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# FLAGLER COUNTY

# Local Mitigation Strategy

# 2011

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Prepared By: Flagler County Local Mitigation Strategy Workgroup



## **TABLE OF CONTENTS**

### **Section I - Introduction**

Local Mitigation Strategy .....	1
Planning Process .....	1
Update Process.....	4
Use and Incorporation of Existing Documents .....	6
Community Participation .....	7
Private Sector Participation .....	8
Reevaluation Criteria.....	9
Conflict Resolution .....	9

### **Section II – Goals, Objectives and Guiding Principles**

Goals & Objectives.....	11
Guiding Principles .....	13
Table 1; Guiding Principles Matrix.....	15-39

### **Section III - Hazard Identification**

Identifying Hazards .....	40
Identification of Assets .....	41
County Description.....	43
Land Uses and Development Trends.....	44
Table 2; Acreage of Land Use in Unincorporated Flagler County.....	45
Hazards Profile.....	46
Hurricanes.....	46
Storm Surge .....	53
Flooding .....	60
Wildfire .....	65
Tornado.....	68
Flood Control Device Failure.....	71
Drought .....	73
Winter Storm/ Freezes .....	75
Nor' Easter Storm.....	78
Tsunami .....	80
Multi Hazard Maps .....	81
Maps.....	82-106

### **Section IV – Vulnerability and Estimated Losses**

Vulnerability Assessments .....	107
Critical Facilities Inventory.....	107
Table 3; Critical Facilities Map.....	109
Repetitive Loss Properties .....	109
Future Buildings in Hazard Areas.....	110
New Construction in Evacuation Zones .....	111-117
Other Vulnerable Facilities .....	118

Damage Loss Estimates .....	118
Table 4: Flagler County Property Values .....	119
ELVIS Values for Flagler County .....	120
Estimated Losses from Hazards .....	120-137

**Section V**

Project Selection and Submission Criteria .....	138
Scoring and Prioritization .....	139
Project Implementation .....	140
Implementation of National Flood Insurance Program (NFIP) .....	140
Mitigation Initiatives .....	142
Table 5; Mitigation Projects .....	143-144

**Section VI**

Potential Funding Sources .....	145
Table 6; Funding Sources for Mitigation Projects .....	145-147

**Section VII**

Plan Maintenance & Monitoring of Plan Implementation .....	148
Technical Analysis .....	148
Expand Participation in the Workgroup .....	149
Monitor Implementation of Mitigation Initiatives .....	149
Evaluating the Plan .....	150
Updating Plan Document .....	151
Plan Promulgation .....	152
Continued Public Involvement .....	152
Table 7; Meeting Schedule & Activities .....	154

**Appendices**

Appendix A – Table A-1 Hazard Quick Reference Table	
Table A-2 Probability Table	
Appendix B – LMS Workgroup List	
Plan Update Review Cycle	
Appendix C – Public Notification	
Appendix D - Resolutions	
Appendix E – Table E-1 Project Worksheet	
Table E-2 Mitigation Initiatives	
Appendix F – LMS Workgroup Meeting Minutes	

**Section I – Introduction**

**A. Local Mitigation Strategy**

The Flagler County Local Mitigation Strategy (LMS) is a community-developed plan to reduce the County’s vulnerability to disasters and minimize damage. The LMS gives Flagler County a chance to undertake a comprehensive “all hazards look” at what actions need to be taken in an effort to minimize the damage when the next disaster strikes.

The purpose of the LMS is to establish an ongoing process making hazard mitigation part of the daily routine for the entire community. The LMS focuses on the major disasters with the potential to affect Flagler County: flooding, fire, hurricanes, storm surge, flooding, wildfire, and several others more thoroughly discussed in Section III. The LMS process identifies a comprehensive list of goals, objectives, plans, programs, and projects in an effort to decrease or eliminate the effects of these hazards and then prioritize the implementation of those initiatives. By identifying these vulnerabilities and proposing solutions to them, Flagler County is in a better position to prevent losses to both lives and property.

The LMS aides in recovery and reconstruction decisions made following a natural disaster, as these decisions are often difficult to make in the chaos following such an event. In addition, with proposed projects (along with supporting research and analysis) pre-identified; the County is able to more quickly obtain post disaster funding.

In 2000, the U.S. legislature put into law the Pre-Disaster Mitigation Act, 44 CFR 201 & 206, which formalized requirements for the development and implementation of the LMS. Though meeting the requirements is optional, if a community wishes to remain eligible and continue participating in and receiving mitigation funding from several Federal grant programs the requirements have to be met. Implementation of the Flagler County LMS program began with the adoption of the LMS document by the Flagler County Board of County Commissioners and the participating municipalities of Bunnell, Beverly Beach, Flagler Beach and Palm Coast.

**B. Planning Process**

The Flagler County LMS was developed in 1999 by a multi-jurisdictional workgroup including officials from Flagler County, the Town of Beverly Beach, City of Bunnell, City of Flagler Beach, City of Palm Coast, Town of Marineland, representatives from local businesses, and civic groups. The workgroup spent over a year developing the LMS documents to satisfy the State Disaster

Administrative requirements enforcing the Federal requirements found in 44 CFR 201 and 206. Flagler County is truly fortunate to have such a hard working and dedicated group of volunteers interested in making the County a safer and more secure place to live.

All jurisdictions have continued to participate in the LMS through the 2011 update. It should be noted however, the Town of Beverly Beach and Town of Marineland though represented in the Plan, on the Workgroup, and in the Mitigation Project Initiatives (section V) that the local governing bodies and their partnering agencies do not have the resources to attend all LMS meetings. Beverly Beach is a small community of less than 340 people, while Marineland has less than 16 people residing within their jurisdiction. Flagler County and Flagler County Emergency Management represent the interests of these groups when they are not available to attend meetings in person. Information sharing is accomplished by communicating in person, over the phone, and through email status updates regarding the LMS initiatives.

The LMS supports, coordinates, and prioritizes mitigation project applications for potential grant program funding consideration. The LMS does not approve implementation and funding of projects. Projects receiving grant funding approval are sent before the jurisdictional governing bodies for review and approval of funds and project implementation through the sponsoring department or agency. The LMS Workgroup acts as a local coordination committee to support and recommend projects for various grant programs; recommends to other regulating agencies or organizations ideas for how to better mitigate the community against natural disasters; and provides educational outreach to the general public about ways they can prepare their families and mitigate their homes and businesses.

The Workgroup identified local and regional government agencies providing mitigation functions. The group continually reviews existing plans, policies, and ordinances for mitigation elements. In addition, the Workgroup adopted procedures to resolve any conflicts arising between government entities during the development and implementation of the LMS. The group identified goals and objectives to steer the group in this process.

The LMS Workgroup continually reviews and identifies Community Guiding Principles and public sector policies related to hazard mitigation and post-disaster redevelopment. The review of existing programs and resources provided the foundation necessary to identify additional planning and regulatory requirements. The initial hazard identification analysis and vulnerability assessment began, and development of an initial list of potential mitigation projects was implemented.

Hazard analysis and vulnerability assessments using computer based mapping and data analysis model is provided by the Florida Department of Community Affairs (DCA). The model known as the Arbiter of Storms (TOAS) is a modular, scalable, multi-hazard meteorological simulation system. The TOAS is used to show the potential impact of storm events in relation to hazardous materials sites, evacuation zones, evacuation roads, and current land uses. Maps representing the output of the TAOS model show a spatial analysis of the potential impact of storms on the built environment. In addition, TAOS is used to predict the potential cost of storm damage based on assessed property values. Knowledge of the potential location of storm events and the associated potential damage is vital to developing a feasible and practical Local Mitigation Strategy.

The Workgroup continually works to develop and update the list of hazard mitigation initiatives, researching potential funding sources, and recommendations of current and future mitigation projects for LMS adoption. In order for the LMS to remain useful it must be reviewed periodically and updated to reflect changing needs and conditions within the County.

The components of the LMS are described in more detail below. In addition, several appendices are provided which contain the Workgroup's list of prioritized LMS initiatives, funding sources for the initiatives, and other support documentation.

Initially the Flagler County Planning and Zoning Department managed the Flagler County LMS process. The Florida Department of Community Affairs provided LMS funding and technical assistance. One of the key components of the process was the establishment of the LMS Workgroup. The Workgroup provided the LMS with direction and focus. The LMS Workgroup is an advisory body composed of a wide range of community representatives, including those from municipalities within the County and the private sector. The group conducted LMS development meetings on a regular basis and continues to do so throughout the life of the document. In addition, County staff continues to hold meetings with each of the participating municipalities to explain the LMS program and gain additional local perspectives on hazard mitigation needs and issues. The development process for the LMS includes formal adoption. Copies of the resolutions adopting the LMS for each municipality and the unincorporated County are contained in the appendix.

The LMS Workgroup in conjunction with County Emergency Management representatives served to facilitate the meetings during the 2009-2011 planning and updating of the Local Mitigation Strategy. These planning efforts included expanding the list of people and organizations invited to participate; revising portions of the local mitigation strategy not meeting requirements set by the Disaster Mitigation Act of 2000; performing a more detailed risk assessment and damage loss estimate analysis; holding regular meetings which include public

participation and commentary on the elements being rewritten and/or updated in the 2011 LMS plan.

Using data collection, analysis, and revisions to the Local Mitigation Strategy with the assistance of the Workgroup members, revisions were made to the document and brought forth to the Workgroup for review, discussion, and approval. Final copies of revisions were sent to the State for review once the Workgroup had approved them. Once the document was completed, it was made available on the Flagler County Emergency Management website to obtain comments from the general public. This was used in conjunction with planning and informational workshops and meetings to get participation from the public. Outcomes of those meetings and workshops were added to the Local Mitigation Strategy document once they are held.

A final copy of the document was presented to the Flagler County Commission and the town of Beverly Beach, City of Bunnell, City of Flagler Beach, and Town of Marineland Councils for their approval and adoption once the revisions were made. The Local Mitigation Strategy was updated and approved by the State of Florida and the Federal Emergency Management Agency, the role of the members of the LMS Workgroup and County Emergency Management staff currently is to review and adjust the document as needed.

The Flagler County School Board is a recognized jurisdiction as it is responsible for the organization and control of the public schools of the District and is empowered to determine the policies necessary for the effective operation and the general improvement of the school system. The School Board is a public corporate entity and may take action only when the Board is meeting in official public session and a quorum is present.

It should be noted, for the purposes of this plan, data representative of Flagler County are also true of the Flagler County School Board. This includes references or statements made which distinguish the variances of hazard effects, threats, vulnerability, historical context, etc. on each jurisdiction. Other than the recognition of its distinct governing capabilities, the only other situation in which the School Board is identified separate from Flagler County within the LMS plan may be found in the mitigation projects Section V, Table Five.

### **C. Update Process**

The LMS Workgroup met several times during the review and revision process. It is important to emphasize the procedure used by the Workgroup was based on the following important concepts:

- A multi-organizational, multi-jurisdictional planning group establishes specific goals and objectives to address the community's vulnerabilities to all types of hazards.
- It utilizes a logical, stepwise process of hazard identification, risk evaluation, and vulnerability assessment, as well as review of past disaster events, consistently applied by all participants.
- Mitigation initiatives are proposed for incorporation into the plan only by those jurisdictions or organizations with the authorities and responsibilities for their implementation.
- The process encourages participants to propose specific mitigation initiatives feasible to implement and clearly directed at reducing specific vulnerabilities to future disasters.

Proposed mitigation initiatives are characterized in a substantive manner, suitable for this level of planning, to assure their cost effectiveness and technical merit, as well as coordinated among jurisdictions to assure conflicts or duplications are avoided.

During the update process, the LMS Workgroup (LMS Workgroup List Appendix B) reviewed and revised goals and objectives, hazard identification, and recent disaster events. Each section of the LMS Plan was reviewed by all of the LMS Workgroup during the update process through email correspondence and direct meetings (LMS Meeting Minutes Appendix F). Flagler County Emergency Management and the LMS Chair made modifications to the plan with recommendations from the LMS Workgroup and new data collected. The plan was reviewed and approved following completion of the necessary changes during LMS Workgroup monthly meetings. All goals and objectives were revised to comply with current Comprehensive Plans. The current list of mitigation initiatives was analyzed and assessed. The LMS Workgroup decided the projects currently on the list had either been completed or were no longer viable projects. A new list of mitigation initiatives was developed. The Workgroup assessed previous mitigation activities and evaluated and revised the mitigation measures. A new Project Worksheet (Appendix E) was also developed to improve tracking and funding for future mitigation initiative projects on the list.

All LMS Workgroup members were part of the plan review team. Every section of the original plan was reviewed and updated. Each section was reviewed as part of the regular LMS Workgroup meetings. At the end of each meeting vote was taken to adopt changes that were then made by staff. Meeting minutes identify sections addressed. Some sections, including Sections III, VI, and V, contain a brief comment about what has been changed in the current update.

Upon completion of the plan update, the LMS document is adopted through resolution Flagler County and all participating agencies within one calendar year

of FEMA's approval of the plan. The updated plan shall include a completed and signed copy of the resolutions or other documentation of formal adoption of the updated plan for each participating jurisdiction within one calendar year.

#### **D. Use and Incorporation of Existing Documents**

The LMS is the cohesive link between the County's Comprehensive Emergency Management Plan and the jurisdictional Comprehensive Plans. The Flagler LMS provides hazard mitigation planning goals and objectives which are, or are in the process of, being incorporated into the jurisdictional Comprehensive Plans. The Comprehensive Plans then mandate the local governments to take specific actions regarding these plans, goals, and objectives.

Since the 2004 LMS Plan update, the local jurisdictions have begun or are undergoing the process of updating and/or rewriting their Comprehensive Plans. The updated plans indicate the local LMS and its processes, including mitigation goals and objectives contained within the LMS, are the guiding principles. Those goals and guiding principles are outlined and discussed in more detail further on in this document.

LMS Projects which are contained within the Comprehensive Plan or are consistent with the Comprehensive Plan receive a higher score and are, consequently, given a higher priority in the list of LMS Project Initiatives. Other municipal documents such as Land Development Regulations, State Comprehensive Plans, and Emergency Management Plans have also been reviewed and incorporated into the LMS. These Guiding Principles are reviewed and updated in order to remain consistent with changes in the documents where materials have been incorporated into the LMS.

Efforts are made in the planning activities to review new documents in order to cover the wide spectrum of plans within the county, municipalities, and state. Currently, Beverly Beach, Marineland, Bunnell, Flagler Beach, Palm Coast, and Flagler County are active participants in the National Flood Program. Updating the table of policies in the LMS continues to incorporate new and updated information throughout the planning process.

The LMS Workgroup reviewed, analyzed, and incorporated Mapping for Emergency Management, Parallel Hazard Information System (MEMPHIS) data into the LMS Plan. Additionally, Property Appraisal data, Storm Tide Atlas data, critical facilities, and Arbiter of Storms data were incorporated in the review and revision process. This data was utilized to assess the impact potential hazards would have on each jurisdiction within the county to determine the priority of mitigation efforts and which initiatives would have the greatest benefit to the community.

Part of the LMS document contains Guiding Principles, which as explained above, were obtained by reviewing other pertinent county and municipal documents. A policy and objective source of reference and brief analysis was compiled. The Workgroup met to review goals and objectives, and arrived at a consensus on the issues deemed most important to the LMS. The principles guide the identification of hazards and the assessment of the vulnerable area(s) within the community. This assessment ultimately drives the prioritization of pre-disaster mitigation projects and programs serving to eliminate loss of life and reducing property damage. All jurisdictions are encouraged to review the LMS document following acceptance through resolution by their respective governing bodies to ensure compliance and incorporation into existing and future plans and planning mechanisms, such as comprehensive and capital improvement plans, when appropriate.

All participating jurisdictions take the information provided in the risk assessment section of the LMS and incorporate this information during the update process of the jurisdictional Comprehensive Emergency Management Plan (CEMP). The information is compared to the risk information currently contained in the CEMP and all updated information from the LMS risk section is incorporated in the plan.

### **E. Community Participation**

Flagler County Local Mitigation Strategy Workgroup Meetings are open to the public and the meeting information is posted on the County website for the general public to see. An announcement is also posted in the County Newspaper, noting the date, time and location of the meeting, at least 5 days prior to the date of the meeting. Citizens have actively participated in the review and update of the LMS document. The LMS Workgroup has a citizen who actively participated in the rewrite and update process, and additional participation from members of the community is continually solicited and encouraged by all members of the LMS Workgroup. The Flagler County Emergency Services website has a section dedicated to LMS and a solicitation for citizen participation. Emergency Management staff actively promotes the LMS Workgroup and solicits participation from citizens during public presentations in the community conducted throughout the year. The LMS document is posted on the County's website so it can be read and reviewed by the public in order to increase participation from the citizens of the county. Other methods used to obtain greater participation of the general public was to provide the County Library with a copy of the LMS document and to incorporate LMS discussion into public meetings to educate the public about the importance of the LMS document and planning for and mitigating against hazards. An effort to increase public participation continues throughout the planning process of updating and reviewing the LMS document.

Upon completion of a draft copy of the updated Local Mitigation Strategy document, a draft is posted on the Flagler County Emergency Services website for public review and comment. A copy of the draft Local Mitigation Strategy document (when applicable) is made available at the Emergency Management office and website. An announcement of the Local Mitigation Strategy meetings is posted on the Flagler County website under notice of public meetings throughout the planning process and the writing of the draft document. The purpose of posting the document online and inviting the community to participate in the planning process is to solicit formal public comments and ideas to incorporate into the final copy of the plan before it is submitted for review to State and Federal reviewers.

Other public outreach activities include public information presentations to the County and municipal Commissions/Councils to obtain comments and receive approval of the updated Local Mitigation Strategy by the appropriate Commission/Council. The public information presentations are not given until the draft document is ready for approval by the appropriate Commission/Council.

#### **F. Private Sector Participation**

Participation from the private sector, nonprofits, and various other agencies within the county is sought throughout the LMS development process. The LMS Workgroup has several members representing the private sector and nonprofits. In addition, invitations to LMS meetings are made to specific individuals who represent private sector interests, such as homebuilders, developers, and the Chamber of Commerce. The Flagler County mailing list and Workgroup members list attached shows the original and current list of LMS work Workgroup members, which includes private sector representatives. Additional members are actively solicited from nonprofit agencies and various other community partners by all members of the LMS Workgroup.

Since insurance rates can be an important issue with the private sector, time is allocated during applicable LMS Workgroup meetings to discuss the Community Rating System. The County's participation in this system is an excellent way to reduce flood insurance rates paid by all sectors of the economy.

Prior to each meeting, working group members are sent an email noting the date, time, and location of the next meeting. The emails are usually accompanied by information from the last meeting, as well as information for the upcoming meeting. By sending emails notifying all members of upcoming meetings, the representatives from the private sector are actively encouraged to participate in the Local Mitigation Strategy planning process. The Flagler County LMS Workgroup continues to hold periodic meetings and coordinate with private and public sector interests.

Continuing efforts to involve more representatives from the private sector, nonprofits, citizens, and academia include informational workshops to invite people from any non-participating businesses and organizations. The workshop features information regarding the Local Mitigation Strategy and the importance of their participation in the planning process. These efforts continue as the planning process is ongoing. Additionally, resources from the Chamber of Commerce are used in order to obtain up-to-date information on businesses and organizations in the county in an effort to assure everyone is given the opportunity to participate in the planning process.

### **G. Reevaluation Criteria**

Each year, as part of the annual budgeting cycle, participating jurisdictions are asked to include a check-off as part of their annual appropriations. This check-off is added to forms requesting capital and certain categories of operating funding, and asks: "Is this expenditure in support of the Countywide Hazard Mitigation Strategy?" If so, the requesting agency or department is asked to provide supporting documentation from the mitigation strategy.

As part of the evaluation and appraisal of the Comprehensive Plan, participating jurisdictions are asked to include an evaluation of the success of implementation of the hazard mitigation strategy. At least once after each disaster event, or in any case no less than once a year, the Workgroup is asked to convene and review activity on the implementation of the hazard mitigation strategy. Through the evaluation process the public continues to be included. Continued public participation efforts are outlined in Section I, E.

### **H. Conflict Resolution**

The decision making process used in the development of the LMS is collaborative in nature. This is accomplished first by ensuring the workgroup is composed of individuals representing a wide range of public and private interests. During the LMS workgroup meetings, a considerable effort is made to obtain a consensus from all participants before the group approves specific issues or recommendations. In order to address intergovernmental disputes, the LMS workgroup adopted the following dispute resolution procedures:

Consensus testing

- Conflict Resolution discussion is initiated by the Chairperson.
- Discussion is directed first to those statements which have the most diverse opinions.
- Each participant has an opportunity to state his/her concern with the idea as presented; concerns are recorded.
- After all concerns are stated, discussion begins on ways to alleviate concerns.
- If necessary, a second round of consensus voting is held.
- Unless a project scores all 3's or better it is not included.

Majority vote

- May be requested by any member if consensus fails.
- Any items included by majority vote are noted.

## Section II – Goals & Guiding Principles

### A. Goals & Objectives

The identification of hazard mitigation goals, objectives, and guiding principles was developed early in the LMS process. LMS goals, objectives, and guiding principles are used to provide direction in developing and prioritizing the list of hazard mitigation initiatives. The LMS goals are broad statements of action, while the objectives provide more specific guidance, and when undertaken and supported by mitigation initiatives protect Flagler County's assets.

Goals identified by the LMS Workgroup are directed by the desire to protect the people and property of Flagler County from the effects of hazardous events. The Workgroup adopted these as the LMS goals. They are up for review annually and can be modified based on a quorum vote of the LMS Workgroup. Flagler County makes every reasonable effort to reduce the vulnerability and exposure of its residents and guests by protecting lives and property from the effects of natural, manmade, and technological disasters. The goals are as follows:

**Goal 1.0** Protect the citizens of Flagler County from natural and manmade hazards

**Goal 2.0** Provide public services during and after a disaster

**Goal 3.0** Reduce the vulnerability of critical and public facilities from the effects of terrorism, natural, manmade, and technological disasters.

**Goal 4.0** Protect public and private property from disasters

**Goal 5.0** Make reasonable efforts to protect water resources, unique natural habitats, and ecologically sensitive areas such as wetlands and hardwood hammocks, and restore, to the maximum extent possible, degraded natural systems to their original site.

**Goal 6.0** Improve coordination of disaster preparedness information to increase public awareness and participation in preparedness, response, recovery, and mitigation activities.

Objectives are also developed to support the goals identified and to better assist in the development of mitigation initiatives. These objectives with associated goals are as follows:

**Goal 1.0** Protect the citizens of Flagler County from natural and manmade disasters

*Objective 1.1* Maximize the protection of the public's health, safety, and welfare from natural, manmade, and technological disasters.

*Objective 1.2* Detailed identification of high-risk areas.

*Objective 1.3* Work with insurance industry on risk assessment.

*Objective 1.4* Improve budget for forestry and local fire fighting.

*Objective 1.5* Develop and maintain evacuation plans for the safe evacuation of residents from coastal storm surges, inland flooding, terrorist acts, hazardous material incidents, and wildland fires.

*Objective 1.6* Ensure mitigation measures are adequately addressed in the comprehensive system of coordinated planning, management, and land acquisition.

*Objective 1.7* Extend Wildfire Ordinance outside of Palm Coast.

*Objective 1.8* Timberland management with Best Management Practices.

*Objective 1.9* Pass and implement mitigation ordinances.

*Objective 1.10* Prioritize code enforcement for fire mitigation.

*Objective 1.11* Manage public lands for firebreaks.

**Goal 2.0** Provide public services during and after a disaster

*Objective 2.1* Ensure adequate shelter space.

*Objective 2.2* Provide adequate sheltering for People with Pets.

*Objective 2.3* Improve communications between agencies.

**Goal 3.0** Reduce the vulnerability of critical and public facilities from the effects of terrorism, natural, manmade, and technological disasters.

*Objective 3.1* Consider designing and installing wind and/or water proofing components and target hardening for all proposed government owned critical facilities.

*Objective 3.2* Develop and maintain energy, communications, and preparedness plans both practical and effective during periods of disrupted energy and communication events.

*Objective 3.3* Incorporate hazard mitigation measures such as wind/flood proofing and target hardening during any rehabilitation of existing public facilities.

**Goal 4.0** Protect public and private property from disasters

*Objective 4.1* Reduce the potential loss of personal and public property caused by natural, manmade, and technological disasters.

*Objective 4.2* Protect natural resources (such as environmentally sensitive lands and aquifers) in order to maximize their survivability and to safeguard them from damages caused by natural, manmade, and technological disasters.

*Objective 4.3* Encourage land and water uses which are compatible with the protection of environmentally sensitive lands and coastal resources.

*Objective 4.4* Support regulatory agencies and land preservation.

*Objective 4.5* Reduce numbers of vulnerable units.

*Objective 4.6* Retrofit old plats for safety.

*Objective 4.7* Protect dune systems and coastal/marine resources from the adverse effects of coastal development

**Goal 5.0** Make reasonable effort to protect water resources, unique natural habitats, and ecologically sensitive areas such as wetlands and hardwood hammocks, and restore, to the maximum extent possible, degraded natural systems to their original site.

*Objective 5.1* Identify potential private resources.

*Objective 5.2* Conserve and protect wetlands and coastal natural features to maintain their economic, aesthetic, and recreational values.

*Objective 5.3* Acquire, retain, manage, and inventory public lands to provide conservation and related public benefits.

*Objective 5.4* Protect and enhance water sources, public utilities, wetlands, natural habitats from potential natural, manmade, and terrorist acts.

**Goal 6.0** Improve coordination of disaster preparedness information to increase public awareness and participation in preparedness, response, recovery, and mitigation activities.

*Objective 6.1* Develop and maintain a comprehensive multi-media, multi-lingual public education program of disaster preparedness, response, recovery, and mitigation.

*Objective 6.2* Conduct educational programs and research to meet local, state, regional planning, growth management, and hazard mitigation needs or concerns.

*Objective 6.3* Work with media representatives to establish a standardized format for use in dissemination of information to the media during all phases of a disaster.

*Objective 6.4* Develop and maintain intergovernmental/coordinated information and uniform procedures for public information offices during periods of potential disaster situations.

## **B. Guiding Principles**

The following set of Guiding Principles was compiled by reviewing existing requirements in the adopted Comprehensive Plans of the County and municipalities. These documents have requirements addressing hazard mitigation and long-term recovery and already serving as the Guiding Principles of the County and municipalities. They are detailed in the Table 1.

In summary, the LMS Goals and Objectives and the existing adopted requirements from the Comprehensive Plans, as well as state, regional, and local planning documents are in place and serve as a framework to guide Flagler County in adequately addressing mitigation. Flagler County Guiding Principles are described in Table 1.

**TABLE 1  
Flagler County Local Mitigation Strategy  
Guiding Principles Table**

Guiding Principles	Source	Notes
<p>a. Streambank and shoreline buffer zones adjacent to surface water bodies to preserve natural vegetation, which provides filtration of storm water runoff.</p> <p>b. General design and construction standards for on-site storm water management systems for new development to ensure that post-disaster runoff rates, volumes, and pollutant loads do not exceed pre-development conditions.</p> <p>c. Best management practices for agricultural and silvicultural land uses, consistent with state and federal recommended standards, to reduce pesticide and fertilizer runoff and soil erosion; and</p> <p>d. Standards for all new developments to ensure compliance with treatment practices and standards adopted by the Water Management District and appropriate rules and regulations.</p> <p>Marineland shall ensure that building and development activities are carried out in a manner, which minimizes the danger to life and property from hurricanes. Development within Coastal High-Hazard Areas shall be restricted and public funding for facilities with Coastal High-Hazard Areas shall be curtailed. Marineland shall provide a timely review of the hazard mitigation and evacuation implications of applications for rezoning, zoning variances or subdivision approvals for all new development in areas subject to coastal flooding.</p>	<p>City of Bunnell, Policy 2.2, Comprehensive Plan</p>	<p>All of the principles are implemented by the City of Bunnell. All are actively enforced. Items A, B, and D are enforced through the Bunnell Land Development Code and the St. John's River Water Management District. Item C is enforced through the State Department of Agriculture.</p>
<p>Public expenditures that subsidize additional development in the coastal hazard areas, i.e. the Federal Flood Insurance Rate Map "V" Zone, shall be prohibited. Public facilities shall not be built in the Coastal High-Hazard Areas, except for public beach or shoreline access or resource restoration.</p>	<p>Town of Marineland, Objective E.1.6, Comprehensive Plan</p>	<p>Implemented- The Regional Planning Council completed the updated Evacuation Study. Local review and coordination are pending.</p>
<p>Facilities, which must function during a hurricane, such as hospitals, blood banks, police and fire stations, electrical power generating plants, communication facilities and emergency command centers shall not be permitted in the Coastal High-Hazard Area. Privately-owned community facilities shall be permitted seaward of the coastal construction control line if an adequate financial plan for disaster recovery cost is demonstrated to Marineland. Potential repair or replacement of these facilities shall not be a burden on public resources.</p>	<p>Town of Marineland, Policy E.1.6.1, Comprehensive Plan</p>	<p>Implemented</p>

## Flagler County Local Mitigation Strategy

The construction or reconstruction of mobile home parks shall be prohibited in Marineland. The Coastal High-Hazard Area and the Coastal Hazard Area as depicted on Map A-5 shall be delineated on the zoning maps for Marineland.	Town of Marineland, Policy E.1.6.2, Comprehensive Plan	Implemented
A comprehensive marine hurricane contingency plan shall be developed to describe what owners are expected to do with their boats in the marina in the event of a hurricane.	Town of Marineland, Policy E.1.6.3, Comprehensive Plan	Implemented
New sanitary sewer facilities in Marineland shall be flood-proofed such that raw sewage shall not leak from sanitary sewer facilities during flood events, and new septic tanks shall be fitted with back-flow preventers.	Town of Marineland, Policy E.1.6.4, Comprehensive Plan	Implemented
Structures in Marineland shall be designed to withstand the wind loads specified in the 1985 edition of the Southern Standards Building Code as amended from time to time.	Town of Marineland, Policy E.1.6.5, Comprehensive Plan	Implemented
Marineland shall develop a step-by-step detailed plan for post-disaster recovery.	Town of Marineland, Policy E.1.6.6, Comprehensive Plan	Ongoing
After a hurricane or other disaster but prior to reentry of the population into evacuation areas, the Marineland City Council shall meet to hear preliminary damages assessments and appoint a Recovery Task Force	Town of Marineland, Policy E.1.7.1, Comprehensive Plan	Implemented
The Recovery Task Force shall review and decide upon emergency building permits, coordinate with state and federal officials to prepare disaster assistance applications, analyze and recommend to the City Council, applications, analyze and recommend to the City Council hazard mitigation options including reconstruction or relocation of damaged public facilities, develop a redevelopment plan, and recommend amendments to the comprehensive plan and other appropriate policies and procedures.	Town of Marineland, Policy E.1.7.2, Comprehensive Plan	Implementation ongoing
Immediate repair and cleanup actions needed to protect the public health and safety including repairs to potable water, wastewater, and power collapse, and minimal repairs to make buildings habitable shall receive first priority in permitting decisions. Long-term redevelopment activities shall be postponed until the recovery task force has completed its tasks.	Town of Marineland, Policy E.1.7.3, Comprehensive Plan	Implementation ongoing
The recovery task force shall proposed comprehensive plan amendments which reflect the recommendations in any interagency hazard mitigation reports or other reports prepared pursuant to section 406 of the Disaster Relief Act of 1974 (PL93-288)	Town of Marineland, Policy E.1.7.4, Comprehensive Plan	Implementation ongoing
If rebuilt, structures which suffer damage in excess of 50% of their appraised values shall be rebuilt to meet all current requirements including those enacted since construction of the structure.	Town of Marineland, Policy E.1.7.5, Comprehensive Plan	Implementation ongoing
Structures which suffer repeated damage to pilings, foundations, or load-bearing walls shall be required to rebuild landward of their current location or to modify the structure to delete the areas most prone to damage.	Town of Marineland, Policy E.1.7.6, Comprehensive Plan	Implementation ongoing

## Flagler County Local Mitigation Strategy

When appropriate, Marineland shall develop and adopt a formal decision-making process to evaluate options for damaged public facilities including abandonment, repair in place, relocation, and reconstruction with structural modifications. This process shall consider these options in light of factors such as cost to construct, cost to maintain, recurring damage, impact on land use, impact on the environment, and public safety.	Town of Marineland, Policy E.1.7.7, Comprehensive Plan	Implementation ongoing
Marineland shall maintain a contingency fund equal to 25% of the value of public facilities in the coastal High-Hazard Area in order to cover the local government's match for disaster assistance grants.	Town of Marineland, Policy E.1.7.8, Comprehensive Plan	Implementation ongoing
Marineland shall identify structures in the Coastal High-Hazard Area, inventory their assessed value, judge the utility of the land for public access, and make recommendations for acquisition when post-disaster opportunities arise.	Town of Marineland, Policy E.1.7.9, Comprehensive Plan	Implementation ongoing
Upon Plan implementation, new permanent or seasonal dwelling units within the CHHA shall be limited.	Town of Marineland, Policy E.1.7.10, Comprehensive Plan	Implementation ongoing
Flagler Beach shall restrict land uses within the CHHA to low-density single family or commercial uses.	City of Flagler Beach, Objective E.1.11, Comprehensive Plan	Limited by Comprehensive Plan densities.
Flagler Beach shall designate the Coastal High Hazard Areas as all lands seaward of the CCCL line as designated by the Department of Natural.	City of Flagler Beach, Policy E.1.11.1, Comprehensive Plan	Implemented on case by case basis consistent with Comprehensive Plan.
Flagler Beach shall incorporate recommendations of the hazard mitigation annex of the Flagler County peacetime emergency plan into its local plan for hazards mitigation.	City of Flagler Beach, Policy E.1.11.2, Comprehensive Plan	This is inconsistent with current CHHA definition
Upon plan implementation, development within the 100-year flood plain shall be limited in order to protect the health, safety, and welfare of the public.	City of Flagler Beach, Policy E.1.11.3, Comprehensive Plan	Need to review local hazard mitigation plan.
The City shall require that the adopted floodplain ordinance be consistently enforced.	City of Flagler Beach, Objective E.1.12, Comprehensive Plan	Implemented with LDR's Flood Damage Prevention Regulations.
The City shall require that all new construction and substantial rehabilitation found to be in a flood hazard zone shall be planned and built in accordance with FEMA requirements.	City of Flagler Beach, Policy E.1.12.1, Comprehensive Plan	On-going process consistent with the Land Development Regulations.
Flagler Beach shall inform all potential property buyers and builders of the possibility of flood and hurricane hazards.	City of Flagler Beach, Policy E.1.12.2, Comprehensive Plan	On-going process consistent with the Land Development Regulations.
Flagler Beach shall use innovative zoning techniques where possible to locate buildings on upland portions of properties impacted by flood hazards.	City of Flagler Beach, Policy E.1.12.3, Comprehensive Plan	Any potential buyer or builder that comes into the Building Department and asks for such information is provided a copy of the FEMA Flood map.
Flagler Beach shall require that a design professional review the construction plans and certify that they meet FEMA requirements for the Flood Hazard Zone.	City of Flagler Beach, Policy E.1.12.4, Comprehensive Plan	Addressed in the Land Development Regulations.
Upon plan implementation, hurricane evacuation times shall be maintained.	City of Flagler Beach, Policy E.1.12.5, Comprehensive Plan	This is already required as a part of the site plan review and approval process which is handled by the City Engineer and City Consulting Engineer who review the plans for compliance.

## Flagler County Local Mitigation Strategy

Flagler Beach shall coordinate with Flagler County to help prepare for evacuation and to minimize and maintain evacuation times.	City of Flagler Beach, Objective E.1.13, Comprehensive Plan	The City's Fire Chief is designated as the Incident Commander for the City. As part of his duties he coordinates with the County to prepare for evacuations in the effort to minimize and maintain evacuation times.
When reviewing proposed development orders, Flagler Beach shall include limits on population density for hurricane evacuation considerations.	City of Flagler Beach, Policy E.1.13.1, Comprehensive Plan	The City's Fire Chief is designated as the Incident Commander for the City. As part of his duties he coordinates with the County to prepare for evacuations in the effort to minimize and maintain evacuation times.
The City shall continue to review and update the City of Flagler Beach portion of the Flagler County Hurricane Evacuation Plan and coordinate with Flagler County on a five year basis.	City of Flagler Beach, Policy E.1.13.2, Comprehensive Plan	Implemented in conjunction with project reviews for consistency with the Comprehensive Plan.
Through public education, Flagler Beach shall inform its citizens of hurricane evacuation routes, proper planning and procedures for evacuation, and the location of official hurricane shelters.	City of Flagler Beach, Policy E.1.13.3, Comprehensive Plan	The City's Fire Chief is designated as the Incident Commander for the City. As part of his duties he keeps the City's Plan up to date and shares changes with the County as required.
Flagler Beach shall designate a task force to coordinate the evacuation of residents in the event of an evacuation.	City of Flagler Beach, Policy E.1.13.4, Comprehensive Plan	In conjunction with the County EOC and various State Agencies the City provides seminars, handouts, web-site information and links to fully inform residents and visitors of evacuation procedures/routes. Flagler County is designated as a Storm Ready Community.
Flagler Beach shall inventory those residents with special needs including the infirm, handicapped, or bedridden, and notify the Flagler County Civil Defense to update their special needs list. Residents with special needs shall be notified by the City and informed of special procedures, which will be followed in the event of the need to evacuate.	City of Flagler Beach, Policy E.1.13.5, Comprehensive Plan	This task force is comprised of Police and Fire who ensure that all citizens are notified of the need to evacuate and what steps to take should they choose to remain. This is part of the City's overall Emergency Plan.
<del>Reducing Vulnerability to Hurricanes.</del> People and property in Flagler County will be protected from the effects of hurricane storm damage.	City of Flagler Beach, Policy E.1.13.6, Comprehensive Plan	Flagler County Emergency Management Services maintains the list of those City residents and other residents throughout the County with special needs. They in turn notify the City's Fire Chief whose department is responsible for providing assistance in the event of a disaster.
<del>Hurricane Evacuation.</del> The Flagler eCounty's hurricane evacuation time for the Coastal High Hazard Area (CHHA) as defined by <del>Sec. 163.3178(2)(h) in Florida Statutes</del> shall <del>through annual review</del> be reduced or maintained <del>via the review of</del> <u>based on</u> known evacuation capacities of transportation routes in the eCounty's eCoastal aAreas during the review of development/redevelopment applications, <u>Evacuation times</u> and shall be in accordance with the times designated by the Northeast Florida Regional Council ( <u>NEFRC</u> ) in their most current Northeast Florida Hurricane Evacuation Study.	Flagler County, Goal 2, Comprehensive Plan	Ongoing process

## Flagler County Local Mitigation Strategy

<p>Land use plan amendments that have the effect of increasing allowable residential density in the <u>Coastal High Hazard Area (CHHA)</u> shall not be approved <u>for parcels, or portions thereof, lying seaward of the Coastal Construction Control Line (CCCL) or within the velocity zone (Zone V or VE as depicted on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps)</u> unless <u>one of the following apply:</u></p> <p>(1)a. <del>The</del> change is made to reflect existing legally permitted density that is not designated on the Future <u>Land Use Map</u>;</p> <p>b. <del>No density increase is permissible for parcels, or portions thereof, lying seaward of the coastal construction control line (CCCL) or within the velocity zone ("V" or "VE" as depicted on the FEMA Flood Insurance Rate Map);</del></p> <p>(2)c. <del>At</del> the requested increase in density <u>on a parcel</u> is offset by a corresponding decrease in density <u>on a different parcel</u>. The offset in density will not result in a net increase in buildout population in the <u>Coastal High Hazard Area (CHHA)</u>; <u>or</u>.</p> <p>(3)d. <del>The</del> requested amendment meets the requirements of Rule 9J-5, <u>applicable sections of Florida Administrative Code (F.A.C.)</u> and is internally consistent with the goals, objectives, and policies of the Comprehensive <u>pPlan</u>.</p>	<p style="text-align: center;">Flagler County, Objective <u>E.2.1</u>, Comprehensive Plan</p>	<p style="text-align: center;">Implementation ongoing- The Regional Council completed the regional evacuation study, local review and coordination are pending.</p>
<p>Offsetting density decreases within the <u>Coastal High Hazard Area (CHHA)</u> must comply with the following criteria:</p> <p>a. The offsetting density decrease was adopted within five years immediately preceding the adoption date of the proposed plan amendment and subsequent to the most recently adopted Evaluation and Appraisal Report.</p> <p>(1)b. <del>The</del> parcel subject to density increase and the parcel subject to the decrease must utilize the same main evacuation route(s) and evacuation shelter(s);</p> <p>(2)c. <del>The</del> developer of the increased density property must demonstrate through appropriate data and analysis that the increase will not result in adverse impacts to hurricane evacuation clearance time and shelter availability <u>as verified by the County's Emergency Management Division Chief and Planning and Zoning Director</u>; and</p> <p>d. If the data and analysis show that the density increase will result in evacuation problems, the developer must mitigate by paying for off-site improvements necessary to maintain the evacuation time and shelter availability.</p> <p>(3)e. <del>The</del> parcel subject to density increase must be connected, or demonstrate the ability to connect <u>prior to site development</u>, to central water and wastewater service.</p>	<p style="text-align: center;">Flagler County, Policy <u>E.2.1.01</u>, Comprehensive Plan</p>	<p style="text-align: center;">Updated to reflect the incorporation of the City of Palm Coast; ongoing enforcement.</p>
<p>All future improvements to roads along the evacuation routes shall include decision solutions, which provide remedies for flooding problems.</p>	<p style="text-align: center;">Flagler County, Policy <u>E.2.1.02</u>, Comprehensive Plan</p>	<p style="text-align: center;">Updated to reflect the incorporation of the City of Palm Coast; ongoing enforcement.</p>
<p>The <u>Flagler</u> County shall update its Comprehensive Emergency Management Plan (<u>CEMP</u>) annually, showing: evacuation routes; hurricane hazards; safety procedures; shelters; and other pertinent information for its citizens.</p>	<p style="text-align: center;">Flagler County, Policy <u>E.2.1.03</u>, Comprehensive Plan</p>	<p style="text-align: center;">Enforced</p>

