

2020 Charlotte County Local Mitigation Strategy



Prepared By:

Charlotte County Local Mitigation Strategy Work Group



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Record of Changes

Record of Changes		
Section Changed	Change Made By	Date Changed
Promulgation Statement	Bradley Geelen	12/2019
Plan Update	Bradley Geelen/LMSWG	12/2019
Added Cyber Incidents	Bradley Geelen	2/2020

**Any changes or updates to the plan will be distributed electronically to stakeholders.*

Promulgation Statement

Patrick Fuller
Director of Emergency Management
CHARLOTTE COUNTY, FL
CHARLOTTE COUNTY LOCAL MITIGATION STRATEGY PROMULGATION

The primary role of government is to provide for the welfare of its citizens. The welfare of citizens is never more threatened than during disasters. The goal of emergency management is to ensure that mitigation, preparedness, response, and recovery actions exist so that public welfare and safety is preserved.

The Local Mitigation Strategy (LMS) is a community developed plan to reduce and or eliminate the risks associated with natural and man-made hazards. The Local Mitigation Strategy's purpose will be achieved through the process of hazard mitigation. As used in the LMS, "hazard mitigation" refers to any actions taken by local governments, other government entities, or private interests to permanently reduce or eliminate short and long-term risks to people and their property from the effects of natural or manmade disasters. It will continue to evolve, responding to lessons learned from actual disaster and emergency experiences, and ongoing planning efforts. Therefore, in recognition of the emergency management responsibilities of the jurisdiction, I hereby promulgate the Charlotte County Local Mitigation Strategy.



Patrick Fuller
Charlotte County Emergency Management Director

Part I: Local Mitigation Strategy Adoption



STATE OF FLORIDA

DIVISION OF EMERGENCY MANAGEMENT

Ron DeSantis
Governor

Jared Moskowitz
Director

August 24, 2020

Patrick Fuller, Director
Charlotte County Emergency Management
26571 Airport Rd.
Punta Gorda, Florida 33982

Re: Local Hazard Mitigation Plan Approval Notification

Dear Director Fuller,

Congratulations! The enclosed letter constitutes the Federal Emergency Management Agency's (FEMA) formal approval of the Charlotte County Local Mitigation Strategy (LMS) plan for the following participating jurisdictions:

Charlotte County, Unincorporated

The plan has been approved for a period of five (5) years and will expire again on August 19, 2025.

The Mitigation Planning Unit would like to thank you for all of your hard work. It has been a pleasure working with you and we look forward to serving you in the future. If you have any questions regarding this matter, please contact your LMS Liaison Dan Curcio at Daniel.Curcio@em.myflorida.com or 850-815-4504.

Respectfully,

Miles E. Anderson,
Bureau Chief, Mitigation
State Hazard Mitigation Officer

MEA/dc

Attachments: 08/19/20 FEMA Approval Letter for Charlotte County, Unincorporated

CHG
BCC

RESOLUTION
NUMBER 2020- 108

A RESOLUTION OF THE BOARD OF COUNTY COMMISSIONERS OF CHARLOTTE COUNTY, FLORIDA, ADOPTING THE CHARLOTTE COUNTY / CITY OF PUNTA GORDA LOCAL MITIGATION STRATEGY AS THE FORMAL GUIDE FOR CHARLOTTE COUNTY'S HAZARD MITIGATION ACTIVITIES.

RECITALS

WHEREAS, the Charlotte County Board of County Commissioners approved an Interlocal Agreement between Charlotte County ("County") and the City of Punta Gorda ("City") on March 9, 2004, requiring that the County and City work jointly to revise and update the County / City Local Mitigation Strategy to ensure its compliance with the Disaster Mitigation Act of 2000; and

WHEREAS, pursuant to that Interlocal Agreement, the City / County Local Mitigation Strategy Working Group has jointly identified local hazards, has assessed county-wide and city-wide vulnerability to these risks and hazards and has prioritized mitigation initiatives that will reduce local vulnerability to these hazards in the form of the Charlotte County / City of Punta Gorda Local Mitigation Strategy; and

WHEREAS, initiatives identified on the Local Mitigation Strategy Initiatives List are given more consideration by state management funding programs such as the Hazard Mitigation Grant Program, the Emergency Management Preparedness Assistance Trust Fund, Communities Trust, Community Development Block Grant, Coastal Partnerships Initiative, and many others; and

WHEREAS, the Local Mitigation Strategy can also serve as the Flood Mitigation Plan as required of all communities participating in the National Flood Insurance

Min

Program; and

WHEREAS, the Local Mitigation Strategy is designed to be a process oriented document with review and revision policies that allow the Local Mitigation Strategy to be changed to meet new or changing conditions, including hazard-event frequency, perceived local needs, and funding opportunities; and

WHEREAS, the Charlotte County Board of County Commissioners adopted the 2015 Local Mitigation Strategy by Resolution 2015-070 on July 14, 2015; and

WHEREAS, Florida Division of Emergency Management requires review and update of the Local Mitigation Strategy every five (5) years; and

WHEREAS, the Local Mitigation Strategy Working Group has reviewed and updated the Local Mitigation Strategy as required.

NOW, THEREFORE, BE IT RESOLVED, by the Charlotte County Board of County Commissioners that:

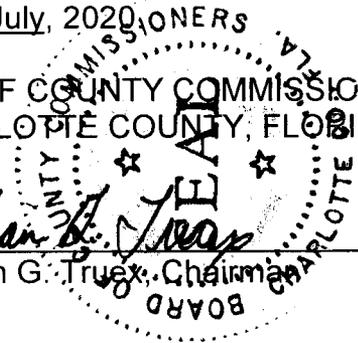
1. The Board of Commissioners of Charlotte County hereby adopts the Charlotte County/City of Punta Gorda 2020 Local Mitigation Strategy as the formal guide for Charlotte County's hazard mitigation activities.

[SIGNATURE PAGE FOLLOWS]

PASSED AND DULY ADOPTED this 28th day of July, 2020.

BOARD OF COUNTY COMMISSIONERS
OF CHARLOTTE COUNTY, FLORIDA

By: William G. Truex
William G. Truex, Chairman



ATTEST:

Roger D. Eaton, Clerk of the Circuit
Court and Ex-officio Clerk of the
Board of County Commissioners

By: Michelle DeBeaudino
Deputy Clerk

APPROVED AS TO FORM
AND LEGAL SUFFICIENCY:

By: Janette S. Knowlton
Janette S. Knowlton, County Attorney
LR20-0472 BSP (PSP)

City of Punta Gorda, Florida

Resolution No. _____ 3535 -2020

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF PUNTA GORDA, FLORIDA, ADOPTING THE CHARLOTTE COUNTY/CITY OF PUNTA GORDA LOCAL MITIGATION STRATEGY AS THE FORMAL GUIDE FOR CITY OF PUNTA GORDA HAZARD MITIGATION ACTIVITIES.

WHEREAS, the City Council of the City of Punta Gorda, Florida, approved an Interlocal Agreement between the Charlotte County (County”) and City of Punta Gorda (“City”) and on March 9, 2004, requiring that the County and City work jointly to revise and update the County/City Local Mitigation Strategy to ensure its compliance with the Disaster Mitigation Act of 2000; and

WHEREAS, pursuant to that Interlocal Agreement, the County/City Local Mitigation Strategy Working Group has jointly identified local hazards, has assessed county-wide and city-wide vulnerability to these risks and hazards and has prioritized mitigation initiatives that will reduce local vulnerability to these hazards in the form of the Charlotte County/City of Punta Gorda Local Mitigation Strategy; and

WHEREAS, initiatives identified on the Local Mitigation Strategy Initiatives List are given more consideration by state management funding programs such as the Hazard Mitigation Program Grant, the Emergency Management Preparedness Assistance Trust Fund, Communities Trust, Community Development Block Grant, Coastal Partnerships Initiative, and many others; and

WHEREAS, the Local Mitigation Strategy also serves as the Flood Mitigation Plan as required of all communities participating in the National Flood Insurance Program; and

WHEREAS, the Local Mitigation Strategy is designed to be a process-oriented document with review and revision polices that allow the Local Mitigation Strategy to be changed to meet new or changing conditions, including hazard-event frequency; perceived local needs, and funding opportunities; and

WHEREAS, the Florida Division of Emergency Management requires review and updates of the Local Mitigation Strategy every five (5) years; and

WHEREAS, the Local Mitigation Strategy Working Group has reviewed and updated the Local Mitigations Strategy as required by law.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF PUNTA GORDA, FLORIDA, THAT:

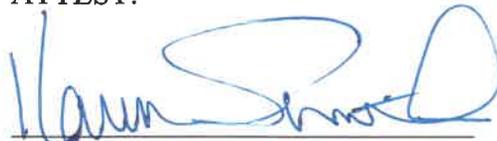
I. The City Council of the City of Punta Gorda hereby adopts the Charlotte County/City of Punta Gorda 2020 Local Mitigation Strategy as the formal guide for the City's hazard mitigation activities.

