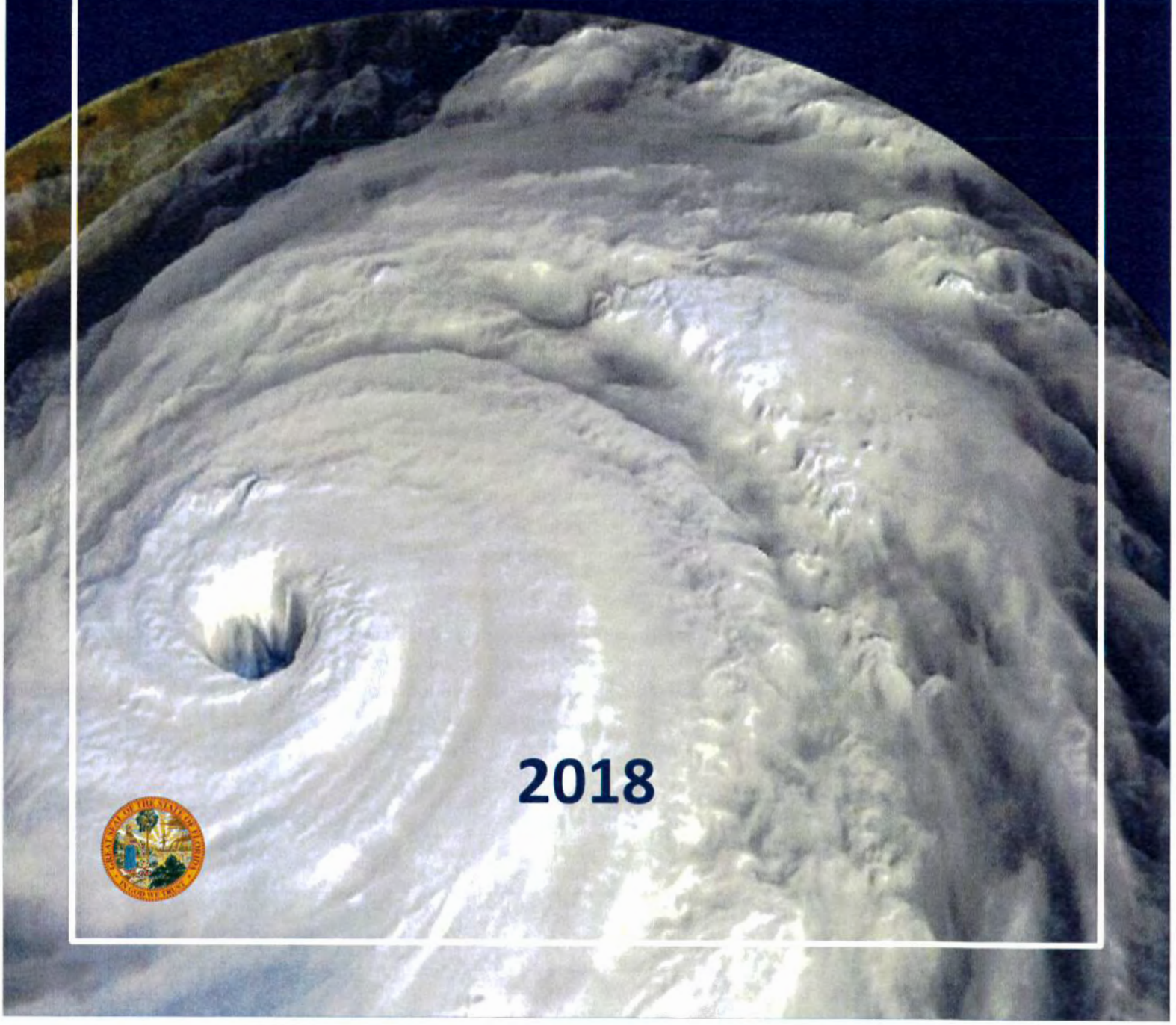
ENHANCED

STATE HAZARD MITIGATION PLAN

STATE OF FLORIDA



2018

EXECUTIVE SUMMARY

Introduction

Under Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act) enacted under the Disaster Mitigation Act of 2000 (DMA2K), the State of Florida is required to have a Federal Emergency Management Agency (FEMA)-approved hazard mitigation plan in order to be eligible for federal hazard mitigation funding. The purpose of the State Hazard Mitigation Plan (SHMP) is to reduce death, injuries, and property losses caused by natural hazards in Florida. The 2018 Plan identifies hazards based on the history of disasters within the state and lists goals, objectives, strategies, and actions for reducing future losses. Implementation of planned, pre-identified, and cost-effective mitigation measures not only helps to reduce losses to lives, property, and the environment but it also streamlines the disaster recovery process. Hazard mitigation is most effective when based on an inclusive, comprehensive, long-term plan that is developed before a disaster occurs.

The SHMP serves several purposes; including providing an explanation of the Florida Division of Emergency Management (FDEM) Mitigation Bureau and the strategies the State uses to implement an effective comprehensive statewide hazard mitigation plan. Plans are coordinated through appropriate state, local, and regional agencies, as well as non-governmental interest groups. This 2018 Plan, and its future revisions, will provide guidance in merging the planning efforts of all state agencies, local governments, the private sector, and non-profit organizations into one viable, comprehensive, and statewide mitigation program.

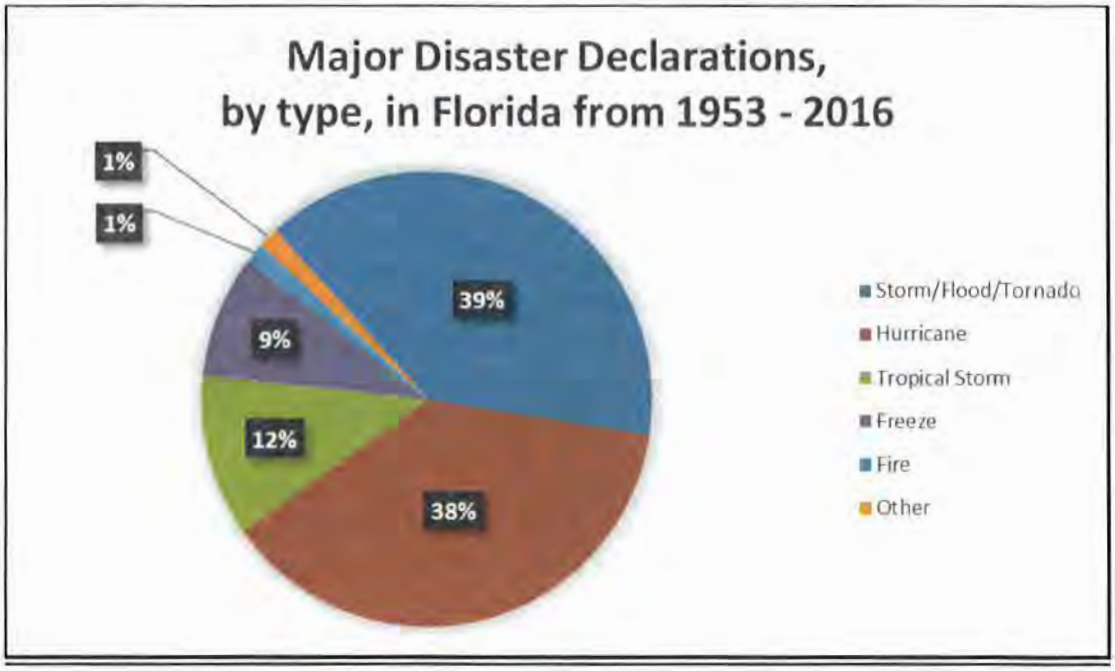
The scope of the SHMP is broad. The plan explains the way in which the Mitigation Bureau administers the Mitigation programs within the state, both within the Mitigation Bureau, and externally with other state and local agencies. Additionally, as required by statute, the Risk Assessment portion of the SHMP identifies natural hazards, as well as technological and human-caused hazards. The Risk Assessment portion analyzes vulnerability of the State in terms of jurisdictions (counties), and in terms of state agency facilities across Florida.

The 2018 SHMP demonstrates that:

- The State has developed a comprehensive mitigation program.
- The State effectively uses available mitigation funding.
- The State is capable of managing all funding, including that which results from achieving enhanced status.

Florida is vulnerable to both natural hazards and technological and human-caused hazards. The most common hazards to Florida are wildfires and floods; however, hurricanes have historically inflicted catastrophic destruction. Florida has had 69 Major Disaster Declarations from 1953 when these federal declarations began, through 2016. Below is a chart demonstrating the types of disasters that have received a Major Disaster Declaration, by type, from 1953 until 2016.

Figure 1 – Major Disaster Declarations, by type, in Florida from 1953 – 2016



Florida first received Hazard Mitigation Grant Program (HMGP) funding in 1993. Florida has received a total of $867,038,534 in HMGP funding from 1998 to 2016.[1] From 1998 until 2005, Florida received 15% of the 90-day Recovery cost estimates after federally declared disasters. In 2007, Florida began to receive 20% of the 90-day Recovery cost estimates because of the Enhanced status of the SHMP. Florida strives to maintain the Enhanced status to continue receiving the extra 5% in HMGP funding because the state recognizes the significant value to mitigation within the state. The additional 5% for HMGP funding from 2007 to 2016 has resulted in an extra $52,863,689 in HMGP funding.

Planning Process and Maintenance

In accordance with 44 CFR 201.4, Florida originally developed the SHMP and it was approved by FEMA in 2004. The plan was continually updated in 2007, 2010, and 2013. In 2014, FEMA extended the update cycle from three years to five years so the 2013 plan that was valid until 2016 was extended until 2018. The updates for 2018 began in mid-2016.

The Mitigation Planning Unit has been responsible for updating the SHMP in the past. Additionally, the Mitigation Planning Unit coordinated the SHMPAT group, which assisted with updating and approving the plan. The SHMPAT group was formed several years ago and included state partners. Each update cycle, new members have been engaged and added, including federal, local, non-profit, and private sector partners.

The 2018 SHMP update began in mid-2016 when the Mitigation Planning Unit conducted an in-depth review of the 2013 SHMP and the 2016 FEMA State Mitigation Plan Review Guide. When the plan update

[1] Records of HMGP funding from 1993 – 1997 were unavailable.

began, the SHMPAT was used as it had been in the past, as a resource for the Mitigation Planning Unit to assist with and approve updates and changes.

In 2017, Chapter 252.3655 went into effect, which mandates an interagency workgroup to share information on the current and potential impacts of natural hazards throughout the state, coordinating the ongoing efforts of state agencies in addressing the impacts of natural hazards, and collaborating on statewide initiatives to address the impacts of natural hazards. More information about this workgroup can be found in the *Planning Process and Plan Maintenance Section.*

After the creation of the group discussed above, the Mitigation Bureau decided to combine it with two other similar statewide mitigation groups: the SHMPAT and the Florida Silver Jackets team. The new group was named Mitigate FL. Therefore, one purpose of the Mitigate FL group is to bring together a cross-section of representatives from various sectors to assist the Mitigation Planning Unit with evaluating, revising, and otherwise maintaining the State's Enhanced Hazard Mitigation Plan. This group includes members from state agencies, local governments, regional planning councils, universities, non-profit organizations, FEMA, and other federal agencies. As these members work together, they gain and share valuable insight into how the plan may be integrated into their respective hazard mitigation planning processes. As they return to their communities or organizations, they bring with them plan knowledge and tools to update their own plans.

After the 2018 Enhanced SHMP underwent final revisions, and the plan was completed to the satisfaction of the State Hazard Mitigation Office (SHMO), the FDEM Mitigation Bureau, and the Mitigate FL group, the plan was officially adopted by the State of Florida via a memorandum signed by the Director of FDEM as the Governor's Authorized Representative. After adoption, the plan was submitted to FEMA for approval. The 2018 Enhanced SHMP update was submitted on 02/23/2018 and approved on 06/11/2018. The plan will be in effect from August 24, 2018 until August 23, 2023.

Risk Assessment

The risk assessment for the State of Florida Enhanced Hazard Mitigation Plan (SHMP) provides the factual basis for developing a mitigation strategy for the state. This section profiles the natural, human-caused, and technological hazards that could possibly affect the state. This risk assessment is used not only for the SHMP, but also is the basis for the Florida Comprehensive Emergency Management Plan (CEMP). Each natural hazard profile includes a discussion of the geographic areas affected, the historical occurrences in the state, an impact analysis, the probability, and the vulnerability and loss estimation by county and of state facilities, and a discussion of overall vulnerability. Alternatively, the human-caused and technological hazards include similar topics of discussion, but not all aspects are able to be quantified. This is because of the limited data available and the imprecise nature of the human-caused and technological hazards.

The risk assessment identifies 21 hazards based on an analysis of federal risk assessment guidance, analysis of the 67 Florida county LMS plans, examination of past disasters, and other research. The 21 hazards include:

- Flood
- Tropical Cyclones

- Severe Storms
- Wildfire
- Erosion
- Drought
- Extreme Heat
- Geological
- Winter Storm
- Seismic
- Tsunami
- Transportation Incident
- Cyber Incident
- Hazardous Materials Incident
- Space Weather Incident
- Radiological Incident
- Terrorism
- Agricultural Disruption
- Biological Incident
- Mass Migration Incident
- Civil Disturbance Incident

State Mitigation Strategy

The State of Florida Enhanced SHMP Mitigation Strategy is to:

> *Reduce the impacts of all hazards within the State of Florida through effective administration of all mitigation grant programs and a coordinated approach to mitigation planning and floodplain management through federal, stote, regional, and local initiatives.*

This mission also serves as the FDEM Mitigation Bureau mission and is the mission of the Mitigate FL interagency group.

Additionally, the Mitigation Bureau has a vision to:

> *Make Florida a hazard resilient and resistant stote.*

The SHMP State Mitigation Strategy details goals and objectives for achieving loss reduction in Florida. The goals and objectives are listed below.

Goal 1: Implement an effective comprehensive statewide hazard mitigation plan.

- Objective 1.1: Provide training opportunities and encourage staff to pursue professional development.
- Objective 1.2: Pursue methodologies that will enhance mitigation successes.
- Objective 1.3: Integrate mitigation practices throughout all state plans, programs, and policies.

Goal 2: Support local and regional mitigation strategies.

- Objective 2.1: Maintain up-to-date risk assessment information in coordination with local communities.
- Objective 2.2: Assist in integrating hazard mitigation concepts into other local and regional planning efforts such as comprehensive plans, local mitigation strategies, and comprehensive emergency management plans.
- Objective 2.3: Ensure that all communities are aware of available mitigation funding sources and cycles.
- Objective 2.4: Assist in the integration of climate change and sea level rise research into state, local and regional planning efforts.
- Objective 2.5: Conduct all possible actions to mitigate severe repetitive loss properties.

Goal 3: Increase public and private sector awareness and support for hazard mitigation in Florida.

- Objective 3.1: Work with other state and regional entities to incorporate mitigation concepts and information into their outreach efforts.
- Objective 3.2: Educate Florida's private sector about mitigation concepts and opportunities.
- Objective 3.3: Develop and integrate hazard mitigation curriculum into higher education.
- Objective 3.4: Educate state risk management entities on mitigation incentives.
- Objective 3.5: Support hazard mitigation research and development.

Goal 4: Support mitigation initiatives and policies that protect the state's cultural, economic, and natural resources.

- Objective 4.1: Support land acquisition programs that reduce or eliminate potential future losses due to natural hazards and that are compatible with the protection of natural or cultural resources.
- Objective 4.2: Support restoration and conservation of natural resources wherever possible.
- Objective 4.3 Seek mitigation opportunities that reduce economic losses and promote responsible economic growth.
- Objective 4.4: Retrofit existing state-owned facilities.
- Objective 4.5: Participate in climate change and sea level rise research that will further the state and local government's ability to plan for and mitigate the impacts of future vulnerability.
- Objective 4.6: Coordinate effective partnerships between state agencies for floodplain management.

Many departments, agencies, and private organizations perform roles valuable to state government disaster mitigation and resistance efforts. Some seemingly unrelated programs are often complimentary to reducing the human and economic cost of disasters. It is a goal of the Mitigate FL Team and the State of Florida to educate its citizens (both public and private sectors) on the importance of mitigation. The state continually reaches out to residents and business groups concerning mitigation best practices, tips and how-to's. Training and education are essential to Florida's ability to respond to hazards and must remain a priority within the constraints of lower budgets. Public education reduces the burden on the

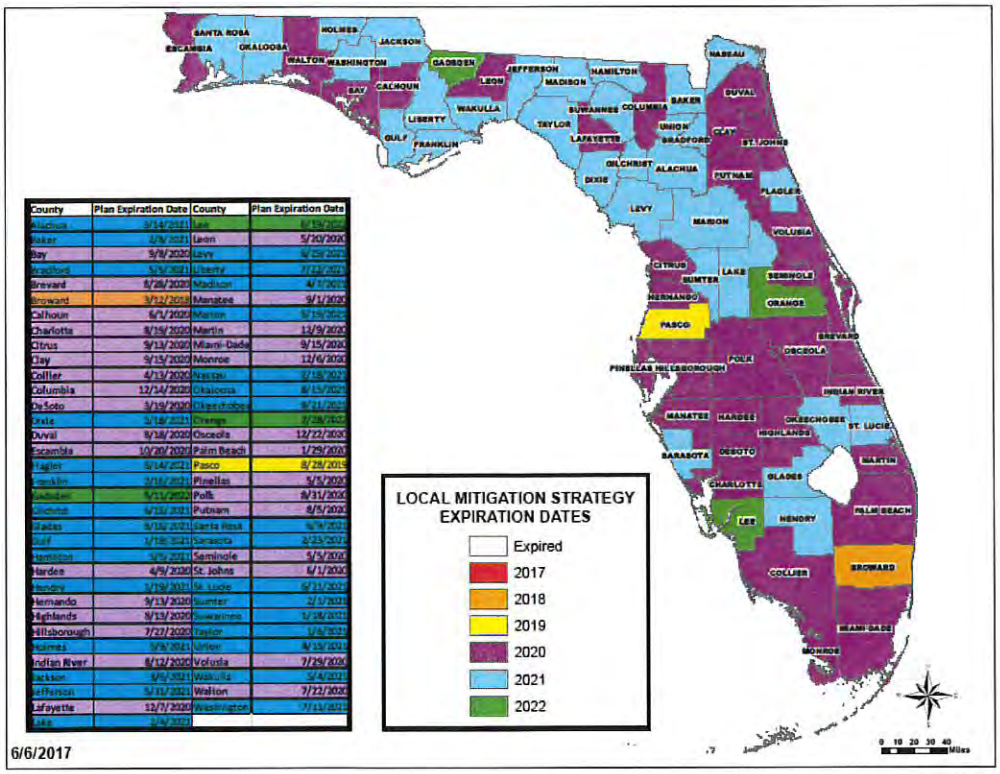
state by increasing citizen capacity. The agency capability assessments included in this plan demonstrate Florida's comprehensive ability to mitigate hazards and guide development in hazard prone areas in accordance with policies and goals.

Local governments have policies, programs and capabilities designed to help mitigate the impacts of hazard events to their jurisdictions. Each community has its own policies, programs, and capabilities. These depend on factors such as the size of the geographic area, its population, or the amount of funding available through local resources. Regardless of size or wealth, each community has a unique core set of policies, programs and capabilities at its disposal related to hazard reduction and mitigation including building codes, land use plans, and regulations, which are discussed in this section.

FDEM has completed a general analysis of existing Local Mitigation Strategies (LMS) to evaluate locally identified policies, programs, and capabilities to maintain and support hazard mitigation planning activities. This analysis is based upon local evaluations of the effectiveness of the identified programs and their accompanying policies within their communities.

There are 67 counties in Florida, all of which have a multi-jurisdictional, multi-hazard LMS. FDEM's Mitigation Planning Unit thoroughly reviews these plans and works closely with the counties to assure that all criteria, including regulations and recommended best practices are met in their LMS. Florida is one of only two states in the nation given authority to review and approve LMS plans. Below is a figure showing the expiration date of all currently approved LMS plans in Florida.

Figure 2 – Local Mitigation Strategy Expiration Dates



County	Plan Expiration Date	County	Plan Expiration Date
Alachua	9/14/2021	Lee	8/19/2022
Baker	2/8/2021	Leon	5/20/2020
Bay	9/8/2020	Levy	8/28/2021
Bradford	5/5/2021	Liberty	7/12/2021
Brevard	8/28/2020	Madison	4/7/2021
Broward	3/12/2018	Manatee	9/1/2020
Calhoun	6/1/2020	Marion	9/19/2021
Charlotte	8/19/2020	Martin	11/9/2020
Citrus	9/13/2020	Miami-Dade	9/15/2020
Clay	9/13/2020	Monroe	12/6/2020
Collier	4/13/2020	Nassau	7/18/2021
Columbia	12/14/2020	Okaloosa	8/15/2021
DeSoto	3/19/2020	Okeechobee	9/21/2021
Dixie	3/18/2021	Orange	7/28/2021
Duval	8/18/2020	Osceola	12/22/2020
Escambia	10/20/2020	Palm Beach	1/29/2020
Flagler	9/14/2021	Pasco	8/28/2019
Franklin	7/11/2021	Pinellas	5/5/2020
Gadsden	9/13/2020	Polk	8/31/2020
Gilchrist	6/15/2021	Putnam	8/5/2020
Glades	9/19/2021	Santa Rosa	9/9/2021
Gulf	1/18/2021	Sarasota	2/25/2021
Hamilton	9/5/2021	Seminole	5/5/2020
Hardee	4/9/2020	St. Johns	6/1/2020
Hendry	1/19/2021	St. Lucie	6/11/2021
Hernando	9/13/2020	Sumter	2/1/2021
Highlands	8/13/2020	Suwannee	1/28/2021
Hillsborough	7/27/2020	Taylor	1/6/2021
Holmes	9/9/2021	Union	8/19/2021
Indian River	8/12/2020	Volusia	7/29/2020
Jackson	8/6/2021	Wakulla	5/4/2021
Jefferson	5/13/2021	Walton	7/22/2020
Lafayette	12/7/2020	Washington	7/13/2021
Lake	8/4/2021		

Funding and Projects

The state uses a variety of programs and funds to achieve its mitigation goals, including federal grant programs such as HMGP, Pre Disaster Mitigation (PDM), Flood Mitigation Assistance (FMA), and the state grant Hurricane Loss Mitigation Program (HLMP). Various grants and programs are discussed throughout this section.

FDEM's Mitigation Bureau has a strong grant management and project implementation program, which is described in this section. Steps in the grant management and project implementation process include Application, Engineering, and Environmental Reviews; Benefit-Cost Analyses; Financial Reporting; Closeout Processes; and Recording Performance.

Appendices

Many documents are included with the SHMP as appendices. These appendices are referenced throughout the plan and support the plan and the FDEM Mitigation Bureau program.

- Appendix A: 2018 Revisions Log
- Appendix B: Governing Policies
- Appendix C: Planning Process Documentation
- Appendix D: Hazard Summary Matrices
- Appendix E: Risk Assessment Tables
- Appendix F: NFIP Policy Statistics
- Appendix G: Wildfire Mitigation Plan Annex
- Appendix H: Sinkhole Report
- Appendix I: Critically Eroded Beaches in Florida
- Appendix J: HMGP Administration Plan
- Appendix K: LMS Update Cycle AAR
- Appendix L: Outreach Record
- Appendix M: State Managed Projects
- Appendix N: Loss Avoidance Reports Tropical Storm Debby
- Appendix O: Loss Avoidance Reports Florida Severe Storms, Tornadoes, Straight-line Winds, and Flooding
- Appendix P: Home Hardening Matters
- Appendix Q: Loss Avoidance Report Hurricane Hermine
- Appendix R: Loss Avoidance Report Hurricane Matthew
- Appendix S: Adoption Documentation
- Appendix T: Annual Updates

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* Appendices are included as separate documents from the SHMP.

Appendices

INTRODUCTION

State Hazard Mitigation Plan Requirements
S20. Did the state provide assurances? [44 CFR §201.4(c)(7)]

Purpose

Under Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act) enacted under the Disaster Mitigation Act of 2000 (DMA2K), the State of Florida is required to have a Federal Emergency Management Agency (FEMA)-approved hazard mitigation plan in order to be eligible for federal hazard mitigation funding. The purpose of the State Hazard Mitigation Plan (SHMP) is to reduce death, injuries, and property losses caused by natural hazards in Florida. The 2018 Plan identifies hazards based on the history of disasters within the state and lists goals, objectives, strategies, and actions for reducing future losses. Implementation of planned, pre-identified, and cost-effective mitigation measures not only helps to reduce losses to lives, property, and the environment but it also streamlines the disaster recovery process. Hazard mitigation is most effective when based on an inclusive, comprehensive, long-term plan that is developed before a disaster occurs.

Section 322, along with other sections of DMA2K, provides an opportunity to reduce the nation's disaster losses through hazard mitigation. The Stafford Act authorizes funding to be made available to states through the Hazard Mitigation Grant Program (HMGP) after presidentially declared disasters. In addition, the Stafford Act sets the requirements for state hazard mitigation plans and requires local jurisdictions to develop and adopt a local mitigation plan in order to receive federal funding for hazard mitigation too. The DMA2K is implemented by the FEMA and requires that all mitigation plans, both at the state and local level, be maintained and updated periodically.

According to the federal regulations outlined in DMA2K, state and local hazard mitigation plans are required to be updated and re-approved by FEMA every five years. The Florida SHMP was originally developed and officially approved by FEMA on August 24, 2004. Since 2004, the SHMP has been updated and re-approved in 2007, 2010, and 2013. In 2014, FEMA extended the update requirement from every three years to every five years. FEMA notified the State of Florida of this rule change and granted an extension for the 2013 Florida Enhanced SHMP so that instead of expiring in 2016, it expires in 2018.

The SHMP serves several purposes; including providing an explanation of the Florida Mitigation Program and the strategies the State uses to implement an effective comprehensive statewide hazard mitigation plan. Plans are coordinated through appropriate state, local, and regional agencies, as well as non-governmental interest groups. This 2018 Plan, and its future revisions, will provide guidance in merging the planning efforts of all state agencies, local governments, the private sector, and non-profit organizations into one viable, comprehensive, and statewide mitigation program.

The 2018 SHMP provides a framework that links pre- and post-disaster mitigation planning with both public and private interests. The intent is to ensure an integrated and comprehensive approach to disaster loss reduction. This approach supports state administration of HMGP and the non-disaster programs such

as the Pre-Disaster Mitigation grant program (PDM) and the Flood Mitigation Assistance program (FMA). The SHMP represents a clear State commitment to mitigation activities, comprehensive state mitigation planning, and improved state program management.

The mission of the SHMP is to:

> *Reduce the impacts of all hazards within the State of Florida through effective administration of all mitigation grant programs and a coordinated approach to mitigation planning and floodplain management through federal, state, regional, and local initiatives.*

This mission also serves as the SHMP Mitigation Strategy and is the mission of the Mitigate FL interagency group.

Additionally, the Mitigation Bureau has a vision to:

> *Make Florida a hazard resilient and resistant state.*

The scope of the SHMP is broad. The plan explains the way in which the Mitigation Bureau administers the Mitigation programs within the state, both within the Mitigation Bureau, and externally with other state agencies and with local agencies. Additionally, as required by statute, the Risk Assessment portion of the SHMP identifies natural hazards, as well as technological and human-caused hazards. Furthermore, the Risk Assessment portion analyzes vulnerability of the State in terms of jurisdictions, (counties), and in terms of state agency facilities across Florida.

The 2018 SHMP demonstrates that:

- The State has developed a comprehensive mitigation program.
- The State effectively uses available mitigation funding.
- The State is capable of managing all funding, including that which results from achieving enhanced status.

What is hazard mitigation?

Hazard mitigation is defined as any action taken to reduce or eliminate the long-term risk to human life and property from manmade or natural hazards. A hazard is any event or condition with the potential to cause fatalities, injuries, property damage, infrastructure damage, agricultural loss, environmental damage, business interruption, or other structural or financial loss.

Hazard mitigation aims to make human development and the natural environment safer and more resilient. Hazard mitigation generally involves enhancing the built environment to significantly reduce risks and vulnerability to hazards. Mitigation can also include removing the built environment from disaster prone areas and maintaining natural mitigating features, such as wetlands or floodplains. Hazard mitigation makes it easier and less expensive to respond to and recover from disasters by breaking the damage and repair cycle.

Examples of hazard mitigation measures include, but are not limited to, the following:

- Development of mitigation standards, regulations, policies, and programs;
- Land use/zoning policies;
- Strong statewide building code and floodplain management regulations;
- Dam safety program, seawalls, and levee systems;
- Acquisition of flood prone and environmentally sensitive lands;
- Retrofitting/hardening/elevating structures and critical facilities;
- Relocation of structures, infrastructure, and facilities out of vulnerable areas;
- Public awareness/education campaigns; and
- Improvement of warning and evacuation systems.

Benefits of hazard mitigation include, but are not limited to the following:

- Saving lives and protecting public health;
- Preventing or minimizing property damage;
- Minimizing social dislocation and stress;
- Reducing economic losses;
- Protecting and preserving infrastructure;
- Reducing legal liability of government and public officials; and
- Less expenditures on response and recovery efforts.

In 2005, a study by the National Institute of Building Sciences reported to Congress that, on average, every dollar spent on mitigation yields four dollars in future benefits.

Regulations

The Disaster Mitigation Act of 2000 (DMA2K) became law October 30, 2000. The act amends the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act) (Public Law 93-288, as amended).

Federal statutes and regulations applicable to State Mitigation Planning include the following:

- Disaster Mitigation Act of 2000 (42 U.S. Code 5121)
- Stafford Act
  - Title III – Major Disaster and Emergency Assistance Administration
    - Section 322 – Mitigation Planning (42 U.S. Code 5165)
      - (a) Requirement of Mitigation Plan
      - (c) State Plans
      - (e) Increased Federal Share for Hazard Mitigation Measures
- Stafford Act
  - Title IV – Major Disaster Assistance Programs
    - Section 404 – Hazard Mitigation (42 U.S. Code 5170(c))
      - (c) Program Administration by States
- 44 Code of Federal Regulations 201 – Mitigation Planning
  - §201.4 Standard State Mitigation Plans
  - §201.5 Enhanced State Mitigation Plans

- 44 Code of Federal Regulations 13 – Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments
    - Subpart B – Pre-Award Requirements
        - §13.11 State Plans
            - (c) Assurances
            - (d) Amendments

Florida statutes and regulations applicable to State Mitigation Planning include the following:

- Florida Statute 252
    - Florida Administrative Code 27P-22
- Florida Statute 252.3655

Other applicable standards include the Emergency Management Accreditation Program (EMAP) Standards. The State of Florida is EMAP Accredited and the Florida Enhanced SHMP is compliant with the EMAP Standards. The applicable Standards include:

- 4.1: Hazard Identification, Risk Assessment and Consequence Analysis
- 4.2: Hazard Mitigation

Assurances

The State of Florida does comply, and assures it will continue to comply, with all applicable federal statutes and regulations in effect with respect to the periods for which it receives grant funding in compliance with 44 CFR 13.11(c). This includes managing and administering FEMA funding in accordance with applicable Federal statutes and regulations.

The state also assures it will amend the Florida Enhanced State Hazard Mitigation Plan in accordance to 44 CFR 13.11 (d). This includes amending the plan whenever necessary to reflect changes in state or Federal laws and statutes.

State Profile

Florida is one of the top tourist destinations in the world, famous for its pristine beaches, palm trees, historic heritage, beautiful nature preserves, and unrivaled entertainment parks. The state is culturally, ethnically, economically, ecologically, and politically diverse, with natural, human, and economic assets worthy of protection from all hazards. A main attraction of the state is the temperate climate, which boasts an average annual high temperature of 81 degrees Fahrenheit (27 degrees Celsius), while the average annual low temperature remains a comfortable 60 degrees Fahrenheit (16 degrees Celsius).

Figure 3 – County Boundary Map of Florida

Geography

The state of Florida has a total area of 34,366,945 acres, ranking it 22nd in the nation in total area. Florida has over 11,000 miles of rivers, streams and waterways with 1,197 statute miles of coastline and 663 miles of beaches, making Florida the third wettest state behind Alaska and Michigan. The state is also home to Lake Okeechobee, at 700 square miles, making it the second largest freshwater lake in the United States. Florida is a relatively flat state with the highest point being 345 feet above sea level with the state average being 100 feet above sea level.

Three geographic land areas make up the Florida landscape; the Atlantic Coastal Plain, the East Gulf Coastal Plain, and the Florida Uplands.

The Atlantic Coastal Plain completely covers the eastern part of Florida. The landscape is low and level and varies from about 30 to 90 miles wide. This includes most of southern Florida, 2,746 square miles, which is covered by the Big Cypress Swamp and the Florida Everglades. To the south of the mainland, lie the Florida Keys curving out to sea about 150 miles in a southwesterly direction.

The East Gulf Coastal Plain presents itself in two sections of Florida. In southwestern Florida, the East Gulf Coastal Plain extends inland to cover parts of the Big Cypress Swamp and the Everglades. The East Gulf Coastal Plain is similar to the Atlantic Coastal Plain on the other side of the Florida peninsula. Barrier islands run along the west coast of Florida and coastal swampland extends inland. The northern section

of the East Gulf Coastal Plain curves around the upper edge of the northeastern Gulf of Mexico at Apalachee Bay and extends west across the Florida panhandle to Florida's western border.

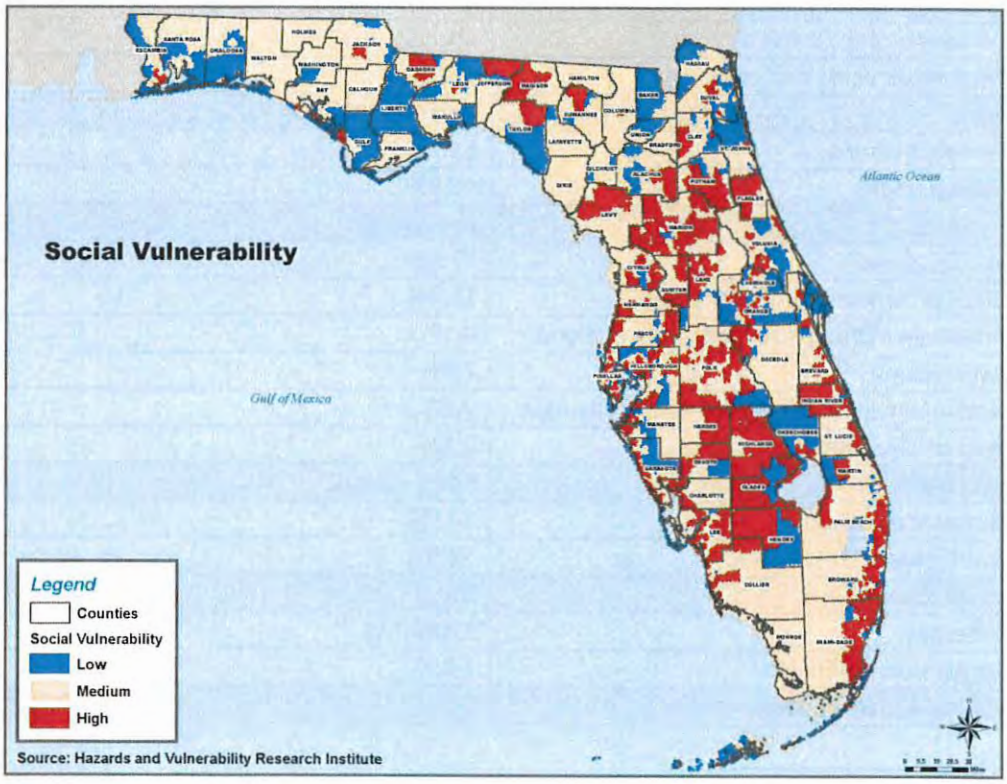
The Florida Uplands run about 275 miles west to east, along the northern edge of the Florida Panhandle and then extend south into the central area of the Florida peninsula. The width of the northern Florida Uplands varies from around 30 to 50 miles and is characterized by low rolling hills of red clay. The section of the Florida Uplands that extends south into the peninsula, covers an area with a length of approximately 160 miles and a width of 100 miles. This area extends from the north, south and to the east, to separate the two sections of the East Gulf Coastal Plain and to separate the East Gulf Coastal Plain from the Atlantic Coastal Plain.

Population Demographics

As of the 2010 US Census, Florida was the fourth largest state by population with over 18 million residents. The US Census 2016 estimates show that Florida has grown significantly in recent years and is now the third largest state by population, with well over 20 million residents.