## Flagler County Local Mitigation Strategy

<p>"The <u>Flagler County's Comprehensive Emergency Management Plan (CEMP)</u> shall recognize the long-term disaster recovery issues addressed in the Coastal Management Element, and shall strive to create a smooth continuum of action between the clean-up and rebuilding phases of the recovery process."</p>	<p>Flagler County, Policy <u>E.2.1.04</u>, Comprehensive Plan</p>	<p>Ongoing process- updated to include the incorporation of the City of Palm Coast. The Regional Council has updated the regional evacuation study; local review and coordination are pending.</p>
<p><u>Hazard Mitigation and Coastal High-Hazard Areas</u>. Building and development activities shall be carried out in a manner which addresses the danger to life and property from hurricanes. Development within <u>the eCoastal hHigh-hHazard Areas (CHHA)</u> shall be reviewed by Flagler County (and other applicable agencies as required). Public funding for new facilities within <u>the eCoastal hHigh-hHazard Areas (CHHA)</u> shall be limited to public access, resource restoration, and passive recreation facilities.</p>	<p>Flagler County, Policy <u>E.2.1.05</u>, Comprehensive Plan</p>	<p>Ongoing process- updated to include the incorporation of the City of Palm Coast. The Regional Council has updated the regional evacuation study; local review and coordination are pending</p>
<p>New sanitary sewer facilities in the hurricane vulnerability zone lower than the <u>fifty-year (50-year)</u> floodplain shall be flood-proofed, raw sewage shall not leak from sanitary sewer facilities during flood events, and new septic tanks shall be fitted with backflow <u>preeventors [sic]</u>.</p>	<p>Flagler County, Objective <u>E.2.2</u>, Comprehensive Plan</p>	<p>Ongoing enforcement</p>
<p><u>Flagler County defines tThe Coastal High-Hazard Area (CHHA) shall coincide with the Category 1 hurricane evacuation zone as determined by the Northeast Florida Regional Planning Council. See Map 6 as the area below the elevation of the Category 1 storm surge line as established by the Sea, Lake, and Overland Surges from Hurricanes (SLOSH) computerized storm surge model used by the Northeast Florida Regional Council (NEFRC) for the Hurricane Evacuation Study and any subsequent updates to the model.</u></p>	<p>Flagler County, Policy <u>E.2.2.01</u>, Comprehensive Plan</p>	<p>In process</p>
<p>The <u>Flagler County's adopted stormwater management regulations Stormwater Ordinance</u> shall include the building elevations of the <u>Federal Emergency Management Agency (FEMA)</u> Flood Insurance Rate Maps, the building requirements of the National Flood Insurance <u>pProgram (NFIP)</u>, or applicable detention of rain as specified in <u>Chapter 40C of the Florida Administrative Code (FAC)</u>.</p>	<p>Flagler County, Policy <u>E.2.2.02</u>, Comprehensive Plan</p>	<p>Implemented. Updated to include the incorporation of the City of Palm Coast. Regional Council has completed the regional evacuation study, review and local coordination are pending.</p>
<p>The hazard mitigation annex of the <u>Comprehensive Emergency Management Plan (CEMP) Local Peacetime Emergency Plan</u> shall be reviewed and updated annually.</p>	<p>Flagler County, Policy <u>E.2.2.03</u>, Comprehensive Plan</p>	<p>Ongoing enforcement</p>
<p>Recommendations of the hazard mitigation annex of the <u>Comprehensive Emergency Management Plan (CEMP) local peacetime emergency plan</u> includes the following task assignments:<u>such that tThe following Flagler County Departments will assist in developing and implementing policies regarding hazardous mitigation.:-</u></p>	<p>Flagler County, Policy <u>E.2.2.04</u>, Comprehensive Plan</p>	<p>Enforced- updated annually.</p>
<p><u>(1) the County Chief Building Official and Planning and Zoning Director Administrator, will assure that zoning requirements and limitations are consistent with anticipated hazards.:-</u></p>	<p>Flagler County, Policy <u>E.2.2.05</u>, Comprehensive Plan</p>	<p>Ongoing enforcement. Updated to reflect the incorporation of the City of Palm Coast.</p>

## Flagler County Local Mitigation Strategy

<p><del>(2)</del> the County Attorney, will stress the importance of proper legal measures employed prior to hazard situations;:-</p>		
<p><del>(3)</del> the Division of Emergency Management <u>Division Chief</u> and <u>Chief Building Official</u> will stress the need of adequate insurance coverage;:-</p>		
<p><del>(4)</del> the Red Cross and <u>Director of Emergency Management Division Chief Services</u> will review designated evacuation shelters that will be made available for various hazardous situations;:-</p>		
<p><del>(5)</del> <del>The</del> <u>Office of Emergency Management Division Chief Services</u> will maintain a check list of resources that are available for various hazard conditions;:-</p>		
<p><del>(6)</del> <del>The</del> <u>Chief Building Official</u> and the <u>Director of Emergency Management Division Chief Services</u> will see that informative programs are initiated in stressing hazard mitigation;:-</p>		
<p><del>(7)</del> <del>The</del> <u>Director of Emergency Management Division Chief Services</u> will assist in the development of <u>s</u>State, regional, and local hazardous mitigation policies affecting the several communities within the jurisdiction;:-</p>		
<p><del>(8)</del> <del>The</del> <u>Office of Emergency Management Division Chief Services</u> will solicit the assistance of private agencies such as insurance <u>agencies</u> <u>contractors</u> and others in the community who could assist in recognizing hazardous problems;:-</p>		
<p><del>(9)</del> <del>The</del> <u>Planning and Zoning Director</u> will assume the responsibility of bringing to the attention of the policy-making officials, <u>i.e., the</u> (Board of County Commissioners), <u>the</u> issues and problems affecting local growth and development;:-</p>		
<p><del>(10)</del> <del>The</del> <u>Planning and Zoning Director</u> will encourage appropriate legislation at the local level to reduce the risk <u>to</u> of life and property in areas vulnerable to the impact of predictable, recurring hazards;:-</p>		
<p><del>(11)</del> <del>The</del> <u>Director of Emergency Services Management Division Chief</u> will maintain a current file of local and past anticipated hazards; <u>and</u>:-</p>		
<p><del>(12)</del> <del>The</del> <u>Planning and Zoning Director</u> will request <u>s</u>State assistance in matters pertaining to hazard mitigation beyond the capabilities of <u>Flagler County local government</u>.</p>		

## Flagler County Local Mitigation Strategy

County-funded public facilities shall not be built in the Coastal High-Hazard Area, unless the facility is for public access or resource restoration or parks.		
General hazard mitigation to [sic] reduce the exposure of human life and property to natural hazards shall be addressed through implementation of the <u>Land Development Regulations (LDRs)</u> and the <u>Development of Regional Impact (DRI)</u> review process.		
Septic tanks in the hurricane vulnerability zone shall be used as an interim measure until centralized facilities are available and hookup is required. Connections to centralized wastewater and water systems will be required within one (1) year from the date of notice that these services are available.	Flagler County, Policy 2.2.06, Comprehensive Plan	Outdated
Reconstruction or replacement of existing hard erosion control structures along the oceanfront which are more than <u>seventy-five percent (75%)</u> destroyed shall be prohibited except for maintenance and care of structures which are needed to protect evacuation routes, public facilities, and utilities.	Flagler County, <u>E.2.2.076</u> , Comprehensive Plan	Ongoing implementation
Flagler County shall direct population concentrations away from known or predicted <u>Coastal High-Hazard Areas (CHHAs)</u> through via acquisition of property within these areas and implementation of local and <u>State</u> regulatory measures including the Coastal Construction Setback Control <u>Line (CCCL)</u> rules, Flagler County Land Development Regulations ( <u>LDRs</u> ), and Flagler County Future Land <u>Use Map</u> .	Flagler County, <u>E.2.2.087</u> , Comprehensive Plan	Ongoing enforcement
The <u>Flagler</u> County shall encourage the relocation of threatened and/or damaged structures and infrastructure landward of the <u>Coastal High-Hazard Area (V zone)</u> .	Flagler County, Policy <u>E.2.2.098</u> , Comprehensive Plan	Ongoing enforcement
The <u>Flagler</u> County may hold a referendum election for the purpose of continued funding of the <u>Environmentally Sensitive Lands (ESL)</u> program with the intent of expanding purchases of flood prone natural areas.	Flagler County, Objective <u>E.2.3</u> , Comprehensive Plan	Ongoing enforcement. Updated to reflect the incorporation of the City of Palm Coast.
Coastal land and land within the Coastal High Hazard Area ( <u>CHHA</u> ) shall have a high priority when the <u>Flagler</u> County undertakes land acquisition programs for the preservation of natural areas, flood plains, or endangered lands.	Flagler County, Policy <u>E.2.3.01</u> , Comprehensive Plan	Ongoing enforcement. Updated to reflect the incorporation of the City of Palm Coast.
Lands seaward of the Coastal Construction Control Line ( <u>CCCL</u> ) shall be designated as unsafe building areas consistent with <u>Section 4.04.10</u> of the Land Development <u>Regulations Code (LDRs)</u> which shall serve as the line from which applicable setbacks are determined.	Flagler County, Policy <u>E.2.3.02</u> , Comprehensive Plan	Ongoing implementation
<u>Development within the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) V Zone shall be limited through Flagler County restrictions regarding the provision of water, sewer, and road facilities to service V Zone areas where infrastructure facilities have been damaged and/or destroyed by storm forces.</u>	Flagler County, Policy <u>E.2.3.03</u> , Comprehensive Plan	Ongoing implementation

## Flagler County Local Mitigation Strategy

<p><u>A statement shall be included on all new subdivision plats located within areas of potential storm surge inundation that: "The area as depicted hereon is subject to storm surge inundation during a Category 1, 2, 3, 4, and 5 hurricane".</u></p>	<p>Flagler County, Policy <u>E.2.3.04</u>, Comprehensive Plan</p>	<p>Enforced- updated to include incorporation of the City of Palm Coast.</p>
<p><u>Flagler County shall implement the minimum evacuation time standards established in the Transportation and Capital Improvements Elements and shall not issue building permits for properties within the Coastal High Hazard Area (CHHA) if a new residential project cannot meet those standards.</u></p>	<p>Flagler County, Policy <u>E.2.3.5</u>, Comprehensive Plan</p>	<p>Updated to reflect the incorporation of the City of Palm Coast; ongoing enforcement.</p>
<p><u>Flagler County shall discourage the location of new adult living facilities, nursing homes, and other similar medical facilities that serve Flagler County's special needs population within the Coastal High Hazard Area (CHHA).</u></p>	<p>Flagler County, Policy <u>E.2.3.6</u>, Comprehensive Plan</p>	<p>Ongoing implementation</p>
<p><u>Lands seaward of the Coastal Construction Control Line (CCCL) shall be designated as unsafe building areas consistent with Section 4.04.10 of the Land Development Regulations Code (LDRs) which shall serve as the line from which applicable setbacks are determined.</u></p>	<p>Flagler County, Policy <u>E.2.3.7</u>, Comprehensive Plan</p>	<p>Ongoing implementation- updated to reflect the incorporation of the City of Palm Coast.</p>
<p><u>By 2000, the Flagler County shall develop a continue to administer a post-disaster and pre-hazard mitigation plan which addresses all jurisdictions in the County and creates benefits for existing and future property owners. Flagler County shall re-evaluate the effectiveness of the plan immediately after a major disaster event to recommend and adopt appropriate modifications.</u></p>	<p>Flagler County, Policy <u>E.2.3.8</u>, Comprehensive Plan</p>	<p>Ongoing enforcement</p>
<p><u>The Flagler County's Comprehensive Emergency Management Plan (CEMP) post hurricane disaster plan shall consider the following:</u></p>	<p>Flagler County, Policy <u>E.2.3.9</u>, Comprehensive Plan</p>	<p>Ongoing enforcement</p>
	<p>Flagler County, Objective <u>E.2.4</u>, Comprehensive Plan</p>	<p>Ongoing implementation</p>
<p><u>(1a) land uses and public facilities in the Coastal zone Area;</u></p>	<p>Flagler County, Policy <u>E.2.4.01</u>, Comprehensive Plan</p>	<p>Enforced</p>
<p><u>(2b) areas of known high-hazard;</u></p>		
<p><u>(3e) the effects of hurricanes on the natural resources of coastal areas; and</u></p>		
<p><u>(4d) prior arrangements with owners in the Coastal High Hazard Area (CHHA), to facilitate acquisition.</u></p>		

## Flagler County Local Mitigation Strategy

<p><u>Flagler County shall continue to ensure a coordinated approach to emergency management efforts in the Coastal Area with the local municipalities, utility providers, and business organizations as prescribed by the Comprehensive Emergency Management Plan (CEMP), as amended. By 1999, the County shall appoint a Post-Disaster Redevelopment Planning Task Force, to prepare and implement a Post-Disaster Redevelopment Plan. This Task Force shall include members of County staff, representatives of coastal municipalities, utility providers and business organizations.</u></p>		
<p><u>By 2000, the Flagler County shall complete the basic application for participation in the Community Rating System program which includes the development and implementation of a flooding mitigation plan.</u></p>		
<p><u>Flagler County shall coordinate the Comprehensive Emergency Management Plan (CEMP) with adjacent counties and municipalities.</u></p>	<p>Flagler County, Policy <u>E.2.4.02</u>, Comprehensive Plan</p>	<p>Enforced</p>
<p><u>Post-Disaster Redevelopment. The Flagler County shall provide <u>damage assessment</u> immediate response to post-hurricane situations via the timely and judicious response of a damage assessment.</u></p>	<p>Flagler County, Policy <u>E.2.4.03</u>, Comprehensive Plan</p>	<p>In process</p>
<p><u>After a hurricane but prior to re-entry of the population into evacuated areas, the <u>Flagler County Board of County Commissioners</u> shall <u>review</u> meet to hear preliminary damage assessments, appoint a Damage Assessment Team, and place a temporary moratorium on building activities not necessary for the public health, safety, and <u>general welfare</u>.</u></p>	<p><u>Flagler County, Policy E.2.4.4, Comprehensive Plan</u></p>	<p>Ongoing implementation</p>
<p><u>The Damage Assessment Team shall include <u>Flagler County staff consistent with Flagler County's Comprehensive Emergency Management Plan (CEMP)</u> the County Building Official, Real Estate Appraisers, Contractors, Insurance Agents, representatives from utility and public works, police and fire, and the County Extension Service, and other members as directed by the County <u>Administrator Commission</u>.</u></p>	<p>Flagler County, Objective <u>E.2.5</u>, Comprehensive Plan</p>	<p>Implemented</p>
<p><u>The Damage Assessment Team shall: review and decide upon emergency building permits; coordinate with s<u>State</u> and f<u>Federal</u> officials to prepare disaster assistance applications; analyze and recommend to the <u>Flagler County Board of County Commissioners</u> hazard mitigation options including reconstruction or relocation of damaged public facilities; develop a redevelopment plan; and recommend amendments to the e<u>Comprehensive p</u>lan, Local Peacetime Emergency Plan, and other appropriate policies and procedures.</u></p>	<p>Flagler County, Policy <u>E.2.5.01</u>, Comprehensive Plan</p>	<p>Implemented</p>

## Flagler County Local Mitigation Strategy

<p>Immediate repair and cleanup actions needed to protect the public health and safety include repairs to: potable water, wastewater, and power facilities; removal or debris; stabilization or removal of structures about to collapse; and minimal repairs to make dwellings habitable. These actions shall receive first priority in permitting decisions. Long-term redevelopment activities shall be postponed until the Damage Assessment Team has completed its tasks.</p>	<p>Flagler County, Policy <u>E.2.5.02</u>, Comprehensive Plan</p>	<p>Enforced</p>
<p>If rebuilt, structures which suffer damage that exceeds the standards established in the Florida Building Code (FBC) and Flagler County Land Development Regulations (LDRs) in excess of fifty percent of their appraised value shall be rebuilt to meet all current requirements, including those enacted since construction of the structure.</p>	<p>Flagler County, Policy <u>E.2.5.03</u>, Comprehensive Plan</p>	<p>Enforced</p>
<p>Structures which suffer repeated damage to pilings, foundations, or load-bearing walls shall be required to rebuild landward of their current location or to modify the structure to <u>eliminate</u> delete the areas most prone to damage.</p>	<p>Flagler County, Policy <u>E.2.5.04</u>, Comprehensive Plan</p>	<p>Enforced</p>
<p>Areas needing redevelopment shall be evaluated by Flagler County in a review process for appropriate land uses, eliminating unsafe conditions, and restoring coastal resources. The redevelopment activity shall not result in an increase in evacuation times above clearance time as <u>referenced herein</u> identified in this element.</p>	<p>Flagler County, Policy <u>E.2.5.05</u> Comprehensive Plan</p>	<p>Enforced</p>
<p>The amount of public access to coastal resources shall increase between now and the year 2020.</p>	<p>Flagler County, Policy <u>E.2.5.06</u> Comprehensive Plan</p>	<p>Enforced</p>
<p>Existing publicly-controlled access to the beach shall be maintained by new development. New beachfront development shall show on their site plans existing beach access ways and the proposed development shall <u>be required to</u> continue <del>that</del> access way, relocate it on the site, or donate it to the <u>Flagler County</u>. (<u>Any</u> Relocated access must be similar in character and convenience to the original access point.)</p>	<p>Flagler County, Policy <u>E.2.5.07</u>, Comprehensive Plan</p>	<p>Enforced</p>
<p>The <u>Flagler</u> County shall accept donations of shoreline lands suitable for use as public access facilities.</p>	<p>Flagler County, Goal <u>E.3</u>, Comprehensive Plan</p>	<p>In process</p>
<p><del>One additional saltwater boat ramps with adequate parking facilities shall be provided by the year 2000 as specified in the Recreation and Open Space Element.</del></p>	<p>Flagler County, Objective <u>E.3.1.01</u>, Comprehensive Plan</p>	<p>Implemented</p>
<p><u>Flagler County will require the dedication of public access to beaches from developments located within the Coastal Area where applicable.</u></p>	<p>Flagler County, Policy <u>E.3.1.02</u>, Comprehensive Plan</p>	<p>Implemented</p>
<p>The <u>Flagler</u> County shall extend every effort to increase the number of public beach access points and parking spaces <u>by</u>.</p>	<p>Flagler County, Policy <u>3.1.03</u>, Comprehensive Plan</p>	<p>Complete</p>
	<p><u>Flagler County, Policy E.3.1.2, Comprehensive Plan</u></p>	<p>Updated</p>

## Flagler County Local Mitigation Strategy

<p>(1a) providing parking facilities at beach access points and facilities as specified in the Recreation and Open Space Element; <u>and</u>.</p>	<p>Flagler County, Policy <u>E.3.1.043</u>, Comprehensive Plan</p>	<p>In process</p>
<p>(2b) requiring public shoreline access in all Flagler County-sponsored coastal development projects.</p>		
<p><u>Flagler County will not vacate or relocate existing easements, walkways, and other access points to beaches, shores, and waterways, without requiring the grant or dedication of equal or greater access points or easements in exchange.</u></p>		
<p><u>Private landowners adjacent to public beach access points, including easements, will not be allowed to restrict public access to the beach through such access.</u></p>		
<p><u>Flagler County shall maintain an inventory of existing public beach access points. By 2012, the County shall study and forecast the need for future beach access requirements based upon projected population. Any findings and needs forecasted shall be incorporated into the Recreation and Open Space and Coastal Management Elements through the Comprehensive Plan amendment process. In the interim, a beach access goal of one (1) beach access point for every one (1) mile of coastline shall be established.</u></p>	<p><u>Flagler County, Policy E.3.1.4,</u> <u>Comprehensive Plan</u></p>	<p>Enforced</p>
<p><u>Flagler County shall encourage that new development or major reconstruction occurring on private property includes dune walkovers to protect dune vegetation and the removal of informal pathways for the restoration of native dune vegetation. Access through public areas shall also use dune walkovers whenever feasible and shall strive to remove existing informal pathways to allow for restoration of native dune vegetation.</u></p>	<p><u>Flagler County, Policy E.3.1.5,</u> <u>Comprehensive Plan</u></p>	<p>Enforced</p>
<p><u>Flagler County shall continue to protect beaches, dunes, coastal vegetation, and coastal wildlife from vehicular and pedestrian traffic by providing off-beach vehicular parking and dune walkovers with a desired goal of one (1) beach access point for every one (1) mile of coastline.</u></p>	<p><u>Flagler County, Policy E.3.1.6,</u> <u>Comprehensive Plan</u></p>	<p>Implemented</p>
<p><u>Off-beach vehicular parking areas shall be paved with pervious surfaces including, but not limited to, turf block, stone, or left unpaved with shell to allow stormwater infiltration wherever feasible and appropriate.</u></p>	<p><u>Flagler County, Policy E.3.1.7,</u> <u>Comprehensive Plan</u></p>	<p>Implemented</p>
<p>Capital Improvement projects in the coastal area shall be prioritized in such a manner as to achieve and maintain adopted level of service standards. Those areas located within DRIs shall be consistent with the development order adopted for the DRI.</p>	<p><u>Flagler County, Policy E.3.1.8,</u> <u>Comprehensive Plan</u></p>	<p>Implemented</p>
<p>The County will use the level of service standards and demand criteria, as stated in the Capital Improvements Element, in reviewing the impacts of new development and redevelopment.</p>	<p><u>Flagler County, Policy E.3.1.9,</u> <u>Comprehensive Plan</u></p>	<p>Implemented</p>

## Flagler County Local Mitigation Strategy

Capital Improvement funding, to the extent permitted by the funding source, should be directed first toward the renewal and replacement of facilities; next to correcting existing deficiencies; and third to building facilities that accommodate new growth.	Flagler County, Objective 3.2, Comprehensive Plan	Complete
Maintaining Scenic Routes. <u>Flagler County shall continue to maintain designated Scenic Routes and shall continue to protect areas</u> The County will establish by establishing a scenic road system in order to help preserve the Coastal Area's natural beauty.	Flagler County, Policy 3.2.01 Comprehensive Plan	Complete
<u>Flagler County shall continue to coordinate with the Corridor Management Entities for the State and/or Federally-designated scenic or historic roadways in order to assist with the implementation of the applicable Corridor Management Plan.</u>	Flagler County, Policy 3.2.02, Comprehensive Plan	Complete
<u>Flagler County shall continue to seek scenic roadway designation for U.S. Highway #1 north of Old Kings Road to the St. Johns County line, and County Road 201 (also known as John Anderson Highway) from the Volusia County line to State Road 100 and State Road A1A shall be designated scenic roads.</u>	Flagler County, Objective E.3.32, Comprehensive Plan	Implemented
Flagler County's Recreation and Open Space Element shall designate the scenic roads and the "Future Land Use Map" shall establish land uses that are consistent with the goal of preserving the natural beauty and scenic vistas along these routes.	Flagler County, Policy E.3.32.01, Comprehensive Plan	Implemented
Properties between designated scenic roads and wetlands or open water shall be zoned the lowest intensity allowed for their respective Future Land Use categories.	<u>Flagler County, Policy E.3.2.2, Comprehensive Plan</u>	Implemented
Infrastructure. Public facilities shall be adequate and available to serve residents and visitors to <u>Flagler the County's Coastal Area.</u>	Flagler County, Policy E.3.32.023, Comprehensive Plan	Enforced
<u>Capital improvement projects in the Coastal Area shall be prioritized in such a manner as to achieve and maintain the desired goals of this Element. Those areas located within Developments of Regional Impact (DRIs) shall be consistent with the Development Order adopted for the DRI.</u>	Flagler County, Policy E.3.32.034, Comprehensive Plan	Enforced
<u>Flagler County will use the Level of Service (LOS) standards and demand criteria, as stated in the Capital Improvements Element, in reviewing the impacts of new development and redevelopment.</u>	Flagler County, Goal E.4, Comprehensive Plan	Implemented
<u>Capital improvement funding, to the extent permitted by the funding source, should be directed first toward the renewal and replacement of facilities; next to correcting existing deficiencies; and third to building facilities that accommodate new growth.</u>	<u>Flagler County, Objective E.4.1, Comprehensive Plan</u>	Implemented
Levels of Service. The Level of Service (LOS) standard adopted elsewhere in this comprehensive plan for facilities in the Coastal Area and the additional standards under this Objective shall be applied whenever development orders or permits are required.	<u>Flagler County, Policy E.4.1.1, Comprehensive Plan</u>	Implemented

## Flagler County Local Mitigation Strategy

Service areas shall be established for water and sanitary sewer facilities- <u>and defined through joint planning agreements, interlocal agreements, or memoranda of understanding.</u> Development within these service areas shall be limited to the capacity of the respective facilities to supply to appropriate service as established by the <u>Level of Service (LOS) standards</u> adopted in this <u>Comprehensive Plan</u> .	<u>Flagler County, Policy E.4.1.2, Comprehensive Plan</u>	Implemented
The Future Land Use Map in the Future Land Use Element established the service areas to be used in the <u>Coastal Area</u> .	Flagler County, Objective <u>E.4.12, Comprehensive Plan</u>	Implemented
<u>Required Improvements, Timing, and Funding.</u> All public facilities shall be available by the time they are needed to serve new development <u>in the Coastal Area through</u> via a <u>Flagler County's eConcurrency mManagement sSystem</u> .	Flagler County, Policy <u>E.4.12.01, Comprehensive Plan</u>	Implemented
The following roadway improvements and funding shall be implemented (with respect to the federal, state, and local governments) as specified in the Traffic Circulation Element:	Flagler County, Policy <u>E.4.12.02, Comprehensive Plan</u>	Implemented
	Flagler County, Objective <u>E.4.23, Comprehensive Plan</u>	Implemented
1) SR 100 from Old Kings Road east to A1A in Flagler Beach from two lanes undivided to four lanes divided by 1995;	Flagler County, Policy 4.2.01, Comprehensive Plan	Completed and/or updated
2) Palm Harbor Parkway from Palm Coast Parkway to Club House Drive from two lanes divided to two lanes divided after 1995 and from Club House Drive to Florida Park Drive from two lanes undivided to four lanes undivided.		
3) A1A from St. Johns County line to south city limits of Flagler Beach from two lanes undivided to four lanes undivided.		
<u>New public infrastructure shall be planned and designed to be compatible with both existing and future adjacent land uses.</u>		
Developments, which would impact existing facilities by reducing the level of service below adopted levels, and which are to be built prior to the availability of scheduled facility improvements shall pay for such impacts or shall provide their own facilities constructed to county standards.		
New or improved roads in the <u>Coastal Area</u> shall, where feasible, include turn lanes, parking lanes, or other paved areas, which can be used to increase the number of traffic lanes for hurricane evacuation.	<u>Flagler County, Policy E.4.3.1, Comprehensive Plan</u>	Updated
Flagler County shall require that public facilities and services needed in the <u>Coastal Area</u> to support development or redevelopment be available concurrent with the impacts of said development or redevelopment <u>through</u> via a <u>eConcurrency mManagement sSystem</u> that establishes the review process required to assure such concurrency.	Flagler County, Policy 4.2.02, Comprehensive Plan	Updated

## Flagler County Local Mitigation Strategy

Intergovernmental Coordination to Protect Coastal Resources: <u>Flagler County shall coordinate with adjoining cities and counties to ensure that coastal resource management will address the natural systems on a system-wide basis regardless of political boundaries.</u>	Flagler County, Policy <u>E.4.23.032</u> , Comprehensive Plan	Implementation ongoing
Coordinating with Other Local Governments: <u>Flagler County shall strive to establish an intergovernmental coordination mechanism that shall be established in order to manage coastal resources affecting or affected by governments other than the Flagler County.</u>	Flagler County, Policy <u>E.4.23.043</u> , Comprehensive Plan	Implemented
The <u>Flagler</u> County shall review the comprehensive plans of the municipalities within its boundaries and adjacent coastal counties to determine if coastal resources are being managed in a consistent manner.	Flagler County, Goal <u>E.5</u> , Comprehensive Plan	Updated to reflect the incorporation of the City of Palm Coast; ongoing enforcement.
The <u>Flagler</u> County may develop joint planning and management programs with the municipalities within its boundaries <u>and Federal and State regulatory authorities</u> for mosquito impoundments, beach renourishment, hurricane evacuation, provision of public access, provision of infrastructure, providing water dependent use sites, controlling stormwater, reducing wastewater treatment plant discharges into the Intracoastal Waterway, and coordinating efforts to protect species with special status.	Flagler County, Objective <u>E.5.1</u> , Comprehensive Plan	Updated to reflect the incorporation of the City of Palm Coast; ongoing enforcement.
Coordinating with existing Resource Protection Plans: <u>The Flagler County shall implement appropriate portions of existing multi-jurisdictional resource protections addressing the inter-lagoonal system and the Coastal Area barrier.</u>	Flagler County, Policy <u>E.5.1.01</u> , Comprehensive Plan	Updated to reflect the incorporation of the City of Palm Coast; ongoing enforcement.
The <u>Flagler</u> County shall forward all <u>applicable</u> development proposals adjacent to the aquatic preserves to the Florida Department of Environmental Protection ( <u>FDEP</u> ) for its review and comment.	Flagler County, Policy <u>E.5.1.02</u> , Comprehensive Plan	Implemented
<del>7 [sic]</del> The <u>Flagler</u> County shall assist the Northeast Florida Regional Planning Council ( <u>NEFRC</u> ) in the protection of regionally-significant coastal resources.	Flagler County, Objective <u>E.5.2</u> , Comprehensive Plan	Updated to reflect the incorporation of the City of Palm Coast; ongoing enforcement.
Improve hurricane evacuation planning efforts with the FCDES and the Northeast Florida Regional Planning Council (NEFRPC) by providing and updating population densities within the hurricane evacuation zone.	Flagler County, Policy <u>E.5.2.01</u> , Comprehensive Plan	Implemented
The City shall provide population densities biennially to Flagler County and shall provide population and trend data to the NEFRPC upon request.	Flagler County, Policy <u>E.5.2.02</u> , Comprehensive Plan	Implemented
The City shall coordinate with FCDES, FDOT and other regulatory agencies to identify roadway and other improvements to the hurricane evacuation road network based upon the number of people who cannot be evacuated within an optimum evacuation time limit.	Palm Coast, Objective 1.6.1 (Evacuation Planning), Comprehensive Plan	The City continues to coordinate with the NEFRC on evacuation planning.
The City shall coordinate future land uses by encouraging the elimination or reduction of land uses that are inconsistent with any appropriate interagency hazard mitigation report recommendations.	Palm Coast, Policy 1.6.1.1, Comprehensive Plan	The Community Development Department regularly coordinates with the County on exchange of data and information.

## Flagler County Local Mitigation Strategy

Through the LDC, the City shall prohibit the reconstruction of certain non-conforming structures or which are deemed to be hazardous structures in the event that they are destroyed to an extent more than fifty (50) percent of their replacement value at the time of destruction.	Palm Coast, Policy 1.6.1.2 Comprehensive Plan	The NEFRC is in the process of completing the Northeast Florida Regional Evacuation Model. As appropriate, City will coordinate with the appropriate agencies to assist in the implementation of the findings, including any needed roadway improvements.
The City shall implement the recommendations of the interagency hazard mitigation report.	Palm Coast, Objective 1.6.2 (Hazard Mitigation), Comprehensive Plan	The City will continue to consider new information to determine appropriate action to reduce risk.
The City shall coordinate with FDOT, Flagler County and the Volusia MPO and surrounding counties and jurisdictions to ensure that Emergency Evacuation Routes are appropriate and functional, and ensure that emergency personnel are informed of the routes and roadway characteristics.	Palm Coast, Policy 1.6.2.1, Comprehensive Plan	Enforced through LDC - Subsection 1.10.04.D relating to Nonconforming Structures in the LDC implements this policy.
The City shall conduct a corridor study to determine the need for an E-W connection at the southern boundary of the Flagler County Airport connecting Citation Parkway. The needs determination shall include both traffic and safety (evacuation) issues as well as consider a location for a new fire station where growth demands it.	Palm Coast, Policy 1.6.2.2, Comprehensive Plan	The City will continue to review recommendations of all applicable hazard mitigation report and review the recommendations for appropriate action.
Develop the capability to evacuate all residents of the City in the event of a threat of natural or manmade disaster.	Palm Coast, Policy 2.1.4.12, Comprehensive Plan	The City regularly attends the Volusia MPO meetings and coordinates with FDOT and Flagler County on transportation planning and construction projects.
In coordination with all appropriate agencies, and within two (2) years of Plan adoption, develop and run a model to simulate an emergency evacuation in order to refine and improve evacuation plans, and to identify primary roadways to serve in an emergency.	Palm Coast, Policy 2.1.5.5, Comprehensive Plan	The City will need to identify funding source to conduct the study.
The City shall develop procedures and training for Public Works Department employees detailing road closures, traffic routing, and signage in the event of a natural or manmade disaster.	Palm Coast, Objective 2.4.4 (Evacuation of Residence), Comprehensive Plan	The City coordinates with various agencies such as the NEFRC, the Flagler County Emergency Services to prepare residents for potential evacuation.
The City shall make provisions for removal of obstacles to free traffic flow in the event of a natural disaster that include the ability to remove fallen trees and disabled vehicles quickly on any of the evacuation routes.	Palm Coast, Policy 2.4.4.1, Comprehensive Plan	The NEFRC is in the process of completing the regional evacuation study. Findings of this study will reviewed for implementation consistent with the City's comprehensive plan.
Within one (1) year of Plan adoption, the City shall amend the LDC to include standards that require a minimum of two (2) means of ingress/egress to arterial or collector roads for all new subdivisions and all new residential developments to be used for access and egress in the event of an emergency consistent with and subject to the exception stated in Policy 2.2.1.2. ( <i>Ordinance #2007-20, §1(b), 10/2/07</i> )	Palm Coast, Policy 2.4.4.2, Comprehensive Plan	Public Works has a monthly training schedule to address this issue.
Within fifteen (15) years of Plan adoption, the City shall pursue the development of one additional roadway connection for ingress/egress to an arterial roadway for the following neighborhoods that have limited access. A. Cypress Knoll, B. Matanzas Woods, C. Indian Trails East	Palm Coast, Policy 2.4.4.3, Comprehensive Plan	The City maintains a Comprehensive Emergency Management Plan which details the duties and roles of different City departments during an emergency.
Within five (5) years of Plan adoption, the City shall conduct a study to identify additional subdivisions with limited access.	Palm Coast, Policy 2.4.4.4, Comprehensive Plan	Enforced through LDC - Subsection 5.02.04.B in the LDC, which regulates connectivity and interconnectivity, implements this policy.

## Flagler County Local Mitigation Strategy

<p>To foster nondiscrimination and encourage the development of community residential alternatives to institutionalization, the City shall, at a minimum, establish the following principles and criteria, supplemental to the provisions of Chapter 419, F. S., for sitting group homes and foster care facilities:</p> <p>A. Availability of existing or planned roads and central utilities;</p> <p>B. Proximity of existing or planned schools, parks, and other public facilities;</p> <p>C. Proximity of existing or planned employment centers;</p> <p>D. Proximity to grocery stores and medical facilities;</p> <p>E. Proximity to bus routes; and</p> <p>F. Locations outside the Coastal High Hazard Zone.</p>	<p>Palm Coast, Policy 2.4.4.5, Comprehensive Plan</p>	<p>The City will continue to coordinate with residents in the identified neighborhood to identify additional access.</p>
<p>The City shall utilize, at a minimum, the following principles and criteria for sitting households with special housing needs:</p> <p>A. Availability of existing or planned roads and central utilities;</p> <p>B. Proximity of existing or planned schools, parks, and other public facilities;</p> <p>C. Proximity of existing or planned employment centers;</p> <p>D. Proximity to grocery stores and medical facilities;</p> <p>E. Proximity to bus routes; and</p> <p>F. Locations outside of the Coastal High Hazard Zone.</p>	<p>Palm Coast, Policy 2.4.4.6, Comprehensive Plan</p>	<p>The City will continue to coordinate with residents in the identified neighborhood to identify additional access.</p>
<p>The City shall utilize, at a minimum, the following principles and criteria for sitting the zoning districts in which mobile homes and/or residential manufactured buildings are permitted:</p> <p>A. Availability of existing or planned roads and central utilities;</p> <p>B. Adequate buffering from proximate residential uses;</p> <p>C. Adequate buffering from rights-of-way; and</p> <p>D. Located outside of the Coastal High Hazard Zone.</p>	<p>Palm Coast, Policy 3.2.1.2, Comprehensive Plan</p>	<p>The City's regulation for group homes mirror the provisions of Chapter 419, F.S. Group homes are approved consistent with these rules and in consideration of the criteria identified in this policy.</p>
<p>Potable Water Facilities and Level of Services</p>	<p>Palm Coast, Policy 3.2.2.3, Comprehensive Plan</p>	<p>The City will continue to review proposed special housing needs for consistency with this policy.</p>
<p>The City shall take all necessary actions to ensure that emergency procedures are sufficient to ensure minimal disruption in service to customers in the event of a natural disaster or other emergencies.</p>	<p>Palm Coast, Policy 3.4.2.3, Comprehensive Plan</p>	<p>Enforced through LDC - Subsection 4.08.03 – Manufactured / Mobile Home Parks in the LDC addresses this policy.</p>

## Flagler County Local Mitigation Strategy

<p>Within five (5) years of Plan adoption, the City shall develop and adopt a Storm water Master Plan that shall identify facility deficiencies and recommend capital improvements projects to correct said deficiencies. The City shall review drainage projects, other than those identified in the Storm water Master Plan in accordance with the following priorities:</p> <p>A. Those improvements, which increase public safety and welfare.</p> <p>B. Those improvements, which reduce property damage, associated with flooding.</p> <p>C. Those improvements which maintain or improve the quality of water flowing into receiving creeks, rivers, ponds, canals, and wetlands.</p> <p>D. Those improvements, which preserve, restore or enhance natural habitats and wetlands.</p> <p>E. Those improvements, which reduce maintenance costs for the City.</p>	<p>Palm Coast, Objective 5.1.1, Comprehensive Plan</p>	<p>Development plans are reviewed to ensure that LOS standards are met. During the Annual Update to the Capital Improvements Element, the availability of facility capacity is evaluated.</p>
<p>The City shall enforce land development regulations specifying limitations on encroachment, alteration, and incompatible land uses in design storm event floodplains.</p>	<p>Palm Coast, Policy 5.1.1.8, Comprehensive Plan</p>	<p>The City Utility Department has an Emergency Response Plan to ensure minimal disruption in service in the event of a natural disaster or other emergencies.</p>
<p>The City's LDC shall be reviewed periodically and amended as necessary to ensure that it is consistent with the latest available regulations promulgated by the Federal Emergency Management Agency in order to reduce property damage and loss of life due to flooding and to obtain other benefits available to the City.</p>	<p>Palm Coast, Policy 5.3.1.1, Comprehensive Plan</p>	<p>Storm water Plan adopted in 2002 and the identified projects have been designed and constructed with funds from the FDEP State Revolving fund.</p> <p>Storm water pipe under roadways are constantly evaluated and replaced as – needed to maintain the safety of the roadway system.</p> <p>Swales are inspected every six months and regarded as-needed to protect against flooding and improve downstream water quality.</p> <p>The system of water control structures which hold surface water at natural levels are monitored once a month and replaced as-needed to insure existing wetland, natural and manmade aquatic habitats are preserved. While funds are budgeted for replacement of one structure a year, the City has been successful in obtaining grants to fund the major part of the replacement costs.</p>
<p>The City shall require elevated first floor living area, and when applicable, compensating storage equal in volume to the floodplain impacted for development within a 100-year floodplain.</p>	<p>Palm Coast, Policy 5.3.6.1, Comprehensive Plan</p>	<p>The City has regulations specifying limitations on encroachment, alteration, and incompatible land uses for floodplains.</p>
<p>The City shall seek funding for reforestation and encourage landowners and developers to regenerate the tree canopy by reforesting the areas impacted by the 1998 wildfires and any future uncontrolled wildfire events that may occur.</p>	<p>Palm Coast, Policy 5.3.6.2, Comprehensive Plan</p>	<p>The LDC adopted in 2008, is reviewed in its entirety annually and updated as necessary. The City incorporates the latest available FEMA regulations into the LDC as necessary.</p>

