



CITY COUNCIL AGENDA ITEM

#9

DISCUSS/TAKE ACTION ON RESOLUTION NO. 959, A RESOLUTION OF THE CITY OF SATELLITE BEACH, BREVARD COUNTY, FLORIDA, ADOPTING THE 2015 UPDATE OF THE BREVARD PREPARES LOCAL HAZARD MITIGATION STRATEGY (LMS) PLAN; PROVIDING AN EFFECTIVE DATE

To: City Manager Courtney Barker
From: Fire Chief Don Hughes
Meeting Date: 8/20/2015
Department: Fire

Recommended Action: Adopt Resolution No. 959 that adopts the Brevard County Local Hazard Mitigation Strategy Plan.

Background: Satellite Beach participates in the Brevard County Local Mitigation Steering Committee. FEMA requires each local jurisdiction to develop a collaborative process that identifies disaster mitigation projects for future FEMA funding.

Budget Impacts: None

Attachments:

- Resolution No. 959
- Brevard County 2015 Local Hazard Mitigation Strategy Plan

9
8-20-15

RESOLUTION NO. 959

**A RESOLUTION OF THE CITY OF SATELLITE BEACH,
BREVARD COUNTY, FLORIDA, ADOPTING THE 2015
UPDATE OF THE BREVARD PREPARES LOCAL
HAZARD MITIGATION STRATEGY (LMS) PLAN;
PROVIDING AN EFFECTIVE DATE**

WHEREAS, the City of Satellite Beach is vulnerable to the human and economic costs of natural, technological and societal disasters; and

WHEREAS, the City of Satellite Beach recognizes the importance of reducing or eliminating these vulnerabilities for the overall good and welfare of the community; and

WHEREAS, the City of Satellite Beach is an active participant in the Brevard Prepares LMS Steering Committee, which has established a comprehensive, coordinated planning process to eliminate or decrease these vulnerabilities; and

WHEREAS, Satellite Beach representatives and staff have identified, a justified number of proposed projects and programs needed to mitigate the vulnerabilities of the unincorporated areas of Brevard County to the impacts of future disasters; and

WHEREAS, these proposed projects and programs have been incorporated into the updated 2015 edition of the Brevard Prepares LMS that has been prepared and issued for consideration and implementation by the communities of Brevard County; and

WHEREAS, the The City of Satellite Beach 2015 LMS is in compliance with the local hazard mitigation requirements of Section 322 of the Disaster Mitigation Act of 2000 (DMA2K) as implemented in 44 C.F.R., Part 201; and

WHEREAS, approval and adoption of the LMS is necessary in order to maintain eligibility for future hazard mitigation project grant funding.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF SATELLITE BEACH, FLORIDA, as follows:

Section 1. The City of Satellite Beach accepts and approves of the 2015 Brevard Prepares Local Hazard Mitigation Strategy Plan.

Section 2. The agency personnel of the The City of Satellite Beach are requested and instructed to pursue available funding opportunities for implementation of the proposals designated herein.

Section 3. The The City of Satellite Beach will, upon securing such funding or other necessary resources, seek to implement the proposals contained in its section of the strategy.

Section 4. The The City of Satellite Beach will continue to participate in the Brevard Prepares Local Mitigation Steering Committee to update and expand the Brevard Prepares Local Mitigation Strategy.

Section 5. The City of Satellite Beach will further encourage other businesses, industries, and community groups within Brevard County to also participate in Brevard Prepares to support the Brevard Prepares Local Mitigation Strategy.

Section 6. This Resolution shall take effect immediately upon its adoption.

Section 7. This Resolution was adopted at a regular meeting of the City Council on the ___ day of _____, 2015.

DOMINICK MONTANARO, VICE-MAYOR

ATTEST:

LEONOR OLEXA, CMC, CITY CLERK

**Brevard County
2015
Local Hazard Mitigation Strategy**



A Multi-Jurisdictional Plan

July 15, 2015

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1.1 ACKNOWLEDGEMENTS

Brevard County Emergency Management engaged a number of community stakeholders and utilized a variety of data sources to complete this installment of the Brevard County Local Mitigation Strategy.

Brevard Prepares, a group that provides a forum for public officials, private firms and the public to develop strategies to prepare for disasters, was crucial to the development of this plan. The group includes all sixteen jurisdictions and Brevard County, as well as the American Red Cross, Health First, the Home Builders & Contractors Association, Eastern Florida State College, Florida Power & Light, St. John's River Water Management District (SJRWMD), Florida Solar Energy Center, Harris Corporation, Circles of Care, Brevard Emergency Amateur Radio Services (BEARS), Brevard Public Schools, and Wuesthoff Health System.

The jurisdictions that participated in this plan are listed below:

- Brevard County
- The City of Cape Canaveral
- The City of Cocoa
- The City of Cocoa Beach
- The Town of Grant-Valkaria
- The Town of Indialantic
- The City of Indian Harbour Beach
- The Town of Malabar
- The City of Melbourne
- The Town of Melbourne Beach
- The Town of Melbourne Village
- The City of Palm Bay
- The Town of Palm Shores
- The City of Rockledge
- The City of Satellite Beach
- The City of Titusville
- The City of West Melbourne

In addition, the East Central Florida Regional Planning Council utilized historical data and information layers from the National Climatic Data Center, the National Oceanic and Atmospheric Administration, Hazus-MH, the Brevard County Property Appraiser's Office, Brevard County Public Works, Brevard County Planning and Development and Brevard County Geographic Information Systems to update this document with the "best available" climate and hazard vulnerability data.

1.2 MISSION

To provide Brevard County residents, businesses and industries, non-profit organizations, and local governments the education and support necessary to reduce the loss of life and human suffering; to minimize property damage; and to protect environmentally sensitive areas from all types of disasters through a comprehensive, risk-based, all-hazard emergency management program.

1.3 EXECUTIVE SUMMARY

The development and implementation of a local mitigation strategy provides a mechanism to address issues that will reduce or eliminate exposure to hazard impacts. Due to the importance of avoiding or minimizing the vulnerabilities to these hazards, the public and private sector interests of Brevard County have joined together in **Brevard Prepares**. Brevard Prepares has undertaken a comprehensive planning process in conjunction with Brevard County Emergency Management and the East Central Florida Regional Planning Council, culminating in the publication of this 2015 update of the "Brevard County Local Hazard Mitigation Strategy."

This is a multi-jurisdictional hazard mitigation plan, and the planning effort has been conducted through the coordinated, cooperative effort of all local governments within Brevard County. These local governments include the City of Cape Canaveral, the City of Cocoa, the City of Cocoa Beach, the Town of Grant-Valkaria, the Town of Indialantic, the City of Indian Harbour Beach, the Town of Malabar, the City of Melbourne, the Town of Melbourne Village, the Town of Melbourne Beach, the City of Palm Bay, the Town of Palm Shores, the City of Rockledge, the City of Satellite Beach, the City of Titusville, the City of West Melbourne and Brevard County.

Other key participant organizations and agencies involved with this project include The American Red Cross, Harris Corporation, Health First, the Home Builders & Contractors Association, Eastern Florida State College, Florida Power & Light, St. John's River Water Management District (SJRWMD), Florida Solar Energy Center, Circles of Care, Brevard Emergency Amateur Radio Services (BEARS), Brevard Public Schools, and Wuesthoff Health System.

For this 2015 update, a new hazard and risk analysis was completed by the East Central Florida Regional Planning Council. With the updated analysis, Brevard Prepares worked to identify, justify and prioritize specific proposals for projects and programs that will avoid or minimize these vulnerabilities in the future. These proposed projects and programs are also referred to as "Mitigation Initiatives" in this document.

This update has been submitted to the Florida Division of Emergency Management (FDEM), who also has the authority to review the document on behalf of the Federal Emergency Management Agency (FEMA), for review in comparison to the requirements from the Local Mitigation Plan Review Guide, revised by FEMA in October 2011. Once a decision has been made that the updated plan adequately addresses these requirements, the plan will be submitted to the participating jurisdictions' governing

bodies for formal adoption and approval. Adoption resolutions can be found in Appendix VII.

The final draft plan will be submitted to the governing bodies of the participating jurisdictions for final approval and adoption. Consistent with the normal practices of the participating jurisdictions, which conduct meetings in accordance with Florida's open meetings statutes, the public will have an opportunity to comment upon each jurisdiction's adoption of the plan during public meetings. In accordance with Federal practice, the participating local jurisdictions have one year from the date of State approval of the plan to complete the formal adoption.

This plan will continue to be updated in the future to ensure it addresses changing conditions in the participating jurisdictions, experiences with disasters that occur and any changes in the characteristics of the hazards that threaten the involved communities. This updating process and future editions of the local mitigation strategy will also be used to inform and involve the general public, and other interested groups, in an effort to elicit their participation in making the community more resilient to the impacts of future disasters.

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1.4 INTRODUCTION

Brevard Prepares has been active since 1998 to make the population, neighborhoods, businesses and institutions of the community more resistant to the impacts of future disasters. The group has been undertaking a comprehensive, detailed evaluation of the vulnerabilities of the community to all types of natural, technological and societal hazards in order to identify ways to make the communities of the planning area more resilient to their impacts. This document reports the results of that planning process for the current planning period as indicated in the below table:

STARTING DATE OF PLANNING	ANTICIPATED COMPLETION	DATE PLAN RELEASED
7/1/05	10/19/09	7/31/10
7/1/10	08/1/15	TBA

1.5 PURPOSE

The Brevard County Local Hazard Mitigation Strategy Update and its underlying planning process are intended to serve many purposes, which are unchanged since the original mitigation plan was issued and continue to be applicable to the plan updating process. They include the following:

- **Provide a Methodical, Substantive Approach to Mitigation Planning.** The approach utilized by Brevard Prepares relies on a step-wise application of sound planning concepts in a methodical process to identify vulnerabilities to future disasters and to propose the mitigation initiatives necessary to avoid or minimize those vulnerabilities. Each step in the process builds upon the previous step, so that there is a high level of assurance that the mitigation initiatives proposed by the participants have a valid basis for both their justification and priority for implementation. One key purpose of this plan is to document that process and to present its results to the community.
- **Enhance Public Awareness.** The plan update identifies the hazards threatening Brevard County and provides an assessment of the relative level of risk they pose, details specific vulnerabilities of the neighborhoods of Brevard County and many of the facilities that are important to the community's daily life and includes a number of proposals to avoid or minimize those vulnerabilities. This information can be helpful to individuals who wish to understand how the community could become safer from the impacts of future disasters. Brevard Prepares will continue to be active in communicating with the public and engaging interested members of the community to participate in the planning process. This update and the analyses contained herein are the principal information resources for such activities.

- **Create a Decision Tool for Management.** The Brevard County Local Mitigation Strategy Update provides information needed by the managers and leaders of local government, business and industry, community associations and other key institutions and organizations to take actions to address vulnerabilities to future disasters. It also provides proposals for specific projects and programs that are needed to eliminate or minimize those vulnerabilities. These proposals, called "mitigation initiatives" in the plan, have been justified on the basis of their economic benefits using a uniform technical analysis, as well as prioritized for implementation using ten objective criteria. This approach has been intended to provide a decision tool for the management of participating organizations and agencies regarding the reason proposed mitigation initiatives should be implemented, which should be implemented first, and indicating the economic and public welfare benefits of doing so.
- **Promote Compliance with State and Federal Program Requirements.** There are a number of state and federal grant programs, policies, and regulations that encourage or even mandate local government to develop and maintain a comprehensive hazard mitigation plan. This plan is specifically intended to assist the participating local governments to comply with these requirements, and to enable them to respond more fully and quickly to state and federal funding opportunities for mitigation-related projects. Since the plan defines, justifies and prioritizes mitigation initiatives that have been formulated through a hazard analysis and vulnerability assessment process, the participating organizations are better prepared to develop the necessary grant application materials for seeking state and federal funding.
- **Enhance Local Policies for Hazard Mitigation Capability.** The planning process utilized by Brevard Prepares supports evaluation of the adequacy of the community's policies and programs in light of the level of risk posed by specific hazards to create a more disaster-resistant future for the community. For this plan update, more recent editions of Comprehensive and Capital Improvement Plans, as well as other policies, were analyzed for existing policies and plans that incorporated mitigation goals and actions.
- **Assure Inter-Jurisdictional Coordination of Mitigation-Related Programming.** A key purpose of the planning process utilized by Brevard Prepares has been to ensure that proposals for mitigation initiatives are reviewed and coordinated among the participating jurisdictions.
- **Create Jurisdiction-Specific Hazard Mitigation Plans for Implementation.** A key purpose of the Brevard County hazard mitigation planning process is to provide each participating local jurisdiction with a specific plan of action that can be adopted and implemented pursuant to its own authorities and responsibilities, yet with

implementation that is coordinated with other organizations participating in Brevard Prepares.

The following sections of the Brevard County Local Hazard Mitigation Strategy present the detailed information supporting these purposes. The remainder of the plan describes the planning organization developed by Brevard Prepares, as well as its approach to managing the planning process. The plan provides a description of the mitigation-related characteristics of each participating jurisdiction, such as its land uses and population growth trends, existing policies and plans incorporating mitigation goals and actions, identified critical facilities present in the community, and properties that have been damaged multiple times by past disasters (found on page LMS-132).

The plan then summarizes the results of the hazard identification and vulnerability assessment process and documents the mitigation initiatives proposed by the participating jurisdictions to address the identified vulnerabilities. In addition, the plan further addresses the mitigation goals and objectives previously established by Brevard Prepares and the actions taken to maintain, expand and refine the Brevard County local mitigation planning process.

1.6 THE LMS TASK FORCE: BREVARD PREPARES

Brevard Prepares is composed of a number of local government agencies, businesses, community organizations, and institutions. This section describes the local jurisdictions and organizations participating in Brevard Prepares and discusses the organizational structure used to complete the planning process. It also provides a summary of the current status of planning activities by the participants, documenting the level of participation by the jurisdictions making up Brevard Prepares. Brevard Prepares' bylaws and operating procedures in Appendix II of the plan update, which are unchanged from the last plan update, further define how participation in the planning process is determined.

On a periodic basis, Brevard Prepares solicits the continuing involvement in mitigation planning by each local jurisdiction in the planning area. Brevard County Emergency Management, the coordinating agency for Brevard Prepares, specifically solicits via email, telephone and correspondence, each jurisdiction to assign one or more individuals to serve as its representative(s) in the group. In these solicitations, the jurisdictions are encouraged to identify agencies and organizations that should represent the jurisdiction and to meet periodically with the other participants of Brevard Prepares. State, regional and federal agencies with facilities or responsibilities in Brevard County are also encouraged to be involved in the planning process.

Voting Members of Brevard Prepares Steering Committee, 2015

Name of Organization	Voting Representative	Title
Waste Management	George Geletko	FL Government Affairs Dir.
	Dina Reider Hicks	Government Affairs Mgr.
Harris Corporation	Elsa Nylander	Corporate Security Mgr.
Home Builders and Contractors Association	Sandy Nicotra	Executive Director
City of Cape Canaveral	Jeff Ratliff	Public Works Director
City of Cocoa	Gene Prince	Fire Chief
City of Cocoa Beach	Charles Holland	Assistant City Manager/CFO
	Ryan Duckworth	Fire Chief
Town of Grant-Valkaria	Richard Hood	Town Administrator
Town of Indialantic	Chris Chinault (Chair)	Town Manager
City of Indian Harbour Beach	Mark Ryan	City Manager
	Todd Scaldo	Fire Chief \ Alt.
Town of Malabar	Bonilyn Wilbanks	Town Administrator
City of Melbourne	Chuck Bogle	Fire Chief
Town of Melbourne Beach	Jamie Titcomb	Town Manager
Melbourne Village	Gail Griswold	Town Clerk
City of Palm Bay	Bamey Weiss	Public Works Division Manager
	Mike Bandish	Emergency Manager PBPD
	Amanda Millirons	Public Works Asst. Dir. \ Alt.
Town of Palm Shores	Carol McCormack	Mayor
	Ed Washburn	Town Planning Consultant
City of Rockledge	Jim McKnight	Town Manager
	Don Griffin	Planning Director \ Alt.
	Alix Bernard	City Planner \ Alt
City of Satellite Beach	Don Hughes	Fire Chief
City of Titusville	Richard Stillwagon (Vice Chair)	Special Projects Coordinator
City of West Melbourne	Keith Mills	Public Works Director
Brevard County	Virginia Barker	Watershed Program Mgr. Natural Resources Mgmt. Dept.
St. John's River Water Management District	Ann Benedetti	Intergovernmental Coordinator
Health First\ Holmes Regional Medical Center	Wayne Struble	Emergency Preparedness Specialist

Other entities such as neighborhood associations, businesses and volunteer agencies are also solicited on an annual basis to join the planning process, as well as through periodic public information actions by Brevard Prepares. A positive response to these

solicitations from Brevard Prepares will result in a request to engage in meetings and planning activities necessary for plan maintenance and implementation.

1.6.1 Participating Jurisdictions and Organizations

Within each of the defined jurisdictions, any involved organizations, agencies, or groups are registered in the program as representatives of that jurisdiction, and are responsible for actual development and implementation of the plan on behalf of that jurisdiction. In the case of this update, the defined jurisdictions are the incorporated municipalities within the planning area as well as the county itself for the unincorporated area. Participating local government agencies are registered as organizations under the appropriate jurisdiction. Other groups, associations, districts, regions and agencies, both public and private, which serve the jurisdiction or are headquartered in Brevard County, generally are listed under 'unincorporated' Brevard County.

Since this is a local, multi-jurisdiction mitigation plan, with an individual mitigation plan for each participating jurisdiction, this approach enables all interested organizations, groups and agencies, regardless of their total number, to be directly and actively involved in the planning within a limited number of jurisdictions. For the 2010 update, there were 16 jurisdictions defined as active participants in the planning. From these 16 jurisdictions, 59 agencies and organizations are supporting the planning process to varying degrees.

For the 2015 Brevard County Local Mitigation Strategy, updates were provided from the following jurisdictions:

- Brevard County
- Cape Canaveral
- Cocoa
- Cocoa Beach
- Grant-Valkaria
- Indian Harbour Beach
- Indianalantic
- Malabar
- Melbourne
- Melbourne Beach
- Melbourne Village
- Palm Bay
- Palm Shores
- Rockledge
- Satellite Beach
- Titusville
- West Melbourne

Efforts will continue to be made by the County to re-engage any municipalities and organizations that have not been actively participating during this planning cycle while continuing to maintain interest for those who have participated. It is intended that the number of participating organizations and groups will continue to grow in future planning cycles.

1.6.2 The Brevard Prepares Organizational Structure

Brevard Prepares encourages participation by all interested local jurisdictions, agencies, organizations and individuals. The organization is intended to represent a partnership between the public and private sectors of the community, working together to create a

disaster-resistant community. The proposed mitigation initiatives developed by Brevard Prepares participants as listed in this updated plan, when implemented, are intended to make the entire community safer from the impacts of future disasters, for the benefit of every individual, neighborhood, business and institution.

Brevard Prepares is organized in the following manner: There is a Steering Committee who has the option of designating ad hoc committees, and support staff. The responsibilities and duties of this organizational structure are detailed in the bylaws and operating procedures of Brevard Prepares, which are provided in Appendix II. This section summarizes the roles of the different components of Brevard Prepares and describes the participation that has actually occurred during the planning period covered by this document. A table listing the designated representatives of participating organizations can also be found in this document.

The Steering Committee represents all of the local jurisdictions and key organizations participating in the planning process, and is the group that makes the official decisions regarding the planning process. The Steering Committee serves as the official liaison of Brevard Prepares to the community, and also provides assignments to ad hoc committees and coordinates their activities should the need arise. Most importantly for this document, however, is the Steering Committee's role to coordinate and approve proposed mitigation initiatives for incorporation into the plan, for determining the priorities for implementation of those initiatives, and for removing or terminating initiatives that are no longer desirable for implementation.

Several members of Brevard Prepares are technical staff from the organizations of the participating jurisdictions. With their expertise, the coordinating process undertaken constitutes a "peer review" of the proposed mitigation initiatives submitted for incorporation into the plan. Through such oversight, each proposed initiative is reviewed for its consistency with the goals and objectives established for the planning process and its relationship to identified hazards and defined vulnerabilities to those hazards. The peer review incorporated into the Brevard County planning process also strives to assure the assumptions used by the organization to develop the proposal are reasonable, that the proposal would not conflict with or duplicate other proposed initiatives, that proposals are feasible and consistent with known requirements, and that the proposal, if implemented, would not cause harm or disruption to adjacent jurisdictions.

Individual jurisdictions, and their agencies and local organizations, are the catalyst to accomplishing the planning process. Information gathered and processed in the original

mitigation plan, as well as the first plan update, has been streamlined and made current for this update.

The planning effort began with developing a community profile of each participating jurisdiction in Brevard County to document the basic characteristics of their community relevant to controlling the impacts of disasters. The jurisdictions then conduct vulnerability assessments of their key facilities, systems and neighborhoods within or serving their area to define, specifically, how these may be vulnerable to the impacts of all types of disasters. Finally, the jurisdictions and their organizations use the vulnerability assessments to formulate and characterize mitigation initiatives that they could implement if the resources to do so became available. These steps have been reviewed for this update and, where needed, modified accordingly.

Once proposed initiatives are reviewed and coordinated, the Steering Committee can then decide to approve them formally by vote in order to incorporate them into the Brevard County Local Hazard Mitigation Strategy. When this occurs, initiatives are considered to be officially a part of the plan, and are expected to be implemented by the sponsoring organization as soon as the resources and/or opportunity to do so become available.

Ad hoc committees may be designated to implement, for example, public information efforts to secure public input and comment on the efforts of Brevard Prepares; to inform the public about the activities of Brevard Prepares; to conduct public information and education programs regarding hazard mitigation; to assist with the conduct of public hearings or meetings; or, to promote public acceptance of the strategy developed by Brevard Prepares. Such a committee would be composed of individuals from the participating agencies and organizations who have an interest or responsibility in education, media relations and community outreach. The support staff, provided by Brevard County Emergency Management, assists participants by scheduling meetings, recording meeting summaries, coordinating the activities of the participating organizations, and by maintaining this plan.

1.6.3 Involvement and Consultation among Adjacent Jurisdictions

This plan update has been developed by Brevard Prepares through a coordinated effort of the local jurisdictions within Brevard County, as well as participating regional and state agencies and key local community and private sector organizations. The list of participating agencies and organizations, provided in Appendix II indicates that organizations with public safety, hazard mitigation, public health, transportation, housing, land use planning and development, business, academic and other interests have been participants in the planning.

The planning process utilized, as defined in the standard operating procedures of Brevard Prepares and provided in Appendix II, mandate that adjacent jurisdictions within the Brevard County mitigation planning area consult and coordinate with each other throughout the planning process, especially during the process to establish the goals and objectives for the plan, as well as to review proposed mitigation initiatives for incorporation into the plan. Where indicated, Brevard Prepares has also consulted with jurisdictions outside of the planning area, accomplished on an informal basis, primarily by discussions among emergency management staff. Emergency management personnel, as in Brevard County, serve as the support staff to the local mitigation planning efforts in adjacent counties.

Upon release of an updated plan for public review and comment, adjacent jurisdictions' input will be solicited as well.

1.6.4 Current Status of Participation in Brevard Prepares

In order to support the participating jurisdictions in the completion of this update of the plan, the support staff met with representatives of the Brevard Prepares Steering Committee, requested updates to jurisdictional plans, and worked with staff and participating private organizations on updates to project initiatives. The participating jurisdictions and organizations then, as applicable, used the results of these updated assessments to develop and propose additional hazard mitigation initiatives for incorporation into the Brevard County Local Hazard Mitigation Strategy.

1.7 PLAN MAINTENANCE

"Plan Maintenance" is considered to be the process by which Brevard Prepares will continue to update and improve the mitigation planning process. It also includes the technical analysis 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 strive continually to engage the community in the planning process. The basic elements of Brevard Prepares' actions to implement and maintain the plan are also described in the operating procedures, found in Appendix II.

Mitigation planning is a dynamic process that must be continually adjusted to account for changes in the community and to refine the information, judgments and proposals documented in the local mitigation plan. The process used by Brevard Prepares to maintain the plan consists primarily of four functions:

- Continue to 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.
- Continue to expand participation in the planning process by soliciting the involvement of additional agencies from the participating jurisdictions, by reaching out to the public, and expanding participation by the private sector
- Routinely monitor implementation of the initiatives in the plan until each is completed and in place, and assess their actual effectiveness following the next relevant disaster event
- 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

The technical analysis conducted by the participating jurisdictions will be an ongoing effort to 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. For the 2015 update, new analysis for hazard identification and vulnerability assessments were completed. During the next planning cycle, participants intend to continue their analyses, so more mitigation-specific local ordinances are identified and documented to indicate the relationship between the action-oriented mitigation strategy and other current planning documents.

Brevard Prepares, through the Brevard County Local Mitigation Strategy, will continue to expand participation in the mitigation planning process. Gaining additional participation in the planning process is also part of the public information and community outreach component of development.

The third category of plan maintenance activities that will be undertaken by Brevard Prepares will be to monitor the implementation of mitigation initiatives by the participating jurisdictions and their agencies. The current status of initiative implementation is detailed in Appendix I of this plan, and Brevard Prepares will update this section of the plan annually, to be included in the next publication of the Brevard County Local Mitigation Strategy.

As a part of monitoring the implementation of mitigation initiatives, following a disaster the participants conduct a post-event mitigation assessment. This is intended to define, for the event, the demonstrated effectiveness of completed mitigation initiatives, or any pre-existing mitigation initiatives, in reducing the human and economic impacts of the

event. As time passes and disaster events occur, this will enable Brevard Prepares to accumulate a database 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 and objectives established for the planning process. As noted above, Brevard Prepares established general goals and a number of specific objectives to guide the participants in the mitigation planning process, and these are provided in Section 1.9: Mitigation Goals, Objectives, and Actions. The attempts to address the established objectives, with the intent of achieving the associated mitigation goals for the community, are a key measure of the effectiveness of the continuing plan maintenance and plan implementation.

Appendix I includes the project listings, which documents the participants' efforts to achieve the established goals and objectives through the implementation of associated proposed mitigation initiatives. As these initiatives are implemented and monitored for their effectiveness in future disasters, Brevard Prepares will be able to determine the overall success of their mitigation planning effort. In future planning cycles, these goals will be reviewed and re-evaluated to ensure they are still as relevant to the unique needs of the community as they are now, and that they continue to address current and expected conditions.

The final activity in plan maintenance is to incorporate the results of all technical analyses, including the development of new mitigation initiatives, and publish an updated edition of the Brevard County Local Mitigation Strategy. In addition to documenting further technical analysis, the program can also be used to document the efforts to continue to engage the public in the planning process, to expand direct participation in the planning, and to increase representation in Brevard Prepares. Continuation of the planning process will enable Brevard Prepares to address the analyses not yet completed and/or the mitigation initiatives still needing to be characterized and proposed.

1.7.1 Plan Evaluation

The local hazard mitigation plan is to be evaluated on an annual basis by Brevard County Emergency Management or its designee. The Brevard County Emergency Management was selected as the organization to evaluate the mitigation plan since the Office serves as support staff for Brevard Prepares, a committee with representatives from all of the participating jurisdictions and organizations. In this role, Emergency Management has responsibility for maintaining the master copy of the LMS, for scheduling and facilitating meetings of Brevard Prepares, and collaborating with

adjacent counties, the State of Florida and the Federal Emergency Management Agency regarding the mitigation plan. In addition, frequently, Emergency Management is the contact point and coordinator for post-disaster funding opportunities for implementation of the proposed mitigation initiatives incorporated into the plan.

The following represents evaluation criteria:

- Assessing recent emergency events and their impact, as well as the resultant influence and/or adjustments that are needed in the mitigation planning process
- Evaluating the progress in addressing the established mitigation goals and objectives, primarily through the development and implementation of initiatives for each goal and objective to ensure progress is being made
- Assessing the extent to which the mitigation plan is effectively interacting with other jurisdictional plans and programs related to mitigation issues, such as being incorporated into a jurisdiction's comprehensive plan, emergency management plan, capital improvement plan, storm water management plan, etc.
- Evaluating the extent to which the vulnerabilities of assessed critical facilities, other facilities and systems, neighborhoods and repetitive loss properties are being addressed through the planning process, including the development and implementation of initiatives
- Assessing whether Brevard Prepares continues to have or needs to expand its membership to promote community participation in the mitigation planning process
- Evaluating continuing progress in the expansion and/or updating of the hazard identification and vulnerability assessment process, the development and implementation of mitigation initiatives, as well as assessing the effectiveness of implemented initiatives
- Assessing specific aspects of the mitigation policies and programs, based on policy data entered into the program, to evaluate specific mitigation issues of interest, especially on a multi-jurisdictional basis, such as variations in local mitigation-related codes

1.7.2 Plan Updating, Review and Approval

The planning period began July 1, 2010 for this update of the Brevard County Local Mitigation Strategy. The planned date for release of the next update of the Brevard County Mitigation Strategy (LMS) is intended to be no later than August 2015 and this begins a new five year cycle.

Brevard County Emergency Management, as the support staff for Brevard Prepares, is responsible for updating the mitigation plan. The updating process is accomplished by convening an initial meeting of the group at the start of the planning cycle. This meeting will be used to establish participation in the update process, to brief participants on the

current status of the planning efforts for each jurisdiction, to review the established mitigation goals and objectives, and to acquaint any new representatives with the technical steps in the planning process. This meeting will also review any changes in the state or federal regulations and/or guidance applicable to the mitigation plan. Each jurisdiction will then be responsible for assessing the previous analysis completed for its community, and, as indicated, modifying or expanding the analysis. Through the coordination of Brevard County Emergency Management, each jurisdiction will then be responsible for updating its jurisdiction's portion of the strategy. Work products and/or planning milestones are to be produced on the schedule established for the update cycle. Emergency Management will, as needed, facilitate meetings with officials from individual jurisdictions to assist with the updating process.

At least annually during the plan update cycle, the Brevard Prepares Steering Committee will meet as a group to review progress with the planning and to coordinate the actions of individual jurisdictions. Upon completion of each of the planning steps by a jurisdiction, the updated information for that step will be provided to Brevard County Emergency Management for review, coordination with information received from other jurisdictions, and data entry into the LMS.

Near the conclusion of the five year planning cycle, a draft of the updated mitigation plan will be prepared and available for public comment and input at the Brevard County Emergency Operations Center. There will be at least two days when – via public notice – anyone may review the document and ask questions of staff. A summary of the plan will be made available on the Brevard County Emergency Management website for the same purpose for those who have Internet availability. This information will also be shared with the community via Brevard County Emergency Management's social media avenues of Facebook and Twitter.

Formal plan review and approval/adoption by the governing bodies of the participating jurisdictions will be sought upon plan update completion. The process begins by a decision of Brevard Prepares that the plan, as a draft, is approved for release. Next, the draft will be reviewed by FDEM, who also has the authority to review the document on behalf of FEMA, for review in comparison to the requirements from the Local Mitigation Plan Review Guide, revised by FEMA in October 2011. Once a decision has been made that the updated plan adequately addresses these requirements, the plan will be submitted to the participating jurisdictions' governing bodies for formal adoption and approval. Upon approval and/or adoption by all of the participating jurisdictions, the draft plan will be considered as finalized.

In the future, each update will be provided to the above-mentioned state agency for review, comment and approval within the plan update schedule requirements imposed, but no later than every five years.

For the 2015 update, the East Central Florida Regional Planning Council (ECFRPC) reviewed both the existing and updated data available for each section of the plan, and the text of each section contained in the 2010 edition of the plan. The sections were re-drafted to update both the text and the data reports contained therein. The updating process, by section, included the following:

Section	Changes/Updates
Executive Summary	Textual revisions
Introduction	Textual revisions
Purpose	Textual revisions
The LMS Task Force: Brevard Prepares	Textual revisions
Plan Maintenance	Textual revisions; updated section summaries
Hazard and Vulnerability Analysis	Completely re-drafted according to new analysis
Mitigation Goals, Objectives and Actions	Textual revisions
Plan Integration	Textual revisions
Appendix I-IV	Re-drafted project listings; textual revisions

1.7.3 Continued Public Involvement

Brevard Prepares, via the Steering Committee, will continue efforts to develop and implement a year-round program to engage the community in the mitigation planning process and to provide them with mitigation-related information and education. These efforts will be to 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.

Public Comment Period

Date	Activity Type	Purpose of Activity	Audience Type	Outreach Method	Comments
12/15/14 through 1/5/15	Public comment period	Solicit public comments and involvement in the final draft of the 2015 update of the mitigation plan.	General public	Upon incorporation of required and recommended revisions received from the State of Florida and FEMA on the 2015 update, a final plan was prepared and posted for public review on the Internet at http://www.embrevard.com . A press and social media releases were also done. A hard copy of the plan was also made available. Other opportunities for public comment will occur at the various adoption hearings.	During the comment period one inquiry was received asking if there was a connection to the NFIP CRS rating system. They had not read the plan. The plan purpose was described to the person inquiring and they had no suggested changes or further comments.

The public is also invited to participate during the adoption hearing process. These and other informational activities will continue to educate the community about the planning process through the presentation of specific topics or programs related to hazard mitigation.

Upon completion of this plan update, it will be made available to the Brevard Prepares Steering Committee for comment. Following the incorporation of relevant input, the participating jurisdictions would take comments from the public during a publicly noticed meeting. Once adopted by all municipalities, the Brevard Board of County Commissioners would consider adoption at their meeting, thus providing another opportunity for public engagement.

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In The Spotlight at Brevard County Emergency Management

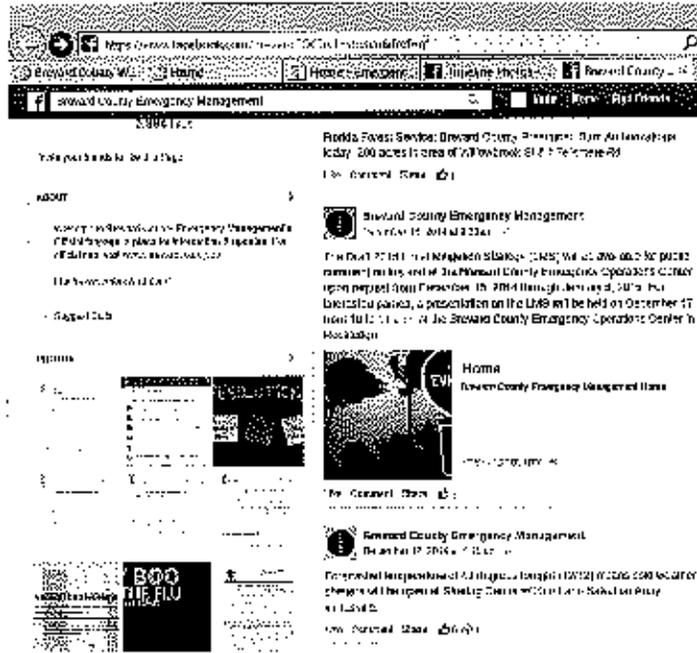
Event Report - Local Mitigation Strategy 2015 Draft



The Draft 2015 Local Mitigation Strategy (LMS) will be available for public comment and all interested County Emergency Operations Center (EOC) members from December 15, 2014 through January 3, 2015. Public comment is preferred on the LMS and will be held on December 17 from 10:00 a.m. at the Brevard County Emergency Operations Center, 10000 U.S. 1, Suite 100, Titusville, FL 32781. To download the draft, visit www.brevard.gov.

- An OIA public comment meeting will be held at Brevard County, 10000 U.S. 1, Suite 100, Titusville, FL 32781, on December 17, 2014 from 10:00 a.m. to 12:00 p.m. The meeting will be held at the Brevard County Emergency Operations Center, 10000 U.S. 1, Suite 100, Titusville, FL 32781.
- Draft 2015 Local Mitigation Strategy (LMS) will be available for public comment and all interested County Emergency Operations Center (EOC) members from December 15, 2014 through January 3, 2015. Public comment is preferred on the LMS and will be held on December 17 from 10:00 a.m. at the Brevard County Emergency Operations Center, 10000 U.S. 1, Suite 100, Titusville, FL 32781. To download the draft, visit www.brevard.gov.
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Was prepared by following: Brevard EOC on Twitter: <https://twitter.com/BrevardEOC> Brevard County Emergency Management on Facebook: <https://www.facebook.com/brevardem> Brevard County Emergency Management on Twitter: <https://twitter.com/BrevardEOC>



1.7.4 The Next Planning Cycles

Brevard Prepares has established a schedule and procedure for both plan implementation and plan maintenance. Initially, the planning efforts by the jurisdictions will seek to build on the analyses and proposals included in this edition of the mitigation plan, primarily by completing more vulnerability assessments, evaluations of plans and programs, and proposing additional mitigation initiatives.

Eventually, after a number of planning cycles with ongoing new analyses, all important facilities and vulnerable neighborhoods within all of the participating jurisdictions will have been evaluated and the mitigation planning effort can enter a more normal maintenance and implementation routine. During these continuing efforts, Brevard Prepares will prioritize its efforts towards focusing on facilities and neighborhoods in known hazard areas, completing assessment of all critical facilities, and identifying and documenting policies and plans that impact hazard mitigation.

The Brevard County Local Mitigation Strategy is a dynamic document, reflecting a continuing and expanding planning process. The efforts of Brevard Prepares will continue into the future, striving to make all of the jurisdictions of Brevard County truly disaster-resistant communities.

Category	Wind Speed	Type of Damage
Five (Major)	≥157 mph ≥137 kt ≥252 km/h	Catastrophic damage will occur. A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
Four (Major)	130–156 mph 113-136 kt 209–251 km/h	Catastrophic damage will occur. Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
Three (Major)	111–129 mph 96-112 kt 178-208 km/h	Devastating damage will occur. Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
Two	96–110 mph 83-96 kt 154-177 km/h	Extremely dangerous winds will cause extensive damage. Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.
One	74–95 mph 62-82 kt 119-153 km/h	Very dangerous winds will produce some damage. Well-constructed frame homes could have damage to roof, shingles, vinyl siding, and gutters. Large branches of trees will snap and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.
Tropical Storm	18–32 m/s, 35–63 knots 39–73 mph, 63–118 km/h	Dangerous winds capable of inflicting damage on structures, although less likely than a Category 1 Hurricane.
Tropical Depression	<17 m/s, <34 knots <38 mph, <62 km/h	Dangerous winds and gusts capable of inflicting damage, but minimal damage done to structures.
Source: National Weather Service, National Hurricane Center.		

There are approximately 22,000 mobile homes throughout the county and numerous structures erected prior to building code changes that resulted from the devastation left by Hurricane Andrew in south Florida. These structures are relatively more vulnerable to high wind damage. Wind damage from the storm itself is related to wind speed and the accompanying "pressure" that is exerted on structures. The worst case hurricane wind scenario for Brevard County would be if a large diameter Category 4 or 5 Atlantic hurricane made landfall in the southeast corner of the County, at Barefoot Bay, and moved north-northwest on a route centered along the I-95 corridor.

1.8 **HAZARD IDENTIFICATION AND VULNERABILITY ASSESSMENT**

1.8.1 **Introduction**

The purpose of the vulnerability assessment is to use best available data and technology to identify and evaluate potential hazard risks facing Brevard County, as well as provide the factual basis for mitigation activities proposed in Brevard County's LMS that aim to reduce those risks.

The vulnerability assessment completed by the ECFRPC provides for the identification and analysis of known hazards that may threaten life and property across the entire planning area. It also includes the results of a multi-jurisdictional vulnerability assessment conducted for each of Brevard County's municipal jurisdictions to determine where locally specific risks vary from those facing the rest of the county (Appendix IV). The risk assessment helps to describe each jurisdiction's vulnerability to identified hazards in terms of the types and numbers of buildings, infrastructure and critical facilities located in hazard areas as well as potential loss estimates for vulnerable structures.

1.8.2 **Vulnerability Assessment Methodology**

The project team utilized Geographic Information Systems (GIS) and Hazus-MH data along with historical data from the National Climatic Data Center (NCDC) and the National Oceanic and Atmospheric Administration (NOAA) to analyze the vulnerability – on jurisdiction basis – the hazards identified in this report present to the Brevard County community. Seven hazards were cross-referenced with a countywide parcel file that documented land use, financial information and specific building-related information in a consistent manner to ensure that the risk assessment did not allow bias for one hazard over another.

1.8.3 **Asset Inventory**

A variety of data exists on buildings, infrastructure, and critical facilities for Brevard County. For purposes of the multi-jurisdictional vulnerability assessment, much of this data was based on the inventory databases made readily available through Hazus-MH, FEMA's loss estimation software as described earlier. This includes the number and type of buildings located in each municipality in Brevard County. The tables provided for a number of hazard assessments which summarize the total building values for each jurisdiction as extracted from the Brevard County Property Appraiser and as utilized for estimating losses to hurricane wind, flood, sea level rise, fire, tornadoes and storm surge.

In addition to the data made readily available through Hazus-MH, some local inventory data has been integrated into the multi-jurisdictional vulnerability assessment. This also includes local property appraiser records for developed parcels in each of the municipal jurisdictions, which were utilized in order to estimate potential losses due to hazardous natural events as further described under the vulnerability assessment section of this report.

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. For the purposes of this document, Brevard County has identified those critical facilities that have the potential for being affected by natural and human caused disasters. The critical facilities within Brevard County are summarized by hazard zone in Appendix VI.

1.8.4 Demographics and Topography

Brevard County is located along the central portion of Florida's eastern coastline. The county is approximately 72 miles in length from north to south and 20 miles wide east to west. Neighboring counties include Volusia, Orange, Osceola, and Indian River, which forms Brevard County's borders to the north, west and south respectively. The Atlantic Ocean forms the eastern boundary of the county and provides an attraction for residents and tourists, as well as a sensitive environmental resource.

The 2010 population of Brevard County was 543,376, which is an increase of 14.1% from 2000. The population is 83.0% Caucasian and consists of 220,871 households with an average of 2.41 persons per household. 20.4% of the population is more than 65 years of age. As of 2010, more than 8% of the population of Brevard County, or approximately 43,943 residents, are considered to have English as a second language, increasing the need from an emergency management perspective for bilingual forms, signage and warning systems.

The county's Comprehensive Emergency Management Plan (CEMP) describes the topography: Brevard County's environment is unique due to the presence of the Atlantic Ocean, the Indian River lagoon system, the Banana River, and the St. John's River. These bodies of water divide the county into three distinct land areas, each with their own ecosystem and character: the barrier island, Merritt Island, and the mainland, which includes the St. John's River Valley flood plain. These areas possess their own opportunities and limitations to development.

The barrier island, bounded on the east by the Atlantic Ocean and on the west by the Indian and Banana River lagoons, is a sensitive environmental resource that

experiences great growth pressures due to the lure of the beaches for both residents and tourists alike. The barrier island performs an important function protecting the inland areas from the powerful forces of the Atlantic Ocean. Therefore, the beaches and dunes are a vital resource that requires protection and careful growth management measures. Much of the barrier island is incorporated by the cities of Cape Canaveral, Cocoa Beach, Satellite Beach, Indian Harbour Beach, the Town of Indian Lant, and the Town of Melbourne Beach. The majority of the unincorporated area of the barrier island includes Canaveral Air Force Station, Patrick AFB and areas south of Melbourne Beach to the Sebastian Inlet.

Merritt Island is bounded by the Banana and Indian River lagoon systems. Merritt Island is bisected by Courtenay Parkway and Tropical Trail, which run north to south. The central hub of activity is located along the S.R. 520 corridor where a variety of commercial establishments are found. Commercial activity is also prominent along the section of Courtenay Parkway from S.R. 520 north to S.R. 528. The northern portion of Merritt Island, between S.R. 528 and the Kennedy Space Center, is comprised primarily of agricultural and residential estate uses with some commercial uses found along Courtenay Parkway. The southern portion of Merritt Island is residential in nature.

The mainland area offers a wide range of opportunities, from urban and rural settings, to the Indian River Lagoon and the St. John's River. The cities of Titusville, Cocoa, Rockledge, Melbourne, West Melbourne and Palm Bay, along with the towns of Palm Shores, Malabar and Grant-Valkaria, line the eastern portion of the mainland from north to south. A significant portion of the land west of Interstate 95 is encompassed by the St. John's River flood plain, an important environmental area that poses limitations to development.

1.8.5 Land Use and Development Trends and Vulnerability

Any new development within Brevard County is likely to have at some degree of vulnerability to the hazards described earlier in this report. The vulnerability of new development can be minimized by proper location, e.g., outside of the flood plain, and/or proper design, e.g., designing for hurricane force winds. Overall, construction in compliance with current building codes, restrictions for the coastal high hazard zone and flood plains, and similar control efforts, e.g., lightning protection, will be expected to have the lowest degree of vulnerability.

Main areas of development as of 2015 include Micco Road to Grant Road to the east of Interstate 95; the area surrounding the Heritage Parkway; as well as a number of areas within or surrounding Palm Bay.

Development trends and vulnerabilities by jurisdiction are as follows:

Brevard County

In the unincorporated area, there has been a decrease in vulnerability based upon several development trends. In the northern unincorporated area, the Farmton Local Plan clustered all allowable residential growth from 11,500 acres to an area of 2,300 acres which corresponded to the more upland areas of the 11,500 acres with no increase in allowable density. In the central unincorporated area, the East Merritt Island Small Area Study (SAS) triggered Future Land Use amendments removing the potential of multi-family development in the coastal area. In the south unincorporated area, there have been no changes made to the earlier SAS performed which served the same function removing the potential for new multi-family development along the south beaches. This greatly reduces the vulnerability of future development of this area.

Cape Canaveral

During the planning period, there has not been significant change in vulnerability in Cape Canaveral since approximately 10% of the land remains to be developed. Redevelopment of existing properties is occurring more frequently than development on vacant land. The City's Future Land Use Element limits residential development throughout the City to 15 units per acre including in the Coastal High Hazard Area (CCHA). Cape Canaveral has implemented a Community Redevelopment Agency and an A1A Economic Opportunity Overlay District, and maintains a Brownfields Redevelopment Program which was developed to increase the pace of future development and redevelopment.

Cocoa

Several changes have taken place in the City of Cocoa which has decreased overall vulnerability since the last plan update. The City determined a need for a Stormwater

Management Study within the Diamond Square Redevelopment Area (Census Tract 626.4) since this area received flooding during 2008 Tropical Storm Fay. The study provided topographic mapping, an evaluation of existing conditions and a presentation of recommended alternatives. The area drains north through Avocado Ditch and Bracco Pond and has been subject to past flooding. This drainage basin was recently reduced by approximately 30 acres by the Florida Department of Transportation (FDOT) US1 improvements which diverted runoff from US1 and adjacent areas to a new stormwater pond in the City of Rockledge. Existing elevations in the area range between approximately 18.4 and 23.5 above sea level, NGVD. 2,606 linear feet of piping was installed or replaced with larger pipes and a retention pond was constructed. The project was substantially completed in January 2012, at a cost of approximately \$491,263.

Cocoa was awarded two (2) grants totaling \$408,000 from the Florida Division of Emergency Management to retrofit or install wind mitigation devices on single family residential homes. 18 homes have been retrofitted to date. Cocoa used a systemic approach to mitigate and retrofit structures to reduce the overall vulnerability of hazards such as wind born debris and loss of homes due to wind storm events. Improvements included the replacement of roofs, doors and/or windows, or installation of storm shutters to allow the structures to withstand hurricane force winds. Additionally, Cocoa has demolished 61 substandard vacant, dilapidated structures since 2010 through code enforcement efforts.

The City of Cocoa updated its Floodplain Ordinance in 2014 to be consistent with FEMA regulations and participates in the FIRM program. The City's Building Official acts as the Floodplain Administrator and ensures all development and redevelopment projects meet the new floodplain standards. All proposed development projects are reviewed for consistency with the City's adopted Comprehensive Plan, Land Development Regulations, and most recently adopted Florida Building Code and Fire Prevention Code.

Vulnerability has decreased based on amendments to the City's Comprehensive Plan's Future Land Use Element, which reduced the permitted density on 146 acres of land. The Future Land Use Plan amendments reduced the permitted number of dwelling units from 237 to 69.

The City of Cocoa replaced it aging City Hall in 2009 with a new building built to within 145 mph winds. A new Utilities Administration building was constructed in 2012 to withstand 145 mph winds that replaced an aging structure that was demolished. The

Public Works Administration building was updated with impact wind rated doors and windows in 2010.

Cocoa Beach

Cocoa Beach has reached an almost built out condition. There is only 2.8 % of vacant land in the City, which can accommodate limited new residential and commercial development. The maximum allowable density for residential use is 10 units per acre. There has been more redevelopment of existing properties rather than developing of vacant parcels. Most of the properties within the City are well maintained. According to the 2010 census, Cocoa Beach's permanent population decreased from 12,482 in 2000 to 11,231 in 2010. The City has also updated their webpage to include an "Emergency Alert" section which allows various messaging to be posted to increase community awareness. Due to a decrease in population, an increase in community communication for awareness, and the requirement that redevelopment must meet current codes; there has been an overall decrease in vulnerability to disaster.

Grant-Valkaria

Several changes have taken place in the Town of Grant-Valkaria which has decreased overall vulnerability since the last plan update. The Town has completed a Comprehensive Plan. Although the land uses remain similar to the Brevard County land-uses adopted when incorporating, the town has decreased overall densities by capping the highest density to 4 units per acre. This density was given in mostly previously platted and developed areas which accounted for a very small percentage of the overall land area. The low density residential makes up the majority of the town and densities have been capped at 1 unit per 1.25 acres. Brevard County had allowed densities at 1 unit per acre. Since the last plan update the town adopted by referendum a requirement for any new development within the low density residential land use to have a minimum size lot of 1.25 acre, thereby reducing the overall number of new homes that could be built. The Town is currently writing a new zoning code for the 1.25 acre lots.

The town has also completed a Stormwater Master Plan that catalogs every stormwater culvert in town with size, type, elevation, and condition to utilize in a capital improvements replacement program and for flood prevention. This data has helped determine the future needs of the Town and budget accordingly. The Town has better data for establishing base flood elevations for new construction outside of subdivisions with designed stormwater systems which will aid in the reduction of our vulnerability.

In 2014, the construction of a new town hall was completed. The Town Hall is on the list as a critical facility and was previously located in a rental unit that was an older metal building adjacent to the Indian River Lagoon in a flood prone area. The new facility was designed to all of the latest building codes and is located in an area that is not within the

flood zone or storm surge areas. Vulnerability to wind damage and flooding has now significantly been reduced as the facility is now located 3.5 miles inland from the Indian River Lagoon.

New construction in town has been primarily limited to single family residential homes, approximately 25 per year. Now there is a better understanding of the drainage system. Drainage improvements are now included in a 5-year capital improvement plan as part of the budget each year. This aids in analyzing the needs for the drainage system and budget accordingly. Although there are still improvements to be made, overall success in the function of the drainage system has reduced the threat of flooding within the town. Overall maintenance of the existing stormwater systems have improved annually which also aids in flood prevention.

The town is now in the review stage of the Land Development Codes and will be addressing issues relating to flood prevention, construction in flood prone areas and designing for fire prevention. Once town specific Land Development Regulations are adopted more reduction in overall vulnerability is expected. The combination of the adoption of the Stormwater Master Plan, the Comprehensive Plan, and staff experience reduce the overall vulnerability to hazards.

Indialantic

The Town of Indialantic is built-out with redevelopment occurring more often than development on vacant land due to the lack of vacant land on which to develop. As these new structures are completed it has decreased the Town's vulnerability as new construction meets updated codes.

Indian Harbour Beach

In the City of Indian Harbour Beach there has not been much change in vulnerability since the City is almost completely built out, with less than 100 acres remaining to be developed. The remaining acreage is mostly made up of infill parcels located within residential and commercial areas. The City, also, has no room to increase its size through annexation. The City does adhere to its Future Land Use policy in the Comprehensive Plan by "not increasing the density and intensity of land use in the Coastal High-Hazard Area".

Malabar

There have been several stormwater upgrades and projects over the last five years in the town of Malabar that have decreased the potential flooding while improving water quality. Regular maintenance of culverts, ditches, and catch basins has also decreased flooding potential. The Town also promotes wildfire awareness through outreach to residents. These items have decreased the overall vulnerability of the Town.

Melbourne

From a development standpoint, the City of Melbourne has maintained its commitment to not increasing vulnerability. The City's Future Land Use Element limits residential development in the Coastal High Hazard Area (CHHA) to 10 dwelling units per acre. A density limitation for the barrier island portions of the City has been in the Comprehensive Plan since 1998 and this provision was expanded to include all CHHA areas during the last update to the Comprehensive Plan in 2010. In addition, the City has also annexed almost three square miles of property that will be part of a wetland mitigation bank. This property, which is part of the St. Johns River floodplain, will be given a Conservation Future Land Use Map designation once environmental permitting is complete. A Conservation designation will provide for the long-term protection and preservation of this environmentally sensitive natural resource. This wetland area will also comprise a greenbelt on the City's western edge that protects Lake Washington, the primary source of drinking water for the City of Melbourne.

