very High Risk	101-105	Category 4	
Osteen 36	180 N SR 415	Osteen	High Risk	96-100	None	
R&B Barn 2 - SW Complex	200 N SR 415	Osteen	High Risk	96-100	None	
R&B Barn 2 - Votran Parking	200 N SR 415	Osteen	High Risk	96-100	None	
Pierson	816 HAGSTROM RD	Pierson	High Risk	96-100	None	
Pierson City Hall	106 N CENTER ST	Pierson	Very High Risk	96-100	None	
Pierson Elementary Replacement	700 N Center St	Pierson	Low Risk	96-100	None	
Pierson Elementary School	1 W 1ST AVENUE	Pierson	Very High Risk	96-100	None	
Pierson Municipal Airport	106 N CENTER STREET	Pierson	Very High Risk	96-100	None	
Pierson Station 44	132 N FOUNTAIN DR	Pierson	Very High Risk	96-100	None	
Rima Ridge 18	500 RODEO RD	Pierson	Low Risk	96-100	None	
Taylor Middle-High School	100 E WASHINGTON AVE	Pierson	Low Risk	96-100	None	
Fire Department Headquarters	4860 S Peninsula Ave	Ponce Inlet	High Risk	101-105	Category 2	
Inlet Harbor Hazmat Facility	133 Inlet Harbor Road	Ponce Inlet	No Risk	101-105	Category 1	AE
Marine Science Center	5000 S ATLANTIC AV	Ponce Inlet	High Risk	101-105	Category 2	
Ponce Inlet 78	4680 S PENINSULA DR	Ponce Inlet	High Risk	101-105	Category 2	
Ponce Inlet Control Tower	ON BEACH	Ponce Inlet	Low Risk	101-105	Category 3	VE
Ponce Inlet Police Department	4301 S PENINSULA DR	Ponce Inlet	Low Risk	101-105	Category 2	

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Critical Facilities (Page 7)

Name of Facility	Address	Jurisdiction/Place	Fire Zone	Wind Zone	Surge Zone	Flood Zone
Ponce Inlet Town Hall	4300 S Atlantic Ave	Ponce Inlet	Low Risk	101-105	Category 4	
Academy of Martial Arts, Inc.	220 CHARLES ST	Port Orange	Low Risk	101-105	Category 1	AE
Adult Activity Center	4790 RIDGEWOOD AV	Port Orange	Low Risk	101-105	Category 2	
Atlantic High School	1250 REED CANAL ROAD	Port Orange	Very High Risk	101-105	None	
Bayside Care Center	3778 MAPLE GROVE CT.	Port Orange	Very High Risk	101-105	None	
Brookdale Yorktowne (formerly Emeritus at Port Orange)	1675 Dunlawton Ave.	Port Orange	Very High Risk	101-105	None	
Canal View Rest Home	864 CANALVIEW BLVD.	Port Orange	Low Risk	101-105	Category 2	
City Gymnasium - Parks Administration	4655 CITY CENTER CIR	Port Orange	Very High Risk	101-105	None	
Commonwealth Christian Academy	5231 S NOVA ROAD	Port Orange	Low Risk	101-105	Category 3	
Coquina Cove Assisted Living	3739 SUNRISE OAKS DR.	Port Orange	High Risk	101-105	None	
Country Manor Assisted Living & Retirement Home LL	1152 OLD HAMMOCK RD.	Port Orange	Very High Risk	101-105	Category 4	
COUNTRYSIDE CARE CENTER	710 PINE FOREST TRL.	Port Orange				
Countryside Lakes	941 Village Trail	Port Orange	Low Risk	101-105	Category 4	
Creekside Middle School	6801 AIRPORT ROAD	Port Orange	Low Risk	101-105	None	
Cypress Creek Elementary School	6100 S WILLIAMSON BLVD	Port Orange	High Risk	101-105	Category 4	
D'Manila Garden, Inc.	316 Moss Avenue	Port Orange	Low Risk	101-105	Category 3	
Fran's Elderly Care	1309 ALCORN RD.	Port Orange	Very High Risk	101-105	None	
Fuel Site - Tomoka Landfill	1990 TOMOKA FARMS RD	Port Orange	Low Risk	101-105	None	
Grace Manor Assisted Living & Memory Care	1321 Herbert Street	Port Orange	Very High Risk	101-105	None	
Halifax Health Medical Center - Port Orange	1041 Dunlawton Ave	Port Orange	Low Risk	101-105	Category 3	
Harbour Oaks Elderly Care	158 FARBROOK AVE.	Port Orange	Low Risk	101-105	Category 3	
Horizon Elementary School	4751 HIDDEN LAKE DR	Port Orange	Very High Risk	101-105	None	
Manila Home Care	5463 LANDIS AVE.	Port Orange	Low Risk	101-105	Category 2	
Open Arms ALF Care Center	401 ORANGE AVE.	Port Orange	Low Risk	101-105	Category 3	
Pathways Early Learning Center	3749 S NOVA ROAD	Port Orange	Low Risk	101-105	Category 3	
Pheasant Paradise	799 Pheasant Run Court	Port Orange	Very High Risk	101-105	None	
Port Orange City Hall	1000 CITY CENTER CIR	Port Orange	Very High Risk	101-105	None	
Port Orange Elementary School	402 DUNLAWTON AVENUE	Port Orange	Low Risk	101-105	Category 3	
Port Orange Endoscopy & Surgery Ctr Inc.	1185 Dunlawton Avenue	Port Orange	Very High Risk	101-105	Category 4	
Port Orange Family YMCA	4701 CITY CENTER PKWY	Port Orange	Very High Risk	101-105	None	
Port Orange Nursing and Rehab Center	5600 Victoria Gardens Blvd.	Port Orange	Very High Risk	101-105	None	
Port Orange Police Department	4545 CLYDE MORRIS	Port Orange	Very High Risk	101-105	None	
Port Orange Public Works	407 VIRGINIA AV	Port Orange	Low Risk	101-105	Category 3	
Port Orange Regional Communication Center	1395 DUNLAWTON AV	Port Orange	Very High Risk	101-105	None	
Port Orange Station 71	4200 RIDGEWOOD AVE	Port Orange	Low Risk	101-105	Category 2	
Port Orange Station 72	6027 CENTRAL PARK BLVD	Port Orange	Very High Risk	101-105	Category 3	
Port Orange Station 73	1090 CITY CENTER BLVD	Port Orange	Low Risk	101-105	None	
Port Orange Station 74	6701 AIRPORT RD	Port Orange	Low Risk	101-105	None	
Port Orange Station 75	1701 TOWN WEST BLVD	Port Orange	High Risk	101-105	None	
Portside Care Center	3832 LONG GROVE LANE	Port Orange	Very High Risk	101-105	None	
Senior Center	3738 HALIFAX DR	Port Orange	Low Risk	101-105	Category 2	AE
Silver Sands Middle School	1300 HERBERT STREET	Port Orange	Very High Risk	101-105	Category 5	
Spruce Creek 12	1979 TAYLOR RD	Port Orange	High Risk	101-105	Category 4	
Spruce Creek Assisted Living Facility, Inc.	5953 Broken Bow Lane	Port Orange	Very High Risk	101-105	Category 4	
Spruce Creek Elementary School	642 TAYLOR ROAD	Port Orange	Very High Risk	101-105	Category 4	
Spruce Creek High School	801 TAYLOR ROAD	Port Orange	Very High Risk	101-105	None	
Station WNTV936	4801 CITY CENTER DR	Port Orange	Very High Risk	101-105	None	
Sterling House of Port Orange	955 Village Trail	Port Orange	Low Risk	101-105	Category 4	
Sugar Mill Elementary School	1101 CHARLES STREET	Port Orange	Low Risk	101-105	Category 3	

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Critical Facilities (Page 8)

Name of Facility	Address	Jurisdiction/Place	Fire Zone	Wind Zone	Surge Zone	Flood Zone
Sweetwater Elementary School	5800 VICTORIA GARDENS BV	Port Orange	Very High Risk	101-105	None	
Twin Acres Rest Home	1155 BUTTERMILK LN.	Port Orange	Very High Risk	101-105	None	
WORC, Inc.	1231 Edna Drive	Port Orange	Very High Risk	101-105	None	
AT&T Cellular One Port Orange	1133 3 STREET	South Daytona	Low Risk	101-105	Category 3	
Intl Academy of Hair Design	2550 S RIDGEWOOD AVE	South Daytona	Low Risk	101-105	Category 3	
James Park Youth Activity Center	1700 JAMES ST	South Daytona	Low Risk	101-105	Category 3	
Piggotte Community Center	504 BIG TREE RD	South Daytona	Low Risk	101-105	Category 3	
Richard Milburn Academy East	1025 MASON AVENUE	South Daytona	Very High Risk	101-105	Category 3	
Rinker Materials Corp - Daytona	2900 S RIDGEWOOD AVE	South Daytona	Low Risk	101-105	Category 2	
South Daytona City Hall	1672 S RIDGEWOOD AVE	South Daytona	Low Risk	101-105	Category 3	
South Daytona Elementary School	600 ELIZABETH PLACE	South Daytona	Low Risk	101-105	Category 2	
South Daytona Fire Station	1672 S RIDGEWOOD AV	South Daytona	Low Risk	101-105	Category 3	
South Daytona Fire Station NO 2 / Warehosue	2107 BRIAN AV	South Daytona	Low Risk	101-105	Category 2	A
South Daytona Police Department	1672 S RIDGEWOOD AV	South Daytona	Low Risk	101-105	Category 3	
South Daytona Station 98	1672 S RIDGEWOOD AVE	South Daytona	Low Risk	101-105	Category 3	
Votran	950 BIG TREE RD	South Daytona	Low Risk	101-105	Category 2	
Warner Christian Academy School	1730 S RIDGEWOOD AVE	South Daytona	Low Risk	101-105	Category 3	

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Critical Facilities by Jurisdiction

The table below is a count of critical facilities separated by jurisdiction within the county. The status of incorporation of the jurisdiction is also listed.

Critical Facilities By Jurisdiction		
Jurisdiction	Number	Incorporation Status
Daytona Beach	65	Incorporated
Daytona Beach Shores	8	Incorporated
DeBary	6	Incorporated
DeLand	44	Incorporated
DeLeon Springs	3	Census Designated Place
Deltona	17	Incorporated
Edgewater	12	Incorporated
Enterprise	1	Census Designated Place
Holly Hill	11	Incorporated
Lake Helen	5	Incorporated
Mims	1	Unincorporated Community
New Smyrna Beach	25	Incorporated
Oak Hill	7	Incorporated
Orange City	18	Incorporated
Ormond Beach	56	Incorporated
Osteen	3	Unincorporated Community
Pierson	8	Incorporated
Ponce Inlet	7	Incorporated
Port Orange	52	Incorporated
South Daytona	14	Incorporated

Critical Facilities within Surge Zones

The following table is a count of all critical facilities within the county that would be at risk of flooding based on the category of the potential hurricane.

Critical Facilities Within Surge Zones	
Surge Status	Number of Facilities
Within Category 1	4
Within Category 2	39
Within Category 3	80
Within Category 4	39
Within Category 5	5
Not Within Any Storm Surge	193

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Water and Sewage Treatment Facilities

The following pages list the water and sewage treatment facilities located in Volusia County, along with their respective hazard zones.

Facility Name	Latitude	Longitude	Type	Flood Zone	Fire Zone	Storm Surge Zone	Wind Zone
FLO025984	29.195	81.001	Sewage Treatment	Zone AE	No Risk	Category 1	101-105 mph
FLA011177	28.924	80.872	Sewage Treatment	X - 500 yr	High Risk	Category 4	101-105 mph
FLO020532	29.288	81.073	Sewage Treatment	Zone AE	High Risk	Category 4	101-105 mph
FLA011128	28.908	81.325	Sewage Treatment	X - 500 yr	High Risk	None	96-100 mph
FLA011118	28.929	81.286	Sewage Treatment	X - 500 yr	High Risk	None	96-100 mph
FLA011179	29.25	81.117	Sewage Treatment	X - 500 yr	Low Risk	None	96-100 mph
FLO020559	29.136	80.994	Sewage Treatment	X - 500 yr	Low Risk	Category 3	101-105 mph
FLO020133	29.03	80.917	Sewage Treatment	Zone AE	Low Risk	Category 2	101-105 mph
FLO027677	29.24	81.044	Sewage Treatment	Zone AE	Low Risk	Category 4	101-105 mph
FLA011139	29.175	81.111	Sewage Treatment	X - 500 yr	Low Risk	None	101-105 mph
FLA011109	29.083	81.043	Sewage Treatment	X - 500 yr	Very High Risk	Category 4	101-105 mph
FLO024546	28.874	81.251	Sewage Treatment	X - 500 yr	Very High Risk	None	96-100 mph
FLA011193	29.265	81.127	Sewage Treatment	X - 500 yr	Very High Risk	None	96-100 mph
FLA011188	29.383	81.083	Sewage Treatment	X - 500 yr	Very High Risk	Category 5	101-105 mph
FLO021431	28.973	80.915	Sewage Treatment	X - 500 yr	Very High Risk	Category 3	101-105 mph
FLA011132	29.083	81.325	Sewage Treatment	X - 500 yr	Very High Risk	None	96-100 mph
FLO020303	29.009	81.298	Sewage Treatment	X - 500 yr	Very High Risk	None	96-100 mph
FLA011121	28.916	81.25	Sewage Treatment	X - 500 yr	Very High Risk	None	96-100 mph
SOUTHERN STATES UTIL	28.922	81.19	Water Treatment	Zone AE	No Risk	None	96-100 mph
SEM. CO/HEATHROW SYS	28.786	81.012	Water Treatment	Zone AE	No Risk	None	101-105 mph
SEM. CO/HEATHROW SYS	28.786	81.012	Water Treatment	Zone AE	No Risk	None	101-105 mph
MCINNIS ELEMENTARY	29.127	81.352	Water Treatment	X - 500 yr	High Risk	None	96-100 mph
LAKE BERESFORD	29.01	81.345	Water Treatment	X - 500 yr	High Risk	None	96-100 mph
WEST VOLUSIA INTERCO	28.897	81.311	Water Treatment	X - 500 yr	High Risk	None	96-100 mph
WEST VOLUSIA INTERCO	28.897	81.311	Water Treatment	X - 500 yr	High Risk	None	96-100 mph
WEST VOLUSIA INTERCO	28.903	81.29	Water Treatment	X - 500 yr	High Risk	None	96-100 mph
WEST VOLUSIA INTERCO	28.903	81.29	Water Treatment	X - 500 yr	High Risk	None	96-100 mph
ORANGE CITY UTILITIE	28.953	81.272	Water Treatment	X - 500 yr	High Risk	None	96-100 mph
ORANGE CITY UTILITIE	28.957	81.269	Water Treatment	X - 500 yr	High Risk	None	96-100 mph
ORANGE CITY UTILITIE	28.957	81.269	Water Treatment	X - 500 yr	High Risk	None	96-100 mph
SOUTHERN STATES UTIL	28.929	81.254	Water Treatment	X - 500 yr	High Risk	None	96-100 mph
ORANGE CITY UTILITIE	28.933	81.25	Water Treatment	X - 500 yr	High Risk	None	96-100 mph
ORANGE CITY UTILITIE	28.933	81.25	Water Treatment	X - 500 yr	High Risk	None	96-100 mph
DELTONA NORTH	28.941	81.244	Water Treatment	X - 500 yr	High Risk	None	96-100 mph
DELTONA NORTH	28.941	81.244	Water Treatment	X - 500 yr	High Risk	None	96-100 mph
SOUTHERN STATES UTIL	28.939	81.224	Water Treatment	X - 500 yr	High Risk	None	96-100 mph
LAKE HELEN WATER DEP	28.984	81.222	Water Treatment	X - 500 yr	High Risk	None	96-100 mph
SOUTHERN STATES UTIL	28.941	81.18	Water Treatment	X - 500 yr	High Risk	None	96-100 mph
SOUTHERN STATES UTIL	28.941	81.18	Water Treatment	X - 500 yr	High Risk	None	96-100 mph
KOVE ESTATES ASSOCIA	28.845	81.173	Water Treatment	Zone A	High Risk	None	96-100 mph
TOMOKA VIEW ESTATES	29.263	81.129	Water Treatment	X - 500 yr	High Risk	None	96-100 mph
TOMOKA VIEW ESTATES	29.263	81.129	Water Treatment	X - 500 yr	High Risk	None	96-100 mph
SCOTTISH INN	29.333	81.127	Water Treatment	X - 500 yr	High Risk	None	96-100 mph
SUGAR MILL COUNTRY C	29.04	80.978	Water Treatment	X - 500 yr	High Risk	Category 5	101-105 mph
SUGAR MILL COUNTRY C	29.04	80.978	Water Treatment	X - 500 yr	High Risk	Category 5	101-105 mph
SUGAR MILL COUNTRY C	29.04	80.978	Water Treatment	X - 500 yr	High Risk	Category 5	101-105 mph
SUGAR MILL COUNTRY C	29.04	80.978	Water Treatment	X - 500 yr	High Risk	Category 5	101-105 mph
NEW SMYRNA BEACH, CI	28.994	80.962	Water Treatment	X - 500 yr	High Risk	Category 5	101-105 mph
NEW SMYRNA BEACH, CI	28.994	80.962	Water Treatment	X - 500 yr	High Risk	Category 5	101-105 mph
NEW SMYRNA BEACH, CI	28.994	80.962	Water Treatment	X - 500 yr	High Risk	Category 5	101-105 mph
NEW SMYRNA BEACH, CI	28.994	80.962	Water Treatment	X - 500 yr	High Risk	Category 5	101-105 mph
NEW SMYRNA BEACH, CI	28.994	80.962	Water Treatment	X - 500 yr	High Risk	Category 5	101-105 mph
NEW SMYRNA BEACH, CI	28.994	80.962	Water Treatment	X - 500 yr	High Risk	Category 5	101-105 mph

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Water and Sewage Treatment Facilities, Page 2

Facility Name	Latitude	Longitude	Type	Flood Zone	Fire Zone	Storm Surge Zone	Wind Zone
HACIENDA DEL RIO	28.925	80.886	Water Treatment	X - 500 yr	High Risk	Category 4	101-105 mph
HACIENDA DEL RIO	28.925	80.886	Water Treatment	X - 500 yr	High Risk	Category 4	101-105 mph
HACIENDA DEL RIO	28.925	80.886	Water Treatment	X - 500 yr	High Risk	Category 4	101-105 mph
HACIENDA DEL RIO	28.927	80.88	Water Treatment	Zone A	High Risk	Category 4	101-105 mph
HACIENDA DEL RIO	28.927	80.88	Water Treatment	Zone A	High Risk	Category 4	101-105 mph
HACIENDA DEL RIO	28.926	80.876	Water Treatment	Zone A	High Risk	Category 4	101-105 mph
HACIENDA DEL RIO	28.926	80.876	Water Treatment	Zone A	High Risk	Category 4	101-105 mph
HACIENDA DEL RIO	28.926	80.876	Water Treatment	Zone A	High Risk	Category 4	101-105 mph
SOUTH WATER FRONT PA	28.908	80.87	Water Treatment	X - 500 yr	High Risk	Category 3	101-105 mph
SOUTH WATER FRONT PA	28.908	80.87	Water Treatment	X - 500 yr	High Risk	Category 3	101-105 mph
SOUTH WATER FRONT PA	28.908	80.87	Water Treatment	X - 500 yr	High Risk	Category 3	101-105 mph
SOUTH WATER FRONT PA	28.908	80.87	Water Treatment	X - 500 yr	High Risk	Category 3	101-105 mph
SOUTH WATER FRONT PA	28.908	80.87	Water Treatment	X - 500 yr	High Risk	Category 3	101-105 mph
CAMP WINONA	29.179	81.341	Water Treatment	X - 500 yr	Low Risk	None	96-100 mph
BLUE SPRINGS STATE P	28.952	81.335	Water Treatment	X - 500 yr	Low Risk	None	96-100 mph
DELAND, CITY OF	29.032	81.324	Water Treatment	X - 500 yr	Low Risk	None	96-100 mph
DELAND, CITY OF	29.038	81.319	Water Treatment	X - 500 yr	Low Risk	None	96-100 mph
DELAND/BRANDYWINE	29.075	81.315	Water Treatment	X - 500 yr	Low Risk	None	96-100 mph
DELAND, CITY OF	29.031	81.309	Water Treatment	X - 500 yr	Low Risk	None	96-100 mph
DELAND, CITY OF	29.021	81.299	Water Treatment	X - 500 yr	Low Risk	None	96-100 mph
DELAND, CITY OF	29.02	81.299	Water Treatment	X - 500 yr	Low Risk	None	96-100 mph
WEST VOLUSIA INTERCO	28.915	81.296	Water Treatment	X - 500 yr	Low Risk	None	96-100 mph
SHERWOOD MEDICAL IND	29.06	81.265	Water Treatment	X - 500 yr	Low Risk	None	96-100 mph
SHERWOOD MEDICAL IND	29.06	81.265	Water Treatment	X - 500 yr	Low Risk	None	96-100 mph
LAKE HELEN WATER DEP	28.995	81.245	Water Treatment	X - 500 yr	Low Risk	None	96-100 mph
QUALITY INN (SAVE IN	29.019	81.238	Water Treatment	X - 500 yr	Low Risk	None	96-100 mph
SOUTHERN STATES UTIL	28.896	81.236	Water Treatment	X - 500 yr	Low Risk	None	96-100 mph
SOUTHERN STATES UTIL	28.896	81.236	Water Treatment	X - 500 yr	Low Risk	None	96-100 mph
SOUTHERN STATES UTIL	28.896	81.236	Water Treatment	X - 500 yr	Low Risk	None	96-100 mph
HANDY WAY #3321/SPAR	29.133	81.2	Water Treatment	Zone A	Low Risk	None	96-100 mph
HANDY WAY #3319/OCAL	29.133	81.2	Water Treatment	Zone A	Low Risk	None	96-100 mph
A&M DISCOUNT BEVERAG	29.133	81.2	Water Treatment	Zone A	Low Risk	None	96-100 mph
DAYTONA BEACH, CITY	29.172	81.116	Water Treatment	X - 500 yr	Low Risk	None	101-105 mph
DAYTONA BEACH, CITY	29.172	81.116	Water Treatment	X - 500 yr	Low Risk	None	101-105 mph
DAYTONA BEACH, CITY	29.172	81.116	Water Treatment	X - 500 yr	Low Risk	None	101-105 mph
DAYTONA BEACH, CITY	29.172	81.116	Water Treatment	X - 500 yr	Low Risk	None	101-105 mph
DAYTONA BEACH, CITY	29.172	81.116	Water Treatment	X - 500 yr	Low Risk	None	101-105 mph
DAYTONA BEACH, CITY	29.172	81.116	Water Treatment	X - 500 yr	Low Risk	None	101-105 mph
DAYTONA BEACH, CITY	29.172	81.116	Water Treatment	X - 500 yr	Low Risk	None	101-105 mph
COLUMBIA ELEMENTARY	28.86	81.103	Water Treatment	Zone A	Low Risk	None	96-100 mph
DAYTONA BEACH, CITY	29.189	81.074	Water Treatment	X - 500 yr	Low Risk	None	101-105 mph
HOLLY HILL, CITY OF	29.24	81.044	Water Treatment	Zone AE	Low Risk	Category 4	101-105 mph
HOLLY HILL, CITY OF	29.24	81.044	Water Treatment	Zone AE	Low Risk	Category 4	101-105 mph
HOLLY HILL, CITY OF	29.24	81.044	Water Treatment	Zone AE	Low Risk	Category 4	101-105 mph
HOLLY HILL, CITY OF	29.24	81.044	Water Treatment	Zone AE	Low Risk	Category 4	101-105 mph
SOUTH DAYTONA, CITY O	29.199	81.043	Water Treatment	X - 500 yr	Low Risk	Category 4	101-105 mph
SPRUCE CREEK REST AR	29.088	81.018	Water Treatment	X - 500 yr	Low Risk	Category 3	101-105 mph
EDGEWATER, CITY OF	28.964	80.96	Water Treatment	X - 500 yr	Low Risk	None	101-105 mph
EDGEWATER, CITY OF	28.964	80.96	Water Treatment	X - 500 yr	Low Risk	None	101-105 mph
EDGEWATER, CITY OF	28.964	80.96	Water Treatment	X - 500 yr	Low Risk	None	101-105 mph
EDGEWATER, CITY OF	28.964	80.96	Water Treatment	X - 500 yr	Low Risk	None	101-105 mph

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Water and Sewage Treatment Facilities, Page 3

Facility Name	Latitude	Longitude	Type	Flood Zone	Fire Zone	Storm Surge Zone	Wind Zone
TOWN OF PIERSON/OP.B	29.241	81.465	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
MEADOWLEA ON THE RIV	28.839	81.333	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
MEADOWLEA ON THE RIV	28.839	81.333	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
DELAND/HOLIDAY HILLS	29	81.319	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
DELAND/WOODLAND MANO	29.091	81.315	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
ORANGE CITY UTILITIE	28.952	81.308	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
ORANGE CITY UTILITIE	28.952	81.308	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
ORANGE CITY UTILITIE	28.952	81.308	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
WEST VOLUSIA INTERCO	28.911	81.307	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
WEST VOLUSIA INTERCO	28.913	81.305	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
DELAND, CITY OF	29.027	81.305	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
WEST VOLUSIA INTERCO	28.883	81.3	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
DELAND, CITY OF	29.035	81.29	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
JOHN KNOX VILLAGE	28.942	81.283	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
ORANGE CITY UTILITIE	28.94	81.274	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
SOUTHERN STATES UTIL	28.9	81.27	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
SOUTHERN STATES UTIL	28.9	81.27	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
SOUTHERN STATES UTIL	28.902	81.258	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
SOUTHERN STATES UTIL	28.902	81.258	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
SOUTHERN STATES UTIL	28.905	81.256	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
SOUTHERN STATES UTIL	28.923	81.243	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
SOUTHERN STATES UTIL	28.883	81.233	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
SOUTHERN STATES UTIL	28.883	81.233	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
SOUTHERN STATES UTIL	28.883	81.233	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
SOUTHERN STATES UTIL	28.883	81.233	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
LAKE HELEN WATER DEP	28.979	81.229	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
SOUTHERN STATES UTIL	28.882	81.203	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
SOUTHERN STATES UTIL	28.882	81.203	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
TYMBER CREEK UTILITI	29.265	81.126	Water Treatment	X - 500 yr	Very High Risk	Category 5	96-100 mph
TYMBER CREEK UTILITI	29.265	81.126	Water Treatment	X - 500 yr	Very High Risk	Category 5	96-100 mph
TYMBER CREEK UTILITI	29.264	81.126	Water Treatment	Zone AE	Very High Risk	Category 4	96-100 mph
TYMBER CREEK UTILITI	29.264	81.126	Water Treatment	Zone AE	Very High Risk	Category 4	96-100 mph
ORMOND BEACH, CITY O	29.278	81.061	Water Treatment	X - 500 yr	Very High Risk	Category 4	101-105 mph
ORMOND BEACH, CITY O	29.278	81.061	Water Treatment	X - 500 yr	Very High Risk	Category 4	101-105 mph
ORMOND BEACH, CITY O	29.278	81.061	Water Treatment	X - 500 yr	Very High Risk	Category 4	101-105 mph
ORMOND BEACH, CITY O	29.278	81.061	Water Treatment	X - 500 yr	Very High Risk	Category 4	101-105 mph
ORMOND BEACH, CITY O	29.278	81.061	Water Treatment	X - 500 yr	Very High Risk	Category 4	101-105 mph
SPRUCE CREEK FLY IN	29.081	81.045	Water Treatment	X - 500 yr	Very High Risk	Category 5	101-105 mph
SPRUCE CREEK FLY IN	29.081	81.045	Water Treatment	X - 500 yr	Very High Risk	Category 5	101-105 mph
COLONY IN THE WOODS	29.141	81.028	Water Treatment	X - 500 yr	Very High Risk	None	101-105 mph
PORT ORANGE, CITY OF	29.136	81.027	Water Treatment	X - 500 yr	Very High Risk	None	101-105 mph
PORT ORANGE, CITY OF	29.136	81.027	Water Treatment	X - 500 yr	Very High Risk	None	101-105 mph
PORT ORANGE, CITY OF	29.136	81.027	Water Treatment	X - 500 yr	Very High Risk	None	101-105 mph
PORT ORANGE, CITY OF	29.136	81.027	Water Treatment	X - 500 yr	Very High Risk	None	101-105 mph
TERRA MAR VILLAGE	28.911	80.865	Water Treatment	X - 500 yr	Very High Risk	Category 3	101-105 mph
TERRA MAR VILLAGE	28.911	80.865	Water Treatment	X - 500 yr	Very High Risk	Category 3	101-105 mph
TERRA MAR VILLAGE	28.911	80.865	Water Treatment	X - 500 yr	Very High Risk	Category 3	101-105 mph
TERRA MAR VILLAGE	28.911	80.865	Water Treatment	X - 500 yr	Very High Risk	Category 3	101-105 mph
TERRA MAR VILLAGE	28.911	80.865	Water Treatment	X - 500 yr	Very High Risk	Category 3	101-105 mph
INDIAN HARBOR EST.	28.901	80.861	Water Treatment	X - 500 yr	Very High Risk	Category 3	101-105 mph
INDIAN HARBOR EST.	28.901	80.861	Water Treatment	X - 500 yr	Very High Risk	Category 3	101-105 mph

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

State Facilities Within Flood Zones

The following table lists the state facilities located within the VE and A flood zones within Volusia County, Florida.

Facility Name	Facility Type	Address	City	Floodzone
Ashby Forestry Site- Fire Tower - D12	Agricultural	1695 PELL ROAD	Osteen	A
Academic Hall	Agricultural	3000 Palm Coast Parkway Southeast	Palm Coast	AE
Classroom Reloc.	Agricultural	3000 Palm Coast Parkway Southeast	Palm Coast	AE
Laboratory Reloc.	Agricultural	940 Tenth Street	New Smyrna Beach	AE
Student Services Center	Agricultural	940 Tenth Street	New Smyrna Beach	AE
Bathhouse - DeLeon Springs SP	Other	601 PONCE DELEON BLVD	De Leon Springs	AE
Cabin - Hontoon Island SP	Other	2309 RIVER RIDGE ROAD	Deland	AE
Concession-Office Hontoon Island SP	Other	Not Listed	Deland	AE
Concession-Visitor Center Meeting Rooms	Other	601 PONCE DELEON BLVD	De Leon Springs	AE
Old Spanish Sugar Mill	Other	601 PONCE DELEON BLVD	De Leon Springs	AE
Restroom Hontoon Island SP	Other	2309 RIVER RIDGE ROAD	Deland	AE
Restroom Hontoon Island SP	Other	2309 RIVER RIDGE ROAD	Deland	AE
SJR Cruises Canoe Rental - Blue Spring State Park	Other	2100 W. FRENCH AVE	Orange City	AE
Storage - Hontoon Island State Park - DeLand	Other	2309 RIVER RIDGE ROAD	Deland	AE
Visitor Program Building - Tomoka Springs	Other	2099 N BEACH STREET	Ormond Beach	AE
Fifth District Court of Appeal	Office	300 South Beach Street	Daytona Beach	AE
Office Modular - Tomoka State Park	Office	2099 N. Beach Street	Ormond Beach	AE
Tiger Bay State Forest Headquarters- D10- Daytona	Office	4316 WEST INTERNATIONAL SPEEDWAY BLVD.	Daytona Beach	A
Main Building	Penal	3601 US Highway 92	Daytona Beach	A
Multi-Purpose	Penal	1001 W. HWY 98	Apalachicola	A
Pavilion-Hobby Craft	Penal	3601 US Highway 92	Daytona Beach	A
Plant-Sewage Treatment	Penal	3601 US Highway 92	Daytona Beach	A
Shed-Water Pump	Penal	3601 US Highway 92	Daytona Beach	A
Storage (Property)	Penal	3601 US Highway 92	Daytona Beach	A
Storage (Tools)	Penal	3601 US Highway 92	Daytona Beach	A
Storage (Toxic Material)	Penal	3601 US Highway 92	Daytona Beach	A
Volusia RJDC - Detention-Jac	Penal	3840 OLD DELAND ROAD	Daytona Beach	A
Work Release Center	Penal	3601 US Highway 92	Daytona Beach	A
Ashby Forestry Site- Residence - D10	Residential	1695 PELL ROAD	Osteen	A
Building #1 - Hawk	Residential	1725 FIFTH STREET	Daytona Beach	AH
Building #2 - Eagle	Residential	1725 FIFTH STREET	Daytona Beach	AH
Ranger Residence - DeLeon Springs SP	Residential	601 PONCE DELEON BLVD.	De Leon Springs	AE
Ashby Forestry Site- Restroom/Storage- D12	Unconditioned Storage	1625 PELL ROAD	Osteen	A
Carport - Parking Lot	Unconditioned Storage	2309 River Ridge Road	Deland	AE
Pavilion-Picnic - Hontoon Island SP	Unenclosed Structure	2309 RIVER RIDGE ROAD	Deland	AE
Restroom/Picnic Shelter -Nocorroco-Tomoka	Unenclosed Structure	2099 N BEACH STREET	Ormond Beach	AE
Shed-Pole Barn - D10 - Daytona Beach	Unenclosed Structure	4316 WEST INTERNATIONAL SPEEDWAY BLVD.	Daytona Beach	A
Shop/Equip Shed - Hontoon Island SP	Utility	2309 RIVER RIDGE ROAD	Deland	AE
Storage - DeLeon Springs	Utility	601 PONCE DELEON BLVD	De Leon Springs	AE
Storage (Flammable) - Hontoon Island SP	Utility	2309 RIVER RIDGE ROAD	Deland	AE
Tiger Bay State Forest Headquarters- Pumphouse-D10	Utility	4316 WEST INTERNATIONAL SPEEDWAY BLVD.	Daytona Beach	A
Volusia RJDC - Maintenance Shed	Utility	3840 OLD DELAND ROAD	Daytona Beach	A
Volusia RJDC - Shed/Generator	Utility	3840 OLD DELAND ROAD	Daytona Beach	A
ARNG Vehicle Maint	Workshop	405 S. BASIN STREET	Daytona Beach	AE
Crew DOT	Workshop	1651 KEPLER RD	Deland	A

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Lift and Pump Stations by Jurisdiction

Facility Name	Address	Jurisdiction
None Provided	2402 W INTL SPEEDWAY BLVD	Daytona Beach
None Provided	303 FENTRESS BLVD	Daytona Beach
None Provided	110 EXECUTIVE DR	Daytona Beach
None Provided	122 MUIRFIELD DR	Daytona Beach
None Provided	278 FENTRESS BLVD	Daytona Beach
None Provided	270 INDIGO DR	Daytona Beach
None Provided	593 N WILLIAMSON BLVD	Daytona Beach
None Provided	598 FENTRESS BLVD	Daytona Beach
None Provided	321 BROWN PELICAN DR	Daytona Beach
None Provided	803 PELICAN BAY DR	Daytona Beach
None Provided	310 YORKTOWNE DR	Daytona Beach
None Provided	1198 PINE ST	Daytona Beach
None Provided	2040 BEVILLE RD	Daytona Beach
None Provided	115 FRANCES DR	Daytona Beach
None Provided	1307 BEVILLE RD	Daytona Beach
None Provided	1500 S CLYDE MORRIS BLVD	Daytona Beach
None Provided	1352 S CLYDE MORRIS BLVD	Daytona Beach
None Provided	1390 S NOVA RD	Daytona Beach
None Provided	1105 BEVILLE RD	Daytona Beach
None Provided	126 DIANNA DR	Daytona Beach
K2D31651	165 OAK TREE CIR	Daytona Beach
None Provided	600 S CLYDE MORRIS BLVD	Daytona Beach
None Provided	1612 RICHARD PETTY BLVD	Daytona Beach
None Provided	1181 INDIAN LAKE RD	Daytona Beach
523584772	507 N CLYDE MORRIS BLVD	Daytona Beach
None Provided	1700 DUNN AV	Daytona Beach
None Provided	301 WILSON AV	Daytona Beach
None Provided	326 PARKWAY ST	Daytona Beach
None Provided	923 MASON AV	Daytona Beach
None Provided	1 FLAGG ST	Daytona Beach
None Provided	1296 3RD ST	Daytona Beach
None Provided	1694 3RD ST	Daytona Beach
None Provided	1101 9TH ST	Daytona Beach
None Provided	739 LOOMIS AV	Daytona Beach
None Provided	395 N BEACH ST	Daytona Beach
None Provided	331 FAIRVIEW AV	Daytona Beach
None Provided	210 N SEGRAVE ST	Daytona Beach
None Provided	201 MAGNOLIA AV	Daytona Beach
None Provided	703 N BEACH ST	Daytona Beach
None Provided	1025 BEL AIRE DR	Daytona Beach
None Provided	104 UNIVERSITY BLVD	Daytona Beach
None Provided	433 AUBURN DR	Daytona Beach
None Provided	101 HARTFORD AV	Daytona Beach
16-07894-K	1392 WRIGHT ST	Daytona Beach
None Provided	1808 MASON AV	Daytona Beach
None Provided	503 S CLYDE MORRIS BLVD	Daytona Beach
None Provided	1011 DOWNEY AV	Daytona Beach
None Provided	121 BASIN ST	Daytona Beach
None Provided	403 BASIN ST	Daytona Beach
None Provided	501 BOSTWICK AV	Daytona Beach
None Provided	103 E ORANGE AV	Daytona Beach
POWER SOURCE FOR LS	101 E MAGNOLIA AV	Daytona Beach
None Provided	30 GOODALL AV	Daytona Beach

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Lift and Pump Stations (Continued)

Facility Name	Address	Jurisdiction
None Provided	322 REVILO BLVD	Daytona Beach
None Provided	859 MALEY ST	Daytona Beach
None Provided	13 S OCEAN AV	Daytona Beach
None Provided	510 ORA ST	Daytona Beach
None Provided	10 FOUNTAINEBLEAU CIR	Daytona Beach
None Provided	708 WASHINGTON ST	Daytona Beach
None Provided	219 MARION ST	Daytona Beach
None Provided	247 N MARTIN LUTHER KING BLVD	Daytona Beach
6" flange with Bypass inst. 01/2014	386 EUCLID AV	Daytona Beach
None Provided	1700 HOPE DR	Daytona Beach
None Provided	1908 1/2 SUNNYPALM DR	Daytona Beach
None Provided	1317 1/2 AVENUE D	Daytona Beach
None Provided	690 WELLINGTON STATION BLVD	Daytona Beach
None Provided	1331 HAND AV	Daytona Beach
None Provided	3098 W INTL SPEEDWAY BLVD	Daytona Beach
None Provided	1210 BELLEVUE AV	Daytona Beach
None Provided	1608 N WILLIAMSON BLVD	Daytona Beach
None Provided	1790 TECHNOLOGY BLVD	Daytona Beach
None Provided	647 SHADY PL	Daytona Beach
797951	1371 S PALMETTO AV	Daytona Beach
None Provided	2203 W INTL SPEEDWAY BLVD	Daytona Beach
None Provided	553 S MARTIN LUTHER KING BLVD	Daytona Beach
None Provided	790 TOWNSEND AV	Daytona Beach
None Provided	829 WASHINGTON ST	Daytona Beach
None Provided	200 SEA DUCK DR	Daytona Beach
None Provided	843 GATEPARK DR	Daytona Beach
None Provided	1700 HOPE DR	Daytona Beach
None Provided	599 SEA DUCK DR	Daytona Beach
None Provided	1551 ROOSEVELT BLVD	Daytona Beach
None Provided	577 CHAMPIONS DR	Daytona Beach
None Provided	2912 BELLEVUE RD	Daytona Beach
None Provided	939 CHAMPIONS DR	Daytona Beach
None Provided	1328 INDIAN LAKE RD	Daytona Beach
None Provided	1471 CORNERSTONE BLVD	Daytona Beach
None Provided	250 TOURNAMENT DR	Daytona Beach
None Provided	113 TUSCANY BEND ST	Daytona Beach
None Provided	301 INDUSTRIAL PKWY	Daytona Beach
None Provided	3879 TIGER BAY RD	Daytona Beach
None Provided	1170 RED JOHN RD	Daytona Beach
None Provided	40 PERFECT DR	Daytona Beach
None Provided	1184 N TOMOKA FARMS RD	Daytona Beach
None Provided	1500 N TOMOKA FARMS RD	Daytona Beach
None Provided	2448 MASON AV	Daytona Beach
None Provided	2021 DUNN AV	Daytona Beach
None Provided	308 GRAND PRESERVE WAY	Daytona Beach
None Provided	2024 STRICKLAND RANGE RD	Daytona Beach
None Provided	2629 LPGA BLVD	Daytona Beach
None Provided	3962 LPGA BLVD	Daytona Beach
None Provided	620 HOLLY ST	Daytona Beach
None Provided	100 LAKESIDE PROFESSIONAL BLVD	Daytona Beach
None Provided	128 BOTEFUHR AV	Daytona Beach
None Provided	148 BOYNTON BLVD	Daytona Beach
None Provided	2328 CRESCENT RIDGE RD	Daytona Beach

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Lift and Pump Stations (Continued)

Facility Name	Address	Jurisdiction
None Provided	175 SEA SPRAY ST	Daytona Beach
None Provided	2730 DACH AV	Daytona Beach
None Provided	16 JEFFERSON LANDING	Daytona Beach
None Provided	2063 S HALIFAX DR	Daytona Beach
None Provided	2206 1/2 S PENINSULA DR	Daytona Beach
None Provided	16 ELIZABETH LN	Daytona Beach
None Provided	2251 S HALIFAX DR	Daytona Beach
None Provided	2431 DODGE DR	Daytona Beach
None Provided	12 GRANVILLE CIR	Daytona Beach
None Provided	310 INTERNATIONAL GOLF DR	Daytona Beach
None Provided	275 BAYBERRY LAKES BLVD	Daytona Beach
None Provided	481 BAYBERRY LAKES BLVD	Daytona Beach
16-0000-A	1 SHADY PL	Daytona Beach
None Provided	100 CINDERBERRY LN	Daytona Beach
None Provided	221 N BEACH ST	Daytona Beach
None Provided	133 CATRIONA DR	Daytona Beach
None Provided	125 GRANDE LAKE DR	Daytona Beach
None Provided	716 WILDER BLVD	Daytona Beach
None Provided	1853 S CLYDE MORRIS BLVD	Daytona Beach
None Provided	764 N TOMOKA FARMS RD	Daytona Beach
None Provided	325 N BEACH ST	Daytona Beach
None Provided	851 CHAMPIONS DR	Daytona Beach
None Provided	2217 MASON AV	Daytona Beach
None Provided	301 N TOMOKA FARMS RD	Daytona Beach
Tuscany Woods Phase 2	446 TUSCANY CHASE DR	Daytona Beach
COUNTY	None Provided	Daytona Beach
COUNTY	None Provided	Daytona Beach
COUNTY	PRINCE OF PEACE CHURCH	Daytona Beach
None Provided	345 MEMORIAL MEDICAL PKWY	Daytona Beach
COUNTY	None Provided	Daytona Beach
PRIVATE	None Provided	Daytona Beach
PRIVATE	None Provided	Daytona Beach
PRIVATE	None Provided	Daytona Beach
PRIVATE	None Provided	Daytona Beach
PRIVATE	None Provided	Daytona Beach
OLD-LS 29 NOW PRIVATELY OWNED BY DIS	DAYTONA INTERNATIONAL SPEEDWAY	Daytona Beach
PRIVATE	None Provided	Daytona Beach
None Provided	1608 N CLYDE MORRIS BLVD	Daytona Beach
PRIVATE	LPGA BLVD (& JIMMY ANN DRIVE)	Daytona Beach
PRIVATE	Life Mobile Home Park	Daytona Beach
PRIVATE	960 S Williamson Blvd	Daytona Beach
None Provided	1613 FLOMICH AVE	Daytona Beach
None Provided	126 E Orange Ave	Daytona Beach
PRIVATE	DIS - Turn 1	Daytona Beach
PRIVATE BACK-US FOR LS-529	EMERGENCY PUMP STATION	Daytona Beach
CONNECTS MH 529-27 TO MH 28, 29 & 30	DAYTONA INTERNATIONAL SPEEDWAY	Daytona Beach
None Provided	882 TOURNAMENT DRIVE	Daytona Beach
IN PLANT PUMP STATION #1	3651 LPGA BLVD	Daytona Beach
PRIVATE HOMA MODEL#GRP26S/3/C	984 N WILLIAMSON BLVD	Daytona Beach
Whitewood	1145 Whitewood	Deltona
Antilles	0 Antilles Terrace	Deltona
Deltona Plaza	Deltona Plaza	Deltona
Fountainhead	1192 Deltona Blvd	Deltona
Motel	0 Welcome Cen. Dr.	Deltona

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Lift and Pump Stations (Continued)

Facility Name	Address	Jurisdiction
Bristol Ct	255 Enterprise Road	Deltona
Waycross	1678 Waycross	Deltona
Vivian Ct	1743 Vivian Ct	Deltona
Gainesville	1510 Gainesville	Deltona
Briarwood	1299 Briarwood	Deltona
Bloomfield	1681 Bloomfield	Deltona
Elkcam	2700 Elkcam	Deltona
Jessamine	2637 Elkcam	Deltona
2008 Canal	2008 Canal	Deltona
Florida Drive	2250 Florida Drive	Deltona
Enterprise Elementary	3rd Street	Deltona
Kendall Ct	2132 Kendall Ct	Deltona
Sable Ct	2411 Sable Ct	Deltona
Winn Dixie	1215 Providence Blvd	Deltona
Ponce DeLeon Plaza	1870 Providence Blvd	Deltona
Deltona Health Care	1851 Elkcam Blvd	Deltona
Condo B	Providence Blvd	Deltona
Condo A	0 Perimeter Drive	Deltona
Deltona Elementary	2022 Adella Blvd	Deltona
Eric Jason Ct	Eric Jason Ct	Deltona
Cardinal	2911 Cardinal Rd	Deltona
IHOP	326 Dirkson Rd	Deltona
River Oaks	355 Dirkson Rd	Deltona
Discovery Elementary	975 Abigail Drive	Deltona
Autumn Woods	183 Autumn Ridge	Deltona
Save-a-lot	Courtland/Howland	Deltona
Publix	2058 Saxon	Deltona
Sterling Park	1700 Sterling Park	Deltona
Twin Lakes	638 Copper Beach	Deltona
Saxon Ridge	442 Haversham Rd	Deltona
Cowentry Estates	397 Elizabeth St	Deltona
CITY HALL LIFT STATION #58	2345 Providence Blvd	Deltona
Spirit Elementary	1500 Meadowlark	Deltona
Sunrise Elementary	3155 Phoenetia	Deltona
Forest Lake Elementary	1600 Doyle Road	Deltona
Osteen Elementary	500 Doyle Road	Deltona
Pine Ridge High School	926 Howland Blvd	Deltona
Live Oaks	925 Blue River	Deltona
Pride Elementary	1100 Learning Lane	Deltona
Lake Baton	1300 Lake Baton Drive	Deltona
Thornby Park	110 Providence Blvd	Deltona
ZUBER LIFT STATION # 1	551 COMMONWEALTH BLVD #LS-1	Port Orange
ISABELLE LIFT STATION #2 & RTU	5132 ISABELLE AVE #LS-2	Port Orange
CYPRESS HEAD #1 LIFT STATION #3	6251 S WILLIAMSON BLVD #LS-3	Port Orange
STERLING CHASE LIFT STATION #4	6085 PHEASANT RIDGE DR #LS-4	Port Orange
CHARLES STREET LIFT STATION #5 & RTU	1000 CHARLES ST #LS-5	Port Orange
OCEANS LIFT STATION #6 & RTU	100 OCEAN AVE #LS-6	Port Orange
BARNETT BANK LIFT STATION #7 & RTU	4382 HALIFAX DR #LS-7	Port Orange
CYPRESS HEAD #2 LIFT STATION #8	6410 CYPRESS SPRINGS PKWY #LS 8	Port Orange
HALIFAX EST LIFT STATION #9 & RTU	1206 SPARTON AVE #LS-9	Port Orange
NIXON/BIRO LIFT STATION #10	850 NIXON LN #LS-10	Port Orange
CHRISTIANCY LIFT STATION # 11 & RTU & GENERATOR	5403 CHRISTIANCY AVE #LS-11	Port Orange
ATLANTIC HIGH SCHOOL LIFT STATION #12 & RTU	1250 REED CANAL RD #LS-12	Port Orange

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Lift and Pump Stations (Continued)

Facility Name	Address	Jurisdiction
SUMMERTREES SOUTH LIFT STATION #13 & RTU	6037 WINDING RIDGE LN # LS-13	Port Orange
PARKWOOD LIFT STATION #14 & RTU	1201 VAGABOND DR # WS 1TS NVA # LS14	Port Orange
SABLE CREEK LIFT STATION #15 & RTU	6103 SABAL CREEK BLVD # LS-15	Port Orange
SAWGRASS POINT LIFT STATION #16	5995 SAWGRASS POINT DR # LS-16	Port Orange
VINEYARDS LIFT STATION #17 & RTU	1480 TAYLOR RD # LS-17	Port Orange
CAMBRIDGE EST LIFT STATION #18 & RTU	220 N BRIGHTON DR # LS-18	Port Orange
BEACON WOODS LIFT STATION #19	3634 DONNA ST # LS-19	Port Orange
NORMAN ST LIFT STATION #20 & RTU	5032 RIVERSIDE DR # LS-20	Port Orange
SPRUCE CREEK HIGH LIFT STATION #21	801 TAYLOR RD # LS-21	Port Orange
SOUTHERN PINE LIFT STATION #22 & RTU	28 ELDA LN SWC LAWRENCE CT # LS-22	Port Orange
CAMBRIDGE WILLAS #23 & RTU (CENTER OF ROAD)	435 WILTSHIRE BLVD # NS 200E MYSTIC #LS-23	Port Orange
SUMMERTREES LIFT STATION #24 & RTU	5950 S WILLIAMSON BLVD # LS-24	Port Orange
SANCTUARY LIFT STATION #25 & RTU	6126 SANCTUARY GARDEN BLVD #LS 25	Port Orange
HARBOUR POINT LIFT STATION #26 & RTU	1201 HARBOUR POINT DR # LS-26	Port Orange
DEEP FOREST LIFT STATION #27 & RTU	921 SANDCREST DR #NEC #LS-27	Port Orange
SLEEPY HOLLOW LIFT STATION #28	700 SLEEPY HOLLOW DR # LS-28	Port Orange
MAPLEWOOD LIFT STATION #29 & RTU	4075 CHAMBERLIN BLVD # LS-29	Port Orange
RAVENWOOD LIFT STATION #30 & RTU	2 WOODSIDE DR # LS-30	Port Orange
WEST PORT SQ LIFT STATION #31 & RTU	5798 S WILLIAMSON BLVD # LS-31	Port Orange
FOXBORO #1 LIFT STATION #32 & RTU	5795 DEVON ST #LS-32	Port Orange
LAURELWOOD LIFT STATION #33	717 LARADO DR # LS-33	Port Orange
GOLDEN POND LIFT STATION #34 & RTU	6200 SPRUCE CREEK RD # LS-34	Port Orange
WOODS LIFT STATION #35 & RTU	1167 APPLE CT # N END #LS-35	Port Orange
WILLOW RUN #1 LIFT STATION #36 & RTU	1105 W WILLOW RUN DR # LS-36	Port Orange
SWEETWATER HILLS LIFT STATION #37 & RTU	763 TUMBLEBROOK DR #NWC BRNCH #LS-37	Port Orange
WATER EDGE #2 LIFT STATION #38	1698 CREEKWATER BLVD #LS-38	Port Orange
NOVA & HERBER LIFT STATION #39 & GENERATOR	3655 S NOVA RD # LS-39	Port Orange
SUGAR FOREST LIFT STATION #40 & RTU	800 SUGAR HOUSE BLVD # LS-40	Port Orange
LAMPLIGHTER LIFT STATION #41	3202 S NOVA RD # LS-41	Port Orange
WATER EDGE #1 LIFT STATION #42 & RTU	1750 NILOUFAR LN #LS-42	Port Orange
CENTRAL PARK LIFT STATION #43 & RTU	520 CENTRAL PARK BLVD #SWC #LS-43	Port Orange
BRANDY HILLS LIFT STATION #44	1058 TOMPKINS DR #SS AT END #LS-44	Port Orange
CRANE LAKE #1 LIFT STATION #45	1851 CRANE POINT DR # LS-45	Port Orange
COUNTRYSIDE LIFT STATION #46 & GENERATOR	633 TAYLOR RD # LS-46	Port Orange
HAWKS RIDGE LIFT STATION #47 & RTU	782 OSPREY DR # LS-47	Port Orange
RIVERWOOD LIFT STATION #48 & RTU	6148 DEL MAR DR # LS-48	Port Orange
SOUTHWIND LIFT STATION #49	1481 MADELINE AVE # LS-49	Port Orange
WILLOW RUN #2 LIFT STATION #50	1249 FRANKLIN DR #NWC #LS-50	Port Orange
PICKWICK LIFT STATION #51	20 DOWNING DR # LS-51	Port Orange
FOREST LAKE LIFT STATION #52	1863 CHORPASH LN # LS-52	Port Orange
GLENWOOD VILLAGE LIFT STATION #55	4692 HIDDEN LAKE DR # LS-55	Port Orange
TOWN PARK #56 & RTU	1584 MADELINE AVE # LS-56	Port Orange
LA COSTA LIFT STATION #57	1151 LA COSTA VILLAGE BLVD #LS-57	Port Orange
CITY HALL LIFT STATION #58	1000 CITY CENTER CIR # LS-58	Port Orange
SAMM AVE LIFT STATION #59	980 CANAL VIEW BLVD # LS-59	Port Orange
CLARK'S LIFT STATION #60 & BUILD & GENERATOR	5891 S WILLIAMSON BLVD # LS-60	Port Orange
CAR WASH STATION #61	1784 DUNLAWTON AVE # LS-61	Port Orange
ANGLERS LIFT STATION #62	4863 ORANGE BLVD # LS-62	Port Orange
LANCEWOOD LIFT STATION #63	5658 LANCEWOOD DR # LS-63	Port Orange
TOWNHOMES WEST LIFT STATION #64 & RTU	3532 CREEKSIDE RD # LS-64	Port Orange
FALCON CREST LIFT STATION #65	6043 SPRUCE CREEK RD # LS-65	Port Orange
WEST BAYSHORE #2 LIFT STATION #66	5479 W BAYSHORE DR # LS-66	Port Orange
WEST BAYSHORE #1 LIFT STATION #67	5539 W BAYSHORE DR # LS-67	Port Orange

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Lift and Pump Stations (Continued)

Facility Name	Address	Jurisdiction
CROSS CREEK LIFT STATION #68	4603 SECRET RIVER TRL # LS-68	Port Orange
OAKLAND PARK LIFT STATION #69	432 BRAHMA LN #LS-69	Port Orange
INTRACOASTAL VILLAS #70	3333 S RIDGEWOOD AVE # LS-70	Port Orange
FOXBORO #2 LIFT STATION #71 & RTU	5561 MILES DR # LS-71	Port Orange
CRANE LAKES #2 LIFT STATION #72	1991 CRANE LAKES BLVD # LS-72	Port Orange
SHALLOW BROOK LIFT STATION #73	4551 ALDER DR # LS-73	Port Orange
SKY LAKE LIFT STATION #74	5932 BOGGS FORD RD # LS-74	Port Orange
GROVES LIFT STATION #75	3800 MADELINE AVE # LS-75	Port Orange
BAYWOOD LIFT STATION #76	401 BAYWOOD CIR # LS-76	Port Orange
WINDSOR HILLS LIFT STATION #77	5798 WINDSOR HILL DR # LS-77	Port Orange
EAST BAYSHORE LIFT STATION #78	75 E BAYSHORE DR #LS-78	Port Orange
RIVERSIDE LIFT STATION #79	5741 RIVERSIDE DR # LS-79	Port Orange
CEDAR LIFT STATION #80	4 CEDAR ST #LS-80	Port Orange
COMMONWEALTH LIFT STATION #81	114 COMMONWEALTH BLVD # LS-81	Port Orange
LOWE'S - GATEWAY LIFT STATION #82	1751 DUNLAWTON AVE #LS 82	Port Orange
MONARCH LIFT STATION #83 & RTU	5401 S WILLIAMSON BLVD # LS-83	Port Orange
PLANTATION I #85	1508 MCGINNIS AVE #LS-85	Port Orange
WHISPERING WOODS LIFT STATION #87	858 AIRPORT RD #LS-87	Port Orange
CORACI #88	1771 TOWN WEST BLVD	Port Orange
COQUINA COVE #89	1998 TOWN WEST BLVD	Port Orange
SUNSET COVE #90	3885 SUNSET COVE DRIVE	Port Orange
WATERS EDGE #3 #91	FORKMEAD LANE	Port Orange
BUTTERMILK #92	1151 BUTTERMILK LN # LS-92	Port Orange
BOURBON STREET #93	3860 BOURBON ST #LS-93	Port Orange
CRYSTAL LAKE #94	REED CANAL ROAD	Port Orange
SEABIRD ISLAND LIFT STATION #101	105 DUNLAWTON AVE NWC SEABIRD #LS-101	Port Orange
CORAL WAY LIFT STATION #102	63 DUNLAWTON AVE # LS-102	Port Orange
JADE WINDS LIFT STATION #103	3590 PENINSULA DR (3600)	Port Orange
OCEAN WAY #6 PONCE INLET #104	86 OCEAN WAY DR # LS-104	Port Orange
INLET POINT #8 PONCE INLET #105	4879 S PENINSULA DR #LS-105	Port Orange
P.I. LIFT STATION MASTER STATION #106 & RTU & GENERATOR	4668 S PENINSULA DR #LS-106	Port Orange
DEEP WATER PONCE INLET #107	133 INLET HARBOR RD #LS-107	Port Orange
LIGHTHOUSE SHORES #6 LIFT STATION PONCE INLET #108 & RTU	4752 S ATLANTIC AVE # LS-108	Port Orange
SEAGULL LANDING #3 LIFT STATION PONCE INLET #111	4431 S PENINSULA DR #LS-111	Port Orange
ANCHOR DR #2 PONCE INLET #112	4354 S PENINSULA DR #LS-112	Port Orange
LAS OLAS #113	37 MAR AZUL N #LS-113	Port Orange
VENETIAN WAY SOUTH #114	230 S VENETIAN WAY #LS-114	Port Orange
SURFSIDE #115	3601 SURFSIDE TER #LS-115	Port Orange
CARDINAL #116	3812 CARDINAL BLVD LS-116	Port Orange
Hillcrest Lift station	0 Wedgewood Ct	Orange City
Sandlewood Lift station	2332 Sandlewood Dr	Orange City
Dresden Ct Lift station	410 Dresden Ct	Orange City
Pineview Lift station	631 Pineview Dr	Orange City
Sunburst RV Lift station	2300 E. Graves Ave	Orange City
Monastery Lift station	0 Monastery Rd	Orange City
Shadowridge Lift station	842 Loral Leaf Dr	Orange City
Irrigation Pond Lift station	2134 Hollowridge Dr	Orange City
Sherwood Oaks Lift station	401 Sherwood Oaks Rd	Orange City
Target Lift station	2575 Enterprise Rd	Orange City
Florida Hospital Lift station	1055 Saxon Blvd	Orange City
OCS Water Plant Lift station	743 Harley Strickland Blvd	Orange City
Steak & Shake Lift station	927 Saxon Blvd	Orange City
Home Depot Lift station	2370 Veterans Memorial Parkway	Orange City
Chick Fil A	1139 Saxon Blvd	Orange City
Oakhurst Lift station	1292 Ivy Lake Dr	Orange City
Deltona Memorial	Saxon Blvd.	Orange City
Well #1	Country Village	Orange City

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Lift and Pump Stations (Continued)

Facility Name	Address	Jurisdiction
Lift Station #1	Opposite 475 Carswell Avenue	Holly Hill
Lift Station #2	231 Riverside Drive	Holly Hill
Lift Station #3	504 Riverside Drive	Holly Hill
Lift Station #4	345 10th Street	Holly Hill
Lift Station #5	946 Riverside Drive	Holly Hill
Lift Station #6	1136 State Avenue	Holly Hill
Lift Station #7	1300 Riverside Drive	Holly Hill
Lift Station #8	State Avenue opposite 1641	Holly Hill
Lift Station #9	1601 Riverside Drive	Holly Hill
Lift Station #10	410 Dorothy Avenue	Holly Hill
Lift Station #10a	429 3rd Street	Holly Hill
Lift Station #11	440 Magnolia Avenue	Holly Hill
Lift Station #11a	702 Commercial Drive	Holly Hill
Lift Station #12	620 Center Lane	Holly Hill
Lift Station #13	397 Dubbs Drive	Holly Hill
Lift Station #14	660 6th Street	Holly Hill
Lift Station #15	619 S. Flamingo Drive	Holly Hill
Lift Station #16	834 8th Street	Holly Hill
Lift Station #17	566 10th Street	Holly Hill
Lift Station #17a	1017 Chippewa Trail	Holly Hill
Lift Station #17b	Great Oaks Circle	Holly Hill
Lift Station #18	460 Walker Street	Holly Hill
Lift Station #18a	1000 15th Street	Holly Hill
Lift Station #19	407 Flomich Street	Holly Hill
Lift Station #20	926 Flomich Street	Holly Hill
Lift Station #21	1000 Walker Street	Holly Hill
Lift Station #24	944 Alabama Avenue	Holly Hill
Lift Station #25	Riviera Country Club	Holly Hill
Lift Station #26	1600 Nova Road (Walgreen's)	Holly Hill
Lift Station #27	2020 Ridgewood Avenue	Holly Hill
Lift Station #28	1812 Ridgewood Avenue	Holly Hill
Dog Park Lift Station	980 Alabama Avenue	Holly Hill
1. CHUCK WALKER	190 E. WISCONSIN AVE.	DeLand
2. WALTS/GARFIELD	401 S. GARFIELD	DeLand
3. CRESCENT PARKWAY	905 CRESCENT PARKWAY	DeLand
4. PLYMOUTH/KANSAS	803 E. PLYMOUTH	DeLand
5. PENN/DELAWARE	629 DELAWARE N.	DeLand
6. JR. HIGH	217 N. DELAWARE	DeLand
7. WINN./THOMPSON	422 W. WINNEMISSETT	DeLand
8. ALABAMA	801 S. ALABAMA	DeLand
9. MONTGOMERY-GATOR PIT	123 S. MONTGOMERY	DeLand
10. MAY STREET	851 W. MAY STREET	DeLand
11. CANDLELIGHT	1039 OAKTREE LANE / Libson Pkwy	DeLand
12. PLYMOUTH/KENTUCKY	605 E. PLYMOUTH	DeLand
13. BLUE LAKE HEIGHTS	1352 CHRIS AVE.	DeLand
14. SAMBO'S	121 W. MANDARIN	DeLand
15. PLYMOUTH PLACE	1015 NEW BEDFORD	DeLand
16. HILL/BERESFORD	891 E. BERESFORD AVE.	DeLand
17. 44/RR	2461 W HY 44 AT RR	DeLand
18. STONE STREET	1100 N. STONE ST.	DeLand
19. BLUE LAKE SCHOOL ELEM.	1396 E. WISCONSIN	DeLand
20. LAKE LINDLEY	998 VILLAGE LAKE DR.	DeLand
21. MILLERS	1002 W. PLYMOUTH AVENUE	DeLand

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Lift and Pump Stations (Continued)

Facility Name	Address	Jurisdiction
22. NATURES WOOD	1226 NATURES WOODS BLVD. 4623993	DeLand
23. AIRPORT II	395 PISTOL RANGE RD.	DeLand
24. AIRPORT I	1501 LANGLEY AVE.	DeLand
25. BURGONE	1101 BURGOYNE RD.	DeLand
26. VALLEY FORGE	1100 VALLEY FORGE	DeLand
27. LAKE MAMIE	109 E. LAKE MAMIE RD.	DeLand
28. HIDDEN HILLS I	227 PALM COVE DR.	DeLand
29. HIDDEN HILLS II	4190 SPRING LAKE DR.	DeLand
30. TRAILS I	950 SHADY BRANCH TRAIL	DeLand
31. TRAILS II	34 OLD TREE LINE TRAIL	DeLand
32. RAINTREE	368 RAINTREE CIRCLE	DeLand
33. VOORHIS (OAKS)	1630 E. VOORHIS AVE.	DeLand
34. HILL/WALTS	400 S. HILL	DeLand
35. REGIONAL SHOPPING PL.	2659 REGIONAL SHOP. PLAZA	DeLand
36. GLENN EAGLES	101 S. GLENN EAGLES DR.	DeLand
37. HEATHER GLENN	1449 HEATHER GLENN DR.	DeLand
38. QUAIL HOLLOW	1860 HONTOON RD.	DeLand
39. ROSEWOOD	2660 GRACIE DR.	DeLand
40. WHISPERWOOD	3070 TURTLE DOVE TR.	DeLand
41. LEXINGTON/RAINES	1425 INTERNATIONAL SPDWY.	DeLand
42. CHURCH ADAMS	807 E. CHURCH	DeLand
43. CASCADES	1025 CLEAR LAKE/1201S. SR 15A	DeLand
44. ARIZONA (VICTORIA PL)	410 BERWICK CIRCLE	DeLand
45. BENT OAKS	1557 ROCKWELL HGTS. DR.	DeLand
46. ATHENS	122 N. FLORIDA AVE.	DeLand
47. STORM STATION	1101 S. AMELIA AVE	DeLand
48. W. CAROLINA / ADELLE	422 W. CAROLINA AVE	DeLand
49. EAST BROOK	647 ASTORIA DR.	DeLand
50. LAKESHORE TRAILS	7754 ROYAL FERN CIR./0 WINTERBERRY	DeLand
51. SPRING ARBOR	1219 W. PLYMOUTH	DeLand
52. VICTORIA SQUARE	195 DODGE AVE.	DeLand
53. CROSSCREEK	1609 KINNAN TR	DeLand
54. SPRING HILL #1	492 W. MATHIS AVE.	DeLand
55. COUNTY FAIRGROUNDS	370 GOSSAMER RD	DeLand
56. COUNTY TRANSFER STATION	3151 E. NEW YORK AVE	DeLand
57. COMFORT INN	400 E. INTERNATL. SPDWY	DeLand
58. WINDROW BUILDING	1101 S. AMELIA AVE.	DeLand
59. N. STONE MEDICAL	1090 N. ORANGE AVE.	DeLand
60. WESTSIDE MASTER REPUMP	1001 N. HAZEN AVE.	DeLand
61. DIVISION/KENTUCKY	675 E. DIVISION ST.	DeLand
62. SOUTH POINT COMMONS	2470 S. WOODLAND BLVD.	DeLand
63. NORTHGATE	295 E. INTERNATL. SPDWY.	DeLand
64. PLUMOSUS PARK	190 E. TAYLOR RD.	DeLand
65. BALTIMORE/CLARA	1485 S. CLARA AVE.	DeLand
66. SAGO PARK	2395 N. WOODLAND BLVD.	DeLand
67. KEPLER RIDGE	2265 N. KEPLER RD.	DeLand
68. BLUE LAKE WOODS	1375 E. NEW YORK AVE	DeLand
69. AIR-TECH PARK	930 E. BISCAYNE	DeLand
70. BADCOCK HOME FURN.	1631 STATE RD. 15A	DeLand
71. ARVIDA MASTER PUMP	1280 E. TAYLOR RD.	DeLand
72. CAMPGROUND	1898 SKYDIVE DR.	DeLand
73. PARADE CIRCLE	1660 PARADE CIRCLE	DeLand
74. WALGREENS	117 E. ROSEHILL AVE.	DeLand

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Lift and Pump Stations (Continued)

Facility Name	Address	Jurisdiction
75. FREEDOM ELEMENTRY	1395 S.BLUE LAKE AVE.	DeLand
76. DOT OFFICES	1650 KEPLER AVE.	DeLand
77. CRYSTAL COVE	2337 CRYSTAL OAK DR.	DeLand
78. VICTORIA PARK COMMONS	2711 MARTIN LUTHER KING AV.	DeLand
79. VICTORIA PARK HILLS	1385 ORANGE CAMP RD.	DeLand
80. GEO.MARKS ELEMENTARY	1000 N. GARFIELD AVE.	DeLand
81. DELAND HIGH SCHOOL	800 OLD N. HILL AVE.	DeLand
82. WATERFORD LAKES	409 S. LAKE LINDLEY	DeLand
83. NSB HANGERS	2000 OLD DAYTONA RD	DeLand
84. SW MIDDLE SCHOOL	605 W. NEW HAMPSHIRE AVE	DeLand
85. LAKES OF DeLAND I	3562 AQUAMARINE DR.	DeLand
86. N. FIRE STATION	257 W. INT.SPDWY BLVD.	DeLand
87. WILLOW RIDGE	000 E. MINNESOTA	DeLand
88. VICTORIA GARDENS I	1134 HERON POINT WAY	DeLand
89. VICTORIA HILLS II	1805 BLUE LAKE AVE	DeLand
90. WOODS AT SOUTHRIDGE	811 E. BEREFORD AVE.	DeLand
91. LAKES OF DeLAND II	832 JADE PRKWY	DeLand
92. CARRIAGE APTS.	213 DYSON DRIVE	DeLand
93. FOREST TRACE	1501 W. MINNESOTA AVE	DeLand
94. GLENNWOOD SPRINGS	1305 WEYMOUTH DR.	DeLand
95. BERRYS RIDGE	3757 AIRPORT RD.	DeLand
96. NORTH RIDGE	125 BLANCO DR.	DeLand
97. PARKMORE MANOR	776 ASTORIA DR.	DeLand
98. HERITAGE PLACE	810 DEERFERN AVE.	DeLand
99. RIDGEWOOD CROSSING	401 S. RIDGEWOOD AVE.	DeLand
100. WP #9 / SE FIREHOUSE	1483 E. TAYLOR RD	DeLand
101. SADDLEBROOK RESERVE	134 SADDLEBROOK WAY	DeLand
102. MALLORY SQUARE	621 N. HAZEN RD	DeLand
103. DeLAND CROSSING	3051 E. NEW YORK AVE	DeLand
104. CLARA PLACE APTS.	318 W. NEW HAMPSHIRE AVE.	DeLand
105. VICTORIA FARMS NW	202 E. CHERRY PLACE	DeLand
106. THE ENCLAVE	133 CASSABELLA BLVD.	DeLand
107. COUNTRY CLUB VILLAS	52 BARRINGTON AVE.	DeLand
108. WELLINGTON WOODS	501 ORANGE CAMP AVE	DeLand
109. WOODLAND CROSSING	1706 N. WOODLAND BLVD.	DeLand
110. THE HIGHLANDS	305 SOUTHERN WINDS BLVD.	DeLand
111. BRANDY/TRAILS MASTER	465 E. LAKE MAMIE AVE	DeLand
112. CLARA / CALVIN	1175 S. CLARA AVE	DeLand
113. NORTH ACCESS RD I	2123 EDSON DR.	DeLand
114. NORTH ACCESS RD II	2245 EDSON DR.	DeLand
115. CITRUS GROVE ELEMENTRY	729 N. HAZEN AVE.	DeLand
116. TAYLOR PLACE APTS	1573-101 S. WOODLAND BLVD.	DeLand
117. ST. JOHN'S MARINA	NONE PROVIDED	DeLand
118. HAMPTON INN	30 SUMMIT PLACE	DeLand
119. COUNTRY CLUB CORNERS	NONE PROVIDED	DeLand
120. COUNTRY CLUB CORNERS II	NONE PROVIDED	DeLand
121. I4/44 BUSINESS CENTER	NONE PROVIDED	DeLand
KEPLER OAKS	NONE PROVIDED	DeLand
TWELVE OAKS I	NONE PROVIDED	DeLand
SPRINGWOOD TOWNHOMES	NONE PROVIDED	DeLand
VICTORIA HILLS III	NONE PROVIDED	DeLand
OAK HAMMOCK RESERVE	NONE PROVIDED	DeLand
TWELVE OAKS II	NONE PROVIDED	DeLand

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Lift and Pump Stations (Continued)

Facility Name	Address	Jurisdiction
BERESFORD WOODS	NONE PROVIDED	DeLand
GARDEN CROSSING	NONE PROVIDED	DeLand
THEATRES MULTIPLEX	NONE PROVIDED	DeLand
RIVERWALK ESTATES	NONE PROVIDED	DeLand
THE WARNERS	NONE PROVIDED	DeLand
PELHAM SQUARE ESTATES	NONE PROVIDED	DeLand
TAYLOR ESTATES	NONE PROVIDED	DeLand
ROYAL OAKS	NONE PROVIDED	DeLand
HUNTINGTON DOWNS	NONE PROVIDED	DeLand
SIX ACRE SUBDIVISION	NONE PROVIDED	DeLand
OAK LANDING	NONE PROVIDED	DeLand
IVANHOE CENTRAL	NONE PROVIDED	DeLand
MILL LAKE STATION	291 BLUE SPRINGS AVENUE	Orange City
INDUSTRIAL DRIVE STATION	259 INDUSTRIAL DRIVE	Orange City
KINGS LAKE STATION	305 KINGS LAKE DRIVE	DeBary
LAKE CHARLES STATION	HIGHLAND AVENUE	DeBary
LAKE SUSAN STATION	96 US HIGHWAY 17-92	DeBary
DGCC ENTRANCE POND STATION	100 DEBARY PLANTATION BLVD	DeBary
QUAIL LAKE STATION	CADDIE DRIVE	DeBary
NO NAME LAKE STATION	HIGHBANKS ROAD	DeBary
Station 1	1690 S. Palmetto Avenue	South Daytona
Station 2	501 Big Tree Road	South Daytona
Station 3	200 Ridge Boulevard	South Daytona
Station 4	2326 Anastasia Drive	South Daytona
Station 5	635 Violet Street	South Daytona
Station 6	808 Valencia Road	South Daytona
Station 7	586 Brook Circle	South Daytona
Station 8	2451 S Ridgewood Avenue	South Daytona
Station 9	29 Sandusky Circle	South Daytona
Station 10	918 Reed Canal Road	South Daytona
Station 11	8 1/2 Spinnaker Circle	South Daytona
Station 12	2025 Hickorywood Drive	South Daytona
Station 13	2938 Lantern Drive	South Daytona
Station 14	794 Aspen Drive	South Daytona
Station 15	2936 Foxcroft Lane	South Daytona
Station 16	407 Banana Cay Drive	South Daytona
Station 17	1610 Magnolia Avenue	South Daytona
Station 18	115 Bryan Cave Road	South Daytona
Station 19	765 Big Tree Road	South Daytona
Station 20	1017 Green Acres Circle	South Daytona
Station 21	2302 S. Nova Road	South Daytona
Station 22	3198 S. Nova Road	South Daytona

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Additional Addendum: Daytona Beach Fuel Tanks

The following table lists the fuel tanks located within the City of Daytona Beach, Florida.

Facility ID	SITE NAME	TANK ATTRIBUTES	HOURS OF OPERATION	REQUIRES TRUCK WITH PUMP	CODB PROJECT MANAGER
9700983	Bethune Point WWTP 1 Shady PL Daytona Beach, FL 32114	1 ea. 6,000 gal. Vehicular Diesel Double walled (DW) steel AST. 1 ea. 1,000 gal. Vehicular Diesel Doubled walled (DW) steel AST.	7am-5pm, 5 days	Yes	Name: Tony Segreto Phone: 386-671-8712 Cell : 321-436-7479 Email: segretoa@codb.us
8631491	Fire Station #3 945 N. Halifax Ave. Daytona Beach, FL 32114	1 ea. 1,000 gal. Vehicular Diesel Double walled (DW) fiberglass UST	7am-5pm, 5 days	Yes	Name: Tony Segreto Phone: 386-671-8712 Cell : 321-436-7479 Email: segretoa@codb.us
9812157	Police Dept 129 Valor Blvd. Daytona Beach, FL 32114	1ea, 6000 gal Vehicular diesel Double walled	7am-5pm-5 days	Yes	Name: Tony Segreto Phone: 386-671-8712 Cell : 321-436-7479 Email: segretoa@codb.us
8622691	Westside Regional WWTP 3651 LPGA Blvd. Daytona Beach, FL 32117	2 ea. 6,000 gal. Vehicular diesel Double walled (DW) steel AST. 1 ea. 4,000 gal. Vehicular Diesel Double walled (DW) steel AST. 1 ea. 12,000 gal. Vehicular Diesel Double walled (DW) steel UST. 1 ea. 12,000 gal. Unleaded Gas Double Walled (DW) steel UST.	7am-5pm, 5 days	Yes Yes No no	Name: Tony Segreto Phone: 386-671-8712 Cell : 321-436-7479 Email: segretoa@codb.us
8622689	Public Works Complex 950 Bellevue Avenue Daytona Beach, FL 32114	2 ea. 12,000 gal. Unleaded gas Double walled (DW) steel AST. 1 ea. 12,000 gal. Vehicular Diesel Double walled (DW) steel AST. 1 ea. 2,000 gal. Unleaded gas Double walled (DW) steel AST.	7am-5pm, 5 days	Yes	Name: Tony Segreto Phone: 386-671-8712 Cell : 321-436-7479 Email: segretoa@codb.us
8517330	Golf & Country Club 600 Wilder Blvd. Daytona Beach, FL 32114	1 ea. 1,000 gal. Vehicular Diesel Double walled (DW) steel AST. 1ea. 2,000 gal. Unleaded Gas Double walled (DW) steel AST.	7am-5pm, 5 days	Yes	Name: Tony Segreto Phone: 386-671-8712 Cell : 321-436-7479 Email: segretoa@codb.us
9300590	Lift Station #1110 1612 Richard Petty Blvd. Daytona Beach, FL 32115	1 ea. 1,000 gal. Vehicular Diesel Double walled (DW) steel AST.	7am-5pm, 5 days	Yes	Name: Tony Segreto Phone: 386-671-8712 Cell : 321-436-7479 Email: segretoa@codb.us
8631492	Fire Station #4 1675 Mason Ave. Daytona Beach, FL 32114	1 ea. 1,000 gal. Vehicular Diesel Double walled (DW) steel AST.	7am-5pm, 5 days	Yes	Name: Tony Segreto Phone: 386-671-8712 Cell : 321-436-7479 Email: segretoa@codb.us
9300589	Lift Station #1162 2020 Beville Road Daytona Beach, FL 32115	1 ea. 1,000 gal. Vehicular Diesel Double walled (DW) steel AST.	7am-5pm, 5 days	Yes	Name: Tony Segreto Phone: 386-671-8712 Cell : 321-436-7479 Email: segretoa@codb.us
9300588	Lift Station #1105 647 Shady Place Daytona Beach, FL 32114	1 ea. 1,000 gal. Vehicular Diesel Double walled (DW) steel AST.	7am-5pm, 5 days	Yes	Name: Tony Segreto Phone: 386-671-8712 Cell : 321-436-7479 Email: segretoa@codb.us

APPENDIX F: INDIVIDUAL JURISDICTIONAL MITIGATION PLANS

All 17 jurisdictions within Volusia County adopt the County LMS and the plan is located in a live, online document in an attempt to streamline the updating process. All jurisdictions house the plans for Mitigation projects in the LMS.

In addition to the Mitigation Action Plan (in section 9 of this report) which lists all jurisdictions active projects, there are a number of completed and terminated projects that are not included in this listing.

The Mitigation initiative project/plans lists for the individual Jurisdictions can be found at the link below.

[Link to Mitigation Plans](#)

Text to Link: <ftp://ftp.ecfrpc.org/Live%20Links/Volusia%20LMS/>

Click on "Initiatives List"

Username: pj

Password: pjP4ss3

JURISDICTION APPENDIX: DAYTONA BEACH

This Appendix further identifies the risk and vulnerability from the natural and man-made hazards in Volusia County. The following tables summarize financial exposure to hazard zones for storm surge and fire within Daytona Beach.

DAYTONA BEACH | Financial Vulnerability to Storm Surge and Fire Risk Zones

Financial Exposure to Storm Surge Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Category 1	1,292	1,081	\$316,533,574	\$398,921,520	\$715,455,094	\$512,415,698
Category 2	2,793	2,153	\$393,703,452	\$633,385,772	\$1,027,089,224	\$667,407,380
Category 3	12,291	10,116	\$470,873,330	\$867,850,024	\$1,338,723,354	\$822,399,062
Category 4	14,294	11,945	\$585,339,138	\$1,149,477,833	\$1,734,816,971	\$1,099,713,755
Category 5	14,700	12,306	\$642,429,465	\$1,318,434,326	\$1,960,863,791	\$1,169,549,896

Financial Exposure to Fire Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Low Risk	15,102	12,495	\$1,185,206,025	\$3,228,526,829	\$4,413,743,039	\$2,637,578,051
High Risk	1,370	1,120	\$110,718,476	\$312,593,326	\$423,311,802	\$292,031,819
Very High Risk	7,422	6,839	\$399,200,179	\$1,493,895,123	\$1,893,095,302	\$1,261,302,031

Data Source(s): FEMA (Flood Data); FDEM (Storm Surge Data); HAZUS (Fire Data); Volusia County (2019 Parcels)

Flooding data included in the Volusia County Floodplain Management Plan (Appendix I)

JURISDICTION APPENDIX: DAYTONA BEACH SHORES

This Appendix further identifies the risk and vulnerability from the natural and man-made hazards in Volusia County. The following tables summarize financial exposure to hazard zones for storm surge and fire within Daytona Beach Shores.

DAYTONA BEACH SHORES | Financial Vulnerability to Storm Surge and Fire Risk Zones

Financial Exposure to Storm Surge Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Category 1	152	111	\$100,585,029	\$122,779,051	\$223,364,080	\$202,762,343
Category 2	286	212	\$127,338,502	\$141,949,299	\$269,287,801	\$238,831,763
Category 3	686	548	\$154,091,975	\$161,119,547	\$315,211,522	\$274,901,183
Category 4	815	665	\$164,040,623	\$187,548,884	\$351,589,507	\$301,336,432
Category 5	815	665	\$164,040,623	\$187,548,884	\$351,589,507	\$301,336,432

Financial Exposure to Fire Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Low Risk	815	665	\$178,678,445	\$235,084,140	\$413,762,585	\$355,941,024
High Risk	0	0	\$0	\$0	\$0	\$0
Very High Risk	0	0	\$0	\$0	\$0	\$0

Data Source(s): FEMA (Flood Data); FDEM (Storm Surge Data); HAZUS (Fire Data); Volusia County (2019 Parcels)

Flooding data included in the Volusia County Floodplain Management Plan (Appendix I)

JURISDICTION APPENDIX: DEBARY

This Appendix further identifies the risk and vulnerability from the natural and man-made hazards in Volusia County. The following tables summarize financial exposure to hazard zones for storm surge and fire within DeBary.

DEBARY | Financial Vulnerability to Storm Surge and Fire Risk Zones

Financial Exposure to Storm Surge Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Category 1	324	238	\$5,1417,203	\$43,329,214	\$94,746,417	\$68,170,704
Category 2	326	239	\$51,619,008	\$43,678,087	\$95,297,095	\$68,448,119
Category 3	326	239	\$51,820,813	\$44,026,960	\$95,847,773	\$68,725,534
Category 4	327	240	\$51,828,288	\$44,027,727	\$95,856,015	\$68,733,776
Category 5	329	241	\$52,616,950	\$44,100,724	\$96,717,674	\$68,828,395

Financial Exposure to Fire Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Low Risk	430	327	\$46,048,620	\$75,660,588	\$121,709,208	\$89,521,167
High Risk	3,901	3,190	\$200,697,229	\$657,310,218	\$858,007,447	\$587,777,697
Very High Risk	6,099	5,351	\$235,413,834	\$765,908,420	\$1,001,322,254	\$658,068,792

Data Source(s): FEMA (Flood Data); FDEM (Storm Surge Data); HAZUS (Fire Data); Volusia County (2019 Parcels)

Flooding data included in the Volusia County Floodplain Management Plan (Appendix I)

APPENDIX G: HAZARD IDENTIFICATION RISK ANALYSIS (HIRA) RISK AND VULNERABILITY

JURISDICTION APPENDIX: DELAND

This Appendix further identifies the risk and vulnerability from the natural and man-made hazards in Volusia County. The following tables summarize financial exposure to hazard zones for storm surge and fire within DeLand.

DELAND | Financial Vulnerability to Storm Surge and Fire Risk Zones

Financial Exposure to Storm Surge Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Category 1	0	0	\$0	\$0	\$0	\$0
Category 2	0	0	\$0	\$0	\$0	\$0
Category 3	0	0	\$0	\$0	\$0	\$0
Category 4	0	0	\$0	\$0	\$0	\$0
Category 5	0	0	\$0	\$0	\$0	\$0

Financial Exposure to Fire Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Low Risk	5,517	4,865	\$265,193,791	\$1,128,691,587	\$1,393,885,378	\$938,546,649
High Risk	1,697	1,527	\$72,963,630	\$369,198,229	\$442,161,859	\$283,677,133
Very High Risk	6,116	5,045	\$221,760,628	\$931,483,842	\$1,153,244,470	\$654,488,071

Data Source(s): FEMA (Flood Data); FDEM (Storm Surge Data); HAZUS (Fire Data); Volusia County (2019 Parcels)

Flooding data included in the Volusia County Floodplain Management Plan (Appendix I)

JURISDICTION APPENDIX: DELTONA

This Appendix further identifies the risk and vulnerability from the natural and man-made hazards in Volusia County. The following tables summarize financial exposure to hazard zones for storm surge and fire within Deltona.

DELTONA | Financial Vulnerability to Storm Surge and Fire Risk Zones

Financial Exposure to Storm Surge Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Category 1	2	1	\$92,110	\$8,857	\$100,967	\$0
Category 2	2	1	\$92,110	\$8,857	\$100,967	\$0
Category 3	2	1	\$92,110	\$8,857	\$100,967	\$0
Category 4	2	1	\$92,110	\$8,857	\$100,967	\$0
Category 5	2	1	\$92,110	\$8,857	\$100,967	\$0

Financial Exposure to Fire Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Low Risk	7,213	6,491	\$178,686,241	\$848,121,569	\$1,026,807,810	\$600,669,572
High Risk	4,791	3,695	\$134,003,267	\$627,677,106	\$761,680,373	\$435,971,599
Very High Risk	26,375	23,449	\$560,573,441	\$3,282,568,428	\$3,843,141,869	\$2,184,762,773

Data Source(s): FEMA (Flood Data); FDEM (Storm Surge Data); HAZUS (Fire Data); Volusia County (2019 Parcels)

Flooding data included in the Volusia County Floodplain Management Plan (Appendix I)

JURISDICTION APPENDIX: EDGEWATER

This Appendix further identifies the risk and vulnerability from the natural and man-made hazards in Volusia County. The following tables summarize financial exposure to hazard zones for storm surge and fire within Edgewater.