The state has 67 counties with varying size and population; the largest, by land area, being Palm Beach County at 2,578 square miles with 1.44 million residents, and Union County being the smallest, by land area, at 245 square miles with a population of 15,142 residents.

Figure 4 – Social Vulnerability Map of Florida



One vulnerability for Florida is the concentration of its population. The state is home to four metropolitan areas with over one million residents, three of which are coastal cities, making them more vulnerable to certain hazards. These four metropolitan areas and their populations are as follows:

- Miami: 6.1 million residents, (2016 estimates, Miami Dade, Broward, Palm Beach counties)
- Tampa: 3 million residents, (2016 estimates, Hillsborough, Pinellas, Hernando, Pasco counties)
- Orlando: 2.4 million residents, (2016 estimates, Lake, Orange, Osceola, Seminole counties)
- Jacksonville: 1.5 million residents, (2016 estimates, Duval, Clay, St. Johns, Nassau, Baker counties)

According to the University of Florida's Office of Economic and Demographic Research (2011), the population of Florida is expected to grow at a rate of 1.4% between 2010 and 2030 resulting in a projected population of approximately 24 million people by the year 2030. As the population of Florida expands, the vulnerability of the state increases.

Below are basic Florida demographics from the US Census Bureau.

Table 1 – Florida Demographics[2][3]

Category	Data
2010 US Census population	18,801,310
2016 US Census population estimates	20,612,439
Age	**Percentage**
2016 Persons under 5 years	5.5%
2016 Persons under 18 years	20.1%
2016 Persons 65 years and over	19.9%
Gender	**Percentage**
2016 Female persons	51.1%
2016 Male persons	48.9%
Race	**Percentage**
2016 White, alone	77.6%
2016 Black or African American, alone	16.8%
2016 American Indian and Alaska Native, alone	0.5%
2016 Asian, alone	2.9%
2016 Native Hawaiian and Other Pacific Islander,	0.1%
2016 Two or More Races	2.1%
Hispanic Origin	**Percentage**
2016 Hispanic or Latino	24.9%
2016 Not Hispanic or Latino	54.9%
Characteristics	**Data**
2016 Veterans	1,480,133
2016 Foreign born persons	19.9%
Families and Living Arrangements	**Data**

[2] https://www.census.gov/quickfacts/fact/table/FL/AFN120212#viewtop
[3] http://edr.state.fl.us/Content/population-demographics/data/index-floridaproducts.cfm

2016 Households	7,393,262
2016 Persons per household	2.64
2016 Language other than English spoken at	28.3%
Education	**Percentage**
2016 High school graduate or higher	87.2%
2016 Bachelor's degree or higher	27.9%
Health	**Percentage**
2016 Persons with a disability, under age 65 years	8.6%

Florida's population is particularly vulnerable because 40% of the population is composed of children (18 years or younger) and seniors (65 years or older).

Florida also has two federally recognized Native American tribes, the Seminole Tribe and the Miccosukee Tribe. Both are located in the southern part of the state and are home to thousands of residents.

Land Use

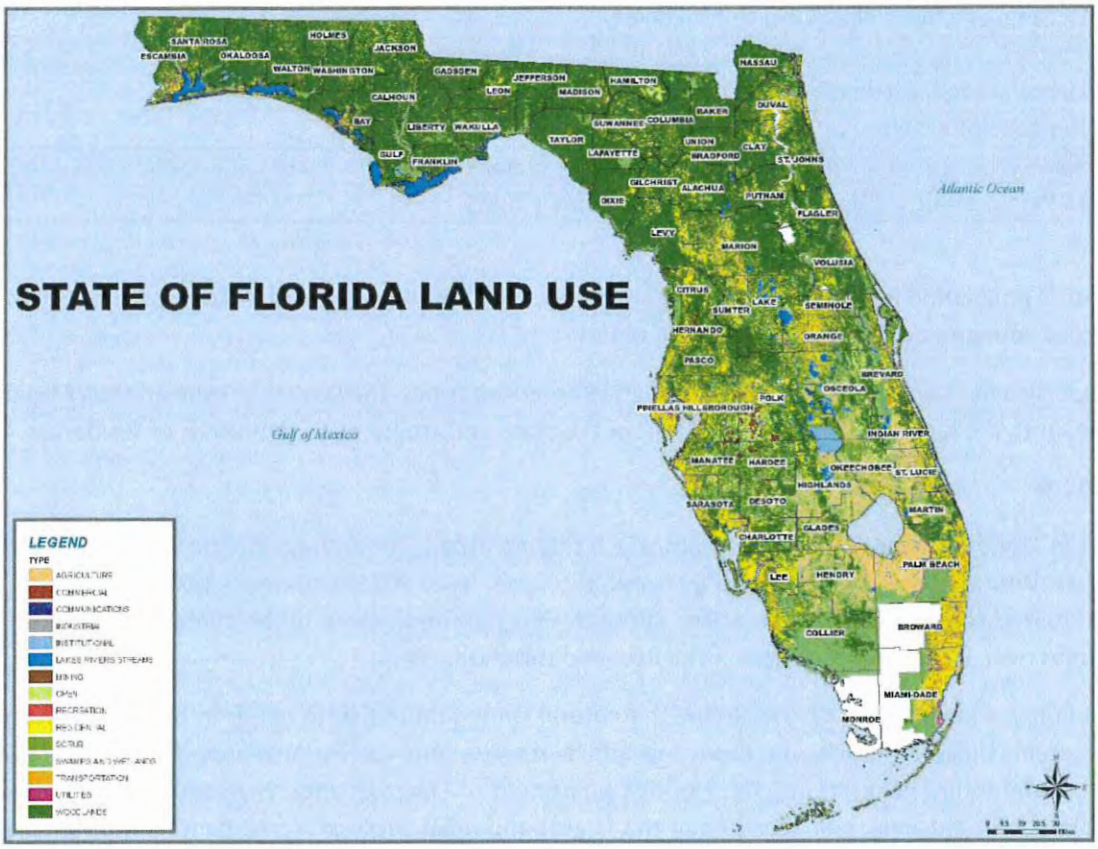
Land in Florida is used for multiple purposes including urban, conservation, agricultural, wetlands, and forests. With a booming agricultural business, the state, as of 2015, had over 47,000 commercial farms that utilized roughly 9.45 million acres. The state has numerous large urban centers and south Florida includes over 1.5 million acres that is the Everglades National Park.

Florida has a long history of conserving the natural lands that the state needs in order to preserve the ecosystems that create clean air, clean and sufficient water, and recreational opportunities for residents, visitors and future generations. The Florida Department of Environmental Protection (DEP), through the Division of State Lands, manages one of the largest and most successful land conservation programs in the nation.[4]

With approximately 10.1 million acres in conservation land, the Division of State Lands assists landowners who want to sell land to the state, purchase land from the state or gain access to public lands. As of February 2017, Florida has 4,043,348 acres of federal conservation lands, 4,882,099 in state conservation lands and 496,494 acres of local (county and municipal) conservation lands. The majority of federal lands are managed by the USDA Forest Service and the National Park Service and the majority of state lands managed by the Florida Forest Service and the Florida Fish and Wildlife Conservation Commission.[5] The five Water Management Districts collectively manage 1,908,969 acres as well. Below is a map of land use in the state.

[4] https://floridadep.gov/lands
[5] http://fnai.org/PDF/Maacres_201702_FCL_plus_LTF.pdf

Figure 5 – State of Florida Land Use



Economy

Below are basic demographics of the Florida economy from the US Census Bureau. It is important to note that nearly 15% of Florida's population is in poverty. Consequently, another vulnerability for the state.

Table 2 – Florida Economic Demographics[6]

Category	Data
2016 Median household income	$48,900
2016 Persons in poverty	14.7%
2016 In civilian labor force, total, of population age 16 years and over	58.5%
2016 In civilian labor force, female, of population age 16 years and over	54.3%
2012 Total accommodation and food service sales ($1000)	$49,817,924
2012 Total retail sales ($1000)	$273,867,145
2015 Total employer establishments	532,830
2015 Total employment	7,777,990

[6] https://www.census.gov/quickfacts/fact/table/FL/AFN120212#viewtop

Florida's top economic driver is tourism. In 2015, the state attracted 106.6 million visitors who spent more than $108.8 billion and generated $11.3 billion in tax revenue in 2015.[7] Florida's reliance upon the tourism industry and the susceptibility of the tourism industry to hazards increases the vulnerability of the state to those hazards.

Florida is a major agricultural hub, with the industry playing a vital role in the state's economy. Florida's tropical/subtropical climate provides a conducive environment for near year-round production of a variety of plant and animal agricultural commodities. Florida farmers and ranchers produce hundreds of distinct commodities, all contributing to an agricultural industry which produced over $8.4 billion in 2014.

Infrastructure

Florida has an extensive infrastructure system. Within the state there are over 122,659 miles of highway, 273,000 miles of public roadways, 30 public transit systems, 3,000 miles of railroad track, 140 airports, 15 seaports, and 34,019 miles of pipelines to maintain and protect. Florida also has a comprehensive education system with 158 colleges and universities and 4,200 public schools for K-12. With over 300 hospitals, government buildings and leases, and dozens of utility companies and services, Florida has a wide ranging list of critical infrastructure.

Critical infrastructure is essential to the state's ability to provide assistance to its people and infrastructure such as transportation routes, utilities, government facilities, schools, and hospitals provide the state with the capacity to respond to disasters.

Government (FDEM and Mitigation Bureau)

The State of Florida government is organized as shown below.

- Florida Executive Office of the Governor
- Florida Senate and Florida House of Representatives
- Florida Judicial Branch, including Circuit Courts and District Courts of Appeal
- 34 State Agencies, including Florida Division of Emergency Management
- 11 Regional Planning Councils and 5 Water Management Districts
- County Government, including Health Department Offices, Elections Supervisors, Property Appraisers, Tax Collectors, Sheriffs, Clerks of Court, and Veterans' Service Offices

The Florida Division of Emergency Management, particularly the Mitigation Bureau is the foundation of the Florida Mitigation Strategy. In 2017, Florida statute 252.3655 went into effect requiring the creation of a natural hazards interagency workgroup.

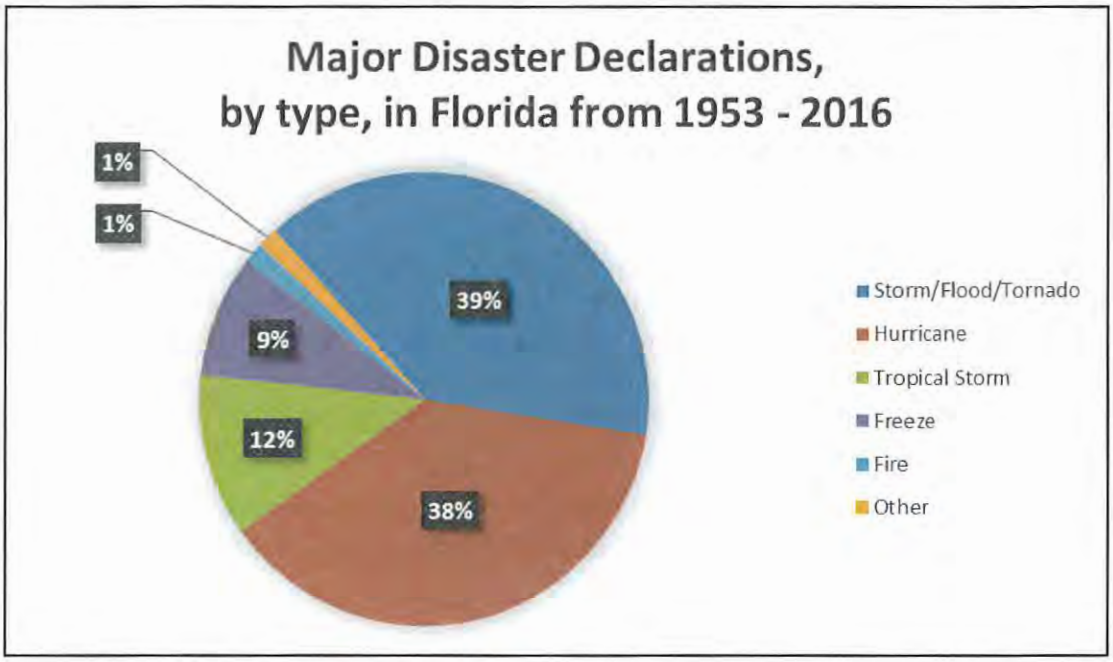
Past Disasters

Florida is vulnerable to both natural hazards and technological and human-caused hazards. In the state of Florida, the most common hazards are wildfires and floods; however, hurricanes have historically inflicted catastrophic destruction. Florida has had 69 Major Disaster Declarations from 1953 when these federal

[7] http://www.visitfloridamediablog.com/home/florida-facts/research/ and https://www.visitflorida.org/media/30679/florida-visitor-economic-impact-study.pdf

declarations began through 2016. Below is a chart demonstrating the types of disasters that have received a Major Disaster Declaration, by type, from 1953 until 2016.

Figure 6 – Major Disaster Declarations, by type, in Florida, 1953 – 2016



Wildfires are not commonly declared as a major disaster declaration, but rather a Fire Management Assistance Declaration. From 1953 through 2016, there have been 56 wildfires that have received the FM declaration. Only one wildfire has received a major disaster declaration in Florida.

Agricultural disruptions are also not commonly declared as a major disaster declaration, but as a Secretarial Disaster Declaration by the USDA. The following data is the number of primary counties that were declared and the contiguous, or surrounding, counties that also declared from 2012 through 2017.

- 2012: 63 primary counties and 4 contiguous counties
- 2013: 33 primary counties and 18 contiguous counties
- 2014: 12 primary counties and 22 contiguous counties
- 2015: 4 primary counties and 12 contiguous counties
- 2016: 18 primary counties and 31 contiguous counties
- 2017: 57 primary counties and 8 contiguous counties

Results of Enhanced SHMP & Florida's Mitigation Program

In support of the Stafford Act and DMA2K, the 2018 SHMP update addresses all required elements in order to achieve Enhanced status. Achieving Enhanced status means that states are able to successfully implement federal grant programs and have built successful mitigation programs. Receiving Enhanced status provides states an additional 5% of recovery costs in HMGP funds when a major disaster is declared.

Florida first received HMGP funding in 1998. Florida has received a total of $867,038,534 in HMGP funding from 1998 to 2016. From 1998 until 2005, Florida received 15% of the 90-day Recovery cost estimates after federally declared disasters. In 2007, Florida began to receive 20% of the 90-day Recovery cost estimates because of the Enhanced status of the SHMP. Florida strives to maintain the Enhanced status to continue receiving the extra 5% in HMGP funding because the state recognizes the significant value to mitigation within the state. The additional 5% for HMGP funding from 2007 to 2016 has resulted in an extra $52,863,689 in HMGP funding.

Additionally, FDEM conducts loss avoidance reports after each Major Disaster Declaration in the state. This consists of evaluating the damages from a disaster, with and without a mitigation project, to determine if the mitigation project was successful in reducing losses. FDEM believes this substantiates the need for mitigation, as well as prove that mitigation is successful in reducing losses. Furthermore, loss avoidance reports prove that FDEM is capable of effectively managing federal mitigation grants. More information can be found in the *State Mitigation Strategy Section* and the *Funding and Projects Section*.

Outline of SHMP

The 2018 SHMP update included re-organization. The outline of the plan is shown in the table below.

Table 3 – Outline of State Hazard Mitigation Plan

Section	Description
Executive Summary Section	The Executive Summary is a quick overview of the entire SHMP.
Introduction Section	The Introduction includes the purpose of the SHMP, as well as elements that are required by statute, such as Regulations and Assurances. The section also includes the definition of hazard mitigation, the Florida state profile, and the results of the Enhanced Florida Mitigation program.
Planning Process and Plan Maintenance Section	The Planning Process and Plan Maintenance Section includes a brief history of the Florida Enhanced SHMP, as well as a narrative regarding the 2018 SHMP Update. The section includes an explanation of the Mitigate FL interagency group and Local and State Plan Integration. Adoption and Approval process descriptions and documentation are also in this section. Finally, there is a section regarding annual reviews and updates, as well as the five-year cycle plan updates.
Risk Assessment Section	The Risk Assessment Section includes the hazard profiles, as well as the vulnerability and loss estimations for each of the eleven natural hazards: • Flood, • Tropical Cyclone, • Severe Storm, • Extreme Heat, • Drought,

	• Wildfire, • Erosion, • Geological, • Seismic, • Tsunami, and • Winter Storm. The SHMP Risk Assessment also includes ten technological and human-caused hazard profiles, because the SHMP Risk Assessment serves as the primary risk assessment for the State of Florida. The technological and human-caused hazards profiled include: • Agricultural Disruption, • Biological Incident, • Civil Disturbance, • Cyber Incident, • Mass Migration, • Hazardous Materials Incident, • Radiological Incident, • Space Weather Incident, • Terrorism, and • Transportation Disruption.
State Mitigation Strategy Section	The State Mitigation Strategy Section discusses the goals and capabilities the Mitigation Bureau has for the next several years. Additionally, there is a description of the state and regional agency mitigation capabilities.
Funding and Projects Section	The Funding and Projects Section discusses how the Mitigation Bureau conducts project management, including financial aspects, of federal grant projects. There is also a discussion of exemplary mitigation projects in Florida in this section.
Appendices	The Appendices are documents that are referenced throughout the SHMP and include: • Appendix A: 2018 Revisions Log • Appendix B: Governing Policies • Appendix C: Planning Process Documentation • Appendix D: Hazard Summary Matrices • Appendix E: Risk Assessment Tables • Appendix F: NFIP Policy Statistics • Appendix G: Wildfire Hazard Mitigation Plan Annex • Appendix H: Sinkhole Report • Appendix I: Critically Eroded Beaches in Florida • Appendix J: HMGP Administration Plan • Appendix K: LMS Update Cycle After Action Report • Appendix L: Outreach Record

	• Appendix M: State Managed Projects • Appendix N: Loss Avoidance Report Tropical Storm Debby • Appendix O: Loss Avoidance Report Severe Storms, Tornadoes, Straight-line Winds, and Flooding • Appendix P: Home Hardening Matters • Appendix Q: Loss Avoidance Report Hurricane Hermine • Appendix R: Loss Avoidance Report Hurricane Matthew • Appendix S: Adoption Documentation • Appendix T: Annual Updates

PLANNING PROCESS AND PLAN MAINTENANCE SECTION

State Hazard Mitigation Plan Requirements
S1. Does the plan describe the planning process used to develop the plan? [44 CFR §§201.4(b) and (c)(1)]
S2. Does the plan describe how the state coordinated with other agencies and stakeholders? [44 CFR §§201.4(b) and (c)(1)]
S11. Was the plan updated to reflect progress in statewide mitigation efforts and changes in priorities? [44 CFR §201.4(d)]
S17. Is there a description of the method and schedule for keeping the plan current? [44 CFR §§201.4(c)(5)(i) and 201.4(d)]
S18. Does the plan describe the systems for monitoring implementation and reviewing progress? [44 CFR §§201.4(c)(5)(ii) and 201.4(c)(5)(iii)]
S19. Did the state provide documentation that the plan has been formally adopted? [44 CFR §201.4(c)(6)]
E2. Does the plan demonstrate integration to the extent practicable with other state and/or regional planning initiatives and FEMA mitigation programs and initiatives? [44 CFR §201.5(b)(1)]
E3. Does the state demonstrate commitment to a comprehensive mitigation program? [44 CFR §201.5(b)(1)]

History of the Florida SHMP

In accordance with 44 CFR 201.4, Florida originally developed the SHMP which was approved by FEMA in 2004. The plan was continually updated in 2007, 2010, and 2013. In 2014, FEMA extended the update cycle from three years to five years, extending the 2013 plan from 2016 to 2018. The updates for 2018 began in mid-2016.

According to 44 CFR statute 201.5(a), states with an approved Enhanced SHMP receive 20% of recovery funds in HMGP funds, rather than the 15% that states with a Standard SHMP receive. In 2006, Florida added the Enhanced plan requirements to the Standard SHMP and Florida first received the extra funding in 2007. Since then, the plan has been Enhanced, earning the state an extra $52 million in HMGP funds.

Table 4 – History of Florida State Hazard Mitigation Plan

Date	Description
August 24, 2004	Florida SHMP approved by FEMA
August 24, 2007	Florida Enhanced SHMP approved by FEMA until August 24, 2010
August 24, 2010	Florida Enhanced SHMP update approved by FEMA until August 24, 2013
August 24, 2013	Florida Enhanced SHMP update approved by FEMA until August 23, 2018 (*originally approved until 2016 but extended due to new rule from FEMA)
August 24, 2018	Florida Enhanced SHMP update approved by FEMA until August 23, 2023 (not official yet)

The Mitigation Planning Unit has been responsible for updating the SHMP in the past. Additionally, the Mitigation Planning Unit coordinated the SHMPAT group, which assisted with updating and approving the plan. The SHMPAT group was formed several years ago and included state partners. Each update cycle, new members were engaged and added, including federal, local, non-profit, and private sector partners.

2018 Update

The 2018 SHMP update began in mid-2016 when the Mitigation Planning Unit conducted an in-depth review of the 2013 SHMP and the 2016 FEMA State Mitigation Plan Review Guide. When the plan update began, the SHMPAT was used as it had been in the past, as a resource for the Mitigation Planning Unit to assist with and approve updates and changes. The plan was reviewed and updated to reflect progress in statewide mitigation efforts and changes in priorities.

In July 2017, Florida statute 252.3655[8] went into effect. The statute mandates an interagency workgroup to share information on the current and potential impacts of natural hazards throughout the state, to coordinate the ongoing efforts of state agencies in addressing the impacts of natural hazards, and to collaborate on statewide initiatives to address the impacts of natural hazards. Each agency within the executive branch of state government, each water management district, and the Florida Public Service Commission is required to designate an agency liaison to the workgroup, while the director of DEM or designee will serve as the liaison and coordinator of the workgroup. Each liaison is required to provide information from his or her respective agency regarding the current and potential impacts of natural hazards to his or her agency, agency resources available to mitigate against natural hazards, and efforts made by the agency to address the impacts of natural hazards. FDEM is also required to submit an annual progress report regarding the implementation of the SHMP, beginning on January 1, 2019.

Since the membership and purpose of this new Natural Hazards Interagency Workgroup was similar to two other statewide mitigation groups – the SHMPAT and the Silver Jackets team – the Mitigation Bureau decided to combine the three groups into one, and title it Mitigate FL. This was done to avoid duplication of efforts and to use resources more effectively.

Since the last SHMP update in 2013, the Mitigation Planning Unit held biannual SHMPAT Meetings. When the 2018 SHMP update began in 2016, the Mitigation Planning Unit began to hold the SHMPAT Meetings quarterly. As explained, the Mitigation Planning Unit continued to hold these meetings, under the title of Mitigate FL Meetings beginning in October 2017. The Meetings from September 2016 through December 2017 were specifically focused on presenting and requesting approval of SHMP updates and changes and soliciting input and feedback. All meeting documentation can be found in *Appendix C: Planning Process Documentation*, but important points are shown below. Below is a list of the meetings from 2013 through the end of 2017.

Table 5 - List of Mitigate FL Meetings from 2013 – 2017

Year	Mitigate FL (SHMPAT) Meetings
2013	• July 2013

[8] http://www.leg.state.fl.us/Statutes/index.cfm?App_mode=Display_Statute&URL=0200-0299/0252/0252.html

	• December 2013
2014	• June 2014 • December 2014
2015	• June 2015 • December 2015
2016	• March 2016 • June 2016 • September 2016 • December 2016
2017	• March 2017 • June 2017 • October 2017 • December 2017

Various sections of the plan were discussed at the Mitigate FL (SHMPAT) Meetings in 2016 and 2017. The table below provides a detailed breakdown of what sections were discussed at which meetings.

Table 6 – Plan Section Discussions

Plan Section	Meeting(s)
Planning Process	• September 2016 • December 2017
Risk Assessment	• September 2016 • December 2016 • March 2017 • June 2017 • October 2017 • December 2017
Goals & Capabilities	• December 2016 • March 2017 • October 2017 • December 2017
Projects & Funding	• March 2017 • December 2017
Severe Repetitive Loss	• October 2017
Plan Maintenance	• March 2017 • December 2017

Several agencies were invited to attend each SHMPAT meeting, including Local, State, Federal, Non-Profit, and Private Sector partners. Below is a list of agencies that participated in SHMPAT and Mitigate FL Meetings from September 2016 until December 2017.

List of Agencies that Participated in Mitigate FL (formerly SHMPAT) Meetings from 2016 to 2018 for the 2018 SHMP update

Table 7 – Mitigate FL (SHMPAT) Meeting Participating Agencies

LOCAL	STATE	FEDERAL
Bay County	Apalachee Regional Planning Council	Federal Emergency Management Agency
Brevard County	Florida Agency for Healthcare Administration	Federal Alliance for Safe Homes
Broward County	Florida Agency Persons with Disabilities	United State Army Corps of Engineers
City of Brooksville	Florida Agency for State Technology	United States Department of Transportation
City of Fernandina Beach	Florida Courts	
City of St. Cloud	Florida Department of Agriculture and Consumer Services	**OTHER**
City of Tallahassee	Florida Department of Business and Professional Regulation	Dewberry
Columbia County	Florida Department of Citrus	Florida Gateway College
Desoto County	Florida Department of Corrections	Integrated Solutions Consulting
Flagler County	Florida Department of Economic Opportunity	Lakeland Regional Health
Hardee County	Florida Department of Education	Langton Consulting
Hendry County	Florida Department of Environmental Protection	Nova Southeastern University
Hernando County	Florida Department of Health	Pegasus Engineering
Holmes County	Florida Department of Juvenile Justice	St. Petersburg College
Jefferson County	Florida Department of Law Enforcement	University of Central Florida
Lee County	Florida Department of Management Services	University of Florida
Miami-Dade County	Florida Department of Revenue	Florida Emergency Preparedness Association
Manatee County	Florida Department of State	Florida Floodplain Managers Association
Martin County	Florida Department of Transportation	
Monroe County	Florida Division of Emergency Management	
Nassau County	Florida Fire Service	
Okaloosa County	Florida Fish and Wildlife Conservation Service	
Orange County	Florida Highway Patrol	
Osceola County	Florida Highway Safety and Motor Vehicles	
Palm Beach County	Florida Lottery	
Pasco County	Florida Office of Early Learning	
Pinellas County	Florida Public Service Commission	
Santa Rosa County	Northeast Florida Regional Council	
Sarasota County	Northwest Florida WMD	
Seminole County	Southwest Florida WMD	
St. Johns County	St. Johns River WMD	
St. Lucie County	Suwannee River WMD	
Taylor County	Volunteer Florida	
Volusia County	West Florida Regional Planning Council	
Wakulla County		

Mitigate FL Meetings

As explained, the Mitigate FL group was created in 2017 by combining three statewide mitigation groups, the Natural Hazards Interagency Workgroup, the SHMPAT, and the Silver Jackets team.

Membership of Mitigate FL is wide ranging. Florida statute 252.3655 requires liaisons from each state agency, water management district, and the Public Service Commission, which is about 40 people. The SHMPAT group included state agencies, non-governmental and non-profit agencies, and local emergency management professionals. The Silver Jackets group includes federal agency representatives and additional state agency members. The membership of all three groups was combined and the contact list includes about 300 people, with about 70 consistent attendees.

Mitigate FL Meetings, are held at least once each quarter, per Florida Statute 252.3655 and are held on the second Tuesday of the quarter (March, June, September, and December) from 1:00 PM to 2:00 PM. If something prevents a Mitigate FL Meeting from occurring, a makeup meeting is scheduled either in person or via conference call and webinar. The Mitigate FL Coordinator, within the Mitigation Planning Unit is responsible for coordinating the Mitigate FL interagency group, including scheduling and facilitating meetings.

Plan Integration

One purpose of the Mitigate FL group is to bring together a cross-section of representatives from various sectors to assist the Mitigation Planning Unit with evaluating, revising, and otherwise maintaining the State's Enhanced Hazard Mitigation Plan. This group includes members from state agencies, local governments, regional planning councils, universities, non-profit organizations, FEMA, and other federal agencies. As these members work together, they gain and share valuable insight into how the plan may be integrated into their respective hazard mitigation planning processes. As they return to their communities or organizations, they bring with them plan knowledge and tools to update their own plans.

Local Integration

FDEM staff works throughout the five-year update cycle with local jurisdictions to ensure the SHMP is incorporated into local plans such as Comprehensive Emergency Management Plans (CEMP) and Local Mitigation Strategies (LMS). In 2010, the SHMPAT began inviting members of the LMS working groups to participate in state level mitigation planning activities, including quarterly SHMPAT (now known as Mitigate FL) meetings. Participation in Mitigate FL meetings from local partners is always valued, as their participation greatly enhances the SHMP update. As a result, it has helped intertwine the two levels of mitigation planning and strengthened the ability of the state plan to support local plans.

Further integration efforts are noted throughout the 2018 SHMP. For example, the Risk Assessment Section discusses how updated risk assessment information was incorporated from each county LMS. It also discusses the various plans that were reviewed in order to complete the update. This integration process helps to further strengthen the tie between the local and state plans.

State Integration

The SHMP is closely aligned with the State of Florida CEMP. Chapter 252, Florida Statutes, (State Emergency Management Act) mandates the development of the Florida CEMP (see *Appendix G: Governing Policies*). The plan is operations-oriented and establishes a framework through which the State of Florida prepares for, responds to, recovers from, and mitigates the impacts of all hazards that could adversely affect people and property. The CEMP was developed using an all-hazards planning approach to standardize the functional framework under which strategies and resources are used to minimize the consequences of an event.

The SHMP's Risk Assessment Section serves as Florida's single point document on hazards and risks. As a result, the SHMP serves as one of the key documents for the CEMP plan and is integrated into the Florida's CEMP by reference and is listed as a supporting document. It is also a reference for state agencies, special districts, local governments, and voluntary agencies seeking guidance and information on statewide hazard mitigation goals and objectives.

The SHMP is also assimilated into a variety of other state and local plans and planning mechanisms. The plan continues to serve as a reference tool for the development and update of LMS plans and other planning mechanisms. Additional planning mechanisms and programs that are integrated into the SHMP include, but are not limited to, the following:

- Local Comprehensive Plans (see DEO's capability piece in the *State Mitigation Strategy Section*)
- The Florida Building Code (see *Funding and Projects Section*)
- Local Comprehensive Emergency Management Plans (see *Appendix B: Governing Policies* and *State Mitigation Strategy Section*)
- Post Disaster Redevelopment Plans (see *State Mitigation Strategy Section*)
- THIRA (see *Risk Assessment Section*)
- FEMA Hazard Mitigation Assistance Programs (see *Funding and Projects Section*)
- Florida's Silver Jackets Team (see *State Mitigation Strategy Section*)

The above examples demonstrate how the plan is integrated to the extent practicable with other state and regional planning initiatives. The state intends to continue this dialogue with state agencies, regional planning councils, water management districts, local jurisdictions, and others for amplified integration of mitigation measures into comprehensive planning, growth management activity, economic development, capital improvement opportunities, as well as emergency management plans.

Federal Integration

An example of Florida's integration of national standards to improve mitigation planning is the state's participation and accreditation in the Emergency Management Accreditation Program (EMAP). EMAP is a voluntary review process for state, territorial, and local emergency management programs. It provides emergency management programs with the opportunity to be recognized for compliance with national standards, to demonstrate accountability, and to focus attention on areas and issues where resources are needed. The EMAP process evaluates emergency management program compliance with 64 standards.

Florida achieved Emergency Management Accreditation Program (EMAP) accreditation in 2003 and again in 2009. The Mitigation Planning Unit integrated applicable standards into the Enhanced SHMP so that it

is EMAP compliant. The applicable standards include the hazard vulnerability and risk assessment, state and local mitigation plans, mitigation grant administration, and public education and outreach. Preparations have begun for the next EMAP re-accreditation and the Mitigation Planning Unit takes an active role in supporting this process.

The SHMP was updated with considerations for all applicable regulations and planning guidance including FEMA's State Mitigation Planning Guide and the Key Topics Bulletins.

More information about tools and strategies used by the state to integrate mitigation planning into local and regional planning processes can be found in the *State Mitigation Strategy Section*, which discusses details of the state's work with local jurisdictions to initiate and complete LMS plans.

Adoption and Approval

After the 2018 Enhanced SHMP underwent final revisions, and the plan was completed to the Mitigate FL and Mitigation Planning Unit's satisfaction, the plan was officially adopted by the State of Florida via a memorandum signed by the Director of FDEM as the Governor's Authorized Representative, on 02/20/2018. After adoption, the plan was submitted to FEMA for approval. The 2018 Enhanced SHMP update was submitted on 02/23/2018 and approved by FEMA on 06/11/2018. The 2018 Florida Enhanced SHMP will be effective from August 24, 2018 until August 23, 2023.

The following documentation can be found in *Appendix S: Adoption Documentation*.

- Adoption
- Submission
- Approval

Plan Maintenance

Annual Reviews and Reports

As previously stated, Florida §252.3655 requires that the FDEM workgroup coordinator prepare an annual progress report that be submitted to the Governor, the President of the Senate, and the Speaker of the House of Representatives. According to the statute, the annual progress report shall:

- Assess the relevance, level, and significance of current agency efforts to address the impacts of natural hazards; and
- Strategize and prioritize ongoing efforts to address the impacts of natural hazards.

In addition to these requirements, the workgroup coordinator, who also serves as FDEM's SHMP Planner, will include annual reviews and updates of the SHMP in the annual progress reports. The SHMP Planner will complete the annual reviews and updates, with assistance from the Mitigation Planning Unit and the Mitigate FL group. The annual reviews and updates will focus on the following topics:

- Hazard profiles and historical occurrences;
- Goals and objectives;

- Project closeouts;
- Program Administration by States audits;
- Various other audits;
- Loss Avoidance Reports after any federally declared disaster in the state; and
- Any mitigation success stories from the state that year.

These annual progress reports will be added as an Appendix to the SHMP and each agency required to participate in the Mitigate FL group, including FDEM, will post the annual progress reports to their respective agency's website.

FEMA Annual Consultation

Additionally FEMA conducts Annual Mitigation Program Consultations with the State of Florida. During this annual consultation, FEMA and the State review the Enhanced Mitigation Program and validate the capabilities of the state. This consultation helps the state to be sure its mitigation program is "On Target" and complies with Enhanced requirements.

According to FEMA's State Mitigation Plan Review Guide, effective in 2016, FEMA will conduct annual reviews and consultations regarding the state's mitigation program. FEMA is responsible for providing technical assistance and reviewing state activities, plans, and programs to ensure mitigation commitments are fulfilled. The benefits of an annual mitigation program consultation to the state include but are not limited to:

- Promoting dialogue between FEMA and the state on the means to achieve, support, and maintain effective state mitigation programs;
- Identifying the status of the state's mitigation program, including strengths and challenges, as well as specific needs and opportunities;
- Ensuring feedback to the state on maintaining continuous HMA grants management performance, particularly for states interested in developing an enhanced plan; and
- For states that currently have an approved enhanced plan, demonstrating continued mitigation capabilities, including HMA grants management performance, in advance of a plan update and not at the review of a five-year mitigation plan update.

During the consultation, topics of discussion will include, but are not limited to, status and specific needs for:

- Advancing implementation of the state mitigation strategy;
- Ensuring the state mitigation plan remains relevant over the approval period;
- Facilitating the plan update and approval process;
- Building mitigation capabilities through training, technical assistance, and partnerships with FEMA and other Federal agencies;
- Advancing local and tribal, as applicable, mitigation planning, including submitting approvable mitigation plans to FEMA; and

- Maintaining and/or improving mitigation capabilities, with particular attention to human resources and funding; and Maintaining and/or improving HMA grants management performance, including effectively using all available funding from FEMA mitigation programs.

After each consultation, FEMA will provide the state with a summary of the discussion. Appendix D of the State Mitigation Plan Review Guide is the Consultation Summary Template and is used for the FEMA Mitigation staff to prepare a summary of the discussion. FEMA will also document recommendations for improvements to the State Mitigation Program and any items that should be corrected or modified before the next state mitigation plan update. FEMA will not require a state mitigation plan update as a result of the consultation.

Florida values these annual consultations and appreciates the opportunity to provide proof of compliance and the opportunity to discuss issues and challenges between the State and FEMA.