Melbourne Beach

The Town of Melbourne Beach is built-out. Recent development trends include redevelopment of parcels due to the lack of vacant land on which to develop. As these new structures are completed, it has decreased the Town's vulnerability as new construction meets updated codes.

Over the last five years, a local floodplain ordinance has been established, the Town has joined the Community Rating System program as of 2015, a permanent Floodplain Administrator has been hired, and repetitive loss properties have been reduced to two areas by implementing stormwater mitigation projects. Current Stormwater projects, in process, mitigate flooding problem areas. Website information has been updated to include Floodplain Ordinance topics. Future land use plans have been amended to not include any increase in density, or lot coverage. New construction project guidelines regarding swales, stormwater run-off, and storm drain protection have been updated by certified and trained permitting staff. The Public Works employees are now required to complete NPDES training. Beach sea oats planting projects are ongoing through local community involvement. Emergency management plans are being updated to include Police, Fire, Public Works and Building Departments. The Police and Fire Departments are currently updating radio communications for future mutual aid conditions during statewide emergency declarations. All of the projects listed and the development trends have made the town less vulnerable and more resilient to disasters.

Melbourne Village

Melbourne Village is nearly built out. It is a town of about 700 residents and one half of one square mile surrounded by Melbourne and West Melbourne. The Town is approximately 90% residential and is mostly owner occupied. There is about 20 acres of

commercial land in 5 parcels, four of which are currently developed and occupied. The remaining parcel is vacant land and is anticipated to be developed in the next ten years. There have been no changes in vulnerability over the last 5 years.

Palm Bay

The city is experiencing a moderate rate of development. Current construction trends show building at about 200 homes annually and those numbers are starting to accelerate. A new interchange will be starting construction in 2016, and expectations are that development will pick-up even more.

The City has continued to improve mitigation measures in key areas. The most recent major change to city code was the adoption of updates to the Floodplain Management Ordinance addressing critical facilities. Changes to the code ensure continued compliance with federal and state law. Conservation designations continue to be utilized to preserve and protect key areas of the St. Johns River floodplain from encroachment along our western border. Those efforts have been coordinated with the St. Johns River Water Management District. As part of the amendments to the Floodplain Ordinance, all future evacuation routes are required to be above the base flood elevations. The northwest section of the St. Johns Heritage Parkway, recently completed, meets that requirement. The design plans for the new interchange in southeast Palm Bay also will meet those regulations, as will the connecting roadways.

Palm Shores

There has been a decrease in vulnerability in the Town based on the following items. The Town currently has approximately 100 plus acres remaining to be developed with much of this acreage being low density residential. This acreage is, for the most, part buffered from US1 and the Indian River by commercial land use on the east side of US1. The Town has upgraded and hardened its riverfront park and fishing pier area to better withstand wind and water damage. The Town has also purchased shutters and a generator for the Town Hall. The Town Council has adopted the latest Flood Maps and Florida Building Codes. The Town has adopted a Continuation of Operations Plan (COOP) in conjunction with Federal, State and County governments, and it adheres to its Coastal Management Policy 5.3 which states, "When considering Comprehensive Plan Amendments within the designated Coastal High Hazard Area, the Town will direct population concentrations away from the Coastal High Hazard Areas."

Rockledge

The current rate of development of vacant or unused land is somewhat slower than anticipated. Since the last plan update the City of Rockledge has decreased overall vulnerability. The City has developed a variety of Stormwater projects. The Barton Lake retention area is a 60-acre lake that provides retention and treatment for almost 800

acres. In addition to Barton Lake, the City of Rockledge is also in the process of constructing a Huntington Lake, which will be 31 acres in size and will provide retention and treatment for an additional 100 acres. That is a total of over 900 acres that the City is now treating since the last update.

The City of Rockledge updated its Floodplain Ordinance in 2014 to be consistent with FEMA regulations and participates in the FIRM program. The City's Building Official acts as the Floodplain Administrator and ensures all development and redevelopment projects meet the new floodplain standards. All proposed development projects are reviewed for consistency with the City's adopted Comprehensive Plan, Land Development Regulations, and most recently adopted Florida Building Code and Fire Prevention Code.

In 2011, the City of Rockledge constructed a new Police Station that is capable of sustaining 150 mph winds; this is in addition to all other City buildings being retrofitted with storm shutters.

Satellite Beach

The city of Satellite Beach has annexed decommissioned military housing community increasing the town density by 500 residences. The annexation of these areas decreased the overall vulnerability of the city as their construction meets current building codes. Most development in the city, which is nearly built out, has been redevelopment or upgrades that must also meet current construction codes and thereby further reducing the city's vulnerability to disaster.

Titusville

During the planning period, the rate of development activity has been somewhat slower than anticipated due to the general economic slowdown and reduction of employment at Kennedy Space Center. In 2014, development rates began to increase and the City is anticipating consistent, moderate growth for the next several years.

The general economic slowdown has resulted in the postponement of a number of high-rise multifamily developments that were approved for construction along the Indian River Lagoon. It is unlikely that several of these developments will be constructed as permits have lapsed and new height restrictions will not permit their renewal. This will result in fewer residences being placed in areas more vulnerable to winds and flooding damage during hurricane events. In addition, at least one large single family development, in excess of 2000 single family units, appears unlikely to be developed before the development agreement on the property expires. Taken in total, the economic climate has reduced the number of residence developed in higher risk areas.

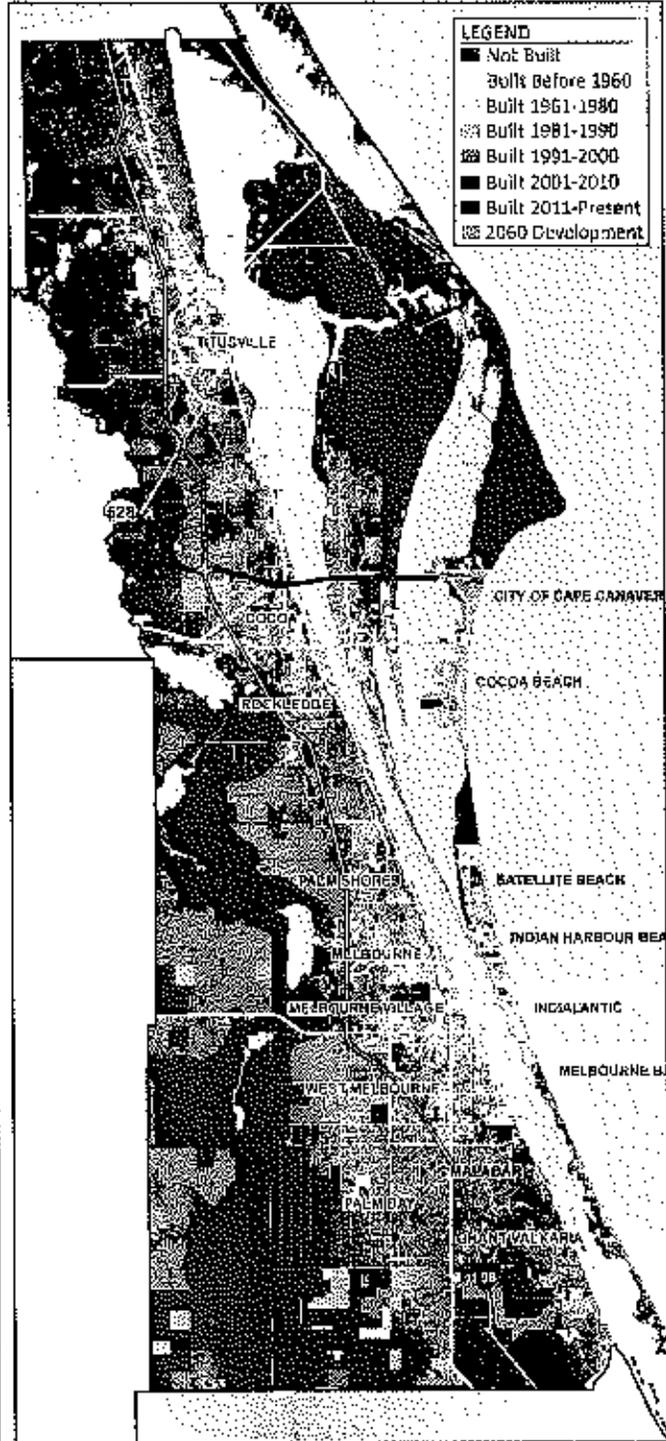
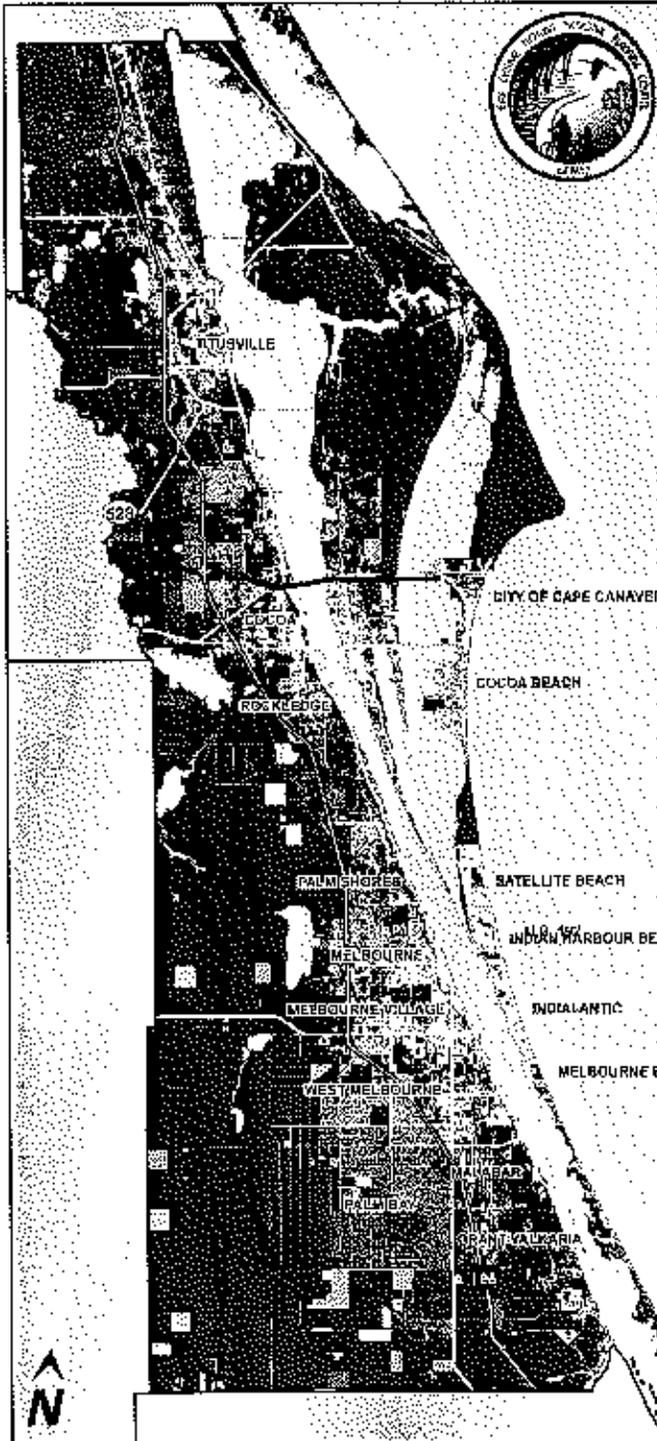
West Melbourne

The City of West Melbourne maintains its commitment to decreasing hazard vulnerability. Most of the development that has occurred in the city limits in the 2000's involves infill development of small properties at the edges of the city limits. The City lies between Melbourne and Palm Bay and is effectively blocked by both the adjacent cities from future annexations into the St. Johns River floodplain and basin. West Melbourne is a rapidly growing area with a population of 19,834 whose economic base is commercial and retail, and occupies 10.37 square miles. 64% of land use is residential. 20% of the jurisdiction remains to be developed that equates to 2.09 square miles. The floodplain previously identified for properties near I-95 has been reduced in the 2010 update of the FEMA maps thus decreasing vulnerabilities there. Residential increased to 64% from 58%, all new construction. Commercial and Industrial uses decreased by one percent to 16% and 7% respectively. Institutional decreased to 8% from 12%. In summary there has been an overall decrease in vulnerability.

The map below depicts potential 2060 development as identified by the East Central Florida Regional Planning Council.

Development Trend to 2013

Development Trend to 2060



Data Source(s): CFGIS (Strategic Regional Policy Plan),



1.8.6 Recent Disaster Events in Brevard County

An important indication of the hazards threatening the county is the actual occurrence of disaster events, and the level of impact they have had on the community. Assessment of past disasters can also be very informative regarding the types, locations, or scope of mitigation initiatives that would be needed to prevent similar damages from future events of the same type. Brevard County has experienced seven Presidentially-declared major disaster events in the last eleven years, and some near misses, representing a number of types of hazards. Three events, Hurricanes Charley, Frances and Jeanne in August and September of 2004, caused at least \$629 million in damages.

Hurricane Wilma, a Category 3 storm, brought 125-mph winds and heavy rains to much of central and southern Florida, downing trees and flooding many communities. Approximately five million people were without electrical power. Wilma struck Brevard County on October 24, 2005, and hit south and central Brevard County particularly hard. In areas such as Cocoa Beach and Indialantic, very little erosion occurred where previous restoration efforts had built wide, protective beaches. In other areas, the dunes along Brevard County's beachfront properties suffered varying degrees of erosion damage. Significant erosion was observed in the recently-completed 2005 emergency dunes of Satellite Beach, Indian Harbour Beach, northern Indialantic, Melbourne Beach (and southward). Those dunes had been constructed in response to the severe damage of the 2004 hurricane season and were intended to provide a protective buffer between rough seas and imperiled properties along those relatively narrow stretches of Brevard County's coastline; however, at least five homes were damaged.

In 2006, the Brevard County Natural Resources Management project repaired approximately 20 miles of damaged dunes along Satellite Beach, Indian Harbour Beach and unincorporated Melbourne Beach. A tropical wave on October 1, 2007 produced even more beach erosion.

Between May 11 and 16, 2008, the Mother's Day fires occurred in Palm Bay, Malabar and Cocoa. The Mother's Day fires impacted over 200 homes, of which 52 were destroyed. Brevard County received \$4.3 million in public assistance funds from FEMA, and the fires caused over \$16 million in property damage.

Tropical Storm Fay resulted in two Presidential Disaster Declarations—one for debris removal and emergency management protective measures ahead of the storm, and the second for its August arrival in 2008. After making landfall near Naples on August 19, the storm exited the state into the Atlantic Ocean near Melbourne on August 20.

Extensive flooding took place in parts of Florida as a result of its stalling over the peninsula. Melbourne accumulated at least 25 inches of rainfall and other parts of Brevard County experienced 25 to 30 inches. The storm damaged 1572 homes in Brevard County, and a tornado associated with Fay ripped through Brevard County, damaging 52 additional homes, rendering nine of them uninhabitable and injuring two people.

After the storms had passed and the impact assessed, from August 19 to 21, Tropical Storm Fay had delivered more rainfall to Brevard County than any other storm in recorded history. The rainfall from Fay was more than double the total amount from Wilma in 2005; Charley, Frances and Jeanne in 2004; Irene in 1999; and nearly double the amount of Erin in 1995. Fay overwhelmed many private and public storm water systems so that some houses and businesses were flooded for up to two weeks. Wind from these events also spread canker through groves and flooding created livestock issues.

For a full listing of historical weather events to hit Brevard County, including economic, agricultural and human impacts, view the National Climatic Data Center data at the following website:

<http://www.ncdc.noaa.gov/stormevents/choosedates.jsp?statefips=12%2CFLORIDA>

To view the storm inventory referenced above via map, visit the following website provided by the National Climatic Data Center: <http://www.ncdc.noaa.gov/cdo-web/search?datasetid=ANNUAL>

For a full listing of Presidential Disaster Declarations, visit the following website:

<http://www.fema.gov/presidential-disaster-declarations>

1.8.7 Initial Hazard Identification

Brevard County is vulnerable to a wide range of natural and human-caused hazards that threaten life and property. FEMA's current regulations and guidance under the Disaster Mitigation Act of 2000 (DMA 2000) require, at a minimum, an evaluation of a full range of natural hazards. An evaluation of human-caused hazards (i.e., technological hazards, terrorism) is encouraged, though not required for plan approval. The initial identification of hazards for inclusion in the risk assessment was based on earlier versions of the Brevard County LMS, as well as a review of the State of Florida Hazard Mitigation Plan and FEMA mitigation planning guidelines.

The next table lists the range of hazards identified that may impact the County. However, certain hazards of low risk, including earthquakes, land subsidence/sinkhole,

and space weather/geomagnetic storms are not profiled in this hazard, risk, and vulnerability assessment:

Type	Hazard	Hazard-Specific Effects	Probability of Occurrence
Natural	Hurricane/Storms Effects	High Winds	5
		Storm Surge	5
		Coastal Erosion	5
		Flood	5
		Tornadoes	5
		Thunderstorms/Lightning	5
	Sea Level Rise		2
	Drought		4
	Severe Winter Storms		1
	Extreme Heat		4
	Wildfire		4
	Agricultural Infestation		4
	Seismic Hazards		1
	Land Subsidence/Sinkhole		1
	Tsunami		1
Technological	Hazardous Materials	Bulk Fuel Tank	2
		Radiological Release	2
		Rail Transportation Incident	2
		Oil Spill	2
	Communications System Failure		4
	Prolonged Utility Failure		5
Societal	Terrorism		2
	Pandemic/Epidemic		4
	Mass Casualty		5
	Transportation Accidents		2
	Civil Disorder		1

Probability Legend

- 1- Greater than 500 year occurrence
- 2- 500 years or less occurrence
- 3- 100 years or less occurrence
- 4- 25 years or less occurrence
- 5- Once a year or more occurrence

Each of the initially identified hazards was studied for their potential impact on Brevard County as well as in terms of the availability of hazard mitigation strategies to reduce that impact. Best available data on historical occurrences, the geographic location and extent as well as the probability of future occurrences were collected and reviewed as part of the hazard identification process. Using this data, the following were selected as the main hazards of concern and will be described and analyzed in the following section:

- Wind
- Storm Surge
- Sea Level Rise
- Flood
- Tornadoes
- Thunderstorms/Lightning
- Extreme Temperatures
- Drought
- Wildfire
- Agricultural Infestation and Disease
- Hazardous Materials
- Coastal Erosion
- Tsunami
- Dam/Levee Failure

1.8.8 Natural Hazards

Hurricane and Storm Effects

Hurricane and storms effects can produce high winds, storm surge, flooding, tornadoes, thunderstorms and lightning. Some of these hazards have the highest likelihood and largest potential damage impacts of all hazards covered in this report. The probability for more hurricane and storm effects to strike the peninsula of Florida and consequently the Brevard County area must be considered very high, a once a year or more occurrence. The greatest threats are storm surge along the barrier islands, wind damage to homes, businesses and coastal lands, inland flooding and mass casualty.

While it is possible for the county to be hit by a category 4 or 5 hurricane, it is very unlikely based on past trends that have seen Florida's northeastern region mainly receiving tropical depressions/storms and categories 1-3. Impacts from these storms can include tree and natural environment destruction, infrastructure and house damage or collapse, downed power lines, blocked roads, flooding, and massive amounts of storm-generated debris. All structures are susceptible to impacts of hurricanes, especially buildings in floodplains, low lying areas and unsound housing or mobile homes. Because this county has experienced hurricanes and/or storms with associated hazards annually it can be assumed to occur again with a similar frequency.

High Winds | *Natural Hazards*

High winds are those that approach or exceed 40 mph and are sustained for an hour or more. High winds accompany severe storms, hurricanes, tornadoes spawned by hurricanes and wind shears or bursts and their side effects, hail and lightning, are widely anticipated events in Brevard County. Due to the subtropical location and 72 miles of coastline, Brevard County is particularly susceptible to hurricanes and tropical storms. With its coastal location and flat topography, all of Brevard County and every municipality in the county are considered to be at high risk from the high winds associated with thunderstorms, tropical storms, and hurricanes.

There are approximately 21,328 mobile homes throughout the county and numerous structures erected prior to building code changes that could be damaged from a storm for such as that which resulted from the devastation created by Hurricane Andrew in south Florida. These structures are relatively more vulnerable to high wind damage. Wind damage from the storm itself is related to wind speed and the accompanying "pressure" that is exerted on those structures.

The following table outlines the classification system for tropical depressions, tropical storms and hurricanes, known as the Saffir-Simpson Scale. It is important to note that

the hazards identified in this section are not always the result of hurricanes and tropical systems, but rather the normal climatic patterns over the state of Florida.

Category	Wind Speed	Type of Damage
Five (Major)	≥157 mph ≥137 kt ≥252 km/h	Catastrophic damage will occur: A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
Four (Major)	130–156 mph 113–136 kt 209–251 km/h	Catastrophic damage will occur: Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
Three (Major)	111–129 mph 96–112 kt 178–208 km/h	Devastating damage will occur: Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
Two	96–110 mph 83–95 kt 154–177 km/h	Extremely dangerous winds will cause extensive damage: Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.
One	74–95 mph 62–82 kt 119–153 km/h	Very dangerous winds will produce some damage: Well-constructed frame homes could have damage to roof, shingles, vinyl siding, and gutters. Large branches of trees will snap and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.
Tropical Storm	18–32 m/s, 35–63 knots 39–73 mph, 63–118 km/h	Dangerous winds capable of inflicting damage on structures, although less likely than a Category 1 Hurricane.
Tropical Depression	<17 m/s, <34 knots <38 mph, <62 km/h	Dangerous winds and gusts capable of inflicting damage, but minimal damage done to structures.
Source: National Weather Service, National Hurricane Center		

The worst case hurricane wind scenario for Brevard County would be if a large diameter Category 4 or 5 Atlantic hurricane made landfall in the southeast corner of the County, at Barefoot Bay and Snug Harbor (both large mobile home communities), and moved north-northwest on a route centered on a corridor approximated by US 1 and the Indian River. This north-northwest route would directly impact the densely developed areas of the county and every incorporated jurisdiction. This route would require evacuation of large parts of the developed areas on the east side of the county. For non-evacuated areas, structural damage from wind would cause thousands of injuries and fatalities. It

would also result in extensive and wide-spread damage to structures, utilities and vegetation. Mobile and manufactured homes throughout the county could be completely destroyed. Extensive roof, doorway and window damage would occur to single family residences and smaller multi-family residences. Larger engineered structures would suffer extensive damage to windows and roofs. Roofs on broad span structures and Butler type buildings would collapse. Above-ground electric transmission and distribution systems would be destroyed. Telecommunication networks would be extensively damaged and many radio and microwave towers destroyed.

There would be large amounts of vegetative debris created, blocking roadways and restricting travel. Major roadways that could be affected by debris that would inhibit recovery include: Interstate 95, US Highway 1, US 192 New Haven Ave, Melbourne; SR46 Main Street, Mims; SR 405 NASA Parkway, Titusville; SR50 Cheney Highway, Titusville; SR 407 Challenger Memorial Parkway, Titusville; SR528 Beachline, Orlando to Port Canaveral, SR524 Bennett Causeway, Cocoa; SR520, Cocoa to Merritt Island; Highway A1A, SR406 Memorial Parkway, SR 513 South Patrick Drive, SR518, Eau Gallie, Melbourne; SR509 Wickham Road, Melbourne; SR 514 Malabar Road, Malabar; SR 516 Palm Bay Road, Palm Bay; and SR507 Babcock Street, Melbourne to south county line. Removal of vegetative debris, as well as construction and demolition debris, would be an enormous problem. Restoration of power and telecommunications would take weeks to complete throughout the area. The economic impacts would be extensive, with most business, including those serving tourists, closed due to damage to their facilities or to the homes of the residents. The probability of high winds are generally higher during hurricane season (June through November), but vary year to year depending on tropical activity in the Atlantic Ocean. Overall, the county is highly susceptible to wind damage compared to other parts of the country.

As stated previously, those residents in mobile and manufacture homes would be of concern as they would be highly affected. Those in mobile or manufactured homes are also at risk not only for this hazard but for others as well. The number of those at risk can be calculated by taking the 2010 census numbers (543,372) divided by the number of mobile and manufactured homes (21,328), then multiplying that by the average number of people per home (2.58 people which is the 2010 Census' average) about 9.87% of the county's residents living in a manufactured or mobile home, or 55,026 individuals. Several large mobile home parks include the previously identified areas of Barefoot Bay and Snug Harbor in southernmost Brevard's mainland. Both are in the highest wind risk area of the county. Other major parks include Hidden Lakes, Cocoa; Lamplighter Village, Melbourne; Southgate Mobile Homes, Cape Canaveral; Ocean

View RV and Mobile Home Court, unincorporated Brevard; Lucky Clover Mobile Home and RV, Melbourne; and the Village of Ponce de Leon, Melbourne Beach.

The homeless are another vulnerable population. The total homeless counted during the *Point- In-Time Count (PITC)* on January 26, 2015 was 1,178 (down 25% from 2013) including 494 unsheltered (down 43% from 2013), 311 children (down 24% from 2013), 44 unaccompanied children (down 70% from 2013), 152 chronically homeless (up 42% from 2013 because Cold Night Shelters were open), and 127 veterans (down 52% from 2013). Even though the actual count may not be completely accurate for a number of reasons, the PITC provides the statistical basis for accurate percentages to show increase or decrease in those populations.

There have been no tropical cyclones in Brevard since 2008; however, a close to coast brush with Hurricane Sandy in 2012 produced notable winds, surge and erosion as described in the coastal erosion section of the plan. The Melbourne Airport ASOS (KMLB) and a mesonet site at Cocoa Beach Pier (XCCO) recorded sustained north-northeast winds of 39 mph. These winds impacted much of the Brevard County barrier islands as well as some eastern portions of the mainland. Gusts of 50-55 mph occurred, especially during passing squalls. Smaller storm surge events were also reported in 2012 from tropical storms Beryl and Debby.

Historical events include: Hurricane David in 1979, Erin in 1995, Floyd in 1999, Charley, Frances, and Jeanne in 2004, and Tropical Storm Fay in 2008.

On September 3, 1979, Hurricane David grazed the coast of Florida as a Category 2 storm. Though it made landfall as a Category 2 storm, the strongest winds were localized to the immediate area around landfall. The highest reported winds occurred in Fort Pierce, 70 mph sustained winds and 95 mph gusts. Because the hurricane remained near the coastline, Hurricane David failed to cause extreme damage in Florida.

Category 1 Hurricane Erin made landfall near the Sebastian Inlet in southern Brevard on August 2, 1995. This storm produced wind damage and extensive flooding countywide. It also spawned a tornado in Titusville which caused minor damage.

The center of Category 4 Hurricane Floyd passed about 115 statute miles off the coast of east central Florida on September 15, 1999, producing wind gusts to near 70 mph. The areas hardest hit were coastal sections of Brevard.

On August 13, 2004, Hurricane Charley swept across the state and affected northern Brevard and produced heavy debris and hurricane force wind gusts. On September 3rd, a couple of weeks after Charley, Hurricane Frances affected Brevard producing wide spread wind damage. Jeanne came through the same year on September 26th. Jeanne's hurricane force gusts produced extensive wind damage in southern Brevard.

Finally, from August 18-23, 2008, Tropical Storm Fay stalled on top of Brevard County producing record setting rain and extensive flooding.

The following tables summarize the financial exposure, building detail and land use summary of all parcels within each of the wind risk zones in Brevard County. The Wind Risk Zones map depicts the hazard zones summarized in these tables, which were generated by Hazus-MH climatic modeling software.

The risk model, from a statewide perspective, places higher probability of a hurricane with higher winds striking the southeastern and far-northwestern portions of the state of Florida. As the coastline recedes northwest along Florida's eastern seaboard, the likelihood of a direct hurricane strike – and the winds they produce – generally diminish over the long term utilizing this model.

Financial Exposure Summary | Wind Zones

County Summary							
Hazard Zone	Parcels in Zone	Parcels Built	Land Value	Building Value	Assessed Value	Taxable Value	Prop. Value Per Acre
101-105 mph	60974 23.73%	41289 62.33%	\$1,419,311,300	\$2,019,792,240	\$7,285,320,320	\$5,465,844,770	\$45,694
106-110 mph	191244 65.67%	187582 71.94%	\$7,559,491,610	\$12,697,794,440	\$30,231,145,540	\$17,055,860,240	\$45,164
111-115 mph	89596 19.60%	29746 75.12%	\$2,947,162,430	\$2,628,922,390	\$7,560,101,860	\$4,264,692,920	\$198,950

Parcel Detail Summary | Wind Zones

County Summary							
Hazard Zone	Parcels in Zone	Parcels Built	Parcels Not Built	Built Pre 1994	Built 1994-2001	Built 2002-2009	Built 2010-Present
101-105 mph	60374 21.76%	41289 68.33%	19065 21.61%	30721 74.43%	4490 13.27%	5664 14.44%	214 0.52%
106-110 mph	191244 65.67%	187582 71.94%	58662 28.05%	66054 64.00%	21492 15.51%	26628 14.51%	1408 1.07%
111-115 mph	89596 19.60%	29746 75.12%	9850 24.55%	24062 77.33%	3094 10.54%	3326 11.10%	205 0.65%

Future Land Use Summary | Wind Zones

County Summary												
Hazard Zone	LD. Res.	M.D. Res.	H.D. Res.	Commercial	Office	Mixed Use	Recreation	Institution	Conservation	Industrial	R.D.	Agriculture
101-105 mph	58127 34.87%	3335 6.35%	13582 22.54%	2754 3.57%	0 0.00%	787 1.50%	97 0.16%	164 0.37%	392 2.50%	408 0.43%	2114 3.50%	8581 5.94%
106-110 mph	107741 56.74%	14063 7.25%	15527 6.97%	6057 4.21%	27 0.40%	2585 1.05%	311 0.13%	448 0.33%	600 2.51%	1762 0.62%	4220 4.22%	462 0.42%
111-115 mph	26992 79.77%	5093 7.21%	3285 3.24%	1457 2.45%	49 0.18%	490 2.32%	214 1.94%	79 0.20%	1363 3.45%	219 0.55%	19 0.03%	1 0.61%

The map on the following page shows wind risk zones in Brevard showing extent as listed below.

Zone 101mph-105mph includes:

- Unincorporated Brevard
- Western City of Cocoa
- All of the City of Titusville

Zone 106mph-110mph includes:

Portions of -

- Unincorporated Brevard
- City of Cocoa
- City of Satellite Beach

All of -

- City of Cape Canaveral
- City of Cocoa Beach
- City of Melbourne
- Town of Melbourne Village
- City of Palm Bay
- Town of Palm Shores
- City of Rockledge
- City of West Melbourne

Zone 111mph-115mph includes:

Portions of -

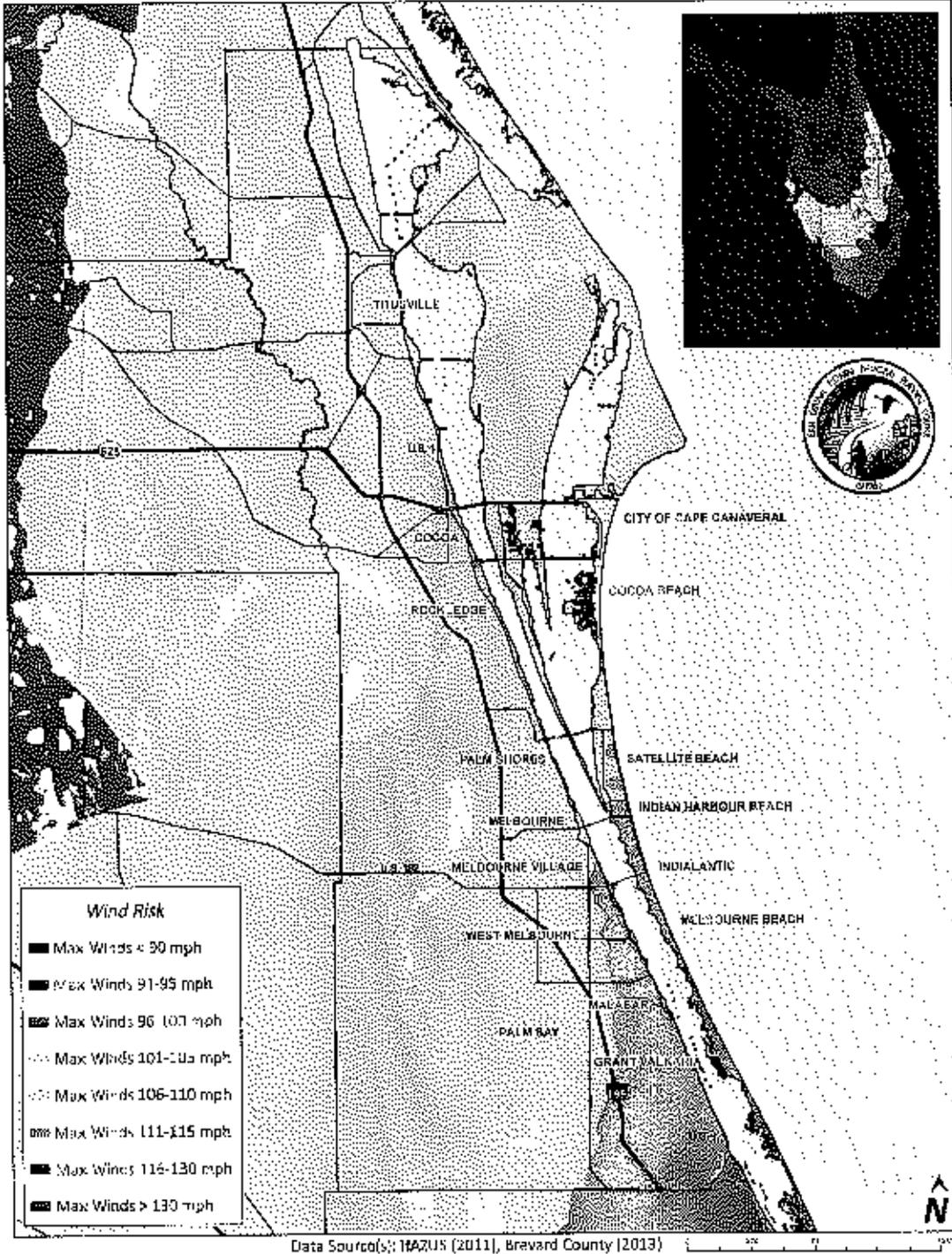
- Unincorporated Brevard
- City of Satellite Beach

All of -

- City of Indianalantic
- Town of Indian Harbor Beach
- Town of Grant-Valkaria
- City of Malabar
- City of Melbourne Beach



Wind Risk Zones



Storm Surge | *Natural Hazards*

Storm surge is a rise above the normal water level along a shore caused by strong onshore winds and/or reduced atmospheric pressure. The surge height is the difference of the observed water level minus the predicted tide. Storm surge can be 50 or more miles wide and sweeps across the coastline around where the hurricane makes landfall. The maximum rises in sea-level move from under the storm to the right of the storm's track, reaching maximum amplitude of 10 to 30 feet at the coast. The storm surge may double, or more, in height when the hurricane's track causes it to funnel water into a bay. Typically, the stronger the hurricane, the higher and more powerful the storm surge will be.

In fact, the greatest threats posed by a hurricane or a tropical storm to Brevard County are storm surge along the barrier islands; wind and water damage to homes, businesses, and coastal lands; and inland flooding. The barrier islands from Cape Canaveral to Sebastian Inlet are susceptible to the effects of storm surge created by tropical systems and severe winter storms. The combination of high tides and wind action can create coastal flooding and saltwater inundation of the barrier islands and are considered significant risk factors. Storm surge is ranked highly by the beach communities spread along the coastline and is of serious concern.

The worst case for storm surge would be if a major Atlantic approaching hurricane, such as a Category 4 or 5, expected to make landfall in south Brevard County were to arrive at high tide and was accompanied by violent wave activity. The following table shows the occurrence of storm surge since 2010, these are the storm surge events since the last plan update.

The storm surge zone maps in this section indicate that the extent of storm surge could impact all of the barrier island communities, as well as the Indian River Lagoon System from the Sebastian River Inlet, along Melbourne up to Cocoa, and northward past Titusville; and including the Banana River shoreline to the county's northern boundary. There is development within most of these areas, including development directly on the water's edge. Thousands of structures within these areas would be vulnerable to storm surge and accompanying wave action through a range of impacts, including erosion of the sand beneath the structure causing it to collapse, physical pressure that would damage the structure or move it off its foundation, and/or receive inundation from surge.

Brevard County could potentially see the washout of highway A1A which is the main north/south thoroughfare for the barrier islands which would severely hinder the

response, reentry and recovery following a storm. The area just north of Patrick Air Force Base would be extremely susceptible to washout, as the narrowest portion of the barrier island and in a catastrophic event the roadway could be breached and a new inlet could be formed. As well, mobile and manufactured home parks on the barrier islands could see devastating impacts due to storm surge, especially areas such as the Southgate Mobile Homes in Cape Canaveral (approximately 65 mobile homes), Ocean View RV and Mobile Home Court (approximately 50 homes) in unincorporated Brevard County, and Lucky Clover Mobile Home and RV (approximately 100 homes) in beachside Melbourne. These mobile and manufactured homes could be moved off of their supports, impacting roadways and other residences in the vicinity.

Other roadways which also serve as evacuation routes for the barrier islands including State Road (SR) 405(NASA Causeway), SR 528 (The Beachline), SR 404 (Pineda Causeway), SR 518 (Eau Gallie Causeway) and SR 192 (Melbourne Causeway) Each would be affected along with utilities that run along those causeways. These utilities and communications systems would be significantly damaged and require extensive and time consuming repairs. If surge zone evacuation was not complete or extensive enough, numerous injuries and fatalities could be expected. There are over 72,000 homes and businesses in the Category 5 surge zone. Areas of industry and tourism like Kennedy Space Center, Cape Canaveral Air Force Station, Port Canaveral, Cocoa Beach Pier, Kelley Park, Lori Wilson Park, Patrick Air Force Base, Sebastian State Park and all areas between would be devastated.

Port Canaveral is the world's busiest cruise port. There are seven cruise lines, with six major cruise terminals. It handles tons of cargo each year. The port has contributed \$500 million annually to the county's economy. Since the tourist industry is generally concentrated in the surge zones, as well as those industry areas mentioned above, the economic impact would be enormous and long-lasting.

Beach erosion would be significant, with the loss of hundreds of beach-front structures due to damaged foundations. In the worst case, environmental damage of well over 10,000 acres of undeveloped land would also be realized and significant, due to salt water inundation over those areas. The damage to Brevard's beaches would not only affect people but also threatened and endangered animal and plant species. Populations like the sea turtles (Hawksbill, Kemp's Ridley, Leatherback and Loggerhead), the beach mouse, Florida scrub jay, and gopher tortoise would be affected or eradicated.

The Indian River Lagoon System is also a draw for tourism and aquaculture in it contributes millions to the economy. The Lagoon also produces more than 25% of the blue crabs to Florida's East Coast. This area would be devastated by change in salinity from overland surge.

Utilizing the National Hurricane Center's Sea, Lake and Overland Surges from Hurricanes (SLOSH) modeling program, Brevard County operated the Cape Canaveral SLOSH basin, a geographical region with known values for topography and bathymetry, to determine storm surge amounts which could be seen during a Category 3 or Category 4 impacting the area. These models also depict impact areas within the previously identified communities that would be vulnerable to storm surge.

For these purposes, the Maximum Envelopes of Water (MEOWs), which are formed from the envelopes of several similar hypothetical storms which run parallel to each other, were combined to establish the Maximum of MEOWs (MOMs) for a Category 3 and Category 4 hurricane impacting Brevard County. The MOMs combine all hypothetical storms which run parallel to each other, from each direction, and depict the maximum amount of water seen within every grid cell that is reached in any several MEOWs.

Recent Storm Tides & Surge for Named Storms Since 2010

Storm Name	Year	Longitude	Latitude	Storm Tide(ft.)	Surge(ft.)	Datum	Location	Basin	State
Beryl	2012	-80.59	28.41	1.95	1.92	Above Normal Astronomical Tide/Above NAVD1988	Trident Pier (NOS) TRDF1	U.S. Atlantic Coast	FL
Sandy	2012	-80.59	28.42	3.77	2.49	Height Above Normal Astronomical Tide Level/NAVD88	Trident Pier (TRDF1-8721604) NOS Tide Gauge	U.S. Atlantic Coast	FL
Debby	2012	-80.59	28.42	1.83	1.46	Above Normal Astronomical Tide/Above NAVD1988	Trident Pier (NOS) TRDF1	U.S. Atlantic Coast	FL

Source: http://cchtopk.scc.su.edu/fangs/faq_e.htm

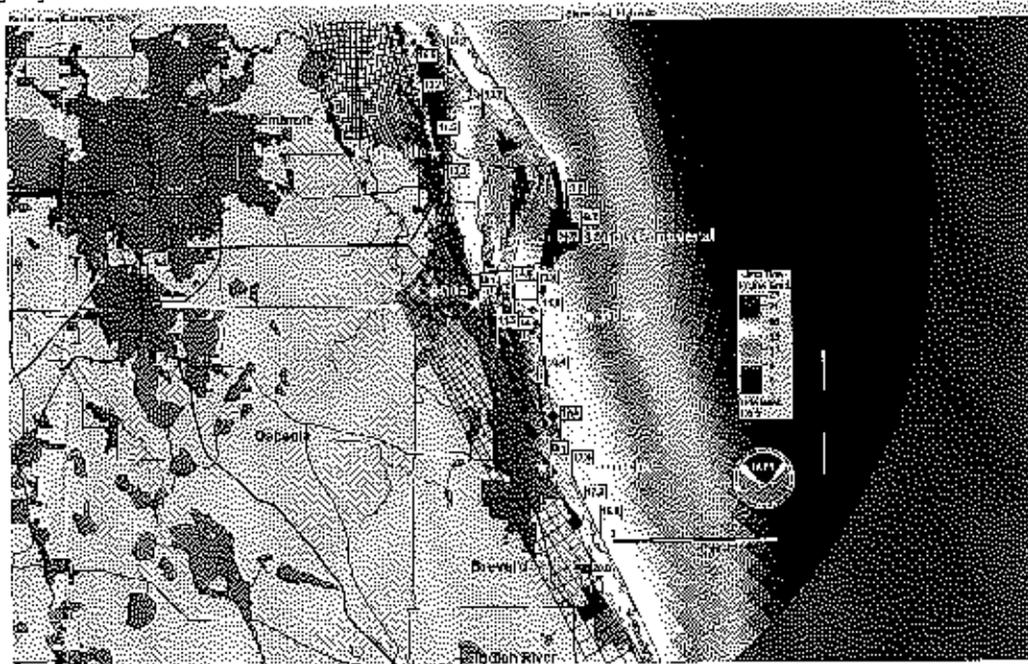
In each of the SLOSH model displays on the following pages, average high tide of one foot was utilized, and the flags represent the height of water above ground surface in

feet. As evidenced in these images, storm surge could critically impact the residents of Brevard County not only on the barrier islands (including Merritt Island) but also through inland flooding.

Category 3 Hurricane - SLOSH Model - MOM

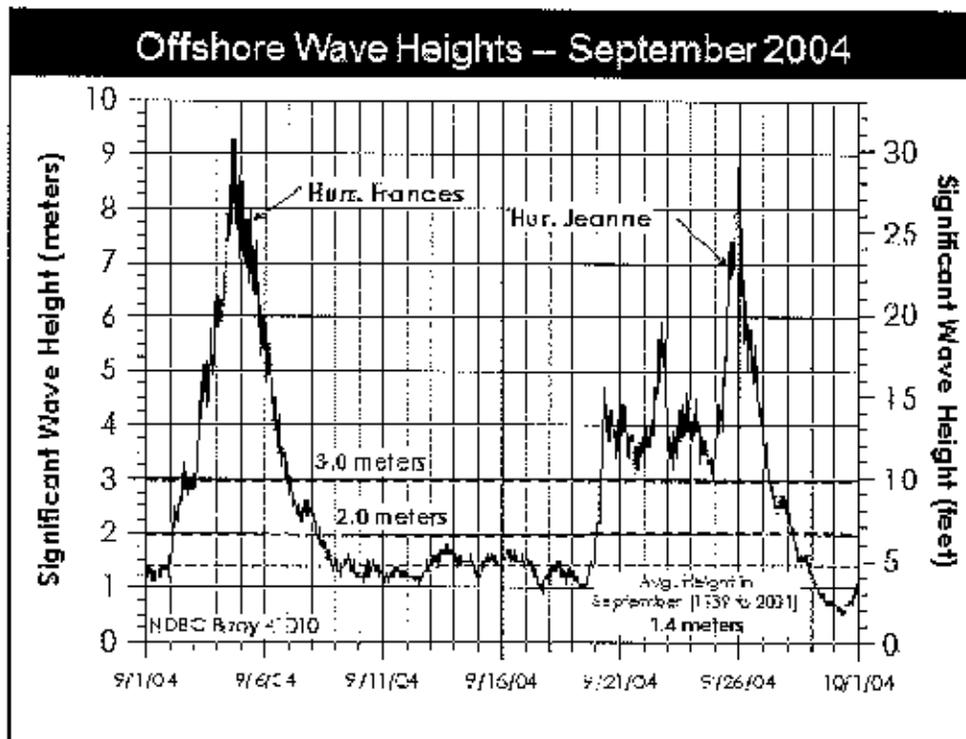


Category 4 Hurricane SLOSH Model - MOM



Historical Surge

Upon making landfall, Hurricane David (September 3, 1979) brought a storm surge of only 2 to 4 feet, due to its lack of strengthening and the obtuse angle at which it hit. In addition, David caused strong surf and moderate rainfall, amounting to a maximum recorded in Vero Beach of 8.92 inches. The National Weather Service Melbourne Office estimated that Hurricane Erin (1995) generated a 2 to 4 feet of storm tide during the Florida east coast landfall. According to the Melbourne office, up to 12 inches of rain fell southwest through northwest of their site. 2004 Hurricane Frances produced storm surge around 8 feet near Sebastian Inlet and 6 feet in Cocoa Beach followed by Hurricane Jeanne which produced a storm surge of 3.8 feet above normal astronomical tide levels was measured at Trident Pier at Port Canaveral about an hour after landfall. Storm surge of up to 6 feet above normal tides likely occurred along the Florida east coast from the vicinity of Melbourne southward to Fort Pierce. While Tropical Storm Fay was an extreme rainfall event breaking a 50-year record in 2008 with 27.65 inches of rain as recorded in Melbourne, it produced minimal storm surge of 1-2 feet above National Geodetic Vertical Datum (NGVD).



In 2012, storms Beryl, Sandy and Debby brought additional surge on top of the astronomical high tides as recorded at the Trident Pier in Port Canaveral.

October 26, 2012, Hurricane Sandy had the worst affected on the coast of Brevard bringing an additional 2.49 feet to the high tide. Sandy moved slowly northwest, parallel to the Florida coast, 200-250 miles offshore. Large and pounding surf coupled with additional surge height affected the beaches for six or more high tide cycles, during a period of high astronomical tides. By the end of the event, many of the beaches had sustained moderate to major beach erosion. Numerous beach cross-overs and lifeguard towers were damaged and sand was washed onto coastal roadways and beach parking areas in several locations. Coastal erosion and other damage estimates for Brevard were in excess of 25 million dollars. No major coastal erosion events with surge have occurred since 2012.

Since storm surge has happened in the past it can be expected to happen again with a once a year or more occurrence. Storm surge elevations for this area are depicted on the SLOSH model storm surge graphics in this section and range from 5.2 to 20 feet above ground level, therefore it could be expected based on these models and historical information that storm surge of these levels could be expected with Category 3 or 4 hurricanes.

The table below was taken from the Brevard County Storm Tide Atlas published in 2010. These heights represent the maximum surge height recorded in the county from the storm tide analysis.

Storm Strength	Brevard
	Up to 6'
Category 2	Up to 10'
Category 3	Up to 16'
Category 4	Up to 21'
	Up to 26'

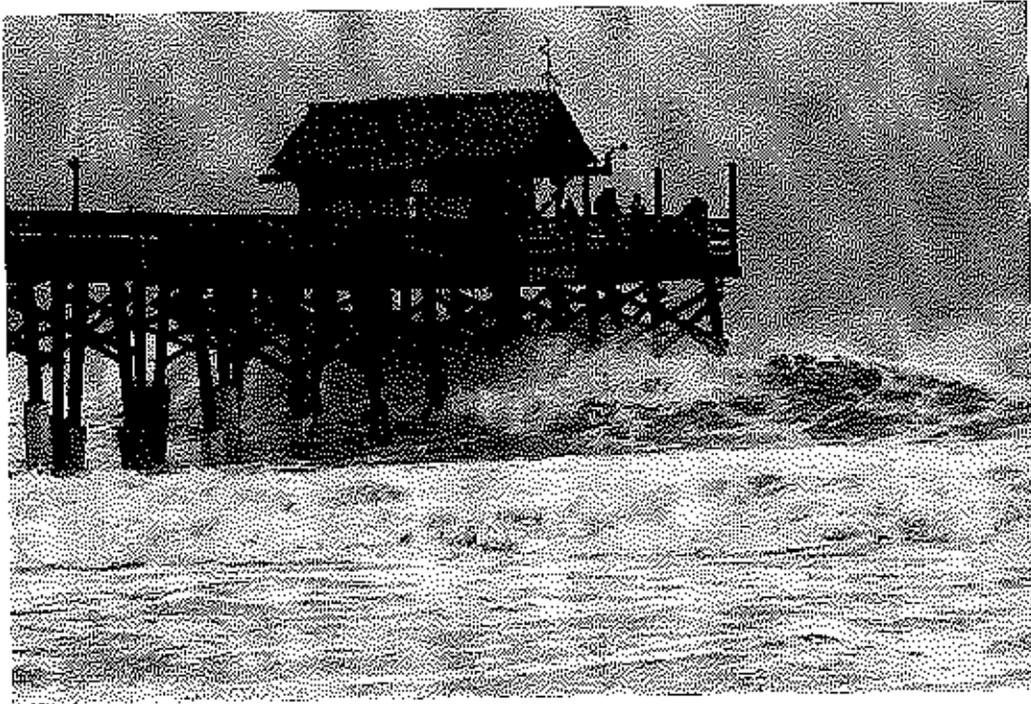


Photo above of Hurricane Sandy storm surge at Cocoa Beach Pier, October 27, 2012. Accessory structures undermined and loss of dune occurred too, below.



Post Storm assessment Hurricane Sandy, Brevard received \$4.6 million from the Florida Department of Environmental Protection (FDEP) matching funds renourishment because FEMA declared an emergency in Brevard. An Additional 30 Million was received from the Flood Control and coastal Emergency fund to help renourished the dune in the north and south reach of Brevard beaches.



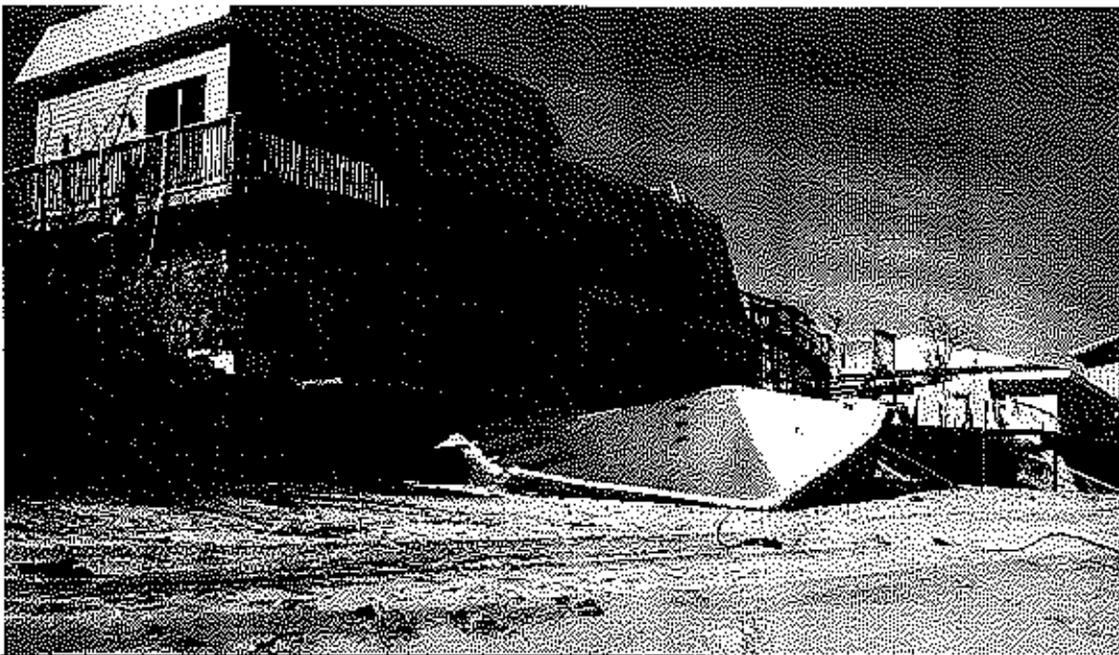
9/26/2004 Hurricane Jeanne photos of damage caused by coastal erosion, surge, and flooding that collapsed several homes and accessory structures in the Melbourne Beach area.