## Flagler County Local Mitigation Strategy

<p>The City shall enforce land development regulations and amend the LDC, as necessary, to specify limitations on the encroachment, setbacks, buffer zones, alteration and incompatible land uses in design storm event floodplains. At a minimum, the City shall include the following criteria as the basis for the protection of 100-year floodplains:</p> <p>A. Minimization of flood damage and related losses by prohibiting new development within 100-year floodplains unless the structures use elevated lowest first floors or flood proofing, and provide compensating storage.</p> <p>B. Protection of appropriate floodplain areas by land acquisition or conservation easements.</p> <p>C. Minimum standards for drainage from developments within 100-year floodplains to reduce impacts on adjoining properties or degradation of the quality of the receiving surface water bodies.</p>	<p>Palm Coast, Policy 5.3.6.3, Comprehensive Plan</p>	<p>Enforced through LDC - LDC subsection 10.02.06.A addresses the requirement relative to the elevated first floor living area; in addition, the SJRWMD requires the compensating storage as part of the permitting requirements.</p>
<p>The City shall participate in the FEMA Community Rating Systems (CRS) program, which involves meeting higher than minimum National Flood Insurance Program (NFIP) standards by 2005.</p>	<p>Palm Coast, Policy 6.1.11.2, Comprehensive Plan</p>	<p>Funds from logging of burned trees in 1998 were used to plant trees along ROWs and in City medians. Future funding would come from same, as well as the tree bank fund established in accordance with LDC subsection 11.02.07 – Tree Bank Fund Established.</p>
<p>The City's LDC shall be reviewed annually to ensure that it is consistent with the latest available regulations promulgated by the FEMA to reduce property damage and loss of life due to flooding.</p>	<p>Palm Coast, Policy 6.1.12.1, Comprehensive Plan</p>	<p>Enforced through LDC.</p>
<p>The City shall protect the natural functions of the 100-year floodplain so that the flood carrying and flood storage capacity are maintained by implementing and enforcing floodplain regulations and reviewing development proposals for the presence of impacts on floodplains.</p>	<p>Palm Coast, Policy 6.1.12.2, Comprehensive Plan</p>	<p>Through existing Ordinance 2003-15 and within Chapter 10 higher than minimum standards are achieved. In 2009, the City achieved a CRS rating of 6 and ranks 12th of the 217 participating Florida communities.</p>
<p>The City shall enforce, at a minimum, the Florida Building Code to limit the potential damage of structures from hurricanes and high winds. Enforcement of the Florida Building Code shall include, but not limited to, wind-resistance commensurate with the risk of coastal environment and building elevations requirements that conform with applicable Federal laws, Flood Insurance Rate Maps, and related City regulations</p>	<p>Palm Coast, Policy 6.1.12.3, Comprehensive Plan</p>	<p>The LDC is reviewed annually, and updated as necessary.</p>
<p>The City shall require construction standards within the "City of Palm Coast Wind-Borne Debris Region" which is generally located east of Belle Terre Parkway. The City shall ensure that design standards, for any building permitted after April 1, 2002, shall be engineered for 120 mph wind and shall include, at a minimum, one of the following: impact shutters, impact glass, or building design for internal pressure. The City shall amend its codes as necessary to implement this Policy.</p>	<p>Palm Coast, Policy 6.1.12.4, Comprehensive Plan</p>	<p>Through existing Ordinance 2003-15 and within Section 10.02, LDC.</p>
<p>By 2005, the City shall participate in the FEMA Community Rating Systems (CRS) program, which involves meeting higher than minimum FEMA standards.</p>	<p>Palm Coast, Policy 6.2.1.1, Comprehensive Plan</p>	<p>City adopted Ordinance # 2001-43, adopting the Florida Building Code with amendments that provides protection from potential damage of structures from hurricanes and high winds.</p>

## Flagler County Local Mitigation Strategy

<p>The City shall amend the LDC within five (5) years of Plan adoption, to address general hazard mitigation and to reduce exposure of human life and property to natural hazards.</p>	<p>Palm Coast, Policy 6.2.1.2, Comprehensive Plan</p>	<p>City adopted Ordinance # 2001-43, which provides the demarcation of lines for building construction standards relating to wind speeds (110 mph west of Belle Terre Pkwy and 120 mph east of Belle Terre Pkwy).</p>
<p>The City shall ensure that Coastal High Hazard Area shall coincide with the Category 1 hurricane evacuation zone as defined in the most current evacuation study by the NEFRPC.</p>	<p>Palm Coast, Policy 6.2.1.3, Comprehensive Plan</p>	<p>Implemented by Ordinance 2003-15. In 2009, the City achieved a CRS rating of 6 and ranks 12th of the 217 participating Florida communities.</p>
<p>The City shall amend the LDC, within one (1) year of Plan adoption, to limit and/or prohibit the reconstruction of certain non-conforming structures or non-conforming portions of structures in the event that they are destroyed to an extent more than fifty percent of their replacement value at the time of destruction.</p>	<p>Palm Coast, Policy 6.2.1.4, Comprehensive Plan</p>	<p>Enforced through LDC - LDC Section 10.02 – Flood Damage Protection outlines the requirements, which are enforced as part of the development review process.</p>
<p>The City shall consider measures including, but not limited to, the acquisition of property within coastal land and land within the Coastal High Hazard Area.</p>	<p>Palm Coast, Policy 6.2.2.1, Comprehensive Plan</p>	<p>The City Comprehensive Plan was amended in December 2008 to reflect the new definition of Coastal High Hazard Area (CHHA).</p>
<p>The City shall encourage the relocation of threatened and/or damaged structures and infrastructure landward of the coastal high hazard area.</p>	<p>Palm Coast, Policy 6.2.2.2, Comprehensive Plan</p>	<p>Enforced through LDC - LDC subsection 1.10.04.B located under Nonconforming Structures requires an existing nonconforming structure be brought into compliance with the LDC to the maximum extent feasible whenever there is a change of use, alteration, or an addition to the existing nonconforming structure. It further states that compliance with the LDC shall include, but not be limited to, parking, driveways, paved surfaces, storm water retention, buffers, landscaping, and fencing / screening.</p>
<p>The LDC shall be amended to incorporate flood damage protection regulations within V Zones located within the Coastal High Hazard Area. At a minimum, the regulations will meet or exceed the Federal Emergency Management Agency (FEMA) requirements.</p>	<p>Palm Coast, Policy 6.2.2.3, Comprehensive Plan</p>	<p>The City acquired Longs Landing Estuary in support of this policy. City continues to seek opportunities to purchase properties within the CHHA as appropriate.</p>
<p>Within five (5) years of the Plan adoption, the City shall revise the pre-hazard and post-disaster hazard mitigation plan, “City of Palm Coast Emergency Plan and Evacuation Plan” and, subsequently, said Plan shall be reviewed annually prior to June 1st of each year. The said Plan shall be developed to ensure maximum coordination and clear lines of communication with FCDES and affected County and City departments to coordinate pre-hazard preparation and expedite post-disaster recovery.</p>	<p>Palm Coast, Policy 6.2.2.4, Comprehensive Plan</p>	<p>The City will monitor damage to structures within the CHHA and identify appropriate structures for acquisition.</p>
<p>The City shall ensure that, following a major disaster, the City evaluates the Damage Assessment Team and Damage Survey Team reports, as required by the Peacetime Emergency Plan, and the City shall develop a specific post-disaster redevelopment plan in coordination with the FCDES and relevant County and City departments. The purpose of the City’s post-disaster redevelopment plan will, at a minimum, be to:</p> <ul style="list-style-type: none"> <li>A. Repair damaged infrastructure needed to protect health and safety.</li> <li>B. Coordinate long-term recovery operations to City infrastructure and public structures.</li> <li>C. Include funding and staffing estimates and set priorities for post-disaster activities.</li> </ul>	<p>Palm Coast, Policy 6.2.2.5, Comprehensive Plan</p>	<p>To date, the City of Palm Coast municipal boundaries does not encompass V Zones. However, LDC subsection 10.02.10 – Coastal Velocity Hazard Areas (V Zones) outlines regulations to implement this policy. These regulations are adopted from FEMA and the LDC is assessed and updated annually, as necessary, to meet FEMA requirements.</p>

## Flagler County Local Mitigation Strategy

<p>Evacuation time for hurricane categories shall be consistent with the following times designated by the 1998 NEFRPC Northeast Florida Hurricane Evacuation Study:</p> <p><b>Category 1-2 Hurricane Light Background Traffic Heavy Background Traffic</b>  Rapid Response 8 hours  8 ¼ hours  Medium Response 9 hours  9 ¼ hours  Long response 10 ¾ hours  10 ¾ hours</p> <p><b>Category 3-4-5 Hurricane Light Background Traffic Heavy Background Traffic</b>  Rapid Response 13 hours  13 ½ hours  Medium Response 13 ½ hours  14 ¼ hours  Long Response 14 ½ hours  15 ½ hours</p>	<p style="text-align: center;">Palm Coast, Policy 6.2.3.1, Comprehensive Plan</p>	<p style="text-align: center;">The City's Comprehensive Emergency Management Plan is reviewed and revised annually.</p>
<p>The City shall coordinate with FCDES, NEFRPC, and other agencies to improve emergency planning with emphasis on maintaining or reducing evacuation times for the City.</p>	<p style="text-align: center;">Palm Coast, Policy 6.2.3.2, Comprehensive Plan</p>	<p style="text-align: center;">The City's Comprehensive Emergency Management Plan includes the City's Post Disaster Redevelopment Plan.</p>
<p>The City shall coordinate with FCDES, NEFRPC, and other agencies to update and employ the hazard mitigation annex of the Peacetime Emergency Plan annually, the purpose of which includes, at a minimum, the following.</p> <p>A. Showing evacuation routes, hurricane hazards, shelters, safety procedures, and other pertinent information for its citizens.  B. Assigning responsibilities and establishing procedures for governmental agencies, volunteer agencies, and individuals, in preparing for and executing evacuation of designated areas of the City.  C. Providing maximum warning time possible to residents of those areas that are deemed to be in danger.</p>	<p style="text-align: center;">Palm Coast, Policy 6.2.4.1, Comprehensive Plan</p>	<p style="text-align: center;">The Northeast Florida Hurricane Evacuation Study will be completed in late 2010. The Study will include updated evacuation zones and update of the Evacuation Transportation Model. Results of the Study will be incorporated into the comprehensive plan as required by State Statutes.</p>
<p>The City shall, if a determination is made that deficiencies in hurricane evacuation times or facilities exist, coordinate with FCDES, NEFRPC, and other agencies to analyze, plan for, and address all noted deficiencies.</p>	<p style="text-align: center;">Palm Coast, Policy 6.2.4.2, Comprehensive Plan</p>	<p style="text-align: center;">The Northeast Florida Hurricane Evacuation Study will be completed in late 2010. The Study will include updated evacuation zones and update of the Evacuation Transportation Model. Results of the Study will be incorporated into the comprehensive plan as required by State Statutes.</p>
<p>The City shall coordinate with FCDES, FDOT, NEFRPC, and/or other relevant State or federal agencies to identify street and other improvements to the hurricane evacuation street network based upon the number of people who cannot be evacuated within an optimum evacuation time limit.</p>	<p style="text-align: center;">Palm Coast, Policy 6.2.4.3, Comprehensive Plan</p>	<p style="text-align: center;">The City continues to coordinate with the various agencies.</p>
<p>The City shall coordinate with FCDES and other relevant local governments organizations to ensure that hurricane evacuation shelters meet or exceed regulatory standards, and that facilities are provided to meet needs of elderly and disabled persons.</p>	<p style="text-align: center;">Palm Coast, Policy 6.2.4.4, Comprehensive Plan</p>	<p style="text-align: center;">The City will continue to coordinate with FDOT, Flagler County, and the NEFRPC to identify improvements to the street network which will improve evacuation time.</p>

## Flagler County Local Mitigation Strategy

<p>The City shall coordinate with the FCDES, NEFRPC, and/or other relevant local governments to prepare and update an inventory for special needs population and ensure that adequate shelters are available to accommodate their needs and to establish a program to assist the special needs population in evacuation and sheltering.</p>		<p>The City will continue to coordinate with FDOT, Flagler County, and the NEFRPC to identify improvements to the street network which will improve evacuation time.</p>
<p>The City will encourage existing recreational, mobile or manufactured housing communities to provide emergency shelter for their residents.</p>	<p>Palm Coast, Policy 6.2.5.1, Comprehensive Plan</p>	<p>The School District has designated several schools as shelters. The Interlocal Agreement with the School District requires an evaluation of available shelter space at schools when reviewing Comprehensive Plan amendments, or development proposals.</p>
<p>The City shall develop a hazard mitigation strategy in the LDC which prohibits the development of new recreational, mobile or manufactured housing and the expansion of existing recreational, mobile or manufactured housing unless the developer/owner has provided emergency sheltering sufficient to house a minimum of 50% of the residents of that development.</p>	<p>Palm Coast, Policy 6.2.5.2, Comprehensive Plan</p>	<p>The School District has designated several schools as shelters. The FCDES is reviewing the needs and coordinating with the School District to establish special needs sheltering.</p>
<p>The City shall support the Flagler County School Board in their efforts to utilize enhanced hurricane shelter protection standards for all reconstruction and new developments in accordance to Florida Law.</p>	<p>Palm Coast, Policy 6.2.5.3, Comprehensive Plan</p>	<p>There is a limited number of mobile or manufactured homes in the City. However, due to the limited number of mobile homes, there is adequate shelter space available for residents in mobile homes or manufactured homes.</p>
<p>The City shall carefully consider all land uses in areas at risk from wildfire and restrict or prohibit certain land uses as necessary to assure public health, safety, and welfare and the protection of property. Land uses and specific development plans for which adequate wildfire mitigation cannot be provided, or that would preclude or severely limit the use of wildfire mitigation or natural resource management options such as prescribed fire, shall not be authorized in severe wildfire hazard areas.</p>	<p>Palm Coast, Policy 6.2.5.4, Comprehensive Plan</p>	<p>The LDC will be amended consistent with the requirements of this policy.</p>
<p>The City shall amend the LDC, within five (5) years of Plan adoption, to identify areas with high wildfire risk and to implement mitigation strategies and such LDC revisions shall, at a minimum, include standards for:</p> <p>A. Establishment of building construction standards and structures that shall be designed to minimize the potential loss of life and property from wildfires, through requirements for outdoor sprinkler systems, fire-resistant buildings or treatments, landscaping with appropriate vegetation species, and site design practices.</p> <p>B. Requirement that developers provide for a minimum of two emergency ingress/egress access ways and provide a defensible space on land between the wild land urban interface areas and adjacent development. Streets, roads, driveways, bridges, culverts, and cul-de-sacs shall be designed to assure access by firefighting equipment, providing for weight class, cornering, turn around and overhead clearance.</p>	<p>Palm Coast, Policy 6.2.5.5, Comprehensive Plan</p>	<p>The School District has designated several schools as shelters. The Interlocal Agreement for Public School Facility Planning addresses this issue and this is looked at during review of proposed school sites and expansions.</p>

## Flagler County Local Mitigation Strategy

<p>All new developments in wildfire hazard areas shall complete and implement a wildfire mitigation plan specific to that development, subject to review and approval by the City, which shall be incorporated as part of the development plan approved for that development. The mitigation plan shall include:</p> <p>A. Project and parcel design features, such as defensible project perimeters, interior project fuel breaks, individual site defensible space, landscaping guidelines and plant material suggestions, and the placement of structures.</p> <p>B. Provisions for periodic inspections by the City to verify construction, implementation, and maintenance of the wildfire mitigation features in accordance with the plan. The inspection period may range from once a year to once every three years depending on site conditions.</p> <p>C. Implementation of the wildfire mitigation plan for the entire life cycle of all developments requiring plans.</p> <p>D. Water storage facilities, accessible by standard fire-fighting equipment, shall be provided, dedicated, or identified for fighting wildfires. Where public supply is available, fire hydrants of sufficient pressure shall be required.</p>	<p>Palm Coast, Policy 6.2.6.1, Comprehensive Plan</p>	<p>Ordinance 2005-06 and 2001-11 – Wildfire Mitigation Ordinance regulates fire hazards and land management to minimize the threat of wildfires. In addition, Open Burning Ordinance 2006-06 is applicable to the prevention of wildfires.</p>
<p>The City shall coordinate with the Florida Division of Forestry to manage the wildland urban interface areas within the City and in surrounding areas and wildfire management practices shall include, but not be limited to, controlled burns, mechanical mowing of vegetation, herbicide treatment, or other means deemed appropriate. The City shall amend the LDC, if necessary, to implement this Policy.</p>	<p>Palm Coast, Policy 6.2.6.2, Comprehensive Plan</p>	<p>Enforced through various LDC provisions.</p>
<p>The City shall promote the expansion of the Firewise Communities Program into other high-risk subdivisions and areas of the City and implement and enhance educational programs promoting Firewise principles.</p>	<p>Palm Coast, Policy 6.2.6.3, Comprehensive Plan</p>	<p>Enforced through various LDC provisions.</p>
<p>The City shall seek funding from public and private agencies to assist in the development and enhancement of wildfire mitigation programs and practices.</p>	<p>Palm Coast, Policy 6.2.6.4, Comprehensive Plan</p>	<p>Within the Wildfire Mitigation Ordinance (2005-06 and 2001-11) and Open Burning Ordinance 2006-06.</p>

## Flagler County Local Mitigation Strategy

<p>The City shall coordinate with Flagler County Department of Emergency Services (FCDES), the NEFRPC, FDOT, and other agencies, as applicable, to accomplish, at a minimum, the following:</p> <p>A. Develop and annually update plans before June 1st for a pre-hazard and post-disaster mitigation plan and post-disaster redevelopment for immediate response to post-disaster situations.</p> <p>B. Annually implement interagency hazard mitigation report recommendations.</p> <p>C. Annually, before June 1st, identify any streets needing other improvements within the hurricane evacuation street network to achieve the optimum evacuation time limits for those persons requiring evacuation.</p> <p>D. Annually, before June 1st, assure adequate shelter space availability by maintaining a shelter inventory and by supporting efforts to ensure shelter upgrades in accordance with Florida Law.</p> <p>E. Annually, before June 1st, analyze, plan for and address deficiencies in hurricane evacuation time and facilities.</p> <p>F. Annually, before June 1st, prepare and update an inventory of special needs population.</p> <p>G. Annually update and employ hazard mitigation annex of the Peacetime Emergency Plan annually.</p> <p>H. Biennially provide estimates of population densities to Flagler County and population and trend data to the NEFRPC upon request.</p> <p>I. Within two (2) years of Plan adoption, develop and run a model to simulate evacuation to implement the reduction of hurricane evacuation times within the hurricane vulnerable zone consistent with the NEFRPC Northeast Florida Hurricane Evacuation Study.</p>	<p style="text-align: center;">Palm Coast, Policy 6.2.6.5, Comprehensive Plan</p>	<p>The City presently has 2 subdivisions that are accredited as Firewise communities (Cypress Knoll and Grand Haven). The City continues to meet with communities to promote the Firewise principles and also offers information on this program on the City's website.</p>
<p><b>Current Policy:</b> Beverly Beach shall plan for the proper and orderly evacuation of all infirmed and disabled residents including the inventory and location of such residents and notification of the Flagler County Civil Defense for inclusion on their special evacuee needs list. <b>Proposed Policy:</b> <del>Beverly Beach The Town</del> shall plan for the proper and orderly evacuation of all infirmed and disabled residents including the inventory and location of such residents and notification of the <del>Flagler County Civil Defense for inclusion</del> <b>Emergency Management</b> for inclusion on their special evacuee needs list.</p>	<p style="text-align: center;">Palm Coast, Policy 6.2.6.6, Comprehensive Plan</p>	<p>Division of Forestry accomplished mowing of hazardous vegetation around City Hall and a water treatment plant in 2007 for fire mitigation under a grant. They've also provided, via a grant, fire mitigation mowing on 2 city-owned parcels that were adjacent to single family homes in order to reduce wildfire threats. In addition, the City is on a list for funding through Flagler County's Local Mitigation Strategy program.</p>

## Flagler County Local Mitigation Strategy

<p><b>Current Policy:</b> Beverly Beach shall not permit any development that would result in an increase in the estimated hurricane evacuation time for Flagler County (Category 3 Storm Event) as projected by the Northeast Florida Regional Hurricane Evacuation Study, as amended. <b>Proposed Policy:</b> Beverly Beach <u>The Town</u> shall not permit any development that would result in an increase in the estimated hurricane evacuation <u>out-of-county clearance times if the adopted 16-hour level of service will not be maintained.</u> time for Flagler County (Category 3 Storm Event) as projected by the Northeast Florida Regional Hurricane Evacuation Study, as amended.</p>	<p>Palm Coast, Policy 7.1.3.10, Comprehensive Plan</p>	<p>The City actively participates in the Local Mitigation Strategy (LMS) working group which is composed of all Flagler County municipalities. The City also coordinates with surrounding municipalities on emergency services.</p>
<p><b>Current Policy:</b> Beverly Beach shall include the recommendations of the hazard mitigation annex contained in the Flagler County Peacetime Emergency Plan into its adopted Comprehensive Plan. <b>Proposed Policy:</b> Beverly Beach <del>The Town</del> shall include the recommendations of the hazard mitigation annex contained in the Flagler County Peacetime Emergency Plan <u>adopts by reference Flagler County's Local Mitigation Strategy into its adopted Comprehensive Plan.</u></p>	<p>Town of Beverly Beach, Policy E.1.12.4 Comprehensive Plan</p>	<p>In September 2010, the Town adopted an Evaluation and Appraisal Report. As part of the report, the Town recommends changes to the existing policies, as indicated in the Proposed Policy, should be made. It should be noted the Town does not provide services (e.g., police and fire protection, solid waste, sanitary sewer or potable water) directly; rather, the Town relies on interlocal agreements for these services.</p>
<p><b>Current Policy:</b> The Town shall incorporate recommendations of interagency hazard mitigation reports into the comprehensive plan. <b>Proposed Policy:</b> <del>The Town shall incorporate recommendations of interagency hazard mitigation reports into the comprehensive plan.</del> <u>adopts by reference Flagler County's Local Mitigation Strategy into its Comprehensive Plan.</u></p>	<p>Town of Beverly Beach, Policy E.1.12.5 Comprehensive Plan</p>	<p>In September 2010, the Town adopted an Evaluation and Appraisal Report. As part of the report, the Town recommends changes to the existing policies, as indicated in the Proposed Policy, should be made. It should be noted the Town does not provide services (e.g., police and fire protection, solid waste, sanitary sewer or potable water) directly; rather, the Town relies on interlocal agreements for these services.</p>
<p><b>Current Policy:</b> Beverly Beach shall include the recommendations of the hazard mitigation annex contained in the Flagler County Peacetime Emergency Plan into its adopted Comprehensive Plan. <b>Proposed Policy:</b> Beverly Beach <del>The Town</del> shall include the recommendations of the hazard mitigation annex contained in the Flagler County Peacetime Emergency Plan <u>adopts by reference Flagler County's Local Mitigation Strategy into its adopted Comprehensive Plan.</u></p>	<p>Town of Beverly Beach, Policy E.1.12.7 Comprehensive Plan</p>	<p>In September 2010, the Town adopted an Evaluation and Appraisal Report. As part of the report, the Town recommends changes to the existing policies, as indicated in the Proposed Policy, should be made. It should be noted the Town does not provide services (e.g., police and fire protection, solid waste, sanitary sewer or potable water) directly; rather, the Town relies on interlocal agreements for these services.</p>
<p><b>Current Policy:</b> The Town shall incorporate recommendations of interagency hazard mitigation reports into the comprehensive plan. <b>Proposed Policy:</b> <del>The Town shall incorporate recommendations of interagency hazard mitigation reports into the comprehensive plan.</del> <u>adopts by reference Flagler County's Local Mitigation Strategy into its Comprehensive Plan.</u></p>	<p>Town of Beverly Beach, Policy E.1.13.4 Comprehensive Plan</p>	<p>In September 2010, the Town adopted an Evaluation and Appraisal Report. As part of the report, the Town recommends changes to the existing policies, as indicated in the Proposed Policy, should be made. It should be noted the Town does not provide services (e.g., police and fire protection, solid waste, sanitary sewer or potable water) directly; rather, the Town relies on interlocal agreements for these services.</p>

## Section III – Hazards Identification & Vulnerability Assessment

### A. Overview

A vulnerability assessment is performed to determine the impact hazards have on the built environment and how they can affect the safety of the residents. The results of the hazard identification indicate some of the hazards warrant a vulnerability assessment due to the frequency of occurrence or those hazards causing major damage in Flagler County. The vulnerability assessment uses the information generated in the hazard identification and hazard profile to identify locations in which residents of Flagler County could suffer the greatest injury or property damage in the event of a disaster. This assessment identifies the effects of hazard events by estimating the relative exposure of people, buildings, and infrastructure to hazardous conditions. Depending on the data available, a vulnerability assessment could involve counting the number of structures or people in the path of hazards or describing what these hazards can do to physical, social, and economic assets.

### B. Identifying the Hazards

Using the established goals and guiding principles, the LMS incorporates vulnerability assessment and hazard identification. Information on the type, location, and probability of hazards is obtained from a variety of sources including the LMS workgroup members, county and municipal agencies, and from regional, state, and federal agencies.

The hazard area is defined as the jurisdictional limits of Flagler County, including the City of Palm Coast, City of Flagler Beach, Town of Beverly Beach, Town of Marineland, and City of Bunnell. Hazard area maps are used which identifies the land uses within the county and municipals in relation to potential hazards. The Workgroup utilizes the following maps to help define hazard areas:

- Hurricane Storm Surge Zones
- Floodplains
- Areas subject to wildfires
- High Wind Areas

Additional hazards have been identified and analyzed, but may not have associated maps, are tsunamis, terrorism, winter storms / freezes, drought, and flood control device failure.

With an understanding of where hazard areas are located in the county, the workgroup assesses the extent to which people and property are vulnerable. Additional maps include:

Critical facilities  
Public facility sites  
Hurricane evacuation shelters  
Hurricane evacuation routes and zones  
Hazardous materials sites

### **C. Identification of Assets**

Asset identification is a critical step in the hazard mitigation planning process. Taking Inventory of existing structures and identifying critical facilities provides insight into the County's vulnerability to select hazards and the magnitude of the potential damages from those hazards. Most risk assessment models examine the impact of various hazards on the built environment, including on the general building stock (residential, commercial, industrial, etc.), critical facilities, government operations, shelters, hospitals, health care facilities, utilities, water, wastewater, hazardous material sites, and schools.

The Florida Department of Community Affairs provided GIS data analysis and Mapping for Emergency Management, Parallel Hazard Information System (MEMPHIS) outputs developed by The Kinetic Analysis Corporation. The MEMPHIS system used inventory data from the Florida Department of Revenue and U.S. Census Bureau to inventory the total number of structures as well as the critical facilities potentially vulnerable to the identified hazards. In some instances, these figures differed slightly from the inventory data received from the Flagler County Property Appraiser's Office.

#### **1. General Building Stock**

Structures were divided into one of seven categories:

- Mobile homes -- Pre-engineered structures include manufactured housing and metal buildings mass-produced for shipment to or erection on site.
- Single-family residential structures -- This includes most single-family structures and low-rise, 1-to-4 unit residential structures.
- Multi-family/condominium structures -- This includes multi-family residential structures, condominium, apartments, and assisted living facilities. Also included in this category are hotels and motels and higher density residential structures.
- Commercial structures -- structures built for professional, shopping, restaurant, and similar uses.
- Recreational structures -- structures associated with recreational activities such as golf course buildings, marina facilities, and structures located in parks and recreational areas.

- Institutional structures -- structures built for institutional, governmental, school, worship, and similar uses.

## 2. Critical Facilities

Hazard identification analyses typically begin and end with determining which of those structures, areas, and services are required to provide a minimal degree of safety, health, and security to residents of a community. Each community must determine the exact composition and relative importance of these critical facilities.

During the initial LMS planning process, Flagler County determined the following shall be deemed as critical facilities:

- Governmental Buildings
- Public Safety Facilities
- Schools/Shelters
- Hospital and Health Care Facilities
- Utilities
- 302 Facilities

### a. Government Operations

Flagler County and local governments use several facilities, offices, and stations to house and coordinate hazard and emergency response activities. These facilities also provide a means to direct operations prior to, during, and after a hazard event. Although most facilities have been designed to withstand a variety of hazards, several historic and locally vital facilities do not (and for these reasons, are not likely to be moved or retrofitted).

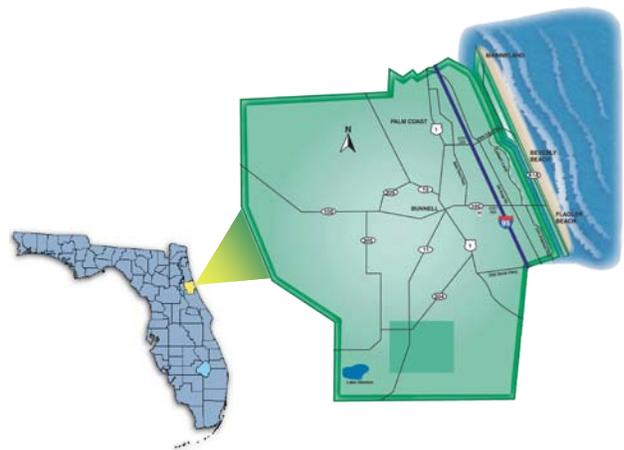
### b. Schools/Shelters

Schools house thousands of children during each weekday and school facilities are used by the entire community for educational, recreation, and other activities throughout the year. At the least, events could cause disruption to these activities. Additionally if schools are open for children, this period allows parents to focus on home and business cleanup and rebuilding. There are several storm shelters in Flagler County (primarily within school facilities). In case of a major storm, plans call for evacuation of affected communities to these shelters. As in many other areas in the United States, emergency preparedness officials have expressed some concern about the adequacy of these shelters to house evacuated populations. A stringent shelter criterion from the American Red

Cross (ARC) limits the number of existing structures used to house evacuated people. Shelters cannot be located in the evacuation zones, must be outside the Category 4 storm surge area, and are limited to 20 square feet of space per person. According to the 2008 Statewide Emergency Shelter Plan, Flagler County has 5 shelters meeting the ARC standards for a total capacity of 4,130 persons. The estimated deficit of general population shelter space in the county is 14,237 square feet needed to house an additional 375 persons. The estimated deficit of Special Needs Shelter space is 28,440 square feet to house an additional 474 persons with special needs. This deficit is expected to grow in the coming years.

#### **D. County Description**

Flagler County occupies approximately 498 square miles or 318,977 acres of land, of which 480 square miles are land area and 18 square miles are water. The county has 18 miles of beachfront property. These numbers include the municipalities within the county. The five municipalities in the county are Palm Coast, Bunnell, Flagler Beach, Beverly Beach, and Marineland. Flagler County has an estimated population of 95,700 as of the 2010 Census, with the majority of those residents living within the City of Palm Coast. Flagler County has been named the fastest growing county in the United States for 2 out of the last four years. The community is a blend of coastal living, mainland suburban living, and rural/agricultural living.



#### **E. Land Uses and Development Trends**

The coastal area of Flagler County east of U.S. 1 comprises about thirty-five percent of the total land area. Most of the development in Flagler County has occurred in the urban areas along the coast due to the proximity to the Atlantic Ocean, access to arterial roads, and the provision of services. Other factors contributing to the growth of the coastal area of the county are soils conducive to development, moderate coastal climate, several parks, and miles of beach access, recreational amenities, and scenic highway A1A. The majority of the recent growth has been in the City of Palm Coast. The development in the coastal areas of Flagler County is generally low-density development.

The region of Flagler County west of U.S. 1 comprises the remaining sixty-five percent of the total land area. The western portion remains relatively rural and undeveloped and much of the land is used for farming and timber production.

## Flagler County Local Mitigation Strategy

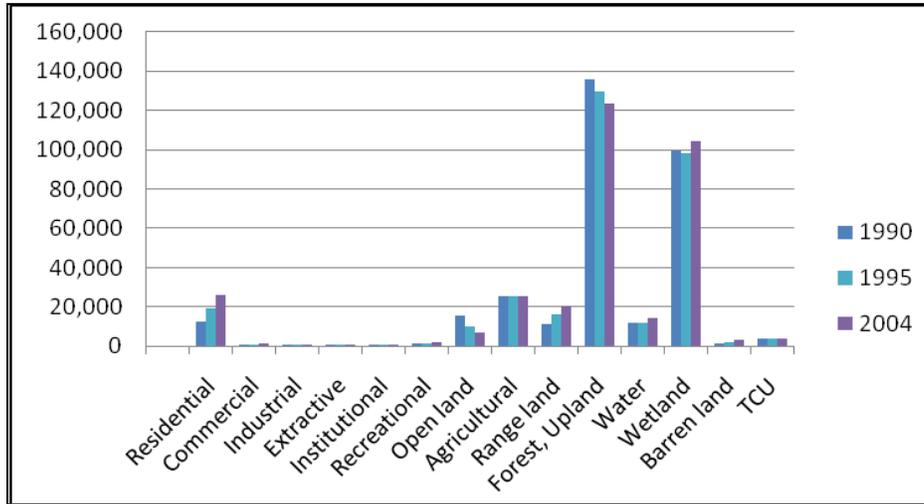
Crops include potatoes, cabbage, feed corn, and assorted vegetables. There are no municipalities in the western portion of the County, but several small rural communities have existed for several years, including Daytona North, St. Johns Park, Espanola, Haw Creek, and Cody's Corner. The development in the western part of the county is very low density and sparsely populated. Development patterns show residential development in the form of scattered single-family homes, mobile homes, and farms.

**TABLE 2  
Acreage of Land Uses  
Unincorporated Flagler County 1990-2004**

	1990		1995		2004		1990-1995 Change		1990-2004 Change		1995-2004 Change	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
Residential	12,708	3.98%	19,444	6.10%	25,767	7.77%	6,736	53.01%	13,059	102.76%	6,323	32.52%
Commercial	438	0.14%	524	0.16%	1,117	0.34%	86	19.63%	679	155.02%	593	113.17%
Industrial	360	0.11%	390	0.12%	413	0.12%	30	8.33%	53	14.72%	23	5.90%
Extractive	99	0.03%	99	0.03%	134	0.04%	0	0.00%	35	35.35%	35	35.35%
Institutional	148	0.05%	186	0.06%	415	0.13%	38	25.68%	267	180.41%	229	123.12%
Recreational	1,256	0.39%	1,517	0.48%	1,761	0.53%	261	20.78%	505	40.21%	244	16.08%
Open land	15,714	4.93%	9,735	3.05%	7,037	2.12%	5,979	38.05%	-8,677	-55.22%	-2,698	-27.71%
Agricultural	25,240	7.91%	25,232	7.91%	25,606	7.72%	-8	-0.03%	366	1.45%	374	1.48%
Range land	11,145	3.49%	15,926	4.99%	20,510	6.18%	4,781	42.90%	9,365	84.03%	4,584	28.78%
Forest, Upland	135,750	42.56%	129,601	40.63%	123,488	37.22%	6,149	-4.53%	12,262	-9.03%	-6,113	-4.72%
Water	11,821	3.71%	11,872	3.72%	14,158	4.27%	51	0.43%	2,337	19.77%	2,286	19.26%
Wetland	99,168	31.09%	98,542	30.89%	104,428	31.47%	-626	-0.63%	5,260	5.30%	5,886	5.97%
Barren land	1,314	0.41%	2,024	0.63%	2,970	0.90%	710	54.03%	1,656	126.03%	946	46.74%
TCU	3,816	1.20%	3,887	1.22%	4,014	1.21%	71	1.86%	198	5.19%	127	3.27%
Total	318,977	100.00%	318,977	100.00%	331,818	100.00%	2		12,841		12,839	

Table 2: Information provided by Flagler County Planning and Zoning Department

**Unincorporated Flagler County Land Use Graph:**



## F. Hazards

The LMS Workgroup investigated various types of natural hazards faced by the County over the past several decades. The hazard identification process includes a history and an examination of various hazards and their occurrences. Information of past hazards was based on history and research from historical documents; County plans and reports; conversations with County residents and public officials; and internet websites. Data and maps available online included sources such as the United States Geological Survey (USGS), Sheldus, MEMPHIS, and the National Weather Service.

In addition to the general body of literature on hazard vulnerability and hazard mitigation, the following reports and data are referenced for plan updates:

- Flood Insurance Rate Maps (FIRMS)
- Property appraisal data
- Storm Tide Atlas (SLOSH Model) data
- The Arbiter of Storms (TAOS) data
- List of critical facilities
- List of public buildings
- Infrastructure, sewage, and water treatment plants
- Hazardous material sites
- Generalized Future Land Use Maps
- Comprehensive Plan for the County and municipalities
- Comprehensive Emergency Management Plan (CEMP) for the County and municipalities

The LMS Workgroup reviewed the list of potential hazards and identified those known to occur in Flagler County and those possibly occurring anywhere within the State. Some hazards mentioned in previous planning phases were revised in this plan update to better reflect vulnerabilities the Workgroup has determined are more suitable to mitigation planning efforts. Characteristics of each hazard is defined and described and past occurrences identified in the following sections. Additional information including a Flagler LMS Hazard Profile Quick Reference Table and hazards probability of future occurrences is outlined in Appendix- A, Table A-1 and Table A-2.

## HAZARD PROFILES

### *HURRICANE*

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#### **Description and Extent**

The entire county of Flagler, because of its subtropical location and long coastline, is particularly susceptible to severe tropical weather. For the purpose of this plan hurricane, tropical storm, tropical system, and tropical depressions are profiled along with hurricanes as the hazards related to these systems, barring varying degrees of intensity, present the same threats to Flagler County.

Hurricanes and tropical storms are tropical cyclones characterized by warm core low pressure system with bands of rain and thunderstorms rotating around a common center. These storms are formed over warm waters. Hurricanes have sustained winds of 75 mph to greater than 156 mph. A Tropical Storm has sustained winds of 39 mph to 73 mph. Hurricanes and Tropical Storms bring heavy rains, tornadoes, storm tides, storm surge, and high seas. Strong non-tropical storm do occasionally occur which also bring periods of heavy rain and storm tides.

Flagler's coastal areas, Flagler Beach, Town of Beverly Beach, and Town of Marineland are not only vulnerable to the effects of these tropical systems but are also exposed to the forces of storm surge, wind-driven waves and tidal flooding, which can be more destructive than cyclone wind. Hurricanes form in the Atlantic Ocean, Caribbean Sea, and Gulf of Mexico during the official Atlantic Hurricane season which extends from June through November. Flagler County could experience a direct hit from a category 5 storm. Hurricane magnitude is classified by the Saffir-Simpson Scale which rates hurricane intensity on a scale of 1 to 5 with five being the most intense.

<b>Saffir-Simpson Hurricane Scale</b>		
<b>Category</b>	<b>Wind Speed</b>	
	<b>mph</b>	<b>knots</b>
5	≥156	≥135
4	131-155	114-134
3	111-130	96-113
2	96-110	84-95
1	74-95	65-83
<b>Non-Hurricane Classifications</b>		
Tropical Storm	39-73	34-64
Tropical Depression	0-38	0-33

Tropical Storms cause minor damage in the form of scattering broken twigs and branches from trees and broken windows from flying debris, while catastrophic hurricanes (156+ mph sustained winds) cause complete roof failure to residential and industrial buildings, major flooding, and the disruption of critical infrastructure, such as compromising utility and electrical power services.

### **Location and Impact**

Hurricanes systems and the effects of the associated hazards of extreme wind, flooding, and tornadoes represent a significant threat to all residents of Flagler County. Residents in the coastal communities (Flagler Beach, Beverly Beach, and Marineland) are further vulnerable to storm surge, wave action, and beach erosion. Flagler County has experienced the effects of 12 hurricanes and tropical storms in the last thirty years; however, in the last century it experienced the effects of at least 100 hurricanes and tropical storms. The predictions for the next twenty-five years are very high for hurricane occurrences in the Atlantic Basin, and, consequently, heighten the probability of more hurricanes striking Florida and affecting the Flagler area.



All of Flagler County is vulnerable to hurricane storm damage from high winds, rain induced flooding, and hurricane spawned tornadoes. The greatest threat from wind and tornadoes is to those living in mobile and manufactured homes. Even inland homes with tie downs do not withstand hurricane conditions or wind-borne debris of any force. Most wind related fatalities are in mobile and manufactured homes, however, all structure types from residential single and multi-family homes, to commercial small business shops and high rise structures, as well as publicly and non-profit organization owned buildings are all endangered to the disastrous effects of hurricanes.

### **Historical Occurrences**

Some of the notable tropical cyclone events occurring in Flagler County between 1970 and 2011 are described below (Information from National Weather Service, National Oceanic and Atmospheric Administration, and National Hurricane Center):

#### **Tropical Storm Gordon.....November 13, 1994**

Gordon approached from the Gulf Coast and caused approximately 7 inches of rain with wind gusts up to 50 mph. Inland flooding caused damage to buildings through both rising fresh-water and the collapse of rain-loaded roofs. Public Works suffered from the effects of both water and wind with damage to roadways, sewer facilities, utility lines, and signs. Marine effects included sunken or grounded boats. Flagler's beaches suffered moderate to severe erosion. A number of sea walls and beach access walks were destroyed. Gordon's total damage is estimated around \$400 million.

#### **Hurricane Floyd.....September 15, 1999**

Floyd was a large and intense Cape Verde hurricane that seriously threatened Florida. Nearing the threshold of a category five storm on the Saffir/Simpson Scale, Floyd produced a flood disaster of immense proportions in the eastern United States. Floyd passed Flagler County 120 miles off shore with wind gusts up to 84 mph at Flagler Beach. Most of Florida's eastern coastal communities, residents, and business owners east of Interstate 95 were evacuated, leading to one of the most memorable evacuation nightmares of late. Storm surge from Floyd caused minor damage to Florida State Road A1A and low lying homes on the Intracoastal. Squalls pounded the coast for several hours with the Town of Marineland suffering heavy damage. Total damage estimates range from \$3 to over \$6 billion dollars in damages from Floyd.

**Hurricane Irene.....October 17, 1999**

Irene was a typical wet October tropical cyclone that intensified to a Category 1 storm, moving over the Florida Keys, Southeast Florida, and passing Flagler County 90 miles offshore. Irene dumped from 10 to 20 inches of rain which resulted in severe flooding conditions. Three single family homes and one multi-family structure received major damage. 167 single family homes, 6 multi-family, and 18 mobile and 18 businesses reported minor damage. Flooding occurred in the northern portion of the county near Marineland, while all beaches suffered minor beach erosion. The flooding lasted for a week and displaced several hundred people and isolated thousands more. The total losses (agricultural and property) were estimated around \$800 million.

**Hurricane Charley.....August 13, 2004**

Hurricane Charley raced across the state from southwest Florida, crossing Flagler County as a weak disorganized Category 1 hurricane. However this cyclone caused brief hurricane conditions especially in coastal locations. Six inches of rain fell over the County. Hurricane Charley strengthened rapidly just before striking the southwestern coast of Florida as a Category 4 hurricane on the Saffir-Simpson Hurricane Scale. Charley was the strongest hurricane to hit the United States since Andrew in 1992 and, although small in size, it caused catastrophic wind damage in Charlotte County, Florida. Serious damage occurred well inland over the Florida peninsula. Charley is estimated to have caused \$6.75 billion dollars in damages in Florida.