The annual review documentation will also be included in annual reviews, reports, and updates completed by the State and will be considered during the five-year SHMP updates.

Five-Year Update

In addition to these annual progress reports and reviews, the SHMP will be updated every five years, in accordance with 44 CFR 201.4. The five-year updates are labor intensive and take several years to complete. As explained before, the 2018 SHMP update began in mid-2016. The Mitigation Planning Unit will follow the timeline below and will begin the 2023 SHMP update in mid-2021 to ensure adequate time to complete the update. Each section of the 2018 SHMP will be reviewed and updated accordingly.

Below is a timeline starting when the 2018 Update began and ending at the end of 2023 and includes annual and five-year update cycle actions.

Table 8 – State Hazard Mitigation Plan Update Timeline

Year	Task(s)
2016	• Quarterly Mitigate FL Meetings • Begin 2018 SHMP Update • FEMA Annual Consultation
2017	• Quarterly Mitigate FL Meetings • Continue 2018 SHMP Update • FEMA Annual Consultation
2018	• Quarterly Mitigate FL Meetings • Submit and receive SHMP approval • FEMA Annual Consultation • Prepare 2019 Mitigate FL 252.3655 Annual Report
2019	• Quarterly Mitigate FL Meetings • Conduct annual SHMP review • FEMA Annual Consultation • Prepare 2020 Mitigate FL 252.3655 Annual Report
2020	• Quarterly Mitigate FL Meetings

	• Conduct annual SHMP review • FEMA Annual Consultation • Prepare 2021 Mitigate FL 252.3655 Annual Report
2021	• Quarterly Mitigate FL Meetings • Conduct annual SHMP review • FEMA Annual Consultation • Prepare 2022 Mitigate FL 252.3655 Annual Report • Begin 2023 SHMP Update
2022	• Quarterly Mitigate FL Meetings • Continue 2023 SHMP Update • FEMA Annual Consultation • Prepare 2023 Mitigate FL 252.3655 Annual Report
2023	• Quarterly Mitigate FL Meetings • Submit and receive SHMP approval • FEMA Annual Consultation • Prepare 2024 Mitigate FL 252.3655 Annual Report

STATE MITIGATION STRATEGY SECTION

State Hazard Mitigation Plan Requirements
S8. Does the mitigation strategy include goals to reduce/avoid long-term vulnerabilities from the identified hazards [44 CFR §201.4(c)(3)(i)]
S12. Does the plan discuss the evaluation of the state's hazard management policies, programs, capabilities, and funding sources to mitigate the hazards identified in the risk assessment? [44 CFR §201.4(c)(3)(ii)]
S13. Does the plan generally describe and analyze the effectiveness of local and tribal, as applicable, mitigation policies, programs, and capabilities? [44 CFR §201.4(c)(3)(ii)]
S14. Does the plan describe the process to support the development of approvable local and tribal, as applicable, mitigation plans? [44 CFR §201.3(c)(5) and §201.4(c)(4)(i)
S16. Does the plan describe the process and timeframe to review, coordinate, and link local and tribal, as applicable, mitigation plans with the state mitigation plan? [44 CFR §201.3(c)(6), §201.4(c)(2)(ii), §201.4(c)(3)(iii), and §201.4(c)(4)(ii)]
E2. Does the plan demonstrate integration to the extent practicable with other state and/or regional planning initiatives and FEMA mitigation programs and initiatives? [44 CFR §201.5(b)(1)]
E3. Does the state demonstrate commitment to a comprehensive mitigation program? [44 CFR §201.5(b)(4)]
E5. Is the state effectively using existing mitigation programs to achieve mitigation goals? [44 CFR §201.5(b)(3)
E6. With regard to HMA, is the state maintaining the capability to meet application timeframes and submitting complete project applications? [44 CFR §201.5(b)(2)(iii)(A)]
E7. With regard to HMA, is the state maintaining the capability to prepare and submit accurate environmental reviews and benefit-cost analyses? [44 CFR §201.5(b)(2)(iii)(B)]
E8. With regard to HMA, is the state maintaining the capability to submit complete and accurate quarterly progress and financial reports on time? [44 CFR §201.5(b)(2)(iii)(C)]
E9. With regard to HMA, is the state maintaining the capability to complete HMA projects within established performance periods, including financial reconciliation? [44 CFR §201.5(b)(2)(iii)(D)]
RL.2 Did Element S8 (mitigation goals) address RL and SRL properties? [44 CFR §201.4(c)(3)(i) and §201.1(c)(3)(v)]
RL3. Did Element S9 (mitigation actions) address RL and SRL properties? [44 CFR §201.4(c)(3)(iii) and §201.4(c)(3)(v)]
RL4. Did Element S10 (funding sources) address RL and SRL properties? [44 CFR §201.4(c)(3)(iv) and §201.4(c)(3)(v)]
RL5. Did Element S13 (local and tribal, as applicable, capabilities) address RL and SRL properties? [44 CFR §201.4(c)(3)(ii) and §201.4(c)(3)(v)]

Mitigation Strategy

The State of Florida Enhanced SHMP Mitigation Strategy is to:

> *Reduce the impacts of all hazards within the State of Florida through effective administration of all mitigation grant programs and a coordinated approach to mitigation planning and floodplain management through federal, state, regional, and local initiatives.*

This mission also serves as the FDEM Mitigation Bureau mission and is the mission of the Mitigate FL interagency group.

Additionally, the Mitigation Bureau has a vision to:

> *Moke Florida a hazard resilient and resistant state.*

The content of this section discusses how the State of Florida accomplishes the Mitigation Program, including Florida's Mitigation Goals and Objectives and the mitigation capabilities of State, Non-Governmental, and Local agencies.

Goals and Objectives

Goals and objectives help capture the overall purpose of the plan and assist with determining possible new directions for hazard mitigation efforts. Setting goals and objectives ensures that the state is headed in the right direction when it comes to hazard mitigation planning by providing ways in which success can be measured. The goals and objectives below are intended to reduce long-term vulnerabilities. It is important that both the goals and objectives are reviewed regularly for continuing relevance to the state hazard mitigation strategy.

For the 2018 update, the Mitigate FL team felt it was important to develop working definitions of goals and objectives. This was done to explain the differences between the two and to provide a consistent measure when establishing the new goals and objectives. The following definitions were used:

- Goal: A broad, long-term vision that the state is working toward accomplishing with regard to hazard mitigation.
- Objective: The approach the state will take in order to achieve the goals.

The following list represents the newly revised goals and objectives by the Mitigate FL team for the 2018 Enhanced State Hazard Mitigation Plan and beyond. Further clarification of changes made from the 2013 Enhanced State Hazard Mitigation Plan can be found in *Appendix A: 2018 Revisions Log.*

Goal 1: Implement an effective comprehensive statewide hazard mitigation plan.

- Objective 1.1: Provide training opportunities and encourage staff to pursue professional development.
- Objective 1.2: Pursue methodologies that will enhance mitigation successes.

- Objective 1.3: Integrate mitigation practices throughout all state plans, programs, and policies.

Goal 2: Support local and regional mitigation strategies.

- Objective 2.1: Maintain up-to-date risk assessment information in coordination with local communities.
- Objective 2.2: Assist in integrating hazard mitigation concepts into other local and regional planning efforts such as comprehensive plans, local mitigation strategies, and comprehensive emergency management plans.
- Objective 2.3: Ensure that all communities are aware of available mitigation funding sources and cycles.
- Objective 2.4: Assist in the integration of climate change and sea level rise research into state, local and regional planning efforts.
- Objective 2.5: Conduct all possible actions to mitigate severe repetitive loss properties.

Goal 3: Increase public and private sector awareness and support for hazard mitigation in Florida.

- Objective 3.1: Work with other state and regional entities to incorporate mitigation concepts and information into their outreach efforts.
- Objective 3.2: Educate Florida's private sector about mitigation concepts and opportunities.
- Objective 3.3: Develop and integrate hazard mitigation curriculum into higher education.
- Objective 3.4: Educate state risk management entities on mitigation incentives.
- Objective 3.5: Support hazard mitigation research and development.

Goal 4: Support mitigation initiatives and policies that protect the state's cultural, economic, and natural resources.

- Objective 4.1: Support land acquisition programs that reduce or eliminate potential future losses due to natural hazards and that are compatible with the protection of natural or cultural resources.
- Objective 4.2: Support restoration and conservation of natural resources wherever possible.
- Objective 4.3 Seek mitigation opportunities that reduce economic losses and promote responsible economic growth.
- Objective 4.4: Retrofit existing state-owned facilities.
- Objective 4.5: Participate in climate change and sea level rise research that will further the state and local government's ability to plan for and mitigate the impacts of future vulnerability.
- Objective 4.6: Coordinate effective partnerships between state agencies for floodplain management.

State Agency Capability Assessment

Many departments, agencies, and private organizations perform roles valuable to state government disaster resistance efforts. Some seemingly unrelated programs are often complimentary to reducing the

human and economic cost of disasters. It is a goal of the Mitigate FL team and the State of Florida to educate its citizens (both public and private sectors) on the importance of mitigation. The state continually reaches out to residents and business groups concerning mitigation best practices, tips and how-to's. Training and education are essential to Florida's ability to respond to hazards and must remain a priority within the constraints of lower budgets. Public education reduces the burden on the state by increasing citizen capacity. The agency capability assessments included in this plan demonstrate Florida's comprehensive ability to mitigate hazards and guide development in hazard prone areas in accordance with policies and goals.

This section includes a review of pre- and post-disaster hazard management capabilities and development guidance offered through agencies' roles and programs.

As the main focus of this section is to discuss capabilities of state agencies specific to the State of Florida, during this 2018 plan update, the Mitigate FL team invited participating state agencies to identify and update their mitigation related capabilities. State agencies and their corresponding capabilities are outlined below.

The following agencies are discussed throughout (acronyms included to facilitate reading):

- Florida Division of Emergency Management (DEM)
- Florida Department of Agriculture and Consumer Services (DACS)
- Florida Department of Economic Opportunity (DEO)
- Florida Department of Education (DOE)
- Florida Department of Environmental Protection (DEP)
- Florida Department of Financial Services (DFS)
- Florida Department of Transportation (DOT)
- Florida Department of Veterans' Affairs (DVA)
- Florida Fish and Wildlife Conservation Commission (FWC)
- Regional Planning Councils (RPCs)
- State Board of Administration (SBA)
- Board of Governor's State University System (BOG SUS)
- Volunteer Florida (VF)
- Water Management Districts (WMDs)

Florida Division of Emergency Management

The State Emergency Management Act, outlined in *Appendix B: Governing Policies*, gives the Florida Division of Emergency Management (FDEM) responsibility to create and maintain a comprehensive statewide program of emergency management. Interagency cooperation is a key component of this responsibility. The statewide emergency management program must ensure that the state can adequately prepare for, respond to, recover from, and mitigate all hazards to which the state is vulnerable. FDEM prepares and implements a State of Florida Enhanced Hazard Mitigation Plan (SHMP), a Comprehensive Emergency Management Plan (CEMP), and Continuity of Operations Plan (COOP), just to name a few, and routinely conducts extensive exercises to test state and county emergency response capabilities.

The Division functions with five bureaus:

- Preparedness
- Response
- Recovery
- Mitigation
- Finance and Administration

While the other four bureaus are interlaced with mitigation holistically, the Bureau of Mitigation directly administers the mitigation planning and assistance programs. As such, the activities within the Bureau of Mitigation are the focus of this section. The Mitigation Bureau consists of five units described below:

- Hazard Mitigation Grant Program
- Non-Disaster Grants Programs
- Mitigation Finance Unit
- State Floodplain Management Office
- Mitigation Planning Unit

Additional information and detail of recent fund allocation for these programs can be found in the *Funding and Projects Section*. Recent projects funded by these programs are listed in *Appendix M: State Managed Projects*.

Hazard Mitigation Grant Program Unit

This unit administers the Hazard Mitigation Grant Program (HMGP). This program makes federal funds available post-disaster for mitigation projects in communities participating in the National Flood Insurance Program (NFIP) and that have an approved Local Mitigation Strategy (LMS). The overall goal of HMGP is to fund cost effective measures that reduce or eliminate the long-term risk of damage from natural hazards. Information about how HMGP money is distributed in Florida can be found in Appendix F: HMGP Administrative Plan.

Florida has an approved Enhanced State Hazard Mitigation Plan; therefore, FEMA provides 20 percent of total disaster costs from a presidentially-declared disaster specifically for mitigation projects, as opposed to the normal 15 percent under a non-enhanced plan. These funds have a 25 percent non-federal match requirement and are distributed as grants to affected communities. They are used to execute those mitigation projects identified in each county's respective LMS.

As a part of the Division's post disaster mitigation coordination efforts, the HMGP unit offers application development workshops to the affected areas. At these workshops, general information about the program and technical assistance is provided along with an opportunity to receive specific answers relating to potential applications. Since 2010, 23 in-person workshops and five state-wide webinar workshops have been held across six disasters.

- After Tropical Storm Debby, FEMA DR-4068, four in-person workshops for affected communities were held October-November 2012.

- After Hurricane Isaac, FEMA DR-4084, FDEM, one statewide webinar and two in-person workshops for affected communities were held April-May, 2013.
- After the Florida Severe Storms and Flooding event, FEMA DR-4183, one statewide webinar and four in-person workshops for affected communities were held January-February 2014.
- After the Florida Severe Storms, Tornadoes, Straight-line Winds, and Flooding event, FEMA DR-4177, one statewide webinar and four in-person workshops for affected communities were held November-December 2014.
- After Hurricane Hermine, FEMA DR-4280, one statewide webinar and four in-person workshops for affected communities were held February-March 2017.
- After Hurricane Matthew, FEMA DR-4283, one statewide webinar and five in-person workshops for affected communities were held March 2017.

Program Administration by States

The Program Administration by States (PAS) allows for FEMA to delegate its grant management responsibilities to States that have demonstrated a commitment to hazard mitigation and that have experience in the requested responsibilities. Within the HMGP Unit, these PAS responsibilities include reviewing project applications, completing benefit-cost analyses, approving scope-of-work modifications, and moving funds between applicable projects. This program gives Florida increased control and oversight over their projects and shortens the standard 24-month grant obligation timeline.

Allocations 27P-22

The Florida Administrative Code 27P-22 delineates how HMGP funding will be allocated after a major disaster declaration. The Rule explains that funding is to be allocated to counties, according to the amount of Public Assistance, Individual Assistance, and Small Business Administration loans allocated during a disaster response and recovery. The Rule is listed in *Appendix B: Governing Policies* for reference.

FEMA allocates 20% of Public Assistance, Individual Assistance, and Small Business Administration response and recovery funds for the HMGP. The available HMGP funds are allocated to the counties according to the Florida Administrative Code 27P-22.006. The Rule states that each county receives HMGP funds in the same proportion of the response and recovery costs. There are three tiers of HMGP funding in Florida. The first tier includes those counties which were impacted by a major disaster that was federally declared and the funding is allocated using the same proportion of response and recovery funds. If there is funding remaining after all eligible projects are funded, then the remaining funding is reallocated to those same counties that received the major disaster declaration whose allocation was not sufficient to fund all submitted eligible projects. Funding reaches the third tier if any remains and all counties, not only declared counties, are eligible to receive the funding.

Non-Disaster Grant Programs Unit

This unit administers the remaining grant programs outlined below.

Pre-Disaster Mitigation Program (PDM)

The PDM program is authorized is authorized by Section 203 of the Robert T. Stafford Disaster Relief and Emergency Act, as amended (Public Law 93-288) (42 U.S.C. 5133) and appropriated annually by the Consolidated Appropriations Act. It is a competitive federal grant program developed to assist state, local, and tribal governments to plan and implement cost-effective hazard mitigation activities. The intent of the program is to reduce overall risk to people and property while also minimizing the cost of disaster recovery. Only the state emergency management agency or a similar office assigned the primary responsibility of emergency management may apply to FEMA for funding under this program. FDEM reviews submitted planning and project applications to verify appropriateness, consistency with state and LMS plans, cost effectiveness, eligibility, technical feasibility and completeness before submitting them to FEMA.

Sub-applicants generally submit applications consisting of wind retrofit, drainage and generator projects. The program provides a maximum of $4 million per project in federal funding and a maximum of $400,000 for new mitigation plans; $300,000 for state/territory plan updates and $150,000 for single jurisdiction local/tribal mitigation plan updates. The program has a non-federal cost share requirement of 25 percent, all of which is assumed by the sub-applicant. All PDM projects are vital to meeting the state's primary goal of reducing the loss of life and property.

Funding availability, priorities and restrictions have varied since 2013; however, Florida will continue to utilize the maximum amount of PDM funding available and hopes that the program will remain in place in the future.

Flood Mitigation Assistance (FMA)

The FMA program is authorized Section 1366 of The National Flood Insurance Act of 1968, as amended (Pub. L. No. 90-448) (42 U.S.C. § 4104c) and appropriated annually by the Consolidated Appropriations Act. Since the last plan update, consistent with the legislative changes made in the Biggert-Waters Flood Insurance Reform Act of 2012, the three NFIP funded mitigation programs (Repetitive Flood Claims, Flood Mitigation Assistance and Severe Repetitive Loss) were consolidated into one single program; Flood Mitigation Assistance Program. The combined "National Flood Mitigation Fund" was to be funded at $90 million per year and has exceeded this amount in in FY 2015, FY 2016, and FY 2017. The new program simplifies and combines the three previous programs and includes the following elements:

- Encourages flood mitigation planning to be integrated into a community's multi-hazard mitigation plan.
- Adds demolition/rebuild (mitigation reconstruction) as an allowable mitigation activity under all programs.
- Caps the use of mitigation grant funds for mitigation planning activities at $50,000 to states and $25,000 for communities.
- Provides for denial of grant funds if not fully obligated in 5 years.
- Restructures the federal share requirement:
    - Up to 100 percent for severe repetitive loss structures (4 or more claims of over $5000 or 2 or more claims exceeding value of structure).

- Up to 90 percent for repetitive loss structures (2 claims over 10 years averaging at least 25 percent of the value of structure).
- Up to 75 percent for other approved mitigation activities.

It is this last piece that most interests Florida, as this change demonstrates an encouraging federal focus on mitigating properties that most frequently and severely experience flood damages. Florida has utilized the Flood Mitigation Assistance Program aggressively throughout the state, particularly in areas where severe repetitive loss properties are found. Obviously, the goal of the program is to reduce the risk of flood damage through building modifications, drainage projects, and floodplain management planning activities. FEMA's continued attempt to unify program elements such as eligibility, application requirements, and grant process guidance is admirable, and Florida looks forward to reducing vulnerability and strengthening resilience within communities through continued participation in this program.

Hurricane Loss Mitigation Program (HLMP)

The Hurricane Loss Mitigation Program (HLMP) is a state administered grant and receives $10 million annually from the Florida Hurricane Catastrophe Trust Fund (Ch. §215.559, Florida Statutes).

Three million dollars is allocated towards the purpose of retrofitting existing facilities that are used as public hurricane shelters. Each year the Division shall prioritize the use of these funds for projects included in the annual report of the Shelter Retrofit Report prepared in accordance with § 252.385(3). The Division is required to give funding priority to projects in regional planning council regions that have shelter deficits and to projects that maximize the use of state funds.

Up to $3.5 million is to be used to improve the wind resistance of residences through loans, subsidies, grants, demonstration projects, direct assistance, and cooperative programs with local and federal governments. The program is developed in coordination with the Advisory Council whose members consist of representatives from the Florida Association of Counties, the Florida Department of Insurance, the Federation of Manufactured Home Owners, the Florida Manufactured Housing Association, the Florida Insurance Council, and the Florida Home Builders Association.

$2.8 million is designated for the Mobile Home Tie-Down Program. Based on legislative directive the Florida Division of Emergency Management provides funding for mobile home tie-downs across the state, a program administered by Tallahassee Community College (TCC). By statute, TCC prepares a separate report for the Governor and the Legislature on these directives.

$700,000 is designated for Hurricane Research to be conducted by Florida International University (FIU) to continue the development of an innovative research of a full-scale structural testing to determine inherent weakness of structures when subjected to categories 1 to 5 hurricane-force winds and rain, leading to new technologies, designs and products.

Through partnering with local housing authorities and non-profit organizations, the Division has been able to promote wind mitigation and provide hazard mitigation upgrades to residents. Funded activities include retrofits, inspections, and construction or modification of building components designed to

increase a structure's ability to withstand hurricane-force winds. The Retrofit Program utilizes the Florida Building Code as its standard for all retrofitting.

Grant funds awarded under the HLMP qualify as state financial assistance under the Florida Single Audit Act. See Section 215.971, Florida Statutes. The Catalog of State Financial Assistance number (CSFA#) for HLMP is 31.066. Because the Legislature provides the Division with HLMP funds through the grants and aid appropriation category, eligible proposers under this request for proposal (RPF) include governmental entities, nonprofit organizations, and qualified for-profit organizations; individual homeowners are ineligible to apply.

Mitigation Finance Unit

The fiscal unit manages all financial aspects of pre and post-disaster mitigation grant programs. This unit has been strengthened in recent years to provide a more comprehensive tracking system for mitigation efforts statewide. Since the last plan update, the unit has implemented Floridamitigation.org, which tracks all project and financial information for the Bureau of Mitigation. For more information on project tracking and financial procedures, please see the *Funding and Projects Section*.

State Floodplain Management Office (SFMO)

The State Floodplain Management Office (SFMO) administers Florida's coordinated statewide floodplain management program through its direct contacts with other State agencies, regional entities such as the ten Regional Planning Councils and five Water Management Districts, and local government cities and counties. FEMA depends on each state's NFIP Coordinator to deliver the NFIP program to communities through conducting compliance reviews of local floodplain management regulatory programs, providing educational programs to enhance communities' knowledge of floodplain management best management practices and to address questions about NFIP flood insurance. The State NFIP Coordinator is the state's Floodplain Manager who represents state-level administration of flood disaster response along with the federal FEMA partner during federally-declared disasters when FEMA staff are deployed. The SFMO also serves an active role in assisting the FEMA's mapping contractors in Flood Insurance Rate Maps (FIRMs) update process, and state staff must review revisions or updates of all local government flood ordinances prior to the effective date of new flood maps. The Office encourages communities to adopt higher regulatory standards in flood ordinances to help them advance in the Community Rating System (CRS) which helps lower the cost of NFIP flood insurance premiums.

Through funding from FEMA's Community Assistance Program - State Support Services Element (CAP-SSSE), the Floodplain Office conducts Community Assistance Visits and Community Assistance Contact Interviews, and offers general technical assistance to Florida communities. Beginning in 2015 and running through 2017, Florida's State Floodplain Management Office implemented an innovative pilot program, approved by the Federal Insurance Management Administration (FIMA) Headquarters administrators, to offer all communities in Florida with NFIP policies the opportunity to participate in CRS to reduce and offset increases in premiums resulting from Congress passing the Biggert Waters Act of 2012. While only partially funded by the CAP-SSSE, the State forged ahead with accomplishing Community Assistance Visits (CAVs) with 208 communities not participating in CRS. It is unlikely that any state has conducted as many CAVs in so little time throughout the 50-year history of the NFIP. The pilot program has, as its primary

goal, substantially improved flood resiliency in communities that have not had the benefit of a CAV in many years if not decades. Many communities were able to correct NFIP floodplain management procedural problems and in exchange, are able to engage in a streamlined process to participate in CRS. The visits culminated in a far greater understanding of community floodplain management quid pro quo responsibilities which the communities agreed to assume when they originally joined the NFIP. The CRS/CAV Pilot Program achieved numerous unanticipated returns on investment, such as stimulating over 150 communities to adopt the state model flood ordinance which is coordinated with the Florida Building Code which uses the International Code Council's base code for buildings. Some 25 communities have already joined the CRS program and about 20 or more communities are working to participate in CRS once they resolve compliance matters and the State is able to close the CAVs. As a follow up to the pilot program, the State has funded the development of an evaluation report, which documents the value added gains achieved by the CRS/CAV Pilot Program. When the report is completed, it may serve as a model for use by FEMA and other States to improve flood resiliency and reduce the cost of NFIP flood insurance premiums through participation in CRS.

The SFMO supports FEMA's Map Modernization and Risk MAP processes throughout the state, and provides training for local officials. The training is conducted primarily through an agreement with the Florida Floodplain Managers Association (FFMA). For more information about work conducted under the most recent CAP-SS5E grants, please see *Appendix L: Outreach Record.*

NFIP Flood Insurance Policy Status

As of January 2018, Florida has 1,738,149 National Flood Insurance Program (NFIP) policies, equaling approximately 35 percent of all policies in the nation. Total premiums equal an annual amount of $950,483,682. These policies cover more than $423 billion in property. Florida has contributed to the NFIP fund an average over the past 40 years nearly 10 times the amount of premiums paid than the State has received in closed paid NFIP claims. As with much of the nation, flooding represents the most damaging natural hazard in the State. As of January 2018, Florida has 3,925 repetitive loss (RL) properties that have been mitigated and 14,887 RL properties that have not been mitigated. Moreover, there are 657 mitigated and non-mitigated properties that are considered severe repetitive loss (SRL). This demonstrates that a strong mitigation program is still necessary in Florida.

Florida currently has now 468 communities (local governments) that participate in the NFIP. There are an additional 10 listed on FEMA's Community Status Book (October 18, 2012) as non-participating with special flood hazard areas. The SFMO continues to enroll new communities with the expectation of increasing the 98 percent participation rate. In the five years since the last plan update (December 31, 2017), the state has enrolled 11 new communities in the NFIP. The newly enrolled communities are:

- Town of Altha, Calhoun County March 26, 2014
- City of Avon Park, Highlands County, November 18, 2015
- Town of Bristol, Liberty County, April 30, 2014
- City of Chiefland, Levy County, January 14, 2014
- Town of Estero, Lee County, March 30, 2015

- Town of Fort White, Columbia County, September 30, 2013
- Town of Greensboro, Gadsden County, December 23, 2013
- Town of Penny Farms, Clay County, March 17, 2014
- City of Sebring, Highlands County, November 18, 2015, and
- City of Williston, Levy County, January 2018
- Town of Loxahatchee Grove, Palm Beach County, January 2018.

The SFMO also promotes the enrollment of communities in the Community Rating System (CRS). CRS is a federal program that incentivizes improved floodplain management practices and public outreach in exchange for NFIP insurance premium rate reductions to policy holders in flood zones. The CRS organizes three broad category goals for which communities may earn credit points for advancing these goals. The main goals of the CRS program are to reduce flood risk/damage, encourage the purchase of NFIP flood insurance, and pursue a broad approach to enhancing floodplain management. As of January 2018, Florida has 240 communities enrolled in CRS, which is a 51 percent participation rate. More information can be found in Appendix F: NFIP Policy Statistics.

Repetitive Loss Strategy

The State of Florida Division of Emergency Management has a comprehensive mitigation program that includes addressing repetitive loss properties in the state. Several of the SHMP goals refer to actions taken to reduce RL properties and four units work with communities on different aspects of RL properties. The Mitigation Planning Unit works with communities from a planning and strategy perspective. The CRS Initiative works with communities to identify Repetitive Loss Areas, and assists CRS communities in gathering repetitive loss information from FEMA. The SFMO unit works with communities to identify projects and assist with planning and strategy. The Grants unit works with communities that apply for PDM and FMA grants. Particularly the FMA program focuses on mitigating RL properties to reduce or eliminate claims to the NFIP.

Repetitive Loss (RL) Properties are defined by FEMA in the National Flood Insurance Program (NFIP) as an NFIP-insured structure that has had at least two paid flood losses of more than $1,000 each in any 10-year period since 1978. Similarly, Severe Repetitive Loss (SRL) Properties are NFIP-insured residential properties that meet either of the following criteria since 1978:

- At least four NFIP claims payments over $5,000 each and the cumulative amount of such claims payments exceeds $20,000; or
- At least two separate claims payments with the cumulative amount of such claims payments exceeding the market value of the buildings.

For either scenario, at least two of the referenced claims must have occurred within any 10-year period and must be separated by a period of greater than 10 days[9].

Goals and Objectives

[9] https://www.fema.gov/national-flood-insurance-program/definitions

The State of Florida considers mitigating RL and SRL properties to be of importance and value. One of the objectives of the SHMP is directly related to SRL properties. Goal 2 states that Florida will support local and regional mitigation strategies and Objective 2.5 states that Florida will conduct all possible actions to mitigate severe repetitive loss properties. The Bureau supports this objective by encouraging and supporting local communities with outreach, education, and planning assistance to mitigate their RL and SRL properties.

Other goals and objectives refer indirectly to the mitigation actions that lead to the reduction of claims to the NFIP. Goal 3 is to increase the public and private sector awareness and support for hazard mitigation in Florida and Objective 3.1 states that Florida will work with other state and regional entities to incorporate mitigation concepts and information into their outreach efforts. Again, FDEM supports this with planning assistance and encouraging local communities to conduct outreach to their RL and SRL properties.

Goal 4 states that Florida will support mitigation initiatives and policies that protect the state's cultural, economic, and natural resources. Objectives 4.1, 4.2, and 4.3 refer to mitigation actions that would reduce or eliminate claims to the NFIP, thereby reducing RL and SRL properties. The objectives support land acquisition programs, restoring and conserving natural resources, and seeking mitigation opportunities that reduced economic losses and promotes responsible economic growth.

FDEM Support and Actions

The Mitigation Planning Unit is responsible for reviewing and approving county Local Mitigation Strategy (LMS) plans. There are two elements required by FEMA and Florida to be in county LMS plans regarding RL properties. FEMA requires that the LMS plan addresses NFIP insured structures within the jurisdiction that have been repetitively damaged by floods. The State of Florida further requires that the LMS plan describe the type and number of FEMA repetitive loss properties within each jurisdiction.

Additionally, if a community participates in the CRS program and they have one or more repetitive loss properties in their community, there are extra steps the community must take and there is a particular emphasis on communities with 50 or more RL properties. For example, these communities must review and update their repetitive loss properties list each year and map repetitive loss areas. The review of the RL properties list must include a review of all historical damage to buildings, including all repetitive loss properties and all properties that have received flood insurance claims payments or have had an estimate of potential damage and dollar losses to vulnerable structures. The communities must also determine and describe the cause of the losses in the RL areas. Furthermore, communities must conduct annual outreach to the property owners or residents in the RL areas regarding that they are in an RL area or an area that has historical flood losses, the availability of flood insurance in their community, various retrofitting and property protection techniques, and the available funding sources to help pay for the mitigation actions.

The Florida CRS Initiative is managed by the State at FDEM, formerly within the Special Project's Team, and now within the Mitigation Bureau and State Floodplain Management Office. CRS staff assist communities with new applications to join CRS, modifications for improved floodplain management programs, recertification to remain in the program, and conduct training throughout the state. In addition to the elements listed above that must be included in the county LMS plan to satisfy the Repetitive Loss

prerequisites of the CRS program, communities can earn additional credit points for their CRS rating through acquisition and relocation projects and other flood protection projects like elevation.

The SFMO, within the Mitigation Bureau also supports the RL and SRL property by assisting and encouraging communities to address their RL properties during their routine CAV's.

Funding Options

Communities and their residents can pursue many options for funding assistance for mitigation projects. States, Tribes, and Local governments can apply for all three of the FEMA mitigation grants. The FMA program is aimed at mitigating flood damaged properties to reduce or eliminate claims under the NFIP.

The PDM program can assist communities with implementing a sustained pre-disaster natural hazard mitigation programs to reduce overall risk to the populations and structures from future hazard events, while also reducing the reliance on Federal funding from future disasters. While the FMA program provides funding for flood mitigation, the PDM program can fund projects targeting other hazards, such as high winds and wildfires.

HMGP is only available to a community after it has experienced a federally declared disaster. The program is intended to ensure that the opportunity to take critical mitigation measures to reduce the risk of loss of life and property from future disasters is not lost during the reconstruction process after a disaster in a community.

After a federally declared disaster, Congress may appropriate funds to be used in HUD's CDBG – Disaster Recovery Program to provide flexible grants to help communities recover after federally declared disasters, particularly in low-income communities[10].

Common mitigation actions and projects include:

- Acquisition and Demolition
- Relocation
- Mitigation reconstructions
- Structure elevation
- Dry flood-proofing of non-residential and historical residential structures
- Minor localized flood reduction projects (drainage projects)
- Structural retrofitting

Mitigation Planning Unit

The Mitigation Planning Unit is primarily responsible for reviewing and approving Local Mitigation Strategy (LMS) plans and for updating the State Hazard Mitigation Plan (SHMP).

Since 2008, the Mitigation Planning Unit has grown to four full-time planning positions, and planners have been able to fully assist local communities in their LMS efforts. This includes 5-year updates to Florida's

[10] https://www.hudexchange.info/programs/cdbg-dr/

67 LMS plans as well as annual updates required by Florida Administrative Code 27P-22 (more information about 27P-22 can be found in *Appendix B: Governing Policies*).

The Mitigation Planning Unit is also responsible for reviewing:

- Disaster Resistant University (DRU) Plans (LMS plans developed for colleges or universities).
- Mitigation components of other plans such as local Comprehensive Emergency Management Plans (CEMP) and various state strategies.
- Floodplain Management Plans.
- Planning criteria of submitted mitigation grant projects.

The Mitigation Planning Unit also:

- Works with FDEM Mitigation Bureau Grant Units on outreach activities and local partnerships.
- Works with SFMO on the integration of floodplain management concepts, plans and practices into other planning mechanisms.
- Coordinates and teaches mitigation trainings across the state.

FEMA has delegated LMS plan review and approval responsibilities to Florida through PAS. As stated before, this designation is given to states that have demonstrated a commitment to hazard mitigation and that have experience in requested responsibilities. The Mitigation Planning Unit is authorized to review, require revisions, and approve the required LMS plans on FEMA's behalf. FEMA conducts an audit review for every ten plans that FDEM submits to FEMA.

In 2017, Florida Statute 252.3655 went into effect requiring the natural hazard interagency workgroup. The statute also required that a position within FDEM be created to be the coordinator of the workgroup. As explained before, the Natural Hazards Interagency Workgroup was combined with the SHMPAT and the Silver Jackets team to form the Mitigate FL group. A new SHMP Coordinator position at FDEM was placed within the Mitigation Planning Unit and is responsible for the Mitigate FL group and for updating the SHMP.

The three aspects of the Mitigate FL group are valuable and important. The natural hazards interagency workgroup will allow for stronger relationships between state agencies, which will lead to a stronger mitigation program. The Mitigate FL team assists the Mitigation Planning Unit with updates to the plan and helps to ensure stakeholder involvement and input in the plan. The Silver Jackets team offers opportunities for partnerships between state and federal agencies regarding mitigation projects across the state.

Enhanced Mitigation Program Capabilities and Validation

Florida is currently managing six disasters under Program Administration by States (PAS). According to the most recent FEMA Annual Consultation, all applications sent from Florida are quickly determined complete.

According to the 2016 and 2017 FEMA Annual Consultations, all Non-Disaster applications are quickly determined to be complete. All Non-Disaster progress and financial reports are complete and submitted on time. Florida successfully closed two grants in the review period.

Additionally, the 2016 FEMA Annual Consultation Summary states that environmental requirements are almost always complete and when there is an incomplete package, Florida has been very responsive and request for information (RFI's) have not gone beyond the informal first request. Additionally, all HMGP progress and financial reports have been completed upon submittal and only one extension was required. Florida successfully closed one grant in the review period and four more have been closed since then.

All HMA projects have been completed within the performance periods. Additionally, most Periods of Performance (POPs) have been extended in accordance with requirements. FEMA has not had an audit finding regarding POPs since 2012.

Florida Department of Agriculture and Consumer Services

Florida Forest Service

Through Chapter 590 of the Florida Statutes, the Florida Forest Service (FFS) is given the primary responsibility for "prevention, detection, and suppression of wildfires (any vegetative fire that threatens to destroy life, property, or natural resources) wherever they may occur." This includes the state's entire 34 million acres of both private and public land. The FFS is also responsible for authorizing all outdoor burning within the State of Florida (Florida Statutes, 590.125).

FFS uses many tools to communicate information to residents and visitors. Information is constantly supplied to various media sources locally and from the state level to inform the public of current wildfire conditions, wildfire suppression progress, actions homeowners can take to lower risk, and FFS activities.