Current coastal setback regulations mitigated some of the damage which occurred. Current dune setbacks for new construction paired with stronger construction saved structures.



9/5/2004 - Hurricane Frances - Two swamped sailboats along the shore of Pineda Landing Park in Melbourne. Surge undermined accessory uses along the beach below.



The following tables summarize the financial exposure, building detail and land use summary of all parcels within each of the storm surge zones in Brevard County. The map on the following page depicts the hazard zones summarized in these tables.

Financial Exposure Summary | Storm Surge Categories

County Summary							
Hazard Zone	Parcels in Zone	Parcels Built	Land Value	Building Value	Assessed Value	Taxable Value	Prop. Value Per Acre
Category 1	11956 4.11%	9647 80.64%	\$1,535,350,850	\$1,450,619,990	\$5,402,077,860	\$2,983,322,100	\$174,524
Category 2 (Cumulative Zone)	30492 11.45%	25807 86.80%	\$3,780,392,570	\$2,979,529,640	\$9,489,072,780	\$5,921,107,560	\$702,058
Category 3 (Cumulative Zone)	53756 18.46%	46602 86.33%	\$5,841,990,100	\$4,924,157,020	\$14,360,387,010	\$8,441,121,140	\$132,588
Category 4 (Cumulative Zone)	62087 21.32%	53134 85.50%	\$5,753,777,000	\$4,775,582,410	\$16,158,138,820	\$9,308,234,240	\$324,000
Category 5 (Cumulative Zone)	85168 29.24%	72707 85.37%	\$6,413,752,080	\$6,060,662,250	\$19,675,361,880	\$11,078,090,850	\$215,967
None	206051 72.76%	135892 65.95%	\$5,082,518,460	\$11,482,286,910	\$25,153,807,040	\$15,507,847,080	\$50,186

Parcel Detail Summary | Storm Surge Categories

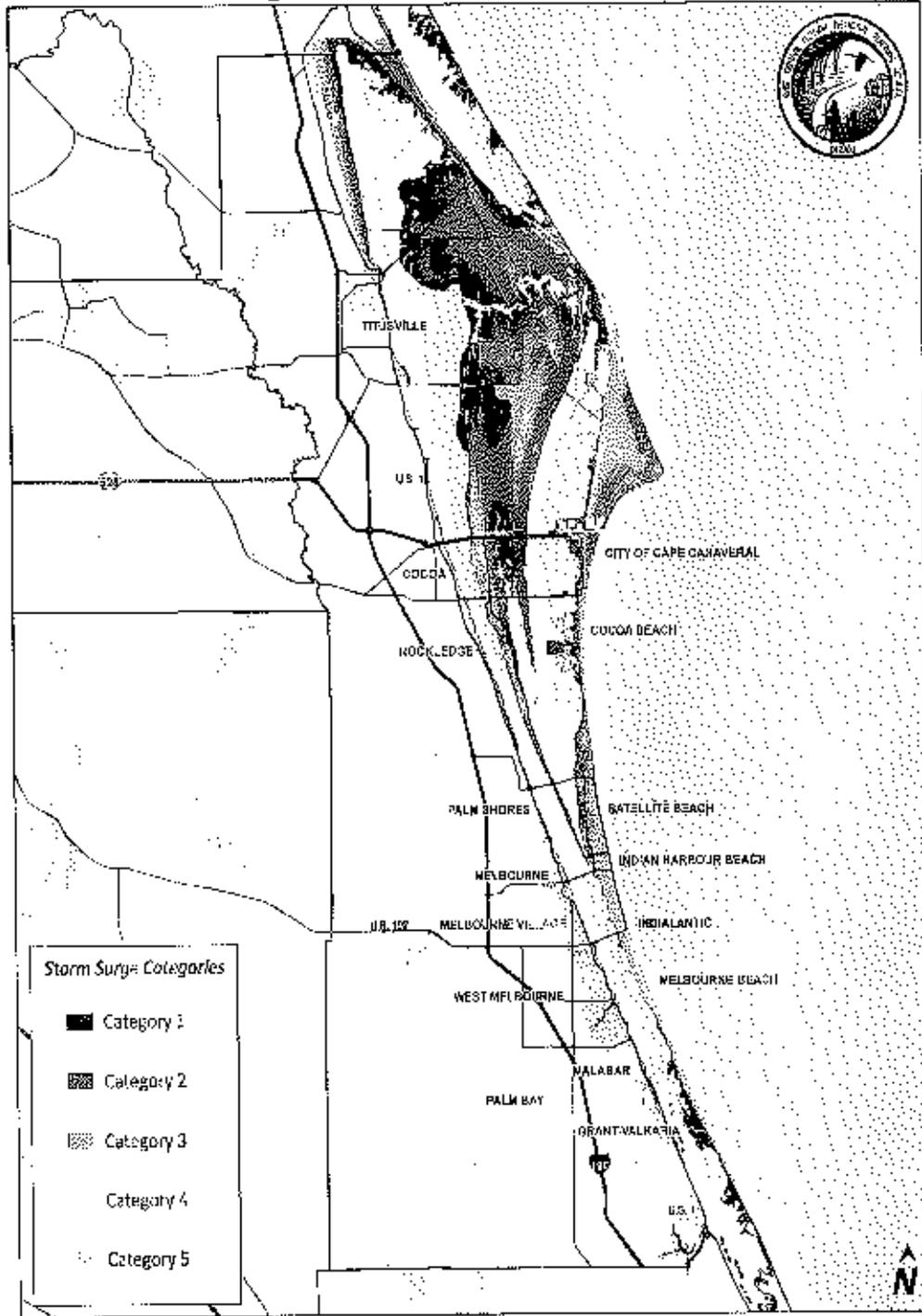
County Summary							
Hazard Zone	Parcels in Zone	Parcels Built	Parcels Not Built	Built Pre-1994	Built 1994-2001	Built 2002-2009	Built 2010-Present
				Category 1	11956 4.11%	9647 80.68%	2800 2.81%
Category 2 Additions to Cat. 1	30492 11.45%	25807 84.60%	4625 15.20%	15158 53.97%	1741 6.75%	1238 4.72%	9695 37.57%
Category 3 Additions to Cat. 2	53756 18.46%	46602 86.50%	7054 13.31%	15497 35.43%	2484 5.33%	1686 5.12%	25985 55.31%
Category 4 Additions to Cat. 3	62087 21.32%	53134 85.58%	8958 14.47%	5053 5.57%	604 1.14%	850 1.54%	46642 87.16%
Category 5 Additions to Cat. 4	85168 29.24%	72707 85.37%	12456 14.63%	16105 12.47%	1410 1.07%	1859 2.56%	55248 78.29%
Not in Zone	206051 72.76%	135892 65.95%	70159 34.05%	83784 61.25%	71834 13.67%	29887 11.65%	1497 1.66%

Future Land Use Summary | Storm Surge Categories

County Summary												
Hazard Zone	L.U. Res.	M.D. Res.	H.D. Res.	Commercial	Office	Mixed Use	Recreation	Institution	Conservation	Industrial	P.D.	Agriculture
												0
Category 1	8524 71.22%	547 4.53%	1613 13.44%	474 3.90%	2 0.02%	253 2.12%	131 1.00%	67 0.56%	187 1.55%	53 0.44%	0 0.00%	40 3.33%
Category 2 Additions to Cat. 1	13986 40.60%	2504 6.02%	1340 6.85%	1070 3.53%	6 0.02%	127 0.42%	85 0.12%	39 0.13%	7 0.02%	106 0.50%	1 0.04%	1 0.00%
Category 3 Additions to Cat. 2	19664 55.47%	2797 5.20%	1878 7.51%	1855 3.45%	8 0.01%	331 1.67%	69 0.33%	87 0.37%	5 0.11%	99 0.13%	1 0.04%	1 0.00%
Category 4 Additions to Cat. 3	3160 5.10%	1390 2.09%	1997 3.21%	682 1.10%	9 0.02%	764 1.23%	45 0.17%	44 0.07%	29 0.05%	189 0.30%	27 0.04%	1 0.00%
Category 5 Additions to Cat. 4	15671 24.70%	2657 3.12%	1958 2.30%	1152 1.35%	16 0.02%	870 1.34%	49 0.07%	53 0.08%	139 3.15%	333 4.65%	8 0.01%	0 0.00%
Not in Zone	148797 71.37%	22523 6.33%	14911 9.38%	6834 3.07%	35 0.02%	1257 0.61%	295 0.14%	414 0.20%	2852 1.88%	1049 0.80%	10152 4.93%	4801 1.54%

**The second and third tables summarize the zones for Categories 2, 3, 4 and 5 by the (hereafter) increase to the previous zone. For example, The numbers for "Category 3" in the second and third tables represent the additional buildings and corresponding land uses that Category 3 adds to Categories 1 and 2 combined.

Storm Surge Zones by Hurricane Category



Data source: Brevard County Storm Tide Atlas, FDOT/MECFRPO 2010 Florida Statewide Regional Evacuation Study

Flooding | *Natural Hazards*

Floods are the inundation of a normally dry area caused by an increased water level in an established watercourse, such as a river, stream, drainage ditch, or ponding of water at or near the point where the rain fell. For Florida as a whole, flooding is a continuous concern, and generally is the cause for more deaths than high winds. In Brevard County and its municipalities, flooding can result from either storm surge associated with hurricanes, riverbank overflow, or ponding from heavy rains within a drainage area.

Due to its topography, the county has experienced inland flooding from at least 12 hurricane strength storms and numerous tropical systems since 1922. In addition, severe winter weather systems have caused significant coastal and inland flooding. Flooding can occur from the ocean or rising waters of the Indian River, Banana River, St. John's River, Mosquito Lagoon, Sykes Creek and Newfound Harbor. The majority of the land west of Interstate 95 makes up part of the St. John's River Valley flood plain.

The county is susceptible to short duration flooding, typical of a frontal system with short periods of rain. However, rainfall can be very intense and usually is associated with thunderstorms. Freshwater flooding occurs when an excessive amount of rainfall accompanies a tropical storm or hurricane. With the topography and high water table of Brevard County, drainage problems 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. Lastly, coastal tidal flooding is generated from high tides and wind action and is a chronic problem within the coastal shoreline. In Brevard County, extreme flooding events can occur throughout the County at any time of the year.

A worst case flooding situation, in excess of the 100-year flood, would probably result from prolonged, heavy rainfall that would cause river and stream flooding, as well as localized flooding where storm drainage capacities were inadequate for the storm event. Any structure of any type located within a floodplain and/or in areas subject to poor drainage would be vulnerable to damage or disruption from flooding, unless its vulnerabilities have been mitigated in an appropriate manner, e.g., elevation above the flood level and protection of utilities. On August 25,



Localized Flooding, Tropical Storm Fay, 2008

1999, numerous thunderstorms passing over Melbourne and Brevard County produced nearly 3 to 8 inches of rain flooding numerous roadways, and 49 homes received minor flooding. On October 24, 2005, Hurricane Wilma produced 10 to 13 inches of rain which fell across the central and north part of the county, and about 200 homes were flooded in Cocoa. The most recent widespread flooding event was the result of record-setting rain during Tropical Storm Fay in 2008. Fay's rain produced 0.01 inches to 3.8 feet of flooding above ground level. Therefore, Brevard County could expect to experience at least 3.8 feet of flooding in the future.

A more recent flood event was due to the close call with Hurricane Sandy, 10/26/2012, which produced storm surge that resulted in coastal flooding and erosion. Large and pounding surf affected the beaches for six or more high tide cycles, during a period of high astronomical tides. By the end of the event, many of the beaches had sustained moderate to major beach erosion. The erosion damaged several home foundations, patios, crossovers, pools, and endangered many other beach-front residences throughout Brevard's Barrier Islands. Total estimated damage was over \$25 million. Example photos in specific areas can be seen under the coastal erosion and surge sections of Natural Hazards. No flooding events of note have occurred since 2012.

Vulnerable populations are those in flood zones including isolated low lying areas, flow ways for streams and creeks, seepage hill bases, wetlands, and coastal areas. Some areas in the zones mentioned include North Merritt Island between Hall Road to the south, north and east boundaries of the Kennedy Space Center, and west boundary of State Road 3. Other areas include Space Coast Gardens, Melrose Manor, and Shakespeare Park in the Cocoa area; Lamplighter Village in south central Brevard; Eau Gallie Road west of I-95, Harlock Road adjacent to and to the east of I-95, the upper basin of Turkey Creek, Sebastian Creek, Fellsmere Grade Road, Little Hollywood and Deer Run in south Brevard. All of the Barrier Island, Merritt Island and Lagoon shoreline jurisdictions are susceptible to coastal flooding.

With flooding assessed as the hazard with the third highest relative risk, Brevard County has a particular interest in participation in the National Flood Insurance Program (NFIP) and the Community Rating System (CRS), in order to assist homeowners and businesses with decisions about property vulnerability and flood insurance. The NFIP allows property owners in the 100-year flood zone to acquire federal flood insurance policies on their land, which is subject to flood hazards. Those cities and counties participating in the CRS qualify residents for reduced rates on flood insurance, which vary depending on level of activities the jurisdiction performs to reduce its flood

potential. Brevard has adopted and enforces floodplain management requirements in accordance with current NFIP standards including regulating new construction in Special Flood Hazard Areas and will continue to comply by:

- Enforcing the Floodplain Management Ordinance which regulates new development and substantial improvements in the special flood hazard areas.
 - Inform the community by news releases and open public meeting
 - Provide community outreach
 - Provide information via county public TV
 - Maintain elevation certificates on file for all new construction in the SFHAS or for substantial improvements to properties in the SFHAS.
 - Use best available (flood map) data for issuing construction permits.
 - Provide Public Education Seminars
 - Provide updated mapping to each municipality
 - Maintain public records and make them available for review.
 - Engage in community outreach
 - Utilize and retain news releases and county public TV broadcasts
 - Maintain records pertaining to LOMAS and LOMRS.
 - Provide information related to flood hazards, flood maps, and NFIP information to the public upon request.
 - Continue community outreach efforts for compliance with the community rating system program (CRS).
 - Integrate new NFIP information and mapping into already existing strong community presentations.
 - Continue to promote flood insurance to property owners.
 - Increase and continue outreach presentations to community and home owners associations
 - Continue to update the public via
 - Community outreach
 - Internet
 - Social Media
 - News releases
 - County public TV
 - Where feasible, continue to identify/acquire land in the SFHA open space/preservation.
 - Promote hazard flood mitigation to the public.
 - Provide LMS upon written request
-

- Integrate into outreach presentation
- Continue drainage maintenance and drainage system improvement projects.
 - Encourage more drainage projects through-out the county in all LMS meetings
- Continue floodplain management activities and explore opportunities for possible CRS class enhancement.
- Adopt and enforce the floodplain management plans.
- Provide continued education and best practices to all municipalities.
- Provide robust community assistance program.
 - Community outreach presentations
- Provide outreach upon request to municipalities not participating in the CRS.
 - Provide continued outreach, best practices to municipalities that are not part of the CRS
 - Document each municipality not a participant in the CRS and continue providing them with best practices
 - Ensure that municipalities not participating in the CRS are members of the LMS working group, allowing them still to receive mitigation information
- Maintain flood hazard publications at the main branch of the library.

The county reported 151 Repetitive Loss Properties due to flooding as of the end of 2014. Payouts total \$8,993,523 for building and contents. Numbers of repetitive loss properties by type and jurisdiction can be found in the last column of the *Flood Insurance Statistics* table on page LMS - 132. Maps showing areas of repetitive loss and flood zones are at the end of this section.

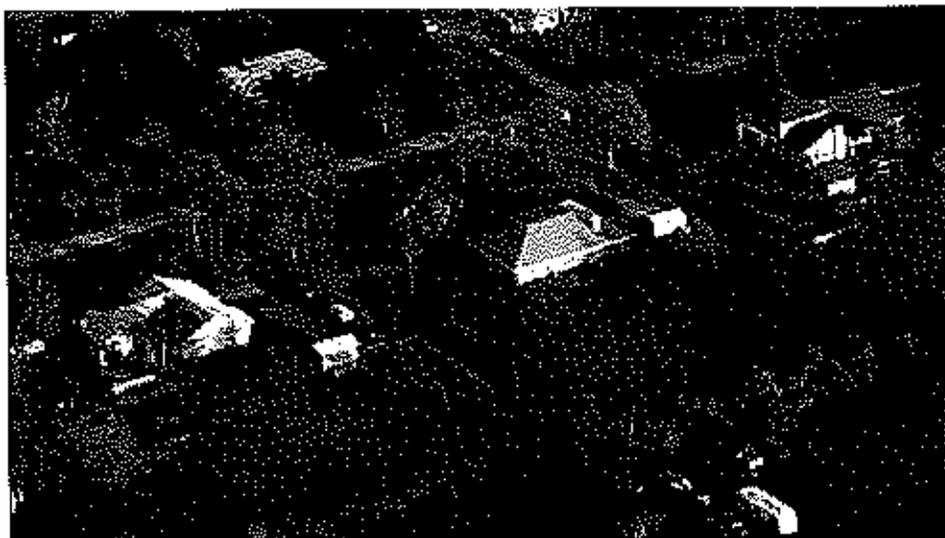


Photo of flooding around homes in Malabar following hurricane Wilma 2005, NWS Melbourne

The following tables summarize the financial exposure, building detail and land use summary of all parcels within each of the flood zones in Brevard County. The map on the following page depicts the hazard zones summarized in these tables. For descriptions of all of the flood zones shown below, reference the following link: <https://msc.fema.gov/webapp/wcs/stores/servlet/info?storeId=10001&catalogId=10001&langId=-1&content=floodZones&title=FEMA%2520Flood%2520Zone%2520Designations>

The probability that Brevard County will continue to experience flooding as described is highly likely, a once a year or more occurrence.

Financial Exposure Summary | Flood Zones

County Summary							
Hazard Zone	Parcels in Zone	Parcels Built	Land Value	Building Value	Assessed Value	Taxable Value	Prnp. Value Per Acre
Flood Zone A	27719 43.3%	12551 54.36%	\$886,795,450	\$1,678,435,520	\$3,586,192,950	\$2,013,447,100	\$34,893
Flood Zone AF	35700 12.25%	17568 49.49%	\$8,115,733,970	\$2,251,501,820	\$7,716,786,250	\$4,122,852,485	\$26,713
Flood Zone AO	124 0.34%	100 80.65%	\$53,224,900	\$8,192,470	\$76,275,700	\$63,044,810	\$2,817,255
Flood Zone AH	1211 1.82%	985 81.34%	\$50,074,490	\$180,993,500	\$265,851,740	\$192,594,590	\$125,745
Flood Zone VE	1393 2.13%	946 68.00%	\$561,430,000	\$147,535,720	\$1,142,952,020	\$585,110,500	\$251,253
Zone X or 500-Yr.	250122 79.32%	176545 70.72%	\$6,897,294,910	\$14,445,381,180	\$82,215,309,270	\$47,725,755,500	\$758,284

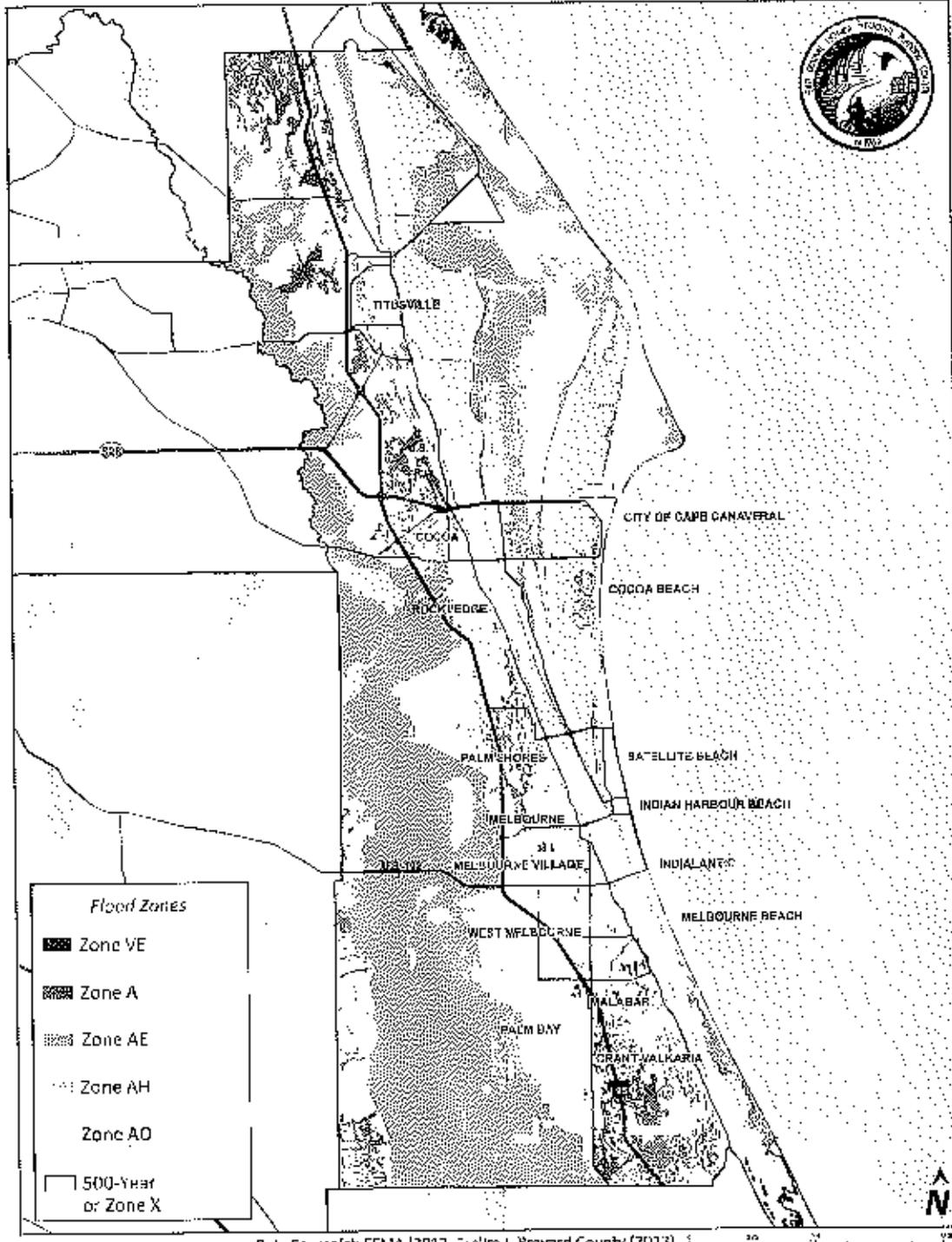
Parcel Detail Summary | Flood Zones

County Summary								
Hazard Zone	Parcels in Zone	Parcels Built	Parcels Not Built	Built Pre-1994	Built 1994-2000	Built 2002-2009	Built 2010-Present	
Flood Zone A	27719	12551	10158	6590	3061	2532	220	2.26%
Flood Zone AF	35700	17568	18082	13415	1784	2271	124	0.35%
Flood Zone AO	124	100	28	25	18	3	0	0.00%
Flood Zone AH	1211	985	226	151	308	453	1	0.00%
Flood Zone VE	1393	946	447	719	115	109	3	0.22%
Zone X or 500-Yr.	250122	176545	58583	120851	23775	30399	1575	0.36%

Future Land Use Summary | Flood Zones

County Summary												
Hazard Zone	I.P. Res.	M.D. Res.	H.D. Res.	Commercial	Office	Mixed Use	Recreation	Institution	Conservation	Industrial	P.D.	Agriculture
Flood Zone A	17090 25.2%	502 1.3%	1309 3.6%	558 1.5%	14 0.0%	45 0.1%	25 0.0%	69 0.2%	2047 4.6%	271 0.7%	233 0.6%	1150 3.0%
Flood Zone AF	25589 74.6%	866 2.4%	3414 9.5%	1007 2.8%	3 0.0%	478 1.3%	260 0.7%	191 0.5%	471 1.3%	261 0.7%	132 0.4%	1855 5.0%
Flood Zone AO	87 0.25%	3 0.0%	25 0.0%	7 0.0%	0 0.0%	0 0.0%	1 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%
Flood Zone AH	209 3.0%	193 2.8%	18 0.0%	6 0.0%	0 0.0%	21 0.0%	0 0.0%	2 0.0%	0 0.0%	1 0.0%	855 20.0%	0 0.0%
Flood Zone VE	757 10.7%	172 0.5%	193 0.5%	45 0.1%	9 0.0%	78 0.2%	67 0.2%	7 0.0%	4 0.0%	0 0.0%	0 0.0%	0 0.0%
Zone X or 500-Yr.	157788 68.5%	20492 4.8%	21679 6.0%	9087 2.5%	59 0.0%	5632 1.5%	271 0.0%	475 0.1%	794 0.2%	3840 9.8%	8360 20.0%	1069 2.8%

Flood Zones (DFIRM 2012)



Data Source(s): FEMA (2013, FIRM.), Brevard County (2013)

Tornado | *Natural Hazards*

A tornado is a violently rotating column of air, descending from a cumuliform cloud or underneath a cumuliform cloud, and often (but not always) is visible as a funnel cloud.

The strength of tornadoes is measured using the Enhanced Fujita Scale which is defined as follows:

EF-Scale:	Typical Damage:
EF-5 (>200 mph)	Incredible. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 m (109 yd.); trees debarked; incredible phenomena will occur.
EF-4 (166-200 mph)	Devastating. Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown and large missiles generated.
EF-3 (136-165 mph)	Severe. Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown.
EF-2 (111-135 mph)	Strong. Roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
EF-1 (86-110 mph)	Weak. Moderate damage. Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads.
EF-0 (65-85 mph)	Gale. Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged.
Source: National Weather Service, Fujita Tornado Damage Scale	

Brevard County historical area-adjusted tornado activity is above Florida state average. It is 3.3 times above overall U.S. average. Tornadoes in this Brevard County have caused 12 fatalities and 638 injuries as recorded between 1950 and 2004.

The 1966 Tampa tornado family was a deadly tornado family that affected the I-4 corridor in Central Florida from the Tampa Bay area to Brevard County on April 4, 1966. Two tornadoes affected the region, each of which featured a path length in excess of 100 miles. One of the tornadoes produced estimated F-4 damage on the Fujita scale; it remains one of only two F-4 tornadoes to strike Florida, the other of which occurred in 1958. Both F-4 tornadoes occurred during El Niño years. Eleven people were killed across the state. The F-4 tornado remains the fourth-deadliest tornado event recorded

in Florida; only tornadoes on March 1962, February 2007, and February 1998 caused more deaths in the state. All of the events were induced by non-tropical cyclones.

The first of the deadly Tampa tornado family touched down around 8:00 a.m. near Largo, Florida, in Pinellas County. The F-4 tornado eventually moved across the state, then over the Cocoa area and lifted near Merritt Island.

The second of the Tampa tornado family was recorded as an F-3 and touched down fifteen minutes later than its predecessor near the Sunshine Skyway Bridge over Tampa Bay. It moved inland over central Florida and closely paralleled the path of the more powerful first tornado. Total damages reached \$50–100,000, and no deaths occurred. The funnel remained aloft for most of its life span, and maximum damage was typical of an F-3 tornado. In the Cocoa Beach area, 150 trailers were destroyed, resulting in more than 100 injuries. More than twenty frame structures and a shopping center were also demolished. Additionally, the tornado struck the training site for the Houston Astros in nearby Cocoa, ripping four light standards from the ground, flattening the center field fence, and destroying all the backstops and batting cages. One of the cages was thrown more than 800 feet into nearby woods. 140 people were injured by the tornado; the majority of the injuries occurred in Brevard County, where 133 people were transported to a hospital in Cocoa Beach.

More recently, two people were injured and 52 homes were damaged when a Tropical Storm Fay-related EF-1 tornado touched down in 2008. Brevard experienced two EF-0 tornadoes in 2010 on January 22nd and March 28th, which resulted in minor commercial and/or residential damage, vegetative debris, and severed power lines.

On June 24, 2012, the third and final tornado associated with a Tropical Storm Debby mini-supercell that traveled from northern Okeechobee County to northern Brevard County occurred just south of State Road 50 and west of Interstate 95, to the west of Titusville. This location was also just north of the Great Outdoors RV Park. Two motorists traveling on Highway 50 observed the tornado briefly touchdown (illuminated by lightning strikes), just to the south of their locations. One of the motorists provided a detailed eyewitness account of the tornado touchdown. While there was little to damage in the immediate area of the tornado, a path of downed tree limbs was noted immediately after the touchdown, from near the entrance of the RV Park to SR 50.

On April 14, 2013, An EF0 tornado with winds estimated between 70 and 80 mph touched down near the Intersection of U.S. 1 and Dixon Boulevard in Cocoa and

travelled northeast to the Indian River where it became a waterspout. The tornado produced minor damage to the roofs and outbuilding of several businesses along U.S. 1, with power lines also downed. Numerous trees were downed along Dixon Boulevard and Indian River Drive. Another EF0 tornado with winds estimated at 75 to 85 mph, affected primarily the Charolais Estates and Colfax Landing subdivisions in Viera/Rockledge. The damage was embedded within a larger swath of strong straight-line winds which affected areas extending farther to the west and east. Several homes experienced damage to roof tiles and soffits. Concrete roof tiles were carried downstream and penetrated several windows. Other metal debris was carried downstream and a fence was blown down. Numerous pool screen enclosures totally collapsed.

On July 6, 2014, a severe thunderstorm produced a southwest-to-northeast aligned damage path. Several eyewitness reports and videos evidence confirmed a brief EF-0 tornado touched down within the overall damage swath. Significant roof damage occurred to three homes on Oklahoma Street, Old Dixie Highway and Brandywine Circle in north Titusville. Inflow winds produced damage, mainly to trees and fences either side of the most significant damage path. Maximum winds were estimated at 65 to 75 mph.

Due to the unpredictable patterns of tornadoes, and because Florida has a relatively high reoccurrence frequency, the entire county and all of its municipalities are at risk for tornado-related wind or debris damage.

Tornadoes also often form on the leading edge of hurricanes and have the potential to cause more destruction than the hurricane itself. They can be a threat in events ranging from tropical storms to the most powerful hurricanes. Since the worst tornado experienced to date within the boundaries of Brevard County was an F-4 tornado, it can be assumed that all of Brevard County is susceptible to an F-4 tornado, and could expect to experience a tornado of this strength in the future. The probability of future tornados is considered highly likely, with a once a year or more occurrence.

A worst case scenario for high winds due to tornadoes would be for a front with multiple tornadoes to move across areas of the county with concentrations of mobile and manufactured homes. Mobile homes and older manufactured homes would be most at risk. In total, there are more than 22,000 mobile and manufactured homes within the county.

The following tables summarize the financial exposure, building detail and land use summary of all parcels within specified distances of all tornadoes that have hit Brevard County since 1950. The map on the following page depicts the hazard zones summarized in these tables.

Financial Exposure Summary | 62-Year Tornado Proximity

County Summary							
Hazard Zone	Parcels in Zone	Parcels Built	Land Value	Building Value	Assessed Value	Taxable Value	Prop. Value Per Acre
Direct Hit	1291 0.42%	940 11.23%	\$133,559,120	\$173,590,300	\$507,493,720	\$216,589,530	\$22,782
Less than 1/8 Mile Away	9650 3.13%	8346 56.57%	\$900,008,010	\$775,253,010	\$1,835,733,290	\$1,091,095,790	\$191,042
Between 1/8 and 1/4 Mile Away	8024 2.90%	7190 12.03%	\$415,914,680	\$623,981,240	\$1,552,141,040	\$490,027,320	\$162,053
Between 1/4 and 1/2 Mile Away	17117 5.82%	14979 84.00%	\$882,871,070	\$1,291,772,430	\$5,575,995,730	\$1,824,887,180	\$164,936
Between 1/2 and 1 Mile Away	33977 11.57%	27240 80.17%	\$1,744,501,370	\$2,901,025,290	\$5,572,457,890	\$3,635,625,540	\$166,256
None In Area	220575 73.74%	149139 37.61%	\$7,649,351,050	\$12,679,827,050	\$30,634,405,200	\$16,907,185,790	\$71,241

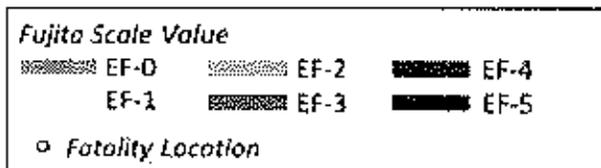
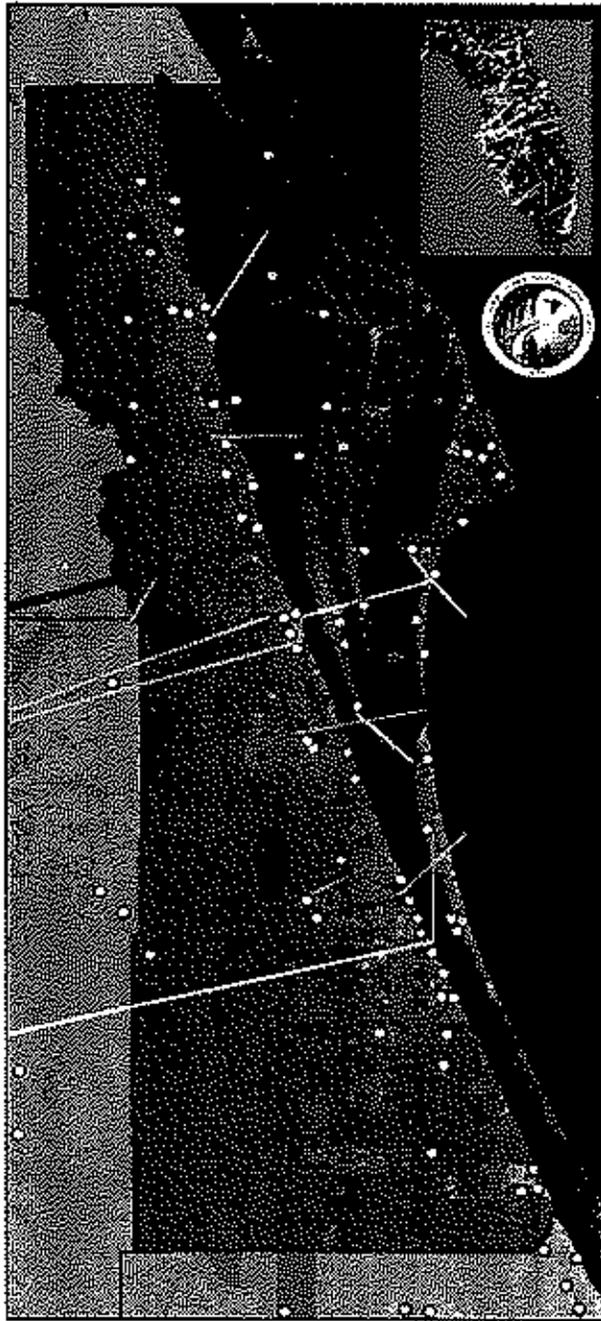
Parcel Detail Summary | 62-Year Tornado Proximity

County Summary							
Hazard Zone	Parcels in Zone	Parcels Built	Parcels Not Built	Built Pre-1994	Built 1994-2003	Built 2007-2009	Built 2010-Present
Direct Hit	1291 0.42%	940 77.81%	351 27.19%	609 65.72%	125 13.30%	115 12.34%	6 0.64%
Less than 1/8 Mile Away	9650 3.13%	8346 86.67%	1304 12.33%	636 75.51%	988 11.92%	1165 13.85%	57 0.68%
Between 1/8 and 1/4 Mile Away	8024 2.90%	7190 12.06%	1494 17.32%	5181 72.06%	824 11.54%	1056 14.81%	60 0.77%
Between 1/4 and 1/2 Mile Away	17117 5.56%	14979 87.50%	2738 16.00%	10648 74.55%	1769 12.30%	1660 15.87%	40 0.58%
Between 1/2 and 1 Mile Away	33977 11.17%	27240 80.27%	6737 19.68%	21080 77.55%	3805 17.00%	3479 12.75%	779 1.07%
None In Area	220575 73.74%	149139 57.81%	71436 31.34%	96090 55.72%	21577 17.47%	28127 12.36%	1335 0.02%

Future Land Use Summary | 62-Year Tornado Proximity

County Summary												
Hazard Zone	L.D. Res.	M.D. Res.	H.D. Res.	Commercial	Office	Mixed Use	Recreation	Institution	Conservation	Industrial	P.D.	Agriculture
Direct Hit	778 0.30%	125 0.47%	26 1.0%	94 2.2%	0 0.00%	66 5.11%	8 0.92%	16 1.26%	29 1.73%	51 0.90%	33 1.56%	58 5.07%
Less than 1/8 Mile Away	6590 60.07%	1923 16.62%	739 2.3%	568 5.82%	0 0.00%	497 2.16%	14 0.15%	66 0.69%	17 0.12%	190 1.38%	211 2.14%	107 1.54%
Between 1/8 and 1/4 Mile Away	5682 65.81%	1057 12.74%	392 4.55%	407 5.76%	0 0.00%	289 3.82%	20 0.29%	52 0.37%	18 0.21%	72 1.43%	385 4.44%	168 1.35%
Between 1/4 and 1/2 Mile Away	10962 59.73%	3010 13.35%	823 4.81%	1085 6.35%	0 0.00%	750 4.34%	89 0.77%	57 0.30%	29 0.17%	146 0.95%	662 3.2%	187 1.05%
Between 1/2 and 1 Mile Away	10641 57.31%	6251 18.90%	7427 8.61%	2851 3.24%	0 0.00%	1941 5.47%	37 0.11%	118 1.35%	57 0.15%	804 9.80%	1586 4.08%	122 0.30%
None In Area	158043 72.06%	13221 4.53%	25997 11.74%	7227 4.28%	76 0.03%	1007 0.77%	508 0.23%	401 0.7%	2226 1.03%	1773 1.34%	7914 7.41%	3312 1.33%

Tornado Tracks (1950-2013)



Data Source(s): NOAA (2013), Brevard County (2013)



Above: A funnel cloud can be seen in the area of Palm Shores and Suntree in Brevard County (2012)
Source: Central Florida News 13



Above: A home in the Viera area of unincorporated Brevard County has been damaged by a tornado.
Source: WFTV Orlando

Thunderstorms and Lightning | *Natural Hazards*

Thunderstorms are formed by the convection behavior of unstable air mass layers, which result in the meteorological effects of wind, heavy rainfall, lightning and thunder, and sometimes hail. Lightning is a visible electrical discharge produced by a thunderstorm. The discharge may occur within or between clouds, between the cloud and air, between a cloud and the ground or between the ground and a cloud. In the United States, there are an estimated 25 million cloud-to-ground lightning flashes each year. Central Florida also has one of the highest density lightning flashes in the world. It is only surpassed by tropical Africa. On average, Brevard County is hit with more than 22,166 lightning strikes a year, the most dangerous months being June, July and August when thunderstorm activity is greatest. Lightning can be fascinating to watch, but it is also extremely dangerous. Florida has more lightning-related deaths and injuries than any other state. The majority of the strikes which cause deaths have occurred in open areas or recreational settings such as golf courses, followed by water related areas like lakes and beach, under trees, and driving equipment like tractors. Not only is the danger to individuals, but the frequency with which it occurs can cause wild fires. Brevard County experiences about 70-80 thunderstorm days a year. The Brevard County Emergency Operations Center monitors and disseminates National Weather Service advisories on severe weather to partner agencies throughout the county. The entire county and all of its municipalities are considered to be at risk from thunderstorms and lightning. These events can cause damage to structures, disruption of utilities (mainly electrical), and surface/air transportation problems.

While all populations can be impacted by severe weather, lack of shelter puts those at outdoor recreational events, mobile and manufactured homes, and the homeless at highest risk.

The Brevard County Parks and Recreation Department manages 108 parks, 3 campgrounds, 3 golf courses, 6 nature centers, 42 beach access sites, 13 school athletic sites, and more than 17,000 acres of Environmentally Endangered Lands sanctuaries and conservation areas. Those parks serve the nearly 550,000 residents of Brevard County including the following municipalities and communities: Aurantia, Barefoot Bay, Canaveral Groves, Cape Canaveral, Cocoa, Cocoa Beach, Eau Gallie, Floridana Beach, Georgianna, Grant-Valkaria, Indialantic, Indian Harbour Beach, June Park, Malabar, Melbourne, Melbourne Beach, Melbourne Shores, Melbourne Village, Merritt Island, Micco, Mims, Patrick Air Force Base, Palm Bay, Palm Shores, Pineda, Port St. John, Rockledge, Satellite Beach, Scottsmeer, Sharpes, South Patrick, Suntree, Titusville, Viera, as well as local visitors from Orlando, Daytona, Vero Beach

and tourists from outside the state. Other popular open areas frequented by tourist include the Brevard Zoo, the Archie Carr National Wildlife Refuge, Canaveral National Seashore, Merritt Island National Wildlife Refuge, Port Canaveral, the Space Coast Stadium, Patrick Air Force Base (PAFB), and Kennedy Space Center (KSC), with many parks used for viewing space vehicle launches.

Those in mobile or manufactured homes are also at risk as they are in other natural hazards. As previously stated, there are approximately 21,328 mobile and manufactured homes in Brevard which equates to an average of 55,026 individuals.

The other vulnerable population is the homeless. The total homeless counted during the *Point- In-Time Count (PITC)* on January 26, 2015 was 1,178 (down 25% from 2013) including 494 unsheltered (down 43% from 2013), 311 children (down 24% from 2013), 44 unaccompanied children (down 70% from 2013), 152 chronically homeless (up 42% from 2013 because Cold Night Shelters were open), and 127 veterans (down 52% from 2013). Even though the actual count may not be completely accurate for a number of reasons, the PITC provides the statistical basis for accurate percentages to show increase of decrease in those populations.

A review on significant thunderstorm events as recorded by the National Climactic Data center for the planning period from 2010 to 2015 notes 46 events of note in Brevard. Winds from those events ranged from 45 to 75 mph. Affected areas were wide spread verifying once again that the entire county would be affected from this hazard. Specific dates with multiple reports included March 30, 2011; August 21, 2012; and March 24, 2013.

A rare Florida derecho (widespread, long-lived, straight-line wind storm that is associated with a land-based, fast-moving group of severe thunderstorms) affected the region during the late afternoon and early evening, of March 30, 2011, well ahead of a strong cold front. The rapidly moving squall line moved across the central portion of Florida at 60 mph. Multiple observations of 65 to 74 mph winds were reported. Hen egg sized hail (2 inch diameter) fell in Palm Bay, a home in Melbourne Beach experienced major roof damage due to severe thunderstorm winds, and thigh-sized tree limbs were downed in the Scottsmoor and Mims areas. Reports of wind and hail damage, and high gusts were also noted in Titusville, Merritt Island, Melbourne Village, and at facilities including Patrick Air Force Base, Melbourne Airport, and Kennedy Space Center.

On August 21, 2012, an upper-level trough crossed east-central Florida. This trough combined with abundant moisture and boundary collisions produced severe storms and areas of damage across Brevard County. A funnel cloud over Pineda Causeway in Melbourne was observed by Patrick Air Force Base spotters; and penny-sized hail in Scottsmoor was observed during the episode.

March 24, 2013 brought thunderstorms that damaged several homes within the Island Lakes Mobile Home Park on Merritt Island. Damage was primarily confined to awnings, carports and pool enclosures. At least two homes experienced some roof damage and several homes were damaged by falling trees. A weather spotter reported nickel size hail at County Road 405 near Walmart in Titusville. Very strong west winds, estimated at 60-75 mph, damaged numerous modular homes in the Maplewood Village Mobile Home Park in West Cocoa. Many awnings destroyed, sheet metal damaged, and one home experienced an exterior roof collapse. One woman was injured while returning to her home after retrieving her dog. She sustained a broken hip when a tree fell on her Florida room as she entered. A two story apartment complex on Adams Avenue in Cape Canaveral also lost a large part of its flat roof. On July 3, 2015 strong thunderstorms caused a tree to fall through the roof at a home on Palmer Street in Rockledge.

Ten jurisdictions ranked lightning in their top three hazards and the county can expect to continue to be susceptible to its effects. The Melbourne Weather Forecast Office reported that in Brevard County between 1959 and 2007, 80 people were injured by lightning and 25 were killed. Some examples of significant historical lightning events which resulted in casualties follow: In 1996, a 32 year old man was killed while watching July 4th fireworks along the river front in Titusville. On July 30, 2000, a 62 year old man was struck by lightning on a golf course in Palm Bay. He died of his lightning injuries on August 1, 2000. A woman taking shelter from thunderstorm rain under a tree on a spoil island in the Indian River Lagoon was killed by lightning on July 18, 2004. Her 10 year old son and a 21 year old woman were seriously injured by the strike. A lightning strike directly hit and killed a man on Melbourne Beach on July 8, 2009. The lightning strike also injured the man's wife and son, who were transported to a local hospital and admitted in 'good condition' with only minor burns.

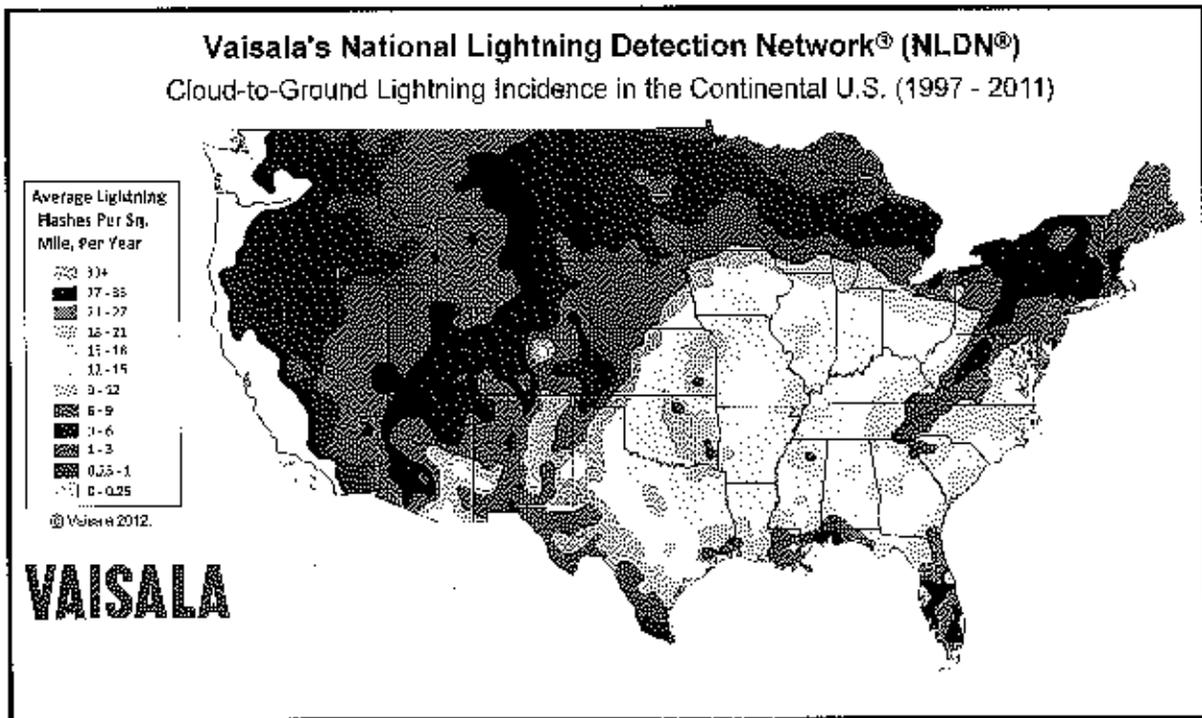
Recent events that caused injury or property damage include a June 13, 2012 incident when a man was struck by lightning during and isolated storm in Cocoa Beach, he was treated in a nearby hospital and released. On August 16th of the same year a local media outlet relayed a report of a woman being struck by lightning on Arborwood Avenue in Port St. John. She was taken to a nearby hospital and reported to be in

stable condition. On August 21st of 2013 a bolt of lightning struck a van that was being driven southbound on Interstate 95 in Mims. The windshield shattered, the engine was disabled, and all four tires were blown out. The front portion of the van then burst into flames. The driver was able to get out of the vehicle safely, with no injuries. Most recently, on July 16, 2014, lightning struck a yacht at the Kennedy Point Yacht Club and Marina in Titusville. The yacht caught fire and spread to three adjacent boats. Three of the four boats were a total loss. Given these examples and the multitude of others, and the various geographical locations, it is evident that the entire county and all of its municipalities are considered to be at risk from lightning. In addition to the tree through the roof in Rockledge, that same July 3, 2015 storm brought lightning that caused several tree fires in the Rockledge area. All were put out by the ensuing rains. Lightning also hit the communications tower at the EOC. Sparks were seen but the grounding system functioned well and no communications were lost.

There is a one-in-50 chance that a thunderstorm or lightning will cause economic damage or loss over 50 dollars anywhere in the entire county. The probability that Brevard County will continue to experience thunderstorm and lightning is considered highly likely, a once a year or more occurrence.

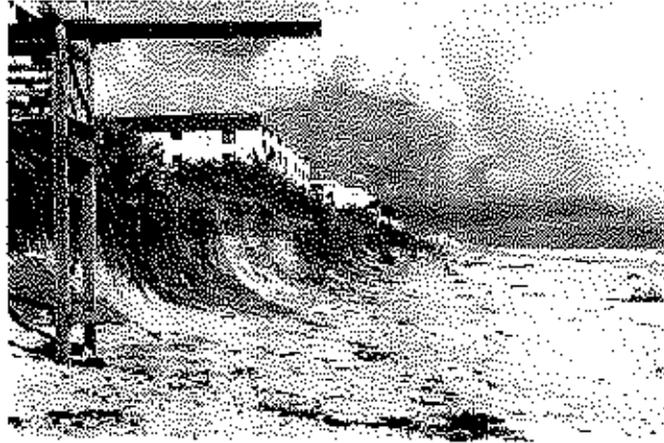
The worst case scenario for lightning would be considered a large storm front resulting in numerous lightning strikes as the front moved across the county. Strikes in outdoor areas could result in direct injuries or fatalities to several but not large numbers of people. Any structure without a lightning protection system is vulnerable, with taller structures, e.g., communications towers (pg. 115) and exposed structures in open areas, and over or near water, like the Cocoa Beach Pier, being at extra risk. To mitigate this hazard the city of Cocoa Beach recently added an initiative to this plan to install a lightning prediction and warning system citywide to provide advanced notification of potential lightning strikes in the area to allow citizens and visitors adequate time to seek appropriate shelter. Structures experiencing direct strikes would suffer differing degrees of damage, from slight to total losses if fires ensued. Strikes to vegetated areas could also cause wildfires which could then damage structures and require evacuations. Direct strikes could also damage critical infrastructure, including electric power systems, as well as telecommunication and radio systems, resulting in failure of these systems. Damaged systems could be repaired or replaced within a few days or weeks, depending on the system and the extent of the damages. Widespread economic losses would not be anticipated. The actual vulnerability to lightning strikes is a factor of the characteristics of the community and the vulnerability of its designated critical facilities and neighborhoods.

The following maps depict lightning risk in Florida as compared to the rest of the continental United States. As can be seen, Florida is one of the riskiest areas in the country for these two types of events. Because of these events in the past, Brevard could expect to experience at least the same level of thunderstorms and lightning strikes in the future.



Coastal Erosion | *Natural Hazards*

Erosion is the wearing away of land by the action of natural forces embodied in waves, water currents and wind. Even though erosion is a natural process, it can be either mitigated or enhanced by human activity. Brevard County, with its long coastline, is susceptible to beach erosion, in particular. The Florida Department of Environmental Protection has classified most of Brevard's Beaches, from Bonsteel Park north, as a critical erosion area. Critical erosion areas are segments of the shoreline where natural processes or human activity has caused or contributed to erosion and recession of the beach or dune system. Localized erosion can also occur away from the coastline along river and stream banks, canals and drainage ditches.