**Hurricane Frances.....September 7, 2004**

Frances made landfall along central Florida's coast bringing Flagler County into the periphery of the storm and causing sustained tropical storm force winds with hurricane force gusts. Most structural damage was associated with mobile homes and weakly constructed permanent structures. Wave heights of 10 to 20 feet were recorded across the coastal waters. Extensive beach erosion occurred due to the long duration of onshore winds both from Frances and a period of onshore flow preceding the event. Rainfall totals across North Florida ranged from 5 to 15 inches. Numerous homes were flooded across the entire region. Rivers in the region were pushed to flood stage with several approaching record flooding. Tornadoes occurred across the region with over 20 confirmed touchdowns. The banded nature of the tropical storm wind damage made it difficult to differentiate between wind damage and tornado damage in subsequent storm damage surveys.

**Hurricane Jeanne.....September 27, 2004**

Jeanne made landfall along the central Florida east coast, very near the location of Hurricane Frances two weeks earlier. Like Frances this system moved west-northwest across central Florida bringing Flagler County into the periphery of the storm causing sustained tropical storm force winds with hurricane force gusts. Most structural damage was associated with mobile homes and weakly constructed permanent structures. Wave heights of 20 feet were recorded across the coastal waters with tides running one to two and a half feet above astronomical tide levels. Extensive beach erosion once again occurred due to the long duration of onshore winds both from Jeanne as well as a period of onshore flow preceding the event. Rainfall totals across North Florida and ranged from 3 to 7 inches. Due to the already saturated conditions, sheet flooding, river flooding, and road washouts occurred. Tornadoes occurred across the coastal region. The banded nature of the tropical storm wind damage again made it very difficult to differentiate between wind damage and tornado damage in subsequent storm damage surveys.

**Tropical Storm Tammy.....October 5, 2005**

Tammy developed off of Cape Canaveral Florida and moved north-northeast toward northeast Florida, placing Flagler County in its path. The strongest wind band and rains were located well north and east of the center and dropped a large amount of rainfall across northeast Florida. This heavy rainfall combined with high tides over the previous days caused flooding across Flagler County. In most cases the flooding was confined to urban and small stream flooding. Tides and high surf caused considerable beach erosion along the Flagler's coast. Rainfall was 3 to 6 inches.

**Hurricane Wilma.....October 24, 2005**

Wilma formed and became an extremely powerful hurricane over the northwestern Caribbean Sea thus earning the record for the most intense storm for the Atlantic Basin. Peak sustained winds reached 175 mph as the storm made its way to Florida. Flagler Beach Pier reported sustained winds up to 53 mph. Rainfall totals of 3 to 5 inches fell on Flagler County with flooding of roadways. Estimates of the cost of Hurricane Wilma were over \$1 billion dollars in damages.

**Tropical Storm Alberto.....June 13, 2006**

Alberto made landfall along the northeast Gulf of Mexico coast and moved north-northeast across north Florida. This motion positioned Flagler on the north and east side of the storm. Maximum sustained winds recorded were 46 mph. Scattered trees and power lines were blown down across the area. Wave heights reached 6-9 ft across the coastal waters. Rainfall totals across northeast Florida ranged from 2 to 6 inches. Some minor temporary flooding of flood prone occurred, but the rainfall was beneficial to the area helping it recover from a minor drought period.

**Tropical Storm Andrea.....May 9, 2007**

Andrea formed off the southeast coast of the United States as the eighth earliest cyclone since 1851 and the first May cyclone since 1981. High surf occurred at Flagler Beach with 6 to 8 foot breakers. Andrea caused significant beach erosion along Flagler County beaches. The Flagler Beach Pier was closed due to high surf. The Florida Department of Transportation had to fill in areas near the seawall with sand.

**Tropical Storm Barry.....June 3, 2007**

Heavy rainfall began effecting Flagler County early in the morning. With 6-8 ft breakers Flagler Beach Pier was closed. Wind gusts were around 38 mph about one block inland. Storm total rainfall amounts neared 6 inches across portions of the forecast area.

**Tropical Storm Fay.....August 23, 2008**

Tropical Storm Fay moved slowly north out of Caribbean Sea, then cut across south and central Florida into the Atlantic Ocean. Fay then slowly curved west and made landfall for the third time near Flagler Beach. Sustained winds along the coast were between 40 and 50 mph with gusts in the 60 to 65 mph range. Storm Surge ranged from 2 to 4 feet along the open coast. Areal flooding occurred over much of northeast Florida with roads and small creeks flooded. Minor flooding of structures occurred across the area. Rainfall approached 15 inches for Flagler County. Numerous trees and power lines were downed with minor structural damage. Several minor tornado touchdowns occurred in the area with no significant damage or injuries.

### **Probability of Future Occurrences and Vulnerability**

The probability future tropical systems will threaten Flagler County is high. According to the National Climatic Data Center Flagler is threatened annually with a near 100% chance of experiencing the effects or reoccurrence of this type of an event. Flagler County is more vulnerable to lesser intensity tropical systems in that the reoccurrence of these episodes transpire at a greater frequency than that of the more powerful incidents.

## *STORM SURGE*

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### **Description and Extent**

Flagler's coastal properties are subject to severe damage while its inhabitants are subject to loss of life resulting from hurricane associated storm surge. Storm surge is water pushed inland by the force of the storm winds generated by a tropical storm or hurricane, capable of reaching 25 feet high and stretching along the coastlines of multiple counties. Height is measured as the difference between the observed level of the sea surface during the event and the level occurring in the absence of the cyclone (i.e., storm surge is usually estimated by subtracting the normal or astronomic tide from the observed storm tide). Storm tide is defined as a combination of storm surge and the normal tide (i.e., a 15-foot storm surge combined with a 2-foot normal high tide over the mean sea level amounts to a 17-foot storm tide).

Advancing surge combines with the normal tides to create the hurricane storm tide, which can increase the mean water level to heights impacting roads, homes, and other critical infrastructure. In addition, wind driven waves are superimposed on the storm tide. When storm surge entails wind driven waves in addition to the storm tide, water levels can rise significantly, resulting in severe flooding along coastal areas, particularly when the storm tide coincides with the normal high tides.

The storm surge combined with wave action can cause extensive damage, severely erode beaches and coastal highways. With major hurricane events similar to Katrina, Camille, or Hugo, complete devastation of coastal communities may occur. Many buildings withstand hurricane force winds until their foundations, undermined by storm surge erosion, are weakened and fail. As Flagler County is susceptible to a category 5 hurricane it, the peak water depth of storm surge would then be approximately 31 feet in depth.

The Saffir/Simpson Hurricane Scale provided by the National Hurricane Center indicates surge values, which vary considerably depending on coastal configuration and onshore wind component. The Arbiter of Storms (TAOS) data used for the KAC Natural Hazards Assessment to support Local Mitigation Strategies in Florida Hurricanes (May 15, 2005) for Flagler County indicates the following typical high end surge ranges:

<b>Hurricane Category</b>	<b>Peak Water Depth (ft.)</b>
Category 1	5.6
Category 2	9.1
Category 3	16.3
Category 4	24.9
Category 5	31.1

**\*\*Note:** Actual storm surge values may vary pending the geography of actual tidal conditions.

Copies of these maps are maintained in the Flagler County Emergency Operations Center for use on a daily basis.

**Maximal Damage Summary data KAC Florida Hurricanes (May 15, 2005) based on 2000 Census**

<b>Damage Type</b>	<b>Cat 1</b>	<b>Cat 2</b>	<b>Cat 3</b>	<b>Cat 4</b>	<b>Cat 5</b>
<b>Tax Parcel based Wind Damage</b>	\$155.92 mil	\$527.24 mil	\$1.32 bil	\$3.05 bil	\$5.67 bil
<b>DOR based Flood Damage</b>	\$16.62 mil	\$145.05 mil	\$692.91 mil	\$2.56 bil	\$3.48 bil
<b>DOR Structures in Flood Zone</b>	674	3,117	6,397	12,513	15,587
<b>Census based Wind Damage</b>	\$158.16 mil	\$516.41 mil	\$1.26 bil	\$2.88 bil	\$5.12 bil
<b>Census based Flood Damage</b>	\$93,580	\$49.08 mil	\$481.57 mi	\$1.2 bil	\$1.38 bil
<b>Uninhabitable Housing Units</b>	98 (.4% of total HU)	369 (1.5% of total HU)	930 (3.8% of total HU)	2,167 (8.9% of total HU)	4,003 (16.4% of Total HU)

**CATEGORY 1 HURRICANE:**

Category 1 Hurricane Countywide Population at Risk based on 2000 Census

	<b>Total</b>	<b>TS Wind</b>	<b>Hur Wind</b>	<b>Ext Wind</b>	<b>Flooded</b>
<b>Total</b>	49,832	49,832	17,405	0	58
<b>Minority</b>	6,465	6,465	1,405	0	0
<b>Over 65</b>	14,247	14,247	6,068	0	6
<b>Disabled</b>	18,354	18,354	6,422	0	0
<b>Poverty</b>	4,287	4,287	1,184	0	0
<b>Lang Iso</b>	665	665	277	0	26
<b>Single Point</b>	2,050	2,050	585	0	0

Category 1 Hurricane Countywide Structures at Risk based on 2000 Census

	<b>Total</b>	<b>TS Wind</b>	<b>Hur Wind</b>	<b>Ext Wind</b>	<b>Flooded</b>
<b>Single Family</b>	17,702	17,702	8,962	0	381
<b>Mobile Home</b>	1,448	1,448	246	0	12
<b>Multi-Family</b>	2,601	2,601	1,600	0	240
<b>Commercial</b>	582	582	280	0	27
<b>Agriculture</b>	1,335	1,335	132	0	3
<b>Gov/Instit</b>	254	254	111	0	11

Category 1 Hurricane Countywide Loss by DOR Use based on 2000 Census

	<b>Exposure</b>	<b>Loss</b>	<b>Percent Loss</b>
<b>Single Family</b>	\$6.85 bil	\$104.97 mil	1.5%
<b>Mobile Home</b>	\$158.28 mil	\$8.26 mil	5.2%
<b>Multi-Family</b>	\$848.89 mil	\$15.96 mil	1.9%
<b>Commercial</b>	\$712.53 mil	\$11.49 mil	1.6%
<b>Agriculture</b>	\$728.95 mil	\$9.44 mil	1.3%
<b>Gov/Instit</b>	\$795.34 mil	\$5.80 mil	0.7%

**CATEGORY 2 HURRICANE:**

Category 2 Hurricane Countywide Population at Risk based on 2000 Census

	<b>Total</b>	<b>TS Wind</b>	<b>Hur Wind</b>	<b>Ext Wind</b>	<b>Flooded</b>
<b>Total</b>	49,832	49,832	49,832	0	3,846
<b>Minority</b>	6,465	6,465	6,465	0	37
<b>Over 65</b>	14,247	14,247	14,247	0	1,211
<b>Disabled</b>	18,354	18,354	18,354	0	1,598
<b>Poverty</b>	4,287	4,287	4,287	0	314
<b>Lang Iso</b>	665	665	665	0	157
<b>Single Point</b>	2,050	2,050	2,050	0	156

## Flagler County Local Mitigation Strategy

Category 2 Hurricane Countywide Structures at Risk based on 2000 Census

	Total	TS Wind	Hur Wind	Ext Wind	Flooded
Single Family	17,702	17,702	17,652	0	2,089
Mobile Home	1,448	1,448	1,411	0	132
Multi-Family	2,601	2,601	2,599	0	719
Commercial	582	582	575	0	108
Agriculture	1,335	1,335	1,291	0	16
Gov/Instit	254	254	251	0	53

Category 2 Hurricane Countywide Loss by DOR Use based on 2000 Census

	Exposure	Loss	Percent Loss
Single Family	\$6.85 bil	\$354.71 mil	5.2%
Mobile Home	\$158.28 mil	\$23.85 mil	15.1%
Multi-Family	\$848.89 mil	\$52.26 mil	6.2%
Commercial	\$712.53 mil	\$38.31 mil	5.4%
Agriculture	\$728.95 mil	\$33.89 mil	4.6%
Gov/Instit	\$795.34 mil	\$24.21 mil	3.0%

### **CATEGORY 3 HURRICANE:**

Category 3 Hurricane Countywide Population at Risk based on 2000 Census

	Total	TS Wind	Hur Wind	Ext Wind	Flooded
Total	49,832	49,832	49,832	9,774	12,522
Minority	6,465	6,465	6,465	445	508
Over 65	14,247	14,247	14,247	3,723	4,685
Disabled	18,354	18,354	18,354	3,617	4,849
Poverty	4,287	4,287	4,287	762	910
Lang Iso	665	665	665	201	264
Single Point	2,050	2,050	2,050	297	380

Category 3 Hurricane Countywide Structures at Risk based on 2000 Census

	Total	TS Wind	Hur Wind	Ext Wind	Flooded
Single Family	17,702	17,702	17,702	3,645	4,601
Mobile Home	1,448	1,448	1,448	101	305
Multi-Family	2,601	2,601	2,601	837	1,181
Commercial	582	582	582	157	190
Agriculture	1,335	1,335	1,335	44	31
Gov/Instit	254	254	251	61	89

## Flagler County Local Mitigation Strategy

Category 3 Hurricane Countywide Loss by DOR Use based on 2000 Census

	Exposure	Loss	Percent Loss
Single Family	\$6.85 bil	\$886.15 mil	12.9%
Mobile Home	\$158.28 mil	\$54.79 mil	34.6%
Multi-Family	\$848.89 mil	\$127.93 mil	15.1%
Commercial	\$712.53 mil	\$95.46 mil	13.4%
Agriculture	\$728.95 mil	\$86.16 mil	11.8%
Gov/Instit	\$795.34 mil	\$66.70 mil	8.4%

### **CATEGORY 4 HURRICANE:**

Category 4 Hurricane Countywide Population at Risk based on 2000 Census

	Total	TS Wind	Hur Wind	Ext Wind	Flooded
Total	49,832	49,832	49,832	9,774	12,522
Minority	6,465	6,465	6,465	445	508
Over 65	14,247	14,247	14,247	3,723	4,685
Disabled	18,354	18,354	18,354	3,617	4,849
Poverty	4,287	4,287	4,287	762	910
Lang Iso	665	665	665	201	264
Single Point	2,050	2,050	2,050	297	380

Category 4 Hurricane Countywide Structures at Risk based on 2000 Census

	Total	TS Wind	Hur Wind	Ext Wind	Flooded
Single Family	17,702	17,702	17,702	17,156	9,854
Mobile Home	1,448	1,448	1,448	1,346	317
Multi-Family	2,601	2,601	2,601	2,580	1,866
Commercial	582	582	582	555	300
Agriculture	1,335	1,335	1,335	1,106	54
Gov/Instit	254	254	254	239	122

Category 4 Hurricane Countywide Loss by DOR Use based on 2000 Census

	Exposure	Loss	Percent Loss
Single Family	\$6.85 bil	\$2.06 bil	30.0%
Mobile Home	\$158.28 mil	\$115.82 mil	73.2%
Multi-Family	\$848.89 mil	\$289.27 mil	34.1%
Commercial	\$712.53 mil	\$219.42 mil	30.8%
Agriculture	\$728.95 mil	\$200.11 mil	27.5%
Gov/Instit	\$795.34 mil	\$167.27 mil	21.0%

**CATEGORY 5 HURRICANE:**

Category 5 Hurricane Countywide Population at Risk based on 2000 Census

	<b>Total</b>	<b>TS Wind</b>	<b>Hur Wind</b>	<b>Ext Wind</b>	<b>Flooded</b>
<b>Total</b>	49,832	49,832	49,832	49,832	25,202
<b>Minority</b>	6,465	6,465	6,465	6,465	2,166
<b>Over 65</b>	14,247	14,247	14,247	14,247	8,644
<b>Disabled</b>	18,354	18,354	18,354	18,354	9,859
<b>Poverty</b>	4,287	4,287	4,287	4,287	2,025
<b>Lang Iso</b>	665	665	665	665	400
<b>Single Point</b>	2,050	2,050	2,050	2,050	928

Category 5 Hurricane Countywide Structures at Risk based on 2000 Census

	<b>Total</b>	<b>TS Wind</b>	<b>Hur Wind</b>	<b>Ext Wind</b>	<b>Flooded</b>
<b>Single Family</b>	17,702	17,702	17,702	17,702	12,557
<b>Mobile Home</b>	1,448	1,448	1,448	1,448	338
<b>Multi-Family</b>	2,601	2,601	2,601	2,601	2,099
<b>Commercial</b>	582	582	582	582	351
<b>Agriculture</b>	1,335	1,335	1,335	1,335	102
<b>Gov/Instit</b>	254	254	254	254	140

Category 5 Hurricane Countywide Loss by DOR Use based on 2000 Census

	<b>Exposure</b>	<b>Loss</b>	<b>Percent Loss</b>
<b>Single Family</b>	\$6.85 bil	\$3.86 bil	56.4%
<b>Mobile Home</b>	\$158.28 mil	\$156.69 mil	99.0%
<b>Multi-Family</b>	\$848.89 mil	\$539.89 mil	63.6%
<b>Commercial</b>	\$712.53 mil	\$410.94 mil	57.7%
<b>Agriculture</b>	\$728.95 mil	\$379.70 mil	52.1%
<b>Gov/Instit</b>	\$795.34 mil	\$326.57 mil	41.1%

**Location and Impact**

A Flagler Basin **S**ea, **L**akes and **O**verland **S**urge from **H**urricane (SLOSH) Model were conducted based on the Saffir-Simpson categorization of hurricanes to identify which areas are inundated from hurricane storm surge. Flagler’s coastal communities of Flagler Beach, Beverly Beach, and Marineland and all structure types, such as residential, multi-family, commercial and publicly owned land/buildings, bare the brunt of disastrous effects of storm surge related flooding and destruction. More inland communities are less likely to experience direct impact due to storm surge; the remainder of the County will subsequently suffer secondary effects as a result of the destruction in the form of economic and environmental disruptions. The National Flood Insurance Program (NFIP) has

mapped all flood hazard areas in Flagler County. Flood Insurance Rate Maps (FIRM) information is available from the County Engineering Department.

Roads leading into the municipal area become submerged at various points (such as SR 100 from Lemon Street to Church Street). Any area east of the I-95 corridor may be impacted by storm surge associated with tropical cyclones and non-tropical weather events thus hindering evacuation and/or emergency response capabilities.

### **Historical Occurrences**

Storm Surges have been observed with multiple tropical systems and nor'easter type events. More notable incidents are listed as follows: (information from Flagler County Emergency Management historical files, Wikipedia, National Weather Service, and the National Climatic Data Center)

- **Hurricane Donna (1960)**... 13 feet of storm surge and \$3.35 billion (2006 dollars) damages
- **Hurricane Dora (1964)**... causing \$239 million (\$1.7 billion in 2005 dollars) in damages
- **Nor'easter (1984)**... up to 20 feet of storm surge and \$8 million in damages
- **Hurricane Floyd (1999)**... 20 feet of storm surge and \$4.5 billion (1995 dollars) in overall damages
- **Tropical Storm Gabrielle (2001)**... 6.2 feet of storm surge and \$6.3 million dollars in damages
- **Hurricane Frances (2004)**... up to 20 feet of storm surge and \$9 billion (2004 dollars)
- **Hurricane Jeanne (2004)**... up to 20 feet of storm surge and \$6.8 billion in damages

### **Probability of Future Occurrences and Vulnerability**

The probability future storm surge episodes will threaten Flagler County's coastal communities is high, while the inland communities chances are moderate. According to the National Climatic Data Center Flagler is threatened annually with a near 100% chance of experiencing the affects or reoccurrence of this type of an event.

## FLOODING

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### Description and Extent

For Florida as a whole, flooding is a continuous problem. Land based flooding occurs from heavy rainfall associated with storms. This causes lakes to overflow, rivers to crest, and low land flooding. All pose hazards to Flagler County.

Flagler County, due to its topography, has suffered from inland flooding caused by storms including a number of hurricanes and tropical storms since 1900. In addition, thunderstorms and nor'easters have caused significant coastal and inland flooding. A flood hazard zone is an area susceptible to being inundated by water. In Flagler County, flooding can occur from a heavy rainfall event, high ocean tides, or rising river waters.

Hurricane and tropical storm induced flooding would also present problems for low-lying areas of Flagler County filling up too fast, especially along coastal waterways. Also, water retention areas overflowing create flooding problems. Although drainage wells and improved drainage systems have mitigated some flooding problems, many of the lakes would be impacted by tropical systems. In the most severe cases flooding can leave up to 3 feet of standing water, depending on the topography of the areas affected, in its wake.

*Short Duration Flooding* - flooding typically associated with a frontal system. A very intense short period of rain usually associated with slow moving thunderstorms.

*Freshwater Flooding* - This type of flooding may occur when an excessive amount of rainfall accompanies a tropical storm or hurricane.

*Drainage* - The topography and high water table of Flagler County can make a small amount of rainfall very significant. Man-made alterations to the land have disrupted natural flow patterns and can lead to shallow flooding over a large area.

*Coastal Tidal* - This type of flooding is generated from high tides and wind action and is a chronic problem within the coastal shoreline of Flagler County.

### **Location and Impact**

Many areas in Flagler County may suffer effects from freshwater flooding as a result of excessive rainfall. Most rivers and creeks in Flagler County are in unpopulated areas; however, flooding associated with these can impact roadways. Isolation of neighborhoods may occur by the inability of natural and mechanical drainage systems to effectively remove the water. Some coastal properties, road arteries, and bridge approaches are subject to severe flooding caused by rare astronomical tides. All areas and property types (i.e. residential, commercial, and public) within the proximity of inland bodies of water below 10 ft. elevation are subject to flooding following intensive rainfall.

Heavy rains within a drainage area and the subsequent inability of some public drainage areas to accommodate the added runoff almost always cause overflow flooding. There are several drainage areas within Flagler County similarly affected, including the Little Haw Creek and Middle Haw Creek areas. This problem would be compounded if heavy rains fell simultaneously in the counties surrounding Flagler County, thus adding to the volume of runoff received by local creeks and canals.

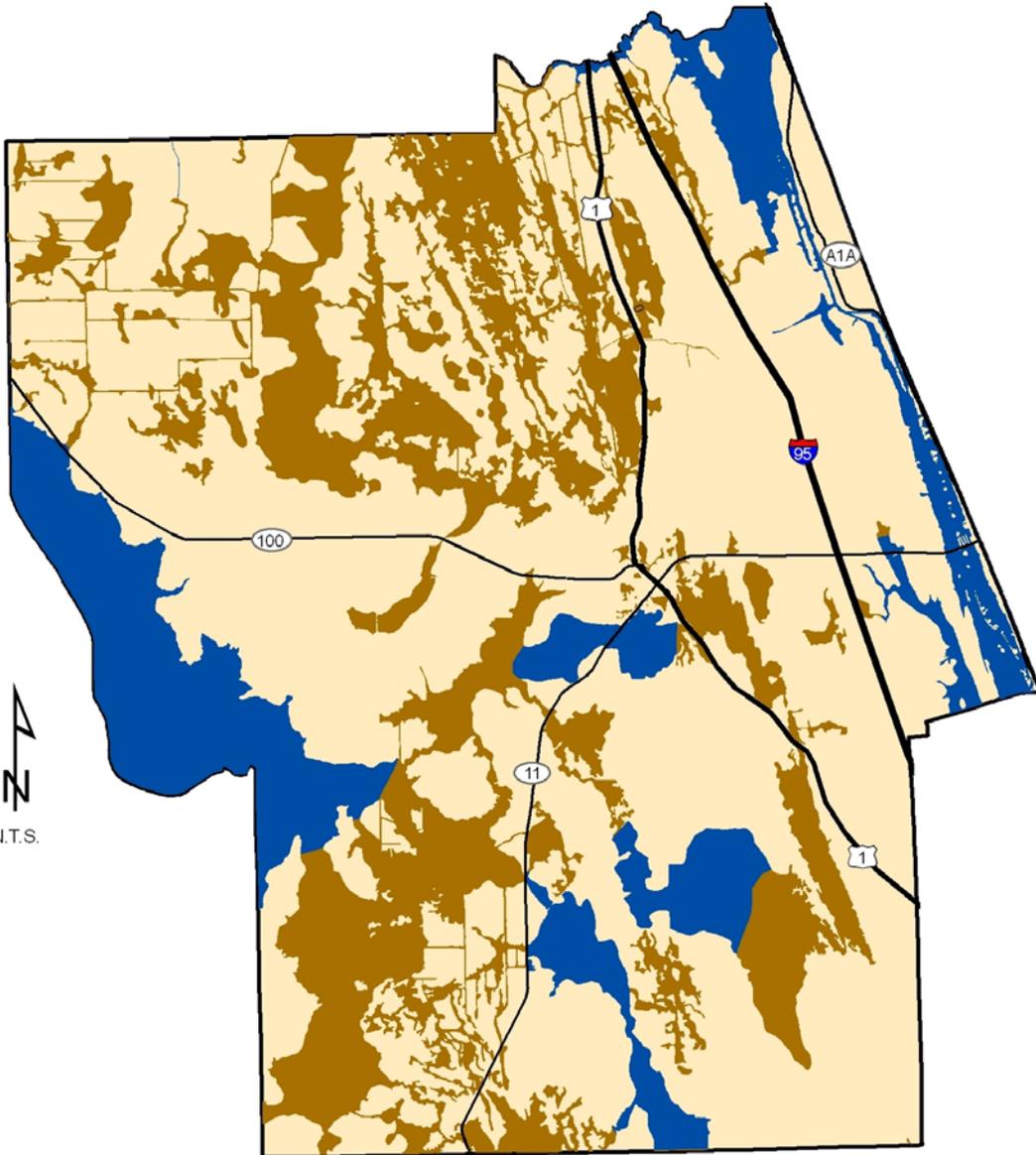
Ponding occurs in low areas characterized by either poorly drained or supersaturated soils (high water table). This type of flooding would be prevalent in the western part of Flagler County where the drainage basins are located.

Other notable areas of flooding include the following:

- Marineland Acres
- Bird of Paradise in the City of Palm Coast
- Old Kings Road North and Princess Place Area
- Otis Stone Hunter Road and Hargrove Grade in Palm Coast
- Daytona North and Water Oak Road
- Old Haw Creek Road
- Old Dixie Highway near I-95
- Korona in Bunnell
- County Road 304 and Florida State Road 11

The map below illustrates the 100- Year Flood Plain and includes the above enumerated areas.

# 100 YEAR FLOODPLAIN MAP



### Legend

- Determined Base Flood Elevations
- No Base Flood Elevations Determined

Source: Federal Emergency Management Agency  
Created by: Northeast Florida Regional Council

This map is for reference use only. Data provided are derived from multiple sources with varying levels of accuracy. This product is for informational purposes and may not have been prepared for, legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

### **Historical Occurrences**

The following highlights some notable flooding events in Flagler County occurring since the last LMS update.

- Bunnell- July 2006. Parts of St. Joe Plaza near Palm Coast Parkway were under two feet of water
- Daytona North- February 2007. One mile of County Road 205 between Daytona North and State Road 100 closed due to 2+ feet of flooding. A major squall line with multiple super cell thunderstorms moved across north and central Florida with tornadic activity in Flagler County.
- Marineland- May 2009. Heavy rainfall began in Flagler County on Sunday, May 17<sup>th</sup> as the result of a strong nor'easter. Due to moist antecedent ground conditions flooding began quickly. Several residents were rescued from flooded homes. The May floods produced 36 inches of rainfall within a week.

### **Probability of Future Occurrences and Vulnerability**

A one hundred year flood is calculated as the level of flood water expected to be equaled or exceeded 100 years on average. The 100 year flood is more accurately referred to as the 1% annual exceedance probability flood, since it is a flood that has 1% chance of being equaled or exceeded in any single year. Based on the following tables provided through FEMA FIRM Zones 49,832 or well over half the population is vulnerable to the damaging effects of flooding. The Flagler County Engineering Department maintains federally provided flood maps which show the 100 and 500-year flood prone areas of Flagler County. The Flagler County area meets the one hundred year flood level if 11+ inches of rainfall occur within a twenty-four hour period.

Rainfall produced flooding at its worst in Flagler County typically lays 2-3 feet of water in various areas. For example, in October 1989 16 inches of rain fell in 3 hours in Palm Coast. While this is an extreme event the outcomes of such storms greatly depend on the amount of rainfall produced before and after such momentous occurrences. Relatively short durations of downpour are not as problematic as those that last for a few days or longer. These conditions are more likely to damage or close down roadways and cause water damage to buildings and homes.

The following charts are from FEMA FIRM Zones and show the vulnerability of the population and buildings of Flagler County in terms of numbers.

## Flagler County Local Mitigation Strategy

**Table 2.1: Population at risk for FEMA FIRM Zones based on 2000 Census**

Zone	Total Pop.	Minority	Over 65	Disabled	Poverty	Lang ISO	Single Pnt
AE	5395	81	1826	1875	492	143	220
X500	4924	376	2095	1935	289	70	89
X	36760	5818	9682	13268	3341	346	1649
A	2753	190	644	1276	165	106	92
ANI	0	0	0	0	0	0	0
IN	0	0	0	0	0	0	0
VE	0	0	0	0	0	0	0
UNDES	0	0	0	0	0	0	0
AO	0	0	0	0	0	0	0
D	0	0	0	0	0	0	0
AH	0	0	0	0	0	0	0
V	0	0	0	0	0	0	0
100IC	0	0	0	0	0	0	0

**Table 2.2: Structures at risk for FEMA FIRM Zones based on 2000 Census**

Zone	Total	Single Family	Mobile Home	Multi-Family	Commercial	Agriculture	Gov/Instit
AE	3500	2245	209	701	140	64	141
X500	2118	1570	39	423	47	21	18
X	17475	13440	1145	1451	341	147	951
A	829	447	55	26	54	22	225
ANI	0	0	0	0	0	0	0
IN	0	0	0	0	0	0	0
VE	1255	209	701	140	64	141	0
UNDES	548	39	423	47	21	18	0
AO	4035	1145	1451	341	147	951	0
D	382	55	26	54	22	225	0
AH	0	0	0	0	0	0	0
V	0	0	0	0	0	0	0
100IC	1046	701	140	64	141	0	0

## Flagler County Local Mitigation Strategy

Table 2.3: Value of Structures by DOR Use for FEMA FIRM Zones based on 2000 Census

Zone	Total	Single Family	Mobile Home	Multi-Family	Commercial	Agriculture	Gov/Insti t
AE	\$1.18 bil	\$785.05 mil	\$23.15 mil	\$201.20 mil	\$56.13 mil	\$35.97 mil	\$73.64 mil
X500	\$1.10 bil	\$662.58 mil	\$4.98 mil	\$223.09 mil	\$97.00 mil	\$92.91 mil	\$19.53 mil
X	\$7.37 bil	\$5.26 bil	\$121.92 mil	\$409.34 mil	\$510.67 mil	\$529.55 mil	\$536.09 mil
A	\$446.02 mil	\$137.22 mil	\$8.22 mil	\$15.25 mil	\$48.72 mil	\$70.52 mil	\$166.08 mil
ANI	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
IN	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
VE	\$390.10 mil	\$23.15 mil	\$201.20 mil	\$56.13 mil	\$35.97 mil	\$73.64 mil	\$0.00
UNDE S	\$437.51 mil	\$4.98 mil	\$223.09 mil	\$97.00 mil	\$92.91 mil	\$19.53 mil	\$0.00
AO	\$2.11 bil	\$121.91 mil	\$409.34 mil	\$510.67 mil	\$529.55 mil	\$536.09 mil	\$0.00
D	\$308.80 mil	\$8.22 mil	\$15.25 mil	\$48.72 mil	\$70.52 mil	\$166.08 mil	\$0.00
AH	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
V	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
100IC	\$366.94 mil	\$201.20 mil	\$56.13 mil	\$35.97 mil	\$73.64 mil	\$0.00	\$0.00

## *WILDFIRE*

### Description and Extent

A wildfire is any uncontrolled fire in combustible vegetation that occurs in a wilderness area. A wildfire differs from other fires by its extensive size, the speed at which it can spread out from its original source, its potential to change direction unexpectedly, and its ability to jump gaps such as roads, rivers and fire breaks. Wildfires are characterized in terms of the cause of ignition, their physical properties, such as speed of propagation, the combustible material present, and the effect of weather on the fire.

Flagler County is susceptible to wildfires throughout the year, particularly during the months with minimal rainfall amounts. The major cause of brush and forest fires is due to lightning and occurs during the months with higher thunderstorm activities. In recent years, homes and businesses have been destroyed by encroaching wildfires. Wildfires are fueled by strong spring winds and a lack of

rainfall during the same period. Flagler County has considerable undeveloped areas with prime fuel sources for wildfires. Wildfires in Flagler County destroy everything in its path including untold acres of forest as well as homes, farms, and businesses in the woodland/ urban interface areas. Flagler County's worst wildfire in recent history destroyed over 82,000 acres. As with other disasters the ramifications of wildfire events can become exacerbated by fires affecting the region and, as was the case for this particular event, the entire state.

The Keetch-Byran drought index was designed specifically for fire potential assessment. It is a number representing the net effect of evapotranspiration and precipitation in producing cumulative moisture deficiency in deep duff and upper soil layers. It is a continuous index, relating to the flammability of organic material in the ground.

- KBDI = 0 - 200: Soil moisture and large class fuel moistures are high and do not contribute much to fire intensity. Typical of spring dormant season following winter precipitation.
- KBDI = 200 - 400: Typical of late spring, early growing season. Lower litter and duff layers are drying and beginning to contribute to fire intensity.
- KBDI = 400 - 600: Typical of late summer, early fall. Lower litter and duff layers actively contribute to fire intensity and will burn actively.
- KBDI = 600 - 800: Often associated with more severe drought with increased wildfire occurrence. Intense, deep burning fires with significant downwind spotting can be expected. Live fuels can also be expected to burn actively at these levels.

### **Location and Impact**

Approximately 40 percent (250,000 acres) of Flagler County is dedicated to forestry and public conservation lands. Additionally, vast portions of the County consist of woods, timberland, and agriculture areas. These areas are intermingled with densely populated areas as well as high value property. The areas of greatest risk, level 9 areas, are located in the woodland/urban interface. These include areas of Palm Coast, Bunnell and unincorporated Flagler County. Flagler County averages over 65 grass and woods fires per year in the unincorporated areas. Wildfires can burn over 82,000 acres in Flagler County. Depending on conditions in the surrounding jurisdictions, conditions have the potential to be even more severe. Wildfire that spreads into the urban interface knows no boundaries with regard to structure types in its path; it will indiscriminately burn all types of commercial, residential, and public properties.

### **Historical Occurrences**

In 1998 Flagler County experienced one of the worst wildfires in its recorded history. The county suffered the loss of homes and property. The fires started in

June sweeping through Palm Coast burning over 1,100 acres, destroying 20 homes and damaging 17 others. Then in early July numerous fire evacuations were ordered culminating in an evacuation of the entire county beginning July 3rd and continuing through the morning of July 6<sup>th</sup>. During the first days of July, an additional 51 homes were destroyed and 175 damaged. By the time the drought and fires ended, 71 homes had been destroyed, 192 damaged, over 82,000 acres had burned and approximately \$3.7 million had been expended by the County.

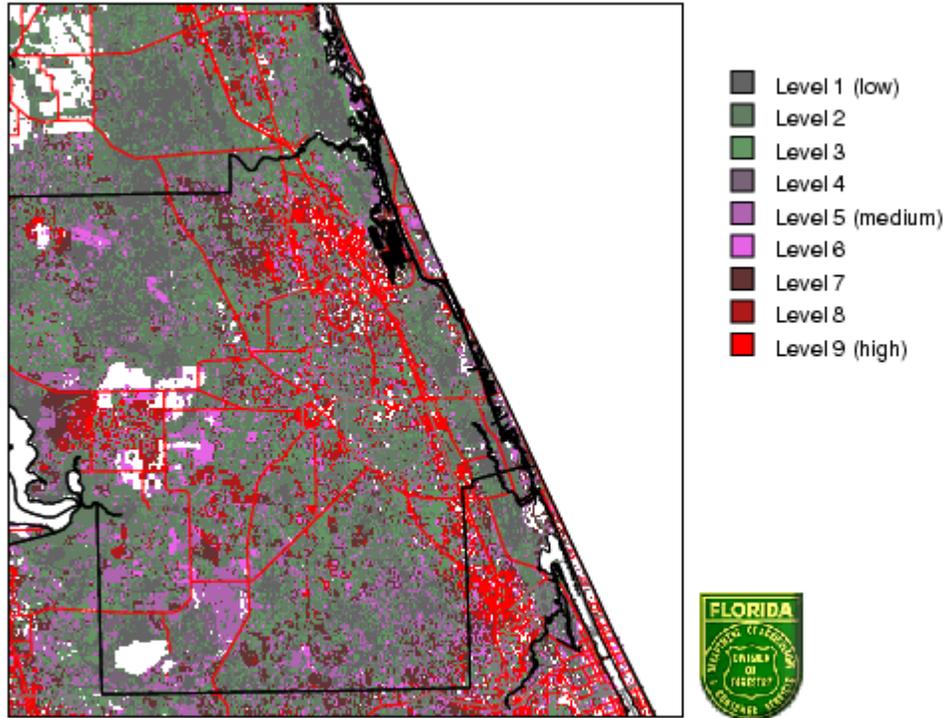
In 1985, two wildfires raged through Palm Coast, Bunnell, and the small community of Korona destroying 131 homes and damaging an estimated 200 others. The combined dollar loss of the fires was an estimated \$200 million with 202 homes totally destroyed and 393 damaged.

Between 1950 and 2011 there have been 8 recorded Wildfires in Flagler County. There were four incidents of wildfire during 1999 affecting the entire county with at least 500 acres burned. In 2000 there was one fire recorded and one wildfire in 2007 that burned at least 6,575 acres. Flagler County's 2011 Wildfire season is proving to be an active one with thousands of acres on fire to the south and north of Flagler County and conditions worsening by the day. Temperature extremes coupled with moderate to severe drought conditions have primed the area for potentially devastating wildfires.

### **Probability of Future Occurrences and Vulnerability**

There is a high probability of annual future wildfire events in Flagler County, especially during drought cycles and abnormally dry conditions, based on prior occurrence. The following map illustrates the areas of Flagler County most susceptible to wildfires. The areas in levels 7,8,9 which contain areas in Bunnell and Palm Coast are at the highest risk for future occurrences.

## FDOF Wildland Fire Levels of Concern Hazards for Flagler



## *TORNADO*

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### **Description and Extent**

According to the National Weather Service a tornado is a violent windstorm characterized by a twisting, funnel-shaped cloud extending to the ground. Tornadoes are generated by thunderstorm and tropical system activity when cool, dry air intersects and overrides a layer of warm, moist air forcing the warm air to rise rapidly. The damage caused by a tornado is a result of the high wind velocity and wind-blown debris, also accompanied by lightning and hail. There is a high degree of susceptibility to storms and tornadoes for residents and property throughout Flagler County. The tornado and severe thunderstorm season lasts all year in Florida. However, the best chance of getting large powerful tornadoes and the most damaging severe thunderstorms is from mid-winter to mid-spring. It is during that time when conditions favor the development

of such storms. Strong tornadoes can also be associated with tropical cyclones during the hurricane season. On an annual basis, the most reported incident in Flagler County are severe storm incidents.

Although the Midwest has the reputation for the worst tornadoes, Florida experiences the largest number of tornadoes per square mile of all the states. Florida has averaged 52 tornadoes reported per year since 1961, with an average of two fatalities per year. Florida's tornadoes are generally of shorter duration (3 miles) and have narrower paths (125 yards wide). Tornadoes in other portions of the nation are generally fourteen (14) miles long and three hundred to four hundred yards wide. However, large and dangerous tornadoes have occurred in Florida, with the month of March being the deadliest for tornado related fatalities. Though the probability exists that Flagler could experience a F5 tornado, based on historical occurrences a F2- F3 category storm is most likely the worst case scenario.

The following chart shows the magnitude classifications for tornados as described by the Fujita or F-Scale outlining some typical effects of each category.

Fujita Tornado Damage Scale

Scale	Wind Speeds	Damage	Frequency
F0	40 to 72 mph	Some damage to chimneys, TV antennas, roof shingles, trees and windows	29%
F1	73 to 112 mph	Automobiles overturned, carports destroyed, trees uprooted	40%
F2	113 to 157 mph	Roofs blown off homes, sheds and outbuildings demolished, mobile homes overturned	24%
F3	158 to 206 mph	Exterior walls and roofs blown off homes. Metal buildings collapsed or are severely damaged. Forests and farmland flattened.	6%
F4	207 to 260 mph	Few walls, if any, standing in well-built homes. Large steel and concrete missiles thrown far distances.	2%
F5	261 to 318 mph	Homes leveled with all debris removed. Schools, motels and other larger structures have considerable damage with exterior walls and roofs gone. Top stories demolished.	Less than 1%

### **Location and Impact**

Due to the unpredictable pattern of tornadoes, and because the entire state, including Flagler County, has a relatively high reoccurrence frequency, the county is vulnerable to tornado induced damage. Flagler County has experienced 21 tornadoes since 1970. The damage potential for a tornado increases as a function of population density. As the number of structures and people increase, the potential damage/injury rate increases. Mobile homes,

poorly constructed or substandard housing and apartment complexes are especially susceptible to damage from a tornado. Mobile homes and substandard housing are exceptionally susceptible because of their lack of resistance to high winds, and apartment complexes and low rent projects because of their size and densities. All of the incorporated municipalities, as well as the unincorporated urbanized areas of Flagler County are vulnerable.

**Historical Occurrences**

The last recorded tornado occurred on July 22, 2007 in Flagler Beach when a waterspout moved onshore as a tornado. The tornado moved west tearing awnings and roofing materials. Debris was tangled in power line wires. The tornado moved west along South 2nd Street and Flagler Avenue where it damaged a large awning before the tornado lifted into the parent storm.