ADOPTED in a regular meeting of the City Council of the City of Punta Gorda, Florida, this 21 day of October 2020.



NANCY PRAFKE, Mayor

ATTEST:



KAREN SMITH, City Clerk

APPROVED AS TO FORM:



DAVID M. LEVIN, City Attorney

Part II: Local Mitigation Strategy Planning Process

SECTION 1: WORKING GROUP ORGANIZATION

Introduction

The Charlotte County Local Mitigation Strategy (LMS) is a community developed plan to reduce and or eliminate the risks associated with natural and man-made hazards. The Local Mitigation Strategy's purpose will be achieved through the process of hazard mitigation. As used in the LMS, "hazard mitigation" refers to any actions taken by local governments, other government entities, or private interests to permanently reduce or eliminate short and long-term risks to people and their property from the effects of natural or manmade disasters. In this regard, the Local Mitigation Strategy is a planning document.

This section describes the local jurisdictions and organizations participating in the ongoing Charlotte County/Punta Gorda Local Mitigation Strategy (LMS) Working Group that began in 1999. It discusses the organizational structure used to complete the required five-year LMS update. It also provides a summary of the current status of planning activities by the participants.

The Working Group Organizational Structure

The Charlotte County/City of Punta Gorda LMS Working Group encourages participation by all interested government entities, agencies, organizations, and individuals. The Working Group is intended to represent a partnership between the public and private sector of the community, working together to create a disaster resistant community. The proposed mitigation initiatives developed by the Working Group and listed in this 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.

The LMS Working Group has expanded on its past attempts to get the public involved. Methods to achieve involvement are articles in the newspaper, emails to employees, mailings to repetitive loss properties, and phone calls and emails regarding grant opportunities. Unfortunately, while the LMS Working Group strives to have adequate representation from local government agencies, business interests, community organizations, institutions, and the public, these entities do not always want to become involved in the planning process. The LMS Working Group continues to reach out to these entities to attempt to get some form of representation from each of these groups. If these groups cannot attend the meetings, the document is available online prior to adoption for review and any comments. Public comments can also be stated before the Board of County Commissioners prior to the plan being officially adopted.

Participating Jurisdictions

Charlotte County and the City of Punta Gorda are the two jurisdictions that have been involved from the initial development of the Charlotte County/City of Punta Gorda Local Mitigation Strategy. These jurisdictions are also participating in the planning process to complete the Charlotte County/City of Punta Gorda Local Mitigation Strategy 2015 update. These two entities represent the only two jurisdictions in the County. Charlotte County represents the unincorporated

portions of the County. Representatives from different segments of the governments of Charlotte County and Punta Gorda in the LMS Working Group are listed below. The City and County are discussed as one in regard to having similar vulnerabilities for all of the hazards, and will be discussed separately only if/when the level of risk varies. Aside from actual LMS Working Group Members, departments within each entity are included through the availability of all planning documents and open comment periods. Ideas and suggestions from these different sectors are requested. By providing the LMS Working Group with information relating to the different elements within Charlotte County, each jurisdiction helps to improve this document.

The project list provided in this LMS will continue to change and evolve as potential new members are identified.

Roles of the LMS Working Group

The LMS Working Group represents all of the local jurisdictions and key organizations participating in the planning process and makes the official decisions regarding the planning process. The LMS Working Group is also responsible for approval of 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.

The LMS Working Group reviews the results of the actual technical analyses and planning activities that are fundamental to the development of this plan. These activities include conducting the hazard identification and vulnerability assessment processes, as well as receiving and coordinating the mitigation initiatives that are proposed by the LMS Working Group participants for incorporation into this plan.

Process

Individual jurisdictions, as well as their agencies and local organizations, are really the key to accomplishing the planning process. The effort begins with developing a community profile of Punta Gorda and Charlotte County to document the basic characteristics of their community that are relevant to controlling the impacts of disasters. Vulnerability assessments of key facilities, systems, and neighborhoods within or serving the jurisdictions are conducted to specifically define 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. Once these proposed initiatives are coordinated, the LMS Working Group can then decide whether or not to incorporate them into the Charlotte County/City of Punta Gorda Local Mitigation Strategy.

The participating jurisdictions, organizations, and individuals in the Charlotte County LMS Working Group have all worked diligently to complete this plan and will continue to do so in the future to create a truly disaster resistant community for the benefit of all its citizens.

<u>Table I-1 Charlotte County/City of Punta Gorda</u>		
<i>Emergency Management Advisory Group - LMS Working Group</i>		
<i>Name</i>	<i>Position/Agency</i>	<i>CRS Step 1 Categories</i>
Bradley Geelen	EM Specialist/ LMS Chair Charlotte County Emergency Management	Emergency Services
Ellen Pinder	EM Coordinator / LMS Vice Chair Charlotte County Emergency Management	Emergency Services
Patrick Fuller	Emergency Management Director Charlotte County Emergency Management	Emergency Services
Lynne Stickley	Emergency Planning Specialist Charlotte County Emergency Management	Emergency Services
Bill VanHelden	Fire Chief - Public Safety Director Charlotte County Fire & EMS	Emergency Services
Anthony Maddox	Director Charlotte County Facilities	Preventive & Property Protection
Roger Warner	Manager Charlotte County Facilities	Property Protection
Karen Bliss	Public Works Engineering Division Storm Water Management	Structural Projects
Paul Polk	Property Appraiser	Public Information
Scott Graham	Director Information Services Property Appraiser	Public Information
Kevin Edwards	Information Services Coordinator Information Technology	Public Information
Elizabeth Nocheck	Concurrency Manager Growth Management	Preventive
Rob Powell	Maintenance and Operations Manager Charlotte County Public Works	Property Protection
Richard Allen	Maintenance and Operations Charlotte County Public Works	Property Protection
Mike Koenig	Resource Coordinator Charlotte County Community Services	Natural Resource Protection
Gary Pederzolli	GIS Programmer Information Technology	Preventive
Matt Trepal	Principal Planner Growth Management	Preventive & Property Protection
Claire Jubb	Customer Service Manager Charlotte County Community Development	Preventive & Property Protection
Carrie Walsh	Housing Manager Human Services	Preventive & Property Protection
Gary Harrell	Planner Metropolitan Planning Organization	Preventive & Property Protection
Mitchell Austin	Urban Planner City of Punta Gorda	Preventive & Property Protection
Shaun Cullinan	Community Development Engineering Division	Preventive & Property Protection

John Smith	City of Punta Gorda	Preventive & Property Protection
Roger Warner	Resources Coordinator Facilities	Preventive & Property Protection
Tommy Scott	Director Community Services	Preventive & Property Protection
Tracie Baird	Animal Control Administrative Services Supervisor	Natural Resource Protection
Ray Briggs	Fire Chief Punta Gorda Fire Department	Emergency Services
Holden Gibbs	Punta Gorda Fire Department	Emergency Services
Rick Christman	Forest Area Supervisor Myakka River District	Emergency Services
David Lupinetti	District Security/ Emergency Management Charlotte County Public Schools	Emergency Services
Mike Desjardins	Charlotte County Schools	Emergency Services
Yamilet SantanaReyes	Preparedness Planner Charlotte County Health Department	Emergency Services
Tina Figliuolo	Charlotte County Homeless Coalition	Public Information
Valerie Miller	Coordinator, Legal & Risk Florida Southwestern- Charlotte Campus	Public Information
Tim Walker	Southwest Regional Florida Planning Council	Public Information
Liz Barton	Administrator Douglas T Jacobson Veterans Nursing Home	Public Information
Jennifer Rodgers	Records Management Liaison Officer	Public Information
Mark Gering	City Engineer	City of Punta Gorda
Lorenzo Daetz	Solid Waste Division	Public Works
Jie Shao	Planner Community Development	Preventive & Property Protection
Jan Huss	ER Director Port Charlotte Bayfront	Emergency Services
Diana Bello	Grants Analyst County Utilities Charlotte	Preventive & Property Protection
Dave Watson	Operations Manager Charlotte County Utilities	Preventive & Property Protection
Josh Overmyer	Floodplain Coordinator	Community Development

SECTION 2: PLANNING PROCESS

Background and Purpose

The LMS Working Group 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 most essential component of the Charlotte County/City of Punta Gorda Local 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 LMS Working Group as they seek funding, authorities, or other resources necessary for implementation of the identified mitigation initiatives.