The hurricane season of 2004 caused significant beach erosion and required mitigation measures to prevent damage to beach side structures. The locations of these measures are indicative of the locations within the county most vulnerable to erosion. Brevard

County received funding for two dune maintenance projects to be undertaken during 2006 and 2007. These projects took place in the Mid-Reach (Satellite Beach, Indian Harbour Beach, and the northern end of Indialantic) and South Beaches (South Melbourne Beach and southward). Together, the projects repaired erosion damage noted after Wilma and restored native vegetation lost during the 2004 hurricane season.

The 2005 Brevard County Shore Protection Project successfully restored to their full width the world-famous beaches from Cape Canaveral through Cocoa Beach (the North Reach) and from Indialantic through Melbourne Beach (the South Reach) using beach

quality sand dredged from an offshore site. Using beach quality sand, the 2005 Emergency Dune Stabilization Project repaired the hurricane-ravaged dunes of all developed coastal properties and most parks from Satellite Beach through Indian Harbour Beach (the Mid-Reach) and from South Melbourne Beach through properties just north of Sebastian Inlet (the South Beaches).

Prior to construction of the Brevard County Federal Shore Protection Project, the North Reach (9.8 miles including cities of Cape Canaveral and Cocoa Beach) was eroding at a rate of 2.6 feet per year and the South Reach (3.8 miles including the towns of Indianalantic and Melbourne Beach) was eroding at a rate of approximately 1 foot per year. Construction and maintenance of a full scale shore protection (beach nourishment) project in these areas in partnership with the Army Corps has significantly mitigated the risk in these areas.

Outside the federal shore protection project, the Mid Reach (7.8 miles including Satellite Beach and Indian Harbour Beach) between 1972 and 2001 the dune/bluff face was eroding at a rate of 0.6 feet per year and the South Beaches (approximately 13 miles from Spessard Holland Park to Sebastian Inlet state park) between 1972 and 2005 the dune bluff eroded at a rate of approximately 1 foot per year, with a slightly slower rate at the south end. Based on the data, Brevard's beaches are expected to continue to erode at similar rates and values.

October 26, 2012, Hurricane Sandy affected the coast of Brevard. Sandy moved slowly northwest, parallel to the Florida coast, 200-250 miles offshore. Due to the very expansive wind fields associated with the hurricane, sustained tropical storm winds reached the east-central Florida beaches and adjacent portions of the barrier islands. Gusts to tropical storm force occurred throughout the coastal counties, with some interior counties also experiencing tropical storm gusts, especially during passing squalls. Large and pounding surf affected the beaches for six or more high tide cycles, during a period of high astronomical tides. By the end of the event, many of the beaches had sustained moderate to major beach erosion. Numerous beach cross-overs and lifeguard towers were damaged and sand was washed onto coastal roadways and beach parking areas in several locations. Coastal erosion and other damage estimates for Brevard were in excess of 25 million dollars. No major coastal erosion events have occurred since 2012.

History has shown a worst case event for beach erosion would be from impacts of storm surge from a hurricane or from northeasters. Substantial loss of sand would undermine

the foundations of large and small beachfront buildings, including single family residences, condominiums, apartments, hotels and commercial structures. A 2015 property appraiser database search shows there are 9,675 Ocean Front parcels in Brevard. Many of the structures, primary and accessory, could collapse or experience severe structural damage during a worst case event, with hundreds or thousands of buildings damaged. Evacuation of the affected areas would be expected to limit injuries and fatalities, however, direct and indirect property losses could easily reach hundreds of millions of dollars. The beach front destruction would also have prolonged economic impacts on the county's vital tourist industry. Infrastructure damage to roadways north of Patrick Air Force Base and all causeways and Mather's bridge could also be substantially affected. There was a report on erosion and sea level rise, by CBS on December 6, 2014, that indicated climate change continues to threaten NASA's launch pads at Cape Canaveral Air Force Station. Nearly 100 feet of beach that served as a buffer between the Atlantic and the launch pads has been lost since 2003. Utilities including sewer, water, electric and stormwater would also be damaged affecting recovery.

In Brevard County, erosion events can occur on all coastal areas of the County, any time of the year. Jurisdictions susceptible to coastal erosion include beachfront areas like: Cape Canaveral, Cocoa Beach, Satellite Beach, Melbourne Beach, Indian Harbour Beach, Indialantic, and unincorporated Brevard (South Patrick Shores, Patrick AFB, Merritt Island, Canaveral National Seashore and the South Beaches); and Lagoon-front jurisdictions like: Titusville, Cocoa, Rockledge, Palm Shores, Melbourne, Malabar, Grant-Valkaria, and unincorporated Brevard (i.e. Scottsmoor, Mims, Merritt Island, Port St. John, Micco). The probability of future erosion along the Brevard County coastline is highly likely with a once a year or more occurrence.



Patio fails at Melbourne Beach home due to coastal erosion after close call from hurricane Sandy, 2012.

Sea Level Rise | Natural Hazards

Sea level rise, caused by climate change, is a phenomenon resulting from a consistent change in the earth's temperature that leads to changes in climatic patterns which ultimately alters weather patterns - including atmospheric and hydrologic impacts – and leads to sea level rise. There is still debate on the degree of the impact; the evidence is clear that a trend is occurring and sea levels have been rising for the better part of the 20th century and into the 21st century.

The greatest impacts from climate change on sea level rise include storm surge and coastal flooding. Sea level rise and climate change also affect atmospheric and hydrologic patterns which in turn impact other hazards like inland flood (increased rainfall periods), drought (decreased rainfall periods), and wildfire (exacerbated by vegetative fuel growth in periods of higher rainfall and then burn risk in drier periods). During the last century, sea level has risen approximately 6-9 inches worldwide and 9 inches along the coast of East Central Florida. The United States Environmental Protection Agency (EPA) has been analyzing the causes, effects and possible responses to sea level rise. EPA's 1995 report, *The Probability of Sea Level Rise*, estimates that if humanity continues to emit greenhouse gases into the atmosphere, the mean sea level could rise 1-2 feet in the next century and 5 feet over the next 150-300 years.

In the fall of 2009, the City of Satellite Beach (City), Florida, authorized a study designed to assess municipal vulnerability to rising sea level and facilitate discussion of potential adaptation strategies. Results suggest the tipping point between relatively benign impacts and those that disrupt important elements of the municipal landscape is +2 ft. (0.6 m) above present. Seasonal flooding to an elevation of +2 ft. is forecast to begin around 2050 and thus the City has about 40 years to formulate and implement an adaptation plan. Additionally, beaches erode 100 – 200 feet with every one foot rise in sea level. With a 50 percent chance of the sea level rising 4 feet by 2200, the beaches could erode 200 to 800 feet. High density shoreline areas can be very costly to protect; therefore, it is important that decisions be made concerning the protection of developed and undeveloped land before it becomes too expensive or impossible to protect. To determine the areas needing protection, coastal managers should look for relative sea level rise in specific areas.

There are 18,998 (including canals) properties along on the Indian River Lagoon System and 9,675 Ocean Front parcels that fall under the purview of the Brevard County LMS. Since most of those waterfront homes are located within 100 to 200 feet

of the high water mark, these properties will be affected in some way by changes in sea level rise. The probability of future sea level rise events in Brevard County is considered likely, but, because of many unknowns was ranked at a 500 year or less occurrence.

The worst case scenario for Brevard County would be for the actual amount of sea level rise to near the more extreme end of the projections. The expected damage would be similar to that of coastal erosion with additional of issues related to saltwater intrusion and widespread flooding. The west side of the barrier islands along the canals, and the low-lying parts of Merritt Island (primarily north of the barge canal, east Merritt Island between SR528 and SR520, and south of Pineda Causeway (SR404), are projected to be impacted the hardest by sea level rise. Secondarily, the homes, condominiums, and structures located directly on the beach or immediately adjacent to the beach in Cape Canaveral, Cocoa Beach, Satellite Beach, Indian Harbour Beach, Indialantic, and Melbourne Beach will feel more impacts from higher tides and periodic strong, persistent wind events. Coastal erosion will be the main and most visible cause, but the increased frequency and level of impact will be the result of sea level rise.

The City of Satellite Beach conducted a Sea Level Rise study in 2010 and found that the biggest impacts from sea level rise would be on the west side of the barrier island, along the Banana River, Grand Canal and its finger canals, and will eventually impact the areas surrounding South Patrick Drive. There are two areas in Satellite Beach that have been tracked for suspected impacts due to Sea Level Rise. Pipes at the west end of Desoto Parkway and Jackson Boulevard have experienced more frequent periodic flooding when the Indian River Lagoon is high and intense thunderstorms come through the area. This was observed by city staff in June 2015. Since these roadways were engineered not to flood, the change could be attributed to sea level rise; but, there have been no specific studies that confirm this. There was a report, as previously mentioned, on sea level rise, by CBS on December 6, 2014. That report indicated climate change and sea level rise continues to threaten NASA's launch pads at Cape Canaveral Air Force Station

(<http://www.cbsnews.com/videos/sea-level-rise-threatens-nasas-launch-pads/>).

Nearly 100 feet of beach that served as a buffer between the Atlantic and the launch pads has been lost since 2003. There are no other recorded incidents specifically attributed to sea level rise.



The following tables summarize the financial exposure, building detail and land use summary of all parcels within each of the sea level rise zones in Brevard County. The Sea Level Rise Hazard Zones are the output of a Hazus-MH climatic impact model, and show the susceptibility to long term sea level rise based on topographic features. The table and map on the following page depict these zones.

Financial Exposure Summary | Sea Level Rise Zones

County Summary							
Hazard Zone	Parcels in Zone	Parcels Built	Land Value	Building Value	Assessed Value	Taxable Value	Prop. Value Per Acre
Submerged/ Wetland	880 0.30%	804 31.35%	\$17,369,860	\$17,830,680	\$199,627,190	\$67,051,910	\$45,457
No Protection	847 0.12%	725 33.23%	\$88,023,400	\$46,750,220	\$247,993,740	\$50,578,830	\$111,661
Protection Unlikely	278 0.10%	151 54.33%	\$75,530,930	\$18,289,250	\$203,079,700	\$74,904,640	\$69,715
Pr. Reasonably Likely	5919 2.37%	4485 74.17%	\$525,788,790	\$718,747,870	\$1,862,380,450	\$340,531,180	\$189,787
Protection Almost Certain	55880 15.19%	50890 90.12%	\$4,589,981,690	\$4,838,354,770	\$23,495,894,520	\$8,340,214,350	\$504,275
No Risk	226916 77.93%	159193 67.51%	\$5,023,516,200	\$14,753,077,150	\$28,195,040,910	\$15,075,894,610	\$60,243

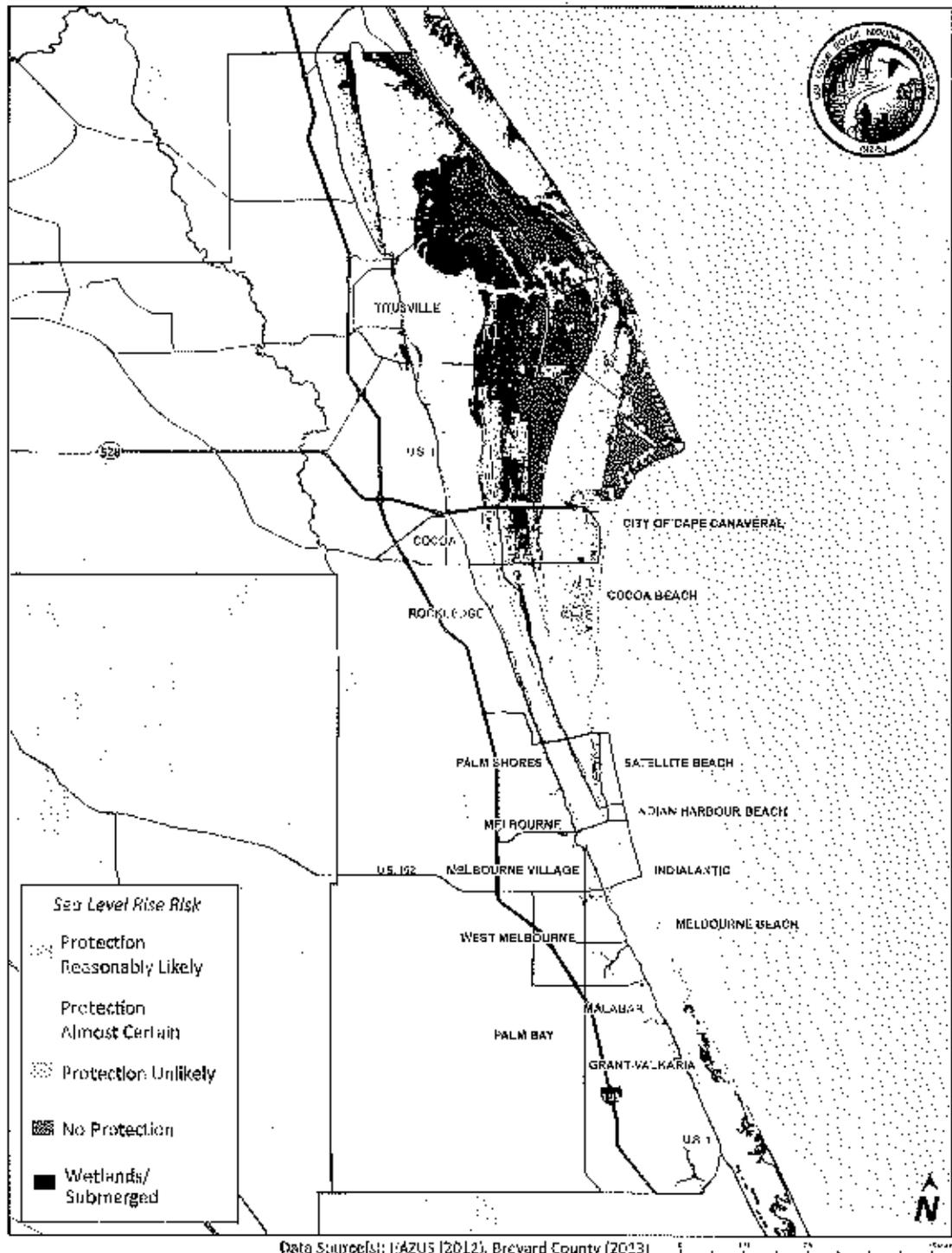
Parcel Detail Summary | Sea Level Rise Zones

County Summary							
Hazard Zone	Parcels in Zone	Parcels Built	Parcels Not Built	Built Pre-1994	Built 1994-2001	Built 2002-2009	Built 2010-Present
Submerged/ Wetland	880 0.30%	804 34.55%	74 8.43%	50 10.47%	15 1.25%	216 71.05%	7 1.6%
No Protection	847 0.12%	725 56.07%	227 26.88%	41 32.93%	20,668 26.64%	49 13.20%	10 8.00%
Protection Unlikely	278 0.10%	151 54.33%	127 45.63%	93 61.21%	27 17.98%	24 15.56%	2 1.32%
Pr. Reasonably Likely	5919 2.37%	4486 75.14%	2411 37.89%	2147 52.84%	1260 27.25%	807 18.87%	48 1.03%
Protection Almost Certain	55880 15.19%	50980 50.16%	5490 9.82%	42740 83.31%	4663 5.25%	3208 6.49%	719 1.3%
No Risk	226916 77.93%	159193 67.51%	78728 34.14%	97066 61.58%	29160 15.24%	31424 25.53%	1045 1.61%

Future Land Use Summary | Sea Level Rise Zones

County Summary												
Hazard Zone	L.D. Res.	M.D. Res.	H.D. Res.	Commercial	Office	Mixed Use	Recreation	Institution	Conservation	Industrial	P.D.	Agriculture
Submerged/ Wetland	487 55.34%	6 0.75%	100 14.77%	79 1.99%	0 0.00%	14 1.54%	9 0.57%	7 0.83%	78 3.30%	28 1.18%	0 0.00%	11 1.25%
No Protection	163 49.24%	7 1.01%	4 1.15%	1 0.28%	0 0.00%	13 3.73%	43 12.84%	4 1.12%	45 1.23%	7 2.00%	0 0.00%	25 6.55%
Protection Unlikely	258 92.81%	2 0.72%	1 0.30%	8 1.07%	0 0.00%	0 0.19%	2 0.27%	5 1.07%	1 0.28%	4 1.12%	0 0.00%	1 0.25%
Pr. Reasonably Likely	5229 75.04%	115 1.68%	302 4.31%	699 10.31%	8 0.12%	171 2.47%	75 1.03%	46 0.99%	48 1.69%	167 2.34%	3 0.04%	6 0.83%
Protection Almost Certain	35872 50.55%	5820 7.75%	8797 12.69%	5912 8.03%	18 0.27%	1973 2.51%	148 1.26%	149 0.20%	12 0.07%	159 0.27%	17 0.04%	1 0.01%
No Risk	162429 71.58%	19385 2.70%	20083 2.85%	5891 8.04%	30 0.04%	2661 3.48%	348 0.15%	470 0.21%	2178 0.35%	2125 0.54%	10259 4.48%	4702 1.76%

Sea Level Rise Zones



Severe Winter Storms | Natural Hazards

A severe winter storm for Brevard County would be an event producing unusually low and prolonged temperatures which may be accompanied by ice or sleet storms. In Brevard County, freezing temperatures can have a great impact on the citrus industry. If temperatures reach freezing levels for extended periods of time, combined with other climatic factors, then crop or landscape damage may occur. This would have a significant impact on Brevard's economy and employment base. The County has experienced several damaging freezes in the past 20 years, including in 2000-2001, when the county was part of a Presidential Disaster Declaration. Recently, in early January 2010, an unusual period of cold temperatures occurred over several days which caused some damage to the area's citrus crop. 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, which can have a significant impact on electrically-dependent critical facilities and persons.

The locations most vulnerable to severe winter weather in Brevard County would be agricultural lands, primarily the approximately 6,500 acres of citrus crops, most of which are located in Merritt Island, and Micco. See the map on page 97 for the location of these larger farmlands. Because Brevard lies on the cusp of the Semi Tropical and Tropical climate zones, it is conducive growing a wide variety of fruits and vegetables. However, the climate that supports such unique vegetative diversity also makes it susceptible to extreme temperature changes. When extremely cold, the effects the county can be seen in areas that grow more tropical fruits. Nurseries and growers in northern parts of the county in Scottsmeer, Titusville, and Mims would be most susceptible. Many residents also have tropical fruit trees and backyard gardens; therefore, all of the county would experience some level of vulnerability to this hazard.

According the University of California at Davis, citrus crops, particularly oranges, begin to sustain damage when temperatures are sustained at or below 29°F for a period of 30 minutes or more at ground level. Business closures and significant damages to the county's citrus and horticultural industries would result in substantial economic damages.

This scenario would be equivalent to or worse than the winter sub-freezing events of 2009 and 2010. Starting on January 21, 2009, Brevard County experienced sub-freezing temperatures for three consecutive nights. Wind chill readings in the 20s also occurred during the morning of the 21st. The coldest morning at most locations was on

the 22nd, when hard freeze conditions spread south across many locations of the interior peninsula to Lake Okeechobee. Official temperature sites reached the mid to upper 20s, with a NWS Cooperative sites at Scottsmoor in Northwest Brevard County reaching 22 degrees. Sub-freezing minimum readings and widespread frost occurred on the 23rd. Only the barrier islands south of Cape Canaveral remained at or slightly above freezing throughout the event.

In 2010, several strong cold fronts brought reinforcing arctic air masses into east central Florida over a consecutive 12-day period. From January 2 through January 14, high temperatures did not exceed 60 degrees on nine to 12 days, with several days recording high temperatures only in the 40s. Several low maximum temperature records were set. During this period, low temperatures fell to or below 40 degrees for 12 consecutive mornings across nearly all of east central Florida. Six to nine mornings saw temperatures fall to 32 degrees or less. Many areas experienced low temperatures in the mid to upper 20s, with a few isolated, rural spots falling to near 20 degrees. Several record low temperature records were set. Frost occurred during several mornings. Long durations of temperatures in the 20s damaged or killed a considerable amount of vegetation, with agricultural crops, citrus, and ornamental flowers. Agricultural reports estimate a third of the Florida Winter fruit and vegetable production were lost, causing hundreds of millions of dollars in losses (state-wide). Also, winds remained near 10 mph on several nights, producing wind chill values in the teens and lower 20s.

Following a cold front, some sleet, snow and freezing rain mixed with a band of light rain from Kissimmee to Palm Bay northward. High temperatures did not exceed 60 degrees for 10 of 12 days between January 2 and 13 at the Melbourne International Airport. For two days, high temperatures were only in the 40s. Daily low maximum temperature records were tied or broken on three days and 32 degrees or below on eight days. For four days, minimum temperatures were in the mid to upper 20s, with the coldest temperature of 25 degrees on January 12th. Four daily minimum temperature records were tied or broken. Similar temperatures occurred across the remainder of Brevard County, although minimum temperatures several degrees warmer on the barrier islands (a freeze occurred along the coast on at least one morning). Frost also occurred on many mornings. Long durations of freezing temperatures resulted in considerable plant damage. In addition, winds near 10 mph occurred on several nights, producing wind chill temperatures in the teens and lower 20s. A rough estimate for (direct weather-related) freeze losses to fruit, vegetable and citrus crops across Brevard County during January totaled 0.87 million dollars.

December of that year also brought record cold and freezing temperatures to Brevard for two consecutive periods. A hard freeze occurred December 14th with temperatures at or below 28 degrees for several hours. Wind chill factors were in the upper teens at most locations around daybreak. Minimum temperatures on Dec. 14 reached as low as 28 degrees in Melbourne and Melbourne Beach, 25 in Palm Bay and 20 in rural Scottsmeer. On December 15th, temperatures fell to 28 in Melbourne and 21 in Scottsmeer.

Minimum temperatures on December 27th reached as low as 31 degrees in Melbourne and 24 in rural Scottsmeer. On December 28th, temperatures fell to 27 in Melbourne and 20 in Scottsmeer. And on December 29th, the minimum temperature reached 28 in Melbourne, and 19 in Scottsmeer. A third night of similarly cold readings occurred on December 29th. A rough estimate of damage to fruit and vegetable crops across east-central Florida from the combined impacts of the December 14-15 and December 27-29 freezes totaled 19 million dollars.

The lowest recorded temperature in Brevard County during this planning period occurred in December of 2010 with 9 days below freezing, and 4 record lows ranging from 24 to 26 degrees. Because this freezing weather event affected all mainland areas in the county it is probable that similar areas in Brevard could experience similar temperatures and outcomes in the future.

Such a situation, although unlikely, could damage the electric power distribution system throughout the county, and the power outages could last weeks. Extended power outages, more than three days, during unusually cold weather would require sheltering and feeding of large numbers of people. Currently Brevard opens cold weather shelters when temperatures are 45°F or below. There may be fatalities among population groups unable to travel to or access shelters, principally the economically disadvantaged and the elderly. The probability of a severe winter storm in Brevard County is considered rare with a greater than 500 year occurrence. The last severe winter weather event with record lows, 24 degrees, was in December of 2010. There have been no instances of severe winter weather since 2010.

Extreme Heat | Natural Hazards

Extreme heat is defined as temperatures that are approximately 10 degrees or more above the average high temperature for a given region lasting a prolonged period of time, usually several weeks. Extreme heat occurs when a layer of high atmospheric pressure descends over a geographical area. High pressure causes the air normally located high in our atmosphere to descend, compress, and increase in temperature. This leads to hazy, humid and muggy air. High pressure systems can reside in an area for weeks as they are resistant to being moved by other weather systems. In addition, high pressure inhibits wind and clouds, which normally mitigates the effect of the sun.

The chart below indicates the heat index (combination of temperature and humidity - or what it feels like) and what is typical in our area during the summer months. The National Weather Service in Melbourne will issue a Heat Advisory if the heat index reaches 108F or higher (even for a short duration), or if high temperatures are expected to reach 98F or above for two consecutive days. They would issue an Excessive Heat Warning if temperatures are expected to reach a heat index values to 113F or greater (extremely rare).

NWS Melbourne Heat Index Chart

Dew Point (°F)	Temperature (°F)															
	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105
65	92	93	94	95	96	97	99	100	101	102	104	105	106	107	108	109
66	91	94	95	96	97	98	99	100	102	103	104	105	107	108	109	110
67	93	94	96	97	98	99	100	101	102	104	105	106	107	108	110	111
68	94	95	96	97	99	100	101	102	104	104	106	107	108	109	110	112
69	95	96	97	98	99	101	101	103	104	106	107	108	109	110	111	112
70	96	97	98	99	100	101	103	104	105	106	108	109	110	112		
71	96	98	99	100	101	103	103	105	106	107	108	110	111			
72	97	99	100	101	102	103	105	106	107	109	110	111	112			
73	98	100	101	102	104	105	106	107	109	109	111	112				
74	99	101	102	103	104	106	107	109	109	111	112					
75	100	102	103	105	106	107	108	109	111	112						
76	101	103	105	106	107	108	110	111	112							
77	103	105	106	107	109	110	111									
78	105	106	108	109	110	111										
79	106	108	109	110	112											
80	107	109	111	112												
81	109	111	112													

Normal Heat Index values for June and September

Normal Heat Index values for July and August

Heat Advisory—Heat Index values 108-112

Excessive Heat Warning—Heat Index values 113 and greater

Every year, most of Brevard County experiences periods in which the air temperature and humidity creates conditions that could potentially harm human health. A "heat island" is when an urban area experiences warmer temperatures than its surrounding rural areas. This is caused by large amounts of concrete absorbing heat from the sun during the day. The heat releases at night keeping temperatures high and allowing little time for cooling. This can lead to increased energy demands and stress at-risk populations, especially those without access to air conditioning. In most cases, extreme heat affects those who do not have the ability to stay inside during extreme heat events. Brevard County does not have a significant population of people that experience heat related injuries. Extreme Heat events can trigger brown outs or blackouts due to the increase in energy demand and stress on the system, which increases the vulnerability of the elderly, very young, and those who have medical conditions that cause heat sensitivity.

Another vulnerable population is the homeless. The total homeless counted during the *Point-In-Time Count (PITC)* on January 26, 2015 was 1,178 (down 25% from 2013) including 494 unsheltered (down 43% from 2013), 311 children (down 24% from 2013), 44 unaccompanied children (down 70% from 2013), 152 chronically homeless, and 127 veterans (down 52% from 2013). Even though the actual count may not be completely accurate for a number of reasons, the PITC provides the statistical basis for accurate percentages to show increase or decrease in those populations. These populations are further affected because they tend to congregate in city centers where libraries are in order to cool-off; however, those areas are susceptible to heat island effects. Libraries would be impacted by these extreme heat events, since they would serve as makeshift cooling stations for the homeless. Brevard County libraries include: the Cape Canaveral Public Library, Central Brevard Library, Cocoa Beach Library, Dr. Martin Luther King, Jr. Public Library and Eau Gallie Library in Melbourne, Melbourne Public Library, Franklin T. DeGroodt Memorial Library in Palm Bay, Melbourne Beach Public Library, Merritt Island Public Library, Mims/Scottsmeer Public Library, Palm Bay Public Library, Port St. John Public Library, Satellite Beach Public Library, South Mainland/Micco Public Library, Suntree/Viera Public Library, Titusville Public Library, and West Melbourne Public Library.

Although extreme heat conditions may not be as notable as other hazards, its consequences can still be devastating. Between 1992 and 2001, deaths from extreme heat in the United States numbered 2,190, compared to 880 deaths from floods and 150 from hurricanes. The average annual number of fatalities directly attributed to extreme heat in the United States is approximately 400. Extreme heat is typically seasonal in

nature with heat waves occurring in the summer months. However, heat waves are associated with high pressure systems and can occur in late spring and early fall as well. In Brevard County, extreme heat events can occur throughout County with exacerbated temperatures in cities like Titusville, Cocoa, Rockledge, Melbourne, and Palm Bay with large paved areas. They are most likely to occur in the summer months, and are considered likely to occur in the future; with a 1 in 25 years or less probability of occurrence. High pressure systems associated with heat waves can move into an area within a matter of days. These systems are resistant to being moved by other systems and can affect a region for days,

Brevard County Average Temperature Summary		
Month	Avg. Temp (F)	Maximum Avg.
January	57.8	66.1 (2013)
February	60.2	65.1 (2003)
March	65.1	73.2 (2012)
April	69.9	73.6 (2012)
May	75.3	78.3 (2010)
June	80.6	83.0 (2010)
July	81.9	83.3 (2010)
August	82.1	83.6 (2010)
September	80.1	84.4 (2009)
October	73.1	76.3 (2002)
November	65.2	68.7 (2003)
December	59.9	66.4 (2003)

The table above depicts average temperatures in Florida, by month, with maximum averages included.

weeks or months. In June of 1998, a deep high pressure ridge persisted across the Gulf of Mexico and Florida throughout most of the June and into early July. It resulted in several long stretches of record breaking high temperatures. Melbourne had 22 days where high temperature records were either tied or broken. Melbourne had four 100 degree or greater days. It was also very dry during this period. Melbourne received only 3% of its normal rainfall. No extreme heat events have been experienced since 1998.

Drought | Natural Hazards

A drought is a period of unusually persistent dry weather lasting long enough to cause serious problems such as crop damage and/or water supply shortages. The severity of the drought depends upon the degree of moisture deficiency, the duration and the size of the affected area. There are actually four different ways that drought can be defined: meteorological drought, agricultural drought, hydrological drought or socioeconomic drought. Meteorological drought is a measure of departure of precipitation from normal. Due to climatic differences, an area that might be considered in a drought in one part of the country may not be a drought in another. Agricultural drought refers to a situation where the amount of moisture in the soil no longer meets the needs of a particular crop. Hydrological drought occurs when surface and subsurface water supplies are below normal, and socioeconomic drought refers to the situation that occurs when physical water shortages begin to affect people. Brevard County Emergency Management regularly monitors information from the National Oceanographic and Atmospheric Administration, National Weather Service, St. Johns River Water Management District

and the Florida Forest Service Keetch-Byram Drought Index for decreases in water, river, and lake levels. There are distinct wet and dry seasons in Brevard. The dry season lasts from December through May, the wet from June through November. During the dry season, periods of drought often occur, and can lead to a persistent and high wildland fire threat. Brevard County and all of its municipalities would be affected by drought conditions. Structures are not vulnerable to the consequences of drought but to resulting fire; potential dollar loss for fire is addressed under wildfire.

The types of drought as stated above affect agriculture as well as people and livestock when water shortages begin and fire danger increases. Also of concern is the changing climate, there is the potential for an increasing risk of environmental impacts from drought and water shortages and future mitigation and adaptation strategies related to this hazard should be considered. Droughts in other areas that contribute to the Floridan Aquifer system can affect water sources in Brevard and other areas of Florida. County drinking and irrigation water comes from a variety of sources including the Floridan Aquifer. Sources by regions in Brevard follow.

North Brevard gets drinking water from the County's Mims Water Treatment Plant which extracts water from a series of surficial aquifer wells. Others in the Mims/Scottsmoor area have individual wells. Saltwater intrusion is of concern for those residents on individual wells near the Indian River Lagoon as rain diminishes and freshwater influx decreases.

Titusville also extracts their water supply from a series of wells in their "Area of Critical Concern". The City of Titusville and County apply land development restrictions that limit any use which would detrimentally affect the aquifer in this area.

The city of Cocoa provides water to central Brevard from Kings Highway in Port St. John down to Pineda Causeway (County Road 404) at Palm Shores then the city of Melbourne's water supply takes over. City of Cocoa has a 10-year Water Management Plan taking supply planning to the year 2020. The City of Cocoa extracts water from the Floridan Aquifer and Intermediate Aquifer and can produce over 60 million gallons a day. The water well system is located just over the Orange/Osceola County boundary line and provides water to the following municipalities, communities, jurisdictions, and major organizations:

- Canaveral Groves;
- Cape Canaveral;
- Cape Canaveral Air Force Station;
- Cocoa;
- Cocoa Beach;
- Kennedy Space Center;

-
- Melbourne (when needed);
 - Merritt Island;
 - Patrick Air Force Base;
 - Port Canaveral;
 - Port St. John;
 - Rockledge;
 - Sharpes;
 - Suntree;
 - Viera;
 - Unincorporated Areas; and
 - Wholesale water to the City Titusville.

In all, the City's system serves about 78,000 customers with a population of approximately 218,000.

The City of Melbourne supplies drinking water comes from Lake Washington which is part of the St. John River. It serves its population of about 77,000 and also customers in surrounding cities and population centers in South Brevard County. This distribution service area is approximately 100 square miles and includes the cities of Melbourne, Melbourne Beach, Indialantic, Indian Harbour Beach, Satellite Beach, Palm Shores, Melbourne Village and a portion of Brevard County. In addition, wholesale water service is provided to West Melbourne, with additional account holders and customers served.

Southern areas of Brevard like Barfoot Bay are served by wellfield run by Brevard County Utilities as well as some on individual wells.

The Southern Barrier island area of Aquarina is served by a system that gets water from a deep confined aquifer that is not subject to drought; however it is also a finite source.

23% of Brevard County is agricultural-usable for citrus, raising cattle or horses. Cattle ranches include the Deseret and Duda Ranches; citrus growers include Victory Groves, Crisafulli Groves, Harvey's Indian River Groves, and Wheeler Farm. Other large farms in Southern Brevard include Nail, Micco Tree, and Willowbrook Farms. These areas would be affected when drought occurs that affects surficial and Floridan aquifer water supplies.

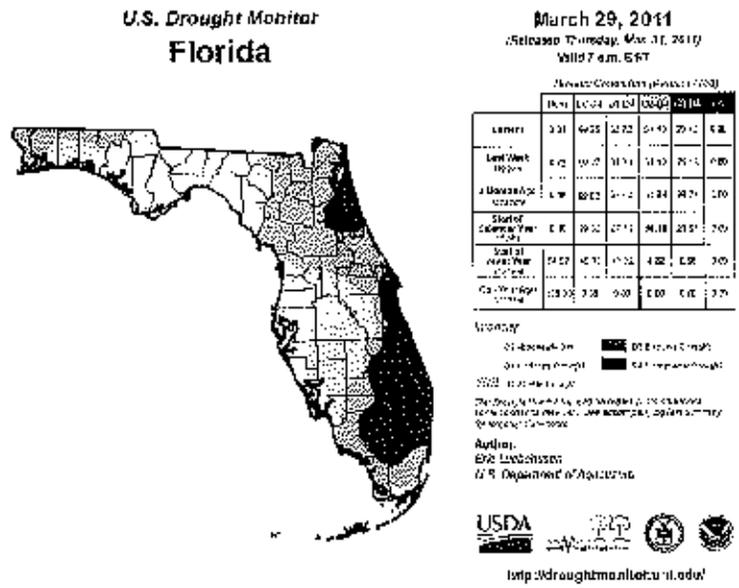
The statewide average rainfall deficits for Florida during 2006 and 2007 were the largest observed since the mid 1950's. According to the National Drought Monitor, as of January 1, 2008, approximately 20% of Florida experienced severe to extreme drought conditions. The drought was most pronounced in southwest Florida and the Kissimmee River watershed rather than on the eastern coastline. By January 2010, most of the state had returned to normal conditions, e.g., an absence of drought conditions, although the Brevard County area remains somewhat drier than the remainder of the state.

U.S. Drought Monitor Classification Scheme

Category	Description	Ranges					Objective Short and Long-term Drought Indicator Blends (Percentiles)
		Possible Impacts	Palmer Drought Index	CPC Soil Moisture Model (Percentiles)	USGS Weekly Streamflow (Percentiles)	Standardized Precipitation Index (SPI)	
D0	Abnormally Dry	Going into drought short-term: dryness slowing planting, growth of crops or pastures. Coming out of drought: some lingering water deficits; pastures or crops not fully recovered.	-1.0 to -1.9	21-30	21-30	-0.5 to -0.7	21-30
D1	Moderate Drought	Some damage to crops, pastures; streams, reservoirs, or wells low, some water shortages developing or imminent; voluntary water-use restrictions requested.	-2.0 to -2.9	11-20	11-20	-0.8 to -1.2	11-20
D2	Severe Drought	Drop of pasture losses likely; water shortages common; water restrictions imposed.	-3.0 to -3.9	6-10	6-10	-1.3 to -1.5	6-10
D3	Extreme Drought	Major crop/pasture losses; widespread water shortages or restrictions.	-4.0 to -4.9	3-5	3-5	-1.6 to -1.9	3-5
D4	Exceptional Drought	Exceptional and widespread crop/pasture losses; shortages of water in reservoirs, streams, and wells creating water emergencies.	-5.0 or less	0-2	0-2	-2.0 or less	0-2

Short-term drought indicator blends focus on 1-3 month precipitation. Long-term blends focus on 6-60 months. Additional indices used, mainly during the growing season, include the USDA/NASS Topsoil Moisture, Keetch-Pyram Drought Index (KBDI), and NOAA/NESDIS satellite Vegetation Health Indices. Indices used primarily during the snow season and in the West include snow water content, river basin precipitation, and the Surface Water Supply Index (SWSI). Other indicators include groundwater levels, reservoir storage, and pasture/range conditions.

Brevard County experienced a 50-year drought during the summer of 1981, and has continued to experience somewhat drier conditions over the last three decades. There have been 3 periods over the past 5 years where Brevard County has been in D1-Moderate Drought conditions or greater. These periods are: August 3, 2010 to September 13, 2011 (Brevard reached a D3-Extreme Drought from late October through March of 2011), January 24, 2012 to June 12, 2012 (Brevard reached a maximum of D1-Moderate Drought level), February 19, 2013 to April 16, 2013 (Brevard reached a maximum of D1-Moderate Drought level).



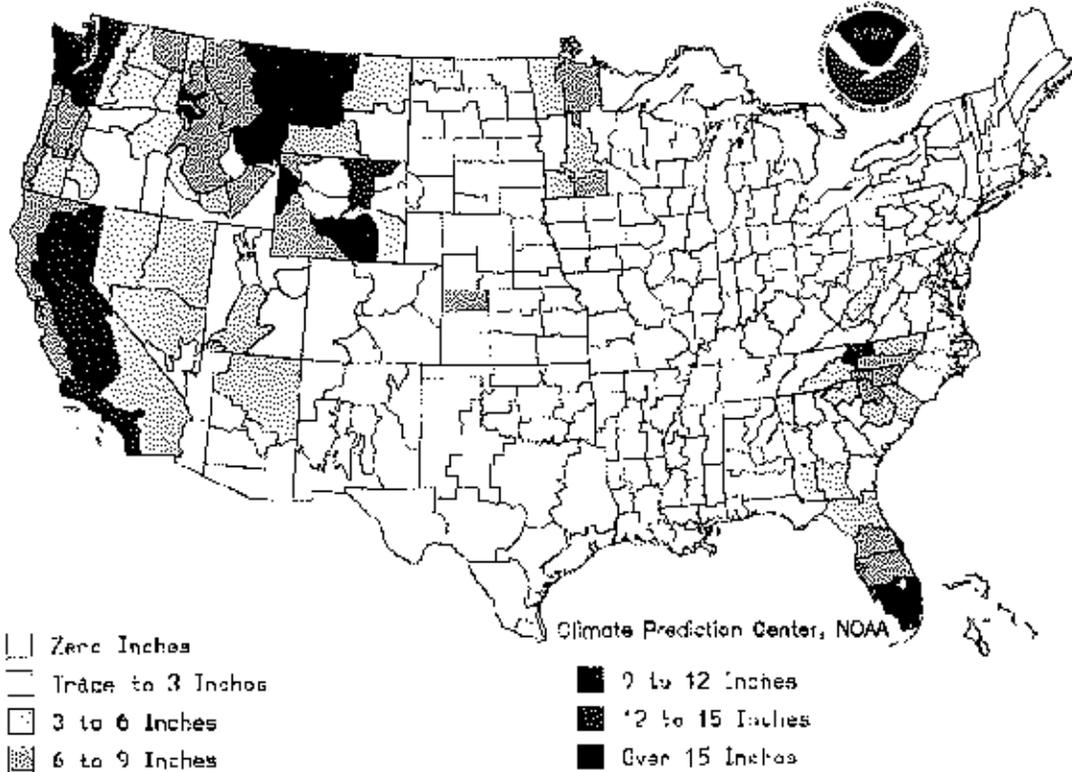
The map to the right shows most of Brevard in a D3 to D4 level drought at the end of March of 2011. There have been no further occurrences since the last mentioned above in February through April of 2013.

This type of meteorological drought has a detrimental effect on water systems relying upon surface water such as the Melbourne Municipal System (Lake Washington). When pre-identified lake levels are reached, there is a higher probability of contamination or poor water quality which 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.

It is considered that the entire county and all of its jurisdictions are at risk from drought, principally through water system failure. Additionally, drought would increase the risk of wildfire, which would be most severe in those locations noted above as having high levels of concern for wildfire. Drought, itself, does not specifically threaten any type of structure, however, heightened wildfire risk resulting from drought conditions could threaten all types of structures within areas of risk, as discussed above. The probability of future drought events in Brevard County is considered possible with at 25 year or less occurrence. Because drought has occurred regularly over the years it can be expected to occur at a D4 level drought again.

The worst case drought would have three major impacts on Brevard County and its jurisdictions. First, the probability of major wildfires would increase significantly, with major property destruction, injuries and fatalities, as well as environmental damage in the impacted areas. Second would be the economic damage to the County's agricultural sector, principally the citrus and cattle industries. Third, the drought would impact the available community water supplies in terms of quantity and quality, as well as the availability of water for agricultural and landscape irrigation. The availability of community water supplies could also affect the ability for urban firefighting. Overall, the impact of a worst case drought would be severe economic consequences due to increased costs to provide adequate potable water and damages to property and crops.

Additional Precip. Needed (in.) to Bring PDI to -0.5
Weekly Value for Period Ending JUL 4, 2015
Long Term Palmer Drought Severity Index (PDI)



Wildfire | Natural Hazards

A wildland fire or wildfire is any free burning uncontrollable wildland fire not prescribed for the area which consumes the natural fuels and spreads in response to its environment. The most at-risk locations are areas where development has occurred or is occurring at the edge of previously undeveloped vegetated areas, such as forests, grasslands, wetlands, etc. This characteristic is prevalent in the jurisdictions with lands in a corridor largely defined by I-95 on the west and US 1 on the east, with some smaller areas located in other parts of the county. This distribution of the locations most vulnerable to wildfire can be seen on the summary map, *Locations of Wildfire Levels of Concern and Fire Risk Areas*, which are attached to this section. The map depicts different degrees of vulnerability of development to wildfire that are calculated by combining indices for wildland fire susceptibility and general fire effects given terrain and other geographic features.

Brevard County is susceptible to wildfires throughout the year, particularly during the months with minimal rainfall amounts (December through April). Four jurisdictions with larger amounts of urban-wildland interface ranked wildfire among their three highest hazards. The major causes of brush and forest fires are due to lightning, human negligence, or cases of criminal mischief, and occurs during the months with higher thunderstorm activities. In recent years, homes and businesses have been threatened by encroaching wildfires. Late winter and spring also are prime periods for wildfires, fueled by strong winds and a lack of rainfall during that same time frame. Brevard County has a considerable amount of undeveloped area with prime fuel source for fires.

During the 1990s, the County was impacted by the disastrous wildfires brought on by drought that swept through the region. Most notable was the summer of 1998 during which over 500,000 acres burned statewide. A total of 150,000 acres burned in Brevard County and 32 homes and 5 businesses were lost (Brevard County Emergency Management, Farmington Fires June 2008).

More recently, the Mother's Day fires of 2008 accounted for \$34 million in damage in Palm Bay alone where 33 homes were destroyed and 236 damaged. In Malabar, two homes, each valued at \$250,000, were destroyed. In total, over 10,000 acres were destroyed during the event, however; it is likely that more damage was avoided due to prescribed burning in the Jordan Scrub Sanctuary and the Micco Scrub Sanctuary three months prior to the fires.

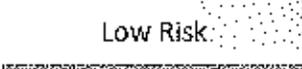
In spring 2011, the Iron Horse Fire burned nearly 17,500 acres across Brevard and Volusia counties and destroyed one mobile home and two hunting camps. Two firefighters were injured putting out the hot spots and heavy smoke forced the closure of Interstate 95 between State Road 442 and SR-46 for a period of time.

Recent fires of smaller scope include:

- Deluxe Fire in the Maytown Quad of North Brevard 11/16/10, 600 acres
- Wickham Farms Titusville on 3/25/11, 300 acres
- Brighthouse Fire SR50 east of the St. Johns River on 2/20/12, 1200 acres
- No Go /Fox Lake Fire near Titusville on 2/23/12, 700 acres
- Road Runner Fire at Port St. John Parkway and Grissom Rd. on 3/8/12, 78 acres
- Lakeside Fire at Babcock and Valkaria Rds., 11/13/13, 75 acres
- St. Johns Fire near Fox Lake Park on 4/28/14, 650 acres
- Terkam Fire near Palm Bay 5/22/15, 200 acres
- Freshwater Command near SR46 on 6/20/15, 450 acres
- Fathers Day Fire near Faun Lake off of SR 46 on 6/21/15, 140 acres
- Nail Farms Fire in southernmost Brevard on 6/24/15 burned 139 acres
- Lake Winder west of Cocoa 8/ 27/2015, 250 acres
- ML Camp fire near Grant-Valkaria on 7/1/201, 320 acres

The worst case for a wildfire event would involve multiple fires throughout the most threatened areas shown on the Wildfire Level of Concern map on the next page. There is an estimated 34,423,980 acres with significant risk for wildfire within Brevard County; therefore based on the worst wildfire to date of 150,000 acres, Brevard County could experience a wildfire of similar magnitude in the future. Below is a graph showing total acres in the associated wildfire risk zones

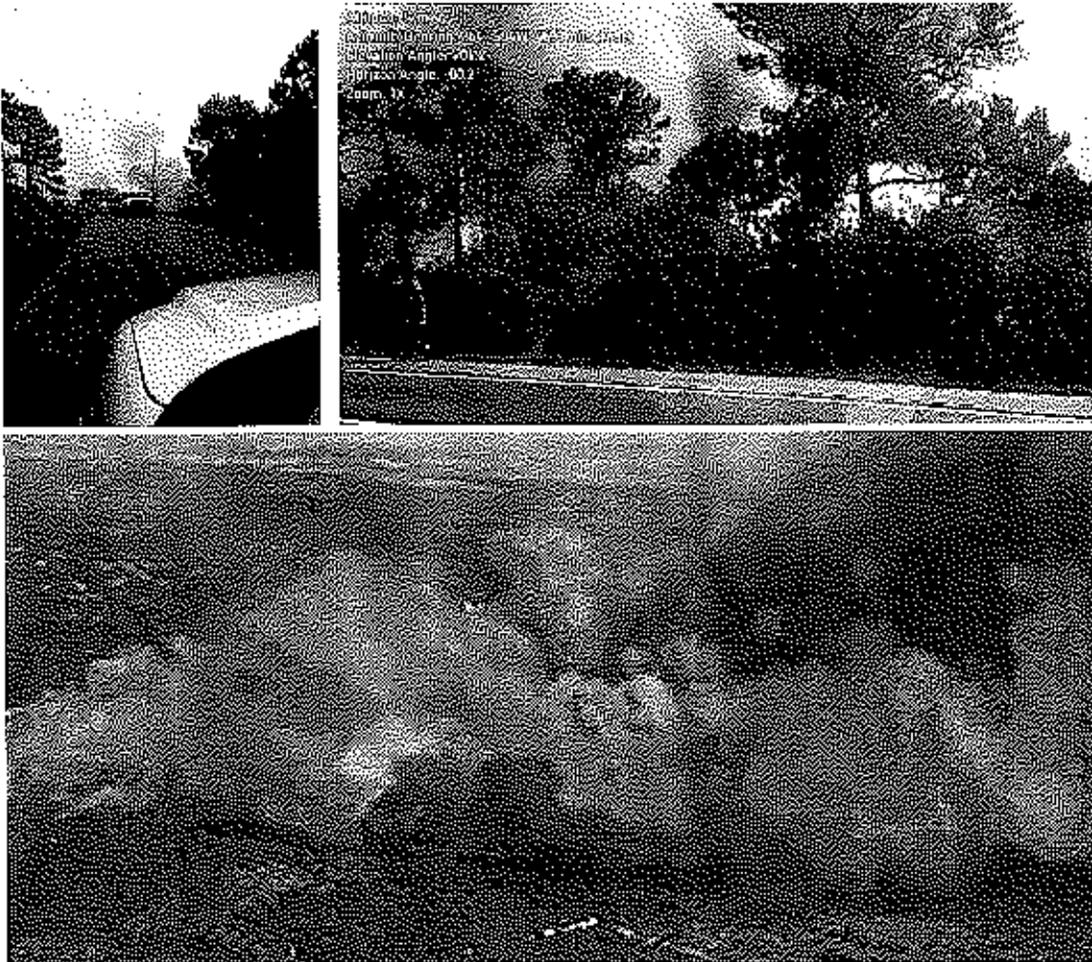
within the county. The high to very high risk areas are principally located north-south corridor between I-95 and US 1; which is extensively developed with commercial, residential and industrial areas. Most structures within, and adjacent to, this high risk area would be vulnerable to wildfire, unless specific structural and landscaping

<i>Wildfire Risk Level</i>	<i>Total Acreage</i>
 Very High Risk	1,672,519
 High Risk	5,302,620
 Low Risk	27,448,841
 No Risk	7,659,808

actions had been taken to mitigate that risk. The area has numerous residential, commercial and industrial structures, both singly and in developments such as mobile home parks that are adjacent to or within vegetated areas. Any of these could be overrun by a wildfire. Failure to successfully evacuate the I-95/US 1 corridor could result in numerous injuries and fatalities. Wide area public health impacts from smoke would

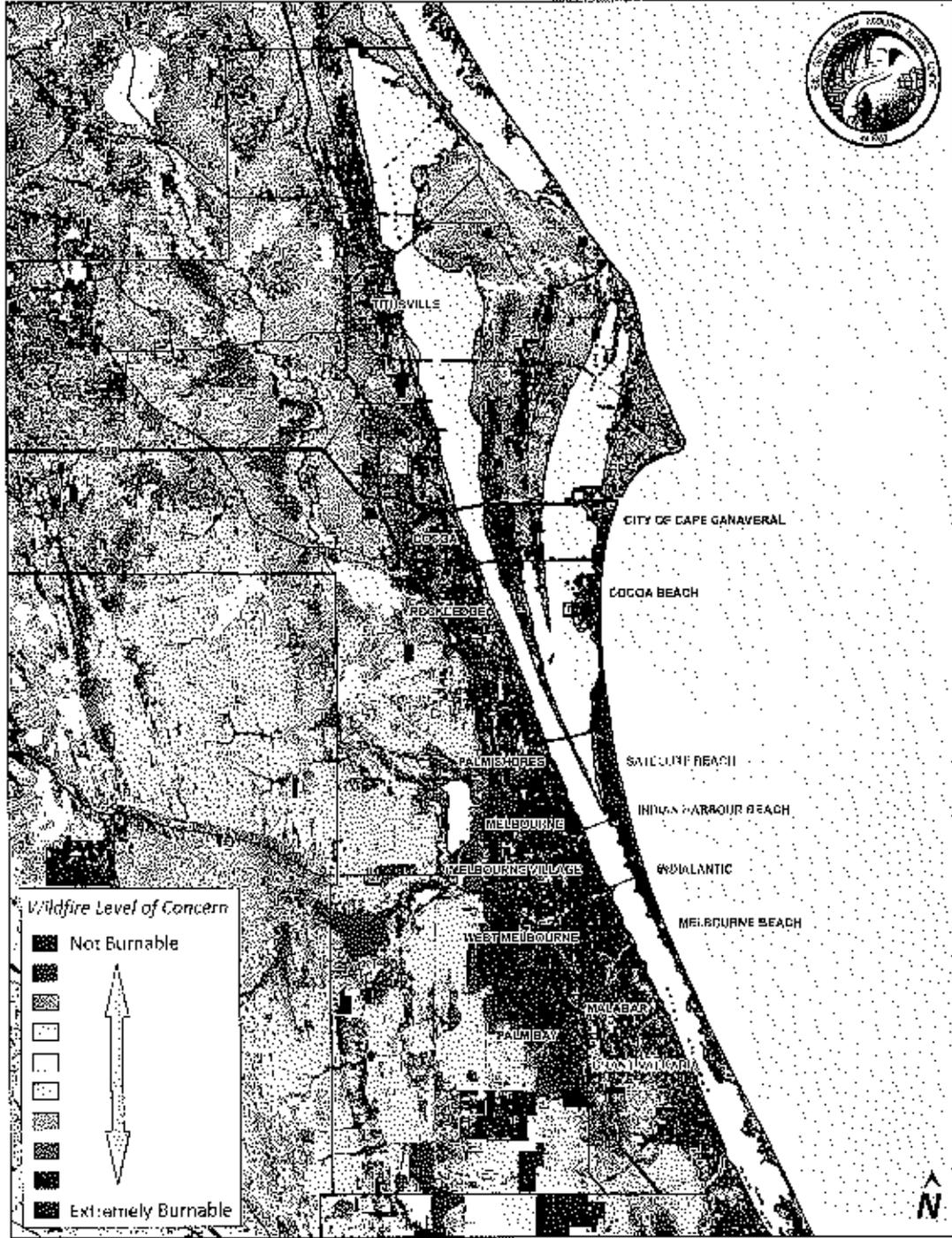
be a concern. Property damage would be extensive, with numerous residences and businesses destroyed. Numerous families would be displaced, and businesses would suffer enormous economic impacts, with many failing to reopen. Damages to overhead utilities would be significant with power loss throughout the area. As the north-south transportation corridors through the county may be affected by such an event, transportation impacts would domino throughout central Florida due to highway and rail closures.