In 2011, FFS completed a state-wide wildfire hazard mitigation plan to serve as an annex to the SHMP. The wildfire annex has been appended to the 2018 SHMP as *Appendix G: Wildfire Hazard Mitigation Plan Annex*, and contains valuable information for communities across the state. In addition to creating the annex, FFS recently updated its publication titled Wildfire Risk Reduction in Florida: Home, Neighborhood, and Community Best Practices, which explains many wildfire mitigation strategies homeowners can implement to keep their homes safe. More wildfire risk reduction information is also posted on the FFS website at www.floridaforestservice.com.

The FFS wildfire mitigation program has two major components designed to reduce risk throughout the state, Fuel Reduction and Information and Education. Programs are coordinated locally through the mitigation specialists located in FFS field offices.

Fuel Reduction

FFS uses prescribed fire and mechanical methods to reduce fuel loading on public and privately owned lands. This reduces wildfire size and intensity. The FFS also provides technical assistance to communities contracting for fuel reduction and is often able to provide fuel reduction activities at little or no cost to homeowners. The FFS has four regional Fire Management Teams equipped to provide fuel reduction services. Local FFS field units also have this capability.

In many areas, pre-suppression fire lines can reduce residential wildfire risk. Well-maintained fire lines significantly reduce chances wildfire will reach populated areas as well as reduce time needed to contain a wildfire. This helps ensure the most effective and efficient use of resources. FFS provides this service to landowners at specified rates.

Information and Education

The FFS information and education component has several facets:

- The Florida Firewise Communities Program: This program is a part of the National Fire Protection Association Firewise Communities USA Recognition Program. It is intended to educate residents on their responsibility to help prevent community wildfires. Homeowner workshops and field visits teach homeowners how to increase their home's chances of surviving a wildfire disaster, even if fire services cannot get to them. Communities that adopt and implement Firewise principles are encouraged to pursue recognition as part of Firewise Communities USA.
- Community Wildfire Protection Plan (CWPP): Communities, defined as a "group of residents," are brought together to develop and initiate a CWPP. These groups need representation from the local governing body (e.g., county officials), the local fire service, and FFS. To ensure that the plan is representative of local needs, other stakeholders are invited to participate in the development of the CWPP. These planning groups often involve Local Mitigation Strategy (LMS) members.
- Wildfire Risk Assessments: Local FFS field units help communities develop a wildfire risk assessment, which incorporates information generated by the Fire Risk Assessment System. This informs the community of actions they can take to lower their overall risk.
- Wildfire Prevention Program: Since over 75 percent of wildfires in Florida are human caused, FFS has an active wildfire prevention program. Television, newspapers, radio, billboards, movie theaters, and local flyer distribution are used.
- Policy Changes: FFS field units work with local governing bodies and LMS groups to change or institute local comprehensive plans, ordinances, and codes that encourage actions and strategies lowering wildfire risk.

Additional information about the programs and services provided by FFS can be found on the web at www.floridaforestservice.com.

Florida Wildland Fire Risk Assessment System (FRAS)

The purpose of the Florida Wildland Risk Assessment is to identify the potential for serious wildfires and prioritize areas for mitigation options. As of December 2012, the FRAS has been updated to include a new canopy layer and to have the ability to reflect current conditions. There have been no updates as of 2016 to this data.

The State of Florida is currently in the process of working with 12 other states to implement an online program that will allow fire managers and the general public to not only access these data, but produce reports based on the data for any size area within the state. This will be very helpful for Florida's counties when working on their fire prevention plans. Results can be used to:

- Locate opportunities for interagency planning.
- Identify opportunities for wildfire mitigation measures.
- Facilitate communication among agencies to better define priorities and improve emergency response to wildfires.
- Develop a refined analysis of a complex landscape using GIS.
- Facilitate communication with local residents to address community priorities and needs.

Florida Department of Economic Opportunity

The Department of Economic Opportunity (DEO) serves as the designated lead coordinating agency for state planning, housing and community development and workforce services related issues. Many of its programs and activities directly and indirectly reduce exposure to disasters. Coordination between divisions and programs of DEO are integral to development and implementation of a statewide mitigation plan. DEO also serves in a supporting role for ESF 6-Mass Care and ESF 14-Public Information and is the lead agency for ESF 18-Business Industry and Economic Stabilization.

A primary goal of the DEO is to ensure that its associates and partners are prepared to respond to emergencies, recover from them, and to mitigate their impact. Threat assessments of various emergency situations that could possibly impact DEOs staff and programs have been conducted. These assessments are useful in determining possible risks, severity of damage, and occurrence probability. Consequently, DEO developed procedures and established standards for enhancing safe, secure, and healthy workplace practices for its associates and visitors.

The Business Continuity Management Program under DEO provides a resilient framework that will allow business operations to continue under adverse conditions. It will also allow for rapid return to normal operations in the event of a minor interruption or major disaster.

DEO reviews most comprehensive plans and Florida Statute 163.3178(2)(d) requires that the Coastal Management Element of the local comprehensive plan contain a component which outlines policies for hazard mitigation and protection of human life against the effects of natural disasters, including population evacuation, which take into consideration the capability to safely evacuate the density of the coastal population proposed in the Future Land Use Element in the event of an impending natural disaster. In 2015, the Legislature amended section 163.3178(2)(f), Florida Statutes, related to the redevelopment component of the Coastal Management Element to require that it include development and redevelopment principles, strategies, and engineering solutions that reduce the flood risk in coastal areas which results from high-tide events, storm surge, flash floods, storm water runoff, and the related impacts of sea-level rise.

For the last several years, the Division of Community Development has been working with planning and emergency management officials to understand how Florida's communities are implementing hazard mitigation principles and whether these principles in each Local Mitigation Strategy (LMS), Comprehensive Emergency Management Plan (CEMP), Post-Disaster Redevelopment Plan (PDRP), and Long-Term Recovery Plan have been incorporated into local comprehensive plans.

DEO works closely with FDEM, contributing extensively to ongoing mitigation initiatives both directly and indirectly. The Bureau of Community Planning and Growth supports the State Hazard Mitigation Plan's goals and objectives through many programs and initiatives including:

- Adaptation Planning
- Coastal Zone Management consistency reviews under the Federal Coastal Management Program
- Assistance with Coastal Management Planning, including coastal redevelopment planning to reduce the risks of coastal flooding and the related impacts of sea level rise
- Hazard Mitigation Planning
- Military Base Encroachment Planning
- Post-Disaster Redevelopment Planning
- Waterfronts Florida Partnerships

The Division of Community Development (DCD) at DEO has been very successful in promoting mitigation throughout Florida. Several successful products and initiatives that DCD has prepared, or partnered on, in recent years are listed below.

- Post-Disaster Redevelopment Planning: A Guide for Florida Communities
- Post-Disaster Redevelopment Planning: Addressing Adaptation during Long-term Recovery
- Protecting Florida Communities: Land Use Planning Strategies and Best Development Practices for Minimizing Vulnerability to Flooding and Coastal Storms
- Wildfire Mitigation in Florida: Land Use Planning Strategies and Best Development Practices
- Wildfire Risk Reduction in Florida: Home, Neighborhood, and Community Best Practices
- Guiding the Way to Waterfronts Revitalization: Best Management Practices
- Disaster Planning for Florida's Historic Resources
- Disaster Mitigation for Historic Structures: Protection Strategies

Community Resiliency

In 2012, the Department kicked-off a five-year project to integrate adaptation to potential sea level rise into current planning mechanisms including the local comprehensive plan, local hazard mitigation plan and post-disaster redevelopment plan. This effort is steered by a focus group of statewide experts on planning for sea level rise adaptation and stakeholders in the coastal area. DEO researched similar efforts in other states as well as how the "Adaptation Action Area" may be implemented at the local level. DEO subcontracted with the South Florida Regional Planning Council to train staff in the other nine regional planning councils in Florida to assist local governments in developing data to be used to plan for adaptation and planning to address coastal flood risks. DEO then piloted adaptation planning projects in the state and is compiling all lessons learned from the projects to be used for statewide outreach.

Waterfronts Florida Portnership Program

The Florida Coastal Management Program created the Waterfronts Florida Partnership Program in 1997 to address the physical and economic decline of traditional working waterfront areas. Waterfronts Florida continues as a coastal technical assistance program of DCD.

Waterfronts Florida provides technical assistance and training to designated communities as well as other coastal communities involved in the revitalization of working waterfronts. To be designated by DEO as a Waterfronts Florida Community, a community must create a vision and action plan for waterfront revitalization targeting environmental and cultural resource protection, public access, economic health, and hazard mitigation. They must also demonstrate formal support from local governments and form a local committee of stakeholders in the community, including property and business owners, to serve as the steering committee for the effort.

Technical assistance is delivered to communities through special projects, visioning assistance, webinars, one-on-one meetings and Program Meetings that occur twice a year in a designated community, featuring guest speakers on topics important to working waterfronts and coastal communities.

DEO recognizes that resiliency and hazard mitigation are important components of this program, as they collectively comprise one of the four identified priorities. Several resources have been prepared for Waterfronts Florida Communities focused on how to become more resilient to coastal flooding and storm surge. Furthermore, DEO has begun to integrate aspects of adaptation planning for sea level rise into the technical assistance offered to communities.

Areas of Critical State Concern

The Area of Critical State Concern program in DCD provides oversight and assistance to local governments that have been recognized by the Florida Legislature as having resources of statewide significance through a designation as an Area of Critical State. The following areas have been designated: Big Cypress Swamp (located in portions of Collier, Dade, and Monroe County); the Green Swamp (portions of Lake and Polk County); Apalachicola Bay (currently the City of Apalachicola in Franklin County); the Florida Keys Area (unincorporated Monroe County, Marathon, Layton, Key Colony Beach, and Islamorada); and the City of Key West Area.

Within these areas (other than the Big Cypress Area), staff reviews comprehensive plans, land development regulations, environmental resource permits, and development orders for consistency with applicable statutes and rules. Staff provides technical assistance regarding planning matters including hurricane evacuation and mechanisms to implement and improve hazard mitigation and address coastal flood risks.

GIS Resources

DCD maintains and updates DEO's geographic information system (GIS) database. Planners use it to evaluate flood and hurricane hazards in land use plan amendments and local government approved Developments of Regional Impact (DRIs). The GIS unit maps are also used during regulatory reviews of comprehensive plan amendments and DRIs. The system also provides planners with storm surge zone and floodplain information and can be used to evaluate the Statewide Hurricane Evacuation Studies.

Division of Community Development, Bureau of Community Planning and Growth

The Bureau of Community Planning and Growth has three regional planning teams responsible for conducting reviews of comprehensive plans and plan amendments, DRIs, Florida Quality Developments, sector plans, rural land stewardship areas, and university campus master plans. The Bureau staff also

reviews development agreements and assists with challenges to local comprehensive plan amendments and land development regulations to ensure consistency with existing comprehensive plans, including inherent hazard mitigation policies. This service supports local governments and ensures compliance with state law.

In 2015, the Legislature used the Community Planning Act to highlight the significance in reducing the flood risk in coastal areas resulting from high-tide events, storm surge, flash floods, storm water runoff, and the related impacts of sea-level rise.

The Coastal Management Element of the comprehensive plan sets forth policies to fulfill these legislative directives. Requirements for the Coastal Management Element state that the future land use map series recognize hurricane evacuation routes and identify Coastal High Hazard Areas (CHHA). The CHHA is the Category 1 storm surge zone as defined by the Sea, Lake and Overland Surges from Hurricanes (SLOSH) Model. Section 163.3177(6)6., Florida Statutes, requires local governments to limit public expenditures that subsidize development in coastal high hazard areas. Many local comprehensive plans have objectives and policies, which limit or restrict residential density, the type of development allowed, establish special building requirements, and that limit the use of public funds within the CHHA.

To implement the 2015 statutory requirements related to the risks of coastal flooding, DEO is providing technical assistance to local governments that are developing comprehensive plan goals, objectives, and policies to address the new statutory requirements. In addition, through its Community Planning Technical Assistance Grant program, and following up on the adaptation planning data gathered under the Coastal Resiliency Program, DEO has provided technical assistance grants to two municipalities and one regional planning council to prepare comprehensive plan goals, objectives and policies consistent with the requirements of section 163.3178(2)(f), Florida Statutes, to use as models for other local governments in the state.

Future land uses and amendments are based in part on land use suitability, which is in turn affected by environmental constraints, transportation, housing, water and sewer, park and open space impacts, and hazard suitability (vulnerability to natural disaster). Pursuant to Section 380.06(30), Florida Statutes, adopted in 2015, DRI review is no longer required for proposed large-scale developments that would otherwise be subject to the DRI review requirements in Section 380.06, Florida Statutes. Instead, they are reviewed through the comprehensive plan amendment process if a comprehensive plan amendment for the proposed development is required. For existing DRIs, staff in the Bureau of Community Planning and Growth identifies the state impacts of large-scale developments (DRIs) and makes recommendations to local governments to approve, suggest mitigating measures, or not approve modifications to such developments. For existing DRIs, the process provides for the incorporation of hazards data and may result in recommendations that hazard mitigation conditions be attached to the development order. For proposed new DRI-sized projects for which a comprehensive plan amendment is required, Bureau staff may also recommend hazard mitigation conditions for the proposed development.

Competitive Florida Partnership

The Competitive Florida Partnership in the Bureau of Community Planning and Growth consists of grants and technical assistance provided to local governments toward the creation and implementation of an

economic development strategic plan. In promoting a comprehensive approach to economic development, the Partnership supports the inclusion of disaster resilience strategies within community plans.

Florida Department of Education

Office of Educational Facilities

The mission of the Office of Educational Facilities within the Florida Department of Education (DOE) is to provide technical support and information for issues related to education facility planning, funding, construction, and operations throughout Florida's K-20 Education System. The Office of Educational Facilities distributes authorized state funds for construction. The Office is also responsible for maintaining State Requirements for Educational Facilities. These include planning, funding, contracting, maintenance, and facility operations. Construction building code requirements are through the Florida Building Code (DEO) and the Florida Fire Prevention Code (State Fire Marshal).

The activities of DOE apply pre- and post- disaster by mitigating damage to education facilities. These facilities often double as shelters in times of disaster.

Florida Department of Environmental Protection

The Florida Department of Environmental Protection (DEP) is the lead state agency for environmental protection, resource management, and stewardship. The department administers regulatory programs and issues permits for air, water, and waste management. It also oversees the state's land acquisition and water management programs. DEP additionally manages the Florida Park Service. The key agency activities discussed below are applicable in both pre- and post-disaster situations.

Division of Water Resource Management

The Division of Water Resource Management is responsible for protecting the quality of Florida's drinking water, rivers, lakes, wetlands, and beaches. It is also responsible for reclaiming lands once mined for minerals. The Division establishes the technical basis for setting surface and groundwater quality standards. It additionally implements a variety of programs to monitor the water resource quality. The following programs under the Division of Water Resource Management have hazard mitigation implications.

Florida Dam Safety Program

The Florida Dam Safety Program (FDSP) receives a grant administered by FEMA to conduct some of the National Dam Safety Program (NDSP) activities. The purpose of the NDSP is to reduce the risks to life and property from dam failure in the U.S.

Dam safety in Florida is a shared responsibility among DEP, the regional water management districts, United States Army Corps of Engineers (USACE), local and regional governments, consultants, and private dam owners to assure the safety of dams and related structures. This effort is overseen by the State of Florida Dam Safety Officer, DEP, Division of Water Resource Management, Engineering, Hydrology, and

Geology Support Section. The State Dam Safety Officer implements the FDSP activities and serves as the State representative to the Association of State Dam Safety Officials (ASDSO).

Florida State regulations on dam safety include the Florida Statutes (Part IV Chapter 373, which is further discussed in *Appendix B: Governing Policies*) and can be found in the Florida Administrative Code for the management and storage of surface water. Under the above statute, Environmental Resources Permits (ERP) are required for all new dam construction and for modification or removal of any existing dams. Additional guidance on Minimum Requirements for Earthen Dams used in Phosphate Mining and Beneficiation Operations and for dikes used in Phosphogypsum stack system impoundments are available under Florida Administrative Code (FAC) Ch. 62-672.

The NDSP provides assistance to the states to establish, maintain, and improve an effective state dam safety program for activities such as the development of regulatory authority for the design, construction, and maintenance of dams; the undertaking of dam inspections; and the development of Emergency Action Plans (EAPs) for dams.

In December of 2010, the FDSP published a guide for dam owners and operators entitled "Emergency Action Plan (EAP) Template for Dams in Florida and Instructions for Developing Emergency Action Plans." A key responsibility of the FDSP is to update the state dam inventory (which is the source of the USACE's National Dam Inventory of Florida dams), review draft EAPs, and implement activities to meet the NDSP goals. The current goals include:

- Reducing the likelihood of dam failures.
- Reducing the potential consequences resulting from dam failure.
- Promoting research and training for state dam safety personnel and other professionals.

Florida's State Floodplain Manager has developed a working relationship with the State Dam Safety Officer to investigate a more coordinated understanding of Florida's dams, and their potential risk to surrounding communities. The DEP is an active member of the Mitigate FL group.

Submerged Lands and Environmental Resource Coordination Progrom

The Submerged Lands and Environmental Resource Coordination Program (ERP) regulates the construction, alteration, maintenance, operation, removal, and abandonment of storm water management systems, dams, impoundments, reservoirs, works (including dredging, filling, and construction in wetlands and other surface waters), and appurtenant works under Part IV of Chapter 373, F.S. It also processes related authorizations for requests to use sovereignty submerged lands under Chapter 253, F.S., and, if within an aquatic preserve, Chapter 258, F.S.

The program has flood mitigation implications because it addresses both storm water runoff quality and quantity (i.e. storm water attenuation and flooding of other properties).

The ERP program, which is implemented by DEP and the five water management districts, regulates the above activities for the protection of water quality, to prevent flooding, and draining of lands and water resources, and to ensure system structural integrity of constructed systems. The program also provides for post-storm emergency permitting to repair or restore damaged systems.

Bureau of Beaches and Coastal Systems

The Division of Water Resource Management also oversees activities affecting Florida's beaches, coastal systems, and sovereign submerged lands along the Atlantic Ocean, Gulf of Mexico, and Straits of Florida. These activities include the restoration and management of critically eroded beaches, safeguarding of the beach and dune systems, and determining shoreline conditions and trends.

The Beaches Programs consist of four interrelated programs: Coastal Construction Control Line Permitting (CCCL), Beaches Inlets & Ports Permitting, Beaches Field Services, and Coastal Engineering. The CCCL program regulates construction seaward of the coastal construction control line to protect the beach and dune system and to ensure that upland construction will withstand storm events to the maximum extent possible. CCCL also reviews temporary post-storm coastal armoring for its long-term impact on the beach and dune system. The Beaches, Inlets & Ports Program regulates erosion control activities that may affect the sandy beaches. The program also regulates activities associated with dredging at the state's 14 seaports.

The Beaches Field Services and Coastal Engineering Programs work in support of the other programs' regulatory functions, providing data, analysis, and compliance coordination. All of the Beaches programs collectively respond to emergency beach stabilization requests, resource evaluations, and storm response.

The Beach Management Funding Assistance Program is administered through DEP's Division of Water Restoration Assistance and administers grant funding provided by the Legislature for beach restoration, erosion control and inlet management activities.

Division of State Lands

The purpose of the Division of State Lands is to:

- Acquire, administer, and dispose of state lands owned by the State Board of Trustees of the Internal Improvement Trust Fund.
- Administer, manage, and maintain the records of all such lands.
- Administer and maintain the state geodetic survey requirements.
- Identify and set ordinary and mean high water boundaries for purposes of sovereignty and land title.

Florida Forever Program

In 1999, the Florida Legislature enacted the Florida Forever Program for the acquisition of lands, water areas, and related resources for outdoor recreation and natural resource conservation purposes. Florida Forever succeeded the Preservation 2000 program, and both programs have acquired and preserved more than 2.5 million acres of land.

The public acquisition of land and conservation easements avoids future developments in timberlands, wetlands, and coastal areas, which in turn reduces or eliminates potential impacts of wildfire, flooding, and coastal storms. Florida Forever also funds acquisition of in-holdings and additions to already existing

conservation lands, the Florida Recreation Development Assistance Program (FRDAP) grant program, the Florida Communities Trust (FCT) grant program, the administration of the Stan Mayfield Working Waterfronts (SMWW) grant program within FCT, and the Rural and Family Lands Protection program (within the FFS).

Florida Geological Survey

The Florida Geological Survey (FGS) has a mission and work plan that shares the common vision and mission of DEP. FGS has additional directives mandated by the Florida Legislature (Section 377.075, Florida Statutes), which include periodically reporting survey progress, findings, and analyses. It also provides technical assistance to the general public, industry, and other local, state, and federal agencies. An FGS project that has hazard mitigation implications is the mapping of depressions, which may be used to support or update the existing map of sinkhole type, development, and distribution in Florida (see FGS Map Series No. 110).

FGS and FDEM partnered in 2013 on a grant from FEMA to map the favorability of sinkholes in the state. The study began with three test sites in the state and was expanded to several counties. The resulting map shows general favorability of an area for sinkhole development. The report and data are included as *Appendix H: Sinkhole Report.*

Additional FGS geologic information that has natural hazard mitigation implications includes reports on spring sheds, aquifer vulnerability and subsurface mapping, earthquakes, and flood control.

Florida Coastal Management Program (FCMP)

The Florida Coastal Management Program (FCMP) is the unit of DEP responsible for maintaining and updating a program based on existing Florida statutes and rules and submitting applications to the National Oceanic and Atmospheric Administration (NOAA) to receive funds under the Coastal Zone Management Act. FCMP allows for federal consistency reviews by state agencies; participation in a program to secure competitive federal funds for acquisition of coastal properties to reduce adverse land use and environmental impacts in the state coastal zone; and sub-grant funding of planning initiatives. For more on FCMP's funding efforts, please see the Coastal Partnership Initiative (CPI) Grant Program information in the *Funding and Projects Section*.

Florida Department of Financial Services

The Florida Department of Financial Services (DFS) is responsible for overseeing the state's finances, collecting revenue, paying state bills, Insurance fraud investigations, auditing state agencies, regulating cemeteries and funerals, and handling fires and arsons. DFS has 15 divisions, two of which apply to mitigation: Division of Consumer Services and Division of State Fire Marshal. The Bureaus and programs listed below are within one of the two previously mentioned divisions.

Consumer Outreach

The Division of Consumer Services offers programs on a variety of topics that inform Florida consumers about insurance and financial issues in an effort to help them make informed decisions; and to serve as a

resource for information before and after disasters. Principle among them for mitigation purposes are Hurricane Preparedness Materials that appear on their webpage.

Disaster Response

The Division has a Disaster Preparedness webpage[11] that contains up to date information about storm recovery and mitigation. The page provides up to the minute alerts concerning insurance information. It additionally provides links to useful resources, information concerning hurricane mitigation, and consumer tips. Citizens can access additional information by calling the hotline at 1-877-MY-FL-CFO.

Division of State Fire Marshal

The Division of State Fire Marshal is dedicated to protecting life, property and the environment from the devastation of fire. Our focus and efforts foster a fire safe environment through engineering, education and enforcement.

The different mitigation related activities of the State Fire Marshal include:

Fire Fighter Certifications

The Division's office issues over 3,000 basic fire fighter certifications a year. Students attend one of 35 certified training centers located across the state or the Florida State Fire College. The State Fire College trains over six thousand students per year in a wide variety of certification and professional development programs to include Pump Operator, Fire Officer, Fire Investigator, HAZMAT, and more.

State Building Inspection

The Division inspects over 14,000 state and over 16,000 public and private buildings a year for safety. The Division also reviews construction plans and documents for new construction, alterations, and renovations on all state-owned and state-leased buildings for Florida Fire Prevention Code compliance.

Florida Fire Incident Reporting Section

This section collects over 1,800,000 fire and emergency reports per year. These reports are combined with the other states reports in the National Fire Incident Reporting System for use by the fire services in analysis and trends. The Florida reports are also used to form the basis for the State Fire Marshal's Annual Report "Florida Fires".

Florida Department of Transportation (FDOT)

The FDOT's primary statutory mandate is to coordinate the planning and development of a safe transportation system that ensures the mobility of people and goods, enhances economic prosperity and preserves the quality of our environment and communities. In developing the state transportation system, FDOT works with local, regional and federal transportation partners. While the highest priorities are safety and system preservation, the agency places great emphasis on developing the transportation system to enhance economic prosperity and preserve the quality of our environment and communities.

[11] http://www.myfloridacfo.com/Division/Consumers/Storm/default.htm

FDOT has a major role in emergency management. To that end, FDOT has designated the following positions for assisting in emergency management efforts:

- Emergency Coordination Officer (ECO): The ECO, or designee, is a member of the Mitigate FL group. The ECO contributes to developing and implementing of Local Mitigation Strategy (LMS) and associated mitigation efforts.
- District Maintenance Engineer (DME): Each DME functions as the coordinator for emergencies in his or her respective district. The person serves as a point of contact for the Emergency Management Finance Chief in public assistance and mitigation efforts.

The agency is committed to maintaining the essential flow of traffic, and to ensuring the safety of Floridians and visitors that use Florida transportation systems. Hazard mitigation efforts related to transportation activities occurs in the planning and project development of transportation improvement projects, and they are part of the design, maintenance and construction areas of the Department.

The following summaries provide an overview of the plans, policies and practices used by the FDOT in its efforts to promote and improve safety, security, and resilience of Florida's transportation systems.

2060 Florida Transportation Plan (FTP)

The 2060 FTP is a statewide plan that defines Florida's future transportation vision and identifies goals, objectives, and strategies to guide transportation decisions over the next 50 years. The FTP contains several goals. The safety and security goal of the FTP is to "Provide a safe and secure transportation system for all users." Another goal is to "Maintain and operate Florida's transportation system proactively." An objective of this proactive maintenance is to reduce the vulnerability and increase the resilience of critical infrastructure to the impacts of extreme weather events and trends related to natural hazards.

Strategic Intermodal System (SIS) Policy Plan

The SIS is a statewide network of high priority transportation facilities including the state's largest and most significant airports, spaceports, deep-water ports, freight rail terminals, passenger rail and intercity bus terminals, rail corridors, waterways, and highways. These facilities represent the state's primary means for moving people and freight between Florida's diverse regions, including between Florida and other states and nations. A major objective of the SIS Strategic Plan is to ensure Florida's transportation system can meet national defense, emergency response and evacuation needs while providing a safe facility for the public.

Project Delivery

FDOT has restructured its mitigation program to promote efficiency, cost effectiveness, and timeliness in project delivery. Decisions are based on interagency coordination and the comparison of options to ensure that the chosen mitigation actions fully compensate for project impacts and that they are cost-effective and successful.

Compliance with environmental laws helps avoid development, including that of transportation infrastructure, in high-risk areas such as designated undeveloped coastal barriers. It helps improve the

resilience of transportation facilities to flooding and other associated impacts, including those risks associated with coastal storms and storm surge.

In project delivery, the FDOT must comply with all applicable federal and state laws and environmental rules, including the following:

- National Environmental Policy Act (NEPA)
- National Flood Insurance Program (NFIP)
- Coastal Barrier Resources Act (CBRA)
- Coastal Zone Management Act (CZMA) including the enforceable policies of the Florida Coastal Zone Management Act (FCMA).

In complying with federal and state requirements, FDOT is committed to the following:

- Mitigating environmental impacts for encroachments into wetlands and floodplains.
- Managing storm water and drainage impacts through design, construction, and maintenance of transportation infrastructure.
- Avoiding or minimizing highway encroachments within the 100-year (base) floodplains, where practicable.
- Minimizing impacts where floodplain encroachments are unavoidable.
- Ensuring the wise use and protection of the state's water, cultural, historic and biological resources.
- Minimizing the state's vulnerability to coastal hazards.
- Ensuring compliance with the state's growth management laws.
- Protecting the state's transportation system.
- Protecting the state-owned right-of-way.

Policy and Design Changes

The FTE adopted a related policy for their facilities that are relied on for hurricane evacuation, which requires the mainline travel lanes to be above the 100-year floodplain elevation. This policy was integrated in the design criteria of the Plans Preparation Manual, Volume 1, Section 2.6.

Hazard mitigation related changes in design criteria include:

- Revising the design standards for making single and multi-post sign components.
- Making signals and equipment more wind resistant.
- Revising the wind speed criteria for structures so that the criteria used is consistent with requirements of the Florida Building Code.
- Changing the height of the superstructure of coastal bridges to be at least one foot above the 100-year wave crest.
- Developing new criteria for areas transitioning from normal crown to super elevations to reduce ponding and hydroplaning.

- Selecting coatings and using weathering steel for steel girders and box girder bridges to maximize bridge service life.
- Improved concrete materials in marine environments to maximize bridge service life.

Bridge Security

In designing significant, high profile structures, antiterrorist measures are considered to minimize vulnerability. Some examples of countermeasures include designing structures for blast effects, selective protection of the structural integrity of key members, and incorporating structural redundancy. Also, for security reasons, certain structural designs, such as those for bridges and certain storm water conveyance facilities are exempt from public records disclosure.

Asset Management

Reducing risk to hazards is also addressed within the broader context of asset management, which includes monitoring the transportation system and maintaining, upgrading, and operating physical assets cost effectively. Annual surveys of the state highway system are conducted to assess the condition and performance of the state's roadways as well as to predict future rehabilitation needs.

In the area of bridge maintenance, FDOT conducted a statewide assessment of bridges potentially vulnerable to wave loading on the superstructure. Emergency response plans were developed to speed response due to bridge loss or damage. Also, the effects of wave loading on the structure are considered during the design of new bridges that may be potentially vulnerable and critical – important to safety, the economy and are of significant value.

Research Efforts

The FDOT Research Center manages a vibrant and diverse transportation research program. Working with Florida's state universities, other agencies, research institutions, other states, and private contractors, the Center performs research in all areas of FDOT.

The Center emphasizes applied research, implementation, performance monitoring, and technology transfer. In addition, it works closely with functional areas within FDOT, peer agencies, and other stakeholders to conduct and implement research.

Current mitigation related research includes:

- Completed an evaluation of state bridges which identified potentially vulnerable transportation infrastructure to predict flooding from sea level and tidal changes.
- Development of wind resistant structures such as signs and signals has been completed and is now being implemented.
- Improving visibility and warning systems.
- Improving roadway design criteria for scour and wave loading.

The FDOT State Materials Office (SMO), located in Gainesville, provides testing, research, inspection, evaluation, recommendations, and training in materials composition, use, and performance for Florida's

transportation system. The SMO develops the criteria for acceptable material quality; provides technical assistance and support to the districts in solving materials-related problems; and monitors field activities for compliance with federal and state policies and procedures.

Florida Department of Veterans' Affairs

The Florida Department of Veterans' Affairs (DVA) is a state agency responsible for assisting, without charge, Florida's veterans, their families and survivors in improving their health and economic well-being through high quality benefit information, advocacy, education, and long-term health care. DVA has Veterans' Claims Examiners co-located with the U.S. Department of Veterans Affairs (VA) Regional Office in Bay Pines, each VA Medical Center, and most VA Outpatient Clinics in Florida.

The department operates seven state veterans' homes. Six are 120-bed skilled nursing facilities and one is a 150-bed assisted living facility. All facilities are inspected annually by the VA and Florida Agency for Health Care Administration. All state veterans' homes have active COOP plans and are tested annually during the State of Florida Hurricane Response Exercise for hurricane preparedness. All DVA facilities are built to the Florida Building Code to ensure they are mitigated.

Florida Fish and Wildlife Conservation Commission

The Florida Fish and Wildlife Conservation Commission (FWC) is committed to mitigating losses for the public safety of Floridians and visitors as well as Florida's state lands, state parks, and Florida's population of fish and wildlife. The mission of the FWC is to manage fish and wildlife resources for their long-term well-being and the benefit of people.

The FWC is the lead component in the Florida Division of Emergency Management's reconnaissance mission to document early impacts of manmade and natural disasters. FWC is also a first responder during and after disasters performing search and rescue, boating safety, and ensuring public safety. FWC enforces waterway security zones to ensure safety and to lessen impacts to Florida's property, natural resources, and environment and assists with derelict vessel recoveries after disasters as well as environmental impacts such as oil spills or other interferences to navigation. FWC also researches and documents impacts to Florida's fisheries, wildlife, and habitat as a result of the disaster and takes the necessary actions to alleviate those impacts. Those actions include open communications with partners and stakeholders for determining the best means of recovery.

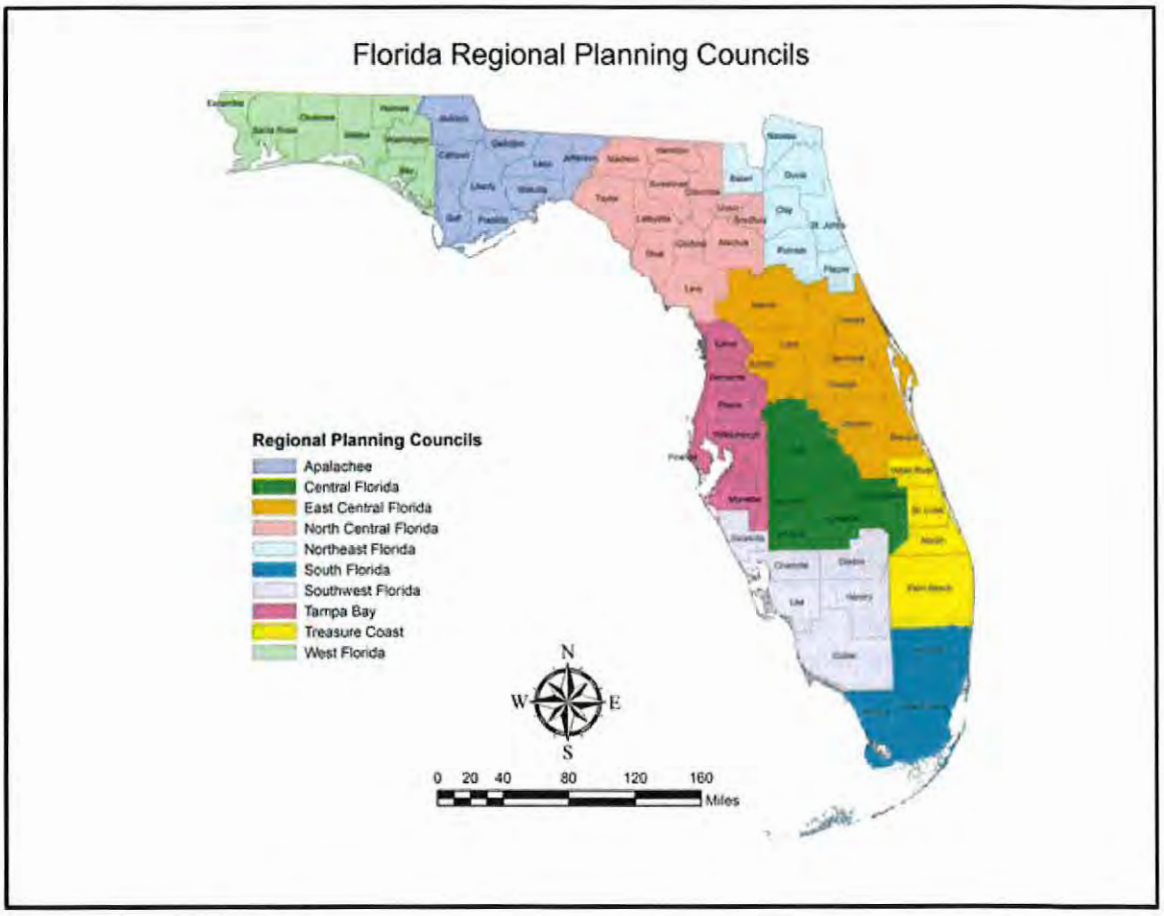
Regional Planning Councils

Florida's 10 Regional Planning Councils (RPCs) are public organizations, owned by their member counties, which bring together the state's local governments to share responsibility for the future of Florida. The RPCs are recognized as Florida's only multi-purpose regional entity that is in a position to plan for and coordinate intergovernmental solutions to problems on greater-than-local issues. Each RPC, as indicated in Figure 7, serves as a bridge between state and local governments representing an area in which mutual resources, characteristics, and issues exist.

Each RPC has a Board of Directors that sets its work program and budget. These governing boards are made up of local elected officials, gubernatorial appointees, and ex-officio members, which include non-

voting members from the Florida DEO, DOT, DEP and the appropriate water management district(s). Funding for RPCs generally comes from local government membership dues and contracts, and federal and state funding.