The Planning Process

The planning process began with the development of the LMS Working Group as an organization by obtaining participation from both Charlotte County and the City of Punta Gorda. The Interlocal Agreement between Charlotte County and the City of Punta Gorda is located in the Introduction to the LMS. The planning work conducted to develop this document relies heavily on the expertise and authorities of the participating agencies and organizations. It is also based on research from existing plans, studies, and technical information. The LMS Working Group is confident that the best judgment of the participating individuals, because of their role in the community, can achieve a level of detail in the analysis that is more than adequate than that found in reference materials for purposes of local mitigation planning. As the planning process described herein continues, more detailed and costly scientific studies of the mitigation needs of the community can be defined as initiatives for incorporation into the plan and implemented as resources become available to do so.

Establishing the Planning Schedule

As indicated in the exhibit below, the LMS Working Group initially establishes a planning schedule for the upcoming planning period that allows the participants to anticipate their involvement in the technical analyses and evaluations that they will be asked to do. The Plan Maintenance Process Section of this LMS details the timeframe for when these analyses and evaluations should be completed. At the outset of the planning period, the LMS Working Group defines the goals that the planning process is attempting to achieve, as well as the specific objectives within each goal that will help to focus the planning efforts. The goals and objectives established by the LMS Working Group for this planning period are described in the Mitigation Goals and Objectives Section of the Mitigation Strategy Part of this LMS document.

Conducting the needed analyses and then formulating proposed mitigation initiatives to avoid or minimize all vulnerabilities of the community to future disasters is an enormous effort, and one that must take place over a long period of time. Therefore, the goals and objectives set by the LMS Working Group are intended to help focus the effort of the participants, for example, by directing

attention to certain types of facilities or neighborhoods, or by emphasizing implementation of selected types of proposed mitigation initiatives.

Hazard Identification and Risk Estimation

The LMS Working Group identifies the natural hazards that threaten portions or all of the community where possible, specific geographic areas subject to the impacts of the identified hazards are delineated. The LMS Working Group also uses general information to estimate the relative risk of the various hazards as an additional method to focus their analysis and planning efforts. The LMS Working Group compares the likelihood or probability that a hazard will impact an area, as well as the consequences of that impact to public health and safety, property, the economy, and the environment. This comparison of the consequences of an event with its probability of occurrence is a measure of the risk posed by that hazard to the community. The LMS Working Group compares the estimated relative risks of the different hazards it has identified to highlight which hazards should be of greatest concern during the upcoming mitigation planning process.

Depending on the participating jurisdiction, a variety of information resources regarding hazard identification and risk estimation have been available. The planners representing the jurisdiction have attempted to incorporate consideration of hazard specific maps, whenever applicable, and have attempted to avail themselves of GIS-based analyses of hazard areas and the locations of critical facilities, infrastructure components, and other properties located within the defined hazard areas. The hazard specific maps considered are listed below:

1. 100/500 Year Floodplain Delineation Maps
2. Sea, Lake, and Overland Surge from Hurricane (SLOSH)
3. Wind Damage Model (Tornado/Hurricane)
4. Areas Subject to Wildfires
5. Areas at Risk to Erosion
6. Community Redevelopment Areas

The LMS Working Group used information provided by the property appraiser's office to determine valuations and potential losses by hazard for every structure located within the county. An explanation of how this was done can be found in the Introduction portion of the Risk Assessment Part of this document. By analyzing valuation and potential losses for the county on a parcel by parcel level, the LMS Working Group gets a more complete picture of potential damage. This information, which is contained in several spreadsheets and databases, can be queried to determine risk for any combination of reasons. This flexibility allows the LMS Working Group to obtain the most complete picture.

Estimating the relative risk of different hazards is followed by the assessment of the vulnerabilities in the likely areas of impact to the types of physical or operational agents potentially resulting from a hazard event. Two methods are available to the LMS Working Group to assess the communities' vulnerabilities to future disasters.

Vulnerability Assessment

The first avenue is a methodical, qualitative examination of the vulnerabilities of all structures within the county to the impacts of future disasters. For the participating jurisdictions and organizations, the individuals most familiar with the facility, system, or neighborhood through a guided, objective assessment process complete the assessment. The process ranks both the hazards to which the facility, system, or neighborhood is most vulnerable, as well as the consequences to the community should it be disrupted or damaged by a disaster. This process typically results in identification of specific vulnerabilities that can be addressed by specific mitigation initiatives that can be proposed and incorporated into this plan. As an associated process, the LMS Working Group also reviews past experiences with disasters to see if those events highlighted the need for specific mitigation initiatives based on the type or location of damage they caused. Again, these experiences can result in the formulation and characterization of specific mitigation initiatives for incorporation into the plan.

The second avenue for assessment of community vulnerabilities involves comparison of the existing policy, program, and regulatory framework promulgated by local jurisdictions to control growth, development, and facility operations in a manner that minimizes vulnerability to future disasters. The LMS Working Group members can assess the individual jurisdictions' existing codes, plans, and programs to compare their provisions and requirements against the hazards posing the greatest risk to that community. If indicated, the participating jurisdiction can then propose development of additional codes, plans, or policies as mitigation initiatives for incorporation into the Charlotte County/City of Punta Gorda Local Mitigation Strategy for future implementation when it is appropriate to do so.

Developing Hazard Mitigation Initiatives

This process enables the LMS Working Group participants to highlight the most significant vulnerabilities, and to assist in prioritizing subsequent efforts to formulate and characterize specific hazard mitigation initiatives to eliminate or minimize those vulnerabilities. Once the highest priorities are defined, the LMS Working Group participants can identify specific mitigation initiatives for the plan that would eliminate or minimize those vulnerabilities.

A methodical, objective procedure for characterizing and justifying the mitigation initiative proposed by each participating jurisdiction for incorporation into this plan has been established. This procedure involves describing the initiative, relating it to one of the goals and objectives established by the LMS Working Group, and justifying its implementation on the basis of its economic benefits and/or protection of public health and safety, as well as valuable or irreplaceable resources. A benefit to cost ratio is established for each initiative to demonstrate that it would indeed be worthwhile to implement if and when the resources to do so became available. Further, each proposed mitigation initiative is "prioritized" for implementation in a consistent manner by each participating organization using a set of ten objective criteria.

Developing the Local Mitigation Plan

Once the above procedure is completed by the agency or organization developing the proposed mitigation initiative, the information used to characterize the initiative is submitted to the LMS Working Group for review and inter-jurisdictional coordination. On receipt of an initiative, the LMS Working Group evaluated the level of public demand for the proposal and considered its potential for conflict with other jurisdiction's program or interests. The LMS Working Group also assures that the proposal is consistent with the goals and objectives established for the planning period and confirms that it would not duplicate or harm a proposal submitted by another jurisdiction or agency. If there is such a difficulty with a proposed initiative, it is returned to the submitting organization for revision or reconsideration.

Approval of the Current Edition of the Plan

At the end of each planning period, a plan document such as this is prepared for release to the community and for action by the governing bodies of the jurisdictions and organizations that participated in the planning process. To facilitate this action, the plan provides hazard assessment information and proposed initiatives in separate discussions grouped by jurisdiction or key organization. With this approach, the governing body only needs to approve, endorse, or act on its own component of the plan, and to address the implementation of mitigation initiatives its own representatives proposed. Consequently, there is no need for one jurisdiction or organization to be concerned with acting on proposals made by and for another.