EDGEWATER | Financial Vulnerability to Storm Surge and Fire Risk Zones

Financial Exposure to Storm Surge Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Category 1	366	314	\$105,441,618	\$81,552,303	\$186,993,921	\$140,339,826
Category 2	2,261	1,948	\$189,483,554	\$288,168,048	\$477,651,602	\$329,925,010
Category 3	9,920	8,802	\$273,525,490	\$494,783,793	\$768,309,283	\$519,510,194
Category 4	11,077	9,790	\$302,313,896	\$637,303,998	\$939,617,894	\$627,143,272
Category 5	11,123	9,827	\$303,800,538	\$641,629,355	\$945,429,893	\$631,304,078

Financial Exposure to Fire Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Low Risk	399	321	\$46,902,690	\$47,634,611	\$94,537,301	\$57,126,027
High Risk	738	503	\$54,707,294	\$109,075,143	\$163,782,437	\$122,844,495
Very High Risk	9,998	9,005	\$319,876,390	\$1,184,879,478	\$1,504,755,868	\$945,496,850

Data Source(s): FEMA (Flood Data); FDEM (Storm Surge Data); HAZUS (Fire Data); Volusia County (2019 Parcels)

Flooding data included in the Volusia County Floodplain Management Plan (Appendix I)

JURISDICTION APPENDIX: HOLLY HILL

This Appendix further identifies the risk and vulnerability from the natural and man-made hazards in Volusia County. The following tables summarize financial exposure to hazard zones for storm surge and fire within Holly Hill.

HOLLY HILL | Financial Vulnerability to Storm Surge and Fire Risk Zones

Financial Exposure to Storm Surge Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Category 1	194	167	\$25,801,886	\$30,132,552	\$55,934,438	\$38,117,316
Category 2	400	360	\$32,042,960	\$51,435,974	\$83,478,934	\$56,513,590
Category 3	4,633	4,195	\$38,284,034	\$72,739,396	\$111,023,430	\$74,909,864
Category 4	5,107	4,637	\$51,502,972	\$118,801,814	\$170,304,786	\$118,766,409
Category 5	5,110	4,640	\$51,629,887	\$118,911,907	\$170,541,794	\$118,935,829

Financial Exposure to Fire Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Low Risk	2,902	2,674	\$115,559,356	\$319,070,097	\$434,629,453	\$320,257,849
High Risk	43	22	\$845,964	\$2,658,995	\$3,504,959	\$2,023,085
Very High Risk	2,180	1,959	\$71,351,888	\$243,781,521	\$315,133,409	\$214,790,484

Data Source(s): FEMA (Flood Data); FDEM (Storm Surge Data); HAZUS (Fire Data); Volusia County (2019 Parcels)

Flooding data included in the Volusia County Floodplain Management Plan (Appendix I)

JURISDICTION APPENDIX: LAKE HELEN

This Appendix further identifies the risk and vulnerability from the natural and man-made hazards in Volusia County. The following tables summarize financial exposure to hazard zones for storm surge and fire within Lake Helen.

LAKE HELEN | Financial Vulnerability to Storm Surge and Fire Risk Zones

Financial Exposure to Storm Surge Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Category 1	0	0	\$0	\$0	\$0	\$0
Category 2	0	0	\$0	\$0	\$0	\$0
Category 3	0	0	\$0	\$0	\$0	\$0
Category 4	0	0	\$0	\$0	\$0	\$0
Category 5	0	0	\$0	\$0	\$0	\$0

Financial Exposure to Fire Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Low Risk	117	30	\$3,938,983	\$6,230,332	\$10,169,315	\$6,439,172
High Risk	262	168	\$11,415,904	\$23,604,372	\$35,020,276	\$22,035,619
Very High Risk	1,315	953	\$46,037,814	\$110,630,220	\$156,668,034	\$91,645,132

Data Source(s): FEMA (Flood Data); FDEM (Storm Surge Data); HAZUS (Fire Data); Volusia County (2019 Parcels)

Flooding data included in the Volusia County Floodplain Management Plan (Appendix I)

JURISDICTION APPENDIX: NEW SMYRNA BEACH

This Appendix further identifies the risk and vulnerability from the natural and man-made hazards in Volusia County. The following tables summarize financial exposure to hazard zones for storm surge and fire within New Smyrna Beach.

NEW SMYRNA BEACH | Financial Vulnerability to Storm Surge and Fire Risk Zones

Financial Exposure to Storm Surge Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Category 1	2,710	2,263	\$545,329,637	\$556,239,092	\$1,101,568,729	\$753,109,743
Category 2	9,489	8,122	\$1,235,996,619	\$1,597,404,229	\$2,833,400,848	\$1,943,643,519
Category 3	12,041	10,444	\$1,926,663,601	\$2,638,569,366	\$4,565,232,967	\$3,134,177,295
Category 4	12,334	10,706	\$1,952,940,787	\$2,696,763,374	\$4,649,704,161	\$3,205,528,664
Category 5	12,754	11,088	\$1,972,907,139	\$2,771,396,493	\$4,744,303,632	\$3,277,466,061

Financial Exposure to Fire Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Low Risk	7,454	6,480	\$1,248,488,406	\$1,429,197,043	\$2,677,685,449	\$1,990,677,914
High Risk	2,577	2,210	\$217,818,892	\$481,626,143	\$699,445,035	\$493,015,255
Very High Risk	5,932	5,047	\$340,016,266	\$851,018,653	\$1,191,034,919	\$788,641,286

Data Source(s): FEMA (Flood Data); FDEM (Storm Surge Data); HAZUS (Fire Data); Volusia County (2019 Parcels)

Flooding data included in the Volusia County Floodplain Management Plan (Appendix I)

JURISDICTION APPENDIX: OAK HILL

This Appendix further identifies the risk and vulnerability from the natural and man-made hazards in Volusia County. The following tables summarize financial exposure to hazard zones for storm surge and fire within Oak Hill.

OAK HILL | Financial Vulnerability to Storm Surge and Fire Risk Zones

Financial Exposure to Storm Surge Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Category 1	626	453	\$72,484,465	\$50,648,581	\$123,133,046	\$75,389,343
Category 2	1,091	679	\$86,237,499	\$75,507,531	\$161,745,030	\$99,420,806
Category 3	1,656	1,020	\$99,990,533	\$100,366,481	\$200,357,014	\$123,452,269
Category 4	1,730	1,074	\$101,845,156	\$105,554,586	\$207,399,742	\$127,516,331
Category 5	1,754	1,093	\$102,383,401	\$107,387,060	\$209,770,461	\$128,909,110

Financial Exposure to Fire Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Low Risk	59	11	\$24,748,035	\$819,002	\$25,567,037	\$974,421
High Risk	892	471	\$38,676,089	\$57,363,588	\$96,039,677	\$64,399,607
Very High Risk	803	611	\$42,728,398	\$59,076,417	\$101,804,815	\$69,940,413

Data Source(s): FEMA (Flood Data); FDEM (Storm Surge Data); HAZUS (Fire Data); Volusia County (2019 Parcels)

Flooding data included in the Volusia County Floodplain Management Plan (Appendix I)

JURISDICTION APPENDIX: ORANGE CITY

This Appendix further identifies the risk and vulnerability from the natural and man-made hazards in Volusia County. The following tables summarize financial exposure to hazard zones for storm surge and fire within Orange City.

ORANGE CITY | Financial Vulnerability to Storm Surge and Fire Risk Zones

Financial Exposure to Storm Surge Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Category 1	0	0	\$0	\$0	\$0	\$0
Category 2	0	0	\$0	\$0	\$0	\$0
Category 3	0	0	\$0	\$0	\$0	\$0
Category 4	0	0	\$0	\$0	\$0	\$0
Category 5	0	0	\$0	\$0	\$0	\$0

Financial Exposure to Fire Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Low Risk	348	216	\$50,022,495	\$74,786,904	\$124,809,399	\$113,923,315
High Risk	811	581	\$80,272,598	\$276,503,517	\$356,776,115	\$239,936,274
Very High Risk	2,764	2,386	\$130,709,104	\$433,443,614	\$564,152,718	\$374,484,357

Data Source(s): FEMA (Flood Data); FDEM (Storm Surge Data); HAZUS (Fire Data); Volusia County (2019 Parcels)

Flooding data included in the Volusia County Floodplain Management Plan (Appendix I)

JURISDICTION APPENDIX: ORMOND BEACH

This Appendix further identifies the risk and vulnerability from the natural and man-made hazards in Volusia County. The following tables summarize financial exposure to hazard zones for storm surge and fire within Ormond Beach.

ORMOND BEACH | Financial Vulnerability to Storm Surge and Fire Risk Zones

Financial Exposure to Storm Surge Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Category 1	927	769	\$260,256,044	\$309,139,518	\$569,395,562	\$435,805,288
Category 2	1,457	1,263	\$350,772,981	\$451,795,086	\$802,568,067	\$612,352,861
Category 3	8,662	7,886	\$441,289,918	\$594,450,654	\$1,035,740,572	\$788,900,434
Category 4	11,403	10,462	\$612,627,516	\$1,023,964,919	\$1,636,592,435	\$1,223,671,593
Category 5	12,661	11,603	\$673,213,154	\$1,278,476,752	\$1,951,689,906	\$1,444,841,698

Financial Exposure to Fire Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Low Risk	2,780	2,541	\$327,179,094	\$540,032,990	\$867,212,084	\$668,582,412
High Risk	5,353	4,796	\$365,173,095	\$1,248,661,275	\$1,613,834,370	\$1,220,722,443
Very High Risk	10,417	9,602	\$697,576,286	\$1,685,417,457	\$2,382,993,743	\$1,673,948,067

Data Source(s): FEMA (Flood Data); FDEM (Storm Surge Data); HAZUS (Fire Data); Volusia County (2019 Parcels)

Flooding data included in the Volusia County Floodplain Management Plan (Appendix I)

JURISDICTION APPENDIX: PIERSON

This Appendix further identifies the risk and vulnerability from the natural and man-made hazards in Volusia County. The following tables summarize financial exposure to hazard zones for storm surge and fire within Pierson.

PIERSON | Financial Vulnerability to Storm Surge and Fire Risk Zones

Financial Exposure to Storm Surge Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Category 1	0	0	\$0	\$0	\$0	\$0
Category 2	0	0	\$0	\$0	\$0	\$0
Category 3	0	0	\$0	\$0	\$0	\$0
Category 4	0	0	\$0	\$0	\$0	\$0
Category 5	0	0	\$0	\$0	\$0	\$0

Financial Exposure to Fire Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Low Risk	107	29	\$4,260,359	\$2,761,476	\$7,021,835	\$3,266,461
High Risk	735	358	\$16,268,871	\$30,542,047	\$46,810,918	\$28,694,699
Very High Risk	405	274	\$11,335,448	\$46,591,894	\$57,927,342	\$20,692,531

Data Source(s): FEMA (Flood Data); FDEM (Storm Surge Data); HAZUS (Fire Data); Volusia County (2019 Parcels)

Flooding data included in the Volusia County Floodplain Management Plan (Appendix I)

JURISDICTION APPENDIX: PONCE INLET

This Appendix further identifies the risk and vulnerability from the natural and man-made hazards in Volusia County. The following tables summarize financial exposure to hazard zones for storm surge and fire within Ponce Inlet.

PONCE INLET | Financial Vulnerability to Storm Surge and Fire Risk Zones

Financial Exposure to Storm Surge Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Category 1	466	306	\$160,936,727	\$96,496,798	\$257,433,525	\$183,535,659
Category 2	789	561	\$200,816,821	\$163,545,872	\$364,362,693	\$261,304,973
Category 3	1,420	1,055	\$240,696,915	\$230,594,946	\$471,291,861	\$339,074,287
Category 4	1,633	1,243	\$268,237,671	\$268,569,593	\$536,807,264	\$393,346,667
Category 5	1,633	1,243	\$268,237,671	\$268,569,593	\$536,807,264	\$393,346,667

Financial Exposure to Fire Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Low Risk	1,191	925	\$207,263,957	\$217,818,746	\$425,082,703	\$328,025,753
High Risk	436	318	\$103,172,264	\$103,679,286	\$206,851,550	\$140,041,860
Very High Risk	0	0	\$0	\$0	\$0	\$0

Data Source(s): FEMA (Flood Data); FDEM (Storm Surge Data); HAZUS (Fire Data); Volusia County (2019 Parcels)

Flooding data included in the Volusia County Floodplain Management Plan (Appendix I)

JURISDICTION APPENDIX: PORT ORANGE

This Appendix further identifies the risk and vulnerability from the natural and man-made hazards in Volusia County. The following tables summarize financial exposure to hazard zones for storm surge and fire within Port Orange.

PORT ORANGE | Financial Vulnerability to Storm Surge and Fire Risk Zones

Financial Exposure to Storm Surge Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Category 1	1,532	1,342	\$154,823,802	\$202,641,051	\$357,464,853	\$239,154,031
Category 2	6,593	5,998	\$351,457,391	\$820,346,663	\$1,171,804,054	\$806,345,719
Category 3	10,605	9,718	\$548,090,980	\$1,438,052,275	\$1,986,143,255	\$1,373,537,407
Category 4	13,132	12,024	\$638,924,300	\$1,916,163,624	\$2,555,087,924	\$1,747,704,637
Category 5	14,121	12,972	\$700,252,798	\$2,104,258,871	\$2,804,511,669	\$1,918,028,545

Financial Exposure to Fire Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Low Risk	7,601	6,963	\$387,667,469	\$963,513,836	\$1,351,181,305	\$973,957,479
High Risk	6,598	6,217	\$329,097,146	\$1,362,329,529	\$1,691,426,675	\$1,258,722,903
Very High Risk	9,341	8,680	\$405,972,741	\$1,690,540,979	\$2,096,513,720	\$1,403,419,446

Data Source(s): FEMA (Flood Data); FDEM (Storm Surge Data); HAZUS (Fire Data); Volusia County (2019 Parcels)

Flooding data included in the Volusia County Floodplain Management Plan (Appendix I)

JURISDICTION APPENDIX: SOUTH DAYTONA

This Appendix further identifies the risk and vulnerability from the natural and man-made hazards in Volusia County. The following tables summarize financial exposure to hazard zones for storm surge and fire within South Daytona.

SOUTH DAYTONA | Financial Vulnerability to Storm Surge and Fire Risk Zones

Financial Exposure to Storm Surge Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Category 1	458	409	\$67,559,639	\$78,401,012	\$145,960,651	\$119,585,799
Category 2	4,177	3,968	\$202,485,134	\$551,760,404	\$754,245,538	\$520,099,635
Category 3	4,972	4,700	\$337,410,629	\$1,025,119,796	\$1,362,530,425	\$920,613,471
Category 4	5,064	4,768	\$339,018,243	\$1,028,241,724	\$1,367,259,967	\$923,538,650
Category 5	5,064	4,768	\$339,018,243	\$1,028,241,724	\$1,367,259,967	\$923,538,650

Financial Exposure to Fire Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Low Risk	4,590	4,355	\$208,784,183	\$572,487,504	\$781,271,687	\$543,009,746
High Risk	262	251	\$9,169,580	\$35,328,417	\$44,497,997	\$30,763,720
Very High Risk	212	162	\$10,065,026	\$22,321,003	\$32,386,029	\$29,319,130

Data Source(s): FEMA (Flood Data); FDEM (Storm Surge Data); HAZUS (Fire Data); Volusia County (2019 Parcels)

Flooding data included in the Volusia County Floodplain Management Plan (Appendix I)

JURISDICTION APPENDIX: UNINCORPORATED VOLUSIA

This Appendix further identifies the risk and vulnerability from the natural and man-made hazards in Volusia County. The following tables summarize financial exposure to hazard zones for storm surge and fire within Unincorporated Volusia County.

UNINCORPORATED VOLUSIA CO. | Financial Vulnerability to Storm Surge and Fire Risk Zones

Financial Exposure to Storm Surge Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Category 1	17,288	3,463	\$849,799,986	\$2,368,173,965	\$1,500,031,353	\$899,472,256
Category 2	27,620	6,331	\$1,169,262,612	\$3,656,214,914	\$2,231,409,375	\$1,404,188,164
Category 3	40,504	11,933	\$1,488,725,238	\$4,944,255,863	\$2,962,787,397	\$1,908,904,072
Category 4	44,174	14,080	\$1,674,058,601	\$5,369,351,565	\$3,478,355,687	\$2,276,301,841
Category 5	46,757	15,654	\$1,858,631,838	\$5,740,359,384	\$4,013,312,681	\$2,655,929,722

Financial Exposure to Fire Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Low Risk	49,454	7,211	\$1,498,701,938	\$4,201,137,676	\$2,724,917,026	\$1,487,413,978
High Risk	27,196	15,656	\$1,405,203,622	\$3,054,912,917	\$4,240,015,526	\$2,622,809,944
Very High Risk	34,892	25,063	\$1,352,161,953	\$3,748,697,150	\$4,608,124,514	\$3,069,592,950

Data Source(s): FEMA (Flood Data); FDEM (Storm Surge Data); HAZUS (Fire Data); Volusia County (2019 Parcels)

Flooding data included in the Volusia County Floodplain Management Plan (Appendix I)

APPENDIX H: HAZARD IDENTIFICATION RISK ANALYSIS (HIRA) CONSEQUENCES

This Appendix identifies the capabilities and potential consequences on a county scale to natural and man-made hazards in Volusia County.

Core Capabilities by Hazard

The table below summarizes the core capabilities that are deemed ‘essential’ for Volusia County to maintain community control in the event that one or more of the hazards below will occur.

Core Capabilities	Wind	Storm Surge	Flood	Lightning	Tornado	Fire	Drought	Ext. Temp	Sea Lv. Rise	Pandemic	HazMat	Terrorism	
Access Control / ID Verif.										X		X	2
Community Resilience	X	X	X	X	X	X	X	X	X	X	X	X	12
Critical Transportation		X	X								X	X	4
Cybersecurity				X								X	2
Economic Recovery	X	X	X	X	X	X	X	X	X	X	X	X	12
Env.Response/Health/Safety	X	X	X	X	X	X	X	X	X	X	X	X	12
Fatality Management					X					X	X	X	4
Forensics/Attribution											X	X	2
Health/Social Services	X	X	X	X	X	X	X	X	X	X	X	X	12
Housing	X	X	X		X	X			X			X	7
Infrastructure Systems	X	X	X	X	X	X					X	X	8
Intelligence/Info Sharing										X	X	X	3
Interdiction/Disruption										X	X	X	3
L.T. Vulnerab. Reduction	X	X	X	X	X	X	X	X	X	X	X	X	12
Mass Care Services	X		X	X	X	X	X	X		X	X	X	10
Mass Search/Rescue	X	X	X		X	X				X	X	X	8
Nat./Cultural Resources	X	X	X	X	X	X					X	X	8
On-Scene Security/Prot.	X	X	X		X	X				X	X	X	8
Operational Communic.	X	X	X	X	X	X	X	X	X	X	X	X	12
Operational Coordinat'n.	X	X	X	X	X	X	X	X	X	X	X	X	12
Phys. Protective Measure										X		X	2
Planning	X	X	X	X	X	X	X	X	X	X	X	X	12
Public/Pvt. Services/Res.	X	X	X		X	X	X			X	X	X	9
Health/Medical Service	X	X	X	X	X	X	X	X	X	X	X	X	12
Public Info/Warning	X	X	X	X	X	X	X	X	X	X	X	X	12
Risk Resilience Mgmt.	X	X	X	X	X	X	X	X	X	X	X	X	12
Risk Mgmt-Programs	X	X	X	X	X	X	X	X	X	X	X	X	12
Screen/Search/Detection										X	X	X	3
Situational Assessment	X	X	X	X	X	X	X	X	X	X	X	X	12
Supple Chain Integrity										X		X	2
Threats/Hazard Identific.	X	X	X	X	X	X	X	X	X	X	X	X	12
	21	21	22	18	22	21	16	15	15	25	26	31	

Top Core Capabilities by Number of Applicable Hazards

Community Resilience (12)

Economic Recovery(12)

Environmental Response (12)

Health/Social Services (12)

Long Term Vulnerability Reduction (12)

Operational Communication (12)

Operational Coordination (12)

Planning (12)

Health/Medical Services (12)

Public Warning (12)

Risk Resilience Management (12)

Risk Management Programs (12)

Situational Assessment (12)

Threat/Hazard Identification (12)

Top Hazards by Core Capabilities Affected

1. Terrorism (31)

2. HazMat (26)

3. Pandemic (25)

4. Tornado (22)

5. Flood (22)

Resource Requirements and Target Capabilities by Hazard

This section of the report details the core capability targets and resource requirements for all natural, societal and technological hazards covered in the Local Mitigation Strategy. The tables provided for each hazard are based off of 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:

- *Flood*
- *Fire*
- *Wind*
- *Storm Surge*
- *Tornado*
- *HazMat Incident*
- *Pandemic*

APPENDIX H: HAZARD IDENTIFICATION RISK ANALYSIS (HIRA) CONSEQUENCES

Fire

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

APPENDIX H: HAZARD IDENTIFICATION RISK ANALYSIS (HIRA) CONSEQUENCES

Drought

Pandemic	
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

APPENDIX H: HAZARD IDENTIFICATION RISK ANALYSIS (HIRA) CONSEQUENCES

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

Terrorism

Pandemic	
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

Lightning

Pandemic	
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

APPENDIX I: VOLUSIA COUNTY FLOODPLAIN MANAGEMENT PLAN

The entire Volusia County Integrated Floodplain Management is imbedded as an appendix within the LMS. The FMP can be found on the following pages of this report.

Beginning in 2020, the Volusia County Integrated Floodplain Management Plan will be updated in conjunction with the Volusia County Local Mitigation Strategy. This is reflected in the title of the Floodplain Management Plan, which has been amended to “2020” from “2018” as part of this report.

Volusia County Integrated Floodplain Management Plan

2020



Prepared for
Volusia County Division of Emergency Management
by
The East Central Florida Regional Planning Council



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- Appendix I: Resolutions of Adoption

I. ACKNOWLEDGEMENTS

The East Central Florida Regional Planning Council would like to thank the Floodplain Management Plan Committee for their participation in the preparation of this plan. The following jurisdictions were instrumental in the completion of this plan: Volusia County, 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. Thank you to the Volusia County Division of Emergency Management for assisting in the plan development and coordination necessary for its success.

II. INTRODUCTION

The National Flood Insurance Program (NFIP) provides federally supported flood insurance in communities that regulate development in floodplains. The Community Rating System (CRS) grades the various Community Floodplain Management Programs and reduces flood insurance premiums in those communities that meet certain requirements. In order to reduce the potential for personal/property losses in flood prone areas and ensure the lowest possible flood insurance premiums for our residents, Volusia County and the jurisdictions of Daytona Beach, Daytona Beach Shores, DeBary, DeLand, Deltona, Edgewater, Holly Hill, New Smyrna Beach, Oak Hill, Orange City, Ormond Beach, Pierson, Ponce Inlet, Port Orange and South Daytona have developed this Floodplain Management Plan which includes specific jurisdictional plans. The Plan was developed and is updated annually with input from the Volusia County Local Mitigation Strategy Steering Committee, Volusia Prepares; and the Volusia County Growth & Resource Management and Public Works Departments. On June 12, 2013, the Volusia Prepares Steering Committee voted unanimously to incorporate the Plan into the Local Mitigation Strategy.

Activity section 510 of the CRS Coordinator's Manual requires an annual update of the Plan's implementation be made available to the local governing body (distributed electronically), the community, and the media. Copies of this plan are available for review at the Volusia County Kelly Administration Building, 123 West Indiana Avenue, DeLand, and the Daytona Beach Regional Library, 105 East Magnolia Avenue, Daytona Beach. Additionally, copies may be obtained by calling the Volusia County Emergency Management Division, 386-258-4088 or downloading a copy from <https://www.volusia.org/services/public-protection/emergency-management/types-of-disasters/floods>. A copy of this report has also been sent to the Daytona Beach News-Journal, the Orlando Sentinel, and the State of Florida NFIP Coordinating Official. This memorandum documents the current status of the Plan's implementation.

III. BACKGROUND

This Floodplain Management Plan was developed by the East Central Florida Regional Planning Council for Volusia County and the jurisdictions within. The plan is designed to encompass a snapshot of floodplain hazards throughout the county and also provide separate jurisdictional plans developed as the appendices of the main plan. This design promotes a unified approach to mitigation and planning efforts and consistency across the county. As part of the planning process, this plan was integrated with the Volusia County Local Mitigation Strategy document (LMS). The LMS provides in-depth analysis of hazards and mitigation strategies. Various sections of the LMS have been identified throughout this Floodplain Management Plan in order to provide additional information for projects and analysis. The Volusia County Floodplain Management Plan follows the format and outline of the Community Rating System guidance. Individual jurisdictional analysis is provided in Appendix A of this document.

IV. PLANNING PROCESS

A. Organize to Prepare the Plan

The 2020 Volusia County Floodplain Management Plan update was prepared by the East Central Florida Regional Planning Council (ECFRPC), a community planning office, in conjunction with the Volusia County Emergency Management Division, the Volusia County Growth Management Department and the jurisdictions within Volusia County. The ECFRPC project manager is a certified planner by the American Institute of Certified Planners. The planning committee consisted of the Volusia Prepares LMS Working Group, County CRS Coordinator, Floodplain Managers, and additional jurisdictional staff responsible for the implementation of floodplain management strategies, State Mitigation Officers and the Florida Division of Emergency Management. The planning process and committee were supported by the jurisdictional commissions, and the names of the planning team members (Volusia Prepares) are included below. These individuals acted as liaisons between the planning team (VCEM and ECFRPC) and city commissioners for support and adoption of the plan. Members were included in the beginning of the planning process via the Volusia Prepares meetings and were provided copies of the draft plan for comment before final plan adoption.

- **Daytona Beach:** *Kimberly Dixon, Utilities*
- **Daytona Bch. Shores:** *Stewart Cruz, Planning*
- **DeBary:** *Alan Williamson, Public Works*
- **DeLand:** *Maria Becker, Risk Management*
- **Deltona:** *Scott McGrath, Planning*
- **Edgewater:** *Tyna Lynn Hilton, Planning*
- **Holly Hill:** *Steve Juengst, Public Works*
- **Lake Helen:** *Becky Witte, City Clerk*
- **New Smyrna Bch:** *Kyle Fegley, Engineering*
- **Oak Hill:** *Mandy Osweiler, City Clerk*
- **Orange City:** *Raul Palenzuela, Public Works*
- **Ormond Beach:** *Becky Weedo, Planning*
- **Ponce Inlet:** *Hank Baker, Building*
- **Port Orange:** *Amanda Lasecki & Jordan Guido, Engineering*
- **South Daytona:** *John Dillard, Community Dev't*
- **Volusia County:** *Larry LaHue & Aubrie Austin, Emergency Management; Nancy Church, IT*
- **Volusia Schools:** *Russ Tysinger, Maintenance/Ops.*

Several planning committee meetings were held throughout the process. Due to the limited time frame to prepare the planning document, meetings focused on multiple steps of the process. The table below lists the planning team meeting dates, locations and focus areas of each meeting. In addition to these meetings, Volusia Prepares members also met on March 14th, 2018.

Table 1: Planning Committee Meetings

Meeting Name & Attendees	Date	Location	Focus Areas
Kick Off Meeting (ECFRPC, County EM)	3/28/2018	Phone Meeting	Project Budget, Plan and CRS Overview, Planning Process, Planning Team, Public Outreach, Surveys
Interim Planning Meeting #1 (ECFRPC, County EM)	6/8/2018	Volusia County EOC	Public Meetings, Volusia Prepares Meeting, Public Survey, Damage Assessment, Scheduling
Interim Planning Meeting #2 (ECFRPC, County EM, Cities & Towns)	6/20/2018	Volusia County Beach Safety Headquarters	Volusia Prepares Members, Action Plan, Jurisdictional Plans, Vulnerability Analysis, Goals and Objectives
Final Planning Meeting (ECFRPC, County EM)	7/31/2018	Volusia County EOC	Draft Plan, Appendices, Volusia Prepares Steering Committee Adoption (FMP to LMS), Final Updates

B. Involve the Public

As part of the planning process, numerous efforts to engage the public were implemented. The planning committee reviewed the survey and provided comments prior to public release. A public survey was created using surveymonkey.com and the link was provided to all jurisdictions for release in newsletters, utility/water bills, and through websites and social media. The link was also made available on the Volusia County Floodplain website. The survey was also made accessible at the public meetings.

The survey announcements provided contact information in order to request a hard copy of the survey, which was then provided with a return envelope. Postcards were also addressed to other facilities specifically requested by jurisdictions, which provided information

and the survey link. The public survey received a total of 43 responses during its collection period from January 5, 2018 to July 10th, 2018. Statistical results for each individual question are located in Appendix B.

Key findings from the public survey are as follows:

- Over 44.2% of respondents have lived in their current residence for over 10 years.
- Approximately 51.2% of respondents indicated their home was built prior to 1987.
- 46.5% responded that they are not concerned about the possibility of their home flooding, 41.9% are somewhat concerned, and 11.6% are very concerned about the possibility of their home being flooded.
- 27.9% of respondents noted that their home is located within a floodplain, 53.5% are located outside a floodplain, and 18.6% are unsure if their home is located within a designated floodplain.
- Of the 24.5% of respondents knowing within the floodplain, 9.1% are in Zone AE, 18.1% are in Zone A1-A30, 9.1% are in Zone AH. However 63.6% are unsure of their zone classification.
- Nearly 76.2% of respondents indicated that their home, to their knowledge, has never flooded due to natural causes.
 - Of the 4.8% of respondents indicating their home had flooded due to natural causes, 16.7% noted that the last flooding occurred between 2000 and 2009 (this would include the 2004 Hurricanes and TS Fay). 33% flooded in 2017.
 - 50.0% of those respondents who have experienced flooding in their homes noted that the flooding was less than 1 foot in depth, 50.0% experienced between 1 and 2 feet of water.
 - The cost of structural damages associated with this flooding was varied; 50.0% noted less than \$1000; 0% noted between \$5000 and \$50,000; and 50.0% were unsure.
 - The approximate dollar value of personal items lost was varied as well; 50.0% noted less than \$1000 in loss; 0% indicated between \$1,000 and \$1,999; and 0% lost more than \$5,000 of personal items (50.0% were unsure).
- 33.3% of total respondents have flood insurance; 57.1% do not; 9.5% are unsure
- Of the 57.1% without flood insurance, the majority (44.0%) stated that the main reason for not having flood insurance was that they feel there is no real threat of a flood on their property; 16.0% indicated that cost is the main reason.
- Nearly 10.3% of respondents noted that flood mitigation efforts had been implemented on their property. 25.6% were unsure, while 64.1% did not have any mitigation efforts undertaken on their property.

- Mitigation included a variety of efforts from pouring a cement barrier at wall bases, building a flood wall, elevating house slab, control ditches, building swales, fill dirt, elevated property and home, sold property adjacent to home for retention pond, and natural vegetation to act as flood barrier.
- 85.7% of respondents indicated that they have never considered implementing flood management strategies on their property. The reasons for the lack of implementation include time and money.
- No respondents (0%) indicated that their property is currently classified as a repetitive flood loss property. 16.2% are unsure.
- 56.8% of respondents have visited the Volusia County Floodplain website (*up from 25.7% in 2013*)
- 13.5% of respondents are very satisfied with jurisdictional efforts of public involvement and outreach as it concerns flood hazards; 18.9% are somewhat satisfied; 5.4% are somewhat dissatisfied; 2.7% are very dissatisfied, and 59.4% are unaware of public involvement/outreach efforts.

The report appendices provide documentation of the various efforts used to inform the public of the survey (see Press Release, Appendix E) and a copy of the public survey with statistical results for each question (Appendix B).

The business community was engaged in the process through a survey created specifically for business owners. The link to this survey was made available to jurisdictions to release to the various Chambers of Commerce and other business oriented agencies and groups within their community. The link was distributed through various websites at the beginning of the planning process, and through a final press release near the end of the planning process (see Press Release, Appendix E). This survey was also made available at the public meetings for any business owners in attendance. This survey received 3 responses during its collection period from January 5th, 2018 to July 10th, 2018. Appendix C provides a copy of the business survey results.

Main findings from the business survey are as follows:

- 66.7% of respondents have been in business at their current locations for 11- 20 years.
- 100% of buildings were constructed between before 1987
- None of the respondents are “not concerned” about their business flooding and 100% (all 3) are “very concerned” about the flooding possibility of streets accessing their business.

- While 50% of respondents indicated they are located within a designated flood hazard zone, 50% are unsure. Of these respondents, 100% noted that they are unsure of their flood zone. One business skipped this question.
- Being located in a flood zone was a concern in business location for 50% of respondents. One business skipped this question.
- 50% of respondents indicated that their place of business has flooded due to natural/environmental causes; this event occurred in 2017. One business skipped this question.
- Flooding has caused 50% of respondents to close their business for 0-1 days and 50% to close for more than 7 days.
- 50% of respondents have flood insurance for their property while 50% are unsure.
- When asked why they do not have flood insurance, 0% of respondents without flood insurance indicated that they feel there is no real threat of flooding on their property while 100% said it is not cost effective.
- 50% of respondents noted that flood mitigation efforts have been implemented on their property.
- 0% of business respondents are satisfied with public involvement and outreach efforts by local jurisdictions as related to floodplain management.

In Volusia County, a number of Home Owner Associations are associated with developments within the 100 year floodplain. An analysis of the floodplain and home owner association data identified 94 associations within the floodplain. Another specialized survey was developed and due to the availability of only mailing addresses, postcards were sent to the 94 home owners association with information and the link to the survey. This survey was open for comment from January 5th to July 10th, 2018. During this time, 4 surveys were completed, resulting in a 5% response rate. Results of this survey are located in Appendix D.

A total of two public meetings were held during the planning process. The meetings kicked off the public process by obtaining initial comments and input from the public. All public meetings were advertised in the Florida Administrative Weekly and a press release was issued to all jurisdictions and the Volusia County Public Information Officer. Appendix E provides samples of the public meeting announcements conducted throughout the county and within jurisdictions.

Due to the size of Volusia County, it was determined the best way to reach the residents was to hold one meeting on the east side of the county (City Island Library, Daytona Beach) and one on the west side (DeLand Public Library). The meetings were held on June 15th and June 18th, 2018, respectively. The meetings consisted of a presentation on the plan background and purpose, question and answer session and an open house session. Computers were provided at the meeting for attendees to access the public survey and

to visit the Volusia County Flood Mapping website to determine whether a specific property is located within the floodplain. Public comments were recorded and brought back to the planning team for discussion and review.

The public was also provided the opportunity to comment on the final draft plan through an open survey period. Emails with the plan and survey links were provided to property, business and homeowners who supplied contact information in the initial surveys. A press release was provided to media outlets and all jurisdictions and partnering agencies and stakeholders were provided the link to the survey and document for dissemination to the public and for use on social media outlets. The public comment period was open from June 15th, to July 10th, 2018. Attempts to encourage public input to the planner or Floodplain Management Plan Committee included information distributed through Utility Bills and informational notices posted on webpages. Local television channels, including Channel 13, were provided with press releases of the FMP Public Survey to televise. Additionally, the County has built a web site and links to provide flood and other natural hazard related information.

C. Coordinate

Existing studies, reports, plans and other information were reviewed in the development of this plan. These documents include the Volusia County Local Mitigation Strategy, local Comprehensive Plans, Land Development Codes, Ordinances, and stormwater management plans. During the LMS update of 2014, individual plan updates were reviewed as well to ensure consistency and overlapping projects and priorities. Table 2 illustrates the plans, reports, codes, and other documents within each jurisdiction. *The Volusia County LMS provides more information concerning each plan and its role in emergency management and floodplain management. This information can be found in Section 7: Capability Assessment of the LMS.* Note that as part of the Floodplain Management Plan, this table has been updated and modified from the LMS. It is recommended that during the next update of the LMS, this table be used as a point of update. Note: All jurisdictions, through this FMP have integrated a standalone Floodplain Management Plan.

Jurisdiction	Local Mitigation Strategy	Comprehensive Land Use Plan	Floodplain Management Plan*	Open Space Management Plan	Stormwater Management Plan	Natural Resource Protection Plan/Policies/Code	Flood Response Plan	Emergency Operations Plan	Continuity of Operations Plan	Evacuation Plan	Disaster Recovery Plan	Capital Improvements Plan	Economic Development Plan	Historic Preservation Plan	Floodplain Ordinance (or Flood Damage Prevention Ordinance)	Zoning Ordinance	Subdivision Ordinance	Land Development Code	Post-disaster Redevelopment /Reconstruction Ordinance /Policy	Building Code	Building Code with FEMA Floodplain Standards (2013)	Fire Code	National Flood Insurance Program	NFIP Community Rating System
Daytona Beach	X	X	X	X	X	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	X	X
DeBary	X	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	X	
Deltona	X	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	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	X
Lake Helen	X	X	X	X	X	X	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		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	X	
Orange City	X	X	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	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	X	X	X
Port Orange	X	X	X	X	X	X	X	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	X
Volusia County	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Table 2: Jurisdictional Plans

Source: Volusia County LMS, 2018

The Planning Team reviewed plans from the County and all jurisdictions for information geared to assist in the data collection, analysis and overall development of this plan. While the Local Mitigation Strategy provided a great deal of information, individual Comprehensive Plans gave the planning team good insight into the policy-driven needs of these jurisdiction from a community resiliency and land use perspective. The datasets compiled from the Future Land Use element of each Comprehensive Plan within the County (city and county) were utilized to create a land-use based GIS analysis in the risk assessment portion of this report. The county Emergency Operations Plan and COOP Plans were also reviewed by the Planning team to ensure the initiative and analyses included in this plan reflect the actual response mechanisms already in place in Volusia County. Of the plans listed above, another crucial piece of information from the jurisdictional level came from building codes and standards located within Land Development Codes.

V. RISK ASSESSMENT

A. Assessing the Hazard

The County consists of approximately 1,210 square miles with 50 miles of Atlantic coastline. Approximately 982 square miles are located in unincorporated areas and 238 square miles are incorporated. On the east side of the County, the Halifax River and the Indian River North/Mosquito Lagoon make up the Intracoastal Waterway and form long, narrow estuaries which separate the mainland from the barrier island. Ponce De Leon Inlet, located near the middle of the coastline, serves as the County's only passage through which ocean tides and hurricane surges pass into the Intracoastal Waterway.

The St. Johns River is the largest river in the County and flows along the west side of the County. The Tomoka River has a tributary area of 159 square miles, which serves the northeastern and central portions of the County. The river flows from south to north and discharges through the Tomoka Basin to the Halifax River, which can be subject to storm surge.

Volusia County's primary and most often occurring hazard is from flooding caused by hurricanes, tropical storms, and subtropical events that are associated with extremely heavy rain. Many areas of Volusia County are

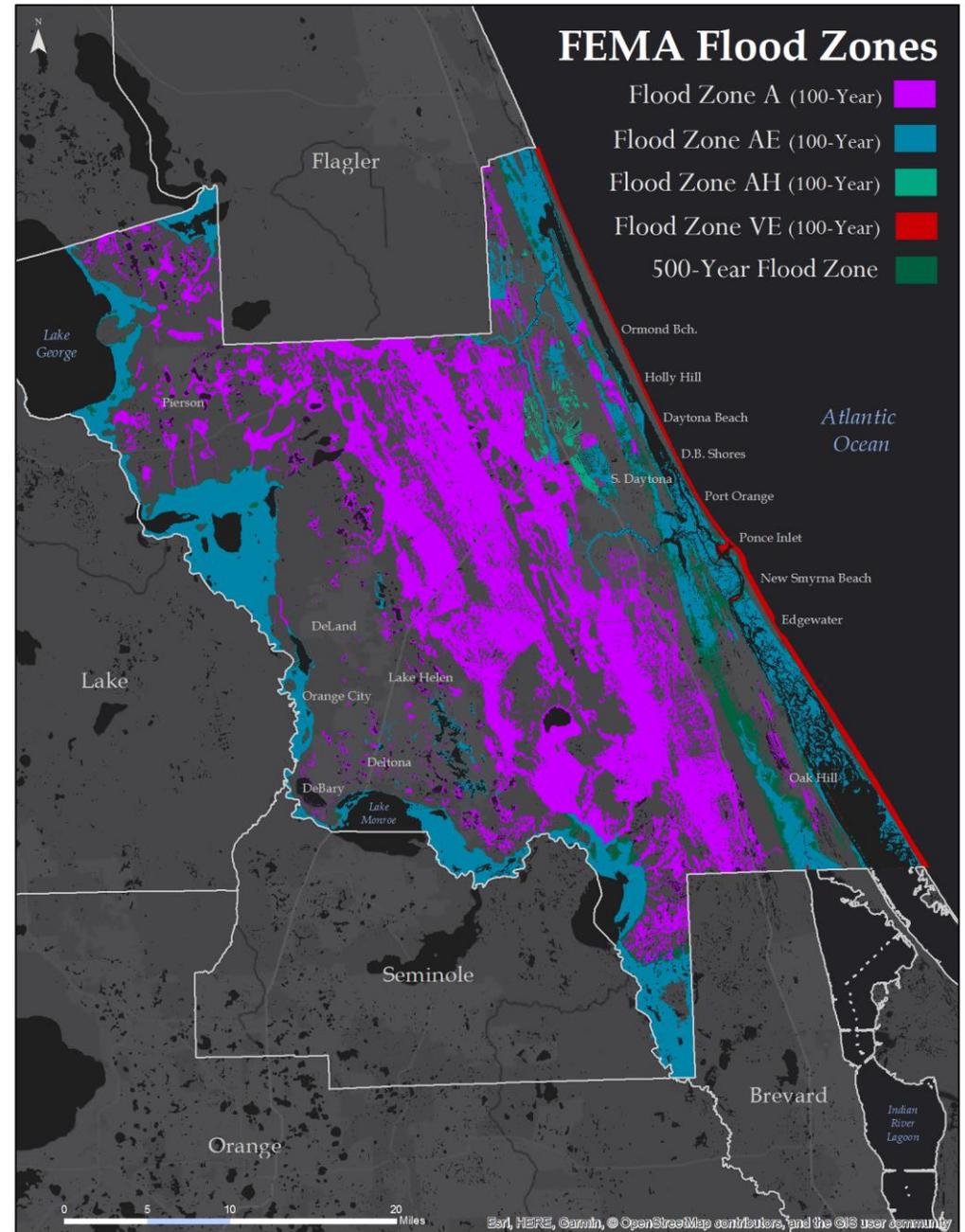


Figure 1: FEMA Flood Zones

susceptible to riverine and urban flooding as well as by storm surge due to coastal storm events. Riverine flooding occurs from the St. Johns River, the Halifax River and the Tomoka River, in addition to associated tributaries and creeks such as Thompson Creek and Laurel Creek in the Ormond Beach area.

Additionally, certain low-lying inland areas in the northwest, north, southeast and southwest are considered flood-prone areas. Many evacuation routes traverse the floodplain and if not mitigated properly (elevated, designed, etc.), could be prone to flooding. The figure on the previous page depicts the Volusia County 2017 DFIRM flood zones throughout the County. The storm surge zone map on the following page visualizes storm surge zones (by hurricane intensity) from the Statewide Regional Evacuation Study for the East Central Florida Region.

Areas vulnerable to flooding are generally located within the floodplain. FEMA updated the Flood Insurance Rate Maps for Volusia County and published them in 2017. Base flood elevations have been calculated in the Flood Insurance Study for Volusia County.

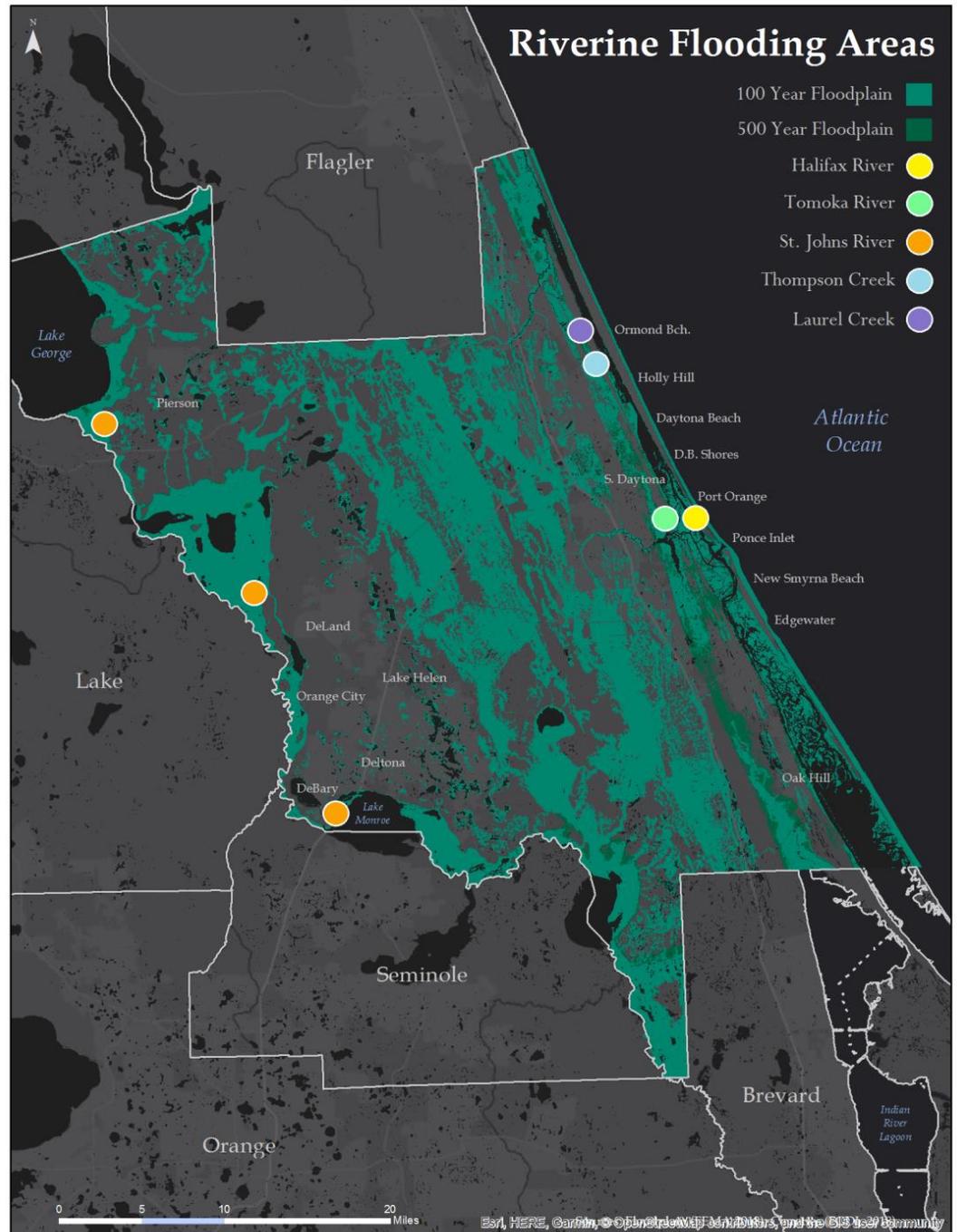


Figure 2: Riverine Flooding Areas

Storm Surge

Coastal flooding caused by tropical storms, hurricanes and unusually high tides combined with strong easterly or northeasterly winds also poses a continuing threat to the County. Storm surge produces most of the flood damage and loss of life associated with storms that make landfall or that closely approach a coastline. Storm surge is the most dangerous hurricane hazard, as 88% of hurricane related deaths are attributed to drowning (Source: National Hurricane Center).

The principal tool utilized in assessing the hazard of storm surge is the Sea, Lake and Overland Surges from Hurricane (SLOSH) model. The computerized SLOSH model predicts the tidal surge heights that result from hypothetical hurricanes with selected various combinations of pressure, size, forward speed, track and winds. The SLOSH model, which is utilized locally for hazard and vulnerability analysis, has been digitized into the County's GIS (Geographical Information System) mapping system. Estimated storm surge heights range from two to four feet in a Category 1 storm to in excess of twenty feet in a Category 5 storm. The table on the following page is from the 2010 Statewide Regional Evacuation Study Program developed for the east central Florida region by the ECFRPC. Through SLOSH Analysis, it was determined that a Category 1 storm surge will produce storm tide heights up to 6 feet. A category 5 storm will produce

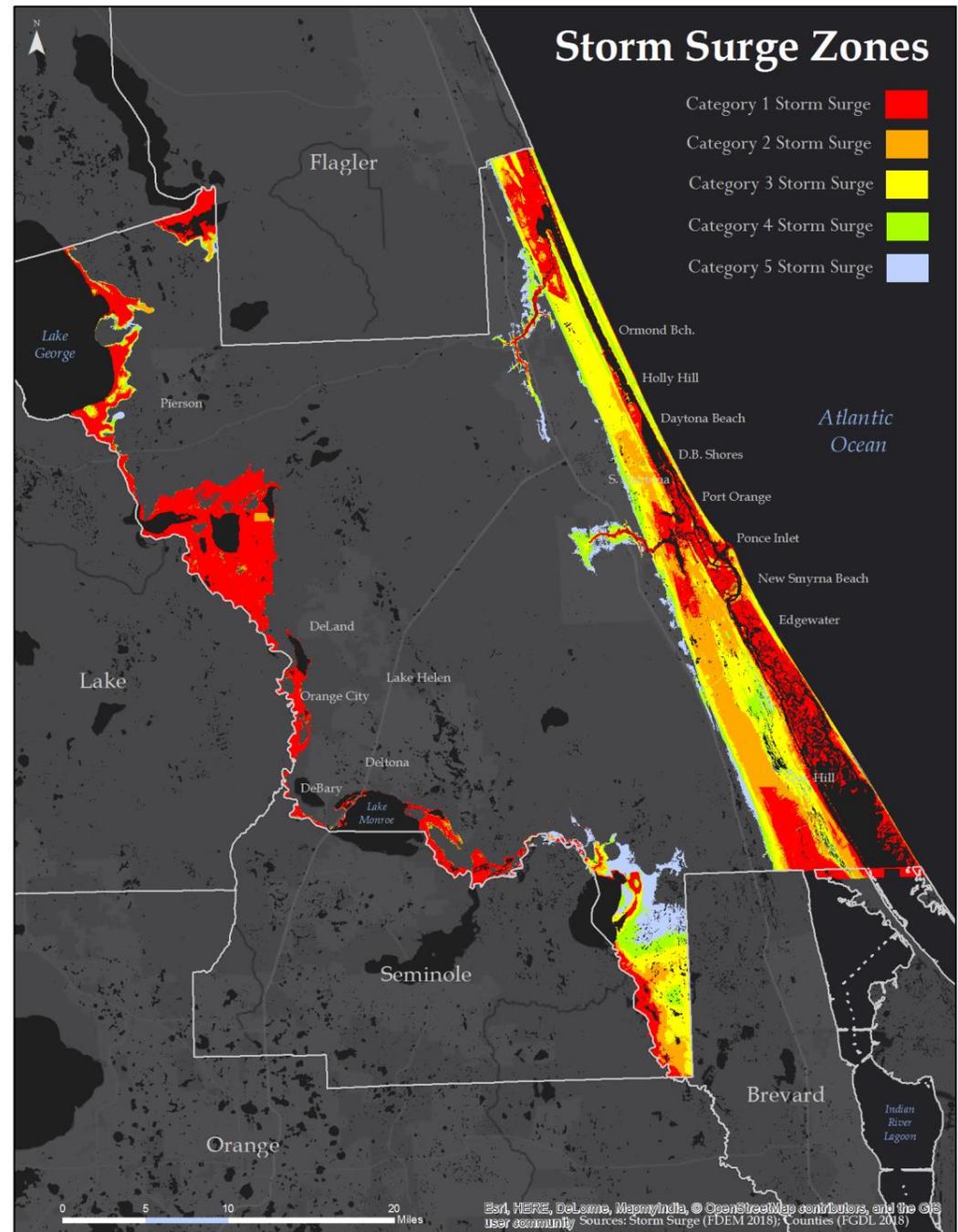


Figure 3: Storm Surge Zones

storm tide heights up to 25 feet. It should be noted again that these surge heights represent the maximum surge height recorded in the county from the storm tide analysis including inland and back-bay areas where the surge can be magnified dependent upon storm parameters.

Since the last FMP update in 2013, two hurricanes have impacted Volusia County. Hurricane Matthew followed a track just off shore of the County (to the east), bringing storm surge, blowing off roofs, downing trees and flooding low-laying areas of the County. Hurricane Irma also impacted the community, bringing large volumes of rain to the County. This rain caused rising waters to infringe near highly sensitive electrical equipment, flooded properties, and widespread lightning. Storm surge from this event flooded beaches, coastal roadways and businesses, and destroyed a boardwalk near Ponce Inlet.

Storm surge also occurred during the 2004 storms: Hurricanes Charley, Frances, and Jeanne. Although no official flooding depth measurements were taken during the 2004 events, it has been estimated that storm surge flooding during the storms caused tidal waters to rise three to five feet above the mean high tide. During Hurricane Frances, over 13 inches of rain fell in the County causing substantial flooding. Over \$390 million worth of damages resulted from wind and flooding impacts. The most recent significant freshwater flooding was a result of the “No-Name” rain event of May 2009 which impacted numerous homes on the east side of the County. This event left some properties in the affected areas two feet under water. In 2008, Tropical Storm Fay caused severe flooding on the west side of the County. Rainfall ranged from 3 inches to over 10 inches along the east coast of Florida. Volusia County reported damages in excess of \$13.5 million.

Since 1965, Volusia County has received numerous disaster declarations for such hazards as hurricanes, tornados, floods and severe freezes. Since 1993, there have been 21 reported flood events in Volusia County. The table on the following page is a list of the severe storm and flooding activation events for the Volusia County Emergency Operations Center. These events include those Presidential Disaster Declarations.

As stated above, riverine and storm-surge induced flooding events can and do occur outside of the 100-year floodplain. Areas where levees and dams are present are also at an increased risk for flooding events, as are areas along the coastline that are within coastal erosion zones. Finally, long term sources of risk such as sea level rise and tsunamis must be included as “lower probability” threats to areas that are not within the floodplain. The last known tsunami-type event occurred in Daytona Beach on July 3, 1992, injuring over 70 individuals. Solutions to these issues can include infrastructure mitigation, shoreline protection and resilient community planning

Table 3: Potential Storm Tide

Hurricane Strength	Volusia Depth
Category 1	Up to 6'
Category 2	Up to 10'
Category 3	Up to 14'
Category 4	Up to 23'
Category 5	Up to 25'

Source: Statewide Regional Evacuation Study (2010)

techniques (including developing in areas that are not prone to flooding). Implementing the principles of smart growth and the clustering of future population centers in non-vulnerable areas will help to lower long term risk to natural hazards such as flooding, storm surge and coastal erosion.

Table 4: Disaster Declarations resulting in Flooding in Volusia County

Date of Event	Type of Event	Area of Event	Damage Estimate	Damage Estimates
			# of Parcels	Dollars
11/17/1994	T.S. Gordon	County-wide	658	\$10,602,924.00
8/3/1995	Hurricane Erin	Edgewater	31	\$65,052.00
7/10/1996	Hurricane Bertha	County-wide	N/A	N/A
9/5/1996	Hurricane Fran	County-wide	N/A	N/A
10/8/1996	T.S. Josephine	County-wide	193	\$1,232,343.00
9/14/1999	Hurricane Floyd	East Side	433	\$18,655,353.00
10/16/1999	Hurricane Irene	East Side	185	\$16,809,266.00
9/16/2000	Hurricane Gordon	County-wide	N/A	N/A
9/14/2001	T.S. Gabrielle	County-wide	44	\$474,135.00
11/15/2001	Rain Event	East Volusia	39	\$561,300.00
9/4/2002	T.S. Edouard	County-wide	N/A	N/A
8/13/2004	Hurricane Charley	County-wide	5,719	\$106,900,000.00
9/4/2004	Hurricane Frances	County-wide	26,964	\$393,900,000.00
9/25/2004	Hurricane Jeanne	County-wide	N/A	\$59,500,000.00
9/8/2005	T.S. Ophelia	County-wide	Beach	N/A
10/23/2005	Hurricane Wilma	County-wide	3	\$752,000.00
8/29/2006	T.S. Ernesto	County-wide	N/A	N/A
8/18/2008	T.S. Fay	County-wide	240	\$13,580,016.00
5/17/2009	May Rain Storm	County-wide	1,654	\$69,516,703.00
10/7/2016	Hurricane Matthew	County-wide	10,041	\$442,509,779
9/11/2017	Hurricane Irma	County-wide	4,808	\$321,038,971

Known Flooding Areas (Countywide)

Figure 3 depicts areas that have been identified by county stakeholders as areas prone to flood damage. These include 1) the Sica Hall Canal; 2) the LPGA Canal; 3) the Nova Canal and 4) the Stone Island community. All of these locations are prone to flooding during relatively moderate rain events. A member of the public also identified Bethune Point Park (near Beville Road) as a known flooding area (see star on map).

Less Frequent Floods

This plan focuses on four types of less-frequent floods. The following events types are included and assessed:

1. Category 3-5 Hurricanes
2. Drawn-Out Rain Events
3. 500-Year Flood Events

The four known flooding areas shown in the map on this page are susceptible to water intrusion into private property and roadways during all three of the events mentioned above. However, it is particularly during the second event, “drawn out rain events”, where residents are less-prepared to deal with the effects and the damage could be higher than expected. These storm events often last days and steadily accrue a number of inches of rain.

Prep for Less Frequent Flood in Flood-Prone Areas

In best case scenarios, residents in these flood-prone areas prepare for these events using sand bags and other short term, temporary mitigation methods. These techniques are common for hurricane preparations but must be done on the fly during drawn-out rain events.

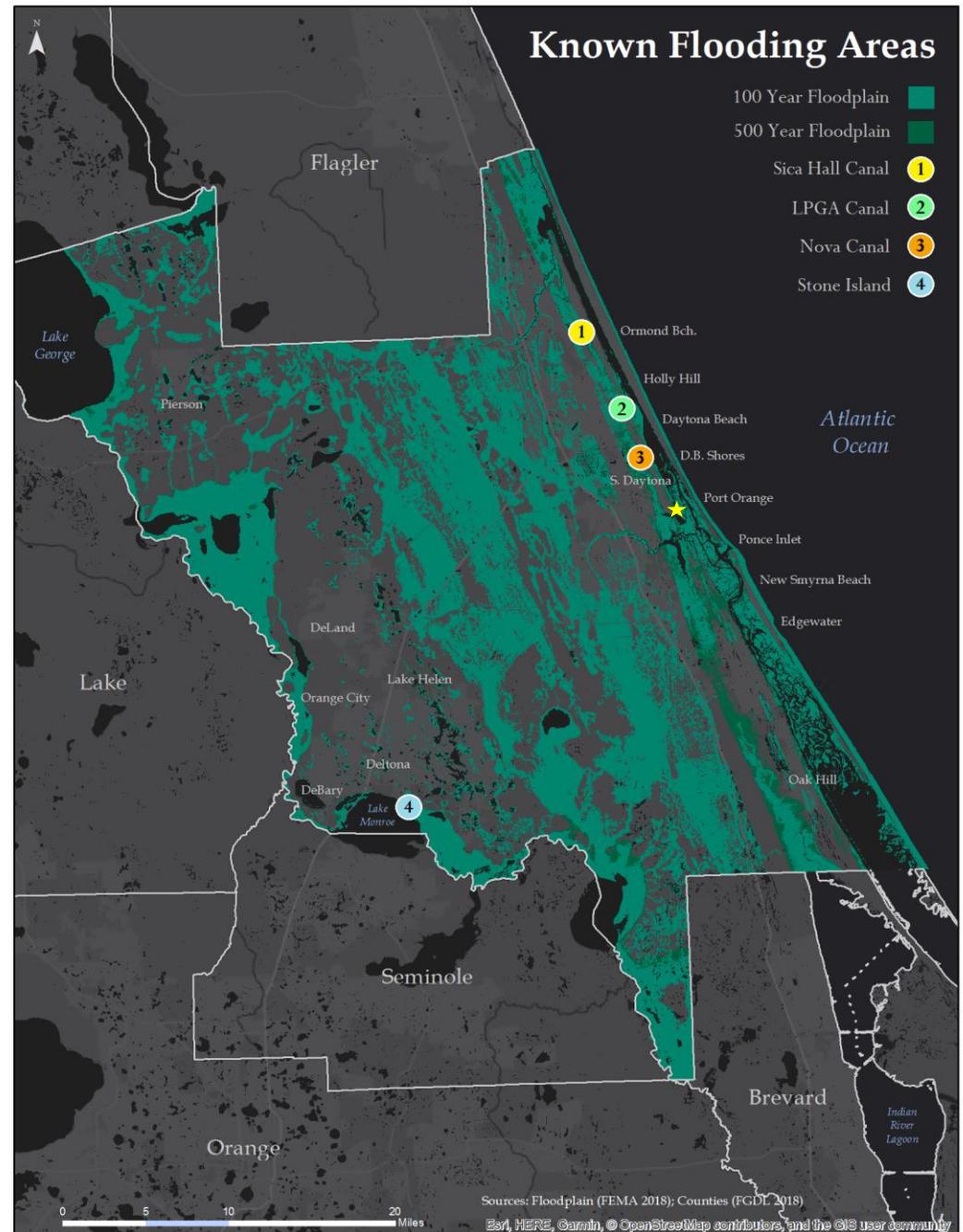


Figure 4: Known Flooding Areas

500 Year Floods

The 500-year flooding event is a third form of a “less frequent flood” that will impact Volusia County at some point in time over the long term. A map of this zone is available to the right.

Long Term Impacts of Sea Level Rise

The frequency of future floods may increase over the long term as sea levels rise along the Atlantic coast and lagoon system. The map below depicts long term hazard zones in the County as determined by NOAA’s Coastal Flood Exposure Mapper. This model takes into account flood zones, sea level rise, storm surge and high tides. The table to the right depicts flooding frequency increases tied to sea level rise.

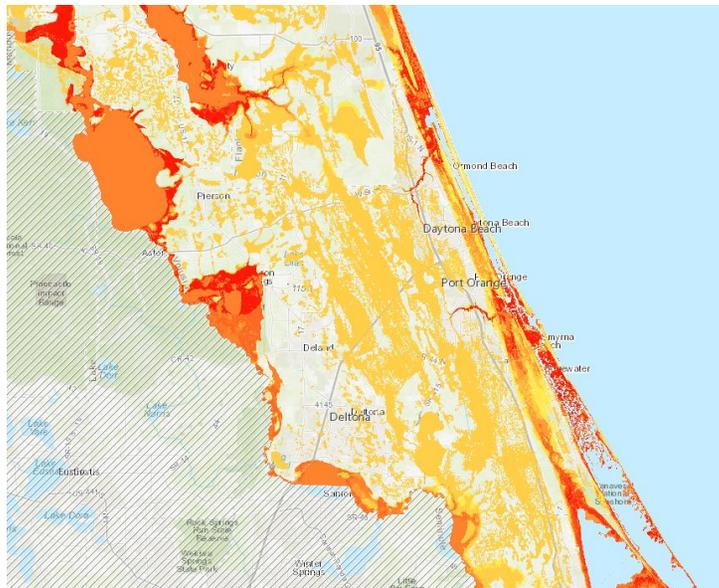


Figure 5: Combined Hazard Zone

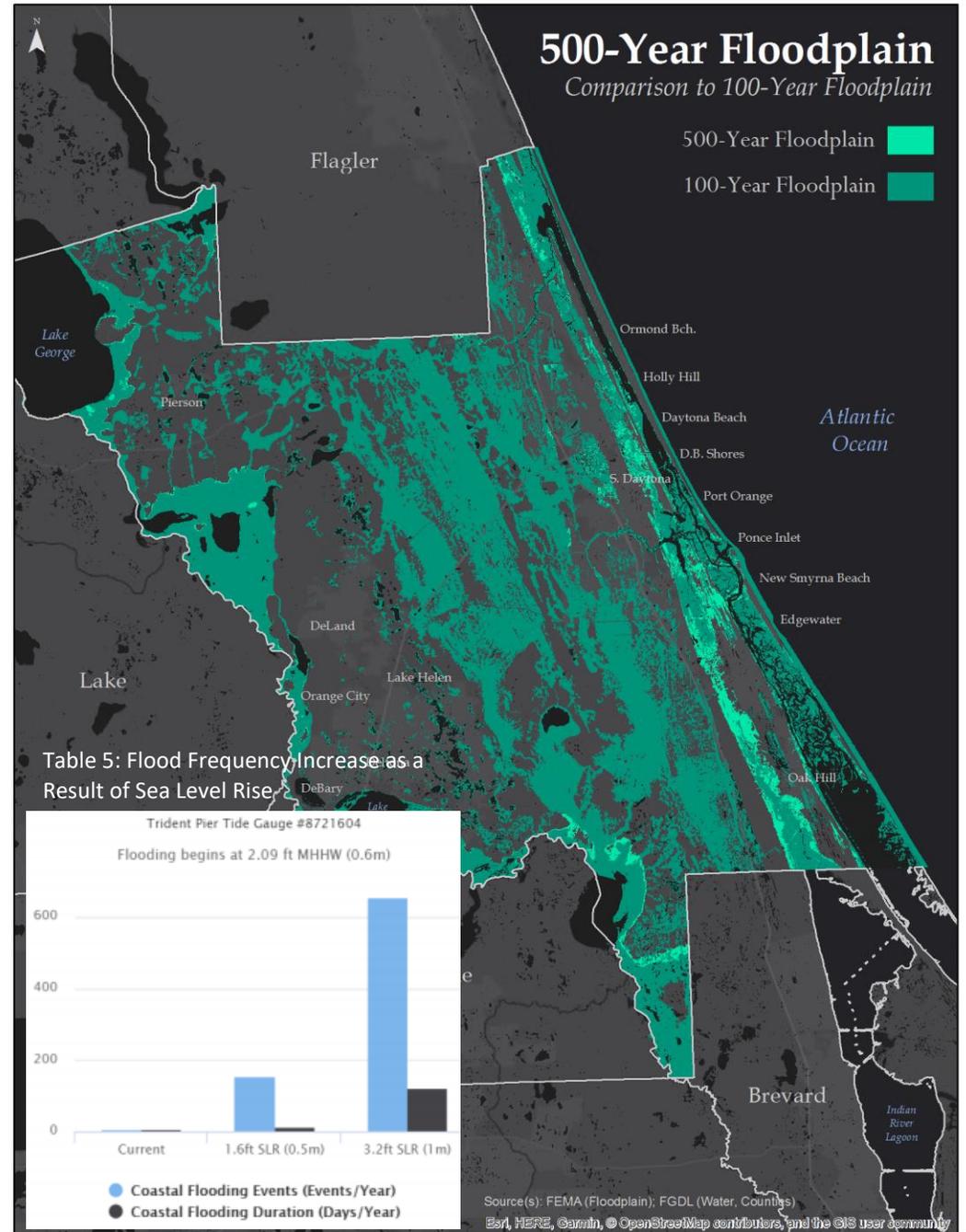


Figure 6: 500 Year Floodplain

Regional and Local Efforts to Plan for Increasing Flood Frequency and Sea Level Rise

Flooding and storms have become more frequent across Florida’s coastal communities due to changing climate and sea level rise. Mean elevation for the State of Florida is approximately 100 feet above sea level with the highest point registering at only 345 feet above sea level. In Volusia County, the highest natural point of elevation is 120 feet above sea level. Local governments and residents are starting to see the beginning impacts sea level rise combined with storms will have on their community. As sea level rise continues, it is becoming of critical importance to understand the potential vulnerability of inundation and flooding on communities and infrastructure, specifically those facilities located in low-lying coastal areas. The U.S. Army Corps of Engineers High Projection Rate Curve anticipates sea level rise along Daytona Beach Shores to be 5.15 feet by 2100. This, along with a 100-year storm, could mean devastation to coastal communities if appropriate planning and action is not taken early enough.

The Volusia County Office of Emergency Management in partnership with the East Central Florida Regional Planning Council (ECFRPC), Florida Department of Transportation, the River to Sea Transportation Planning Organization, and UF GeoPlan has taken a deep dive into the assessment of impacts of sea level rise inundation as well as impacts of sea level rise, combined with a 100-year coastal storm. By taking a risk-based approach and identifying vulnerable facilities, agencies and jurisdictions can implement adaptation practices overtime that will protect these facilities and minimize impacts on the community.

The information, data and recommendations developed through these efforts has been made available to communities and agencies throughout Volusia County to aid them in the planning for future conditions related to flooding and sea level rise inundation.

In 2016, the Space Coast Transportation Planning Organization funded a sea level rise analysis for the County to look at impacts from the US Army Corps of Engineer projection rate curves including the high projection rate curve which exceeds the CRS minimum future condition analysis of NOAA 2012 Intermediate-High projection by approximately 1 foot by 2100. The analysis included an assessment of evacuation routes and the major roadway network, evacuation support facilities, scenic byways, railroads, and also addressed impacts to stormwater storage. Numerous recommendations were provided in the report including the adoption of a base sea level rise modeling scenario. This report can be found <https://www.perilofflood.net/projects>.

In 2017, through a Florida Department of Environmental Protection Grant, the VCOEM and partners continued to build on the counties assessment of impacts from flooding and sea level rise. Using the FDOT Sea Level Scenario Sketch Planning Tool along with FEMA’s Hazus-MH software, impacts of sea level rise, combined with a 100-year-storm were modeled, along with hypothetical alterations of a historical hurricane under sea level rise scenarios. Using these models and Volusia County data, critical assets such as shelters, airports, power plants, and other critical facilities were assessed to determine potential impacts during such a 100-year storm event with increased coastal flooding.

Assessments also included evacuation routes and property impacts. Potential economic impacts were assessed in terms of property value and damage assessments using HAZUS. The study also looked at the different approaches Volusia County can use to build resiliency including retreat, accommodate, and protect. Resources, along with recommendations for implementing new data and strategies, policies and information into existing plans throughout the county were discussed.

Emphasis was placed on Emergency Preparedness, Land-Use, and Transportation. The data, resources and recommendations within this report should provide Volusia County with a solid foundation to guide conversations and coordination to determine the appropriate approach in each situation. This report can be found at <https://www.perilofflood.net/projects>.



The frequency of coastal flooding (pictured) is projected to increase with rises in sea levels.

B. Assessing the Problem

1. VULNERABILITY SUMMARY

Table 5 depicts the Hazard Risk Score for each jurisdiction as it concerns flooding and storm surge as per the Local Mitigation Strategy. Each hazard was scored by the jurisdictions based on a number of vulnerability factors including area impacted, health and safety of the population, property, environment, and economic vulnerability. Each hazard was given a score between one and five with five being the greatest. This number was then multiplied by the score of the hazards probability of occurrence (1-5) resulting in a risk rating for each jurisdiction. Additional hazard information can be found in the Volusia County Multi-Jurisdictional Local Mitigation Strategy (LMS), Section 5 – Hazard Profiles. Specific information for Hurricane and Tropical Storms can be found in Section 5.3; Flood can be found in Section 5.10; and Storm Surge can be found in Section 5.11. Section 7.3.4 Floodplain Management describes the Volusia County NFIP actions and the Community Rating System.

The Flood Hazard analysis includes location and spatial extent of the hazard, historical occurrences and impacts, historical summary of insured flood losses, analysis of loss properties and probability of future occurrences.

In order to update the Volusia County Multi-Jurisdictional Local Mitigation Strategy of 2014, a Vulnerability Assessment was updated using HAZUS and MEMPHIS data, as well as the most recent local parcel data for GIS analysis. Hazard maps, hazards exposure and loss estimates were also included. (See Sections 4, 5 and 6 of the LMS for further information.) In addition, each jurisdiction reviewed the hazards scores that were included in the 2005 and 2010 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.

As per the 2014 Volusia County FMP, Volusia County’s probability of flood occurrences is rated as “high” (expected to occur at least every 5 years). While all 17 jurisdictions in Volusia County participate in NFIP, 10 jurisdictions currently participate in the Community Rating System (CRS): Daytona Beach, Daytona Beach Shores, Deltona, Edgewater, Holly Hill, New Smyrna Beach, Ponce Inlet, Port Orange, South Daytona, and Volusia County.

2. LIFE, SAFETY AND HEALTH

Freshwater flooding along rivers and streams causes significant property damage and has the potential of causing personal injury and deaths. Over the past 20 years, freshwater flooding had become the leading cause of death related to hurricanes. This is due in part to the successful evacuation planning efforts in the United States which had significantly reduced the number of deaths (in the U.S.) related to storm surge until 2005. However, it is also recognized that many coastal and inland residents do not recognize the risk associated with freshwater flooding, especially when driving.

In response, a national program, “Turn Around, Don’t Drown” was implemented in 2002. Typically, the rainfall associated with, and in advance of, a hurricane does not in itself necessitate the emergency evacuation of residents during the passage of a hurricane. Days after a storm however, the coastal flooding and rainfall – particularly from slow moving storms - may cause the evacuation of inland residents as swollen rivers and streams breach their bank or levees. Rainfall may cause the inundation of roadways sought as evacuation routes. In addition, given Florida’s climatology and the normal summer weather, flooding may occur as a disassociated event prior to the hurricane, flooding evacuation routes and saturating the ground. Contingency plans including rerouting, sandbagging and pumping will be coordinated with local and state law enforcement and the State Department of Transportation. Rainwater inundation of evacuation routes must be addressed in an evacuation plan. The planning strategy to address this problem is to plan for the passage of all vehicles over such roadways before substantial rainfall from the hurricane is expected. The Central Florida region is among the fastest growing regions in the nation. Volusia County is located within the northeastern quadrant of this region and has seen a vast increase in population since the late 1970’s. From a safety and health perspective, the locations of new populations migrating to Volusia County over the next few decades would benefit if located away from floodplains. Two strategies to counter human exposure to floodplains include urban infill and increased density near existing transit nodes.

Daytona Beach - 66,645	New Smyrna Beach - 25,796
Daytona Beach Shores - 4,481	Oak Hill - 2,029
DeBary - 20,394	Orange City - 11,403
DeLand - 31,569	Ormond Beach - 42,162
Deltona - 90,124	Pierson - 1,849
Edgewater - 22,077	Ponce Inlet - 3,220
Holly Hill - 12,142	Port Orange - 61,105
Lake Helen - 2,740	South Daytona - 12,789

Health Hazards from Flood Waters and Mold

Volusia County Emergency Management will utilize its social media accounts and local news stations to warn citizens of mold exposure in circumstances involving standing water and drawn-out rain events discussed on page 14. In addition, the study at [this link](#) analyzes the vulnerability of countywide stormwater systems to infringing water. Effective stormwater systems can limit the volume of standing water on public and private property after storm events.

Impact of Hazards on Warning and Evacuation Procedures

The Volusia County Emergency Management twitter account stays engaged with residents before, during and after flood hazard events. In the event of mass communication and power outages in the community, the EOC will communicate with residents via shelter staff and law enforcement as the situation requires. Strong winds can prevent certain actions.

3. CRITICAL FACILITIES

Flooding can have impacts on critical facilities and the ability to respond to emergencies. According to the Florida Division of Emergency Management, "critical facilities" are defined as those structures from which essential services and functions for victim survival, continuation of public safety actions, and disaster recovery are performed or provided. Shelters, emergency operation centers, public health, public drinking water, sewer and wastewater facilities are examples of critical facilities. Though not explicitly included in the definition, supporting life-line infrastructure essential to the mission of critical facilities must also be included in the inventory when appropriate. All but four jurisdictions in Volusia County has a critical facility within the 100-Year Floodplain or the 500-Year Floodplain. Although several western jurisdictions are low in elevation, a disproportionately high number of critical facilities that are exposed to the floodplain are within a short distance to the Atlantic Ocean or inter-coastal waterway on the east side of the county. A majority of the exposed critical facilities countywide are located east of Interstate-95.

The inundation of critical facilities can have a profound effect on the ability for coordination among county and city planning officials and mitigation activities must provide guidance to avoid 'domino effect' losses from a critical infrastructure perspective. For example, if a critical facility such as the Volusia County EOC is completely destroyed in a disaster, there are a number of other communication and logistical critical facilities that utilize the EOC as a 'home base' for their own activities. In these cases, strategies must be put in place to ensure that backup facilities can manage the loss of core critical infrastructure loss. The East Central Florida Regional Planning Council and Volusia County Emergency Management completed a Continuity of Operations Plan in 2013 for the loss of the Volusia County EOC, while other plans focused on other facilities can strengthen cooperative efforts in the future.

Specific areas of concern from a critical infrastructure and facility perspective include communication towers, water management infrastructure, facilities that double as storm shelters (including schools) and core-logistical facilities (EOC, etc.).

The table on the following page outlines the number of critical facilities exposed to the floodplain, by jurisdiction. Please reference **Appendix A** at the end of this document to view a more detailed listing of exposed critical facilities by jurisdiction.

Volusia County Emergency Management has updated its Critical Facility listing in time for the 2020 Floodplain Management Plan update. The map on this page depicts the flood hazard zones and the locations of vulnerable critical facilities at the countywide scale. Appendix A includes highly detailed maps of critical facility exposure by jurisdiction. The table below summarizes vulnerable facilities by jurisdiction.

Table 6: Vulnerable Critical Facilities by Jurisdiction

Jurisdiction	Vulnerable Critical Facilities	
	100-Yr Floodplain	500-Yr Floodplain
Daytona Beach	35	47
Daytona Beach Shores	0	0
DeBary	0	0
DeLand	1	1
Deltona	2	2
Edgewater	0	2
Holly Hill	9	16
Lake Helen	0	0
New Smyrna Beach	7	31
Oak Hill	8	8
Orange City	0	0
Ormond Beach	15	18
Pierson	1	1
Ponce Inlet	1	3
Port Orange	5	10
South Daytona	1	7
Unincorporated	41	48
Countywide	126	194

Source(s): Volusia County E.M (Facilities); FEMA (Floodplain)

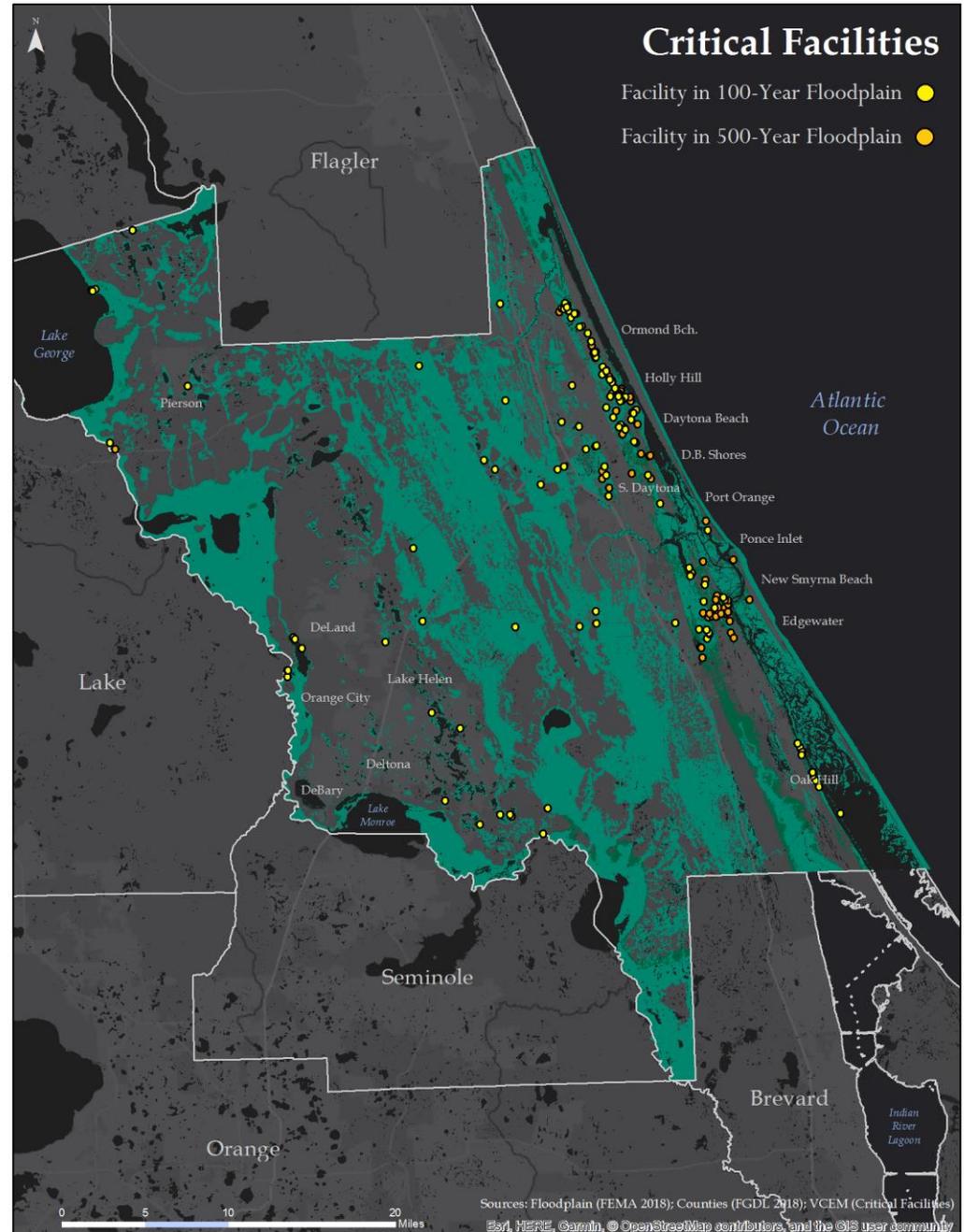


Figure 7: Critical Facilities

4. ECONOMIC ANALYSIS

Analysis of the financial values of all parcels exposed to the 100-Year Floodplain in Volusia County revealed that approximately 17 billion dollars in property value is located (partially or completely) within the 100-Year Floodplain. Of these parcels, 44.0% are considered “low value” parcels (valued under \$50,000) while only 1.85% of parcels are valued over one million dollars.

The VE floodplain zone, a specific portion of the 100-year floodplain, is located along the coastal area and includes properties that are subject to flooding from velocity occurrences such as wave action.

The following data summarizes the exposure within the 100-year flood zone.

- **Land Value:** \$6,457,318,636
- **Assessed Value:** \$17,677,741,449
- **Taxable Value:** \$12,552,049,286

While the VE zone is located near coastal areas, much of the 100-year floodplain is located within inland portions of the county. Please reference the table on the following page to view cumulative financial exposure to the entire 100-year floodplain (all zones), by jurisdiction.

As shown in the map to the right, properties in coastal areas of eastern Volusia County are among the most vulnerable on a value per square foot basis.

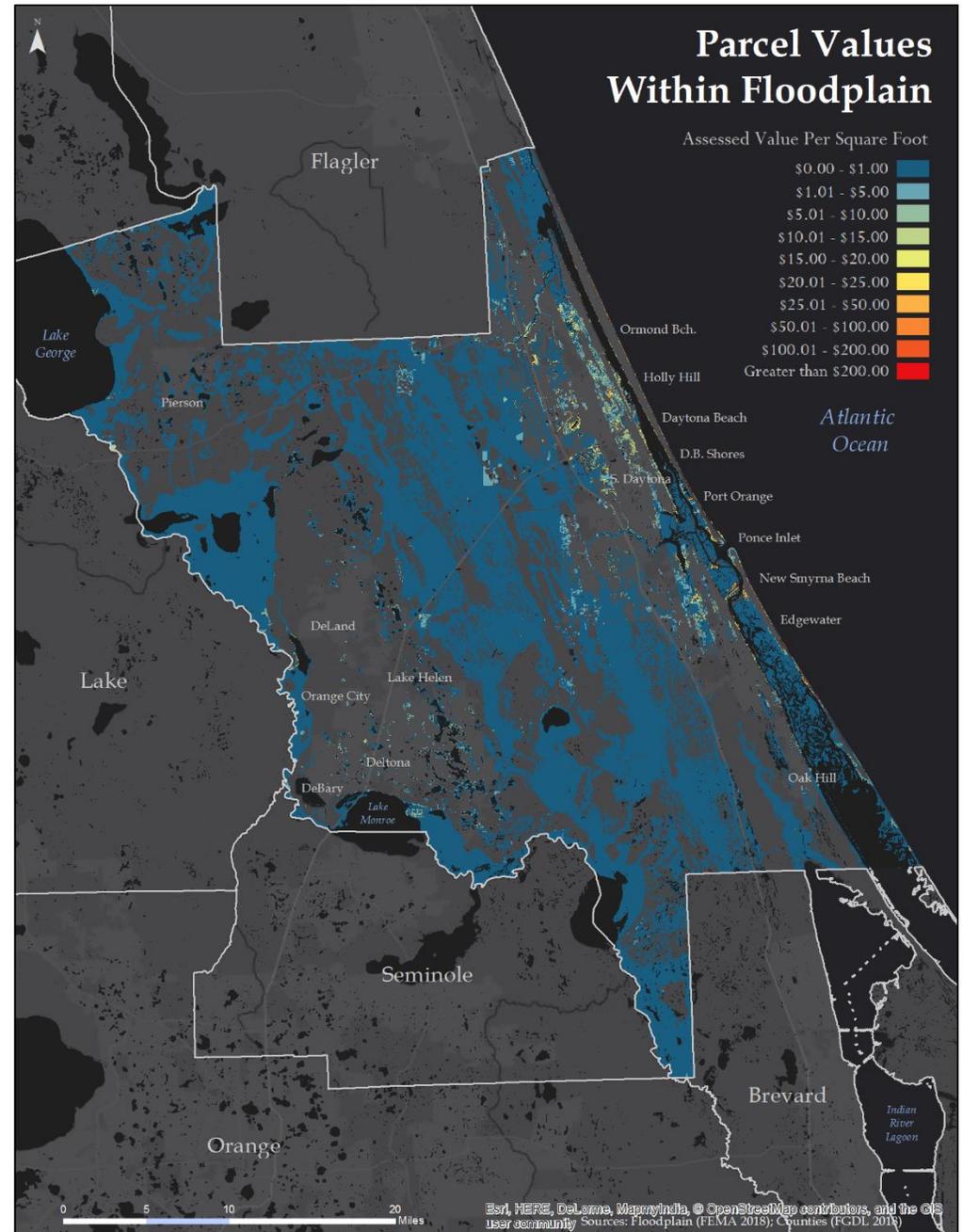


Figure 8: Parcel Values within Floodplain

Table 7: Total Financial Exposure to 100-Year Floodplain

Municipality	Parcels in Floodplain	Buildings in Floodplain	Land Value in Floodplain	Assessed Value in Floodplain	Taxable Value in Floodplain	Building Value in Floodplain
Daytona Beach	14,872	8,770	\$1,031,935,148	\$3,626,954,919	\$2,317,906,555	\$2,492,556,826
Daytona Beach Shores	4,955	132	\$408,090,848	\$1,442,221,431	\$1,332,476,443	\$995,734,555
DeBary	1,457	1,095	\$93,671,202	\$263,763,736	\$191,512,792	\$162,003,662
DeLand	215	121	\$36,181,192	\$112,726,316	\$50,845,772	\$71,983,599
Deltona	5,646	4,524	\$122,580,488	\$711,052,496	\$398,048,314	\$563,266,460
Edgewater	899	644	\$131,100,527	\$244,402,829	\$161,654,623	\$108,511,438
Holly Hill	3,007	2,102	\$112,732,648	\$433,456,264	\$342,878,826	\$315,339,218
Lake Helen	284	140	\$14,937,971	\$38,079,497	\$23,442,299	\$21,641,857
New Smyrna Beach	8,370	3,618	\$926,691,147	\$2,402,551,188	\$1,928,001,263	\$1,409,897,440
Oak Hill	607	399	\$67,278,856	\$106,502,626	\$61,701,575	\$36,099,228
Orange City	72	33	\$27,650,938	\$116,356,750	\$80,042,861	\$85,525,073
Ormond Beach	4,541	3,235	\$576,874,554	\$1,558,730,380	\$1,243,135,285	\$853,502,766
Pierson	162	70	\$7,777,178	\$16,874,499	\$9,865,908	\$8,429,260
Ponce Inlet	1,936	328	\$268,287,790	\$652,777,628	\$538,859,301	\$377,696,350
Port Orange	5,185	4,496	\$323,141,861	\$1,099,399,477	\$808,861,362	\$745,005,376
South Daytona	2,648	2,262	\$135,742,067	\$452,465,156	\$324,926,657	\$304,715,096
Unincorporated	34,172	10,229	\$2,172,644,221	\$4,399,426,257	\$2,737,889,450	\$2,111,056,027
Countywide	89,028	41,928	\$6,457,318,636	\$17,677,741,449	\$12,552,049,286	\$10,662,964,231

An analysis of previous flood zones showed considerable growth of the area located within the floodplain from 2007 to 2017. Newly exposed areas can be viewed on the map to the right (light green).