Since wildfires have happened in Brevard in the past, the probability for future wildfires is likely, particularly during drought cycles and dry, windy conditions. It is estimated that frequency of occurrence is once every 25 years or less.



Jeram Fire, Palm Bay, 6/22/18 burned 200 acres. At the fire's height, officials were forced to close two of three southbound lanes of I-95 south of Grant Road and a large portion of Babcock Street in roughly the same area.

Wildfire Level of Concern



Data Source(s): HAZUS (2011), Brevard County (2013)

The following tables summarize the financial exposure, building detail and land use summary of all parcels within each of the fire risk zones in Brevard County as determined by Hazus-MH and the Florida Forest Service. The map on the following page depicts the hazard zones summarized in these tables.

Financial Exposure Summary | Fire Risk Zones

County Summary							
Hazard Zone	Parcels in Zone	Parcels Built	Land Value	Building Value	Assessed Value	Taxable Value	Prop. Value Per Acre
No Risk	309 0.15%	184 12.57%	\$50,934,819	\$28,915,893	\$104,413,953	\$56,619,790	\$46,544
Low Risk	157682 47.01%	94809 61.04%	\$8,717,515,789	\$4,911,084,100	\$23,537,405,459	\$12,527,265,509	\$64,753
High Risk	54489 12.33%	34778 57.54%	\$2,386,025,910	\$3,095,023,979	\$8,958,081,760	\$5,818,702,650	\$85,979
Very High Risk	98324 29.53%	78846 80.14%	\$7,555,507,070	\$5,511,427,140	\$7,488,141,803	\$6,787,118,680	\$177,949

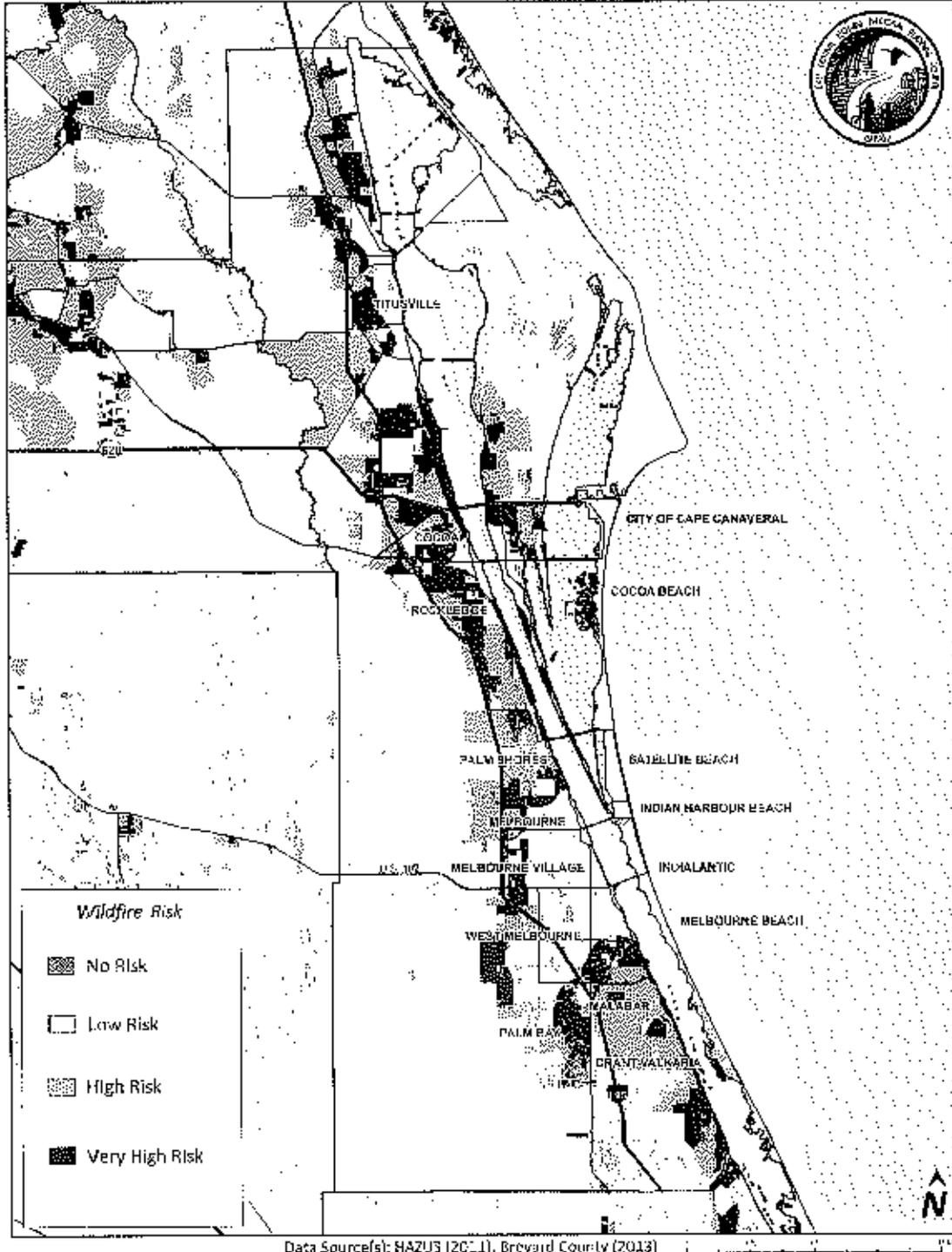
Parcel Detail Summary | Fire Risk Zones

County Summary							
Hazard Zone	Parcels in Zone	Parcels Built	Parcels Not Built	Built Pre-1994	Built 1994-2001	Built 2002-2009	Built 2010-Present
No Risk	309 0.19%	184 57.92%	375 67.02%	189 75.54%	51 16.35%	15 7.07%	1 0.30%
Low Risk	157682 47.00%	94809 59.19%	47728 30.31%	70600 74.37%	7617 3.09%	11307 16.15%	1267 1.31%
High Risk	54489 13.09%	34778 62.55%	29821 37.43%	12921 37.15%	11100 21.92%	10461 36.04%	296 0.35%
Very High Risk	98324 23.66%	78846 80.11%	19178 14.54%	58154 73.77%	10569 13.15%	10037 12.73%	263 0.23%

Future Land Use Summary | Fire Risk Zones

County Summary												
Hazard Zone	L.D. Res.	M.D. Res.	H.D. Res.	Commercial	Office	Mixed Use	Recreation	Institution	Conservation	Industrial	P.D.	Agriculture
No Risk	299 53.40%	3 0.54%	75 13.62%	12 2.25%	0 0.00%	7 1.25%	6 1.07%	3 0.54%	64 11.45%	2 0.35%	10 1.74%	37 6.82%
Low Risk	91466 57.11%	9779 7.14%	14976 10.93%	5758 4.20%	29 0.22%	3252 2.43%	576 4.27%	438 3.25%	918 6.66%	1583 1.16%	5709 4.14%	5705 4.20%
High Risk	40771 75.34%	2495 4.49%	3606 6.50%	1674 3.01%	33 0.60%	95 1.73%	114 0.21%	100 0.18%	1190 2.14%	416 0.75%	4748 8.57%	294 0.53%
Very High Risk	59372 79.77%	9710 5.80%	11543 11.73%	3729 3.92%	0 0.00%	897 0.93%	196 0.10%	150 0.15%	203 0.21%	478 0.49%	1757 1.77%	10 0.01%

Wildfire Risk Zones



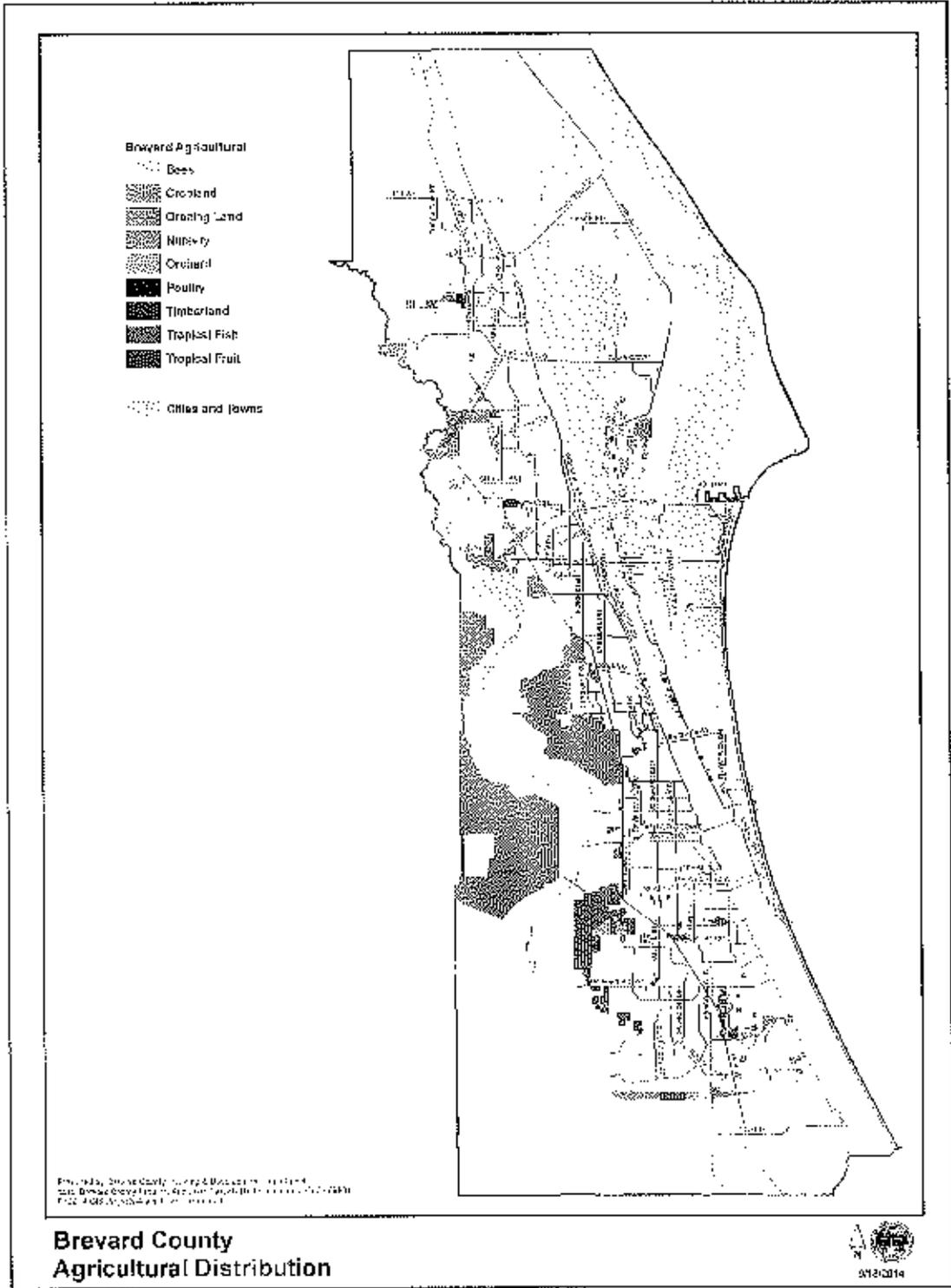
Agricultural Infestations and Diseases | *Natural Hazards*

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

Brevard County has 158,900 acres of land with an "Agricultural" land use designation. In 1997 and 1998, Florida's agricultural community was forced to focus time and resources communicating to the general public about the Mediterranean fruit fly (Medfly) and the control methods used to eradicate the pest when the fly threatened the state's \$6.8 million agriculture industry. The Florida Cooperative Extension is a partnership between the University of Florida Institute of Food and Agricultural Sciences (IFAS), the United States Department of Agriculture (USDA) and county governments in Florida to provide scientific knowledge and expertise to the public through educational programs. Brevard County has cattle farms, citrus orchards and other agricultural enterprises that are vulnerable to infestations and disease. Cattle diseases like Mad Cow, Hartwater, and hoof-and-mouth and Citrus disease like Greening and Canker are of concern to Brevard farmers. Coordination with the University of Florida IFAS Brevard County Extension is the first step in mitigation planning for agricultural infestations and disease. A notable source of information on the distribution of invasive plants, insects, animals and diseases in Brevard can be found at the Early Detection and Distribution Mapping system website, <http://www.eddmaps.org>, known as EDDMapS. The EDDMapS web-based mapping system documents invasive species and disease distribution. The site combines data from other databases and organizations as well as volunteer observations to create a national network of invasive species distribution data that is used by scientists, researchers, land managers, land owners, educators, conservationists, ecologists, farmers, foresters, state and national parks. To the left is a KMZ file showing the distribution of invasive Melaleuca tree from the EDDMapS website.



A map of the distribution of agricultural lands in Brevard follows on the next page.



Invasive Species | *Natural Hazards*

Florida's natural ecosystems are increasingly coming under attack by invading exotic species which displace native species, thereby degrading the diversity of floral and faunal resources. Florida has ecosystems not found in the other 47 contiguous states, and it also has more non-native species than any state other than Hawaii. Many of these species have become sufficiently abundant or otherwise destructive to be considered pests. Faculty members at the University of Florida currently are conducting research and outreach programs to better understand and control these exotic invasive species.

Plants

With its plant-friendly south temperate/subtropical climate, Florida particularly suffers from the introduction and unchecked growth of exotic plants. Almost half (1,180) of the 3,834 plant species found in Florida have arrived here since European occupation. Since plants are the base of the food chain, exotic "takeovers" can jeopardize plant-dependent wildlife and the whole ecosystem. The Florida Exotic Pest Plant Council (FLEPPC) has identified 152 non-native invasive species that are invading and disrupting native plant communities (2011 list). EDDMapS notes 176 separate invasive plant species found in Brevard County to date. Example pest plants include hydrilla, old world climbing fern, melaleuca and Brazilian Pepper. Many of the listed species are distributed throughout the county and are found in natural and disturbed landscapes.

Wildlife

In Florida, at least 60 species of exotic birds have bred in the wild. Despite this fact, the chance of persisting survival of non-indigenous birds is uncertain. Among those species which have survived and thrived as pests are Muscovy ducks, rock doves, European starlings, house sparrows, and monk parakeets.

Though troublesome in other respects, some species (such as feral pigs) are important as prey for native predators (Florida panthers) and serve as an attraction for hunters. However, negative impacts from invasive species include habitat destruction, competition with native species, predation, hybridization, disease and parasites. Florida mammal pests include the Norway rat, roof rat, house mouse and feral pig. Siting of invasive fish in Brevard include lionfish, and Nile tilapia.

Insects

Annually, insect pests cause an estimated \$1 billion in damages in Florida, and many of the worst pests are non-indigenous. According to entomologist Dr. John Capinera, 12-

18 invading species become established in Florida annually. These non-natives arrive by flying, walking, swimming, rafting and by stowing away on cargo (often on infested plants commercially imported).

On top of having profound ecological impacts, invasive species cost Floridians over \$500 million each year; these costs include monitoring, testing, management, eradication, and restoration efforts.

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

Seismic Hazards | *Natural Hazards*

Nowhere in Brevard County is there a more than .02g Seismic Zone, rendering the county a reasonably safe area from this hazard. Therefore, earthquake hazards have not been a significant consideration for the mitigation planning process by Brevard Prepares or any of the participating jurisdictions.

Sinkholes and Subsidence | *Natural Hazards*

This hazard does not affect Brevard County to any great extent. Mapping indicates little risk for Brevard County. Risk of sinkhole activity for the entire county is low. Therefore, subsidence hazards have not been a significant consideration for the mitigation planning process by Brevard Prepares or any of the participating jurisdictions.

Space Weather and Geomagnetic Storms | *Natural Hazards*

The sun is the main source of space weather. Sudden bursts of plasma and magnetic field structures from the sun's atmosphere called coronal mass ejections (CME) together with sudden bursts of radiation, or solar flares, all cause space weather effects on Earth.

Space weather hazards include malfunction or even permanent damage of power distribution grids and of telecommunication, navigation and surveillance satellites, disturbances of over-the-horizon (OTH) radar, HF, VHF and UHF communications, surveying and navigation systems that use Global Positioning System (GPS) satellites, surveillance (optical and radar) and satellite tracking. This hazard has an unknown but rare occurrence level.

For more information on space weather, visit the Florida Division of Emergency Management's web site: <http://www.floridadisaster.org/EMTOOLS/spacewx/index.htm>

Tsunami | *Natural Hazards*

Tsunamis, the potentially devastating waves that can follow seismic events are threats to any coastal region. Florida has 1,197 miles of coastline, more than any of the lower 48 States.

Causes in this area include a seismic shift in the Puerto Rico Trench part of the tectonic plates between the Caribbean, North America, and South America. Tsunamis that would affect this area could also be caused by undersea landslides creating an Atlantic ocean-wide tsunami (a.k.a. Tele-tsunami). A Tele-tsunami could also originate from the Azores-Gibraltar Fracture Zone.

Deep ocean Assessment and Reporting of Tsunamis (DART) buoys confirm tsunami propagation. A network of seven DART buoys is in operation within western Atlantic, Caribbean, and Gulf of Mexico. NOAA's Tsunami Warning Centers continuously monitor seismic activity for potential tsunami generation. Tsunami warnings are issued if a magnitude 7 or greater earthquake is detected on or near the coast.

Although tsunamis are an unpredictable, with an unknown and rare occurrence, due to the location of Brevard County, it is vulnerable to tsunami activity; therefore, Brevard County must be prepared for the potential threat.

Brevard County has 72 miles of susceptible shoreline and is a host to many seasonal tourists and could have an estimated 40,000 people affected by tsunami activity. According to the National Weather Service (NWS), an estimated 12,000 residents live within the Tsunami Hazard Zone.

The maximum tsunami we could see in Brevard is 1.5 meters. The danger zone in Brevard County extends 300 feet inland. Should a tsunami affect this area, residents and tourists would evacuate the beach to beyond the 300-foot danger zone (inland of coastal roadways) or west of Highway A1A and, if evacuation of danger zone is not possible, move to the second floor (at least 15 feet high) of a well-constructed building. In 2011, the City of Indian Harbor Beach became the first "Tsunami Ready" community on the eastern seaboard.



Jurisdictions within the tsunami danger zone include: Cape Canaveral, Cocoa Beach, Satellite Beach, Melbourne Beach, Indian Harbour Beach, Indianalantic, and Unincorporated Brevard. There are approximately 24,741 businesses and residences east of Highway A1A in those jurisdictions. Based on tourism numbers a conservative average of daily beach goers is over 10 thousand. Those beachgoers are typically concentrated at crossovers and well known parks, such as Jetty Park in Cape Canaveral, the Cocoa Beach Pier and Lori Wilson Park in Cocoa Beach, and other parks along the coast.

Because of the rarity of this type of event, the occurrence is greater than 500 years. While tsunamis are a known hazard risk in Brevard, no tsunami has ever occurred in the County.



Dam/Levee Failure | *Natural Hazards*

A dam failure is defined as an uncontrolled release of a reservoir. The causes of dam failures can be divided into three groups: dam overtopping, excessive seepage and structural failure of a component. Despite efforts to provide sufficient structural integrity and to perform inspection and maintenance, problems can develop that can lead to failure.

Brevard County has no dams, but there is a weir on Lake Washington in Melbourne. A weir is a barrier across a body of water designed to alter its flow characteristics. The Lake Washington weir is critical to maintaining water levels in the lake, which is one of the area's drinking water supplies. The St. John's River Water Management District (SJRWMD) is responsible for maintaining the weir and in 2007, permanent repairs were made to improve the flow and create a new boat channel. It is anticipated that in any future events, the SJRWMD would coordinate with the Florida Department of Environmental Protection for any emergency repairs.

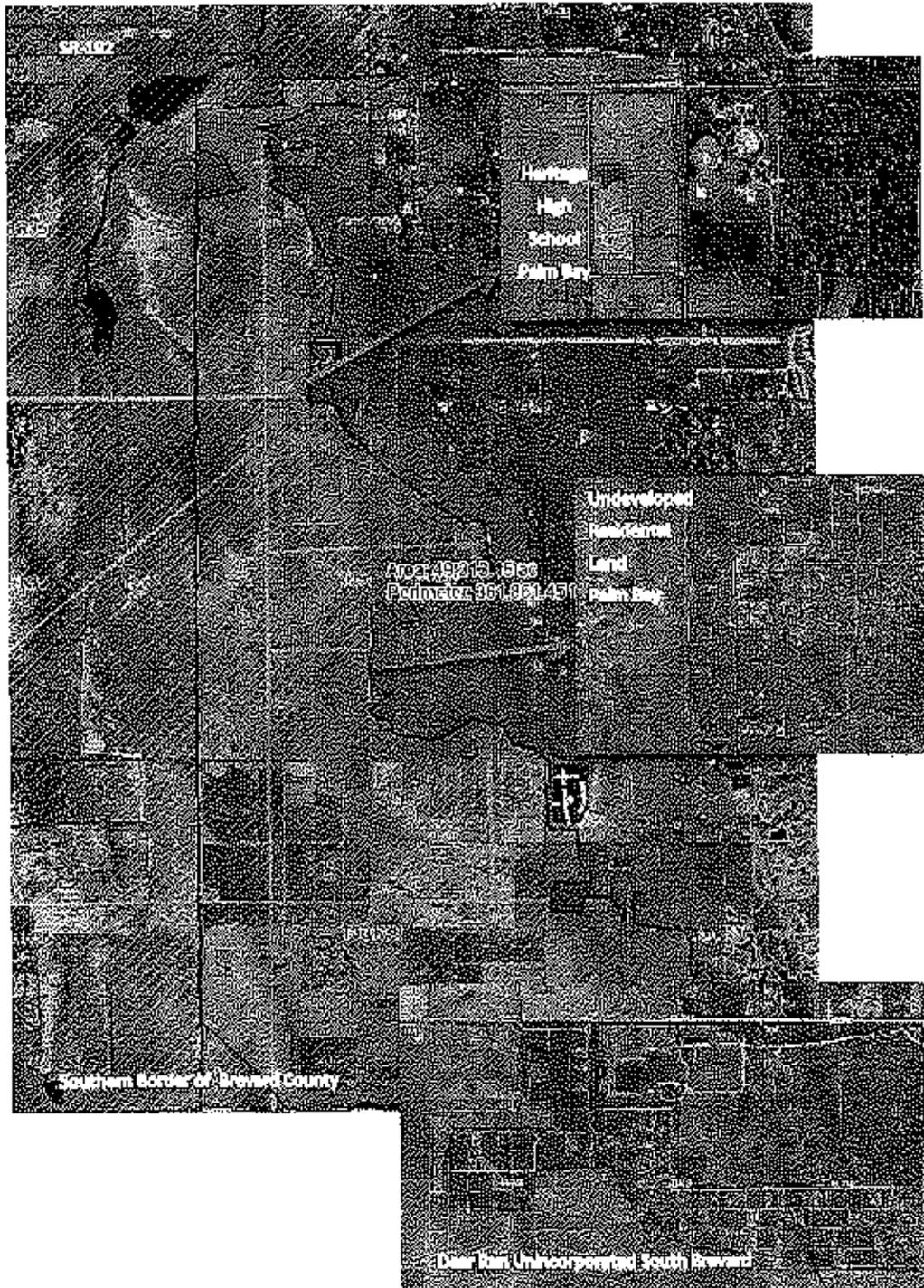
Since 1977, the SJWMD has actively maintained a federal levee system in the Upper St. Johns River Basin in Brevard and Indian River counties. There are approximately 127 miles of levees in the upper basin, of which 92 miles are federal flood protection levees and 35 miles are District levees. Approximately 30 miles of these levees lie within the jurisdictional boundaries of Brevard County.

The primary purpose of the original Upper St. Johns River Basin Project, when it was authorized by the federal government in the 1950s, was to protect agricultural land. The U.S. Army Corps of Engineers initiated construction of the project in 1966. The operation and maintenance responsibility of much of the federal levee system in the basin was turned over to the District in the late 1970s after the original federal water control project was abandoned.

Today, levees on the east side of the project area protect agricultural lands, a high school and some undeveloped residential parcels in the western Palm Bay; and a subdivision in southern unincorporated Brevard from riverine flooding.

Levees on the west-side of the river are designed to detain water from immediately entering the river. Western-most homes in the northern Palm Bay including the High School and southern Brevard Subdivision, due to their construction date, required finished floor elevations above the 100-year flood. While those structures may see water in yards or have affected septic systems, they would not see water in the

structure or have impeded roadway access as the result of a levee failure. The map below shows those areas.

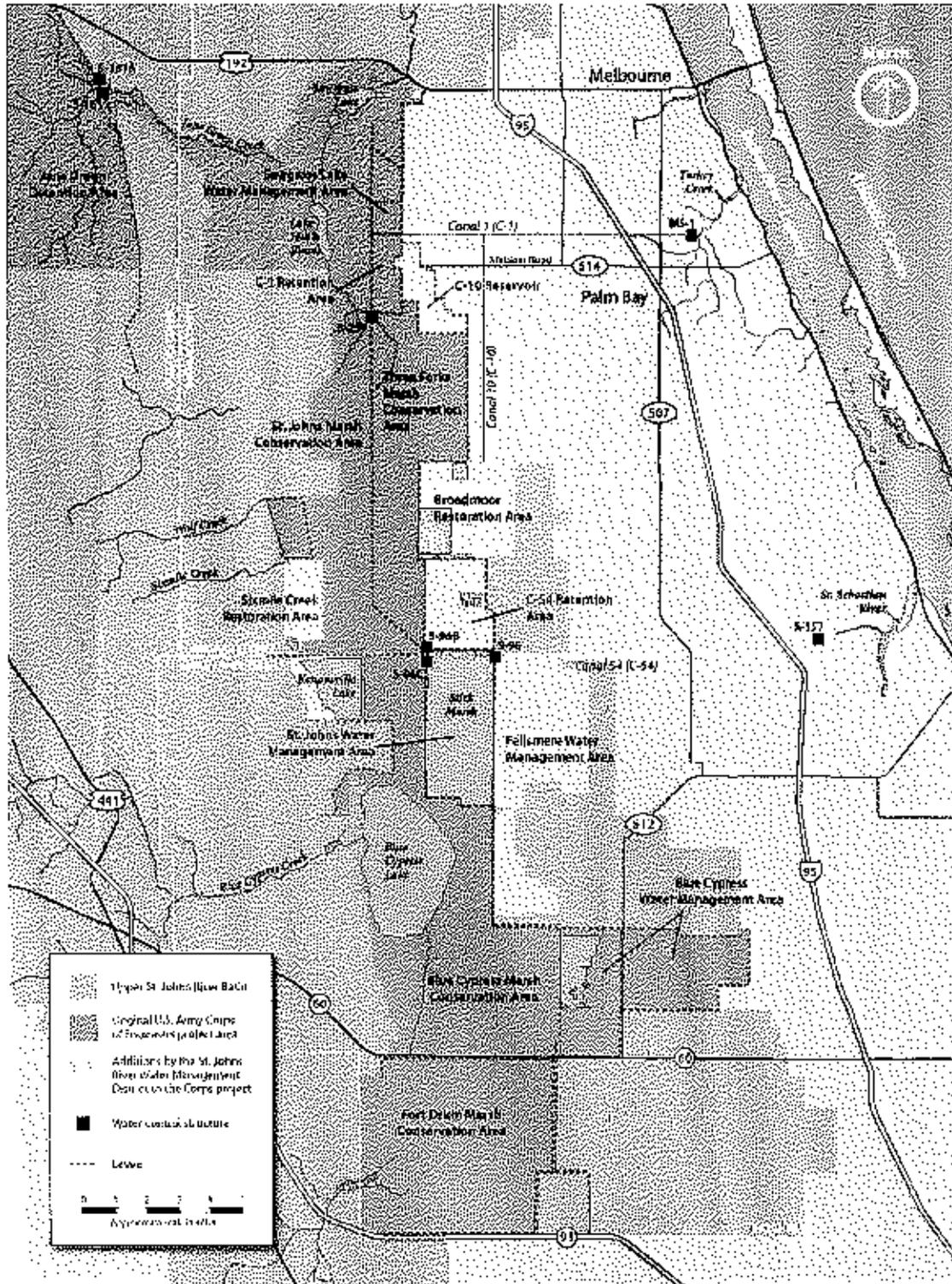


There is no specific data that would indicate depth of flooding for a levee breach in Brevard. However, after discussions with SJRWMD engineers and the county engineer; using SJRWMD technical publication SJ85-3, by Dr. Donthamsetti V. Rao, P. E., and the DFIRM panels and topographic maps for the area, an estimate was determined. The 100-year flood elevation in the area of the levees ranges from 20.5 to 24.6 feet NGVD. The 100-year floodplain in this area did not take the levees into account so we could expect that those 100-year floodplain areas east of the levees would be affected by a levee breach. The land area east of the levees and within the 100-year floodplain is over 49,000 acres and topography ranges from 10 to 20 ft. NGVD. Most of the acreage is too wet for development and is restricted to development by floodplain regulations as much is well below the 10-year flood elevation of 18.9 to 24.2 NGVD. If there was a catastrophic levee failure which breached down to 10 feet NGVD, and it was left unchecked for prolonged period of time, there could be a range of 0.5 to 14.6 feet of water above ground surface east of the levees. Currently the levees are about 3-feet higher than the 100-year flood elevation.

The SJRWMD conducts annual co-inspections of the federal structures and levees, accompanied by the Corps, and produce a status report. Although minor maintenance items exist and must be addressed, all federal and District water control structures are in good working order.

Since construction began in 1988 on the current Upper St. Johns River Basin Project, major storm events have occurred in four separate years: Tropical Storm Gordon in 1994, four hurricanes in 2004, Tropical Storm Fay in 2008 and an October 8, 2011 unnamed storm. These separate and very different events all served to test the project's flood management efficacy. Historical performance of the project has repeatedly proven that the levees and structures perform at or above expectations during storms and rain events.

The SJRWMD is committed to continuing its work with the Corps to ensure maintenance efforts are appropriate and protective of the levee systems. The probability of future weir or levee failures in Brevard County is greater than 500 years. No failure has occurred to the levee system in Brevard County.



1.8.9 Technological Hazards

Technological hazards include those that are caused by man-made technological advancements, although some can be a result of natural hazards in specific circumstances.

Hazardous Materials | *Technological Hazards*

Hazardous materials are materials that if released, can pose a threat to human health or the environment. Hazardous material releases can cause acute or chronic health effects, damage to property, expensive cleanup/contractor costs, serious injury and even death. Hazardous materials are stored and transported throughout the East Central Florida area in various quantities. The storage of hazardous materials ranges from residential storage of household products to bulk storage of large volumes for industrial purposes. Hazardous materials are transported by various methods such as railcars, barges and trucks. For purposes of this study, only those locations where the bulk storage of hazardous materials is present will be addressed because the amount of bulk storage material affects its potential risk.

The release of a hazardous material during handling would most likely be the initial responsibility of the facility or carrier. If the release could not be contained by the facility or carrier, then resources would need to be mobilized to remediate the release. Immediate action must be taken to respond to the release to preserve health and safety and reduce the impact to the neighboring community and the environment. Hazardous material releases in highly populated areas could result in evacuation or "shelter-in-place" situations.

Brevard County has many facilities and operations, both public and private, where significant quantities of hazardous materials are present. The space industry poses a unique challenge to Brevard County. The county also has several major roadways, railroad routes and marine port facilities that support transportation of large quantities of hazardous materials. As sources of hazardous materials releases, fixed-facilities and transportation routes are often in close proximity to populated areas, significant property development and very valuable environmental resources important to the human and economic well-being of the county. Due to the continuous presence of hazardous materials being transported or stored in and around Brevard County, hazardous materials events of varying magnitudes are considered highly likely future events.

The worst case scenario would involve the release of a highly toxic hazardous material near a highly populated area. Local hazmat specialty teams would likely be taxed and

require additional outside support. Acute medical care facilities would be overwhelmed. Mass decontamination would be required; contamination of first responders, response vehicles, and medical treatment centers would exponentially complicate response actions. The hazardous material could potentially leach into the soil and affect the water supply. It could potentially take months or years to fully clean up a hazardous material release or spill. In the event of a worst-case scenario, responders from Orange, Volusia and Martin Counties would be available for assistance if need be.

Brevard County has a Hazardous Materials Response Plan Annex as part of its Comprehensive Emergency Management Plan; documentation is available upon request.

The following tables summarize the financial exposure, building detail and land use summary of all parcels within specific distances of hazardous material facilities in Brevard County. It is important to note that the one-mile radius is only a crucial radius for HazMat facilities that store gaseous substances. Baseline 'highest hazard' areas are generally within a half-to-quarter of a mile radius from these facilities.

Financial Exposure Summary | Hazardous Material Facility Proximity

County Summary							
Hazard Zone	Parcels in Zone	Parcels Built	Land Value	Building Value	Assessed Value	Taxable Value	Prop. Value Per Acre
Within 0.25 MI.	10379 3.56%	8559 92.36%	\$580,845,350	\$987,554,370	\$2,788,567,870	\$1,490,575,700	\$189,299
Within 0.5 MI.	17347 11.11%	26648 32.82%	\$1,597,959,970	\$2,706,681,380	\$7,816,401,190	\$3,795,469,050	\$212,814
Within 1 Mile	37842 50.16%	72847 32.00%	\$8,917,865,920	\$3,338,885,510	\$17,821,391,790	\$8,904,102,940	\$244,825
Outside 1 Mile	203872 69.84%	135752 66.75%	\$7,609,609,670	\$19,512,062,560	\$27,705,777,220	\$15,781,834,990	\$56,784

Parcel Detail Summary | Hazardous Material Facility Proximity

County Summary							
Hazard Zone	Parcels in Zone	Parcels Built	Parcels Not Built	Built Pre-1994	Built 1994-2001	Built 2002-2009	Built 2010 Present
Within 0.25 MI.	10379 3.56%	8559 82.47%	1820 17.54%	3054 35.56%	1707 19.94%	1190 13.92%	108 1.26%
Within 0.5 MI.	17347 11.11%	26648 52.85%	5699 17.62%	17586 65.49%	4104 15.36%	4376 16.42%	732 2.82%
Within 1 Mile	37842 50.16%	72847 52.11%	14995 11.07%	30588 61.15%	9565 13.27%	11710 16.20%	859 1.19%
Outside 1 Mile	203872 69.84%	135752 66.75%	57620 28.25%	95774 67.24%	10452 14.34%	24088 27.74%	338 0.69%

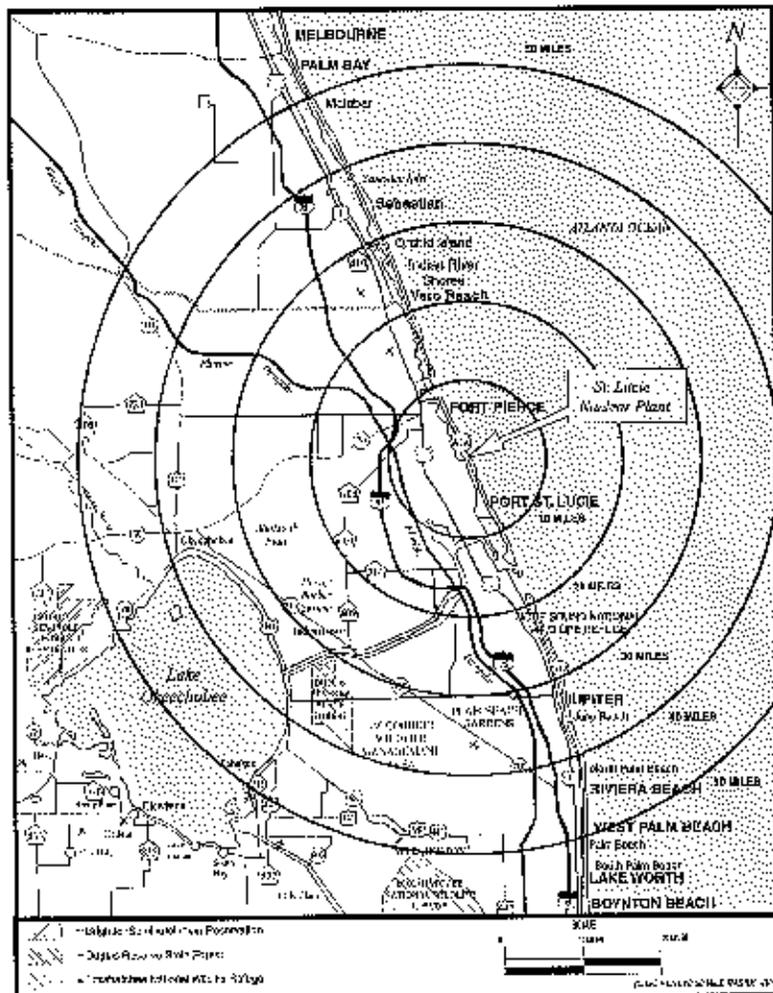
Future Land Use Summary | Hazardous Material Facility Proximity

County Summary											
Hazard Zone	I.D. Res.	M.D. Res.	H.D. Res.	Commercial	Office	Mixed Use	Recreation	Institution/Conservation	Industrial	P.O.	Agriculture
Within 0.25 MI.	6131 59.26%	1024 9.87%	781 7.53%	356 3.37%	4 0.04%	435 4.19%	73 0.7%	55 0.52%	62 0.6%	457 4.41%	691 6.65%
Within 0.5 MI.	17741 74.65%	4774 24.70%	3016 13.22%	2904 12.28%	7 0.03%	1803 7.64%	97 0.4%	124 0.5%	228 0.95%	1038 3.21%	1888 5.85%
Within 1 Mile	50019 56.57%	18655 21.57%	9405 10.70%	4480 5.17%	17 0.02%	2909 3.29%	216 0.25%	340 0.39%	621 0.71%	1650 1.91%	4324 4.95%
Outside 1 Mile	152369 74.93%	8811 4.19%	20789 10.02%	7016 3.48%	58 0.03%	1343 0.68%	406 0.2%	350 0.2%	1704 0.81%	429 0.2%	5855 2.85%

Radiological Incident | Technological Hazards

A radiological incident is the uncontrolled release of radioactive material that can harm people or damage the environment. The United States has had only one major commercial nuclear power plant incident. In 1979, the Three Mile Island facility near Harrisburg, Pennsylvania had a partial meltdown that prompted stringent regulations and response guidelines. Other incidents have occurred, but these have been infrequent and have caused few off-site consequences.

Brevard County is located outside of the Plume Exposure Pathway (10 mile radius) of the Florida Power and Light Nuclear Power Generating Station in St. Lucie County, in which shelter in place or evacuation would be the immediate protective actions. The southern end of the county is located in the Ingestion Pathway Zone (50 mile radius), including portions of Palm Bay, Malabar, Grant-Valkaria, and unincorporated Brevard County; impacts to this area following a Plant accident may be ingestion related. Embargos may be placed on foodstuffs grown or raised within the area, if contaminated with radiation. In addition to providing assistance within operations in the 50-mile ingestion pathway, Brevard also hosts evacuees from the 10-mile Plume Exposure Pathway.



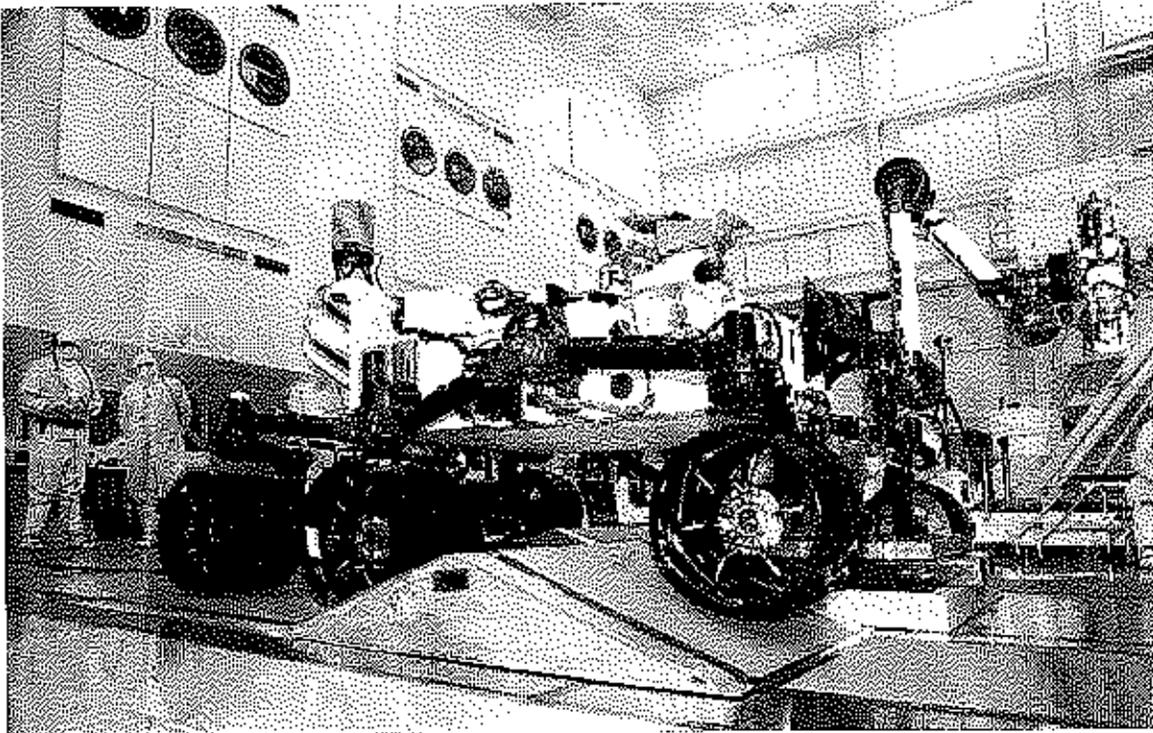
Another radiological concern for Brevard County would be an on-pad or low-altitude launch situation during a space launch or landing involving a Major Radiological Source

(MRS). The principal risk to the population would be from inhalation or ingestion of radiation contaminants.

Of primary concern for each either radiological hazard mentioned is that of perceived threat to life from a catastrophic event. Prevention and control of large crowds will reduce the number and severity of additional incidents that divert or overwhelm local emergency response agencies.

The overall probability of a radiological incident in Brevard County remains very low. The County has a Radiological Contingency Plan and Radiological Launch Plan; documentation is available upon request.

Mars Science Lab – Curiosity Rover



Railroad Transportation Incident | Technological Hazards

Brevard County includes heavily used roadways and railroads with a total of 146 railroad crossings. At this time there are no current rail stops in the county. A rail incident presents a potential scene where wreckage, victims and survivors may be strewn over a wide area. It can be further complicated by hazardous cargo. An incident can occur in a populated area or in an inaccessible area. In the likelihood that a passenger rail line travels through Brevard County, a rail incident response plan allows proactive planning and preparation for that eventuality.

The following table shows high traffic railroad crossings in Brevard County that are along the Florida East Coast Railway line. The table sorts the crossings by Annual Average Daily Traffic (AADT) and Truck Annual Average Daily Traffic as a method of identifying crossings with the highest risk parameters.

High Traffic Railroad Crossings and Average Daily Traffic in Brevard County

Road Name	Local Street Name	Jurisdiction	AADT	Truck AADT	% Truck Volume	Speed Limit
S.R. 50	Cheney Highway	Titusville	12100	1258	10.4%	35
S.R. 405	NASA Causeway	Titusville	13600	435	3.2%	55
S.R. 528	Beachline Expressway	Cocoa	35000	2730	7.8%	60
See Local Name	Michigan Avenue	Cocoa	12300	369	3.0%	45
S.R. 570	King Street	Cocoa	31000	2046	6.6%	35
See Local Name	Barion Boulevard	Rockledge	12500	503	4.0%	35
C.R. 507	Hames Boulevard	Rockledge	13200	616	4.6%	45
S.R. 404	Pineda Causeway	Palm Shores	40000	2000	5.0%	45
See Local Name	Post Road	Melbourne	12100	545	4.5%	35
See Local Name	Lake Washington Road	Melbourne	13400	603	4.5%	NA
C.R. 511	Aurora Road	Melbourne	11200	504	4.5%	40
S.R. 518	Eau Claire Boulevard	Melbourne	18400	1285	6.9%	35
See Local Name	Sarno Road	Melbourne	14600	1077	7.3%	35
See Local Name	Dabcock Street	Melbourne	7000	756	10.8%	35
S.R. 506	NASA Boulevard	Melbourne	17900	591	3.3%	35
See Local Name	Hibiscus Boulevard	Melbourne	13100	590	4.5%	35
See Local Name	Lincoln Avenue	Melbourne	15700	1978	12.6%	30
See Local Name	S. East Palm Bay Road	Palm Bay	26000	884	3.4%	35
S.R. 514	Mulabar Road	Mulabar	11800	791	6.7%	30

Source: FDOT. Roads are listed north to south.

Although it is difficult to determine the probability of a significant railroad accident, the table above summarizes locations where such accidents could potentially pose a greater risk. The County recently updated its plan for a railroad incident, and information concerning this type of hazard can be provided upon request.

Bulk Fuel Incident | *Technological Hazards*

Like hazardous chemical incidents, bulk fuel incidents generally occur without warning, are a life-threatening situation for residents and require a quick and thorough response from fire, HazMat and emergency response crews immediately following an incident. In the event of a bulk fuel spill or containment scenario, a quick response is critical due to the risk posed to human life and the risk of chemical exposure to secondary sources, such as water sources or sewage systems. In Brevard County, a majority of the risk from bulk fuels comes from Port Canaveral, where quantities of bulk fuels are moved. A number of companies run operations in Brevard County, including Glover Oil Company, Transmontaigne, Florida City Gas, Florida Gas and Seaport Canaveral Corporation.

Oil Spills | *Technological Hazards*

Oil spills may occur for a variety of reasons, including oil tanker leak, pipeline failure, and compromised oil rigs. As learned from the Deepwater Horizon incident in April 2010, oil spills can have massive impacts on the environment, public health and the local economy.

Although there are currently no offshore oil rigs that would likely impact Brevard County from the Caribbean Sea or the Atlantic Ocean, efforts to drill for oil offshore are ongoing in both Cuba and the Bahamas and should be monitored. Recent legislative changes in Florida supporting oil exploration illustrates that there are no guarantees that spills will not happen near our beaches. In the event of another incident in the Gulf of Mexico, the concern would be for oil to travel via the Gulf Stream to the eastern coast of Florida.

There have been several minor oil spills at Port Canaveral: in 2010, 420 gallons of oil spilled in the water during a transfer from ship to barge. These oil spills tend to be cleaned up quickly and may have a small impact on port traffic or operations. The businesses located in and near Port Canaveral could potentially be minimally impacted during the mitigation process. The probability of future oil spills of varying degrees occurring in Brevard County is considered likely. In a typical year the county will experience near 100 spills – most of them small.

Communications Failure | *Technological Hazards*

Communication failure is defined as the severe interruption or loss of private and or public communications systems, including but not limited to transmission lines, broadcast, relay, switching and repeater stations as well as communications satellites, electrical generation capabilities, and associated hardware and software applications necessary to operate communications equipment. These disruptions may result from

equipment failure, human acts (deliberate or accidental), or the results of natural or human made disasters.

A communications failure would affect essential facilities and the day to day operations of local government as well as the business community. Sites of concern would range from dispatch agencies, satellite uplink and downlink sites, internet service provider sites, and the telecommunication industry switching sites. Interruptions in day to day communications would create problems for businesses, public agencies, citizens and emergency services. The probability of communications failure in Brevard County is considered to be infrequent, with a once in 25 year or less occurrence.

Problems encountered by Brevard County and its municipalities would range from minor inconveniences to loss of production and revenues for businesses. Emergency services could face more serious consequences, as poor or nonexistent communications could escalate what would have been a minor emergency into a disaster situation. The following map shows key communication facilities in Brevard County.

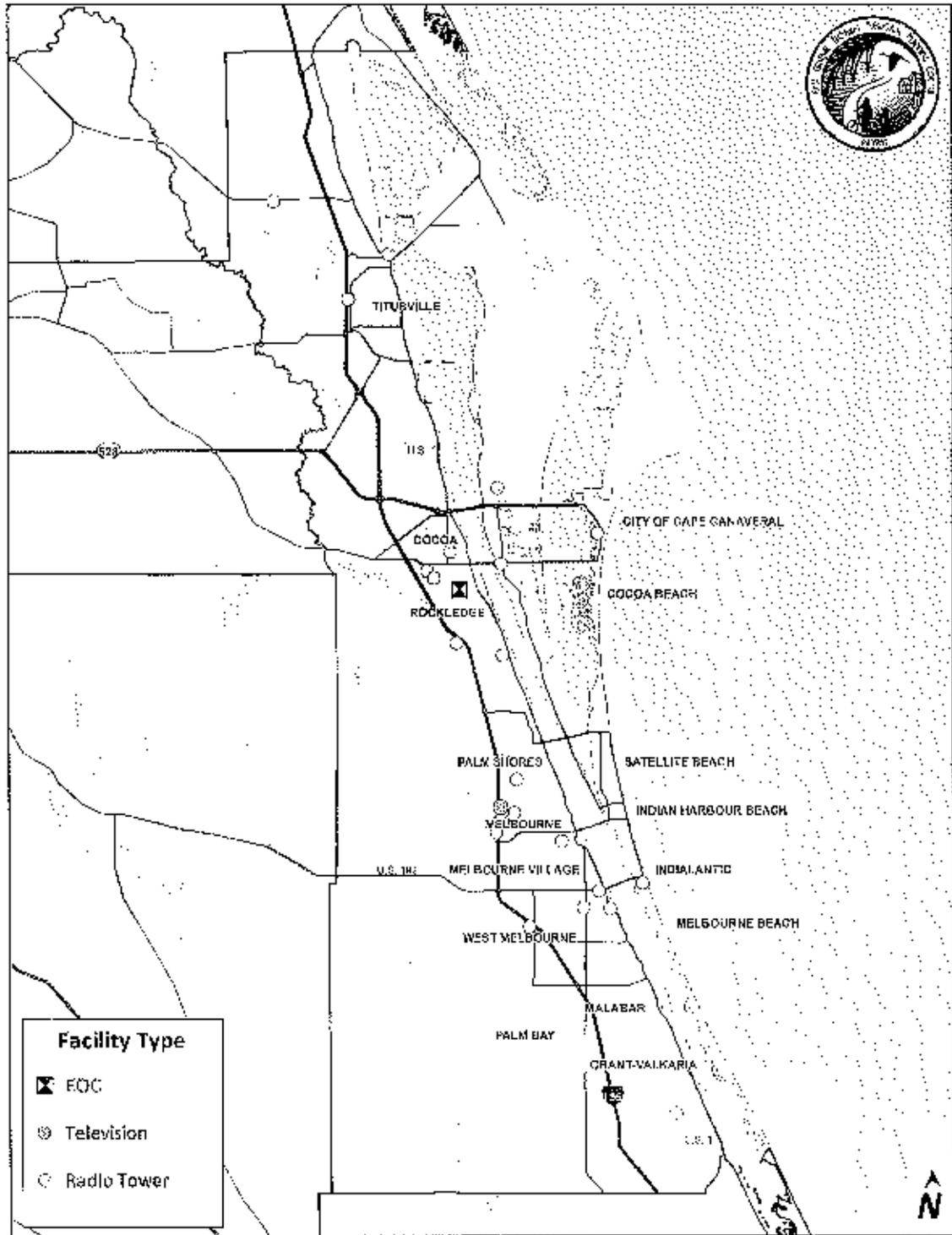
Prolonged Utility Failure | *Technological Hazards*

Power failure can result from a variety of related causes, including sagging lines due to hot weather, flashovers from transmission lines to nearby trees and incorrect relay settings. According to the electric utility industry's trade association, the potential for such disturbances is expected to increase with the profound changes now sweeping the electric utility industry.

To address times when generating capacity is tight, or falls below consumer demand due to State or local emergencies, the Florida Electrical Emergency Contingency Plan was developed. Alerts have been created to give early warning of potential electricity shortfalls and bring utilities, emergency management officials and the general public to a state of preparedness.