The following table highlights the historical occurrences of recorded touchdowns in Flagler County and denoting the various strengths of tornadoes. The strongest recorded tornado on record is an F2.

<b>Tornado Class</b>	<b>Number of Occurrences Within Flagler County</b>	<b>28 Year Recurrence Interval (years)</b>
F0	17	1.7
F1	2	9.3
F2	2	14
F3	no record	--
F4	no record	--
F5	no record	--
<i>All Tornado Events</i>	21	1.3

Historical Data obtained National Climatic Data Center

**Probability of Future Occurrences and Vulnerability**

The KAC Tornado Risks Hazards report for Flagler County indicates the tornado risk for Flagler is 1 in 250 (medium) for annual reoccurrence. Flagler County will experience on average more than one tornado event annually. These events will likely range between an F0 to F2 and can cause substantial damage.

Population at Risk for KAC Tornado Risk based on 2000 Census

Zone	Total	Single Family	Mobile Home	Multi-Family	Commercial	Agriculture	Gov/Instit
Low (1 in 500)	0	0	0	0	0	0	0
Medium (1 in 250)	49,832	6,465	14,247	18,354	4,287	665	2,050
High (1 in 100)	0	0	0	0	0	0	0
Very High (1 in 50)	0	0	0	0	0	0	0

*FLOOD CONTROL DEVICE FAILURE*

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**Description and Extent**

A flood control device is a barrier that impounds water. These devices serve the primary purpose of retaining water, as well as managing or preventing water flow into specific land regions. Flood Control Device Failure can be caused by a flooding event and can cause damage to property downstream from the flood control device when the water starts moving. There are more than 80,000 dams in the United States, according to the 2007 update to the National Inventory of Dams. Approximately one third of these pose a "high" or "significant" hazard to life and property if failure occurs. Due to the nature of these structures, the term flood control device is more appropriate in definition than is "dam". For the purpose of this plan, dams are identified as flood control devices.

Flood control device failure or breeches can occur with little warning. Intense storms may produce a flood in a few hours or even minutes for upstream locations. Flash floods occur within six hours of the beginning of heavy rainfall, and flood control device failure may occur within hours of the first signs of breaching. Other failures and breeches can take much longer to occur, from days to weeks, as a result of debris jams or the accumulation of water.

Floods generally result from excessive precipitation, and can be classified under two categories: general floods, precipitation over a given river basin for a long period of time along with storm-induced wave or tidal action; and flash floods, the product of heavy localized precipitation in a short time period over a given

location. In a worst case scenario of flood control device failure in Palm Coast there could be up to 2 feet of standing water, and depending on the area, business and homes would be in the path of this flooding.

### **Location and Impact**

The unincorporated Flagler County and the City of Palm Coast are the only jurisdictions with flood control devices. None of the jurisdictions have levees. There is several flood control devices located throughout Palm Coast. These structures are 30+ years old, and have outlived their useful service life. There have been quick band-aid type repairs on most of the existing structures, mostly using flowable fill. Palm Coast has currently scheduled and budgeted to replace one device per year. With the rain events experienced over the last few years, there have been more failures than anticipated. Therefore, the City is currently seeking bids for replacement of two devices and has applied for grant funding to replace another flood control device. Partial failures are anticipated to occur in the future if these devices are not replaced. The commercial and residential structures threatened by the subsequent flooding from these types of failures are not elevated or otherwise mitigated to withstand disastrous flooding events.

### **Historical Occurrences**

#### **Failures**

- L-4 Completely failed in March of 2002, and was replaced.
- PA-1 Partially failed in May of 2005, and was replaced.
- BA-1 Is failing and is currently out to bid.
- RB-1 Has failed and is currently out to bid.
- R-1 Has been repaired numerous times and is in grant application stage

### **Probability of Future Occurrences and Vulnerability**

Until repairs or replacements are made to the failing flood control devices in the City of Palm Coast there is a 100% chance the effects of flooding waters will be experienced by this community. Flood Control Device failure means that roadways, buildings, and homes are all vulnerable to flooding.

## *DROUGHT*

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### **Description and Extent**

Drought is a normal climatic occurrence happening almost everywhere on the planet and is recognized as a deficiency of precipitation over an extended period of time. Typically May-June have highest drought numbers. Flagler County experienced extreme droughts during the summers of 1998 through 2001, and is currently experiencing drought conditions in 2011. This type of drought has a detrimental effect on water systems relying upon surface water. When identified levels are reached, a higher probability of contamination occurs and can result in an emergency situation. Droughts or significant rainfall shortages also reduce the water table level and may affect those systems dependent on the shallow aquifer. The most severe drought classification is “extreme drought”. As evidenced below Flagler County has experienced this extreme condition on multiple occasions with a record low of 20 inches below normal rainfall.

The Palmer Drought Severity Index (PDSI) is an index of the relative dryness or wetness of an area. The PDSI indicates the prolonged and abnormal moisture deficiency or excess. The PDSI is an important climatological tool for evaluating the scope, severity, and frequency of prolonged periods of abnormally dry or wet weather. The PDSI considers rainfall averages below 2.9 inches a moderate drought, while 4 inches or less is considered extreme drought conditions.

- -4.0 inches or less below normal is considered an extreme drought
- -3.0 to -3.9 inches below normal is considered a severe drought
- -2.0 to -2.9 inches below normal is considered a moderate drought
- -1.9 to +1.9 inches is considered near normal conditions
- 2.0 to 2.9 inches above normal is considered an unusual moist period
- 3.0 to 3.9 above normal inches is considered a very moist period
- 4.0 inches and above is considered an extremely moist period

### **Location and Impact**

As with freezes, there is no way to predict when a drought will occur or how long it may last. Drought conditions existed in Florida from 1965 through 1982, after which time conditions have generally returned to normal. Drought conditions reappeared in 1998 through 2001 and again from 2006 to present. The conditions have been particularly severe during certain years and various areas of the state have been affected to different degrees. Generally throughout the

entire state water levels in rivers and lakes were lowered, as was the water table. Various local governments within the County imposed water usage restrictions.

Although drought conditions do not impact structures, they do impact the local economy. Farmers were particularly affected by the drought conditions as the water table fell and deeper wells had to be drilled for irrigation purposes. The most recent drought to affect Flagler County has stretched over a period of years; therefore, the historical rating is high.

### **Historical Occurrences**

The chart below shows rainfall totals from 1995-2011. In 2006 Flagler experienced extreme drought conditions with 20 inches below normal rainfall and in 2000 at 15 inches below normal rainfall. Flagler County is on track to have another historical low of 15 inches below normal.

<b>Year</b>	<b>Rain Total</b>	<b>Difference from Average (50")</b>
1995	67.87"	17" above normal
1996	64.14	14" above normal
1997	58.25	8" above normal
1998	45.89	5" below normal
1999	39.86	11" below normal
2000	34.81	15" below normal
2001	46.68	3" below normal
2002	54.67	4" above normal
2003	48.9	2" below Normal
2004	59.18	9" above normal
2005	60.74	11" above normal
2006	29.37	20" below normal
2007	40.04	10" below normal
2008	41.70	9" below normal
2009	57.80	8" above normal
2010	34.98	15" below normal
2011	7.04	***

### **Probability of Future Occurrences and Vulnerability**

In the past 16 years rainfall averages have fallen below average over 50% of time. The probability for all of Flager County to experience drought conditions is high, or nearly 100% chance of annual reoccurrence for drought conditions. The duration of drought conditions will increase or decrease the likelihood of damages sustained as a result of these conditions. Currently, Flagler is experiencing a period of moderate drought conditions.

## *WINTER STORM AND FREEZE*

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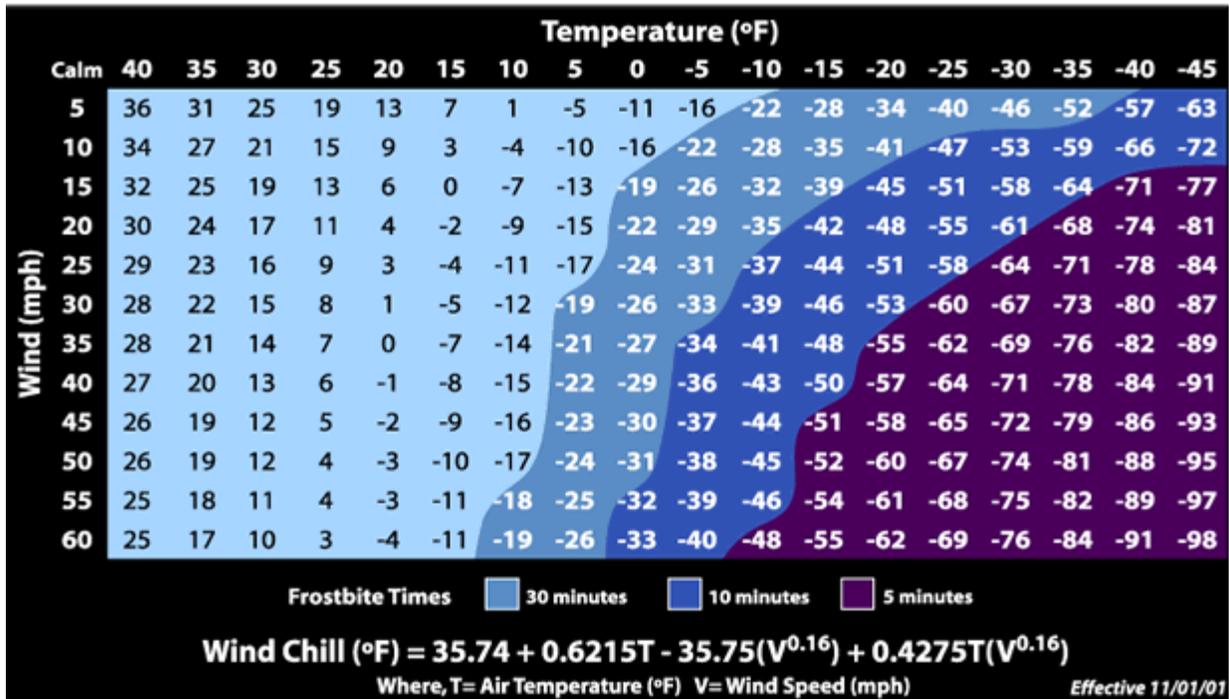
### **Description and Extent**

Winter storms can vary in size and strength and include heavy snowstorms, freezing rain, sleet, ice storms, and blowing and drifting snow conditions. Extremely cold temperatures accompanied by strong winds can result in wind chills causing bodily injury, such as frostbite and death. A variety of weather phenomena and conditions can occur during winter storms. These include heavy snowfall, ice storms, freezing rain, sleet, and wind chill. Although these conditions are rare in Flagler County, winter storms and freezes can impact people, especially low or fixed income and elderly populations. The coldest recorded temperature in Flagler County dropped to 15 degrees Fahrenheit in 1985; while these temperatures are typically seen overnight, daytime extreme temperature drops can last anywhere from a few hours up to two weeks duration.

Wind Chill is the term used to describe the rate of heat loss on the human body resulting from the combined effect of low temperature and wind. As winds increase, heat is carried away from the body at a faster rate, driving down both the skin temperature and eventually the internal body temperature. Exposure to low wind chills can be life threatening to both humans and animals alike. In Flagler County one could experience Wind Chills between 36\* F and -11\* F. If conditions were right Wind Chills could fall even lower. Below is the National Weather Service Wind Chill Chart.



# NWS Windchill Chart



## Location and Impact

Each winter Florida faces the threat of a moderate freeze. This presents a problem for Florida as a whole because of the large amount of agricultural activity conducted throughout the state. In Flagler County, freezing temperatures have their greatest impact on the agriculture produce industry, but little if any impact on structures. If temperatures reach freezing level for extended periods of time, combined with other climatic factors, crop damage may occur. This would have a significant impact on Flagler’s economy and employment base.

<b>FREEZE WARNING</b>	32-27 degrees for a period of 2 hours or greater
<b>HARD FREEZE WARNING</b>	27 degrees or less for 2 hours or greater
<b>WINTER STORM WATCH</b>	Possibility of accumulating winter precipitation within the next 24-48 hours
<b>WINTER STORM WARNING</b>	Accumulating winter precipitation likely within the next 24 hours

Jacksonville National Weather Service Office Winter Weather Warning Criteria

Additionally, consumer demand of electricity during periods of extreme cold weather may require the electric utility to implement rolling blackouts to selected areas in order to avert a total electrical grid overload. These blackouts can have a significant impact on electrically dependent critical facilities and persons with special needs.

### **Historical Occurrences**

The County has experienced several damaging freezes in the past ten years. A winter storm was recorded in November 2006 which produced snow and sleet over Flagler Beach, North Palm Coast, and Flagler County Airport and in January 2008 which produced isolated flurries. For a week and a half in January 2010 Flagler County experienced hard freezes (extended freezing temperatures holding at 32 degrees or colder). Sleet occurred on 1/9/2010 in the morning hours with minimal accumulation on cold surfaces.

The "Great Blizzard of '93" clobbered the eastern US and produced perhaps the largest swath of heavy snow ever recorded. Up to 5 inches reported in the Florida panhandle, the greatest single snowfall event in the state's history.

The "storm of the century" or "super storm" roared across Florida producing a variety of severe and unusual weather conditions over a period of about 18 hours. A severe squall line raced eastward at over 50 mph ahead of an intense low producing several tornadoes and strong downbursts as it moved through the state causing seven fatalities. This was followed by an unprecedented (for the Gulf Coast) winter storm surge of 9 to 12 feet in Taylor County, with storm surges and/or tidal and wind driven flooding of 5 to 9 feet elsewhere along the Gulf Coast to the Keys. This was followed by a period of 8 to 12 hours where sustained winds were up to 50 mph and gusts reached 70 mph, keeping tides much above normal along the west coast and causing severe beach erosion in many areas. As colder air poured in behind the intense low, up to four inches of snow fell in the panhandle from north of Pensacola to Crestview, and a trace to 3 inches of snow fell elsewhere across north Florida. Record or near record low temperatures occurred over much of the state the following two nights.

The total number of fatalities from the storm was 47, including 14 from storm surge and flooding, 7 from tornadoes and/or strong downbursts, and 4 from high winds in the aftermath of the squall line. Eleven people drowned offshore in the Gulf of Mexico after strong winds swamped or capsized ships. Eleven others died during rescue operations and cleanup activities. Total property damage was estimated at \$1.6 billion.

**Probability of Future Occurrences and Vulnerability**

Flagler County has a low or less than 25% likelihood of experiencing the effects of winter storm and freezing on an annual basis.

***NOR' EASTER STORM***

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**Description and Extent**

Nor'easters are prolonged periods of fresh to strong northeast winds causing significant beach erosion, tidal flooding, and, in extreme cases, structural damage and heavy rains. Along the coast, these storms can cause wind and water damage similar to some category one hurricanes. Nor'easters are usually caused by two types of meteorological events. The most common is the pressure differences between a frontal boundary to the south and high pressure to the north. Such weather features bring prolonged periods of nor'easterly winds causing rough surf, dangerous rip currents, and beach erosion. The second cause is a developing or intensifying extra tropical low pressure system to the south and strong high pressure to the north. The most intense nor'easter storm that could affect Flagler County is a class 1 or weak storm; the affects being similar to that of a category 1 hurricane.

The following chart is the Dolan-Davis Nor'easter Intensity Scale which lists the magnitude of nor'easter storms by detailing the duration, power, beach erosion, beach recovery, dune erosion, dune breaching, and property damage.

<b>Storm Class</b>	<b>Duration (hr)</b>	<b>Power (m<sup>2</sup>/h)</b>	<b>Beach Erosion</b>	<b>Beach Recovery</b>	<b>Dune Erosion</b>	<b>Dune Breaching</b>	<b>Property Damage</b>
Class 1 (weak)	8	32	Minor changes	Full & usually immediate	None	No	No
Class 2 (moderate)	18	107	Modest: confined to lower beach	Full & usually immediate	None	No	Minor, local
Class 3 (significant)	34	353	Erosion: extends across entire beach	Usually over considerable period of time (months)	Can be significant	No	Loss of many structures at local scale

## Flagler County Local Mitigation Strategy

Class 4 (severe)	63	1455	Severe beach erosion and recession	Recovery seldom total	Severe dune erosion or destruction	Where beach is narrow	Losses of structures at community level
Class 5 (extreme)	96	4548	Extreme beach erosion (up to 50 meters in places)	Permanent & clearly noticeable changes	Dunes destroyed over extensive areas	Wide-spread	Extensive regional scale (millions of dollars)

### Location and Impact

These types of Nor'easters are uncommon in Florida, but when they do occur they can cause exceptional damages to our local beaches and sustained winds can cause minor structural damage to all manner of properties, be it commercial, residential, or publicly owned. These storms can also produce very heavy rains. Flagler Beach, Beverly Beach and the Town of Marineland are most susceptible to the damaging effects of nor'easter events as they are beach communities.

### Historical Occurrences

The last major Nor'easter occurred in 1996 and destroyed 700 feet of the pier and caused a 6 feet storm surge. Flagler County coastline due to its position on the upper east coast of Florida is vulnerable to Nor'easters.

### Probability of Future Occurrences and Vulnerability

Flagler Beach, Beverly Beach, and Marineland have a low or less than 25% chance. This threat will occur at least once every five years or more. While the remaining areas of the County will experience the weather associated with nor'easters, it does not pose serious threat.

## *TSUNAMI*

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### **Description and Extent**

A tsunami is a series of long waves on the ocean generated by sudden displacement of a large volume of water, usually due to an underwater earthquake, landslides, or volcanic eruptions. Tsunamis have been recorded in various places around the globe, including Florida. Two tsunami events have been noted in the past. One generated by the Charleston, SC earthquake of 1886 was recorded in Jacksonville and may have affected points further south. Another larger tsunami may have affected the entire east coast was generated by the great Lisbon Quake in 1655 off the coast of Portugal. This wave was recorded from Nova Scotia to Havana. No settlements or reliable records existed in Florida at the time; therefore, no documentation exists locally for this event. Another possible source for tsunami activity is the Puerto Rican trench which computer modeling shows tsunamis generated from the trench can reach the Florida coast. These giant waves can greatly affect low-lying coastal areas by inundating mass areas of land.

- This criteria is based on Tsunami magnitude (*m*) proposed by Iida (1958) as summarized in Horikawa (1978)

$$m = 2.61 M - 18.44$$

**m** : Tsunami magnitude

**M** : Earthquake magnitude

<b>Tsunami magnitude <i>m</i></b>	<b>Tsunami height <i>H</i></b>	<b>Damage</b>
-1	50 cm	None
0	1 m	Very small damage
1	2	Coastal and ship damage
2	4 ~ 6	Damage and lives lost in certain landward areas
3	10 ~ 20	Considerable damage along more than 400 km of coastline
4	30	Considerable damage along more than 500 km of coastline

*Source: Horikawa (1978)*

### **Location and Impact**

Flagler County is not in immediate danger of a tsunami; however scientists in England have studied the effects of a potential tsunami in the Atlantic Ocean caused by the possible eruption of a volcano in the Canary Islands that would lead to part of the mountain falling into the ocean. These natural hazards are not common in the Atlantic Ocean but have happened in the Pacific Ocean in past decades. The impact would affect all manner of structures from residential to publicly owned property.

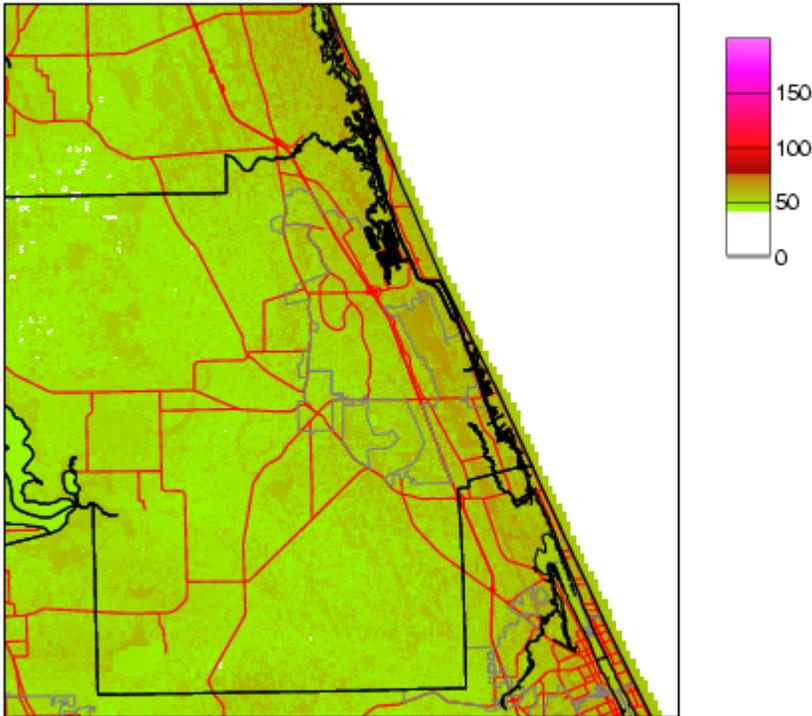
### **Historical Occurrences and Probability of Future Occurrences**

The KAC Tsunami Risk report dated May 15, 2005, states due to unreliable historical records and few publications the tsunami threat in Florida is difficult to assess. Their opinion suggests a tsunami event would be a 1 in 500 year event. Therefore, tsunami events are so rare they are not completely profiled because there is a lack of data to provide extent.

### **G. Multi Hazard Maps**

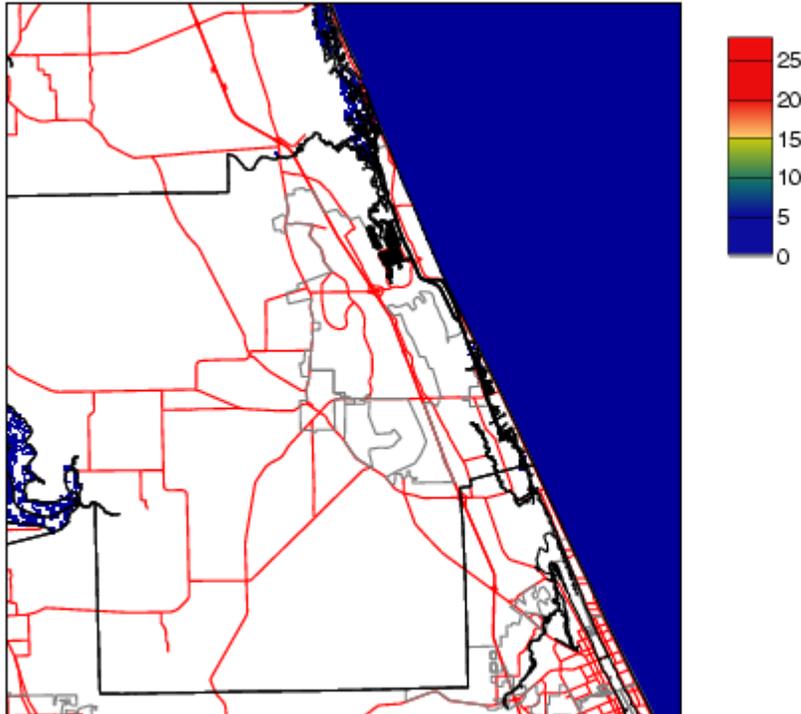
The attached maps outline areas of hazard vulnerability in the County and its municipalities. These maps are currently being updated to reflect new and current information on hazard vulnerability areas. The maps are replaced with better quality more detailed maps with a larger amount of information.

# 10 Year Tropical Events Hazards for Flagler



Wind speed in miles per hour.  
Offshore data masked at -100 ft.

# 10 YEAR TROPICAL EVENTS HAZARDS FOR FLAGLER



Water Depth in Feet.  
Offshore data masked at -100 ft.

## 10 Year Event Water Depth

### Impact Summary

Peak winds 65.mph, peak water depth 2.5ft.

### 10 Year EventDamage Summary:

Tax Parcel based Wind Damage: \$ 10.97 Million

DOR based Flood Damage: \$ 0.00 dollars

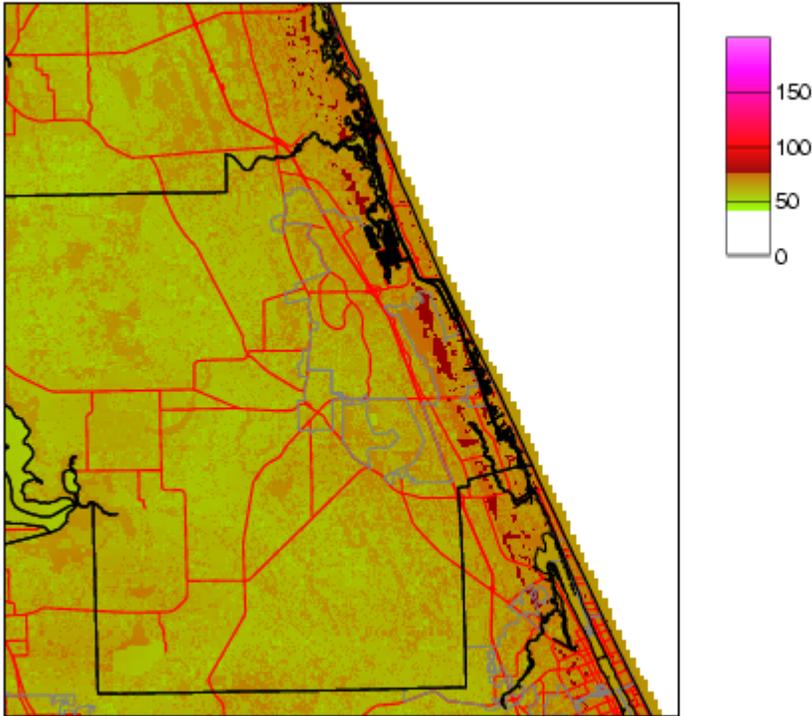
DOR Structures in Flood Zone: 0

Census based Wind Damage: \$ 13.39 Million

Census based Flood .Damage: \$ 0.00 dollars

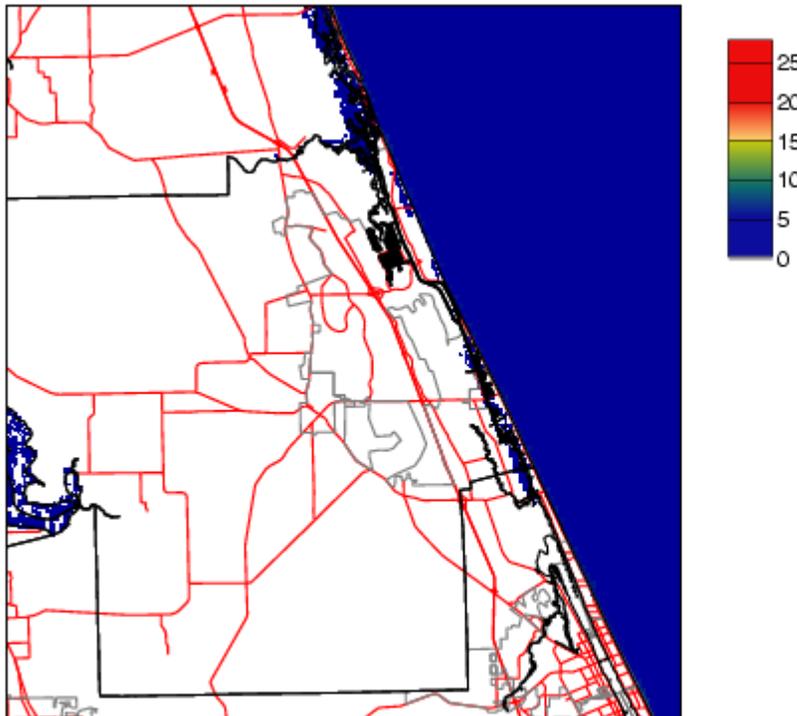
Uninhabitable Housing Units: 3 0.0% of total HU.

# 25 Year Tropical Events Hazards for Flagler



Wind speed in miles per hour.  
Offshore data masked at -100 ft.

# 25 YEAR TROPICAL EVENTS HAZARDS FOR FLAGLER



Water Depth in Feet.  
Offshore data masked at -100 ft.

## 25 Year Event Water Depth

### Impact Summary

Peak winds 79.mph, peak water depth 4.1ft.

### 25 Year EventDamage Summary:

Tax Parcel based Wind Damage: \$ 62.64 Million

DOR based Flood Damage: \$ 4.92 Million

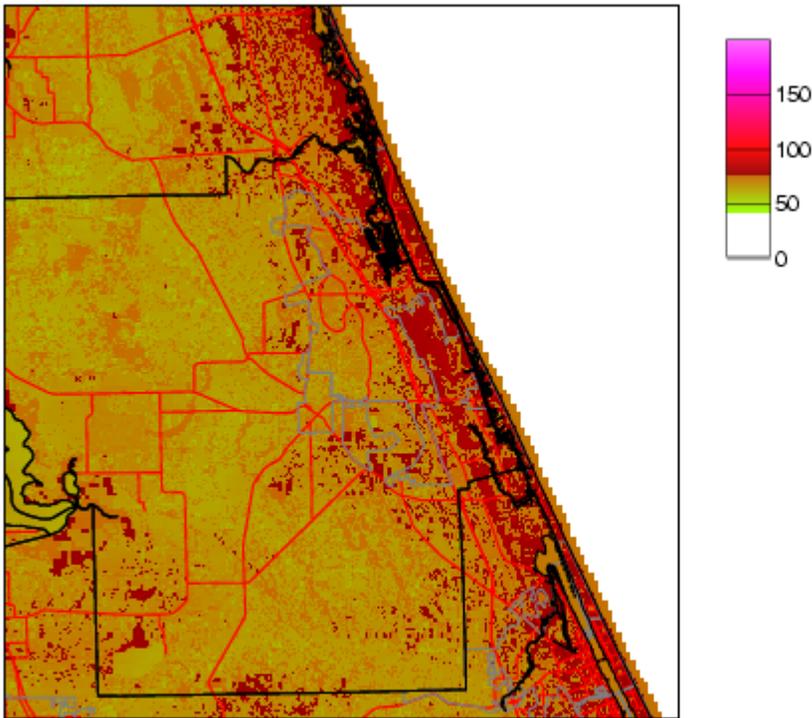
DOR Structures in Flood Zone: 250

Census based Wind Damage: \$ 66.14 Million

Census based Flood .Damage: \$ 0.00 dollars

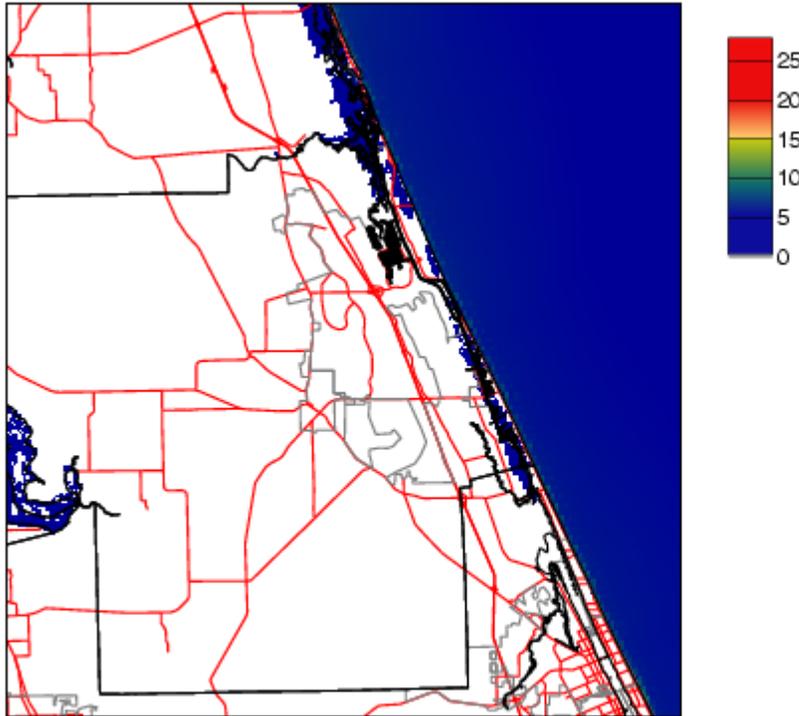
Uninhabitable Housing Units: 34 0.1% of total HU.

# 50 Year Tropical Events Hazards for Flagler



Wind speed in miles per hour.  
Offshore data masked at -100 ft.

50 YEAR TROPICAL EVENTS HAZARDS FOR FLAGLER



Water Depth in Feet.  
Offshore data masked at -100 ft.

50 Year Event Water Depth

**Impact Summary**

Peak winds 89.mph, peak water depth 5.5ft.

**50 Year EventDamage Summary:**

Tax Parcel based Wind Damage: \$ 142.04 Million

DOR based Flood Damage: \$ 13.71 Million

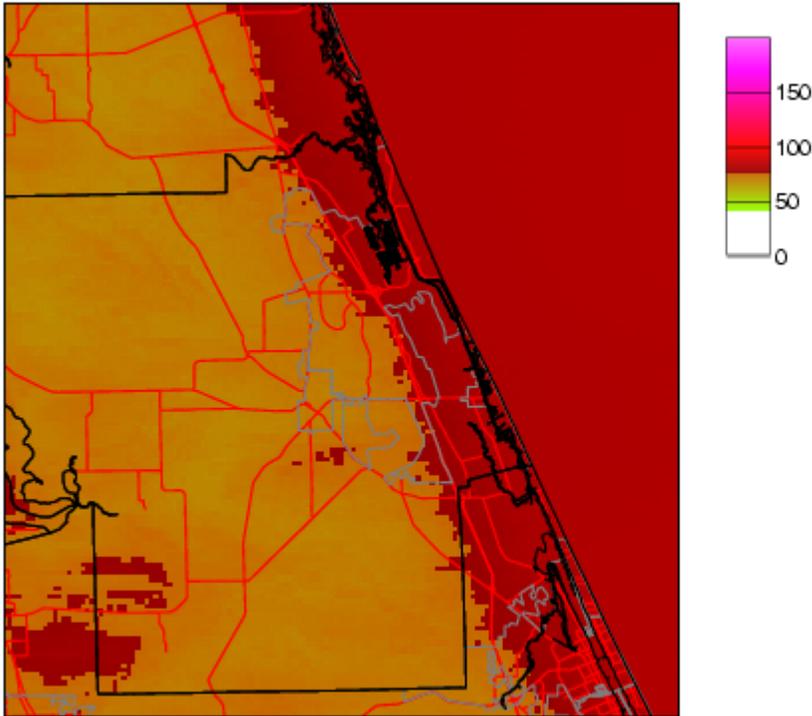
DOR Structures in Flood Zone: 569

Census based Wind Damage: \$ 145.07 Million

Census based Flood .Damage: \$ 0.00 dollars

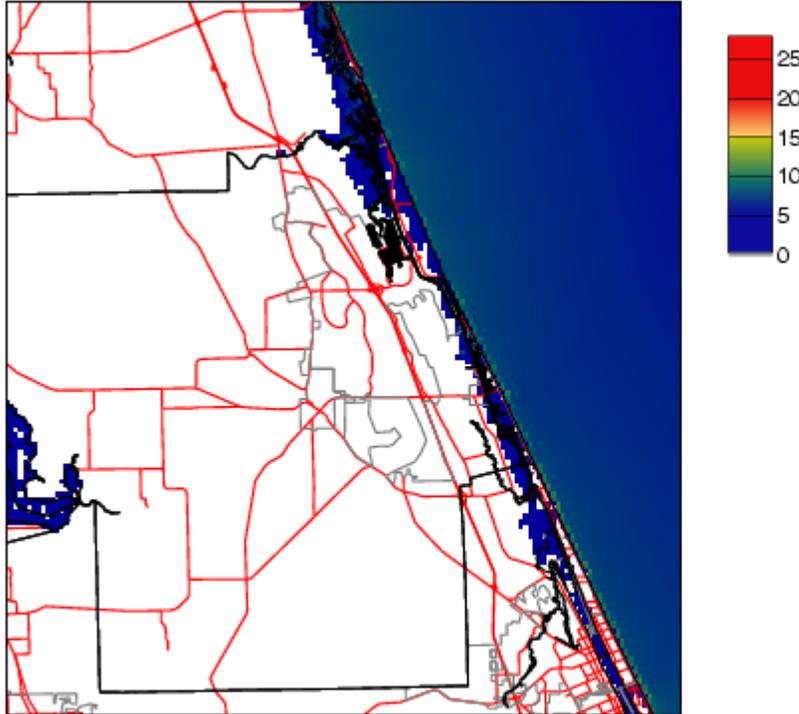
Uninhabitable Housing Units: 89 0.4% of total HU.

# 100 Year Tropical Events Hazards for Flagler



Wind speed in miles per hour.  
Offshore data masked at -100 ft.

100 YEAR TROPICAL EVENTS HAZARDS FOR FLAGLER



Water Depth in Feet.  
Offshore data masked at -100 ft.

100 Year Event Water Depth

**Impact Summary**

Peak winds 85.mph, peak water depth 6.9ft.

**100 Year EventDamage Summary:**

Tax Parcel based Wind Damage: \$ 207.18 Million

DOR based Flood Damage: \$ 50.61 Million

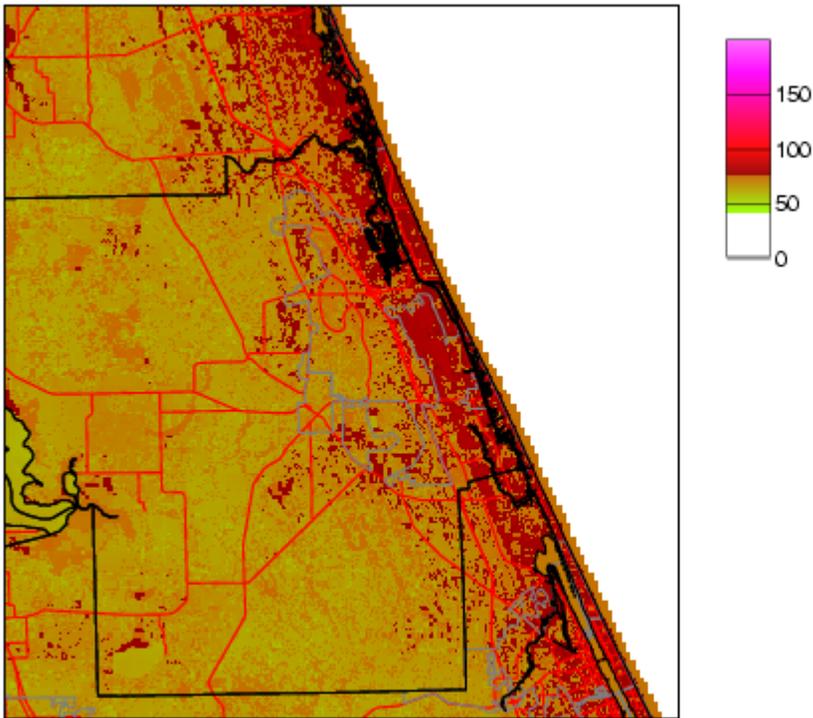
DOR Structures in Flood Zone: 1896

Census based Wind Damage: \$ 194.74 Million

Census based Flood .Damage: \$ 27.03 Million

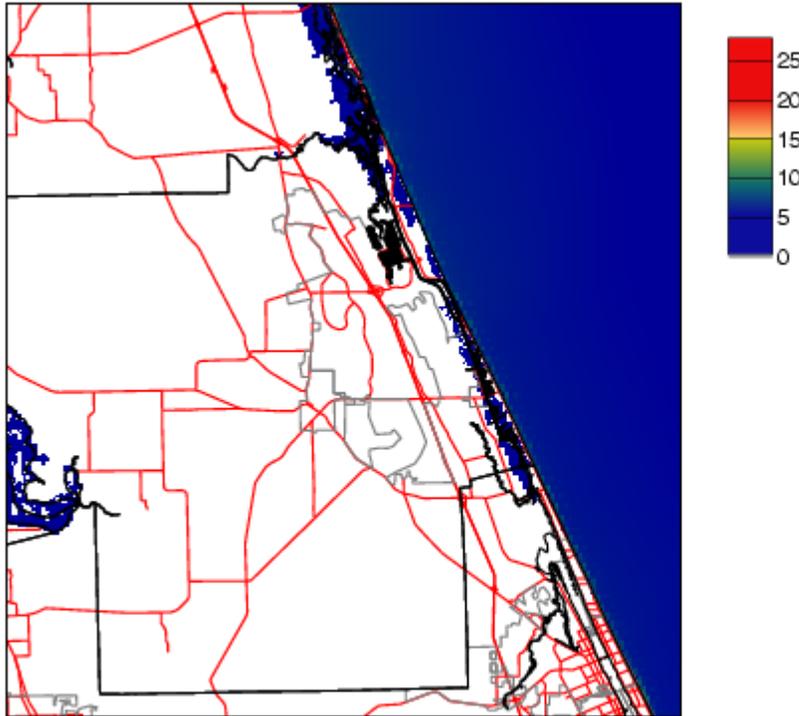
Uninhabitable Housing Units: 129 0.5% of total HU.

# Category 1 Hurricanes Hazards for Flagler



Wind speed in miles per hour.  
Offshore data masked at -100 ft.

CATEGORY 1 HURRICANES HAZARDS FOR FLAGLER



Water Depth in Feet.  
Offshore data masked at -100 ft.

Category 1 MaximaWater Depth

**Impact Summary**

Peak winds 90.mph, peak water depth 5.6ft.