A considerable amount of expansion has occurred in northeastern Volusia County in the Ormond Beach, Holly Hill, Daytona Beach and Daytona Beach Shores areas. This floodplain growth increases financial liability within the county, as a number of the parcels in these areas are developed. A substantial amount of expansion of the floodplain also occurred in the central portions of the county to the east of Lake Helen and to the northeast of Deltona. Parcels in this area are primarily undeveloped and have future land uses that do not allow future development for the most part. Within Deltona, Orange City, DeBary, Lake Helen and portions of Southern DeLand, the floodplain has expanded primarily in areas in close proximity to lakes and other water bodies.

Volusia County is also susceptible to increases in the size of the 100-year Floodplain as a result of rising sea levels. This would primarily affect parcels in close proximity to the coast, lagoon and inland rivers.

Floodplain Size Comparison

2007 DFIRM – Volusia County: 406,303 Acres
 2017 DFIRM – Volusia County: 417,939 Acres (+2.9%)

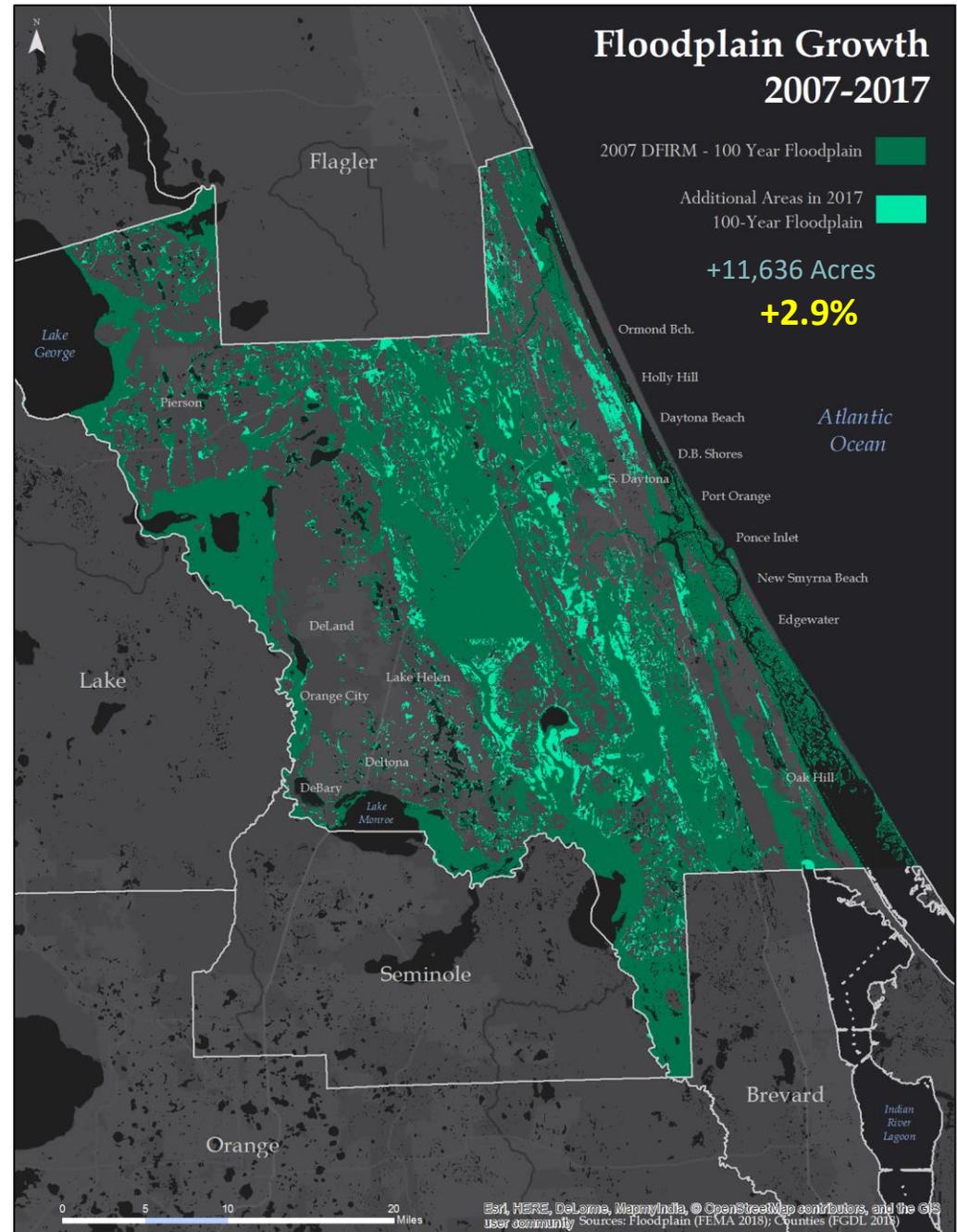


Figure 9: Floodplain Growth

5. PROPERTY ANALYSIS

An analysis of properties located totally, or in part, within the floodplain reveals that 30.9% of all parcels countywide are located in the floodplain, totaling 41,928 structures. This includes 10,229 structures within unincorporated Volusia County and 31,699 structures in all other municipalities combined. It is important to note that 52.9% of the parcels exposed to the floodplain are undeveloped, while built parcels represent a full spectrum of development from the 1940's and forward.

The table on the next page breaks down the year built of all buildings within the 100 year floodplain, by jurisdiction.

Key Dates Include:

The following dates are important from a building code perspective, as parcels built before or after these dates had different requirements at the time of construction.

1968

Federally-backed flood insurance became available to all Americans.

1986

The County Stormwater Management ordinance was amended, enacting minimum design standards.

2002

The Florida building code went into effect.

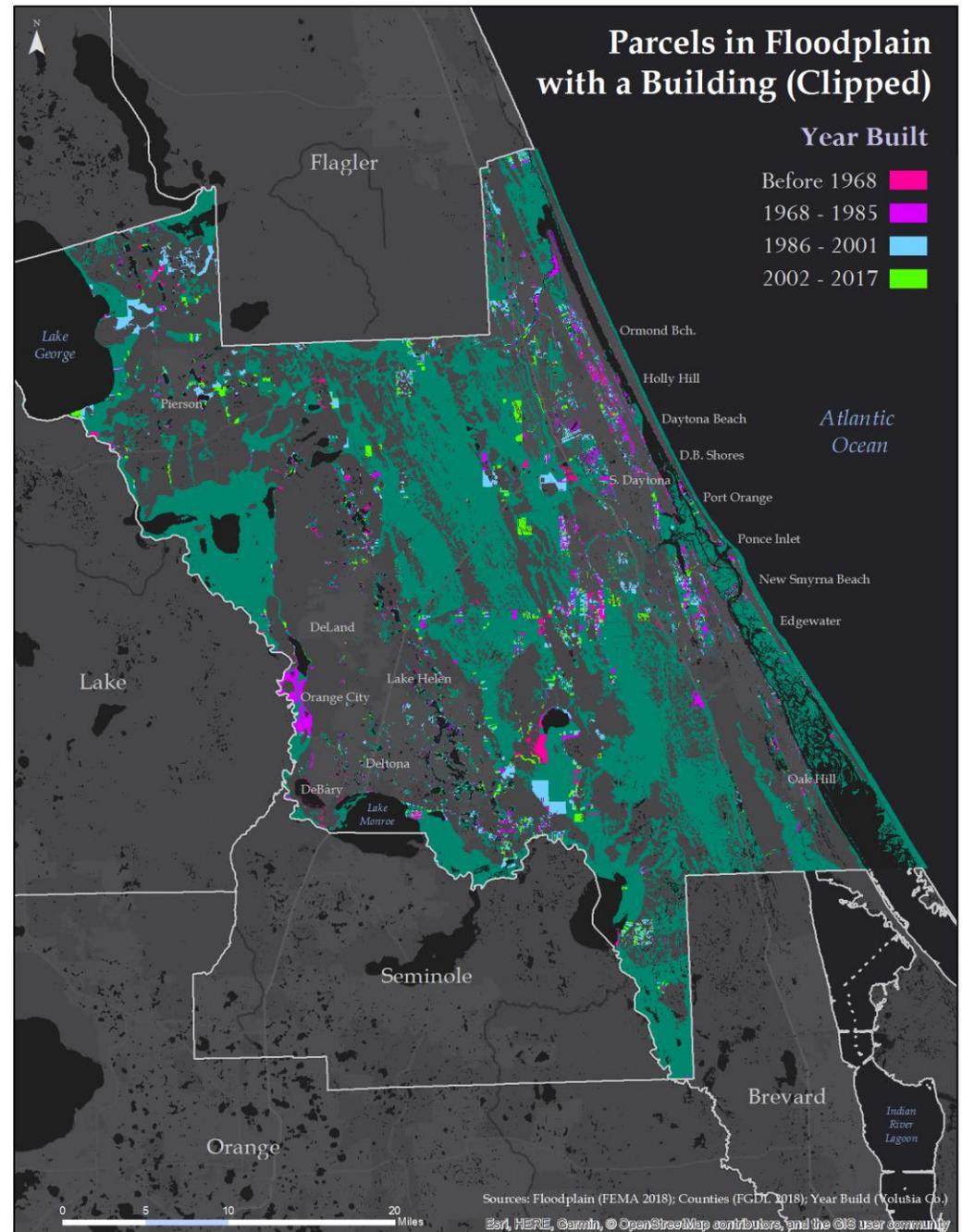


Figure 10: Buildings in the Floodplain

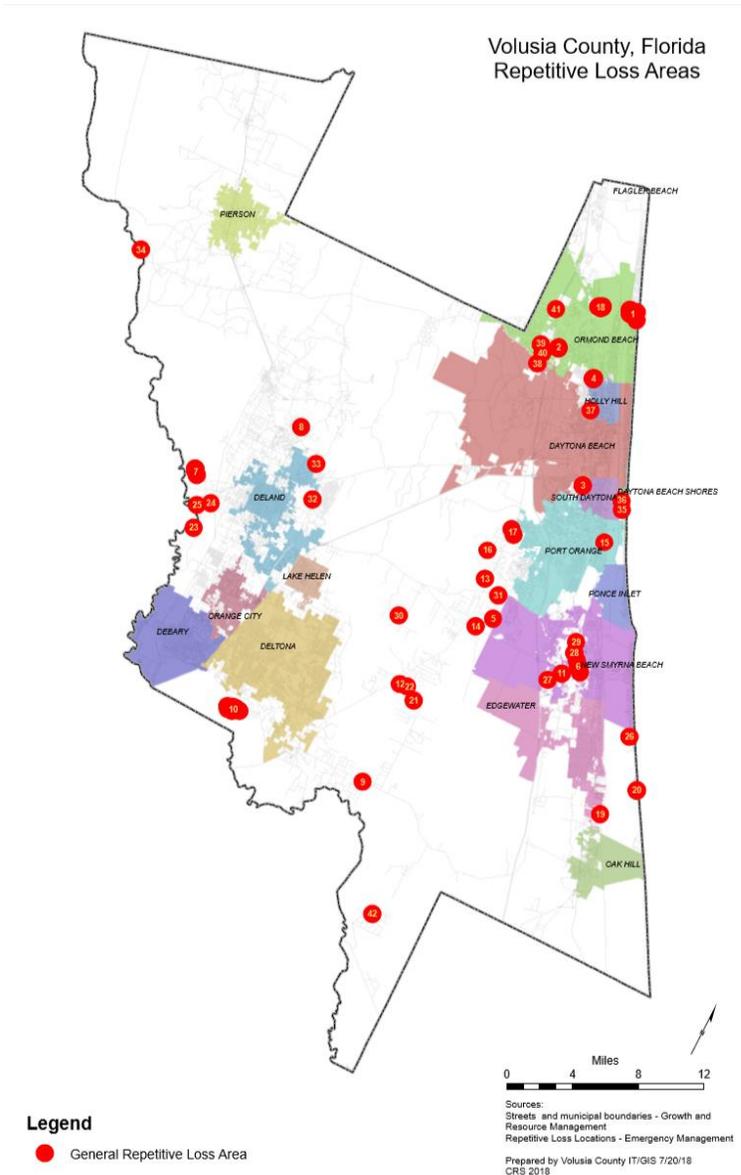
Table 8: Year Built of Structures in the 100-Year Floodplain

Municipality	# Parcels in Floodplain	% Parcels in Floodplain	Buildings in Floodplain	% Parcels Not Built	# Built < '68	# Built '68 - '85	# Built '86-'01	# Built '02-'13
Daytona Beach	14,872	49.6%	8,770	59.0%	3,138	2,915	1,634	1,083
Daytona Beach Shores	4,955	74.9%	132	97.3%	54	56	10	12
DeBary	1,457	14.2%	1,095	24.8%	192	234	411	258
DeLand	215	1.6%	121	43.7%	6	9	28	78
Deltona	5,646	14.5%	4,524	19.9%	146	1,200	2,137	771
Edgewater	899	8.0%	644	28.4%	115	204	202	123
Holly Hill	3,007	51.0%	2,102	30.1%	941	715	253	193
Lake Helen	284	16.9%	140	51.4%	67	32	25	16
New Smyrna Beach	8,370	41.5%	3,618	56.8%	709	1,049	1,191	669
Oak Hill	607	34.8%	399	34.3%	45	160	88	106
Orange City	72	1.8%	33	54.2%	4	4	11	14
Ormond Beach	4,541	22.9%	3,235	28.8%	468	1,173	1,121	473
Pierson	162	13.0%	70	56.8%	29	23	12	6
Ponce Inlet	1,936	53.5%	328	83.1%	34	166	70	58
Port Orange	5,185	21.4%	4,496	13.3%	548	1,739	1,403	805
South Daytona	2,648	46.5%	2,262	14.6%	653	1,128	383	98
Unincorporated	34,172	38.3%	10,229	70.1%	1,653	3,588	3,068	1,922
Countywide	89,028	30.9%	41,928	52.9%	8,801 21.0%	14,395 34.3%	12,047 28.7%	6,685 15.9%

6. REPETITIVE LOSS ANALYSIS

There are repetitive loss properties within 14 of the 16 jurisdictions within Volusia County. These properties have experienced an average of 2.62 flood events per property. 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 the Daytona Beach, New Smyrna Beach and Ormond Beach areas. The western side of the county also has a number of repetitive loss properties, most notably the cluster within the Stone Island residential area in the southwestern portion of the county.

Previously collected data showed that the majority of properties have not undergone mitigation efforts; however there is insufficient data to measure an actual percentage for the entire county. Internal County data shows that the percent of repetitive loss properties that have been mitigated is below the 50% level.



Mitigation Strategy for Repetitive Loss Properties

The Volusia Prepares working group, mentioned previously in this plan, prioritizes mitigation projects among the county and all municipalities through the Action Plan.

Of the many project types included in the Action Plan is the mitigation of repetitive loss properties by raising the properties or through other measures. These properties are often mitigated with funds from the Federal Emergency Management Agency’s (FEMA) Hazard Mitigation Grant Program (HMGP).

For a listing of the repetitive loss properties that have been given a priority for mitigation by the Volusia Prepares working group, reference the Action Plan in Appendix G.

7. FLOOD CLAIM ANALYSIS

All jurisdictions in Volusia County participate in the National Flood Insurance Program (NFIP) and 10 participate in the Community Rating System (CRS) program as noted in Table 2. The number of flood insurance policies county-wide totals 11,914. The table below breaks down the number of flood insurance policies, claims and claims paid by jurisdiction during the year from 1978 to 2009 and from 2010 to 2017.

There have been 1,560 flood losses reported in Volusia County through the NFIP from 1970 through November 2017, totaling more than \$35 million in claims payments. Since 1978, \$27,726,387 has been paid back in claims. All flooding event types are included.

It is also important to note that these numbers include only those losses to structures insured through NFIP policies and for which claims were sought and received. Following the 2004 hurricanes, 1,106 claims totaling \$14.3 million were paid in Volusia County. The 2016 and 2017 hurricane seasons also resulted in claims being paid to policyholders.

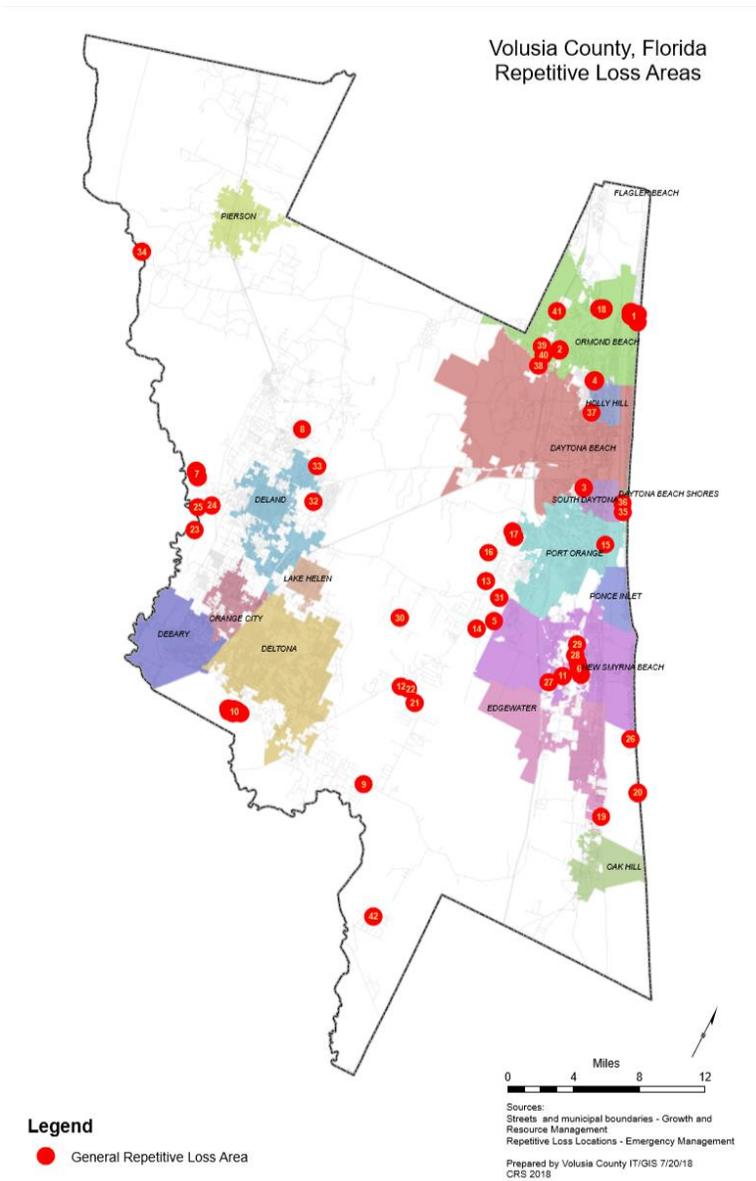


Figure 12: Flood Insurance Policies and Claims

Jurisdictional Flood Claim Information

Flood claim and repetitive loss property information is compiled by FEMA and individual municipalities. Please refer to the individual municipal contacts on page 2 of this plan for more information by jurisdiction.

8. NATURAL PROTECTION

The Volusia County Comprehensive Plan and jurisdictional comprehensive plans all include a conservation element which aims to prevent the degradation of water bodies, wetlands, rivers, estuaries and essential upland areas. Goals and policies in the conservation elements include the protection of surface water resources and the floodplains associated with the water sources, including limiting dwelling unit densities within the floodplains and flood-prone areas. The County and the jurisdictions recognize the importance wetlands and floodplains of surface water bodies play in protecting uplands.

To this effect, the protection of undisturbed segments of floodplains associated with surface water bodies shall continue through land use controls, conservation easements, public acquisition and other methods. These and other policies in the Comprehensive Plans aim to protect and utilize physical and ecological functions of natural drainage ways and patterns to protect developed areas from flood impacts. Wetland and easements maintained along water bodies not only serve as flooding buffers to development but also provide habitat for various species which may otherwise be displaced through fill and development.

According to the analysis performed using GIS, 211,943 acres of existing conservation land in Volusia County is

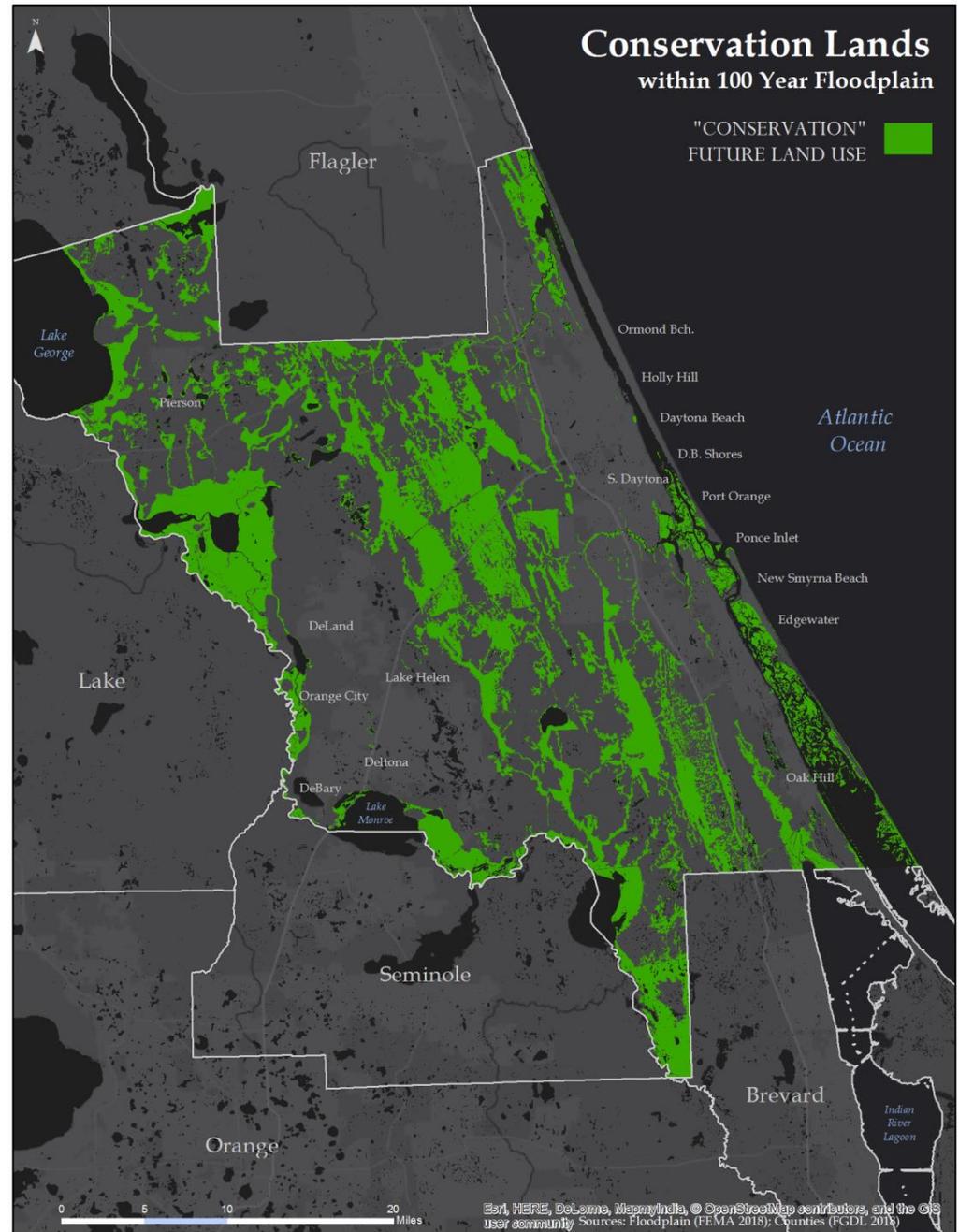


Figure 13: Conservation Lands in the Floodplain

exposed to the 100-year floodplain. Using the size of the countywide floodplain, this means that 50.7% of the 100-year floodplain has a conservation future land use within Volusia County. This would be inclusive of all types of conservation properties such as wetlands and other floodplain areas. It should be the goal of all jurisdictions within the County to maximize the amounts of undeveloped lands in the floodplain with a conservation future land use. This would ensure that development does not infringe into the floodplain.

9. LAND USE AND TREND ANALYSIS

Table 12 below summarizes the total allocation of Future Land Use Designations by acreage of all parcels exposed to the 100-Year Floodplain in Volusia County. A majority of the exposed developed parcels are categorized as “Low Density Residential” (52.9% of exposed built parcels), up slightly from 52.0% in 2012. It is important to note that conservation lands were removed from the Future Land Use analysis to provide a separate analysis. The residential numbers above also exclude agriculture and recreational lands.

Population and Development Trends

- Volusia County Population, 2000: 445,060
- Volusia County Population, 2010: 494,610 (+11.1%)
- Volusia County Population, 2017: 538,692 (+8.9%)

**Source: US Census Bureau (2017)*

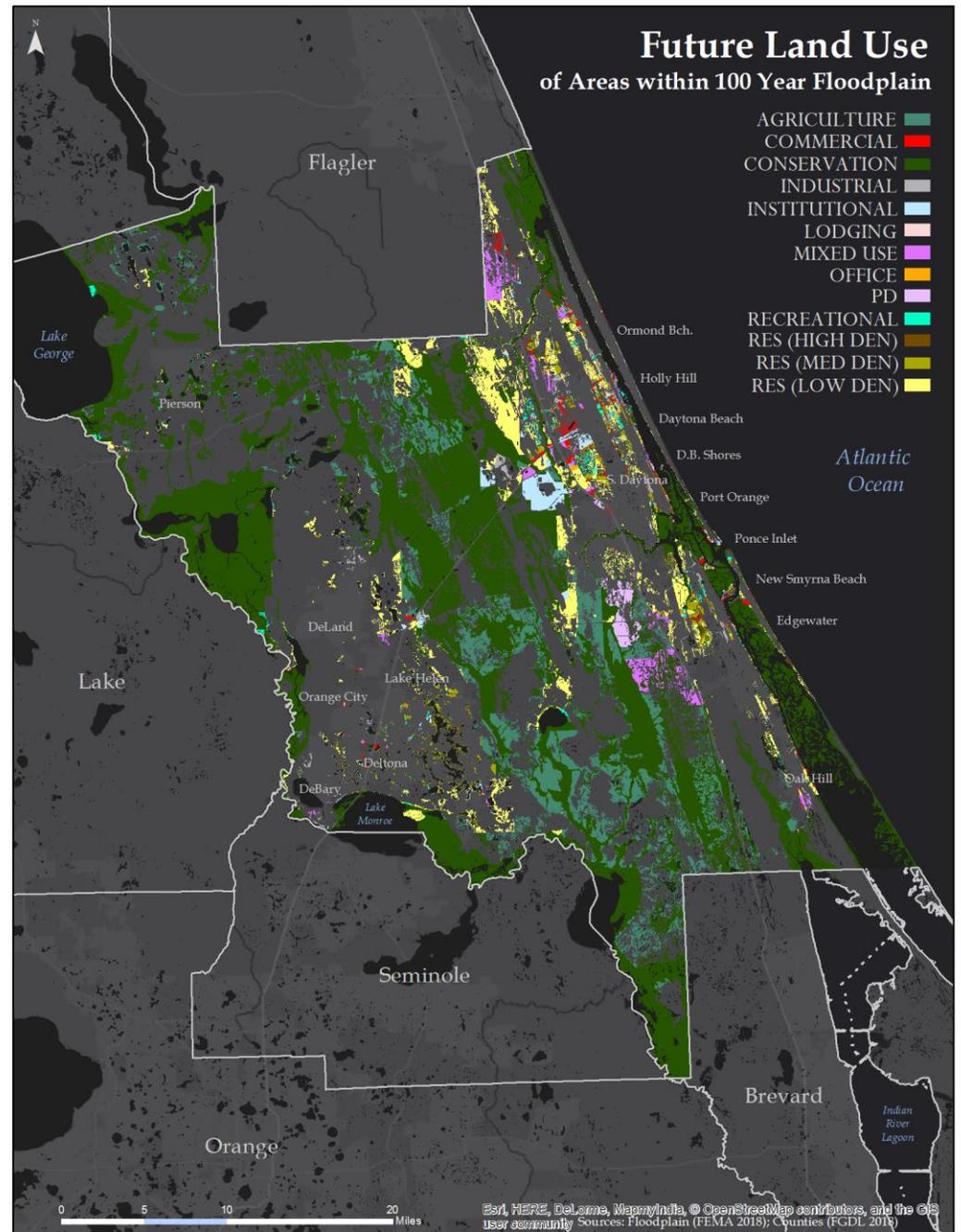


Figure 14: Future Land Uses in the Floodplain

Table 11: Analysis of Acreage of Future Land Uses Located within the 100 Year Flood Plain

*** Note: "Commercial" includes the "Office" and "Lodging" future land use designations*

Municipalities	Low Res.	M-H Res.	Commercial	Mixed Use	Institutional	Industrial	PD	Agriculture	Recreation
Daytona Beach	6951	851	1188	882	309	968	-	-	832
Daytona Beach Shores	1	26	-	-	0.1	-	-	-	-
DeBary	215	54	61	73	65	147	-	144	-
DeLand	300	2	-	111	1	212	-	-	-
Deltona	920	2627	106	67	372	-	-	154	95
Edgewater	280	166	16	1982	57	86	-	-	15
Holly Hill	414	36	24	0.3	10	142	-	-	81
Lake Helen	200	-	-	10	5	2	-	-	-
New Smyrna Beach	1075	643	220	222	23	180	1873	1844	152
Oak Hill	185	42	54	182	13	-	-	200	0.4
Orange City	6	0.2	25	49	38	0.6	-	-	-
Ormond Beach	1780	171	391	1593	71	154	-	-	63
Pierson	5	-	-	-	-	-	-	186	5
Ponce Inlet	86	26	20	-	40	-	-	-	11
Port Orange	1145	611	154	87	254	116	159	-	-
South Daytona	172	207	26	52	21	38	-	-	39
Unincorporated	11982	827	138	72	3180	227		45273	424
Countywide	25717	6289	2423	5382	4459	2273	2032	47,801	1717

The following map shows the evacuation routes and storm shelter locations as identified by the Statewide Regional Evacuation Study (SRES). It is important to note that shelters located within a floodplain may be inaccessible to the public during flooding events, either due to property flooding or the flooding of access roads. The analysis showed that only three shelters are located within the 100-year floodplain.

The following evacuation routes are primary movers of traffic out of Volusia County:

- Interstate 4 (to Orlando)
- Interstate 95 (to Miami, Jacksonville)
- State Road 40 (to Lake County)
- State Road 415 (to Sanford)
- U.S. 1 (coastal)

The table on the following page lists all of the designated storm shelters in Volusia County.

In the event of a mass-evacuation situation in Volusia County, the roadways utilized to reach these storm shelters could become damaged or inundated by water, thus creating the need for mitigation activities that would identify shelters that have additional capacity or those that can serve excess capacity from an inundated shelter.

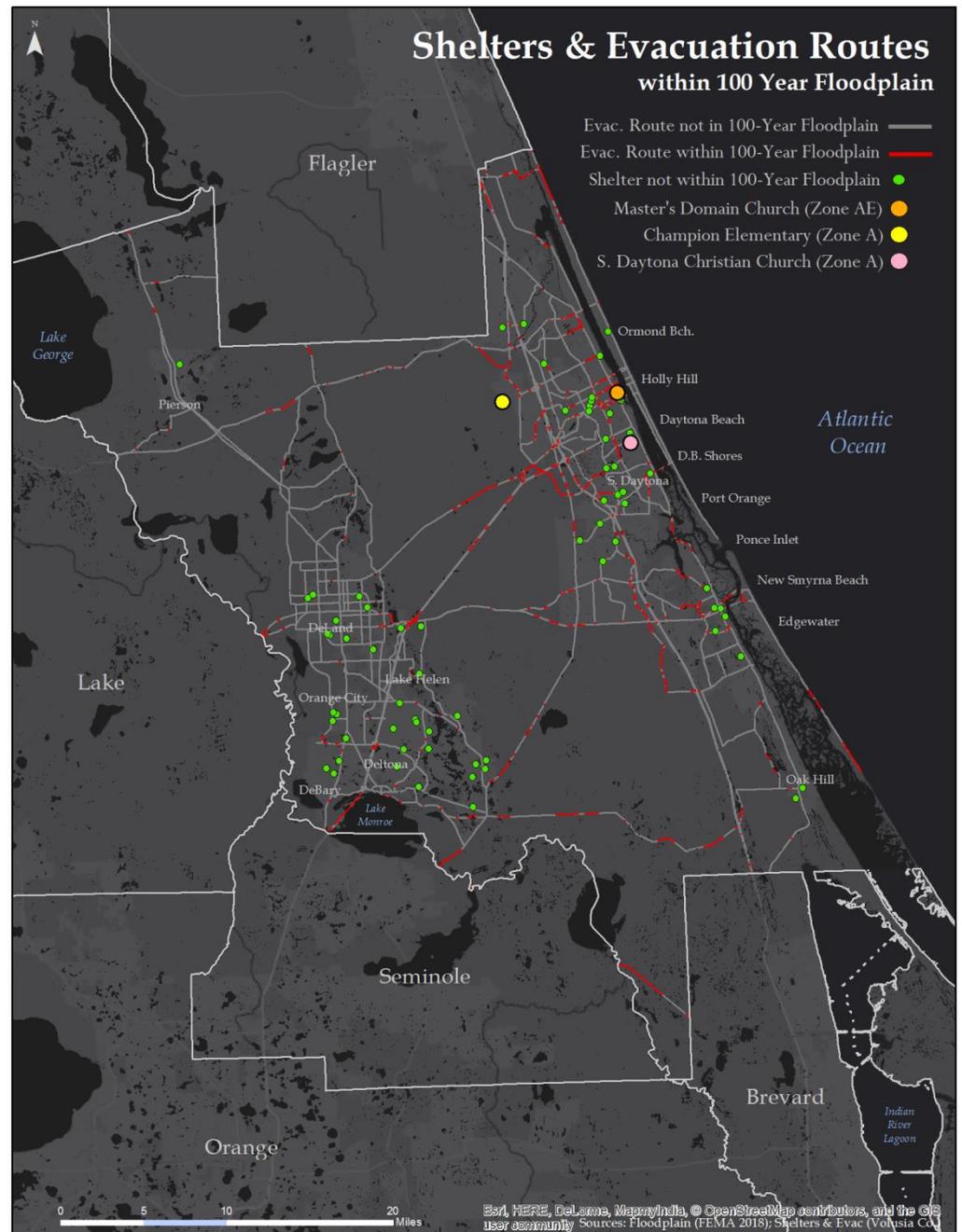


Figure 15: Shelters and Evacuation Routes in the Floodplain

Table 12: List of Storm Shelters in Volusia County (2018)

Shelter Name	City	Evac.	Flood Zone	Surge Zone
ALLEN GREEN CIVIC CENTER	Port Orange			
ATLANTIC HIGH SCHOOL	Port Orange			
BABE JAMES COMMUNITY CENTER	New Smyrna Bch.	B	500 Year	3
BIBLEWAY CHURCH OF GOD IN CHRIST	Oak Hill	C		3
BLUE LAKE ELEMENTARY SCHOOL	DeLand			
CAMPBELL MIDDLE SCHOOL	Daytona Beach	E		4
CHAMPION ELEMENTARY SCHOOL	Daytona Beach		A	
CHISHOLM COMMUNITY CENTER	DeLand			
CITRUS GROVE ELEMENTARY SCHOOL	DeLand			
COVENANT UNITED METHODIST CHURCH	Port Orange			
CREEKSIDE MIDDLE SCHOOL	Port Orange	E		
CYPRESS CREEK ELEMENTARY SCHOOL	Port Orange	E		4
DAYTONA CHRISTIAN & MISSIONARY CHURCH	Daytona Beach			
DAYTONA STATE COLLEGE - DAYTONA BEACH	Daytona Beach			
DAYTONA STATE COLLEGE - DELAND	Unincorporated			
DEBARY ELEMENTARY SCHOOL	DeBary			
DELAND HIGH SCHOOL	DeLand			
DELAND MIDDLE SCHOOL	DeLand			
DELTONA HIGH SCHOOL	Deltona			
DELTONA LAKES ELEMENTARY SCHOOL	Deltona			
DISCOVERY ELEMENTARY SCHOOL	Deltona			
EDGEWATER YMCA	Edgewater	C		3
EMMAUS LUTHERAN CHURCH	Orange City			
FIRST BAPTIST CHURCH OF DEBARY	DeBary			
FIRST BAPTIST CHURCH OF OAK HILL	Oak Hill	D		3
FIRST CHRISTIAN CHURCH	Daytona Beach	C	500 Year	3
FIRST CHURCH OF THE NAZARENE	New Smyrna Bch.	C	500 Year	3
FLORIDA COAST TO COAST RED CROSS CHAPT.	Daytona Beach	E		5
FOREST LAKE ELEMENTARY SCHOOL	Unincorporated			
FREEDOM ELEMENTARY SCHOOL	DeLand			
FRIENDSHIP ELEMENTARY SCHOOL	Deltona			
GALAXY MIDDLE SCHOOL	Deltona			
HERITAGE MIDDLE SCHOOL	Deltona			
HINSON MIDDLE SCHOOL	Daytona Beach			
HORIZON ELEMENTARY SCHOOL	Port Orange			
JAMES PARK YOUTH ACTIVITY CENTER	South Daytona	E		4
LIBERTY INDEPENDENT BAPTIST CHURCH	Unincorporated			

Shelter Name	City	Evac.	Flood Zone	Surge Zone
LIVE OAK GYM	New Smyrna Bch.	C		3
MAINLAND HIGH SCHOOL	Daytona Beach			
MANATEE COVE ELEMENTARY SCHOOL	Orange City			
MASTER'S DOMAIN CHURCH OF GOD IN CHRIST	Daytona Beach	C	AE	3
MOUNT CALVERY FREE WILL BAPTIST CHURCH	Unincorporated			
NEW SMYRNA BEACH HIGH SCHOOL	New Smyrna Bch.	C		3
OSTEEN ELEMENTARY SCHOOL	Unincorporated			
OUR SAVIOR'S EVANG. LUTHERAN CHURCH	Port Orange			
PALM TERRACE ELEMENTARY SCHOOL	Daytona Beach			
PATHWAYS ELEMENTARY SCHOOL	Ormond Beach			
PIGGOTTE COMMUNITY CENTER	South Daytona	E		4
PINE RIDGE HIGH SCHOOL	Deltona			
PINE TRAIL ELEMENTARY SCHOOL	Ormond Beach			
PORT ORANGE ELEMENTARY SCHOOL	Port Orange	C		3
PORT ORANGE YMCA	Port Orange			
PRIDE ELEMENTARY SCHOOL	Deltona			
RIVER SPRINGS MIDDLE SCHOOL	Orange City			
SAINT ANN'S CATHOLIC CHURCH	DeBary			
SEABREEZE SENIOR HIGH SCHOOL	Daytona Beach	A		4
SICA HALL COMMUNITY CENTER	Holly Hill	E		4
SOUTH DAYTONA CHRISTIAN CHURCH	South Daytona	C	A	3
SOUTHWESTERN MIDDLE SCHOOL	Unincorporated			
SPIRIT ELEMENTARY SCHOOL	Deltona			
SPRUCE CREEK BAPTIST CHURCH	Unincorporated	E		5
ST MARYS EPISCOPAL CHURCH	Daytona Beach	E		4
SUNRISE ELEMENTARY SCHOOL	Deltona			
SWEETWATER ELEMENTARY SCHOOL	Port Orange			
T. DEWITT TAYLOR MIDDLE/HIGH SCHOOL	Pierson			
TIMBERCREST ELEMENTARY SCHOOL	Deltona			
TRINITY ASSEMBLY OF GOD	Deltona			
TRINITY EVANGELICAL LUTHERAN CHURCH	New Smyrna Bch.	C		3
TUBMAN KING COMMUNITY CHURCH	Daytona Beach	E		4
UNIVERSITY HIGH SCHOOL	Orange City			
VOLUSIA COUNTY FAIRGROUNDS (PF)	Unincorporated			
VOLUSIA PINES ELEMENTARY SCHOOL	Lake Helen			
WES CRILE GYMNASIUM	Deltona			

VI. MITIGATION STRATEGY

Flood Mitigation specifically involves the managing and controlling of flood movement in an effort to prevent and control flooding. Flood mitigation is any action taken to reduce risk to people or property from flooding and its effects. The Volusia County Multi-jurisdictional Local Mitigation Strategy (LMS) has evolved over the years and not only focuses on flooding, but other natural hazards. The Volusia Prepares LMS Working Group (LMS Working Group) has developed Bylaws and Operating Procedures 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.

A. Setting Goals

The Floodplain Management Plan Committee reviewed the goals of the current Volusia County FMP and the Local Mitigation Strategy. The following goals and objectives were adopted for the 2020 Volusia County Floodplain Management Plan.

GOAL 1 - Prevent new development in the floodplain from increasing runoff and resulting in increases in flood volumes in the floodplain.

Objective 1.1 Enforce the building requirements, from the National Flood Insurance Program and not allow variances that are feasibly avoidable.

Objective 1.2 Ensure any new development in the floodplain is in accordance with county or municipal ordinances.

Objective 1.3 Minimize flood hazards and protect water quality county-wide by employing watershed-based approaches that balance environmental, economic, and engineering considerations.

Objective 1.4 Protect environmentally sensitive lands and aquifers to maximize their survivability from known flood hazards where appropriate and financially feasible.

Objective 1.5 Reduce flood exposure and maximize flood protection efforts.

Goal 2 – Develop and maintain a proactive public awareness and outreach that informs and notifies property owners that they are located in a flood zone and provides assistance and information regarding flood zones, protection of property, local drainage and sewer back-up problems.

Objective 2.1 Create easily accessible information to educate residents about the hazards, loss reduction measures, and the natural and beneficial functions of floodplains.

Objective 2.2 Encourage land and water uses compatible with the protection of environmentally sensitive lands and coastal resources.

Objective 2.3 Review the adequacy and completeness of emergency procedures that address catastrophic flood events and every year conduct a test of the flood warning system.

Objective 2.4 Minimize impacts from flooding in FEMA designated special flood hazard areas (i.e. flood zones starting with the letters “V” or “A”) where financially feasible.

Objective 2.5 Build a constituency that desires to see the plan's recommendations implemented.

Objective 2.6 Provide leadership in protecting low-income properties and public housing from the impacts of floods.

Goal 3 - Continue with the Hazard Mitigation Grant Program to identify and obtain funding for both pre-and-post disaster residential mitigation projects regarding flooding.

Objective 3.1 Continue to identify cost-beneficial residential units for various flood mitigation grants.

Objective 3.2 Continue to utilize “Volusia Prepares” Local Mitigation Strategy to guide and assist the County and municipalities in establishing priorities for hazard mitigation projects.

Goal 4 – Reduce the number of repetitive loss properties within Volusia County.

Objective 4.1: Mitigate identified repetitive loss properties through the HMGP funding program when possible.

Goal 5 - Review the locations and effects on areas that experience flooding and determine what steps, if any, the County and municipalities can take to alleviate future impacts.

Objective 5.1 Maintain a database of flood problems and hazards, mitigation and repetitive loss claim history.

Objective 5.2 Build public and political support for projects that prevent new problems, reduce losses, and protect the natural and beneficial functions of floodplains.

Objective 5.3 Continue to prioritize capital projects that will mitigate flood impacts in those areas of the County and municipalities that have experienced significant flooding problems.

Objective 5.4 Continue and enhance existing programs that acquire wetland areas for passive recreation uses while providing significant watershed volume storage and buffer areas from the floodplain.

VIII. MITIGATION ACTIVITIES

Flood Mitigation specifically involves the managing and controlling of flood movement in an effort to prevent and control flooding. Flood mitigation is any action taken to reduce risk to people or property from flooding and its effects. The Volusia County Multi-jurisdictional Local Mitigation Strategy (LMS) has evolved over the years and not only focuses on flooding, but other natural hazards. The Volusia Prepares LMS Working Group (LMS Working Group) has developed Bylaws and Operating Procedures 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.

Table 13: Funding Sources for Property Mitigation Activities

Eligible Activities	Hazard Mitigation Grant	Pre-Disaster Mitigation	Flood Mitigation Assistance	Repetitive Flood Claim	Community Development Block Grant	Public Assistance Program	Severe Repetitive Loss
Acquisition/Demolition <i>(for purposes of open space)</i>	✓	✓	✓	✓	✓		✓
Relocation	✓	✓	✓	✓	✓		✓
Elevation	✓	✓	✓	✓	✓		✓
Dry Flood-proofing <i>(historic residential structures)</i>	✓	✓	✓	✓	✓		✓
Public Facility Mitigation					✓	✓	✓
Mitigation Reconstruction					✓		✓

A detailed description of the funding sources can be found in Section 9 of the Volusia County Local Mitigation Strategy.

A. Flooding Preventative Activities

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 management and mitigation planning, comprehensive land use planning, in addition to the enforcement of zoning and subdivision ordinances and building codes that regulate how land is developed and structures are built. Additionally, it protects environmental, historic and cultural resources in the community. Although some conflicts can arise, these planning initiatives generally present significant opportunities to integrate mitigation principles and best practices into the local decision making process in an effort to manage floodplain development. Table 2 refers to Volusia County and its jurisdictions plans, policies, codes and ordinances.

B. Property Preventative Activities

Property preventive activities are generally undertaken by property owners on a building-by-building or parcel basis. Some activities may include:

- **Buy-Out & Acquisition** - The act of acquiring or gaining possession to flood damaged properties and permanently preserving the land.
- **Relocation** – Moving a structure out of the floodplain to higher ground where it will not be exposed to flooding.
- **Elevation** – Raising a structure so that the lowest floor is above the flood level.
- **Flood Insurance** – A specific insurance coverage against property loss from flooding.
- **Wet Flood-Proofing** – Making uninhabited portions of the structure resistant to flood damage and allowing water to enter during flooding.
- **Dry Flood-Proofing** – Sealing the structure to prevent floodwaters from entering.

C. Natural Resource Protection Activities

These activities are customarily conducted to preserve or restore natural areas or the natural functions of floodplain and watershed areas. 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 of Natural Resource Protective Measures:

- Floodplain protection; watershed management
- Low impact development; bioswales; native landscaping
- Riparian buffers
- Erosion and sediment control
- Wetland preservation and restoration

D. Emergency Services Activities

Emergency services measures are taken prior to, during, and after an emergency to minimize vulnerability and impact. Volusia County Division of Emergency Management actively participates in training and exercise, as well as evacuation planning and emergency response. Currently Volusia County and 15 jurisdictions have an evacuation plan in place. In addition, Volusia County participated in the Statewide Regional Evacuation Study. Figure 15 depicts the regional evacuation routes and shelters within Volusia County. Other activities include sandbagging for flood protection and emergency response training and exercises. Volusia County and its municipalities continue to be proactive in emergency response training and exercises. Some examples include participation in the Statewide Tsunami Exercise and the Statewide Tornado Drill.

E. Structural Projects

Structural projects keep floodwaters away from an area with a levee, reservoir, or other flood control measure. Structural projects are usually designed by engineers and managed or maintained by public works staff. Examples of structural projects include:

- Reservoirs
- Channel modifications
- Levees/floodwalls/seawalls
- Beach nourishment
- Diversions, Flood Dams
- Storm sewers; bioswales on roadways; “Green Streets”

F. Public Education and Awareness Activities

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. Through an agreement with

Volusia County, WNDB 1150AM/WHOG 95.7FM radio and WDSC TV-15 are Volusia County's official emergency management information stations. WNDB has a broadcast outlet at the CEOC. WDSC enhances the County's ability to provide critical public safety information with a direct, live television connection. Volusia County's website hosts a flood map viewer which is an on-line mapping program that has searchable flood maps. The flood map viewer allows an individual to type in an address or property identification number to see the parcel on an interactive map in relation to the high-risk flood areas. Volusia County and its jurisdictions also provide real estate agents with floodplain disclosures. Information regarding floods can also be found at the County Libraries. Volusia County actively provides updates on events and public outreach through Facebook and Twitter.

It was identified through the public survey process that many residents are unsatisfied with educational and outreach efforts provided by the jurisdictions. It is recommended that throughout the year and during the yearly plan update, at least one public meeting be held to provide information to the residents concerning mitigation and associated funding options. In addition, social media, mailings, workshops, and informational booths at events are also suggested as well as public service announcements and information in the local newspaper. Providing strategies, funding resources and other education material both electronically on all the jurisdictional websites and in print in libraries and City Halls would be beneficial.

G. Action Plan

The Volusia County Multi-Jurisdictional Local Mitigation Strategy features a mitigation action plan that is maintained through the LMS Working Group as well as the FMP working group. The Mitigation Strategy 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. This detailed Action Plan can be found in Section 8 of the Volusia County Multi-Jurisdictional Local Mitigation Strategy. Flood-specific projects are located in Appendix G of this report.

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 of the Hazard Mitigation Plan. The Mitigation Action Plan can be found in Appendix G.

The LMS working group has reviewed and prioritized the initiatives and projects found in the Action Plan. The prioritization was based on the following 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 and ease of Implementation, Community Rating System, Repetitive Loss Mitigation, and Benefit Cost Ratio. Please refer to the table on the next page which justifies the scoring the system. It is important to note that since this plan is to be incorporated into the Volusia County Local Mitigation Strategy (LMS), it will fall under all of the implementation, evaluation and revision criteria and schedule as outlined specifically in the LMS.

Post-Disaster Redevelopment Strategies and Procedures

The County has completed and incorporated a Post Disaster Redevelopment Plan and Debris Management Plan into its ongoing planning process. In addition, a Continuity of Operations Plan has been developed to ensure that all County Emergency Support Functions (ESF's) work in unison following a hazard event. A link to these three plans is included below:

- [Volusia County Continuity of Operations Plan](#)
- [Volusia County Debris Management Plan](#)
- [Volusia County Post-Disaster Redevelopment Plan](#)

Natural Hazard Mitigation Strategies and Procedures

The County deals with natural hazard mitigation and procedures through this plan and the Local Mitigation Strategy. The Local Mitigation Strategy Priority Projects listing includes projects geared to reduce the impacts of flooding, storm surge, wind, and other natural hazards. In addition, the Priority Projects dealing with flooding have been added to Appendix G (the Action Plan) of this report. The 2020 Floodplain Management Plan has been affirmed with Resolutions of Adoption (Appendix I) for incorporation into the Volusia County Floodplain Management Plan. A link to the plan is included below:

- [Volusia County Local Mitigation Strategy](#) (scroll down to “Local Mitigation Strategy 2015 – FEMA Approved”)

Table 14: Prioritization and Scoring Worksheet

<i>Prioritization Criteria</i>	<i>Scoring</i>			
<u>Population Benefited</u>	4 Points: Project will benefit a multi-jurisdictional area	3 Points: Project will benefit a jurisdictional area	2 Points: Project will benefit less than 100% of a jurisdiction.	
<u>Health and Safety Considerations</u>	4 Points: Project would benefit 75% or more of the population.	3 Points: Project would benefit 50 -74 % of the population.	2 Points: Project would benefit 25-49% of the population.	1 Point: Project would benefit less than 25% of the population.
<u>Environmental Impact</u>	1 Point: Project improves the environment.	0 Point: Risk to the environment is undetermined.	(-1) Point: Project poses a risk to the environment.	
<u>Consistency with other plans and programs</u>	4 Points: Project is incorporated into the LMS CEMP and Comp Plan and supports the NFIP.	3 Points: Project is incorporated into at least two of these plans.	2 Points: Project is incorporated into at least one of these plans.	1 Point: Project is consistent with other local standards, aside from LMS, CEMP, and Comp Plan.
<u>Reduces Risk of Future Property Damage</u>	4 Points: Mitigates a hazard of high frequency or risk.	3 Points: Mitigates a hazard of moderate frequency or risk.	2 Points: Mitigates a hazard of low frequency or risk.	1 Point: Mitigates a hazard of very low frequency or risk.
<u>Supports Essential or Critical Services</u>	5 Points: Project will ensure continuity of operations for essential infrastructure or services.	3 Points: Project will support infrastructure or services with loss/damage history	1 Point: Project will support infrastructure or services without loss/damage history.	0 Points: Projects operation will have no impact on community infrastructure or services if disrupted.
<u>Probability of Receiving Funding for Implementation</u>	4 Points: Limited funding potential exists.	3 Points: Potential funding sources are other state or federal grants or similar funding sources.	2 Points: Potential funding is readily available through emergency preparedness or mitigation funding sources.	0 Points: Potential funding is readily available through local funding sources.
<u>Feasibility of Implementation</u>	4 Points: Project would be relatively easy to implement in one year.	3 Points: Project would be easy to implement in three years.	2 points: Project would be easy to implement in five years.	0 Points: Project would be difficult to implement.
<u>Community Rating System (CRS)</u> -public information, mapping - damage reduction -flood preparedness	4 Points: Project supports CRS elements	3 Points: Project supports three CRS elements.	2 Points: Project supports two CRS elements.	1 Point: Project supports one CRS element.
<u>Repetitive Loss (RL) Mitigation</u>	4 Points: Project protects 50% or more of the RL structures.	2 Points: Project protects less than 50% of the RL structures.	4 Points: Project does not protect a RL structures.	
<u>Benefit Cost Ratio (BCR)</u>	5 Points: Project has a BCR of "1" or higher, using FEMA approved software.	3 Points: Project has a BCR of less than "1" using FEMA approved software.	0 Points: the BCR cannot be determined.	

IX. PLAN MAINTENANCE

A. Adopt the Plan

Each jurisdiction participating in the CRS program is required to adopt the Floodplain Management Plan formally through individual jurisdictional boards. Appendix I provides copies of all adopted resolutions. Please note, this section is a working section, as the adoption process may vary amongst the jurisdictions. As each jurisdiction provides a copy of the adopted resolution, it will be added to the appendix of the plan. The Volusia County Emergency Management Division is responsible for the master copy of the Floodplain Management Plan.

B. Implement, Evaluate, and Revise

As the responsible party for the FMP, the Volusia County Emergency Management Division will oversee the implementation, evaluation, and revision of the plan on a County-wide basis. Jurisdictional implementation and revision of Appendix A is the responsibility of each individual jurisdiction.

Procedures for monitoring the implementation, progression and revisions of the plan are completed through the Local Mitigation Strategy Steering Committee, also referred to as “Volusia Prepares”. This committee meets on a quarterly basis to review aspects of the LMS, including the FMP, and other topics such as CRS upkeep and requirements. The working group is made up of Volusia County Emergency Management staff and one representative from each participating Town or City. The working group implements the plan through Resolutions of Support and Resolutions of Adoption, evaluates the plan on a case-by-case basis, and revises the plan through the development of the “Action Plan” of priority projects, which are updated during Steering Committee Meetings as needed.

The LMS Steering Committee and the FMP Planning Committee are generally comprised of the same jurisdictional staff members. For the purpose of updating and maintaining the FMP, the FMP Planning Committee composition will continue to encompass the jurisdictional staff responsible for the implementation of the FMP and related policies and projects as it had been during the initial planning process. Pursuant to CRS Activity #510, an annual progress report is submitted.

This Floodplain Management Plan is considered an appendix to the Volusia County LMS. To that end, the maintenance of this document will occur in conjunction with the yearly LMS updates. During the third quarter of the calendar year

(July/August/September), the County and the jurisdictions will provide any updates, including data and projects, to the County for review by the LMS Steering Committee/FMP Planning Committee. The steering committee will review any updates and the County will be responsible for implementing the updates in the master plan. In addition, the evaluation report will be prepared by the FMP Planning Committee and address updates per jurisdiction. Each community will submit its copy of the annual evaluation report with its recertification annually. The Volusia County Emergency Management Division will be responsible for the five year update process. During this update period, the public will have the opportunity to participate in the updating process. It is recommended that at least one public meeting is held during this period to provide input. In addition, it is recommended that notification be submitted via databases, utility mailings, websites, and social media, concerning the update process, public meetings, and other avenues of input. The current plan as well as the proposed changes should be made available on each jurisdictional website as well as a hard copy be provided at the City Halls and libraries. Press releases, radio and TV announcements may also be utilized to inform the public.

Once per year, elected officials will be provided a copy of the most current Floodplain Management Plan in conjunction with the LMS. At that time, hard copies of the plan will be replaced at the designated location in participating jurisdictions. The table below indicates where the jurisdictions will keep a hard copy of the plan for public use

Table 15: Plan Storage Locations

City	Hard Copy Location
Main Copy	City Island Library - 105 East Magnolia Avenue, Daytona Beach FL 32114
Daytona Beach	125 Basin Street (Suite 100), Daytona Beach FL 32114
Daytona Beach Shores	2990 S. Atlantic Avenue, Daytona Beach Shores FL 32118
DeBary	<i>Not Specified</i>
DeLand	<i>Not Specified</i>
Deltona	<i>Not Specified</i>
Edgewater	104 N. Riverside Drive, Edgewater FL 32132
Holly Hill	<i>Not Specified</i>
Lake Helen	<i>Not Specified</i>
New Smyrna Beach	<i>Not Specified</i>
Oak Hill	<i>Not Specified</i>
Orange City	<i>Not Specified</i>
Ormond Beach	22 South Beach Street (Room 104), Ormond Beach FL 32174
Pierson	<i>Not Specified</i>
Ponce Inlet	<i>Not Specified</i>
Port Orange	<i>Not Specified</i>
South Daytona	1672 S. Ridgewood Avenue, South Daytona FL 32119



Appendix A

Jurisdictional Profiles





Daytona Beach

Floodplain Management Goals and Objectives

Goal: Promote the public health, safety and general welfare, and to minimize public and private losses due to flood conditions in specific areas

- Objective: Maintain the City's Community Rating System Classification;
- Objective: Provide flood protection information to residents;
- Objective: Coordinate and implement small and/or large scale projects to help alleviate drainage and flood concerns;
- Objective: To protect human life, health and to eliminate or minimize property damage;
- Objective: Require the use of appropriate construction practices to prevent or minimize future flood damage;
- Objective: Manage filling, grading, dredging, mining, paving, excavation, drilling operations, storage of equipment or materials and other development activities which may increase flood damage or erosion potential;
- Objective: Manage the alteration of flood hazard areas, watercourses and shorelines to minimize the impact of development on the natural and beneficial functions of floodplains;
- Objective: To minimize the need for rescue and relief efforts associated with flooding that are generally undertaken at the expense of the general public;
- Objective: To minimize prolonged business interruptions;
- Objective: To minimize damage to public facilities and utilities, such as water mains, gas mains, electric lines, telephone lines and sanitary sewer lines, streets, bridges and stormwater culverts located in floodplains;
- Objective: To maintain a stable tax base by providing for the sound use and development of flood prone areas in such a manner as to minimize flood blight areas;
- Objective: To ensure that potential homebuyers are notified when the property is in a flood hazard area;
- Objective: To help maintain a stable tax base by providing for the sound use and development of flood prone areas in order to minimize flood blight areas.

Goal: To create programs to manage the surface water runoff

- Objective: Develop/maintain storm water management plan;
- Objective: Develop alternative water supply on western city limits.

Daytona Beach

Exposed Critical Facilities

Facility Name	Facility Type	Flood Zone
Worc Haven Assisted Living	Assisted Living	A
Golden Abbey Assisted Living	Assisted Living	AE
Forest Lake Manor	Assisted Living	AE
Herald's Retirement Home	Assisted Living	AE
Compassion in Healthcare	Assisted Living	AE
Trinity Care Center	Assisted Living	AE
Manor on Green	Assisted Living	A
Good Samaritan Society	Assisted Living	A
Cingular Wireless – Int'l Speedway	HazMat Facility	A
Florida Rock Industries	HazMat Facility	A
Communication Facility DYBHFLGY	HazMat Facility	A
Communication Facility DYBHFLMN	HazMat Facility	A
Century Link QCC Daytona	HazMat Facility	A
MCI Facility FLDAYFDL	HazMat Facility	A
Sprint Cell Site FL3134	HazMat Facility	A
Sprint Pop Site	HazMat Facility	A
Conrad Yelvington Distributors	HazMat Facility	A
FAA DAB ATCT	HazMat Facility	AE
Decorative Electro Coatings	HazMat Facility	A
Wastewater Treatment Plant	HazMat Facility	A
Daytona Beach Fire Station 1	Fire Station	A
Daytona Beach Fire Station 6	Fire Station	AE
Daytona Beach Public Works	Government	AE
Fifth District Court of Appeal	Government	AE
Sunrise Surgical Center	Medical	A
Bethune Cookman College	School	A
Champion Elementary School	School	A
Father Lopez High School	School	A
Turie T Small Elementary School	School	A
Word and Praise Chr. Learning Ctr.	School	A
Daytona Electric Substation	Utility	A
Halifax Wrecking Company	Waste Facility	A
Florida Rock Daytona	Waste Facility	A

Floodplain Exposure Analysis

Percent of Parcels in the Floodplain 49.6%
 Buildings in the Floodplain 8,770

Exposed Acreage: Residential Future Land Use 7,802
 Exposed Acreage: Commercial Future Land Use 1,188
 Exposed Acreage: Mixed Use Future Land Use 882
 Exposed Acreage: Industrial Future Land Use 968
 Exposed Acreage: PD Future Land Use -
 Exposed Acreage: Institutional Future Land Use 309

Total Exposure: Land Value \$1,031,935,148
 Total Exposure: Building Value \$2,492,556,826
 Total Exposure: Assessed Value \$3,626,954,919
 Total Exposure: Taxable Value \$2,317,906,555

Daytona Beach Shores



Floodplain Management Goals and Objectives

Goal: Prevent new development in the floodplain from increasing runoff and resulting in increases in flood volumes in the floodplain.

- Objective 1.1 Enforce building requirements from the National Flood Insurance Program and not allow variances that are feasibly avoidable.
- Objective 1.2 Prevent new development in the floodplain.
- Objective 1.3 Minimize flood hazards and protect water quality by employing approaches that balance environmental, economic, and engineering considerations.
- Objective 1.4 Protect environmentally sensitive lands to maximize their inherent mitigation attributes and reduce known flood hazards where appropriate and financially feasible.
- Objective 1.5 Reduce flood exposure and maximize flood protection efforts.

Goal: Develop and maintain a proactive public awareness and outreach that informs and notifies property owners that they are located in a flood zone and provides assistance and information regarding flood zones, protection of property, local drainage and sewer back-up problems.

- Objective 2.1 Create easily accessible information to educate residents about the hazards, loss reduction measures, and the natural and beneficial functions of floodplains.
- Objective 2.2 Encourage land and water uses compatible with the protection of environmentally sensitive lands and coastal resources.
- Objective 2.3 Review the adequacy and completeness of emergency procedures that address catastrophic flood events.
- Objective 2.4 Minimize impacts from flooding in FEMA designated special flood hazard areas (i.e. flood zones starting with the letters "V" or "A") where financially feasible.
- Objective 2.5 Build a constituency that desires to see the plan's recommendations implemented.

Goal: Continue with the Hazard Mitigation Grant Program to identify and obtain funding for both pre-and-post disaster residential mitigation projects regarding flooding.

- Objective 3.1 Identify various flood mitigation grants that may assist residences located in the floodplain.
- Objective: Utilize "Volusia Prepares" Local Mitigation Strategy to guide and assist in establishing priorities for hazard mitigation projects.

Goal: Reduce the number of repetitive loss properties within Volusia County.

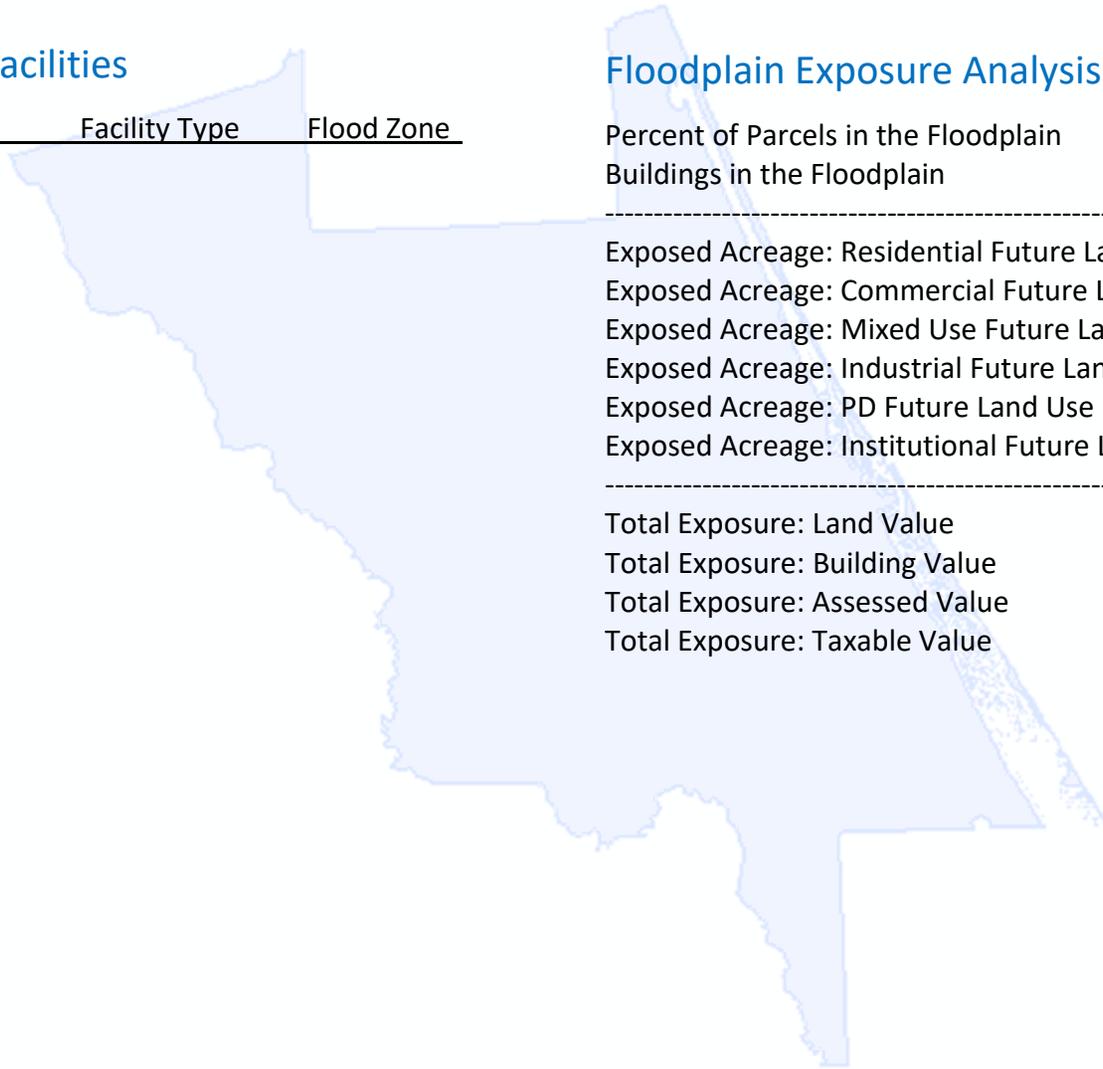
Goal: Review the locations and effects on areas that experience flooding and determine what steps, if any, the City can take to alleviate future impacts.

- Objective 5.1 Maintain a database of flood problems and hazards, mitigation and repetitive loss claim history.
- Objective 5.2 Build public and political support for projects that prevent new problems, reduce losses, and protect the natural and beneficial functions of floodplains.
- Objective 5.3 Prioritize capital projects that will mitigate flood impacts in areas of the City that have experienced significant flooding problems.

Daytona Beach Shores

Exposed Critical Facilities

Facility Name	Facility Type	Flood Zone
None		



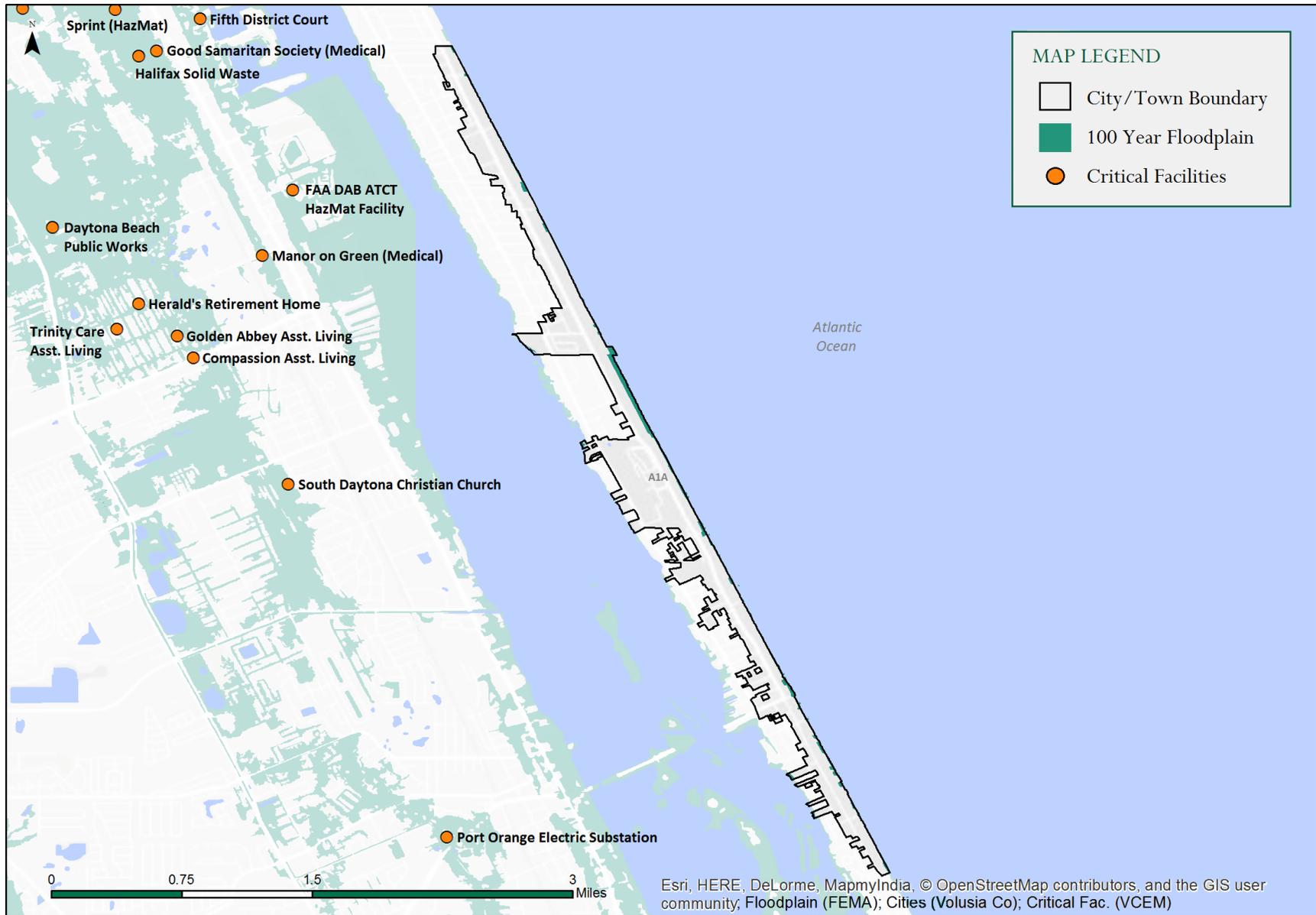
Floodplain Exposure Analysis

Percent of Parcels in the Floodplain	74.9%
Buildings in the Floodplain	132

Exposed Acreage: Residential Future Land Use	27
Exposed Acreage: Commercial Future Land Use	-
Exposed Acreage: Mixed Use Future Land Use	-
Exposed Acreage: Industrial Future Land Use	-
Exposed Acreage: PD Future Land Use	-
Exposed Acreage: Institutional Future Land Use	0.1

Total Exposure: Land Value	\$408,090,848
Total Exposure: Building Value	\$995,734,555
Total Exposure: Assessed Value	\$1,442,221,431
Total Exposure: Taxable Value	\$1,332,476,443

Jurisdiction Map: Critical Facilities within the 100-Year Floodplain





DeBary

Floodplain Management Goals and Objectives

Goal: Manage storm water runoff and the preservation of water resources.

- Objective: Alleviate downstream flood hazards
- Objective: Prevent significant loss of life and property due to runoff from any foreseeable rainfall event
- Objective: Reduce the capital expenditure associated with flood-proofing and the installation and maintenance of storm drainage systems.

Goal: Promote the public health, safety and general welfare and to minimize public and private losses due to flood conditions in specific areas.

- Objective: Protect human life, health and to eliminate or minimize property damage
- Objective: Minimize expenditure of public money for costly flood control projects
- Objective: Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public
- Objective: Maintain a stable tax base by providing for the sound use and development of flood-prone areas in such a manner as to minimize flood blight areas.
- Objective: Ensure that potential homebuyers are notified that property is in a flood hazard area.

DeBary

Exposed Critical Facilities

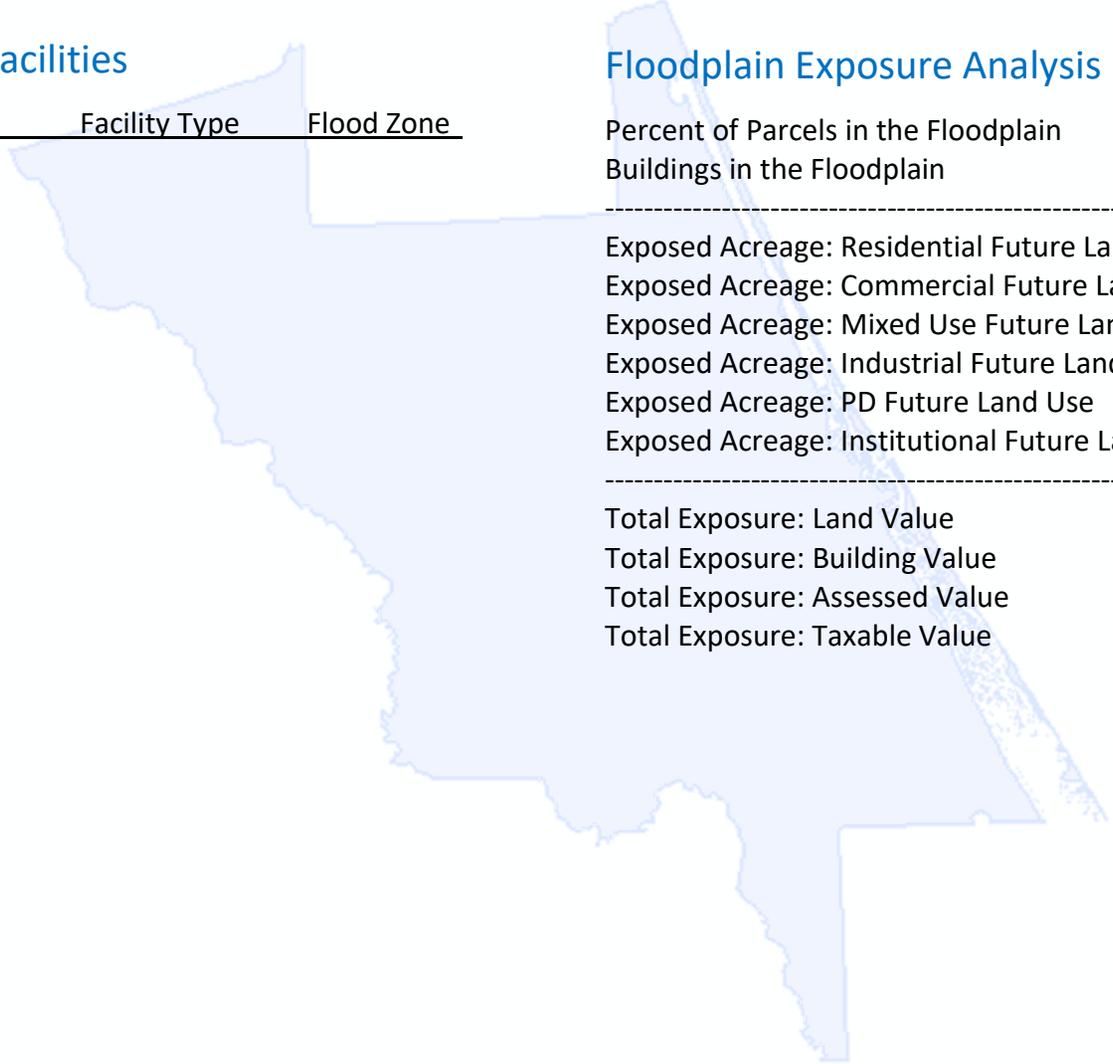
Facility Name	Facility Type	Flood Zone
None		

Floodplain Exposure Analysis

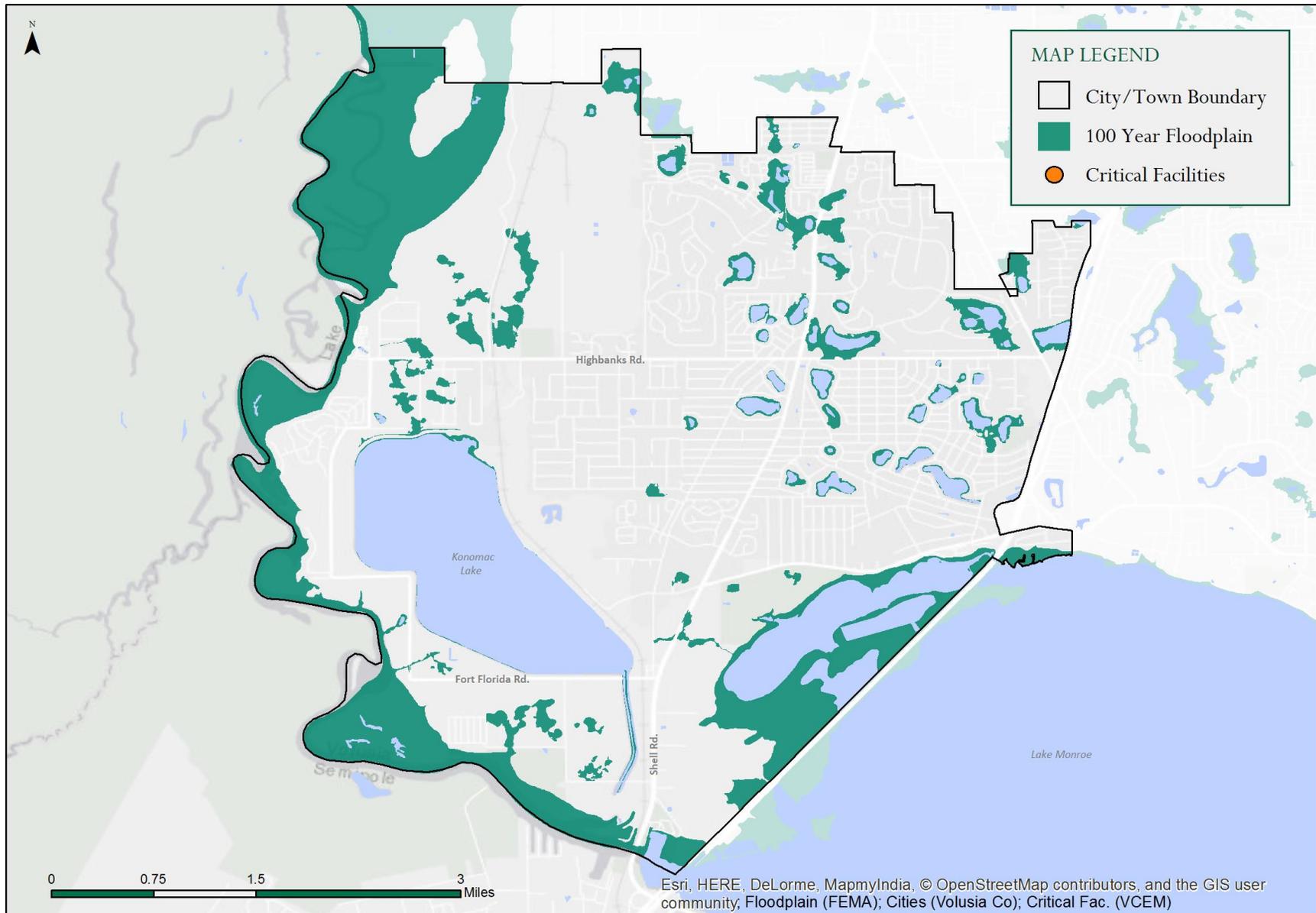
Percent of Parcels in the Floodplain	14.2%
Buildings in the Floodplain	1,095

Exposed Acreage: Residential Future Land Use	269
Exposed Acreage: Commercial Future Land Use	61
Exposed Acreage: Mixed Use Future Land Use	73
Exposed Acreage: Industrial Future Land Use	147
Exposed Acreage: PD Future Land Use	-
Exposed Acreage: Institutional Future Land Use	65

Total Exposure: Land Value	\$93,671,202
Total Exposure: Building Value	\$162,003,662
Total Exposure: Assessed Value	\$263,763,736
Total Exposure: Taxable Value	\$191,512,792



Jurisdiction Map: Critical Facilities within the 100-Year Floodplain



DeLand



Floodplain Management Goals and Objectives

Goal 1: Minimize public and private losses due to flood conditions in specific areas.

- Objective 1.1: Prioritize and implement capital projects to alleviate known drainage and flooding problems.
- Objective 1.2: Maintain existing storm water facilities to function near optimal capacity.
- Objective 1.3: Sweep streets to maintain positive visual appearance and to prevent build-up of debris in storm systems within City right of way.
- Objective 1.4: Maintain storm water pump stations and standby generators in good condition at all times

Goal 2: Provide adequate funding for construction of storm water system improvements and operation and maintenance of existing systems

- Objective 2.1: Obtain revenue from all storm water system users by collection of utility fees accessed in proportion to benefit derived.
- Objective 2.2: Analyze and adjust storm water utility rates as necessary to fund priority capital projects and operating expenses.

Goal 3: Regulate new development and redevelopment to reduce or eliminate increases in flood volumes and additional flooding conditions.

- Objective 3.1: Enforce building requirements from the National Flood Insurance Program
- Objective 3.2: Prevent new development in the flood plain unless mitigated.
- Objective 3.3: Consider downstream effects of new development and require mitigation as appropriate.
- Objective 3.4: Reduce quantity and improve quality of runoff from developed properties when redeveloped.

DeLand

Exposed Critical Facilities

Facility Name	Facility Type	Flood Zone
DeLand Water Supply Plant	Utility	A

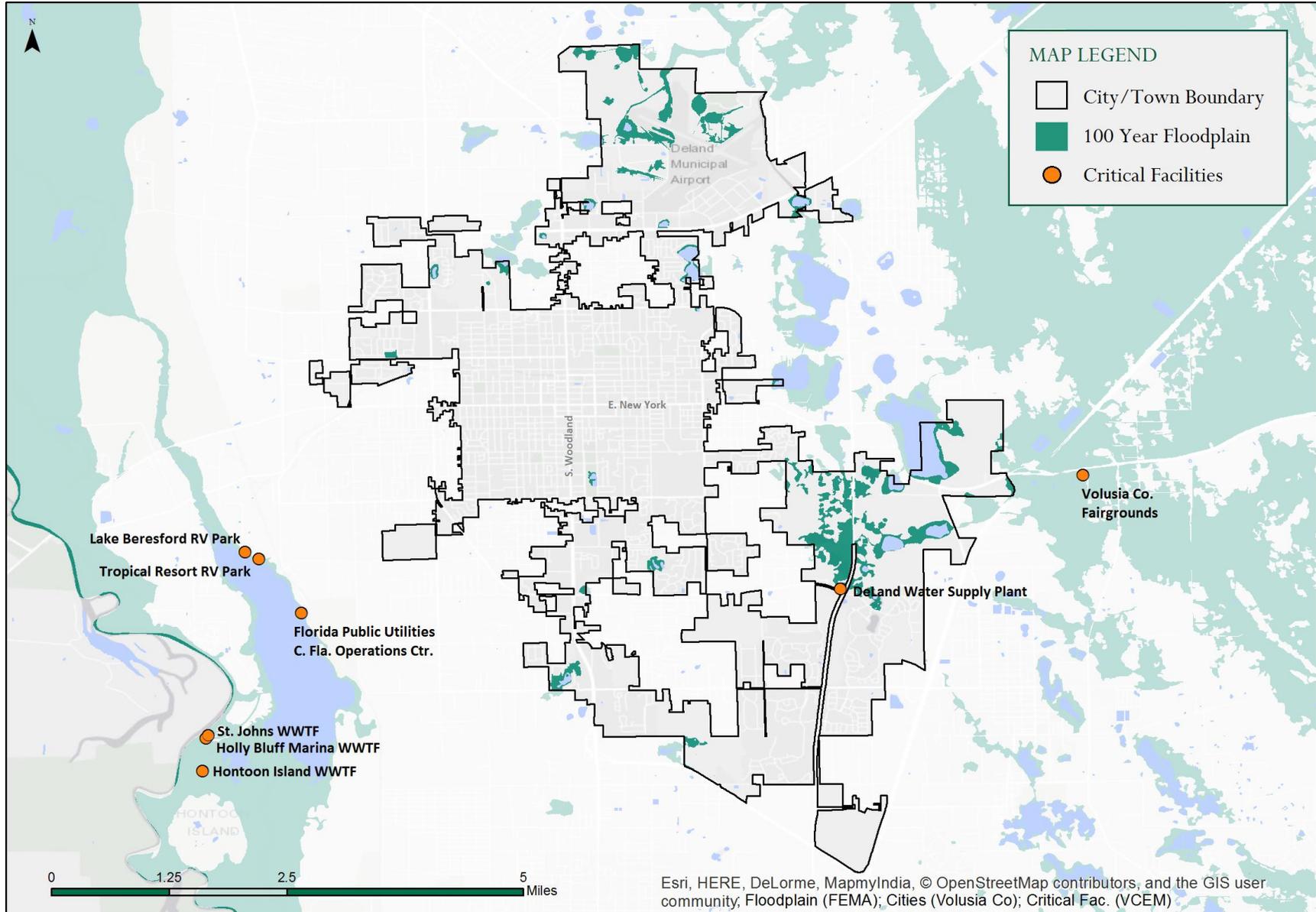
Floodplain Exposure Analysis

Percent of Parcels in the Floodplain	1.6%
Buildings in the Floodplain	121

Exposed Acreage: Residential Future Land Use	302
Exposed Acreage: Commercial Future Land Use	-
Exposed Acreage: Mixed Use Future Land Use	111
Exposed Acreage: Industrial Future Land Use	212
Exposed Acreage: PD Future Land Use	-
Exposed Acreage: Institutional Future Land Use	1

Total Exposure: Land Value	\$36,181,192
Total Exposure: Building Value	\$71,983,599
Total Exposure: Assessed Value	\$112,726,316
Total Exposure: Taxable Value	\$50,845,772

Jurisdiction Map: Critical Facilities within the 100-Year Floodplain



Deltona



Floodplain Management Goals and Objectives

Goal: Protect and appropriately utilize the physical and ecological functions of natural drainage ways and related drainage patterns.