Implementation of Approved Mitigation Initiatives

Once incorporated into the Charlotte County/City of Punta Gorda Local Mitigation Strategy, the agency or organization proposing the initiative becomes responsible for its implementation. This includes developing a budget for the effort or applying to state and federal agencies for financial support for implementation.

Benefits of the Planning Process

It is important to emphasize that the procedure used by the LMS Working Group is based on the following important concepts:

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

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

The Local Mitigation Strategy Five Year Update

FEMA requires that Local Mitigation Strategies undergo a thorough update every five years. Accordingly, the LMS Working Group conducted a thorough update of the Charlotte County/Punta Gorda multijurisdictional LMS. This involved, in addition to the same processes described above, a meticulous review and revision of every section of the LMS. The changes made to this document are outlined as followed:

- I. Plan Adoption
 - A. Once approved plan has been adopted, the resolutions will be inserted here.

- II. Planning Process
 - A. Past project update: The LMS Working Group reviewed and updated the status of the previously submitted LMS projects. This information is provided in tables in the Mitigation Strategy Part of the plan and is organized according to whether a project has been completed, removed, or deferred (including the explanation of why those projects were deferred). Tables of these projects are located in Part IV Section 1, Table IV.1-1

- III. Risk Assessment
 - A. New analyses of hazard vulnerability: The LMS Working Group conducted hazard vulnerability analyses using the most recent and best available population and property appraiser data. In order to meet the standards of the Emergency Management Accreditation Program (EMAP) all hazards are now part of the LMS including manmade disasters.
 - B. Inclusion of recent hazard occurrences: The LMS Working Group consulted extensive literature containing reports of hazard events that have occurred since the update. If the event did not cause extensive damage or cost to the county it was not listed.

- IV. Mitigation Strategy
 - A. The LMS Working Group reviewed but did not change the goals and objectives.
 - B. New projects: The LMS Working Group actively solicited for new projects throughout the update period. These projects are presented in a ranked order

according to how high they scored in a vote held at our second public LMS Working Group meeting, and according to their scores in a thorough benefit-cost review conducted by the LMS Working Group. The LMS Working Group benefit-cost review was based on a benefit-cost scoring worksheet, a copy of which is included in this LMS. The score a project received in the benefit-cost review was given priority over the LMS Working Group vote when calculating a project's final ranking.

- C. The LMS Working Group added projects and initiatives to improve Charlotte County's and Punta Gorda's Community Rating System (CRS) standing. The inclusion of several maps

IV. Plan Maintenance Process

- A. Ambitious actions are planned to incorporate this updated LMS, once approved, into any relevant local planning mechanisms.
- B. Further public outreach initiatives that have both already been completed and planned are now mentioned.

Local Mitigation Strategy Working Group Meetings

During the drafting stage of the LMS update process, the LMS Working Group held one publicly open meeting. This meeting was advertised on the county website and an ad was put in the local newspaper inviting the public to attend the planning process. An email was sent to all county, city, and public stakeholders involved in updating the LMS.

The focus of this meeting was a reexamination of the LMS's goals and objectives which would enable the solicitation of more effective mitigation projects. All members present were also asked to review the entire LMS document in hopes that the revision would be as complete and cooperative as possible.

The meeting announcements and sign-in sheets are located in Appendix 1.

At this meeting, it was decided that all communication for the plan would be done electronically through email or phone calls. If a section needed further revision the stakeholders responsible for that section would then arrange to meet. The emails are located in Appendix 1.

The stakeholders discussed the sections that would need further review, how the tasks were divided will be described in this paragraph. The property appraiser's office and the GIS departments will be responsible for updating the maps, demographical information, and property estimations. Community development is responsible for updating the CRS requirements, floodplain management sections, and information regarding community development. All stakeholders were required to give feedback on the mitigations initiatives, goals, objectives, and future projects, including approving and ranking of projects. They were also required to read the plan and give input.

After this meeting, the LMS Working Group members were in constant contact with each other concerning potential mitigation projects. All agencies and members responsible for updating the project list for the LMS were sent an electronic copy of the Project Evaluation sheet. The sheets would give each project a ranking based on the projects benefits and cost. The LMS Working Group submitted their projects electronically a month after the meeting. In order to give the LMS Working Group time to review the projects and consider their benefits and costs the list was then compiled by ranking order. The compiled list was then sent to all agencies and members of the LMS workgroup in an electronic vote format.

SECTION 3: EXISTING PLANNING MECHANISMS

At the earliest stages of the update process, the LMS Working Group diligently examined relevant planning mechanisms already in place that could significantly inform the revision of the LMS. They are as follows:

CHARLOTTE COUNTY

Standard Building Code

The basic rationale for this building code, which is used by most local governments in the state, is to protect the health, safety, and general welfare of the public as it relates to the construction and occupancy of buildings and structures. This concept is very important because it provides an underlying basis for a building code to address wind hazards from hurricanes and tornadoes.

Smart Charlotte 2050 Comprehensive Plan

The Comprehensive Plan has a number of land use regulations that directly and indirectly relate to hazard mitigation activities.

Comprehensive Emergency Management Plan (CEMP)

The Charlotte County CEMP identifies the manner in which the county will function in the event of an emergency. The CEMP delineates emergency chains-of-command, and roles of various governmental agencies in disaster preparedness, response, recovery, and mitigation. Specifically, preparedness and response activities are forms of mitigation in that they are intended to reduce the loss of life and property prior to a threatening disaster.

Community Wildfire Protection Plan (CWPP)

The Charlotte County CWPP addresses the challenges of the Wildland/Urban Interface (WUI). The plan identifies and prioritizes areas for hazardous fuel reduction treatments, recommends measures homeowners and communities can take to reduce ignitability of structures in the addressed areas, and identifies community education and outreach. Then plan in itself is a mitigation program to protect the loss of life and property should a wildfire occur.

Public Information/Education Program on Emergency Preparedness

The Office of Emergency Management works with other entities to promote public information and education of a variety of emergency preparedness issues.

Hazardous Materials Program

Both local governments participate in the various State and Federal Hazardous Materials Reporting Programs, as coordinated through the Local Emergency Planning Committee. Information gathered by the LEPC is made available to local Fire Departments, Sheriff, and Emergency Management Departments, for the purpose of enabling emergency responders to have advanced knowledge of dangers posed by hazardous materials. This plan in itself is a mitigation program to protect the loss of life and property should a hazardous materials event occur.

CITY OF PUNTA GORDA

Article 14, Land Development Regulations, Flood Damage Prevention

This article addresses building codes and other regulations for structures located in all areas of special flood hazard within the City of Punta Gorda. Included under this regulation are a minimum finished floor elevation and a requirement to obtain a flood proofing certificate.

City of Punta Gorda Emergency Plan

The City of Punta Gorda's Emergency Plan identifies the manner in which the City will function in the event of an emergency. The Emergency Plan delineates emergency chains-of-command, and roles of various governmental agencies in disaster response, preparedness, recovery and mitigation. Specifically, response and preparedness activities are forms of mitigation in that they are intended to reduce the loss of life and property prior to a threatening disaster.

City of Punta Gorda Comprehensive Plan

The Comprehensive Plan has a number of land use regulations that directly and indirectly relate to hazard mitigation activities.

City of Punta Gorda Downtown Redevelopment Plan

This plan addresses the problems of seasonal flooding in the downtown area by working to improve drainage facilities in the waterfront area.

Land Development Code 3-2-221 ET SEQ, Floodplain Management

This ordinance addresses building codes and other regulations for structures located in all areas of special flood hazard within Charlotte county. Included under this regulation are a minimum finished floor elevation and a requirement to obtain an elevation certificate.

CHARLOTTE COUNTY/CITY OF PUNTA GORDA

Flood Warning Program Annex

The Charlotte County Flood Warning Program establishes a framework through which Charlotte County may prevent, prepare for, respond to, and recover from salt water or freshwater flooding conditions that could adversely affect the health, safety and general welfare of Charlotte County's residents or visitors.