**Category 1 MaximaDamage Summary:**

Tax Parcel based Wind Damage: \$ 155.92 Million

DOR based Flood Damage: \$ 16.62 Million

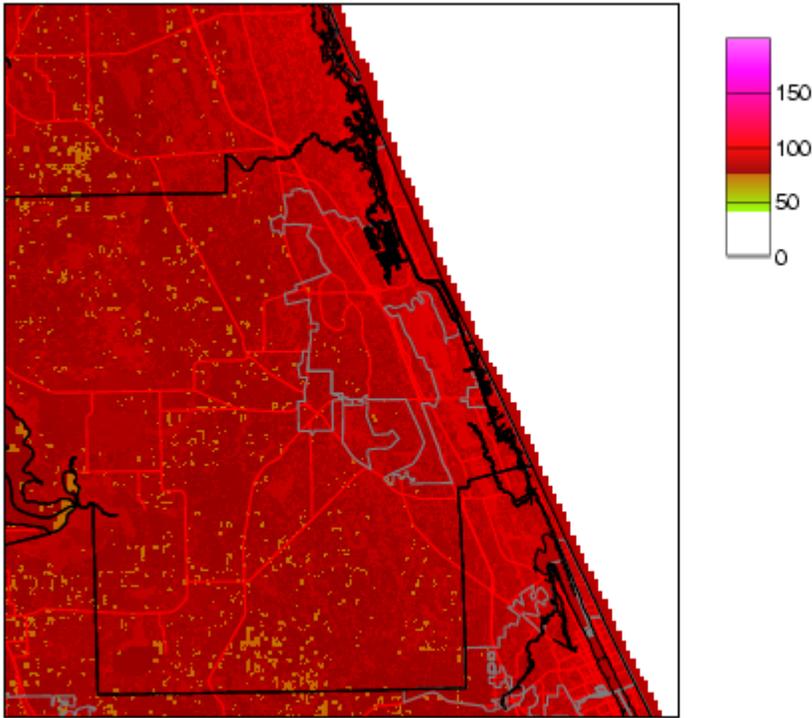
DOR Structures in Flood Zone: 674

Census based Wind Damage: \$ 158.16 Million

Census based Flood .Damage: \$ 93.58 Thousand

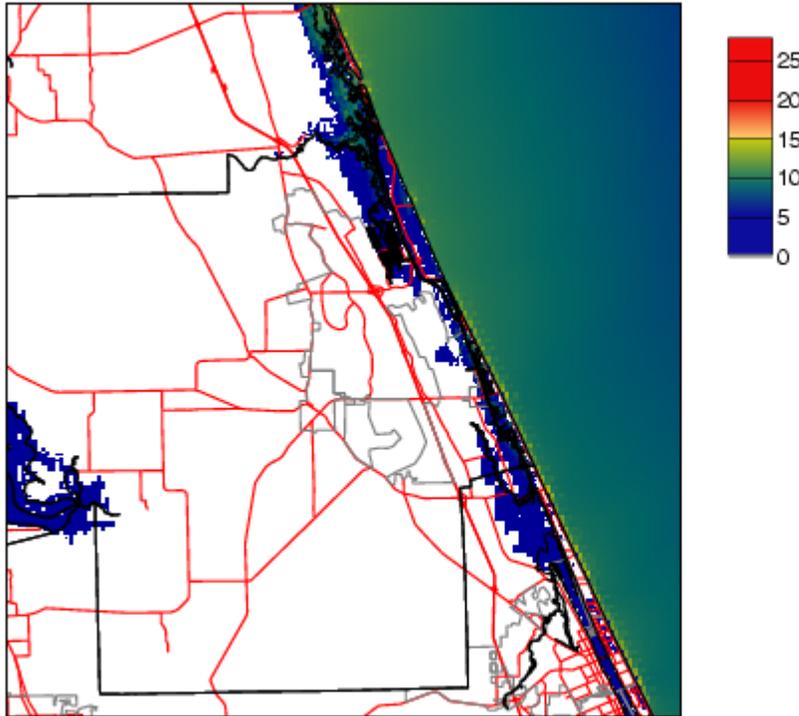
Uninhabitable Housing Units: 98 0.4% of total HU.

# Category 2 Hurricanes Hazards for Flagler



Wind speed in miles per hour.  
Offshore data masked at -100 ft.

CATEGORY 2 HURRICANES HAZARDS FOR FLAGLER



Water Depth in Feet.  
Offshore data masked at -100 ft.

Category 2 MaximaWater Depth

**Impact Summary**

Peak winds 111.mph, peak water depth 9.1ft.

**Category 2 MaximaDamage Summary:**

Tax Parcel based Wind Damage: \$ 527.24 Million

DOR based Flood Damage: \$ 145.05 Million

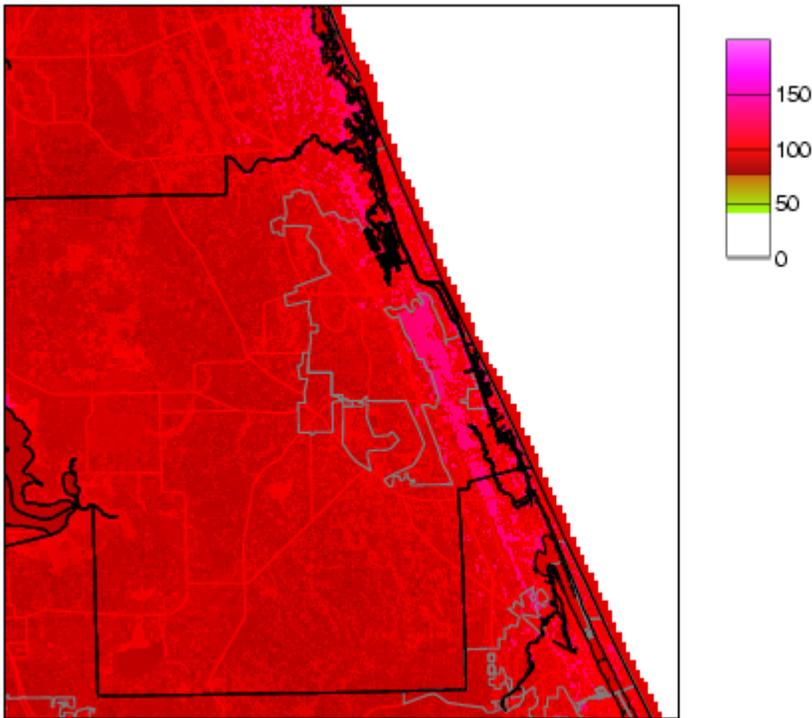
DOR Structures in Flood Zone: 3117

Census based Wind Damage: \$ 516.41 Million

Census based Flood .Damage: \$ 49.08 Million

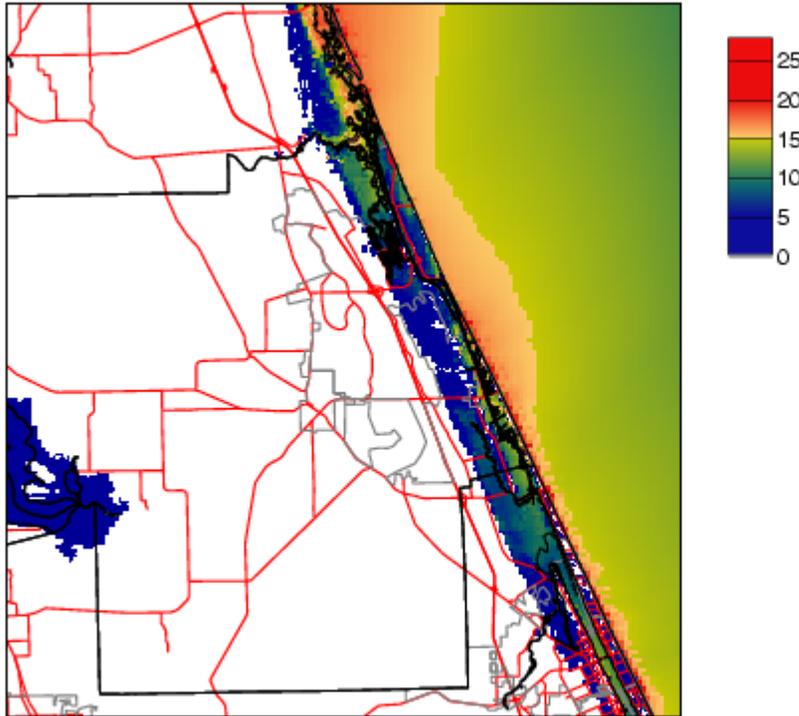
Uninhabitable Housing Units: 369 1.5% of total HU.

# Category 3 Hurricanes Hazards for Flagler



Wind speed in miles per hour.  
Offshore data masked at -100 ft.

CATEGORY 3 HURRICANES HAZARDS FOR FLAGLER



Water Depth in Feet.  
Offshore data masked at -100 ft.

Category 3 MaximaWater Depth

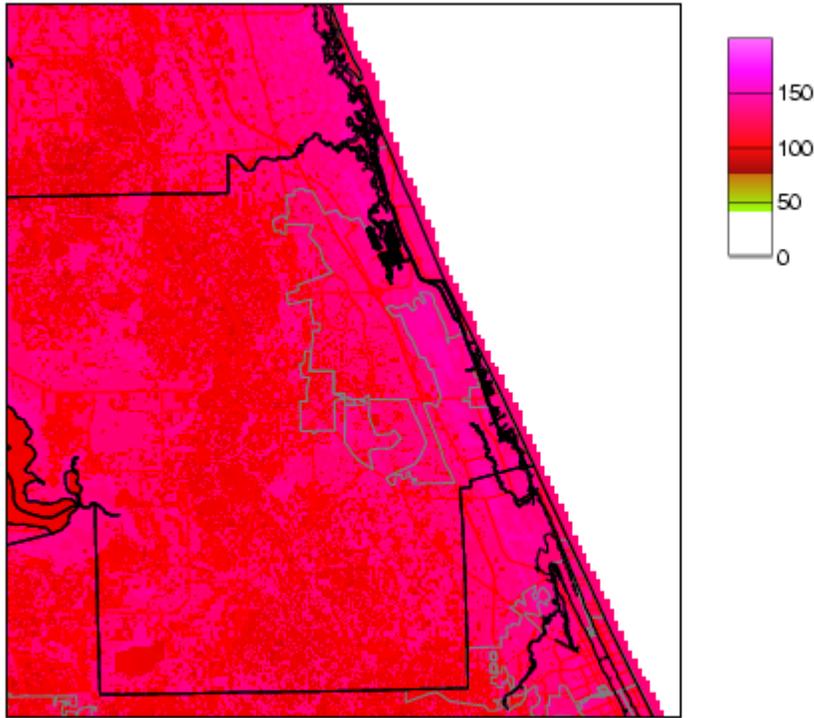
**Impact Summary**

Peak winds 134.mph, peak water depth 16.3ft.

**Category 3 MaximaDamage Summary:**

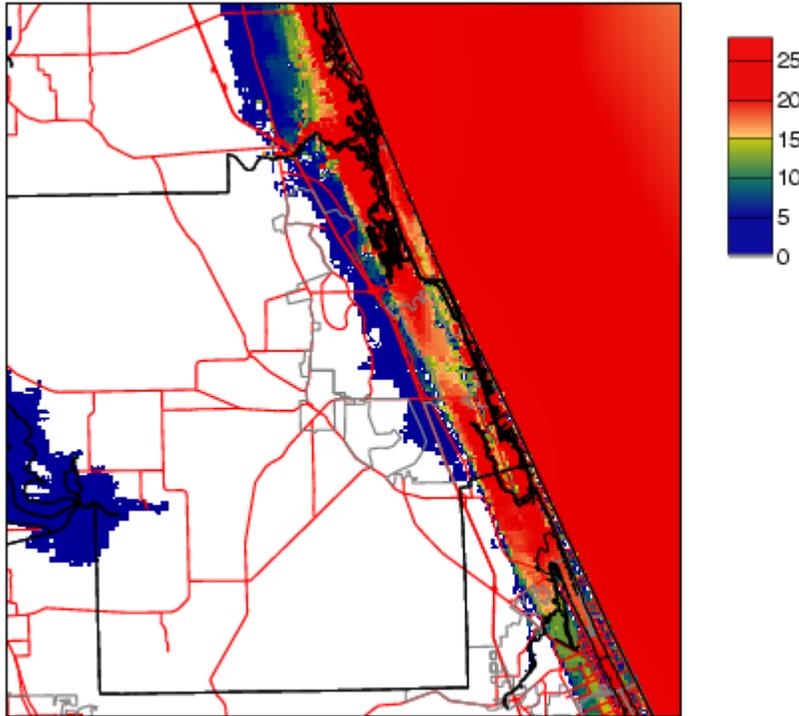
Tax Parcel based Wind Damage: \$ 1.32 Billion  
DOR based Flood Damage: \$ 692.91 Million  
DOR Structures in Flood Zone: 6397  
Census based Wind Damage: \$ 1.26 Billion  
Census based Flood .Damage: \$ 481.57 Million  
Uninhabitable Housing Units: 930 3.8% of total HU.

# 4 Hurricanes Hazards for Flagler



Wind speed in miles per hour.  
Offshore data masked at -100 ft.

CATEGORY 4 HURRICANES HAZARDS FOR FLAGLER



Water Depth in Feet.  
Offshore data masked at -100 ft.

Category 4 MaximaWater Depth

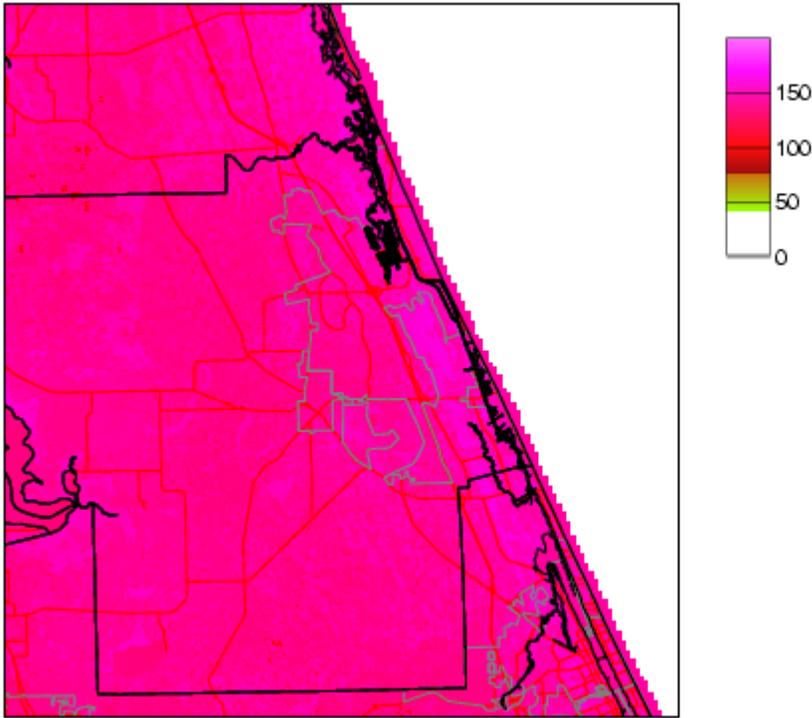
**Impact Summary**

Peak winds 161.mph, peak water depth 24.9ft.

**Category 4 MaximaDamage Summary:**

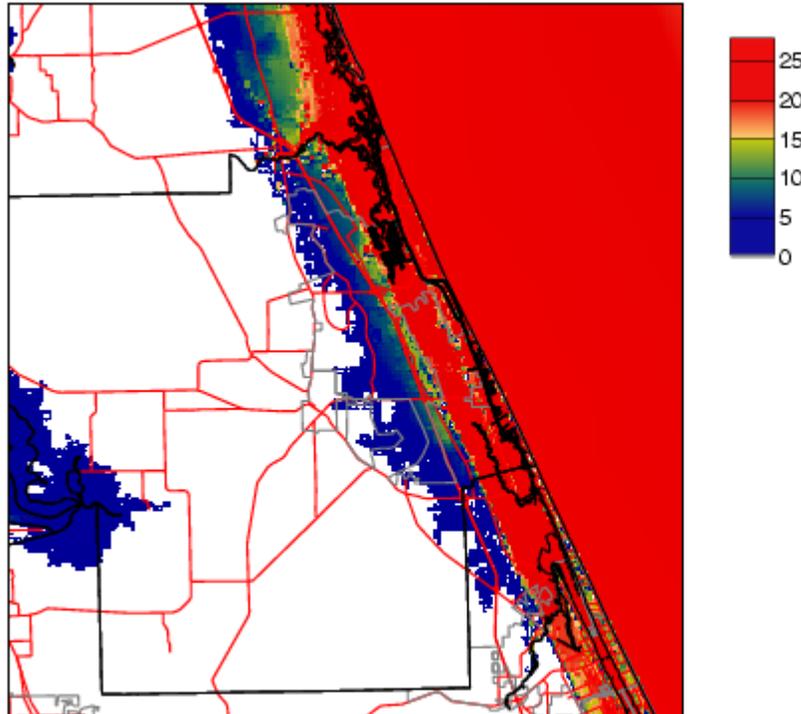
- Tax Parcel based Wind Damage: \$ 3.05 Billion
- DOR based Flood Damage: \$ 2.56 Billion
- DOR Structures in Flood Zone: 12513
- Census based Wind Damage: \$ 2.88 Billion
- Census based Flood .Damage: \$ 1.20 Billion
- Uninhabitable Housing Units: 2167 8.9% of total HU.

# Category 5 Hurricanes Hazards for Flagler



Wind speed in miles per hour.  
Offshore data masked at -100 ft.

CATEGORY 5 HURRICANES HAZARDS FOR FLAGLER



Water Depth in Feet.  
Offshore data masked at -100 ft.

Category 5 MaximaWater Depth

**Impact Summary**

Peak winds 189.mph, peak water depth 31.1ft.

**Category 5 MaximaDamage Summary:**

Tax Parcel based Wind Damage: \$ 5.67 Billion

DOR based Flood Damage: \$ 3.48 Billion

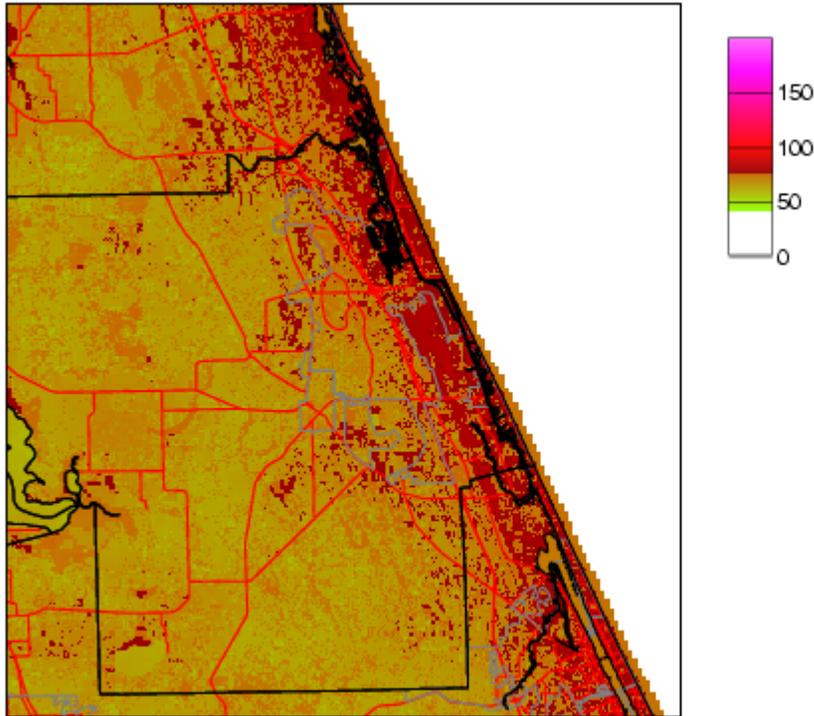
DOR Structures in Flood Zone: 15587

Census based Wind Damage: \$ 5.12 Billion

Census based Flood .Damage: \$ 1.38 Billion

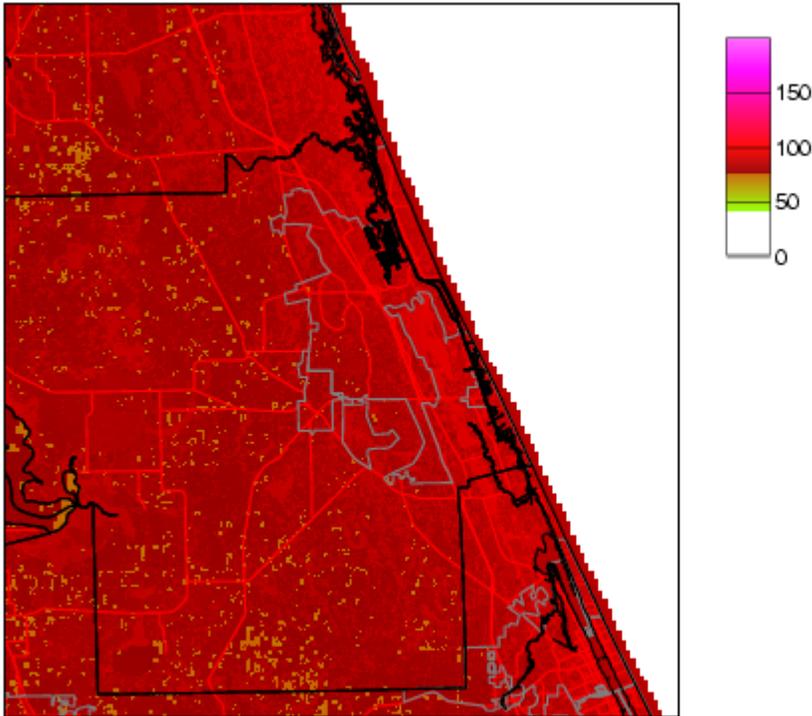
Uninhabitable Housing Units: 4003 16.4% of total HU.

A natural hazards risk assessment to support local mitigation strategies in Florida Category 1 Hurricanes for Flagler County



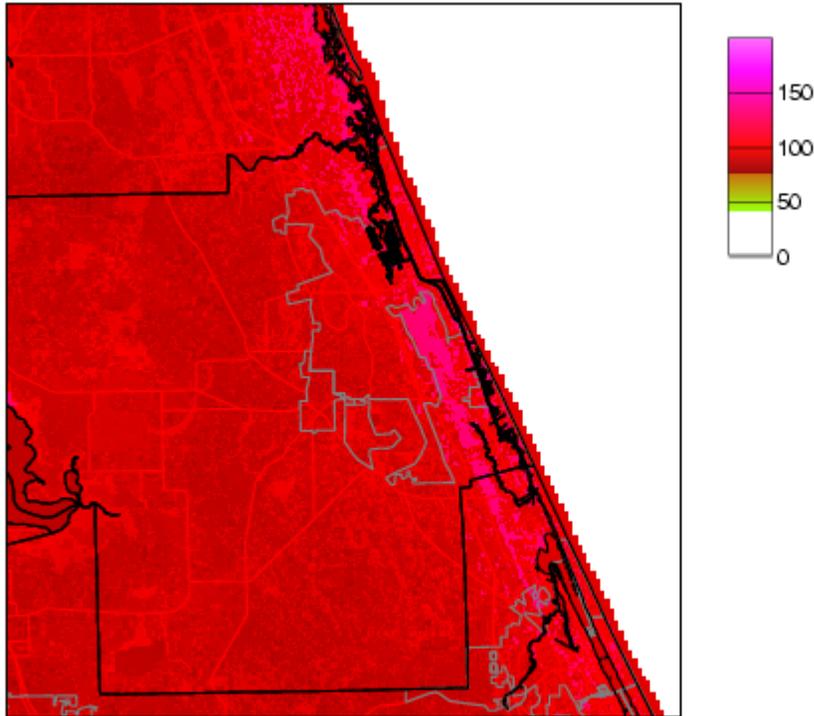
Wind speed in miles per hour.  
Offshore data masked at -100 ft.

A natural hazards risk assessment to support local mitigation strategies in Florida Category 2 Hurricanes for Flagler County



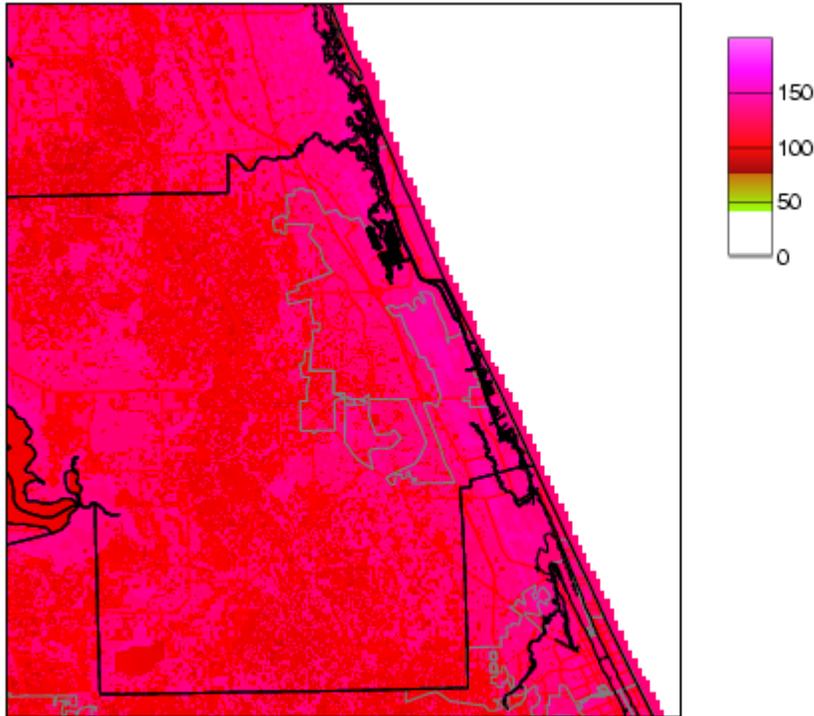
Wind speed in miles per hour.  
Offshore data masked at -100 ft.

A natural hazards risk assessment to support local mitigation strategies in Florida Category 3 Hurricanes for Flagler County



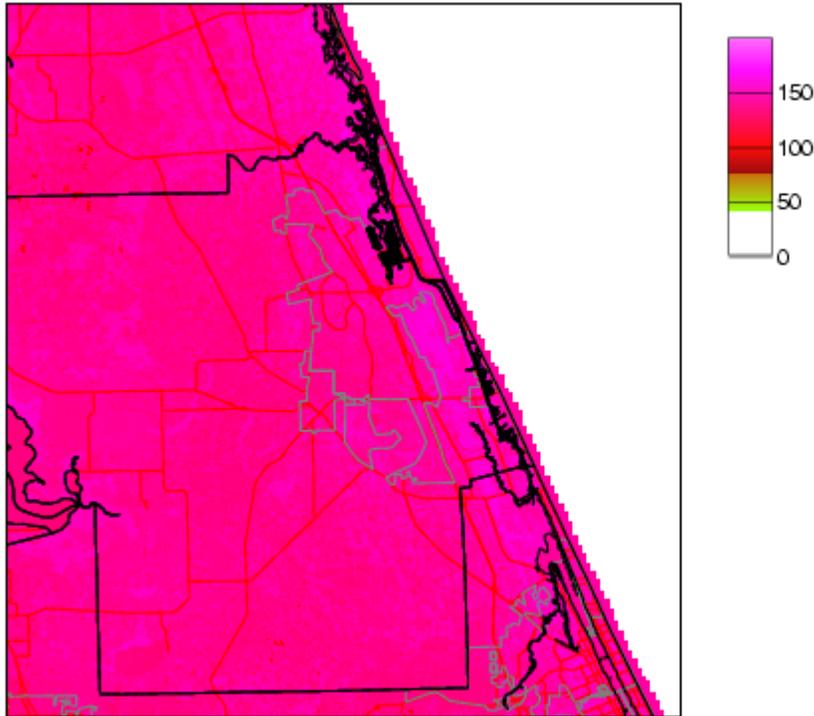
Wind speed in miles per hour.  
Offshore data masked at -100 ft.

A natural hazards risk assessment to support local mitigation strategies in Florida Category 4 Hurricanes for Flagler County



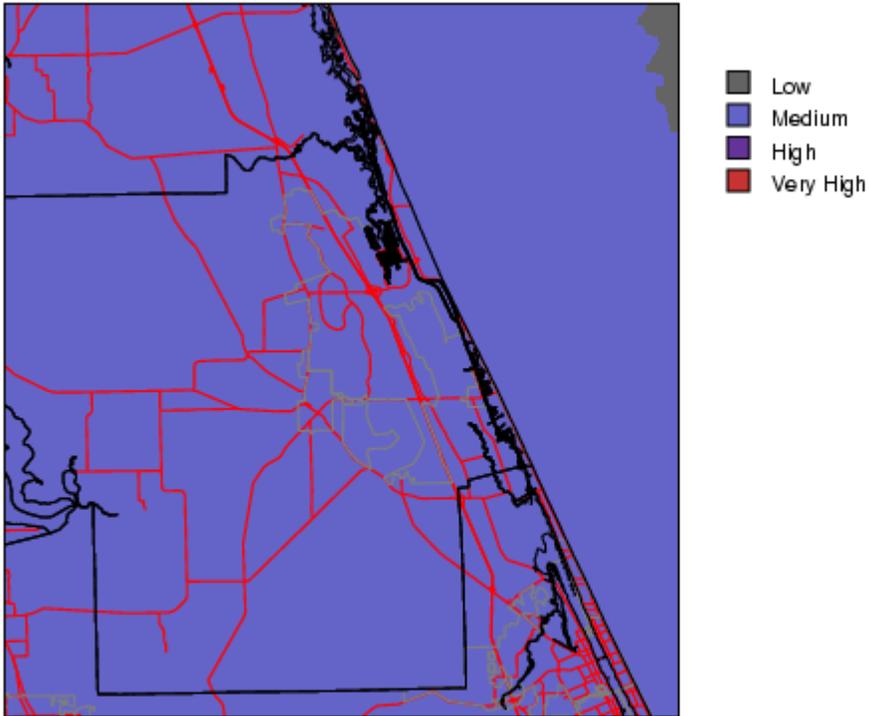
Wind speed in miles per hour.  
Offshore data masked at -100 ft.

A natural hazards risk assessment to support local mitigation strategies in Florida Category 5 Hurricanes for Flagler County

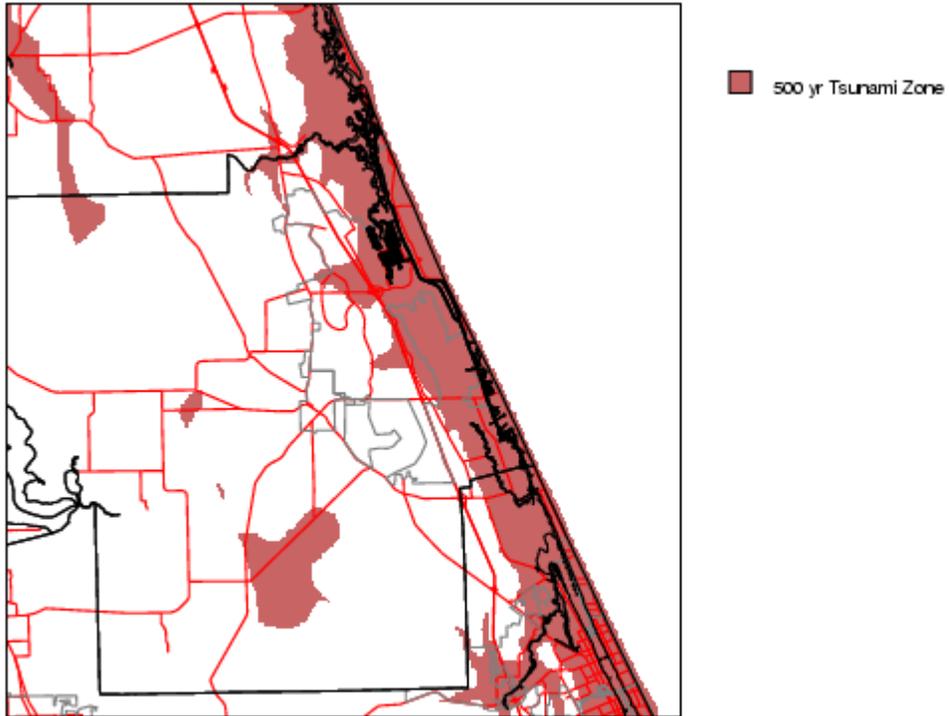


Wind speed in miles per hour.  
Offshore data masked at -100 ft.

A natural hazards risk assessment to support local mitigation strategies in Florida KAC Tornado Risks for Flagler County



A natural hazards risk assessment to support local mitigation strategies in Florida KAC Tsunami Risks for Flagler County



**Section IV – Vulnerability and Estimated Losses**

**A. Vulnerability Assessments**

The Flagler County Work Group conducted numerous vulnerability assessments during the planning period. These assessments build on the identification of hazards in the community and the risk these hazards pose to the community. The vulnerability assessment process examines more specifically how the facilities, systems, and neighborhoods of Flagler County would be damaged or disrupted by the hazard events identified.

The vulnerability assessment process for the LMS Work Group begins with profiling the communities of Flagler County and examining specific characteristics contributing to the vulnerability of the structures, people, and functioning specific to that component of the community. The assessment conducted by the Work Group includes determining the potential cost of property damage as a measure of vulnerability.

This section assesses the jurisdictions for the presence of critical facilities, which are structures whose function is critical to the safety and welfare of the community. The presence of critical facilities in a jurisdiction increases the importance of mitigating the potential for future disaster impacts in such areas. This section also includes identification of any repetitive loss properties located in the jurisdictions assessed.

**B. Critical Facilities Inventory**

Critical Facilities are defined as those structures from which essential services and functions for victim survival, continuation of public safety actions, and disaster recovery are performed or provided. Supporting lifeline infrastructures essential to the mission of critical facilities must also be included, when appropriate. For the purposes of this document, Flagler County has identified those critical facilities with the potential of being affected by natural disasters. Such facilities include the following:

- Hospitals, nursing homes, and assisted living facilities likely to contain occupants who may not be sufficiently mobile to avoid death or injury during a natural disaster such as floods and high winds.
- Law Enforcement offices, fire stations, emergency medical services facilities, vehicle and equipment storage facilities, and emergency operations centers needed for emergency response activities before, during, and after a natural disaster;
- Buildings designated as shelters

- Public and private utility facilities vital to maintaining or restoring normal services to affected areas before, during, and after a natural disaster;
- Structures or facilities producing, using, or storing highly volatile, flammable, explosive, toxic, and/or water-reactive materials classified as extremely hazardous materials under the Sara Title III, Community Right to Know Act.
- Communications facilities

Initiatives designed to protect critical facilities shall be aimed at:

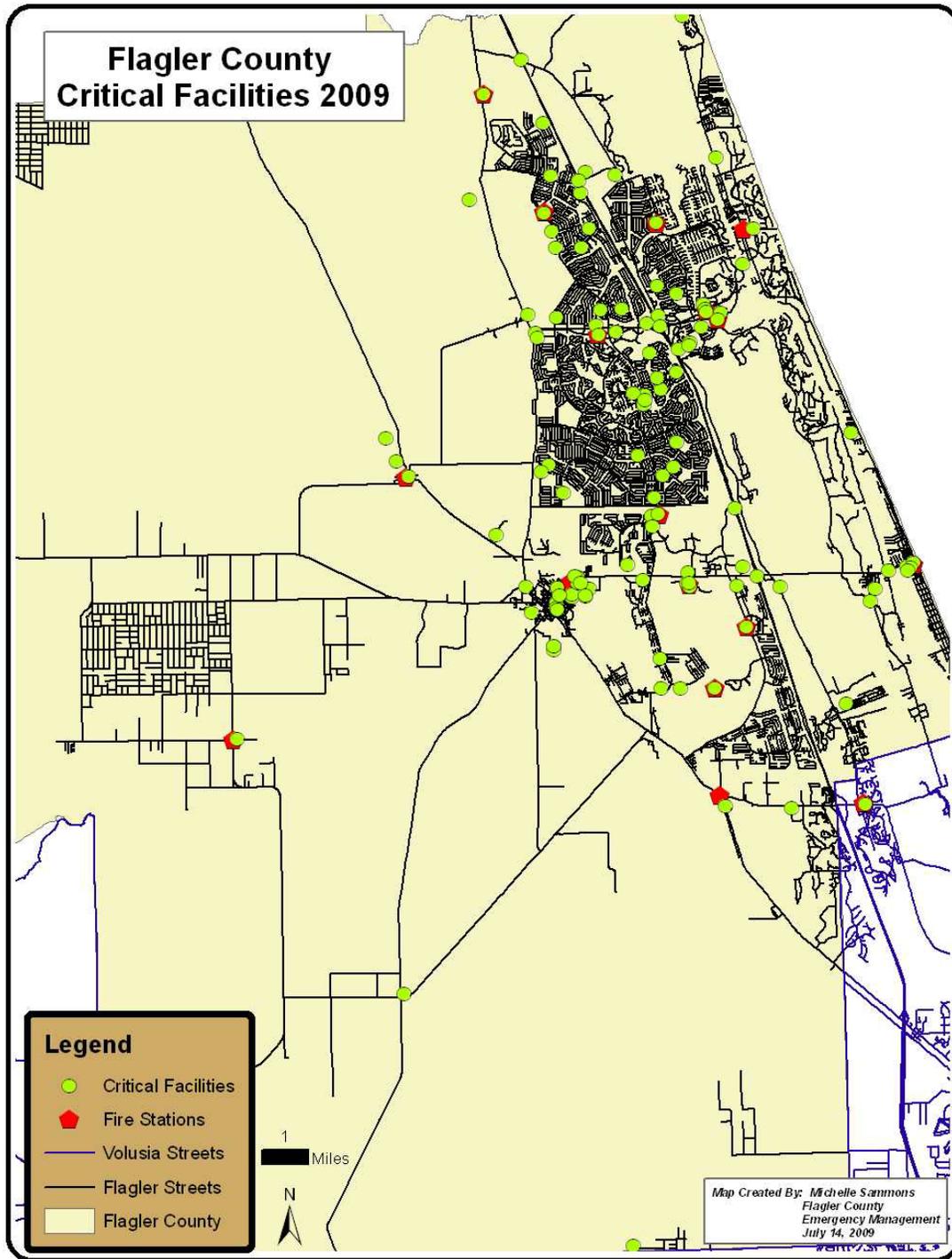
- Reducing the potential for damage to vital public facilities;
- Reducing the potential for pollution of flood waters by hazardous materials;
- Ensuring the facilities is operable during most natural disaster emergencies.

A hazardous material is any substance, if released into the environment, would have a harmful and sometimes fatal effect on persons, plants, and animals coming into contact with it. Commercial industry present in Flagler County stores and utilizes materials such as ammonia, petroleum distillates, chlorine and pesticides on a daily basis. Hazardous materials are transported to and through the County by rail, highway, and air. Any time a hazardous material is utilized in any manner there is a chance of release, which could endanger human life or the environment.

Hazardous materials include highly flammable fuels, herbicides/pesticides, petroleum and related products, natural gas, and chemicals. Transportation of hazardous materials on Interstate 95, Highway 100, US 1 Highway, through the air, by water barge on the Intracoastal Waterway, and over the Florida East Coast Railway systems is well mapped by Emergency Management in Flagler County. Specific hazards analysis and planning can be found in the Response Plan.

There are a small number of 302 facilities (fifteen) within Flagler County who use Extremely Hazardous Substances (EHS). Chlorine and Ammonia are the most prevalent chemicals reported. Kanthal Industries, (approximately 120 employees) utilizes phenol on property. In any case, there are over 3,000 hazardous chemicals licensed for transport by the US Department of Transportation, many of which would have a disastrous effect if released in an accident. In fact, one of the most difficult problems encountered in the management of a hazardous material accident scene is the identification of the product(s) involved. See appendix for critical facilities list.

TABLE 3  
Critical Facilities  
Map



**C. Repetitive Loss Properties**

Another indication of the hazards threatening the county is the frequency which properties are repeatedly damaged by disaster events. These properties, which may be buildings, roads, utilities, or similar construction, are termed “repetitive loss properties.” Properties can fall into this classification based on repeated damages from a variety of hazards, and the repetitive loss areas identified in Flagler County are as follows:

- Flagler Beach Pier
- A1A from S. 12<sup>th</sup> St. to S. 23<sup>rd</sup> St.
- Roads and parcels in Marineland Acres
- Parcels near Dead Lake
- Roadway and properties along Water Oak Blvd.
- Roadways and properties near Haw Creek

A specific category of repetitive loss properties is those insured under the National Flood Insurance Program (NFIP), and have had repeated claims for flood loss damages. There are 20 properties in Flagler County classified as repetitive loss properties, 18 of those are single family homes, with one multi or 2-4 family home, and one property is a condominium building. The following chart shows the repetitive losses in dollars as reported to NFIP in Flagler County:

<b>JURISDICTION</b>	<b>18-Single Family Loss</b>	<b>1-Multi-Family Loss</b>	<b>1-Commercial Loss</b>	<b>TOTAL LOSS REPORTED</b>
Unincorporated Flagler	\$168,971.64	\$0	\$0	\$168,971.64
Flagler Beach	\$331,523.34	\$0	\$37,044.21	\$368,567.55
Palm Coast	\$32,768.81	\$10,875.34	\$0	\$43,644.15
Bunnell	\$274,467.86	\$0	\$0	\$274,467.86
Beverly Beach	\$6,288.28	\$0	\$0	\$6,288.28
<b>TOTAL REPETITIVE LOSS</b>	<b>\$814,019.93</b>	<b>\$10,875.34</b>	<b>\$37,044.21</b>	<b>\$861,939.48</b>

**D. Future Buildings in Hazard Areas**

There are several proposed or approved Master Planning Unit Developments (MPUDs) and Development of Regional Impact (DRIs) in the evacuation zones. The remainder of the hazards affects the entire County, only agricultural lands, or very small areas. All new construction is subject to the State of Florida Building Code, requiring wind code upgrades and flood plain mitigation. Flagler County Land Development Code currently has no specific provisions related to evacuation zones. However, as part of the typical review process for new development, the Emergency Management Department may provide additional mitigation measures warranted due to evacuation clearance, shelter deficiencies, and other considerations under the specific purview of Emergency Management and outside the scope of the Land Development Code.