- Objective: The City shall discourage development within any known flood plains as identified by the best available data, such as FEMA flood maps.
- Objective: Development and structures shall be discouraged within the 100-year flood plain; however, if located therein they shall be constructed in a manner that results in a no loss in of existing 100 year floodplain storage and function.
- Objective: If structures are allowed in the 100-year flood plain, development within areas prone to 100 year flooding shall compensate for the full amount of flood storage displacement within the 100 year floodplain and shall not increase expected flood levels for adjacent properties or reduce receiving surface water quality below established levels.
- Objective: The functions of flood plains and other flood prone areas shall be protected by directing development away from such areas. If activities do occur within floodplain or flood prone areas such impacts shall be minimized. In addition, if development does occur within floodplain/prone areas then techniques such as compensating storage and the elevation/design of improvements shall be required to ensure that floodplain functions are protected.

Goal: The City of Deltona shall continue to implement the comprehensive surface and groundwater watershed management plan.

- Objective: On-site sewage disposal systems and associated drain fields shall be discouraged within the flood plain of surface water bodies as provided for in land development regulations, to the extent that such systems are designed and located so as to not contribute to the degradation of ambient water quality as consistent with applicable State regulations.
- Objective: Undisturbed segments of flood plains shall be protected through public acquisition, land use controls, conservation easements, or other methods as appropriate.
- Objective: Proposed structures located within the flood plain of surface water bodies and within flood prone areas, shall be required to utilize building methods as provided in land development regulations, to the extent that fill material required for construction or other impervious surfaces will not reduce the ability of the floodplains to store and convey floodwaters, or degrade the natural physical and biological functions of protected habitat without approved mitigation. Impacts of fill in the floodplains and flood prone areas shall be considered both sites specifically and cumulatively. 9J-5.013(2)(c)(9)
- Objective: Dwelling unit densities shall not be increased within the flood plains of surface water bodies and in other flood prone areas as provided for in land development regulations, and per Florida Statute in that allowable densities do not create potential flood hazards, or degrade the natural functions of the flood plain. Dwelling unit density determinations in the floodplain shall consider both site specific and cumulative impacts.

Goal: Protect and appropriately utilize the physical and ecological functions of natural drainage ways and related drainage patterns.

Deltona

Exposed Critical Facilities

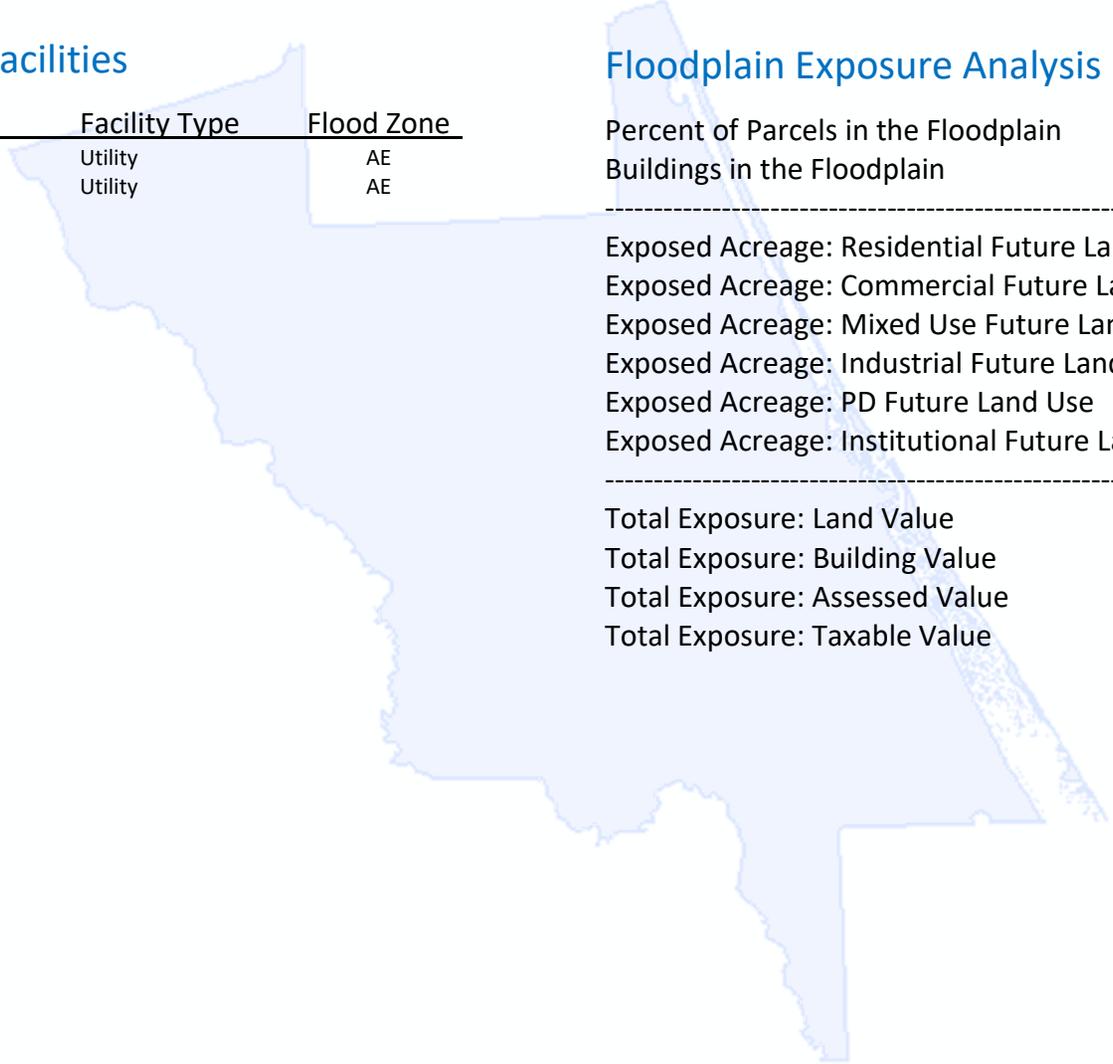
Facility Name	Facility Type	Flood Zone
Deltona Water Plant	Utility	AE
TAP Electric Substation	Utility	AE

Floodplain Exposure Analysis

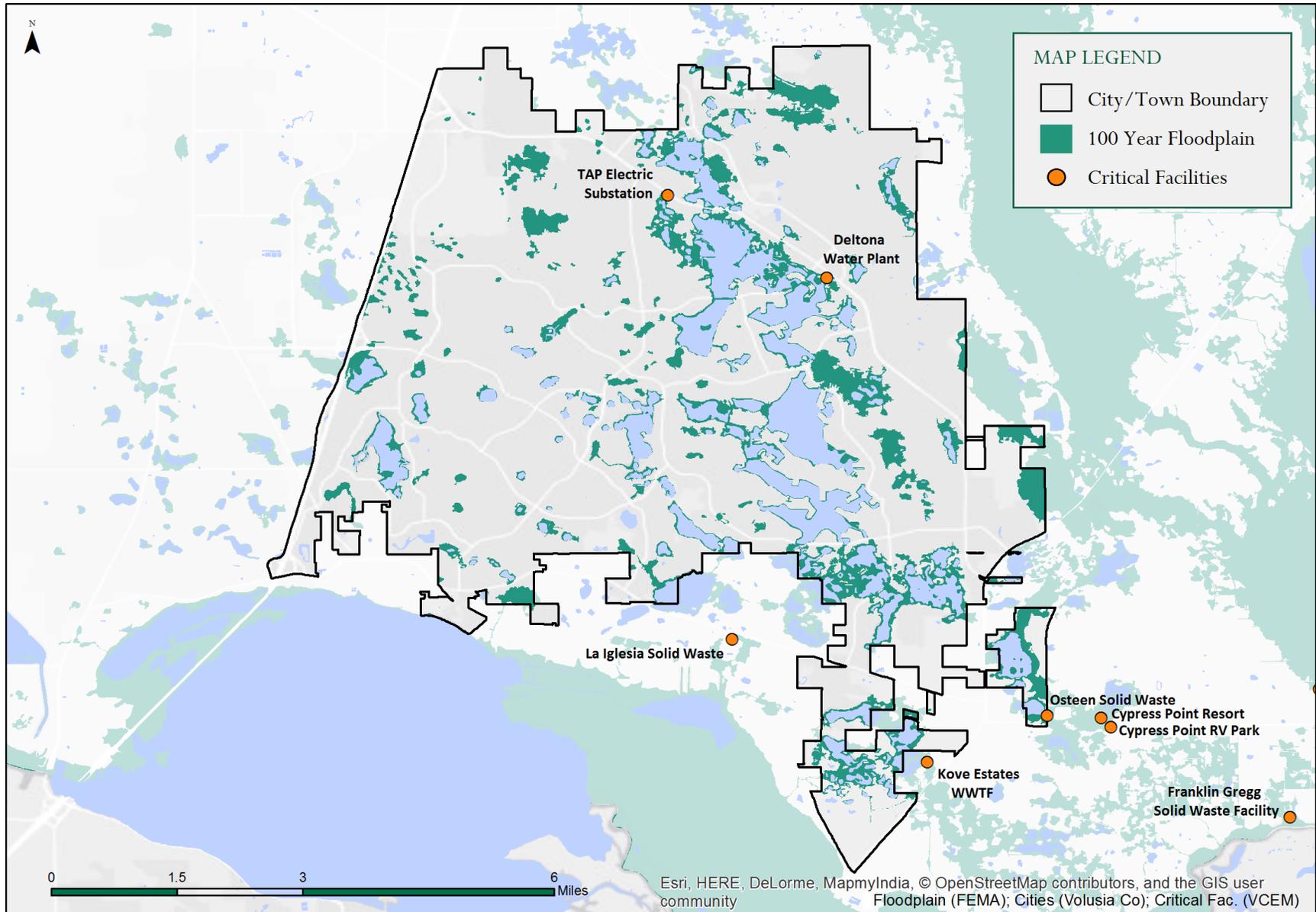
Percent of Parcels in the Floodplain	14.5%
Buildings in the Floodplain	4,524

Exposed Acreage: Residential Future Land Use	3,547
Exposed Acreage: Commercial Future Land Use	16
Exposed Acreage: Mixed Use Future Land Use	1,982
Exposed Acreage: Industrial Future Land Use	-
Exposed Acreage: PD Future Land Use	-
Exposed Acreage: Institutional Future Land Use	57

Total Exposure: Land Value	\$122,580,488
Total Exposure: Building Value	\$563,266,460
Total Exposure: Assessed Value	\$711,052,496
Total Exposure: Taxable Value	\$398,048,314



Jurisdiction Map: Critical Facilities within the 100-Year Floodplain



Edgewater



Floodplain Management Goals and Objectives

Goal: Continue to maintain a floodplain management ordinance, which includes the development standards required for participation in the National Flood Insurance Program.

- Objective: New construction, or substantial improvement, of any residential structure shall have the lowest floor, including basement, elevated no less than one foot (1') above the base flood elevation or crown of the paved road whichever is greater, or 16 inches (16") above an unpaved road.
- Objective: Plans and designs for subdivisions shall minimize potential flood damage by locating recreation and conservation uses, if included in the plans, to areas within the Flood Zone, reserving as much land as possible outside the flood zone for other land uses. Flood zones shall be identified on all final development plans submitted to the City.

Goal: Strongly discourage development within flood prone areas is strongly discouraged and mitigate any adverse impacts to the surrounding area that may be related to drainage, public health or public safety.

- Objective: Encroachments within the published flood way will not be approved under any circumstances.
- Objective: Compensatory storage for 100-year flood plain encroachments shall be provided in accordance with the City requirements.
- Objective: Projects located near the coast should evaluate any flooding effects associated with both storm surge (FEMA Zones V and VE) and the freshwater flood (FEMA Zones A, AE, AH and AO).

Goal: Protect the natural function and values of the 100-year floodplain.

- Objective: 100-year floodplain shall be given high priority in the selection of conservation areas within the City and for public acquisition of lands for conservation and recreational purposes.
- Objective: Development within the 100 Year Floodplain shall provide necessary mitigation to maintain the natural storm water flow regime.
- Objective: All new construction and substantial improvements of existing construction shall be constructed with materials and utility equipment resistant to flood damage, and using methods and practices that will minimize flood damage and prevent the pollution of surface waters during a 100 year flood event.

Goal: Limit development in the Coastal High Hazard Area and direct population concentrations away from this area.

- Objective: No new public facilities shall be located in the Coastal High Hazard Areas other than those necessary to support the levels of service identified in the Capital Improvement Element and for overriding health and safety reasons.
- Objective: By December 2014, the City shall identify areas in the Coastal High Hazard Area needing redevelopment, including eliminating unsafe conditions and inappropriate uses as opportunities arise.
- Objective: No future land use amendments shall be approved within the Coastal High Hazard Area which will increase the previously permitted density.

Edgewater

Exposed Critical Facilities

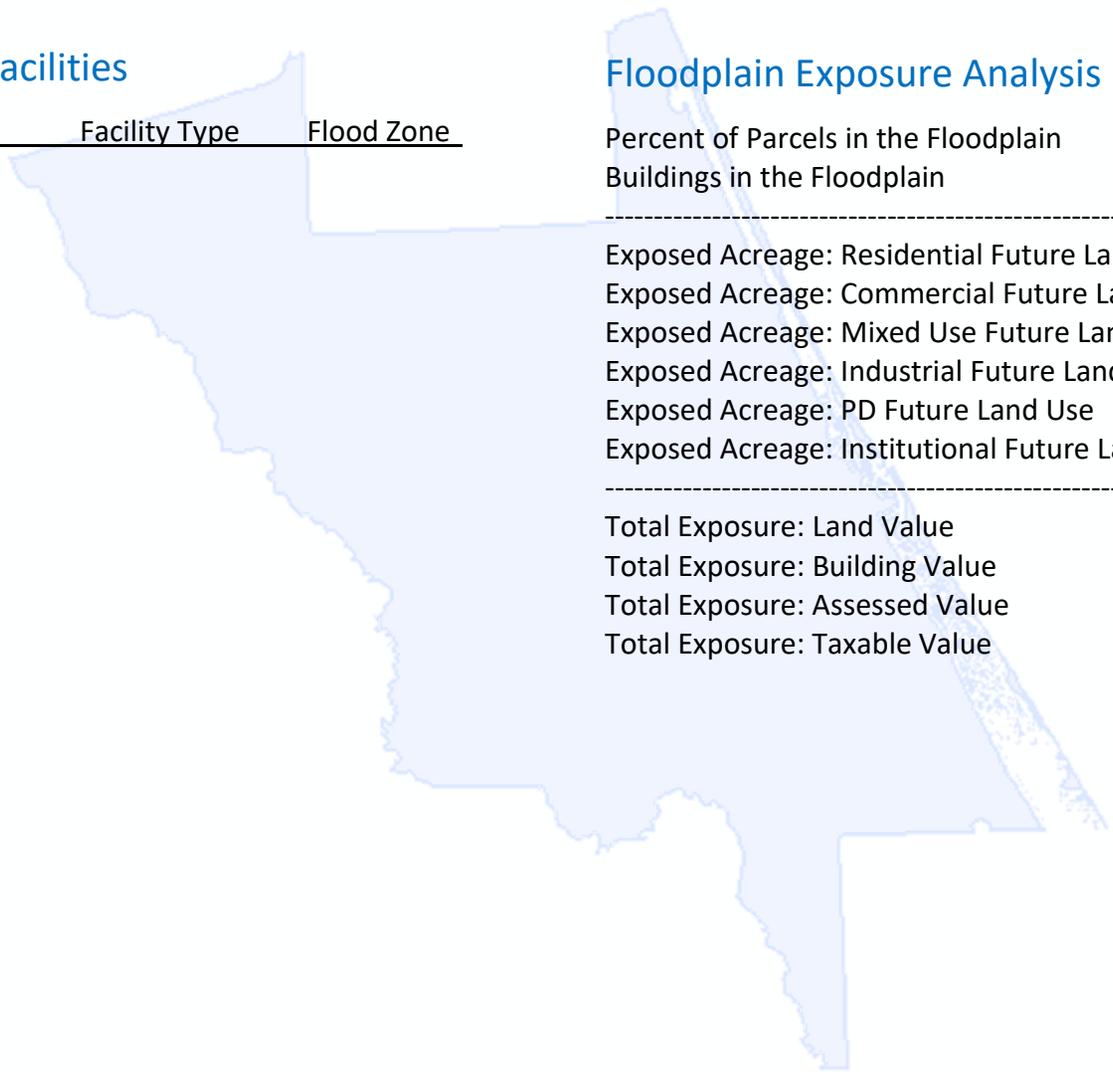
Facility Name	Facility Type	Flood Zone
None		

Floodplain Exposure Analysis

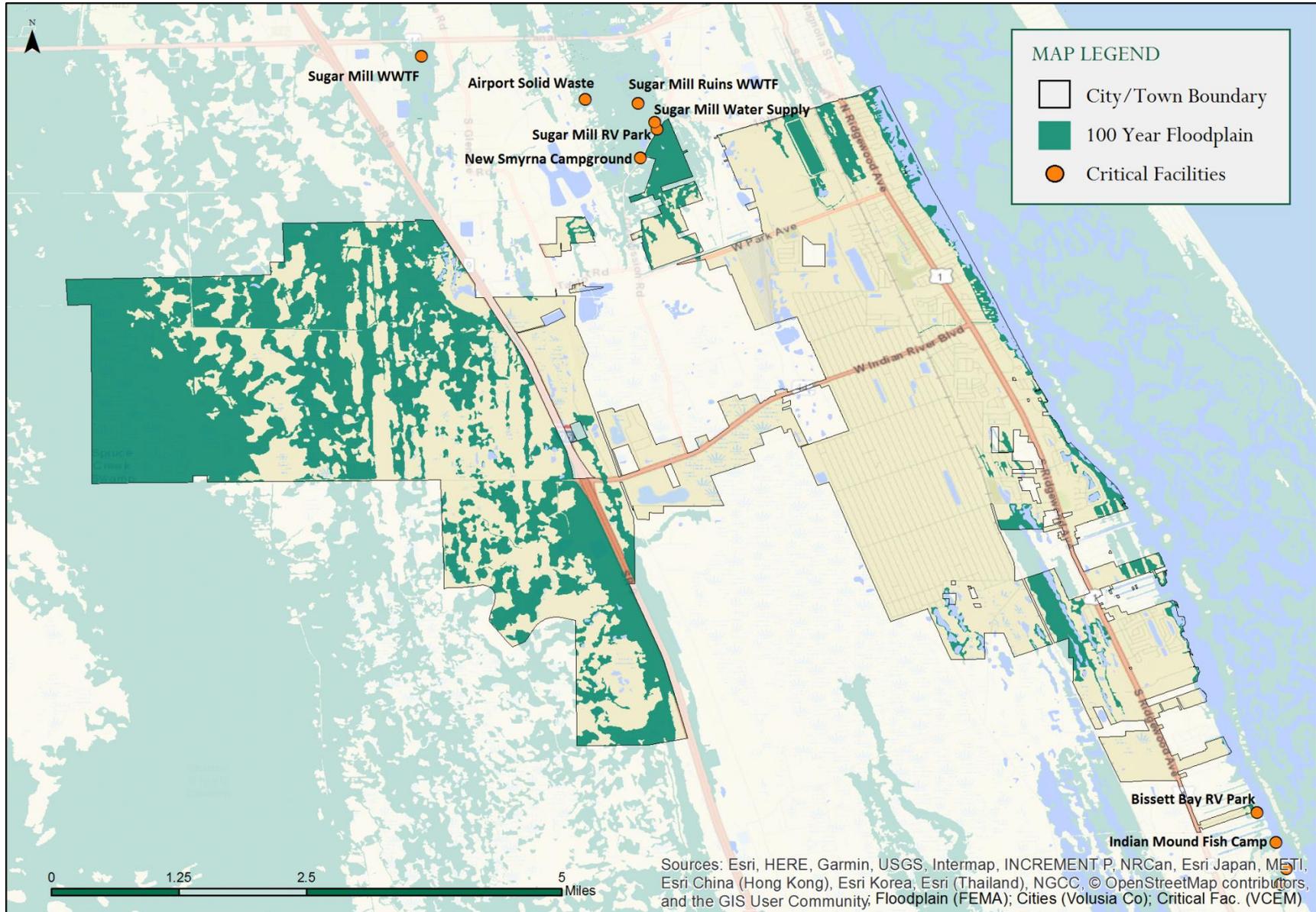
Percent of Parcels in the Floodplain	8.0%
Buildings in the Floodplain	644

Exposed Acreage: Residential Future Land Use	446
Exposed Acreage: Commercial Future Land Use	16
Exposed Acreage: Mixed Use Future Land Use	1,982
Exposed Acreage: Industrial Future Land Use	86
Exposed Acreage: PD Future Land Use	-
Exposed Acreage: Institutional Future Land Use	57

Total Exposure: Land Value	\$131,100,527
Total Exposure: Building Value	\$108,511,438
Total Exposure: Assessed Value	\$244,402,829
Total Exposure: Taxable Value	\$161,654,623



Jurisdiction Map: Critical Facilities within the 100-Year Floodplain





Holly Hill

Floodplain Management Goals and Objectives

Goal: Safeguard the public health, safety and general welfare and to minimize public and private losses due to flooding through regulation of development in flood hazard areas.

- Objective: Minimize unnecessary disruption of commerce, access and public service during times of flooding
- Objective: require the use of appropriate construction practices in order to prevent or minimize future flood damage
- Objective: Manage filling, grading, dredging, mining, paving, excavation, drilling operations, storage of equipment or materials and other development which may increase flood damage or erosion potential
- Objective: Manage the alteration of flood hazard areas, watercourses and shorelines to minimize the impact of development on the natural and beneficial functions of the floodplain
- Objective: Minimize damage to public and private facilities and utilities
- Objective: Help maintain a stable tax base by providing for the sound use and development of flood hazard areas
- Objective: Minimize the need for future expenditure of public funds for flood control projects and response to and recovery from flood events
- Objective: Meet the requirements of the National Flood Insurance Program for community participation as set forth in the Title 44 Code of Federal Regulations, Section 59.22

Holly Hill

Exposed Critical Facilities

Facility Name	Facility Type	Flood Zone
Amerigas Propane	HazMat Facility	AE
Level 3 Communication Tower	HazMat Facility	AE
Gorman Holly Hill	HazMat Facility	AE
Metra Electronics	HazMat Facility	AE
Commercial Chemical Products	HazMat Facility	AE
Product Quest MFG	HazMat Facility	A
Holly Hill Electric Substation	Utility	AE
Holly Hill Wastewater Facility	Waste Facility	AE
VCUD Wastewater Facility	Waste Facility	AE

Floodplain Exposure Analysis

Percent of Parcels in the Floodplain	51.0%
Buildings in the Floodplain	2,102

Exposed Acreage: Residential Future Land Use	450
Exposed Acreage: Commercial Future Land Use	24
Exposed Acreage: Mixed Use Future Land Use	0.3
Exposed Acreage: Industrial Future Land Use	142
Exposed Acreage: PD Future Land Use	-
Exposed Acreage: Institutional Future Land Use	10

Total Exposure: Land Value	\$112,732,648
Total Exposure: Building Value	\$315,339,218
Total Exposure: Assessed Value	\$433,456,264
Total Exposure: Taxable Value	\$342,878,826

Jurisdiction Map: Critical Facilities within the 100-Year Floodplain



Lake Helen



Floodplain Management Goals and Objectives

There are no additional goals to the countywide goals stated in the report.



Lake Helen

Exposed Critical Facilities

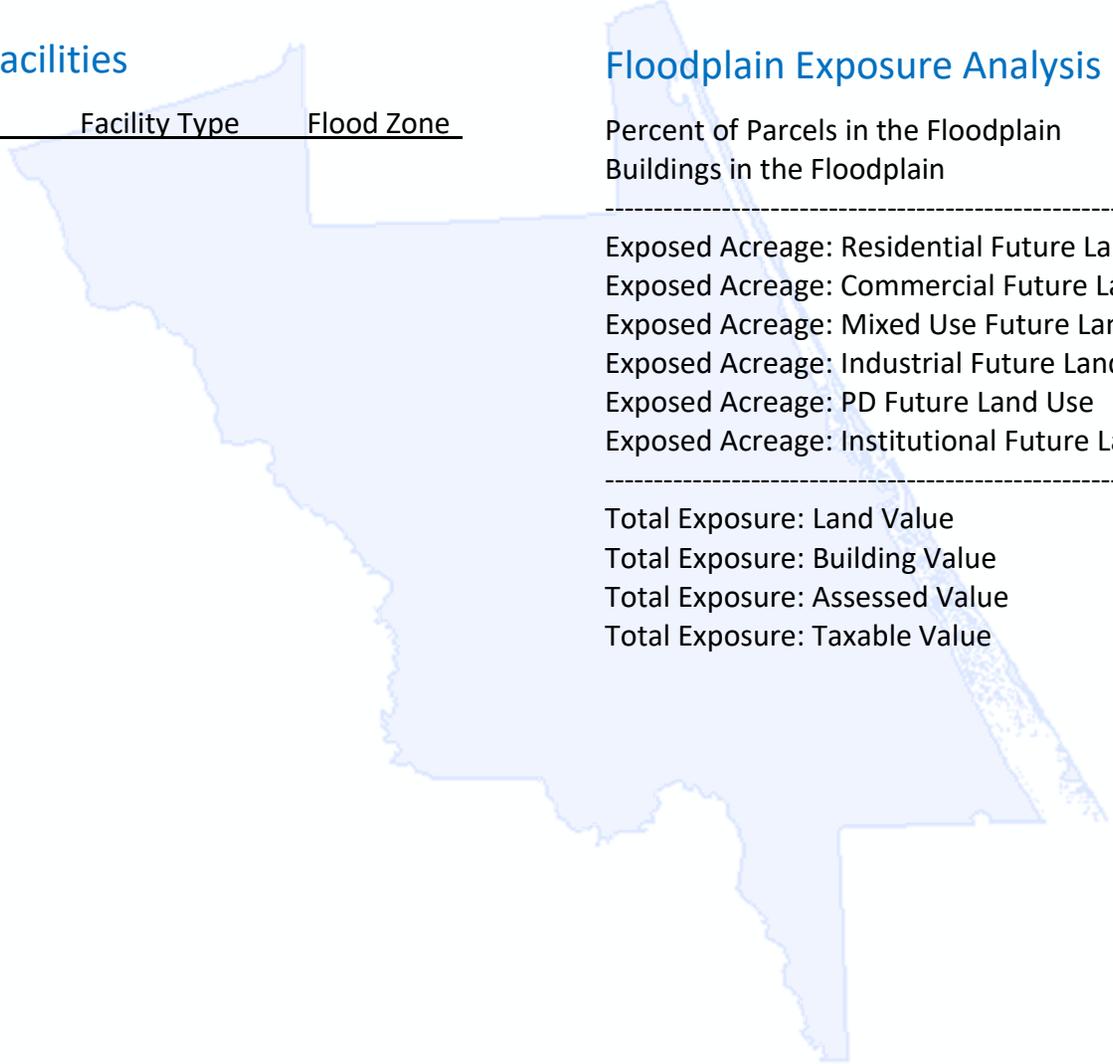
Facility Name	Facility Type	Flood Zone
None		

Floodplain Exposure Analysis

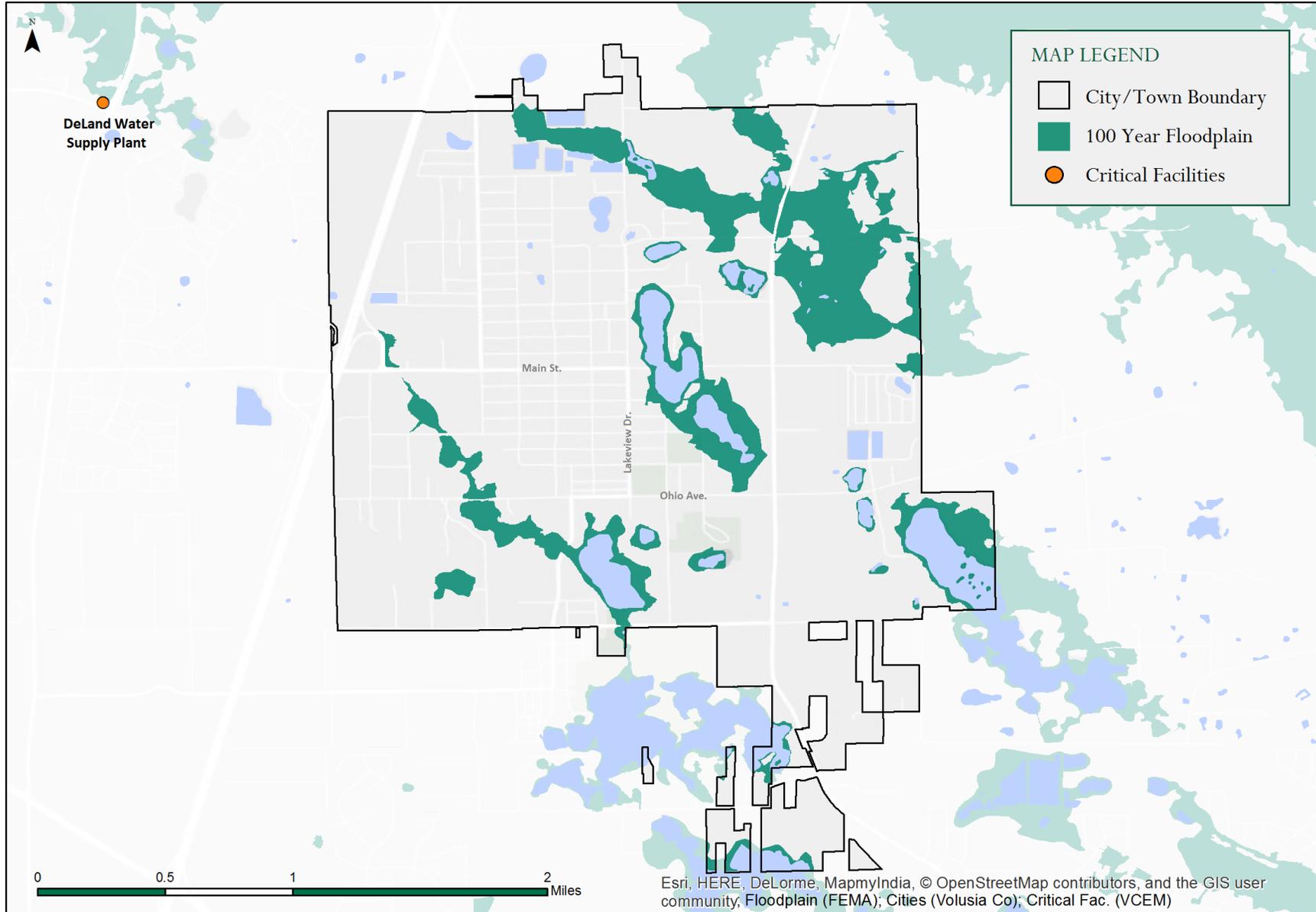
Percent of Parcels in the Floodplain	16.9%
Buildings in the Floodplain	140

Exposed Acreage: Residential Future Land Use	200
Exposed Acreage: Commercial Future Land Use	-
Exposed Acreage: Mixed Use Future Land Use	10
Exposed Acreage: Industrial Future Land Use	2
Exposed Acreage: PD Future Land Use	-
Exposed Acreage: Institutional Future Land Use	5

Total Exposure: Land Value	\$14,937,971
Total Exposure: Building Value	\$21,641,857
Total Exposure: Assessed Value	\$38,079,497
Total Exposure: Taxable Value	\$23,442,299



Jurisdiction Map: Critical Facilities within the 100-Year Floodplain



New Smyrna Beach



Floodplain Management Goals and Objectives

Goal: Promote the public health, safety and general welfare, and to minimize public and private losses due to flood conditions in specific areas.

- Objective: Maintain the City's Community Rating System Classification;
- Objective: Provide flood protection information to residents;
- Objective: Coordinate and implement small and/or large scale projects to help alleviate drainage and flood concerns;
- Objective: To protect human life, health and to eliminate or minimize property damage;
- Objective: require the use of appropriate construction practices in order to prevent or minimize future flood damage;
- Objective: Manage filling, grading, dredging, mining, paving, excavation, drilling operations, storage of equipment or materials and other development which may increase flood damage or erosion potential;
- Objective: Manage the alteration of flood hazard areas, watercourses and shorelines to minimize the impact of development on the natural and beneficial functions of the floodplain;
- Objective: To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
- Objective: To minimize prolonged business interruptions;
- Objective: To minimize damage to public facilities and utilities, such as water and gas mains, electric, telephone and sewer lines, streets, bridges and culverts located in floodplains;
- Objective: To maintain a stable tax base by providing for the sound use and development of flood prone areas in such a manner as to minimize flood blight areas;
- Objective: To endeavor that potential homebuyers are notified that property is in a flood hazard area;
- Objective: To help maintain a stable tax base by providing for the sound use and development of flood prone areas in such a manner as to minimize flood blight areas.

Goal: Create programs to manage the surface water runoff

- Objective: Develop/maintain storm water management plan
- Objective: Develop alternative water supply on western city limits

New Smyrna Beach

Exposed Critical Facilities

Facility Name	Facility Type	Flood Zone
Tiffany on River	Assisted Living	AE
Smyrna West	Assisted Living	AE
Fairgreen Assisted Living	Assisted Living	AE
Little River Manor	Assisted Living	AE
Airport Substation	HazMat Facility	AE
Momentive Performance Materials	HazMat Facility	AE
New Smyrna Beach Solid Waste	Waste Facility	AE

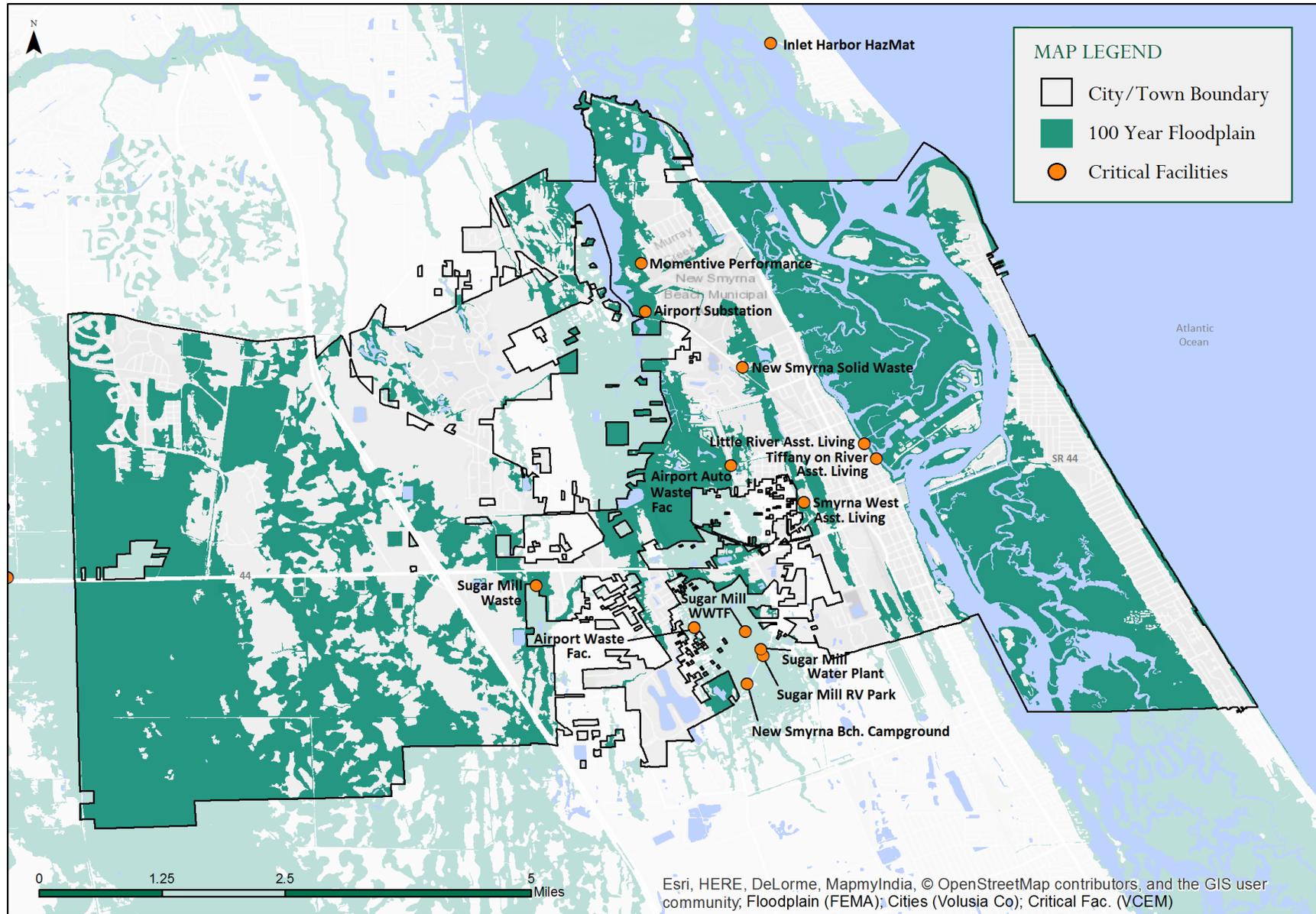
Floodplain Exposure Analysis

Percent of Parcels in the Floodplain	41.5%
Buildings in the Floodplain	3,618

Exposed Acreage: Residential Future Land Use	1,718
Exposed Acreage: Commercial Future Land Use	220
Exposed Acreage: Mixed Use Future Land Use	222
Exposed Acreage: Industrial Future Land Use	180
Exposed Acreage: PD Future Land Use	1,873
Exposed Acreage: Institutional Future Land Use	23

Total Exposure: Land Value	\$926,691,147
Total Exposure: Building Value	\$1,409,897,440
Total Exposure: Assessed Value	\$2,402,551,188
Total Exposure: Taxable Value	\$1,928,001,263

Jurisdiction Map: Critical Facilities within the 100-Year Floodplain



Oak Hill



Floodplain Management Goals and Objectives

There are no additional goals to the countywide goals stated in the report.



Oak Hill

Exposed Critical Facilities

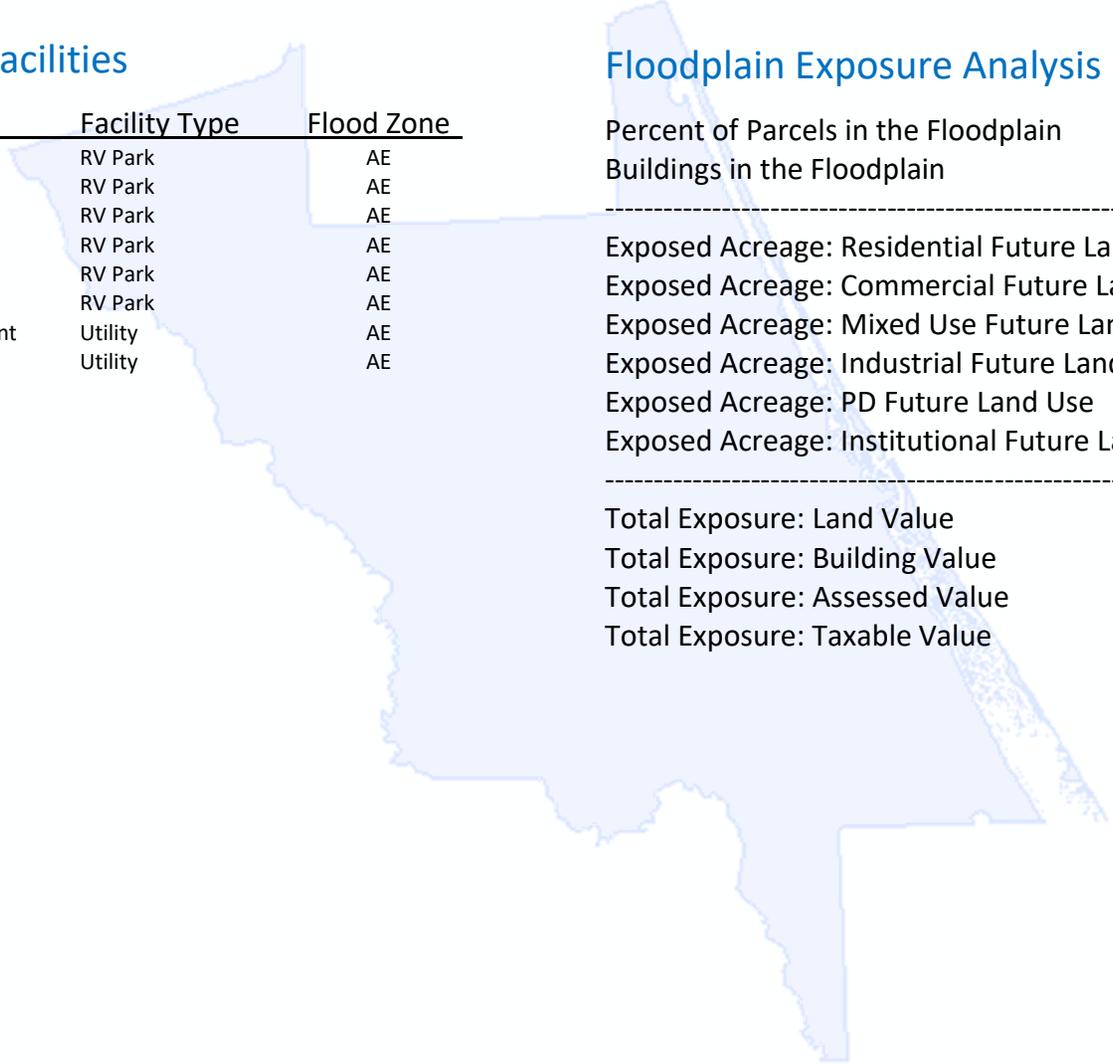
Facility Name	Facility Type	Flood Zone
Castaway Lagoon	RV Park	AE
Jackson Hole Park	RV Park	AE
Lopez RV Park	RV Park	AE
Indian Mound Fish Camp	RV Park	AE
Mosquito Lagoon RV Park	RV Park	AE
Travis RV Park	RV Park	AE
Noel's Mobile Home Water Plant	Utility	AE
Riverwood Park Water Plant	Utility	AE

Floodplain Exposure Analysis

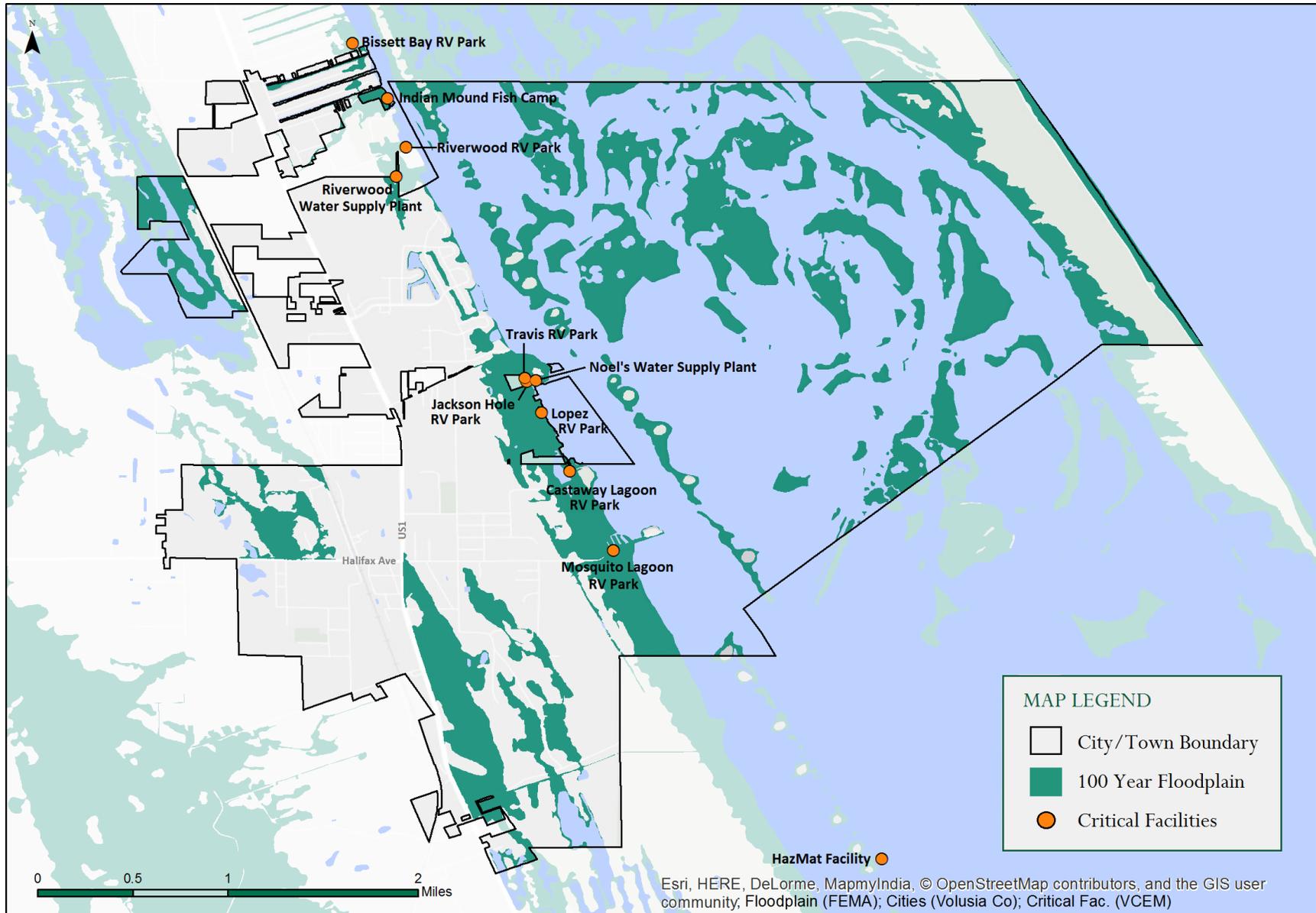
Percent of Parcels in the Floodplain	34.8%
Buildings in the Floodplain	399

Exposed Acreage: Residential Future Land Use	227
Exposed Acreage: Commercial Future Land Use	54
Exposed Acreage: Mixed Use Future Land Use	182
Exposed Acreage: Industrial Future Land Use	-
Exposed Acreage: PD Future Land Use	-
Exposed Acreage: Institutional Future Land Use	13

Total Exposure: Land Value	\$67,278,856
Total Exposure: Building Value	\$36,099,228
Total Exposure: Assessed Value	\$106,502,626
Total Exposure: Taxable Value	\$61,701,575



Jurisdiction Map: Critical Facilities within the 100-Year Floodplain



Orange City

Floodplain Management Goals and Objectives

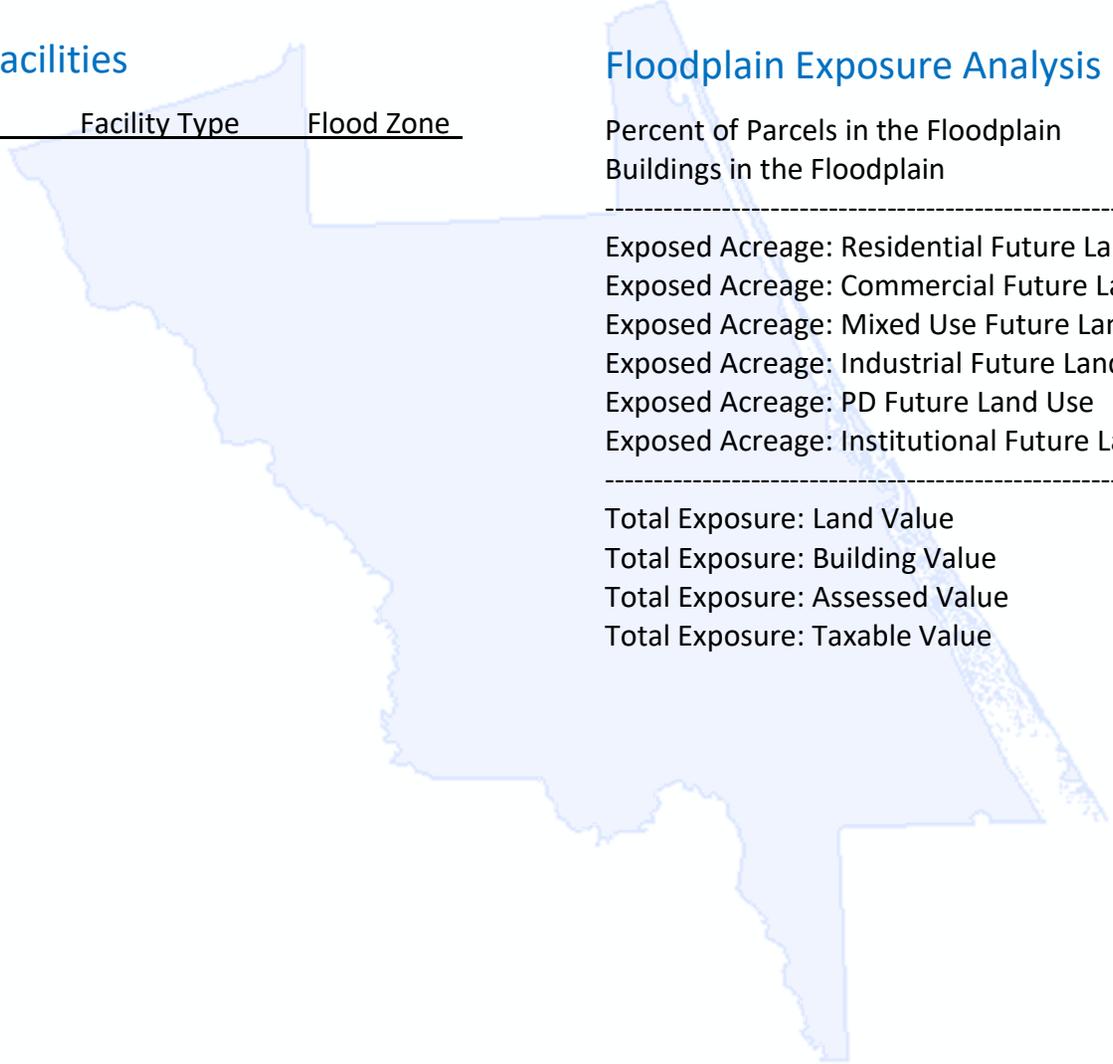
There are no additional goals to the countywide goals stated in this report.



Orange City

Exposed Critical Facilities

Facility Name	Facility Type	Flood Zone
None		



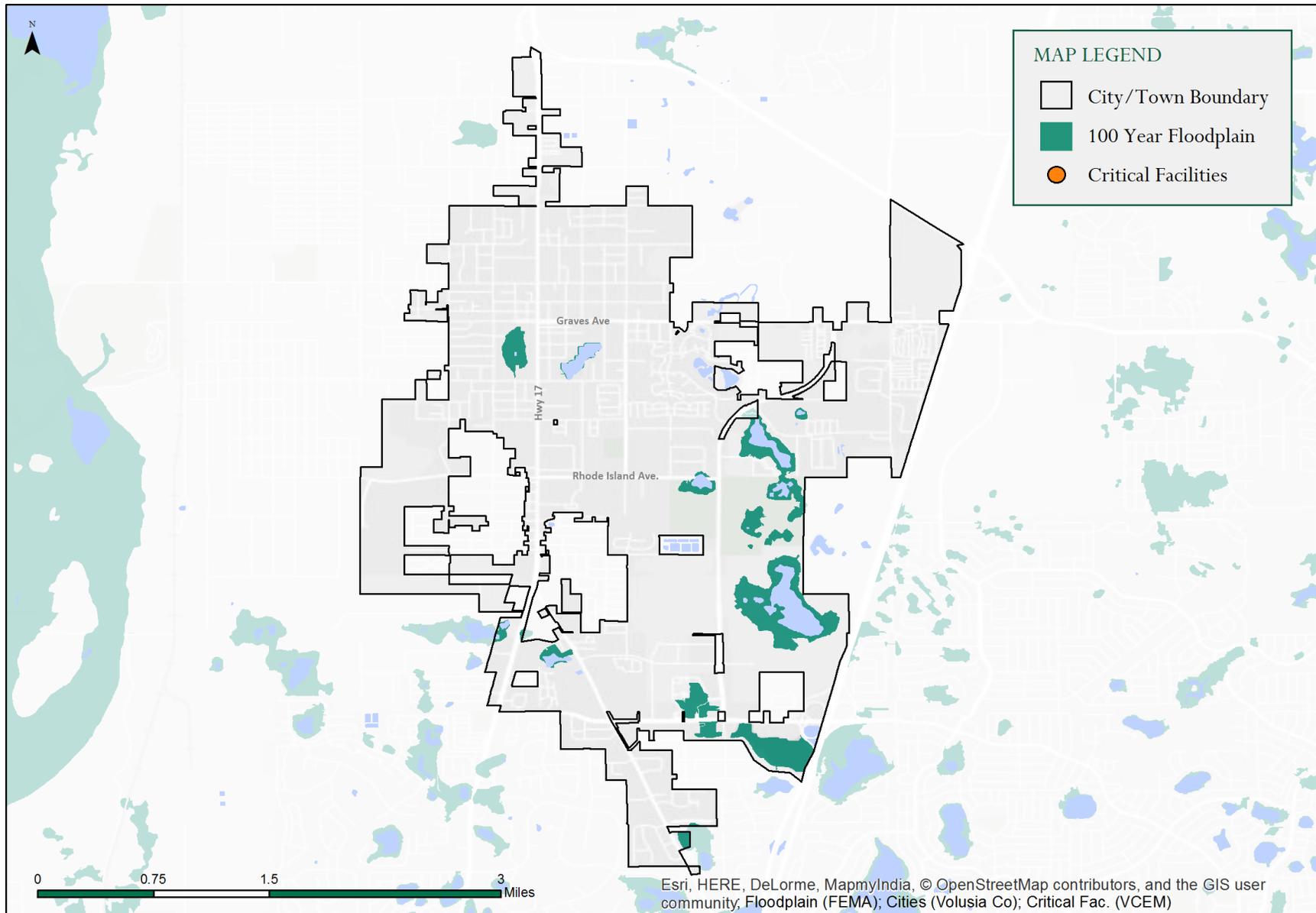
Floodplain Exposure Analysis

Percent of Parcels in the Floodplain	1.8%
Buildings in the Floodplain	33

Exposed Acreage: Residential Future Land Use	6
Exposed Acreage: Commercial Future Land Use	25
Exposed Acreage: Mixed Use Future Land Use	49
Exposed Acreage: Industrial Future Land Use	0.6
Exposed Acreage: PD Future Land Use	-
Exposed Acreage: Institutional Future Land Use	38

Total Exposure: Land Value	\$27,650,938
Total Exposure: Building Value	\$85,525,073
Total Exposure: Assessed Value	\$116,356,750
Total Exposure: Taxable Value	\$80,042,861

Jurisdiction Map: Critical Facilities within the 100-Year Floodplain



Ormond Beach



Floodplain Management Goals and Objectives

Goal: Promote the public health, safety and general welfare, and to minimize public and private losses due to flooding through the regulation of development in flood hazard areas.

- Objective: Protect human life and health;
- Objective: Minimize or eliminate property damage;
- Objective: Minimize the need for future expenditure of public money for costly flood control projects and response to and recovery from flood events;
- Objective: Minimize unnecessary disruption of commerce, access and public service during times of flooding; Objective: Minimize damage to public and private facilities and utilities located in areas of special flood hazard;
- Objective: Help maintain a stable tax base by providing for the sound use and development of flood hazard area;
- Objective: Ensure that potential buyers are notified that property is in an area of special flood hazard;
- Objective: Require the use of appropriate construction practices in order to prevent or minimize future flood damage; and
- Objective: Manage the alteration of flood hazard areas, watercourses, and shorelines to minimize the impact of development on the natural and beneficial functions of the floodplain.

Ormond Beach

Exposed Critical Facilities

Facility Name	Facility Type	Flood Zone
Seasons by Riviera	Assisted Living	AE
Southland Suites	Assisted Living	AE
Evergreen Assisted Living Facility	Assisted Living	A
Horizon Assisted Living Facility	Assisted Living	AH
Brookdale Ormond Beach West	Assisted Living	AE
CEMEX Ready Mix Plant	HazMat Facility	AE
Florida Power & Light Substation	HazMat Facility	A
Ormond Beach Fleet Operations	HazMat Facility	AE
Coquina Center	Medical	AE
Fleming Electric Substation	Utility	A
Ormond Electric Substation	Utility	AE
Ormond Solid Waste Transfer Facility	Waste Facility	AE
Daprile Property Solid Waste	Waste Facility	A
CEMEX Construct Materials Facility	Waste Facility	AE
Wastewater Treatment Plant	Waste Facility	AE

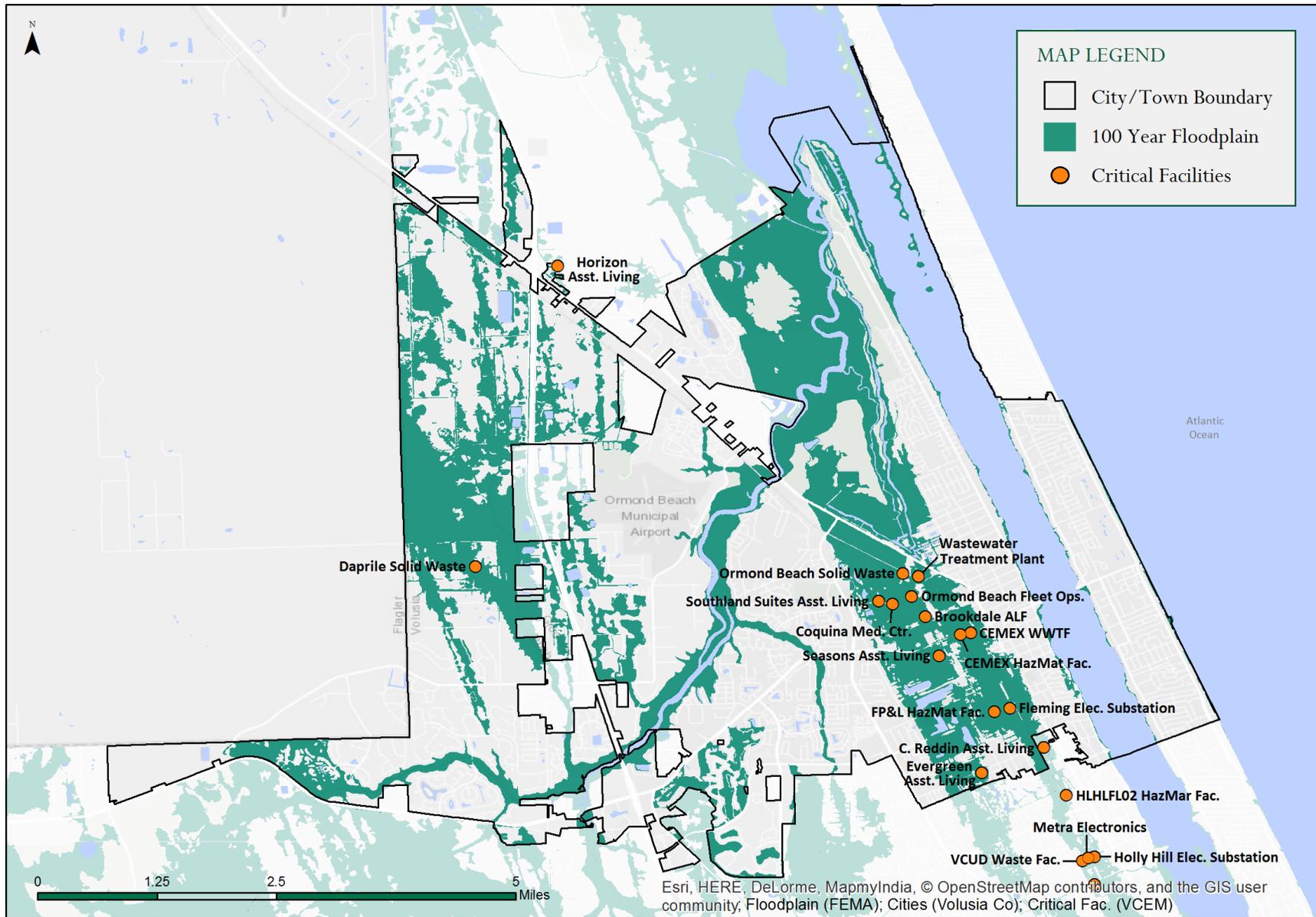
Floodplain Exposure Analysis

Percent of Parcels in the Floodplain	22.9%
Buildings in the Floodplain	3,235

Exposed Acreage: Residential Future Land Use	1,951
Exposed Acreage: Commercial Future Land Use	391
Exposed Acreage: Mixed Use Future Land Use	1,593
Exposed Acreage: Industrial Future Land Use	154
Exposed Acreage: PD Future Land Use	-
Exposed Acreage: Institutional Future Land Use	71

Total Exposure: Land Value	\$576,874,554
Total Exposure: Building Value	\$853,502,766
Total Exposure: Assessed Value	\$1,558,730,380
Total Exposure: Taxable Value	\$1,243,135,285

Jurisdiction Map: Critical Facilities within the 100-Year Floodplain



Pierson

Floodplain Management Goals and Objectives

There are no additional goals to the countywide goals stated in the report.



Pierson

Exposed Critical Facilities

Facility Name	Facility Type	Flood Zone
Pole Barn State Facility	Government	A

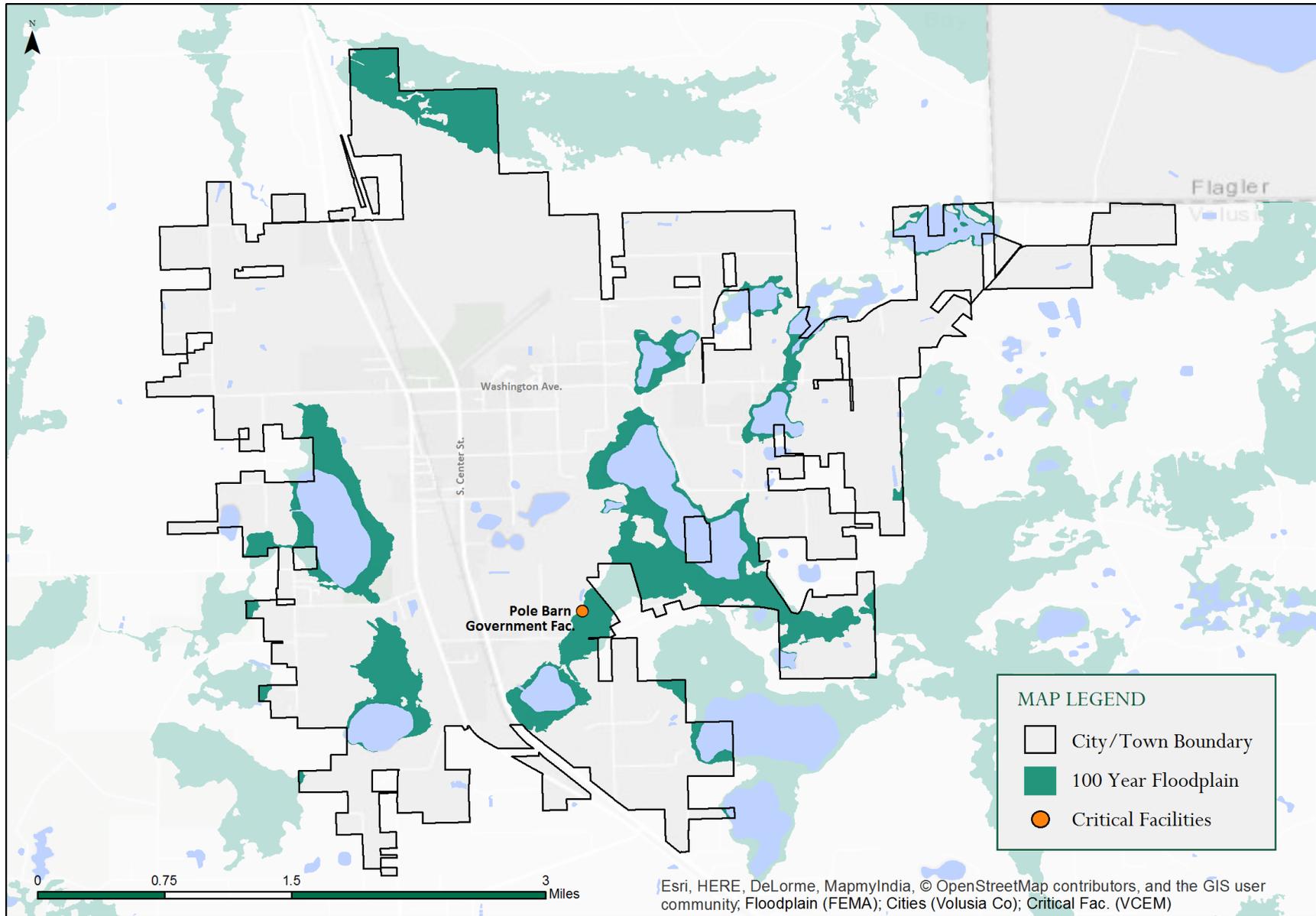
Floodplain Exposure Analysis

Percent of Parcels in the Floodplain	13.0%
Buildings in the Floodplain	70

Exposed Acreage: Residential Future Land Use	5
Exposed Acreage: Commercial Future Land Use	-
Exposed Acreage: Mixed Use Future Land Use	-
Exposed Acreage: Industrial Future Land Use	-
Exposed Acreage: PD Future Land Use	-
Exposed Acreage: Institutional Future Land Use	-

Total Exposure: Land Value	\$7,777,178
Total Exposure: Building Value	\$8,429,260
Total Exposure: Assessed Value	\$16,874,499
Total Exposure: Taxable Value	\$9,865,908

Jurisdiction Map: Critical Facilities within the 100-Year Floodplain



Ponce Inlet



Floodplain Management Goals and Objectives

Goal: Conserve, protect, and restore coastal natural resources in order to maintain and enhance native habitats, floral and faunal species diversity, water quality, and natural surface water characteristics: and preserve and expand opportunities for the general public to access, use and enjoy the ocean beaches, the Halifax River, and other natural resource areas with passive and active recreational potential.

- Objective: Ensure the long-term protection, restoration and enhancement of the natural upland and wetland habitats of the coastal area, particularly areas identified as critical habitat for threatened and endangered species and species of special concern, through cooperation and coordination with federal, state and regional agencies, as well as Volusia County and adjoining coastal municipalities.
- Objective: Protect, conserve and enhance coastal resource wetlands, wildlife habitat and living marine resources by continued implementation of the LUDC's development regulations.
- Objective: The town shall permit the use of limited shoreline land areas based on type of water-dependent use, adjacent land use, water quality, impact on critical habitat and coastal resources and in accordance with the priorities for shoreline uses set forth in Policy 1.3.1.
- Objective: The town shall develop strategies to lessen the impact of a destructive storm on human life, property, public facilities and natural resources.
- Objective: Population concentrations shall be directed away from the Coastal High Hazard Area* (CHHA).
- Objective: Public facilities shall be prohibited that will encourage new development inside the CHHA, unless the facilities are consistent with policies specifically identified in this Comprehensive Plan.
- Objective: Prior to the development of public facilities in the CHHA, it shall be determined that there are no other feasible sites outside said area.
- Objective: If constructed, all public facilities in the CHHA shall be flood-proofed to ensure minimum damages from storms and hurricanes.
- Objective: The town shall regulate development that could impact natural dune systems by requiring developments to provide a plan that addresses that avoids disturbance to dunes if possible, and provides dune protection and stabilization measures, flood-proofing of utilities and requirements for structural wind resistance and floodplain management; Policy 1.4.6 - All development in the Hurricane Vulnerability Zone (HVZ) shall be consistent with the federal flood hazard requirements; Policy 1.4.7 - The town shall continue to participate in the National Flood Insurance Program (NFIP); Policy 1.4.8 - Any reconstruction or repair of the infrastructure necessitating state funds shall be designed to minimize potential damage (i.e., wind and/or flooding) from hurricanes or other storms; Policy 1.4.9 - The town, in accordance with Federal Emergency Management Agency requirements, shall adopt and implement a mitigation plan to reduce damage in areas of repetitive loss due to flooding; Policy 1.4.10 - The town shall continue to participate in the county's Emergency Management Service's "Local Mitigation Strategy" (LMS), as necessary and appropriate, through capital improvements programming and land development regulations in order to establish a continuing program of hurricane mitigation. The LMS is a result of a county-wide multi-jurisdictional program called Volusia 2020.
- Objective: In conjunction with Port Orange, Volusia County and Daytona Beach Shores, the town shall ensure that it maintains hurricane evacuation times at no more than 16 hours from the time of the first official order to evacuate during a Category 5 storm event as measured on the Saffir-Simpson scale prior to the consideration of any proposals to amend a Future Land Use designation that has the effect of increasing residential density in the community.

Goal: Protect, enhance, and restore the natural function of the beach and dune system.

- Objective: The town will continue to administer and enforce its comprehensive dune management program for the purpose of preserving and enhancing the existing dunes and stabilizing vegetation.
- Objective: The town shall coordinate with the East Central Florida Regional Planning Council, Volusia County and other coastal cities, as appropriate, in continually evaluating the long-term problems related to post-disaster redevelopment.

Ponce Inlet

Exposed Critical Facilities

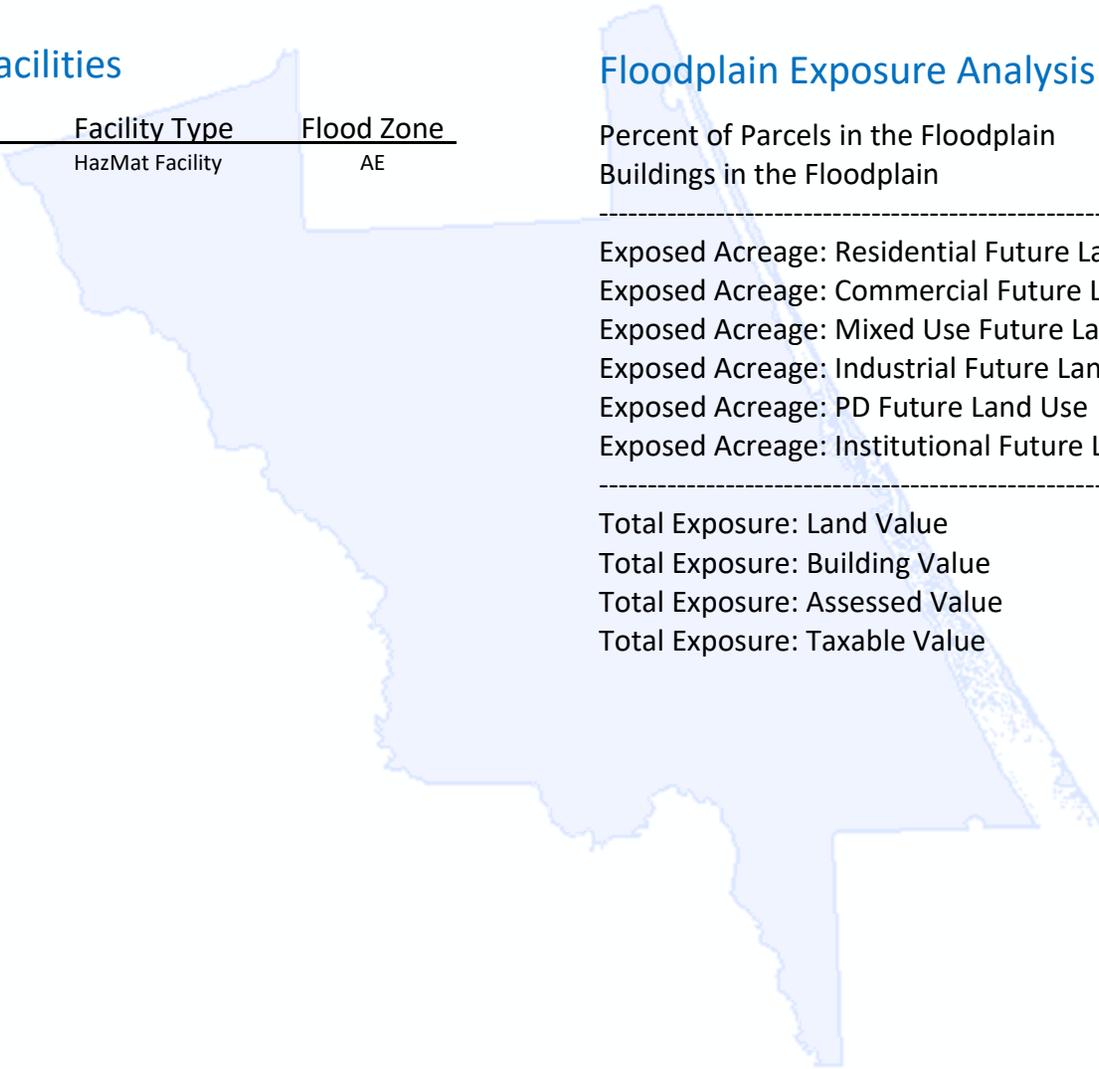
Facility Name	Facility Type	Flood Zone
Inlet Harbor Restaurant/Marina	HazMat Facility	AE

Floodplain Exposure Analysis

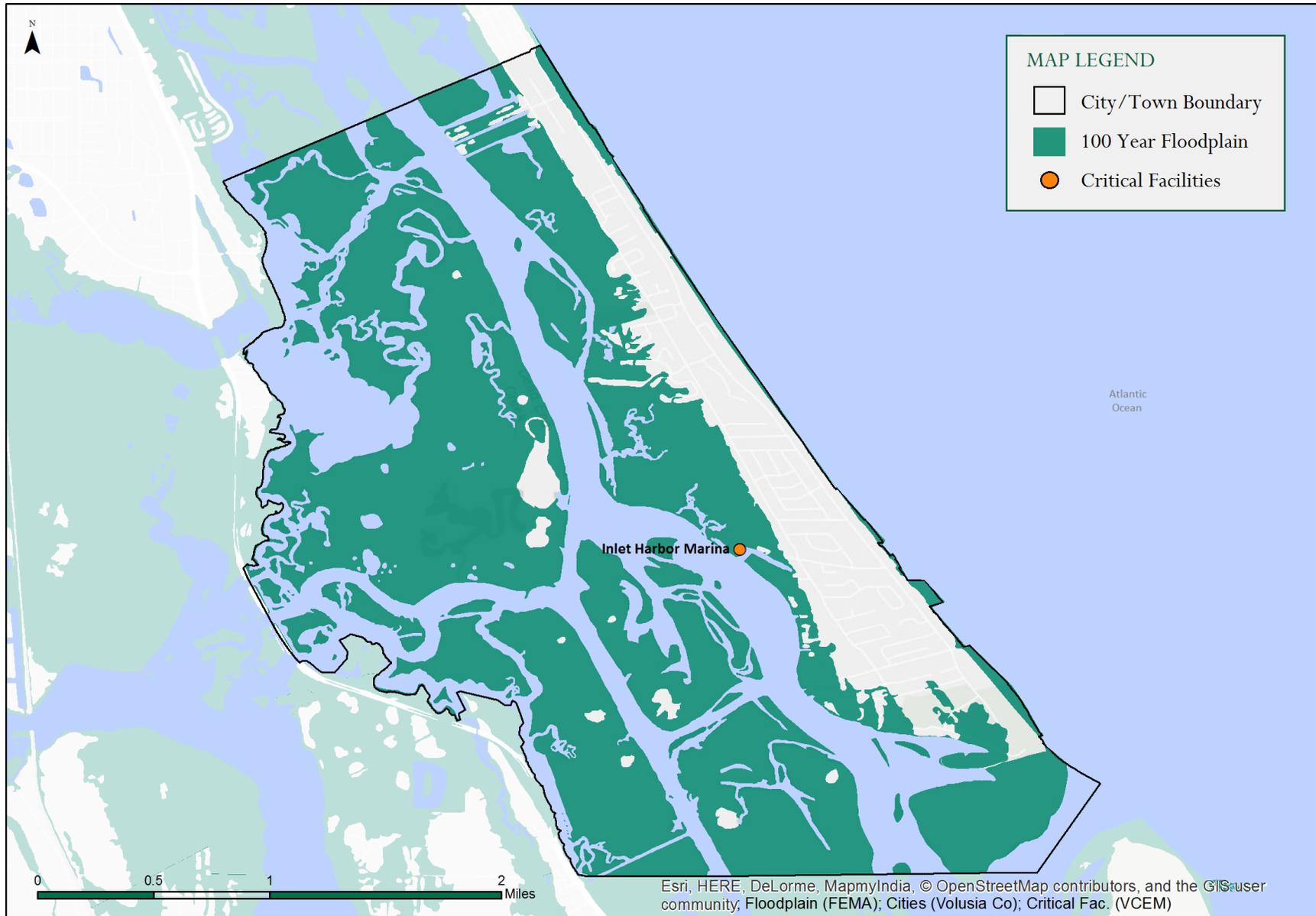
Percent of Parcels in the Floodplain	53.5%
Buildings in the Floodplain	328

Exposed Acreage: Residential Future Land Use	112
Exposed Acreage: Commercial Future Land Use	20
Exposed Acreage: Mixed Use Future Land Use	-
Exposed Acreage: Industrial Future Land Use	-
Exposed Acreage: PD Future Land Use	-
Exposed Acreage: Institutional Future Land Use	40

Total Exposure: Land Value	\$268,287,790
Total Exposure: Building Value	\$377,696,350
Total Exposure: Assessed Value	\$652,777,628
Total Exposure: Taxable Value	\$538,859,301



Jurisdiction Map: Critical Facilities within the 100-Year Floodplain



Port Orange



Floodplain Management Goals and Objectives

Goal: Provide an efficient and effective drainage and storm water management system which, to the maximum extent practical, protects persons and property from flooding, prevents negative impacts to the groundwater aquifer, and safeguards surface waters against erosion and degradation of quality.

- Objective: To provide a storm water management level-of-service that will eliminate existing local flooding during the 25-year, 24-hour storm, and require all new development to provide storm water management facilities based on a 25-year, 24-hour storm event; *Policy:* Continue to utilize the Port Orange Master Drainage Plan, which establishes high water elevations, addresses existing deficiencies, and coordinates the construction of new facilities; *Policy:* Utilize the full carrying capacity of the existing culverts and ditches. The City will perform annual inspections of system elements to ascertain whether ditches have been maintained and culverts cleaned; *Policy:* Review on a yearly basis the priorities for replacement, correction of facility deficiencies, and provision of future drainage facility needs. These priorities will be based on those facilities that: 1) have failed or have a high probability of failure; and 2) will meet future capacity needs. The City shall establish a construction schedule for identified improvements in order to meet the future needs of flood control and storm water management.

Goal: Lessen the impact of a destructive storm on human life, property, public facilities and natural resources.

- Objective: To utilize land development regulations that minimizes danger to life and property; *Policy:* If constructed, all public facilities in the Coastal High Hazard Area, where necessary and appropriate, shall be flood-proof to ensure minimum damages from storms and hurricanes; *Policy:* City utility infrastructure shall be designed to withstand floods and wind damage associated with major storms and hurricanes. Furthermore, the City shall require, where necessary and appropriate, that electric, telephone, television cable, and other private utility infrastructure be designed to withstand flood and storm damage; *Policy:* Incorporate the recommendations of the Comprehensive Emergency Management Plan and the Local Mitigation Strategy (LMS), and other relevant interagency reports and agreements into the Comprehensive Plan and Land Development Code, as appropriate; *Policy:* Continue to participate in the county-wide Local Mitigation Strategy (LMS) program and implement the LMS, as necessary and appropriate, through capital improvements programming; *Policy:* Continue to participate in the National Flood Insurance Program (NFIP); *Policy:* Continue to pursue the improvement of Port Orange's insurance rating under the NFIP Community Rating System (CRS).

Goal: Conserve, protect, manage, restore, and enhance the City's air, water, and soil resources in order to maintain a living environment that supports a healthy population and does not cause illness.

- Objective: To protect, enhance and improve the ambient water quality of surface waters within the City; *Policy:* On-site waste treatment system facilities and drain fields shall not be located within 75 feet of the 100-year floodplain; within 75 feet of an upland/wetland interface; or within 120 feet of the mean high water mark of any surface water body, whichever is greater. On-site waste treatment systems should be located as far inland from a water body or wetland as possible.

Goal: Conserve, protect, manage, restore, and enhance the functional, aesthetic, and qualitative value of the natural environment for the benefit of present and future generations.

- Objective: To protect the natural function of the 100-year floodplains of Spruce Creek, the Halifax River, and their tributaries. In accordance with the provisions of the Comprehensive Plan, the City shall enforce development regulations, to maintain the capability of floodplains to carry, store and filter flood waters; *Policy:* Continue the use of the Conservation land use designation, as well as the Floodplain-Conservation (F-C) Zoning District, to protect the natural functions of floodplains and shorelines; *Policy:* Floodplains whose functional values have been degraded or destroyed through human intervention should be restored, if possible, through the public acquisition of historic floodplain lands. Various state, regional, and local acquisition programs shall be used for this purpose; *Policy:* No fill will be allowed in the Floodplain-Conservation (F-C) Zoning District that will decrease the flood carrying capacity of the riverine floodplain; *Policy:* No fill will be allowed in isolated floodplain pockets that will decrease the flood storage capacity of depressional wetlands; *Policy:* If any filling of land occurs during site design such that the volume of floodplain storage would be reduced, an equal volume of soil shall be excavated within the same floodplain to provide compensatory storage; *Policy:* Ensure that fill material or other structures do not adversely obstruct the natural movement of floodwater overland sheet flow or pose a threat to the public health, safety, and welfare; *Policy:* Encourage the development of a strict floodplain management program by state, regional, and local governments designed to preserve hydrologically significant wetlands and other natural floodplain features.