Part III: Risk Assessment

SECTION 1: RISK ASSESMENT INTRODUCTION

Each hazard’s section contains all of the information pertaining to that hazard. This includes a profile of the hazard in general and a history of the hazard in Charlotte County¹ in particular, and an assessment of the county’s vulnerability to the hazard. Exceptions occur, however, whenever a hazard has overlapping impacts. This is most notable in the case of tropical cyclones, where the section “Tropical Cyclones” analyzes the impact of storm surge and “Thunderstorms/High Wind Events” analyzes the impact of a tropical cyclone’s wind. The order of the sections in the Risk Assessment part of the LMS is very roughly determined by the level of concern the LMS Working Group believes each hazard deserves. For an overview of how the LMS Working Group evaluated the threat of each hazard, please consult Table III.1-1.

Table III.1-1. Hazard Vulnerability Overview

Type	Hazard	Probability	Impact	Frequency	Distribution
Natural	Coastal Erosion	Medium	Moderate	Annually	Coastal areas and barrier islands
	Drought	Medium	Major	5-10 Years	County-wide
	Earthquakes	Low	Minor	500 Years	County-wide
	Exotic Pests	Low	Minor	Continuous	County-wide
	Extreme Heat	High	Minor	Annually	County-wide
	Flooding	Medium	Major	1-2 Years	Localized
	Freeze	Medium	Minor	5-10 Years	County-wide
	High Wind Event	High	High	1-2 Years	County-wide
	Sinkholes	Low	Minor	30+ Years	Localized
	Tornado	Medium	Moderate	Several Per Year	County-wide
	Tropical Cyclone*	Medium	Major-Catastrophic	2-3 Years	Coastal areas and barrier islands
	Tsunami	Low	Major	500 Years	Coastal areas and barrier islands
	Wildfire	High	Moderate	Several per Year	County-wide
Technological	Dam Failure	Low	Minor	N/A	Three parcels in northwest corner of county
	Hazardous Materials	Medium	Minor	Several per Year	County-wide
	Terrorism	Low	Major-Catastrophic	N/A	County-wide
	Critical Infrastructure Disruption	High	Moderate	Several per Year	County-wide
	Cyber Incident	High	Major-Catastrophic	Daily	County-wide

*Refers to the storm surge impact of a tropical cyclone. For the wind impact of a tropical cyclone, refer to High Wind Event.

This table addresses the top hazards to potentially affect Charlotte County. The hazards were separated by type: Natural or Technological. Each hazard’s section includes two main components (as further described below): hazard identification and vulnerability analysis. The vulnerability analysis is usually further divided into three sections: history of hazard occurrence, probability of hazard occurrence, and an estimation of potential losses. Probability has three categories: high likely to (occur), Medium (may occur), Low (low occurrence). Annually means once every year. Distribution indicates areas affected by each hazard. County-wide includes the county’s jurisdictions (i.e. City of Punta Gorda)

The following hazards were not included due to the little to no risk of the hazard: Nuclear Power Plant Incidents, Civil Disturbance, Mass Immigrations, Coastal Oil Spill, Epidemic, and Major Traffic Accidents. For further information on these hazards and their impact on Charlotte County refer to the Comprehensive Emergency Management Plan or Appendix II of this plan. The impacts

¹ Unless explicitly identified otherwise, “Charlotte County” or “the county” refers to both unincorporated Charlotte County and the City of Punta Gorda collectively.

of lightning and hail are omitted since mitigation efforts for these impacts are the same as projects submitted for high wind events.

Hazard Identification:

In the hazards sections there is a general description of natural and technological hazards that could possibly affect the jurisdiction. If a hazard has scales of severity, like a hurricane's Saffir-Simpson scale, this section outlines those scales.

Vulnerability Analysis:

HAZARD HISTORY:

The hazards section catalogues recent occurrences of hazards that had some impact on Charlotte County or the City of Punta Gorda. It records the date, place, and a description of an event. Much of the data in this section was collected from NOAA's NCDC Storm Event Database.

PROBABILITY OF HAZARD OCCURRENCE:

Since the majority of this plan is concerned with natural hazards, the LMS Working Group was careful not to give probability excessive attention. Natural hazards are not very predictable. For example, we can say that structures located in the 100-year floodplain have a 1% chance of flooding annually. Of course, this does not mean that these structures will experience flooding exactly once every hundred years. On the contrary, they may not experience flooding for 500 years or, on the other hand, may experience flooding for five consecutive years. The terms high, medium, and low are used to describe the probability of each hazard occurring in the County. High means the hazard could occur every year; medium means the hazard could occur within a five-year period; and low means the hazard could occur in a time period greater than five years.

ESTIMATION OF POTENTIAL LOSSES

This section inventories the losses that Charlotte County stands to lose in a worst-case-scenario hazard. This is a monetary value referred to as "total exposure." This is most often a dollar amount calculated by adding a structure's building value, its content value, and its functional use value. The values of the county's buildings were obtained from the Charlotte County Property Appraiser. Content value and functional use value were calculated based on tables provided in FEMA's guide 3-12, "State and Local Mitigation Planning how-to guide, Understanding Your Risks." This process is somewhat further explained at the beginning of the subsequent section, Charlotte County Asset Overview.

The total asset exposure to a hazard is broken down, whenever possible, into the two jurisdictions this Local Mitigation Strategy was designed for, Charlotte County and the City of Punta Gorda. The exposure value is further divided into land use types.

SECTION 2: CHARLOTTE COUNTY ASSET OVERVIEW

CHARLOTTE COUNTY’S ASSETS BY LAND USE TYPE

According to Charlotte County Property Appraiser records, there are 105,857 buildings located in Charlotte County, with a total building value of approximately \$18.2 billion. However, the value of an asset at risk to hazards is often much more than the value of a building alone. Accordingly, the dollar values shown in Table III-1 referred to as “Total Exposure” here and throughout the LMS, represent a calculation of the replacement value of Charlotte County buildings. According to FEMA’s publication “Understanding Your Risks: Identifying Hazards and Estimating Losses,” the replacement value of a building is the value of a building itself plus the value of its contents and, where appropriate, its functional use value. For agricultural land, a property’s agricultural value was added as well, since such assets are also at risk to hazards.

Within Charlotte County, 93.6% of the structures are classified as residential land use. These structures represent 83.4% of the total value for the County. While only 2.5% of the structures in Charlotte County are classified as commercial (the land use type containing the second most number of buildings), the commercial land use has 7.3% of the total value for the County.

Table III.2-1: Estimated Values for Structures Located in Charlotte County and the City of Punta Gorda by Land Use						
	City of Punta Gorda		Charlotte County		Both Jurisdictions Combined	
Land Use	No. of Structures	Total Exposure	No. of Structures	Total Exposure	No. of Structures	Total Exposure
Agricultural	0	\$0	1,180	\$80,930,055	1,180	\$80,930,055
Commercial	347	\$231,472,940	2305	\$1,094,782,346	2652	\$1,326,255,286
Government	153	\$196,653,587	773	\$502,834,195	926	\$669,487,782
Industrial	65	\$9,691,918	820	\$270,047,347	885	\$279,739,265
Institutional	80	\$100,764,934	581	\$477,938,588	661	\$578,703,522
Misc.	36	\$21,287,004	266	\$35,884,392	302	\$57,171,396
Residential	8,140	\$1,701,487,509	91,111	\$13,491,649,643	99,251	\$15,193,137,152
Total	8,821	\$2,261,357,892	97,036	\$15,954,066,566	105,857	\$18,215,424,458

Source: Charlotte County property appraiser data analysis by Charlotte County LMS Working Group

CHARLOTTE COUNTY’S ASSETS BY JURISDICTION

Wherever possible in this LMS, the analysis of assets, risks, and potential losses will be broken down between the unincorporated areas of Charlotte County and its only jurisdiction, the City of Punta Gorda. Within Punta Gorda’s city limits lie 8.1% of the county’s total structures. Collectively they amount to 12.4% of the total value of all county structures. Also, of note is the fact that the majority of Charlotte County’s historic structures are within or just outside Punta Gorda’s city limits.

CHARLOTTE COUNTY ECONOMY, TAX BASE, AND MAJOR EMPLOYERS

The economy of Charlotte County, FL employs 59K people. The largest industries in Charlotte County, FL are Retail Trade (10,075 people), Health Care & Social Assistance (8,181 people), and Construction (5,663 people), and the highest paying industries are utilities (\$48,750), Finance & Insurance (\$48,101), and Mining, Quarrying, & Oil & Gas Extraction (\$47,404). Median household income in Charlotte County, FL is \$46,511. Males in Charlotte County have an average income that is 1.34 times higher than the average income of females, which is \$44,078. During calendar year 2017, Charlotte County welcomed an estimated 422,500 visitors; tourism generated an estimated \$380,841,400 in direct expenditures and made an estimated \$580,783,200 economic impact.