Figure 7 – Florida Regional Planning Councils



Mitigation Programs and Functions

Because the state is increasingly vulnerable to natural, technological, and human-caused disasters, emergency management planning is a critical element of the 21st century planning paradigm. The role of RPCs in emergency management has increased over the past 30 years as governments recognize the benefits and necessity of working together as well as integrating the "whole of community" in emergency management planning. The planning effort has expanded to address all five mission areas: Prevention, Protection, Response, Recovery and Mitigation.

Statewide Regional Evacuation Study

Working together in a coordinated manner, RPCs in Florida completed a multi-year Statewide Regional Evacuation Study (SRES), which represents an unprecedented undertaking to concurrently update regional evacuation studies for each region. The studies included all-hazards and vulnerability

assessments, behavioral analyses, shelter planning, and evacuation transportation modeling. The SRES provides planning tools that promote fully integrated, seamless planning across counties and regions to manage the movement of large numbers of citizens safely out of areas in danger. Emergency management offices across the state continue to use parts of the SRES in implementing their operational plans and procedures. Transportation and community development planners rely on the tools developed as part of the SRES in their mitigation and planning efforts.

Local Emergency Planning Committees (LEPC)

As with natural disasters, RPCs play a significant role in the hazards analyses planning process in Florida for hazardous materials. The Emergency Planning and Community Right-to-Know Act (EPCRA) requires that all facilities possessing extremely hazardous substances with an amount equal to or greater than certain thresholds, submit a report to the State Emergency Response Commission. The Regional Report identifies these chemicals, their quantities, the potential threat of a release, and critical facilities and special locations (i.e., schools, hospitals, and nursing homes) and threat zones. This information can be used for response planning and mitigation of these hazards in the community. RPC staff serve as the coordinators for Local Emergency Planning Committees (LEPCs). The goal of the LEPCs is twofold: First, to establish working relationships among agencies and industries that manage and respond to incidents by training alongside other responders; and second, to educate the public and facilities managers with regard to preparedness, contingency planning, and mitigation.

Local Mitigation Strategies (LMS)

RPCs provide planning and technical services to assist their local governments in developing Local Mitigation Strategies. The purpose of the LMS is to reduce or eliminate the impact of hazards within a community and diminish the loss of life and property damage. The LMS serves as a bridge between a local government's comprehensive growth and emergency management plans, land development regulations, building codes, ordinances, and related policies. With these plans in place, communities are able to prioritize and coordinate efforts to reduce or eliminate hazards in the future.

Post Disaster Redevelopment Plans (PDRP)

In addition to the LMS, the RPCs have been involved with and provided technical assistance in post-disaster redevelopment planning, working with the myriad of federal, state, and local stakeholders to develop plans for long-term recovery and community restoration. These plans address issues associated with short-and long-term recovery including, but not limited to Land Use and Mitigation, Disaster Housing, Permitting and Rebuilding Issues, Infrastructure Restoration, Environmental Restoration, Economic Redevelopment, and Health and Human Services. The PDRPs have continued to evolve and many are addressing additional issues such as adaptive strategies pertaining to the possibility of climate change and sea level rise impacts.

Other Regional Programs and Projects

RPC staff members can also serve on review teams for County Comprehensive Emergency Management Plans (CEMPs). As the Economic Development Districts in the State of Florida, many RPCs are modeling disaster scenarios to determine impacts and vulnerabilities associated with hazards. They are identifying

industry clusters, supply lines, etc., as well as including an Emergency Management section in the regional Comprehensive Economic Development Strategies (CEDS) which addresses mitigation and resiliency.

When appropriate, RPCs have assisted local governments in preparing Public Assistance (PA) and Hazard Mitigation Grant Program (HMGP) applications following disasters. In addition, RPCs have served as the local entity for private non-profits and universities in pre-disaster mitigation projects. As part of its state-mandated mediation obligations, regional planning councils are required to have a dispute resolution process to address intergovernmental disputes. The intent of this Regional Dispute Resolution Process is to provide a flexible process to reconcile differences on planning and growth management issues. This capacity may be helpful in long-term redevelopment.

State Board of Administration

The State Board of Administration is created in Article IV, Section 4(e) of the State Constitution. Its members are the Governor, the Chief Financial Officer, and the Attorney General, serving as Trustees. The Board derives its powers to oversee state funds from Article XII, Section 9 of the Constitution. The State Board of Administration (SBA) provides a variety of investment services to various governmental entities. These include managing the assets of the Florida Retirement System, the Lawton Chiles Endowment Fund, the Local Government Surplus Funds Trust Fund, the Florida Hurricane Catastrophe Fund (FHCF), and a variety of other mandates. The FHCF was created in November 1993 during a special legislative session after Hurricane Andrew. The purpose of the FHCF is to protect and advance the state's interest in maintaining insurance capacity in Florida by providing reimbursements to insurers for a portion of their catastrophic hurricane losses.

Board of Governors State University System of Florida

The Board of Governors (BOG) manages the State University System (SUS) and ensures its coordination and operation. The state university system enrolls over 300,000 students and 60,000 faculty and staff. The BOG establishes policy and guidance to continue execution of mission-essential functions of the SUS of Florida and the State Emergency Management Act. Each university must develop and adopt policies, regulations, and procedures as required to ensure the continued health, safety, and well-being of the campus community. Such activities include the designation of an emergency manager and alternate, and the development and management of a Comprehensive Emergency Management Plan (CEMP) and Continuity of Operations Plan (COOP). Furthermore, universities are authorized to enter into mutual aid and other cooperative agreements to enhance campus safety and security. Universities within the SUS are prepared to:

- Maintain health, safety, and security of university students, staff, visitors, and property.
- Initiate and provide for the coordination of activities relating to emergency preparedness response, recovery, and mitigation among agencies and officials.
- Maintain essential functions in a setting that is endangered and/or debilitated.
- Execute viable operational plans to return the university to normal operating conditions, within a reasonable time frame, based on existing circumstances.
- Report on campus health and safety efforts.

- Comply with casualty, sanitation, and fire safety standards, including Florida Building Codes.

Volunteer Florida

Since 1997, the Governor's Commission on Volunteerism and Community Service (Volunteer Florida) has served as the lead agency for Emergency Support Function (ESF) 15 - Volunteers and Donations. Volunteer Florida is a 25-member governor appointed commission. Its mission is to strengthen Florida's communities through volunteerism and service. To fulfill this mission, the Commission facilitates the development, promotion, and implementation of volunteer and community service programs and practices. Volunteer Florida has entered into memoranda of understanding with over 35 support organizations to provide resources, services, and capabilities for disaster response, recovery, and mitigation.

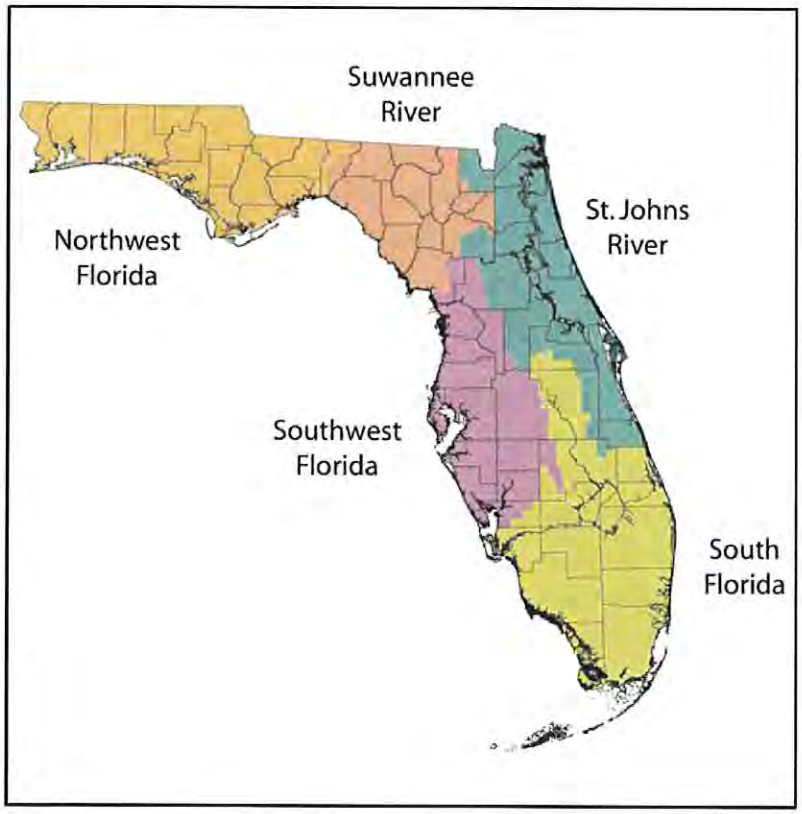
As the ESF 15 lead agency, Volunteer Florida provides the following disaster related services:

- Manages the activities and staffing of ESF 15 at the State Emergency Operations Center (SEOC) in Tallahassee.
- Operates the State Volunteers and Donations Hotline in times of disaster.
- Routes disaster donations to local agencies that need them.
- Trains Florida AmeriCorps members to assist communities impacted by disaster.
- Helps potential disaster volunteers connect with local disaster volunteer managers.
- Develops the response capabilities of Florida's voluntary agencies through networking, training and exercises.
- Provides training, presentations and support to County ESF 15 organizations, Volunteer Reception Centers, ESF 15 support organizations, and other partners.
- Participates in mitigation planning activities to consider possible mitigation projects, rule and ordinance changes that would reduce disaster-related costs and promote and engage volunteer organizations.

Water Management Districts

DEP has "general supervisory authority" over Water Management Districts (WMD) which are regional government entities (Chapter 373, Florida Statutes). There are five districts in the state, as shown in Figure 8, with boundaries determined by watersheds and other natural, hydrologic, and geographic features. Each works with the state to manage and protect water resources in times of crisis or emergency, as well as to manage and protect those same resources for the short and long term. In 1972, with the Florida Water Resources Act (Chapter 373), the state expanded the responsibilities of water management districts to include regional water resource management and environmental protection as well as flood control and water supply.

Figure 8 – Florida Water Management Districts



The water management districts administer flood protection programs and perform technical investigations into water resources. The districts partner with FEMA as Cooperating Technical Partners (CTPs) in the national Map Modernization process of updating the NFIP Flood Insurance Rate Maps for Florida communities. The districts also develop water management plans for water shortages in times of drought and to acquire and manage lands for water management purposes under the Save Our Rivers program. Regulatory programs delegated to the districts include programs to manage the consumptive use of water, aquifer recharge, well construction, and surface water management.

As part of their surface water management programs, the districts administer the department's storm water management program. This increases the districts' contacts with local governments by directing the districts to help with the development of the water elements in local government comprehensive plans. County LMS planners also request data and information from the WMDs during their plan update process. WMDs ensure present and future water provision for the state and exist as a direct mitigation measure.

Northwest Florida Water Management District (NWFWMD)

The Northwest Florida Water Management District (NWFWMD) has worked for decades to protect and manage water resources in a sustainable manner. It does this for the continued welfare of people and natural systems across a 16-county region. Within the district's 11,305 square-mile area, there are several

major hydrologic (or drainage) basins. They include the Perdido River and Bay watershed, the Pensacola Bay System (Escambia, Blackwater and Yellow Rivers), the Choctawhatchee River and Bay watershed, the St. Andrew Bay watershed, the Apalachicola River and Bay system, the Ochlockonee River and Bay watershed, and the St. Marks River and Apalachee Bay watershed (including the Wakulla River).

The NWFWMD's strategic priorities include:

- *Springs Protection and Restoration:* Protect and restore water quality and flows within the major spring systems of northwest Florida. The NWFWMD conducts an array of activities to restore and protect its springs. Among these are septic-to-sewer retrofit projects, enhanced agricultural best management practices in partnership with agricultural producers, water quality and flow monitoring, and spring bank and streambank restoration and protection.
- *Minimum Flows and Minimum Water Levels (MFLs):* Develop and implement science-based MFLs that protect water resources and associated natural systems. Implementation of an effective MFL program is an important part of the District's overall effort to ensure the long-term protection and sustainability of regionally significant water resources, including the St. Marks River Rise; Wakulla Spring; Sally Ward Spring; Jackson Blue Spring; and the coastal Floridian aquifer in Walton, Okaloosa, and Santa Rosa counties.
- *Apalachicola-Chattahoochee-Flint River Basin:* Protect Apalachicola River and Bay water quality and freshwater inflow. The district continues to work with state agencies and local governments to protect the economic and ecological viability of the Apalachicola River and Bay watershed system.
- *Water Supply:* Plan and facilitate sustainable water supplies for future reasonable and beneficial uses. The district accomplishes this in many ways through water use permitting, well regulation, water supply planning and assessment, water resource development, and water supply development assistance.
- *Watershed Protection and Restoration:* Protect and restore watershed resources and functions. The district conducts watershed-based planning and restoration efforts and supports cooperative projects in partnership with local governments, state resource agencies, and other regional stakeholders.
- *Flood Protection and Floodplain Management:* Maintain natural floodplain functions and minimize harm from flooding. The district works in cooperation with the Federal Emergency Management Agency (FEMA) on the flood map modernization and Risk Mapping, Assessment, and Planning (Risk MAP) program. As a cooperating technical partner (CTP), the district collaborates with state and local agencies to deliver quality data to increase public awareness and support for actions that reduce flood risks.

Suwannee River Water Management District (SRWMD)

The Suwannee River Water Management District (SRWMD) covers 7,640 square miles with a population of approximately 320,000. Suwannee is the smallest of the state's water management districts in terms of geographic area, population served, tax base, and agency staff. The district has the highest

concentration of freshwater springs in the state and ground and surface waters are intimately related. This makes the area very important for water quality and quantity.

The district is highly rural in character. Accordingly, most of the region's residential growth is in unincorporated rural areas. The Interstate 75 corridor from Lake City to Gainesville is experiencing rapid development and is projected to contain much of the district's future population. Total population is projected to increase to about 750,000 by 2050.

The district faces challenges in managing the water and related resources as the region continues to grow and develop. The district's water resources are affected by groundwater withdrawals and pollution outside of its boundaries, including Georgia and cities located along the northeastern coast of Florida.

The district's strategic priorities are as follows:

- *Sustainable Water Supply:* Ensure an adequate and sustainable water supply for all reasonable beneficial uses while protecting springs and other natural systems.
- *Water Conservation:* Maximize water conservation for all water uses. Conservation measures are encouraged with management incentives and regulatory mechanisms.
- *Minimum Flows and Levels:* Ensure district priority water bodies are protected for current and future generations. The district's efforts to develop minimum flows and levels (MFLs) for its major rivers and springs have revealed that water supplies are limited. Thus, management efforts must focus on protecting springs and natural systems, developing alternative water supplies that offset groundwater withdrawals, and encouraging regional water supply development. This must be accomplished by balancing the water needs of our communities and natural systems. Through the use of MFLs, the district works to protect and conserve water resources, which helps plan for adequate water supplies while protecting resources from significant harm.
- *Heartland Springs Initiative:* Ensure springs have adequate flow, maintain good water quality, and sustain healthy biological communities. Setting and achieving a high standard for protecting and managing springs demands a historic level of cooperation, coordination, and investment of public and private funds. Vital signs of the district's natural systems are monitored through an extensive system of water quality and quantity data networks. The information collected is used in the development of MFLs, regulatory programs, land management, and flood protection.
- *Water Management Lands:* Manage land and real estate interests to provide non-structural flood control, protect surface and ground water quality, and to enhance water resource related natural systems. SRWMD owns 160,000 acres of land and has conservation easements over an additional 125,000 acres. These lands provide benefits such as floodwater storage and conveyance, wildlife habitat, and recreation. Over 324 river front miles are protected.
- *Non-Structural Flood Protection:* Enhance flood risk information to protect life and property against flood hazards. District administered FEMA funds have made flood insurance rate map modernization possible for many jurisdictions. Such maps help guide local development regulations to avoid new development flood hazards.

St. John's River Water Management District (SJRWMD)

The St. Johns River Water Management District (SJRWMD) is responsible for balancing citizens' needs for water with nature's needs. The SJRWMD manages groundwater and surface water supplies in all or part of 18 counties in northeast and east-central Florida. The core missions of the SJRWMD are:

- *Water Supply:* To implement a regional strategy to provide sufficient waters for users and the environment.
- *Water Quality and Natural Systems Protection and Improvement:* To protect water quality and natural systems of the district and improve those resources within Surface Water Improvement and Management basins.
- *Flood Protection:* To prevent increases in flooding and operate and maintain the district's regional flood control projects. This is accomplished through a focus on implementing the environmental resource permitting program and maintaining the Upper St. Johns River Basin and the Ocklawaha River Basin regional flood control projects.
- *Organizational Effectiveness:* To provide for organizational structure and tools that result in and reward continuous improvement and enhanced service delivery.

Southwest Florida Water Management District (SWFWMD)

The Southwest Florida Water Management District (SWFWMD) encompasses roughly 10,000 square miles in all or part of 16 counties and serves a population of approximately 5.5 million people. The goal of the SWFWMD is to protect water resources, minimize flood risks, and ensure the public's water needs are met.

Responsibilities include, but are not limited to:

- Flood protection
- Water use
- Well construction and environmental resource permitting
- Water conservation
- Education
- Land acquisition
- Water resource and supply development
- Supportive data collection and analysis efforts

South Florida Water Management District (SFWMD)

The South Florida Water Management District (SFWMD) oversees the water resources in the southern half of the state. It covers 16 counties from Orlando to the Florida Keys and serves 8.1 million residents. SFWMD is the oldest and largest of the state's five water management districts. Created in 1949, the agency is responsible for managing and protecting water resources by balancing and improving water quality, flood control, natural systems and water supply.

The district owns a variety of land assets that are a reflection of its many programs, functions, and responsibilities. Over the course of several decades, the district has acquired land needed to support flood

control infrastructure, protect South Florida's water resources and restore the region's impaired ecosystems.

Because of the region's vulnerability to sudden hazards, SFWMD is especially concerned with emergency management and mitigation. It has adopted a wide variety of measures to mitigate against potential damage. A few are listed below:

- The district has a full time emergency manager charged with seeing that the district is prepared for any emergency - not just those related to weather.
- Throughout the year, the district conducts an active inspection and maintenance program on its flood control system. This includes:
    - Approximately 2,100 miles of canals and 2,000 miles of levees/berms
    - More than 600 water control structures and 625 project culverts
    - 70 pump stations
    - Approximately 3,500 hydrological monitoring stations at more than 650 flow sites, including 200 rain gauges and 26 weather stations
- In advance of a storm's arrival, SFWMD may begin a gradual drawdown of its canals. This enhances the ability of local drainage facilities to route excess runoff into the district's primary canal system, which routes floodwaters to storage areas or to the coast.
- Perform aquatic weed control and tree removal programs to ensure maximum conveyance of the flood control system.
- The district schedules regular canal clearing maintenance in preparation for hurricanes or other storm events. This mitigates against flooding that could be caused by canal debris inhibiting water flow.
- The district has fortified a "safe room" within its critical pumping stations to allow District personnel to remain within these facilities before, during, and after hurricane events to ensure continuous operation of the Central and South Florida Flood Control Project.
- Following a storm event, the district deploys Rapid Impact Assessment Teams to immediately assess the integrity of its water control canals, storage areas, and structures. Areal inspection is also conducted.
- The district offers an informative brochure entitled "Managing Flood Waters - Before and After the Storm" that explains how the flood control system in South Florida works and the proper maintenance of on-site water management systems. "Managing Every Drop" is another publication that captures both the flood control and drought management aspects of water management.
- The SFWMD's Comprehensive Water Conservation Program, including a year-round landscape irrigation conservation measures rule, is designed to measurably reduce water use while promoting a lasting water conservation ethic throughout South Florida. Local governments may adopt alternative landscape irrigation ordinances based on local water demands, system limitations, or resource availability. These long-term actions help mitigate against water shortage.

- The district evaluates each of its properties and plans the timing and frequency of prescribed fire according to several parameters, including vegetative community type, fuel loads, size, and surrounding land use.
- The district is an active participant in the Governor's Regional Domestic Security Task Force and works closely with local, state, and federal partners regarding homeland security prevention, preparedness, and response issues.
- The District provides a representative on the counties' LMS working groups to assist in pre-identifying and ranking various mitigation projects.

Non-Governmental Agency Capability Assessment

Certain non-governmental agencies are also part of the Florida Mitigation Strategy and Program. Summaries have been included of several non-governmental organizations mitigation activities. While many non-governmental agency activities align well with state policies, we have chosen not to include them in our evaluation. To do so may give the impression that non-governmental agencies further a state-driven agenda and this is inappropriate. Summaries may use acronyms from time to time. For your convenience, all acronyms for participating agencies are listed below:

- American Red Cross (ARC)
- Federal Alliance for Safe Homes (FLASH)
- Florida Association of Counties (FAC)
- Florida Floodplain Managers Association (FFMA)
- Florida Home Builders Association (FHBA)
- Florida International University International Hurricane Research Center (FIU IHRC)
- Florida League of Cities (FLC)

American Red Cross

The 1905 American Red Cross (ARC) Congressional Charter designates its purpose to "continue and carry on a system of national and international relief in time of peace and apply the same in mitigating the sufferings caused by pestilence, famine, fire, floods and other great national calamities and to devise and carry on measures for preventing the same."

As America's premier humanitarian disaster relief organization, the ARC seeks to prevent needless suffering. Therefore, ARC works closely with its local, state, and national partners to help people turn preparedness and mitigation into a personal priority. In keeping with the National Preparedness System (National Preparedness Goal, PPD-8, and the National Mitigation Framework), the ARC will work toward:

- Ensuring the Florida population is aware of and understands the effects of threats and hazards and the vulnerabilities and risks associated with them.
- Engaging the "whole community" in meaningful ways. Whole community means individuals, the private sector, communities, nongovernment organizations, faith-based organizations, all levels of government, etc.

The goal of the ARC is to foster a "culture of prevention & preparedness" that helps families and communities become safer and more prepared when disasters strike. ARC programs are applicable in both pre- and post-disaster situations.

- Goal 1: Develop local community networks to address community-wide preparedness issues: Convene, connect and collaborate across sectors (emergency management, faith-based organizations, individuals and families, public health, schools, non-profits, business, and grass-root organizations) to assess and raise awareness of community risks, build trust, and foster relationships.
- Goal 2: Motivate people and organizations to take preparedness actions. Deliver community preparedness activities to enable the public to reduce risk resulting from disasters.
- Goal 3: Utilize Red Cross geospatial technology platform such as Red Cross Visual Interactive Event Wizard (RCView) to identify vulnerable communities to incidents of fires and develop strategies to smoke detector installation campaigns. Mobilize support for mitigation through partnerships to support the National Home Fire Campaign goal to reduce home fire deaths and injuries by 25%.

Current mitigation activities in which the ARC is engaged are listed below.

Awareness and Education

Raise awareness statewide of specific actions citizens or the community can take to prevent and reduce disaster losses. Preparedness Education includes a solid platform through activities such as: Home Fire Campaign (HFC), The Pillowcase Project, Citizen CPR, and Health and Safety Classes as requested. In addition, there are various Emergency, Children's Preparedness (Monster Guard), Health & Safety, and Pet First Aid Apps available to the public for free. A self-guided Ready Rating tool is available to government, non-government, and community partners for free 24/7 online. Red Cross Information about all Red Cross preparedness resources may be accessed via www.RedCross.org

Mitigation on a Disaster Relief Operation

The immediate period following a disaster presents an opportune time to educate and motivate citizens about the steps they can and should take to prevent or reduce future losses. Red Cross chapters and disaster relief operations are uniquely positioned to encourage the public to rebuild stronger and safer. Therefore, ARC seeks to integrate mitigation into disaster response and relief efforts.

Some ways that mitigation may be integrated into American Red Cross disaster relief operations include:

- Identify and seize opportunities to help disaster victims reduce or prevent future disaster losses.
- Ensure the dissemination and appropriate use of Red Cross disaster safety and mitigation materials and messages.
- Collaborate with the in-kind donations stakeholders and partners to identify sources of donated resources (goods, materials, and services) that can be used by disaster victims for mitigation purposes.

For more information about Red Cross disaster initiatives and success stories go to http://www.redcross.org

Federal Alliance for Safe Homes

Federal Alliance for Safe Homes (FLASH®) is a nonprofit, 501(c)3, organization committed to promoting life safety and property protection. The organization includes an unprecedented alliance of private, public, and nonprofit partners dedicated to protecting families and homes from natural and manmade disasters. These include earthquake, flooding, hail, hurricane, lightning, severe storms, tornadoes, wildfires, winter freeze, and more. FLASH programs are applicable in both pre- and post-disaster situations.

FLASH began in 1998 as an advertising campaign designed to raise awareness about safety and mitigation options in Florida post-Hurricane Andrew. The campaign borrowed its consumer driven strategy from the highway safety movement to create widespread demand for safer, better-built homes. Founded as the Florida Alliance for Safe Homes, FLASH grew and expanded to become the Federal Alliance for Safe Homes in 2002. Today, its award-winning programs target a diverse and growing audience of consumers, code officials, design professionals, elected leaders, homeowners, and homebuilders.

The FLASH mission is to help reduce deaths, injuries, suffering, property damage, and economic losses caused by natural and manmade disasters. FLASH uses a social marketing philosophy to deliver disaster safety information. By creating awareness and fostering understanding, FLASH works to bring about acceptance and behavior change to both lay and technical audiences. Initiatives combine current, reliable information about the latest tools and techniques to create safer, better-built homes while offering free consumer resources and referrals to keep audiences progressing toward the goal. Some FLASH initiatives include those listed below.

#HurricaneStrong

Launched during the 2016 hurricane season, #HurricaneStrong is a national resilience initiative to save lives and homes through collaboration with leading organizations in the disaster safety movement. The collaboration offers empowering hurricane safety and mitigation information through business workshops, digital channels, events, home improvement store workshops, media outreach, school lesson plans, and a social media campaign featuring a #HurricaneStrong "pose." In 2016, #HurricaneStrong garnered success with White House recognition, national television programming, Public Service Announcements, more than 200 traditional news stories, 695 Home Depot workshops, 15,000 Tweets, 4,400 contributors on Twitter, and an audience reach exceeding 24 million. For more information, visit www.hurricanestrong.org.

Building Code Commentaries

FLASH developed a series of building code focused commentaries that have been the basis of keynote addresses, congressional briefings, and legislative testimonies. The commentaries have been credited as inspiration for several federal policies and studies regarding building codes and resilience.

DisasterSmort

The multi-faceted program provides resources and assets to elected officials to promote understanding of resilience policy fundamentals that include building codes, beyond-code mitigation, incentive-aligned relief programs, public-private initiatives, and smart disaster finance. The program includes toolkits, in-person forums, and a publication for media professionals.

FLASH Cards

This popular and colorful print campaign offers 26 easy-to-understand cards featuring weather perils, safety tools, and special topics like homeland security. The cards contain valuable information in an easy-to-understand format while offering resource lists for more detailed and technical data. Now available in Spanish, the campaign provides consumers with a handy reference tool to de-mystify mitigation techniques and is easily co-branded for widespread distribution.

FLASH Insurance Guide

The popular "If Disaster Strikes Will You Be Covered? A Homeowners' Insurance Guide to Natural Disasters?" addresses how to stay safe, save money, and protect homes. Topics include earthquake, flood, hail, hurricane, lightning, power outage, tornado, wildfire, and winter freeze. The Guide, available in English and Spanish, was developed in partnership with The Actuarial Foundation.

www.FLASH.org

The FLASH website provides one-stop shopping for those interested in the most accurate and up-to-date disaster safety information and provides new interactive DIY tools for homeowners to learn how to protect their homes.

Multi-media Public Service Campaigns

FLASH produces, distributes and launches an annual public service campaign to raise awareness and keep disaster safety top-of-mind. Using 30-second television and radio spots in English and Spanish, the campaign promotes FLASH websites and free resources. The campaign can be customized and used by partners in any media market.

Ready Business

One of the pillars of a community is its business segments. In partnership with FEMA and Ready.gov, FLASH created a business continuity program to move organizational leaders through a step-by-step process to, 1) Identify Risk, 2) Develop a Plan and 3) Take Action. The two components of the Ready Business Program are a series of hazard-specific Ready Business Toolkits and in-person Ready Business Workshops. Since its 2016 launch, more than 160 business have been through the program.

High Wind Safe Room Resources

Highwindsaferooms.org provides homeowners seeking information about building a safe room in their homes. Homeowners can "Give an Ordinary Room an Extraordinary Purpose" with instructions for building or retrofitting bathrooms, closets, wine cellars or other rooms with a tornado safe room. They'll also find a cost calculator, animation, and links to important safety and structural details.

Volunteer Construction Guides

Assets are currently used by local volunteer organizations that rebuild or renovate hundreds of properties in at-risk communities annually. FLASH developed high wind, flood, and wildfire guides and accompanying volunteer cards to assist volunteers that are doing the actual work. Through public-private partnerships, the use of the guides could be expanded.

Florida Association of Counties

The Florida Association of Counties (FAC) is a not-for-profit organization that has represented Florida's 67 counties since 1929. While its primary mission is to provide legislative advocacy for its members, FAC also has an extensive training and education program. The Certified County Commission (CCC) program has elective courses titled "Emergency Management: The Role of the County Commissioner" and "A County Commissioners Guide to Wind Mitigation Programs and Applications."

Emergency Management and Mitigation Training

In 2012, FAC was awarded an RCMP (now known as HLMP) grant from FDEM to develop, schedule, and conduct a Wind Mitigation Resources "pilot course" for county governments and their staff. In all, eight courses were delivered around the state with more than 120 attendees. In 2013, FAC was awarded a second grant and scoped to provide six county courses, two courses before Regional Planning Councils, and one course through a statewide video conference system. In addition, FAC has proposed to FDEM to develop and deliver a comprehensive flood mitigation training course for county commissioners through its CCC program in the future.

Florida Floodplain Managers Association

The Florida Floodplain Managers Association (FFMA) is the Florida chapter of the National Association of State Flood Plain Managers (ASFPM). FFMA was formed to improve floodplain management in Florida by supporting comprehensive management of floodplains and related water resources. FFMA believes that through coordination and education, the public and private sectors can reduce loss of life and properties resulting from floods, preserve the natural and cultural values of floodplains, and avoid actions that increase flood hazards.

To help reach these goals, FFMA and ASFPM fosters communication among those responsible for flood hazard activities, provides technical assistance and advice to governments and others about actions or policies that will affect flooding, and encourages flood hazard research, education, and training. Since its inception in June 2003, the Florida Floodplain Managers Association (FFMA) has improved the success of floodplain management programs in Florida. FFMA uses the activities listed below to contribute to mitigation efforts in Florida.

- *Information Exchange:* Through guidance, training programs, workshops and conferences, FFMA works closely with the state of Florida to improve the state emergency management program, including involving local, state and federal stakeholders in the process.
- *Publications and Newsletters:* "Plain Talk" is produced semi-annually as Fall/Winter and Spring/Summer and is currently e-mailed to our members. This newsletter highlights issues confronting Florida floodplain managers and keeps them up to date. FFMA coordinates with the SFMO to provide technical floodplain management articles on a regular basis.

- *Membership:* Membership composition includes state and local floodplain managers and a broad representation of federal agency staff, private industry, academia, research and related organization representatives. The FFMA now has over 700 members and continues to grow. FFMA works to continually increase membership by demonstrating that all local floodplain management programs have value to their communities.
- *Certified Floodploin Manager Program (CFM):* ASFPM has established a national program for professional certification of floodplain managers. The program has coordinated the certification of numerous floodplain managers in the State of Florida. It recognizes continuing education and professional development that enhance the knowledge and performance of local, state, federal, and private-sector floodplain managers. Through local floodplain managers, FFMA helps develop advanced training that will be field deployed in Florida for Continuing Education Credit (CEC) for the CFM. FFMA strongly advocates increased opportunities for CEC's for the CFM.
- *Annual Conferences:* FFMA has hosted annual conferences in Florida since 2004. Hundreds of professionals have attended from Florida, state agencies, and FEMA Region IV.
- *Statewide Training Events:* FFMA coordinates annually with the SFMO to conduct training for local officials across the state. This training includes numerous topics such as coastal construction issues, elevation certificates, substantial improvement/damage determination, Community Rating System application and implementation, floodplain management basics, implications of map updates, and other topics of interest and value to Florida floodplain managers.

Florida Home Builders Association

The Florida Home Builders Association (FHBA) is a trade association representing the residential construction industry in Florida. It is actively engaged in governmental affairs, political action, and legal defense programs designed to promote and protect homeownership opportunities in Florida. FHBA provides numerous services to its members including continuing education, insurance, leadership training, research, and networking opportunities. The FHBA trains licensed individuals throughout the State on the proper implementation of the Florida Building Code, a standard that helps Florida's buildings stand the test of time. According to statutes, Florida's licensed individuals are required to complete continuing education credits, of which, at least one hour must be spent on mitigation. One example of FHBA's education programs is a series of courses that were developed to teach the building/structural component of the Unified Florida Building Code. These classes specifically support the implementations of structural mitigation in Florida. FHBA's programs are applicable in both pre- and post-disaster situations.

Disaster Contractor's Network

Jointly supported by the FHBA; the Associated Builders and Contractors of Florida (ABC); Florida Roofing, Sheet Metal and Air Conditioning Contractors Association (FRSA), Association of General Contractors (AGC), the Center for Disaster Risk Policy at Florida State University, FDEM, Florida Department of Business and Professional Regulation, and FEMA Region IV (FEMA), the Disaster Contractors Network (DCN) provides services and training to building professionals. This includes online training offered through the Center for Disaster Risk Policy at Florida State University. Year-round mitigation activities and incentives

are among the topics covered in DCN's online training. The DCN also provides resources for the general public about repairing their home or business after a disaster and provides a resource for homeowners to use when seeking trained professionals after a disaster.

Florida International University International Hurricane Research Center

The Florida International University (FIU) International Hurricane Research Center (IHRC) was created in 1996 through a public-private partnership between the post-Hurricane Andrew We Will Rebuild Foundation and the State of Florida through FIU in Miami. The We Will Rebuild Foundation was a private sector organization created by local business leaders in Miami-Dade County at the request of the President of the United States and the Governor of Florida. The FIU/IHRC programs focus on both pre- and post-disaster situations.

The IHRC promotes a multi-disciplinary research mission to mitigate hurricane damage to people, the economy, and the built and natural environments. The Center's overall objective is to help the State of Florida, vulnerable U.S. East Coast and Gulf States, and the nations of the Caribbean and Central America to reduce human and property losses regularly inflicted by hurricanes. Individual laboratories under the IHRC umbrella are dedicated to hurricane impact forecasting and mitigation. Their activities are discussed below.

Public Hurricane Loss Model

The Laboratory for Insurance, Financial, and Economic Research has developed a publicly funded model to predict long-term wind damage and associated insured losses for residential properties. A storm surge and flood damage component is currently being added to the model. The Public Hurricane Loss Model is the first certified public model to project hurricane losses for the State of Florida and is used by state regulators to help evaluate rate filings and by insurance companies to assess hurricane risk and generate loss estimates that can then be used as input in the rate making process. The model is certified by the Florida Commission on Hurricane Loss Projection Methodology.

Coastal and Estuarine Storm Tide (CEST) Model

The Laboratory for Coastal Research quantitatively assesses coastal area vulnerability and hurricane storm surges. The CEST Model is used to estimate storm surge as low-pressure weather systems, such as hurricanes, approach coastal areas. The model takes into account not only the expected tide at landfall and the atmospheric pressure and wind of the weather system, but also major coastal topographic features such as coastal ridges and barrier islands. The IHRC research team works closely with the storm surge research team at the federal government's National Hurricane Center (NHC) co-located on the FIU campus.

Wall of Wind (WoW) Program

The Laboratory for Wind Engineering Research is dedicated to making buildings more resilient during high wind events either through new products or improved mitigation techniques. The "Wall of Wind" (WoW) facility is capable of performing controlled and repeatable testing inflows that adequately and economically replicate hurricane winds up to a Category 5, and accompanied by wind-driven rain. In 2014, under the federal government's Natural Hazards Engineering Research Infrastructure program, the facility

was designated a National Science Foundation (NSF) Experimental Facility – one of only seven throughout the United States. Together with a different type of wind engineering facility at the University of Florida, the NSF designation for FIU's Wall of Wind makes Florida a national, and even international, leader in hurricane research designed to enhance public safety.

The combination of these IHRC laboratories promotes an interdisciplinary, wide-ranging disaster research agenda that addresses Florida's principal hazards, exposures, and vulnerabilities.