Port Orange

Exposed Critical Facilities

Facility Name	Facility Type	Flood Zone
Coquina Grove	Assisted Living	AE
Fran's Elderly Care	Assisted Living	AE
Portside Care Center	Assisted Living	AE
Port Orange HazMat Facility	HazMat Facility	AE
Port Orange Electric Substation	Utility	AE

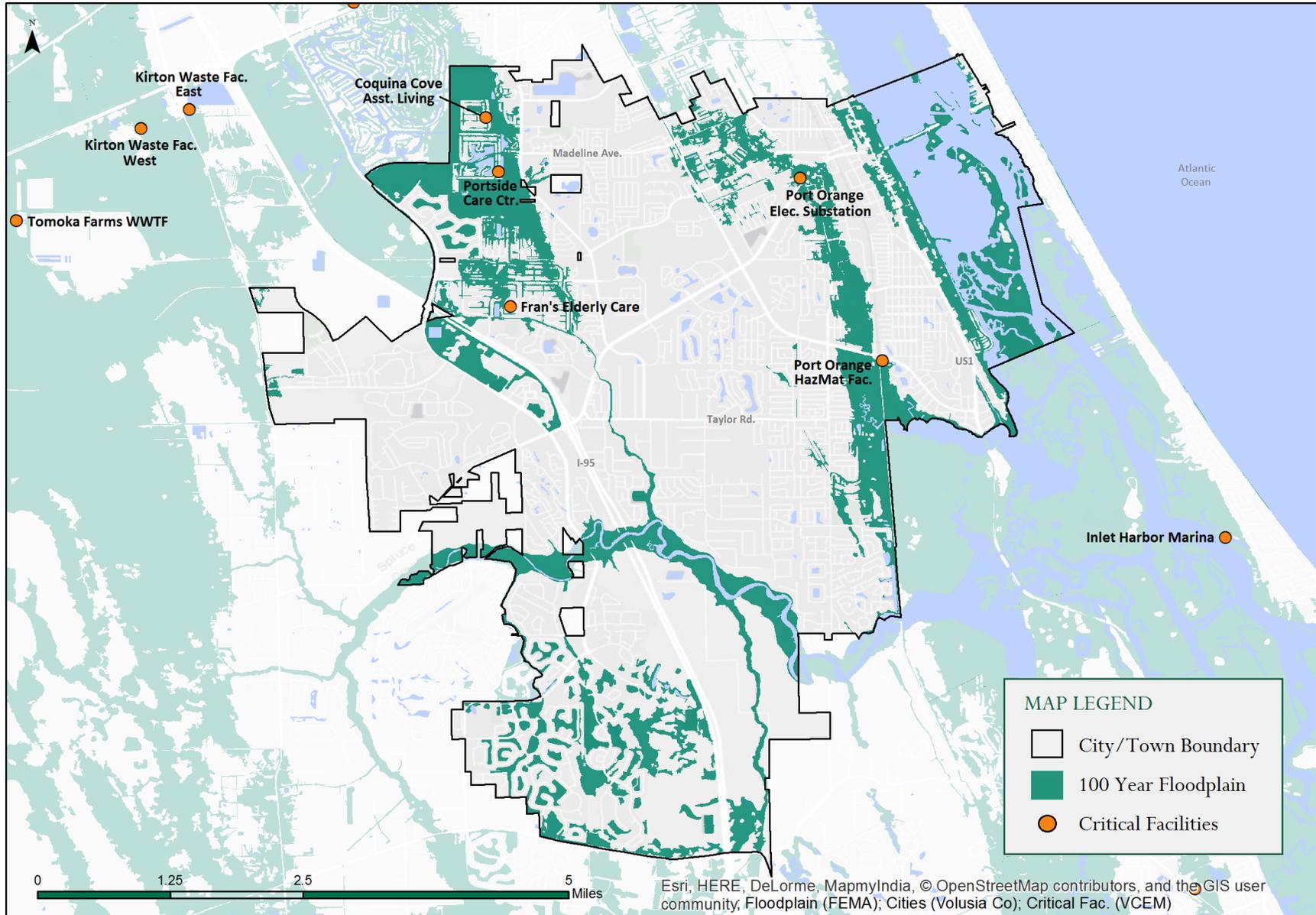
Floodplain Exposure Analysis

Percent of Parcels in the Floodplain	21.4%
Buildings in the Floodplain	4,496

Exposed Acreage: Residential Future Land Use	1,756
Exposed Acreage: Commercial Future Land Use	154
Exposed Acreage: Mixed Use Future Land Use	87
Exposed Acreage: Industrial Future Land Use	116
Exposed Acreage: PD Future Land Use	159
Exposed Acreage: Institutional Future Land Use	254

Total Exposure: Land Value	\$323,141,861
Total Exposure: Building Value	\$745,005,376
Total Exposure: Assessed Value	\$1,099,399,477
Total Exposure: Taxable Value	\$808,861,362

Jurisdiction Map: Critical Facilities within the 100-Year Floodplain



South Daytona



Floodplain Management Goals and Objectives

Goal: To protect human life and health through preparedness of emergency response teams from the Fire, Police and Public Works Departments;

Goal: Provide leadership in protecting residential properties and businesses from the impacts of floods by coordinating historical data with updated storm water management studies to identify possible flooding concerns;

Goal: To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public with proper planning and cost effective storm water improvements;

Goal: To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets and bridges located in floodplains through hardening facilities and Public Works Department preparedness;

Goal: To help maintain a stable tax base by providing for the sound use and development of flood prone areas in such a manner as to minimize flood blighted areas;

Goal: Provide advice and assistance to property owners by the Floodplain Manager and Chief Building Official, concerning the protection of their properties from flooding;

Goal: Maintain a Public awareness program that informs all property owners in the flood zones that they are located in a flood zone through mail-outs and web-site postings;

Goal: Maintain an aggressive grant program to identify and obtain funding for both pre and post disaster mitigation projects through the Community Development and the Ridgewood Corridor Re-Development Departments, and;

Goal: Create programs to manage the surface water runoff through maintaining an updated storm water management plan through the Public Works Department in conjunction with the Floodplain Manager and Chief Building Official.

South Daytona

Exposed Critical Facilities

Facility Name	Facility Type	Flood Zone
South Daytona Christian Church	Shelter	A

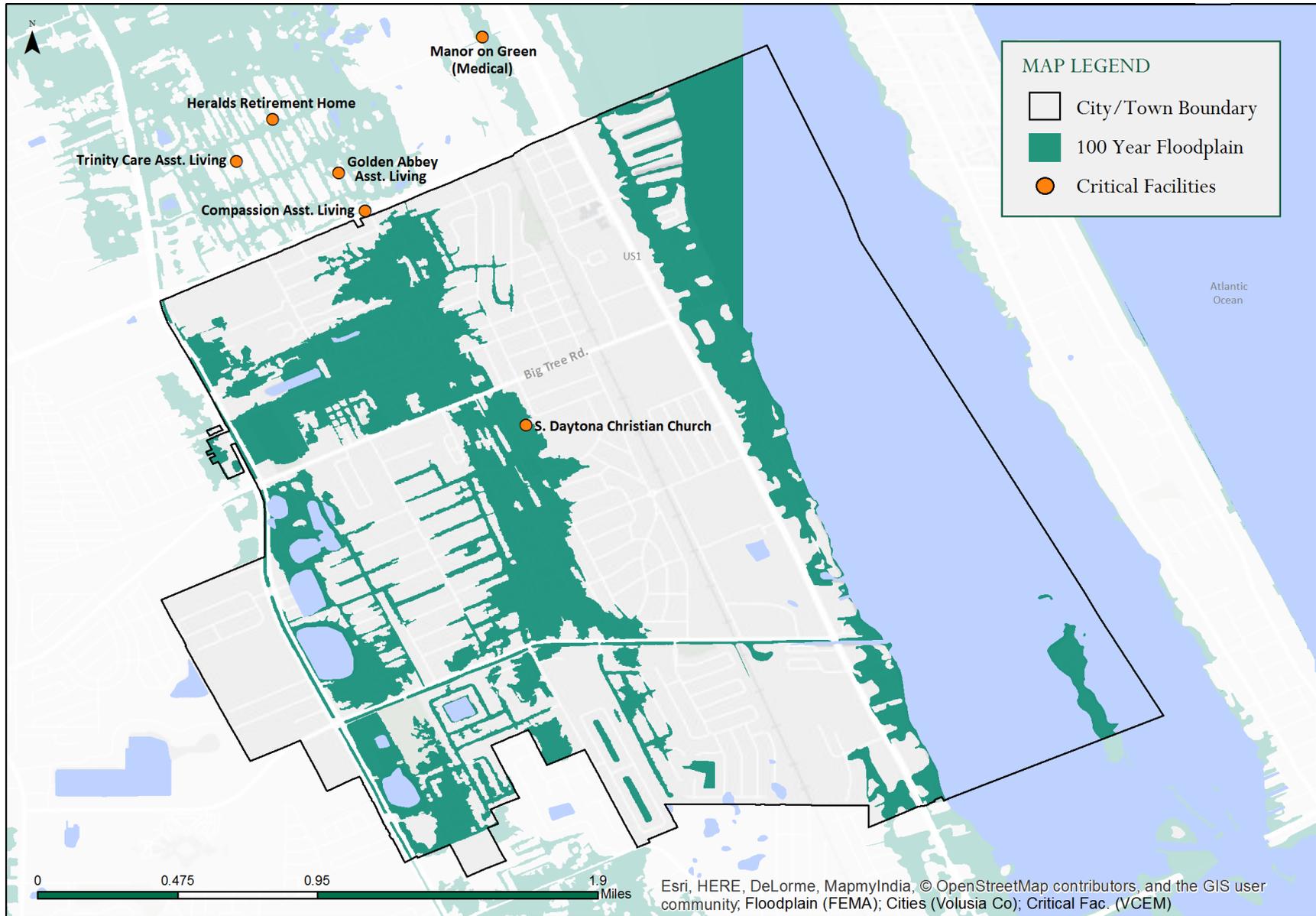
Floodplain Exposure Analysis

Percent of Parcels in the Floodplain	46.5%
Buildings in the Floodplain	2,262

Exposed Acreage: Residential Future Land Use	379
Exposed Acreage: Commercial Future Land Use	26
Exposed Acreage: Mixed Use Future Land Use	52
Exposed Acreage: Industrial Future Land Use	38
Exposed Acreage: PD Future Land Use	-
Exposed Acreage: Institutional Future Land Use	21

Total Exposure: Land Value	\$135,742,067
Total Exposure: Building Value	\$304,715,096
Total Exposure: Assessed Value	\$452,465,156
Total Exposure: Taxable Value	\$324,926,657

Jurisdiction Map: Critical Facilities within the 100-Year Floodplain



Unincorporated



Floodplain Management Goals and Objectives

Goal: Prevent new development in the floodplain from increasing runoff and resulting increases in flood volumes in the floodplain. Achieved through Volusia County Floodplain Development Ordinance, building permitting process and storm water management plans are on-going.

Goal: Develop a public awareness program that informs all property owners in the flood zones that they are located in a flood zone. Complete. Brochure is mailed annually to all 5,000 residents in the floodplain.

Goal: Provide advice and assistance to property owners concerning the protection of their properties from flooding, local drainage and sewer back-up problems. Information available and provided to property owners by Growth & Resource Management, Library, Public Presentations, Mail-outs – on-going.

Goal: Continue flood hazard mitigation program to identify and obtain funding for both pre-and-post disaster residential mitigation projects. Identify cost-beneficial residential units for various flood mitigation grants; Community Services shuttering program – ongoing.

Goal: Prioritize capital projects that will mitigate flood impacts in those areas of the County that have experienced significant flooding problems. Stormwater drainage programs – on-going.

Goal: Utilize “Volusia Prepares” Local Mitigation Strategy to guide and assist the County in establishing priorities for flood hazard mitigation projects. LMS Steering Committee meets quarterly to review mitigation initiatives and identify potential funding sources – on-going.

Goal: Review the locations and effects on areas that experience flooding and determine what steps, if any, the County can take to alleviate future impacts. Stormwater conducts inspections of flood prone areas to determine best mitigation activities – on-going.

Goal: Develop Floodplain Management Plans for participating CRS municipalities in Volusia County (and others as desired). Complete. Plan is in the adoption phase by all 16 municipalities and unincorporated Volusia County.

Unincorporated

Exposed Critical Facilities

Facility Name	Facility Type	Flood Zone
Coe Field	Airport	A
Cross Creek Farms Stolport	Airport	A
Correan Reddin	Assisted Living	A
Driveway Maintenance Facility	HazMat Facility	AE
Samsula HazMat Facility 812949	HazMat Facility	A
Florida Public Utilities Operation Center	HazMat Facility	AE
Southwest Livestock Barn/Pavilion	Government	A
Volusia County Fairgrounds	Government	A
Tomoka Work Camp	Jail	A
Cypress Point Resort	RV Park	A
New Smyrna Beach Campground	RV Park	A
Lake Beresford RV Park	RV Park	AE
Stoughton's Pine Island Campground	RV Park	AE
Pine Island Campground and Marina	RV Park	AE
Sugar Mill Ruins RV Park	RV Park	AE
Cypress Point Golf Club	RV Park	A
Riverwood Park Campground	RV Park	AE
Bissett Bay RV Park	RV Park	AE
Tropical Resort & Marina	RV Park	AE
Haven Recovery Center Utility	Utility	A
Mike's Corner Utility	Utility	A
Sugar Mill Ruins Utility	Utility	AE
Osteen C&D	Waste Facility	A
Kirton Self C&D West	Waste Facility	A
La Iglesia Del Senior	Waste Facility	A
Franklin Gregg Property	Waste Facility	A
Kirton C&D Landfill East	Waste Facility	A
Airport Used Parts Salvage Yard	Waste Facility	AE
Blair's Jungle Den	Waste Facility	AE
St. Johns River Club Condo WWTP	Waste Facility	AE
Sugar Mill Ruins WWTP	Waste Facility	AE
Samsula Academy WWTP	Waste Facility	A
Kove Estates Facility	Waste Facility	A
Hontoon Island Park Facility	Waste Facility	AE
Holly Bluff Marina	Waste Facility	AE
Pine Island WWTP	Waste Facility	AE
Sugar Mill Mobile Home Park WWTP	Waste Facility	A
New Hope Villas WWTP	Waste Facility	A
Pine Island STP	Waste Facility	AE
Tomoka Farms Landfills (2)	Waste Facility	A

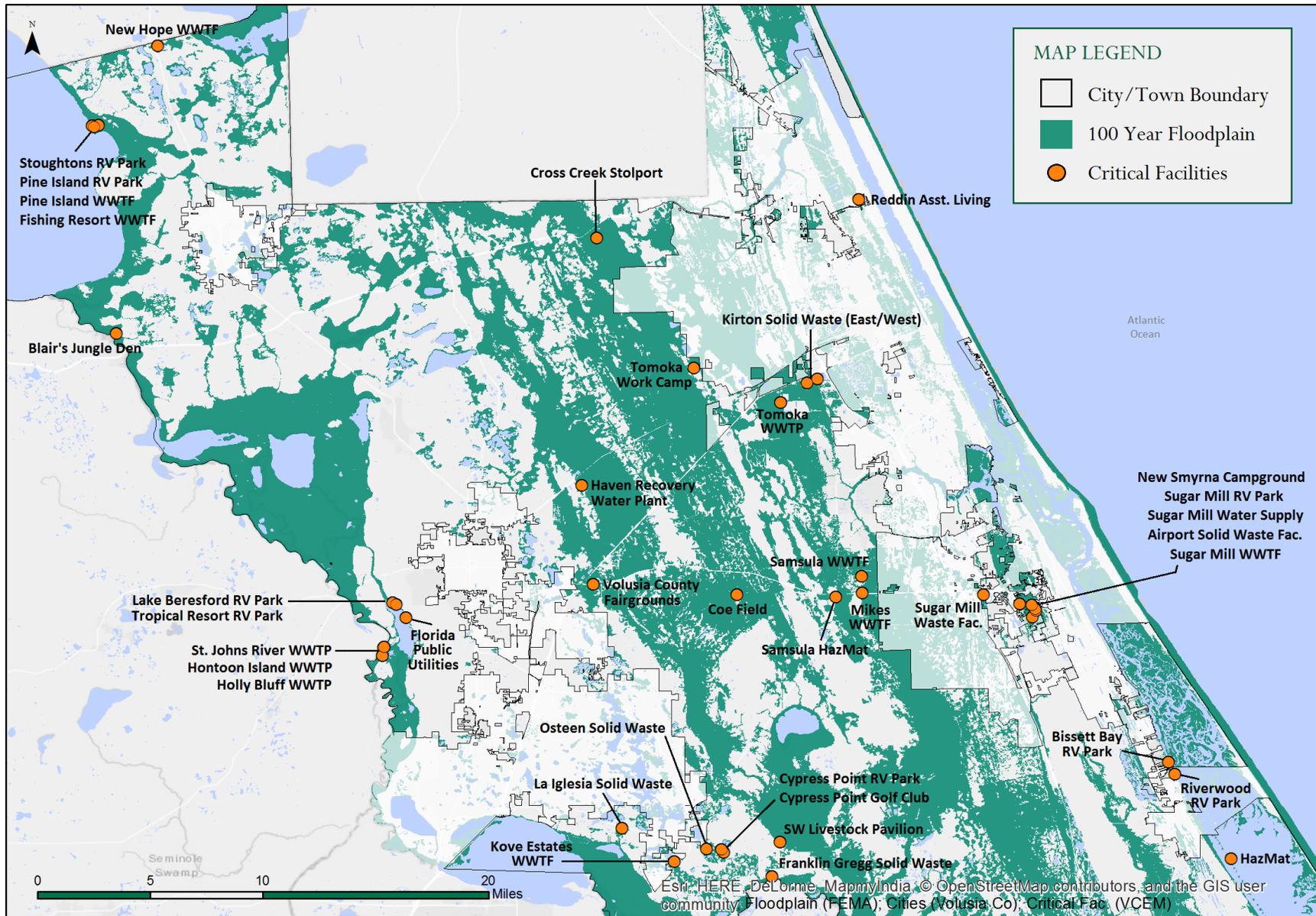
Floodplain Exposure Analysis

Percent of Parcels in the Floodplain	38.3%
Buildings in the Floodplain	10,229

Exposed Acreage: Residential Future Land Use	12,809
Exposed Acreage: Commercial Future Land Use	138
Exposed Acreage: Mixed Use Future Land Use	72
Exposed Acreage: Industrial Future Land Use	227
Exposed Acreage: PD Future Land Use	-
Exposed Acreage: Institutional Future Land Use	3,180

Total Exposure: Land Value	\$2,172,644,221
Total Exposure: Building Value	\$2,111,056,027
Total Exposure: Assessed Value	\$4,399,426,257
Total Exposure: Taxable Value	\$2,737,889,450

Jurisdiction Map: Critical Facilities within the 100-Year Floodplain (Map only depicts vulnerable critical facilities in unincorporated areas)



Appendix B Public Survey



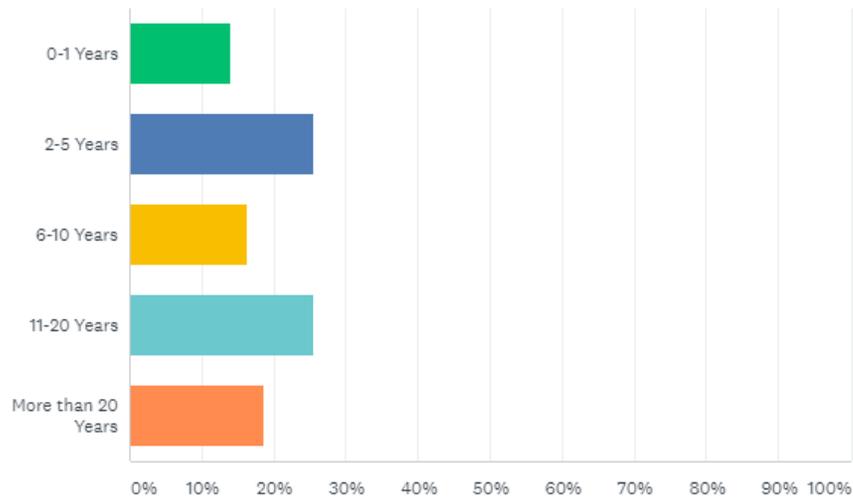
The following statistics were compiled for each of the questions on the Public Survey:

Q1

Customize Export

How long have you lived in your current residence?

Answered: 43 Skipped: 0



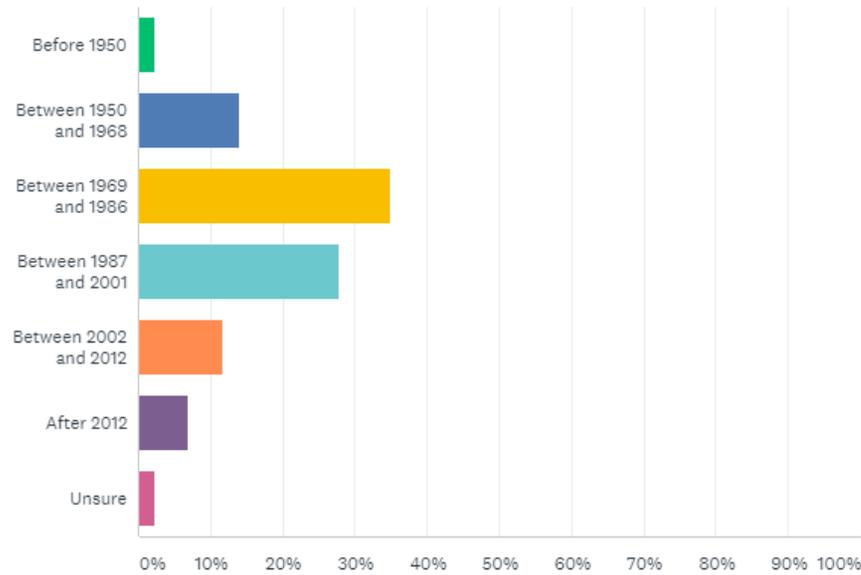
ANSWER CHOICES	RESPONSES
0-1 Years	13.95% 6
2-5 Years	25.58% 11
6-10 Years	16.28% 7
11-20 Years	25.58% 11
More than 20 Years	18.60% 8
TOTAL	43

Q2

Customize Export

In what year was your home built?

Answered: 43 Skipped: 0



ANSWER CHOICES	RESPONSES
Before 1950	2.33% 1
Between 1950 and 1968	13.95% 6
Between 1969 and 1986	34.88% 15
Between 1987 and 2001	27.91% 12
Between 2002 and 2012	11.63% 5
After 2012	6.98% 3
Unsure	2.33% 1
TOTAL	43

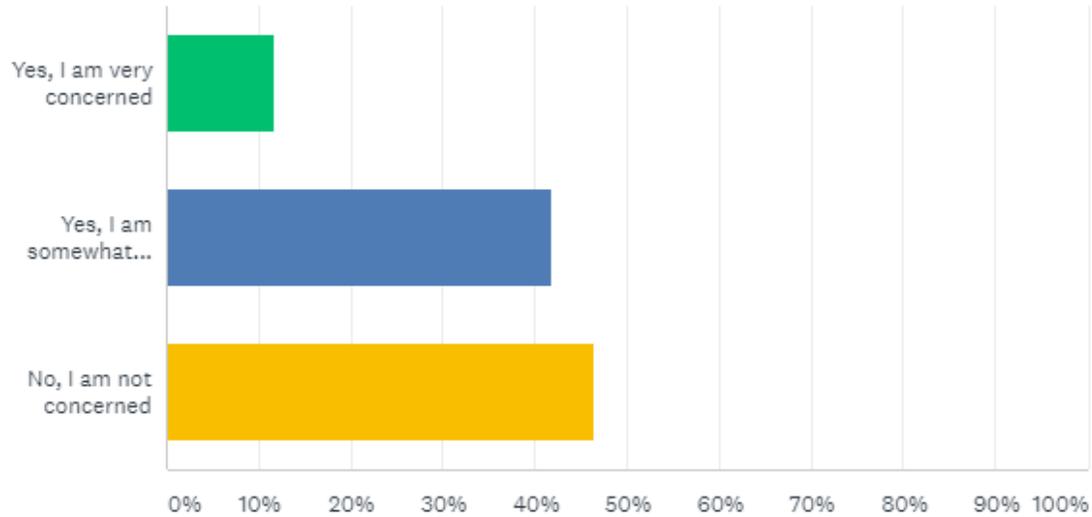
Q3

Customize

Export ▼

Are you concerned about the possibility of your home being flooded?

Answered: 43 Skipped: 0



ANSWER CHOICES	RESPONSES
▼ Yes, I am very concerned	11.63% 5
▼ Yes, I am somewhat concerned	41.86% 18
▼ No, I am not concerned	46.51% 20
TOTAL	43

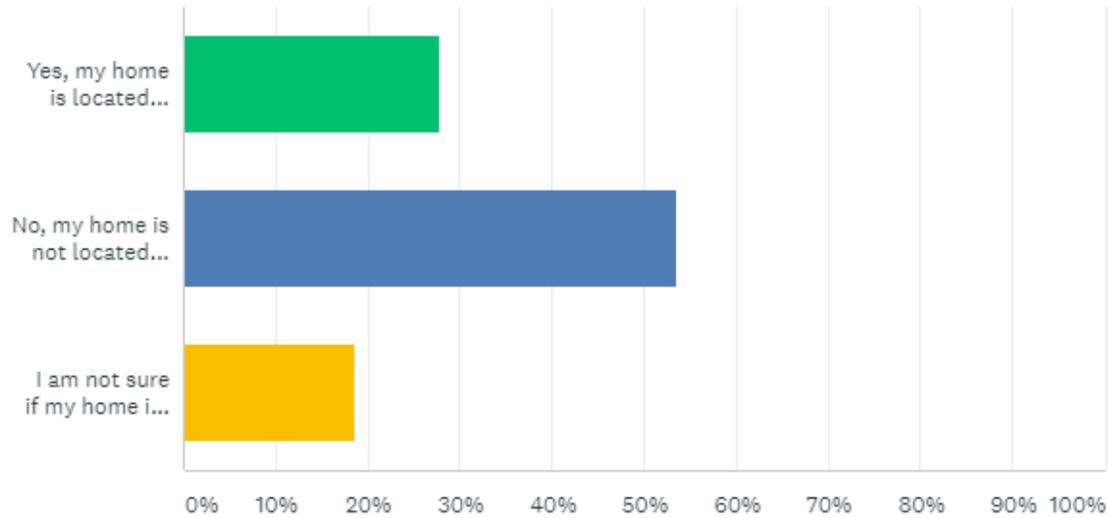
[Comments \(9\)](#)

Q4

Customize Export

Is your home located within a designated flood hazard zone (floodplain)?

Answered: 43 Skipped: 0



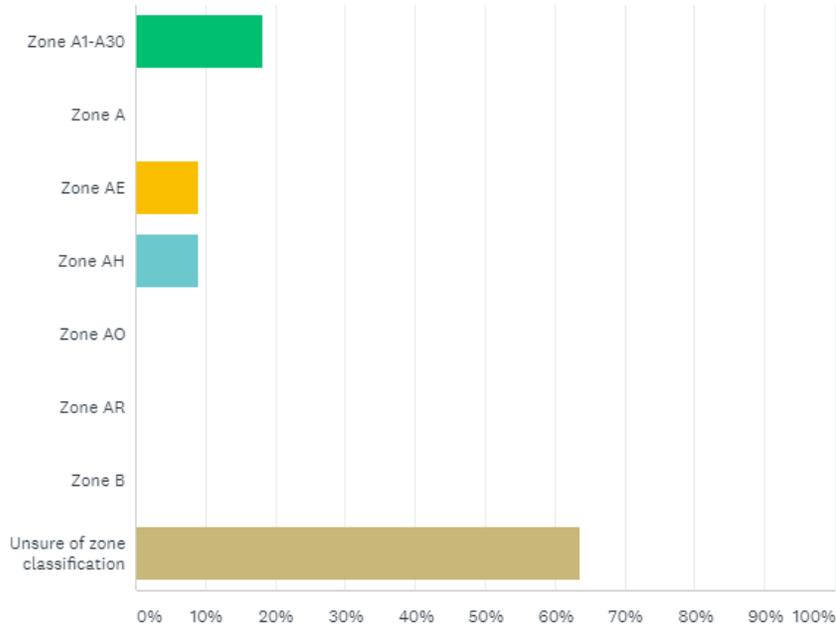
ANSWER CHOICES	RESPONSES
Yes, my home is located within a designated flood hazard zone.	27.91% 12
No, my home is not located within a designated flood hazard zone.	53.49% 23
I am not sure if my home is located within a designated flood zone.	18.60% 8
TOTAL	43

Q5

Customize Export

Which flood zone is your property located in?

Answered: 11 Skipped: 32



ANSWER CHOICES	RESPONSES
Zone A1-A30	18.18% 2
Zone A	0.00% 0
Zone AE	9.09% 1
Zone AH	9.09% 1
Zone AO	0.00% 0
Zone AR	0.00% 0
Zone B	0.00% 0
Unsure of zone classification	63.64% 7
TOTAL	11



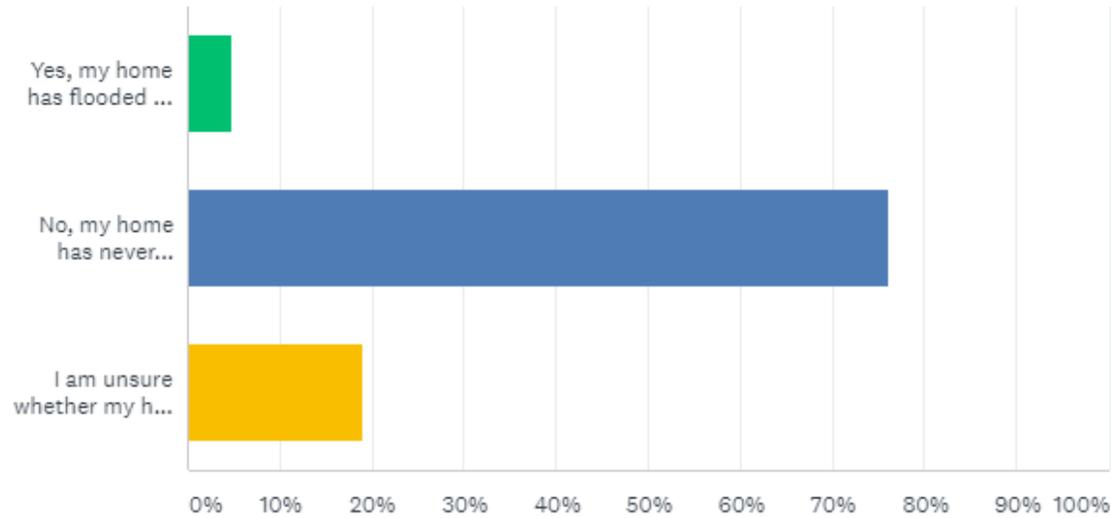
Q6

Customize

Export ▼

Has your home ever flooded due to natural/environmental causes?

Answered: 42 Skipped: 1



ANSWER CHOICES	RESPONSES
▼ Yes, my home has flooded due to natural/environmental causes.	4.76% 2
▼ No, my home has never flooded due to natural/environmental causes.	76.19% 32
▼ I am unsure whether my home has experienced flooding due to natural/environmental causes.	19.05% 8
TOTAL	42

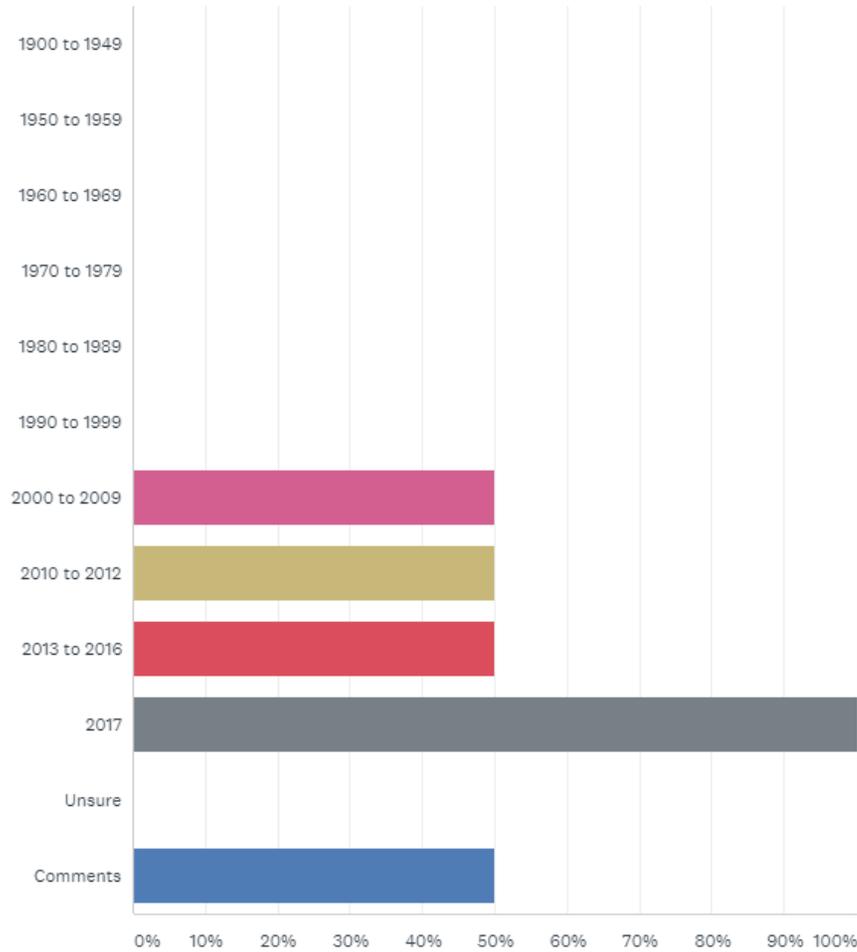
[Comments \(5\)](#)

Q7

Customize Export

To your best knowledge, during which time period did your home last flood?
(Check all that apply)

Answered: 2 Skipped: 41

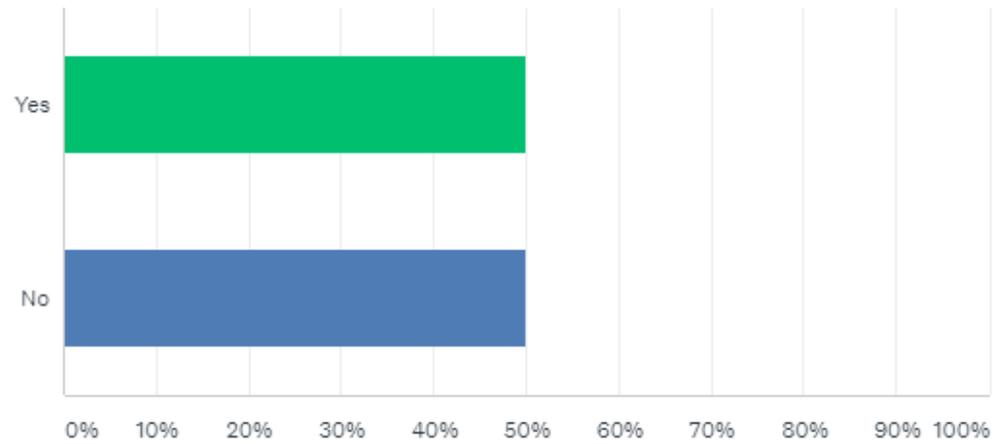


Q8

Customize Export

Have you seen an increase in the duration and frequency of these flood events?

Answered: 2 Skipped: 41



ANSWER CHOICES	RESPONSES
Yes	50.00% 1
No	50.00% 1
TOTAL	2

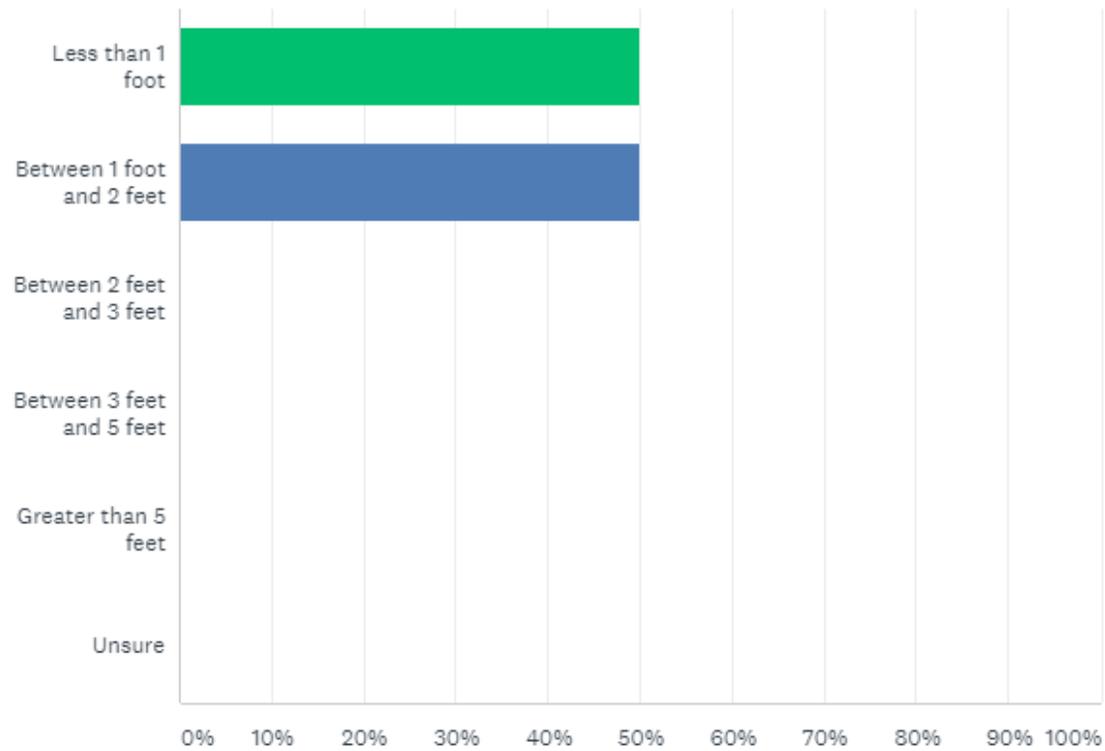


Q9

Customize Export

What was the depth of the water in your home during the your last flooding event noted in previous question?

Answered: 2 Skipped: 41

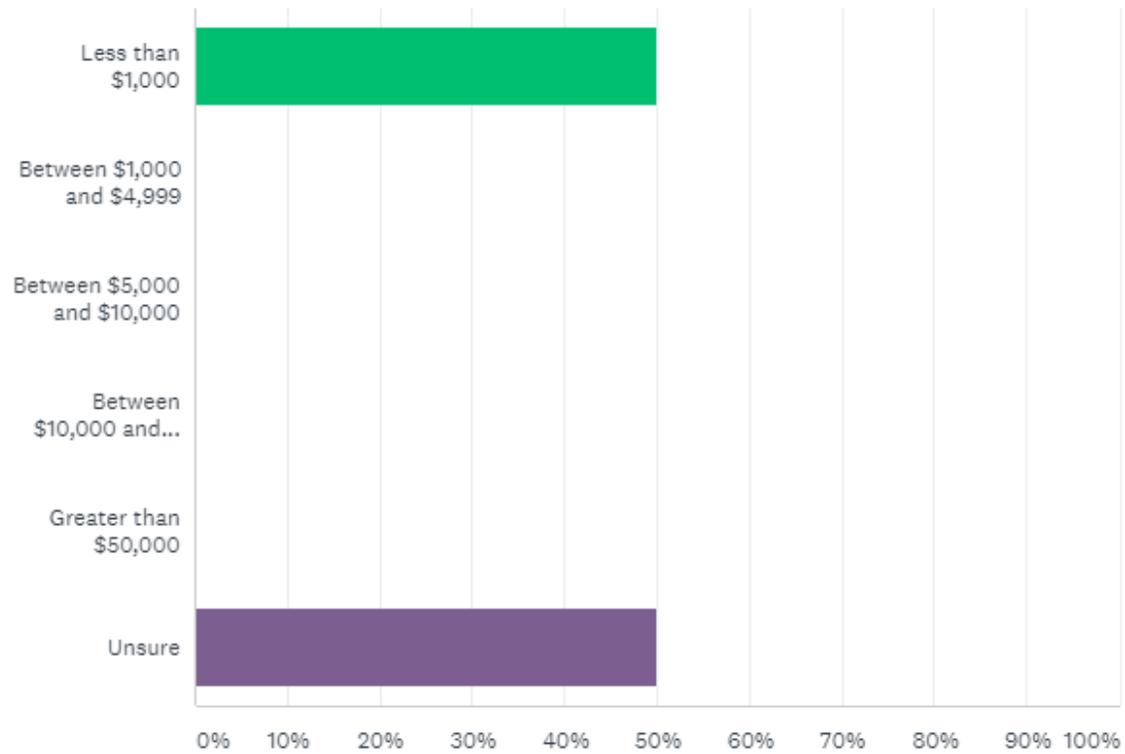


Q10

Customize Export

What was the approximate dollar value of all structural damages to your home during the last flooding event?

Answered: 2 Skipped: 41

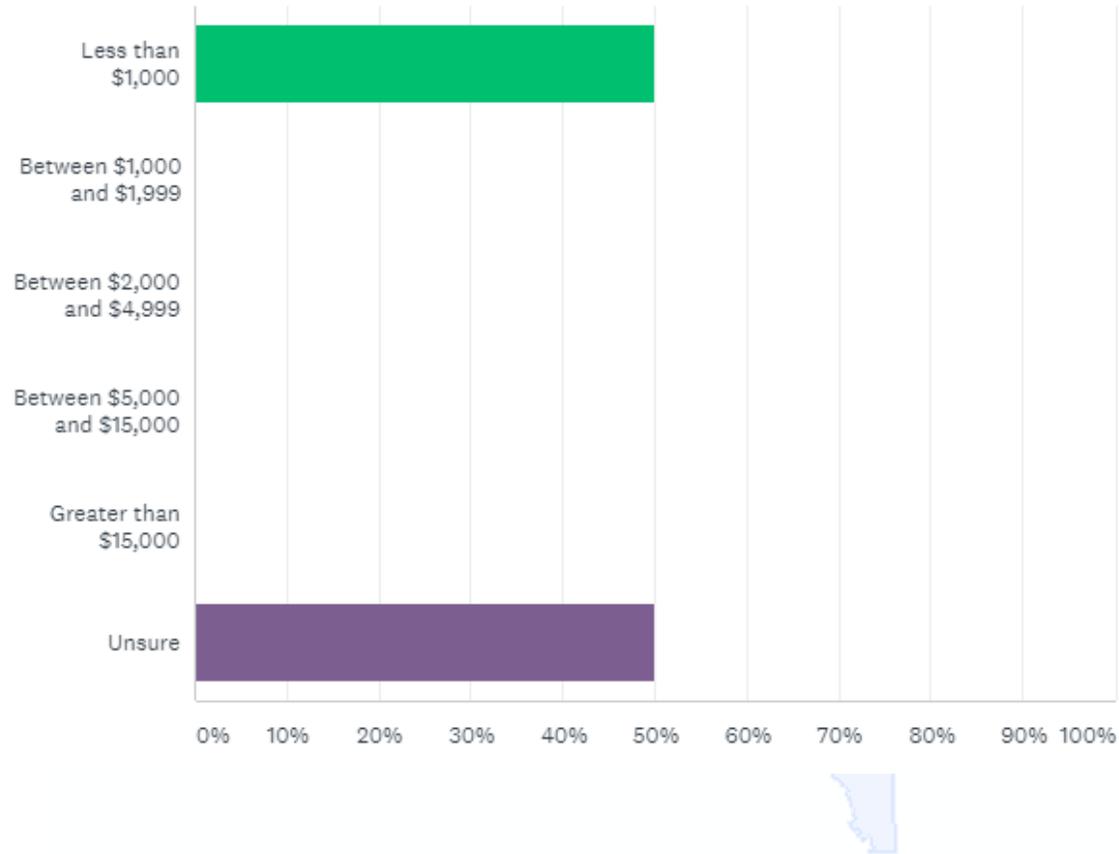


Q11

Customize Export

What was the approximate dollar value of all personal items lost during the last flooding event?

Answered: 2 Skipped: 41

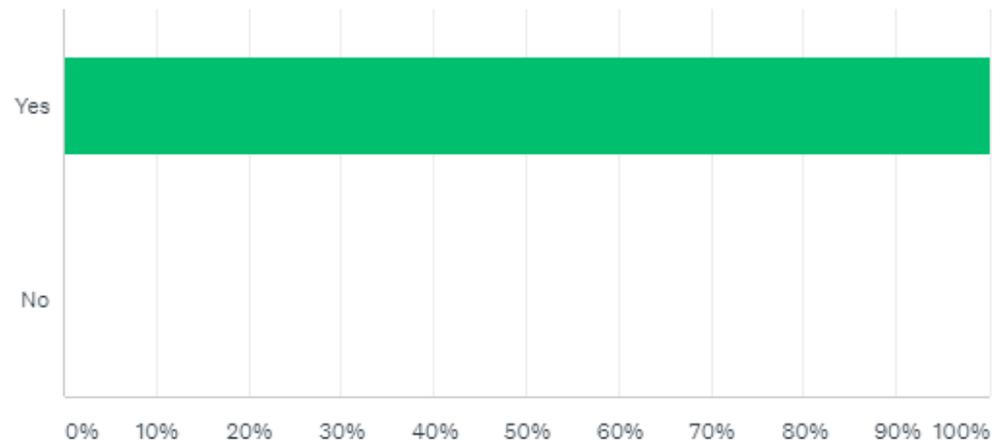


Q12

Customize Export

Has local roadway flooding (in your neighborhood) directly impacted access to your property?

Answered: 2 Skipped: 41



ANSWER CHOICES	RESPONSES
Yes	100.00% 2
No	0.00% 0
TOTAL	2

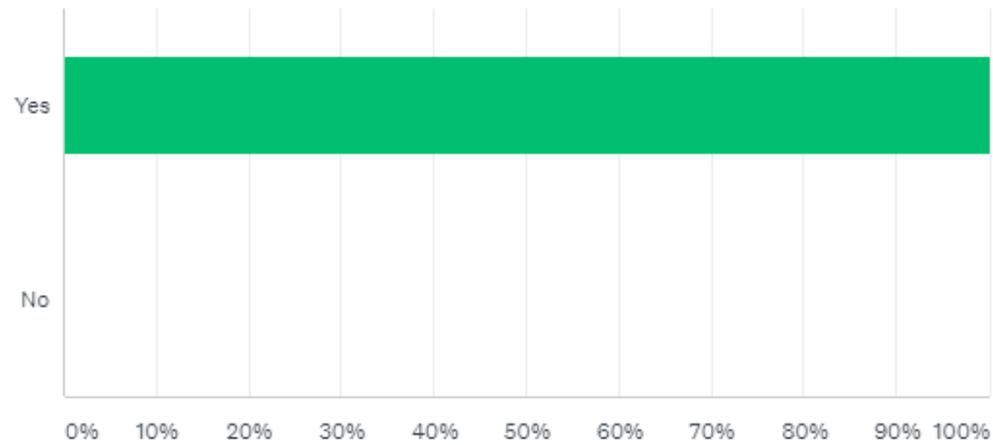


Q13

Customize Export

Have you seen an increase in the duration and frequency of these flood events?

Answered: 2 Skipped: 41



ANSWER CHOICES	RESPONSES
Yes	100.00% 2
No	0.00% 0
TOTAL	2

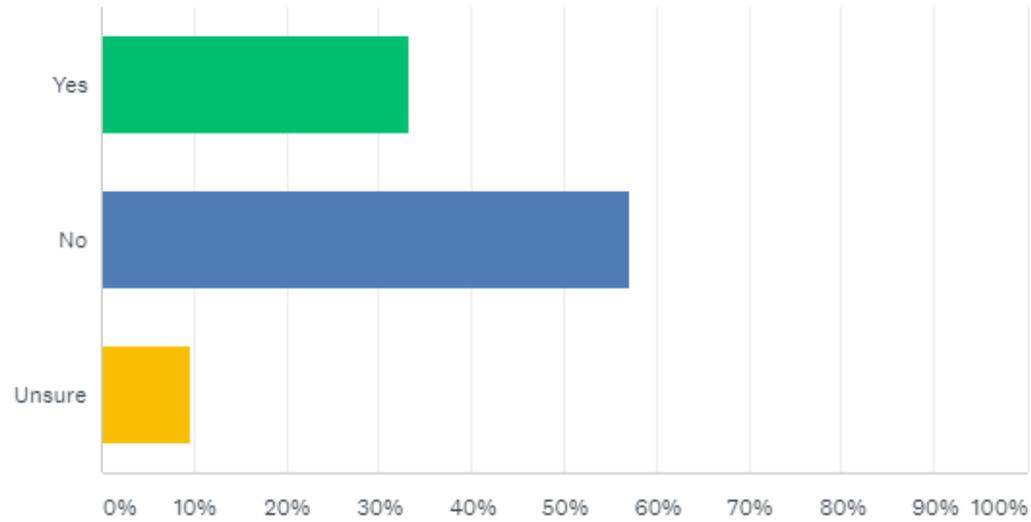


Q14

Customize Export

Do you currently have flood insurance for your property?

Answered: 42 Skipped: 1



ANSWER CHOICES	RESPONSES
Yes	33.33% 14
No	57.14% 24
Unsure	9.52% 4
TOTAL	42

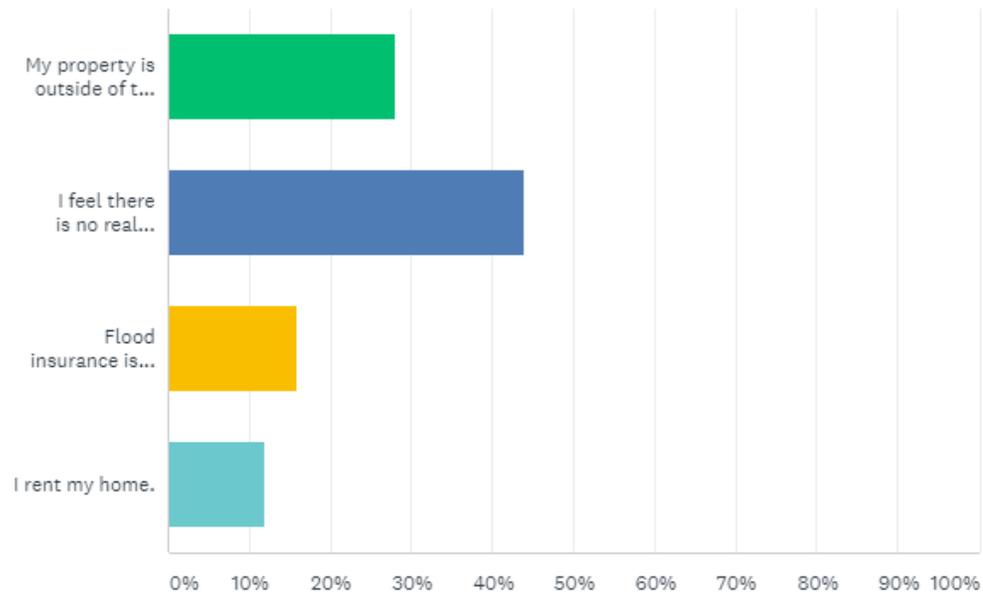
[Comments \(1\)](#)

Q15

Customize Export

Which of the following reasons best describes why you do not have flood insurance?

Answered: 25 Skipped: 18



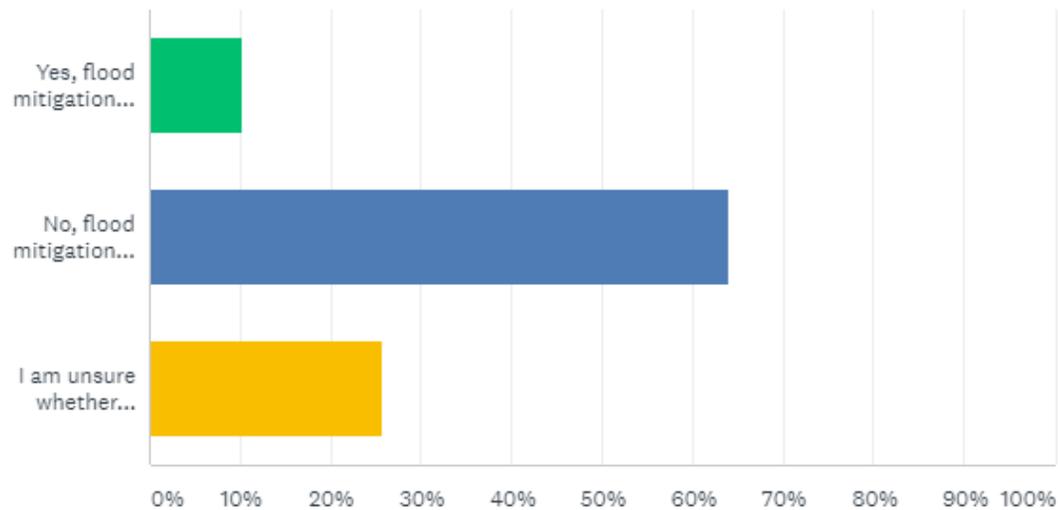
ANSWER CHOICES	RESPONSES
My property is outside of the floodplain.	28.00% 7
I feel there is no real threat of a flood on my property.	44.00% 11
Flood insurance is too expensive.	16.00% 4
I rent my home.	12.00% 3
TOTAL	25

Q16

Customize Export

Have any flood mitigation efforts been implemented to your property? (i.e. steps taken to remedy or improve structural vulnerability to flooding or flood proofing your home)

Answered: 39 Skipped: 4



ANSWER CHOICES	RESPONSES
Yes, flood mitigation efforts have been implemented on my property.	10.26% 4
No, flood mitigation efforts have not been implemented on my property.	64.10% 25
I am unsure whether mitigation efforts have been implemented on my property.	25.64% 10
TOTAL	39

Q17

Export ▼

Describe the mitigation efforts conducted on your property.

Answered: 4 Skipped: 39

RESPONSES (4)

TEXT ANALYSIS

TAGS (0)

Add Tags ▼

Filter by Tag ▼

Search responses



Showing 4 responses

We built higher than 100 yr. flood plain

6/15/2018 10:38 PM

[View respondent's answers](#)

[Add Tags ▼](#)

Grading of land on front of property away from home and towards a retention pond.

6/14/2018 5:55 PM

[View respondent's answers](#)

[Add Tags ▼](#)

Bottom floor is parking and access only

6/12/2018 4:30 PM

[View respondent's answers](#)

[Add Tags ▼](#)

HOA has retention areas and waterways continually upgraded

6/6/2018 12:30 PM

[View respondent's answers](#)

[Add Tags ▼](#)

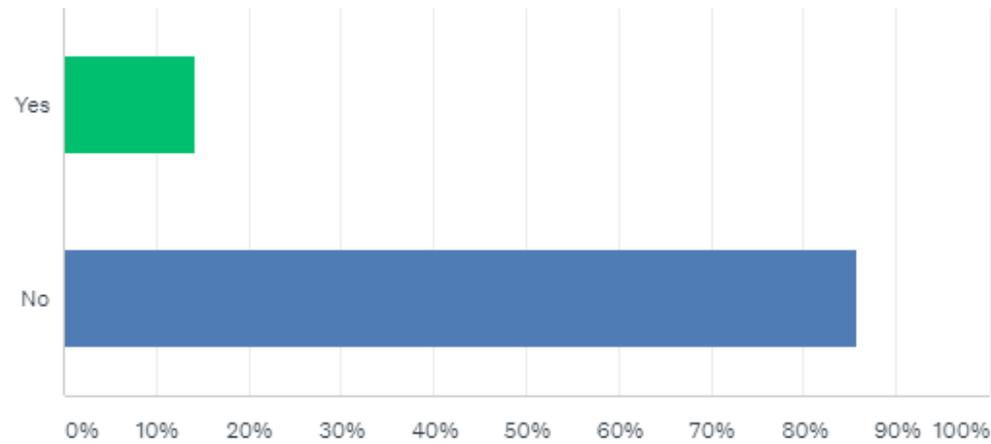
Q18

Customize

Export ▼

Have you considered implementing flood management strategies on your property?

Answered: 35 Skipped: 8



ANSWER CHOICES	RESPONSES
Yes	14.29% 5
No	85.71% 30
TOTAL	35



Q19

Export ▼

What mitigation strategies have you considered to implement and/or what is your biggest hold-back to implementing mitigation strategies?

Answered: 13 Skipped: 30

RESPONSES (13)

TEXT ANALYSIS

TAGS (0)



Add Tags ▼

Filter by Tag ▼

Search responses



Showing 13 responses



It is 19 feet above the adjacent lake mean high water mark and been thru hurricanes and did not flood.

6/15/2018 2:21 PM

[View respondent's answers](#)

[Add Tags ▼](#)



This is a multi-family (townhouse) dwelling, so all homeowners would need to agree on a strategy, and that does not seem likely at this time.

6/15/2018 9:24 AM

[View respondent's answers](#)

[Add Tags ▼](#)



We don't feel anything would work because the entire neighborhood, street and adjacent yards flood

6/13/2018 4:39 PM

[View respondent's answers](#)

[Add Tags ▼](#)



property is owned by apartment complex and too expensive

6/13/2018 2:42 PM

[View respondent's answers](#)

[Add Tags ▼](#)



Unknown

6/13/2018 2:16 PM

[View respondent's answers](#)

[Add Tags ▼](#)

Q19

Export ▼

What mitigation strategies have you considered to implement and/or what is your biggest hold-back to implementing mitigation strategies?

Answered: 13 Skipped: 30

RESPONSES (13)

TEXT ANALYSIS

TAGS (0)



Add Tags ▼

Filter by Tag ▼

Search responses



Showing 13 responses



I'm in Zone AX, elevation 28'

6/6/2018 1:30 PM

[View respondent's answers](#)

[Add Tags ▼](#)



Prepare for a flood by moving important items to a higher location.

6/5/2018 6:23 PM

[View respondent's answers](#)

[Add Tags ▼](#)



n/a

6/5/2018 11:46 AM

[View respondent's answers](#)

[Add Tags ▼](#)



Future plans include a French drain to help with severe tropical rainfall. Not a huge concern since I have only seen the area slow to drain twice in 22 years.

6/5/2018 11:09 AM

[View respondent's answers](#)

[Add Tags ▼](#)



Not sure what the options are

6/5/2018 10:44 AM

[View respondent's answers](#)

[Add Tags ▼](#)



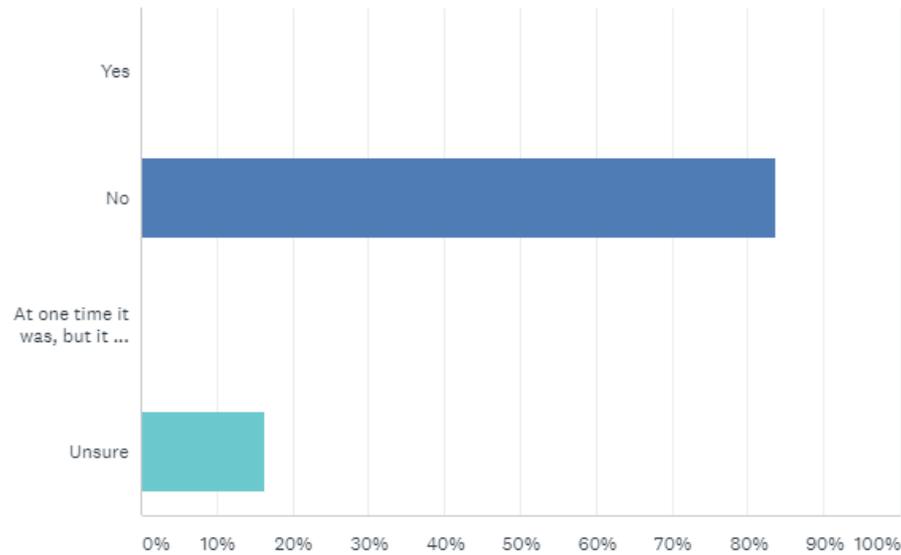
Building a berm. Time and money

Q20

Customize Export

Is your home currently classified as a repetitive flood loss property (defined as a structure that has experienced two floods in the last ten years with at least \$1,000 in damages per event)?

Answered: 37 Skipped: 6



ANSWER CHOICES	RESPONSES
Yes	0.00% 0
No	83.78% 31
At one time it was, but it has been removed due to mitigation.	0.00% 0
Unsure	16.22% 6
TOTAL	37

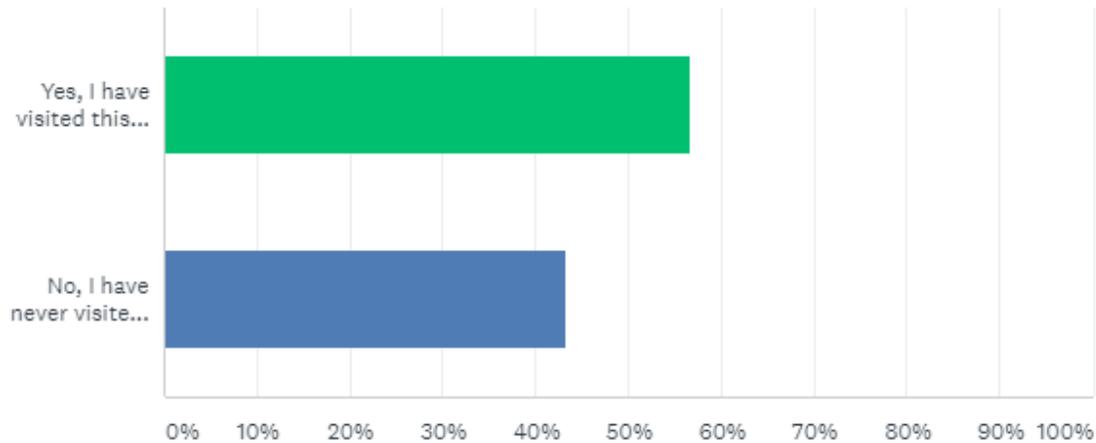
Comments (0)

Q21

Customize Export

Did you know that you can view the current flood plain and other County-wide resources at the following web site:
<http://www.volusia.org/services/public-protection/emergency-management>

Answered: 37 Skipped: 6



ANSWER CHOICES	RESPONSES
Yes, I have visited this web site	56.76% 21
No, I have never visited this web site	43.24% 16
TOTAL	37

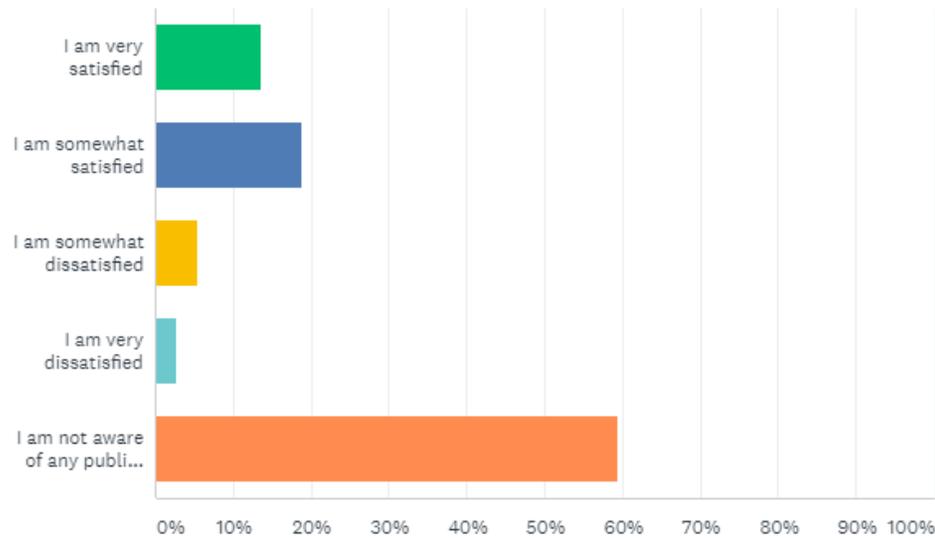
Comments (0)

Q22

Customize Export

How satisfied are you with how your jurisdiction handles public involvement and outreach concerning flood hazards in your area?

Answered: 37 Skipped: 6

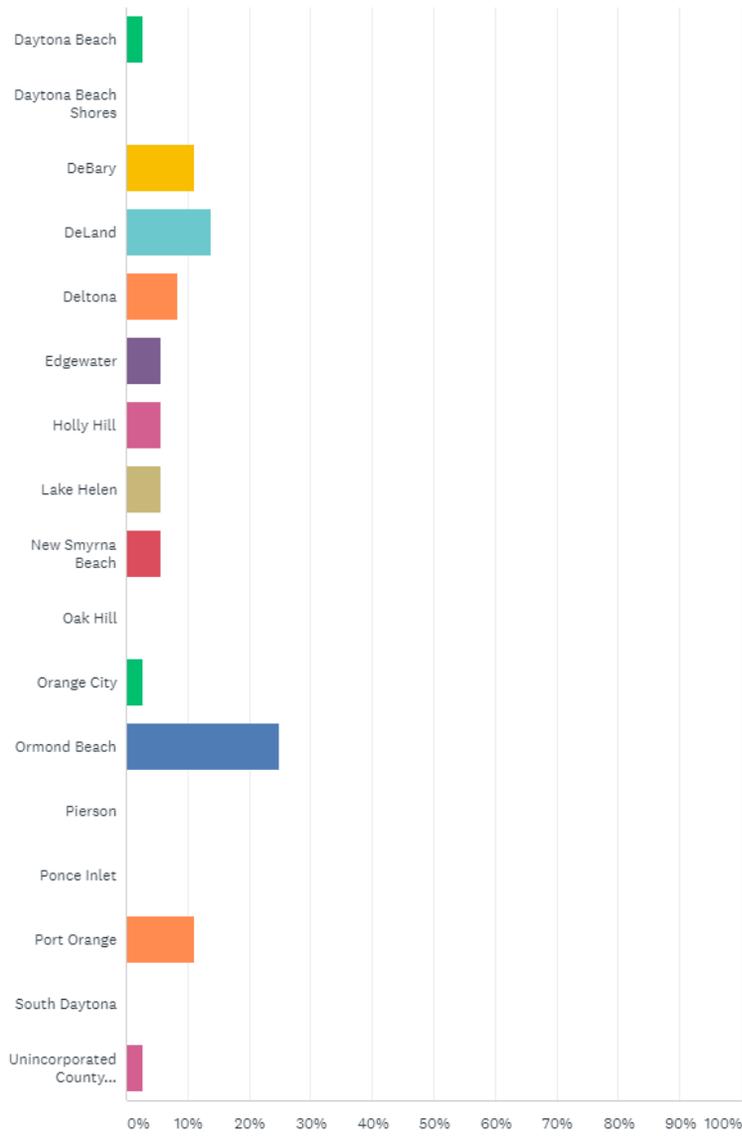


ANSWER CHOICES	RESPONSES
I am very satisfied	13.51% 5
I am somewhat satisfied	18.92% 7
I am somewhat dissatisfied	5.41% 2
I am very dissatisfied	2.70% 1
I am not aware of any public involvement/outreach efforts concerning flood hazards conducted by my jurisdiction	59.46% 22
TOTAL	37

Comments (4)

Your property is located in which jurisdiction?

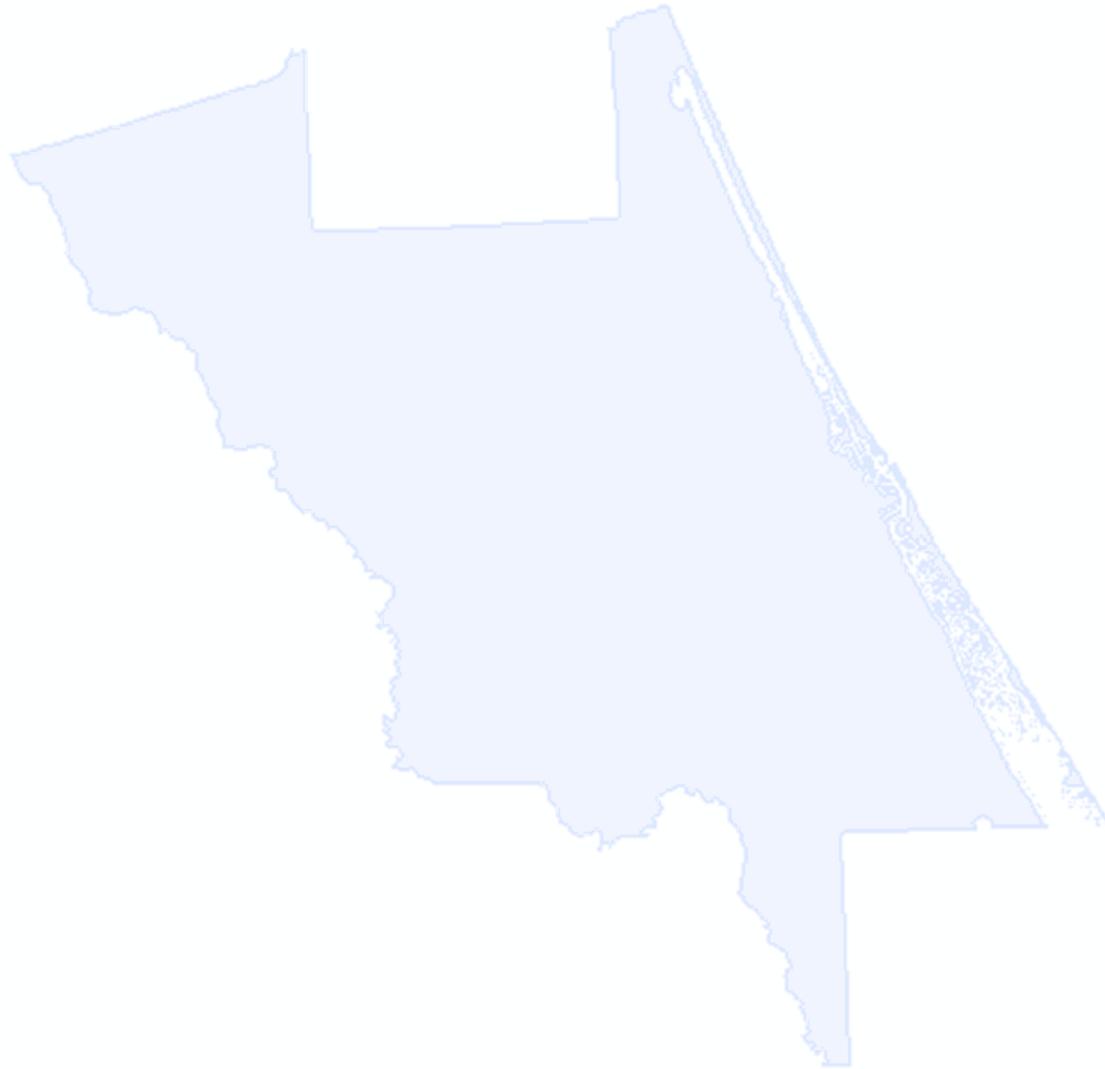
Answered: 36 Skipped: 7



Appendix C Business Survey



The following statistics were compiled for each of the questions on the Business Survey:

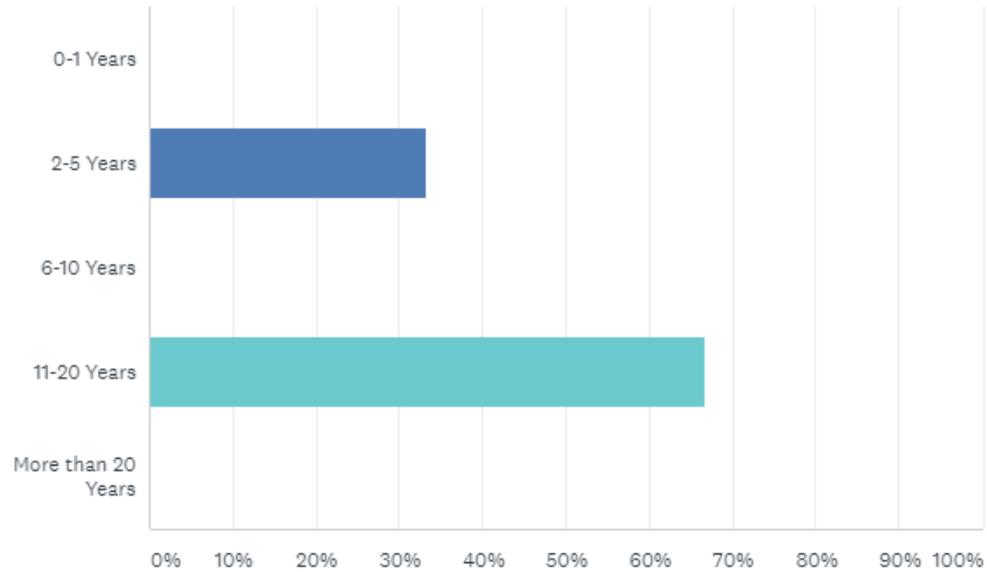


Q1

Customize Export

How long have you been in business at your current location?

Answered: 3 Skipped: 0



ANSWER CHOICES	RESPONSES
0-1 Years	0.00% 0
2-5 Years	33.33% 1
6-10 Years	0.00% 0
11-20 Years	66.67% 2
More than 20 Years	0.00% 0
TOTAL	3

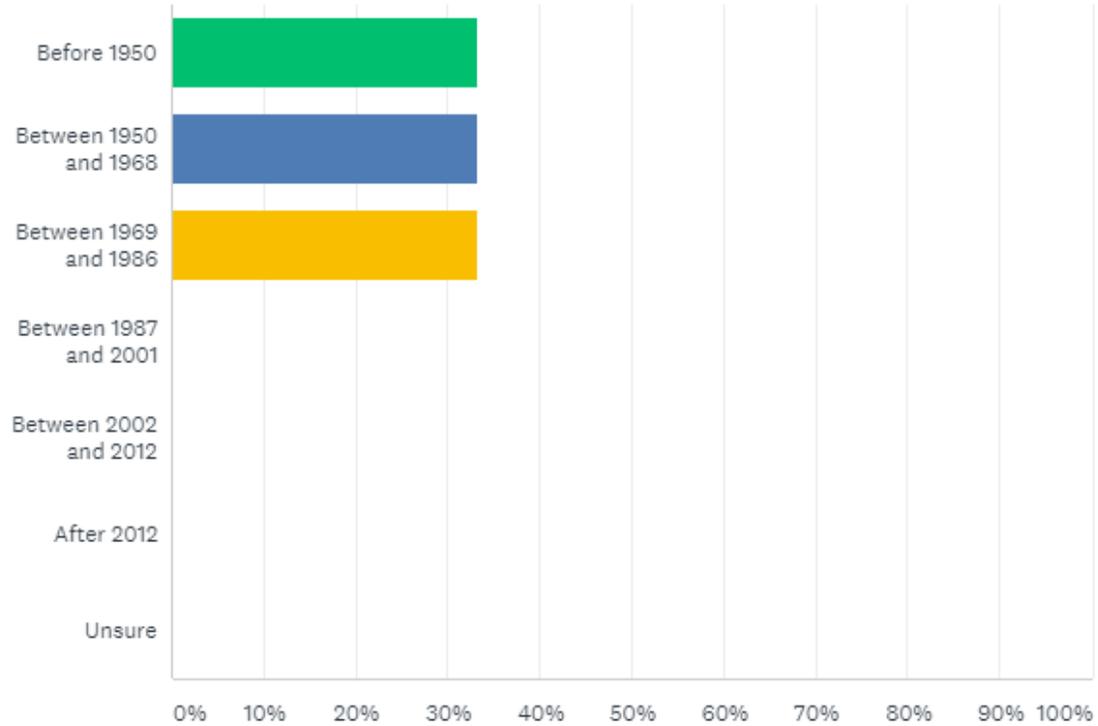
Q2

Customize

Export ▼

In what year was your building constructed?

Answered: 3 Skipped: 0

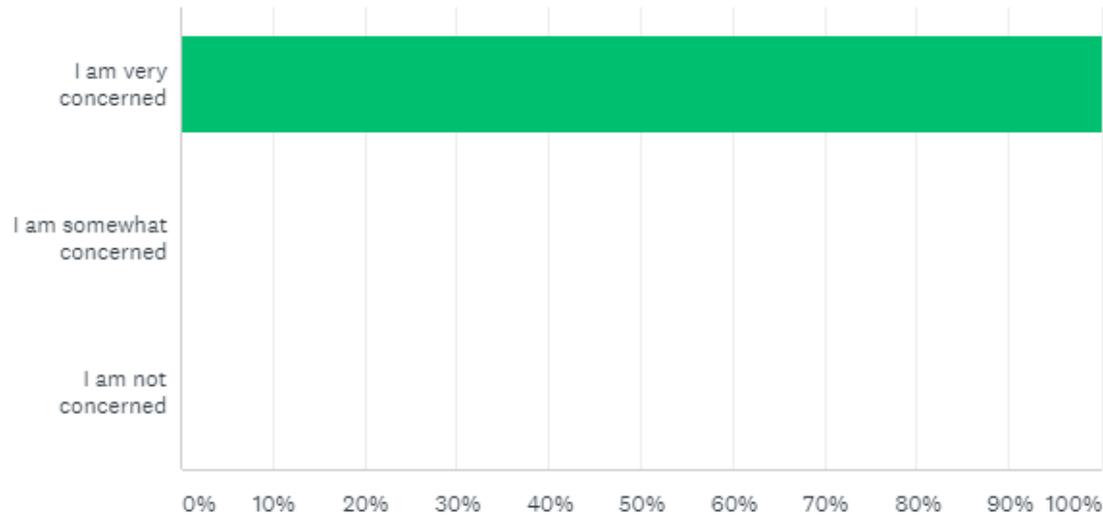


Q3

Customize Export

How concerned are you about the possibility of your place of business being flooded?

Answered: 3 Skipped: 0



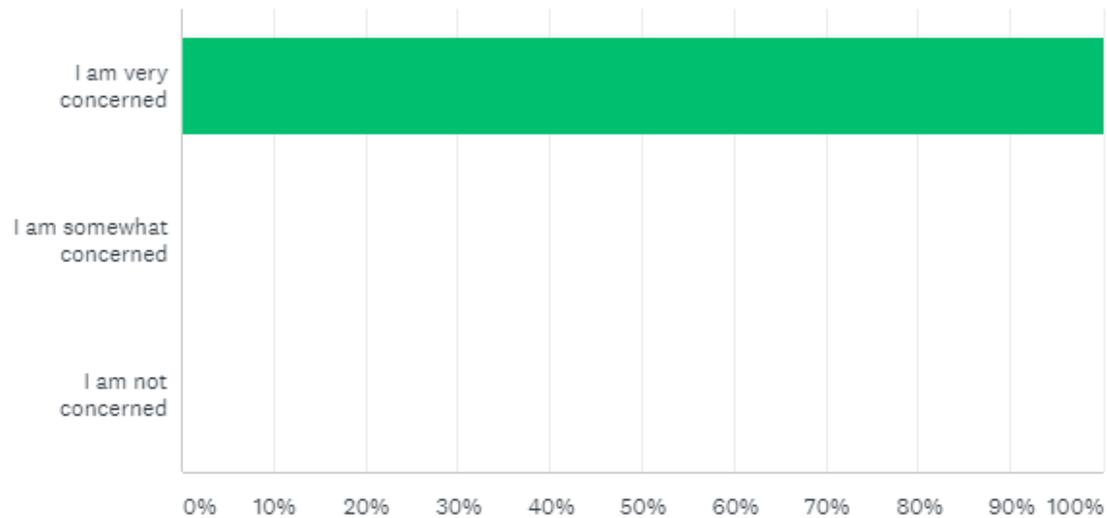
ANSWER CHOICES	RESPONSES
I am very concerned	100.00% 3
I am somewhat concerned	0.00% 0
I am not concerned	0.00% 0
TOTAL	3

Q4

Customize Export

How concerned are you about the possibility of the streets accessing your place of business being flooded?

Answered: 3 Skipped: 0



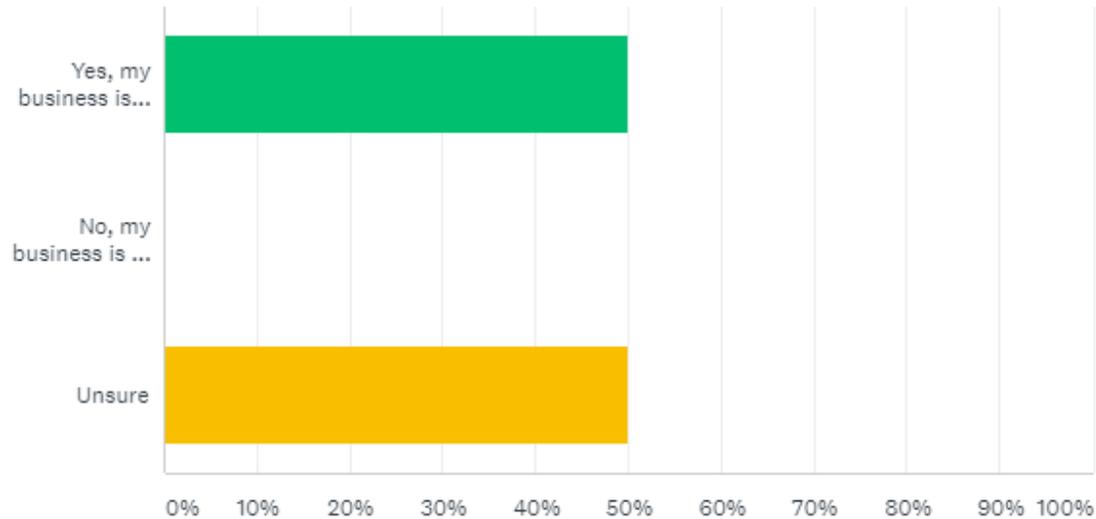
ANSWER CHOICES	RESPONSES
I am very concerned	100.00% 3
I am somewhat concerned	0.00% 0
I am not concerned	0.00% 0
TOTAL	3

Q5

Customize Export

Is your business located within a designated flood hazard zone (floodplain)?

Answered: 2 Skipped: 1



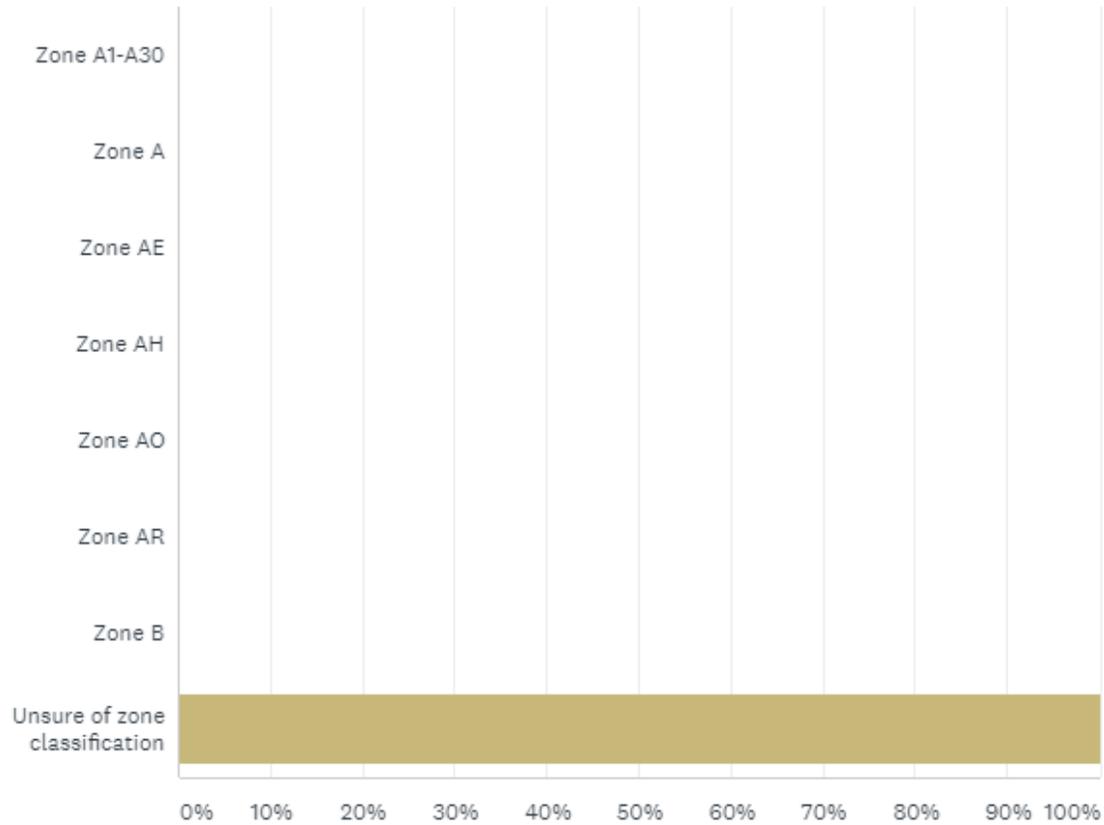
ANSWER CHOICES	RESPONSES
Yes, my business is located within a designated flood hazard zone	50.00% 1
No, my business is not located within a designated flood hazard zone	0.00% 0
Unsure	50.00% 1
TOTAL	2

Q6

Customize Export

Which flood zone is your property located in?

Answered: 1 Skipped: 2

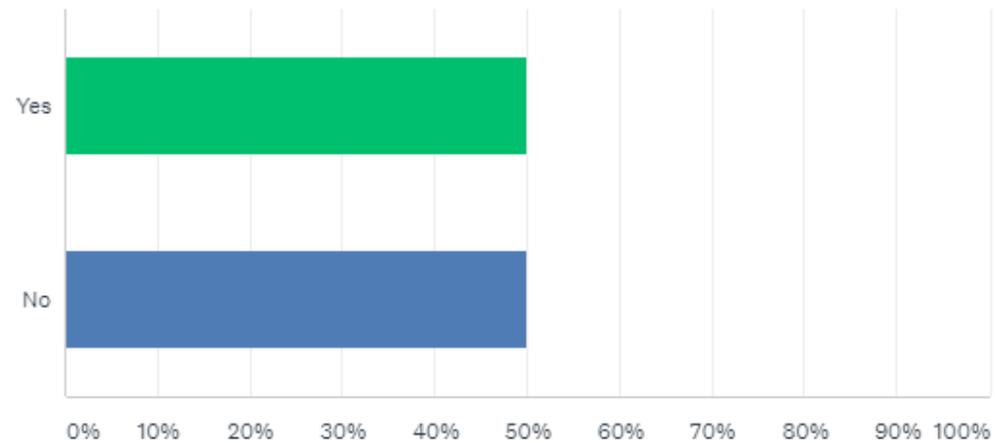


Q7

Customize Export

Was being located in a flood zone a concern in locating your business at its current location?

Answered: 2 Skipped: 1



ANSWER CHOICES	RESPONSES
Yes	50.00% 1
No	50.00% 1
TOTAL	2

Comments (1)

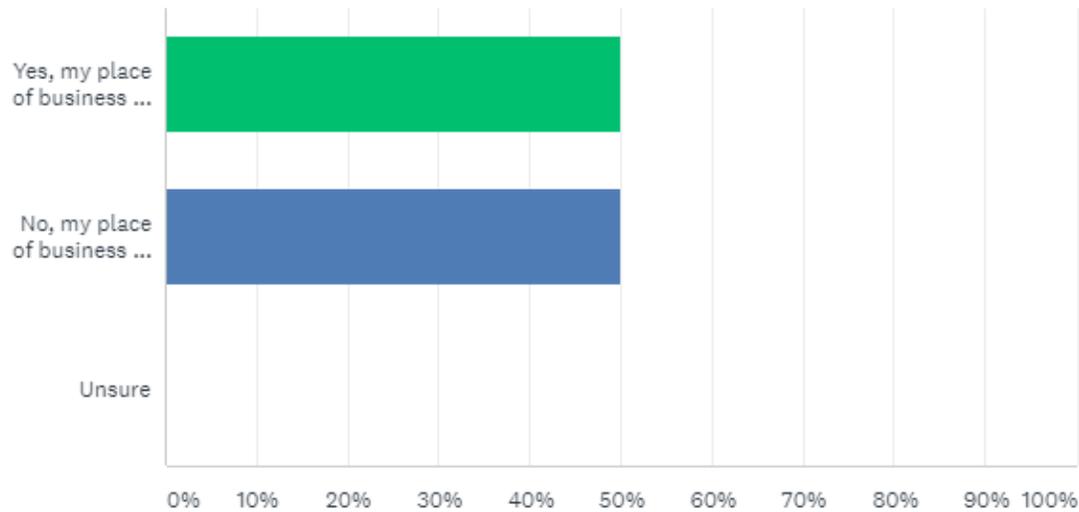


Q8

Customize Export

Has your place of business ever flooded due to natural/environmental causes?