REPETITIVE LOSS PROPERTIES

There are 133 repetitive loss structures in Charlotte County and its Jurisdictions. This is comprised of 108 in the county and 25 structures in The City of Punta Gorda. These repetitive loss structures make up 0.13% of the total number of structures in the County. This accounts for 1.21% of all repetitive loss properties in the state of Florida. These structures are scattered throughout both Charlotte County and Punta Gorda, with most them clustering on the islands in the western section of the county.

Table 2-2 Repetitive Loss Structure in Charlotte County by Land Use

Table III.2-2: Repetitive Loss Structures in Charlotte County by Land Use			
	City of Punta Gorda	Charlotte County	Both Jurisdictions Combined
Land Use	No. of Structures	No. of Structures	No. of Structures
Commercial	4	6	10
Residential	21	102	123
Total	25	108	133

Since the repetitive loss properties stand to incur the most damage from a storm event, as history has proven, Charlotte County and the City of Punta Gorda are making meaningful efforts to acquire and destroy these properties, thus eliminating any future monetary losses. As of November 30, 2019, the number of NFIP policies in force in Charlotte County was 27,969 and 8,719 in Punta Gorda. Charlotte County has had 2,177 total losses which resulted in a payout totaling \$13,700,516.81. The City of Punta Gorda has had 574 total losses which resulted in a payout totaling \$2,146,291.

CRITICAL FACILITIES

A critical facility is a structure which essential services and functions for victim survival, continuation of public safety actions, and/ or disaster recovery is performed. There are 104 structures in Charlotte County that are critical facilities. These structures are labeled essential services and are scattered throughout both Charlotte County and Punta Gorda (Map III.2-2). Critical facilities within the county and its Jurisdictions have various levels of vulnerability. However, a large majority of these “critical” facilities are considered vulnerable to tropical or flooding events due to their geographic location and the county’s low elevation. Other vulnerabilities include loss of power and physical damage to the facility.

Map III.2-2 Critical Facilities



SECTION 3: LAND USE & DEVELOPMENT TRENDS

EAST COUNTY (EAST OF RANGE LINE 23E/24E AND INTERSTATE 75)

Eastern Charlotte County is distinctively rural in nature. Very few public services are provided to the few residents of this county section. Currently the vast majority of this section of the county's land use is occupied by agriculture and preservation land. Due to East County's inland location and relatively large amount of agricultural land use, it stands to suffer more from certain disasters than the rest of the county. These disasters include wildfire, drought, freeze, and pests.

SOUTH COUNTY (WEST OF RANGE LINE 23E/24E AND SOUTH OF THE PEACE RIVER)

This portion of the county contains the only municipality, the City of Punta Gorda. It is characterized by a greater mix of residential and commercial. This section of the county contains the county's most historically significant buildings. Everything else being equal, historical structures should receive more mitigation attention than non-historical structures.

MID COUNTY (NORTHWEST OF THE PEACE RIVER AND NORTHEAST OF THE MYAKKA RIVER)

Despite not having any incorporated areas, this section of the county has more residents than the other three combined. The type of land use is mostly residential and commercial. However, vacant residential and commercial lands comprise a large portion of Mid County. While this means that the potential for growth is there, Charlotte County is not expected to experience significant levels of growth in the short term. Charlotte County provides full urban service across this section of the county.

WEST COUNTY (SOUTHWEST OF THE MYAKKA RIVER)

West County's land use pattern is similar to that found in Mid County. The most distinguishing characteristic of West County is its miles of coastline. They encourage growth and development but are more vulnerable to the extent of the impacts of tropical cyclones than the other sections of the county. Only this section of the county is susceptible to erosion.

The Future: Projections

POPULATION

Charlotte County and its only municipality, the City of Punta Gorda, will continue to experience population growth in the ensuing decades. New residents will increase the demand for urban services and infrastructure – more potable water and sanitary sewage, additional roadways and roadway improvements, and the need for expanded police and fire protection to name a few.

According to the Smart Charlotte 2050 Comprehensive Plan the projected population of Charlotte County for 2015 is 168,000, up from the 160,380 of the 2010 US Census. For every five-year period following, up until the year 2050, Charlotte County can expect to experience a consistent amount of growth.

Seasonal Population

Seasonal residents and tourists flock to Southwest Florida during the winter months between November and April, with most visiting during the months of January, February, and March. The greatest impact on infrastructure and services is encountered during this three-month time span. According to the Smart Charlotte 2050 comprehensive plan over 16,000 seasonal residents visit the county throughout the year.

Residential Land Use Needs

Projected housing demand and residential land allocation can be determined by the projected population and numbers of persons per dwelling unit. The projected number of dwelling units needed in the future would be determined for each area of the county by dividing persons per dwelling units into the projected populations. These figures provide an estimation of how many future homes will be needed, and in turn, the amount of land necessary to provide for them. Unfortunately, the only year for which population projection data *by planning zone* is available is for the distant year 2050 (Table III-1).

	West County		Mid County		South & East County		Punta Gorda	
Year	Population	Dwelling Units	Population	Dwelling Units	Population	Dwelling Units	Population	Dwelling Units
2015	37,482	29,822	82,642	48,677	13,651	12,612	22,385	8,140
2050	155,692	87,153	199,919	109,579	94,981	54,357	26,262	15,123

Source: Charlotte County Property Appraisers Data Analysis

Since hurricane Charley many buildings in Charlotte County, including critical infrastructure, have either been replaced by stronger more fortified buildings or the existing buildings have been hardened to be more resilient. Codes and standards have been strictly enforced to make sure new construction is being built to code. Flood controls are on a phased reconstruction cycle to improve flood control. Drainage in Punta Gorda is also in a phased reconstruction cycle to improved roadway flooding. Charlotte County as a whole is more resilient since the last update.

SECTION 4: TROPICAL CYCLONE

HAZARD IDENTIFICATION

Tropical cyclones are coastal storms that form over the ocean, within the tropics. These storms cover a smaller area than extra tropical coastal cyclones, the storm center is warmer than the surrounding air, and the strongest winds are about 100,000 feet above the ground. Tropical cyclones are categorized by wind speed, as shown in Table III.4-1. This Charlotte County Local Mitigation Strategy will describe, analyze, and attempt to mitigate only tropical storms and all 5 categories of hurricanes. Since tropical depressions are relatively weak and any mitigation activity designed with tropical storms/hurricanes in mind would also mitigate damage caused by tropical depressions, this plan will ignore tropical depressions.

Category	Wind Speed
Tropical Depression	Maximum sustained winds near the surface less than 39 mph
Tropical Storm	Winds of 39 – 73 mph
Hurricane	Winds of 74 mph or more

Source: FEMA/NWS “Hazardous Weather and Flooding Preparedness Course”

Tropical cyclones are generated by the rising and cooling of humid air over the ocean. They need the following ingredients to develop: ocean water over 80° F and about 200 feet deep; winds converging near the water surface; unstable air, so the warm air will continue rising; humidity up to approximately 18,000 feet, to supply heat energy; winds moving in one direction, to move the storm along without breaking it up; and upper atmosphere high pressure, to help move out the rising air of the storm (FEMA/NWS).

Hurricanes are classified using the following Saffir-Simpson Hurricane Damage Potential Scale, based on central barometric pressure and wind speed (Table III.4-2).

Category	Central Pressure (Millibars)	Central Pressure (Inches)	Winds (mph)	Winds (Knots)	Damage
1	>980	>28.94	74 - 95	64 – 82	Minimal
2	965 – 979	28.50 – 28.91	96 – 110	83 – 95	Moderate
3	945 – 964	27.91 – 28.49	111 – 129	96 – 112	Extensive
4	920 – 944	27.17 – 27.90	130 – 156	113 – 136	Extreme
5	<920	<27.17	>157	>137	Catastrophic

Source: FEMA/NWS “Hazardous Weather and Flooding Preparedness Course”

POTENTIAL IMPACT

Hydro meteorological hazards associated with tropical cyclones include the following: coastal flooding caused by storm surge; riverine flooding caused by heavy rains; tornadoes; and windstorms due to extremely strong winds. These hazards are described below. For more information, please refer to the section dedicated to each of the hazards (Part III, Sections 4, 5, and 7.)