Power failure can have the following potential impacts on Brevard County: electrical power outage, surface and air transportation disruption, potable water system loss or disruption, sewer system outage, telecommunication system outage, human and health safety, psychological hardship, economic disruption and disruption of community services. All municipalities are at equal risk for prolonged power outages; however, some communities may be restored more quickly than others depending on other high priority locations with which they share a grid. The probability of prolonged utility failure in Brevard County is considered possible with a once a year or more occurrence.

Communication Facilities



Source(s): Brevard County

1.8.10 Societal Hazards

Societal hazards are hazards that are created by humans or hazards that directly impact humans by means other than a natural or technological incident. The societal hazards covered in this report include terrorism, pandemic, mass casualty, transportation incidents and civil disorder.

Terrorism | *Societal Hazards*

A terrorist incident could involve a wide variety of materials or actions, or combinations of materials and actions. These could range from uncomplicated incidents impacting relatively small areas, to highly complex incidents with very widespread physical or economic consequence. The response to such an incident would require specialized personnel and resources beyond the capabilities of Brevard County and its municipalities, and require assistance from mutual aid organizations, adjacent counties, the State of Florida and the Federal government. A "cyber terrorist attack" could also result in extensive disruption to computer networks, telecommunication systems or Internet services, and be intended to cause severe or widespread economic damage and/or physical impacts in the community.

Brevard County has many facilities and systems that are considered to be "Critical Infrastructure" whose continued and uninterrupted operation is necessary for the health, safety and well-being of the community. These facilities could be considered potential targets for a terrorist attack and an attack on these locations could have important and potentially widespread consequences for adjacent neighborhoods or the community as a whole. Vulnerability of the county and its municipalities to the consequences of a terrorist attack on these facilities or systems is due to the potential for the following to occur:

- Disruption to the ability to initiate and sustain emergency response operations
- Increased safety risks to the community from the release of hazardous materials or dangerous substances
- Disruption to the ability to maintain all types of governmental functions, including law and order, public safety, education, and similar critical operations
- Threats to institutions serving large numbers of individuals with higher vulnerability to the health and safety consequences
- Threats to the economic vitality of the community and its businesses
- Damage or disruption to components of the transportation or utility infrastructure resulting in additional physical or economic consequences

The probability of a terrorism event occurring in Brevard County is considered as an unknown but anticipated occurrence. Brevard County has a Terrorism Response Annex as part of the Comprehensive Emergency Management Plan; documentation is available upon request.

Pandemic/Epidemic } Societal Hazards

Pandemics typically occur in waves lasting anywhere from six to eight weeks. As immunity is developed within a population, the virus will recede for a period of 8-12 weeks. The virus will then reemerge slightly mutated for another wave lasting six to eight weeks. This process repeats during a pandemic two to three times.

Symptoms of pandemic influenza vary depending on the virulence of the strain but mirror typical seasonal symptoms including: fever, coughing, sore throat, congestion, headaches, soreness in the muscles and joints, chills and fatigue. During a pandemic, these symptoms can be severe resulting in hospitalizations and death.

The severity of pandemic influenza has varied in the past, but estimates range from an infection rate of 30 to 40 percent. Mortality rates will depend on the virulence of the strain. The 1918 strain has an estimated mortality rate of three percent of infected persons. Special populations to consider are those with weakened immunity such as infants and the elderly, those with an autoimmune disease and individuals with respiratory complications. However, pandemics in the past have also affected those with healthy immunity such as young adults because of the massive immune response certain strains have generated.

The most effective strategy to combating pandemic influenza is vaccination. However, since a pandemic is caused by a novel strain, it is likely vaccine will not be available for the first wave and sometimes not until the middle of the second wave. Alternate strategies for mitigation include the use of antiviral medication, antibiotics for bacterial pneumonia often associated with influenza, social distancing and public health hygienic practices. However, some conditions that have been recorded in Brevard County, including West Nile Virus and Dengue Fever, require more serious treatment and containment.

It is considered that populated areas throughout the county and all of its jurisdictions are at risk from human disease. Disease is not a risk, in itself, to the physical or operational integrity of any type of structure. However, high absenteeism could threaten the operating capabilities of businesses, industries, institutions and government agencies.

In the event of a pandemic, medical and health care facilities would be overwhelmed, with local care not readily accessible to those in need. Fatalities would significantly increase. Public safety would be compromised due to illness among public safety and security agencies. Quarantine and isolation techniques would be imposed, requiring a significant enforcement challenge. Temporary health care facilities and field hospitals would have to be activated and staffed by professionals from outside the county. Overall, the human and economic consequences of the event would be very substantial.

The probability of a pandemic or an epidemic occurring in Brevard County is considered possible with a 100 year or less occurrence. Brevard County has a Pandemic Plan Annex as part of the Comprehensive Emergency Management Plan; documentation is available upon request.

Mass Casualty | Societal Hazards

A mass casualty incident (MCI) is any incident in which emergency medical services resources, such as personnel and equipment, are overwhelmed by the number and severity of casualties.

Brevard County is a major terminal area for both air and marine transportation, one of the major tourist ports in the world, and home of the only viable worldwide spaceport. Characteristics include heavily used roadways and railroads. Large volumes of toxic, explosive and flammable substances pass through Brevard County. The probability of disasters involving mass casualties resulting from an aircraft crash, port or cruise ship incident, highway, or rail accident in Brevard County is considered probable with a 25 year or less occurrence.

Brevard County has a Mass Casualty Response Annex as part of its Comprehensive Emergency Management Plan; documentation is available upon request.

Transportation Incidents | Societal Hazards

Disruption of highway systems, mass transit or commercial and industrial modes of transportation can strangle traffic and can affect the productivity of an urban area. Interdependencies exist between transportation and nearly every other sector of the economy. A failure to the transportation infrastructure is defined as a shutdown of a segment of the transportation sector.

Most significant transportation incidents are the effects of **natural or technological hazards**. **Operator error or equipment malfunction is typically an isolated event**; however, **these isolated events can also result in mass casualties**.

Urban areas are dependent on a **maintained and functioning transportation system** in order for it to carry out **daily activities and major accidents can have a significant cascading impact on the short-term efficiency of an area**.

I-95 in the **state of Florida is considered one of the most dangerous roads in the United States in terms of crash incidence and overall fatalities**. The **National Highway Transportation Safety Administration discovered that from 2004 to 2008, there were 765 deaths on Florida's 382-mile I-95 network, an average of 1.73 accidents per mile during that time span**. A total of **118 fatalities, or 15.4% of the statewide total, occurred in Brevard County from 2004 to 2008**.

A **secondary source of risk for transportation incidents in Brevard County is the presence of Port Canaveral is the second-busiest cruise port in the world, with millions of visitors annually**. It also encompasses **cargo and naval operations**.

The **probability of future transportation accidents in Brevard County is considered highly likely with a once a year or more occurrence**.

Civil Disorder | *Societal Hazards*

Civil disorder is the **result of groups or individuals within the population feeling, rightly or wrongly, that their needs or rights are not being met, either by the society at large, a segment thereof, or the current overriding political system**. Civil disturbances can also occur in **reaction to political movements or special events that attract large crowds, or as a result of an unemployment or economic crisis**. When groups or individuals **disrupt the community to the point where intervention is required to maintain public safety, the event has become a civil disturbance**.

Civil disturbance spans a **wide variety of actions and includes, but is not limited to, labor unrest, strikes, civil disobedience, demonstrations, riots, prison riots or rebellion leading to revolution**. Triggers could include **racial tension, religious conflict, unemployment, a decrease in normally accepted services or goods, such as extreme water, food, or gasoline rationing, or unpopular political actions**. The **most common type of civil disturbance is riots**. Riots can **cause extensive social disruption, loss of jobs, death, and**

property damage. The loss and damages may result from those involved in the action or initiated by authorities in response to the perception of a potential threat.

There have been no recorded instances of large, unlawful civil disturbances in Brevard County that have exceeded the ability of existing law enforcement resources and partnering agencies to suppress and control. Aside from existing operations planning and ongoing security preparedness efforts, there is little that may be done in terms of hazard mitigation. The probability of civil disturbances occurring in Brevard County is considered an unknown and rare probability of occurrence.

Jurisdictional Hazard Ranking

The following table illustrates the top three hazards as identified by each jurisdiction:

Jurisdiction	Number One	Number Two	Number Three
Cape Canaveral	High Winds	Storm Surge	Lightning
Cocoa	High Winds	Hazardous Materials	Utility Failure
Cocoa Beach	Lightning	High Winds	Flooding
Grant-Valkaria	High Winds	Flooding	Wildfire
Indian River	High Winds	Storm Surge	Utility Failure
Indian Harbour Beach	High Winds	Storm Surge	Utility Failure
Malabar	Wildfire	Flooding	Utility Failure
Melbourne	Lightning	High Winds	Utility Failure
Melbourne Beach	High Winds	Storm Surge	Lightning
Palm Bay	Flooding	Wildfire	High Winds
Palm Shores	High Winds	Lightning	Utility Failure
Rockledge	Lightning	Hazardous Materials	High Winds
Satellite Beach	High Winds	Storm Surge	Lightning
Titusville	High Winds	Flooding	Lightning
West Melbourne	High Winds	Lightning	Utility Failure
Unincorporated Brevard County	High Winds	Lightning	Utility Failure

1.8.11 Jurisdiction Policies for Control of Vulnerabilities

An important aspect of the vulnerability assessment process has been to determine if the local jurisdictions have policies, plans, codes or requirements in place that are intended to avoid or minimize the vulnerability of the community to the hazards that threaten it. These policies and programs can take many forms, such as building and land use codes, hazard mitigation and emergency response plans, requirements for facility operations and maintenance, etc. If local governments' policies, plans and requirements effectively address the hazards posing the greatest risk to the community, then the vulnerability to future disasters can be reduced.

These mitigation-related policies were discussed in the previous versions of the plan and, updated information is in Appendix V of this plan. As this is a living document this information will continue to be updated outside the review cycle and inserted into the local mitigation strategy as appropriate.

Just like the vulnerability assessment process being undertaken by Brevard Prepares for facilities, systems and neighborhoods, the assessment of the extent to which the policy framework responds to the hazards of concern is another vehicle to identify the need for mitigation initiatives. In this case, however, the mitigation initiatives proposed by a participating local government jurisdiction would be non-structural in concept, i.e., the development of new plans, codes or policies to address the identified hazards and to reduce the present or future vulnerabilities of the community. The following section describes some of the policies employed by Brevard County and its jurisdictions to control specific hazard vulnerabilities.

High Winds

The jurisdictions of Brevard County have implemented at least 60 policies that mitigate the effect of High Winds. As can be seen from the tables below, a majority of policies fall into the areas of building code, evacuation routes and those regulating mobile or manufactured housing in some way. Although not all jurisdictions listed "building code" in their policy analysis, all use the Florida Building Code as their standard. Indian Harbour Beach states that hazard mitigation regulations will be reviewed and enforced as they relate to building practices. Melbourne Beach refers to anchoring new construction and substantial improvements. Titusville has a regulation that any alteration, repair, reconstruction or improvement to a structure must protect human life. Palm Bay also states that new construction or substantial improvements must use methods to minimize damage. West Melbourne mentions updating and enforcing building codes to ensure safe and healthful structures.

To facilitate evacuation, Indian Harbour Beach shall limit development that would increase hurricane evacuation times, and Melbourne, Palm Shores and Palm Bay have similar policies to protect evacuation routes by considering population density. Several, but not all jurisdictions have policies in place to ensure that the time duration for evacuation to shelters does not increase with new development.

Police and fire departments will coordinate with the County in evacuating Titusville; Rockledge mentions evacuating the recreational vehicle park. The county will determine the priority of road improvements by evacuation times/volume/capacity. In Satellite Beach, it is the responsibility of recreational park management to notify occupants to evacuate, and the city is to correlate coastal population densities with BCOEM's evacuation plans.

There were at least 21 citations regarding mobile or manufactured housing in the policy framework, many of which refer to anchors and tie-downs. Cape Canaveral prohibits placement of mobile and manufactured housing outside of parks or neighborhoods designated for this purpose. In Cocoa, all mobile and manufactured housing must be located on masonry and tied down. Further, in Cocoa Beach, the city shall inventory and identify structures to consider for purchase should they be 50% or more destroyed in an emergency. In Palm Shores, the mobile and manufactured housing stands shall not settle under weight of the structure, and existing mobile and manufactured housing parks are encouraged to upgrade through code enforcement. In the event of any conflict between regulations, the county states that the more restrictive regulations shall prevail. In addition, new mobile and manufactured housing, or recreational vehicle development, is not permitted on the barrier islands. Satellite Beach bans mobile and manufactured housing within the city. Structures that are not hurricane-resistant are prohibited in Malabar.

Other considerations in mitigating high wind events are protecting the public from flying debris such as signage or trees limbs. Indian Shores has two policies regarding signage, one of which states that all shall be able to withstand the force of 120 mph winds. Trees shall be kept pruned and trimmed to prevent hazards to persons in Cape Canaveral; Palm Bay may remove from its property trees or limbs unsafe to public utilities; and Satellite Beach refers to debris removal in its city code. These kinds of policies should be replicated in other jurisdictions.

The following table illustrates policies directed at high wind mitigation:

Policies for High Winds Mitigation						
<i>Jurisdiction</i>	<i>Signs</i>	<i>Building Code</i>	<i>Trees/ debris</i>	<i>Dunes</i>	<i>Shelter</i>	<i>Over head wires</i>
Cape Canaveral		1	1			
Cocoa						
Cocoa Beach						
Indian Lake	2					
Indian Harbour Beach		1				
Malabar		1				
Melbourne		1				
Melbourne Beach		1				
Melbourne Village	1	1	1			
Grant-Valkaria	Uses BC COMP Plan					
Palm Bay		1	1		2	
Palm Shores						
Rockledge		1				
Satellite Beach			1	1		
Titusville		5			1	
West Melbourne		2				
Brevard County Unincorporated						1

The following table illustrates additional policies, as well as plans and actions concerning high winds mitigation:

Policies for High Winds Mitigation

Jurisdiction	Mobile Home Regulations	Evacuation	Study	Plan	Drills
Cape Canaveral	1				
Cocoa	1				
Cocoa Beach	1				
Indian Lake		1			
Indian Harbour Beach		1			
Malabar					
Melbourne		2		1	
Melbourne Beach					
Grant Valkaria	Uses BC COMP				
Palm Bay	2	2			
Palm Shores	2	1			
Rockledge	5	1		1	
Satellite Beach	7	3			
Titusville		1		1	
West Melbourne					
Brevard County Unincorporated	2	2	1	1	1

Examples of non-structural initiatives that might strengthen the policy framework are plans or procedures for: pre-hurricane preparation of a facility or system, relocation to an alternative operational site, or removal and storage of valuable contents, etc.

Lightning

Although Brevard County has incurred occasional damage from wildfires or power outages caused by lightning, as well as occasional deaths or injuries, only one policy could be construed as aimed directly at mitigating the effects of lightning.

Unincorporated Brevard County stated, "The franchisee shall maintain wires, cables and all other real and personal property and facilities constituting the system in good repair during the term of the franchise."

In addition, there were only four policies identified concerning Major Fire-Wildland. Some possible non-structural initiatives to remedy this situation, would be to prepare and implement educational programs in urban and wildfire safety, develop codes or policies for improved wildfire mitigation or develop a plan for periodic vegetative fuels reduction on undeveloped lands in the county.

Other more focused non-structural options to remedy this deficit are to develop plans, policies or procedures for suspension of operations during a lightning episode; damage assessment and operation restoration after a lightning strike; a plan for equipment/facility protection during lightning episodes; alternative locations for operations; or a policy of routine testing of all lightning protection equipment or systems.

Flooding

The vast majority of mitigation-related policies included in the strategy - more than 400 - are for flood mitigation. Many crossover more than one category listed below, such as: avoidance of new construction in wetlands. All jurisdictions have instituted policies controlling the destruction and/or encroachment into wetlands, thus preventing any increase in flooding risk caused by new development.

Those communities, where applicable, have also addressed protection or restoration of dunes for retention purposes by recognizing the protection from floodwaters these natural barriers provide to the population. (Some of the policies relating to dunes also may be listed under "Landslide/Erosion".)

Examples include:

- Direct future incompatible land uses away from protected wetlands
- Promote construction of boardwalks to protect dunes and wetlands
- Working towards acquiring vacant shoreline
- No new construction permitted that threatens the dune systems or beach
- Coastal development that does not alter tidal flushing/circulation patterns
- Protection of natural salinity levels in estuarine areas

Jurisdictions of Brevard County will also have to plan for the effects of the Biggert-Waters Act, which could lessen the number of residents within the county with flood insurance.

The following table illustrates if and how many policies Brevard County and its jurisdictions have for flood mitigation:

Policies for Flood Mitigation						
<i>Jurisdiction</i>	<i>Dunes</i>	<i>Wetlands</i>	<i>Building Codes</i>	<i>Avoidance</i>	<i>Drainage</i>	<i>Mobile Home Regulations</i>
Cape Canaveral		1	3		5	
Cocoa		3	3	3	5	
Cocoa Beach	2	2	5	2		
Indianland	1	1	1	1	1	
Indian Harbour Beach	2	2	9	2	6	
Malabar	4	28	5	4		
Melbourne	3	6	19	5	9	4
Melbourne Beach	2	1	5	1	3	
Melbourne Village						
Grant-Valkaria	Uses BC COMP					
Palm Bay		10	12	4	3	4
Palm Shores		2	2	1	2	1
Rockledge	1	1	23	10	12	2
Satellite Beach	2	4	7	16	27	4

Policies for Flood Mitigation						
<i>Jurisdiction</i>	<i>Dunes</i>	<i>Wetlands</i>	<i>Building Codes</i>	<i>Avoidance</i>	<i>Drainage</i>	<i>Mobile Home Regulations</i>
Titusville		3	17	13	13	2
West Melbourne		3	3	1	7	
Brevard County Unincorporated		2	26	6	12	3

Every jurisdiction reported has building codes restricting the placement of, the elevation of or requirements to control the flotation or lateral movement of structures in any flood risk area.

The jurisdictions have also demonstrated consistency in establishing elevation standards, although they vary among jurisdictions. Depending upon reference to wave, tide, or inland flood plain, jurisdictions have required the lowest floor to be elevated to or above base flood elevation, (up to 12 inches above Base Flood Elevation in one jurisdiction). As well, jurisdictions have implemented policies to enable construction to resist flood damage, examples include having the crown of the road above Base Flood Elevation (BFE) and to have no utilities installed below BFE.

The strongest mitigation effort reducing future or expanded risk to flood prone areas, is implementing risk avoidance.

Avoidance action items include:

- Restrictions for building new facilities in exposed areas
- Provisions that development must not degrade current conditions
- Development in the 10-25 year floodplain shall not result in loss of flood storage
- Granting a variance will not result in increased flood heights
- Development within flood-prone areas are not to negatively impact adjacent land
- No financial support for new local transportation corridors in Coastal High Hazard Areas
- No sanitary sewer or transmission lines in Coastal High Hazard Areas
- Prohibits construction in ocean bluff protection area
- Town-funded public facilities shall not be built in Coastal High Hazard Areas
- Noticing potential home buyers are notified that property is in a flood area

- Prohibits expenditures for development or redevelopment east of Coastal Construction Control Line
- Minimizes the need for rescue and relief efforts associated with flooding
- Avoiding Public subsidization of infrastructure in Coastal High Hazard Zones
- Encouraging retention of floodplain as an open space preserve

Some policies relating to drainage issues are:

- County shall develop regulations to ensure drainage is not effected
- Stormwater management systems to employ Best Management Practices
- Stormwater runoff shall be adequately treated on roadway systems
- County to determine feasibility of innovative stormwater treatment methods
- Initiating drainage needs assessment where flooding occurs
- Maintain storm sewers to reduce maintenance dredging along canals
- Determine feasibility of updating stormwater treatment facilities
- Protect drainage functions by controlling grading, runoff rate and direction
- New construction or reconstruction must retain the first ½" runoff
- Encourage diversion of stormwater runoff to recharge areas
- Reduce point sources of direct stormwater discharge into water bodies
- Prevent or regulate construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards to other lands

Another important area to examine is how mobile or manufactured homes are addressed in the policy framework. At least seven jurisdictions mentioned some regulations, such as:

- Anchoring and tying down manufactured homes
- New mobile and manufactured home and recreational vehicle park development not permitted on barrier island
- Prohibiting the placement of mobile and manufactured homes except in an existing mobile or manufactured home parks or subdivisions
- Encouraging existing mobile and manufactured home parks to upgrade through code enforcement

Brevard County has a particular interest in participation in the federal floodplain-mapping project and the Community Rating System (CRS), in order to assist homeowners and businesses with decisions about property vulnerability and flood insurance. The National Flood Insurance Program (NFIP) allows property owners in the 100-year flood zone to acquire federal flood insurance policies on their land, which is subject to flood hazards. By participating in the CRS, a FEMA program, residents are

qualified for reduced rates on flood insurance, which vary depending on level of activities the jurisdiction performs to reduce its flood potential.

A summary of participation in flood-related activities is shown in the table below:

Flood Related Activities

<i>Community Name/Number</i>	<i>GRS Entry Date</i>	<i>Current Effective Date</i>	<i>Current Class</i>	<i>% Discount for SFHA¹</i>	<i>% Discount for Non-SFHA²</i>	<i>Status</i>	<i>NFIP</i>
Brevard County 125092	10/01/91	10/01/10	7	15	5	C	Yes
Cape Canaveral 125094	10/01/93	05/01/13	7	15	5	C	Yes
Cocoa 120020	10/01/94	10/01/04	10	0	0	R	Yes
Cocoa Beach 125097	10/01/94	10/01/04	10	0	0	R	Yes
Grant-Valkaria 120224	No						Yes
Indianapolis 125115	No						Yes

Flood Related Activities

<i>Community Name/Number</i>	<i>CRS Entry Date</i>	<i>Current Effective Date</i>	<i>Current Class¹</i>	<i>% Discount for SFHA^{2,3,4}</i>	<i>% Discount for Non-SFHA^{5,6,7} Status</i>	<i>Status</i>	<i>NFIP</i>
Indian Harbour Beach 125116	No						Yes
Malabar 120024	No						Yes
Melbourne 120025	10/01/93	05/01/13	7	15	5	C	Yes
Melbourne Beach 125128	No						Yes
Melbourne Village 125125	No						Yes
Palm Bay 120404	10/01/93	05/01/12	6	20	10	C	Yes
Palm Shores	No						Yes

Flood Related Activities

<i>Community Name/Number</i>	<i>CRS Entry Date</i>	<i>Current Effective Date</i>	<i>Current Class²</i>	<i>% Discount for SFHA³</i>	<i>% Discount for Non-SFHA⁴</i>	<i>Status ⁵</i>	<i>NFIP</i>
120612							
Rockledge 120027	10/01/91	10/01/13	8	10	5	C	Yes
Satellite Beach 120028	10/01/92	5/1/12	8	10	5	C	Yes
Titusville 125162	10/01/92	5/1/11	7	15	5	C	Yes
West Melbourne 120335	No						Yes

Source: FEMA, Policy and Claim Statistics for Flood Insurance

<http://www.fema.gov/policy-claim-statistics-flood-insurance/policy-claim-statistics-flood-insurance/policy-claim-13>

All jurisdictions are continuing their participation in these programs, and a few expressed interested in being part of the Community Rating Scale program, but were hampered by lack of staff to oversee the program. Most jurisdictions have flood insurance information available online or at city or town offices for their residents.

These are the flood insurance statistics for Brevard County as of July 2013 and repetitive loss properties as of December 2014:

Flood Insurance Statistics				
<i>Community Name</i>	<i>Policies In-Force</i>	<i>Insurance In-Force Whole</i>	<i>Written Premium In-Force</i>	<i>Number of NFIP Insured Repetitive Loss Properties</i>
Brevard County	26,862	7,128,358,700	10,987,928	78 Residential 3 Commercial 0 Institutional
Cape Canaveral	3,720	656,553,200	1,028,071	3 Residential 1 Commercial (at Port Canaveral) 0 Institutional
Cocoa Beach	7,132	1,307,947,000	2,570,551	2 Residential 1 Commercial 0 Institutional
Cocoa	650	143,067,000	222,210	5 Residential 0 Commercial 0 Institutional
Grant-Valkaria	15	4,056,000	8,384	8 Residential

Flood Insurance Statistics				
<i>Community Name</i>	<i>Policies In-Force</i>	<i>Insurance In-Force Whole</i>	<i>Written Premium In-Force</i>	<i>Number of NFP Insured Repetitive Loss Properties</i>
				0 Commercial 0 Institutional
Indianantic	1,076	284,593,400	441,958	3 Residential 0 Commercial 0 Institutional
Indian Harbour Beach	2,089	526,234,600	768,442	1 Residential 0 Commercial 0 Institutional
Malabar	207	60,868,600	97,273	4 Residential 0 Commercial 0 Institutional
Melbourne Beach	922	260,478,600	475,020	4 Residential 0 Commercial 0 Institutional
Melbourne Village	35	9,881,200	13,057	0 Residential 0 Commercial 0 Institutional

Flood Insurance Statistics				
<i>Community Name</i>	<i>Policies In-Force</i>	<i>Insurance In-Force Whole</i>	<i>Written Premium In-Force</i>	<i>Number of NEIP Insured Repetitive Loss Properties</i>
Melbourne	4,230	1,068,618,300	1,667,648	21 Residential 1 Commercial 0 Institutional
Palm Bay	4,867	1,217,034,200	1,810,446	10 Residential 0 Commercial 0 Institutional
Palm Shores	49	14,111,500	17,892	0 Residential 0 Commercial 0 Institutional
Rockledge	1,220	318,508,500	493,474	0 Residential 0 Commercial 0 Institutional
Satellite Beach	2,306	639,462,300	887,214	2 Residential 0 Commercial 0 Institutional
Titusville	1,472	378,216,600	581,861	1 Residential 0 Commercial

Flood Insurance Statistics				
<i>Community Name</i>	<i>Policies In-Force</i>	<i>Insurance In-Force Whole</i>	<i>Written Premium In-Force</i>	<i>Number of NFIP Insured Repetitive Loss Properties</i>
				0 Institutional
West Melbourne	1,368	308,584,500	451,669	3 Residential
				0 Commercial
				0 Institutional

Source: FEMA, Policy and Claim Statistics for Flood Insurance

<http://www.fema.gov/policy-claim-statistics-flood-insurance/policy-claim-statistics-flood-insurance/policy-claim-13>

It is important to note that the Brevard County mitigation planning process intentionally encourages participating jurisdictions to continue to assess this information and to propose non-structural mitigation initiatives for the plan to strengthen their mitigation policy and program framework. The policies, codes and plans identified here are not an exhaustive list, and efforts will be made to update this information for the new planning cycle since most jurisdictions are simultaneously submitting new Comprehensive Plans and other plans to reviewing bodies. At that time, there can be further examination of the relationship between the mitigation strategy and other planning efforts as well.

Since modifications or enhancements to the policy and program framework are typically the responsibility of individual jurisdictions, where applicable, modifications to existing plans and programs in order to improve the policy framework of the jurisdictions for control of risks and vulnerabilities may be proposed as mitigation initiatives.

1.9 Mitigation Goals, Objectives, and Actions

This section of the Brevard County Local Mitigation Plan describes the goals and objectives established by Brevard Prepares, and the completed and anticipated actions for implementation and maintenance of this plan in an ongoing effort to achieve these goals.

1.9.1 Develop Goals and Objectives for the Mitigation Plan

Brevard Prepares has established a number of goals and objectives to guide its work in the development of this plan. The goals and objectives help to focus the efforts of the group in the mitigation planning effort to achieve an end result that matches the unique needs, capabilities and desires of the participating jurisdictions. For purposes of this update, the mitigation goals and objectives established by Brevard Prepares have not been changed. The following are a list of all goals and objectives.

1. The disaster-resistant economy will be strengthened
 - a. Local government will establish programs, facilities and resources to support business resumption activities by impacted local businesses and industry
 - b. Local government emergency response and disaster recovery plans will appropriately consider the needs of key employers in the community
 - c. Local government will encourage community businesses and industries to make their facilities and operations disaster resistant
 - d. Components of the infrastructure needed by the community's businesses and industries will be protected from the impacts of disaster
2. Local government in partnership with the community will continue to develop, implement and maintain effective mitigation programs
 - a. The capability to effectively utilize data and information related to mitigation planning and program development including "lessons learned"
 - b. The effectiveness of mitigation initiatives implemented in the community will be measured
 - c. Outreach programs to gain participation in mitigation programs by business, industry, institutions and community groups will be developed and implemented
 - d. The community's public and private sector organizations will partner to promote hazard mitigation programming throughout the community
 - e. Local elected governing bodies will promulgate the local mitigation plan and support community mitigation
3. The health, safety and welfare of our disaster-resistant community will be maintained
 - a. Local governments will establish and enforce building and land development codes that are effective in addressing the hazards
 - b. Land use policies, plans and regulations will discourage or prohibit inappropriate location of structures or infrastructure

- c. Local government will ensure that hazard mitigation needs and programs are given appropriate emphasis
 - d. Regulations will be established and enforced to ensure that public and private property maintenance is consistent with minimizing vulnerabilities to disaster
 - e. Designated evacuation routes will be relocated, retrofitted or modified to remain open before, during and after disaster events, and vehicle access routes to key areas will remain open.
 - f. The potential for infrastructure system failure because of or during a disaster will be minimized through routine maintenance
 - g. Local government will support key employers in the community in the implementation of mitigation measures for their facilities and systems
 - h. Facilities in the community posing an extra health or safety risk when damaged or disrupted will be made less vulnerable to the impacts of a disaster
 - i. Programs for removal, relocation or retrofitting of vulnerable structures and utilities in hazard areas will be established and implemented
 - j. There will be adequate resources, equipment and supplies to meet victims' health and safety needs after a disaster
 - k. Adequate systems for notifying the public at risk and providing emergency instruction during a disaster will be available
 - l. Local governments will protect high hazard natural areas from new or continuing development
 - m. Local jurisdictions will participate fully in the National Flood Insurance Program and the associated Community Rating System
 - n. Reconstruction and rehabilitation of structures and utilities in the community will incorporate appropriate hazard mitigation techniques
4. Public education will be enhanced to increase the level of disaster awareness
- a. The community will be periodically updated regarding local efforts in mitigation planning and programming
 - b. The owners and operators of businesses and industries in the community will be knowledgeable in appropriate techniques
 - c. Managers of public facilities will be knowledgeable in hazard mitigation techniques and the components of the community's mitigation plan
 - d. All interested individuals will be encouraged to participate in hazard mitigation planning and training
 - e. The public living or working in defined hazard areas will be aware of that fact, understand their vulnerability and know appropriate techniques
 - f. Education programs in risk communication and hazard mitigation will continue to be established and implemented

The goals were established by the Brevard Prepares Steering Committee in 2004 and then formally adopted. These goals continue to guide the work of Brevard Prepares. The goals selected are related to the broad mitigation needs and capabilities of the communities involved, rather than addressing a specific hazard type or category.

Therefore, the Brevard County mitigation goals and objectives, by definition, are "multi-hazard" in scope and can be described as statements of the desired "mitigation-related capabilities" that will be present in each participating jurisdiction in the future as the goals are achieved.

1.9.2 Using a "Goal-Based" Planning Process

The goals established by Brevard Prepares are considered to be broad, general guidance that define the long-term direction of the planning. As indicated in the list of goals and objectives attached to this section, each goal statement has one or more objectives that provide a more specific framework for actions to be taken by Brevard Prepares and its participants. The objectives define actions or results that can be placed into measurable terms by Brevard Prepares, and translated into specific assignments by the Steering Committee for implementation by the participating jurisdictions and associated agencies and organizations.

The objectives selected by Brevard Prepares are intended to create a specific framework for guiding the development of proposed mitigation initiatives for incorporation into the plan. Whenever feasible, the planning participants have attempted to associate each proposed mitigation initiative with the objective statement the initiative is intended to achieve. By associating a mitigation initiative with a specific objective, the proposed initiative is also, of course, intended to help achieve the broader goal statement to which the objective corresponds. Proposing mitigation initiatives that are consistent with the selected objectives is a principal mechanism for the participants to achieve the stated goals of the mitigation-planning program.

As the Brevard County Local Hazard Mitigation Strategy is reviewed and updated by Brevard Prepares participants, the goals and supporting objective statements are also reviewed to ensure they are still applicable to meeting the unique needs, interests and desires of the community. The following goals and objectives were reviewed for this update, and it was determined to continue to plan towards these mitigation goals:

1.9.3 Addressing Known Risks and Vulnerabilities

A logical consequence of having determined the hazards and amount of risk from each to the participating jurisdictions, and having assessed facilities and neighborhoods for their vulnerabilities to those hazards the involved agencies and organizations have the information at hand with which to propose initiatives addressing both known vulnerabilities and established goals. Appendix I is a list of initiatives proposed for the assessed facilities, neighborhoods or repetitive loss properties in the reports given by each jurisdiction.

In addition, there are many initiatives included in the plan that are of general benefit to the whole county and all of its citizens through, for example, protecting facilities and

systems that benefit all communities. These proposed initiatives address a wide range of vulnerabilities to different hazards that, because of the facility or system protected, basically address countywide vulnerabilities. Numerous other initiatives have been included in the strategy to reduce specific communitywide vulnerabilities, proposed by incorporated jurisdictions. The initiatives would facilitate traffic and evacuation route mobility, communications, drainage, relocate overhead wires, restore shoreline, provide portable bridges, and purchase equipment that might be shared with others during disaster events. These are all designed to benefit travelers and residents alike.

1.9.4 Mitigation Planning for Critical Facilities

Another indication of the goal-based mitigation planning process used in Brevard County is that critical facilities in the participating jurisdictions have been identified and, when applicable, their vulnerabilities to future disasters assessed. To date, a large majority of mitigation initiatives have been proposed that are intended to benefit these designated critical facilities and these are listed in Appendix I.

Among the goals established by Brevard Prepares that specifically address the mitigation needs of critical facilities are:

- Goal #1: The disaster-resistant economy will be strengthened
- Goal #2: Local government in partnership with the community will continue to develop, implement and maintain effective mitigation programs
- Goal #3: The health, safety and welfare of our disaster-resistant community will be maintained

The jurisdictions' action to propose initiatives for critical facilities is evidence of the participants' attempt to achieve its goals.

1.9.5 Modification to Other Policies, Plans and Programs

Finally, it is the intention of Brevard Prepares to continue to improve the existing policy framework for the participating jurisdictions so that they will be able to more effectively manage the community's vulnerabilities to future disasters. Any shortfalls in the number of policies addressing identified higher risk hazards can be addressed by implementing non-structural initiatives intended to modify or enhance current plans, policies and programs.

Organizations proposing initiatives may associate them, if applicable, with the plans or policies to be changed. These are reported on a jurisdiction-by-jurisdiction basis, and proposed mitigation initiatives intended to modify or improve existing policies and programs are listed in Appendix I. The proposed modifications to the listed policies and

programs are additional documentation of Brevard Prepares' efforts to achieve its established goals and objectives. Goal #3, with the objective of, "Regulations will be established and enforced to ensure that public and private property maintenance is consistent with minimizing vulnerabilities to disaster" is directed at improving the jurisdictions' mitigation-related policy framework. A list of mitigation policies and programs by jurisdiction can be found as part of Appendix V.

1.9.6 Implementation of Mitigation Actions, Responsibilities and Schedules

As noted above, implementation of the Brevard County Local Mitigation Strategy is through the proposal and completion of the mitigation initiatives incorporated into the plan. As these initiatives are implemented over the years, the facilities, systems and neighborhoods of the participating jurisdictions will become less vulnerable to the impacts of future disasters, and the communities of Brevard County will become increasingly more disaster resistant.

The individual agencies and organizations that originally proposed the mitigation initiatives incorporated into the plan are responsible for their implementation when the resources or opportunity to do so become available. In most cases, this means that the proposing agencies identify the most feasible funding source (e.g., a state or federal grant program, the agency's budgetary process, etc.), submit an application to the funding source or otherwise allocate funds, and, upon receipt of funding, take the necessary steps to implement the project (e.g., design, permitting, construction, etc.). In other cases, this may mean that should a unique opportunity for implementation of an initiative arise, e.g., upon receipt of unexpected funds, immediately after a disaster event, etc., the agency can proceed with implementation of the initiative.

While the actual responsibility for implementation of a mitigation initiative remains the responsibility of the sponsoring agency, Brevard Prepares, as a multi-jurisdictional, cooperative organization, has a substantial involvement in plan implementation, and can assist with the coordinating and scheduling of the implementation of approved mitigation initiatives. As a part of the planning process on an annual basis, per the Operating Procedures, approved mitigation initiatives included in the plan are re-evaluated as to their relevancy.

Brevard Prepares can assign four categories of priority for implementation: current, priority for implementation deferred or terminated. "Current" priority means that the sponsoring agency or organization should seek to implement the initiative as a part of their normal operations or activity scheduling. "Priority for implementation" means that, due to unique circumstances, the implementation of a mitigation initiative should be moved forward. "Deferred" priority means that the initiative is still a valid proposal, but that under present circumstances, its implement should be deferred until a future date,

allowing the participating agencies to focus on higher priority initiatives. All have been deferred due to funding constraints.

For approved mitigation initiatives that are considered "current" or "priority for implementation," Brevard Prepares assigns a recommended implementation schedule, which is intended to encourage the organization to attempt to meet that schedule. As appropriate, it is planned that the organizations sponsoring the listed initiatives will continue to seek the resources or opportunities for implementation.

1.9.7 Benefit-to-Cost Review

A key analytical measure used by Brevard Prepares is the benefit-to-cost ratio, which expresses the estimated benefits, in dollars, in comparison to the estimated costs to implement and maintain the proposed mitigation initiative. However, a sophisticated methodology for calculating a benefit-to-cost ratio is likely to be necessary at the time of actual implementation, applying to state or federal agencies for funding, or for the design and construction stage of development.

For an initiative to be considered "cost effective," the dollar value of the benefit derived needs to exceed the costs to implement and maintain the initiative; in other words, the benefit-to-cost ratio should be greater than 1.0.

The process for calculating a simple benefit-to-cost ratio begins with the sponsor of a proposed mitigation initiative estimating the direct and indirect costs of the "worst case" disaster scenario that the mitigation initiative is intended to address. If the initiative were to be implemented, these are the future costs that would be avoided, or, in other words, the "benefits" derived from implementing the initiative. Both direct costs of the disaster scenario are considered, such as structural damages, as well as indirect costs, such as lost wages. The total of the direct and indirect costs are then divided by the predicted life of the initiative, in years. This then gives the dollar benefits of the project on an annual basis. The objective of this analysis is to quickly and easily derive a simple annual economic benefit value that will be useful in the mitigation planning process to differentiate among the economic benefit value of different proposals.

The cost side of the benefit-to-cost ratio is estimated by determining the estimated cost to initially implement the proposal, such as initial construction cost for a "bricks and mortar" project, or the development costs for a training program. This value is then divided by the predicted life of the initiative, in years, to give a simple annual cost to implement the proposal. To this amount any annual costs that implementation of the project would incur is then added, such as annual operations and maintenance costs or annual implementation costs.

Next, the approach then considers any "cost impact" of the proposal, or the costs that would be incurred by others in the community due to implementation of the initiative, such as the economic effect on new construction of adopting a more stringent building code. The cost impact figure is also annualized by the life of the project, and then any

annual cost impact values, such as an annual user fee or tax, is added to give a total annual cost impact. By dividing the annual costs of the "benefits" of the proposal by the annual cost and cost impact necessary to implement the proposal, a "preliminary benefit-to-cost ratio" is estimated. The preliminary ratio provides a simplified calculation of whether a proposal would be economically justifiable, based on whether the benefit-to-cost ratio is greater than one. If it is greater than one, the economic benefits of implementing the project exceed the economic costs of doing so.

However, there will be mitigation initiatives proposed to address public health and safety issues, or for the protection of valuable cultural or environmental resources. These values cannot be readily defined as dollar amounts. Therefore "multipliers" are applied to the preliminary benefit-to-cost ratio to account for these factors. The first multiplier is to account for health and safety benefits of a proposal, and the second is to consider the protection of valuable environmental resources that would be derived from implementation of an initiative. The two multipliers are applied in sequence to the preliminary benefit-to-cost ratio, beginning with the safety/health multiplier.

The multipliers increase the preliminary benefit-to-cost ratio proportionally to the health/safety or resource protection value of the proposal. For example, in this way, retrofitting of a hospital or museum roof to withstand high winds, which may not have a preliminary benefit-to-cost ratio greater than one, and hence not be economically justifiable, can, after application of the appropriate multipliers, be seen as justified due to the safety/health or cultural resource benefit it will impart. After application of these multipliers, the program refers to the derived ratio as the "final benefit-to-cost ratio".

The multipliers used for the predicted health and safety benefits of a proposed mitigation initiative are:

1. If there is no health and safety benefit: a multiplier of 1 is applied, which leaves the preliminary ratio unchanged.
2. If up to 1000 peoples' safety and health would be benefited, the multiplier of 1.5 is applied.
3. If up to 50,000 people would be benefited, a multiplier of 2.0 is applied.
4. If up to 250,000 people would be benefited, a multiplier of 2.5 is applied.
5. If more than 250,000 people would be benefited, a multiplier of 3.0 is applied.

For the protection of valuable cultural or environmental resources by implementation of a proposed initiative, the following multipliers are then applied:

1. For no benefit to valuable resources: a multiplier of 1 is applied.
2. For a benefit to up to 10 acres of a valuable environmental resources and/or one culturally valuable structure, a multiplier of 1.1 is applied.
3. For a benefit to up to 50 acres of a valuable environmental resource and/or two culturally-valuable structures, a multiplier of 1.3 is applied.
4. For a benefit to up to more than 50 acres of a valuable environmental resource and/or more than two culturally valuable structures, a multiplier of 1.5 is applied.

1.10 Plan Integration

One of the methods to implement the Brevard County Local Mitigation Strategy effectively is to propose and implement initiatives that will modify other community plans, policies and programs. Efforts to incorporate the mitigation plan into Comprehensive Plans, Capital Improvement Plans, Master Plans and Comprehensive Emergency Management Plans, or other programs and policies, etc., wherever appropriate, will be given emphasis in each planning cycle.

The County's 2012 Comprehensive Emergency Management Plan, that is in compliance with the requirements of the Florida Division of Emergency Management, has had the benefit of over 10 years' implementation of this local mitigation strategy. Through Brevard Prepares, participating jurisdictions are working to incorporate mitigation principles and concepts into their normal planning and programming operations and activities.

A variety of methods are available for participating jurisdictions to integrate the information from the mitigation plan with other important plans and programs, many of which are key to the implementation of proposed mitigation initiatives. For Brevard County jurisdictions, consideration is given to integration of the mitigation plan with the following, as applicable to the specific jurisdiction:

- Comprehensive Plan/Evaluation and Reports
- Emergency Management Plan
- Capital Improvement Plan
- Operations and Maintenance Plan
- Stormwater Management Plan
- Economic Development Plan
- Related planning and training programs, e.g., for emergency response personnel
- Public education and information programs

The process for integrating planning efforts is the responsibility of the individual jurisdiction, acting principally through the agency or organization sponsoring proposed mitigation initiatives incorporated into the plan. For the mitigation strategy, many initiatives are identified and developed through the hazard identification and vulnerability assessment process. Others originate through the analysis of the jurisdiction's framework of mitigation-related policies or the after action assessment of emergency events. Once identified, developed, and approved for incorporation into the plan, the jurisdiction's agency representatives can, as applicable, incorporate the initiatives into one of the types of plans or programs noted above. Generally, a proposed and approved mitigation initiative would be incorporated into the applicable plan or program on the next update of that plan or program, which varies with the specific jurisdiction.

In addition, the plans noted above are likely to contain proposed projects and programs that would be directly relevant to hazard mitigation in the jurisdiction, e.g., drainage control projects in a Stormwater Management Plan. These are frequently integrated with the local hazard mitigation strategy by identifying them as proposed initiatives, characterizing them appropriately in accordance with the Brevard Prepares mitigation planning process, and approving them for incorporation into the mitigation strategy. In this way, the project is identified in both plans, making the plans both consistent and mutually supportive.

Further, when a jurisdiction includes relevant projects in the local hazard mitigation plan, and the plan is approved by FDEM, the projects are eligible for federal mitigation funding programs. Conversely, by integrating projects originally developed through the mitigation planning process with another jurisdictional plan, such as the jurisdiction's Capital Improvement Plan, funding for implementation of the initiative can occur through other budgetary channels.

1.11 Appendix I

1.11.1 Initiative/Project Listing

This section of Brevard County Local Mitigation Plan contains the compilation of the proposed mitigation initiatives/projects that have been formulated as the result of the planning efforts by Brevard Prepares. These mitigation initiatives form the fundamental mechanism for the implementation of the local mitigation plan. After each successful implementation of an initiative, the benefited community will become that much more resistant to the impacts of future disasters. Projects were deleted or deferred due to monetary constraints.