Answered: 2 Skipped: 1



ANSWER CHOICES	RESPONSES
Yes, my place of business has flooded due to natural/environmental causes.	50.00% 1
No, my place of business has never flooded due to natural/environmental causes.	50.00% 1
Unsure	0.00% 0
TOTAL	2

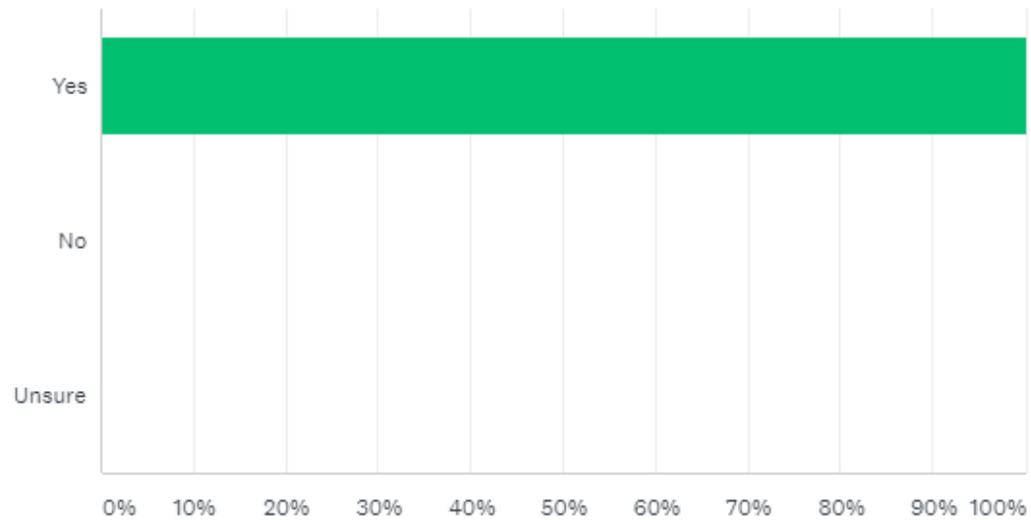
Comments (0)

Q9

Customize Export

Have you seen an increase in the frequency or duration of these flood events?

Answered: 2 Skipped: 1



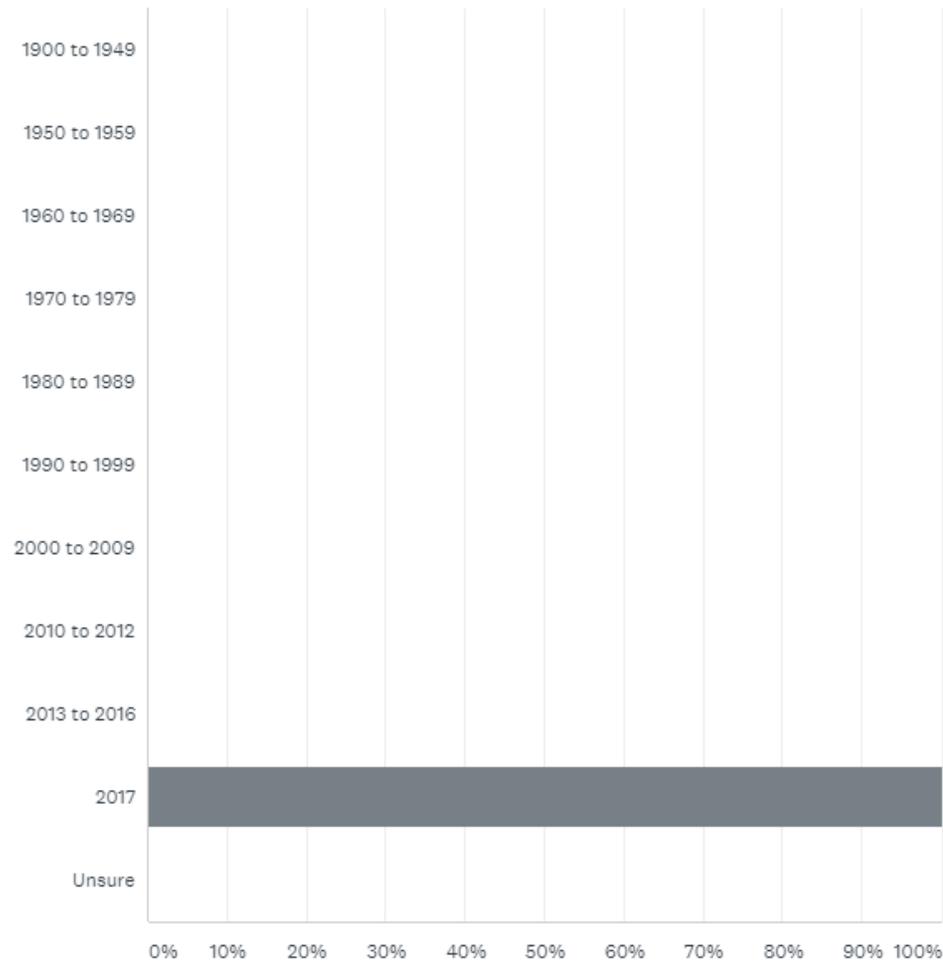
ANSWER CHOICES	RESPONSES
Yes	100.00% 2
No	0.00% 0
Unsure	0.00% 0
TOTAL	2

Q10

Customize Export

To your best knowledge, during which time period did your place of business last flood? (Check all that apply)

Answered: 1 Skipped: 2

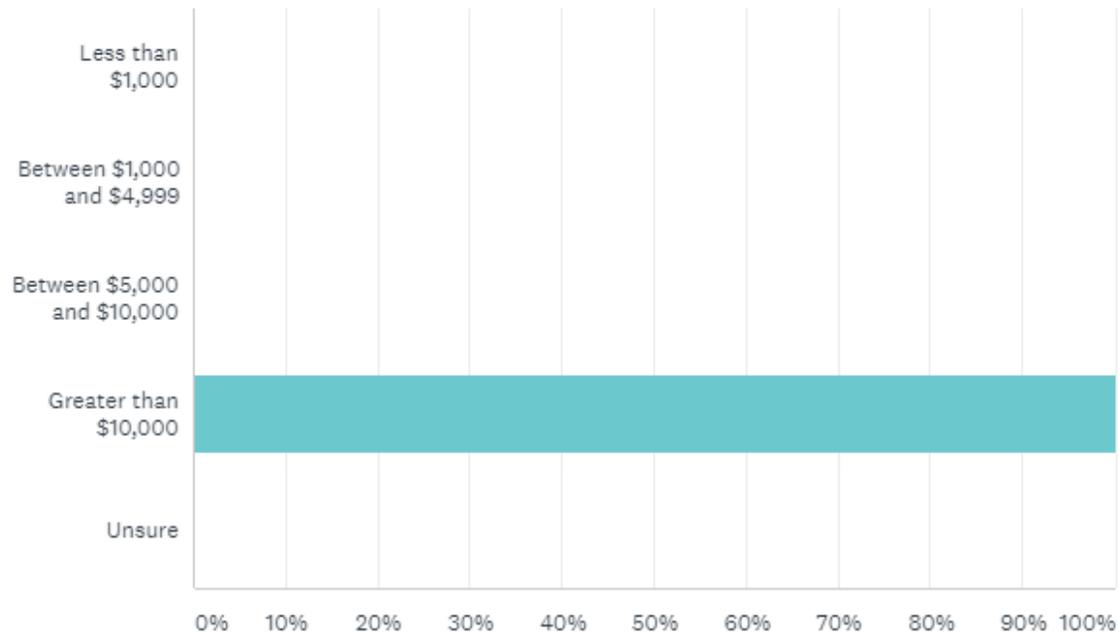


Q11

Customize Export

What was the approximate dollar value of all damages and losses to your business during the last flooding event?

Answered: 1 Skipped: 2



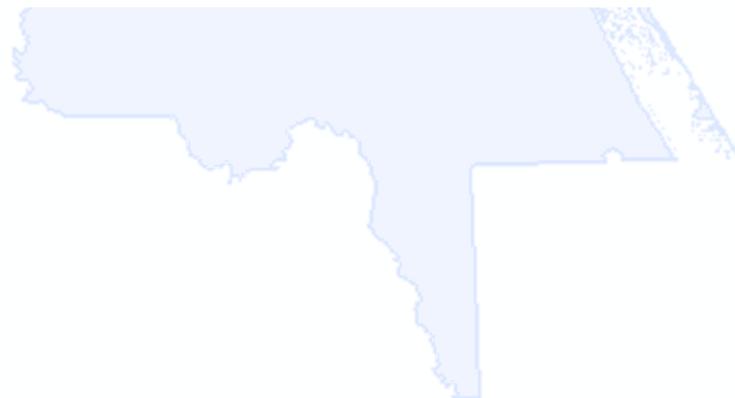
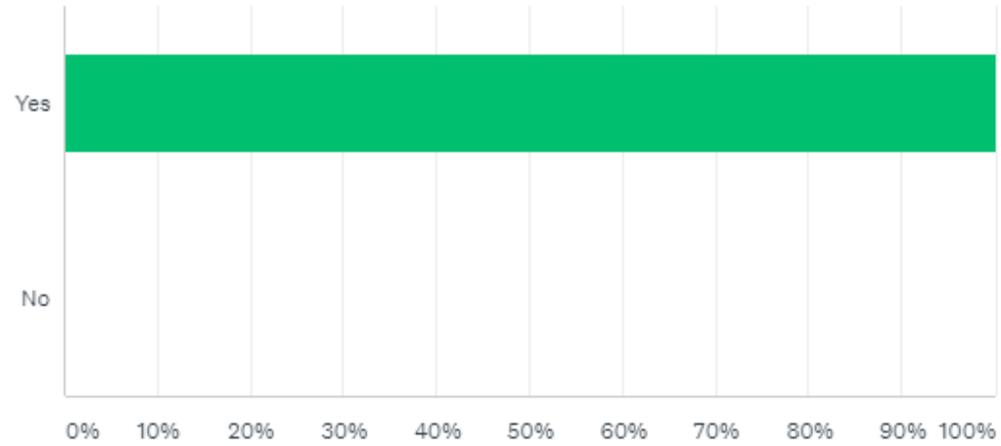
Q12

Customize

Export ▼

Has roadway flooding ever impacted access to your business?

Answered: 1 Skipped: 2



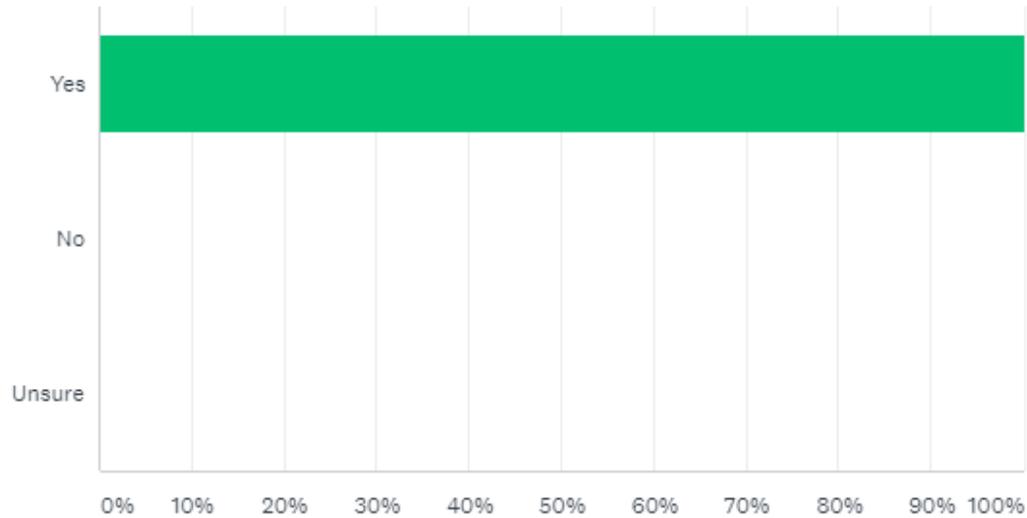
Q13

Customize

Export ▼

Have you seen an increase in the frequency or duration of these flood events?

Answered: 1 Skipped: 2



ANSWER CHOICES	RESPONSES
▼ Yes	100.00% 1
▼ No	0.00% 0
▼ Unsure	0.00% 0
TOTAL	1

Q14

Export ▼

Describe, if any, the economic effect local flooding has on your business (ie, loss of business days, employees unable to work, profit loss, etc.)?

Answered: 2 Skipped: 1

RESPONSES (2) TEXT ANALYSIS TAGS (0)

Add Tags ▼ Filter by Tag ▼

Search responses  

Showing 2 responses

We have property damage from the flooded street water being forced onto our property.

6/15/2018 8:59 AM

[View respondent's answers](#) [Add Tags ▼](#)

I have been relocated, 60 miles round trip a day, no reimbursement from the county for gas or time.

6/13/2018 4:43 PM

[View respondent's answers](#) [Add Tags ▼](#)



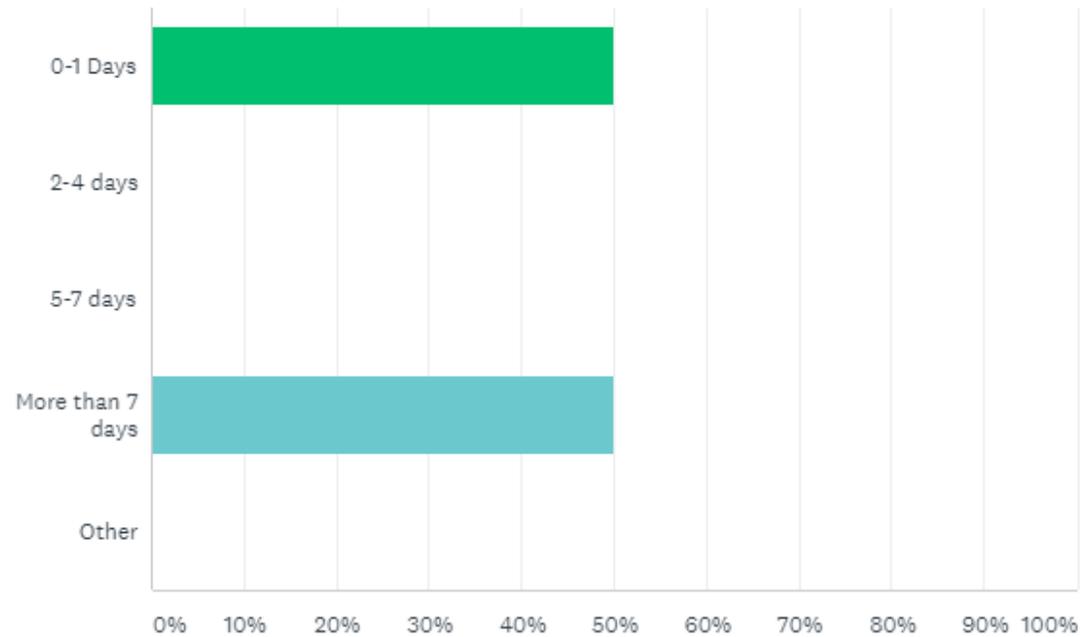
Q15

Customize

Export ▼

Approximately how many days of business, per year, do you lose due to flooding in your area?

Answered: 2 Skipped: 1

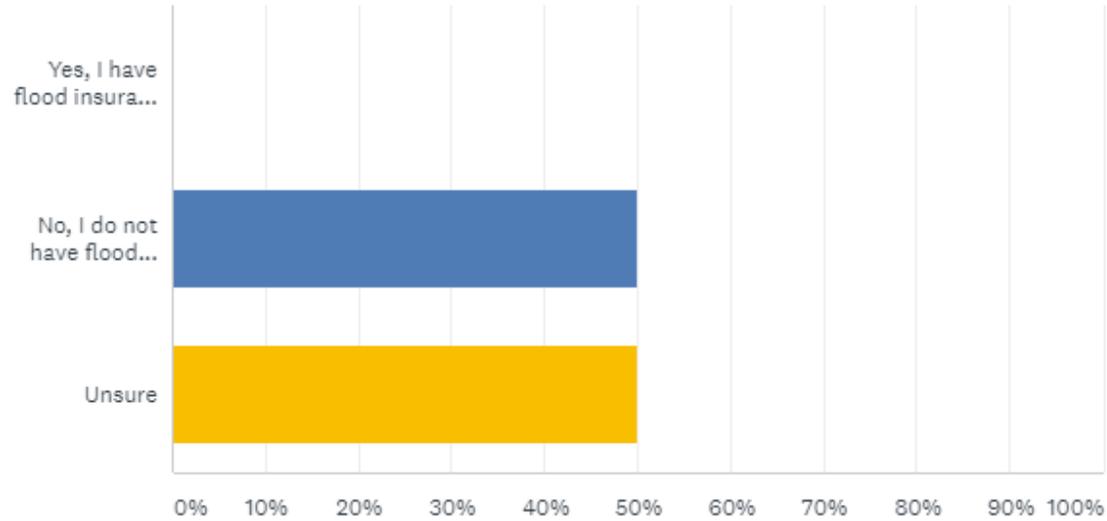


Q16

Customize Export

Do you currently have flood insurance for your property?

Answered: 2 Skipped: 1



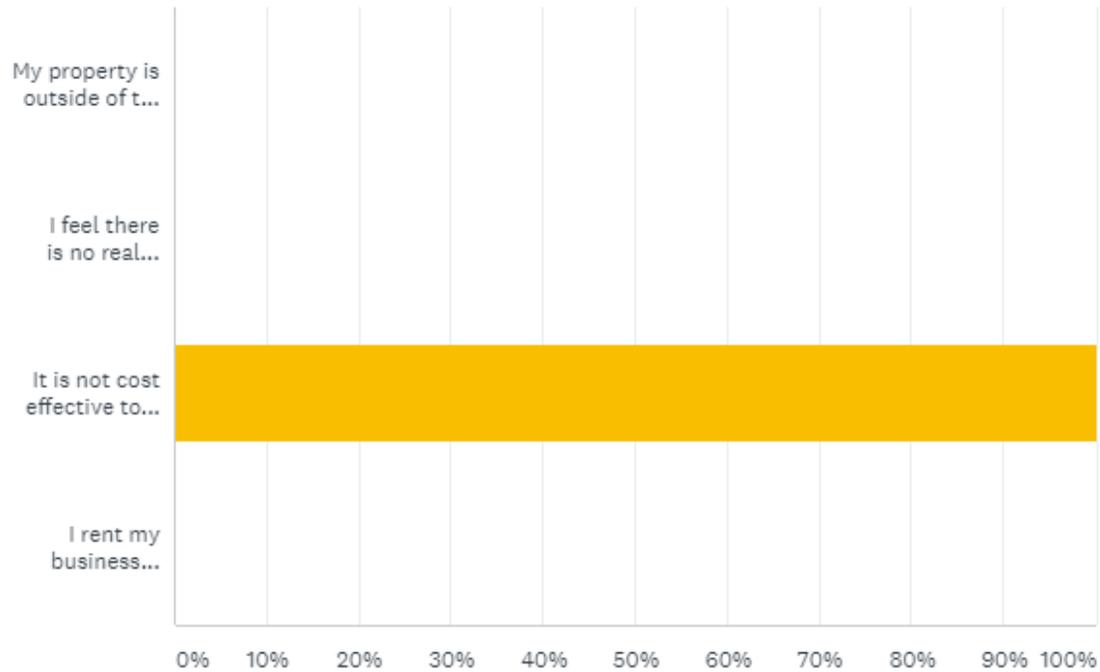
ANSWER CHOICES	RESPONSES
Yes, I have flood insurance for my property	0.00% 0
No, I do not have flood insurance for my property	50.00% 1
Unsure	50.00% 1
TOTAL	2

Q17

Customize Export

Which of the following reasons best describes why you do not have flood insurance?

Answered: 1 Skipped: 2

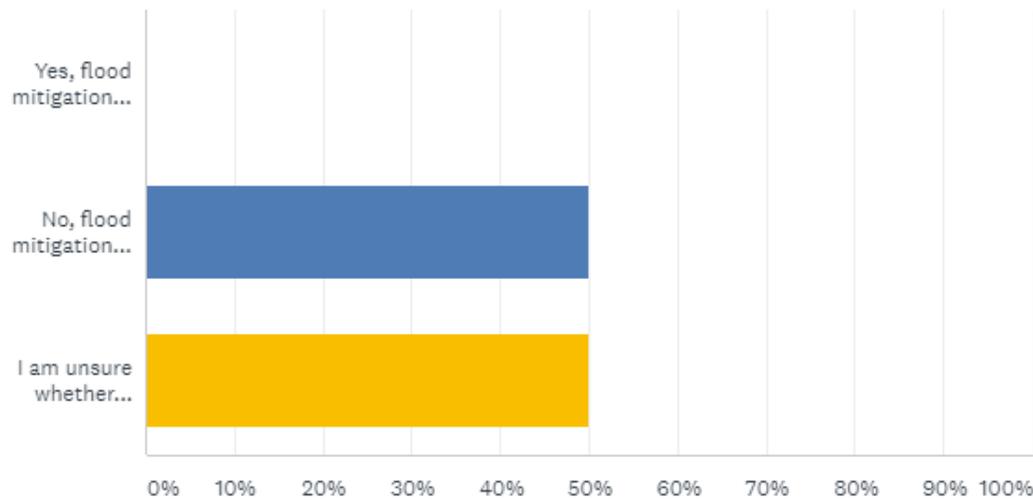


Q18

Customize Export

Have any flood mitigation efforts been implemented to your property?
 (IE.steps taken to remedy or improve structural vulnerability to flooding or flood proofing your property)

Answered: 2 Skipped: 1



ANSWER CHOICES	RESPONSES
Yes, flood mitigation efforts have been implemented on my property.	0.00% 0
No, flood mitigation efforts have not been implemented on my property.	50.00% 1
I am unsure whether mitigation efforts have been implemented on my property.	50.00% 1
TOTAL	2

Q19

Export ▼

Describe the mitigation efforts conducted on your property.

Answered: 0 Skipped: 3

RESPONSES (0)

TEXT ANALYSIS

TAGS (0)



Add Tags ▼

Filter by Tag ▼

Search responses



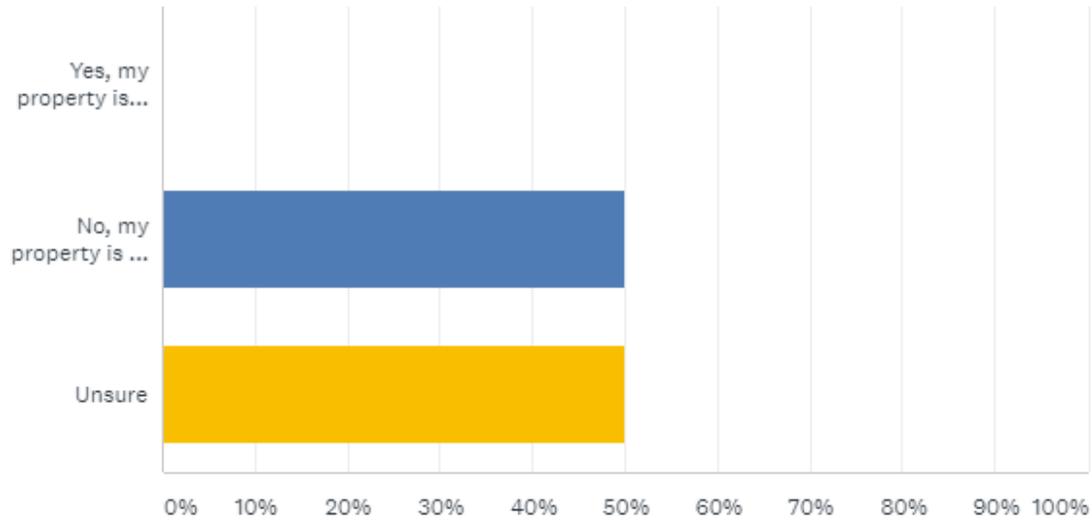
Showing 0 responses

Q20

Customize Export

Is your property classified as a repetitive flood loss property?

Answered: 2 Skipped: 1



ANSWER CHOICES	RESPONSES
Yes, my property is classified as a repetitive flood loss property	0.00% 0
No, my property is not classified as a repetitive flood loss property	50.00% 1
Unsure	50.00% 1
TOTAL	2

Q21

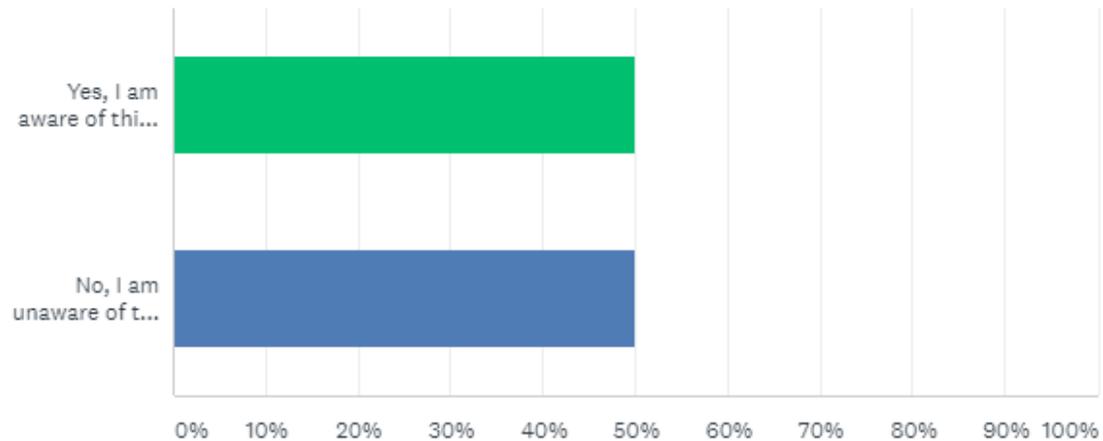
Customize

Export ▼

Did you know that you can view the current flood plain and other County-wide resources at the following web site:

[http://www.volusia.org/services/public-protection/emergency-management/ ?](http://www.volusia.org/services/public-protection/emergency-management/)

Answered: 2 Skipped: 1



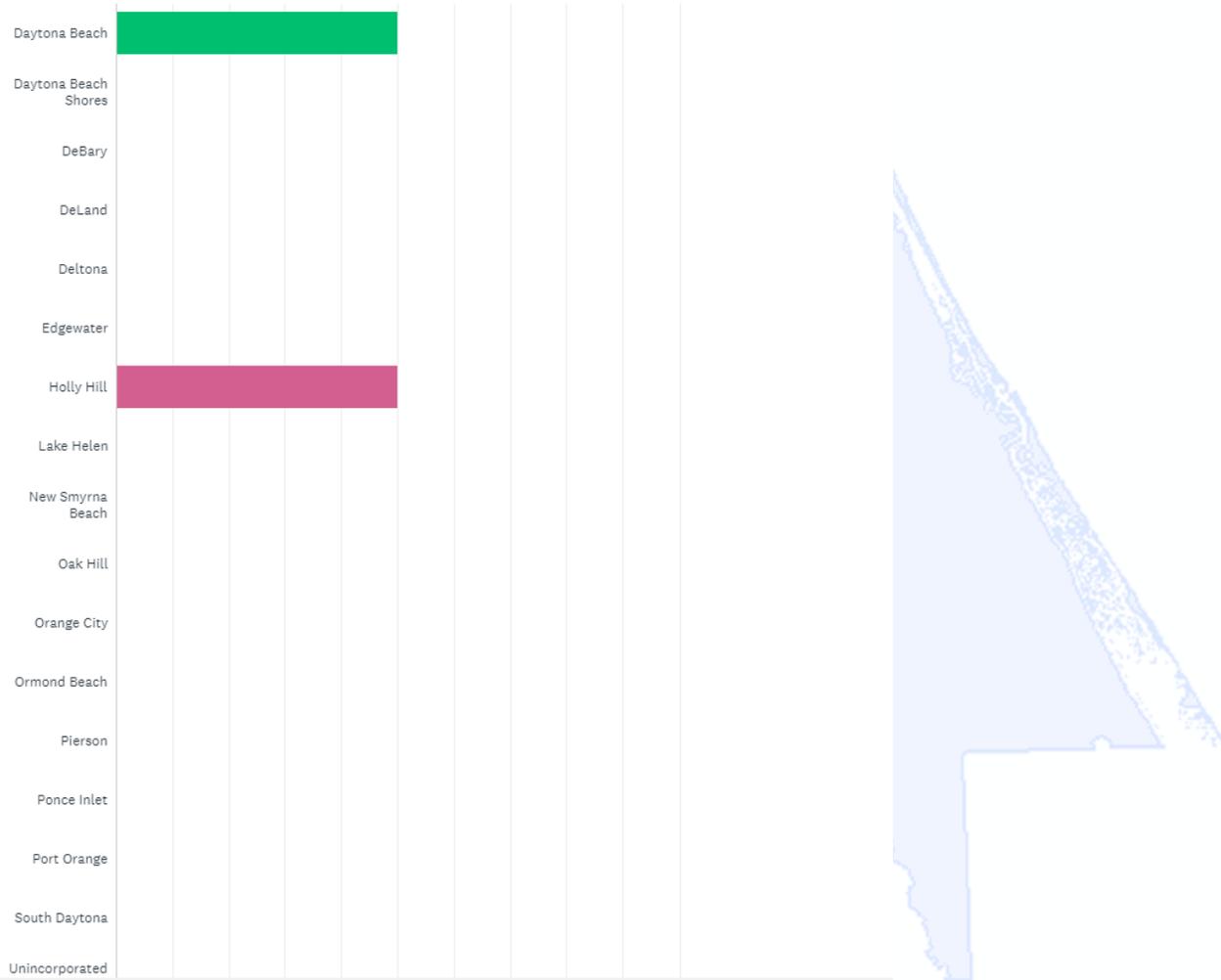
ANSWER CHOICES	RESPONSES
Yes, I am aware of this web site	50.00% 1
No, I am unaware of this web site	50.00% 1
TOTAL	2

Q22

Customize Export

Your property is located in which jurisdiction?

Answered: 2 Skipped: 1

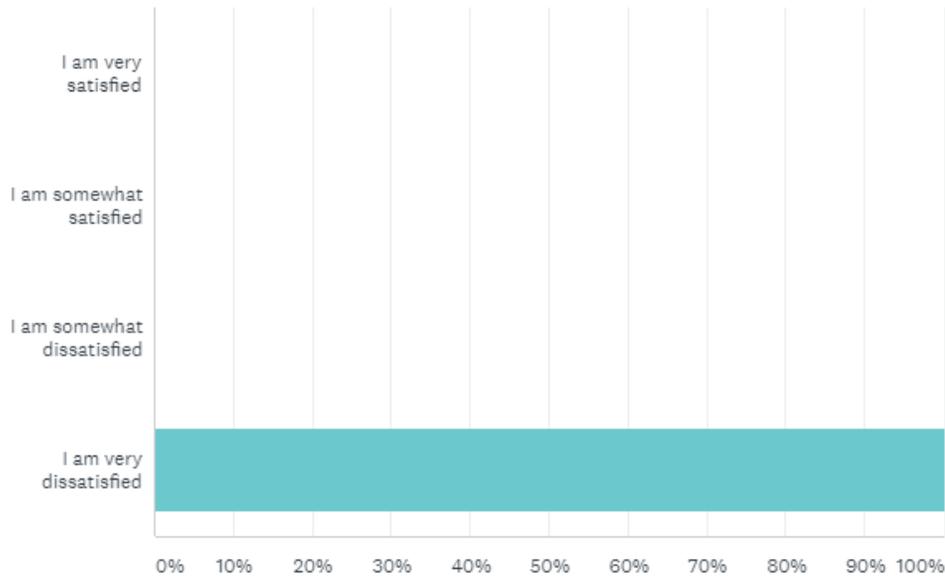


Q23

Customize Export

How satisfied are you with how your jurisdiction handles public involvement and outreach concerning flood hazards in your area?

Answered: 2 Skipped: 1



ANSWER CHOICES	RESPONSES
I am very satisfied	0.00% 0
I am somewhat satisfied	0.00% 0
I am somewhat dissatisfied	0.00% 0
I am very dissatisfied	100.00% 2
TOTAL	2

Appendix D

Neighborhood Association Survey



The following statistics were compiled for each of the questions on the Neighborhood Association Survey:

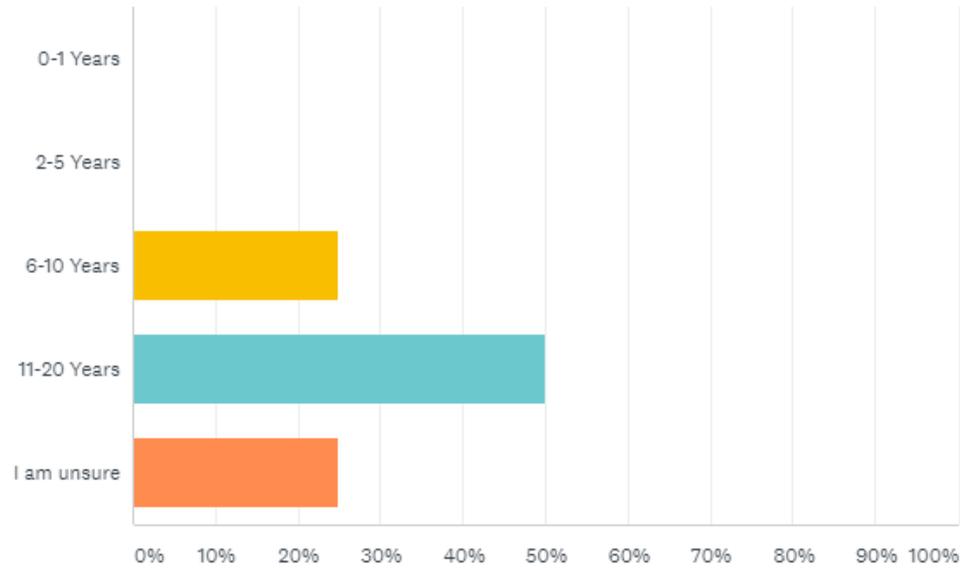


Q1

Customize Export

How long has your neighborhood association been active?

Answered: 4 Skipped: 0



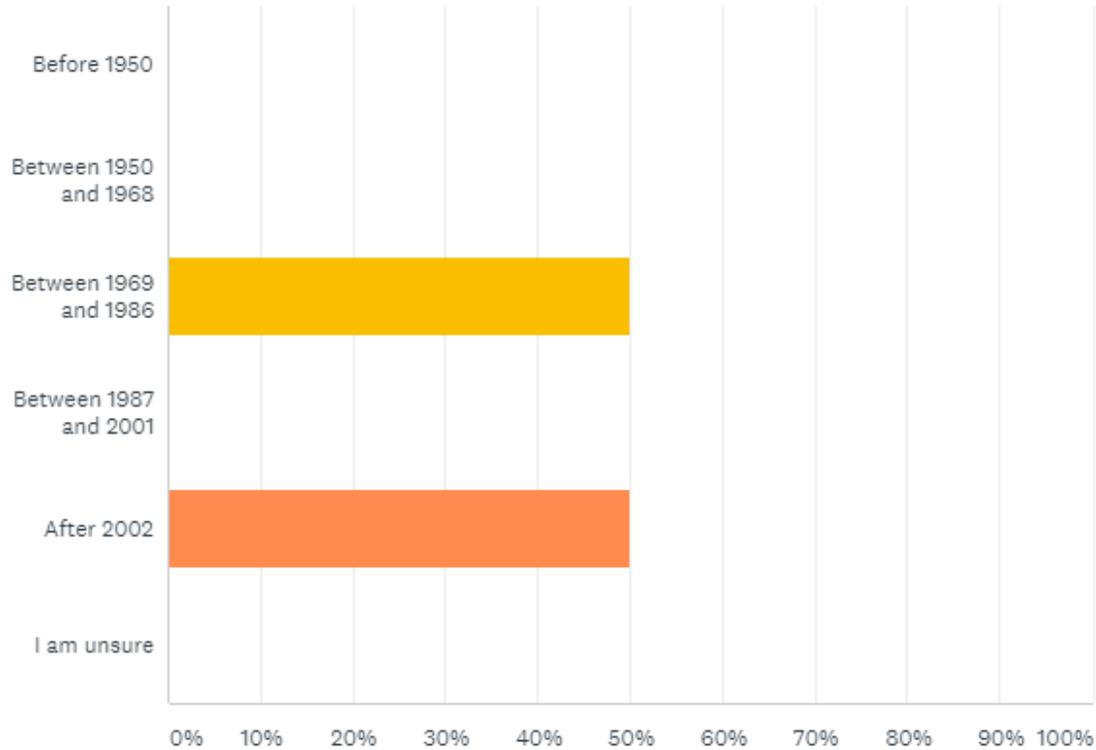
ANSWER CHOICES	RESPONSES
0-1 Years	0.00% 0
2-5 Years	0.00% 0
6-10 Years	25.00% 1
11-20 Years	50.00% 2
I am unsure	25.00% 1
TOTAL	4

Q2

Customize Export ▼

In what year were the homes in your coverage area built?

Answered: 4 Skipped: 0

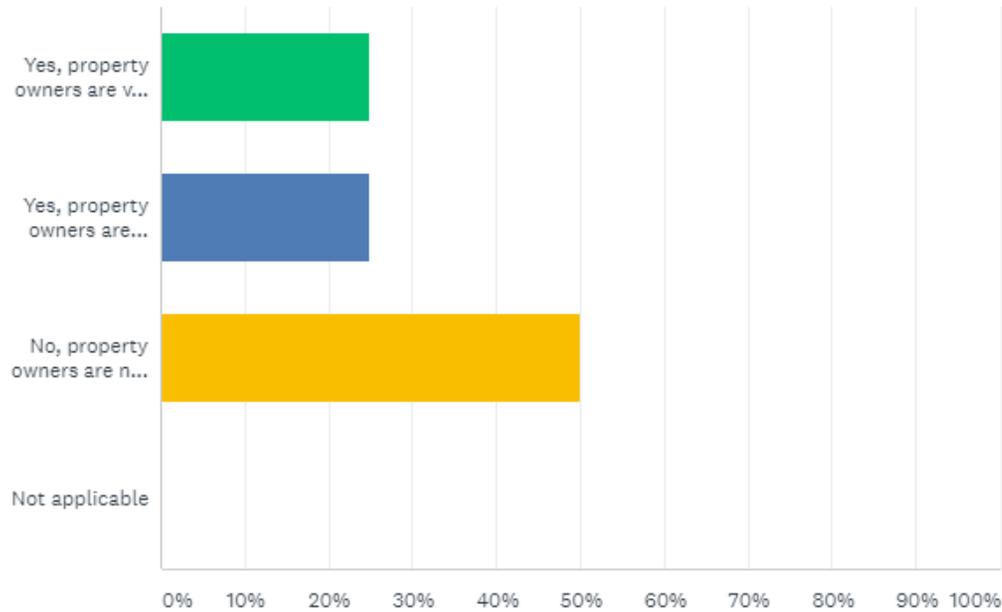


Q3

Customize Export

Is flooding a real concern for property owners in your association?

Answered: 4 Skipped: 0



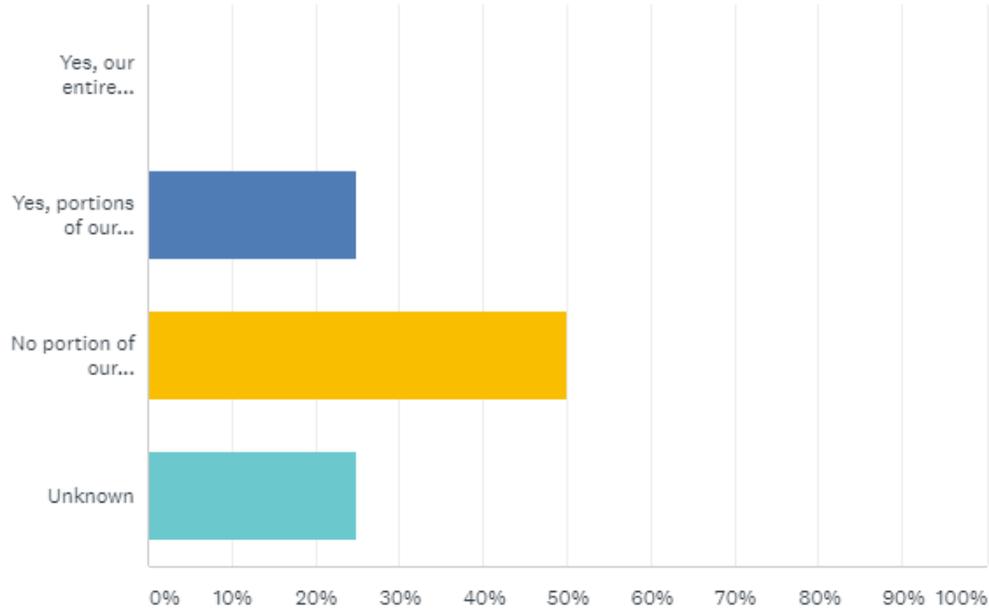
ANSWER CHOICES	RESPONSES
Yes, property owners are very concerned about flooding	25.00% 1
Yes, property owners are somewhat concerned about flooding	25.00% 1
No, property owners are not concerned about flooding	50.00% 2
Not applicable	0.00% 0
TOTAL	4

Q4

Customize Export

Is your Homeowner's Association neighborhood located in the flood plain?

Answered: 4 Skipped: 0



ANSWER CHOICES	RESPONSES
Yes, our entire neighborhood is located in the flood plain	0.00% 0
Yes, portions of our neighborhood are located in the floodplain	25.00% 1
No portion of our neighborhood is located in the floodplain	50.00% 2
Unknown	25.00% 1
TOTAL	4

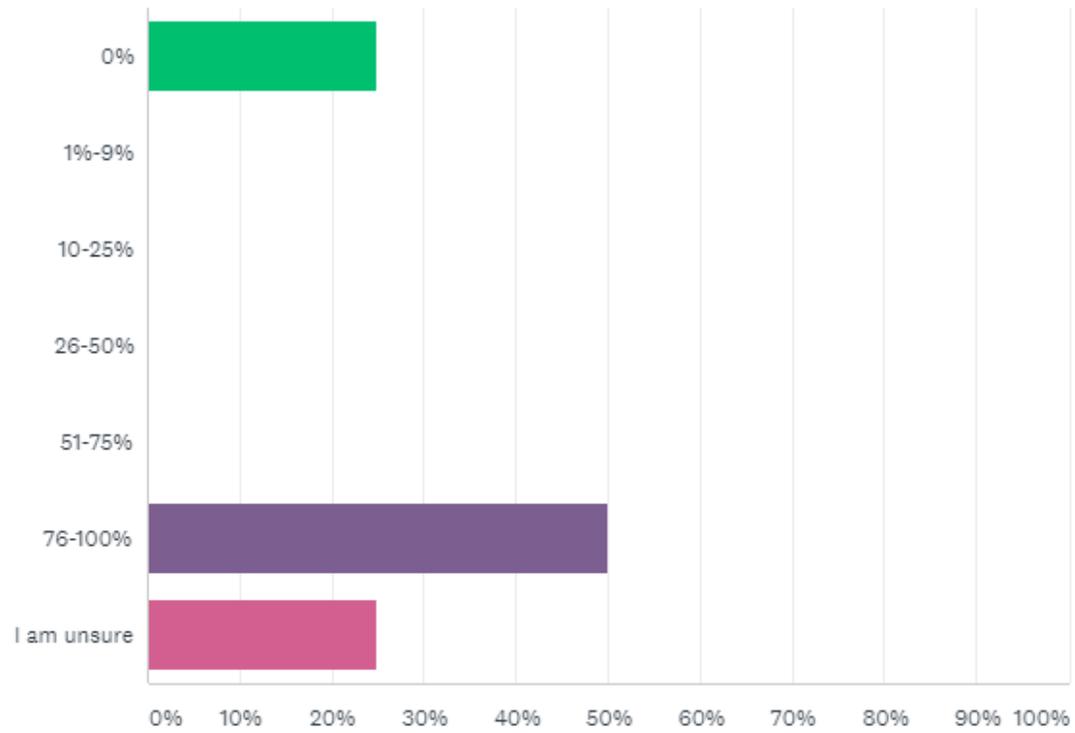
Q5

Customize

Export ▼

Approximately what percentage of the homes within your association are within a designated flood hazard zone?

Answered: 4 Skipped: 0

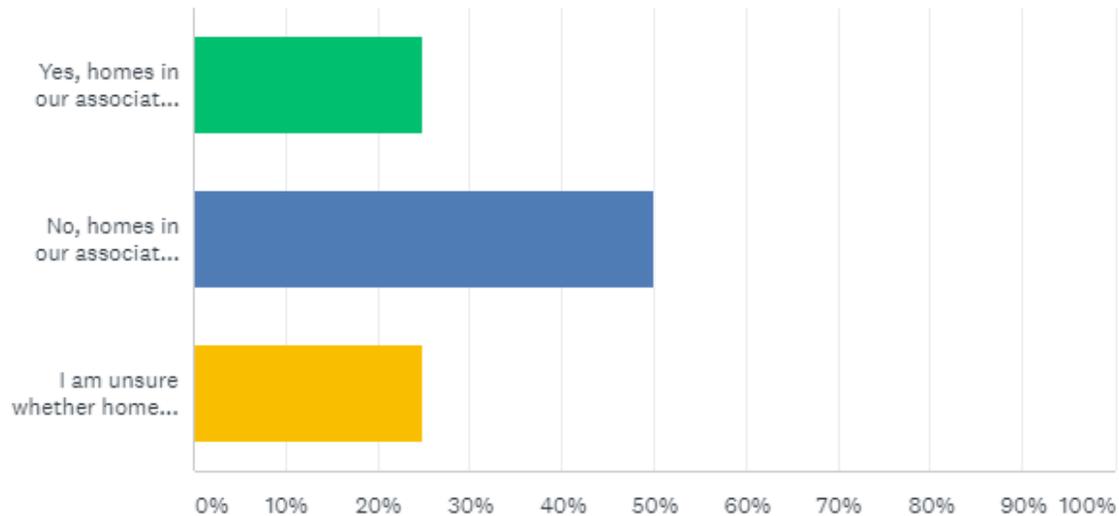


Q6

Customize Export

Have homes in your association area ever been flooded due to natural environmental causes?

Answered: 4 Skipped: 0



ANSWER CHOICES	RESPONSES
Yes, homes in our association area have flooded.	25.00% 1
No, homes in our association area have never flooded.	50.00% 2
I am unsure whether homes in our association have flooded.	25.00% 1
TOTAL	4

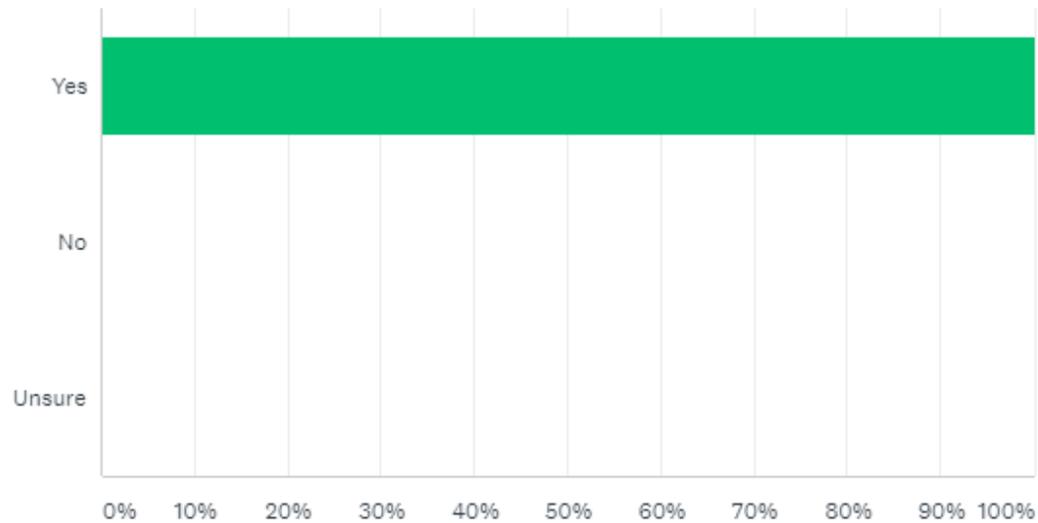
Comments (0)

Q7

Customize Export

If you answered yes to the previous question, has there been an increase in the frequency and duration of these flood events?

Answered: 2 Skipped: 2



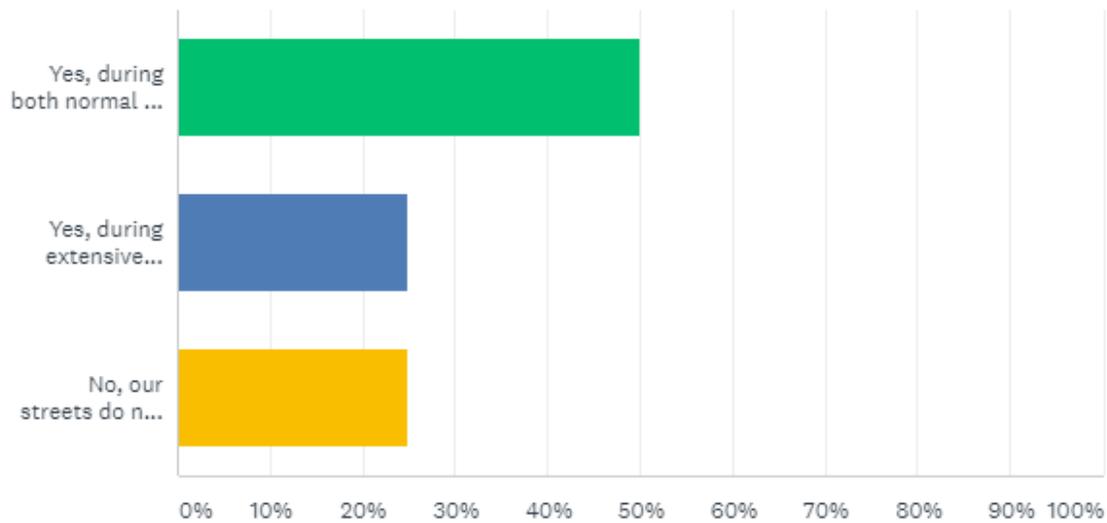
ANSWER CHOICES	RESPONSES
Yes	100.00% 2
No	0.00% 0
Unsure	0.00% 0
TOTAL	2

Q8

Customize Export

Do the roadways in your neighborhood experience major flooding during normal or extensive rainfall?

Answered: 4 Skipped: 0



ANSWER CHOICES	RESPONSES
Yes, during both normal and extensive	50.00% 2
Yes, during extensive rainfall only	25.00% 1
No, our streets do not normally flood	25.00% 1
TOTAL	4

Comments (0)

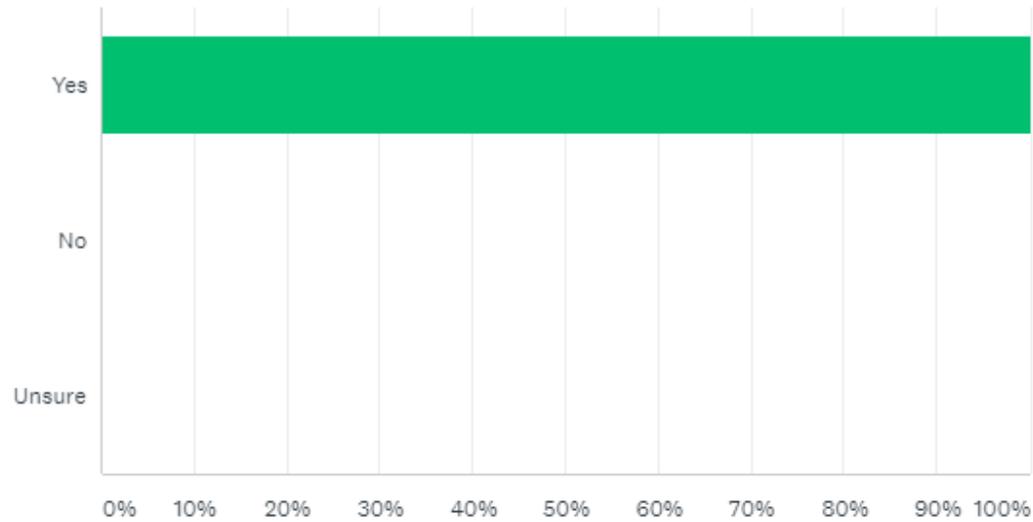
Q9

Customize

Export ▼

If you answered yes to the previous question, has there been an increase in the frequency and duration of these flood events?

Answered: 2 Skipped: 2

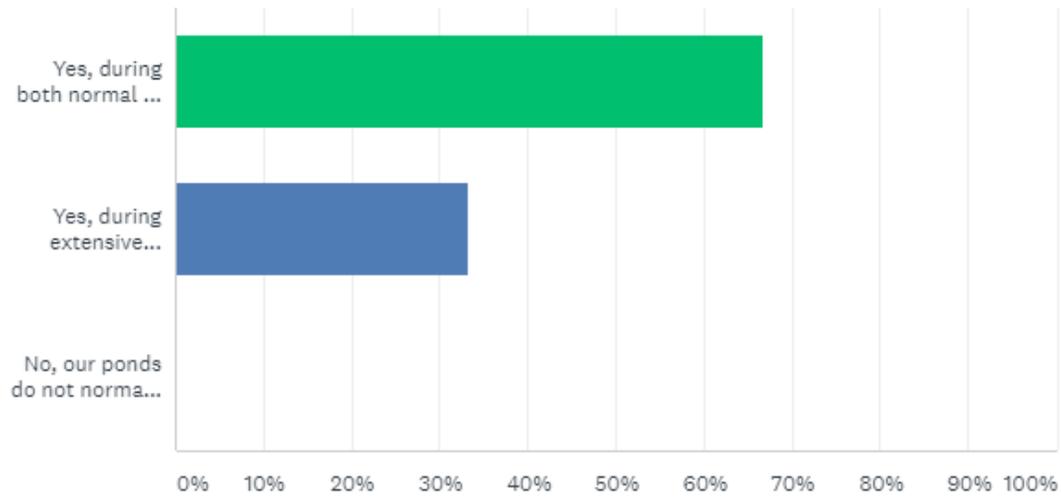


Q10

Customize Export

Do retention ponds in your neighborhood flood during normal or extensive rainfall?

Answered: 3 Skipped: 1



ANSWER CHOICES	RESPONSES
Yes, during both normal and extensive	66.67% 2
Yes, during extensive rainfall only	33.33% 1
No, our ponds do not normally flood	0.00% 0
TOTAL	3

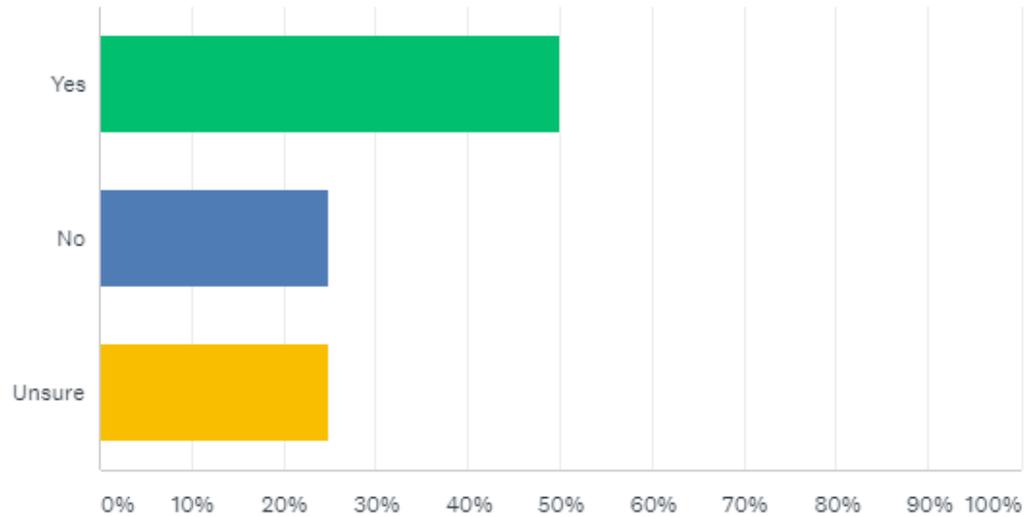
[Comments \(2\)](#)

Q11

Customize Export

If you answered yes to the previous questions, has there been an increase in the frequency and duration of these flood events?

Answered: 4 Skipped: 0



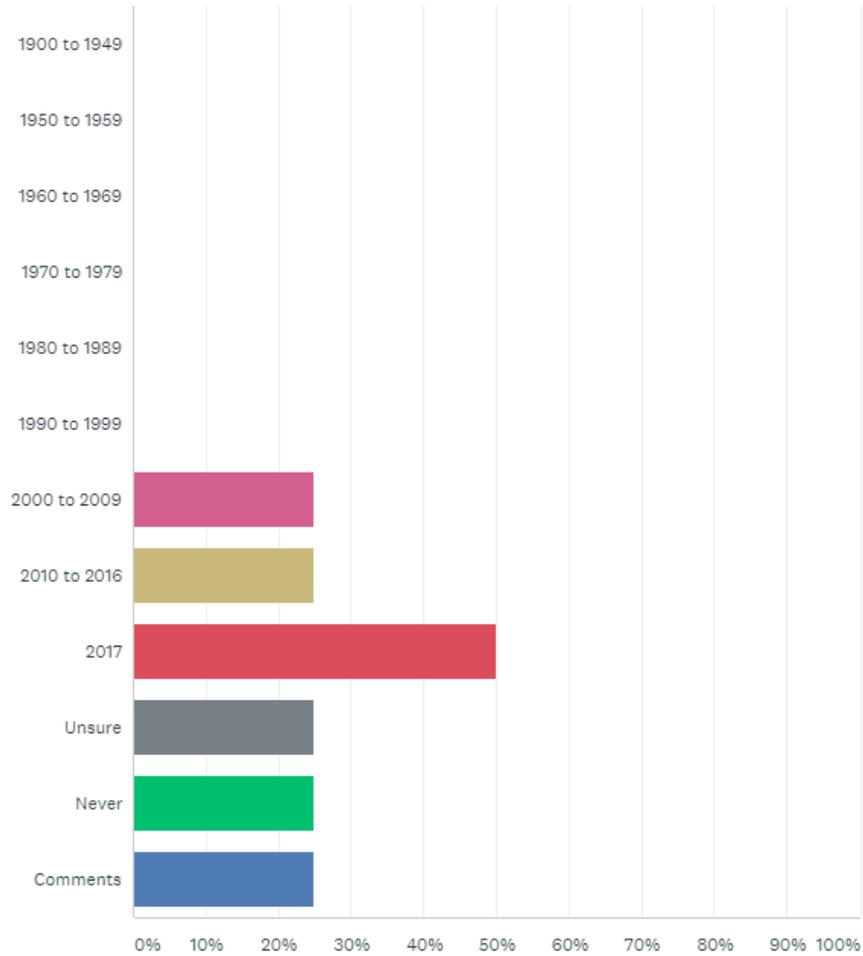
ANSWER CHOICES	RESPONSES
Yes	50.00% 2
No	25.00% 1
Unsure	25.00% 1
TOTAL	4

Q12

Customize Export

To the best of your knowledge, during which time period did a home in your association area last flood? (Check all that apply)

Answered: 4 Skipped: 0

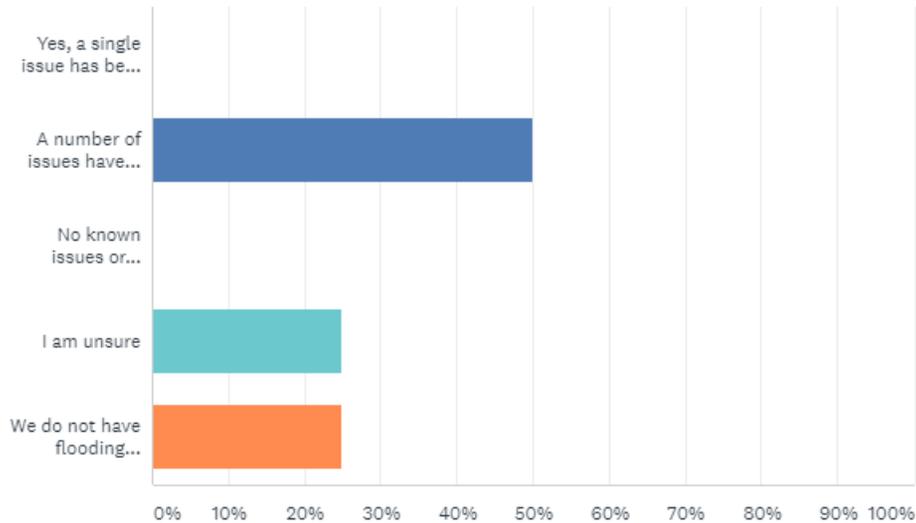


Q13

Customize Export

Has a known problem area been identified as the source of most flooding issues experienced by your neighborhood?

Answered: 4 Skipped: 0



ANSWER CHOICES	RESPONSES
Yes, a single issue has been identified as the main contributor to the flooding.	0.00% 0
A number of issues have been identified which contribute to the flooding.	50.00% 2
No known issues or sources have been identified which contribute to the flooding.	0.00% 0
I am unsure	25.00% 1
We do not have flooding issues.	25.00% 1
TOTAL	4

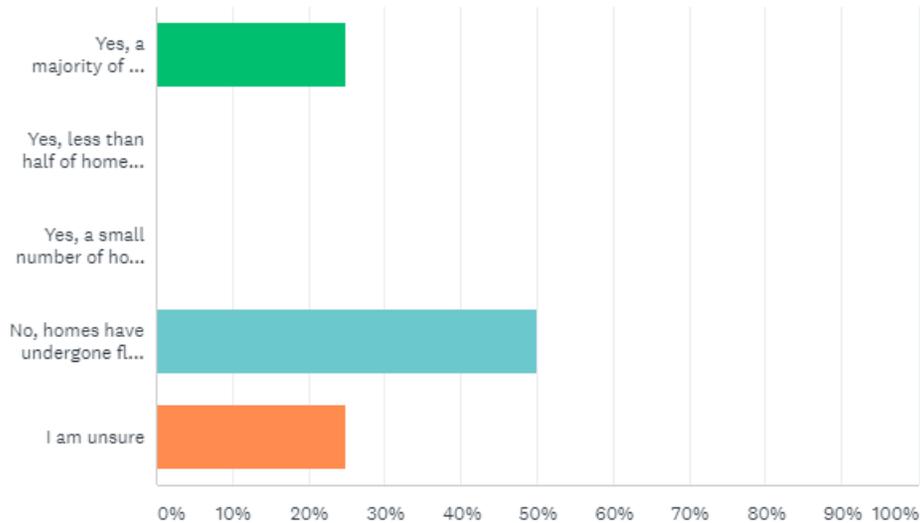
[Comments \(1\)](#)

Q14

Customize Export

Have homes in your association undergone flood mitigation efforts? (i.e. steps taken to remedy or improve structural vulnerability to flooding or flood proofing your home)

Answered: 4 Skipped: 0



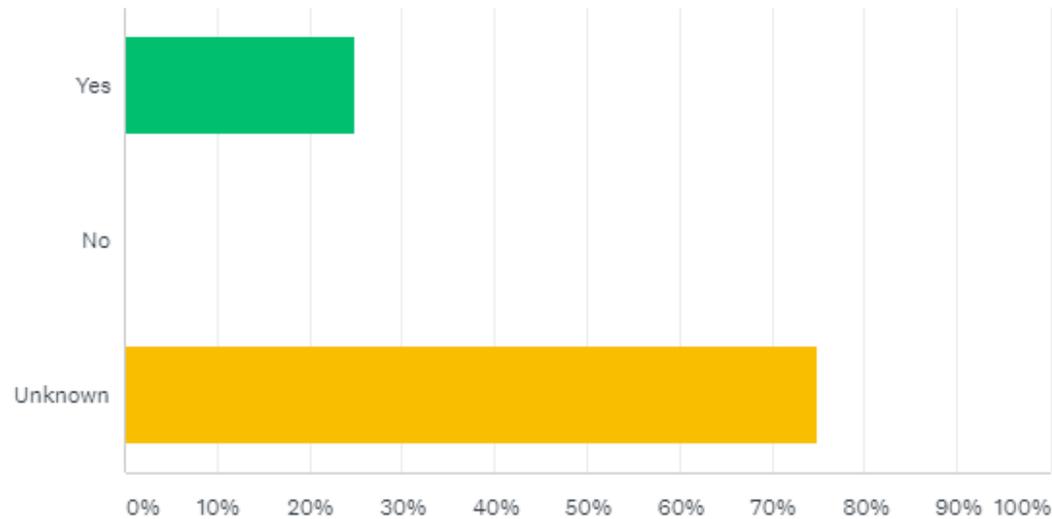
ANSWER CHOICES	RESPONSES
Yes, a majority of the homes have undergone flood mitigation efforts	25.00% 1
Yes, less than half of homes have undergone flood mitigation efforts	0.00% 0
Yes, a small number of homes have undergone flood mitigation efforts	0.00% 0
No, homes have undergone flood mitigation efforts	50.00% 2
I am unsure	25.00% 1
TOTAL	4

Q15

Customize Export

Are there any restrictions to structural improvements that, if removed, could possibly reduce the risk of flood loss to properties in your area?

Answered: 4 Skipped: 0



ANSWER CHOICES	RESPONSES
Yes	25.00% 1
No	0.00% 0
Unknown	75.00% 3
TOTAL	4

Q16

Export ▼

If you answered "Yes" to the previous question, please explain these types of restrictions.

Answered: 1 Skipped: 3

RESPONSES (1)

TEXT ANALYSIS

TAGS (0)



Add Tags ▼

Filter by Tag ▼

Search responses 



Showing 1 response



Re Sod and rental homes not properly maintained.

6/13/2018 9:22 PM

[View respondent's answers](#)

[Add Tags ▼](#)

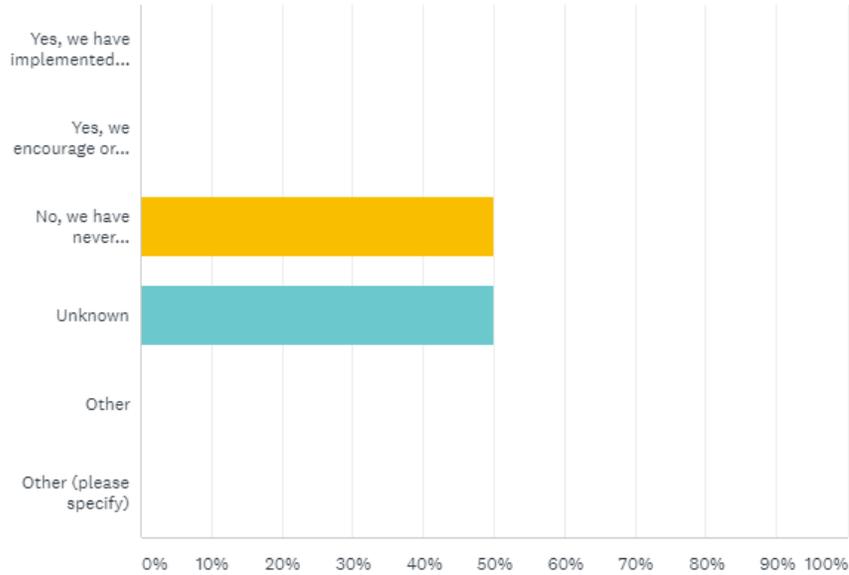


Q17

Customize Export

Has your association ever implemented large-scale flood mitigation efforts?
(Example: activities to alleviate flood impacts in the community)

Answered: 4 Skipped: 0



ANSWER CHOICES	RESPONSES
Yes, we have implemented incentive programs	0.00% 0
Yes, we encourage or assist property owners with flood mitigation efforts	0.00% 0
No, we have never implemented large-scale flood mitigation efforts	50.00% 2
Unknown	50.00% 2
Other	0.00% 0
Other (please specify)	0.00% 0
TOTAL	4

Q18

Export ▼

If you answered 'Yes' to the above question, what types of improvements were made?

Answered: 0 Skipped: 4

RESPONSES (0)

TEXT ANALYSIS

TAGS (0)



Add Tags ▼

Filter by Tag ▼

Search responses



Showing 0 responses

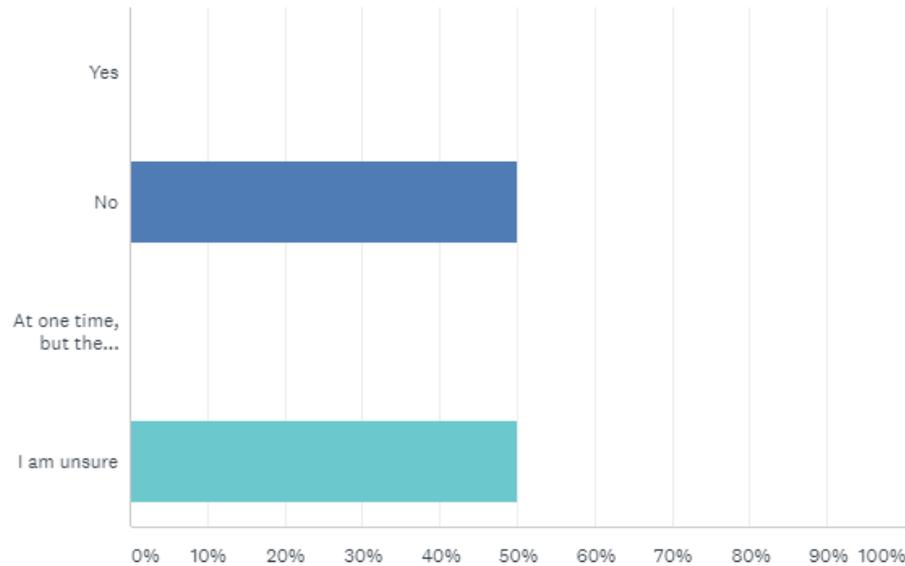


Q19

Customize Export

Are there homes in your association area that are classified as Repetitive Flood Loss properties (defined as a structure that has experienced two floods in the last ten years with at least \$1,000 in damages per event)?

Answered: 4 Skipped: 0



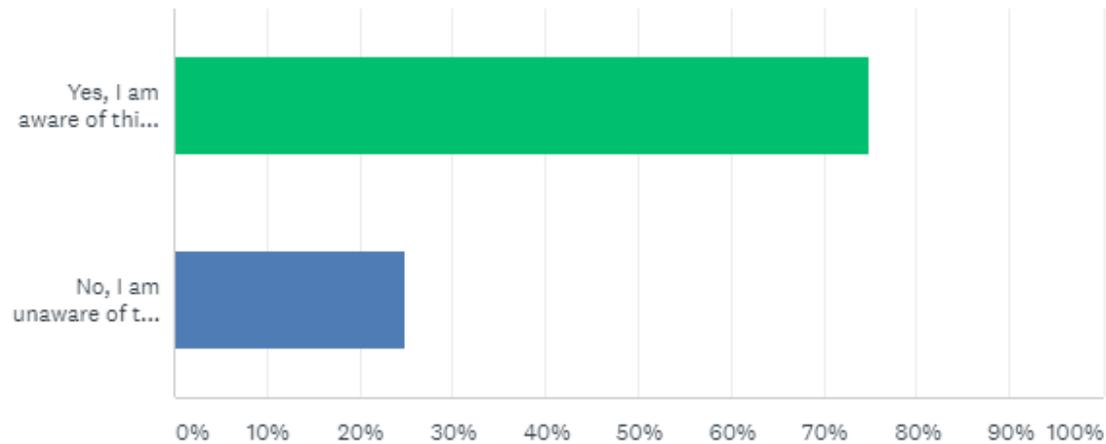
ANSWER CHOICES	RESPONSES
Yes	0.00% 0
No	50.00% 2
At one time, but the classification has been removed	0.00% 0
I am unsure	50.00% 2
TOTAL	4

Q20

Customize Export

Did you know that you can view the current flood plain and other County-wide resources at the following web site:
<http://www.volusia.org/services/public-protection/emergency-management>

Answered: 4 Skipped: 0



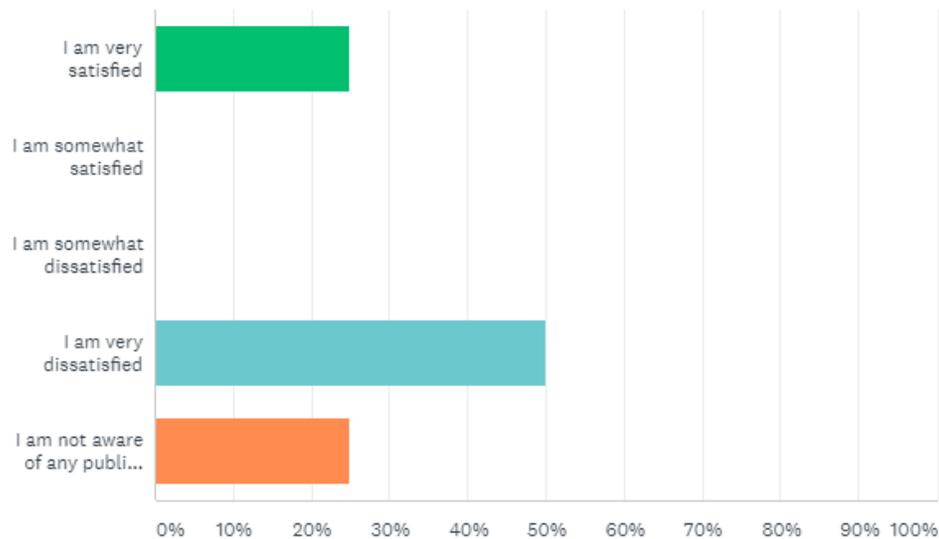
ANSWER CHOICES	RESPONSES
Yes, I am aware of this web site.	75.00% 3
No, I am unaware of this web site.	25.00% 1
TOTAL	4

Q21

Customize Export

How satisfied are you with how your jurisdiction handles public involvement and outreach concerning flood hazards in your area?

Answered: 4 Skipped: 0



ANSWER CHOICES	RESPONSES
I am very satisfied	25.00% 1
I am somewhat satisfied	0.00% 0
I am somewhat dissatisfied	0.00% 0
I am very dissatisfied	50.00% 2
I am not aware of any public involvement/outreach efforts concerning flood hazards	25.00% 1
TOTAL	4

Comments (1)

Q22

Export ▼

Enter the name of your Homeowner's Association.

Answered: 3 Skipped: 1

RESPONSES (3)

TEXT ANALYSIS

TAGS (0)

Add Tags ▼

Filter by Tag ▼



Showing 3 responses

Riviera Village Association, Inc.

6/15/2018 9:32 AM

[View respondent's answers](#)

[Add Tags ▼](#)

Woodland Ridge HOA

6/14/2018 6:00 PM

[View respondent's answers](#)

[Add Tags ▼](#)

Fairway Estates

6/13/2018 4:36 PM

[View respondent's answers](#)

[Add Tags ▼](#)

Q23

Export ▼

Enter Contact Information for your Homeowner's Association.

Answered: 2 Skipped: 2

ANSWER CHOICES ▼		RESPONSES ▼	
Name	Responses	100.00%	2
Company	Responses	0.00%	0
Address	Responses	0.00%	0
Address 2	Responses	0.00%	0
City/Town	Responses	0.00%	0
State/Province	Responses	0.00%	0
ZIP/Postal Code	Responses	0.00%	0
Country	Responses	0.00%	0
Email Address	Responses	0.00%	0
Phone Number	Responses	100.00%	2

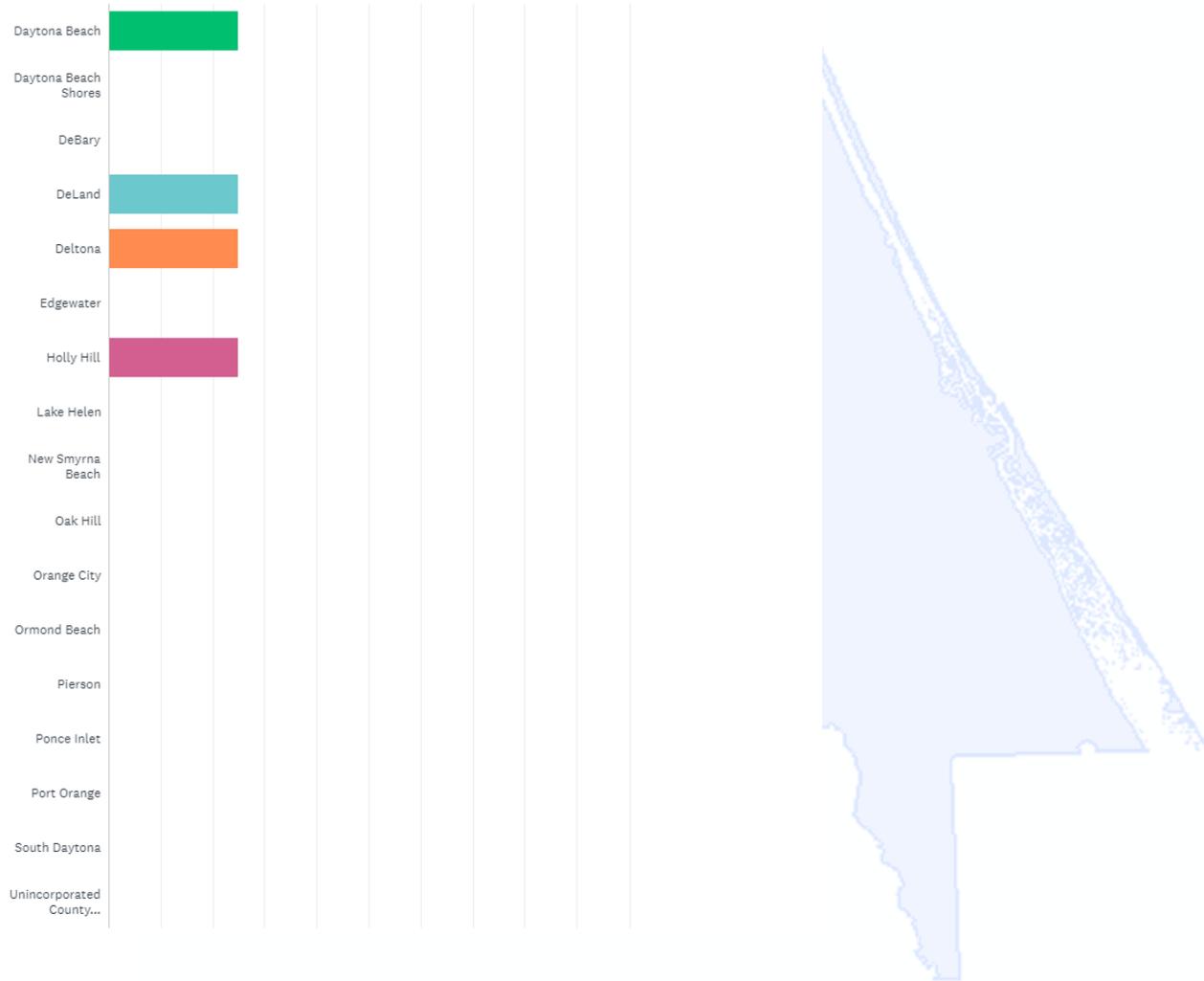


Q24

Customize Export

Your Homeowner's Association is located in what jurisdiction?

Answered: 4 Skipped: 0



Appendix E

Public Meeting Information



Overview

Public meetings were held on June 15th, 2018 in DeLand and June 18th, 2018 in Daytona Beach to gather feedback from the public and update the public on the progression of the plan. Two hard copies of the Draft Plan were provided at each meeting, and links to the plan (online) were distributed.

Meeting Format

The public meetings began with introductions of all persons in attendance, including residents and the project team. PJ Smith of the planning team then presented the plan via the PowerPoint included in this portion of the report. Following the presentation, hard copies of the plan were looked over by members of the public. Larry LaHue (VCEM), Aubrie Austin (VCEM), Michelle Cechowski (ECFRPC), Mark Reali (ECFRPC) and PJ Smith (ECFRPC) then answered questions from the public. The presentation portion of each meeting took approximately ten to fifteen minutes, while the discussions lasted for over one hour. Following the discussion, the project team stayed in the meeting location until the meeting window closed to ensure that all members of the public (even those arriving late) were heard.

Documents within this Appendix

The following documents are provided within this Appendix:

- PowerPoint Presentation (6/15)
- Sign In Sheet (6/15)
- PowerPoint Presentation (6/18)
- Sign In Sheet (6/18)
- Press Release for Public Meetings

PowerPoint Presentation (6/15/2018)

VOLUSIA FLOODPLAIN MANAGEMENT PLAN

**PUBLIC MEETING
JUNE 15, 2018**




AGENDA

- Welcome
- Project Overview
- Plan Overview
- Questions and Concerns
- Open House




AGENDA

- Welcome
- Project Overview**
- Plan Overview
- Questions and Concerns
- Open House




PROJECT OVERVIEW

Purpose:

- Amend Floodplain Management Plan (FMP) to develop municipal specific FMPs based on Community Rating System Guidance.
- Determine vulnerability to newly-released FEMA floodplain (2017 FIRM Maps)
- Incorporate FMP into the County's Local Mitigation Strategy




COMMITTEE PARTICIPANTS

- Jurisdictional staff (*County, 14 Cities, 2 Towns*)
 - LMS Working Group
- Floodplain Managers
- NFIP Coordinator
- State Hazard Mitigation Officer




PUBLIC INVOLVEMENT

- Public Meetings (2)
 - DeLand, Daytona Beach
- Resident Survey
- Business Survey
- HOA Survey
- Comment on Draft Plan
 - The draft plan is available at www.ecfrpc.org.
 - Please send your comments to tara@ecfrpc.org




6/15 PowerPoint (Continued)

OTHER STEPS

- Assessment of the flood hazard using best available data (2017 DFIRM Maps).
- Review past flood claims and issues.
- Describe areas that provide natural and beneficial functions and habitat for rare and endangered species
- Analyze current and future development, redevelopment and population trends in comparison to the extent of the 100-year and 500-year floodplains.



FINAL STEPS

- **Finalize Draft Plan**
Incorporation of all comments on the Draft Plan
- **Adopt the Plan**
The County and all 16 jurisdictions will enact Resolutions of Adoption to adopt the plan.



AGENDA

- Welcome
- Project Overview
- Plan Overview**
- Questions and Concerns
- Open House



PLAN OVERVIEW

- ✓ **Planning Process**
- **Vulnerability Assessment**
 - Impacts on Life, Safety & Health
 - Critical Facility Exposure
 - Property Value Exposure
 - Exposure by Land Use
 - Repetitive Loss Property Analysis
 - Flood Claim Analysis
- **Mitigation Strategy and Action Plan**



MITIGATION STRATEGIES

- Flood Prevention
- Property Preventative
- Natural Resource Protection
- Emergency Services
- Structural Projects
- Public Education and Awareness



OTHER PLAN SECTIONS

- Appendix A – Jurisdiction Profiles
 - Goals and Objectives
 - Flood Maps
 - Exposure Data (Land Use, Financial, Repetitive Loss)
- Appendix B – Public Survey Information
- Appendix C – Business Survey Information
- Appendix D – Neighborhood Association Survey
- Appendix E – Public Meeting Information
- Appendix G – Action Plan
- Appendix H – Public Comment on Draft Plan
- Appendix F & I – Resolutions of Support & Resolutions of Adoption



6/15 PowerPoint (Continued)

DRAFT FMP

Go to www.ecfrpc.org to view the draft Floodplain Management Plan
***Appendices will be added at the conclusion of public comment

Feedback

Please email your feedback to Tara McCue at tara@ecfrpc.org.
The feedback deadline is July 10th, 2018.



QUESTIONS

Has the process of updating the Volusia County Floodplain Management Plan provided you with more knowledge of the purpose of the plan?

How satisfied are you with the public outreach conducted as part of the planning process for the plan update?

What additional feedback do you have concerning the Floodplain Management Plan?



AGENDA

Welcome
Project Overview
Plan Overview
Questions and Concerns
Open House



OPEN HOUSE

Contact Us

Larry LaHue (llahue@volusia.org)
Aubrie Austin (alaustrin@volusia.org)

Tara McCue (tara@ecfrpc.org)
Michelle Cechowski (michelle@ecfrpc.org)
PJ Smith (pjsmith@ecfrpc.org)
Mark Reali (mreali@ecfrpc.org)





Volusia County Floodplain Management Plan Public Meeting

June 15, 2018
9:30 AM - 12:00 pm
DeLand Regional Library



NAME	Zip Code	Phone Number	Email Address
Suze Peace	32724	386-837-5469	4sfpeace@bellsouth.net
Larry Lathue	32174	386-754-1500	llathue@volusia.org
FRED PEACE	32724	386-738-0924	4sfpeace@bellsouth.net
Michelle Cechowski	32720	407-402-3761	michelle@ecfrpc.org
Aubrie Austin	32724	386 214 0029	alaustin@volusia.org
PJ SMITH	32801 (Non-Volusia)	407-496-5463	PJSMITH@ECFRPC.ORG
Mark Reali	34758	256 337 0872	mreali@ecfrpc.org

PowerPoint Presentation (6/18/2018)

VOLUSIA FLOODPLAIN MANAGEMENT PLAN

**PUBLIC MEETING
JUNE 18, 2018**




AGENDA

- Welcome
- Project Overview
- Plan Overview
- Questions and Concerns
- Open House




AGENDA

- Welcome
- Project Overview**
- Plan Overview
- Questions and Concerns
- Open House




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- Determine vulnerability to newly-released FEMA floodplain (2017 FIRM Maps)
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6/18 PowerPoint (Continued)

OTHER STEPS

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 - Impacts on Life, Safety & Health
 - Critical Facility Exposure
 - Property Value Exposure
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 - Repetitive Loss Property Analysis
 - Flood Claim Analysis
- **Mitigation Strategy and Action Plan**



MITIGATION STRATEGIES

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- Property Preventative
- Natural Resource Protection
- Emergency Services
- Structural Projects
- Public Education and Awareness



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- Appendix D – Neighborhood Association Survey
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- Appendix F & I – Resolutions of Support & Resolutions of Adoption



6/18 PowerPoint (Continued)

DRAFT FMP

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QUESTIONS

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What additional feedback do you have concerning the Floodplain Management Plan?



AGENDA

Welcome
Project Overview
Plan Overview

Questions and Concerns
Open House



OPEN HOUSE

Contact Us

Larry LaHue (llahue@volusia.org)
Aubrie Austin (alAustin@volusia.org)

Tara McCue (tara@ecfrpc.org)
Michelle Cechowski (michelle@ecfrpc.org)
PJ Smith (pjsmith@ecfrpc.org)
Mark Reali (mreali@ecfrpc.org)



Press Release



June 6, 2018

Contact: Shelley Szafraniec, APR, CPRC
386-822-5062, ext. 15637

Public input sought on floodplain management plan

Volusia County's Emergency Management Division will host two public meetings to engage the community in the development of the Floodplain Management Plan. At the meetings the public can review and comment on the plan.

The meetings will be:

- 9:30 a.m. to noon
Friday, June 15, at the Deland Regional Library, 130 E. Howry Ave., DeLand
- 9 a.m. to noon
Monday, June 18, at the Daytona Beach Regional Library, 105 E. Magnolia Ave., Daytona Beach

The draft plan will be posted on www.edfrc.org on June 15th, 2018.