## Flagler County Local Mitigation Strategy

### New Construction in Evacuation Zones:

NAME	ORDINANCE Number	# of Units & Type	Square Footage (living area per unit unless otherwise noted)	Planned Completion Date	Location
<b>Arbor Trace at Palm Harbor</b>	2000-58	Residential - 57 condo units	1,100 sq. ft.	3 years (completed)	Lying north of Palm Coast Pkwy, west of Old Kings Rd, & east of Florida Park Drive
<b>Arbor Trace II at Palm Harbor</b> (a/d/a Arbor Trace II at Palm Coast PUD)	2003-04	Residential - 50 condo units	1,100 sq. ft.	Commence construction within 1 year of approval (completed)	North of Palm Coast Pkwy, west of Old Kings Rd, and east of Florida Park Drive
<b>Colbert Landings (Phase I Residential)</b>	2005-22	Residential - 250 single-family	Minimum Lot Size: 6,600 sq. ft. (unit sq. ft. not noted)	Within 12 months of approval, must submit Preliminary Plat or Site Plan application. A 12-month extension may be granted. No other time requirement provided.	NW corner of SR 100 East and Colbert Lane
<b>European Village</b>	2002-04	Mixed Use: <u>Residential</u> - 95 units (townhouse style);  <u>Nonresidential</u> - 35 specialty shops	<u>Residential sq. ft.:</u> Minimum = 650 Maximum = 3,000 <u>Specialty shops sq. ft.:</u> Maximum = 1,000	Construction of project must begin within 2 years of PUD approval and completed within 5 years. Completed.	West of Intracoastal Waterway (ICW) and Palm Harbor Pkwy, and adjacent to Hammock Dunes Bridge
<b>Grand Haven</b>	2003-30	Mixed Use: <u>Residential</u> – 1,901 units (single-family attached & detached; condominiums / multifamily); <u>Nonresidential</u> - 85,000 sf	Minimum Lot Size: <u>Single-family detached</u> – 6,000 sq. ft.  <u>Single-family attached</u> –	Final preliminary plat or development plan no later than 10/31/07.	West of ICW, and adjacent to east and west sides of Colbert Lane

**Flagler County  
Local Mitigation Strategy**

			Not noted.		
<b>Hammock Beach Golf Country Club</b>	2004-16	Mixed Use: <u>Residential</u> - 340 single-family detached  <u>Nonresidential</u> - 20 acres	Minimum Lot Size: 6,000 sq. ft.	15 years or as long as the Project is ongoing, whichever is longer.	Lying east of Old Kings Road and north of Forest Grove Drive
<b>Harborside Inn and Marina</b>	2005-18 & 2007-24	Mixed Use: 209 hotel condominium units Commercial 84-slip Marina with ship store & fueling facility	Not provided.	5 years with possible extensions in increments of 2 years each.	NE c/o of Club House Drive and Palm Harbor Pkwy (north of Hammock Dunes Bridge)
<b>Hidden Lakes</b>	2004-04	Residential - 580 single-family detached	Minimum Lot Size: 6,000 sq. ft.	Preliminary Plat or Site Plan submitted within 10 years of approval.	Adjacent to East side of Old Kings Road
<b>JX Properties</b>	2006-11 (1 <sup>st</sup> minor modification recorded in OR Book 1627, Pgs 428-431) (2 <sup>nd</sup> minor modification recorded in OR Book 1668, Pgs 813-816)	Mixed Use:  Residential – 2,411 <u>Single-family</u> - 773 <u>Multifamily</u> – 1,638  Commercial/School/Parks	<u>Single-family</u> : 1,200 sf  <u>Multi-family</u> : 650 sf	Within 24 months of approval, submit preliminary plat approval for Tract Q (wetlands). No other time requirement provided.	NE section of SR 100 East and Old Kings Road
<b>Marina Cove</b>	Flagler County Ord. # 84-13 adopted the PUD prior to	Residential: 110 townhouse units with noncommercial marina.	Minimum – 800 sq. ft.	Not provided in document; however, project is completed.	East of Palm Harbor Pkwy, north of Hammock Dunes Bridge, and adjacent to ICW

**Flagler County  
Local Mitigation Strategy**

	the adoption of zoning, which was done in Dec 1985.				
<b>Old Hammock Cove</b>	2005-31	Residential: 136 units (60 condos, 73 townhouse units, & 3 detached single-family)	Minimum Lot Size: <u>Condo</u> – not noted <u>Townhouse</u> - 2,500 <u>Single-family</u> - 6,600	Not addressed.	West of Palm Harbor Pkwy and south of Club House Drive.
<b>Palm Coast Condominiums</b>	2004-19	Residential: 42 condo units	Minimum: 1,600 sf Maximum: 2,000 sf	Not addressed.	NW corner of Palm Harbor Pkwy and Club House Waterway
<b>Palm Harbor Golf Course</b>	2005-19 & 2007-23	Residential: 161 units (3 detached single-family & 158 golf villa condo units); Redevelopment of existing golf course	<u>Single-family</u> Minimum Lot Size: 10,000 sq. ft.;  <u>Condo Units</u> : not noted.	5 years with possible extensions in increments of 2 years each	East of Club House Drive and west of Palm Harbor Parkway
<b>Village at Palm Coast Phase II</b>	2002-23	Mixed Use: <u>Residential</u> - 406 units (single-family estate lots; patio homes; townhouse units; & garden style condo units)  <u>Village Center</u> – 16,000 sf	<u>Single-family estate lots</u> – 10,000 sf / lot; <u>Patio Homes</u> : Minimum – 1,400 sf Maximum – 2,200 sf; <u>Townhouse</u> : Minimum – 1,000 sf Maximum – 1,800 sf; <u>Garden style condos</u> : Minimum – 850 sf Maximum – 1,500 sf	The preliminary plat or site plan must be submitted within 10 years of PUD approval.	East of Palm Harbor Pkwy, north of Hammock Dunes (ICW on the east side and Cimmaron Waterway on the north side)
<b>Beach Haven</b>		1 existing/ 195 residential units		Unknown; the 2005 BCC approval did not include expiration	Latitude: 29.654679774097943 Longitude: -81.20776176452637

## Flagler County Local Mitigation Strategy

					(East of Intracoastal, West of SR A1A, North of Matanzas Shores, South of Dupont Estates-Maritime Estates)
<b>Bulow Preserve</b>		0 existing 108 total residential units		Unknown	Latitude: 29.444661599931777 Longitude: -81.12911939620971 (Old Lenssen parcel, on both sides of John Anderson)
<b>Bulow Village (a/k/a Bulow Plantation)</b>		Approved for 1,020 residential units/ 276 manufactured home sites and 387 R/V sites (confirmed by Jeff at management office)		2012	Latitude: 29.434309025990973 Longitude: 29.434309025990973 (East of Old Kings Road, West of Bulow Creek, South of Old Kings Village, North of Plantation Oaks-Fairchild Oaks)
<b>Eagle Lakes</b>		7 existing/739 total residential units (344 in Phase I, 395 in Phase II; Chapter 163 Development Agreement permits up to 749 units)		2013 (to complete all phase I utilities)	Latitude: 29.42341339038633 Longitude: -81.15097403526306 (East of I-95, West of Old Kings Road, South of Closed Landfill, North of Volusia County line-Dance parcel)
<b>Flagler Market Place</b>			<u>7 commercial lots on 49.74+/- acres</u>	None listed	Latitude: 29.476913187041887

**Flagler County  
Local Mitigation Strategy**

					Longitude: -81.15826427936554 (North of SR 100, West of Colbert Lane- Viscomi project)
<b>Grand Reserve East</b>		300 residential units		2012 (for utility completion)	Latitude: 29.486677719699795 Longitude: -81.14969730377197 (East of Roberts Road, West of Intracoastal, South of Sea Ray)
<b>Grand Reserve West</b>		300 residential units	<u>716,750 sf on 58.39 acres</u>	2018 (for utility completion and commercial site development plan approval)	Latitude: 29.485370232819946 Longitude: -81.15609169006347 (Between Colbert lane and Roberts Road, North of Publix)
<b>Hammock Beach River Club</b>		453 residential units (includes 150 multi-family)	<u>230,694 sf. Retail/office</u>	2021	Latitude: 29.476077250766234 Longitude: -81.1530876159668 (South of SR 100 on both sides of John Anderson)
<b>Hammock Dunes DRI</b>		3,239 fully-entitled/3,800 residential units	<u>Includes ambiguous "hotel" units and reference to commercial areas on master plan</u>	2012 (due to 2007 Legislature's HB 7203)	Latitude: 29.576405664693183 Longitude: -81.18351459503174 (on Barrier Island at intersection of Hammock Dunes

## Flagler County Local Mitigation Strategy

					Bridge)
<b>Harbor View Marina</b>		622 residential units (161 single family; 461 multi-family)	<u>45,738 sf (no single establishment greater than 40,000 sf)</u>	Unknown, the 2006 BCC approval did not include expiration	Latitude: 29.50061074608288 Longitude: -81.15785121917724 (East of Colbert Lane, West of Palm Coast Plantation, South of Palm Coast Plantation, North of Marina Village-Sea Ray)
<b>Marina Village</b>		511 residential units (restricted to east of Colbert Lane)	<u>160,500 sf commercial, retail, and/or office (min 40,000 sf to east, max 85,500 sf on west parcel) project includes up to 80 wet boat slips and 200 dry boat slips</u>	2018	Latitude: 29.493252255127462 Longitude: -81.15278720855713 (Both sides of Colbert Lane, North of Roberts Road intersection, West of Sea Ray-Intracoastal)
<b>Matanzas Shores DRI</b>		998 existing units/ 1,450 residential units total		D.O. in 1985 did not incorporate a build out date. Interpretation in 1998 no build out date was established in the D.O.	Latitude: 29.651285923981927 Longitude: -81.20673179626465 (Part North of Washington Oaks on both sides of SR A1A; Sea Colony to South on East side of A1A, North of Armand Beach Estates)
<b>Old Hammock Plantation</b>		26 residential units	<u>30,000 sf commercial professional/retail</u>	Unknown; the 2007 BCC	Latitude: 29.620027288457397

**Flagler County  
Local Mitigation Strategy**

				approval did not include expiration	Longitude: -81.20455920696258 (Old Delores Motel site, East of Intracoastal, West of SR A1A, South of Stuckey-Washington Oaks)
<b>Old Kings Village</b>		232 residential units	<u>36,000 sf neighborhood commercial (but excluding convenience stores, filling stations, and fast food restaurants)</u>	Unknown; the 2007 BCC approval did not include expiration	Latitude: 29.43907433104791 Longitude: -81.15864515304565 (East of Old Kings Road, West of Bulow Creek, South of Cline, North of Bulow Village)
<b>Palm Coast Plantation</b>		131 existing residential units/ Unit 1A – 136 total units Unit 1B – 83 total units Unit 2 – 153 total units Unit 3 – 105 total units Unit 4 – 157 total units		Unknown; the 2001-2003 BCC approvals did not include expiration	Latitude: 29.51670791503103 Longitude: -81.16377353668213 (East of Colbert Lane, West of Intracoastal, South of Grand Haven, North of Harborview)

#### **D. Other Vulnerable Facilities**

In addition to the repetitive loss properties and critical facilities identified by the County and municipalities, there are other vulnerable properties identified and examined for potential losses and future mitigation actions. These properties include those non-repetitive loss properties located in a flood zone, properties located in the urban/wildland interface, properties located within the zone of vulnerability of a facility containing hazardous materials, and others determined vulnerable throughout the identification process. Through the identification process, the value of the properties identified as vulnerable are determined, therefore, ultimately allowing for a damage loss estimate for each hazard.

To identify additional vulnerable properties two devices are utilized. First, data provided from an effort between the State of Florida Department of Community Affairs and Kinetic Analysis Corporation known as MEMPHIS (Mapping for Emergency Management, Parallel Hazard Information Systems) which provides information on vulnerable properties is evaluated. To supplement the information gained through the state provided source the Federal Emergency Management Agency provided HAZUS-MH software (Hazards U.S. / Multi-Hazards), developed specifically to complete risk assessments for flood and hurricanes. This was used to identify vulnerable properties from a database within the software. This information includes housing stock and property values, in addition to numerous other data.

#### **E. Estimated Losses**

As of the current draft of the Flagler County Local Mitigation Strategy, the State provided information is mostly available to the County and ready for review. Additionally, the HAZUS-MH data has been provided to the Local Mitigation Strategy Work Group who is facilitating the current (2011) update of the plan. However, the census data used in the HAZUS-MH software is outdated and inaccurate. It is expected the process of identifying any and all vulnerable structures is time consuming. A full analysis is conducted using new data source and software products and analysis as it becomes available.

Once a thorough identification and analysis of vulnerable properties within the County and its municipalities is completed, a damage loss estimate analysis is conducted. The loss estimate is conducted via the State provided data source and supplemented by the HAZUS-MH software provided by FEMA. The State provided data includes values for different types of properties and loss estimates for vulnerable structures for a number of different hazards. The HAZUS-MH software includes a regional inventory of assets, supports advanced analysis functions and provides mapping capabilities. The HAZUS-MH provided data has a polygon feature, which includes census tracts/blocks showing features such as demographics and general building stock, line data features which includes utility

pipelines, and road segments, and point data features, which includes essential and lifeline facilities, high potential loss facilities, and bridges. The provided demographic and economic data is from the most recent U.S. Census.

The State provided analysis includes property values and a source for mapping vulnerable areas of each County. To conduct this analysis access to either the internet site or the State provided data CD is needed. For the HAZUS-MH software, the damage loss estimate is comprised of a series of activities. The first step is to define the study region. This includes defining jurisdictional and geographical boundaries. The second step is to create a base map of the study region using HAZUS/MH provided data. This is the step where additional local data can be added. The base map includes features such as defined boundaries, key features, demographic data, and other important point locations. After a base map is created and any additional data is added, the next step is to identify the hazards of interest. After the hazards are chosen, the next step is to develop and run the hazard scenario. The outcome from the analysis provides the necessary data to complete a damage loss estimate.

To supplement the information extracted from the outcome of the two damage loss estimate alternative methods, 2008 information from the Flagler County Property Appraiser's Office is provided in order to show property values for the County. The following table supplies information on the property values in Flagler County.

**TABLE 4  
Flagler County Property Values 2008**

<b>FLAGLER COUNTY</b>	<b>Residential</b>	<b>Commercial</b>	<b>Industrial</b>	<b>Agricultural</b>	<b>Institutional</b>	<b>Government</b>	<b>Other</b>	<b>Total</b>
<b>Value (in millions of dollars)</b>	9292.26	1050.30	149.31	254.93	23.03	11.90	365.43	<b>11,147.16</b>
<b>Percentage (of total value)</b>	83.36	9.42	1.34	2.28	.21	.11	3.28	<b>100.0</b>

**1. ELVIS**

The following table contains values from the Economic Loss Vulnerability Index System (ELVIS). ELVIS values were used to compare the relative risk of various hazards through the use of loss costs. A loss cost is the long term average of the damage a hazard causes. An example to help explain the use of loss costs: Take a \$100,000 house. Over 100 years, the house suffers 40% wind damage once (\$40,000 loss), 10% damage twice (\$10,000 each), and 5% damage three times (\$5000 each), for a total loss over the time frame of \$40,000 + \$20,000 + \$15,000=\$75,000. Therefore, over the 100 year period the house cost \$750 per year (\$75,000/100), or \$0.75 per \$1000 of the value of the house.

**ELVIS (Economic Loss Vulnerability Index System) Values for Flagler**

Hazard	SF Res	Mob home	MF Res	Commercial	Agriculture	Gov/Instit
Wind	1.9464	2.4581	1.9464	1.9464	1.9464	1.9464
Wind (5mph)	1.2422	15752	1.2422	1.2422	1.2422	1.2422
Flood	.7419	.7048	.6751	.7419	.7419	.7641
Flood (1 ft)	.4709	.4474	.4285	.4709	.4709	.4850
Wildfire	.0181	.0181	.0181	.0181	.0181	.0181
Exposure	\$6.85 BI	\$158.28 MI	\$848.8 9 MI	\$712.53 MI	\$728.95 MI	\$795.34 MI

**2. ESTIMATED LOSSES FROM HURRICANES:**

MEMPHIS data was used to determine the estimated loss from hurricanes. Please note for this section the estimated loss data for category one hurricanes is also utilized for Flagler County nor'easter events due to the similarities in presentation of the effects/ outcomes of these type disasters. Additionally, the hurricane estimated risk data is representative of storm surge vulnerability for each jurisdiction. As the National Weather Service seeks to create new nomenclature for reporting and assessing storm surge now that it is formally recognized as having its own unique classifications separate of those for tropical systems, future plan updates will then follow with more specificity in discussions involving the storm surge sections. MEMPHIS data was created utilizing the following methodology and assumptions:

- Threats are described in terms of peak one minute sustained wind in mph for wind and peak water level in feet for storms.
- Population at risk, housing, and damage estimates are based on Census 2000 (U.S. Census Bureau, 2000 Census of Population and Housing, Summary File 3: Technical Documentation, 2002).

## Flagler County Local Mitigation Strategy

- All other data (topography, land cover, historical hurricane activity) used is from spring 2004.
- The relevant hazard data such as wind and water levels were extracted from the TAOS output files.
- 2000 Department of Revenue Tax Records was used to create an exposure data base for use in the analysis. The tax data was geo-referenced against TIGER file road network, partial address match, or using zip code and Public Land Survey Systems (PLSS).
- As tax records normally undervalue property, it was assumed properties were valued at 80% fair market value. Contents and additional property (automobiles, boats, etc.) were estimated according to use type in keeping with practices used in the insurance industry.
- The loss estimates were based on the census housing survey. The housing data includes the number and median value of various types of housing units (mobile homes, single family, etc.). From this data the total infrastructure in each census block was estimated. The exposure in the census block is a composite of the survey data and the estimate of other infrastructure (commercial, governmental, etc.) which typically supports a given level of housing.
- Census based estimates utilized the following method: housing values obtained from the STF-3 files. Contents were estimated as with tax parcel based system. Infrastructure, commercial exposures, and government/institutional exposures were estimated from the satellite derived land cover.

Loss Costs per \$1000 by DOR Use based on 2000 Census

Damage Type	Cat 1	Cat 2	Cat 3	Cat 4	Cat 5
Tax Parcel based Wind Damage	\$155.92 MI	\$527.24 MI	\$1.32 BI	\$3.05 BI	\$5.67 BI
DOR based Flood Damage	\$16.62 MI	\$145.05 MI	\$692.91 MI	\$2.56 BI	\$3.48 BI
DOR Structures in Flood Zone	674	3,117	6,397	12,513	15,587
Census based Wind Damage	\$158.16 MI	\$516.41 MI	\$1.26 BI	\$2.88 BI	\$5.12 BI
Census based Flood Damage	\$93,580	\$49.08 mil	\$481.57 mi	\$1.2 bil	\$1.38 bil
Uninhabitable Housing Units	98 (.4% of total HU)	369 (1.5% of total HU)	930 (3.8% of total HU)	2,167 (8.9% of total HU)	4,003 (16.4% of Total HU)

**CATEGORY 1 HURRICANE:**

<b>COUNTYWIDE</b>					
POPULATION AT RISK based on 2000 Census					
	Total	TS Wind	Hur Wind	Ext Wind	Flooded
<b>Total</b>	49,832	49,832	17,405	0	58
<b>Minority</b>	6,465	6,465	1,405	0	0
<b>Over 65</b>	14,247	14,247	6,068	0	6
<b>Disabled</b>	18,354	18,354	6,422	0	0
<b>Poverty</b>	4,287	4,287	1,184	0	0
<b>Lang Iso</b>	665	665	277	0	26
<b>Single Point</b>	2,050	2,050	585	0	0
STRUCTURES AT RISK based on 2000 Census					
<b>Single Family</b>	17,702	17,702	8,962	0	381
<b>Mobile Home</b>	1,448	1,448	246	0	12
<b>Multi-Family</b>	2,601	2,601	1,600	0	240
<b>Commercial</b>	582	582	280	0	27
<b>Agriculture</b>	1,335	1,335	132	0	3
<b>Gov/Instit</b>	254	254	111	0	11
LOSS by DOR Use based on 2000 Census					
	Exposure	Loss		Percent Loss	
<b>Single Family</b>	\$6.85 BI	\$104.97 MI		1.5%	
<b>Mobile Home</b>	\$158.28 MI	\$8.26 MI		5.2%	
<b>Multi-Family</b>	\$848.89 MI	\$15.96 MI		1.9%	
<b>Commercial</b>	\$712.53 MI	\$11.49 MI		1.6%	
<b>Agriculture</b>	\$728.95 MI	\$9.44 MI		1.3%	
<b>Gov/Instit</b>	\$795.34 MI	\$5.80 MI		0.7%	

**CATEGORY 2 HURRICANE:**

<b>COUNTYWIDE</b>					
POPULATION AT RISK based on 2000 Census					
	Total	TS Wind	Hur Wind	Ext Wind	Flooded
<b>Total</b>	49,832	49,832	49,832	0	3,846
<b>Minority</b>	6,465	6,465	6,465	0	37
<b>Over 65</b>	14,247	14,247	14,247	0	1,211
<b>Disabled</b>	18,354	18,354	18,354	0	1,598
<b>Poverty</b>	4,287	4,287	4,287	0	314
<b>Lang Iso</b>	665	665	665	0	157
<b>Single Point</b>	2,050	2,050	2,050	0	156

**Flagler County  
Local Mitigation Strategy**

STRUCTURES AT RISK based on 2000 Census					
Single Family	17,702	17,702	17,652	0	2,089
Mobile Home	1,448	1,448	1,411	0	132
Multi-Family	2,601	2,601	2,599	0	719
Commercial	582	582	575	0	108
Agriculture	1,335	1,335	1,291	0	16
Gov/Instit	254	254	251	0	53
LOSS by DOR Use based on 2000 Census					
	Exposure	Loss		Percent Loss	
Single Family	\$6.85 BI	\$354.71 MI		5.2%	
Mobile Home	\$158.28 MI	\$23.85 MI		15.1%	
Multi-Family	\$848.89 MI	\$52.26 MI		6.2%	
Commercial	\$712.53 MI	\$38.31 MI		5.4%	
Agriculture	\$728.95 MI	\$33.89 MI		4.6%	
Gov/Instit	\$795.34 MI	\$24.21 MI		3.0%	

**CATEGORY 3 HURRICANE:**

COUNTYWIDE					
POPULATION AT RISK based on 2000 Census					
	Total	TS Wind	Hur Wind	Ext Wind	Flooded
Total	49,832	49,832	49,832	9,774	12,522
Minority	6,465	6,465	6,465	445	508
Over 65	14,247	14,247	14,247	3,723	4,685
Disabled	18,354	18,354	18,354	3,617	4,849
Poverty	4,287	4,287	4,287	762	910
Lang Iso	665	665	665	201	264
Single Point	2,050	2,050	2,050	297	380
STRUCTURES AT RISK based on 2000 Census					
Single Family	17,702	17,702	17,702	3,645	4,601
Mobile Home	1,448	1,448	1,448	101	305
Multi-Family	2,601	2,601	2,601	837	1,181
Commercial	582	582	582	157	190
Agriculture	1,335	1,335	1,335	44	31
Gov/Instit	254	254	251	61	89
LOSS by DOR Use based on 2000 Census					
	Exposure	Loss		Percent Loss	
Single Family	\$6.85 BI	\$886.15 MI		12.9%	
Mobile Home	\$158.28 MI	\$54.79 MI		34.6%	
Multi-Family	\$848.89 MI	\$127.93 MI		15.1%	
Commercial	\$712.53 MI	\$95.46 MI		13.4%	
Agriculture	\$728.95 MI	\$86.16 MI		11.8%	
Gov/Instit	\$795.34 MI	\$66.70 MI		8.4%	

**CATEGORY 4 HURRICANE:**

<b>COUNTYWIDE</b>					
<b>POPULATION AT RISK based on 2000 Census</b>					
	<b>Total</b>	<b>TS Wind</b>	<b>Hur Wind</b>	<b>Ext Wind</b>	<b>Flooded</b>
<b>Total</b>	49,832	49,832	49,832	9,774	12,522
<b>Minority</b>	6,465	6,465	6,465	445	508
<b>Over 65</b>	14,247	14,247	14,247	3,723	4,685
<b>Disabled</b>	18,354	18,354	18,354	3,617	4,849
<b>Poverty</b>	4,287	4,287	4,287	762	910
<b>Lang Iso</b>	665	665	665	201	264
<b>Single Point</b>	2,050	2,050	2,050	297	380
<b>STRUCTURES AT RISK based on 2000 Census</b>					
<b>Single Family</b>	17,702	17,702	17,702	17,156	9,854
<b>Mobile Home</b>	1,448	1,448	1,448	1,346	317
<b>Multi-Family</b>	2,601	2,601	2,601	2,580	1,866
<b>Commercial</b>	582	582	582	555	300
<b>Agriculture</b>	1,335	1,335	1,335	1,106	54
<b>Gov/Instit</b>	254	254	254	239	122
<b>LOSS by DOR Use based on 2000 Census</b>					
	<b>Exposure</b>		<b>Loss</b>		<b>Percent Loss</b>
<b>Single Family</b>	\$6.85 BI		\$2.06 BI		30.0%
<b>Mobile Home</b>	\$158.28 MI		\$115.82 MI		73.2%
<b>Multi-Family</b>	\$848.89 MI		\$289.27 MI		34.1%
<b>Commercial</b>	\$712.53 MI		\$219.42 MI		30.8%
<b>Agriculture</b>	\$728.95 MI		\$200.11 MI		27.5%
<b>Gov/Instit</b>	\$795.34 MI		\$167.27 MI		21.0%

**CATEGORY 5 HURRICANE:**

<b>COUNTYWIDE</b>					
POPULATION AT RISK based on 2000 Census					
	<b>Total</b>	<b>TS Wind</b>	<b>Hur Wind</b>	<b>Ext Wind</b>	<b>Flooded</b>
<b>Total</b>	49,832	49,832	49,832	49,832	25,202
<b>Minority</b>	6,465	6,465	6,465	6,465	2,166
<b>Over 65</b>	14,247	14,247	14,247	14,247	8,644
<b>Disabled</b>	18,354	18,354	18,354	18,354	9,859
<b>Poverty</b>	4,287	4,287	4,287	4,287	2,025
<b>Lang Iso</b>	665	665	665	665	400
<b>Single Point</b>	2,050	2,050	2,050	2,050	928

STRUCTURES AT RISK based on 2000 Census					
<b>Single Family</b>	17,702	17,702	17,702	17,702	12,557
<b>Mobile Home</b>	1,448	1,448	1,448	1,448	338
<b>Multi-Family</b>	2,601	2,601	2,601	2,601	2,099
<b>Commercial</b>	582	582	582	582	351
<b>Agriculture</b>	1,335	1,335	1,335	1,335	102
<b>Gov/Instit</b>	254	254	254	254	140

LOSS by DOR Use based on 2000 Census			
	<b>Exposure</b>	<b>Loss</b>	<b>Percent Loss</b>
<b>Single Family</b>	\$6.85 BI	\$3.86 BI	56.4%
<b>Mobile Home</b>	\$158.28 MI	\$156.69 MI	99.0%
<b>Multi-Family</b>	\$848.89 MI	\$539.89 MI	63.6%
<b>Commercial</b>	\$712.53 MI	\$410.94 MI	57.7%
<b>Agriculture</b>	\$728.95 MI	\$379.70 MI	52.1%
<b>Gov/Instit</b>	\$795.34 MI	\$326.57 MI	41.1%
	<b>Exposure</b>	<b>Loss</b>	<b>Percent Loss</b>
<b>Single Family</b>	\$10.30 million	\$7.32 million	71.1%
<b>Mobile Home</b>	\$3.58 million	\$3.58 million	100.0%
<b>Multi-Family</b>	\$16.16 million	\$11.99 million	74.2%
<b>Commercial</b>	\$1.27 million	\$878.30 thousand	69.0%
<b>Agriculture</b>	\$22.22 thousand	\$16.22 thousand	73.0%
<b>Gov/Instit</b>	\$0.00 dollars	\$0.00 dollars	NaN%

### **3. ESTIMATED LOSSES FROM FLOODING AND FLOOD CONTROL DEVICE FAILURE (PALM COAST):**

MEMPHIS data was used to determine the estimated loss from flooding. Data for estimated losses for flooding are also true for instances involving flood control device failures in Palm Coast. MEMPHIS data was created utilizing the following methodology and assumptions:

- This data is from the digital versions of the FEMA FIRMS. Zones indicated in the table refer to FEMA FIRM Zones.
- Population at risk, housing, and damage estimates are based on Census 2000 (U.S. Census Bureau, 2000 Census of Population and Housing, Summary File 3: Technical Documentation, 2002).
- All other data (topography, land cover, historical hurricane activity) used is from spring 2004.
- The relevant hazard data such as wind and water levels were extracted from the TAOS output files.
- 2000 Department of Revenue Tax Records was used to create an exposure data base for use in the analysis. The tax data was geo-referenced against TIGER file road network, partial address match, or using zip codes and Public Land Survey Systems (PLSS).
- As tax records normally undervalue property, it was assumed properties were valued at 80% fair market value. Contents and additional property (automobiles, boats, etc.) were estimated according to use type in keeping with practices used in the insurance industry.
- The loss estimates were based on the census housing survey. The housing data includes the number and median value of various types of housing units (mobile homes, single family, etc.). From this data the total infrastructure in each census block was estimated. The exposure in the census block is a composite of the survey data and the estimate of other infrastructure (commercial, governmental, etc.) which typically supports a given level of housing.
- Census based estimates utilized the following method: housing values obtained from the STF-3 files. Contents were estimated as with tax parcel based system. Infrastructure, commercial exposures, and government/institutional exposures were estimated from the satellite derived land cover. The Census data is at the block group level and the exact position of the block group centroid may fall in or out of the flood zone. For lower flood levels such as Category 1 storms with very narrow flood zones, there may be a larger difference between the tax based assessment and census based assessment because of the potential for any given block group to hit or miss the zone.

## Flagler County Local Mitigation Strategy

**Table 2.1: Population at risk for FEMA FIRM Zones based on 2000 Census**

Zone	Total Pop.	Minority	Over 65	Disabled	Poverty	Lang ISO	Single Pnt
AE	5395	81	1826	1875	492	143	220
X500	4924	376	2095	1935	289	70	89
X	36760	5818	9682	13268	3341	346	1649
A	2753	190	644	1276	165	106	92
ANI	0	0	0	0	0	0	0
IN	0	0	0	0	0	0	0
VE	0	0	0	0	0	0	0
UNDES	0	0	0	0	0	0	0
AO	0	0	0	0	0	0	0
D	0	0	0	0	0	0	0
AH	0	0	0	0	0	0	0
V	0	0	0	0	0	0	0
100IC	0	0	0	0	0	0	0

**Table 2.2: Structures at risk for FEMA FIRM Zones based on 2000 Census**

Zone	Total	Single Family	Mobile Home	Multi-Family	Commercial	Agriculture	Gov/Instit
AE	3500	2245	209	701	140	64	141
X500	2118	1570	39	423	47	21	18
X	17475	13440	1145	1451	341	147	951
A	829	447	55	26	54	22	225
ANI	0	0	0	0	0	0	0
IN	0	0	0	0	0	0	0
VE	1255	209	701	140	64	141	0
UNDES	548	39	423	47	21	18	0
AO	4035	1145	1451	341	147	951	0
D	382	55	26	54	22	225	0
AH	0	0	0	0	0	0	0
V	0	0	0	0	0	0	0
100IC	1046	701	140	64	141	0	0

## Flagler County Local Mitigation Strategy

Table 2.3: Value of Structures by DOR Use for FEMA FIRM Zones based on 2000 Census

Zone	Total	Single Family	Mobile Home	Multi-Family	Commercial	Agriculture	Gov/Institution
AE	\$1.18 bil	\$785.05 mil	\$23.15 mil	\$201.20 mil	\$56.13 mil	\$35.97 mil	\$73.64 mil
X500	\$1.10 bil	\$662.58 mil	\$4.98 mil	\$223.09 mil	\$97.00 mil	\$92.91 mil	\$19.53 mil
X	\$7.37 bil	\$5.26 bil	\$121.92 mil	\$409.34 mil	\$510.67 mil	\$529.55 mil	\$536.09 mil
A	\$446.02 mil	\$137.22 mil	\$8.22 mil	\$15.25 mil	\$48.72 mil	\$70.52 mil	\$166.08 mil
ANI	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
IN	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
VE	\$390.10 mil	\$23.15 mil	\$201.20 mil	\$56.13 mil	\$35.97 mil	\$73.64 mil	\$0.00
UNDE S	\$437.51 mil	\$4.98 mil	\$223.09 mil	\$97.00 mil	\$92.91 mil	\$19.53 mil	\$0.00
AO	\$2.11 bil	\$121.91 mil	\$409.34 mil	\$510.67 mil	\$529.55 mil	\$536.09 mil	\$0.00
D	\$308.80 mil	\$8.22 mil	\$15.25 mil	\$48.72 mil	\$70.52 mil	\$166.08 mil	\$0.00
AH	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
V	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
100IC	\$366.94 mil	\$201.20 mil	\$56.13 mil	\$35.97 mil	\$73.64 mil	\$0.00	\$0.00

#### 4. ESTIMATED RISK FROM TORNADOES:

The KAC Tornado Risks Hazards report for Flagler County indicates the tornado risk for Flagler is 1 in 250 years (medium).

MEMPHIS data was used to determine the estimated loss from tornadoes. MEMPHIS data was created utilizing the following methodology and assumptions:

- This table describes the threat of damage from tornadoes, based on an analysis of National Severe Storms Forecast Center data from 1950-2003.
- Population at risk, housing, and damage estimates are based on Census 2000 (U.S. Census Bureau, 2000 Census of Population and Housing, Summary File 3: Technical Documentation, 2002).
- All other data (topography, land cover, historical hurricane activity) used is from spring 2004.
- The relevant hazard data such as wind and water levels were extracted from the TAOS output files.
- 2000 Department of Revenue Tax Records was used to create an exposure data base for use in the analysis. The tax data was geo-referenced against TIGER file road

## Flagler County Local Mitigation Strategy

network, partial address match, or using zip code and Public Land Survey Systems (PLSS).

- As tax records normally undervalue property, it was assumed properties were valued at 80% fair market value. Contents and additional property (automobiles, boats, etc.) were estimated according to use type in keeping with practices used in the insurance industry.
- The loss estimates were based on the census housing survey. The housing data includes the number and median value of various types of housing units (mobile homes, single family, etc.). From this data the total infrastructure in each census block was estimated. The exposure in the census block is a composite of the survey data and the estimate of other infrastructure (commercial, governmental, etc.) which typically supports a given level of housing.
- Census based estimates utilized the following method: housing values obtained from the STF-3 files. Contents were estimated as with tax parcel based system. Infrastructure, commercial exposures, and government/institutional exposures were estimated from the satellite derived land cover. The Census data is at the block group level and the exact position of the block group centroid may fall in or out of the flood zone. For lower flood levels such as Category 1 storms with very narrow flood zones, there may be a larger difference between the tax based assessment and census based assessment because of the potential for any given block group to hit or miss the zone.

<b>COUNTYWIDE</b>							
POPULATION at Risk for KAC Tornado Risk based on 2000 Census							
Zone	Total	Minority	Over 65	Disabled	Poverty	Lang Iso	Sing Pnt
Low (1 in 500)	0	0	0	0	0	0	0
Medium (1 in 250)	49,832	6,465	14,247	18,354	4,287	665	2,050
High (1 in 100)	0	0	0	0	0	0	0
Very High (1 in 50)	0	0	0	0	0	0	0
STRUCTURES at Risk for KAC Tornado Risk based on 2000 Census							
Zone	Total	Single Family	Mobile Home	Multi-Family	Comm	Ag	Gov/Insti t
Low (1 in 500)	0	0	0	0	0	0	0
Medium (1 in 250)	23922	17702	1448	2601	582	254	1335
High (1 in 100)	0	0	0	0	0	0	0
Very High (1 in 50)	0	0	0	0	0	0	0
VALUE OF STRUCTURES at Risk for KAC Tornado Risk based on 2000 Census							

**Flagler County  
Local Mitigation Strategy**

<b>Low (1 in 500)</b>	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
<b>Medium (1 in 250)</b>	\$10.09 BI	\$6.85 BI	\$158.28 MI	\$848.89 MI	\$712.53 MI	\$728.95 MI	\$795.34 MI
<b>High (1 in 100)</b>	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
<b>Very High (1 in 50)</b>	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00

**5. ESTIMATED RISK FROM TSUNAMI:**

MEMPHIS data was used to determine the estimated loss from flooding. MEMPHIS data was created utilizing the following methodology and assumptions:

- Tsunami risk in Florida is difficult to assess, as there are no reliable historical records and few publications on the subject.
- Simulated techniques were used simulating 3 events: Caribbean volcanic events, Caribbean and Central American earthquakes, and East Atlantic (the Cumbre Vieja volcano, on the island of La Palma, in the Canary Islands) volcanic events.
- In general these events produced at worst 6 to 7 meter waves on the Atlantic coast of Florida.
- Expert opinion suggests these would be 1 and 500 year events.
- Population at risk, housing, and damage estimates are based on Census 2000 (U.S. Census Bureau, 2000 Census of Population and Housing, Summary File 3: Technical Documentation, 2002).
- All other data (topography, land cover, historical hurricane activity. etc.) used is from spring 2004.
- 2000 Department of Revenue Tax Records was used to create an exposure data base for use in the analysis. The tax data was geo-referenced against TIGER file road network, partial address match, or using zip code and Public Land Survey Systems (PLSS).
- As tax records normally undervalue property, it was assumed properties were valued at 80% fair market value. Contents and additional property (automobiles, boats, etc.) were estimated according to use type in keeping with practices used in the insurance industry.
- The loss estimates were based on the census housing survey. The housing data includes the number and median value of various types of housing units (mobile homes, single family, etc.). From this data the total infrastructure in each census block was estimated. The exposure in the census block is a composite of the survey data and the estimate of

## Flagler County Local Mitigation Strategy

- other infrastructure (commercial, governmental, etc.) which typically supports a given level of housing.
- Census based estimates utilized the following method: housing values obtained from the STF-3 files. Contents were estimated as with tax parcel based system. Infrastructure, commercial exposures, and government/institutional exposures were estimated from the satellite derived land cover. The Census data is at the block group level and the exact position of the block group centroid may fall in or out of the flood zone. For lower flood levels such as Category 1 storms with very narrow flood zones, there may be a larger difference between the tax based assessment and census based assessment because of the potential for any given block group to hit or miss the zone.

COUNTYWIDE							
POPULATION at risk for KAC Tsunami risk based on 2000 Census							
Zone	Total	Minority	Over 65	Disabled	Poverty	Lang ISO	Single Pnt
Out of Zone	21879	1538	7928	8894	1733	375	753
500 yr Tsunami	0	0	0	0	0	0	0
STRUCTURES at risk for KAC Tsunami risk based on 2000 Census							
Zone	Total	SF Res	Mob Home	MF Res	Commercial	Agriculture	Gov/Inst
Out of Zone	15048	11978	328	2189	332	135	86
500 yr Tsunami	0	0	0	0	0	0	0
Value Structures at risk for KAC Tsunami risk based on 2000 Census							
Out of Zone	\$6.42 Bil	\$4.67 Bil	\$34.26 Mil	\$786.69 Mil	\$500.31 Mil	\$350.67 Mil	\$79.32 Mil
500 yr Tsunami	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00

## **8. ESTIMATED RISK FROM WILDLAND FIRES:**

MEMPHIS data was used to determine the estimated loss from flooding. MEMPHIS data was created utilizing the following methodology and assumptions:

- The official wildland fire level of concern (LOC) layer from the Division of Forestry was used. LOC is an integer scaled from 0 to 9 indicating the relative risk of wildland fire, and is an output of the Florida Division of Forestry Fire Risk Assessment System (FRAS)
- Population at risk, housing, and damage estimates are based on Census 2000 (U.S. Census Bureau, 2000 Census of Population and Housing, Summary File 3: Technical Documentation, 2002).
- All other data (topography, land cover, historical hurricane activity. etc.) used is from spring 2004.
- 2000 Department of Revenue Tax Records were used to create an exposure data base for use in the analysis. The tax data was geo-referenced against TIGER file road network, partial address match, or using zip code and Public Land Survey Systems (PLSS).
- As tax records normally undervalue property, it was assumed properties were valued at 80% fair market value. Contents and additional property (automobiles, boats, etc.) were estimated according to use type in keeping with practices used in the insurance industry.
- The loss estimates were based on the census housing survey. The housing data includes the number and median value of various types of housing units (mobile homes, single family, etc.). From this data the total infrastructure in each census block was estimated. The exposure in the census block is a composite of the survey data and the estimate of other infrastructure (commercial, governmental, etc.) which typically supports a given level of housing.
- Census based estimates utilized the following method: housing values obtained from the STF-3 files. Contents were estimated as with tax parcel based system. Infrastructure, commercial exposures, and government/institutional exposures were estimated from the satellite derived land cover. The Census data is at the block group level and the exact position of the block group centroid may fall in or out of the flood zone. For lower flood levels such as Category 1 storms with very narrow flood zones, there may be a larger difference between the tax based assessment and census based assessment because of the potential for any given block group to hit or miss the zone.