Historically, the worst damage from tropical cyclones comes from coastal flooding caused by storm surge. A storm surge is an abnormal rise in water level caused by wind and low-pressure forces; the lower the pressure of the storm, the greater the height of the storm surge. High winds and low pressure can build a wall of water out in the ocean about 10 feet high. The highest surges in the U.S. have reached 20 feet. When the surge reaches land, the wall of water can cause extensive coastal flooding (FEMA/NWS).

Hurricane-force winds also can cause extensive damage and death. The strongest winds in a hurricane occur from 10 to 30 miles from the center of the eye, in a region called the eye wall. Winds that extend outward from the eye wall in the front right quadrant are the most devastating. Precursor winds will affect land well before the most damaging winds of the eye (FEMA/NWS).

Storm surge is a type of flooding that is exclusively associated with tropical cyclones and is included in this profile for that reason. Surge is simply water that is pushed toward the shore by the force of the winds swirling around the storm. This advancing surge combines with the normal tides to create the tropical cyclone storm tide, which can increase the mean water level 15 feet or more. The level of surge in a particular area is also determined by the slope of the continental shelf. According to the National Hurricane Center (NHC), the greatest potential loss for life related to a tropical cyclone is from the storm surge.

TROPICAL CYCLONE RISK ANALYSIS

HISTORY OF TROPICAL CYCLONE EVENTS IN CHARLOTTE COUNTY

The extensive damage caused by hurricane Charley in 2004 had a large effect on Charlotte County at the time. And the affects felt by hurricane Irma in 2017 has allowed Charlotte County to leverage Federal hazard mitigation funding. To help mitigate the potential loss of life and property county-wide. Charlotte County has rebuilt and strengthened many of its critical facilities since these disasters. Charlotte County is working to fund and complete other projects on its projects list to continue its efforts to be prepared for the next potential disaster.

September 24, 2017, Hurricane Irma:

Estimated \$5 to 6 million in damage to private and public resources caused by this powerful hurricane hitting Charlotte County as well as the majority of the State.

August 13, 2004, Hurricane Charley:

Hurricane Charley, a powerful but compact Category 4 hurricane made landfall August 13th. The center of Charley crossed the barrier islands of Cayo Costa and Gasparilla Island then moved up Charlotte Harbor before making landfall at Mangrove Point, just southwest of Punta Gorda. The airport in Punta Gorda recorded sustained winds of 87 mph with gusts to 112 mph before the wind equipment blew apart. No storm surge was reported but Charlotte Harbor reported a four-foot drop in the water level. Hurricane Charley caused 4 direct fatalities, over \$5.4 billion (2004 USD) in damages, and damaged/destroyed over 16,000 homes and 656 commercial buildings.

September 25, 2004, Hurricane Jeanne:

Hurricane Jeanne followed nearly the same path across Florida as Hurricane Frances three weeks earlier and was the unprecedented 4th hurricane to damage Florida during the 2004 Hurricane Season. After four hurricanes in only six weeks, 69.0% of households applied for and received a total of \$38 million in Individual Assistance.

October 24, 2005, Hurricane Wilma:

Hurricane Wilma produced tropical storm force winds across much of southwest and west central Florida. In Charlotte County, a peak wind gust from the north of 70 MPH was reported at the Punta Gorda Airport at 851 AM EDT. Heavy rains of 4 to 8 inches caused urban street flooding and filled ditches to capacity. State Road 31 was flooded 4 miles north of the Lee County Line. As of November 18th, there were 931 insurance claims that totaled \$529,000 (NOAA).

PROBABILITY OF TROPICAL CYCLONE OCCURRENCE

Due to the frequent occurrences of tropical cyclones in the Charlotte County area in the past, the probability that the county will experience more in the future is medium. The entire county is equally vulnerable to the effects of a tropical cyclone. While a Category 5 is possible, in any given year, Charlotte County could expect to see a Category 4 Hurricane make landfall within the county limits or within 50 miles of the county limits.

ESTIMATING POTENTIAL LOSSES

Tropical storm damage is caused by storm surge, flooding, and winds. Storm surge is the most damaging of all tropical storm impacts. The potential risks associated with the storm surge aspect of tropical cyclones are the sole focus of this section's analysis. The risks associated with high winds and flooding are discussed in their respective sections of this plan.

The SLOSH (Sea, Lake, and Overland Surges from Hurricanes) model is the computer model developed by the National Weather Service for coastal inundation risk assessment and the prediction of storm surge. It estimates storm surge heights resulting from historical, hypothetical, or predicted hurricanes.

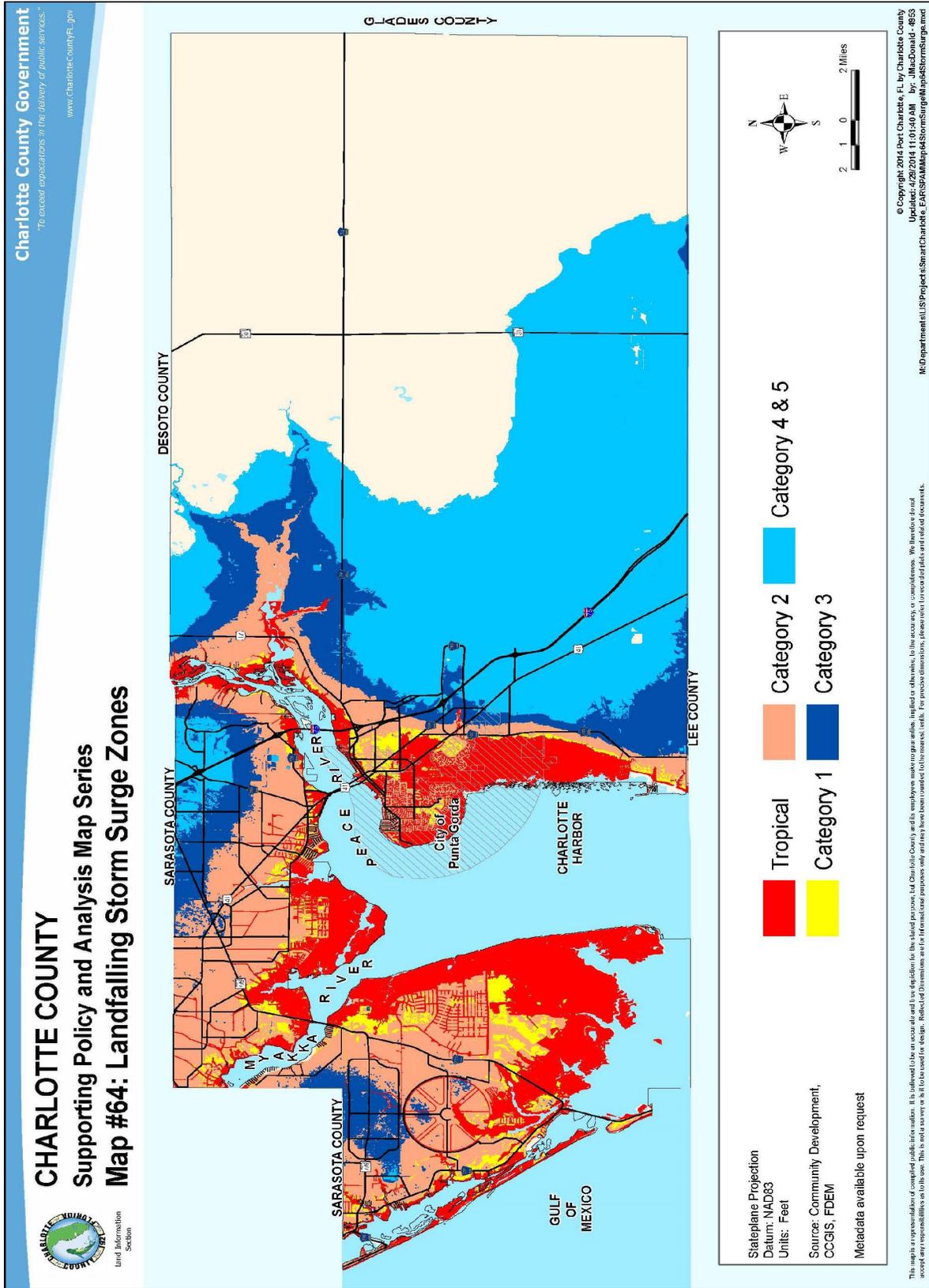
The potential impacts a Tropical Cyclone can have on Charlotte County and its jurisdictions which includes The City of Punta Gorda would be large scale and have lasting effects. The County or its jurisdictions would incur many costs to respond to and recover from such an event. The costs incurred would be both short-term and long-term with lasting effects County-wide but especially on its vulnerable populations such as the elderly, fiscally constrained and agricultural depending on the affected areas. High category hurricanes are the highest risk for counties in Florida and can have a detrimental effect on land, agriculture, property and, structures. There is also the risk of impact on County facilities and critical infrastructure that services the community which must be kept as operational as possible during an event. These critical facilities and infrastructure are managed and prioritized in the Emergency Operation Center during the event.