There are also several surveys available to provide comment. Residents are asked to complete the surveys and can complete more than one if applicable. The survey links are:

Business: <https://www.surveymonkey.com/r/2018VCBusiness>

Public: <https://www.surveymonkey.com/r/2018VCPublic>

Neighborhood: <https://www.surveymonkey.com/r/2018VCNeighborhood>

For more information, a copy of the agenda or to submit a comment by email, contact Michelle Cechowski at 407-245-0300 ext. 317. The deadline to submit comment is July 31st, 2018.

-30-



www.volusia.org

VOLUSIA COUNTY COUNCIL

ED KELLEY COUNTY CHAIR	JOYCE M. CUSACK AT-LARGE	DEBORAH DENYS VICE CHAIR, DISTRICT 3	PAT PATTERSON DISTRICT 1	BILLIE WHEELER DISTRICT 2	HEATHER POST DISTRICT 4	DR. FRED LOWRY DISTRICT 5
---------------------------	-----------------------------	---	-----------------------------	------------------------------	----------------------------	------------------------------

Appendix F

Resolutions of Support



City of Daytona Beach – Resolution of Support

RESOLUTION NO. 18-236

A RESOLUTION IN SUPPORT OF THE PLANNING PROCESS OF THE EAST CENTRAL FLORIDA REGIONAL PLANNING COUNCIL FOR THE DEVELOPMENT AND INTEGRATION OF "THE VOLUSIA COUNTY LOCAL MITIGATION STRATEGY AND THE CITY'S FLOODPLAIN MANAGEMENT PLAN"; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, coastal and riverine flooding are significant threats to the safety of residents of Volusia County and its municipalities; and

WHEREAS, the National Flood Insurance Program (NFIP) provides federally supported flood insurance in communities that regulate development in floodplains; and

WHEREAS, the Community Rating System ("CRS") grades the various community Floodplain Management programs and reduces flood insurance premiums in those communities that meet certain requirements; and

WHEREAS, in an effort to reduce the potential for personal/property losses in flood-prone areas and ensure the lowest possible flood insurance premiums for residents, Volusia County has contracted with East Central Florida Regional Planning Council to draft the revised Floodplain Management Plan in alignment with the CRS Guidelines; and

WHEREAS, the East Central Florida Regional Planning Council is also required to integrate the FMP into the Local Mitigation Strategy; and

WHEREAS, the Floodplain Management Plan will be completed in August of 2018; and

WHEREAS, Interim Utilities Director recommends the City support the planning process of the East Central Florida Regional Planning Council to further the goals of the Community Rating System and National Flood Insurance Program.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF DAYTONA BEACH, FLORIDA:

SECTION 1. The City Commission considers the Floodplain Management Plan to be of the utmost importance to the City and supports the Floodplain Management Plan planning process.

SECTION 2. This Resolution shall take effect immediately upon its adoption.


DERRICK L. HENRY
Mayor

ATTEST:


LETTIA LAMAGNA
City Clerk

Adopted: July 18, 2018

Daytona Beach Shores – Resolution of Support

RESOLUTION NO. 2018-08

A RESOLUTION OF THE CITY OF DAYTONA BEACH SHORES, VOLUSIA COUNTY, FLORIDA IN SUPPORT OF THE PLANNING PROCESS FOR THE DEVELOPMENT OF THE REVISED "VOLUSIA COUNTY AND MUNICIPAL FLOODPLAIN MANAGEMENT PLAN"; PROVIDING A SAVINGS PROVISION; PROVIDING FOR CONFLICTS; PROVIDING FOR SEVERABILITY AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, Article VIII, Section 2, *Constitution of the State of Florida*, authorizes the City of Daytona Beach Shores to exercise any power for municipal purposes except as otherwise provided by law; and

WHEREAS, coastal and riverine flooding are significant threats to the safety of residents of Volusia County and its municipalities; and

WHEREAS, the National Flood Insurance Program (NFIP) provides federally supported flood insurance in communities that regulate development in floodplains; and

WHEREAS, the Community Rating System (CRS) grades the various community floodplain management programs and reduces flood insurance premiums in those communities that meet certain requirements; and

WHEREAS, in an effort to reduce the potential for personal/property losses in flood-prone areas and ensure the lowest possible flood insurance premiums for residents, the County of Volusia has contracted with the East Central Florida Regional Planning Council (ECFRPC) to draft the revised Floodplain Management Plan (FMP) in alignment with the CRS Guidelines; and

WHEREAS, the ECFRPC is also required to integrate the FMP into the Local Mitigation Strategy; and

WHEREAS, the FMP will be revised in July 2018.

NOW, THEREFORE, BE IT RESOLVED THAT THE CITY COUNCIL OF THE CITY OF DAYTONA BEACH SHORES, FLORIDA, AS FOLLOWS:

SECTION ONE. FINDING. The City Council of the City of Daytona Beach Shores hereby considers the Floodplain Management Plan to be of the utmost importance to the City of Daytona Beach Shores and supports the Floodplain Management Plan Planning Process.

SECTION TWO. SAVINGS. The prior actions of the City of Daytona Beach Shores relating to floodplain management are hereby ratified and affirmed.

SECTION THREE: CONFLICTS. All resolutions or parts thereof in conflict with this

Res. 2018-08
Page 1 of 2

Resolution are hereby repealed to the extent of such conflict.

SECTION FOUR. SEVERABILITY. If any section, subsection, sentence, clause, phrase, or portion of this Resolution, or application hereof, is for any reason held invalid or unconstitutional by any court of competent jurisdiction, such portion or application shall be deemed a separate, distinct, and independent provision and such holding shall not affect the validity of the remaining portions thereof.

SECTION FIVE. EFFECTIVE DATE. This Resolution shall take effect immediately upon its adoption.

CITY OF DAYTONA BEACH SHORES, FLORIDA

By: 
Mayor, Harry Jennings

ATTEST:

By: 
Michael T. Booker, City Manager


Cheri Schwab, City Clerk

APPROVED AS TO FORM AND LEGALITY:

By: 
Lonnie Groot, City Attorney

Passed and adopted on first reading this 24 day of July, 2018.

Posted this 24 day of July, 2018.



DeBary – Resolution of Support

RESOLUTION NO: 18-17

**A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF DEBARY,
FLORIDA IN SUPPORT OF THE PLANNING PROCESS FOR THE
DEVELOPMENT OF THE REVISED "VOLUSIA COUNTY & MUNICIPAL
FLOODPLAIN MANAGEMENT PLAN"**

WHEREAS, Coastal and riverine flooding are significant threats to the safety of residents of Volusia County and its municipalities: and,

WHEREAS, The National Flood Insurance Program (NFIP) provides federally supported flood insurance in communities that regulate development in floodplains: and

WHEREAS, The Community Rating System (CRS) grades the various community floodplain management programs and reduces flood insurance premiums in those communities that meet certain requirement: and

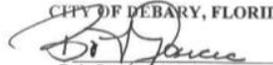
WHEREAS, In an effort to reduce the potential for personal/property losses in flood-prone areas and ensure the lowest possible flood insurance premiums for residents, Volusia County has contracted with East Central Florida Regional Planning Council to draft the revised floodplain management plan in alignment with CRS guidelines: and

WHEREAS, The East Central Florida Regional Planning Council is also required to integrate the floodplain management plan into the local mitigation strategy: and

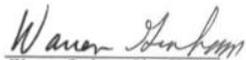
WHEREAS, The floodplain management plan will be revised in July 2018.

The City of DeBary considers the floodplain management plan to be of utmost importance to Volusia County and the City of DeBary, and supports the floodplain management plan planning process.

ADOPTED the 18th day of July, 2018.

CITY COUNCIL
CITY OF DEBARY, FLORIDA

Bob Garcia, Mayor

ATTEST:


Warren Graham, City Clerk

DeLand – Resolution of Support

RESOLUTION NO. 2018 -54

A RESOLUTION OF THE CITY COMMISSION OF DELAND, FLORIDA SUPPORTING THE VOLUSIA INTERGRATED FLOODPLAIN MANAGEMENT PLAN; PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, areas of the City of DeLand are vulnerable to the human and economic costs of natural, technological and societal disasters; and

WHEREAS, the City Commission of the City of DeLand recognizes the importance of developing projects and programs to reduce or eliminate those vulnerabilities for the overall good and welfare of the community; and

WHEREAS, proposed projects and programs have been incorporated into the current edition of the Volusia Integrated Floodplain Management Plan that has been prepared and issued for consideration and implementation by the communities and jurisdictions of Volusia County.

NOW THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION OF DELAND, FLORIDA:

Section 1. The City of DeLand hereby accepts and approves of its designated portion of the Volusia Integrated Floodplain Management Plan.

Section 2. The City of DeLand accepts and endorses the mitigation goals and objectives established for the countywide plan.

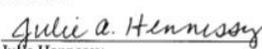
Section 3. The agencies and organizations within the City of DeLand will, upon receipt of such funding or other necessary resources, seek to implement the proposals contained in the City's individual section of the strategy.

Section 4. This Resolution shall become effective immediately upon its adoption.

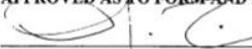
PASSED AND DULY ADOPTED this 16th day of July, 2018.


Robert F. Appa
Mayor-Commissioner

ATTEST:


Julie Hennessy
City Clerk-Auditor

APPROVED AS TO FORM AND LEGALITY:


Darren J. Elkind
City Attorney

Edgewater – Resolution of Support

RESOLUTION #2018-R-12

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF EDGEWATER, FLORIDA; IN SUPPORT OF THE PLANNING PROCESS FOR THE DEVELOPMENT OF THE REVISED "VOLUSIA COUNTY & MUNICIPAL FLOODPLAIN MANAGEMENT PLAN", REPEALING RESOLUTIONS IN CONFLICT HERewith; PROVIDING FOR SEVERABILITY AND ESTABLISHING AN EFFECTIVE DATE.

WHEREAS, Coastal and riverine flooding are significant threats to the safety of residents of Volusia County and its municipalities: and,

WHEREAS, The National Flood Insurance Program (NFIP) provides federally supported flood insurance in communities that regulate development in floodplains: and

WHEREAS, The Community Rating System (CRS) grades the various community floodplain management programs and reduces flood insurance premiums in those communities that meet certain requirement: and

WHEREAS, In an effort to reduce the potential for personal/property losses in flood-prone areas and ensure the lowest possible flood insurance premiums for residents, Volusia County has contracted with East Central Florida Regional Planning Council to draft the revised floodplain management plan in alignment with CRS guidelines: and

WHEREAS, The East Central Florida Regional Planning Council is also required to integrate the floodplain management plan into the local mitigation strategy: and

WHEREAS, The floodplain management plan will be revised in July 2018.

NOW, THEREFORE, be it resolved by the City Council of the City of Edgewater, Florida as follows:

1

2018-R-12

Section 1. The City of Edgewater considers the floodplain management plan to be of utmost importance to Volusia County and the City of Edgewater, and supports the floodplain management plan planning process.

Section 2. If any section, subsection, sentence, clause, phrase, or portion of this Resolution, or application hereof, is for any reason held invalid or unconstitutional by any Court, such portion or application shall be deemed a separate, distinct, and independent provision, and such holding shall not affect the validity of the remaining portions or applications hereof.

Section 3. All resolutions or parts of resolutions in conflict herewith be and the same are hereby repealed.

Section 4. This resolution shall take effect immediately upon its adoption.

THIS SECTION INTENTIONALLY LEFT BLANK

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2018-R-12

Section 5. After a motion to approve by Councilman Blazi with second by Councilwoman Power, the vote on this resolution was as follows:

	AYE	NAY
Mayor Michael Ignasiak	✓	_____
Councilwoman Christine Power	✓	_____
Councilwoman Amy Vogt	✓	_____
Councilman Dan Blazi	✓	_____
Councilman Gary Conroy	✓	_____

PASSED, APPROVED AND ADOPTED this 16th day of July, 2018.

ATTEST:

Robin Matusick
Robin Matusick
 City Clerk/Paralegal

**CITY COUNCIL OF THE
 CITY OF EDGEWATER, FLORIDA**

By: *Michael Ignasiak*
Michael Ignasiak
 Mayor

For the use and reliance only by the City of Edgewater, Florida. Approved as to form and legality by:
 Aaron R. Wolfe, Esquire, City Attorney
 Doran, Sims, Wolfe & Ciocchetti

Approved by the City Council of the City of Edgewater at a meeting held on this 16th day of July, 2018 under Item # Sj

3

2018-R-12

Oak Hill – Resolution of Support

RESOLUTION NO. 2018 - 06

A RESOLUTION OF THE CITY OF OAK HILL, VOLUSIA COUNTY, FLORIDA, IN SUPPORT OF THE PLANNING PROCESS FOR THE DEVELOPMENT OF THE REVISED "VOLUSIA COUNTY & MUNICIPALITY FLOODPLAIN MANAGEMENT PLAN"; PROVIDING FOR SEVERABILITY; REPEALING RESOLUTIONS IN CONFLICT HERewith AND ESTABLISHING FOR AN EFFECTIVE DATE.

WHEREAS, coastal and riverine flooding are significant threats to the safety of residents of Volusia County and its municipalities; and

WHEREAS, the National Flood Insurance Program (NFIP) provides federally supported flood insurance in communities that regulate development in floodplains; and

WHEREAS, the Community Rating System (CRS) grades the various community floodplain management programs and reduces flood insurance premiums in those communities that meet certain requirements; and

WHEREAS, in an effort to reduce the potential for personal/property losses in flood-prone areas and ensure the lowest possible flood insurance premiums for residents, Volusia County has contracted with East Central Florida Regional Planning Council to draft the revised floodplain management plan in alignment with the CRS guidelines; and

WHEREAS, the East Central Florida Regional Planning Council is also required to integrate the FMP into the local mitigation strategy; and

WHEREAS, the floodplain management plan will be completed in July of 2018; and

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF OAK HILL, FLORIDA:

Section 1. The City Commission of the City of Oak Hill hereby considers the floodplain management plan to be of upmost importance to the City of Oak Hill and supports the floodplain management plan planning process.

Section 2. If any section, subsection, sentence, clause, phrase, or portion of this Resolution, or application hereof, is for any reason held invalid or unconstitutional by any Court, such

Section 3. All resolutions or parts of resolutions in conflict herewith are hereby repealed.

Section 4. This resolution shall take effect upon adoption.

It was moved by Commissioner Bittle and seconded by Commissioner Lindlau that said Resolution 2018 - 06, is passed on first reading. A roll call vote of the City Commission on said motion resulted as follows:

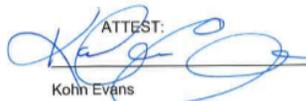
Mayor Gibson	<u>YES</u>
Vice Mayor Hyatt	<u>YES</u>
Commissioner Lindlau, Seat #2	<u>YES</u>
Commissioner Bittle, Seat #3	<u>YES</u>
Commissioner Bracy, Seat#4	<u>YES</u>

Passed upon first reading this 9th day of July, 2018.



Douglas A Gibson, Mayor

ATTEST:



Kohn Evans

City Clerk/Administrator

Approved as to form and legality for the use and reliance of the City of Oak Hill, Florida, only.



Scott E. Simpson, City Attorney

Ormond Beach – Resolution of Support (Page 1 of 2)

RESOLUTION NO. 2018-90

A RESOLUTION OF THE CITY OF ORMOND BEACH SUPPORTING THE PLANNING PROCESS TO UPDATE THE VOLUSIA COUNTY MULTI-JURISDICTIONAL LOCAL MITIGATION STRATEGY THROUGH THE DEVELOPMENT OF A REVISED INTEGRATED FLOODPLAIN MANAGEMENT PLAN, AND SETTING FORTH AN EFFECTIVE DATE .

WHEREAS, areas of the City of Ormond Beach are vulnerable to coastal and riverine flooding that significantly threaten the safety of residents, and

WHEREAS, the National flood Insurance Program (NFIP) provides federally supported flood insurance in communities that regulate development in floodplains, and

WHEREAS, the Community Rating System (CRS) rewards communities that exceed the minimum requirements of the NFIP that help citizens prevent or reduce flood losses, and

WHEREAS, the City of Ormond Beach has been an active participant in *Volusia Prepares*, the Local Mitigation Strategy (LMS) working group, which has established comprehensive, coordinated planning process involving the County and its municipalities, as well as other public and private setor organizations, to eliminate or decrease these vulnerabilities, and

WHEREAS, in a continuing effort to reduce the potential for personal/property losses in flood-prone areas and ensure the lowest possible flood insurance premiums for residents, the City LMS representatives are working with Volusia County and the East Central Florida Regional Planning Council to draft a revised Floodplain Management Plan in alignment with the Community Rating System (CRS) guidelines, and

WHEREAS, the East Central Florida Regional Planning Council is also required to integrate the FMP into the local mitigation strategy, and

WHEREAS, it is anticipated that the Floodplain Management Plan will be completed in April of 2019, now therefore,

BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF ORMOND BEACH, FLORIDA, THAT:

SECTION ONE. The City Commission hereby considers the Floodplain Management Plan to be of utmost importance to the City of Ormond Beach and supports the planning process.

SECTION TWO. This Resolution shall take effect immediately upon its adoption.

APPROVED AND AUTHENTICATED this 31st day of July, 2018.



BILL PARTINGTON
Mayor

ATTEST:


LISA DAHME
City Clerk

Ormond Beach – Resolution of Support (Page 2 of 2)



CITY OF ORMOND BEACH

City Manager • 22 S. Beach Street • Ormond Beach • Florida • 32174 • (386) 676-3200 • Fax (386) 676-3384

**CITY MANAGER
MEMORANDUM**

To: The Honorable Mayor Partington and City Commissioners
Through: Joyce A. Shanahan, City Manager
From: Steven Spraker, Planning Director
Date: July 31, 2018
Subject: Support of Planning Process to Develop an Integrated FMP
Commission Goal: N/A

Introduction:

This is a Resolution for the City Commission's support of the planning process to update the Volusia County Multi-Jurisdictional Local Mitigation Strategy Integrated Floodplain Management Plan.

Background

In an effort to reduce the Nation's mounting natural disaster losses, the U.S. Congress passed the Disaster Mitigation Act of 2000 (DMA 2000). Section 322 of DMA 2000 emphasizes the need for state and local government entities to closely coordinate on 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 propositioned and are more apt to receive available mitigation funds before and after the next disaster strikes.

The Volusia County Multi-Jurisdictional Local Mitigation Plan was updated in 2013 by adopting the Floodplain Management Plan which integrated individual municipal Floodplain Management Plans. Every five years, the Floodplain Management Plan is required to be updated. For this reason, the County contracted with the East Central Florida Regional Planning Council to complete the update for 2018. The planning process for the update of the floodplain management plan is in accordance with the Community Rating System following steps:

Planning Process Steps

Page 1 of 3

Organize to Prepare the Plan
Involve the Public
Coordinate with other Agencies
Re-Assess the Hazard
Re-Assess the Problem
Review the Goals
Revise Action Plan
Adopt the Revised Plan

Budget Impact:

There is no budget impact to the City of Ormond Beach.

Citizen Impact:

The City of Ormond Beach is a CRS community and is currently rated as a 6, which provides a 20% flood insurance discount to policy holders in a special flood hazard area. The City is able to receive additional points by participating in the planning process in the development of the Volusia County Integrated Floodplain Management Plan which solidifies the current CRS rating and flood insurance discounts to the residents and exceeds the state and federal guidelines.

Recommendation:

It is recommended that the City Commission approve the Resolution to support the planning process in the update of the Volusia County Integrated Floodplain Management Plan.

Attachments:

- 18-090A - VOLUSIA COUNTY SUPPORT INTEGRATED FLOODPLAIN MANAGEMENT PLAN PROCESS P18-0091G MT # 3594 (PDF)

REVIEWED BY:

Kelly McGuire, Finance Director 7/23/2018

Claire Whitley, Acting Assistant City Manager 7/23/2018

Page 2 of 3

APPROVED BY:

Joyce A. Shanahan, City Manager 7/25/2018

Appendix G Action Plan

LMS Flood Mitigation Initiatives



About the Action Plan

The Action Plan portion of the Floodplain Management Plan includes the active flood mitigation projects on the LMS Mitigation Initiatives spreadsheet. This listing is updated quarterly by the Volusia Prepares steering committee.

Completed and terminated projects have been removed from the project listing. In addition, projects that do not mitigate flood hazards have also been removed. Finally, projects that have gone past their originally scheduled "Completion Date" have a blank value within the "Completion Date" field.

The listing is effective July 2018 and includes updates from the June 2018 Volusia Prepares quarterly meeting. It is sorted by jurisdiction and project number.

Additional fields are included on the full project listing. For a complete project listing, please request a copy from the Volusia County Emergency Management office.

Project #	Priority	Jurisdiction	Responsible Organization	Mitigation Technique Category	Initiative	Funding	Estimated Cost	Completion Date	Status
VOL-0422		Daytona Beach	City of Daytona Beach	S	VOL-0422 Acquisition/Demolition of Repetitive Loss Structure	HMGP	\$1,975,155		Current
VOL-0423		Daytona Beach	City of Daytona Beach	S	VOL-0423 Acquisition/Demolition of Repetitive Loss Structure	HMGP FMA	\$2,028,000		Current
VOL-0425		Daytona Beach	City of Daytona Beach	S	VOL-0425 Acquisition/Demolition of Repetitive Loss Structure	HMGP FMA	\$2,153,500		Current
VOL-0432		Daytona Beach	City of Daytona Beach	S	VOL-0432 Acquisition/Demolition of repetitive loss structure	HMGP FMA	\$168,000		Current
VOL-0443		Daytona Beach	Public Works	P	VOL-0443 The city will be completing storm water mitigation along Orange Ave to reduce flooding in nearby critical facilities, repetitive loss properties and nearby neighborhoods and Historic Districts/Places	HMGP Local	\$20,000,000		Current
VOL-0446		Daytona Beach	City of Daytona Beach	S	VOL-0446 Acquisition and Demolition of repetitive loss structure: The residential structure on South Keech Street	HMGP FMA	\$55,547		Current
VOL-0044R		Daytona Beach	Utilities	S	VOL-0044 R B5/B6 Phase 2 - Nova Canal Drainage Basin	HMGP	\$8,000,000		Current
VOL-0165	H	Daytona Beach	Utilities	PP	VOL-0165 Stormwater/flood abatement	HMGP FMA	\$1,800,000		Current
VOL-0166	M	Daytona Beach	Utilities	PP	VOL-0166 A-5 barrier peninsula watershed Ocean Dunes Rd/Ocean	HMGP	TBD		Deferred
VOL-0168	M	Daytona Beach	Utilities	S	VOL-0168 B-3 Halifax River drainage basin-Wilder Outfall Study	HMGP FMA	\$1,400,000		Current
VOL-0413	H	Daytona Beach	Utilities	PP	RepLoss; Acquisition and Demolition.	HMGP FMA	\$110,000		Current
VOL-0418		Daytona Beach	Utilities	PP	VOL-0418 RepLoss; Acquisition and Demolition	HMGP FMA	\$229,800		Current
VOL-0288	H	DeBary	City of DeBary	S	VOL-0288 City of DeBary Emergency Outfall System	HMGP	\$4,669,590		Current
VOL-0346		DeBary	City of DeBary	PP	VOL-0346 Purchase 15 - 800 MHz radios	HMGP	TBD		Deferred
VOL-0347	L	DeBary	City of DeBary	ES	VOL-0347 Programmable message boards/trailers	HMGP	\$110,000		Current
VOL-0390	M	DeBary	City of DeBary	PE	VOL-0390 Community Information using an AM radio frequency EAS	HMGP	\$28,570		Current
VOL-0403	H	DeBary	City of DeBary	S	VOL-0403 Gravity Overflow Systems	HMGP	\$1,285,788		Current
VOL-0404	H	DeBary	City of DeBary	S	VOL-0404 East Side Flood Management System Upgrade	HMGP	\$2,126,225		Current
VOL-0414		DeBary	City of DeBary	S	VOL-0414 Implementation of a storm sewer system to prevent yard, roadway and structural flooding along Naranja Rd., 2nd street West and Alicante Rd., within the Plantation Estates Subdivision.	HMGP	\$220,856		Current
VOL-0415		DeBary	City of DeBary	S	VOL-0415 300 May Place Acquisition and Demolition Project	HMGP FMA	\$389,585		Current
VOL-0445		DeBary	Pegasus Eng., LLC	P	VOL-0445 Implementation of a storm sewer system to prevent yard, roadway and structural flooding along Shell Rd	HMGP FMA	\$147,673		Current
VOL-0002	H	DeLand	Public Works	S	VOL-0002 Construct a stormwater pumping station and force main	HMGP	TBD		Current
VOL-0053	H	DeLand	Public Services	ES	VOL-0053 Purchase/install emergency generator for Volusia County Fairgrounds	HMGP	\$70,000		Current
VOL-0054	H	DeLand	Public Services	ES	VOL-0054 Purchase/install emergency generator for Pistol Range Road	HMGP	\$70,000		Current
VOL-0241	H	DeLand	Public Services	S	VOL-0241 Acquisition and expansion of stormwater ponds	HMGP	\$4,220,000		Current
VOL-0242	H	DeLand	Public Services	S	VOL-0242 Raise head works and effluent pump station	HMGP	\$1,000,000		Current

Category Prevention - P ----- Property Protection - PP ----- Structural - S ----- Emergency Services - ES ----- Public Education - PE ----- Non-Structural - NS

Project #	Priority	Jurisdiction	Responsible Organization	Mitigation Technique Category	Initiative	Funding	Estimated Cost	Completion Date	Status
VOL-0349	H	DeLand	City of DeLand	PP	VOL-0349 Acquisition and expansion of stormwater for DeLand Middle	HMGP	TBD		Deferred
VOL-0351	H	DeLand	City of DeLand	PP	VOL-0351 Acquire flooded property along New Hampshire between Amelia Ave & Garfield	HMGP	\$500,000		Current
VOL-0510	28	DeLand	City of DeLand	PP NS ES	VOL-0510 Standby generator power for Sanborn Center which is used for meal prep for 1st responders in disaster	HMGP	\$110,424	Jan-21	Current
VOL-0073		Deltona	Public Works	S	VOL-0073 Lake level management program for Lake Theresa Basin lakes	HMGP	\$517,581		Current
VOL-0080		Deltona	Public Works	S	VOL-0080 Pump systems should either be enlarged or an emergency pump system set up	HMGP	\$48,620		Current
VOL-0081		Deltona	Public Works	S	VOL-0081 Provide a pumping system from the drainage retention area (DRA)	HMGP	\$127,565		Current
VOL-0082		Deltona	Public Works	S	VOL-0082 Culvert improvements for drainage retention area	HMGP	\$77,696		Current
VOL-0083		Deltona	Public Works	S	VOL-0083 "Big Ditch" connection between Lake Mitnik and Lake Doyle	HMGP	\$100,000		Current
VOL-0084		Deltona	Public Works	S	VOL-0084 Outfall improvements for drainage retention area adjacent to Beechdale Drive	HMGP	\$1,000,000		Current
VOL-0085	M	Deltona	Public Works	S	VOL-0085 Outfall improvements for Pioneer Lake	HMGP	\$90,803		Current
VOL-0086	M	Deltona	Public Works	S	VOL-0086 Outfall improvements for Castle Lake	HMGP	\$209,911		Current
VOL-0087		Deltona	Public Works	S	VOL-0087 Outfall improvements for drainage retention area south of Elkcam Boulevard	HMGP	\$141,474		Current
VOL-0088		Deltona	Public Works	S	VOL-0088 Culvert improvements at Elkcam Boulevard	HMGP	\$158,674		Current
VOL-0089		Deltona	Public Works	S	VOL-0089 Culvert improvements at Humphrey BLVD	HMGP	\$84,749		Current
VOL-0090	M	Deltona	Public Works	S	VOL-0090 Culvert improvements at Enterprise-Osteen Road	HMGP	\$31,606		Current
VOL-0091		Deltona	Public Works	S	VOL-0091 Culvert improvement at Braddock Road	HMGP	\$43,906		Current
VOL-0092		Deltona	Public Works	S	VOL-0092 Culvert improvement at Brickell Drive	HMGP	\$34,309		Current
VOL-0093		Deltona	Public Works	S	VOL-0093 Culvert improvement at Harbor Drive	HMGP	\$29,372		Current
VOL-0094		Deltona	Public Works	S	VOL-0094 Culvert improvements for Enterprise-Osteen Road	HMGP	\$17,340		Current
VOL-0095		Deltona	Public Works	S	VOL-0095 Culvert improvements for Doyle Road	HMGP	\$30,574		Current
VOL-0283		Deltona	City of Deltona	P	VOL-0283 Tivoli/wheeling drainage project	HMPG	\$200,000		Current
VOL-0284		Deltona	City of Deltona	P	VOL-0284 Drainage project	HMPG	\$550,000		Current
VOL-0376	M	Deltona	Fire	PE	VOL- 0376 Public Education Specialist	HMGP	\$45,000		Current
VOL-0406	M	Deltona	Public Works	S	VOL-0406 Lake Lapanocia Pump Station	HMGP	\$200,000		Current
VOL-0407	M	Deltona	Public Works	S	VOL-0407 Piedmont Pump Station	HMGP	\$150,000		Current
VOL-0408	M	Deltona	Public Works	S	VOL-0408 Kingsway/Lehigh Culvert	HMGP	\$200,000		Current
VOL-0409	M	Deltona	Public Works	S	VOL-0409 Tivoli & Wheeling Pump	HMGP	\$500,000		Current
VOL-0460		Deltona	Public Works		VOL-0460 Exmore Avenue Stormwater Improvements	HMGP	\$150,000		Current
VOL-0461		Deltona	Public Works		VOL-0461 Lamplighter Section Line Stormwater Improvements	HMGP FMA	\$415,000		Current
VOL-0463		Deltona	Public Works		VOL-0463 Montebello Avenue Stormwater Improvements	HMGP FMA	\$250,000		Current

Project #	Priority	Jurisdiction	Responsible Organization	Mitigation Technique Category	Initiative	Funding	Estimated Cost	Completion Date	Status
VOL-0464		Deltona	Public Works		VOL-0464 Picasso Avenue Stormwater Improvements	HMGP FMA	\$415,000		Current
VOL-0465		Deltona	Public Works		VOL-0465 Tune Avenue Stormwater Improvements	HMGP FMA	\$225,000		Current
VOL-0466		Deltona	Public Works		VOL-0466 Zinnia Avenue Stormwater Improvements	HMGP FMA	\$210,000		Current
VOL-0531	25	Deltona	City of Deltona	PP S ES	VOL-0531 Hardening Critical Facilities in Deltona: Station 64	Retrofit	\$68,468	Jan-21	Current
VOL-0532	25	Deltona	City of Deltona	PP S ES	VOL-0532 Hardening Critical Facilities in Deltona: Deltona Water	Retrofit	\$75,635	Jan-21	Current
VOL-0533	25	Deltona	City of Deltona	PP S ES	VOL-0533 Hardening Critical Facilities in Deltona: Public Works	Retrofit	\$116,714	Jan-21	Current
VOL-0066		Edgewater	Fire	PE	VOL-0066 Educate citizens about CEMP, by using CERT members.	HMGP	TBD		Current
VOL-0070	M	Edgewater	Fire	ES	VOL-0070 Purchase emergency back-up generator for the YMCA	HMGP	\$60,000		Current
VOL-0334R	M	Edgewater	Fire	PP	VOL-0334R Acquire repetitive loss home at Cheeta Drive	HMGP	\$241,810		Current
VOL-0424	21	Edgewater	City of Edgewater	ES	VOL-0424 Purchase two (2) portable 6" pumps	HMGP	\$84,244		Current
VOL-0485	24	Edgewater	Public Works	P PP S NS	VOL-485 - Generators for City of Edgewater lift stations (4)	HMGP	\$196,996	Jan-21	Current
VOL-0486	23	Edgewater	Public Works	NS ES	VOL-0486 Portable Generators - Traffic Signals (7)	HMGP	\$4,389	Jan-21	Current
VOL-0487	22	Edgewater	Public Works	NS ES	VOL-0487 - Edgewater Code House generator	HMGP	\$10,000	Jan-21	Current
VOL-0496	21	Edgewater	Public Works	NS ES	VOL-0496 - Edgewater City Hall generator - purchase & installation	HMGP	\$133,919	Jan-21	Current
VOL-0497	21	Edgewater	Public Works	NS ES	VOL-0497 - Water Treatment Plant/EOC Generator replacement	HMGP	\$350,000	Jan-21	Current
VOL-0498	20	Edgewater	Public Works	P PP S NS	VOL-0498 - Acquire & demolish repetitive flood loss home at 405 Hart Avenue	HMGP FMA	\$227,000	Jan-21	Current
VOL-0499	20	Edgewater	Public Works	P PP S	VOL-0499 - Menard May Park Erosion Project shoreline stabilization. Timber pier replacement, fishing pier lighting, & upland retaining wall.	HMGP	\$254,925	Jan-21	Current
VOL-0542	24	Edgewater	City of Edgewater	P PP S ES	VOL-0542 Improvement #1 to 50 lift stations in Edgewater	HMGP	\$150,000	Jan-21	Current
VOL-0543	24	Edgewater	City of Edgewater	P PP S ES	VOL-0543 Improvement #2 to 50 lift stations in Edgewater	HMGP	\$150,000	Jan-21	Current
VOL-0544	24	Edgewater	City of Edgewater	P PP S ES	VOL-0544 Improvement #3 to 50 lift stations in Edgewater	HMGP	\$150,000	Jan-21	Current
VOL-0475	40	FL Hospital	EM Coordinator	PP ES	VOL-0475 Emergency power upgrade for hospital critical infrastructure sustainability during power outages at FL Hospital Memorial Medical	HMGP	\$2,400,000	Jan-21	Current
VOL-0476	40	FL Hospital	EM Coordinator	ES	VOL-0476 Emergency power upgrade for hospital critical infrastructure sustainability during power outages at FL Hospital Oceanside	HMGP	\$850,000	Jan-21	Current
VOL-0500	33	Halifax Health	Halifax Health	P PP S NS ES	VOL-0500 - Data Center hardening @ Daytona Beach campus	HMGP	\$2,000,000	Jan-21	Current
VOL-0502	34	Halifax Health	Halifax Health	P PP NS ES	VOL-0502 Replacement of 3 (1960 Diesel) Emergency power generators and transfer switches	HMGP	\$4,750,000	Jan-21	Current
VOL-0503	34	Halifax Health	Halifax Health	P PP NS ES	VOL-0503 Emergency power for HVAC equipment at Port Orange Hospital facility	HMGP	\$300,000	Jan-21	Current
VOL-0534	37	Halifax Health	Halifax Health	P PP	VOL-0534 Hardening of Hospice Critical Care Site at Port Orange Beach Care Center 2nd Floor	HMGP	\$277,500	Jan-21	Current
VOL-0535	37	Halifax Health	Halifax Health	P PP	VOL-0535 Hardening of Hospice Critical Care Site at Ormond Beach Care Center	HMGP	\$109,900	Jan-21	Current
VOL-0536	37	Halifax Health	Halifax Health	P PP	VOL-0536 Hardening of Hospice Critical Care Site at Southeast Volusia Care Center	HMGP	\$187,650	Jan-21	Current

Category Prevention - P ----- Property Protection - PP ----- Structural - S ----- Emergency Services - ES ----- Public Education - PE ----- Non-Structural - NS

Project #	Priority	Jurisdiction	Responsible Organization	Mitigation Technique Category	Initiative	Funding	Estimated Cost	Completion Date	Status
VOL-0537	37	Halifax Health	Halifax Health	P PP	VOL-0537 Hardening of Hospice Critical Care Site at West Volusia Care Center	HMGP	\$150,950	Jan-21	Current
VOL-0278	L	Holly Hill	City of Holly Hill	S	VOL-0278 Trailer mounted emergency pumps- Jursidiction requested to	HMGP	\$34,370		Current
VOL-0279	L	Holly Hill	Public Works	S	VOL-0279 State Avenue (6th - 8th St) Department Stormwater-	HMGP	\$76,000		Current
VOL-0280	L	Holly Hill	Public Works	S	VOL-0280 Tuscaloosa Street drainage Department improvements-	HMGP	\$98,000		Current
VOL-0281	L	Holly Hill	Public Works	S	VOL-0281 Eagle Drive and Peacock Rd Department Drainage	HMGP	\$100,000		Current
VOL-0282	L	Holly Hill	Public Works	S	VOL-0282 Espanola Ave Drainage Department Improvements-	HMGP	\$275,000		Current
VOL-0357	L	Holly Hill	City of Holly Hill	PP	VOL-0357 Cave Avenue Structure purchase- Jursidiction requested to	HMGP	\$55,000		Current
VOL-0457		Holly Hill	City of Holly Hill	PP	VOL-0457 Hurricane shutters and City Hall Annex	HMGP	\$12,000		Current
VOL-0474	21	Holly Hill	Public Works	PP	VOL-0474 Cordova Drainage Basin Improvements Phase I	HMGP	\$1,529,875	Jan-21	Current
VOL-0507	33	Holly Hill	City of Holly Hill	PP S	VOL-0507 Drainage improvements - installation of 29 duckbill valves along outfalls to Halifax River	HMGP	\$350,000	Jan-21	Current
VOL-0508	31	Holly Hill	City of Holly Hill	PP	VOL-0508 - Shutters for City Hall	HMGP	\$25,067	Jan-21	Current
VOL-0530	29	Holly Hill	Public Works	P	VOL-0530 Drainage Improvements South Espanola Avenue	HMGP	\$318,000	Jan-21	Current
VOL-0545	29	Holly Hill	City of Holly Hill	P ES NS	VOL-0545 Generator for Sica Hall	HMGP	\$70,000	Jan-21	Current
VOL-0553		Holly Hill	City of Holly Hill	S	VOL-0553 Refurbishment of Lift Station # 9	TBD	TBD	TBD	TBD
VOL-0554		Holly Hill	City of Holly Hill	S	VOL-0554 Refurbishment of Lift Station # 19	TBD	TBD	TBD	TBD
VOL-0555		Holly Hill	City of Holly Hill	S	VOL-0555 Refurbishment of Lift Station # 21	TBD	TBD	TBD	TBD
VOL-0504	21	Lake Helen	City of Lake Helen	PP NS	VOL-0504 City of Lake Helen Virginia Drive Sub-base stabilization and repaving.	HMGP	\$229,830	Jan-21	Current
VOL-0505	24	Lake Helen	City of Lake Helen	NS	VOL-0505 City of Lake Helen Ohio stormwater culvert	HMGP	\$90,000	Jan-21	Current
VOL-0506	27	Lake Helen	City of Lake Helen	PP	City of Lake Helen Police Dept/EOC flood and wind prevention by sealing for water and protecting doors & windows	HMGP	\$41,175	Jan-21	Current
VOL-0520	20	Lake Helen	City of Lake Helen	ES	VOL-0520 City of Lake Helen Pre-Disaster Mitigation Proposal	HMGP	\$21,161	Jan-21	Current
VOL-0103R	L	New Smyrna	Fire Service	ES	VOL-0103R Relocate and replace Fire Department Station #50 (main	HMGP	\$2,000,000		Current
VOL-0386	M	New Smyrna Beach	City of NSB	PP	Vol-0386 Central Beachside Flood Mitigation Project Phase II	FEMA	\$1,808,000		Current
VOL-0410	M	New Smyrna Beach	City of NSB	S	VOL-0410 New Smyrna Beach Central Beachside Storm Water Management Project	HMGP	\$2,500,000		Current
VOL-0467		New Smyrna Beach	Fire Service		VOL-0467 Isleboro subdivison storm water management project, of building a retention pond.	HMGP	\$3,500,000		Current
VOL-0549	28	New Smyrna	City of NSB	P PP S	VOL-0549 Elevation of flood- prone homes	HMGP	\$4,802,280	Jan-21	Current
VOL-0550	28	New Smyrna	City of NSB	P PP S	VOL-0549 Elevation of flood- prone homes	HMGP	\$6,650,121	Jan-21	Current
VOL-0398	H	Orange City	City of Orange City	S	VOL-0398 Fawn Ridge Subdivision	HMGP	\$500,000		Current
VOL-0399	H	Orange City	City of Orange City	S	VOL-0399 Treemont Drainage Project	HMGP	\$500,000		Current
VOL-0451		Orange City	City of Orange City	PP	VOL-0451 Mill Lake & Pooser Pond Stormwater improvement. Install stormwater pump stations to prevent flooding.	HMGP	TBD		Current
VOL-0050	M	Ormond Beach	Public Works	S	VOL-0050 Drainage improvements to areas of "Old Ormond" (mainland)	HMGP	\$500,000		Current
VOL-0174		Ormond Beach	City of Ormond Beach	ES	VOL-0174 Purchase mobile command center for use during an	HMGP	\$100,000		Current
VOL-0387	M	Ormond Beach	City of Ormond Beach	S	Vol-0387 Thompson Creek Stormwater Department Improvement	HMGP	\$65,000		Current

Category Prevention - P ----- Property Protection - PP ----- Structural - S ----- Emergency Services - ES ----- Public Education - PE ----- Non-Structural - NS

Project #	Priority	Jurisdiction	Responsible Organization	Mitigation Technique Category	Initiative	Funding	Estimated Cost	Completion Date	Status
VOL-0435		Ormond Beach	City of Ormond Beach	PP	VOL-0435 This initiative is to acquire at risk structures in the Central Park area along Laurel Creek Thompson Creek and FP&L Ditch, including 2 repetitive Loss structures.	HMGP FMA	\$46,500,000		Current
VOL-0442		Ormond Beach	Emergency Mgmt.	PP	VOL-0442 Central Park Drainage Improvements - will provide flood mitigation benefits by acquisition of land and construction of control structure for discharge to Pond 4, as well as excavating a channel to connect Pond 3 & 4	HMGP FMA	\$293,000		Current
VOL-0452		Ormond Beach	City of Ormond Beach	S	VOL-0452 Flooding control pump on Fleming Ave, which will discharge into the Halifax River	HMGP	\$8,635,265		Current
VOL-0468		Ormond Beach	Engineering Division	P	VOL-0468 772 N Beach St. Convert property into a stormwater storage site to aid with the prevention of flooding.	FMA	\$188,000		Current
VOL-0472	33	Ormond Beach	Public Works	PP P	VOL-0472 Wilmette Avenue Stormwater Pump Station - install permanent pump station Laurel Creek	HMGP	\$254,754	Jan-21	Current
VOL-0473	33	Ormond Beach	Public Works	PP ES	VOL-0473 Ormond Beach Lift Station backup - purchase 4 pumps	HMGP	\$185,492	Jan-21	Current
VOL-0509	34	Ormond Beach	City of Ormond Beach	ES	VOL-0509 Ormond Beach Emergency Operations Center - build Community Center that will be used as EOC in disaster	HMGP	\$1,500,000	Jan-21	Current
VOL-0512	38	Ormond Beach	City of Ormond Beach	P PP NS	VOL-0512 Fleming Avenue Stormwater improvements	HMGP	\$500,000	Jan-21	Current
VOL-0521	39	Ormond Beach	City of Ormond Beach	P PP NS	VOL-0521 Woodrige Drive Drainage Improvements	HMGP	\$185,000	Jan-21	Current
VOL-0540	28	Ormond Beach	City of Ormond Beach	P PP S	VOL-0540 Elevate and retrofit flood damaged home- 520 W St. Ormond Beach, FL	HMGP	\$300,000	Jan-21	Current
VOL-0546	34	Ormond Beach	City of Ormond Beach	P PP ES	VOL-0546 Strickland Creek flood protection	HMGP	\$12,000,000	Jan-21	Current
VOL-0547	31	Ormond Beach	City of Ormond Beach	P PP	VOL-0547 Drainage improvements	HMGP	\$1,400,000	Jan-21	Current
VOL-0556		Ormond Beach	City of Ormond Beach	P PP S	VOL-0556 Elevation of Severe Repetitive Loss home: 89 N. St. Andrews		TBD		Current
VOL-0218		Pierson	Town of Pierson	P	VOL-0218 Secure water supply	HMGP	\$50,000	Jan-21	Current
VOL-0219		Pierson	Town of Pierson	ES	VOL-0219 Establish an Emergency Operations Center in Community	HMGP	\$225,000	Jan-21	Current
VOL-0221		Pierson	Town of Pierson	S	VOL-0221 Establish stormwater management maintenance program	HMGP	\$60,000	Jan-21	Current
VOL-0450		Pierson	Town of Pierson	ES	VOL-0450 Purchase and install emergency generator @ Pierson Town	HMGP	\$70,000	Jan-21	Current
VOL-0173	H	Ponce Inlet	Fire Service	ES	VOL-0173 Purchase the equipment necessary to equip a mobile command center	HMGP	\$50,000		Current
VOL-0419		Ponce Inlet	VC Emergency Mgmt.	S	VOL-0419 Install hurricane resistant windows & doors on Fire Station.	HMGP	\$44,000		Current
VOL-0420	H	Ponce Inlet	Town of Ponce Inlet	S	VOL-0420 Purchase 4" Pump for flood control	HMGP	\$44,000		Current
VOL-0130	M	Port Orange	City of Port Orange	PP	VOL-0130 Purchase Seabird Island; remove mobile homes, and convert	HMGP	TBD		Deferred
VOL-0158		Port Orange	City of Port Orange		VOL-0158 Retrofit old 175 kw generator into a portable unit that can be used anywhere	HMGP Local	\$30,000		Current
VOL-0160		Port Orange	City of Port Orange	P	VOL-0160 Install coquina rock to prevent erosion along Halifax River	HMGP	\$80,000		Current
VOL-0169R	M	Port Orange	City of Port Orange	ES	VOL-0169R Retrofit the Port Orange Cypress Head golf course banquet	HMGP	\$350,000		Current
VOL-0228	H	Port Orange	City of Port Orange	S	VOL-0228 Taylor Woods and S. Williamson Drainage retrofit	HMGP	\$750,000		Current
VOL-0229	H	Port Orange	City of Port Orange	S	VOL-0229 Taylor RD Drainage retrofit	HMGP	\$2,500,000		Current
VOL-0391	H	Port Orange	VC Emergency Mgmt.	S	VOL-0391 B-23 Canal Seawall Improvement	HMGP	\$2,800,000		Current

Category Prevention - P ----- Property Protection - PP ----- Structural - S ----- Emergency Services - ES ----- Public Education - PE ----- Non-Structural - NS

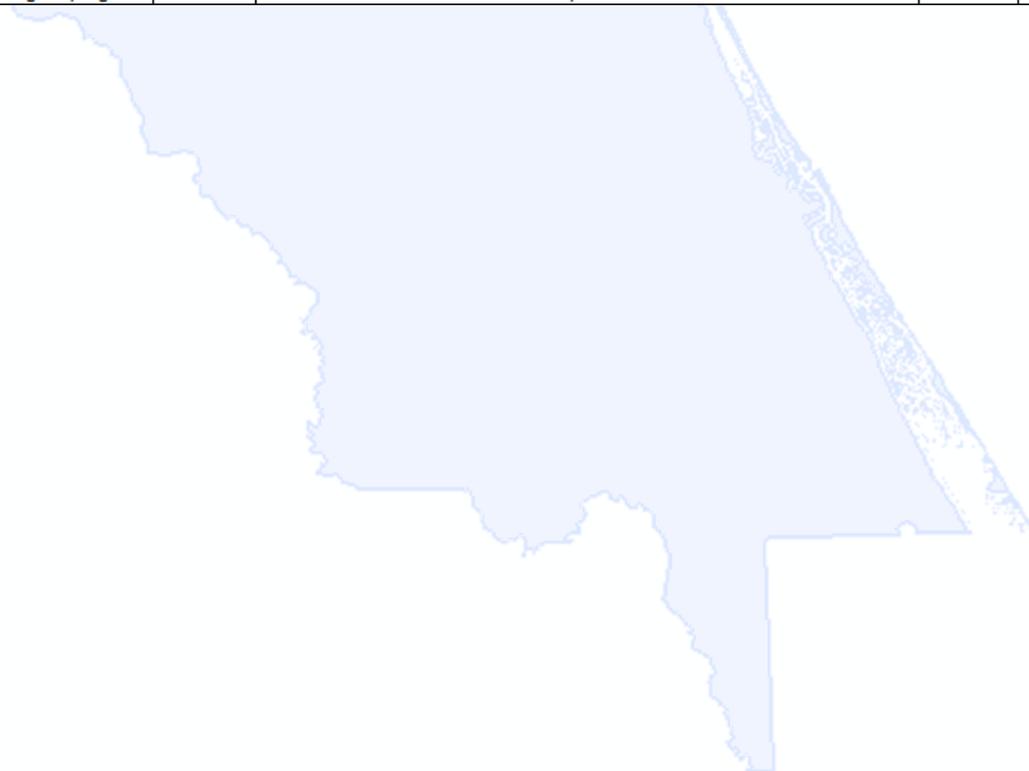
Project #	Priority	Jurisdiction	Responsible Organization	Mitigation Technique Category	Initiative	Funding	Estimated Cost	Completion Date	Status
VOL-0438		Port Orange	VC Emergency Mgmt.	P	VOL-0438 Halifax/ Nova Road Drainage - to utilize existing City of Port Orange property (Thompson), the intent is to construct a three acre stormwater pond to create capacity along the Halifax/Nova Road Canal which caused flood damage to 151 structures (residential and non-residential) in May 2009.	HMGP	\$2,000,000		Current
VOL-0439		Port Orange	VC Emergency Mgmt.	P	VOL-0439 The Intent of the project is to acquire the Smmit Golf property	HMGP	\$1,000,000		Current
VOL-0440		Port Orange	VC Emergency Mgmt.	P	VOL-0440 Port Orange's intent is to mitigate flooding of Dunlawton Ave S.R> 421, a major evacuation route to I-95, by purchasing properties and installing retrofit drainage improvements.	HMGP	\$800,000		Current
VOL-0441		Port Orange	VC Emergency Mgmt.	PP	VOL-0441 Acquire properties identified at the end of Spruce Creek Road to install retrofit drainage improvements to mitigate flooding	HMGP	\$429,000		Current
VOL-0480	38	Port Orange	Public Works	P PP S	VOL-0480 White Place and Riverside Drive drainage improvements	HMGP	\$80,000	Jan-21	Current
VOL-0481	32	Port Orange	Public Works	P PP S	VOL-0481 Tumblebrook Drive (Sweetwater Hills) stormwater improvements (201409)	HMGP	\$131,000	Jan-21	Current
VOL-0482	34	Port Orange	Public Works	P PP S	VOL-0482 Southwinds Stormwater Pond Outfall Retrofit (201441)	HMGP	\$1,295,000	Jan-21	Current
VOL-0483	38	Port Orange	Public Works	P PP S	VOL-0483 Pipe replacement (201647) replace pipe with reinforced concrete pipe to improve stormwater conveyance to reduce potential	HMGP	\$5,000,000	Jan-21	Current
VOL-0484	39	Port Orange	Public Works	P PP S	VOL-0484 Storm drain pipe lining (180202)	HMGP	\$841,172	Jan-21	Current
VOL-0515	35	Port Orange	Public Works	ES	VOL-0515 Backup generators for Fire Stations 71 and Fire Station 73	HMGP	\$133,000	Jan-21	Current
VOL-0519	38	Port Orange	Public Works	P S PP	VOL-0519 Virginia and Monroe Street Drainage Improvement	HMGP	\$269,250	Jan-21	Current
VOL-0541	32	Port Orange	City of Port Orange	P PP NS	VOL-0541 Howes Street drainage improvements	HMGP	\$455,250	Jan-21	Current
VOL-0516	28	School Board	School Board	NS ES PE	VOL-0516 Provide emergency generators for 9 shelter locations	HMGP	\$540,000	Jan-21	Current
VOL-0517	28	School Board	School Board	NS ES PE	VOL-0517 Upgrade 6 shelter locations - provide emergency generator connections and air quality improvements	HMGP	\$258,000	Jan-21	Current
VOL-0518	28	School Board	School Board	NS ES PE	VOL-0518 Upgrade 3 shelter locations - provide emergency generators connections and air quality improvements	HMGP	\$129,000	Jan-21	Current
VOL-0389	H	South Daytona	City of South Daytona	PP	Vol-0389 South Daytona EOC/Public Works Facility	HMGP	\$6,200,000		Current
VOL-0447		Daytona Beach	Daytona Beach	S, PP	VOL-0447 Acquisition/Demolition of repetitive loss structure: The residential structure at South Carolina Street had two insured flood losses 9/16/2004 and 5/20/2009 for a combined insurance payout of 67,	HMGP FMA	\$57,913		Current
VOL-0453		South Daytona	City of South Daytona	P	VOL-0453 Purchase a vacant parcel of land & install a stormwater retention pond to help recent flooding .	HMGP	\$300,000		Current
VOL-0469		South Daytona	City of South Daytona	P	VOL-0469 construction of stormwater management system adjacent to City Hall. This will help emergency vehicles have more access to the road during minor storm events.	HMGP	\$340,000		Current
VOL-0511	33	South Daytona	City of South Daytona	ES	VOL-0511 permanent generator for the Piggotte Center - critical facility during disasters	HMGP	\$80,000	Jan-21	Current
VOL-0552	26	South Daytona	City of South Daytona	P PP S	VOL-0549 Elevation of flood- prone home	HMGP	\$1,169,000	Jan-21	Current
VOL-0023	M	Unincorporated	VC Emergency Mgmt.	P	VOL-0023 Develop and implement a Community Emergency Management Academy	HMGP	TBD		Deferred

Category Prevention - P ----- Property Protection - PP ----- Structural - S ----- Emergency Services - ES ----- Public Education - PE ----- Non-Structural - NS

Project #	Priority	Jurisdiction	Responsible Organization	Mitigation Technique Category	Initiative	Funding	Estimated Cost	Completion Date	Status
VOL-0026		Unincorporated	Private Agencies	PP	VOL-0026 Develop a countywide contractor licensing program	HMGP Local	\$15,000	Jan-21	Current
VOL-0027	M	Unincorporated	VOL2020 MP Subcommittee	PP/PE/P/S	VOL-0027 LMS Steering Committee support a home mitigation education & incentive program	HMGP	TBD	Jan-21	Current
VOL-0038		Unincorporated	VC Road & Bridge	S	VOL-0038 Replace Bridge #794010 (Taylor Road over B-19)	HMGP	\$250,000	Jan-21	Current
VOL-0045		Unincorporated	Private Agencies	PP	VOL-0045 Protect United Way Headquarters with generator & window protection	HMGP	\$43,000	Jan-21	Current
VOL-0115	H	Unincorporated	VC Fire Service	ES	VOL-0115 Replace existing Fire Station 23	HMGP	\$2,000,000	Jan-21	Current
VOL-0132		Unincorporated	Private Agencies	ES	VOL-0132 Fund CERV program	HMGP	TBD	Jan-21	Current
VOL-0153	H	Unincorporated	VC Fire Service	ES	VOL-0153 Construct a structural collapse training facility	HMGP	TBD	Jan-21	Current
VOL-0154	H	Unincorporated	VC Fire Service	ES	VOL-0154 Purchase specialized rescue equipment	HMGP	TBD	Jan-21	Current
VOL-0181	M	Unincorporated	Private Agencies	S	VOL-0181 Infrastructure placement in Tomoka Estates Subdivision	HMGP	\$1,230,848	Jan-21	Current
VOL-0198	M	Unincorporated	VC Sheriff Dept.	ES	VOL-0198 Updated 09/10/08 Construct a hardened, centralized evidence	HMGP	\$412,000	Jan-21	Current
VOL-0201	L	Unincorporated	VC Emergency Mgmt.	PP	VOL-0201 Increase the base flood elevation requirement	Local	TBD		Deferred
VOL-0204	M	Unincorporated	VC Emergency Mgmt.	ES	VOL-0204 Integrate and expand the existing CERT programs	HMGP	\$135,000	Jan-21	Current
VOL-0255	M	Unincorporated	Public Works	PP	VOL-0255 Volusia County Public Works Service Center	HMGP	\$500,000	Jan-21	Current
VOL-0265		Unincorporated	VC Env. Management	NRP	VOL-0265 Habitat Stabilization/Revegetation Project	HMGP	TBD		Deferred
VOL-0266		Unincorporated	VC Env. Management	PP	VOL-0266 Shoreline Erosion Control and Restoration Project	HMGP	TBD		Deferred
VOL-0267	M	Unincorporated	VC Emergency Mgmt.	PP	VOL-0267 Stone Island Flood Mitigation Project	HMGP	\$5,000,000	Jan-21	Current
VOL-0268	M	Unincorporated	VC Emergency Mgmt.	PP	VOL-0268 Tomoka Estates Flood Mitigation Project	HMGP	\$10,000,000	Jan-21	Current
VOL-0270	H	Unincorporated	VC Fire Service	ES	VOL-0270 Emergency Power for 4 County Fire Stations	HMGP	\$80,000	Jan-21	Current
VOL-0271	H	Unincorporated	VC Fire Service	ES	VOL-0271 Training Facility Improvements	HMGP	\$3,000,000	Jan-21	Current
VOL-0274	H	Unincorporated	VC Fire Service	ES	VOL-0274 Weather Stations for 22 Fire Stations	HMGP	\$11,000	Jan-21	Current
VOL-0290	H	Unincorporated	VC Fire Service	ES	VOL-0290 Replace Fire Station 43 in Seville	HMGP	\$2,000,000	Jan-21	Current
VOL-0291	H	Unincorporated	VC Fire Service	ES	VOL-0291 Replace Fire Station 13 in Ormond Beach	HMGP	\$2,000,000	Jan-21	Current
VOL-0292	H	Unincorporated	VC Fire Service	ES	VOL-0292 Replace Fire Station 15 in Daytona Beach	HMGP	\$2,000,000	Jan-21	Current
VOL-0293	H	Unincorporated	VC Fire Service	ES	VOL-0293 Replace Fire Station 41 in DeLeon Springs	HMGP	\$2,000,000	Jan-21	Current
VOL-0294	H	Unincorporated	VC Fire Service	ES	VOL-0294 Replace Fire Station 32 in DeLand	HMGP	\$2,000,000	Jan-21	Current
VOL-0320	M	Unincorporated	VC Emergency Mgmt.	PP	VOL-0320 DEMO/REBUILD REPETITIVE LOSS HOME AT 1633 SPRING GARDEN DRIVE ASTOR	HMGP	TBD		Deferred
VOL-0321R	M	Unincorporated	VC Emergency Mgmt.	PP	VOL-0321R Elevate & retrofit rep loss property at Stone Trail, Enterprise	HMGP	TBD		Deferred
VOL-0366	M	Unincorporated	VC Emergency Mgmt.	PE	VOL-0366 Understanding Volusia County's demographics to anticipate behavior & mitigate hazards	HMGP	TBD		Deferred
VOL-0368	M	Unincorporated	VC Emergency Mgmt.	PE	VOL-0368 Condominium mitigation video	HMGP	TBD		Deferred
VOL-0416		Unincorporated	VC Emergency Mgmt.	S	VOL-0416 Nova Canal Outfall Improvements	HMGP FMA	\$15,000,000	Jan-21	Current
VOL-0431		Unincorporated	VC Emergency Mgmt.	PP	VOL-0431 Acquire and Demolition 2 structures located at 1890 Pioneer TR, NSB	HMGP	TBD		Deferred
VOL-0514	32	Unincorporated	Public Works	P P P S	VOL-0514 Rio Way Regional Retention Pond	HMGP	\$3,000,000	Jan-21	Current
VOL-0522	28	Unincorporated	VC Emergency Mgmt.	P P P S	VOL-0522 1048 Shockney Drive Elevation & Retrofit	HMGP	\$368,900	Jan-21	Current

Category Prevention - **P** ----- Property Protection - **PP** ----- Structural - **S** ----- Emergency Services - **ES** ----- Public Education - **PE** ----- Non-Structural - **NS**

Project #	Priority	Jurisdiction	Responsible Organization	Mitigation Technique Category	Initiative	Funding	Estimated Cost	Completion Date	Status
VOL-0523	28	Unincorporated	VC Emergency Mgmt.	P P P S	VOL-0523 1013 Shockney Drive Elevation & Retrofit	HMGP	\$422,400	Jan-21	Current
VOL-0524	28	Unincorporated	VC Emergency Mgmt.	P P P S	VOL-0524 988 Shockney Drive Elevation & Retrofit	HMGP	\$384,300	Jan-21	Current
VOL-0525	28	Unincorporated	VC Emergency Mgmt.	P P P S	VOL-0525 356 Seminole Drive Elevation & Retrofit	HMGP	\$384,300	Jan-21	Current
VOL-0526	28	Unincorporated	VC Emergency Mgmt.	P P P S	VOL-0526 Cherokee Road Elevation & Retrofit	HMGP	\$379,800	Jan-21	Current
VOL-0527	28	Unincorporated	VC Emergency Mgmt.	P P P S	VOL-0527190 Flamingo Drive Elevation & Retrofit	HMGP	\$411,050	Jan-21	Current
VOL-0528	28	Unincorporated	VC Emergency Mgmt.	P P P S	VOL-0528 241 Cherokee Road Elevation & Retrofit	HMGP	\$377,500	Jan-21	Current
VOL-0529	28	Unincorporated	VC Emergency Mgmt.	P P P S	VOL-0529 1052 Shockney Drive Elevation & Retrofit	HMGP	\$382,650	Jan-21	Current



Appendix H

Public Comment on Draft Plan



Overview

Public comment consisted of two portions:

1. Planning Meeting Comments on Draft Plan

Public Comment received during the two planning meetings. Summaries of the topics of discussion and input received are located within this section in bullet point format.

2. Email Comments on Draft Plan

A public comment process was advertised online and during the public meetings. The public comment period allowed residents to comment on the draft plan and lasted through July 2018. No comments were received as part of this process.

Public Comment Notes – Public Meetings

Questions from the public on administrative and process issues are not included below.

June 15th Public Meeting

- *6/15, Suze Peace and Fred Peace:* The County needs to look into the potential impacts of sea level rise on future flooding conditions.
- *6/15, Suze Peace and Fred Peace:* The impact of interstate-4 and other transportation projects has decreased water quality in the DeBary area. Water quality should be addressed in the plan.
- *6/15, Suze Peace and Fred Peace:* The impacts of development on the size of the floodplain should be addressed
- *6/15, Suze Peace and Fred Peace:* Discussed regulations on development in flood-prone areas, and went into detail in discussing the importance of retention pond TMDL limits. The project team explained the county policy for retention ponds on each side of the County.
- *6/15, Suze Peace and Fred Peace:* Discussion of the CRS point system, origins of the “integrated” plan, benefits to the community (financial, etc.)

June 18th Public Meeting

- *6/18, Michaela Harbour and Donald Roman:* Bethune Point is a repeat flood hazard area; it is suggested that the project team add this to the frequent flooding locations map within the FMP.
- *6/18, Donald Roman:* Inquired about the process of debris removal and plans that communicate with the FMP to meet the needs of the County. Mr. Roman emphasized the importance of quick debris removal and the slow response time during the 2017 Hurricane season.
- *6/18, Donald Roman:* It will be important to monitor sea level rise in real time to gauge the accuracy of predictions that have been made.
- *6/18, Donald Roman and Michaela Harbour:* Residents informed the project team that a number of residents on the lagoon experience vastly different flooding effects depending on the direction of the storm. These people may need more in-depth instructions on how to deal with variabilities in the effects of wind direction.
- *6/18, Donald Roman:* Inquired about the potential cause of sea level rise being subsidence due to development along Florida's coastline. Inquired about the root causes and how the plan will deal with these questions
- *6/18, Donald Roman:* Inquired about how, if development is inevitable, the County will stop future development from occurring in flood-prone areas. Mr. Roman has expressed an interest that these issues be addressed in the plan.
- *6/18, Donald Roman:* Mr. Roman asks about the Action Plan and the types of projects that are covered.

Appendix I

Resolutions of Adoption



City of Daytona Beach – Resolution of Adoption

RESOLUTION NO. 18-347

A RESOLUTION ADOPTING THE 2018 VOLUSIA COUNTY INTEGRATED FLOODPLAIN MANAGEMENT PLAN; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, coastal and riverine flooding are significant threats to the safety of residents of Volusia County and its municipalities; and

WHEREAS, the National Flood Insurance Program provides federally supported flood insurance in communities that regulate development in floodplains; and

WHEREAS, the Community Rating System grades the various community floodplain management programs and reduces flood insurance premiums in those communities that meet certain requirements; and

WHEREAS, efforts have been made to reduce the potential for personal/property losses in flood-prone areas and ensure the lowest possible flood insurance premiums for residents; and

WHEREAS, the adoption of the 2018 Volusia County Integrated Floodplain Management Plan is in alignment with the Community Rating System Guidelines, and integration into the Local Mitigation Strategy supports this effort; and

WHEREAS, adoption of the plan is a requirement of the Community Rating System; and

WHEREAS, Utilities Director considers the Floodplain Management Plan to be of the utmost importance to the citizens of The City of Daytona Beach and recommends adoption of the Volusia County Integrated Floodplain Management Plan 2018.

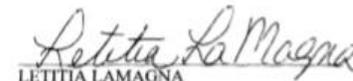
NOW, THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF DAYTONA BEACH, FLORIDA:

SECTION 1. The Volusia County Integrated Floodplain Management Plan 2018 is hereby adopted. A copy of the Plan is attached hereto and made a part hereof by reference.

SECTION 2. This Resolution shall take effect immediately upon its adoption.


DERRICK L. HENRY
Mayor

ATTEST:


LETTITIA LAMAGNA
City Clerk

Adopted: October 17, 2018

City of Daytona Beach Shores – Resolution of Adoption

RESOLUTION NO. 2018-18

A RESOLUTION OF THE CITY OF DAYTONA BEACH SHORES, VOLUSIA COUNTY, FLORIDA RELATING TO THE 2018 VOLUSIA COUNTY FLOODPLAIN MANAGEMENT PLAN; PROVIDING A SAVINGS PROVISION; PROVIDING FOR CONFLICTS; PROVIDING FOR SEVERABILITY AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, Article VIII, Section 2, Constitution of the State of Florida, authorizes the City of Daytona Beach Shores to exercise any power for municipal purposes except as otherwise provided by law; and

WHEREAS, coastal and riverine flooding are significant threats to the health and safety of residents of Volusia County and its municipalities; and

WHEREAS, the City of Daytona Beach Shores recognizes the importance of reducing vulnerabilities to flood events for the overall good and welfare of the community; and

WHEREAS, City of Daytona Beach Shores has been an active participant in Volusia Prepares, the Local Mitigation Strategy working group, which has established a comprehensive, coordinated planning process involving the county and its municipalities, as well as other public and private sector organizations, to eliminate or decrease these vulnerabilities; and

WHEREAS, the National Flood Insurance Program (NFIP) provides federally supported flood insurance in communities that regulate development in floodplains; and

WHEREAS, the Community Rating System (CRS) grades the various community floodplain management programs and reduces flood insurance premiums in those communities that meet CRS certain requirements; and

WHEREAS, in an effort to reduce the potential for personal and property losses in flood-prone areas and ensure the lowest possible flood insurance premiums for residents; and

WHEREAS, the adoption of the 2018 Volusia County Floodplain Management Plan, in alignment with the CRS Guidelines, and integration into the Local Mitigation Strategy supports this effort; and

WHEREAS, as adoption of the plan is a requirement of the Community Rating System; and

WHEREAS, the City of Daytona Beach Shores hereby considers the adoption of the 2018 Volusia County Floodplain Management Plan to be of the utmost importance to the citizens of Daytona Beach Shores.

NOW, THEREFORE, BE IT RESOLVED THAT THE CITY COUNCIL OF THE CITY OF DAYTONA BEACH SHORES, FLORIDA, AS FOLLOWS:

SECTION ONE. ADOPTION. The City Council of the City of Daytona Beach Shores hereby accepts and approves of its designated portion of the 2018 Volusia County Floodplain Management Plan. The City Council of the City of Daytona Beach Shores also hereby accepts and endorses the mitigation goals and objectives established by Volusia Prepares for the countywide Plan, and the anticipated schedule for the next updating of the strategy.

SECTION TWO. SAVINGS. The prior actions of the City of Daytona Beach Shores relating to floodplain management are hereby ratified and affirmed.

SECTION THREE: CONFLICTS. All resolutions or parts thereof in conflict with this Resolution are hereby repealed to the extent of such conflict.

SECTION FOUR. SEVERABILITY. If any section, subsection, sentence, clause, phrase, or portion of this Resolution, or application hereof, is for any reason held invalid or unconstitutional by any court of competent jurisdiction, such portion or application shall be deemed a separate, distinct, and independent provision and such holding shall not affect the validity of the remaining portions thereof.

SECTION FIVE. EFFECTIVE DATE. This Resolution shall take effect immediately upon its adoption.

CITY OF DAYTONA BEACH SHORES, FLORIDA

By: [Signature] Mayor Harry Jennings

ATTEST:

By: [Signature] Michael T. Booker, City Manager

[Signature] Cheri Schwab, City Clerk

APPROVED AS TO FORM AND LEGALITY:

By: [Signature] Lonnie Groot, City Attorney

City of DeBary – Resolution of Adoption

RESOLUTION NO: 2019-03

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF DEBARY, FLORIDA IN SUPPORT OF THE 2018 VOLUSIA COUNTY & MUNICIPAL FLOODPLAIN MANAGEMENT PLAN

WHEREAS, Coastal and riverine flooding are significant threats to the safety of residents of Volusia County and its municipalities: and,

WHEREAS, The National Flood Insurance Program (NFIP) provides federally supported flood insurance in communities that regulate development in floodplains: and

WHEREAS, The Community Rating System (CRS) grades the various community floodplain management programs and reduces flood insurance premiums in those communities that meet certain requirements: and

WHEREAS, In an effort to reduce the potential for personal/property losses in flood-prone areas and ensure the lowest possible flood insurance premiums for residents, Volusia County has contracted with East Central Florida Regional Planning Council to draft the revised floodplain management plan in alignment with CRS guidelines: and

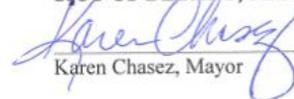
WHEREAS, The East Central Florida Regional Planning Council is also required to integrate the floodplain management plan into the local mitigation strategy: and

WHEREAS, The floodplain management plan has been adopted by Volusia County.

The City of DeBary considers the floodplain management plan to be of utmost importance to Volusia County and the City of DeBary, and supports the floodplain management plan.

ADOPTED the 6th day of February, 2019.

CITY COUNCIL
CITY OF DEBARY, FLORIDA


Karen Chasz, Mayor

ATTEST:


Annette Hatch, City Clerk

City of DeLand – Resolution of Adoption

RESOLUTION NO. 2018 -69

A RESOLUTION OF THE CITY COMMISSION OF DELAND, FLORIDA, ADOPTING THE CITY OF DELAND'S DESIGNATED PORTION RELATING TO THE VOLUSIA INTEGRATED FLOODPLAIN MANAGEMENT PLAN; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, areas of the City of DeLand are vulnerable to the human and economic costs of natural, technological and societal disasters; and

WHEREAS, the City of DeLand governing body recognizes the importance of developing projects and programs to reduce or eliminate those vulnerabilities for the overall good and welfare of the community; and

WHEREAS, proposed projects and programs have been incorporated into the current edition of the Volusia Integrated Floodplain Management Plan that has been prepared and issued for consideration and implementation by the communities and jurisdictions of Volusia County.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION OF DELAND, FLORIDA:

Section 1. The City of DeLand hereby accepts and approves of its designated portion of the Volusia Integrated Floodplain Management Plan.

Section 2. The City of DeLand accepts and endorses the mitigation goals and objectives established for the countywide plan.

Section 3. The agencies and organizations within the City of DeLand will, upon receipt of such funding or other necessary resources, seek to implement the proposals contained in the City's individual section of the strategy.

Section 4. This Resolution shall become effective immediately upon its adoption

PASSED AND DULY ADOPTED this 5th day of September, 2018.



ATTEST:

Julie A. Hennessy
Julie Hennessy
City Clerk-Auditor

Robert F. Apes
Robert F. Apes
Mayor-Commissioner

APPROVED AS TO FORM AND LEGALITY:

Darren J. Elkind
Darren J. Elkind
City Attorney



City of Deltona – Resolution of Adoption

RESOLUTION NO. 2019-02

A RESOLUTION OF CITY OF DELTONA, FLORIDA; ADOPTING THE VOLUSIA COUNTY INTEGRATED FLOODPLAIN MANAGEMENT PLAN AS PART OF THE CITY OF DELTONA LOCAL MITIGATION STRATEGY; PROVIDING FOR CONFLICTS, SEVERABILITY AND AN EFFECTIVE DATE.

WHEREAS, Lacustrine, palustrine, riverine, and other flooding events are significant threats to the health and safety of the citizens of the City of Deltona; and

WHEREAS, the Deltona City Commission recognizes the importance of reducing vulnerabilities to flood events for the overall good and welfare of the community; and

WHEREAS, the City of Deltona has been an active participant in “Volusia Prepares”, the Local Mitigation Strategy working group, which has established a comprehensive, coordinated planning process involving the County and other municipalities, as well as other public and private sector organizations, to eliminate or decrease these vulnerabilities; and

WHEREAS, the City of Deltona participates in the FEMA Community Rating System (CRS) and is interested in maintaining and improving its CRS status; and

WHEREAS, the National Flood Insurance Program (NFIP) provides federally subsidized flood insurance within the City of Deltona because the City regulates development in floodplains; and

WHEREAS, the National Flood Insurance Program Community Rating System (CRS) rates various community floodplain management programs and reduces flood insurance premiums in those communities that meet Community Rating System Program requirements; and

WHEREAS, in an effort to reduce the potential for personal and property losses in flood-prone areas and ensure the lowest possible flood insurance premiums for residents, the City of Deltona is required to adopt the 2018 Volusia County Integrated Floodplain Management Plan as part of the City’s the Local Mitigation Strategy; and

WHEREAS, the formal adoption of the Plan by the City is a requirement of the Community Rating System Program.

City of Deltona, Florida
Resolution No. 2019-02
Page 2 of 2

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF DELTONA, FLORIDA:

Section 1. The City hereby adopts the 2018 Volusia County Integrated Floodplain Management Plan as part of the City of Deltona Local Mitigation Strategy.

Section 2. Conflicts. All Resolutions or parts of Resolutions insofar as they are inconsistent or in conflict with the provisions of this Resolution are hereby repealed to the extent of any conflict.

Section 3. Severability. In the event any portion of this Resolution is determined to be invalid, illegal or unconstitutional by a court of competent jurisdiction, such decision shall in no manner affect the remaining portion or sections of the Resolution which shall remain in full force and effect.

Section 4. Effective Date. This resolution shall take effect immediately upon its final adoption by the City Commission.

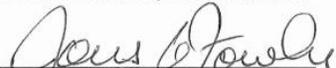
PASSED AND ADOPTED BY THE CITY COMMISSION OF THE CITY OF DELTONA, FLORIDA, THIS 4th DAY OF February, 2019.


Heidi K. Herzberg, MAYOR

ATTEST:


Joyce Raftery, CMC, MMC, CITY CLERK

Approved as to form and legality for use and reliance of the City of Deltona, Florida:


CITY ATTORNEY

NAME	YES	NO
AVILA-VAZQUEZ	✓	
BRADFORD	✓	
KING	✓	
McFALL	✓	
NABICHT	✓	
RAMOS	✓	
HERZBERG	✓	

City of Edgewater - Resolution of Adoption

RESOLUTION #2018-R-12

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF EDGEWATER, FLORIDA; IN SUPPORT OF THE PLANNING PROCESS FOR THE DEVELOPMENT OF THE REVISED "VOLUSIA COUNTY & MUNICIPAL FLOODPLAIN MANAGEMENT PLAN", REPEALING RESOLUTIONS IN CONFLICT HEREWITH; PROVIDING FOR SEVERABILITY AND ESTABLISHING AN EFFECTIVE DATE.

WHEREAS, Coastal and riverine flooding are significant threats to the safety of residents of Volusia County and its municipalities; and,

WHEREAS, The National Flood Insurance Program (NFIP) provides federally supported flood insurance in communities that regulate development in floodplains; and

WHEREAS, The Community Rating System (CRS) grades the various community floodplain management programs and reduces flood insurance premiums in those communities that meet certain requirements; and

WHEREAS, In an effort to reduce the potential for personal/property losses in flood-prone areas and ensure the lowest possible flood insurance premiums for residents, Volusia County has contracted with East Central Florida Regional Planning Council to draft the revised floodplain management plan in alignment with CRS guidelines; and

WHEREAS, The East Central Florida Regional Planning Council is also required to integrate the floodplain management plan into the local mitigation strategy; and

WHEREAS, The floodplain management plan will be revised in July 2018.

NOW, THEREFORE, be it resolved by the City Council of the City of Edgewater, Florida as follows:

1

2018-R-12

Section 1. The City of Edgewater considers the floodplain management plan to be of utmost importance to Volusia County and the City of Edgewater, and supports the floodplain management plan planning process.

Section 2. If any section, subsection, sentence, clause, phrase, or portion of this Resolution, or application hereof, is for any reason held invalid or unconstitutional by any Court, such portion or application shall be deemed a separate, distinct, and independent provision, and such holding shall not affect the validity of the remaining portions or applications hereof.

Section 3. All resolutions or parts of resolutions in conflict herewith be and the same are hereby repealed.

Section 4. This resolution shall take effect immediately upon its adoption.

THIS SECTION INTENTIONALLY LEFT BLANK

2

2018-R-12

Section 5. After a motion to approve by Councilman Blazi with second by Councilwoman Power, the vote on this resolution was as follows:

	AYE	NAY
Mayor Michael Ignasiak	✓	—
Councilwoman Christine Power	✓	—
Councilwoman Amy Vogt	✓	—
Councilman Dan Blazi	✓	—
Councilman Gary Conroy	✓	—

PASSED, APPROVED AND ADOPTED this 16th day of July, 2018.

ATTEST:

Robin Matusick
Robin Matusick
City Clerk/Paralegal

**CITY COUNCIL OF THE
CITY OF EDGEWATER, FLORIDA**

By: Michael Ignasiak
Michael Ignasiak
Mayor

For the use and reliance only by the City of Edgewater, Florida. Approved as to form and legality by:
Aaron R. Wolfe, Esquire, City Attorney
Doran, Sims, Wolfe & Ciochetti

Approved by the City Council of the City of Edgewater at a meeting held on this 16th day of July, 2018 under Item # 5j

3

2018-R-12

City of Holly Hill – Resolution of Adoption (Page 1 of 2)

who are violating the city’s ordinances to keep their parks free from any unwanted activity.

Mayor Penny opened public participation. No one spoke.

RESULT: APPROVED AT 1ST READING [UNANIMOUS] Next: 11/13/2018 7:00 PM
MOVER: Penny Currie, District 2 - Commissioner
SECONDER: John C. Danio, District 3 - Commissioner
AYES: Byrnes, Currie, Danio, Via, Penny



2. Resolution

Resolution 2018-R-69 A Resolution of the City Commission of the City of Holly Hill, Florida, Renaming a Portion of 15Th Street to "Whac a Mole Way"; Providing for Conflicting Resolutions; Providing for Severability; and Providing for an Effective Date.

(Requested by Brian Walker, City Planner)

Mr. Forte stated Bob Space Racer’s is where Whac-A-Mole is manufactured and it is a well-known arcade game and probably distributed throughout the country, throughout the world. It’s a very popular game. Holly Hill is proud to be the home of Bob Space Racer’s and the manufacturing of Whac-A-Mole. The city has made national news by recognizing Bob Space Racer’s for Whac-A-Mole.

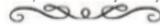
Mayor Penny opened public participation. No one spoke.

Mayor Penny mentioned the text he received from Tony Cassatta and thanked everyone for their support over the years and vote on this and apologized for not being able to attend the meeting.

RESULT: ADOPTED [UNANIMOUS]
MOVER: Arthur J. Byrnes, District 1 - Commissioner
SECONDER: Chris Via, District 4 - Commissioner
AYES: Byrnes, Currie, Danio, Via, Penny

RESOLUTION

Enacted and approved this 23rd day of October, 2018, in Holly Hill



3. Resolution

Resolution 2018-R-70 A Resolution of the City Commission of the City of Holly Hill, Florida, Authorizing the City Manager to Accept and Approve Its Designated Portion of the Volusia County Integrated Floodplain Management Plan. Providing for Severability and Providing an Effective Date.

(Requested by Joseph Forte, City Manager)

Mayor Penny opened public participation. No one spoke.

RESULT: ADOPTED [UNANIMOUS]
MOVER: Penny Currie, District 2 - Commissioner
SECONDER: John C. Danio, District 3 - Commissioner
AYES: Byrnes, Currie, Danio, Via, Penny

RESOLUTION

Enacted and approved this 23rd day of October, 2018, in Holly Hill



4.

RFQ 18-PW-01 - Professional Surveying Services

(Requested by John McKinney, Finance)

Mayor Penny opened public participation. No one spoke.

RESULT: APPROVED [UNANIMOUS]
MOVER: Penny Currie, District 2 - Commissioner
SECONDER: Chris Via, District 4 - Commissioner
AYES: Byrnes, Currie, Danio, Via, Penny

Enacted and approved this 23rd day of October, 2018, in Holly Hill



5.

2019 Aquatech B-10 Jet/Vacuum

(Requested by John McKinney, Finance)

Mayor Penny opened public participation. No one spoke.

RESULT: APPROVED [UNANIMOUS]
MOVER: Arthur J. Byrnes, District 1 - Commissioner
SECONDER: Penny Currie, District 2 - Commissioner
AYES: Byrnes, Currie, Danio, Via, Penny

Enacted and approved this 23rd day of October, 2018, in Holly Hill



6.

Capital Lease - 2018 Aquatech B-10 Jet/Vac

(Requested by John McKinney, Finance)

City of Holly Hill – Resolution of Adoption (Page 2 of 2)



STAFF REPORT
CITY OF HOLLY HILL, FLORIDA
City Commission
Resolution

7.3

MEETING DATE: October 23, 2018
FROM: Joseph Forte
SUBJECT: Resolution 2018-R-70 A Resolution of the City Commission of the City of Holly Hill, Florida, Authorizing the City Manager to Accept and Approve Its Designated Portion of the Volusia County Integrated Floodplain Management Plan. Providing for Severability and Providing an Effective Date.
NUMBER: (ID # 2259)
APPLICANT:
PLANNER:

DISCUSSION:

Holly Hill has been an active participant in Volusia Prepares, the Local Mitigation Strategy working group, which has established a comprehensive, coordinated planning process involving the county and its municipalities, as well as other public and private sector organizations, to eliminate or decrease these vulnerabilities. Holly Hill representatives and staff have identified, justified and prioritized a number of proposed projects and programs needed to mitigate the vulnerabilities of Holly Hill to the impacts of future flood events.

The National Flood Insurance Program (NFIP) provides federally subsidized flood insurance in communities that regulate development in floodplains and the National Flood Insurance Program Community Rating System (CRS) rates the various community floodplain management programs and reduces flood insurance premiums in those communities that meet Community Rating System Program requirements.

In an effort to reduce the potential for personal and property losses in flood-prone areas and ensure the lowest possible flood insurance premiums for residents; and

The adoption of the 2018 Volusia County Integrated Floodplain Management Plan and integration into the Local Mitigation Strategy supports this effort and the formal adoption of the Plan by the local governing body is a requirement of the Community Rating System Program.

The attached Resolution provides for the City of Holly Hill to accept and approve the designations within the Volusia County Floodplain Management Plan.

FISCAL ANALYSIS:

N/A

STAFF RECOMMENDATION:

Updated: 10/17/2018 3:55 PM

Page 1

Packet Pg. 71

Resolution (ID # 2259)

Meeting of October 23, 2018

7.3

Approve Resolution 2018-R-70.

COMMISSION

GOAL:

Goal #4: Provide proficient public health and safety services in terms of police and fire protection, water, storm water, waste water and solid waste management and disaster preparedness with a focus on intergovernmental collaboration, private sector partnerships, and utilization of technologies and proven innovations.

MOTION:

APPROVE RESOLUTION 2018-R-70, AUTHORIZING THE CITY MANAGER TO ACCEPT AND APPROVE ITS DESIGNATED PORTION OF THE VOLUSIA COUNTY INTEGRATED FLOODPLAIN MANAGEMENT PLAN.

Updated: 10/17/2018 3:55 PM

Page 2

Packet Pg. 72





New Smyrna Beach Resolution To Be Added Here

City of Oak Hill – Resolution of Adoption

RESOLUTION 2018-10

A RESOLUTION OF THE CITY OF OAK HILL OF VOLUSIA COUNTY, FLORIDA RELATING TO THE VOLUSIA COUNTY INTEGRATED FLOODPLAIN MANAGEMENT PLAN

Whereas, coastal and riverine flooding are significant threats to the health and safety of the citizens of Volusia County and its municipalities; and

Whereas, the Oak Hill City Commission recognizes the importance of reducing vulnerabilities to flood events for the overall good and welfare of the community; and

Whereas, Volusia County has been an active participant in Volusia Prepares, the Local Mitigation Strategy working group, which has established a comprehensive, coordinated planning process involving the county and its municipalities, as well as other public and private sector organizations, to eliminate or decrease these vulnerabilities; and

Whereas, Volusia County's representatives and staff have identified, justified and prioritized a number of proposed projects and programs needed to mitigate the vulnerabilities of unincorporated areas of Volusia County to the impacts of future flood events; and

Whereas, the National Flood Insurance Program (NFIP) provides federally subsidized flood insurance in communities that regulate development in floodplains; and

Whereas, the National Flood Insurance Program Community Rating System (CRS) rates the various community floodplain management programs and reduces flood insurance premiums in those communities that meet Community Rating System Program requirements; and

Whereas, in an effort to reduce the potential for personal and property losses in flood-prone areas and ensure the lowest possible flood insurance premiums for residents; and

Whereas, the adoption of the 2013 Volusia County Integrated Floodplain Management Plan and integration into the Local Mitigation Strategy supports this effort; and

Whereas, the formal adoption of the Plan by the local governing body is a requirement of the Community Rating System Program;

Now therefore, be it resolved on this 24th day of September 2018 that,

1] The Oak Hill City Commission hereby accepts and approves of its designated portion of the Volusia County Integrated Floodplain Management Plan,

- 2] The Oak Hill City Commission accepts and endorses the mitigation goals and objectives established by Volusia Prepares for the countywide Plan, and the anticipated schedule for the next updating of the strategy,
- 3] The Oak Hill City Commission finds that the proposed flood mitigation projects and programs included in the Plan by other jurisdictions and organizations are acceptable, that they will not adversely affect the county or its neighborhoods, and that they do not conflict with or duplicate the flood mitigation proposals made by the county itself,
- 4] The agency personnel of Volusia County are requested and instructed to pursue available funding opportunities for implementation of the proposals designated therein,
- 5] The agencies and organizations within Volusia County will, upon receipt of such funding or other necessary resources, seek to implement the proposals contained in the county's individual section of the Plan, and
- 6] The Oak Hill City Commission will continue to participate in the updating and expansion of the Volusia County Integrated Floodplain Management Plan in the years ahead, and
- 7] The Oak Hill City Commission will further seek to encourage the businesses, industries and community groups operating within Volusia County to also participate in the updating and expansion of the Volusia County Integrated Floodplain Management Plan in the years ahead,

It was moved by Commissioner Bracy and seconded by Vice Mayor Hyatt that said Resolution 2018 - 10, is passed on first reading. A roll call vote of the City Commission on said motion resulted as follows:

Mayor Gibson	YES
Vice Mayor Hyatt	YES
Commissioner Lindlau, Seat #2	YES
Commissioner Bittle, Seat #3	YES
Commissioner Bracy, Seat#4	YES

Passed upon first reading this 24th day of September 2018.