Hazard: W = Winds FR = Fire UL= Utility Loss L = Lightning SS = Storm Surge C = Civil Disorder FL = Flooding E = Erosion HZ= Hazmat WS = Winter Storm D = Drought I = Infestation/Disease All = All Hazards Funding Source: 1-PDM (Post Disaster Mitigation) 2-SHSP (State Homeland Security Program) 3-CDBG (Community Development Block Grant) 4-FMA (Flood Mitigation Assistance) 5-HMGP (Hazard Mitigation Grant Program) 6-PA (Public Assistance) 7-SRLP (Severe Repetitive Loss Program) 8-General Fund (Jurisdiction Annual Budget) Other specific funding sources are spelled out in column Status: C-Completed D-Deferred Funding Unavailable N-New U-Updated IP-In Progress (and % complete)								
Number	Jurisdiction	Responsible Organization	Hazard	Project Description	Funding Source	Date	Estimated Completion	Status
BRV-0230	All	Brevard County Emergency Mgmt	All	Outreach for Mitigation Brevard Prepares	2	6/15/2015	2016	N
BRV-0222	Brevard County (Unincorporated)	Facilities	UL	Shutters for County Government Center	1, 2, 5, 6, 8	6/17/1999	9/30/2030	D
BRV-0223	Brevard County (Unincorporated)	Fire and Rescue	FR	Metal Shutters for Fire Stations	6, NFPA	7/20/1999	7/25/2012	C
BRV-0224	Brevard County (Unincorporated)	Fire and Rescue	W	Acquisition of additional brush trucks	8	7/20/1999	7/1/2006	C
BRV-0230	Brevard County (Unincorporated)	Fire and Rescue	All	Over-head Bay Doors for 10 fire stations	1, 2, 5, 6, 8	7/20/1999	6/30/2030	D
BRV-0231	Brevard County (Unincorporated)	Fire and Rescue	W	Recup firefighter gear replacement cost	8	11/15/2004	7/25/2012	C
BRV-0232	Brevard County (Unincorporated)	Fire and Rescue	W	Emergency Comm Improvements	1, 2, 5, 6, 8	11/16/2004	6/30/2030	C
BRV-0234	Brevard County (Unincorporated)	Facilities	W	Purchase 12V to 120V Power Converters	1, 2, 5, 6, 8	6/14/1999	9/30/2030	D
BRV-0235	Brevard County (Unincorporated)	Facilities	All	Harden Clerk of Court Archive Facility	1, 2, 5, 6, 8	11/16/2004	9/30/2030	D
BRV-0236	Brevard County (Unincorporated)	Animal Services	All	N. Brevard Animal Shelter - Generator	1, 5, 6, 8	6/14/1999	7/20/2020	D
BRV-0237	Brevard County (Unincorporated)	Animal Services	All	S. Brevard Animal Shelter - Generator	1, 5, 6, 8	6/14/1999	2005	C

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Number	Jurisdiction	Responsible Organization	Hazard	Project Description	Funding Source	Date	Estimated Completion	Status
BRV-0238	Brevard County (Unincorporated)	Animal Services	W	N. Brevard Animal Shelter - Shutters	1, 5, 6, 8	6/14/1999	7/25/2020	D
BRV-0239	Brevard County (Unincorporated)	Animal Services	W	S. Brevard Animal Shelter - Shutters	1, 5, 6, 8	6/14/1999	7/25/2020	D
BRV-0240	Brevard County (Unincorporated)	Animal Services	All	S. Brevard Animal Shelter - Potable Water	1, 5, 6, 8	6/14/1999	7/20/2020	D
BRV-0241	Brevard County (Unincorporated)	Animal Services	All	S. Brevard Animal Shelter - Lighting	1, 5, 6, 8	6/14/1999	6/30/2020	L
BRV-0242	Brevard County (Unincorporated)	Animal Services	L	N. Brevard Animal Shelter - Lightning	1, 5, 6, 8	6/14/1999	7/20/2020	D
BRV-0243	Brevard County (Unincorporated)	Animal Services	All	N. Brevard Animal Shelter - Potable Water	1, 5, 6, 8	6/14/1999	7/20/2020	D
BRV-0249	Brevard County (Unincorporated)	Natural Resources	-L	Garro Lakes Phase 1 - Drainage	8WU	11/16/2004	08/31/13	C
BRV-0250	Brevard County (Unincorporated)	Road & Bridge	W	Aurania Road - Drainage, Retention Pond	1, 5, 6, 8	7/20/1999	8/30/2020	D
BRV-0251	Brevard County (Unincorporated)	Road & Bridge	F	Hammock Road - Erosion Flooding	1, 5, 6, 8	7/20/1999	9/30/2020	D
BRV-0252	Brevard County (Unincorporated)	Road & Bridge	FL	Windover Farms - Retention Areas	1, 5, 6, 8	7/20/1999	9/30/2020	L
BRV-0253	Brevard County (Unincorporated)	Road & Bridge	W	West 195/Six Mile Creek - Drainage	1, 5, 6, 8	7/20/1999	9/30/2020	D
BRV-0254	Brevard County (Unincorporated)	Road & Bridge	FL, SS, W	Lloyd and Harrison - Build up	1, 5, 6, 8	7/20/1999	9/30/2020	D
BRV-0255	Brevard County (Unincorporated)	Road & Bridge	W	Willall Road - Build up road	1, 5, 6, 8	6/20/1999	9/30/2020	D
BRV-0256	Brevard County (Unincorporated)	Road & Bridge	FL	Salt Lake Landing - Build up road	1, 5, 6, 8	7/20/1999	9/30/2020	D
BRV-0257	Brevard County (Unincorporated)	Road & Bridge	FL	Walding, Tina, and Equip Shop - Shutters	1, 5, 6, 8	7/20/1999	9/30/2020	D
BRV-0258	Brevard County (Unincorporated)	Road & Bridge	FL	Main Facility, 2675 Lake No. - Shutters	1, 5, 6, 8	8/20/1999	9/30/2020	D
BRV-0259	Brevard County (Unincorporated)	Road & Bridge	FL	5 changeable Message Signs	1, 5, 6, 8	7/20/1999	8/30/2020	D

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Funding Source: 1-PDM (Post Disaster Mitigation) 2-SHSP (State Homeland Security Program) 3-CDBG (Community Development Block Grant) 4-FMA (Flood Mitigation Assistance) 5-HMGP (Hazard Mitigation Grant Program) 6-PA (Public Assistance) 7-SRLP (Severe Repetitive Loss Program) 8-General Fund (Jurisdiction Annual Budget) Other specific funding sources are spelled out in column								
Status: C-Completed D-Deferred Funding Unavailable N-New U-Updated IP-In Progress (and % complete)								
Number	Jurisdiction	Responsible Organization	Hazard	Project Description	Funding Source	Date	Estimated Completion	Status
BRV-0266	Brevard County (Unincorporated)	Natural Resources	FL	Crane Creek Phase 1 - Drainage	SWU	11/16/2004	12/31/14	IP
BRV-0271	Brevard County (Unincorporated)	Sherriff's Office	W	Enhanced Grounding for transmitters	800 MHz	11/18/2004	7/12/2005	C
BRV-0273	Brevard County (Unincorporated)	Sherriff's Office	ALL	Automatic generator for tower	800 MHz	1/31/2002	7/12/2005	C
BRV-0275	Brevard County (Unincorporated)	Road & Bridge	ALL	Palm Estates/Shakespeare Park - Drainage	1, 5, 6, 8	7/20/1999	9/30/2020	D
BRV-0278	Brevard County (Unincorporated)	Road & Bridge	FL	Victor Road - Increase retention time	1, 5, 6, 8	7/20/1999	9/30/2020	D
BRV-0278	Brevard County (Unincorporated)	Road & Bridge	FL	Hidden Pine Ranchettes - Swale system	1, 5, 6, 8	7/20/1999	9/30/2020	D
BRV-0279	Brevard County (Unincorporated)	Road & Bridge	FL	Friday Acres - Replace damaged pipe	1, 5, 6, 8	7/20/1999	9/30/2020	D
BRV-0280	Brevard County (Unincorporated)	Road & Bridge	FL	Gracia Estates - Raise and evaluate	1, 5, 6, 8	7/20/1999	9/30/2020	D
BRV-0281	Brevard County (Unincorporated)	Road & Bridge	FL	Hall, Cheese Hammock, etc - Drainage	1, 5, 6, 8	7/20/1999	9/30/2020	D
BRV-0282	Brevard County (Unincorporated)	Road & Bridge	FL	Judaon Road - Pave road	1, 5, 6, 8	7/20/1999	9/30/2020	D
BRV-0283	Brevard County (Unincorporated)	Road & Bridge	FL	Barton Blvd, West Extension - Pave road	1, 5, 6, 8	7/20/1999	9/30/2020	D
BRV-0284	Brevard County (Unincorporated)	Road & Bridge	UL	Rockledge Drive (South) -	1, 5, 6, 8	7/20/1999	9/30/2020	D
BRV-0285	Brevard County (Unincorporated)	Road & Bridge	FL	Serollito Blvd - Improve road & drainage	1, 5, 6, 8	7/20/1999	9/30/2020	D
BRV-0286	Brevard County (Unincorporated)	Road & Bridge	W	Rango, Lako, Gray Roads - Drainage	1, 5, 6, 8	7/20/1999	9/30/2020	C
BRV-0287	Brevard County (Unincorporated)	Road & Bridge	FL	North Gray Road - Drainage	1, 5, 6, 8	7/20/1999	9/30/2020	D
BRV-0288	Brevard County (Unincorporated)	Road & Bridge	FL	Lake Drive, Cocoa - Drainage	1, 5, 6, 8	7/20/1999	9/30/2020	D
BRV-0289	Brevard County (Unincorporated)	Road & Bridge	FL	Mathers Bridge - Replace Bridge	1, 5, 6, 8	8/20/1995	9/30/2020	D

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Number	Jurisdiction	Responsible Organization	Hazard	Project Description	Funding Source	Date	Estimated Completion	Status
BRV-0290	Brevard County (Unincorporated)	Road & Bridge	FL	555 Cone Road - Rep Storm Damage Facility	1, 5, 6, 8	6/20/1999	9/30/2020	D
BRV-0291	Brevard County (Unincorporated)	Road & Bridge	FL	Cone Rd, Office Bldg & Storage - Shutters	1, 5, 6, 8	7/20/1999	9/30/2020	D
BRV-0292	Brevard County (Unincorporated)	Road & Bridge	FL	Werner Way - Replace Damaged Facilities	1, 5, 6, 8	7/20/1999	9/30/2020	D
BRV-0293	Brevard County (Unincorporated)	Road & Bridge	FL	#40C-07 Office and Storage Fac - Shutters	1, 5, 6, 8	7/20/1999	9/30/2020	D
BRV-0294	Brevard County (Unincorporated)	Road & Bridge	W	East, Citrus River Marshes - Drainage	1, 5, 6, 8	7/20/1999	9/30/2020	D
BRV-0295	Brevard County (Unincorporated)	Road & Bridge	FL	East (8) Areas Joseph/Pine Is - Drainage	1, 5, 6, 8	7/20/1999	9/30/2020	D
BRV-0296	Brevard County (Unincorporated)	Road & Bridge	FL	MacArthur - Jooints - Drainage	1, 5, 6, 8	7/20/1999	9/30/2020	D
BRV-0297	Brevard County (Unincorporated)	Road & Bridge	FL	Pinebreeze Park - Drainage	1, 5, 6, 8	7/20/1999	9/30/2020	D
BRV-0298	Brevard County (Unincorporated)	Road & Bridge	FL	Riviera Blvd, North Riverside - Drainage	1, 5, 5, 8	7/20/1999	9/30/2020	D
BRV-0299	Brevard County (Unincorporated)	Road & Bridge	W	Lake Washington, Wickham - Drainage	1, 5, 6, 8	7/20/1999	9/30/2020	D
BRV-0300	Brevard County (Unincorporated)	Road & Bridge	FL	Parkway Drive, Wickham/Jarvis - Drainage	1, 5, 6, 8	6/20/1999	9/30/2020	D
BRV-0301	Brevard County (Unincorporated)	Road & Bridge	FL	Crook Road, Post/Parkway - Drainage	1, 5, 6, 8	7/20/1999	9/30/2020	D
BRV-0302	Brevard County (Unincorporated)	Road & Bridge	FL	Hatlock Road, Aurora/Lake Wash - Drainage	1, 5, 5, 8	7/20/1999	9/30/2020	D
BRV-0303	Brevard County (Unincorporated)	Road & Bridge	FL	Rodes Blvd, RR152/Ellis - Drainage	1, 5, 6, 8	7/20/1999	9/30/2020	D
BRV-0304	Brevard County (Unincorporated)	Road & Bridge	FL	N. Riverside, Eau Gallie/Coral - Drainage	1, 5, 6, 8	6/20/1999	9/30/2020	D
BRV-0305	Brevard County (Unincorporated)	Road & Bridge	FL	Wickham Road, Sarno/Ellis - Drainage	1, 5, 6, 8	7/20/1999	9/30/2020	D
BRV-0306	Brevard County (Unincorporated)	Road & Bridge	FL	Wickham Rd/Eau Gallie/Crook - Drainage	1, 5, 6, 8	7/20/1999	9/30/2020	D

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Number	Jurisdiction	Responsible Organization	Hazard	Project Description	Funding Source	Date	Estimated Completion	Status
BRV-0207	Brevard County (Unincorporated)	Road & Bridge	UL	Old Dixie Highway, Grant/Sea1 - Drainage	1, 5, 6, 8	7/20/1999	9/30/2020	D
BRV-0306	Brevard County (Unincorporated)	Road & Bridge	FL	Micox Road, Babcock/Bottle LA - Drainage	1, 5, 6, 8	7/20/1999	9/30/2020	D
BRV-0309	Brevard County (Unincorporated)	Road & Bridge	FL	Grant Road, Babcock/Brabrook - Drainage	1, 5, 6, 8	7/20/1999	9/30/2020	D
BRV-0310	Brevard County (Unincorporated)	Road & Bridge	FL	Bahama Drive, Rivers/Sea/Palm - Drainage	1, 5, 6, 8	7/20/1999	9/30/2020	D
BRV-0311	Brevard County (Unincorporated)	Road & Bridge	W	Lake Washington Estate, Dist 4 Drainage	1, 5, 6, 8	7/20/1999	9/30/2020	D
BRV-0312	Brevard County (Unincorporated)	Road & Bridge	FL	Cano Creek - Dist 3 & 5 - Drainage	1, 5, 6, 8	7/20/1999	9/30/2020	D
BRV-0313	Brevard County (Unincorporated)	Road & Bridge	FL	Simon Rd, West 105/South SR102 - Drainage	1, 5, 6, 8	9/20/1999	9/30/2020	D
BRV-0314	Brevard County (Unincorporated)	Road & Bridge	FL	Wickham, Seagrass South to PHS Drainage	1, 5, 6, 8	7/20/1999	9/30/2020	D
BRV-0315	Brevard County (Unincorporated)	Road & Bridge	W	Deer Run Subdivision - Drainage	1, 5, 6, 8	6/20/1999	9/30/2020	D
BRV-0316	Brevard County (Unincorporated)	Road & Bridge	FL	Valkaria, Micox/Babcock - Drainage Study	1, 5, 6, 8	7/20/1999	9/30/2020	D
BRV-0317	Brevard County (Unincorporated)	Road & Bridge	FL	Dist 5, Pineleaf/Franklin, ATA - Drainage	1, 5, 6, 8	7/20/1999	9/30/2020	D
BRV-0318	Brevard County (Unincorporated)	Road & Bridge	FL	Post/Aurora, Fort Leonard/Lake W - Drainage	1, 5, 6, 8	7/20/1999	9/30/2020	D
BRV-0319	Brevard County (Unincorporated)	Road & Bridge	FL	Wincover Farms - Drainage	1, 5, 6, 8	7/20/1999	9/30/2020	D
BRV-0320	Brevard County (Unincorporated)	Road & Bridge	W	Juno Pk, Police, Brandywine Drainage Study	1, 5, 6, 8	7/20/1999	9/30/2020	D
BRV-0321	Brevard County (Unincorporated)	Road & Bridge	FL	4690 N Wickham Rebuild Storage Facility	1, 5, 6, 8	7/20/1999	9/30/2020	D
BRV-0322	Brevard County (Unincorporated)	Road & Bridge	FL	4890 N Wickham - Repl Trailer w/ Building	1, 5, 6, 8	7/20/1999	9/30/2020	D
BRV-0323	Brevard County (Unincorporated)	Road & Bridge	FL	6170 SW Babcock - Rebuild of Pile & storage	1, 5, 6, 8	7/20/1999	9/30/2020	D

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BRV-0324	Brevard County (Unincorporated)	Road & Bridge	SS	1445 Wickham Wy- Rebuild Storage Facility	1, 5, 6, 8	7/20/1999	3/30/2020	D
BRV-0325	Brevard County (Unincorporated)	Road & Bridge	FL	4990 N Wickham - Replace Generator & Shed	1, 5, 6, 5	7/20/1999	3/30/2020	D
BRV-0366	Brevard County (Unincorporated)	Brevard County Parks & Recreation	W	Shutters, Cuyler Park Community Center	1, 5, 6, 5	7/20/1999	7/20/2020	D
BRV-0367	Brevard County (Unincorporated)	Brevard County Parks & Recreation	W	Shutters, Isaac Campbell Sr. Park Center	1, 5, 6, 5	7/20/1999	7/20/2020	D
BRV-0368	Brevard County (Unincorporated)	Brevard County Parks & Recreation	JL	Shutters, North Area Operations Center	1, 5, 6, 8	7/20/1999	7/20/2020	D
BRV-0369	Brevard County (Unincorporated)	Brevard County Parks & Recreation	W	Shutters, Port St. John Community Center	1, 5, 6, 8	7/20/1999	7/20/2020	D
BRV-0370	Brevard County (Unincorporated)	Brevard County Parks & Recreation	UL	Shutters, Tom Starcher Park Comm Center	1, 5, 6, 0	7/20/1999	7/20/2020	D
BRV-0371	Brevard County (Unincorporated)	Brevard County Parks & Recreation	UL	Shutters, Space Coast Comm Sport Complex	1, 5, 6, 8	7/20/1999	7/20/2020	D
BRV-0372	Brevard County (Unincorporated)	Brevard County Parks & Recreation	UL	Shutters, Merritt Island/Beach Maint Fac	1, 5, 6, 8	7/20/1999	7/20/2020	D
BRV-0373	Brevard County (Unincorporated)	Brevard County Parks & Recreation	UL	Shutters, Cocoa West Recreation Center	1, 5, 6, 5	7/20/1999	7/20/2020	D
BRV-0374	Brevard County (Unincorporated)	Brevard County Parks & Recreation	W	Shutters, Joe Lee Park Community Center	1, 5, 6, 8	7/20/1999	7/20/2020	D
BRV-0375	Brevard County (Unincorporated)	Brevard County Parks & Recreation	W	Shutters, Kiwanis Island Park Rec Center	1, 5, 6, 0	7/20/1999	7/20/2020	D
BRV-0377	Brevard County (Unincorporated)	Brevard County Parks & Recreation	W	Shutters, Travis Park Community Center	1, 5, 6, 0	7/20/1999	7/20/2020	D
BRV-0378	Brevard County (Unincorporated)	Brevard County Parks & Recreation	UL	Shutters, Veterans Mem Park Comm Bldg	1, 5, 6, 8	7/20/1999	7/20/2020	D
BRV-0379	Brevard County (Unincorporated)	Brevard County Parks & Recreation	W	Shutters, Whody Simpson Park Community Center	1, 5, 6, 8	7/20/1999	7/20/2020	D
BRV-0380	Brevard County (Unincorporated)	Brevard County Parks & Recreation	JL	Shutters, Max K. Rodes Community Bldg	1, 6, 6, 8	7/20/1999	7/20/2020	D
BRV-0382	Brevard County (Unincorporated)	Brevard County Parks & Recreation	UL	Emergency Radio Parks & Rec Admin Office	1, 5, 6, 8	7/20/1999	7/20/2020	D

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BRV-0323	Brevard County (Unincorporated)	Brevard County Parks & Recreation	W	Emergency Radio North Operations Area	1, 5, 6, 8	7/20/1999	7/20/2020	D
BRV-0324	Brevard County (Unincorporated)	Brevard County Parks & Recreation	W	Emergency Radio Central Operations Area	1, 5, 6, 8	7/20/1999	7/20/2020	D
BRV-0355	Brevard County (Unincorporated)	Brevard County Parks & Recreation	W	Emergency Radio South Operations Area	1, 5, 6, 8	7/20/1999	7/20/2020	D
BRV-0355	Brevard County (Unincorporated)	Brevard County Parks & Recreation	W	Generator, Gaylor Park Community Center	1, 5, 6, 8	7/20/1999	7/20/2020	D
BRV-0367	Brevard County (Unincorporated)	Brevard County Parks & Recreation	U	Generator, Isaac Campbell St. Park	1, 5, 6, 8	7/20/1999	7/20/2020	D
BRV-0368	Brevard County (Unincorporated)	Brevard County Parks & Recreation	UL	Generator, Manatee Hammock Campground	1, 5, 6, 8	7/20/1999	7/20/2020	D
BRV-0397	Brevard County (Unincorporated)	Brevard County Parks & Recreation	W	Generator, Station Park Community Center	1, 5, 6, 8	7/20/1999	7/20/2020	D
BRV-0398	Brevard County (Unincorporated)	Brevard County Parks & Recreation	UL	Generator, Central Area Park Operations	1, 5, 6, 8	7/20/1998	7/20/2020	D
BRV-0394	Brevard County (Unincorporated)	Brevard County Parks & Recreation	LL	Generator, Central Area Parks / Mainland	1, 5, 6, 8	7/20/1999	7/20/2020	D
BRV-0395	Brevard County (Unincorporated)	Brevard County Parks & Recreation	UL	Generator, Cocoa West Recreation Complex	1, 5, 6, 8	7/20/1999	7/20/2020	D
BRV-0396	Brevard County (Unincorporated)	Brevard County Parks & Recreation	UL	Generator, Joe Lee Smith Park	1, 5, 6, 8	7/20/1999	7/20/2020	D
BRV-0397	Brevard County (Unincorporated)	Brevard County Parks & Recreation	UL	Generator, Kiwanis Island Park Community Center	1, 5, 6, 8	7/20/1999	7/20/2020	D
BRV-0399	Brevard County (Unincorporated)	Brevard County Parks & Recreation	UL	Generator, Travis Park Community Center	1, 5, 6, 8	7/20/1999	7/20/2020	D
BRV-0400	Brevard County (Unincorporated)	Brevard County Parks & Recreation	UL	Generator, Woody Simpson Park Community Center	1, 5, 6, 8	7/20/1999	7/20/2020	D
BRV-0402	Brevard County (Unincorporated)	Brevard County Parks & Recreation	LL	Generator, Long Point Park Campground	1, 5, 6, 8	7/20/1999	7/20/2020	D
BRV-0407	Brevard County (Unincorporated)	School Board	ALL	Oak Park Elementary - Generator/Wiring	8	10/1/2014	2005	C
BRV-0410	Brevard County (Unincorporated)	School Board	U	Melbourne High School, Wiring	8	10/1/2014	2008	C

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BRV-0413	Brevard County (Unincorporated)	School Board	UI	Apollo Elem School-Generator/Wiring	8	7/20/1999	2020	D
BRV-0424	Brevard County (Unincorporated)	Road & Bridge	FL	Merrill Park - Stormwater improvements	1, 5, 6, 8	9/20/1999	9/30/2020	D
BRV-0425	Brevard County (Unincorporated)	Road & Bridge	FL	Skysark Blvd. - Drainage	1, 5, 6, 8	7/20/1999	9/30/2020	D
BRV-0426	Brevard County (Unincorporated)	Emergency Management	W	I.M.S Financial Issues	1, 2, 5, 6, 8	8/23/1999	8/30/2030	L
BRV-0446	Brevard County (Unincorporated)	Emergency Management	W	Barfoot Bay - Shelters	1, 2, 5, 6, 8	5/24/1999	9/30/2030	D
BRV-0447	Brevard County (Unincorporated)	Emergency Management	W	Create I.M.S Coordinator Position	1, 2, 5, 6, 8	7/20/1999	9/30/2030	D
BRV-0524	Brevard County (Unincorporated)	Sheriff's Office	ALL	Replace 125 800Mhz Radios	800 MHz	7/20/1999	7/1/2005	C
BRV-0528	Brevard County (Unincorporated)	Natural Resources	FL	Old Oaks Lodge Hammock	1, 5, 6, 8,	7/20/1999	12/31/30	D
BRV-0527	Brevard County (Unincorporated)	Solid Waste	FL	Shutters Sarno and Central Disposal Fac	SWU, 5	7/20/1999	08/31/11	C
BRV-0523	Brevard County (Unincorporated)	Natural Resource	All	Crane Creek St. Johns Outfall Imp.	SWU, 5	11/18/2004	08/31/13	C
BRV-0554	Brevard County (Unincorporated)	Natural Resources	FL	Sarno Lakes Phase 2	SWU, 5	7/20/1999	08/31/13	C
BRV-0585	Brevard County (Unincorporated)	Natural Resources	FL	Upper east Galie Improvements	SWU, 5	11/18/2004	9/30/2030	D
BRV-0616	Brevard County (Unincorporated)	Fire and Rescue	W	Provide Bay Doors for 33 Fire Station	1, 2, 5, 6, 8	11/15/2004	8/30/2030	D
BRV-0620	Brevard County (Unincorporated)	Natural Resources	FL	South Beach Residents' Prop Acquisition	SWU/HROS LWP	10/30/2008	05/15/09	C
BRV-0621	Brevard County (Unincorporated)	Natural Resources	FL, SS	South Beaches Vacant Property Acquisition	SWU, 5	5/21/2000	12/31/20	D
BRV-0622	Brevard County (Unincorporated)	Natural Resources	FL	South Beaches Commercial Prop Acquisition	SWU, 1	10/30/2008	04/30/15	IP
BRV-0623	Brevard County (Unincorporated)	Transportation Engineering	ALL	Traffic Operations Relocation	8	11/18/2004	8/30/2015	IP

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BRV-0624	Brevard County (Unincorporated)	Transportation Engineering	FL	Intelligent Transportation System (ITS)	1, 5, 6, 8	11/16/2004	9/30/2020	D
BRV-0625	Brevard County (Unincorporated)	Transportation Engineering	FL	Convert Traffic Signal to Mast Arm Asmt	1, 5, 6, 8	11/16/2004	9/30/2020	D
BRV-0626	Brevard County (Unincorporated)	Transportation Engineering	FL	Retrolit Traffic Signal Emergency Power	1, 5, 6, 8	11/16/2004	9/30/2020	D
BRV-0627	Brevard County (Unincorporated)	Transportation Engineering	UI	Emergency Communications Equipment	8	11/16/2004	9/30/2020	IP
BRV-0628	Brevard County (Unincorporated)	Transportation Engineering	FL	Repetitive Loss Property Acquisition 1	1, 5, 6, 8	11/16/2004	9/30/2020	D
BRV-0629	Brevard County (Unincorporated)	Transportation Engineering	FL	Repetitive Loss Property Acquisition 2	8	11/16/2004	9/30/2015	IP
BRV-0630	Brevard County (Unincorporated)	Transportation Engineering	FL	Repetitive Loss Property Acquisition 3	1, 5, 6, 8	11/16/2004	9/30/2020	D
BRV-0631	Brevard County (Unincorporated)	Transportation Engineering	FL	Repetitive Loss Property Acquisition 4	1, 5, 6, 8	11/16/2004	9/30/2020	D
BRV-0632	Brevard County (Unincorporated)	Transportation Engineering	FL	Repetitive Loss Property Acquisition 5	1, 5, 6, 8	11/16/2004	9/30/2020	D
BRV-0633	Brevard County (Unincorporated)	Transportation Engineering	UI	Repetitive Loss Property Acquisition 6	8	11/16/2004	9/30/2015	IP
BRV-0634	Brevard County (Unincorporated)	Transportation Engineering	FL	Repetitive Loss Property Acquisition 7	1, 5, 6, 8	6/20/1999	9/30/2020	D
BRV-0635	Brevard County (Unincorporated)	Transportation Engineering	FL	Repetitive Loss Property Acquisition 8	1, 5, 6, 8	11/16/2004	9/30/2020	D
BRV-0636	Brevard County (Unincorporated)	Transportation Engineering	FL, SS	Repetitive Loss Property Acquisition 9	1, 5, 6, 8	11/16/2004	9/30/2020	IP
BRV-0643	Brevard County (Unincorporated)	Fire and Rescue	W	Fire Station 65 Hardening	8	11/16/2004	7/25/2012	D
BRV-0644	Brevard County (Unincorporated)	Fire and Rescue	W	Fire Station 64 Hardening	8	7/20/1999	7/25/2012	D
BRV-0645	Brevard County (Unincorporated)	Fire and Rescue	W	Fire Station 62 Hardening	1, 2, 5, 6, 8	11/16/2004	9/30/2030	D
BRV-0646	Brevard County (Unincorporated)	Fire and Rescue	FR	Fire Station 63 Hardening	8	7/20/1999	4/1/2015	D

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BRV-0547	Brevard County (Unincorporated)	American Red Cross	All	Purchase 1000 Coats & 20 Trailers	8	11/16/2004	2015	IP 50%
BRV-0548	Brevard County (Unincorporated)	American Red Cross	W	American Red Cross HQ - Shutters	8	11/16/2004	2010	C
BRV-0567	Brevard County (Unincorporated)	Fire and Rescue	UL	Fire Station 21 Hardening	1, 2, 5, 6, 8	1/19/2005	9/30/2030	D
BRV-0568	Brevard County (Unincorporated)	Fire and Rescue	W	Fire Station 87 Hardening	1, 2, 5, 6, 8	7/20/1999	9/30/2030	D
BRV-0569	Brevard County (Unincorporated)	Wuesthoff Health Systems	UL	Wuesthoff Prog Care Facility Hardon Win/Door	8	1/19/2005	2025	D
BRV-0570	Brevard County (Unincorporated)	Wuesthoff Health Systems	W	Assisted Liv Care Harder Win/Door Shutters	8	11/18/1999	2011	C
BRV-0572	Brevard County (Unincorporated)	Florida Solar Energy Center	UL	Post Disaster Building Codes Updates	1, 5, 6, 8	1/19/2005	9/30/2025	D
BRV-0573	Brevard County (Unincorporated)	Florida Solar Energy Center	UL	Develop Renewable Power Site Plan Guideline	1, 5, 6, 8	1/19/2005	9/30/2025	D
BRV-0577	Brevard County (Unincorporated)	Florida Solar Energy Center	UL	Purchase Portable Renewable Generators	1, 5, 6, 8	1/19/2005	9/30/2025	D
BRV-0578	Brevard County (Unincorporated)	Florida Solar Energy Center	W, H	Purchase Fuel Cell Generator Trailers	1, 5, 6, 8	1/19/2005	9/30/2025	D
BRV-0579	Brevard County (Unincorporated)	Florida Solar Energy Center	UL	Building Durability & Moisture Intrusion	1, 5, 6, 8	1/19/2005	9/30/2025	D
BRV-0600	Brevard County (Unincorporated)	Florida Solar Energy Center	UL	Solar Water Heating for Hotels	1, 5, 6, 8	11/16/2004	9/30/2025	D
BRV-0681	Brevard County (Unincorporated)	Florida Solar Energy Center	UL	Keep the Lights on for Special Need Homes	1, 5, 6, 8	1/19/2005	9/30/2025	D
BRV-0683	Brevard County (Unincorporated)	Florida Solar Energy Center	UL	Alternative Fuel Cell Emergency Vehicle	1, 5, 6, 8	11/16/2004	9/30/2025	D
BRV-0685	Brevard County (Unincorporated)	Circles of Care	UL	2020 Commerce Dr - Generator	1, 5, 6, 8	1/19/2005	9/30/2030	D
BRV-0688	Brevard County (Unincorporated)	Circles of Care	UL	4001 Stensson Rd - Generator	1, 5, 6, 8	1/19/2005	9/30/2030	D
BRV-0687	Brevard County (Unincorporated)	Circles of Care	UL,W	2000 Commerce Dr - Shutters & Generator	1, 5, 6, 8	1/19/2005	9/30/2030	D

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BRV-0688	Brevard County (Unincorporated)	Circles of Care	W	400 E. Sheridan Rd. - Build Storage Shed	1, 5, 6, 8	1/19/2005	9/30/2030	D
BRV-0609	Brevard County (Unincorporated)	Circles of Care	W	400 E. Sheridan Rd. - Hardie Siding	1, 5, 6, 8	1/10/2005	9/30/2030	D
BRV-0602	Brevard County (Unincorporated)	Brevard Amateur Radio Emergency Service	A	Enhance Emergency Amateur Comm Network	1, 5, 6, 8	1/19/2005	9/30/2020	D
BRV-0693	Brevard County (Unincorporated)	Brevard Amateur Radio Emergency Service	All	Update Emerg. Amateur Mobile Service Comm Vehicle	1, 2, 5, 6, 8	1/19/2005	9/30/2020	D
BRV-0896	Brevard County (Unincorporated)	Wuesthoff Health Systems	W	Wuesthoff Medical Center - Generator	8	11/19/2004	2025	D
BRV-0897	Brevard County (Unincorporated)	Wuesthoff Health Systems	W	Wuesthoff Medical Center - Replace Roof	8	11/18/2004	2025	D
BRV-0700	Brevard County (Unincorporated)	School Board	W	Emergency Protective Meas for Edu Svc Fac	8	1/16/2005	2025	D
BRV-0701	Brevard County (Unincorporated)	School Board	UL	BDOEM Space Needs Shelters - Generators	By EOC	10/1/2014	2010	C
BRV-0703	Brevard County (Unincorporated)	School Board	JL	Shutter Installation - Central Middle School	5	10/1/2014	2013	C
BRV-0705	Brevard County (Unincorporated)	School Board	UI	Potable Water Tanks & Sew Res for E-HPA's	8	10/1/2014	2008	C
BRV-0706	Brevard County (Unincorporated)	School Board	UL	Communication Improvements @ Heritage HS	5	10/1/2014	2009	C
BRV-0738	Brevard County (Unincorporated)	Natural Resources	E, SS	Flood Hazard Mitigation-Kingsmill St. Div. Pamphile Rd & Aurora Rd	5	11/16/2004	12/31/30	D
BRV-0740	Brevard County (Unincorporated)	Natural Resources	E, SS	Flood Hazard Mitigation Window Frames, Lake Washington/Post Road residential areas	5	11/16/2004	12/31/30	D
BRV-0743	Brevard County (Unincorporated)	Animal Services	All	Purchase of a pick up truck and livestock trailer	1, 5, 6, 8	10/30/2008	7/20/2020	D
BRV-0744	Brevard County (Unincorporated)	Animal Services	All	Improve Pasture Area @ the South Animal Care Center	1, 5, 6, 8	10/30/2008	7/20/2020	D
BRV-0745	Brevard County (Unincorporated)	Animal Services	All	Expansion of the North Animal Care Center	1, 5, 6, 8	10/30/2008	7/20/2020	D

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BRV-0748	Brevard County (Unincorporated)	Animal Services	All	expansion of the South Animal Care Center	1, 5, 6, 8	10/30/2008	7/20/2020	D
BRV-0751	Brevard County (Unincorporated)	Natural Resources	F-	Broadway Drainage Hardening	5, 8	10/30/2008	06/30/14	IP
BRV-0752	Brevard County (Unincorporated)	Natural Resources	FL	Flood hazard mitigation - West Coast	SWU, 5	11/18/2004	10/31/14	IP
BRV-0753	Brevard County (Unincorporated)	Natural Resources	E, SS	Flood hazard mitigation north Merritt Island	SWU, 5	11/18/2004	12/31/20	C
BRV-0755	Brevard County (Unincorporated)	Water Resources	UI	Slip Lining Beachside sewer lines	8	1/19/2005	2010	IP
BRV-0774	Brevard County (Unincorporated)	Library Services	FL	Central Brevard Library - Generator	EPA/TMDL DEP/NFP SRR/WAC	10/30/2008	11/30/14	IP
BRV-0787	Brevard County (Unincorporated)	Emergency Management	All	New Brevard County EOC and PSAAP Center	1, 2, 5, 6, 8	12/18/2013	12/18/2023	N
BRV-0793	Brevard County (Unincorporated)	Brevard County Parks & Recreation	UL	Generator - Barber Island Environmental Center	1, 5, 6, 8	8/29/2014	8/29/2024	N
BRV-0796	Brevard County (Unincorporated)	Brevard County Parks & Recreation	UL	Generator - Fudge Athletic Complex Maintenance Facility	1, 5, 6, 8	8/29/2014	8/29/2024	N
BRV-0799	Brevard County (Unincorporated)	Brevard County Parks & Recreation	UL	Generator - Irons H. Canova	1, 5, 6, 8	8/29/2014	8/29/2024	N
BRV-0806	Brevard County (Unincorporated)	Brevard County Parks & Recreation	UL	Generator - PCWMA Park	1, 5, 6, 8	8/29/2014	8/29/2024	N
BRV-0807	Brevard County (Unincorporated)	Brevard County Parks & Recreation	UL	Generator - Sam's House Environmental Center	1, 5, 6, 8	8/29/2014	8/29/2024	N
BRV-0808	Brevard County (Unincorporated)	Brevard County Parks & Recreation	UL	Generator - Sawgrass Golf Course Maintenance Facility	1, 5, 6, 8	8/29/2014	8/29/2024	N
BRV-0809	Brevard County (Unincorporated)	Brevard County Parks & Recreation	UL	Generator - Viera Regional Park Maintenance Facility	1, 5, 6, 8	8/29/2014	8/29/2024	N
BRV-0817	Brevard County (Unincorporated)	Brevard County Parks & Recreation	W	Shutters - Sam's House Environmental Center	1, 5, 6, 8	8/29/2014	8/29/2024	N
BRV-0819	Brevard County (Unincorporated)	Brevard County Parks & Recreation	W	Shutters - Sawgrass Golf Course Clubhouse	1, 5, 6, 8	8/29/2014	8/29/2024	N

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Number	Jurisdiction	Responsible Organization	Hazard	Project Description	Funding Source	Date	Estimated Completion	Status
BRV-0820	Brevard County (Incorporated)	Brevard County Parks & Recreation	W	Shutters - Seaside near Meeting HCL	1, 5, 8, 8	8/29/2014	6/29/2024	N
BRV-0821	Brevard County (Unincorporated)	Brevard County Parks & Recreation	W	Shutters - Spessard Hot and Golf Course Clubhouse	1, 5, 6, 8	8/29/2014	6/29/2024	N
BRV-0822	Brevard County (Unincorporated)	Brevard County Parks & Recreation	UL	Generator - Space Coast Comm. Sports Complex Maintenance Facility	1, 5, 6, 5	8/20/2014	6/29/2024	N
BRV-0823	Brevard County (Unincorporated)	Brevard County Parks & Recreation	UL	Generator - Spessard Holland Golf Course Maintenance Facility	1, 5, 6, 8	8/20/2014	8/20/2024	N
BRV-0142	Cape Canaveral	City Hall/Admin.	JI	Telephone emergency alert system	5	11/18/1999	2011	C
BRV-0143	Cape Canaveral	Public Works	FL, W	Sewer Lift Stations - 60 Kw Generator	5	11/18/1999	2018	D
BRV-0145	Cape Canaveral	Public Works	UL	Cape Canaveral stormwater upgrade	5	11/18/1999	2018	D
BRV-0146	Cape Canaveral	Public Works	W, UL	Portable Lighting Generator	5	11/18/1999	2018	C
BRV-0148	Cape Canaveral	Public Works	FL, SS, L	Clean, restore 3,000 ft. of drainage canal	5	11/18/1999	2016	D
BRV-0102	Cocoa	Fire Department	W, UL	Emergency generators at 3 Fire Stations	8	5/8/1999	6/30/2020	D
BRV-0108	Cocoa	Utilities	UL	Generators at 15 lift stations	8	5/8/1999	6/30/2020	D
BRV-0113	Cocoa	Utilities	W	Replace roll-up door JPSS	8	5/8/1999	6/30/2020	D
BRV-0119	Cocoa	Utilities	UL	Emerg Power Generator Industrial P&G	8	1/15/1999	6/30/2020	D
BRV-0110	Cocoa	Utilities	U	Generator Utilities Admin Bldg	8	5/8/1999	2012	C
BRV-0122	Cocoa	Utilities	W	Storm shutters on HS pump bldg Dyal WTP	8	5/8/1999	12/31/2013	C
BRV-0123	Cocoa	Utilities	W	Replace roll-up door Viewahatchee WTP	8	5/8/1999	6/30/2020	D
BRV-0248	Cocoa	Fire Department	W	Install storm shutters Ocean Gate Centers	8	5/8/1999	6/30/2020	D
BRV-0247	Cocoa	Fire Department	W	Remove single window from Fire Sta 2	8	5/8/1999	10/1/2014	C
BRV-0756c	Cocoa	Public Works	W	Strengthen Public Works Facility	8	1/19/2005	8/30/2020	D
BRV-0757	Cocoa	Public Works	FL	Diamond Square Drainage Improvements	8	1/19/2005	2012	C
BRV-0756a	Cocoa	Public Works	W	Reconstruct Fire Station #2	8	1/19/2005	6/30/2020	D
BRV-0340	Cocoa Beach	Public Works	FL	Storm Shutters - Fire Station #1	8	1/15/1999	5/10/2005	C
BRV-0342	Cocoa Beach	Public Works	W	Storm Shutter - Fire Station #2	8	1/15/1999	3/1/2005	C
BRV-0343	Cocoa Beach	Public Works	W	Storm Shutters - Utilities	8	1/15/1999	11/1/2004	C
BRV-0545	Cocoa Beach	Public Works	W	Recreation Storm Shutters	8	1/15/1999	2/29/2015	U
BRV-0337	Cocoa Beach	Public Works	W	Traffic Control Devices (emergency)	8	1/15/1999	8/1/2008	C

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Funding Source: 1-PDM (Post Disaster Mitigation) 2-SHSP (State Homeland Security Program) 3-CDRG (Community Development Block Grant) 4-FMA (Flood Mitigation Assistance) 5-HMGP (Hazard Mitigation Grant Program) 6-PA (Public Assistance) 7-SRLP (Severe Repetitive Loss Program) 8-General Fund (Jurisdiction Annual Budget) Other specific funding sources are spelled out in column								
Status: C-Completed D-Deferred Funding Unavailable N-New U-Updated IP-In Progress (and % complete)								
Number	Jurisdiction	Responsible Organization	Hazard	Project Description	Funding Source	Date	Estimated Completion	Status
BRV-0434	Cocoa Beach	Stormwater Utility	FL	Atlantic Av Stormwater Project	4	10/15/2014	1/15/2017	U
BRV-0436	Cocoa Beach	Stormwater Utility	ALL	Downtown Stormwater Project	FDEP/FDOT/IRLN:FP	10/15/2014	11/15/2017	IP (design)
BRV-0759	Cocoa Beach	Stormwater Utility	FL	Fairways RR Flood Mitigation	8	1/15/1999	1/15/2011	C
BRV-0788	Cocoa Beach	Fire Department	L	Citywide Lightning Protection System	5, 6	6/29/2014	3/1/2016	N
BRV-0789	Cocoa Beach	Communications	UL	Communications Tower	2, 8	8/20/2014	1/15/2016	N
BRV-0790	Cocoa Beach	Fire Department	UL	VHF back-up radio system	1, 2	8/20/2014	6/30/2015	N
BRV-0784	Grant Valkaria	Town Hall	FL	Stormwater Master Plan	8	10/30/2008	3/1/2014	C
BRV-0785	Grant-Valkaria	Town Hall	FL	Emergency radios	1, 5, 6, 8	10/30/2008	1/1/2020	D
BRV-0786	Grant-Valkaria	Town Hall	AL	Town Hall	8	10/30/2008	3/1/2014	C
BRV-0791	Grant-Valkaria	Town Hall	UL	Emergency Generator for New Town Hall	1, 6	8/29/2014	8/29/2024	N
BRV-0795	Grant-Valkaria	Brevard County Parks & Recreation	UL	Generator - Habitat Golf Course Maintenance Facility	1, 5, 6, 8	8/29/2014	8/29/2024	N
BRV-0814	Grant-Valkaria	Brevard County Parks & Recreation	W	Shutters - Habitat Golf Course Clubhouse	1, 5, 6, 8	8/29/2014	8/29/2024	N
BRV-0734	Indian Harbour Beach	Fire/Rescue Department	W	Replace Bay Doors to wind-resistant doors	8	9/20/2009	Mar-11	C
BRV-0779	Indian Harbour Beach	Public Works	W	Public Works Garage Doors	8, 6	9/20/2009	Sep-19	D
BRV-0780	Indian Harbour Beach	Public Works	W	Nanco Park Restrooms	8, 6	9/20/2009	Sep-19	D
BRV-0002	Indian Harbour Beach	City Hall/Admin.	W	Retrofit Ind Harbour Main Drainage Canal	1, 6	2/4/2014	1/1/2020	D
BRV-0003	Indian Harbour Beach	Fire Department	FR	Replacing Engine 356 (20yrs old)	6	2/4/2014	1/1/2025	D
BRV-0004	Indian Harbour Beach	Fire Department	FR	Replacing Ladder Truck 26 (15yrs old)	6	2/4/2014	1/1/2025	D
BRV-0005	Indian Harbour Beach	Fire Department	W, FR	Replacing SCBA bottles/packs	6	2/4/2014	1/1/2025	D
BRV-0006	Indian Harbour Beach	Fire Department	W	Extending Southside Fire Bays	8	1/15/1999	1/1/2025	D
BRV-0007	Indian Harbour Beach	City Hall/Admin.	FR, UL	Hooking up power & Adding generator to (RC) storage unit. Part of COOP Plan.	8	2/4/2014	1/1/2020	D
BRV-0808	Indian Harbour Beach	Brevard County Parks & Recreation	UL	Generator - North Beaches Maintenance Facility	1, 5, 6, 8	8/29/2014	8/29/2024	N
BRV-0792	Malabar	Town Hall	W	Town Hall (Shutters/Window Relief) Greening	5, 6, 8	8/28/2014	8/30/2016	N
BRV-0795	Malabar	Brevard County Parks & Recreation	UL	Generator - Habitat Golf Course Maintenance Facility	1, 5, 6, 8	8/29/2014	8/29/2024	N

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Number	Jurisdiction	Responsible Organization	Hazard	Project Description	Funding Source	Date	Estimated Completion	Status
BRV-0814	Maitland	Brevard County Parks & Recreation	W	Shutters - Habitat Golf Course Clubhouse	1, 5, 6, 8	8/28/2014	8/28/2024	N
BRV-0168	Melbourne	City Hall/Admin.	U	Streets Dept - Generator Bldg	1, 4, 5, 6, 8	7/20/1999	1/1/2020	D
BRV-0404	Melbourne	Brevard County Parks & Recreation	UL	Generator, Wickham Park Campground	1, 5, 6, 8	7/20/1999	7/20/2020	D
BRV-0812	Melbourne	City Hall/Admin.	W	Intersection at 7 locations - Mast Annis Front St. Park	8	11/16/2004	9/30/2014	C
BRV-0813	Melbourne	City Hall/Admin.	E	Shoreline Stabilization	8	11/16/2004	6/8/2006	C
BRV-0733	Melbourne	Public Works	E	US 1 Specific Corridor Stormwater Washout	1301	1/19/2005	12/16/2013	C
BRV-0810	Melbourne	Brevard County Parks & Recreation	UL	Generator - Wickham Park Maintenance Facility	1, 5, 6, 8	8/29/2014	8/29/2024	N
BRV-0811	Melbourne	Brevard County Parks & Recreation	UL	Generator - Wickham Park Senior Center	1, 5, 6, 8	8/29/2014	8/29/2024	N
BRV-0825	Melbourne	Public Works	FL	Dairy Road at Kanawha Street Drainage Improvements	4, 5, 7, 8	5/15/2015	2020	N
BRV-0826	Melbourne	Public Works	FL	Edgewood Drive North Bank Erosion Control	4, 5, 7, 8	6/15/2015	2020	N
BRV-0827	Melbourne	Public Works	FL	Florida Ave Drainage Improvements	4, 5, 7, 8	6/15/2015	2020	N
BRV-0204	Melbourne Beach	Town Hall	UL	Incorp Mitigation Strategy to Comp Plan 8th Ave Area - Stormwater Drainage	5	10/30/2009	2016	IP 10%
BRV-0205	Melbourne Beach	Town Hall	ALL	8th Ave Area - Stormwater Drainage	5	11/18/1998	2010	C
BRV-0740	Melbourne Beach	Town Hall	FL, SS	Basin 8- Fine Street	5	11/18/1998	2015	C
BRV-0778	Melbourne Beach	Public Works	FL, SS	Orange ST Excavation	8	10/30/2008	2020	U
BRV-0215	Melbourne Village	Town Hall/Police Dept.	W	Town Hall/Police Department Shutters	8	6/14/1999	2008	C
BRV-0216	Melbourne Village	Town Hall/Police Dept.	U	Town Hall Police Department Generator	8	6/14/1999	2009	C
BRV-0217	Melbourne Village	Town Hall/Police Dept.	U	Rights-of-Way Tree Trimming	8	6/14/1999	2005	C
BRV-0218	Melbourne Village	Town Hall/Police Dept.	W	Town Garage Shutters	5	6/14/1999	2009	C
BRV-0219	Melbourne Village	Town Hall/Police Dept.	Ad. Hazards	Purchase Emergency Communication Equip.	8	6/14/1999	2009	C
BRV-0220	Melbourne Village	Town Hall/Police Dept.	W	Purchase A Watercouse Pump	8	6/14/1999	2009	C
BRV-0128	Palm Bay	Public Works	E	Basin 11 Powell Subdivision Drainage	3	7/20/1999	9/30/2007	C
BRV-0130	Palm Bay	Public Works	FL	Basin 2 Kingwood Dr-Drainage	3	7/20/1999	1/31/2015	IP
BRV-0135	Palm Bay	Public Works	FL	Spine Traffic Signal-Backup power	8	7/20/1999	10/31/2013	C

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Number	Jurisdiction	Responsible Organization	Hazard	Project Description	Funding Source	Date	Estimated Completion	Status
BRV-0187	Palm Bay	Fire Department	ALL	Training Facility	Hire Impact Fee	7/20/1999	9/30/2016	U
BRV-0492	Palm Bay	Public Works	W	Upgrade Communications Equipment	8	11/9/2004	9/30/2019	D
BRV-0506	Palm Bay	Public Works	FL	Basin 1 Reduce/Elim Flood Relieve Flood	SJRWMD/ DCA	7/20/1999	1/7/2008	C
BRV-0544	Palm Bay	Public Works	UL	Backup Generators-Traffic	8	11/9/2004	5/31/2005	C
BRV-0756	Palm Bay	Public Works	FL	Basin 3 Drainage System improvements	8	11/9/2004	9/30/2011	C
BRV-0736	Palm Bay	Police Department	FL	Intervehicle Communication Equipment	1, 5, 8, 8	7/20/1999	9/30/2019	D
BRV-0737	Palm Bay	Emergency Management	ALL	Standby Generator	1, 5, 6, 8	7/20/1999	9/30/2018	D
BRV-0759	Palm Bay	Utilities	W	Utility Operations Facility Reliclit	1, 5, 6, 8	11/16/2004	9/30/2019	D
BRV-0760	Palm Bay	Police Department	ALL	Law Enforcement Mobile Command Vehicle	US DOJ - COPS Grant & LETF Funds	11/9/2004	9/30/2012	C
BRV-0782	Palm Bay	Public Works	FL	Malabar Road Pipe Failures	1, 5, 8, 8	10/1/2014	9/30/2019	D
BRV-0797	Palm Bay	Brevard County Parks & Recreation	UL	Generator - Greater Palm Bay Senior Center	1, 5, 6, 8	5/25/2014	8/29/2024	N
BRV-0806	Palm Bay	Brevard County Parks & Recreation	UL	Generator - Palm Bay Regional Park Maintenance Facility	1, 5, 6, 8	6/29/2014	8/29/2024	N
BRV-0812	Palm Bay	Brevard County Parks & Recreation	W	Shutters - Greater Palm Bay Senior Center	1, 5, 6, 8	8/29/2014	8/29/2024	N
BRV-0810	Palm Shores	Town Hall/Admin.	W	Town Hall - Wind Relief	8	11/16/2004	2005	C
BRV-0811	Palm Shores	Town Hall/Admin.	All	Purchase 10 800 MHz radios	8	11/16/2004	2009	D
BRV-0827	Rockledge	City Hall (Building)	UL	Samoa Blvd. - Drainage Improvements	8		Jan-17	IP
BRV-0828	Rockledge	City Hall (Building)	W	WWTF - Emergency Vehicle Storage	1, 5, 8	11/16/2004	2017	U
BRV-0832	Rockledge	City Hall (Building)	ALL	North/South Master Canal - Drainage	STORM WATER	11/16/2004	2008	C
BRV-0830	Rockledge	City Hall (Building)	ALL	Casa Loma - Drainage	STORM WATER	11/16/2004	2015	IP
BRV-0840	Rockledge	City Hall (Building)	All	Carlton Park Drainage Improvements	1,5,8	11/16/2004	2016	D

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Number	Jurisdiction	Responsible Organization	Hazard	Project Description	Funding Source	Date	Estimated Completion	Status
BRV-0042	Rockledge	City Hall (Building)	FL	Pipe Line/Fork Lift - canal	1, 5, 6	11/18/1999	2010	D
BRV-0598	Rockledge	Brevard County Parks & Recreation	W	Generator, McLarty Park Community Center	1, 5, 6, 8	7/20/1999	7/20/2020	D
BRV-0651	Rockledge	City Hall (Building)	UL	Public works - 100 kt Generator	8	11/18/1999	2007	C
BRV-0652	Rockledge	City Hall (Building)	UL	17 intersection micro and solar array	8	11/18/2004	2011	C
BRV-0853	Rockledge	City Hall (Building)	FL	Rockledge Drive stabilization (planning)	1, 5, 8	11/18/1999	2017	D
BRV-0554	Rockledge	City Hall (Building)	W	Rockledge Drive (eng)	8	11/18/2004	2005	C
BRV-0655	Rockledge	City Hall (Building)	FL	Rockledge Drive Stabilization (Const.)	8	11/18/2004	2005	C
BRV-0850	Rockledge	City Hall (Building)	UL	15year/Murrell Mast Area	8	11/18/1999	2003	C
BRV-0659	Rockledge	City Hall (Building)	UL	Murrell/Barnes Traffic Signs/ Mast Arm	BREVARD COUNTY	10/30/2008	2010	IP
BRV-0600	Rockledge	City Hall (Building)	FL	Create 60 acre master retention area	STORM WATER	11/18/1999	2010	C
BRV-0563	Rockledge	City Hall (Building)	FL	Installation Weather Station at EOC	8	11/18/1999	2015	D
BRV-0750	Rockledge	City Hall (Building)	FL	Flse Bnd Frame Main	WATER WATER	11/18/1999	2008	C
BRV-0800	Rockledge	Brevard County Parks & Recreation	JL	Generator - Martin Anderson Senior Center	1, 5, 6, 8	5/29/2014	5/29/2024	N
BRV-0815	Rockledge	Brevard County Parks & Recreation	W	Shutters - Martin Anderson Senior Center	1, 5, 6, 8	8/28/2014	8/28/2024	N
BRV-0332	Satellite Beach	City Hall	AL	Eng. study - Building Wind Vulnerability Isl. Grand Sc.	8	7/20/1999	2025	D
BRV-0459	Satellite Beach	City Hall	FL, SS, W	Patrick-Traffic Sig/Bike P	8	7/20/1999	2015	C
BRV-0468	Satellite Beach	City Hall	W	Police In-door incident training facility	8	7/20/1999	2025	D
BRV-0575	Satellite Beach	City Hall	FL	AT&T/RS&T - North Drainage System	5	7/20/1999	2013	C
BRV-0010	Titusville	City Hall	FL	Basin 1 - Drainage	1, 5, 6, 8	10/27/2003	9/30/2023	D
BRV-0514	Titusville	City Hall	ALL	Area 2 Sycamore Subbasin - Flood Control	1, 5, 6, 8	10/27/2003	9/30/2023	D
BRV-0015	Titusville	City Hall	FL	Main St. Sub Basin - Drainage	5	4/5/1999	9/30/2013	C
BRV-0005	Titusville	City Hall	UL	Vista and Lakeview Avenue inlets & Ditch	8	11/18/2004	9/30/2013	C
BRV-0096	Titusville	City Hall	W	Harrison Street - Drainage	1, 5, 6, 8	11/18/2004	9/30/2020	D
BRV-0100	Titusville	City Hall	W	Drainage Plan for Basins 3-6	0	11/18/2004	9/30/2013	C
BRV-0301	Titusville	Brevard County Parks & Recreation	All	Generator, Sandrift Recreation Center	1, 5, 6, 8	7/20/1999	7/20/2020	D

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Status: C-Completed D-Deferred Funding Unavailable N-New U-Updated IP-In Progress (and % complete)								
Number	Jurisdiction	Responsible Organization	Hazard	Project Description	Funding Source	Date	Estimated Completion	Status
BRV-0530	Titusville	City Hall	FL	Max Brewer Causeway - Rock Rejuvenation	1, 5, 6, 8	4/5/1999	9/30/2020	D
BRV-0617	Titusville	City Hall	U	Portable generators for Water/Wastewater	1, 5, 6, 8	11/9/2004	9/30/2020	C
BRV-0758	Titusville	City Hall	FL	City fire stations wind retrofit	1, 5, 6, 8	4/5/1999	9/30/2020	D
BRV-0781	Titusville	City Hall	W	Vehicle Maintenance Facility Upgrade	8	10/30/2008	9/30/2020	C
BRV-0702	Titusville	City Hall	W	Water Resource Facilities	1, 5, 6, 8	10/30/2008	9/30/2020	D
BRV-0783	Titusville	City Hall	FL	Wind Reinforce Mantona Mans Bldgs.	1, 5, 6, 8	10/30/2008	9/30/2020	D
BRV-0794	Titusville	Brevard County Parks & Recreation	UL	Generator - Chain of Lakes Maintenance Facility	1, 5, 6, 8	8/29/2014	8/29/2024	N
BRV-0785	Titusville	Brevard County Parks & Recreation	UL	Generator - Enchanted Forest Environmental Complex	1, 5, 6, 8	8/29/2014	8/29/2024	N
BRV-0802	Titusville	Brevard County Parks & Recreation	UI	Generator - North Area Maintenance Facility	1, 5, 6, 8	8/29/2014	8/29/2024	N
BRV-0804	Titusville	Brevard County Parks & Recreation	UL	Generator - North Brevard Senior Center	1, 5, 6, 8	8/29/2014	8/29/2024	N
BRV-0812	Titusville	Brevard County Parks & Recreation	W	Shutters - Enchanted Forest Environmental Center	1, 5, 6, 8	8/29/2014	8/29/2024	N
BRV-0816	Titusville	Brevard County Parks & Recreation	W	Shutters - North Brevard Senior Center	1, 5, 6, 8	8/29/2014	8/29/2024	N
BRV-0818	Titusville	Brevard County Parks & Recreation	W	Shutters - Sandhill Recreation Center	1, 5, 6, 8	8/29/2014	8/29/2024	N
BRV-0801	West Melbourne	Brevard County Parks & Recreation	UL	Generator - Max K. Rojas Park Maintenance Facility	1, 5, 6, 8	8/29/2014	8/29/2024	N
BRV-0828	West Melbourne	City Hall/Admin	UI	Portable generator 1 - wastewater lift station	4, 5, 7, 8	6/15/2015	2020	N
BRV-0829	West Melbourne	City Hall/Admin	UL	Portable generator 2 - wastewater lift station	4, 5, 7, 8	6/15/2015	2020	N

1.12 Appendix II

1.12.1 Brevard Prepares Bylaws

BYLAWS AND OPERATING PROCEDURES

Local Mitigation Strategy Development Brevard County Florida

ARTICLE I. PURPOSE OF *Brevard Prepares*

The purpose of *Brevard Prepares* is to decrease the vulnerability of the citizens, governments, businesses and institutions of Brevard County, Florida, to the future human, economic and environmental costs of natural, technological, and societal disasters. *Brevard Prepares* will develop, monitor, and maintain a local strategy for hazard mitigation and post-disaster redevelopment, which will be intended to accomplish this purpose.