Florida League of Cities

The Florida League of Cities (FLC) was created in 1922 by city officials who wished to unite the municipal governments in the state. The Florida League of Cities has become one of the largest state municipal leagues in the nation, which represents 412 of Florida's municipalities. The League's mitigation programs are applicable in both pre- and post-disaster situations.

The aim of the Florida League of Cities is to promote local self-government and serve the needs of the municipal governments in Florida. This includes:

- Advocacy at both the state and federal levels.
- Increasing public knowledge of municipal services and issues.
- Providing municipal officials with training and technical assistance.
- Providing cost-effective programs and products to local governments.

Through its participation in the state hazard mitigation planning process, the Florida League of Cities recognizes a need for informing the elected municipal officials. Officials need to know the importance of community-based hazard mitigation planning and implementation of mitigation initiatives.

Through Florida League outreach, officials learn to reduce community risk and vulnerability to hazards. A potential program to educate elected officials about hazard mitigation may be integrated with the Institute for Elected Municipal Officials. This Institute offers a comprehensive overview of Florida municipal government presented by a faculty of top professionals in the field.

Local Policies and Programs Capability Assessment

Local governments have policies, programs and capabilities designed to help mitigate the impacts of hazard events to their jurisdictions. Each community has its own policies, programs, and capabilities. These depend on factors such as the size of the geographic area, its population, or the amount of funding available through local resources. Regardless of size or wealth, each community has a unique core set of policies, programs, and capabilities at its disposal related to hazard reduction and mitigation including building codes, land use plans, and regulations.

There are always challenges to implementing an effective program. Common challenges among Florida's 67 counties include: lack of consistent participation in county Local Mitigation Strategy workgroups; lack of awareness of the benefits of mitigation, particularly among city and county elected officials; and the inability to dedicate adequate time to mitigation efforts due to other emergency management responsibilities such as response activations.

FDEM has completed a general analysis of existing Local Mitigation Strategies (LMS) to evaluate locally identified policies, programs, and capabilities to maintain and support hazard mitigation planning activities. This analysis is based upon local evaluations of the effectiveness of the identified programs and their accompanying policies within their communities.

Florida Building Code

The Florida Building Code (FBC) is a statewide building construction regulatory system that places emphasis on uniformity and accountability in order to ensure building strength in the events of natural disasters. The building code is implemented and enforced locally by individual counties. This delegation allows for greater state coverage, but also presents challenges as some smaller counties do not have the staff and resources that other counties might have.

All construction in the state must adhere to the FBC. This allows local jurisdictions to ensure structures are more resistant to certain types of natural disasters, especially to wind and flood events.

Zoning, Land Use Regulations, and Comprehensive Plans

Land development is governed by local comprehensive planning. Zones are designated for certain uses (commercial, industrial, residential, etc.) by the county and amendments are made at the local level. These development regulations assist in mitigation by restricting construction in hazard prone areas such as floodplains or coastal high hazard zones.

Overseeing these changes allows counties to direct development for the safety, health, and welfare of its residents. Comprehensive plans play a major role in local growth management. Florida's comprehensive plans include provisions for emergency situations and natural disasters.

These growth management plans allow jurisdictions to direct development away from disaster prone areas such as floodplains. Zoning changes must be approved through the appropriate channels of government, which allow jurisdictions to monitor the safety and welfare of residents. Every county and most jurisdictions have a state-approved comprehensive plan.

Floodplain Management

Communities in Florida are strongly encouraged to participate in the National Flood Insurance Program (NFIP). Participation in the NFIP is a pre-requisite for receiving FEMA mitigation grants and allows homeowners in the community the ability to purchase flood insurance. To remain in good standing with the NFIP, communities must conform to certain standards and have an approved and adopted flood prevention ordinance.

As of January 2018, Florida has 468 communities participating in the NFIP, which is 98 percent of communities in the state. Many of Florida's communities also participate in the Community Rating System (CRS). Furthermore, as of January 2018, there were 240 communities enrolled in the CRS program, which is 51%, indicating that the communities actively maintain and encourage initiatives on flood prevention. Both the NFIP and the CRS program allow county level mitigation programs to address RL and SRL properties. More information regarding this topic can be found above in the State Agency Capability Assessment Section and in *Appendix F: NFIP Policy Statistics*.

Local Mitigation Strategy

Each county submits a Local Mitigation Strategy (LMS) for FEMA approval in order to be eligible for federal mitigation program funding. The LMS analyzes risk, establishes goals, and prioritizes community mitigation projects for funding. Plans are typically multi-jurisdiction, multi-hazard plans that are maintained throughout the year and fully updated every five years. Local mitigation working groups are composed of many different community partners. Participation jurisdictions must adopt the LMS in order to be eligible for mitigation grants.

All 67 Florida counties have an approved LMS. In addition, several universities and colleges maintain their own mitigation plans or participate in the development and update of county-wide plans. As of October 1, 2017, 435 of the 454 jurisdictions have adopted their LMS plans, resulting in 95.8 percent of Florida's population being covered by an adopted LMS.

Comprehensive Emergency Management Plan

The State of Florida requires that every county develop and maintain a compliant Comprehensive Emergency Management Plan (CEMP). This plan addresses the threats to which a county or a region are exposed and how the local governing agency plans to respond to them.

The CEMP covers mitigation, response, recovery, and preparedness and is intended to provide a comprehensive understanding of emergency management for the jurisdiction. Florida Administrative Code establishes basic requirements for county CEMPs, including the requirement for county CEMPs to have a mitigation annex. In this annex, the CEMP must show the county's ability to coordinate project implementation and identify new projects. In 2012, the criteria for county CEMPs was revised. As part of these revisions, counties that have a FEMA approved and adopted LMS were required to address only three mitigation-specific criteria in their CEMP as opposed to 29 criteria for those counties without an approved LMS.

CEMPs require a risk assessment to be completed. FDEM encourages counties to integrate the LMS risk assessment into the CEMP in order to strengthen the tie between the two plans and reduce duplicated efforts. CEMPs are due to the state for review every four years.

Post Disaster Redevelopment Plan

The Post Disaster Redevelopment Plan (PDRP) identifies policies, operational strategies, and roles and responsibilities for implementation that will guide decisions affecting long-term recovery and redevelopment of a community after a disaster. The PDRP emphasizes seizing opportunities for hazard mitigation and community improvements consistent with the goals of the local comprehensive plan and with full participation of its citizens.

Amendments to Chapter 163, F.S. in 2015 (commonly known as Perils of Flood requirements) further clarified that the redevelopment component will:

- Include development and redevelopment principles, strategies, and engineering solutions that reduce the flood risk in coastal areas which results from high-tide events, storm surge, flash floods, storm water runoff, and the related impacts of sea-level rise.

- Encourage the use of best practices development and redevelopment principles, strategies, and engineering solutions that will result in the removal of coastal rea property from flood zone designations established by the Federal Emergency Management Agency.
- Identify site development techniques and best practices that may reduce losses due to flooding and claims made under flood insurance policies issued in this state.
- Be consistent with, or more stringent than, the food-resistant construction requirements in the Florida Building Code and applicable food plain management regulations set forth in 44 C.F.R. part 60.
- Require that any construction activities seaward of the coastal construction control lines established pursuant to Section 161.053, F.S., be consistent with Chapter 161, F.S.
- Encourage local governments to participate in the National Flood Insurance Program Community Rating System administered by the Federal Emergency Management Agency to achieve flood insurance premium discounts for their residents.

To date, 27 Counties and municipalities have amended their comprehensive plans to address these requirements.

Coordination of the Local Mitigation Program and Local Plan Reviews

As stated before, the Disaster Mitigation Act of 2000 (DMA2K) requires every Florida County to have a FEMA-approved Local Mitigation Strategy (LMS). The hazard identification, risk analyses, and vulnerability assessments provide estimates of potential property losses throughout the state. Building upon these assessments, each county identifies a prioritized list of hazard mitigation measures, with an action plan for their implementation. The LMS has become the foundation of Florida's pre- and post-disaster mitigation planning activities.

Every LMS is reviewed on a regular basis and must be updated, approved, and adopted every five years. For this reason, the state's efforts are now directed toward maintaining a high standard and improving the effectiveness of these plans. LMS plans are often at different stages in the update and renewal process depending upon when it was approved. Additionally, each year every county is required to keep their LMS in compliance by meeting the standard outlined within the Florida Administrative Code (FAC) 27P-22. By the last business day each January, each county is required to adhere by the rule and provide:

- Current list of the members of the LMS working group, identifying current chairperson, vice-chairperson, and/or coordinator (and contact information);
- Current list of mitigation measures and their estimated costs;
- Major changes (when applicable) to the risk assessment, critical facilities list, repetitive loss properties list or plan maps occurring in the past year.

There are 67 counties in Florida, all of which have a multi-jurisdictional, multi-hazard LMS. FDEM's Mitigation Planning Unit thoroughly reviews these plans and works closely with the counties to assure that all criteria, including regulations and recommended best practices are met in their LMS.

Figure 9 – Florida Local Hazard Mitigation Plan Status

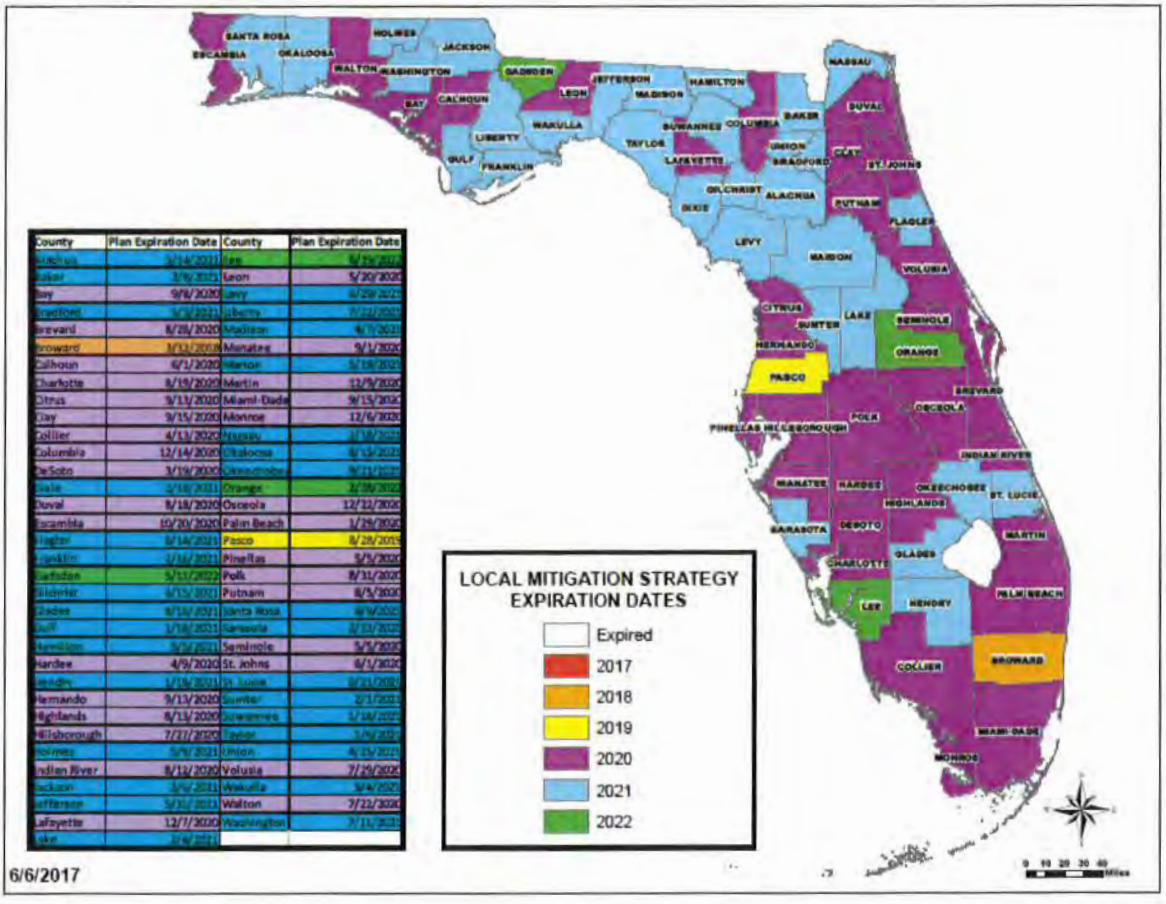
In order to provide technical assistance to local planners, the state provides principal contacts for local government representatives, municipalities, and members of the private sector regarding hazard mitigation planning and programming. This helps to ensure effective understanding of local conditions and characteristics important to successful implementation of mitigation and redevelopment measures by communities. They work with counties from early in the review process and provide feedback on drafts, answer questions, conduct workshops, and provide examples of good plans.

The responsibilities of the Mitigation Planning Unit staff are to support mitigation strategy maintenance and improvement by local governments; to understand conditions relevant to mitigation and redevelopment planning for these communities; to represent the interests of the communities to FDEM in program development and implementation; and to provide technical assistance to the LMS working groups on updating and implementing the LMS.

The state also offers FEMA G-318 and G-393 trainings to interested entities upon their request. This training provides guidance and instruction on preparing and reviewing local plans in an effort to assure that Florida counties have the appropriate tools and resources to update their local plans. The state offers G-393, Mitigation for Emergency Managers, which helps teach communities how to overcome roadblocks and successfully implement mitigation.

Since the last approved State Hazard Mitigation Plan (SHMP), the planning unit has successfully assisted all of Florida's counties through the update and re-approval process of their LMS plans. With only a handful of resolutions adopting the plan left to be submitted to FEMA, as of October 1, 2017, 95.8 percent of Florida's population is covered by an approved and adopted LMS. Broward County is the next plan set to expire in March 2018 and has already been reviewed and approved by the state, FEMA, and adopted by three-quarters of their jurisdictions, followed by Pasco County in August 2019. Below is a map depicting the LMS expiration dates.

Figure 10 – Local Mitigation Strategy Expiration Dates



County	Plan Expiration Date	County	Plan Expiration Date
Alachua	3/14/2021	Lee	6/29/2020
Baker	3/9/2021	Leon	5/30/2020
Bay	9/8/2020	Levy	6/29/2021
Bradford	3/3/2021	Liberty	7/22/2020
Brevard	8/28/2020	Madison	4/7/2021
Broward	3/13/2018	Manatee	9/1/2020
Calhoun	6/1/2020	Marion	5/18/2020
Charlotte	8/19/2020	Martin	12/9/2020
Citrus	9/13/2020	Miami-Dade	9/15/2020
Clay	9/15/2020	Monroe	12/6/2020
Collier	4/13/2020	Nassau	1/18/2020
Columbia	12/14/2020	Okaloosa	8/19/2020
DeSoto	3/19/2020	Okeechobee	9/11/2020
Dixie	2/18/2021	Orange	8/28/2020
Duval	8/18/2020	Osceola	12/22/2020
Escambia	10/20/2020	Palm Beach	1/28/2020
Flagler	8/14/2021	Pasco	8/28/2019
Franklin	2/16/2021	Pinellas	8/5/2020
Gadsden	5/13/2022	Polk	8/31/2020
Gilchrist	4/15/2021	Putnam	8/5/2021
Glades	8/16/2021	Santa Rosa	6/9/2020
Gulf	1/18/2021	Sarasota	8/23/2022
Hamilton	5/5/2021	Seminole	5/5/2020
Hardee	4/9/2020	St. Johns	6/1/2022
Hendry	1/19/2021	St. Lucie	8/23/2020
Hernando	9/13/2020	Sumter	2/1/2021
Highlands	8/13/2020	Suwannee	1/18/2022
Hillsborough	7/27/2020	Taylor	1/6/2022
Holmes	5/9/2021	Union	4/19/2021
Indian River	8/12/2020	Volusia	7/29/2020
Jackson	3/6/2021	Wakulla	3/4/2021
Jefferson	5/31/2021	Walton	7/22/2020
LaFayette	12/7/2020	Washington	7/11/2021
Lake	3/4/2021		

In an effort to identify best practices, the Mitigation Planning Unit created a survey to gather feedback on the last cycle of LMS plan updates. The survey was distributed to each LMS chairperson that oversaw their

county's LMS update process. After analyzing the results, a report detailing the process that was used and recommend improvements for future LMS update cycles was developed. The report can be found in *Appendix K: LMS Update Cycle After Action Report.*

The Mitigation Planning Unit has been delegated the authority to review and approve LMS plans on FEMA's behalf, under the PAS program. Florida created a LMS review tool that is based on FEMA's review tool but also includes helpful tools for reviewers.

Plan Review Procedure

To begin the LMS approval process, updated LMS plans must be submitted to FDEM no later than six months before the plan's expiration date. Plans that are submitted later than this timeframe will be reviewed in the order they were received. FDEM will attempt to complete reviews within 30 days. This official submittal should consist of:

- SharePoint submission of the LMS Plan in its entirety including all Appendices;
- Electronic Microsoft Word version of the Plan Review Tool;
- Electronic (CD) of the plan document(s) to be reviewed.

The submitted plan document is considered a DRAFT until it is approved by FEMA. Plan submittals should be addressed to:

Miles E. Anderson
State Hazard Mitigation Officer
Florida Division of Emergency Management
2555 Shumard Oak Boulevard
Tallahassee, FL 32399
Attn: Mitigation Planning Unit

The assigned mitigation planner will provide a confirmation of receipt to the LMS chairperson as soon as it is received.

Two state mitigation planners conduct a detailed and thorough review of the LMS using the Florida Review Tool document to ensure compliance with all federal and state requirements, as well as ensuring alignment with the SHMP. Once the reviews are complete, both planners discuss their findings and reconcile any differences. Upon completion of the review (within 30 days, if possible), the assigned mitigation planner will inform the LMS chairperson that the plan is:

a. The plan is Approved Pending Adoption (APA) and is ready to be sent to FEMA.
OR
b. In need of revision. In this case, the revised plan must be corrected and resubmitted to FDEM within 30 days of notification.

After review of the final draft, FDEM will submit the document to FEMA no later than 90 days before the plan expiration date. Along with the plan, FDEM submits the Florida Review Tool document for FEMA's

records, which includes page numbers of where elements are met in the plan, as well as the certification that the Mitigation Planning Unit has approved the plan.

If the plan is not approved by FEMA, FDEM will notify the LMS chairperson that the plan must be revised. If the plan reaches FEMA's "approval pending adoption" phase, at least one participating jurisdiction must resolve to adopt the plan within one year. Ideally all jurisdictions will adopt the plan within one year. A copy of all resolutions to adopt must be submitted to DEM for transmittal to FEMA.

Because of the PAS program, FEMA conducts an audit review of one plan for every ten that FDEM approves and submits.

RISK ASSESSMENT SECTION

State Hazard Mitigation Plan Requirements in this section are:
S3. Does the risk assessment include an overview of the type and location of all natural hazards that can affect the state? [44 CFR §201.4(c)(2)(i)]
S4. Does the risk assessment provide an overview of the probabilities of future hazard events? [44 CFR §201.4(c)(2)(i)]
S5. Does the risk assessment address the vulnerability of state assets located in hazard areas and estimate the potential dollar losses to these assets? [44 CFR §§201.4(c)(2)(ii) and 201.4(c)(2)(iii)]
S6. Does the risk assessment include an overview and analysis of the vulnerability of jurisdictions to the identified hazards and the potential losses to vulnerable structures? [44 CFR §§201.4(c)(2)(ii) and 201.4(c)(2)(iii)]
S7. Was the risk assessment revised to reflect changes in development? [44 CFR §201.4(d)]
S16. Does the plan describe the process and timeframe to review, coordinate and link local and tribal, as applicable, mitigation plans with the state mitigation plan? [44 CFR §§201.3(c)(6), 201.4(c)(2)(ii), 201.4(c)(3)(iii), and 201.4(c)(4)(ii)]
RL1. Did Element S6 (risk assessment) address RL and SRL properties? [44 CFR §§201.4(c)(2)(ii), 201.4(c)(2)(iii), and 201.4(c)(3)(v)]

Introduction

The risk assessment for the State of Florida Enhanced Hazard Mitigation Plan (SHMP) provides the factual basis for developing a mitigation strategy for the state. This section profiles the natural, human-caused, and technological hazards that could possibly affect the state. Each natural hazard profile includes a discussion of the geographic areas affected, the historical occurrences in the state, an impact analysis, the probability, and the vulnerability and loss estimation by county and of state facilities. Alternatively, the human-caused and technological hazards include similar topics of discussion, but not all aspects are able to be quantified. This is because of the limited data available and the imprecise nature of the human-caused and technological hazards.

Because of the extensive data available to determine vulnerability to natural hazards, the natural hazard profiles contain complete analyses. However, there is less data available to determine vulnerability to human-caused and technological hazards. Because of this, the human-caused and technological hazard profiles differ from the natural hazard profiles and may not contain complete vulnerability analyses.

2018 Update

FDEM used a contractor to write the Risk Assessment section in the previous updates of the SHMP. However, FDEM purchased a data analysis tool and was able to produce the data in-house for the 2018 SHMP update. The GIS Unit within FDEM was responsible for producing the data needed for the Risk Assessment and the Mitigation Planning Unit was responsible for analyzing the data and writing the hazard profiles.

Significant research was required to update the eleven natural hazard profiles and the ten technological and human-caused hazards. References and sources are included as footnotes in the hazard profiles, but the main sources of data included:

- Declared Events
- NCDC
- HAZUS-MH
- HelpFL Tool
- Internet Research

LMS Integration

Each of the 67 counties in the state of Florida has an approved Local Mitigation Strategy (LMS) plan. Those plans were reviewed in preparation for the 2018 SHMP update to determine which hazards the counties identified and how they ranked each hazard. This information is included in each hazard profile in the SHMP and helps to provide a picture of the hazards and vulnerabilities the state experiences. Over the next five years, each LMS plan will be reviewed for this information as it is reviewed for compliance and approval. This will allow the information to be readily available for the next SHMP update.

Since each county ranks their identified hazards differently, the Mitigation Planning Unit developed a key to organize how each county ranked each hazard. The method chosen to align all county plans into one ranking system was frequency of occurrence. The chart below describes the method for this determination.

Table 9 – County Hazard Ranking Matrix Key

Ranking Level	Code	Description
High Hazard Ranking	H	One or more occurrences each year
Medium/High Hazard Ranking	MH	One occurrence every 3 years
Medium Hazard Ranking	M	One occurrence every 5 – 7 years
Low Hazard Ranking	L	One occurrence every 10 years
Not Identified	-	-

Since the table is large, codes were used for each hazard. These codes are listed below.

- FL: Flood
- DF: Dam Failure
- HU/TS: Hurricane/Tropical Storm
- TO: Tornado
- SS: Severe Storm
- WF: Wildfire
- DR: Drought
- EH: Extreme Heat
- WS: Winter Storm
- FR: Freeze
- ER: Erosion
- SH: Sinkholes
- LS: Landslides
- SM: Seismic Events
- TR: Terrorism
- TC: Technological Incidents
- MM: Mass Migration

Table 10 – County Hazard Ranking Matrix

County	FL	DF	HU/TS	TO	SS	WF	DR	EH	WS	FR	ER	SH	LS	SM	TR	TC	MM
Alachua	MH		M	M	M	H											
Baker	H		H	M	H	H	H	H	L	L		L					
Bay	H		H	H		M						L					
Bradford	H		H	H	H	MH	H	M	L	L	L	L					
Brevard	H	L	H	H	H	MH	M	L	L		MH			L	L	M	
Broward	H		MH	H	H	MH	M	MH		L	MH	L			M	H	L
Calhoun	H		H	MH	H	H	MH	MH	L	L	L	L					
Charlotte	H		M	M	H	M	MH	L		M	M	L		L	L	M	
Citrus	H	L	H	H	H	H	H	M				H				H	
Clay	H		M	M	H	H	M	M	M	M		M		L	L	M	
Collier	MH	L	MH		H	H					H						
Columbia	M		M	H	H	M	M	M	L	M	M	M					
DeSoto	H		MH	M	H	M	H			M		L			L	L	
Dixie	H		H	M	M	M	M	M	M	M	L	L			L	L	L
Duval	H		H	L	H	H	L	L		L					L	M	
Escambia	H	L	H	MH	H	M	M			L	L	L	L	L	L	L	L
Flagler	H		H	H	H	H	L	H			MH				L	L	
Franklin	H		H	H	H	MH	H	M	L	L	MH						
Gadsden	H	L	H	H	H	H	MH	H	M	H		L	L				
Gilchrist	H		M	M	H	H	M	M	M	M		M					
Glades	H	L	H	M	H	H	M	M	M	M		L	L	L		H	
Gulf	H	L	H	M	M	H	M	M		M	M	L			L	M	
Hamilton	H	L	H	MH	MH	H	H	H	MH	MH	M	H					
Hardee	H		MH	MH	H	H	MH	MH	MH	MH							
Hendry	M	L	H	M	H	H	H	H	M	M		L	L	L	L		
Hernando	H		H	H	H	H	H	L	H	H	M	H				L	
Highlands	H	L	H		H	H	H	H	M	M		L	L		L	H	
Hillsborough	H	M	MH	H	H	H	L	L	L	L	L	M			L	M	L
Holmes	H	L	M	L	H	H	L	L	L		H	L					
Indian River	H	L	H	M	H	M	H	M	M	M	H	L		L	L	M	
Jackson	H		H	H	H	H	M	M			L	M			L	L	
Jefferson	H	L	H	M	H	H	H	H	M	H	L	M					
Lafayette	M		MH	M	H	H	M	M	L	M	M	M					
Lake	M	L	M	M	H	M	M	M	M	M	L	M					
Lee	M		M	M	H	H	M	M		H	H						
Leon	M		L	M	H	M	M					H			L	M	
Levy	H		M	H		H	H	H		H	M	H					
Liberty	H		H	MH	H	H	MH	H	MH	H	H	L					
Madison	H		MH	M	H	M	H		MH							H	
Manatee	H	M	H	H	H	H	H	M	L	L	M	L		L	H	H	
Marion	H		L	M		M	L	L	L		L	M					
Martin	H	L	M	M	H	M	L	L			M	L		L	L	M	L
Miami-Dade	H		H	H	H	L	M		M		M						
Monroe	H		MH	H	H	MH	L	L		L	H						
Nassau			L	L	M	L	L	L		L	L					L	
Okaloosa	MH	M	M	MH	MH	H	H	M		L		L					
Okeechobee	M		H	M	M	H	H		H	H	L	L	L				
Orange	H		H	H	H	H	H	H	M	M		H			M	H	
Osceola	H		H	H	H	H						L			H	L	
Palm Beach	H		H	L	H	L	M	L		L	L				L	M	L
Pasco	MH		M	H	H	H	H	L	L	L	M	H				M	
Pinellas	M	L	H	H	H	M	M	H	L	L	H	M			M	H	
Polk	H	L	MH	H	H	H	MH	M		H		H				M	
Putnam	MH	L	M	M	H	MH	MH	MH		M		M		L	L	L	
Santa Rosa	H		H	H	H	H	M	M	MH	MH	H						
Sarasota	H	L	H	H	H	H	H				H	M		L			
Seminole	H		H	H	MH	MH	H	MH	L	L		M		L	M	H	L

County	FL	DF	HU/TS	TO	SS	WF	DR	EH	WS	FR	ER	SH	LS	SM	TR	TC	MM
St. Johns	H		H	M	H	H	L	L	M	H	M				L	M	
St. Lucie	H		H	M	H	M	H	M		M	H	L				L	L
Sumter	H		M	M	H	H	M	M		M						M	
Suwannee	H		H	H	H	H	MH	H	L	MH	H	H					
Taylor	M	L	H	H	H	H	M		L	L	M	M		L	L	L	
Union	H		H	MH	H	H	H	MH	L	L	L	L					
Volusia	H		H	H	H	H	M		L	L	H	L					
Wakulla	H	L	H	L	H	H					M	M			L	M	
Walton	H	L	H	H	H	M	L	L	L	L	H	L					
Washington	M		M	M	H	L			L		M	L			L	M	

Please note that these rankings are subjective, as the Mitigation Planning Unit wanted to display how each county identified and ranked hazards for their county and had to fit each county ranking method into one for the whole state. These rankings are based on each county LMS and how they ranked and described their own hazards.

Current Status and Future Maintenance

As of 2018, this risk assessment is the most current and detailed hazard analysis for the State of Florida. The information has been analyzed using the most current data sets available at the time of revision and update. As this risk assessment is continually updated, this information will be used to further refine the current state mitigation strategies.

Identified Hazards

The list below shows the natural hazards that are profiled in this risk assessment.

- Flood
- Tropical Cyclones
- Severe Storms
- Wildfire
- Erosion
- Drought
- Extreme Heat
- Geological
- Winter Storm
- Seismic
- Tsunami

Because this risk assessment serves as the single risk assessment for the State of Florida, other hazards have been included to meet requirements. EMAP and other planning mechanisms require that the CEMP and SHMP identify the same hazards. To avoid duplication of effort, the SHMP risk assessment serves as the CEMP risk assessment, as well as the risk assessment for any other emergency management plans. The technological and human-caused hazards included in this risk assessment are listed below.

- Transportation Incident
- Cyber Incident

- Hazardous Materials Incident
- Space Weather Incident
- Radiological Incident
- Terrorism
- Agricultural Disruption
- Biological Incident
- Mass Migration Incident
- Civil Disturbance Incident

These 21 hazards were identified based on examination of past disasters, frequency of occurrence, probability of occurrence, possible impacts, analysis of individual LMS hazard rankings, and jurisdiction and state vulnerability. Severity? Magnitude?

Hazard Profiles

The hazard profiles all follow the same outline, the sections and a short description of the intent of the section is listed in the table below.

Table 11 – Hazard Profile Description

Hazard Profile Section	Description
Hazard Description	This section includes a basic overview of the hazard, such as causes, various types of the hazard, the measurements of the hazard, advisories for the hazard and any other pertinent information. There are also statements about the overall frequency and magnitude determinations that were made regarding the hazard. Each hazard description includes a section titled "Potential Impacts of Climate Change," where the potential impacts of climate change on that hazard are discussed. If there are no known potential impacts of climate change for a given hazard, there is a statement in place of the discussion.
Geographic Areas Affected by Hazard	This section discusses the areas of the state that are likely to be impacted by the hazard. There may also be references to where the hazard has occurred in the past.
Historical Occurrences of Hazard	This section lists significant occurrences of the hazard between 2006 and 2016. If there are significant occurrences before 2006, they are listed separately. There is also a list of every Major Disaster Declaration in the state for the hazard, if there are any.
Hazard Impact Analysis	This section lists impacts that are possible due to the hazard occurring in the state. They are categorized into impacts affecting: • Public; • First Responders; • Continuity of Operations (including continued delivery of services); • Property, Facilities, Infrastructure; • Environment; • Economic condition of the jurisdiction; and

	• Public Confidence in the Jurisdiction's Governance. The impacts were categorized this way to align more easily with EMAP Standard requirements.
Probability of Future Occurrences of Hazard	This section includes a description of the likelihood of the hazard occurring in the future. There is probabilistic data from HAZUS-MH and HelpFL for some hazards. Annual probability is also determined by averaging the number of occurrences within a specified timeframe. There is also a statement about the determined overall probability of the hazard.
LMS Integration	Natural Hazards: This section shows which counties included the hazard in their LMS plan and how they ranked it. Technological and Human-Caused Hazards: This section lists the counties that profiled the hazards in their LMS plan. Note: See explanation above for how each county LMS was reviewed and combined into one cohesive table.
Vulnerability Analysis and Loss Estimation, by Jurisdiction	Natural Hazards: This section includes a discussion of the overall vulnerability and an estimation of losses possible. This information is gathered from various sources, discussed below. Technological and Human-Caused Hazards: This section includes a discussion of overall vulnerability. Where possible, loss estimation information is provided. There are also examples of the cost of incidents in the past to provide a baseline of losses possible.
Vulnerability Analysis and Loss Estimation, of State Facilities	Natural Hazards: This section includes a discussion of the vulnerability of state facilities. Where possible, the value of state facilities is included to provide information regarding possible loss estimations. Technological and Human-Caused Hazards: This section includes a discussion of overall vulnerability of the state.
Hazard Summary Matrix	There is a statement about the ranking system below, as well as a statement about the overall vulnerability of the respective hazard in each profile. These statements are followed by the Hazard Summary Matrix. Overview: A few sentences from the hazard description. Frequency: Ranking of how often the hazard occurs. • Not Likely: every 50-100 years • Likely: every 5-10 years • Very Likely: annual Probability: Rankings of the likelihood of the hazard occurring. • Not Likely: every 50-100 years • Likely: every 5-10 years • Very Likely: annual Magnitude: • Injuries/Deaths: Ranking of how many injuries and deaths are likely due to the hazard occurrence. o Low: no injuries or deaths recorded o Medium: any injuries recorded, but no deaths o High: any deaths recorded

	• Infrastructure: Ranking of the general impact on infrastructure due to the hazard occurrence.
	  ○ Low: little to no damage to property
	  ○ Medium: significant damage to property
	  ○ High: destruction of property
	• Environment: Ranking of general impact on the environment due to the hazard occurrence.
	  ○ Low: little to no damage to environment
	  ○ Medium: some damage to environment
	  ○ High: significant damage to environment
	Overall Vulnerability: Ranking based on summary of Frequency, Probability, and Magnitude.
	Each category is given a number:
	• Not Likely and Low = 1
	• Likely and Medium = 2
	• Very Likely and High = 3
	When all 5 categories are added together, the overall vulnerability is a number between 5 and 15. Hazards are given an Overall Vulnerability ranking based on the rubric below.
	• 5: Low overall vulnerability
	• 6-10: Medium overall vulnerability
	• 11-15: High overall vulnerability

Data Sources

HAZUS-MH

HAZUS-MH is a nationally applicable standardized methodology that contains models for estimating potential losses from floods and hurricanes. HAZUS-MH uses Geographic Information Systems (GIS) technology to estimate physical, economic, and social impacts of disasters. This helps users to visualize the spatial relationship between populations and other more permanently fixed geographic assets or resources for the specific hazard being modeled. HAZUS-MH is used for preparedness, response, recovery, and mitigation and is useful in the risk assessment step in the mitigation planning process.

HAZUS-MH 4.0 uses 2010 Census data for population and general building stock information, which is aggregated to the Census Track and Block (wind and flood, respectively). Furthermore, the Flood model incorporates a dasymetric model which more accurately represents where the population is located based on land use and land cover.

HelpFL

The Hazards and Vulnerability Research Institute (HVRI) at the University of South Carolina developed a new and innovative scientific analysis, modeling, metrics, and visualization technique for the Florida Division of Emergency Management's Mitigation Bureau. These new methods are intended to create a baseline for Floridians to begin more comprehensively planning for and mitigating against threats to lives and property. The project had two main goals, to update and advance the science of spatially enabled hazard models and to develop and deploy a hazards analysis web mapping application for visualization

and printing of hazard event data, zone areas of impact and threat, and a composite of hazard, social, and place vulnerability.

The Hazards of Place (HOP) model developed by the HVRI is an established conceptual model for identifying and assessing hazard risk. From this conceptual model, HVRI created a set of geospatial models for assessing risks and hazards in Florida. Outputs include geospatial models, geospatial data pertaining to hazard event locations, hazard zones, and hazard zone/probability combinations creating a Hazard Vulnerability Index (HazVI) for Florida. Hazards included in the HelpFL tool are geophysical, meteorological, and hydrological casual agents and include: earthquakes, sinkholes, tsunami, hurricane wind (tracks), hurricane storm surge (SLOSH), winter weather, wind, severe storm, lightning, heat, hail, fog, drought, tornadoes, extra-tropical coastal storms, 500-year flood, 100-year flood, flash flooding, coastal erosion, and wildfire.

The completed tool is called the Hazards Events and Locations Prognosticator – Florida, or "HelpFL" for short. This project was funded through an HMGP planning grant. For this 2018 Risk Assessment update, HelpFL calculated population using ArcGIS Online enrichment analysis, which utilized the 2017 American Community Survey population tables.

SOLARIS-FITS

Florida State Owned Lands and Records Information System – Facility Inventory Tracking System (SOLARIS-FITS) is a Florida Legislative required self-reporting database to record and maintain the inventory of real estate properties that are owned, leased, rented, or otherwise occupied by any state government entity. This database was developed in collaboration by both the Florida Department of Environmental Protection and the Florida Department of Management Services. Those occupying a state facility are instructed to input data to the SOLARIS-FITS database. The data used for the 2018 Risk Assessment update was based on the 2016 tax year. According to the data, there are 20,231 state owned, leased, rented, or occupied facilities in the state of Florida.