Douglas A Gibson, Mayor

ATTEST:


Kohh Evaris
City Clerk/Administrator

Approved as to form and legality for the use and reliance of the City of Oak Hill, Florida, only.



Scott E. Simpson, City Attorney





City of Ormond Beach – Resolution of Adoption

RESOLUTION NO. 2018-137

A RESOLUTION OF THE CITY OF ORMOND BEACH ADOPTING THE 2018 VOLUSIA COUNTY FLOODPLAIN MANAGEMENT PLAN; AND SETTING FORTH AN EFFECTIVE DATE.

WHEREAS, areas of the City of Ormond Beach are vulnerable to coastal and riverine flooding that significantly threaten the safety of residents; and

WHEREAS, the National Flood Insurance Program (NFIP) provides federally supported flood insurance in communities that regulate development in floodplains; and

WHEREAS, the Community Rating System (CRS) rewards communities that exceed the minimum requirements of the NFIP that help citizens prevent or reduce flood losses; and

WHEREAS, the City of Ormond Beach actively participates in Volusia Prepares, the Local Mitigation Strategy (LMS) working group, and adopted the Volusia County Multi-jurisdictional LMS by Resolution 2005-55 on March 15, 2005; and

WHEREAS, the City of Ormond Beach strengthened the LMS by adopting the 2013 Volusia County Integrated Floodplain Management Plan by Resolution 2013-112 on June 18, 2013; and

WHEREAS, The County of Volusia contracted with the East Central Florida Regional Planning Council (ECFRPC) to complete the required 5-year update of the 2013 Volusia County Integrated Floodplain Management Plan; and

WHEREAS, the City Commission adopted Resolution 2018-90 supporting the planning process to update the 2013 Volusia County Integrated Floodplain Management Plan in compliance with the Community Rating System (CRS) guidelines; and

WHEREAS, the East Central Florida Regional Planning Council has completed the 2018 Volusia County Integrated Floodplain Management Plan (the "Plan") in accordance with the FEMA Community Rating System planning process; and

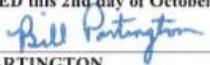
WHEREAS, the City Commission finds the Plan consistent with its goals and objectives in reducing the potential for personal/property losses in flood-prone areas and ensuring the lowest possible flood insurance premiums for residents, now therefore,

BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF ORMOND BEACH, FLORIDA, THAT:

SECTION ONE. The City Commission hereby accepts the Plan attached hereto as Exhibit "A", approves those designated parts of the Plan pertaining to laws within the City, and hereby adopts the same as the official Floodplain Management Plan.

SECTION TWO. This Resolution shall take effect immediately upon its adoption.

APPROVED AND AUTHENTICATED this 2nd day of October, 2018.



BILL PARTINGTON
Mayor

ATTEST:


LISA DAHME
City Clerk

City of Pierson – Resolution of Adoption

RESOLUTION NO. 2018-12

A RESOLUTION OF THE TOWN COUNCIL OF THE TOWN OF PIERSON, FLORIDA IN SUPPORT OF THE PLANNING PROCESS FOR THE DEVELOPMENT OF THE REVISED "VOLUSIA COUNTY & MUNICIPAL FLOODPLAIN MANAGEMENT PLAN"

WHEREAS, Coastal and riverine flooding are significant threats to the safety of residents of Volusia County and its municipalities: and,

WHEREAS, The National Flood Insurance Program (NFIP) provides federally supported flood insurance in communities that regulate development in floodplains: and

WHEREAS, The Community Rating System (CRS) grades the various community floodplain management programs and reduces flood insurance premiums in those communities that meet certain requirement: and

WHEREAS, In an effort to reduce the potential for personal/property losses in flood-prone areas and ensure the lowest possible flood insurance premiums for residents, Volusia County has contracted with East Central Florida Regional Planning Council to draft the revised floodplain management plan in alignment with CRS guidelines: and

WHEREAS, The East Central Florida Regional Planning Council is also required to integrate the floodplain management plan into the local mitigation strategy: and

WHEREAS, The floodplain management plan will be revised in July 2018.

The Town of Pierson considers the floodplain management plan to be of utmost importance to Volusia County and the Town of Pierson and supports the floodplain management plan.

The within and foregoing Resolution No. **2018-12** was read before the Town Council of the Town of Pierson, Florida at its meeting held at Pierson Town Hall, on the **24th day of July 2018**

It was moved by Council Member **Herbert Bennett** and seconded by Vice Chair **James Peterson** that said Resolution be duly adopted.

A roll call vote of the Council on said motion resulted as follows:

Samuel G.S. Bennett, Chairman	<u> AYE </u>
James T. Peterson, Vice Chairman	<u> AYE </u>
Herbert J. Bennett, Council Member	<u> AYE </u>
Robert F. Greenlund, Council Member	<u> AYE </u>
Thomas R. Larrivee, Council Member	<u> AYE </u>

Be it finally resolved that this Resolution No. **2018-12** shall be made a part of the permanent records of the Town of Pierson, Florida.

ATTEST:



Carmen M. Spelorzi, Town Clerk



Samuel G.S. Bennett, Chairman

Town of Ponce Inlet – Resolution of Adoption

RESOLUTION 2018-10

A RESOLUTION OF THE TOWN COUNCIL OF THE TOWN OF PONCE INLET, FLORIDA IN SUPPORT OF THE PLANNING PROCESS FOR THE DEVELOPMENT OF THE REVISED "VOLUSIA COUNTY & MUNICIPAL FLOODPLAIN MANAGEMENT PLAN"

WHEREAS, coastal and riverine flooding are significant threats to the safety of residents of Volusia County and its municipalities: and,

WHEREAS, the National Flood Insurance Program (NFIP) provides federally supported flood insurance in communities that regulate development in floodplains: and

WHEREAS, the Community Rating System (CRS) grades the various community floodplain management programs and reduces flood insurance premiums in those communities that meet certain requirement: and

WHEREAS, in an effort to reduce the potential for personal/property losses in flood-prone areas and ensure the lowest possible flood insurance premiums for residents, Volusia County has contracted with East Central Florida Regional Planning Council to draft the revised floodplain management plan in alignment with CRS guidelines: and

WHEREAS, the East Central Florida Regional Planning Council is also required to integrate the floodplain management plan into the local mitigation strategy: and

WHEREAS, the floodplain management plan will be revised in August 2018.

NOW, THEREFORE, BE IT RESOLVED BY THE TOWN COUNCIL OF THE TOWN OF PONCE INLET, FLORIDA AS FOLLOWS:

SECTION 1: The Town of Ponce Inlet considers the floodplain management plan to be of utmost importance to Volusia County and the Town of Ponce Inlet and supports the floodplain management plan planning process.

SECTION 2. This Resolution shall take effect immediately upon its adoption.

It was moved by Councilmember Paritsky and seconded by Vice-Mayor Hoss that said Resolution be passed. A roll call vote of the Town Council on said motion resulted as follows:

Mayor Smith, Seat #1	Yes
Councilmember Milano, Seat #2	Excused Absent
Vice-Mayor Hoss, Seat #3	Yes
Councilmember Perrone, Seat #4	Yes
Councilmember Paritsky, Seat #5	Yes

Adopted this 23rd day of August, 2018.



ATTEST:

Jeanne Witt
Jeanne Witt, CMC
Town Manager/Town Clerk

Town of Ponce Inlet, Florida

Gary L. Smith
Gary L. Smith, Mayor

City of Port Orange – Resolution of Adoption

RESOLUTION NO. 18-52

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF PORT ORANGE, VOLUSIA COUNTY, FLORIDA; ADOPTING THE CITY OF PORT ORANGE'S DESIGNATED PORTION RELATING TO THE "VOLUSIA COUNTY INTEGRATED FLOODPLAIN MANAGEMENT PLAN"; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, areas of the City of Port Orange are vulnerable to the human and economic costs of natural, technological, and societal disasters; and,

WHEREAS, the City of Port Orange's governing body recognizes the importance of developing projects and programs to reduce or eliminate those vulnerabilities for the overall good and welfare of the community; and

WHEREAS, proposed projects and programs have been incorporated into the current version of the Volusia County Integrated Floodplain Management Plan that has been prepared and issued for consideration and implementation by the communities and jurisdictions of Volusia County.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF PORT ORANGE, VOLUSIA COUNTY, FLORIDA:

Section 1. The City of Port Orange hereby accepts and approves of its designated portion of the Volusia County Integrated Floodplain Management Plan, attached hereto as **Exhibit "A"**.

(RESO. NO. 18-52)

Section 2. The City of Port Orange accepts and endorses the mitigation goals and objectives established for the county-wide plan.

Section 3. The agencies and organizations within the City of Port Orange will, upon receipt of such funding or other necessary resources, seek to implement the proposals contained in the City's individual section of the strategy.

Section 4: The Resolution shall become effective immediately upon its adoption.



MAYOR DONALD O. BURNETTE

ATTEST:


Robin L. Fenwick, CMC City Clerk

Adopted on the 13 day of November, 2018

Reviewed and Approved: 
Margaret T. Roberts, City Attorney



EXHIBIT "A"

A COMPLETE COPY OF
THE 2018 VOLUSIA COUNTY INTEGRATED
FLOODPLAIN MANAGEMENT PLAN
is available in the Office of the City Clerk:

Robin L. Fenwick, CMC, City Clerk
1000 City Center Circle
Port Orange, FL 32129
(386) 506-5563

City of South Daytona – Resolution of Adoption (page 1 of 2)

RESOLUTION NO. 18-24

A RESOLUTION BY THE CITY COUNCIL OF THE CITY OF SOUTH DAYTONA, FLORIDA, AUTHORIZING THE ADOPTION OF THE 2018 UPDATE TO THE CITY OF SOUTH DAYTONA ANNUAL PROGRESS REPORT FOR THE CITY'S FLOODPLAIN MANAGEMENT PLAN; PROVIDING FOR CONFLICTING RESOLUTIONS; PROVIDING FOR SEVERABILITY; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, areas of the City of South Daytona are vulnerable to the human and economic costs of natural, technological and societal disasters, and

WHEREAS, the City of South Daytona governing body realizes the importance of reducing or eliminating those vulnerabilities for the overall good and welfare of the community, and

WHEREAS, the City of South Daytona has been an active participant in Volusia Prepares, the Local Mitigation Strategy working group, which has established a comprehensive, coordinated planning process involving the county and its municipalities, as well as other public and private sector organizations, to eliminate or decrease these vulnerabilities, and

WHEREAS, the City of South Daytona representatives and staff have identified, justified and prioritized a number of proposed projects and programs needed to mitigate the vulnerabilities of areas of South Daytona to impacts of future disasters, and

WHEREAS, the City of South Daytona updates its Floodplain Management Plan annually to include the status of projects and programs to mitigate flooding, and

WHEREAS, the City of South Daytona Floodplain Management Plan is incorporated into the Five-Year Countywide Local Mitigation Strategy Plan that was updated and approved in 2015.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF SOUTH DAYTONA, VOLUSIA COUNTY, FLORIDA:

Section 1. Description of Actions. The City Council of the City of South Daytona approves the updated Annual Progress Report for the City's Floodplain Management Plan.

Section 2. Repealer. All prior resolutions, if any, which conflict with this resolution are hereby repealed.

Section 3. Severability. If any section, subsection, sentence, clause, phrase or portion of this resolution, or application hereof, is for any reason held invalid or unconstitutional by any Court, such portion or application shall be deemed a separate, distinct, and independent provision, and such holding shall not affect the validity of the remaining portions or application hereof.

Section 4. Effective Date. This resolution shall become effective immediately upon its adoption.

APPROVED AND ADOPTED upon first and final reading at the regular meeting by the City Council of the City of South Daytona, Florida, on the 10 day of September, 2018.

SIGNED:

William C. Hall, Mayor

ATTEST:

Joseph W. Yarbrough
City Manager

CERTIFIED AS TO FORM:

Scott Simpson
City Attorney

ATTACHMENT "A"

City of South Daytona Floodplain Management Plan Annual Progress Report (2018)

1.) Floodplain Management Plan Implementation Update/Status

The City has accomplished or is continuously striving to achieve each of the City's mitigation initiatives. The City of South Daytona Floodplain Management Plan was incorporated into the Volusia County Integrated Management Plan by Resolution and the annual progress report update. An electronic copy of the Volusia County Integrated Floodplain Management Plan 2015 Update and the City of South Daytona Floodplain Management Plan and Action Plan is available for review at the County of Volusia website: <http://www.volusia.org/services/public-protection/emergency-management/>. The City of South Daytona 2017 Annual Progress Report is available for review at the City of South Daytona's website: <http://www.southdaytona.org/departments/division.php?structureid=29>.

Goal – To protect human life and health through preparedness of emergency response teams from the Fire, Police and Public Works Departments.

Status – The City has prepared and updates the South Daytona Disaster/Recovery Plan as needed. The plan outlines interdepartmental coordination for a unified response to disasters including flooding events. The Fire Department, Police, Public Works and the Community Development Department play vital roles in the implementation of any emergency response.

Goal – Provide leadership in protecting residential properties from the impacts of floods by coordinating historical data with updated storm water management studies to identify possible flooding concerns.

Status – The City Council and City Manager are dedicated to the protection of the community from flooding issues. South Daytona is a coastal community with an average ground elevation of about 6.0' above sea level. This geographical feature dictates the need to be active, aggressive and responsive to the community needs for flood protection.

Goal – To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public with proper planning and cost effective storm water improvements.

Status – The City is continuously assessing the Stormwater Infrastructure and making necessary improvements as needed. South Daytona implemented a Stormwater Utility Fee to fund projects and has spent over \$30,000,000 in the past 20 years on stormwater related projects.

Goal – To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets and bridges located in floodplains through hardening facilities and Public Works Department preparedness.

Status – Public Works, in conjunction with other utility and service providers work together to maintain in proper condition, replace when needed, and harden when necessary, all utilities, streets and bridges within the City.

City of South Daytona – Resolution of Adoption (Page 2 of 2)

Goal – To help maintain a stable tax base by providing for the sound use and development of flood prone areas in such a manner as to minimize flood blighted areas.

Status – An integral part of a stable tax base for sound development is adhering to sound development codes and stormwater protection. South Daytona has in place a very strict development code that exceeds the minimum requirements set forth in the Florida Building Code and the Community Rating System Program.

Goal – Provide advice to property owners by the Floodplain Manager and Chief Building Official, concerning the protection of their properties from flooding.

Status – This service is provided on request by both the Floodplain Manager and Chief Building Official and has been an invaluable outreach program to assist homeowners and business owners with their localized drainage issues.

Goal – Maintain a Public awareness program that informs all property owners in the flood zones that are located in a flood zone through mail-outs and website.

Status – City staff continues to mail letters annually to homeowners of repetitive loss structures and those located in the SFHA regarding their location/status of their flood zone. The City website also provides many different documents and links for Public Awareness.

Goal – Maintain an aggressive grant program to identify and obtain funding for both pre- and post-disaster mitigation projects through the Community Development and the Redevelopment Departments.

Status – City staff continues to apply for grants and most recently was awarded over \$200,000 for a stormwater improvement project to reduce flooding in the Lantern Park Subdivision. The project includes building a stormwater pond for retention of run-off and reduction of flooding. The City has received over 30 million dollars over the past 40 years for mitigation and stormwater that have significantly reduced the number of structures that could flood during storm events.

NEW Status: The City was awarded over \$300,000 in grant funds for a stormwater project to reduce flooding in the Jones Street neighborhood. The project includes a stormwater pond for retention of run-off and reduction of flooding and was completed in the spring of 2017.

Goal – Create programs to manage the surface water runoff through maintaining an updated stormwater management plan through the Public Works Department in conjunction with the Floodplain Manager and Chief Building Official.

Status – South Daytona has a Master Drainage Plan that is updated regularly with field collected data from Public Works after major storm events. Improvements are designed for areas with reoccurring flooding issues.

2.) Failure to meet objectives or implement goals/initiatives.

N/A – The City of South Daytona meets their objectives or implements goals/initiatives as provided for in the plan.

3.) New projects and recommendations.

New Mitigation Projects:

VOL – 0471 Windle Lane Stormwater Project

This project includes the purchase of a 2.26 acre vacant lot adjacent to the two existing stormwater ponds. The existing ponds are located on 1.37 acres and serve two phases of the Coventry Forest Subdivision. The acquired 2.26 acre lot will be excavated along with the other two existing ponds to make one large wet detention system. This larger system will have a pumping station to aid in recovery efforts during and after major storm events thereby allowing better ingress/egress for our emergency services vehicles. The project also includes an outfall structure designed to stop tail water from Reed Canal backing up into the proposed pond system. Funding of the project includes FEMA - \$262,500, DEP - \$50,000 and the City is applying for additional funds in 2019 through SJRWMD.

VOL – 0552 – South Daytona SRL Reconstruction Project 1

2411 S. Palmetto Avenue, Severe Repetitive Loss Structure, Demolition and Reconstruction of Home.

Past LMS Projects and Status:

VOL-0389 – South Daytona EOC/Public Works Facility, Design underway; no funding to date.

VOL-0210 – Country Club Manor Subdivision, Design underway; no funding to date.

VOL-0246 – Reed Canal Reconstruction Design, Design underway; no funding to date.

VOL-0244 – Golfview Subdivision Retrofit – Phase V Stormwater, Completed 2008.

VOL-0245 – Lantern Park Retrofit – Phase V Stormwater, Completed in 2016.

VOL-0247 – Western Road Stormwater Improvements, Completed 2006.

VOL-0248 – Greenbriar Subdivision Retrofit Completed 2012.

VOL-0378 – Stevens Canal Outflow Pond Completed 2010.

VOL-0395 Reed Canal Stormwater Treatment Facility Completed 2012.

VOL-0453 Lantern Subdivision Retention Pond Completed in 2016.

VOL-0469 Jones Street Stormwater Project Completed in 2017.

Volusia County – Resolution of Adoption

RESOLUTION 2018- 121

A RESOLUTION OF THE COUNTY COUNCIL OF VOLUSIA COUNTY, FLORIDA ADOPTING THE VOLUSIA COUNTYWIDE INTEGRATED FLOODPLAIN MANAGEMENT PLAN; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, coastal and riverine flooding are significant threats to the health and safety of the citizens of Volusia County and its municipalities;

WHEREAS, the Volusia County Council recognizes the importance of reducing vulnerabilities to flood events for the overall good and welfare of the community;

WHEREAS, Volusia County has been an active participant in "Volusia Prepares," the local mitigation strategy working group that established a comprehensive, coordinated planning process involving the county and its municipalities, as well as other public and private sector organizations, in order to eliminate or decrease these vulnerabilities;

WHEREAS, Volusia County's representatives and staff have identified, justified and prioritized a number of proposed projects and programs needed to mitigate the vulnerabilities of unincorporated areas of Volusia County to the impacts of future flood events;

WHEREAS, the National Flood Insurance Program ("NFIP") provides federally subsidized flood insurance in communities that regulate development in floodplains;

WHEREAS, the NFIP community rating system ("CRS") rates the various community floodplain management programs and reduces flood insurance premiums in those communities that meet CRS requirements;

WHEREAS, efforts to reduce the potential for personal and property losses in flood-prone areas and ensure the lowest possible flood insurance premiums for residents are in the interest of the residents of Volusia County;

WHEREAS, the adoption of the 2018 Volusia County Integrated Floodplain Management Plan (the "Plan") and integration of it into the local mitigation strategy supports this effort; and

WHEREAS, the formal adoption of the Plan by the local governing body is a requirement of the CRS program.

BE IT RESOLVED BY THE COUNTY COUNCIL OF VOLUSIA COUNTY, FLORIDA, IN OPEN MEETING DULY ASSEMBLED IN THE THOMAS C. KELLY ADMINISTRATION CENTER, DELAND, FLORIDA THIS 18TH DAY OF SEPTEMBER, 2018, AS FOLLOWS:

SECTION 1. The Volusia County Council hereby accepts, approves and adopts the "Volusia County Integrated Floodplain Management Plan" as the Plan pertains to unincorporated Volusia County.

SECTION 2. The Volusia County Council accepts and endorses the mitigation goals and objectives established by "Volusia Prepares" for the countywide Plan, and the anticipated schedule set forth on page 46 of the Plan for the next updating of the strategy.

SECTION 3. The Volusia County Council finds that the proposed flood mitigation projects and programs included in the Plan by other jurisdictions and organizations are acceptable, that they will not adversely affect the county or its neighborhoods, and that they do not conflict with or duplicate the flood mitigation proposals made by the county itself.

SECTION 4. Volusia County will make reasonable efforts to pursue available funding opportunities for implementation of the proposals designated in the Plan.

SECTION 5. The agencies and organizations within Volusia County will, upon receipt of such funding or other necessary resources, seek to implement the proposals contained in the county's individual section of the Plan.

SECTION 6. The Volusia County Council intends to continue to participate in the updating and expansion of the Plan in the years ahead.

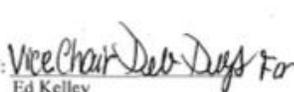
SECTION 7. The Volusia County Council will further seek to encourage the businesses, industries and community groups operating within Volusia County to participate in the updating and expansion of the Plan in the years ahead.

SECTION 8. EFFECTIVE DATE. This resolution shall take effect immediately upon its adoption.

DONE AND ORDERED IN OPEN MEETING.

**COUNTY COUNCIL
VOLUSIA COUNTY, FLORIDA**

ATTEST: 
George Recktenwald
Interim County Manager

BY: 
Ed Kelley
County Chair





APPENDIX J: CONSEQUENCES BY HAZARD

The consequences by hazard can be found on the following pages of this report. Within this section, environmental, economic and societal issues associated with each hazard covered in this report are identified.

RISK and VULNERABILITY (4.3.1)	 People	Property	Environment	Program Operations
HAZARD/HIRA				
Natural				
Hurricanes/Tropical Storms	<p>According to the Volusia County Property Appraiser, over 45% of the County's population resides along the coast (205,000 people). The coastal region also leads the County in tourism. The large coastal population is highly vulnerable to the affects of a hurricane. Volusia County's worst hurricane season was 2004. Hurricanes Charley, Frances and Jeanne impacted Volusia County, back-to-back. Although Charley was the only storm to impact the County with hurricane-force winds, never-the-less these storms had a major impact on homes and infrastructure, and caused adverse human consequences. (Section V)</p>	<p>Volusia County's worst hurricanes on record were Hurricanes Charley, Frances and Jeanne in 2004. These back-to-back storms battered Volusia County with tropical storm force winds for weeks. Storms of this magnitude have the potential to destroy homes and infrastructure, injure and kill people in its path, and cause massive environmental consequences. Cumulatively the County experienced over \$560,000,000 in damages. Approximately 40% of homes were damaged. Based on the hazard analysis, Volusia County's annualized losses to residential buildings from Hurricanes is over \$280 million. For non-residential buildings, annualized losses total almost \$70 million. (Section V and VI)</p>	<p>Hurricanes do not only bring high winds to Volusia County, they also have the potential to produce inland flooding, tornadoes, storm surge, and significant beach erosion. These four hazards can severely impact the environment by downing trees, eroding sensitive coastal dunes and ecosystems, loss of sea turtle nests, and causing the runoff of debris and potentially hazardous materials into our waterways. Because erosion events were part of other hazard events (e.g., storm surge, hurricane, severe winter storm) the monetary damage for the erosion alone is unknown.</p>	<p>Program operations may be impacted by a hurricane. Historically, tropical depressions and tropical storms have not impacted the County's ability to perform it's day-to-day program and CEOC operations. Preparedness, response, and recovery efforts have been implemented with no additional strain to the County. In the case of a direct land-falling hurricane in Volusia County, program operations may become strained, especially if it is a major hurricane (Cat 3 or greater). In these situations we will rely on assistance from other counties through the Emergency Management Assistance Compact (EMAC) (mutual aid) or through the State and FEMA. In some cases, it may take several weeks or months to return program operations to a normal level. (VC CEMP)</p>
Floods	<p>According to FEMA, flooding is the most costly natural hazard in the U.S. and can cause long-term adverse psychological impacts. According to FloodSmart.gov, all 50 states are at risk to flooding and flash floods. Flash floods are particularly dangerous because they can quickly sweep cars off roadways, causing injuries and casualties to people in its path. (Volusia County does not experience true "flash flooding"). In addition to life safety, property can be damaged by just an inch of water (FloodSmart.gov). Homeowners insurance and renter's insurance does not cover flooding. A separate policy under the NFIP must be purchased. Citizens without flood insurance may not receive any assistance to repair their homes and property following an event. Countywide, there are 47,452 structures in the 100-year floodplain. For a map the 100-year floodplain, see Figure 5.10.</p>	<p>Property in low-lying areas or Special Flood Hazard Areas (100 year floodplain) are susceptible to damage from flooding (FloodSmart). Floods can destroy homes and businesses, erode property along creeks and rivers, and washout roads and bridges. In some cases, flooding is a secondary hazard from a hurricane event. Volusia County has experienced ten major flood events since 1994 resulting in over \$35,000,000 in insured flood losses. (Section V)</p>	<p>Flooding has the potential to put our environment at risk in different ways. Flooding erodes our river beds which causes sediments to enter the waterways, potentially clogging our stormwater systems. Floods can also bring hazardous materials/pollution into our waterways via runoff. The County's sensitive riparian ecosystems are often negatively impacted in this process. When Lake Okeechobee nears flood level, water is emptied directly into the intracoastal waterway. This water, rich in nutrients, results in algae blooms and oxygen depletion in our rivers, resulting in fish die-offs. Due to a lack of data on historical environmental impacts from flooding in Volusia County, we were unable to directly calculate the full cost.</p>	<p>In rare occasions, program operations may be impacted by a flood. The VCEOC does not sit in a Special Flood Hazard Area (SFHA), although much of the surrounding land, roadways, and access points do. Historically, the EOC has remained operational during flood events with no impact to program operations. County programs may become strained responding to local or statewide flooding events. In these situations we may rely on assistance from other counties and the state through the Emergency Management Assistance Compact (EMAC) and mutual aid agreements.</p>
Thunderstorms	<p>Severe thunderstorms are a common occurrence in Volusia County throughout the year. These are dangerous events capable of producing high winds, hail, tornadoes, and lightning. All citizens in Volusia County are at risk to the negative effects of thunderstorms. Downed trees, damage to homes, loss of electricity, and rarely, casualties are common byproducts of severe thunderstorms. (Section V and VI)</p>	<p>According to NOAA's Climatic Data Center, from 1996 - 2013, Volusia County had 120 severe thunderstorm/wind events, causing approximately \$142 million in property damage with zero fatalities. All property in Volusia County is at risk to the negative effects of thunderstorms. Downed trees, damage to homes, businesses, and infrastructure, and loss of electricity are common byproducts of severe thunderstorms. (Section V and VI)</p>	<p>Severe thunderstorms in Volusia County have historically had a minimal impact on the environment. In some cases, these storms can down trees and vegetation and cause localized flooding. Please see "Floods" above.</p>	<p>There is no risk to program operations from thunderstorms. VCEM's ability to respond to and manage the event should not be impacted. The VCEOC is equipped with two generators and redundant communication systems. In a catastrophic event, the VCEM may rely on outside support to maintain operations as stated in the above hazard examples.</p>
Tornadoes	<p>Tornadoes pose a great risk to people and structures. While Volusia County is not located in "tornado alley", people are at risk to the impacts of a tornado. From 1953 to 2009, Volusia County had 69 tornado events, responsible for 2 deaths and 107 injuries. (table 5.12) Not only can tornadoes threaten life safety, they can demolish homes and businesses, destroy infrastructure, and impact entire communities.</p>	<p>Tornadoes pose a great risk to property. From 1996 to 2013, Volusia County had 37 tornado events, responsible for over \$142,000,000 in property damage. Two fatalities and 128 injuries were reported. (Section V, NOAA Climatic Data Center) Tornadoes can reach wind speeds over 200mph, (although the most powerful tornado to impact Volusia County was an EF3) lifting homes and businesses off of their foundations, crippling infrastructure and creating automobile sized missiles. Entire communities may be destroyed.</p>	<p>Because of the vast range of wind speeds associated with tornadoes, the environment is at risk to a variety of impacts. Even an EF0 (65-85mph) can uproot trees and vegetation. In stronger tornadoes, debris will tossed miles away from the source, potentially entering our waterways. Hazardous materials may escape if vehicles are damaged or storage tanks are compromised.</p>	<p>Unless there is a direct impact from a tornado, there is no risk to program operations at the County level. Preparedness, response, and recovery efforts should not be impeded. The VCEOC would remain operational, supporting the local officials. In the case of a direct hit to the VCEOC, program operations would be minimally affected, as the building is hardened to withstand an EF-4 tornado.</p>
Wildfire	<p>Wildfires are one of the most common hazard events in Volusia County. Between 2000 - 2008, the average number of wildfires per year was 129 (Table 5.18). People and their property are at risk to the impacts of a wildfire. Wildfires can burn down trees, vegetation, homes and businesses. Smoke from wildfires can be detrimental to the health of citizens living in close proximity to the fires. Smoke and ash from wildfires can obscure vision and cause extended road closures.</p>	<p>Wildfires can destroy public and private property, ravish parklands, and disrupt the service of critical utilities. The most recorded wildfires in a 2-month period in Volusia County was 233 fires between June and July 1998; 163,000 acres burned. The fires threatened 29,000 homes, \$60,000,000 in timber was lost, and \$2,100,000 in property damage resulted. Both forested and urban areas are at risk to wildfires. (Section V and VI)</p>	<p>Though many wildfires are a natural process, the environment may be negatively impacted. Wildfires can start in urban or woodland areas. The national average size of a wildfire is 309.6 acres (NOAA Wildfire Report 2012). Not only are trees impacted by these fires, so are the native species of plants and animals. Smoke and ash from the fires can pollute waterways and the air.</p>	<p>There is a minimal risk to program operations posed by wildfires. Historically, the VCEOC has been impacted by a wildfire on two occasions, however the smoke intrusion was never severe enough to require COOP activation. If there was a wildfire at or near the VCEOC that caused air pollution or blocked access roads to the facility, program operations may become strained. In this situation, VCEMD may activate our COOP Plan. In extreme circumstances, the VCEM may seek outside help through mutual aid agreements and EMAC.</p>
Drought/ Extreme Heat	<p>People are indirectly at risk to drought. Drought negatively affects agriculture and livestock, which impacts the food people eat. Farmers are the most directly impacted by the impacts of drought. Extreme heat is one of the leading causes of natural hazard deaths in the United States (International Journal of Health Geographics).</p>	<p>Property may be at high risk to drought under extreme circumstances. Extended periods of drought impacts agricultural products and farmlands. Crop losses may be significant. The fern industry may be adversely impacted. Volusia County experienced droughts in 1981, 1985, 1998, 1999, and 2000. (Section V and VI)</p>	<p>The environment is also at risk to drought and extreme heat. Without water, vegetation and sensitive ecosystems may be negatively impacted. Stream flows may be reduced, impacting riparian and riverine ecosystems. (Section V)</p>	<p>Program operations will not be impacted by drought conditions.</p>
Hail	<p>Everyone in Volusia County is at risk to hail. Hail can cause injuries and, in rare cases, death if people are outside during an extreme hail event. In Volusia County there have been no recorded fatalities or injuries reported from hail. (Section V) Hail is more harmful to homes and businesses as it can damage roofs and windows on buildings and vehicles.</p>	<p>Although hail storms do not typically cause widespread damage to property, if the size of the hailstones are great enough, hail can puncture roofs, break car windshields, dent bodywork, and damage windows. Total losses from the 78 hail events from 1996 - 2013 in Volusia County is over \$110,000. (Table 5.3). Because hail is formed during thunderstorms, see "Thunderstorms" for more information.</p>	<p>Although the entire County and environment is vulnerable to hail, there are no direct significant impacts to the environment. An example of an indirect impact may be vehicular accidents on roadways that leak gasoline and hazardous materials into roadways.</p>	<p>Program operations will not be impacted directly by hail. Because hail is formed during thunderstorms, see "Thunderstorms" for more information.</p>
Sea Level Rise	<p>Coastal areas and low-lying river-adjacent areas are susceptible to sea level rise. Often times, these areas are highly populated. Sea level rise is a long term hazard and short term loss of life is not a likely outcome.</p>	<p>Property adjacent to the Atlantic Ocean, Indian River Lagoon, Halifax River and the St. Johns River are at risk for sea level rise. Impacts to property in Volusia County are expected to begin in the 2040 to 2070 time frame.</p>	<p>Sea level rise can inundate structures over the long term, posing an environmental risk if these facilities carry hazardous materials. Sea level rise is also projected to deteriorate coastal systems such as dunes.</p>	<p>Volusia County took part in the East Central Florida Regional Resiliency Action Plan, the East Central Florida Regional Resilience Collaborative, and other internal sea level rise studies. Sustainability of program operations was analyzed as part of these efforts.</p>
NOAA Climatic Data Center	<p>http://www.ncdc.noaa.gov/</p>			

RISK and VULNERABILITY (4.3.1) (con't)	 People	Property	Environment	Program Operations
HAZARD/HIRA				
Natural (Cont'd)				
Severe Winter Storms	<p>All of Volusia County is vulnerable to winter storms. Being in the southern portion of the nation, we rarely experience severe winter storm events, however there were two extended cold periods in the 1980's that froze many of the orange groves. (Section V) NOAA's Climactic Data Center has recorded 0 severe winter storms from 1996 - 2009. Historically the greatest impact of cold weather has been on the homeless population. Shelters have been opened during cold weather events for them.</p>	<p>All of Volusia County is vulnerable to winter storms. The greatest impact was to the orange groves and fern industry in the 80's. The fern industry was also impacted. No dollar amount of damage is available.</p>	<p>The environment is at risk to the negative effects of winter weather. Freezing temperatures can hurt crops and vegetation, particularly non-native species.</p>	<p>Program operations will not be impacted by winter weather.</p>
Lightning	<p>Everyone in Volusia County is at risk to lightning, as Florida is the lightning capitol of the U.S. Lightning can cause serious personal injuries and, in some cases, death. Since 1994, lightning has caused 1 death and five injuries. (Section V) Lightning is also harmful to homes and businesses, potentially sparking fires or destroying an electrical system. Beach goers, boaters, and golfers are at particular risk to lightning.</p>	<p>All of Volusia County is at risk to lightning. Lightning has caused over \$1,367,000 in property damage since 1996. (Table 5.8, NOAA Climactic Data Center) Lightning is responsible for causing numerous structure fires and wildfires in Volusia County, particularly during our dry season in the later winter/early spring.</p>	<p>The environment is vulnerable to lightning strikes. Lightning can spark fires, and if conditions are dry enough, lightning can spark a serious wildfire (Section V). See "Thunderstorms" and "Wildfires" for more information.</p>	<p>Program operations will not be impacted directly by lightning. If VCEOC is directly hit by lightning, we have redundant power, IT, and communication systems in place.</p>
Coastal Erosion	<p>Although there is no life-safety issue with coastal erosion, people living on the coastline of Volusia County are at risk to this hazard type. Because coastal erosion can be a result of tropical storms, hurricanes, and nor'easters, homes and structures built along the coastline may be damaged in a hurricane event. Homes may fall into the ocean and protective dunes may be destroyed.</p>	<p>All property along the coast of Volusia County is at risk to coastal erosion. Private properties in some areas lose inches or feet of beach each year to eroding coastlines. Coastal erosion has caused over \$400,000,000 in damages. (Table 5.13) For a map of critical erosion areas, see Figure 5.8.</p>	<p>The environment is extremely vulnerable to coastal erosion. Erosion can occur via wind or water. Erosion of soil and sand can lead to sedimentation in waterways, loss of habitat for coastal ecosystems, and changes in the coastal geomorphology. (Section V)</p>	<p>Program operations are not at risk to coastal erosion. The VCEOC is located 20 miles inland from the coast.</p>
Sinkhole	<p>Sinkholes are a natural and common geologic feature in areas with underlying limestone and other porous rock types that are soluble in water. There were 80 sinkholes in Volusia County between 1973 and 2005. (Table 5.12) People are at risk to sinkholes should the structure or car they are in be impacted by a sinkhole suddenly opening. No injuries from sinkholes have been recorded in Volusia County.</p>	<p>Property is at risk to sudden sinkhole formation, particularly in west Volusia County. In 2004, a sinkhole devoured a 160 foot section of Howland Boulevard in Deltona. It is estimated it took 1 million cubic yards of dirt to fill it.</p>	<p>The most important environmental issue with respect to sinkholes is the sensitivity of aquifers to groundwater contamination. The effect of man on sinkholes is most severe in cases where polluted surface waters enter sinkhole aquifers. Since they are natural holes, they are attractive sites for the dumping of trash and HAZMAT.</p>	<p>There are no risk to program operations from sinkhole formation.</p>
Tsunami	<p>The residents of the coastal region of Volusia County are at risk to a tsunami. In August 2008, a qualitative tsunami hazard assessment indicated that the U.S. Atlantic coast has a very low Tsunami risk based on low wave run-up, low tsunami hazard frequency, and no reported fatalities. That said, a tsunami event could potentially impact a significant portion of the coastal population. Fortunately there should be a minimum six hours advance notice, sufficient time to evacuate the vulnerable population.</p>	<p>Should a tsunami event impact Volusia County, severe or catastrophic damage could occur. Massive amounts of vegetative and construction debris would result, boats would be washed inland, power lines could collapse, and underground utilities could be destroyed. (Section V)</p>	<p>A tsunami event could be environmentally devastating. Vegetation in large stretches of the coast would be hurt substantially as saltwater-tolerant mangroves and grasses take over from other species. For rare animals with specific reproduction sites, like marine turtles, the tsunami's effects could spell extinction. Salt water intrusion into aquifers would occur. Sewage and other pollutants would contaminate ground water.</p>	<p>Program operations may be impacted by a tsunami. Although Volusia County has never experienced a tsunami, VCEM developed a tsunami response plan that indicated response and recovery efforts may become strained. We will rely on assistance from other counties through mutual aid, the State and FEMA. It may take months to return program operations to a normal level.</p>
Storm Surge	<p>Storm surge occurs when the water level of a tidally influenced body of water increases above the normal astronomical high tide and is associated with tropical storms and hurricanes. Storm surge is the biggest threat to people associated with a tropical cyclone. It is critical for those living in storm surge zones to evacuate when ordered to do so.</p>	<p>All of Volusia County's 48 miles of coastline are vulnerable to storm surge. (Figure 5.11) Billions of dollars of property are located in storm surge zones. The State of Florida has established a Coastal Construction Control Line (CCCL). To minimize property damage, no structures may be built seaward of this line. During several previous storm surge events, some parts of SR A1A were undermined.</p>	<p>Storm surge can be extremely detrimental to the environment, destroying turtle nesting sites, inundating coastal areas and rivers with saltwater, polluting ground water, and killing sensitive vegetative ecosystems.</p>	<p>Program operations may be impacted by a large storm surge event (Category 3 or higher hurricane). Although Volusia County has never experienced a large storm surge event, we have experienced many small-scale storm surge events that caused homes to flood and moderate coastal erosion. Some routine program operations were suspended until the VCEOC returned to a Level 3 (monitoring) status.</p>
Public Health Emergencies	<p>All Volusia County residents are at risk to public health emergencies such as a pandemic influenza, pneumonic plague, epidemic, food contamination, etc. The very young and the very old are especially vulnerable as their immune systems are fragile. Public health emergencies may be accidental, natural, or intentional. Several cases of dengue fever (DEN-1) have been reported in Martin County. None have been reported in Volusia County to date. Volusia County has experienced cases of imported malaria. Although rare, there have been cases of west Nile virus encephalitis in Volusia County. Fortunately WNV is asymptomatic in 80% of the cases.*</p>	<p>Property is not directly at risk to public health emergencies. In rare instances, agriculture may be the source of a deadly bacteria or virus that can spread to consumers.</p>	<p>The environment is likely not to be impacted by a public health emergency unless it is terrorism or HAZMAT related. See HAZMAT/terrorism sections for more information.</p>	<p>Program operations may be impacted by a public health emergency. Historically, influenza and other public health emergencies have not impacted the County's ability to perform it's day-to-day program and VCEOC operations. In the event that numerous VCEOC members were impacted by the event, a reduced staff may be used to operate the VCEOC. Virtual communications from home offices may be required if the situation escalated. In these situations, the VCEOC may rely on assistance from other counties through EMAC. In some cases, it may take several weeks or months to return program operations to a normal level.</p>
Citation	*www.floridahealth.gov			

RISK and VULNERABILITY (4.3.1) (con't)	 People	Property	Environment	Program Operations
HAZARD/HIRA				
Human-Caused or Technological				
Cyber Attack	<p>A successful cyber attack at the local level may negatively impact the public's ability to conduct business with the County. It's possible that they would be unable to pay utility or tax bills online. On a national scale, increased online control of critical infrastructure means greater vulnerability of electrical power grids, water and transportation systems, oil pipelines, refineries and power-generation plants.</p>	Property is not at risk from a cyber attack.	The environment is not at risk from a cyber attack.	Should a cyber attack take down the County internet/intranet system, emergency management programmatic activities may experience a minor impact. Cyber infrastructure enables storage and transfer of massive amounts of knowledge to enable planning, resource allocation, personnel deployment, and coordination of emergency situations. The Volusia County Information Technology Department would activate its COOP in this situation.
Civil Disturbance	<p>The public may be negatively impacted by a civil disturbance. If a civil disturbance were to occur during a major NASCAR event, bystanders may be injured or killed. Similar results may occur during Biketoberfest and Bikeweek when hundreds of thousands of motorcycle enthusiasts visit Volusia County.</p>	Property is at risk to a civil disturbance. Rioters may damage both private and public property, disrupting the ability to respond to the situation and causing damages in the hundreds of thousands of dollars. Florida has experienced seven major riots, beginning with the 1923 Rosewood riot, then 1967 Tampa riots, 1980 Miami riots, 1982 Miami riots, 1987 Tampa riots, 1989 Tampa riots, and most recently the 1996 St. Petersburg riots.	The environment is at moderate risk to a civil disturbance. Rioters may burn vehicles and buildings, releasing toxic gas, fumes, and fluids onto roads.	Program applications will not be adversely affected by a civil disturbance.
Coastal Oil Spill	<p>The impact of a coastal oil spill may impact those with pre-existing breathing difficulties living close to the coast. The VCHD and VC Environmental Management will monitor air, water, sediment, and waste generated by the cleanup operations.</p>	Property is not directly at risk from a coastal oil spill.	The environment is at high risk to the impacts from a coastal oil spill. Refer to the "Volusia County Coastal Oil Spill Cleanup and Debris Removal Plan" beginning on page 7 for a description of the potential environmental impact from an oil spill.	Program applications will not be adversely affected by a coastal oil spill.
Terrorist Attack	<p>The citizens of Volusia County are at risk to a terrorist attack every day. Volusia County is home to NASCAR and hosts hundreds of thousands of visitors every year for race events, motorcycle events, and other spectator events such as "Wings and Waves" and the New Smyrna Beach "Balloon Fest." Volusia County is home to five colleges and universities with an international blend of students. The risk of terrorist attack includes injury and death.</p>	Property is at risk to a terrorist attack. A single explosion or dirty bomb could destroy multiple facilities and injure or kill hundreds of people.	The environment is at risk to a terrorist attack. A dirty bomb or large explosion could potentially contaminate a large area.	Program operations are at minimal risk to a terrorist attack. The VCEOC is a hardened, secure facility. Should a terrorist attack occur in Volusia County, additional resources may be necessary that would be requested through mutual aid agreements and the State. Routine program operations may be temporarily suspended.
Mass Migration	The citizens of Volusia County are at minimal risk to a mass migration event.	Property is not directly at risk from a mass migration event.	The environment is at minimal risk to a mass migration event.	Program operations are at minimal risk to a mass migration event.
HAZMAT (fixed, mobile, and terrorism)	<p>The citizens of Volusia County are at risk to Hazardous Materials (HAZMAT) every day. HAZMAT can come from fixed or mobile sources, (facilities, trains, semi trucks) or can be intentionally used for harm in a terrorist act. Citizens may be impacted on roadways, at school, in their homes, through their food supply, or in public venues (large stadiums, athletic events, movie theaters, the Speedway, etc). The risks of hazardous materials may be illness, injury, or death. With 2 major interstate highways, 2 major rivers, and 2 railroads in Volusia County, hazardous materials incidents occur on a daily basis; fortunately, the vast majority of these involve minor petroleum spills or sewage discharges.</p>	Property in Volusia County is at risk and vulnerable to the impacts of hazardous materials. Chemical spills, bioterrorism, WAD, cyber attacks, etc, all impact our property and infrastructure. A single explosion could devastate a facility or cluster of facilities. Homes and businesses could receive damage or even collapse. Hazardous materials can erode or corrode infrastructure as well.	The environment is highly vulnerable to hazardous materials, regardless if the release or spill is accidental, intentional, or natural. Hazardous materials can be spread through water, air, or the food supply. Once HAZMAT are in environmental systems, it may take days, weeks, months, or years to clean-up.	Program operations are at a minimal risk to HAZMAT. The VCEOC is not located in close proximity to any hazardous materials facilities. Volusia County Environmental Management, the lead agency for hazardous materials (ESF 10), would work closely with the Volusia County Fire Services HAZMAT team during a large HAZMAT event.
Agroterrorism	<p>Agroterrorism is a term used to denote the deliberate introduction of disease-causing organisms and chemicals into the food supply through agriculture. It could impact the public if crops or agricultural foodstuffs contaminated with disease-causing organisms were to enter the food chain.</p>	Agroterrorism could potentially impact crops and livestock. Losses could be in the millions of dollars.	Agroterrorism could have a negative impact on the environment from the standpoint of crop destruction.	Program applications will not be adversely affected by an agroterrorism event. If necessary, additional support would be requested through mutual aid and FDEM.

Citations:	
US Census Bureau	www.census.gov
FEMA	www.fema.gov
FloodSmart	http://www.floodsmart.gov
U.S. - Italy Research Workshop	http://training.fws.gov/CSP/Resources/conservation_science_web_series/information_page/dubow/Environmental_Effects_of_Extreme_Floods.pdf
National Flood Hazard Layer	https://hazards.fema.gov/femaportal/wps/portal/NFHLWMSkmsdownload
NOAA Wildfire Report 2012	http://www.ncdc.noaa.gov/sotc/fire/
Florida Riot History	http://www.connexions.org/CxLibrary/Docs/CxP-Riots_List.htm
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CONSEQUENCES (4.3.2)	 The Public	 Responders	 Continuity of Operations & Delivery of services	 Property, facilities & Infrastructure
HAZARD/HIRA				
Natural				
Hurricanes/Tropical Storms	<p>The public may face extreme consequences from hurricanes and tropical storms. Hurricanes have the potential to injure and kill people, destroy residences and businesses, and interrupt water, power, and sewer services necessary to return to a normal way of life. Regardless if citizens have insurance or receive assistance, the recovery process from a major hurricane may be very costly and take weeks, months, or years to complete and have serious psychological impacts.</p>	<p>Responders may face extreme difficulties when responding to a hurricane or tropical storm event. Hurricanes can down trees and power lines, destroy critical infrastructure such as local EOCs, fire stations, and hospitals, and damage bridges, roadways, and government buildings critical for response and recovery operations. Responders may have to rescue citizens isolated without resources. Responders should be aware of their risks at all times.</p>	<p>In an extreme event, such as a major hurricane, there may be an impact on delivery of routine program operations as the focus will be on response/recovery to the event.</p>	<p>There are numerous potential consequences that may result from a hurricane or tropical storm. Property along the coast and in storm surge areas may be severely impacted or destroyed. County facilities along the coast in storm surge zones have been identified. Critical infrastructure such as utilities, roadways, bridges, hospitals, EOCs, Police/Fire/EMS stations may be damaged or destroyed in an event.</p>
Floods	<p>The public may face extreme consequences from flooding and/or flash floods (although Volusia County does experience true "flash flooding"). Floods have the potential to injure and kill people, especially those who drive through flooded roadways. Floods can destroy residences and businesses, and interrupt water, power, and sewer services necessary to return to a normal way of life. Regardless if citizens have flood insurance or receive assistance, the recovery process from a flood may be very costly and take weeks, months, or years to complete.</p>	<p>Responders may face difficulties when responding to a flood event. Floods can destroy homes, businesses, and critical infrastructure such as local EOCs, fire stations, and hospitals. Floods can wash out bridges and roadways, as well as destroy government buildings critical for response and recovery operations. Responders may have to perform swift water rescues to citizens trapped in flooded areas. (This occurred during Tropical Storm Fay). Responders should be aware of their risks at all times.</p>	<p>The VCEOC is not located in a SFHA; however, many access roads may be impacted by flooding. In an extreme flood event, there may be an instance when access to the VCEOC is difficult. If something like this should occur, EOC personnel may be transported by VCSO's helicopter assets or all terrain vehicles.</p>	<p>There are numerous potential consequences that may result from a flood. Property in the floodplain or other low-lying areas may be severely impacted or destroyed. County facilities in the floodplain have been identified. Critical infrastructure such as utilities, roadways, bridges, and Police/Fire/EMS stations may be damaged or destroyed in an event.</p>
Thunderstorms	<p>The public may face some minor consequences from a thunderstorm. Thunderstorms have the potential to injure and/or kill people, damage residences and businesses, and interrupt power service. These impacts are very minimal compared to hurricanes and floods. It is important for beach goers to leave the beach when a thunderstorm approaches. Boaters and golfers should seek shelter. Recovery from a thunderstorm event may take several days.</p>	<p>Responders may face some difficulties when responding to a thunderstorm event. Trees may be down, blocking critical roadways and access points. Power lines may also be down in roadways or on private property creating a dangerous situation. Localized flooding may make some roads impassible.</p>	<p>VCEMD does not anticipate any issues maintaining operations and the delivery of services following a thunderstorm. In a catastrophic event, VCEMD has a COOP Plan in place that could be activated and implemented at any time.</p>	<p>Consequences to property, facilities, and infrastructure from thunderstorms are minimal. Downed trees and power lines are typical consequences from thunderstorms. Roofs and windows of homes and businesses may be damaged. Power service to residences and critical facilities may be impacted in the short-term.</p>
Tornadoes	<p>All of the public in Volusia County is at risk to tornadoes. Tornadoes are a common occurrence in Volusia County. The public could face serious consequences from a touchdown, particularly mobile home residents. Tornadoes can be deadly. Common consequences are damage to homes and businesses, interruption of utility services, and devastation to the local economy.</p>	<p>Responders may face significant difficulties responding to a tornado touchdown. Search & rescue operations may be required. Communication systems may be destroyed. In an extreme event, road signs and landmarks may be missing when trying to navigate to citizens in need. Power lines, debris, and trees may block roadways and access points. Responders should exercise extreme caution.</p>	<p>VCEMD does not anticipate any issues maintaining operations and the delivery of services in the event of a tornado in the County. If there is a widespread tornado outbreak, or if the VCEOC is directly hit by a tornado, it may be necessary to move to the alternate EOC location or function from another location to maintain operations during the event. For more information, see the VCEMD COOP Plan.</p>	<p>All property in Volusia County is at risk to tornadoes. The consequences to property, facilities, and infrastructure from a tornado may be catastrophic. Depending on the scale of the tornado, damage could be minimal or cataclysmic. Historically, Volusia County's greatest magnitude tornado was an EF3. An EF3 can cause extensive damage, level well constructed homes and buildings, uproot trees, and throw heavy vehicles. Public infrastructure and utilities may be demolished.</p>
Wildfire	<p>The public will feel the direct consequences of a wildfire if their home or place of employment is in the wildfire impact zone. Homes and businesses may be destroyed in a fire, utility service could be interrupted, and access to roadways may be limited. The public may also be impacted by air pollution from the wildfires.</p>	<p>Responders will be directly impacted by a wildfire. Wildfires may change directions quickly as the wind and environmental elements change. Wildfires are often difficult to control and may take numerous resources to do so. Inhalation of smoke and fumes may pose a health risk to firefighters.</p>	<p>VCEMD does not anticipate any issues maintaining operations and the delivery of services during a wildfire. In an event that directly impacts the VCEOC, VCEMD has a COOP Plan in place that could be activated and implemented at any time.</p>	<p>Property, facilities, and infrastructure in the wildfire zone may be significantly impacted. Homes and businesses may be destroyed in a fire, utility service could be interrupted, and access to roadways may be limited.</p>
Drought/Extreme Heat	<p>Consequences of drought and extreme heat on the public are not always direct. Agriculture will be the most directly impacted by drought. The public's food supply may be impacted. If water restrictions are implemented by government, residential lawns and gardens will be impacted.</p>	<p>Responders will not be impacted by drought. In extreme heat, caution should be exercised for first responders. Responders must be sure to maintain adequate hydration.</p>	<p>Historically VCEMD has not had any issues continuing operations and delivering services during droughts or extreme heat events.</p>	<p>Homes, businesses, critical facilities and infrastructure should not be significantly impacted by drought and extreme heat. In some drought situations, river flows may be reduced and impact hydrologic processes such as irrigation capacities, and tourism related businesses (lakes, golf courses, etc). The St Johns River Water Management District may prohibit lawn irrigation, which may impact residences and golf courses. Wells may fall to dangerously low levels.</p>
Hail	<p>Consequences of hail on the public include possible injuries and, in extremely rare cases, death. Hail may indirectly cause public injury if it results in automobile accidents. Because hail is a product of thunderstorms, see "Thunderstorms" for more consequences to the public.</p>	<p>Consequences of hail on responders is minimal. Hail is typically a very brief event due to physics of the atmospheric conditions in Volusia County that are required to make hail. Responders should remain inside during hail storms. Because hail is associated with thunderstorms, see "Thunderstorms" for more information.</p>	<p>VCEMD will not have any issues continuing operations and delivering services during hail events. See "Thunderstorms" for more information.</p>	<p>Hail has the potential to damage property, facilities, and infrastructure. Large hail can puncture roof tops, windshields, vehicles, windows, and other outdoor structures. Because hail is associated with thunderstorms, see "Thunderstorms" for more information.</p>

CONSEQUENCES (4.3.2) (con't)	 The Public	Responders	Continuity of Operations & Delivery of Services	Property, Facilities & Infrastructure
HAZARD /HIRA				
Natural				
Severe Winter Storms	Consequences to the public from winter weather include cold temperatures and the potential loss of power. The major impact of severe winter storms in Volusia County is on the homeless population. Shelters may need to be opened during severe winter storms.	Responders will not be adversely impacted from a severe winter storm, as the duration is limited in Volusia County.	Program operations will continue during a winter weather event. If there is a power outage, VCEMD has redundant power, IT, and communication systems in place to maintain operations. VCEMD will continue to coordinate the statewide response throughout the entire winter weather event.	The greatest potential impact of cold weather is on the County's agricultural industry. Orange groves may freeze. The fern industry could be seriously impacted. This could result in lost jobs, most of which are held by migrant workers.
Lightning	Consequences of lightning on the public include possible injuries and, some cases, death. Lightning may strike homes and businesses, potentially sparking a fire or damaging electrical systems. Because lightning is a product of thunderstorms, see "Thunderstorms" for more consequences to the public.	Consequences of lightning on responders are minimal. Lightning may spark building and housing fires, requiring immediate response. When possible, responders should remain inside if there is lightning. Because lightning is associated with thunderstorms, see "Severe Thunderstorms" for more information.	VCEMD will not have any issues continuing operations and delivering services during lightning events. In the event of a lightning strike to the building, VCEMD has a backup power generator, redundant communication systems, and has a IT failover system in place. See "Severe Thunderstorms" for more information.	Lightning has the potential to damage property, facilities, and infrastructure. Lightning can spark fires and destroy electrical systems. From 1996 - 2013, NOAA's Climatic Data Center reports there has been 1 fatality, 20 injuries, and \$1.37 million in property damage caused by lightning in Volusia County. Because lightning is associated with thunderstorms, see "Severe Thunderstorms" for additional information.
Storm Surge	Consequences of storm surge on the public could be devastating. During storm surge, sea water inundates low lying areas of coastal regions drowning human beings and live-stock, erodes beaches and embankments, destroys vegetation and reduces soil fertility.	Consequences of storm surge on responders would be similar to those encountered during a major hurricane.	If there were a major storm surge event, routine program operations may be impacted to a similar extent as during a major hurricane.	Storm surge has the same potential impact on property, facilities, and infrastructure as do major hurricanes.
Coastal Erosion	The public faces numerous consequences to coastal erosion. Coastal erosion plagues many of the public beaches in Volusia County. In addition to the loss of public beaches, private property and homes could be destroyed. Homes could into the ocean in some rare instances.	Responders will not be impacted by coastal erosion.	VCEMD will not have any issues continuing operations and delivering services due to coastal erosion.	Properties, facilities, and infrastructure along the coastline may be impacted by coastal erosion. Coastal erosion can cause homes to fall into the ocean. Critical utilities and roadways may be impacted if the beaches erode and water is able to inundate their systems. Tax revenue may be impacted.
Tsunami	Consequences of a tsunami on people would be similar to those of a major storm surge event.	Consequences of a tsunami on responders would be similar to a major storm surge event.	The impact of a tsunami on program operations would be similar to a major storm surge event.	The impact of a tsunami on property, facilities, and infrastructure would be similar to that experienced during a major storm surge event.
Sinkhole	Consequences of a sinkhole on people would be minimal. Should a major sinkhole form on or near a major roadway, it's possible cars may drive into it before responders arrive.	Consequences of a sinkhole on responders would be minimal.	There would be no impact on program operations from a sinkhole.	The impact of a sinkhole on property, facilities, and infrastructure would be minimal. The most expensive sinkhole event was the sinkhole that opened on Howland Blvd in Deltona. Approximately 1 million cubic yards of dirt was needed.
Sea Level Rise	Consequences from sea level rise to the public include loss of residential property value, loss of businesses, and a loss of community assets such as beaches and other water-adjacent public parks. Sea level rise is not a threat to life on its own. It can, however, increase the storm surge associated with hurricanes over the long term.	Responders would likely not be impacted by sea level rise. Structure deterioration could put life at risk, however this issue would likely be solved (or the property would be vacated) years before occupants were put at risk.	There would be no impact on continuity of operations over the long term. Strategies such as facility relocation can ensure continuity within the County.	Property values can be completely lost over the long term with rising seas. Critical facilities within the high risk sea level rise zones should be relocated or public services could be interrupted. Infrastructure at risk includes stormwater pipes, outfalls, lift stations, pump stations and electrical stations. Stormwater infrastructure in particular is vulnerable to saltwater intrusion, which can erode pipes.
Public Health Emergencies	Consequences to the public from public health emergencies (influenza, plague, food contamination, etc) are vast. The public may experience temporary illness, long-term illness, or even death. Hospitals and doctor's offices may become crowded, patients may experience long lines, and pharmaceuticals may be limited. In 2009, the H1N1 pandemic swept the U.S. Vaccinations, medications, and education materials were provided to the public to minimize the impacts of the flu. (CDC H1N1 Flu)	Responders may also feel the consequences of public health emergencies. They may be exposed to the risk and become ill. Responders may have to wear protective gear and receive vaccinations to mitigate their risk. For more information on a Public Health Emergency Response, refer to the VCHD pandemic flu annex.	In an extreme event, such as a widespread public health emergency, there may be an instance when the VCEOC is impacted. If the VCEOC becomes contaminated, it may be necessary to move to our alternate EOC location or function from another location to maintain operations during the event. For more information, see the VCEM COOP Plan.	It is unlikely that the consequences of a public health emergency would impact property, facilities, or infrastructure.

CONSEQUENCES (4.3.2) (con't)	 The Public	Responders	Continuity of Operations & Delivery of services	Property, facilities & Infrastructure
HAZARD /HIRA				
Human-Caused or Technological				
Terrorist Attack	The public is at risk to a terrorist attack. NASCAR events typically have over 100,000 spectators. Bikeweek/Biketoberfest draw 500,000 participants. We have 5 colleges and universities, and most have stadiums. Shopping malls are plentiful. The consequences of a terrorist attack may be serious injury, death, and psychological impairment.	Responders are at risk to a terrorist attack. It's possible responders could be injured or killed attempting to rescue survivors from buildings. Secondary devices are always a concern.	Continuity of operations would not be seriously impacted by a terrorist event. The CEOC is a secure, hardened facility. If there were a direct attack on the CEOC, it would be limited to the lobby area. In such a case, it may be necessary to move to our alternate EOC for a short period.	Property, facilities, and infrastructure are all at risk to a terrorist attack. Since 9/11, the County and its municipalities, as well as colleges and universities, have taken tremendous effort to increase security and educate the public about terrorist attacks.
Cyber Attack	The impact on the public from a cyber attack could be substantial in a worst-case scenario. If the grid were to be taken out, an extended period of power outage would cause food to spoil. Medication that requires refrigeration could be lost. People dependent on ventilators and oxygen concentrators could be impacted.	Responders would not be impacted by a cyber attack.	Continuity of operations would not be seriously impacted by a cyber attack. Information contained on the County web site would be unavailable.	The impact of a cyber attack on property, facilities, and infrastructure would be minimal.
Civil Disturbance	The impact on the public from a civil disturbance would be limited to those taking part in the civil disturbance and those in the vicinity of the event.	Responders may be impacted by a civil disturbance. It's possible that responders could be injured or killed by those instigating the civil disturbance. Responders must exercise extreme caution when dealing with a civil disturbance.	Continuity of operations would not be seriously impacted by a civil disturbance. The VCEOC is a secure facility. In extreme events, mutual aid would be requested from adjacent counties.	The impact of a civil disturbance on property, facilities, and infrastructure could be substantial. Homes and businesses could be burned. Facilities could be damaged. Streets may be blocked.
Mass Migration	The impact on the public from a mass migration event would be minimal.	The impact on responders to a mass migration event would be limited to those responders managing the mass migration population.	Continuity of operations would not be seriously impacted by a mass migration event. In a large event, mutual aid would be requested from adjacent counties.	The impact of a mass migration event on property, facilities, and infrastructure would be minimal.
Coastal Oil Spill	The impact of a coastal oil spill on the public would be minimal. Persons with pre-existing breathing issues may be impacted by fumes. Volusia County Environmental Management and the VCHD will monitor air quality.	Responders may be impacted by a coastal oil spill. Appropriate PPE will have to be worn at all times to prevent contamination.	Continuity of operations would not be impacted by a coastal oil spill.	It is unlikely that a coastal oil spill will have an impact of property, facilities, or infrastructure. Oil may contaminate docks and boats if were to enter through Ponce de Leon Inlet.
Agroterrorism	The public may be adversely impacted by an agroterrorism event. If food or agriculture is infected with a disease causing organism, it may make its way into the food chain. The effects could impact hundreds or thousands of citizens.	Responders may be impacted by an agroterrorism event if they are exposed to food or agricultural products infected with a disease causing organism.	Continuity of operations would likely not be impacted by an agroterrorism event.	It is unlikely that an agroterrorism event would have an impact on property, facilities, or infrastructure.
HAZMAT (fixed, mobile and terrorism)	The public will be immediately impacted by the consequences of a Hazardous Materials (HAZMAT) release/spill/explosion. HAZMAT can come from fixed or mobile sources, or can be intentionally used for harm in a terrorist act. Citizens may be impacted on roadways, at school, in their homes, through their food supply, or in public venues (large stadiums, athletic events, movie theaters, etc). The consequences of hazardous materials may be illness, injury, or death. In a major event (such as a radiological release, explosion, or chlorine spill), citizens may be displaced from their homes until the site is cleaned.	Responders face the immediate consequences of HAZMAT incidents. They must determine the type of material released/spilled, and decide on the appropriate response and cleanup of the material. The County has a variety of response teams to include HAZMAT, RMAT (radiological material), and EOC (bomb squad). These responders are specially trained to deal with these incidences and they are provided protective gear to reduce their vulnerability to the hazardous materials.	In the event of a HAZMAT release/spill or Terrorist act, there may be an instance when the VCEOC is impacted. If the VCEOC is damaged or the delivery of services is interrupted, it may be necessary to move to our alternate EOC location or function from another location to maintain operations during the event. For more information, see the VCEMD COOP Plan.	Property, facilities, and infrastructure will be significantly impacted by a HAZMAT incident. Especially in the event of an explosion, homes, businesses, industries, and infrastructure may be damaged or destroyed. In addition, most mobile hazmat releases are caused by traffic accidents, which can destroy vehicles, roadways, and signage.
Citations:				
CDC H1N1 Flu	http://www.cdc.gov/h1n1flu/			
VCHD Public Health Preparedness	http://www.floridahealth.gov/chd/Volusia/HurricaneInformation.html			
CSIRO impacts of an oil spill	http://www.csiro.au/Outcomes/Oceans/Hot-ocean-topics-index/Environmental-impact-of-oil-spills.aspx			
U.S. States & Territories National Tsunami Hazard Assessment: Review and Update	http://nthmp.tsunami.gov/2012tsuhazworkshop/abstracts/Dunbar-Weaver_abs.pdf			

CONSEQUENCES (4.3.2) (con't)	 Environment	Economic condition of the Jurisdiction	Public Confidence in governance
HAZARD/HIRA			
Natural			
Hurricanes/Tropical Storms	Consequences to the environment include erosion of critical dunes, impacts to sensitive coastal ecosystems, downed trees and vegetation, and polluted waterways from the runoff of debris and hazardous materials. VC Environmental Management and the VCHD will take the lead on the monitoring and cleanup of any adverse environmental impacts.	Hurricanes and tropical storms have impacted Volusia County in the hundreds of millions of dollars. The 2004 hurricanes were the largest, most costly disaster. The economic impact to affected jurisdictions has been significant. In any hurricane event, the impact to tourism is millions of dollars a day. It may take several years to recoup the economic costs of a single hurricane event.	Maintaining public confidence in emergency management and County Government is vital. To ensure the public is prepared for a hurricane, VCEMD has completed the following: 1) Video Disaster Preparedness Guide available on the website, 2) Surveys capturing behavioral patterns are conducted after every hurricane evacuation out to gauge the level of preparedness and evacuation compliance, 3) Numerous public presentations, 4) VCEMD prepares for hurricane season with a countywide media campaign through VC Community Information and the Daytona Beach News Journal 5) In the event of a hurricane, the PIO section has premade materials for use in VCEMD's comprehensive social media program; 6) Throughout the year VCEM provides preparedness information via the County's weekly video magazine broadcast on WDSC. All of these programs are in place to instill public confidence in government, even in times of a disaster. For more information, see the ECFRPC Behavioral Analysis documenting evacuation order compliance.
Floods	Environmental consequences to flooding are vast. Flooding may erode river beds, causing sediments to enter the waterways, clogging our water management systems & waterways downstream. Floods can bring hazardous materials or pollution into waterways via runoff. Riparian ecosystems are negatively impacted with the introduction of sediments, pollutants & nutrients. VCHD and VC Environmental Management will monitor the waterways and riparian areas for any adverse impacts.	From 1994 - 2009 there were 11 major flood events in Volusia County causing over \$100,000,000 in damages. (Table 5.14) As of 2010, repetitive losses in the County total almost \$36,000,000 (Table 5.15). The impact of flooding on transportation, agriculture, business continuity, and government services is substantial. Mitigation practices can reduce the impact of flooding on our economy. It is also important that citizens and businesses purchase flood insurance so they can be operational in a short amount of time.	Education, mitigation activities, and awareness are key components to maintaining public confidence in government during a disaster. In conjunction with FEMA, NOAA, USACE, FDEM, and the Florida Department of Insurance, the County provides information on floods and flood insurance to the public. During the NFIP mapping process, citizens were invited to participate and learn about flood risks. VCEMD has distributed over 5,000 NOAA weather radios to mobile home residents to alert them of flood events. VCEMD has premade media products for their social media campaign if there is an event. Additionally, VCEMD has managed 38 Flood Mitigation Assistance grant projects, mitigating homes against future flood losses. This serves to build public confidence in governance.
Thunderstorms	Thunderstorms in Volusia County have historically had few consequences to the environment. In some cases, these storms can down trees and vegetation and cause localized flooding. Please see the "Floods" above. No major consequences to the environment are expected.	Consequences to the economic condition of the County will be minimal. The County has numerous thunderstorms throughout the year. The annual cost of damage to property and infrastructure is minimal.	Public confidence in government will not be impacted by severe Thunderstorm Events. In the case of a catastrophic storm, VCEMD has premade media products for distribution on our webpage and on our social media outlets (@VCEMDemergencyinfo). NOAA weather radios will also send out important information to citizens so they can educate themselves and find resources after the event.
Tornadoes	Because of the vast range of wind speeds associated with tornadoes, consequences to the environment vary greatly. Even an EF0 (65-85mph) can uproot trees and vegetation. In stronger tornadoes, debris will be tossed miles away from the source, potentially entering our waterways. Hazardous materials may escape if vehicles are damaged or storage tanks are compromised. VC Environmental Management and VCHD would monitor the environment for adverse impacts.	Tornadoes are typically a local disaster. The County's economy may only be minimally impacted by a tornado event. If a large outbreak occurred, there could be a greater economic effect. If a small community was hit by a severe tornado, the entire community & local economy could be devastated. Local assistance through the County COAD, especially the American Red Cross, would be utilized.	Public confidence in government will not likely be impacted by a tornado event. If there is a countywide tornado outbreak, VCEMD has premade media products for distribution on our webpage and on our social media outlets (@VCEMDemergencyinfo). NOAA weather radios will also send out important information to citizens so they can educate themselves and find resources after the event. Some local communities have tornado sirens and community safe rooms to protect their citizens.
Wildfire	Although wildfires are a natural process, the environment may be negatively impacted. Not only are trees impacted by these fires, so are the native species of plants and animals. The smoke and ash from the fires can pollute waterways and our air. The VC Fire Services and VCHD will monitor the air and water quality in an event.	Wildfires are typically a local disaster and the County's economy should not be impacted to a large extent. If a large fire does occur and cannot be controlled quickly, there could be a greater economic effect. The Coke Zero race was postponed one year due to smoke from wildfires. If a small community was hit by a wildfire, the local economy could be devastated. Local assistance through the County COAD, especially the American Red Cross, would be utilized.	Public confidence in government will likely not be impacted by a wildfire event. If a large wildfire occurs that cannot be quickly controlled, VCEMD has premade media products for distribution and through social media outlets (@VCEMDemergencyinfo). NOAA weather radios will also send out important information to citizens so they can educate themselves and find resources after the event. In 1998, 29,000 homes were at risk from the wildfires. Only 6 homes, 1 mobile home, and 2 businesses were lost. This success serves to bolster public confidence in governance. (5.14.3)
Drought/ Extreme Heat	Environmental consequences of drought & extreme heat are significant. Drought reduces the availability of water, reduces crop yields, & impacts our local ecosystems. Droughts may result in an increase in wildfires. For instance, the 1998 drought contributed directly to the wildfires that burned over 163,000 acres. (Section V)	Drought has the potential to significantly impact the County's economy. The annual economic impact of Volusia County's agriculture and natural resources industries is \$781 million. An extended period of drought could seriously impact this.	Public confidence in government will likely not be impacted by a drought or extreme heat event. Droughts are common in Florida and Volusia County. Insurance and assistance programs are widely available to farmers.
Hail	There are no known direct consequences on the environment from Hail. See "Thunderstorms" for more information.	Consequences to the economic condition of the County will be minimal to non-existent, as hail is a fairly uncommon event. The County has very few hail events each year. The annual cost in damages is minimal. Most of the damages from hail are covered under homeowners insurance and auto insurance & therefore do not impact local economy.	Public confidence in government will not be impacted by a hail event. See "Thunderstorms" for more information.
Sea Level Rise	Consequences to the environment include loss of beaches, dune systems, riverbank ecosystems and other ecosystems near the shoreline.	Economic consequences include loss of property value and loss of business income. Mitigation in the short term can greatly reduce long term economic risk to sea level rise.	Public confidence in government would be affected in two ways; 1) Via inaction on sea level rise issues, leading to losses in property value and critical environmental assets, or 2) Too much action on sea level rise in the short term, leading to over-investment.

CONSEQUENCES (4.3.2) Part 2	 Environment	 Economic condition of the Jurisdiction	 Public Confidence in Governance
HAZARD/ THIRA			
<i>Natural</i>			
Severe Winter Storms	Consequences to the environment from winter weather are minimal. Non-native plant species may be impacted.	The economic condition of the County may be impacted by an extended cold spell. The fern industry would be impacted the most.	Public confidence in government will likely not be impacted by a winter weather event. Winter weather is not a common occurrence in Volusia County.
Lightning	Consequences to the environment from lightning are minimal. The greatest impact is lightning-generated fires. In the case of a fire, see "Wildfires" for more information. Also see "Severe Thunderstorms" since lightning is associated with this hazard type.	Consequences to the economic condition of the County will be minimal to non-existent. Most of the damage resulting from lightning strikes are covered under homeowners insurance, & therefore do not impact the local economy.	Public confidence in government will not be impacted by a lightning event. See "Thunderstorm" for more information.
Storm Surge	Consequences to the environment from storm surge could be devastating. Salt water intrusion into sensitive estuaries could destroy ecosystems. Salt water would intrude into the aquifer, our source for drinking water. Storm surge would spread sewage from septic systems.	Consequences to the economy from a storm surge event are potentially devastating. Homes and businesses would be destroyed. The property tax base would suffer. Tourism, a main driver of our economy, would be impacted.	Public confidence in government may be impacted depending on the speed of recovery. If the recovery process is perceived to going too slowly, public confidence in the government would be lessened. This is a real possibility considering that the public expects immediate response from the government. Public confidence in government suffered in the wake of hurricanes Katrina and Sandy.
Coastal Erosion	There are several consequences to the environment from coastal erosion. Coastal erosion by wind or water can deplete the coastal ecosystems. Protective dunes on the shore may be reduced or washed away in hurricanes and high surf. Eroded sands and soil can enter water and sewer systems, causing issues for the public and environment.	Coastal erosion is very costly and can burden local economies. Beach nourishment is extremely costly, approximately \$2.00/cubic yard.	Public confidence in government should not be impacted by coastal erosion. Rapidly eroding beaches remain a high priority for nourishment.
Tsunami	The consequences to the environment from a tsunami would be similar to that of storm surge.	The consequences to the economy would be similar to that of storm surge.	Public confidence in government may be impacted to a similar extent to that of storm surge.
Sinkhole	The most important current and future environmental issue with respect to sinkholes is the sensitivity of sinkhole aquifers to groundwater contamination. The effect of man on sinkholes is most severe in cases where polluted surface waters enter sinkhole aquifers.	There will not be a major impact to the economy due to a sinkhole event.	Public confidence in government should not be impacted by a sinkhole event.
Public Health Emergencies	Consequences to the environment from a public health emergency are unlikely. Unless the event is terrorism or HAZMAT related, there will be no direct impact. See HAZMAT below for more information.	The economic condition of the County may be impacted by a widespread public health emergency. If a significant percentage of the population becomes ill, they will not be able to go to work or spend money. The economy will be directly impacted by both of these factors. With vaccinations and early detection of pandemics and other public health issues, the impacts can be minimized.	Public confidence in governance may be minimally impacted by a public health emergency. In Volusia County, Environmental Management and the VCHD monitors air & water quality, tracks potential influenzas & other contagious viruses/bacteria, and provides education & outreach on health. VCHD advertises their public health preparedness capabilities online to show transparency to the public. VCHD also runs hospital preparedness programs and hosts healthcare coalitions & partnerships. In a widespread event, VCHD is prepared to meet the needs of the public. Therefore, public confidence in government should only be minimally impacted in a major event.

CONSEQUENCES (4.3.2) Part 2	 Environment	 Economic condition of the Jurisdiction	 Public Confidence in governance
HAZARD/HIRA			
Human-Caused or Technological			
Terrorism	<p>The environment could be impacted by a terrorist event, particularly if a dirty bomb were used. A large explosion at a facility could release large amounts of asbestos and other toxic materials that would be carried by the wind and possibly enter lakes and rivers.</p>	<p>In the event of a large terrorist attack, the economy would be negatively impacted. Tourism would certainly be impacted to a serious degree.</p>	<p>Public confidence in government would be impacted by a terrorist event. If there were a large event at a large gathering of people (the Speedway, for example) and there were numerous deaths and injuries, the public would perceive that government's ability to detect and prevent terrorist attacks was unsatisfactory. Even if there were a small event, the public would expect the government to have had advance information. A dedicated public affairs effort would be necessary to try to regain the public's confidence.</p>
Cyber Attack	<p>Consequences to the environment would not result from a cyber attack.</p>	<p>The economic condition of the County may be impacted by a cyber attack. Citizens may not be able to use computers to order goods and services or pay bills online. Online delivery of public services may be diminished.</p>	<p>Public confidence in government may be impacted by a cyber attack, particularly if major systems such as the electrical grid are impacted. The public may perceive that the government did not take sufficient steps to prevent the attack, and that recovery from the attack is taking too long.</p>
Civil Disturbance	<p>Minimal consequences to the environment may result from a civil disturbance in the form of smoke and hazardous fumes from fires.</p>	<p>The economic condition of the County may be impacted by a civil disturbance. If there were a large event, tourists may be hesitant to visit Volusia County due to the perception that it is not safe to do so. Homes, businesses, and critical facilities may be damaged and require expensive repairs. If large numbers of businesses were impacted, tax revenue would be impacted.</p>	<p>Public confidence in government may be impacted by a civil disturbance. If the government is unable or takes too long to bring the civil disturbance under control, the public may perceive that government is not able to deal with this type of event.</p>
Mass Migration	<p>There would be no consequences to the environment from a mass migration event.</p>	<p>The economic condition of the County should not be impacted by a mass migration event.</p>	<p>Public confidence in government may be impacted by a mass migration. If the government is unable or takes too long to manage the event by efficiently organizing processing, screening, and housing the migrants, the public may perceive that government is not capable of dealing with a mass migration event.</p>
Coastal Oil Spill	<p>There would be serious consequences to the environment from a coastal oil spill. Sensitive ecosystems would be damaged. Turtle nesting sites may be destroyed. The sand would be contaminated.</p>	<p>The economic condition of the County would be seriously impacted by a coastal oil spill event. During the Deep Water Horizon oil spill, tourism in Volusia County suffered as people thought all of Florida was impacted. All of our charter fishing industry would be devastated. If a coastal oil spill were to occur here, tourism would cease. Businesses located on the peninsula may have to permanently shut down. Tax revenue would be severely impacted.</p>	<p>Public confidence in government would be impacted by a coastal oil spill event. Clean-up and environmental restoration is likely to take months or years to accomplish. The public would get frustrated with the pace of the recovery. Volusia County PIO would be constantly reassuring the public that government, in cooperation with private industry, was doing everything it could to recover from the spill.</p>
Agroterrorism	<p>There may be serious consequences to the environment from an agroterrorism event. If a disease causing agent were introduced into the agricultural areas of the County, millions of dollars in damage could result.</p>	<p>The economic condition of the County would be seriously impacted by an agroterrorism event. Agriculture is a \$781 million a year business in Volusia County.</p>	<p>Public confidence in government may be impacted by an agroterrorism event. If the event spread throughout the County and impacted multiple farms, the public may perceive that government is not able to manage an agroterrorism event.</p>

<p>HAZMAT (fixed, mobile and terrorism)</p>	<p>The environment is likely to experience significant consequences from a HAZMAT incident. Sensitive ecosystems could be destroyed or significantly disturbed. Hazardous materials can be quickly spread through water, air, or the food supply. Once HAZMAT are in our environmental systems, it may take days, weeks, months, or years to clean-up.</p>	<p>Depending on the size of the incident, the County's economy could experience enormous consequences. As reported by the Huffington Post, the BP oil spill in 2011 has cost approximately \$40 billion to clean up. This would be a worst-case scenario. More common incidents such as HAZMAT spills on highways or releases at chemical facilities impact the economy if an industry or transportation routes are shut down.</p>	<p>Public confidence in governance may be impacted by a HAZMAT incident. In small, localized events, VCEMD does not believe there would be any impact on public confidence. These events happen on a regular basis. In a major chemical release, radiological release, or terrorist incident, citizens may be inclined to lose confidence in governance. In these instances, VCEMD is prepared to draft and issue media products for distribution on our webpage (www.volusia.org/emergency) or on our social media outlets (@vcemergencyinfo).</p>
<p>Citations:</p>			
<p>Volusia County Agriculture</p>	<p>http://www.volusia.org/services/community-services/extension/agriculture/</p>		
<p>FL Department of Agriculture</p>	<p>http://www.freshfromflorida.com/Divisions-Offices/Marketing-and-Development/Education/For-the-Community/Video-and-Audio/Livestock-and-Animals/Video-Script-SART-State-Agricultural-Response</p>		
<p>FL Drought Status</p>	<p>http://www.plantmaps.com/interactive-florida-drought-conditions-map.php</p>		
<p>Beach Nourishment Study</p>	<p>http://coastal.tamug.edu/AM/ComparisonofBeachNourishmentalongtheU.S.Atlantic,GreatLakes,GulfofMexico,andNewEnglandShorelines/Index.html</p>		
	<p>http://response.restoration.noaa.gov/oil-and-chemical-spills/oil-spills/how-oil-harms-animals-and-plants-marine-environments.html</p>		

RESOLUTION 2020- 59
RESOLUTION OF THE COUNTY COUNCIL OF VOLUSIA
COUNTY, FLORIDA, RELATING TO THE VOLUSIA COUNTY
LOCAL MITIGATION STRATEGY; PROVIDING AN
EFFECTIVE DATE.

WHEREAS, Volusia County is vulnerable to the human and economic costs of natural, technological and societal disasters, and

WHEREAS, the Volusia County Council recognizes the importance of reducing or eliminating those vulnerabilities for the overall good and welfare of the community, and

WHEREAS, Volusia County has been an active participant in Volusia Prepares, the Local Mitigation Strategy working group, which has established a comprehensive, coordinated planning process involving the county and its municipalities, as well as other public, private and non-profit sector organizations, to eliminate or decrease these vulnerabilities, and

WHEREAS, Volusia County's representatives and staff have identified, justified and prioritized a number of proposed projects and programs needed to mitigate the vulnerabilities of unincorporated areas of Volusia County to the impacts of future disasters, and

WHEREAS, Volusia County's representatives and staff have reviewed the information provided by or for other participating jurisdictions and organizations, including the projects and programs they have proposed for incorporation into the Volusia County Local Mitigation Strategy, and

WHEREAS, these proposed projects and programs have been incorporated into the current edition of the Volusia County Local Mitigation Strategy that has been prepared and issued for consideration and implementation by the communities and jurisdictions of Volusia County.

NOW, THEREFORE, BE IT RESOLVED, BY THE COUNTY COUNCIL OF THE COUNTY OF VOLUSIA, FLORIDA, IN OPEN MEETING DULY ASSEMBLED IN THE THOMAS C. KELLY ADMINISTRATION CENTER, DELAND, FLORIDA THE 19th DAY OF MAY, A.D. 2020, AS FOLLOWS:

SECTION I: The Volusia County Council hereby accepts and approves its designated portion of the Volusia County Local Mitigation Strategy.

SECTION II: The Volusia County Council accepts and endorses the mitigation goals

and objectives established by Volusia Prepares for the countywide strategy, and the anticipated schedule for the next updating of the strategy.

SECTION III: The Volusia County Council finds that the proposed mitigation projects and programs included in the plan by other jurisdictions and organizations are acceptable, that they will not adversely affect the county or its neighborhoods, and that they do not conflict with nor duplicate the mitigation proposals made by the county itself.

SECTION IV: Volusia County personnel are requested and instructed to pursue available funding opportunities for implementation of the proposals designated therein.

SECTION V: All the government and non-profit agencies and organizations within Volusia County are encouraged, upon receipt of funding or other necessary resources, to implement the jurisdiction's proposals contained in the strategy.

SECTION VI: The Volusia County Council will continue to participate in the updating and expansion of the Volusia County Local Mitigation Strategy in the years ahead.

SECTION VII: The Volusia County Council will further seek to encourage the businesses, industries and community groups operating within Volusia County to also participate in the updating and expansion of the Volusia County Local Mitigation Strategy in the years ahead.

SECTION VIII: This Resolution shall become effective immediately upon its adoption.

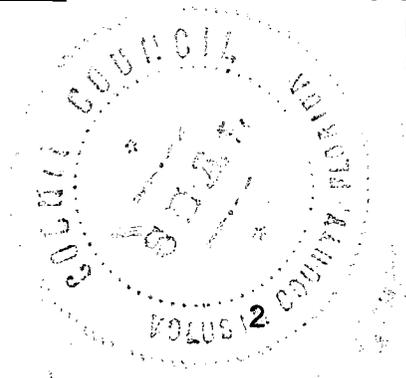
DONE AND ORDERED IN OPEN MEETING.

ATTEST:

By: 
George Recktenwald
County Manager

COUNTY COUNCIL
VOLUSIA COUNTY, FLORIDA:

By: 
Ed Kelley
County Chair





STATE OF FLORIDA

DIVISION OF EMERGENCY MANAGEMENT

Ron DeSantis
Governor

Jared Moskowitz
Director

August 21, 2020

James Judge II, Director
Volusia County Emergency Management
3825 Tiger Bay Road,
Daytona Beach, Florida 32124

Re: Local Hazard Mitigation Plan Approval Notification

Dear Director Judge,

Congratulations! The enclosed letter constitutes the Federal Emergency Management Agency's (FEMA) formal approval of the Volusia County Local Mitigation Strategy (LMS) plan for the following participating jurisdictions:

Volusia County, Unincorporated
City of Daytona Beach Shores
City of DeBary
City of DeLand
City of Holly Hill
City of Lake Helen

City of New Smyrna Beach
City of Orange City
City of Ormond Beach
Town of Ponce Inlet
City of Port Orange

The plan has been approved for a period of five (5) years and will expire again on July 30, 2025.

The Mitigation Planning Unit would like to thank you for all of your hard work. It has been a pleasure working with you and we look forward to serving you in the future. If you have any questions regarding this matter, please contact your LMS Liaison Kristin Buckingham at Kristin.Buckingham@em.myflorida.com or 850-815-4519.

Respectfully,

Miles E. Anderson,
Bureau Chief, Mitigation
State Hazard Mitigation Officer

MEA/kb

Attachments: 08/12/20 FEMA Approval Letter for Volusia County (plus 10 jurisdictions)