ARTICLE II. MEMBERSHIP

Participation in *Brevard Prepares* is voluntary by all participating entities. Membership is established in accord with the following provisions:

- Participation in *Brevard Prepares* is open to all jurisdictions, organizations and individuals supporting its purposes, and
- The membership and participation of local governments in *Brevard Prepares* is controlled by contractual agreements between the Florida Department of Community Affairs, Brevard County and the participating municipalities. These contractual agreements are incorporated hereto by reference, and their provisions are controlling.

ARTICLE III. ORGANIZATIONAL STRUCTURE

The organizational structure of *Brevard Prepares* shall consist of a Steering Committee and ad hoc committees.

A. The Steering Committee

Brevard Prepares shall be guided by a Steering Committee of not more than twenty-two (22) members, consisting of designated representatives of the following:

- One representative from the government of Brevard County and each participating municipality,
- One representative from organizations and associations representing key business, industry, and community interest groups of Brevard County, and
- Other interested individuals from the general public appointed by a majority vote of the Steering Committee.

Members of the Steering Committee will be designated by formal resolution, appointment or other action to serve as the official representative and spokesperson for the jurisdiction or organization regarding the activities and decisions of *Brevard Prepares*.

To maintain good standing, members of the Steering Committee or their alternate must not have more than one unexcused absence from annual meetings.

B. Ad hoc committees

Brevard Prepares may designate ad hoc committees, as needed. Membership of the permanent subcommittees is unlimited and is open to all interested jurisdictions, organizations and individuals. Temporary committees may be established at any time for special purposes by the chair of the Steering Committee, and their membership designated at that time. Membership in such subcommittees is not restricted. There are no requirements for individuals to maintain good standing as members of temporary committees.

C. Program Staff

Brevard County Emergency Management will provide and/or coordinate individuals and organizations serving as the program staff for *Brevard Prepares*.

ARTICLE IV. OFFICERS

Any member in good standing of the Steering Committee is eligible for election as an officer. The Steering Committee will have a chair elected by a majority vote of a quorum of the members. The Steering Committee will also elect by majority vote a vice chair. One of these positions will be elected from the representatives of local government and the other from the representatives of local government or the private sector. Each will serve a term of one year, and be eligible for re-election for an unlimited number of terms. The chair and vice chair of the Steering Committee are also considered to be chair and vice chair of *Brevard Prepares*.

The chair of the Steering Committee will preside at each meeting of the Steering Committee, establish temporary committees, and assign personnel to them. The vice chair will fulfill the duties and responsibilities of the chair in his or her absence.

The chair of each temporary committee will be designated from the members in good standing of the Steering Committee, and will serve at the pleasure of the chair of the Steering Committee.

ARTICLE V. RESPONSIBILITIES

A. Steering Committee

The Steering Committee will be responsible for oversight and coordination of all actions and decisions by *Brevard Prepares*, and is solely responsible for formal actions in the name of *Brevard Prepares*, including the release of reports, development of resolutions, issuance of position papers, and similar activities. The Steering Committee makes

assignments to ad hoc committees, coordinates their work, and takes action on their recommendations.

B. Subcommittees

The responsibilities of ad hoc committees will be defined at the time they are established by the chair of the Steering Committee. As an example, there may be a need to assemble a committee for public information efforts to secure public input and comment on the efforts of *Brevard Prepares*; to inform the public about the activities of *Brevard Prepares*; to conduct public information and education programs regarding hazard mitigation; to assist with the conduct of public hearings; and, to promote public acceptance of the strategy developed by Brevard Prepares.

C. Program Staff

Technical, clerical and other types of support activities to the Steering Committee and subcommittees will be provided through Brevard County Emergency Management and other county agencies as assigned. Emergency Management will also serve as the legal governmental representative of the Working Group, and is empowered under County Code to accept and disburse funds, enter into contracts, hire staff, and take such other actions as necessary in support of, or in the name of, *Brevard Prepares*. Other jurisdictions and organizations may also provide such services on a voluntary basis upon request of Emergency Management and/or the chair of the Steering Committee.

ARTICLE VI. ACTIONS BY BREVARD PREPARES

A. Authority for Actions

Only the Steering Committee has the authority to take final actions in the name of *Brevard Prepares*. Actions by committees or program staff are not considered as final until affirmed by action of the Steering Committee.

B. Meetings, Voting and Quorum

Meetings of the Steering Committee and ad hoc committees will be conducted in accord with Robert's Rules of Order, when deemed necessary by chair of the meeting. Regular meetings of the Steering Committee will be scheduled annually with a minimum of 10 working days notice. This meeting may be designated a *Brevard Prepares* meeting, with appropriate official notice given so that the general public may attend. The scheduling of meetings of a temporary committee is at the discretion of its chair.

All final actions and decisions made in the name of *Brevard Prepares* will be by affirmative vote of a quorum of the Steering Committee. A quorum shall be one-third plus one of the members of the Steering Committee in good standing at the time of the vote. Each member of the Steering Committee will have one vote. Voting by proxy, written or otherwise, is permitted.

C. Special Votes

Special votes may be taken under emergency situations or when there are others extenuating circumstances that are judged by both the chair and vice chair of the

Steering Committee to prohibit scheduling of a regular meeting of the Steering Committee. Special votes may be by telephone, email and/or first class mail, and shall be in accord with all applicable statutes for such actions.

D. Public Hearings

When required by statute or the policies of Brevard County, or when deemed necessary by the Steering Committee, a public hearing regarding actions under consideration for implementation by *Brevard Prepares* will be held.

E. Documentation of Actions

All meetings and other forms of action by the Steering Committee and ad hoc committees will be documented and made available for inspection by the public.

VII. ADOPTION OF AND AMENDMENTS TO THE BYLAWS

The Bylaws of *Brevard Prepares* may be adopted and/or amended by a two-thirds majority vote of the members in good standing of the Steering Committee. All proposed changes to the bylaws will be provided to each member of the Steering Committee not less than 10 working days prior to such a vote.

VIII. DISSOLUTION OF *BREVARD PREPARES*

Brevard Prepares may be dissolved by affirmative vote of 100% of the members in good standing of the Steering Committee at the time of the vote, by order of a court of competent jurisdiction, and/or by instruction of the Brevard County Board of Commissioners. At the time of dissolution, all remaining documents, records, equipment and supplies belonging to *Brevard Prepares* will be transferred to Brevard County Emergency Management for disposition.

Adopted December 19, 2013

Operating Procedures for Brevard Prepares

1.0 Background and Purpose

Brevard Prepares was established to identify and recommend projects and programs that, when implemented, would eliminate, minimize, or otherwise mitigate the vulnerability of the people, property, environmental resources and economic vitality of the community to the impacts of future disasters. These identified projects and programs are termed "mitigation initiatives" and constitute the principal component of the Brevard County Local Hazard Mitigation Strategy. The fundamental purpose of this plan is to guide, coordinate and facilitate the efforts of the agencies, organizations, and individuals participating in the Task Force as they seek funding, authorities or other resources necessary for implementation of the identified mitigation initiatives.

Brevard Prepares has established an organizational structure to support its operations, and has adopted bylaws that govern the membership and functioning of the group. To complement these bylaws, these procedures have been prepared to define how this organizational structure identifies, evaluates and processes the mitigation initiatives needed to reduce the community's vulnerability to future disasters. The procedures identify the steps through which newly proposed mitigation initiatives are evaluated and coordinated among the participants in Brevard Prepares, and then incorporated into the local mitigation strategy. The procedures also define how the local mitigation strategy will be routinely updated, enhanced and maintained in the future.

2.0 Overview of the Procedure

This procedure defines the fundamental operations by Brevard Prepares to develop, expand and maintain the local mitigation strategy, including the following:

- Support of the organization and its operations,
- Identification of the natural, technological and societal hazards threatening the community,
- Evaluation of the human, economic and environmental vulnerabilities to those hazards,
- Assessment of the existing framework of policies, plans and requirements of the community as related to the capability to eliminate, reduce or mitigate the community's vulnerabilities to the identified hazards,
- Identification, characterization, justification and prioritization of new initiatives to eliminate, reduce or mitigate the community's vulnerabilities,
- Evaluation and coordination of new mitigation initiatives by Brevard Prepares,
- Resolution of conflicts between participants in the planning regarding proposed mitigation initiatives and their implementation,
- Incorporation of mitigation initiatives into the plan for future implementation,
- Coordination of the implementation of mitigation initiatives in the plan, and
- Periodic review of the status of implementation of the initiatives incorporated into the local mitigation strategy, and assessment of their priority for the ensuing planning period, and

- Preparation and distribution of updated editions of the local mitigation strategy to the community for review and adoption by the jurisdictions and organizations represented on Brevard Prepares.

3.0 Development and Maintenance of Brevard Prepares' Organization

The categories and types of participants that are eligible for membership in Brevard Prepares are specified in the bylaws. Participants in Brevard Prepares include many different types of agencies, organizations and individuals, such as government agencies, regional authorities, community and neighborhood groups, business associations, private businesses and industries, local institutions, and even interested individuals. Organizational participants in Brevard Prepares have the following duties:

- To assign individuals to serve as agency or organizational representatives on Brevard Prepares,
- To have these representatives attend meetings and contribute to the discussions and decision making conducted by Brevard Prepares,
- To provide expertise, information or perspective on the identification and definition of hazards threatening the community,
- To conduct technical evaluations of the vulnerabilities of the facilities, systems, neighborhoods, operations and/or valuable resources for which they are responsible or otherwise depend upon,
- To identify, characterize, prioritize and propose for incorporation into the plan various structural and non-structural mitigation initiatives that would eliminate, reduce or mitigate the vulnerabilities of their facilities, systems, operations or resources to the impacts of future disasters,
- To adopt, endorse or otherwise approve their portion of the local mitigation strategy,
- To strive to implement the mitigation initiatives identified by the organization and incorporated into the plan by Brevard Prepares as the resources and/or authorities to do so become available,
- To continue to appraise Brevard Prepares of the implementation status of the organization's proposed mitigation initiatives incorporated into the plan, and
- To support or otherwise participate in Brevard Prepares' activities in the community to further develop its overall mitigation capability.

The bylaws of Brevard Prepares also establish the organizational structure and responsibilities of a permanent Steering Committee overseeing development, maintenance and implementation of the local mitigation strategy. The Steering Committee may also establish temporary ad hoc subcommittees if needed for special assignments. The general duties and responsibilities of these committees are identified in the bylaws, and this procedure defines how these committees carry out those duties.

A program staff functioning under the direction of the Steering Committee also supports Brevard Prepares. The program staff will establish a schedule of meetings of the committees, notify individuals of the meeting time and locations, and otherwise support the committees in their activities. The program staff will also routinely issue reports to the Steering Committee regarding the status of participation of the agencies and

organizations with membership in Brevard Prepares, as well as on the progress of these agencies and organizations in developing and maintaining their role in the strategy. To do this, the program staff will maintain a list of the public and private organizations and agencies making up Brevard Prepares.

The program staff will also support the organization through the following operations:

- Scheduling meetings of the committees under the direction of the committees' chairpersons,
- Supporting meetings as needed by preparing agendas and facilitating discussion, as well as preparing and distributing summaries of meetings,
- Training and informing participants in the technical and administrative operations needed for development and maintenance of the strategy,
- Assisting with the technical analyses, when necessary,
- Processing information and data provided by the participants for its use in the local mitigation strategy,
- Supporting agency and organizational efforts for the implementation of the mitigation initiatives incorporated into the plan,
- Maintaining the computer database of the mitigation initiatives proposed by the participants and incorporated into the plan, and
- Providing other such information and support as feasible to accomplish the mission of Brevard Prepares.

4.0 Increasing Community Awareness and Understanding of Hazard Mitigation

One of the key roles of Brevard Prepares is to increase the general public's awareness of the benefits of hazard mitigation and the available techniques for making the community more disaster resistant. An important assessment necessary for the effective development and maintenance of the Brevard County Local Mitigation Strategy is to evaluate the current level of the public's understanding of, acceptance for and willingness to implement a range of mitigation initiatives. Periodically, Brevard Prepares will survey portions of the community or otherwise solicit information regarding the public's perspective on mitigation needs and programs, as well as the factors that make the public more vulnerable to disasters than is warranted.

The Steering Committee will be responsible for ensuring that processes undertaken for the development, implementation and maintenance of the Brevard County Local Mitigation Strategy have adequately considered public needs and viewpoints. As needed, Brevard Prepares will encourage appropriate participating agencies and organizations to propose mitigation initiatives that would, upon implementation, further public understanding and utilization of good mitigation practices.

5.0 Identification of the Hazards Threatening the Community

Jurisdictional and organizational representatives are responsible for Brevard Prepares' initial and ongoing efforts to identify the natural, technological and societal hazards threatening the community. The purpose of this analysis is to define those locations, facilities or systems within Brevard County that may be vulnerable to the impacts of

those hazards and warrant further assessment. For the convenience of subsequent planning, the analysis will be conducted, as much as feasible, on the basis of local government jurisdictional boundaries.

In its discretion, Brevard Prepares may conduct this analysis on behalf of all jurisdictions, or may request each local government jurisdiction to conduct the analysis independently using the common methodology. To the extent information is available; Brevard Prepares and/or the individual jurisdiction will utilize data provided in a geographic information system (GIS) format for those identified hazards that have been so characterized. When feasible, information and data resulting from Brevard Prepares' efforts will be recorded a GIS format as well. In the absence of available GIS data, the analysis will be conducted on the basis of "best judgment" by the planning participants.

The hazard identification analysis will be accomplished through the following general methodology:

- Identifying all significant natural, technological and societal hazards that threaten Brevard County.
- Defining or estimating the geographic and/or operational scope of the areas and/or community functions within Brevard County that could be impacted by the hazard.
- Determining or estimating the probability or frequency of occurrence of the hazard event.
- Defining, estimating or predicting the general consequences of the event to human health and safety, to property, to valuable environmental resources and the economic vitality of the community.
- Deriving a measure of risk to reflect the relative significance of hazard being addressed to the jurisdiction being evaluated.

The measure of relative risk may then be used by the jurisdiction and/or Brevard Prepares to guide and prioritize the subsequent mitigation planning process. The hazard identification process is intended to encompass both developed areas of Brevard County as well as those likely to be developed in the future.

Hazard identification information and other findings from this analysis will be made available for use by the public and other interested organizations and agencies. As applicable, the findings of the analysis will be included in the individual jurisdictional and/or organizational sections of the Brevard County Local Mitigation Strategy.

6.0 Vulnerability Assessment

Considering the relative risk of the identified hazards for each local jurisdiction, the participants will then conduct an assessment of the vulnerability of specific facilities, systems, and/or neighborhoods within those jurisdictions, as applicable to their authorities, responsibilities and/or interests. Brevard Prepares promotes the use of a process to ensure countywide uniformity in the technical approach by all participating jurisdictions. Brevard Prepares, through its support staff, is also responsible for monitoring progress in implementation of the vulnerability assessment process.

The vulnerability assessments of specific facilities and systems will be conducted by those agencies, organizations or individuals represented on Brevard Prepares that have established operational control over the facilities or systems, or otherwise have been designated as responsible for their operation and maintenance. For neighborhoods, the assessment will be conducted by the local government agency with expertise, responsibility or interest in the location, and/or by representatives of the applicable neighborhood or community association.

Vulnerability assessments will include evaluation of the potential for physical damage or operational failure due to the occurrence of the hazards identified as threatening the community. This evaluation will also include the vulnerability of the community to physical damage or operational failure of that facility, system or neighborhood.

The vulnerability assessment process will identify, for the evaluated facilities, systems and neighborhoods, those features or functions relatively more vulnerable to damage or failure in the event of the occurrence of a specified hazard. This finding is then available for the Brevard Prepares participants and/or the Steering Committee to use in the development of proposed initiatives needed to eliminate, reduce or otherwise mitigate those vulnerabilities.

For each update of the plan, participants will identify those facilities, systems and/or neighborhoods thought to be vulnerable to the impacts of a disaster that have not yet be subject to a vulnerability assessment. Brevard Prepares will strive to obtain assessments for all potential vulnerable facilities, systems or neighborhoods until the entire community has been evaluated.

In addition, to the extent feasible, Brevard Prepares will strive to obtain vulnerability assessments for undeveloped land that is likely to be developed in the future. This will be done to identify the mitigation actions necessary during the land's development, should it occur, to protect new facilities, systems and neighborhoods from future hazard events. These identified mitigation actions will be formulated as proposed mitigation initiatives for incorporation into the plan and that would, upon implementation, guide the development of the land in the desired manner.

The findings from the vulnerability assessment will be made available for use by the public and other interested organizations and agencies. As applicable, the findings of

the analysis will be included in the individual jurisdictional and/or organizational sections of the Brevard County Local Mitigation Strategy.

7.0 Evaluation of Existing Policies, Plans and Regulations

Using the results of the hazard identification and vulnerability assessment process, the jurisdictions and Brevard Prepares will maintain an ongoing effort to evaluate the existing policies, plans and regulations of the local government jurisdictions in the planning area. This analysis will be used to define the capabilities of the local jurisdictions' policies, plans and regulations to effectively control or manage the identified hazards and/or eliminate or minimize the vulnerability to those hazards. The Steering Committee will implement a common analysis methodology to define the following characteristics of the policy, planning and regulatory framework of Brevard County and its local jurisdictions:

- The existing array of policies, plans and regulations established by local jurisdictions in Brevard County that are relevant to the control and management of hazards and vulnerabilities to those hazards,
- Shortfalls or gaps in the policies, plans and regulations of the local jurisdictions to adequately eliminate or reduce vulnerabilities to identified hazards,
- Inconsistencies or conflicts between the policies, plans and regulations of local jurisdictions resulting in reduced capabilities to eliminate or reduce vulnerabilities to identified hazards, and
- Inadequacies of local jurisdiction's policy, planning or regulatory framework to fully comply with state or federal hazard mitigation requirements.

This analysis may be conducted by the Steering Committee, the program staff and/or individual local jurisdictions using the methodology established. The findings of the analysis will be available for the applicable participating local jurisdictions to identify mitigation initiatives to modify or enhance the existing policy, planning and regulatory framework and to incorporate these initiatives into the corresponding section of the Brevard County Local Mitigation Strategy.

8.0 Identification and Characterization of Proposed Mitigation Initiatives

All agencies and organizations participating in Brevard Prepares are encouraged to propose mitigation initiatives for processing and incorporation into the local mitigation strategy, based on the findings of the hazard identification, vulnerability assessment, and evaluation of policies, plans and regulations. Formulation of mitigation initiatives will be done only by those individual agencies, organizations or jurisdictions participating in Brevard Prepares that have the responsibility or authority to implement the identified mitigation initiative should the resources and/or authorities become available to do so. When needed, the Steering Committee may request an agency, organization or jurisdiction that has such responsibility or authority for its cooperation and support to formulate proposed mitigation initiatives determined to be needed based on the results of the hazard identification, vulnerability assessment or evaluation of policies, plans and regulations.

The identification and characterization of proposed mitigation initiatives for incorporation into the Brevard County Local Mitigation Strategy will be in accord with a common methodology. Proposed mitigation initiatives may be structural, non-structural or combined structural and non-structural, and will be identified and characterized by representatives of the agency or organization intending to propose that initiative for incorporation into the strategy. The program staff may offer assistance and guidance to the participating agency or organization regarding the process to identify and characterize mitigation initiatives, but the participant is responsible for the validity of the information utilized to characterize the proposed initiative. A participating agency or organization may identify and characterize as many mitigation initiatives as desired to propose for incorporation into the Brevard County Local Mitigation Strategy.

9.0 Prioritization and Submission of Proposed Mitigation Initiatives

In order to most effectively allocate limited resources available for implementation of mitigation actions in the community, all initiatives proposed for incorporation into the plan will be prioritized in accord with a common methodology. The participating agency or organization proposing each initiative is responsible for use of this methodology.

Upon completion of the identification, characterization and prioritization of a mitigation initiative proposed for incorporation into the strategy, the participating agency or organization will submit the proposal to the Steering Committee for review and coordination with other proposed mitigation initiatives. The submittal will be on a schedule and in a format established by the Committee for this purpose.

10.0 Review and Coordination of Proposed Mitigation Initiatives

The Steering Committee is responsible for ensuring the inter-jurisdictional and inter-organizational review and coordination of proposed mitigation initiatives. To accomplish this responsibility, the Committee will do the following:

- Establish a schedule for the participants to submit proposed mitigation initiatives to be considered for incorporation into the next edition of the Brevard County Local Mitigation Strategy,
- Distribute guidance as needed to facilitate complete and accurate submittals by the participants,
- Review each proposed mitigation initiative received for completeness, adherence to the prescribed methodology, the validity of the characterization information and data used by the participant, and the likelihood that the proposal will actually mitigate the hazard(s) or vulnerability(ies) of concern,
- Compare proposed mitigation initiatives with others already incorporated into the plan or being submitted during the current planning period to ensure an absence of conflict or redundancy in purpose,
- If needed, return the proposed mitigation initiatives to the submitting agency or organization for additional information or analysis and re-submittal, and
- Upon receipt of an acceptable mitigation initiative, it is then ready to be incorporated into the mitigation plan.

11.0 Incorporation of Proposed Mitigation Initiatives into the Strategy

The Steering Committee, at its next meeting, will approve all available and acceptable mitigation initiatives for incorporation into the Brevard County Local Mitigation Strategy. The Steering Committee may concur with the recommendation or disagree.

In the event that the Steering Committee refuses to incorporate the proposed mitigation initiative into the Local Mitigation Strategy, a full explanation for the action will be provided to the participant and suggestions made regarding corrective actions that could be taken to enable the proposal to be so incorporated. The proposing agency or organization would then be responsible for taking such actions and resubmitting the proposal for incorporation into the strategy:

No proposed mitigation initiative will be considered as incorporated into the plan until it is the given an affirmative majority vote by the Steering Committee for incorporation into the plan.

12.0 Resolving Conflicts

In the event that a mitigation initiative proposed by a participating agency or organization is determined by the Steering Committee to be in conflict with one or more other initiatives in the plan or being submitted by others, the Committee will take action to resolve the conflict. This will be done in the following manner:

- The participants proposing the conflicting mitigation initiatives will be notified of the findings of the Committee and requested to make any such modifications to the proposals needed to resolve the conflicts,
- Should the participants be initially unwilling or unable to make such modifications to their proposed mitigation initiatives, the Committee will schedule and hold a detailed discussion of the matter and involve both participants and any other interested parties,
- In the event that such detailed discussions do not result in voluntary action on the part of the participants making the proposals, the Committee will formulate a recommendation to resolve the conflict. In making this recommendation, in its discretion, the Committee may give preference to the proposal already incorporated into the plan, to that first submitted to the Committee for review, and/or to the proposal achieving the highest priority score, and
- The Steering Committee will then take any such action as deemed appropriate to reconcile the conflict prior to approval actions for incorporation of the proposal(s) into the plan.

13.0 Incomplete Processing of Proposed Mitigation Initiatives

If proposed mitigation initiatives are submitted to the Steering Committee after the deadline established for that purpose, in its discretion, the Committee may decline the process such proposed initiatives for the next edition of the plan. However, the Committee will retain the submissions, and review and process the initiatives in accord with this procedure for purposes of incorporating them into the subsequent edition of the plan. These unprocessed mitigation initiatives will be termed "pending" mitigation initiatives, and may be listed in the next published edition of the plan under that term.

Pending mitigation initiatives will not be eligible for funding or resources made available through the steering committee and/or the Brevard County Mitigation Plan in the same manner as would proposed initiatives that are fully processed, prioritized and incorporated into the strategy. The participating agencies and organizations may separately, in their discretion, pursue implementation of pending mitigation initiatives at any time.

14.0 Implementation of Proposed Mitigation Initiatives

Following its incorporation into the Brevard County Local Mitigation Strategy, each participating agency or organization is responsible to attempting to secure the funding, resources or other approvals and permits necessary to implement the proposed mitigation initiative. Brevard Prepares and the support staff will provide such support to the agency or organization as is feasible at the time, but the agency or organization itself maintains full legal, financial and administrative responsibility for implementation of the proposed action.

On request of the agency or organization attempting to implement an approved mitigation initiative, the Steering Committee will certify to any identified party that the proposed mitigation initiative was subjected to the above noted review and coordination process, and that it has been approved for incorporation into the strategy. If desired, this certification and documentation of an initiative's incorporation into the plan may be delegated by the Steering Committee to the program staff.

15.0 Monitoring of Implementation of Mitigation Initiatives

The Steering Committee will be responsible for monitoring the status of implementation of proposed mitigation initiatives incorporated into the Local Mitigation Strategy. On an annual basis, the participating agencies and organizations will make information available to identify if one or more of the following actions have been accomplished by the agency or organization proposing the initiative:

- Initial actions to obtain funding, permits, approvals or other resources needed to begin implementation of the initiative,
- Any necessary design or development actions have been initiated or completed, or if funding has been obtained,
- Complete implementation of the mitigation initiative,
- If the agency or organization proposing the initiative no longer intends to implement the initiative, and/or
- Additional information or analysis has been developed that would modify the priority originally assigned to the initiative upon its incorporation into the strategy.

In monitoring the implementation status of the mitigation initiatives incorporated into the Brevard County Local Mitigation Strategy, the Steering Committee will evaluate the continued priority for implementation to be afforded each initiative incorporated into the strategy. This determination will be made with consideration of the following factors:

- The proposed initiative's relationship to current or more recent hazard identification and risk assessment evaluations conducted by the jurisdiction and/or Brevard Prepares,

- **Recent experience with hazard events in Brevard County and the relevance to the proposed initiative to mitigating the vulnerabilities to those hazards,**
- **The initiative's predicted current and/or continuing acceptance to the community for implementation, and**
- **The current probability of receiving funding for implementation from local, state or federal sources and its consistency with current local, state and federal program priorities.**

On an annual basis, and for preparation of the next updated edition of the plan, the Steering Committee will designate initiatives as priority for implementation, continued at its currently designated priority, or deferred for future action. The Steering Committee will also be informed by the jurisdiction's representative when an initiative is being or has been implemented and can be removed from the plan: or, the proposing agency or organization has terminated action on the initiative and has requested its removal from the plan.

The Steering Committee will act to finalize the list of approved proposed mitigation initiatives to be incorporated into the next updated edition of the Brevard County Local Mitigation Strategy.

16.0 Approval and Issuance of the Brevard County Local Mitigation Strategy

On a five-year cycle, or in accord with state and federal requirements, Brevard Prepares will approve and issue an update of the Local Mitigation Strategy. To do this, the Steering Committee will, by affirmative majority vote, allow release of the updated version of the plan, which will contain at least the following information:

- The currently approved listing of the mitigation initiatives proposed by participating agencies and organizations,
- A statement of Brevard Prepares' goals and objectives for initiative implementation for the coming planning period,
- Updated information regarding the findings of the hazard identification, vulnerability assessment and evaluation of policies, plans and regulations,
- Progress on implementation of the mitigation initiatives previously incorporated into the strategy,
- A listing of the currently participating agencies and organizations and the status of their participation, and
- The current edition of the Brevard Prepares' bylaws and operating procedures.

The updated plan will contain any proposed and approved or pending mitigation initiatives processed by Brevard Prepares during the preceding planning period. It will also include the approved proposed mitigation initiatives listed in any previous editions of the plan unless they are have been removed or terminated from the plan.

Each major jurisdiction and/or organization participating in the mitigation planning process will have a separate section of the plan document specifically intended to list the findings of any analyses done for that jurisdiction. This separate section will also

contain the complete list of mitigation initiatives proposed by that jurisdiction or organization.

Brevard Prepares will announce, by public notice, the completion, approval and release of the plan. Prior to or concurrent with formal action to release the plan, the Steering Committee may determine that a public hearing or public forum is necessary or required to allow the community an opportunity to review and comment on the plan both while it is being updated and prior to its formal approval. Upon such a determination, Brevard Prepares and/or the support staff will take the necessary actions to plan, conduct and document the public comment and/or hearing process.

Brevard Prepares will also take such actions as feasible to make the Brevard County Local Mitigation Strategy readily available to members of the public and other interested organizations and agencies. At a minimum, a full copy of the plan will be available to each participating jurisdiction or organization. A publicly accessible copy will also be made available through Brevard County Emergency Management website.

Upon approval and release of the Brevard County Local Mitigation Strategy, the Steering Committee will request the governing body of each participating jurisdiction or organization to take action to adopt, approve, and/or endorse their designated section of the plan. It is not necessary for individual jurisdictions or organizations to take any action concerning the portions of the plan pertaining to another jurisdiction or organization. Upon approval of their portion of the Brevard County Local Mitigation Strategy, the participating jurisdiction or organization will notify the Steering Committee. In the event that their portion of the plan is rejected, disapproved or significantly modified in whole or in part, the Steering Committee will be notified of the reasons. The representatives of that jurisdiction or organization will then be requested to work with the Steering Committee to address and resolve the impediments interfering with receipt of approval or endorsement by the participating jurisdiction or organization.

17.0 Approval of Supplements to the Plan

When indicated, the Steering Committee may, in its sole discretion, elect to approve issuance of a supplement to the currently approved mitigation plan. This supplement may contain one or more proposed mitigation initiatives that have been fully processed in accord with this procedure. Upon its issuance, the supplement and the mitigation initiatives contained therein are considered to be an integral part of the Brevard County Local Mitigation Strategy pending the approval of the supplement by the governing body of the jurisdiction or organization that proposed the initiatives.

18.0 Evaluation of the Plan

The plan is to be evaluated on an annual basis by Brevard County Emergency Management or its designee. Brevard County Emergency Management was selected as the organization to evaluate the mitigation plan for the Office serves as support staff for Brevard Prepares, a committee with representatives from all of the participating jurisdictions and organizations. In this role, Emergency Management has responsibility for maintaining the master copy of the plan, for scheduling and facilitating meetings of

Brevard Prepares, and maintaining liaison with adjacent counties, and the State of Florida. In addition, frequently, Emergency Management is the contact point and coordinator for post-disaster funding opportunities for implementation of the proposed mitigation initiatives incorporated into the plan.

The evaluation process can include the following steps, as indicated at the time:

- Assessing recent emergency events and their impact, as well as the resultant influence and/or adjustments that are needed in the mitigation planning process
- Evaluating the progress in addressing the established mitigation goals and objectives, primarily through the development and implementation of initiatives for each goal and objective to ensure progress is being made.
- Assessing the extent to which the mitigation plan is effectively interacting with other jurisdictional plans and programs related to mitigation issues, such as being incorporated into a jurisdiction's comprehensive plan, emergency management plan, capital improvement plan, stormwater management plan, etc.
- Evaluating the extent to which the vulnerabilities of assessed critical facilities, other facilities and systems, neighborhoods and repetitive loss properties are being addressed through the planning process, including the development and implementation of initiatives.
- Assessing whether Brevard Prepares continues to have or needs to expand its membership to promote community participation in the mitigation planning process.
- Evaluating continuing progress in the expansion and/or updating of the hazard identification and vulnerability assessment process, the development and implementation of mitigation initiatives, as well as assessing the effectiveness of implemented initiatives.
- Assessing specific aspects of the mitigation policies and programs, based on policy data entered into the program, to evaluate specific mitigation issues of interest, especially on a multi-jurisdictional basis, such as variations in local mitigation-related codes.

19.0 Assistance with Initiative Funding and Implementation

Each participating agency and organization is responsible for implementation of the mitigation initiatives contained within their portion of the Brevard County Local Mitigation Strategy when the necessary resources, funding, authorities and/or authorizations to do so become available. Brevard Prepares will, nevertheless, offer assistance and support to the participating agencies and organizations in implementing their proposed mitigation initiatives as appropriate opportunities arise.

The Steering Committee, with the support of the support staff will, during each planning cycle, attempt to obtain information regarding upcoming state and federal programs which may offer opportunities for participating agencies and organizations to receive funding for initiative implementation. The Committee will assess the proposed mitigation initiatives listed in the current approved edition of the Brevard County Local Mitigation Strategy for all jurisdictions and organizations, and identify the proposed mitigation initiatives matching the funding requirements and/or limitations of the applicable state

and federal program. The Committee will then select the proposed initiatives in descending order of priority ranking and, in turn, notify the participating agency or organization of the potential availability of funding for initiative implementation. If it wished to apply for the funding available, the applicable agency or organization would be responsible for then agreeing to complete the necessary application forms, provide any matching funds, etc. If the agency or organization was unable or unwilling to undertake the application process, the Steering Committee and/or program staff would notify the agency or organization with the next highest ranked proposed mitigation initiative listed in the current strategy. In the event that two or more proposed mitigation initiatives listed in the plan were eligible for the funding opportunity and had the same priority ranking, the Committee and/or support staff would simultaneously notify the proposing agencies or organizations.

This action by the Committee and support staff is only intended to facilitate implementation of the various initiatives listed in the Brevard County Local Mitigation Strategy. Nothing in this procedure or the Bylaws of Brevard Prepares is intended to prohibit, interfere with or discourage any participating agency or organization from seeking the funding, resources or authorities at any time to implement proposed mitigation initiatives listed in the Brevard County Local Mitigation Strategy.

20.0 Assessment of Recent Disaster Events

Within 60 days following a significant disaster or emergency event impacting Brevard County or any of its municipal jurisdictions, the Steering Committee and/or jurisdiction representatives will conduct an analysis of the event to capture any "lessons learned" for the purpose of continuing development of the Local Mitigation Strategy. The Committee, with the support staff, will classify the event based on the hazard category and assess the magnitude of the event and the community's reaction to it. The direct and indirect damage, response and recovery costs will also be gathered or estimated. Any mitigation techniques in place in the impacted areas would be assessed for their apparent effectiveness in decreasing damages. The type and extent of the damages that were experienced would also be evaluated to determine the types of mitigation initiatives that should be incorporated into the plan to avoid similar losses during future hazard events of the same type. Based on this assessment, the Committee would recommend to one or more of the participating agencies or organizations that they propose appropriate mitigation initiatives for incorporation into the next edition of the plan. In its discretion, the agency or organization could then propose such an initiative and transmit it to the Committee for processing in accord with this procedure.

Voting Members of Brevard Prepares, 2015

Name of Organization	Voting Representative	Title
Waste Management	George Geletko	FL Government Affairs Dir.
	Dina Reider Hicks	Government Affairs Mgr.
Harris Corporation	Elsa Nylander	Corporate Security Mgr.
Home Builders and Contractors Association	Sandy Nicotra	Executive Director
City of Cape Canaveral	Jeff Rattiff	Public Works Director
City of Cocoa	Gene Prince	Fire Chief
City of Cocoa Beach	Charles Holland	Assistant City Manager/CFO
	Ryan Duckworth	Fire Chief
Town of Grant-Valkaria	Richard Hood	Town Administrator
Town of Indialantic	Chris Chinault (Chair)	Town Manager
City of Indian Harbour Beach	Mark Ryan	City Manager
	Todd Scaldo	Fire Chief \ Alt.
Town of Malabar	Bonilyn Wilbanks	Town Administrator
City of Melbourne	Chuck Bogle	Fire Chief
Town of Melbourne Beach	Jamie Titcomb	Town Manager
Melbourne Village	Gail Griswold	Town Clerk
City of Palm Bay	Barney Weiss	Public Works Division Manager
	Mike Bandish	Emergency Manager PBPD
	Amanda Millirons	Public Works Asst. Dir. \ Alt.
Town of Palm Shores	Carol McCormack	Mayor
	Ed Washburn	Town Planning Consultant
City of Rockledge	Jim McKnight	Town Manager
	Don Griffin	Planning Director \ Alt.
	Alix Bernard	City Planner \ Alt
City of Satellite Beach	Don Hughes	Fire Chief
City of Titusville	Richard Stillwagon (Vice Chair)	Special Projects Coordinator
City of West Melbourne	Keith Mills	Public Works Director
Brevard County	Virginia Barker	Watershed Program Mgr. Natural Resources Mgmt. Dept.
St. John's River Water Management District	Ann Benedetti	Intergovernmental Coordinator
Health First\ Holmes Regional Medical Center	Wayne Struble	Emergency Preparedness Specialist

**Brevard County
Brevard Prepares**

Adoption and Modification of the Bylaws

**Date of First Bylaw:
February 5, 1999**

Date of Modification of Bylaws:	12/13/2013	Reason for Bylaws Change:	Changed name of group, number of members, and organization of Steering Committee, streamlines to one large committee and ad hoc committees, etc.
Date of Modification of Bylaws:	10/01/2011	Reason for Bylaws Change:	Change of Steering Committee meeting frequency from bi-annually to annually.

1.13 Appendix III

1.13.1 Meeting Documentation

This section of the Local Mitigation Strategy documents meeting agendas and minutes

1.13.1.1 LMS Meeting - June 15, 2015 Agenda

BREVARD LOCAL MITIGATION STRATEGY

STEERING COMMITTEE MEETING

June 15, 2015

2:00 PM

AGENDA

1. Welcome and Introduction of New Members
2. LMS Revision Update
3. New Business
 - a. Presentation of Initiatives - City of West Melbourne
 - b. Presentation of an Initiative – Brevard County
 - c. Presentation of Initiatives – City of Melbourne
 - d. Vote on Initiatives
4. Discuss Next Meeting Date
5. Adjourn



1.13.1.2 LMS Meeting - June 15, 2015 Meeting Minutes**STEERING COMMITTEE MEETING MINUTES****June 15, 2015**Committee Members in Attendance:

Chair Chris Chinault, Town of Indian River
Gene Prince, City of Cocoa
Ryan Duckworth, City of Cocoa Beach
Rick Hood, Town of Grant-Valkaria
Mark Ryan, City of Indian Harbour Beach
Chuck Bogle, City of Melbourne
Amanda Millirons, City of Palm Bay
Ed Washburn, Town of Palm Shores
Alix Bernard, City of Rockledge
Ann Benedetti, St. Johns River Water Management District
Don Hughes, City of Satellite Beach
Keith Mills, City of West Melbourne

Other Attendees:

Tom Baker, City of Melbourne
Jim Williams, City of Palm Bay
Chris Dorans, BCEM Intern
Debbie Coles, BCEM
Veronica Krall, BCEM
Kimberly Prosser, BCEM

Meeting was called to order at 2:03 p.m. by Chris Chinault, Local Mitigation Strategy (LMS) Steering Committee Chair. Mr. Chinault gave a brief overview of how important the LMS is to making each jurisdiction more resilient and able to receive grant funds following a disaster.

Each member was asked to introduce themselves and their organization. New members in attendance included Fire Chief Gene Prince with the City of Cocoa, Amanda Millirons Senior Planner for the city of Palm Bay, and Ed Washburn, planning consultant for Palm Shores. Veronica Krall, Brevard County Emergency Management (EM) Financial Specialist, was introduced as the next Emergency Management support staff to the LMS Steering Committee and will take over from Debbie Coles once the LMS revision is complete and adopted later this year.

The LMS coordinator, Debbie Coles, gave an overview of the status of the LMS to the Steering committee. Present Committee members were given a binder of the draft LMS to follow as Ms. Coles presented latest revision to the document. The Mitigation Section at FDEM is currently reviewing presented draft but has yet to issue an Approval Pending Adoption (APA) status letter. Each jurisdiction was asked to provide meeting dates for their various jurisdictions so EM staff could assure they received the final LMS version for adoption in timely fashion prior to the expiration date of the current LMS on August 29, 2015. It was explained that at least one jurisdiction must adopt the LMS prior to that expiration date to maintain compliance and the ability to be eligible for post-disaster grant funding.

The Steering Committee then heard New Business item to consider adoption of various initiative projects as follows:

The City of Melbourne proposed three initiatives related to erosion control and drainage improvement:

1. Dairy Road at Kanawha Street Drainage Improvements

A portion of the Kanawha Street Drainage Basin, located north of Edgewood Drive, south of Hall Street, east of Dairy Road, and west of Parsons Avenue, experiences localized lot flooding during frequent storm events due to poor lot grading. The project consists of modifying several existing yard inlets, lining an existing rear yard drain, regrading a rear-yard swale, and installing a catch basin and rear yard drain.

Ryan Duckworth motioned for approval which was seconded by Richard Hood, and then approved unanimously by the Committee. It has been assigned project number BRV-0825.

2. Edgewood Ditch North Bank Erosion Control

The north bank of the Edgewood Ditch experiences severe erosion. The eroding ditch is encroaching upon rear yards of single-family lots located immediately adjacent to and north of the ditch. The project consists of installing gabion baskets along the north bank, from Dunbar Avenue to Country Club Road. The south bank, adjacent to the road shoulder, was stabilized with gabions in 2008.

Ryan Duckworth motioned for approval which was seconded by Don Hughes, and then approved unanimously by the Committee. It has been assigned project number BRV-0826.

3. Florida Ave Drainage Improvements

Roadway flooding frequently occurs on Florida Avenue west of the Babcock Street intersection on Meadowridge Drive, on Mazur Drive, and on Jay Tee Drive. An existing 24-inch pipe along Jay Tee needs to be replaced with a 42-inch pipe, a 30-inch pipe within the Florida Avenue rights-of-way needs to be replaced with a 48-inch pipe, and an existing 36-inch outfall pipe needs to be replaced with a 60-inch pipe.

Ryan Duckworth motioned for approval which was seconded by Don Hughes, and then approved unanimously by the Committee. It has been assigned project number BRV-0827

The City of West Melbourne proposed two initiatives for portable generators to be used at lift stations during power outages caused by emergency events.

Richard Hood motioned for approval of both projects which was seconded by Gene Prince, and then approved unanimously by the Committee. They have been assigned project numbers BRV-0828 and BRV-0829.

The last project initiative was proposed by Brevard County Emergency Management.

The project is to develop, under the "Brevard Prepares" banner, a county-wide outreach initiative using a webpage and computer based presentation request form for Local Mitigation Strategy presentations. The project would include a PowerPoint approved by the Steering Committee that could be modified to be jurisdiction specific or used county-wide. This would enable all jurisdictions to do a presentation when needed or request the Brevard County Emergency Management LMS coordinator do so.

Ryan Duckworth motioned for approval which was seconded by Don Hughes, and then approved unanimously by the Committee. It has been assigned project number BRV-0830.

Next Meeting Date – TBD in June of 2016.

Meeting adjourned at approximately 4:00 p.m.

1.13.1.3 LMS Meeting - December 29, 2014 Agenda

**BREVARD LOCAL MITIGATION STRATEGY
STEERING COMMITTEE MEETING**

**August 29, 2014
2:30 PM**

AGENDA

1. Welcome and Introductions
2. LMS Revision Update and Revised Adoption Timeline
3. New Business
 - a. Initiatives Consideration for Adoption - City of Cocoa Beach
 - b. Initiative Consideration for Adoption - Town of Grant-Valkaria
 - c. Initiative Consideration for Adoption - Town of Malabar
 - d. Initiatives Consideration for Adoption - Brevard County - Parks & Rec
4. Next Meeting Date
5. Adjourn



1.13.1.4 LMS Meeting - December 29, 2014 Meeting Minutes

STEERING COMMITTEE MEETING MINUTES

August 29, 2014

Committee Members in Attendance:

Chair Chris Chinault, Town of Indian River
Vice-Chair Richard Stillwagon, City of Titusville
Virginia Barker, Brevard County
Ryan Duckworth, City of Cocoa Beach
Rick Hood, Town of Grant-Valkaria
Bonilyn Wilbanks, Town of Malabar
Mike McCabe, City of Palm Bay
Alix Townsend, City of Rockledge
Don Hughes, City of Satellite Beach

Other Attendees:

Jim Williams, City of Palm Bay
Marsha Cantrell, Brevard County Parks and Recreation
Terry Stoms, Brevard County Parks and Recreation
Michele Jones, BCOEM
Ron Ricci, BCOEM
Debbie Coles, BCOEM

Meeting was called to order at 2:35 pm by Chris Chinault, LMS Steering Committee Chair.

Each member was asked to introduce themselves and their organization.

The Chair requested voting members slots that are not filled be contacted for updates. Current positions that need appointees include Health First, Melbourne Beach, and Indian Harbour Beach.

The LMS coordinator, Debbie Coles, gave an overview of the status of the LMS revisions and updates to the timeline. We received a preliminary review of the draft LMS from the State. Below is a bulleted list of the State's comments and a brief description in italics on the plan to address the comments. Items in red require action by the Steering Committee Member:

Planning Process:

- While the plan includes names of voting members and their jurisdictions, it does not include their **job title or position**. Please include **this information per jurisdiction**. *The LMS coordinator requested review of circulated mailing list that includes titles for verification and to respond. It will be sent for review to those Committee Members that could not make the meeting.*

- Is the public feedback/input incorporated into the plan? The plan must document how public feedback was incorporated into the plan. Please provide documentation of how the public was involved during the drafting stage (include copies of public notices, newspaper notices, social media etc.)

We were awaiting State feedback to post for public comment. This will be done within the next month. A notice in a paper of general circulation will instruct those interested parties that they may view the document on the internet or in person at the EOC. A news release, Facebook and Twitter may also be used to solicit public comment. The period will be for two weeks and subsequent documentation provided to the State.

Hazard Risk and Vulnerability:

- In regards to "Agricultural Infestations and Diseases" as well as "Invasive Species" you must clarify specific locations and jurisdictions that are more vulnerable. Is there any particular part of the county that is more vulnerable to these infestations/invasive species than others? Are the cattle farmers, citrus orchards, and agriculture enterprises concentrated in specific areas?

The LMS Coordinator will work with the Brevard County Ag Extension Office and Planning and Zoning to get the requested detail.

- For "Flooding," provide how deep the flooding could be on the ground. For example, X type of storm results in localized flooding from x to y inches in depth.

The LMS Coordinator will work with engineering and planning to get those details from recent flood events.

- For "Coastal Erosion," provide estimate of coastline subjected to past or future erosion (how much has been lost, may be lost?)

The LMS Coordinator will work with Brevard County Natural Resources to get those details.

- For "Drought," provide a measure of drought intensity, i.e. the Drought Severity Classification- <http://droughtmonitor.unl.edu/AboutUs/ClassificationScheme.aspx>.

The LMS Coordinator will work with the National Weather Service to get the requested detail.

- For "Extreme Heat," include estimates of possible extreme temperatures that have been observed or may be reached?

The LMS Coordinator will work with the National Weather Service to get the requested detail.

- For "Agricultural infestations and diseases," includes estimates of possible spread of infestation or value/measure of crops to be lost? And similar for "Invasive species."
- For "Agricultural Infestations and Diseases," please specify the occurrences relevant specifically to Brevard County, same for "Invasive Species"

The LMS Coordinator will work with the Brevard County Ag Extension Office and Planning and Zoning to get the requested detail.

- In regards to ALL hazards, probability is described using general descriptors (e.g. "very high", "highly likely", "very likely", "likely", "possible"). However, if general descriptors like these are used, then they must be defined in the plan. For example, "high likely" could be defined as equals near 100% chance of occurrence next year or happens every year.

Reverting to the approved language in our existing plan is acceptable to the State or simply defining the language above. The current plan rates 1 to 5 with the following definitions:

- 1- Unknown but rare occurrence
- 2- Unknown but anticipate an occurrence
- 3- 100 years or less occurrence
- 4- 25 years or less occurrence
- 5- Once a year or more occurrence

- Per "Extreme heat" provide consequences specific to Brevard County and its jurisdictions.

The LMS Coordinator will work with the National Weather Service to get the requested detail.

- For "Agricultural Infestations and Diseases," will all the 158,900 acres of Ag land be effected, please provide more detail.

The LMS Coordinator will work with the Ag Extension Office.

- Similar lack of specificity for "Invasive Species".

The LMS Coordinator will work with the Ag Extension Office, Natural Resource Management Department, and Fish and Wildlife Service to resolve concern.

Mitigation Strategy

- The plan addresses participation in the National Flood Insurance Program on P. 79-82 of Section 1.7.8 and states that they will continue to comply with NFIP but does not state explicitly how. Please note that simply stating, "the community will continue to comply with NFIP" will not meet this requirement. A description could include but is not limited to: "adoption and enforcement of floodplain management requirements, including regulating new construction in SFHAs; description of community assistance and monitoring activities".

The LMS Coordinator will work on this with the County Floodplain Coordinator.

-
- Sec 1.7.11 provides a good narrative of policies in place to mitigate against hazards, but not all hazards by jurisdiction. Moreover, Sec 1.8.6 does not list specific actions per hazard posing a threat to each jurisdiction. You could remedy this in Appendix I, Project Listing, by including a column that identifies which hazard is addressed.

For Steering Committee Action - the LMS coordinator will send this out to the Steering Committee Members to coordinate inserting answers into the project list "Hazard" column to solve this concern.

- For each action/project the plan must identify potential funding sources and expected timeframes for completion.

For Steering Committee Action - the LMS coordinator will send this out to the Jurisdictions insert potential funding along with a link to the various federal grant opportunities. The jurisdictions may also use those funding sources as listed in the legend.

- Since this is a multijurisdictional plan, it must describe each participating jurisdiction's individual planning mechanisms where hazard mitigation information/action may be incorporated. Under section 1.9, please be more specific about which jurisdictions will include hazard mitigation objectives/actions in which of their planning mechanisms. FEMA requirements place emphasis on each participating jurisdiction's action. As it stands, Section 1.9 is too general and does not include detail on specific jurisdictional planning mechanisms. A list of these specific plans by jurisdiction will suffice.

The LMS coordinator will contact each jurisdiction as necessary for this information; you may also send that information along with the other action items.

- No explanation given for why projects (many from 1999) are deferred. Please revise project list to reflect progress in projects. What is happening with those projects listed with a date earlier than the last update (2009-2010)?

For Steering Committee Action - the LMS coordinator will send this out to the Steering Committee Members to coordinate inserting answers into the project list "Estimated Completion" column to solve this concern.

The Steering Committee was tasked to bring the items marked in red above to their jurisdictions to insert some missing details. An email of the initiative list will be sent for turn around by November 1, 2014.

Remaining Timeline for LMS adoption:

- November 1st - Information to solve state concerns come back from Jurisdiction's Committee Members.
- Public Comment Period – End of September or early October post document on Brevard County Emergency Management website and make available at the EOC for public comment.

-
- Cities and Towns will hold public hearings, December / January
 - Revisions sent to State seeking Pending Approval Status – November
 - Brevard County Commission to hold a final adoption hearing pending State designation of “pending approval” status on the document in March of 2015.
 - Transmittal of all documentation of hearings at cities, towns, and County to State.

New Business hearings on adoption of various initiative projects:

Ryan Duckworth with the City of Cocoa Beach brought three initiatives forward for consideration:

Citywide Lightning Prediction System – moved for approval by Richard Stillwagon, seconded by Mike McCabe, approved unanimously by the Committee.

Communications Tower - moved for approval by Bonilyn Wilbanks, seconded by Virginia Barker, approved unanimously by the Committee.

VHF back-up radio system - moved for approval by Richard Stillwagon, seconded by Bonilyn Wilbanks, approved unanimously by the Committee.

Richard Hood presented on an emergency generator for Grant-Valkaria’s Town Hall – moved for approval by Bonilyn Wilbanks, seconded by Alix Townsend, approved unanimously by the Committee.

Bonilyn Wilbanks, Town Administrator for Malabar, presented a project for shutters for the Town Hall. It was moved for approval by Virginia Barker, seconded by Alix Townsend, approved unanimously by the Committee.

Brevard County Parks and Recreation – Marsha Cantrell and Terry Stoms represented Parks and Recreation. The projects were voted on in groups, generators and shutters. Generator projects:

- Barrier Island Environmental Center
- Chain of Lakes Maintenance Facility
- Enchanted Forest Environmental Center
- Flutie Athletic Complex Maintenance Facility
- Greater Palm Bay Senior Center
- Habitat Golf Course Maintenance Facility
- Irene H. Canova Park
- Martin Anderson Senior Center

- North Area Maintenance Facility
- North Beaches Maintenance Facility
- North Brevard Senior Center
- Palm Bay Regional Park Maintenance Facility
- POW/MIA Park
- Max K. Rodes Park Maintenance Facility
- Sam's House Environmental Center
- Savannahs Golf Course Maintenance Facility
- Space Coast Communities Sports Complex Maintenance Facility
- Spessard Holland Golf Course Maintenance Facility
- Viera Regional Park Maintenance Facility
- Wickham Park Maintenance Facility
- Wickham Park Senior Center

Generator projects were moved for approval by Richard Stillwagon, seconded by Alix Townsend, approved unanimously by the Committee.

Hurricane Shutter Projects:

- Enchanted Forest Environmental Center
- Greater Palm Bay Senior Center
- Habitat Golf Course Clubhouse
- Martin Anderson Senior Center
- North Brevard Senior Center
- Sam's House Environmental Center
- Sandrift Recreation Center
- Savannahs Golf Course Clubhouse
- Scottsmoor Meeting Hall
- Spessard Holland Golf Course Clubhouse

Shutter projects were moved for approval by Richard Stillwagon, seconded by Alix Townsend, approved unanimously by the Committee.

Next Meeting Date – TBD following LMS adoption.

Meeting adjourned at 4:00 pm.