FEMA

The FEMA website provides information about each federal declaration that has been made for Florida, including emergency declarations, major disaster declarations, and fire management assistance declarations.

The Risk Mapping, Assessment and Planning (RiskMAP) program aims to identify flood risk and promote informed planning and development practices to help reduce risk. The GIS portion of the RiskMAP program was used to develop the flood hazard profile and analyses.

NOAA/NWS/NHC

The National Oceanic and Atmospheric Administration (NOAA) is a large agency with many purposes. The National Weather Service (NWS) is part of NOAA and both agencies provided information via their websites that is included in the natural hazard profiles.

The National Hurricane Center (NHC) is within NOAA/NWS and works to issue the best watches, warnings, forecasts, and analyses, as well as increase the understanding of tropical weather. Much of the tropical

cyclone hazard profile stems from information on this website. NHC is located on the Florida International University in Miami, Florida.

National Climatic Data Center (NCDC)/ National Centers for Environmental Information (NCEI)

The NCDC Storm Event Database contains records which document three things: the occurrence of storms and other significant weather phenomena with sufficient intensity to cause loss of life, injuries, significant property damage, and disruption to commerce; rare or unusual weather phenomena that generates media attention; and other significant meteorological events, such as record maximum or minimum temperatures. The database was used to search for data from January 2006 until December 2016. Event types recorded include coastal flood, cold/wind chill, drought, excessive heat, extreme cold/wind chill, flash flood, flood, frost/freeze, hail, heat, heavy rain, high wind, lightning, sleet, storm surge/tide, strong wind, thunderstorm wind, tornado, tropical depression, tropical storm, wildfire, winter storm, and winter weather.

The Florida State University (FSU) Climate Center is affiliated with the NCDC and works to provide data, information and services for Florida and the US regarding climate data, extreme events, and special analysis.

Drought.gov

NOAAs National Integrated Drought Information System (NIDIS) program is intended to coordinate and integrate drought research and create a drought early warning information system. The programs website is called Drought.gov and contains a wealth of information that is included in the drought hazard profile.

Southern Wildfire Risk Assessment

The Southern Wildfire Risk Assessment (SWRA) works with various other agencies to provide wildfire information for southern US states, including identifying areas that are prone to wildfires. The SWRA Portal (SWRAP) also works to create awareness and to support mitigation planning. This information was used to develop GIS information for the wildfire hazard profile.

USGS

United States Geological Survey (USGS) provides the US with reliable scientific information to describe and understand the Earth and to minimize the loss of life and property from natural disasters. Information from USGS is included in several hazard profiles, including the geological hazard profile.

Florida State Agencies

Information from State of Florida agencies, such as Division of Emergency Management (FDEM), Department of Environmental Protection (FDEP), and Department of Agriculture and Consumer Services (FDACS) was used to develop the hazard profiles and the GIS data shown.

Flood Hazard Profile

1. Flood Description

A flood or flooding refers to the general or temporary conditions of partial or complete inundation of normally dry land areas from the overflow of inland or tidal water and of surface water runoff from any source. Floodplains are defined as any land areas susceptible to being inundated by water from any flooding source. While many people underestimate the severity of floods, loss of life and property from flooding are real threats in Florida. According to NOAA, in Florida, 2 died from a flood in 2009, 1 died in 2012, and 3 died in 2014.[12] Flood stages are the water elevations at which varying levels of damage to personal property occurs. Locally heavy precipitation may produce flooding in areas other than delineated floodplains or along recognized drainage channels. If local conditions cannot accommodate intense precipitation through a combination of infiltration and surface runoff, water may accumulate and cause flooding.

Types of Flooding

In Florida, several variations of flooding occur due to the effects of severe thunderstorms, tropical cyclones, seasonal rain, and other weather-related conditions. This hazard profile will focus on two broad categories of flooding, inland flooding and coastal flooding.

- Inland Flooding
  - Riverine Reach
  - Flash Floods
  - Dam or Dike Failure
- Coastal Flooding
  - Tidal Flooding

Inland or Riverine Flooding

Florida's low-lying topography combined with its subtropical climate makes it highly vulnerable to inland or riverine flooding. Riverine flooding occurs when the flow of runoff is greater than the carrying capacities of the natural drainage systems. Flood damage is proportional to the volume and the velocity of the water. High volumes of water can move heavy objects and undermine roads and bridges. Flooding can occur as a result of precipitation upstream without any precipitation occurring near the flooded areas. For example, portions of major drainage basins in Alabama and Georgia drain into the rivers in north Florida, and excessive rainfall in these southern states often causes flood conditions in Florida.

Flash floods present more significant safety risks than other riverine floods because of the rapid onset, the high water velocity, the debris load, and the potential for channel scour. In addition, more than one flood crest may result from a series of fast moving storms. Sudden destruction of structures and the washout of access routes may result in the loss of life.

[12] http://www.nws.noaa.gov/om/hazstats.shtml#

Although rural flooding is dangerous to fewer people and may be less costly than urban flooding, it can cause great damage to agricultural operations.

The U.S. Geological Survey has established a system of monitoring stations to retrieve data about stream flow conditions. This system works in real time for flood warnings and for short-term trends. The system is accessible at the following website: http://waterdata.usgs.gov/fl/nwis/rt.

Riverine Reach

The influence of river flooding on river stage gradually decreases with proximity to the Gulf, and the influence of tides and storm surges on river stage gradually increases the flood levels in bodies of water. Tides affect river stages at low and medium flows in the upper tidal reach and at all flows in the lower tidal reach. In the lower part of the lower tidal reach, stages during storm surges are higher than river flood stages. Soils are present in all riverine wetland forests, but the most nutrient-rich swamps are dry during low-flow periods. Most surface soils in the deepest riverine swamps, upper and lower tidal swamps and lower tidal mixed forests are continuously saturated mucks.

Upper Tidal Reach

Upper tidal mixed forests are found on low levees or in transitional areas between swamps and higher forest types. Upper tidal swamps are present at elevations below median monthly high stage and usually have surface soils that are permanently saturated mucks. The lower Suwannee River is the best example of an upper tidal reach in Florida.

Lower Tidal Reach

The lower tidal reach in a floodplain is found on elevations that do not receive regular tidal inundation or frequent river flooding, but have a high water table and are briefly inundated by storm surges several times a decade. The lower Suwannee River is an example of this. Lower tidal mixed forests include swamps with numerous small reaches and are found on deep muck soils that are below the elevation of the median daily or monthly high stage.

Flash Flooding

As Florida's population has rapidly increased since 1960, so has the profile of the state's landscape. Rapid urbanization has manifested itself in the form of increased impervious surface areas such as asphalt roads, concrete areas, sidewalks, and structures. This increase has led to a much higher level of flash flooding during heavy rainstorms and flooding events. The design of urban drainage systems in the past has concentrated on disposing of storm water as rapidly and efficiently as possible in a concentrated area; however, stormwater is often collected and transported elsewhere without a comprehensive strategy for dealing with it as a system. As a result, drainage in many of Florida's urbanized areas is often "piecemeal" and lacking comprehensive design.

Dam/Dike Failure Flooding

The failure of a dam or dike may also result in a flood event. The amount of water impounded by a dam is measured in acre-feet; an acre-foot of water is the volume that covers an acre of land to a depth of one foot. Dam failures are not routine. Two factors influence the potential severity of full or partial dam failure: (1) The amount of water impounded, and (2) the density, type, and value of development downstream.

In 2007, the U.S. Army Corps of Engineers declared that the Herbert Hoover Dike was on the top of the list of nationwide dams in need of repair. Since 2001, USACE had provided over $870 million in rehabilitation funds for the dike.[13] The Herbert Hoover Dike is one of many dams in Florida, each of which are listed in the National Inventory of Dams and are assigned a high, significant, or low hazard classification based on potential for loss of life and damage to property if the dam fails. Classifications are updated based on development and changing demographics upstream and downstream.

Dam hazard is a term indicating the potential hazard to the downstream area resulting from failure or operational errors of the dam or facilities. The level of risk associated with dams is classified into three categories based on definitions from USACE:

- Low: A dam where failure or operational error results in no probable loss of human life and low economic and/or environmental loss. Losses are principally limited to the owner's property.
- Significant: A dam where failure or operational error results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or affect other concerns. These dams are often located in predominantly rural or agricultural areas but could be located in areas with more dense populations and significant infrastructure.
- High: A dam where failure or operational error will probably cause loss of human life.

A number of outside forces can cause dam failure, including prolonged periods of rain or flooding, landslides into reservoirs, failure of dams upstream, high winds, and earthquakes. Failure due to natural events such as earthquakes or tornadoes is significant because there is little to no advance warning. Improper design and maintenance, inadequate spillway capacity, internal erosion or "piping" within a dam, or a deliberate attack may also cause dam failure.[14]

National statistics show that overtopping of dams due to inadequate spillway design, debris blockage of spillways, or settlement of the dam crest account for 34 percent of all dam failures. Foundation defects, including settlement and slope instability, account for 30 percent of all failures. Piping and seepage cause 20 percent of national dam failures. This includes internal erosion caused by seepage, seepage and erosion along hydraulic structures, leakage through animal burrows, and cracks in the dam. The remaining 16 percent of failures are caused by other means, including the failure of conduits and valves.[15]

Coastal Flooding

Coastal flooding is usually the result of a severe weather system such as a severe thunderstorm, hurricane, or tropical storm with high winds. Water driven ashore by the wind, known as a storm surge, is the main cause of coastal flooding.

The damaging effects to structures in beach areas are caused by a combination of higher levels of storm surge, winds, waves, rains, erosion, and battering by debris. Sea walls, jetties, and the beach areas are affected by coastal flooding, and the loss over a period of time becomes costly. Loss of life and property

[13] http://www.saj.usace.army.mil/Missions/Civil-Works/Lake-Okeechobee/Herbert-Hoover-Dike/
[14] http://www.damsafety.org/news/?p=412f29c8-3fd8-4529-b5c9-8d47364c1f3e
[15] http://www.ecy.wa.gov/PROGRAMS/wr/dams/failure.html

damage are often more severe because a storm surge involves velocity wave action and accompanying winds. Storm surge is discussed in depth in the Tropical Cyclone Profile.

Tidal Flooding

A tide is the periodic rise and fall of a body of water resulting from gravitational interactions between the Sun, Moon, and Earth.[16] Tides are very predictable and most coastal areas experience two high tides and two low tides every day. High tides occur about every 12 hours and 25 minutes and it takes about half that time (6 hours and 12.5 minutes) for the tide to go from high to low or low to high.[17]

King tides are higher than normal tides and usually occur in the autumn months from September to November. These tides tend to be 6 inches or more above the average high tide of that area. Similar to regular high and low tides, king tides are predictable and usually last for 5-7 days.[18] King tides can cause flooding of streets and even structures. It is also important to note that weather conditions and concurrent rainfall can exacerbate the effects of king tides.

Advisories

Below are the advisories that the NWS issues regarding flooding hazards:[19]

- Flood Advisory: normally issued as an Urban and Small Stream Flood Advisory, this is issued when the flooding is not expected to be severe enough to warrant a flood warning, but it may cause inconvenience and could threaten life or property if caution is not exercised. Examples include nuisance flooding of low-lying areas and areas of poor drainage and minor flooding of roadways.
- Flood or Flash Flood Watch: issued when conditions are favorable for a specific hazardous weather event, including flooding, to occur, meaning flooding is possible.
- Flood Warning: issued when a hazardous weather event, including flooding, is imminent or already happening.
- Areal Flood Warning: issued for flooding that occurs more gradually, normally from prolonged and persistent moderate to heavy rainfall.
- Flash Flood Warning: issued when a flash flood is imminent or occurring, referring to a sudden violent flood that can take minutes to hours to develop. It is even possible to experience a flash flood in areas not receiving rain.
- River Flood Warning: issued when a river is forecast to go above its designated flood stage at the forecast point.
- Coastal Flood Advisory/Watch/Warning: issued when flooding along the coast of the Atlantic Ocean, Pacific Ocean, or the Gulf of Mexico is possible. The flooding must be due to water being forced from the nearby body of water onto land, and not from rainfall.

[16] http://tidesandcurrents.noaa.gov/glossary.html
[17] http://oceanservice.noaa.gov/education/kits/tides/tides05_lunarday.html
[18] http://www.southeastfloridaclimatecompact.org/wp-content/uploads/2016/06/KingTideToolkit.pdf
[19] http://www.floodsafety.noaa.gov/watch_warning.shtml

Floodplains

According to FEMA, a floodplain is any land area susceptible to being inundated by floodwaters, from any source. The USGS further defines a floodplain as the relatively flat lowland that borders a river, and is usually dry but is subject to flooding.[20]

To establish floodplains, FEMA adopted the base flood elevation, which is the level of a flood that has a one percent probability of occurring in any given year. This level of flood is referred to as the base flood, the one percent flood, or the 100-year flood. The area that would be inundated by a base flood is called the 100-year floodplain. This is often misunderstood because many assume such a flood would only occur once every 100 years; however, as explained, the "100" number is referring to the one percent chance of the flood reaching that specified floodplain. The same theory is applied to understand the 500-year floodplain; it has a 0.2 percent chance of occurring each year.

FEMA has identified and mapped areas of flood risk on Flood Insurance Rate Maps and the zones are called Special Flood Hazard Areas (SFHA). The 100-year floodplain is considered a high-risk area and is denoted as Zone A. The 500-year floodplain is shown by the notation Zone C or Zone X. The areas between the 100 and 500-year floodplains are shown using Zone B and Zone X. Additionally, high risk coastal areas are denoted as Zone V. This information is shown in the table below.

TABLE 12 – FEMA Flood Zone Designations[21]

Zone	Description
Low to Moderate Risk Areas	
C and X (unshaded)	Area of minimal flood hazard, usually depicted on FIRMs as above the 500-year flood level. Zone C may have ponding and local drainage problems that don't warrant a detailed study or designation as a base floodplain. Zone X is the area determined to be outside the 500-year flood and protected by levee from 100-year flood.
B and X (shaded)	Area of moderate flood hazard, usually the area between the limits of the 100-year and 500-year floods. B Zones are also used to designate base floodplains of lesser hazards, such as areas protected by levees from 100-year flood, or shallow flooding areas with average depths of less than one foot or drainage areas less than 1 square mile.
High Risk Areas	
A	Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas; no depths or base flood elevations are shown within these zones.
AE	The base floodplain where base flood elevations are provided. AE Zones are now used on new format FIRMs instead of A1-A30 Zones.
A1 – 30	These are known as numbered A Zones (e.g., A7 or A14). This is the base floodplain where the FIRM shows a BFE (old format).
AH	Areas with a 1% annual chance of shallow flooding, usually in the form of a pond, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones.

[20] https://pubs.usgs.gov/fs/FS-229-96/
[21] https://www.fema.gov/flood-zones

AO	River or stream flood hazard areas, and areas with a 1% or greater chance of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Average flood depths derived from detailed analyses are shown within these zones.
AR	Areas with a temporarily increased flood risk due to the building or restoration of a flood control system (such as a levee or a dam). Mandatory flood insurance purchase requirements will apply, but rates will not exceed the rates for unnumbered A zones if the structure is built or restored in compliance with Zone AR floodplain management regulations.
A99	Areas with a 1% annual chance of flooding that will be protected by a Federal flood control system where construction has reached specified legal requirements. No depths or base flood elevations are shown within these zones.
High Risk Coastal Areas	
V	Coastal areas with a 1% or greater chance of flooding and an additional hazard associated with storm waves. These areas have a 26% chance of flooding over the life of a 30-year mortgage. No base flood elevations are shown within these zones.
VE, V1 – 30	Coastal areas with a 1% or greater chance of flooding and an additional hazard associated with storm waves. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones.
Undetermined Risk Areas	
D	Areas with possible but undetermined flood hazards. No flood hazard analysis has been conducted. Flood insurance rates are commensurate with the uncertainty of the flood risk.

Mitigation measures are taken to reduce the flood risk in the floodplain; however, development is not prohibited. Management of floodplains is accomplished through building codes, local ordinances, and zoning regulations to mitigate the damage from floodwaters. The floodway is the channel of a watercourse and those portions of the adjoining floodplain that needs to be kept open to provide for the passage of a base flood. The floodway fringe is the portion of the floodplain which when fully developed should not result in more than a one-foot rise in flood levels.

Floodplains cover a very large area in Florida. Pressure from developers to build, and the potential tax revenues from developments, make it difficult to keep floodplains undeveloped and makes floodplain management challenging. This lack of control coupled with inadequate information available regarding the extent of floodplains and flood prone areas typically leads to unsound development on floodplain land.

Floodplains offer many benefits to communities by providing natural flood and erosion control, natural water filtration processes, habitats for plant and animal communities, as well as recreational areas and scientific field-study. Acting as natural flood storage areas, floodplains decrease the destructive force of floodwaters downstream by reducing the velocity of floodwaters. Though floodplain vegetation is partly responsible for slowing the rush of floodwaters, it also serves other valuable functions such as reducing soil erosion, trapping floodwater sediment that increases soil fertility by providing nutrients to environments, and reducing sediment load downstream.

The chemical filtration processes and biological activity that occur within a floodplain can also help reduce flood-generated pollution from agricultural and urban runoff and sewage overflow. Floodplains preserve and recharge groundwater supplies and provide opportunities for recreation, education, and scientific study. Urban expansion may encourage development in floodplains that would otherwise be reserved for these benefits.

The 100-year floodplain of the lower Suwannee River is a good example of the overall topography of the floodplain areas within the state. The lower Suwannee River runs across the entire north-central area of the state and starts from its confluence with the Santa Fe River to the tree line near the Gulf of Mexico. The Suwannee's floodplain is divided into three reaches based on changes in hydrology, vegetation, and soils with proximity to the coast: riverine (non-tidal), upper tidal, and lower tidal.

National Flood Insurance Program and Repetitive Loss Properties

One of the consequences of flooding is repetitive loss. A repetitive loss property is one for which two or more losses of at least $1,000 each have been paid by the National Flood Insurance Program (NFIP) over a rolling 10-year period.

As of January 2018, 468 communities participate in the NFIP, with only 10 communities not participating. Furthermore, there are 1.7 million NFIP policies in the state of Florida, with flood insurance coverage totaling over $423 trillion. According to the Florida NFIP Insurance Report and the NFIP Policy and Claims Report, there have been 255,725 NFIP claims in Florida since the beginning of the program in 1978, with the total paid equaling over $4.2 trillion. With a 98% participation rate it is clear that the NFIP is extremely important to the state of Florida. Furthermore, Florida pays $950 million in insurance premiums each year to the NFIP, proving that Florida is also important to the NFIP program. For more information about the NFIP, please see Section 4: Goals and Capabilities.

Table 13 – Florida NFIP Policies

Description	Total
Number of NFIP policies in Florida	1,738,149
Total coverage	$423,756,701,200
Total paid in premiums	$950,483,682
Total number of claims since 1978	255,725
Total paid in claims since 1978	$4,169,105,407

Repetitive Loss (RL) properties are the focus of strong mitigation programs. Mitigating RL and Severe Repetitive Loss (SRL) properties is strategic, because if there are properties that are known to flood, targeting them to mitigate will prevent flooding and losses in likely properties and give a high return on investment.

This table shows RL properties that have been mitigated, by county. Refer to *Appendix F: NFIP Policy Statistics* for the full table, Repetitive Loss County Summary.

Table 14 – Repetitive Loss Properties (Mitigated)

Description	Total
Total payments (building and contents)	$366,342,649.89
Average payment per claim	$36,361.55
Losses	10,075
Properties	3,925

This table shows RL properties that have not been mitigated. As of January 2018, there are 14,887 non-mitigated RL properties.

Table 15 – Repetitive Loss Properties (Non-Mitigated)

Description	Total
Number of RL buildings	14,887
Number of RL buildings Insured	8,019
Number of RL Losses	38,819
Number of RL Losses Insured	21,685
Total of RL Losses	$1,287,010,406.95
Total of RL Losses Insured	$860,098,672.03

This table provides a summary of all Severe Repetitive Loss (SRL) properties in Florida. This information is not available separated by mitigated and non-mitigated properties.

Table 16 – Severe Repetitive Loss Properties (Mitigated and Non-Mitigated)

Description	Total
Total payments (building and contents)	$146,305,534.07
Average payment per claim	$43,856.57
Losses	3,336
Properties	657

Furthermore, the NFIP's Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result of CRS, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS:

- Reduce flood losses
- Facilitate accurate insurance rating
- Promote the awareness of flood insurance

As of January 2018, there are 240 communities enrolled in the CRS program.

Sea Level Rise

Florida is vulnerable to sea level rise given its extensive shoreline and low elevation. If sea levels do rise, a number of consequences including the salination of fresh water sources, land loss, and increases in storms and flooding could be observed.

Rising sea level affects the salinity of both surface water and ground water through salt-water intrusion. Shallow coastal aquifers such as those in Florida are at risk to this salt-water intrusion process. The freshwater Everglades currently recharges Florida's Biscayne aquifer, the primary water supply to the Florida Keys. As rising water levels submerge low-lying portions of the Everglades, portions of the aquifer would become saline.

Communities that withdraw water from aquifers in various parts of Florida, including the Biscayne Aquifer in southeastern Florida, the Floridian Aquifer along the northeastern coast and in the Florida panhandle, and the Tamiami Aquifer in southwestern Florida, have already experienced problems with saltwater intrusion.

As sea levels rise, water inundates and erodes coastal wetland ecosystems such as mangroves and salt marshes. Higher water levels wash away wetlands and flood previously dry land. These coastal wetland ecosystems are crucial to absorbing the impact of tropical storms and provide a breeding ground for a significant proportion of sea life.

Sea level rise would increase the vulnerability of coastal areas to flooding during storms. During a tropical storm or hurricane, storm surge would build up on top of a higher base of water resulting in damages that are more significant.

Additionally, shore erosion increases storm vulnerability by removing the dunes and beaches that otherwise provide a buffer between coastal property and storm waves and surge.

Lastly, sea level rise would result in an increase in coastal flooding from rainstorms because low areas drain more slowly as sea levels rise.

Potential Effects of Climate Change on Flooding

Inland and Riverine Flooding

A warmer atmosphere holds more water vapor and, therefore, can result in heavier and more long-lasting rainfall events.[22] A possible global pattern is for arid areas to become drier and moist areas to become wetter. Where precipitation is enhanced, strong storms are expected to become stronger with the result that rainfall events with a given recurrence frequency, e.g. the 25-year storm, will happen more often.[23]

[22] Peterson, T.C. et al. (2012). Explaining extreme events of 2011 from a climate perspective. Bulletin of the American Meteorological Society, July, 1044; http://journals.ametsoc.org/doi/full/10.1175/BAMS-D-12-00021.1; Williams et al. (2012). Physical climate forces. In, Burkett and Davidson (Eds.), Coastal impacts, adaptation and vulnerability: A technical input to the 2012 National Climate Assessment. http://www.coastalstates.org/wp-content/uploads/2011/03/Coastal-Impacts-Adaptation-Vulnerabilities-Oct-2012.pdf., p. 41.; http://www.ssec.wisc.edu/~kossin/articles/NCA_Coasts.pdf

[23] Knutson et al. (2010). Simulated reduction in Atlantic hurricane frequency under twenty-first-century warming conditions. Nature Geoscience, 1(6), 161.

Coastal Flooding

A warmer atmosphere may influence three drivers of coastal flooding: rainfall intensity and frequency, storm surge intensity, and sea level. Rising sea levels would raise the base for coastal floods and storm surge resulting in greater flood depths within existing flood hazard zones; as well as landward expansion of coastal and tidal rivers and stream floodplains and storm surge zones in areas with relatively flat topography. The relationship between a given increase in sea level and the resulting expansion of a coastal flood hazard or storm surge zone depends on the slope of local coastal topography as well as the type of geologic substrate (sand, clay, gravel, rock, etc.), and the presence and type of vegetation.[24] The boundaries of coastal flood zones will expand more rapidly as the rate of sea level rise increases.[25]

If frequency of higher intensity tropical cyclones increases (see *Tropical Cyclones Profile*) coastal communities will experience the storm surge flooding associated with those stronger storms more often (Category 4 and 5 hurricanes).[26] However, storm surge height is not solely determined by hurricane intensity. It also is a function of the size and speed of the storm, the geometry and bathymetry of the coast, and the process by which the storm develops prior to landfall.[27] The effects of climate change on tropical storm size (radius of maximum wind and outer radius) have not yet been studied thoroughly.

Sea Level Rise

Florida is vulnerable to sea level rise given its extensive shoreline and low elevation. The "relative sea level" that is measured by a tide gauge at a particular location, is a function of both changes in the elevation of the sea's surface due to changes in the volume of water in the ocean (eustatic sea level) and vertical movement of the land upon which the tide gauge sits due to subsidence or tectonic movement of the earth's crust. Eustatic sea level rise experienced at any particular location results primarily from expansion of sea water volume as heat is transferred from the atmosphere to the oceans, and the melting of glaciers and polar ice sheets. Both of these drivers are expected to cause an increase in the rate at which sea level is rising.[28] Regional eustatic sea level rise may differ from global average eustatic sea level rise due to distance from melting glaciers, different rates of sea level volume expansion because of the salinity and temperature of regional surface waters, and the effects of wind and currents on heat transfer between the atmosphere and the oceans.[29]

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[24] Williams et al.(2012), p. 30.

[25] AECOM (2013); Handmer et al. (2012). Changes in impacts of climate extremes: human systems and ecosystems. In, Field et al. (Eds.), Managing the risks of extreme events and disasters to advance climate change adaptation. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change. http://ipccwg2.gov/SREX/images/uploads/SREX-All_FINAL.pdf, p. 260.; https://ipcc.ch/pdf/special-reports/srex/SREX-Chap4_FINAL.pdf

[26] Williams et al. (2012), pp. 29-30.

[27] Lin et al. (2012). Physically based assessment of hurricane surge threat under climate change. Nature Climate Change, 2, 462; Williams et al.(2012), p. 29.

[28] Parris et al. (2012). Global sea level rise scenarios for the US National Climate Assessment. NOAA Tech Memo OAR CPO-1. http://cpo.noaa.gov/sites/cpo/Reports/2012/NOAA_SLR_r3.pdf.

[29] Note: Water with higher salinity or that already is warm will expand less for a given amount of added heat than water that is less salty or colder. Areas closer to the tropics, such as Florida, tend to have warmer, saltier ocean water than areas closer to the poles, so the amount of sea water expansion from atmospheric warming may be less than the global average. See Bindhoff et al. (2007). Observations: Oceanic climate change and sea level. In S. Solomon

Rising sea levels would result in gradual coastal inundation, the most immediate impact of which is increased height of high tides. Similarly to regular tides, as sea levels rise, king tides will reach further inland and result in more severe damages to coastal communities[30]. In addition, rising sea levels may cause landward expansion of coastal flood zones. Through a combination of direct inundation and erosion, rising sea levels also cause recession of both beaches and coastal wetlands *(see Coastal Erosion Profile)*. The increased weight that results from a greater volume of sea water pushes saltwater into coastal aquifers and can worsen saltwater intrusion caused by excessive ground water withdrawal. Rising sea levels also push salt water further upstream in tidal rivers and streams, raise coastal ground water tables, and push saltwater further inland in soils at the margins of coastal wetlands causing wetland boundaries to expand where they are unimpeded.

2. Geographic Areas Affected by Flood

The entire State of Florida is particularly susceptible to flooding due to the large amounts of coastline, significant drainage systems, and the relatively low elevations. Many other factors contribute to flooding in Florida and therefore help to define the geographic area impacted by flooding. Areas along waterways, including lakes, rivers, streams and wetlands, are particularly susceptible to flooding due to heavy storms and rain or storm surge.

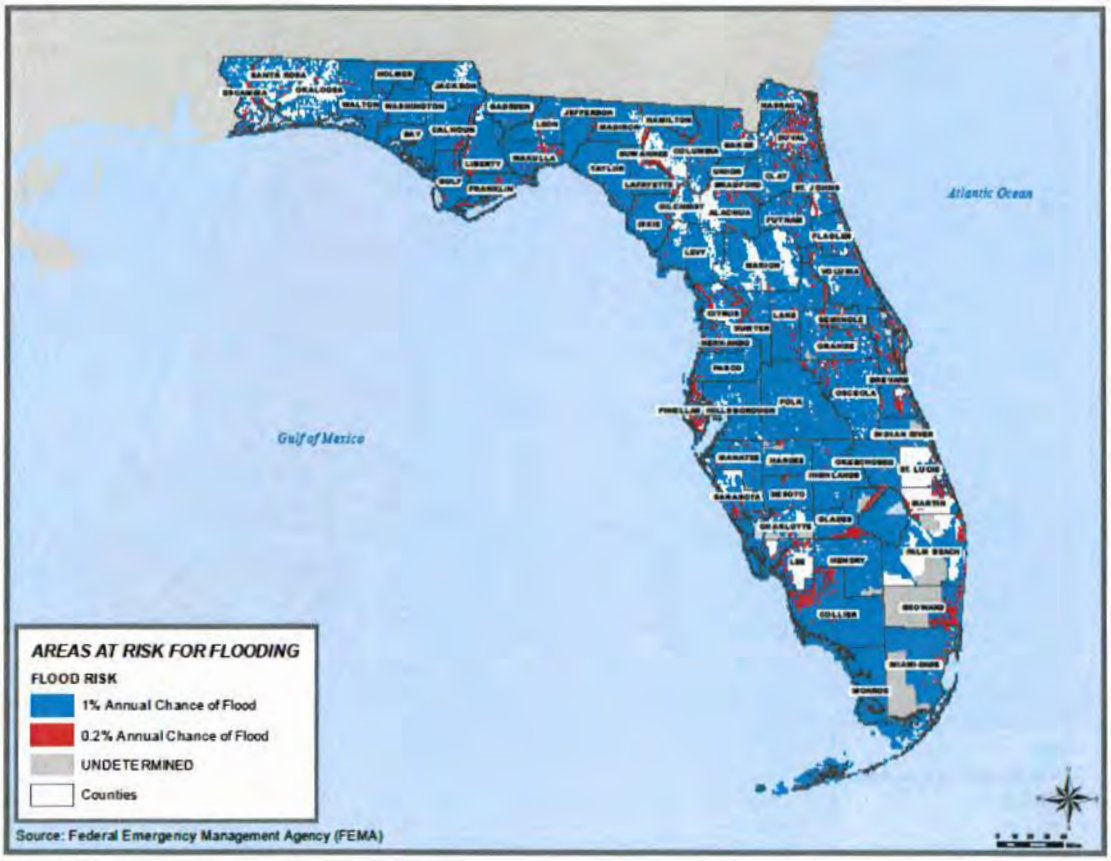
A geographic assessment of the flooding hazard was obtained using FEMA DFIRM floodplain data. This data is available for vulnerable counties in the state and it outlines the areas in the 100- year and the 500-year floodplains, with 1 percent annual probability and 0.2 percent probability of floods, respectively.

Below is a map showing the 100-year floodplain and the 500-year floodplain. The 500-year floodplain includes the areas in the 100-year floodplain, plus additional areas, which are shown in red.

et al. (Eds.), Climate change 2007: The physical science basis. Contribution of Working Group I to the fourth assessment report of the Intergovernmental Panel on Climate Change, (pp. 385-432). https://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch5.html).

[30] https://www.epa.gov/cre/king-tides-and-climate-change

Figure 11: Areas at Risk for Flooding, 100- and 500-year Floodplains

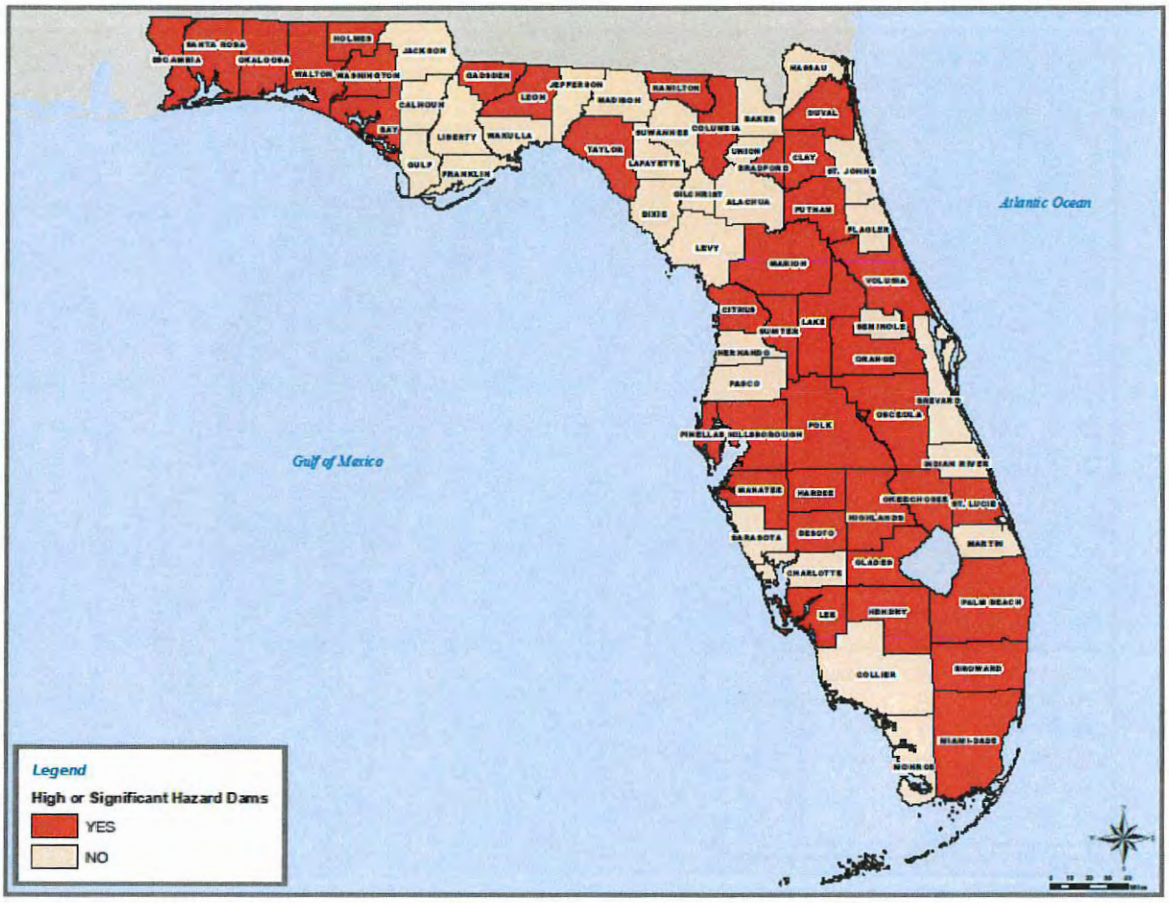


According to the USACE National Inventory of Dams, there are 1202 dams in the state of Florida as of March 2017. Of those, 80 are high hazard dams and 330 were significant hazard dams.[31] The Florida DEP coordinates the Florida Dam Safety Program and maintains a database of the 850 non-federal dams.[32] It has been determined that the counties, river systems, and the immediate areas around these dams are the zones with the highest vulnerability to flooding resulting from dam failure. Overall dam failure is a low priority with respect to flooding since the risks of coastal and inland flooding are much higher.

Figure 12 indicates which counties have high or significant hazard dams. The specific locations of the dams are not provided in the plan due to security concerns.

[31] http://nid.usace.army.mil/cm_apex/f?p=838:3:0::NO::P3_STATES:FL; Florida Department of Environmental Protection, Dam Safety Unit.
[32] http://dep.state.fl.us/water/mines/damsafe.htm

Figure 12: Counties with High or Significant Hazard Dams



3. Historical Occurrences of Flood

Inland and Coastal Flooding

Florida has experienced several flooding events. Below is a table highlighting significant flooding events from 2006 to 2016.

Table 17 – Significant Flooding Occurrences in Florida, 2006-2016[33]

Date	Description
2008	Tropical Storm Fay • August 2008 • Over $117 million in Public and Individual assistance

[33] http://www.nws.noaa.gov/om/hazstats.shtml#

2009	Heavy Rainfall • Substantial flooding from two incidents across the state • Over $46 million in Public and Individual assistance from both storms • 2 fatalities
2012	Heavy spring rains and Tropical Storms Beryl and Debby • Heavy rainfall in spring and summer in the Florida panhandle, caused flooding in Escambia County • Tropical Storm Beryl led to extensive street flooding in Miami-metro area • Tropical Storm Debby caused flooding in the Florida panhandle with an estimated over $75 million for Public and Individual assistance for this storm alone • 1 fatality
2014	Severe Storms, Tornadoes, Straight line winds, and Flooding • Significant impacts in western Florida panhandle • Over $163 million in Public and Individual assistance • 3 fatalities
2016	Hurricanes Hermine and Matthew • Over $76 million in Public and Individual assistance for both storms • Hermine impacted the big bend region of Florida and Matthew impacted the East coast, specifically the northeastern coast

Additionally, there have been several FEMA major disaster declarations in Florida that specifically are related to flooding events. Please note that some of these events are also listed under Severe Storms and Tornadoes or Tropical Cyclones. Also, there are some events that are categorized by FEMA as tropical storms or hurricanes and not flooding, even though the event may have caused significant flooding.