**Flagler County  
Local Mitigation Strategy**

<b>COUNTYWIDE</b>							
POPULATION at risk for FDOF Fire Risk LOC based on 2000 Census							
Zone	Total	Minority	Over 65	Disabled	Poverty	Lang ISO	Single Pnt
Level 1 (low)	65	0	6	0	0	76	0
Level 2	6038	772	759	2754	669	106	382
Level 3	14747	2417	4349	4253	1180	27	491
Level 4	2580	411	424	801	222	25	123
Level 5 (medium)	2793	273	930	1288	74	0	39
Level 6	1408	221	555	547	109	0	95
Level 7	7853	723	2582	3231	563	81	266
Level 8	3664	320	1097	979	166	102	147
Level 9 (high)	1923	372	583	1036	443	141	111
STRUCTURES at risk for FDOF Fire Risk LOC based on 2000 Census							
Zone	Total	SF Res	Mob Home	MF Res	Commercial	Agriculture	Gov/Inst
Level 1 (low)	3315	436	2148	211	328	54	138
Level 2	4252	1664	1515	464	166	90	353
Level 3	6318	2128	2908	555	401	107	219
Level 4	1670	1399	77	99	28	10	57
Level 5 (medium)	3063	2102	263	406	87	39	166
Level 6	1380	923	90	187	39	9	132
Level 7	2988	2148	211	328	54	138	109
Level 8	2640	1515	464	166	90	353	52
Level 9 (high)	4253	2908	555	401	107	219	63
VALUE OF STRUCTURES at risk for FDOF Fire Risk LOC based on 2000 Census							
Level 1 (low)	\$1.49 BI	\$186.25 MI	\$827.93 MI	\$102.92 MI	\$106.31 MI	\$127.97 MI	\$143.03 MI
Level 2	\$1.69 BI	\$612.09 MI	\$544.88 MI	\$126.71 MI	\$88.42 MI	\$99.22 MI	\$215.99 MI
Level 3	\$2.61 BI	\$820.31 MI	\$1.05 BI	\$132.78 MI	\$127.72 MI	\$200.58 MI	\$284.44 MI
Level 4	\$628.19 MI	\$517.59 MI	\$5.81 MI	\$33.26 MI	\$23.87 MI	\$7.74 MI	\$39.93 MI
Level 5 (medium)	\$1.31 BI	\$818.20 MI	\$27.97 MI	\$152.89 MI	\$151.35 MI	\$63.74 MI	\$95.70 MI
Level 6	\$580.53 MI	\$338.28 MI	\$8.75 MI	\$30.31 MI	\$79.95 MI	\$58.82 MI	\$64.42 MI
Level 7	\$1.40 BI	\$827.93 MI	\$102.92 MI	\$106.31 MI	\$127.97 MI	\$143.03 MI	\$89.74 MI
Level 8	\$1.11 BI	\$544.88 MI	\$126.71 MI	\$88.42 MI	\$99.22 MI	\$215.88 MI	\$33.01 MI
Level 9 (high)	\$1.82 BI	\$1.05 BI	\$132.78 MI	\$127.72 MI	\$200.58 MI	\$284.44 MI	\$28.33 MI

**10. ESTIMATED RISK FROM TROPICAL EVENTS:**

**10-Year Tropical Events**

<b>COUNTYWIDE</b>					
POPULATION AT RISK for 10 year Tropical Storm event based on 2000 Census					
	<b>Total</b>	<b>TS Wind</b>	<b>Hur Wind</b>	<b>Ext Wind</b>	<b>Flooded</b>
<b>Total</b>	49,832	49,832	0	0	0
<b>Minority</b>	6,465	6,465	0	0	0
<b>Over 65</b>	14,247	14,247	0	0	0
<b>Disabled</b>	18,354	18,354	0	0	0
<b>Poverty</b>	4,287	4,287	0	0	0
<b>Lang Iso</b>	665	665	0	0	0
<b>Single Point</b>	2,050	2,050	0	0	0
STRUCTURES AT RISK for 10 year Tropical Storm event based on 2000 Census					
<b>Single Family</b>	17,702	17,702	0	0	0
<b>Mobile Home</b>	1,448	1,448	0	0	0
<b>Multi-Family</b>	2,601	2,601	0	0	0
<b>Commercial</b>	582	582	0	0	0
<b>Agriculture</b>	1,335	1,335	0	0	0
<b>Gov/Instit</b>	254	254	0	0	0
VALUE OF STRUCTURES AT RISK for 10 year Tropical Storm event based on 2000 Census					
	<b>Exposure</b>	<b>Loss</b>		<b>Percent Loss</b>	
<b>Single Family</b>	\$6.85 BI	\$7.04 MI		0.1%	
<b>Mobile Home</b>	\$158.28 MI	\$1.08 MI		0.7%	
<b>Multi-Family</b>	\$848.89 MI	\$1.24 MI		0.1%	
<b>Commercial</b>	\$712.53 MI	\$812.54 TH		0.1%	
<b>Agriculture</b>	\$728.95 MI	\$567.43 TH		0.1%	
<b>Gov/Instit</b>	\$795.34 MI	\$226.67 TH		0.0%	

**25-Year Tropical Storm**

<b>COUNTYWIDE</b>					
POPULATION AT RISK for 25 year Tropical Storm event based on 2000 Census					
	<b>Total</b>	<b>TS Wind</b>	<b>Hur Wind</b>	<b>Ext Wind</b>	<b>Flooded</b>
<b>Total</b>	49,832	49,832	3736	0	0
<b>Minority</b>	6,465	6,465	47	0	0
<b>Over 65</b>	14,247	14,247	1114	0	0
<b>Disabled</b>	18,354	18,354	1083	0	0
<b>Poverty</b>	4,287	4,287	310	0	0
<b>Lang Iso</b>	665	665	81	0	0
<b>Single Point</b>	2,050	2,050	136	0	0
STRUCTURES AT RISK for 25 year Tropical Storm event based on 2000 Census					
	<b>Total</b>	<b>TS Wind</b>	<b>Hur Wind</b>	<b>Ext Wind</b>	<b>Flooded</b>
<b>Single Family</b>	17,702	17,702	762	0	91
<b>Mobile Home</b>	1,448	1,448	27	0	5
<b>Multi-Family</b>	2,601	2,601	206	0	136
<b>Commercial</b>	582	582	48	0	13
<b>Agriculture</b>	1,335	1,335	6	0	3
<b>Gov/Instit</b>	254	254	8	0	2
VALUE OF STRUCTURES AT RISK for 25 year Tropical Storm event based on 2000 Census					
	<b>Exposure</b>		<b>Loss</b>		<b>Percent Loss</b>
<b>Single Family</b>	\$6.85 bil		\$41.49 mil		0.6%
<b>Mobile Home</b>	\$158.28 mil		\$4.09 mil		2.6%
<b>Multi-Family</b>	\$848.89 mil		\$6.60 mil		0.8%
<b>Commercial</b>	\$712.53 mil		\$4.58 mil		0.6%
<b>Agriculture</b>	\$728.95 mil		\$3.66 mil		0.5%
<b>Gov/Instit</b>	\$795.34 mil		\$2.22 mil		0.3%

**50-Year Tropical Storm**

<b>COUNTYWIDE</b>					
POPULATION AT RISK for 50 year Tropical Storm event based on 2000 Census					
	<b>Total</b>	<b>TS Wind</b>	<b>Hur Wind</b>	<b>Ext Wind</b>	<b>Flooded</b>
<b>Total</b>	49,832	49,832	15207	0	0
<b>Minority</b>	6,465	6,465	909	0	0
<b>Over 65</b>	14,247	14,247	5516	0	0
<b>Disabled</b>	18,354	18,354	5777	0	0
<b>Poverty</b>	4,287	4,287	986	0	0
<b>Lang Iso</b>	665	665	277	0	26
<b>Single Point</b>	2,050	2,050	474	0	0
STRUCTURES AT RISK for 50 year Tropical Storm event based on 2000 Census					
<b>Single Family</b>	17,702	17,702	8180	0	307
<b>Mobile Home</b>	1,448	1,448	245	0	10
<b>Multi-Family</b>	2,601	2,601	1521	0	214
<b>Commercial</b>	582	582	264	0	26
<b>Agriculture</b>	1,335	1,335	150	0	3
<b>Gov/Instit</b>	254	254	102	0	9
VALUE OF STRUCTURES AT RISK for 50 year Tropical Storm event based on 2000 Census					
	<b>Exposure</b>		<b>Loss</b>		<b>Percent Loss</b>
<b>Single Family</b>	\$6.85 bil		\$94.73 mil		1.4%
<b>Mobile Home</b>	\$158.28 mil		\$8.01 mil		5.1%
<b>Multi-Family</b>	\$848.89 mil		\$14.51 mil		1.7%
<b>Commercial</b>	\$712.53 mil		\$10.31 mil		1.4%
<b>Agriculture</b>	\$728.95 mil		\$8.60 mil		1.2%
<b>Gov/Instit</b>	\$795.34 mil		\$5.88 mil		0.7%

**100-Year Tropical Storm**

<b>COUNTYWIDE</b>					
POPULATION AT RISK for 100 year Tropical Storm event based on 2000 Census					
	<b>Total</b>	<b>TS Wind</b>	<b>Hur Wind</b>	<b>Ext Wind</b>	<b>Flooded</b>
<b>Total</b>	49,832	49,832	29036	0	1115
<b>Minority</b>	6,465	6,465	2759	0	19
<b>Over 65</b>	14,247	14,247	9426	0	379
<b>Disabled</b>	18,354	18,354	10813	0	250
<b>Poverty</b>	4,287	4,287	2306	0	19
<b>Lang Iso</b>	665	665	467	0	12
<b>Single Point</b>	2,050	2,050	1037	0	17
STRUCTURES AT RISK for 100 year Tropical Storm event based on 2000 Census					
<b>Single Family</b>	17,702	17,702	13778	0	1142
<b>Mobile Home</b>	1,448	1,448	348	0	56
<b>Multi-Family</b>	2,601	2,601	2410	0	609
<b>Commercial</b>	582	582	365	0	56
<b>Agriculture</b>	1,335	1,335	227	0	9
<b>Gov/Instit</b>	254	254	143	0	24
VALUE OF STRUCUTRES AT RISK for 100 year Tropical Storm event based on 2000 Census					
	<b>Exposure</b>		<b>Loss</b>		<b>Percent Loss</b>
<b>Single Family</b>	\$6.85 bil		\$137.27 mil		2.0%
<b>Mobile Home</b>	\$158.28 mil		\$11.71 mil		7.4%
<b>Multi-Family</b>	\$848.89 mil		\$22.23 mil		2.6%
<b>Commercial</b>	\$712.53 mil		\$14.24mil		2.0%
<b>Agriculture</b>	\$728.95 mil		\$12.55 mil		1.7%
<b>Gov/Instit</b>	\$795.34 mil		\$9.17 mil		1.2%

**Section V – Mitigation Initiatives**

**A. Project Selection and Submission Criteria**

The Flagler County LMS Workgroup developed an extensive list of potential mitigation initiatives based on the goals, objectives, and guiding principles, and the hazard identification and vulnerability assessment. The list contains a variety of mitigation initiatives including studies to further investigate vulnerable properties, engineering/construction projects and proposed revisions to existing LMS related local government policies.

The Flagler County Local Mitigation Strategy proposes actions aimed at mitigating the losses caused by identified hazards. The Flagler County Mitigation Projects Initiatives List prioritizes hazard mitigation activities important to the County. However, in recognition disasters come in a variety of shapes, sizes, intensities and locations, the County and the participating municipalities must, by necessity, reserve flexibility to fund and implement timely and appropriate initiatives.

The list of prioritized initiatives is useful because it identifies which mitigation initiatives are important on a countywide basis. The list of mitigation initiatives part of the LMS serves as a guide for the County and municipalities when deciding which initiatives to fund and implement. In addition, it helps improve intergovernmental coordination because the County may need to partner with a municipality or other organization in order to complete the mitigation activity. The original list of mitigation initiatives from the initial planning process has been reorganized and re-categorized in order to make the information easier to understand and prioritize.

Individuals or agencies desiring to have a project placed on the list of project initiatives must complete the Mitigation Project Worksheet and submit it to the LMS Workgroup. The Workgroup reviews the project, discuss the benefits and impacts of the project, suggests changes or improvements to be made to the project, scores and ranks the project, and votes on adding the project to the list of initiatives. See appendix for the list of mitigation initiatives.

**B. Scoring and Prioritization**

Originally prioritization of initiatives was conducted by a consensus of the Workgroup. Initiatives were prioritized on a scale from High to Low. No formal procedure was particularly followed. However, the group would take into consideration how each initiative fell into the needs of the County.

The LMS Workgroup developed a method for prioritizing initiatives. This methodology includes a number of ranking categories including “contained in the comprehensive plan”, “funding sources available”, “time for implementation”, “project sponsor”, etc. Points are awarded to each ranking category based on different levels of how each category is addressed by the mitigation initiative. A cost/benefit analysis is conducted for every project. Cost of each project is compared to the population benefiting from the project and the potential damage to life and property when ranking and prioritizing each project.

Mitigation initiatives are prioritized based on the scoring system developed by the LMS Workgroup. This scoring system takes into consideration the following criteria:

<b>Criteria Category</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>0</b>
Contained Within the Comprehensive Plan	Specifically referenced in Plan	N/A	Consistent with Plan	N/A	Not currently indentified in Plan
Benefits to Percentage of Flagler County's Population	76 to 100% of the population benefited	51 to 75% of the population benefited	26 to 50% of the population benefited	11 to 25% of the population benefited	0 to 10% of the population benefited
Probability of Acceptance by Flagler County's Population (Public Support)	Likely to be endorsed by the entire population	Of benefit only to those directly affected and would not adversely affect others	Would be somewhat controversial with special interest groups or a small percentage of the population	Would be strongly opposed by special interest groups or a significant percentage of the population	Would be strongly opposed by nearly all of the population
Probability of Matching Funds	Funding match is available	N/A	Partial Funding match available	N/A	No funding match available
Feasibility /Readiness of Implementation	Relatively easy to implement within 1 year and environmentally sound	Not anticipated to be difficult to implement and environmentally acceptable	Somewhat difficult to implement because of complex requirements and/or environmental concerns	Difficult to implement because of significantly complex requirements and/or environmental permitting	Very difficult to implement due to extremely complex requirements and/or environmental permitting problems
Timeframe of Implementation	1 year	2 years	3 years	4 years	More than 4 years
Effective Life Expectancy	More than 20 years	10 to 20 years	5-10 years	Up to 5 years	N/A
Grand Funding Availability (Identified Funding Source)	Currently available	Available in 1 year	Available in 2 years	A funding source has been identified	A funding source has not been identified

Additionally, the LMS Workgroup recognizes projects protecting life and property are the priority of the Local Mitigation Strategy. Therefore, the Workgroup utilizes a “Life Safety Multiplier” when scoring mitigation initiatives. Projects protecting the life/safety of the population have a scoring multiplier of 1.5 and projects protecting the property of the population are scored with a multiplier of 1.25.

In order to add a mitigation initiative to the Flagler County LMS List of Initiatives, a project worksheet must be completed by the sponsoring agency. The Worksheet requires a description of the project/action, the estimated cost, sponsoring agency and contact information, the LMS Goal or Objective targeted by the project, available funding source, and the estimated timeframe for completion (see Appendix E for more detail). The Worksheets are reviewed, analyzed, and discussed at the next LMS Workgroup Meeting. The cost/benefit is reviewed and discussed by the group. The projects are then scored and ranked based on the score received.

### **C. Project Implementation**

Projects and programs are implemented by the sponsoring agency. Typically, a project or initiative is brought to the Workgroup by the agency or group seeking funding for the proposed project. The party responsible for implementation could either be the County or any of the municipalities, based on the jurisdiction where the initiative is based. The responsible party could also be another agency or group such as a hospital, stage agency, or local organization.

### **D. Implementation of National Flood Insurance Program (NFIP)**

Every jurisdiction in Flagler County participates in the National Flood Insurance Program (NFIP); local actions to maintain NFIP compliance include, but are not limited to:

- Continue to enforce their adopted Floodplain Management Ordinance requirements, which include regulating all new development and substantial improvements in Special Flood Hazard Areas (SFHA)
- Continue to maintain all records pertaining to floodplain development, which shall be available for public inspection.
- Continue to notify the public when there are proposed changes to the floodplain ordinance or Flood Insurance Rate Maps.
- Maintain the map and Letter of Map Change repositories.
- Continue to promote Flood Insurance for all properties.
- Continue their Community Rating System outreach programs.

## Flagler County Local Mitigation Strategy

Community Name	Policies In-Force	Insurance In-Force whole \$	Written Premium In-Force \$
Beverly Beach, Town of	124	\$ 15,991,800.00	\$ 49,982.00
Bunnell, City of	40	\$ 10,056,300.00	\$ 24,457.00
Flagler Beach, City of	2,177	\$ 465,184,400.00	\$ 852,384.00
Flagler County	6,189	\$ 1,623,961,100.00	\$ 2,073,820.00
Marineland, Town of	11	\$ 2,424,900.00	\$ 5,184.00
Palm Coast, City of	3,669	\$ 1,057,341,300.00	\$ 1,173,371.00

**FEMA: Current as of 07/31/2009**

The Community Rating System (CRS) is a voluntary program for NFIP-participating communities. The goals of the CRS are to reduce flood losses, to facilitate accurate insurance rating, and to promote the awareness of flood insurance. The CRS has been developed to provide incentives for communities to go beyond the minimum floodplain management requirements to develop extra measures to provide protection from flooding. The incentives are in the form of premium discounts. The City of Palm Coast recently moved its Community Rating System (CRS) from a 7 to a 6. The City of Flagler Beach has a CRS designation of 7. Flagler County/ School Board, Town of Beverly Beach, and the Town of Marineland do not participate in the CRS.

COMMUNITY RATING SYSTEM ELIGIBLE COMMUNITIES (FLAGLER COUNTY)							
Community Number	Community Name	CRS Entry Date	Current Effective Date	Current Class	% Discount for SFHA (1)	% Discount for Non-SFHA(2)	Status (3)
120087	Flagler Beach, City of	10/1/1995	10/1/2000	7	15	5	C
120684	Palm Coast, City of	5/1/2004	5/1/2009	6	20	10	C

(1) For the purpose of determining CRS discounts, all AR and A99 zones are treated as non-SFHAs.

(2) Increase in discount for Classes 1-6 effective May 1, 2001.

(3) Status: C=Current, R=Rescinded

It must be emphasized in many cases, detailed information regarding the areas potentially impacted by a specific hazard, as well as its potential health and safety, property, environmental and economic impacts may not be available. Further, it has not been the intent of the LMS Workgroup, nor have funding resources been available, to conduct extensive new studies to obtain such information solely for the purposes of the development of this mitigation plan. Therefore, it has often been necessary to rely on the informed judgment of knowledgeable local officials to identify hazards and derive estimates of the risk each poses to the community.

### **E. Mitigation Initiatives/Actions**

During the planning process the LMS Workgroup reviews and analyzes the mitigation initiatives and various actions developed achieving the community's goals and objectives to reduce and avoid the effects of the identified hazards. Identified mitigation actions and initiatives are into the following groups:

- **Prevention:** Government administrative or regulatory actions or processes influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses. Examples include planning and zoning, building codes, capital improvement programs, open space preservation, and storm water management regulations.
- **Property Protection:** Actions involve the modification of existing buildings or infrastructure to protect them from a hazard, or removal from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, flood proofing, storm shutters, and shatter-resistant glass.
- **Public Education & Awareness:** Actions to inform and educate citizens, elected officials, and property owners about potential risks from hazards and potential ways to mitigate them. Such actions include outreach projects, real estate disclosure, hazard information centers, and school-age and adult education programs.
- **Natural Resource Protection:** Actions, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems. These actions include sediment and erosion control stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.
- **Structural Projects:** Actions involve the construction of structures to reduce the impact of a hazard. Such structures include storm water controls (e.g. culverts), floodwalls, seawalls, retaining walls, and safe rooms.

The mitigation initiatives listed on the following table were developed by the Workgroup. New initiatives are periodically added to the list and completed projects are deleted from the list. See Appendix E, Table E-2 for initiative descriptions and project status.

Local Mitigation Strategy

**TABLE 5  
Mitigation Initiatives List for Flagler County**

LMS Goal/Objective	LMS Ranking	Project Description	Priority Level	Score
<b>Prevention</b>				
1.5	N/A	<a href="#">Emergency Access for Cypress Knoll Subdivision</a>	Completed	26
4.1	2	<a href="#">Aerial Emergency Response Enhancements</a>	High	42
4.1	6	<a href="#">Mitigate City of Bunnell Safety Complex</a>	High	34
<b>Property Protection</b>				
3.3	8	<a href="#">Mitigate FCSO Storage Capabilities</a>	Med	27
2.3	N/A	<a href="#">City Wide 800MHz Radio System Upgrade</a>	Completed	30
3.3	15	<a href="#">Storm Shutters for Public Works</a>	Med	17
5.3	13	<a href="#">Flagler Beach Pier Damage Mitigation</a>	Med	22
3.3	4	<a href="#">Hardening of Critical Facilities</a>	High	38
5.3	N/A	<a href="#">Long's Landing</a>	Completed	31
5.3	N/A	<a href="#">Waterfront Park</a>	Completed	30
5.3	N/A	<a href="#">Big Mulberry Branch</a>	Completed	23
5.4	9	<a href="#">Mobile Pumps</a>	Med	26
5.4	10	<a href="#">Sand Bag Machine</a>	Med	25
5.4	11	<a href="#">Herbicide Equipment to Mitigate Weeds in Canal</a>	Med	24
3.2	7	<a href="#">Emergency Generators for Wastewater Pump Stations</a>	High	32
1.1	4	<a href="#">Flood Monitoring System</a>	High	38

**Local Mitigation Strategy**

<b>Public Education &amp; Awareness</b>				
<b>6.1</b>	14	<a href="#">Emergency Preparedness and Local Mitigation Strategy Educational Pamphlet</a>	Med	20
<b>Natrual Resource Protection</b>				
<b>4.2</b>	4	<a href="#">Flagler County Shore Mitigation Project</a>	High	38
<b>1.1</b>	3	<a href="#">Wildfire Mitigation, Containment, and Suppression Improvements</a>	High	41
<b>Structural Projects</b>				
<b>4.1</b>	1	<a href="#">Mitigate Weir Canal Palm Coast</a>	High	44
<b>1.1</b>	4	<a href="#">Mitigate Public Safety Facilities</a>	High	38
<b>4.1</b>	10	<a href="#">Mitigate Stormwater System Equipment</a>	Med	25
<b>5.4</b>	15	<a href="#">Gravity Sewer Smoke Testing</a>	Med	17
<b>4.1</b>	16	<a href="#">Marineland Acres Repetive Flooding</a>	Med	15
<b>4.1</b>	5	<a href="#">Flagler Beach Stormwater Mitigation</a>	High	35
<b>4.1</b>	3	<a href="#">Bunnell Main Canal Mitigation</a>	High	41
<b>4.1</b>	3	<a href="#">Bunnell Stormwater Mitigation</a>	High	41
<b>3.1</b>	5	<a href="#">School Board Stormwater Mitigation</a>	High	35
<b>3.2</b>	12	<a href="#">Mitigate PEP Panel</a>	Med	23

\* denotes projects that benefit all jurisdictions

**Section VI – Funding Sources**

**A. Funding Sources**

The following information on Table 6 provides sources of available funding used for hazard mitigation projects. The table includes the name of the grant, the sponsoring agency, type of assistance available and who is eligible. As additional or updated information becomes available the list is amended accordingly.

**TABLE 6  
Funding Sources for Mitigation Projects**

PROGRAM	DESCRIPTION
Base Grants (Emergency Management Preparedness & Assistance - EMPA & Emergency Management Performance Grant - EMPG)	These funds (EMPA/State & EMPG/Federal) provide counties the ability to maintain and enhance local emergency operations. Counties are reimbursed quarterly for salaries and expenses of local emergency management departments.
Emergency Management Preparedness & Assistance (EMPA) Competitive Grant Program	<b><u>The State Legislature did not appropriate funds for this program in FY 2008/09.</u></b> These funds are awarded annually to eligible applicants for competitively selected project proposals enhancing emergency management objectives. Projects are to be completed in one year. Specific selection criteria and other guidelines are detailed in Rule Chapter 9G-19, F.A.C. and in the application packet. These funds require Legislative approval.
Emergency Operations Center (EOC) -- appropriated through HB7121	State funds (general revenue) and Hazard Mitigation Grant Program funds (federal) were awarded to 24 local governments for the construction of a new EOC. HB7121 was passed July 2006.
Member Projects	These funds have been appropriated by the Florida Legislature for specific projects initiated by legislators. (i.e., construction, pilot projects, etc.)
Shelter Retrofit	These funds are an annual state appropriation to retrofit critical facilities to be used as shelters. The 07/08 funds will be used to match the HMGP Hurricane Shelter Retrofit funds associated with HB 7121. have been appropriated by the Florida Legislature for specific projects initiated by legislators. (i.e., construction, pilot projects, etc.)
Citizen Corps	These funds are designed to help families and communities be safer, stronger and better prepared to respond to any kind of disaster. Citizen Corps embraces the personal responsibility to be prepared; to get training in first aid and emergency skills; and to volunteer to support local emergency responders, disaster relief and community safety. The key component of the Citizen Corps program is the Community Emergency Response Teams.

## Flagler County Local Mitigation Strategy

Community Emergency Response Team (CERT)	These funds provide training to CERT members. This training helps the CERT members prepare citizens for emergency situations in their community and neighborhood. CERT members give critical support to first responders in emergencies, provide immediate assistance to victims, collect disaster information to support first responder efforts and provide first neighborhood help in the immediate hours following a major emergency. The concept is families helping themselves and neighbors helping neighbors to prepare, respond and recover in their own neighborhood.
State Homeland Security Grant Program	The Department of Homeland Security / Federal Emergency Management Agency (FEMA) annually awards targeted states with funds to enhance domestic security. These funds are passed through to state and local agencies, as well as private contractors for specific projects approved by the Domestic Security Oversight Council. The specific projects include the purchase of equipment, the development of planning documents, conducting training and exercises, and salary for regional staff positions.
Flood Mitigation Assistance program	This funding provides pre-disaster retrofitting repetitively flooded structures.
Hazard Mitigation Grant Program	These funds can be used for projects protecting either public or private property such as flood proofing or installation of hurricane shutters or property acquisition, relocation, or elevation to protect structures from future disasters.
National Flood Insurance Program	These funds assists state, county and municipalities and agencies to develop, implement, and maintain appropriate floodplain management regulations.
Pre-Disaster Mitigation Grant Program	These funds provide a new competitive grant program to assist communities implement hazard mitigation related activities in order to avert the future disasters. The PDM program is proactive and aims to reduce natural and technological risks to populations and structures before the next disaster occurs.
Repetitive Flood Claims Program	These funds provide pre-disaster funding for mitigation projects at 100% Federal funding.
Residential Construction Mitigation Program	This program receives \$7 million annually from the Florida Hurricane Catastrophe Trust Fund. \$2.8 million of these funds are specifically for the Mobile Home Tie-Down Program. Hurricane Research is conducted by Florida International University (FIU) to improve the wind resistance of residences through loans, subsidies, grants, demonstration projects, direct assistance, and cooperative programs with local and federal governments.
Severe Repetitive Loss Program (SRL)	<b><u>We have not received funding for the Severe Repetitive Loss Program as of yet. Projects were submitted for consideration on July 31, 2008 and the Division is hopeful these funds will be awarded.</u></b> These funds provide residential buildings having at least: (a) two separate claims payments with the cumulative amount of the claims exceeding the market value of the building; or (b) four claims payments over \$5,000 each and the cumulative amount of such claims payments exceeds \$20,000. The SRL Program is different from the other mitigation grant programs because property owners who decline offers of mitigation assistance may experience an increase in their flood insurance premium to more closely reflect the flood risk to the structure.
Special Needs Generator / HB7121	State funds (general revenue) and Hazard Mitigation Grant Program funds (federal) were awarded for the purchase and installation of permanent generators at Special Needs Shelter throughout the state. HB7121 was passed July 2006.
Hazardous Materials Emergency Preparedness Grant Program	These funds are provided to the Regional Planning Councils to conduct hazardous planning and training activities. These funds are awarded to the Division from the U.S. Department of Transportation.

## Flagler County Local Mitigation Strategy

Local Emergency Planning Committee Staff Support	These state funds are provided to the Regional Planning Councils to conduct administrative support activities for the Local Emergency Planning Committees.
Hazards Analysis Updates	These state funds are provided to the counties or the Regional Planning Councils to conduct hazard analysis updates for facilities reporting the presence of extremely hazardous substances.
Individual Assistance	These funds are available to assist individuals. After the President signs the disaster declaration including individual assistance programs, it is important to inform individuals and businesses through press releases and community relations efforts that Federal and State programs are available to assist them in recovery efforts. A person whose primary residence has been damaged due to a disaster may qualify for various forms of federal disaster assistance. When damage assessment teams go into the field, they estimate the degree of damage to the home, evaluate the victim's insurance coverage and determine the habitability of the home. Businesses damaged by a disaster may be eligible for certain individual assistance programs as provided by the Small Business Administration (SBA).
Public Assistance	Public assistance funding supplements the efforts of state and local governments to restore the public infrastructure of the disaster area to pre-disaster function or design. These efforts primarily address the restoration of public facilities or services which have been damaged or destroyed. After a Presidential Declaration, there are two types of public assistance authorized: "emergency" and "permanent" work. Emergency work includes disaster debris removal, emergency protective measures for the public safety, to protect improved property, and/or to maintain operation of essential facilities. Permanent work involves actions necessary for the restoration of disaster-damaged facilities owned by State/ local governments, federally recognized Indian Tribes, and certain private non-profit organizations. Eligible categories of permanent work include roads/bridges, water control facilities, buildings/equipment, utility systems, and parks, recreational or other facilities that do not fit in the other categories.
Fire Assistance	Fire Declarations are issued by FEMA after the State's request for federal assistance for an uncontrolled fire, or complex of fires, which constitute a threat of disaster to the public safety and/or to improved property. FEMA assistance; however, will not be provided to eligible applicants unless total costs exceed an established Fire Cost Threshold.

## **Section VII – Plan Maintenance and Updating**

This section discusses the manner in which Flagler County LMS continues to be maintained and updated over time. Plan Maintenance is considered to be the process by which the Flagler County LMS Workgroup continues to update, improve, and expand the mitigation planning process. It also includes the technical analyses needed for the process to propose more mitigation initiatives for incorporation into the plan. Plan Maintenance further includes the group's activities to monitor implementation of the plan, to evaluate the effectiveness of implemented mitigation initiatives, and to continually strive to engage the community in the planning process.

### **A. Plan Maintenance and Monitoring of Plan Implementation**

Mitigation planning is a dynamic process continually adjusted to account for changes in the community and to further refine the information, judgments, and proposals documented in the Local Mitigation Plan. The process used by the Flagler County Workgroup to maintain the plan consists primarily of four functions.

1. Continue to expand and improve the mitigation plan by accomplishing additional technical analyses, such as vulnerability assessments, evaluation of the policy framework of the participating jurisdictions, and post-event analysis of disasters, etc.
2. Continue to expand participation in the planning process by soliciting the involvement of additional agencies from the participating jurisdictions, by implementing public information programs, and by inviting expanded participation by the private sector.
3. Routinely monitor implementation of the initiatives in the plan until each is completed and in-place, and to assess their actual effectiveness following the next relevant disaster event.
4. Routinely monitor the LMS Plan by reviewing the plan annually at the LMS Workgroup meeting and making any changes necessary to the plan.
5. Issue an updated plan document for use by the participating jurisdictions, to inform the community, and when appropriate for submittal to state and federal agencies for approval pursuant to the Disaster Mitigation Act of 2000.

### **B. Technical Analysis**

The technical analyses conducted by the participating jurisdictions is an ongoing effort to continually assess the hazards threatening the community, the vulnerabilities to those hazards, and the adequacy of the participating jurisdictions' policy and program framework to control those vulnerabilities. When indicated, the technical analysis also includes formulating proposed

mitigation initiatives to eliminate or minimize the identified vulnerabilities. In future planning cycle, the Workgroup continues to assess the vulnerabilities of critical facilities, repetitive loss properties, and the jurisdictions to stated hazards. Vulnerability assessments are fundamental to identifying needed mitigation initiatives to propose for incorporation into the plan, and as this process is continued, additional mitigation initiatives are proposed for incorporation into the plan.

Another technical analysis important to maintenance of the plan is the expanded and refined evaluation of the policy and program framework of the participating jurisdictions and the adequacy of this framework to control the vulnerabilities of the community. To date, the current comprehensive land use plans, land development codes, general policies of the participating jurisdictions have been assessed in detail. As the plans are updated, the Flagler County LMS is revised to reflect these changes. During future planning cycles, the Workgroup participants intend to expand the analysis of the policy and program framework. The emphasis of this plan maintenance activity during the upcoming planning cycle is to evaluate the effectiveness of mitigation affiliated policies, the adequacy of their enforcement, and recommend modifications.

### **C. Expand Participation in the Workgroup**

Gaining additional participation in the planning is part of the public information and community outreach component of the Workgroup's approach to plan development. The specific public information activities are directly related to expanding participation in the mitigation planning are listed under the "Continued Public Involvement" heading of this section. The Workgroup has planned these activities to expand participation in the planning through active involvement of additional local agencies, community groups, and private sector interests as partners in the planning.

### **D. Monitor Implementation of Mitigation Initiatives**

When an initiative is completed, it is noted on the list of initiatives and removed from the list. As part of monitoring the implementation of mitigation initiatives, following a disaster and as a part of the post-event analysis the Workgroup conducts, the effectiveness of completed mitigation initiatives, or any pre-existing mitigation initiatives, in reducing the human and economic impacts of the event can be estimated. As time passes and disaster events occur, this enables the Workgroup to accumulate records of mitigation success stories with regard to the value of the property losses avoided and the number of fatalities, injuries or illnesses prevented.

Monitoring the effectiveness of plan implementation and maintenance also involves assessing the effectiveness of the mitigation goals established for the planning process. General goals were established by the Workgroup to guide

participants in the mitigation planning process. The Workgroup's attempts to achieve the associated mitigation goals for the community, is a key measure of the effectiveness of the continuing plan maintenance and plan implementation. As these initiatives are implemented and monitored for their effectiveness in future disasters, the Workgroup is then able to determine the overall success of their mitigation planning effort. In future planning cycles, these goals are reviewed and re-evaluated to ensure they are still relevant to the unique needs of the community and continue to address current and expected conditions.

### **E. Evaluating the Plan**

The Plan is thoroughly reviewed by the LMS Workgroup every five years to determine whether there have been any significant changes in Flagler County that may, in turn, necessitate changes in the types of mitigation actions proposed. New development in identified hazard areas, increased exposure to hazards, the increase or decrease in capability to address hazards, and changes to federal or state legislation are examples of factors that may affect the necessary content of the Plan. The plan review provides Flagler County officials with an opportunity to evaluate those actions that have been successful and to explore the possibility of documenting potential losses avoided due to the implementation of specific mitigation measures. The plan review also provides the opportunity to address mitigation actions that may not have been successfully implemented as assigned. Flagler County Emergency Management is responsible for reconvening the LMS Workgroup and conducting the five-year review.

#### **LMS Evaluation Criteria**

During the five-year plan review process, the following questions are considered as criteria for evaluating the LMS by assessing the effectiveness and appropriateness of the Plan:

- ✓ Do the goals address current and expected conditions?
- ✓ Has the nature or magnitude of risks changed?
- ✓ Are the current resources appropriate for implementing the Plan?
- ✓ Are there implementation problems, such as technical, political, legal or coordination issues with other agencies?
- ✓ Have the outcomes occurred as expected?
- ✓ Did the County and participating agencies and other partners participate in the plan implementation process as assigned?

Upon completion of the review and update process, the Flagler County LMS is submitted to the State Mitigation Officer at the Florida Division of Emergency Management (FDEM) for final review and approval in coordination with the Federal Emergency Management Agency (FEMA).

## **F. Updating Plan Document**

The results of technical analyses are incorporated into the plan and new mitigation initiatives are developed based on these analyses. A new, updated edition of the Flagler County Local Mitigation Strategy is published upon completion. The LMS should be revised at least annually to ensure it remains current and reflects changing conditions within the community. In order to ensure the Local Mitigation Strategy remains updated, Flagler County Emergency Management and the LMS Chair have agreed to review and revise the strategy annually as part of the CEMP annual review. To assist in this process, the Workgroup developed the following procedures:

### **Each Year Prior to June 30:**

1. Update hazard maps and history, if needed.
2. Update list of mitigation programs and policies, if needed.
3. Revise list of mitigation initiatives, including the removal of completed or unnecessary projects, proposal of new initiatives, and prioritization of remaining projects.
4. Follow up with project sponsors to ensure preliminary cost-benefit analysis for projects technically feasible, potentially cost effective, and environmentally sound are conducted.
5. Notify project sponsor of grant funding availability for mitigation programs.
6. Add any new funding sources to the list to consider matching with mitigation initiatives.
7. Submit revised local mitigation strategy for public review and adoption by each jurisdiction's Board of Commissioners.

### **Following a Declared Emergency/Disaster:**

1. Obtain information regarding the availability of and requirements for Hazard Mitigation Grant Program (HMGP), Community Development Block Grants (CDBG), and any other special post-disaster funding and forward to the LMS Workgroup.
2. Identify suitable projects for HMGP, CDBG, and any other special post-disaster funding from the existing list of initiatives and add any new projects identified.
3. Incorporate recommendations of the State Mitigation Task Force into the Flagler County LMS.
4. Ensure projects are prioritized and assist sponsoring agencies with applying for funding for those projects with the highest priority and the greatest likelihood of being funded.

5. Keep list of any new projects identified to add to annually revised list of mitigation initiatives.
6. Keep narrative and financial records of community and repetitive damage for updating hazard history.

To correspond with many mitigation and government grant cycles, the planning period is to begin June 30<sup>th</sup>. The schedule for the upcoming planning cycle is included in Table 7 at the end of this section. The Workgroup meets annually (at a minimum) in order to regularly update the Local Mitigation Strategy. As necessary, Flagler County Emergency Management and the LMS Chair make minor revisions to the document and contact the Workgroup for meetings.

At the conclusion of the planning cycle, a draft of the updated mitigation strategy is prepared and distributed for public comment and input. The draft is placed on the Flagler County Emergency Services website ([www.flagleremergency.com](http://www.flagleremergency.com)) and discussed at a public meeting. The website and meeting are used to receive public commentary on the update of the Local Mitigation Strategy. The update is then provided to state and federal agencies, if desired, for review, comment, and/or approval. Formal plan approval by the governing bodies of the participating jurisdictions is provided upon issuance of an updated plan document.

### **G. Plan Promulgation**

Promulgation of the plan is an important step in assuring its implementation and functioning of the mitigation incorporated within the plan. It is the expectation of the Workgroup the governing body or executive leadership of each participating jurisdiction or organization reviews, considers, and acts on the information provided in the Flagler County LMS. If the governing body approves of the plan, this is basically an approval or endorsement of the proposed mitigation initiatives. This approval or endorsement, with or without modification by the governing body, represents both consent and commitment by the representatives of the organization or jurisdiction to seek the resources needed to implement the priority initiatives contained therein. In addition, resolutions signed by each jurisdiction have been included with plan as approval of the Flagler County LMS and inter-agency agreement to implement its initiatives. Only through actual implementation of the proposed mitigation initiatives contained in this plan can it actually help to make Flagler County a disaster resistant community.

### **H. Continued Public Involvement**

The Workgroup continues efforts to develop and implement a program to engage the community in the mitigation planning process and to provide them with mitigation-related information and education. These efforts continually invite

public comments and recommendations regarding the mitigation goals for the community, the priorities for planning, and the unique needs of each community for mitigation-related public information. Local Mitigation Strategy pamphlets are designed, printed, and made available for the public at the Flagler County Emergency Operations Center. The LMS is available on the Emergency Services website and public commentary is requested. Each of these activities continues to engage the community in the planning process through the presentation of hazard mitigation.

Input received via the website, at the Flagler County EOC, via mail, or during meetings is recorded and brought for consideration at the annual Flagler County LMS Workgroup meeting. Any revisions having the support of the Workgroup are submitted as an amendment to the LMS to the applicable jurisdiction's county or city commission for approval. Upon approval, the amendment is integrated into the written plan by the Flagler County Emergency Management and the LMS Chair. Approved mitigation initiatives may be implemented as soon as they are approved.

**TABLE 7  
Meeting Schedule and Activities for Plan Maintenance and  
Updating**

Time Period	Activity by Group	
Month	Flagler County LMS Workgroup	Emergency Management & LMS Chair
1	<ul style="list-style-type: none"> <li>• Review current LMS and identify portions requiring updates</li> </ul>	<ul style="list-style-type: none"> <li>• Review participant list and continue to solicit additional involvement as indicated; strive for active involvement by each jurisdiction.</li> <li>• Review committee membership list and make adjustments as indicated</li> <li>• Compile and review comments received on last plan issued</li> </ul>
2		<ul style="list-style-type: none"> <li>• Receive and process any proposed mitigation initiatives</li> </ul>
3		<ul style="list-style-type: none"> <li>• Update websites and send articles to the Chamber of Commerce and PIO</li> </ul>
4	<ul style="list-style-type: none"> <li>• Review stats of organization and jurisdictional participation and progress in completion of the needed technical analyses; make recommendations to support staff of the additional involvement to solicit</li> </ul>	
7	<ul style="list-style-type: none"> <li>• Review schedule for finalization of next plan</li> <li>• Review current progress in initiative and plan implementation</li> </ul>	<ul style="list-style-type: none"> <li>• Establish final deadline for receipt of any mitigation initiatives for incorporation to the plan</li> </ul>
10	<ul style="list-style-type: none"> <li>• Review draft plan</li> </ul>	<ul style="list-style-type: none"> <li>• Finalize data entry regarding all technical analyses and proposed mitigation initiatives</li> <li>• Prepare, print, and distribute draft edition of the plan</li> </ul>
11	<ul style="list-style-type: none"> <li>• Meet to review, discuss, and approve release of draft plan</li> </ul>	<ul style="list-style-type: none"> <li>• Schedule and support meeting</li> </ul>
12	<ul style="list-style-type: none"> <li>• Secure approval or adoption of final plan issued by participating jurisdictions' governing bodies</li> </ul>	<ul style="list-style-type: none"> <li>• Prepare, print, and release final plan, adjusted in accord with directions of the Workgroup</li> <li>• Submit updated data to the state on request</li> </ul>