Table 18 – FEMA Major Disaster Declarations in Florida, 1953 – 2016[34]

Date	Name
October 22, 1953	DR-12: Flood
July 3, 1970	DR-289: Heavy Rains, Flooding
May 26, 1973	DR-387: Severe Storms, Flooding
August 22, 1975	DR-479: Flooding
September 26, 1975	DR-484: High Winds, Heavy Rains, Flooding
May 15, 1979	DR-586: Severe Storms, Tornadoes, Flooding
September 29, 1979	DR-607: Severe Storms, Flooding
July 7, 1982	DR-664: Severe Storms, Flooding
March 16 – April 9, 1990	DR-862: Flooding, Severe Storm
June 23 – 30, 1992	DR-952: Flooding, Severe Storm
October 3 – 4, 1992	DR-966: Flooding, Severe Storm, Tornadoes
March 12 – 16, 1993	DR-982: Tornadoes, Flooding, High Winds, Tides, Freezing
July 2 – 29, 1994	DR-1035: Severe Storm, Flooding, Tropical Storm Alberto

[34] https://www.fema.gov/disasters?field_state_tid_selective=47&field_disaster_type_term_tid=6837&field_disaster_declaration_type_value=DR&items_per_page=20

October 13 – November 20, 1995	DR-1074: Severe Storm, Flooding
October 7 – 21, 1996	DR-1141: Severe Storms, Flooding
February 2 – 4, 1998	DR-1204: Severe Thunderstorms, Tornadoes, and Flooding
October 3 – 11, 2000	DR:1345: Heavy Rains and Flooding
June 13 – August 22, 2003	DR-1481: Severe Storms and Flooding
December 25, 2006	DR-1680: Severe Storms, Tornadoes, and Flooding
March 26 – May 9, 2009	DR-1831: Severe Storms, Flooding, Tornadoes, and Straight-line Winds
May 17 – 28, 2009	DR-1840: Severe Storms, Flooding, Tornadoes, and Straight-line Winds
July 2 – 7, 2013	DR-4138: Severe Storms and Flooding
April 28 – May 6, 2014	DR-4177: Severe Storms, Tornadoes, Straight-line Winds, and Flooding

4. Flood Impact Analysis

Public

- Injury/Death
  - Drowning
  - Vehicle accidents
  - Extended wait for emergency response
  - Become stranded on rooftop, or trapped inside building or car
  - Exposure to hazardous materials or wastewater
- Traffic
  - Panic to evacuation
  - Accidents from driving through flooded roads – car washed away, water deeper than expected
- Damage to property
  - Mold infestation
  - Need to replace property damaged, furniture, clothes, etc.
  - Repairing damaged property
  - Issues with damage to uninsured property

Responders

- Injury/Death
  - Responding to calls during flooding, traversing flooded roads
  - Drowning
  - Dangerous rescue missions, from roofs, unstable buildings, stranded cars
  - Exposure to hazardous materials or wastewater
  - Power outage dangers, such as being electrocuted by live downed wires

Continuity of Operations (including continued delivery of services)

- Floodwaters may damage buildings, electrical systems, paperwork, etc. making continued operations difficult or impossible
- Floodwaters may hinder access to buildings (roads or sidewalks) preventing employees and the public from entering a building

Property, Facilities, Infrastructure

- Property damage
  - Floodwaters can damage property or carry heavy debris that could cause damage
- Infrastructure damage
  - If water overwhelms the drainage systems it can backup and cause damage to drains or even result in wastewater release

Environment

- Release of wastewater could damage environment
- Damage to habitat for plants and animals
- Inundation of agricultural areas could destroy crops
- Event generated debris impacting waterway navigation and submerged wetland habitats

Economic Condition

- Closure or delay of businesses because of flooded roads or water damage, leads to loss in revenue
- Crop damage or loss leads to decline in agricultural revenues

Public Confidence in Jurisdiction's Governance

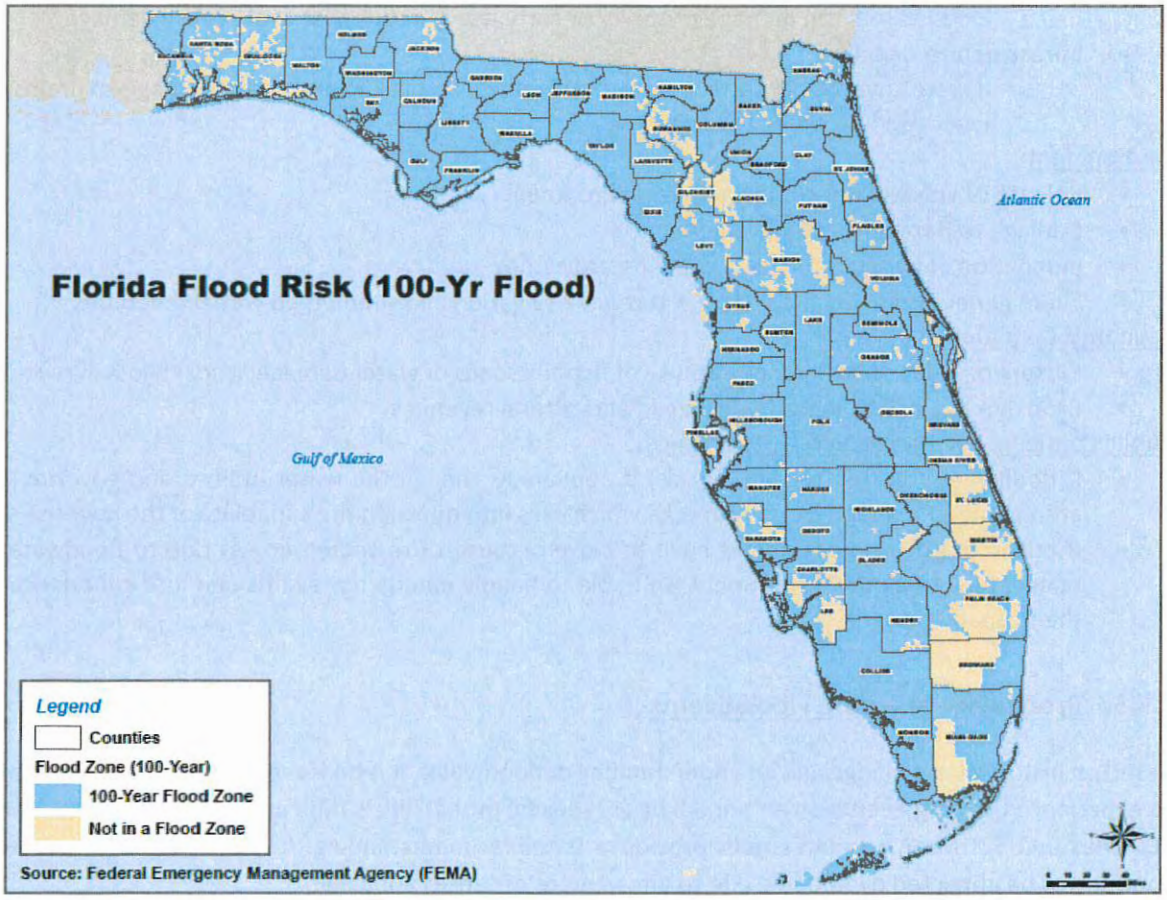
- If floodwaters do not recede quickly, it appears as though the water utilities and government aren't able to manage water properly, which calls into question the capability of the government
- If public or government offices have to close because of restricted access due to floodwaters, people may think the government isn't able to handle emergency events and lose confidence in their capabilities

5. Probability of Future Flood Events

Based on historical knowledge and an understanding of floodplains, it is believed that Florida will continue to experience flooding events on an annual basis. Specific probability is difficult to determine, however, 100-year and 500-year estimates help provide a baseline understanding. It is likely that Florida will continue to be impacted by flooding due to any number of causes annually.

The figure below shows the areas with a one percent annual probability of a flood, or the 100-year flood.

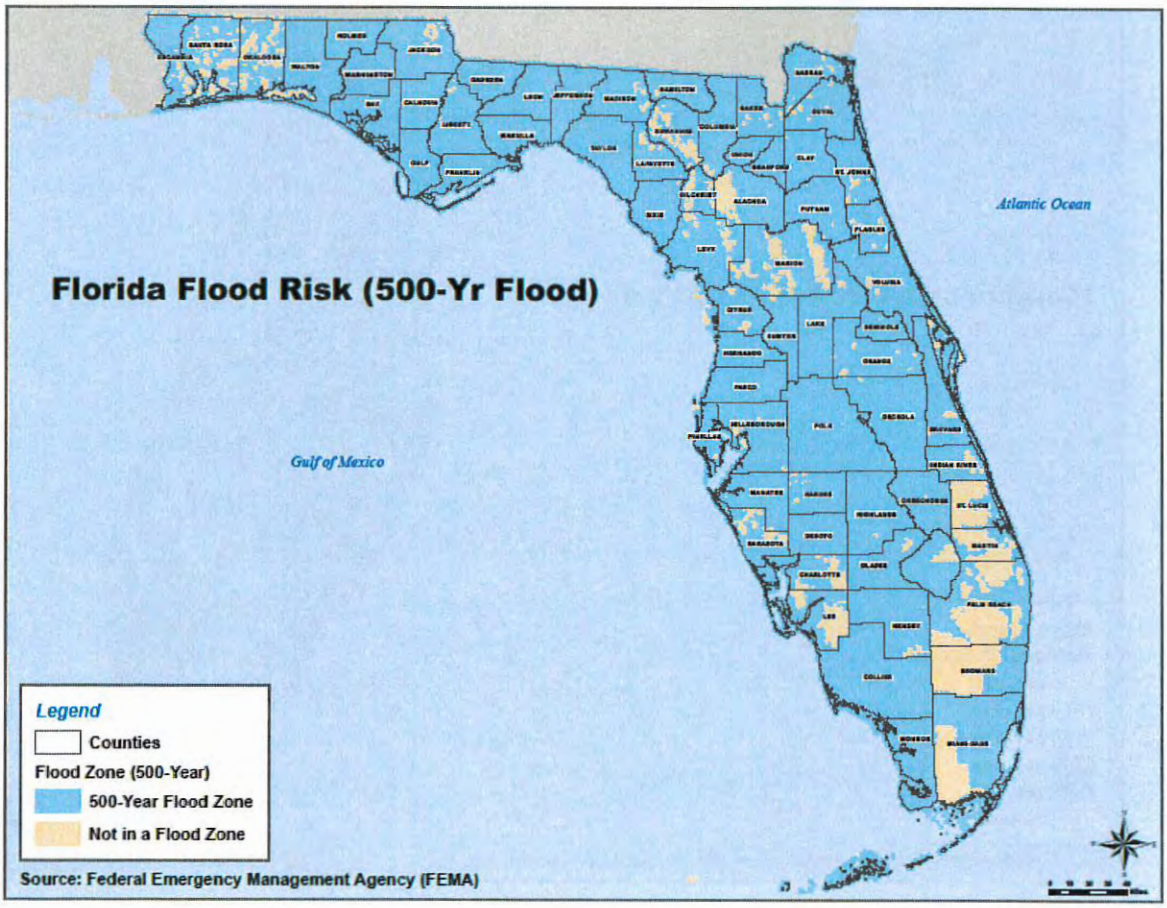
Figure 13: Florida 100-Year Flood Risk



This map demonstrates that nearly the entire state is within the 100-year flood zone.

Below is a figure showing the areas with a 0.2 percent chance annual probability of a flood, or the 500-year flood.

Figure 14: Florida 500-Year Flood Risk



This map shows that similarly to the 100-year flood zone, the 500-year flood zone covers nearly the entire state.

Below is a figure depicting the Flash Flood Risk in Florida. The potential of flash floods are difficult to predict. In 2003, subject matter experts developed the Flash Flood Potential Index (FFPI), which used the following equation where M represents Slope, L refers to Land Cover or Use, S represents Soil Type or Texture, and V equals the Vegetation Cover or Forest Density:

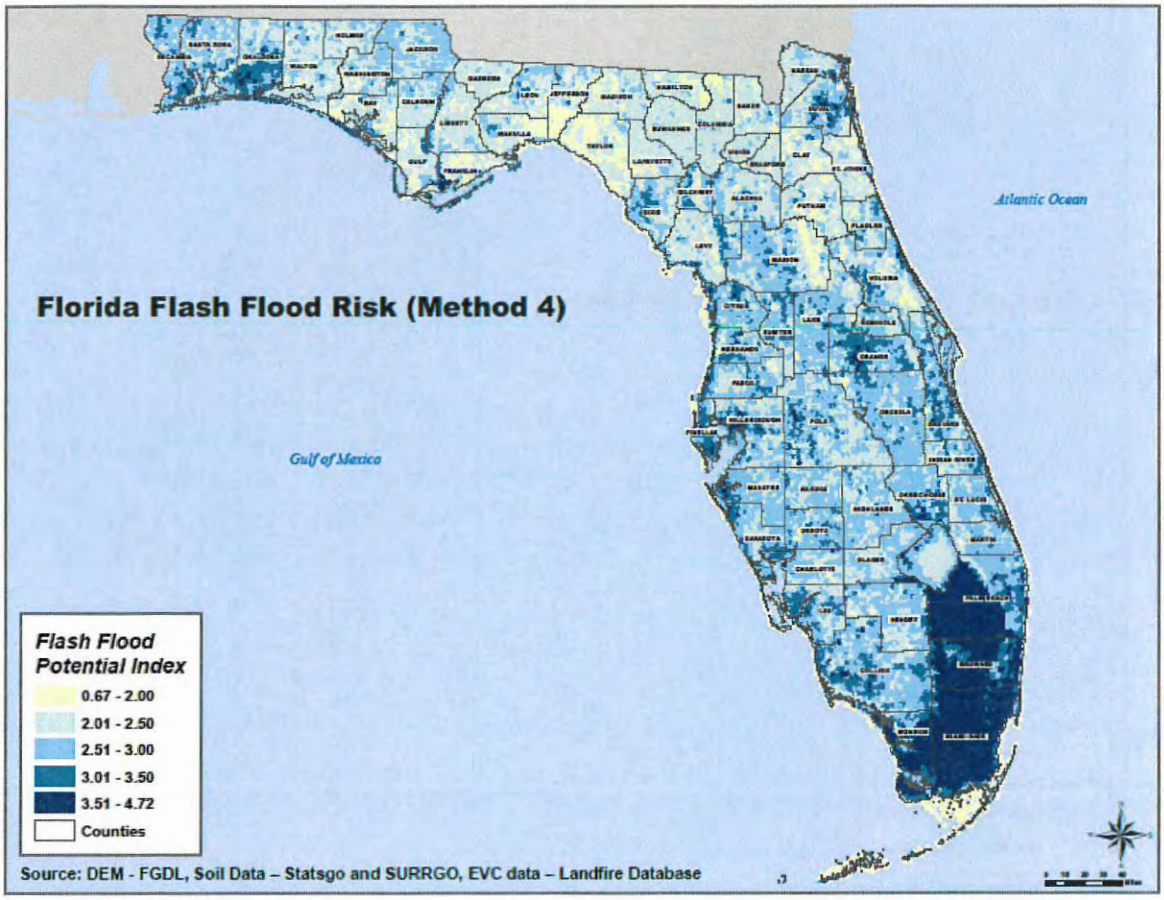
FFPI = (M + L + S + V) / N

Since 2003, this equation has been refined into four scenarios to more accurately represent specific areas and conditions. For Figure 15, the equation used is referred to as Model 4:

FFPI = (2*M+S+2*LV)/5

More information about the FFPI can be found here:
http://www.crh.noaa.gov/Image/dmx/hydro/FFPI/FFPI_WriteUp.pdf.

Figure 15: Florida Flash Flood Risk



This map shows the areas of the state that are at risk for Flash Flooding, based on various ground measures such as land use, soil type, vegetation cover, and the slope of the area. This shows that most area have a Flash Flood Potential of between 2.01 and 3.50.

Probability Based on Historical Occurrences

An analysis of flood reports from 2012 to 2016 in Florida, from the NCDC Storm Events Database indicates that there will be nine to ten coastal floods, sixteen flash floods, and nineteen to twenty floods each year in Florida.[35]

[35] http://www.ncdc.noaa.gov/stormevents/listevents.jsp?beginDate_mm=01&beginDate_dd=01&beginDate_yyyy=2008&endDate_mm=12&endDate_dd=31&endDate_yyyy=2011&county=ALL&eventType=Coastal+Flood&statefips=12%2CFLORIDA

Table 19: NCDC Flood Reports 2012 – 2016[36]

Type of Flood	NCDC Reports	Average per Year
Coastal Flood	48	9.6
Flash Flood	81	16.2
Flood	98	19.6
Total	227	45.4

6. 2018 LMS Flood Integration

An analysis of all 67 Florida County LMS Plans and their individual flood hazard rankings is shown below. Only two counties did not identify Flooding as a Hazard, while 42 counties did not identify Dam Failure as a Hazard.

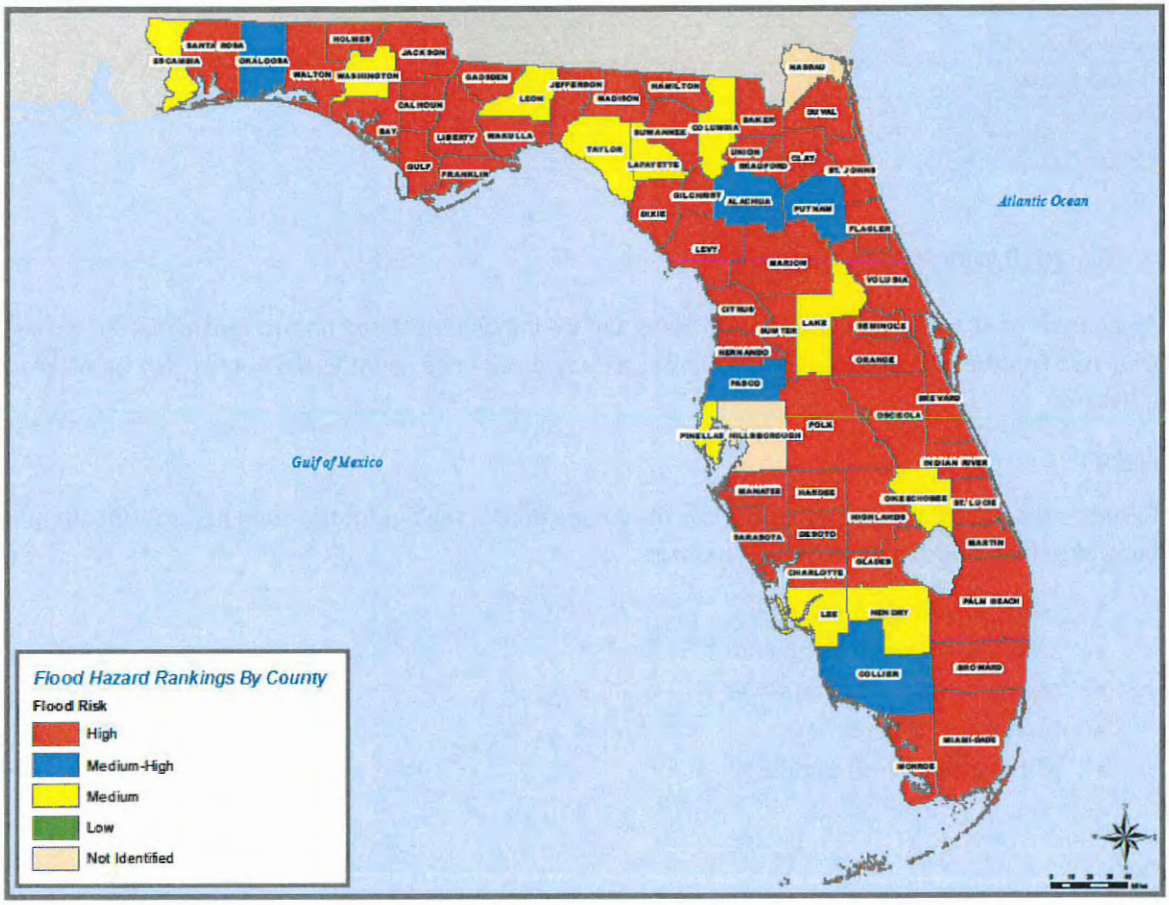
Flood

Based on the LMS plans, Figure 16 displays the jurisdictional rankings for the flood hazard. Not all counties have identified floods as one of their hazards.

- High-risk Jurisdictions: 49
- Medium-High-risk Jurisdictions: 5
- Medium-risk Jurisdictions: 11
- Low-risk Jurisdictions: 0
- Not identified Jurisdictions: 2

[36] Note: multiple reports that occurred on the same day were counted as one event.

Figure 16: Flood Hazard Rankings by County



Dam Failure

Based on the LMS plans, Figure 17 displays the jurisdictional rankings for the dam failure hazard. Not all counties have identified dam failure as one of their hazards.

- High-risk Jurisdictions: 0
- Medium-High-risk Jurisdictions: 0
- Medium-risk Jurisdictions: 2
- Low-risk Jurisdictions: 23
- Not identified Jurisdictions: 42

Figure 17: Dam Failure Hazard Rankings by County

7. Vulnerability Analysis and Loss Estimation by Jurisdiction

Below is a table showing the population totals within the 100-year and 500-year floodplains, based on the HelpFL analysis. The population totals are based on a weighted average analysis of 2010 Census Blocks population that intersect the 100-year and 500-year floodplains, respectively. In addition, this weighted average analysis incorporates residential generalized use codes from the Florida Department of Revenue statewide 2016 parcels dataset, which more accurately considers where the population resides within 2010 Census Blocks. This analysis was then aggregated for each County. Please note that the data in the 500-year column is the number of people at risk, in addition to the 100-year population at risk, because the 500-year floodplain is the 100-year floodplain plus additional area.

Table 20: Inland Flood Hazard, Population[37]

Inland Flood Hazard Population		
County	100-year	500-year
Alachua	3,537	157
Baker	412	21
Bay	5,062	343
Bradford	672	21
Brevard	3,149	1,833
Broward	32,036	74,225
Calhoun	490	19
Charlotte	7,500	86
Citrus	2,395	580
Clay	1,382	380
Collier	12,783	4,375
Columbia	986	46
Desoto	482	70
Dixie	596	79
Duval	8,898	4,354
Escambia	1,904	131
Flagler	879	305
Franklin	1,001	261
Gadsden	327	3
Gilchrist	214	48
Glades	246	1,621
Gulf	680	69
Hamilton	251	29
Hardee	493	72
Hendry	1,606	212
Hernando	1,053	291
Highlands	791	5
Hillsborough	86,854	1,786
Holmes	953	23
Indian River	1,820	1,125
Jackson	711	11
Jefferson	318	11
Lafayette	295	63
Lake	2,555	69
Lee	17,277	5,660
Leon	2,514	288
Levy	752	29

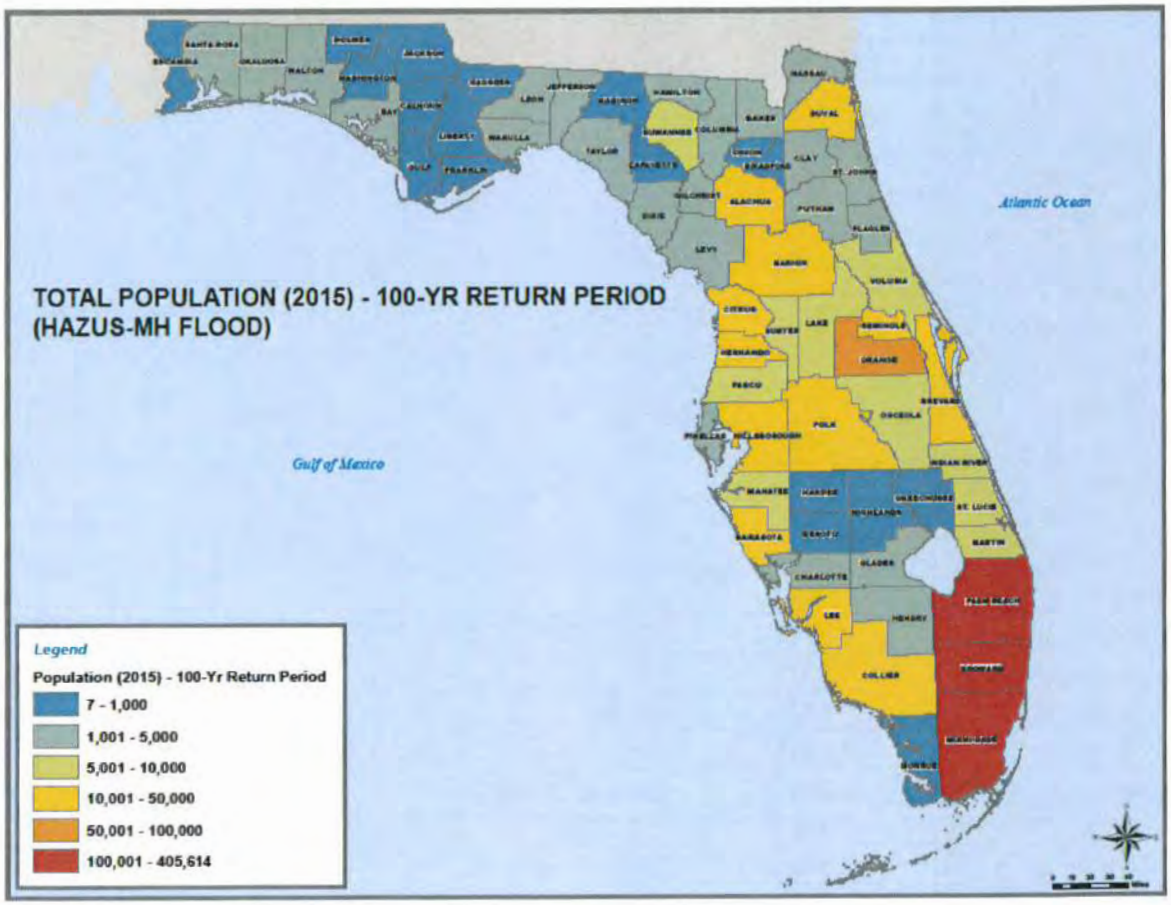
[37] Note: the data in the 500-year column is the number of people at risk, in addition to the 100-year population at risk, because the 500-year floodplain is the 100-year floodplain plus additional area.

Liberty	193	12
Madison	537	16
Manatee	8,994	1,081
Marion	2,246	471
Martin	801	863
Miami-Dade	184,272	15,422
Monroe	4,937	390
Nassau	960	307
Okaloosa	1,214	180
Okeechobee	1,022	500
Orange	10,616	2,119
Osceola	3,421	816
Palm Beach	12,334	6,513
Pasco	8,349	2,447
Pinellas	24,294	8,850
Polk	5,726	422
Putnam	1,440	46
Santa Rosa	717	265
Sarasota	7,691	4,109
Seminole	3,947	1,051
St. Johns	2,739	990
St. Lucie	1,507	442
Sumter	682	57
Suwannee	1,348	276
Taylor	1,290	446
Union	161	0
Volusia	7,966	3,769
Wakulla	796	173
Walton	1,087	16
Washington	756	10

According to this data, there are eight counties with over 10,000 people at risk for a 100-year flood event. For a 500-year flood event, there are eight counties with over 100,000 people at risk and five counties with over 10,000 people at risk.

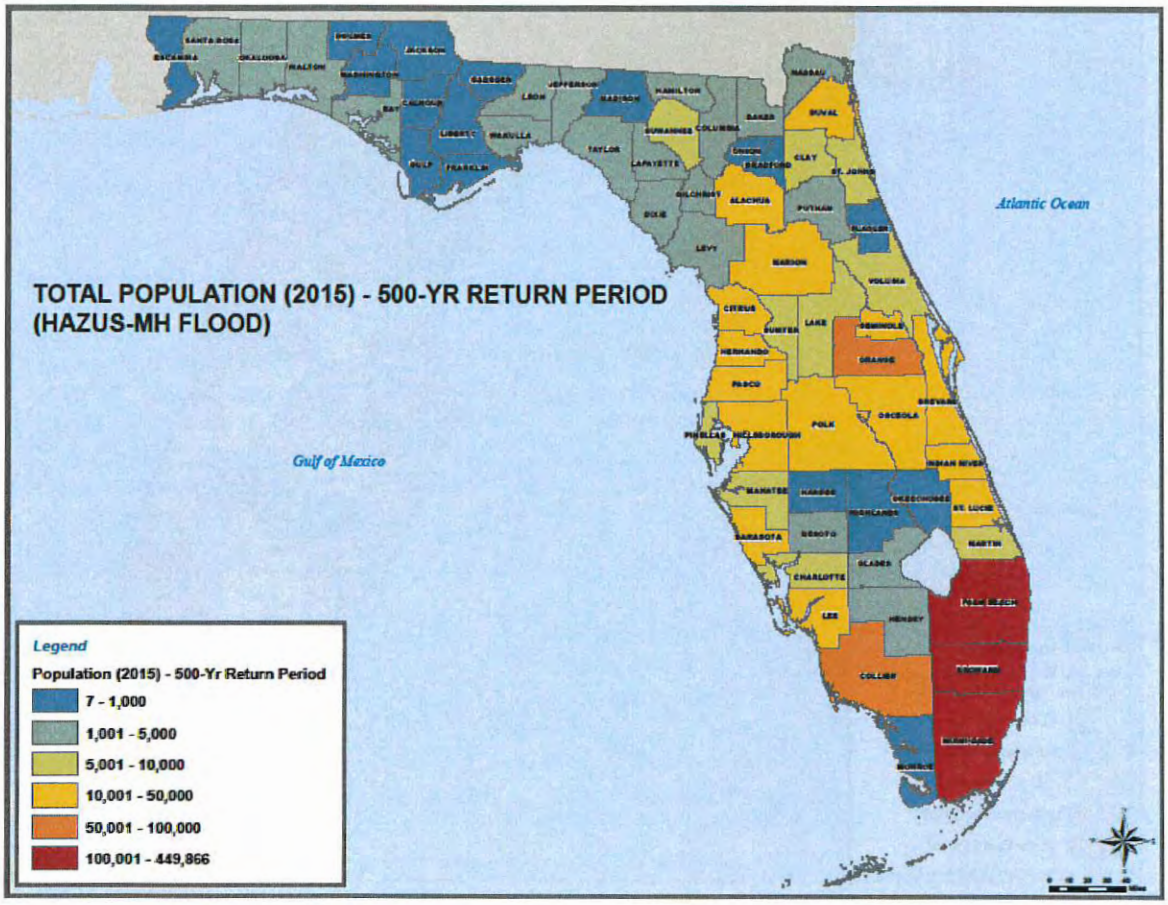
Below are two figures depicting the population living within the 100-year and 500-year probabilistic return period, as modeled using the HAZUS-MH Flood model riverine analysis and the 2015 American Community Survey. The information below, combined with population values above can provide a more complete analysis than using only one data source.

Figure 18: Population in the 100-year Probabilistic Return Period



This map shows that there three counties with over 100,000 people that live within the 100-year probabilistic return period floodplain, Miami-Dade, Broward, and Palm Beach counties. Orange County has between 50,000 and 100,000 people living within the 100-year return period area. Tables with this data can be found in *Appendix E: Risk Assessment Tables.*

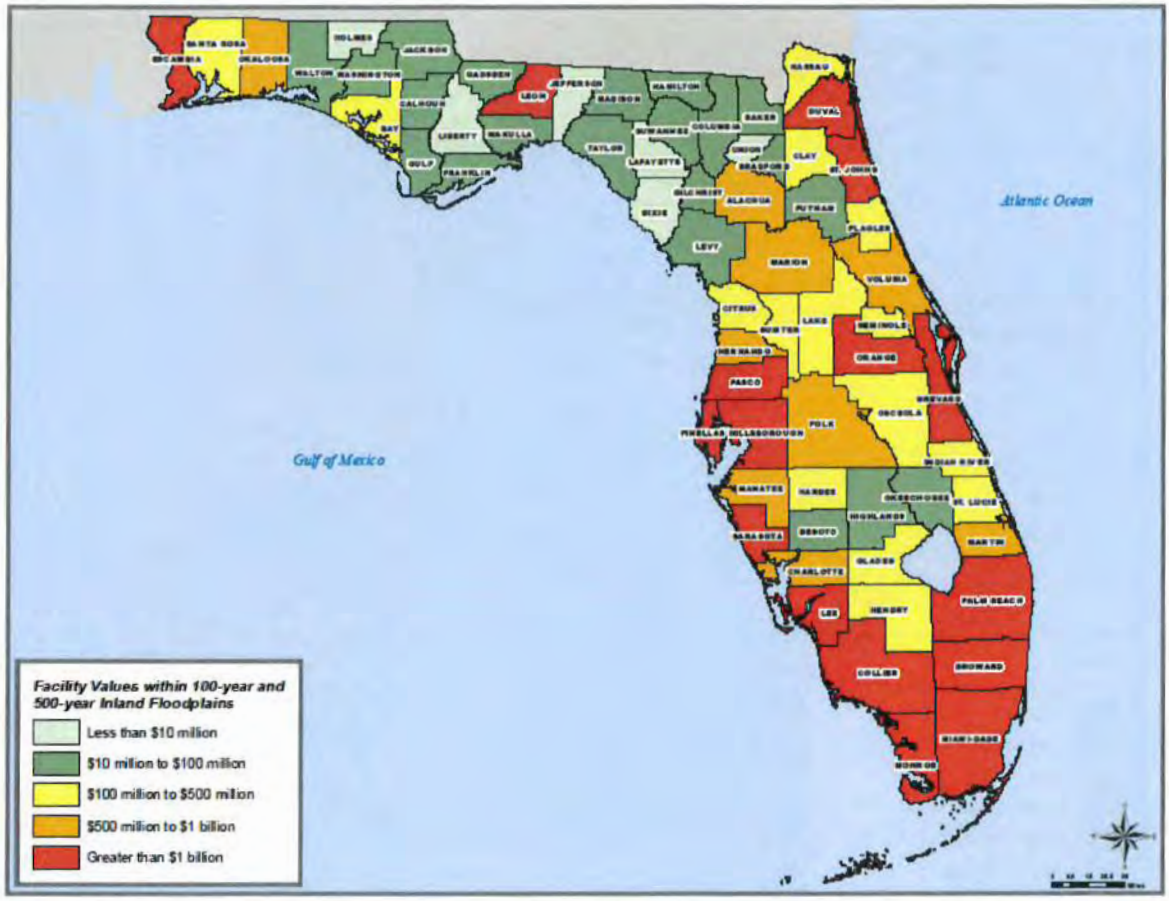
Figure 19: Population in the 500-year Probabilistic Return Period



This map shows that there three counties with over 100,000 additional people that live within the 500-year probabilistic return period floodplain, Miami-Dade, Broward, and Palm Beach counties. Collier and Orange counties have an additional 50,000 to 100,000 people living within the 500-year return period area. Tables with this data can be found in *Appendix E: Risk Assessment Tables*.

Below is a figure showing the value of facilities that are located within the 100-year and 500-year floodplains. This data is based on an analysis of the state facility database and the HelpFL inland flooding data.

Figure 20: Facility Values within 100 and 500-year Floodplains



The analysis included public facilities, such as hospitals, fire stations, police stations, and schools. According to this data, there are 16 counties with over $1 billion worth of public facilities within the 100-year and 500-year floodplains, including Escambia, Leon, Duval, St. Johns, Orange, Brevard, Hillsborough, Pinellas, Pasco, Sarasota, Lee, Collier, Monroe, Miami-Dade, Broward, and Palm Beach. A table with this detailed information is available in *Appendix E: Risk Assessment Tables*.

The figures below shows the value of all real property within the 100-year and 500-year floodplains (Figures 21 and 22). Tables with detailed information can be found in *Appendix E: Risk Assessment Tables*.