POTENTIAL FUTURE RISK

Charlotte is a coastal county making it more vulnerable from the storms that come from the Gulf. This includes tropical cyclones, and high wind events. Damage from high winds, storm surge, and rain-induced flooding can impact all structures and utilities. The structures most susceptible to damage are older buildings, dilapidated housing, and other less hardened properties such as mobile homes. Widespread electrical outage is probable, as well as water and sewage backup in flooded areas. Depending on the intensity of the event, economic and environmental impacts can be severe. All populations may be impacted by these events, but those at highest risk are the elderly, the disabled, lower income, and the homeless.

Charlotte County has 47961 homes built before the code change in 1992 and 11848 mobile homes. This would make 60% of the homes in Charlotte County vulnerable to tropical cyclones.

Map III.4-1. Storm Surge Zones



SECTION 5: FLOODING

HAZARD IDENTIFICATION

According to FEMA, floods are the most common and widespread of all natural disasters, with the exception of fire Flood water often damages property and can even kill. Floods can also cause damages such as pollution of the wells and city water systems, making them unsafe to use (IFAS Disaster Handbook). Freshwater flooding along rivers and streams can and does cause significant property damage and has the potential of causing personal injury and deaths.

A flood, as defined by the National Flood Insurance Program (NFIP) is: A general and temporary condition of partial or complete inundation of two or more acres of normally dry land area or of two or more properties (at least one of which is your property) from:

- Overflow of inland or tidal waters;
- Unusual and rapid accumulation or runoff of surface waters from any source;
- Mudflow; or
- Collapse or subsidence of land along the shore of a lake or similar body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels that result in a flood as defined above.

Floods can be slow or fast rising but generally develop over a period of days. Floods can come in the form of “flash floods,” which usually result from intense storms dropping large amounts of rain within a brief period. Flash floods occur with little or no warning and can reach full peak in only a few minutes (IFAS Disaster Handbook). Other floods are more gradual, as with a large storm front, a tropical storm, or a hurricane washing ashore (FEMA).

FLOODING RISK ANALYSIS

HISTORY OF FLOODING IN CHARLOTTE COUNTY

Charlotte County has a history of flooding due to rainfall events a storm surge events. The following is a listing of dates in which Charlotte County residents have submitted flood insurance claims to the National Flood Insurance Program. The dollar figures reflected in the figures below include damage to county infrastructure, along with damages to homes and businesses.

Excessive Rainfall

June Between 16” and 20” of rain fell across the county within a 24-hour period.

2003 Approximately \$4.7 million in damages occurred to public infrastructure. 41 living units were affected with an estimated \$50,000 in damage.

Tropical Storm Gabrielle

Sept 2001 Direct hit from tropical storm caused widespread flooding along Shoreview Drive and Gulf Blvd. Significant flooding also took place in the City of Punta Gorda. Over 300 homes were affected with minor-moderate levels of flooding. Estimated damages to infrastructure, residences, and businesses are between \$4-6 million.

Sept Hurricane Gordon

2000 Passing Hurricane caused flooding in the Manasota Key area along Shoreview Drive and

Gulf Blvd. Other areas included the Peace River shoreline area in Punta Gorda. Flood Insurance claims totaled over \$132,584.02.

Tropical Storm Harvey (no landfall)

Sept 1999 Passing tropical storm caused flooding in the Manasota Key area along Shoreview Drive and Gulf Blvd. Minor flooding occurred in a few homes. Flood Insurance claims were totaled over \$21,592.40.

Hurricane Georges (no landfall)

Sept 1998 Passing hurricanes caused abnormally high surf, causing beach erosion and threatening some homes, putting water in a few on Manasota Key; flood insurance claims of \$3558.50.

Excessive Rainfall

Sept 1997 Up to 10" of rain fell in Port Charlotte causing widespread street flooding in Charlotte County; some houses sustained water damage; \$15,846.79 in flood insurance claims were paid out.

Tropical Storm Josephine (no landfall)

Oct 1996 Some street flooding occurred, Englewood experienced some flooding from high tide; high tide eroded beach and caused one home to fall into the water; \$253,631.39 in flood insurance claims were paid out.

Winter Rain Storm

Mar 1993 Flooding caused by high tides coupled with blowing winds; flood insurance claims of \$383,008.69 were paid out.

Flooding due to 6 days of rain

Jun 1992 23.5" of rain fell in Murdock, 18" fell in Punta Gorda, and 28" fell in Englewood; approx. \$1,600,000 in damages was reported.

Tropical Storm Keith

Nov 1988 Approximately 2" of rain fell in Charlotte County; flooding occurred in Punta Gorda and other low-lying areas due to high tides coupled with a minimal storm surge. Flood insurance claims of \$224,384.60 were paid out.

Stalled front with excessive rain

Sep 1988 Homes in Grove City suffered damages from flooding, none of which were uninsured; 11.5" of rain fell in Englewood, with 7.5" in Punta Gorda and 4.5" in Port Charlotte. Flood insurance claims of \$1,066.51.

Hurricane Elena (not landfalling)

Aug 1985 Storm surge caused flooding of up to 5' in some areas. Flood insurance claims of \$161,356.46 were paid out.

Abnormal High Tide

Mar 1983 Flooding occurred in the City of Punta Gorda. Flood insurance claims of \$7,967.89 were paid out.

No-Name Storm

Jun 1982 Several inches of rainfall along with a minimal, but damaging storm surge; approx. 10,965 acres of land flooded with salt water; approximately 1800 acres of land flooded with fresh water rain runoff; damage estimates approx. \$1,000,000.

Hurricane Agnes (not landfalling)

Jun 1972 5"-7" rainfall in Charlotte County; caused flooding of 3"-6" in parts of County; damages approx. \$62,105.

Hurricane Charley

Aug 2004 Estimated \$5.4 billion in damage to private and public resources caused by this powerful category 4 hurricane hitting Charlotte County and proceeding up the harbor to Desoto County.

Hurricane Wilma

Oct 2005 Heavy rains of 4 to 8 inches caused urban street flooding and filled ditches to capacity.

Hurricane Irma

Sep 2017 Estimated \$5 to 6 million in damage to private and public resources caused by this powerful hurricane hitting Charlotte County as well as the majority of the State.

PROBABILITY OF FLOODING IN CHARLOTTE COUNTY

The county's very low elevation, coastal location, and climate all lead to the conclusion that the occurrence of a flood in Charlotte County is highly probable. The probability of freshwater flooding has been quantified by FEMA through the National Flood Insurance Program (NFIP). Areas subject to flooding, the 100-year floodplain, have been delineated in Flood Insurance Rate Maps (FIRM) for the County. The model used to determine the 100-year floodplain is a cumulative model, which means that it is based on several storm events; no one storm will inundate all the areas within the flood zone. This information was linked with the information from the property appraiser's office to determine the 100-year floodplain designation for each parcel.

ESTIMATING POTENTIAL LOSSES

In order to determine the potential losses a flood could cause in Charlotte County, the floor elevation needed to be established for each structure in the County. This number was then subtracted from the depth of the flood waters to determine the level of flood water damage for each individual structure within the county. Using depth damage calculation tables provided by FEMA, the amount of building loss, content value loss, functional use loss, and total value loss were determined.

The estimations of potential losses due to a flood will be analyzed according to FEMA's flood zone designations. These designations are used for the purposes of the National Flood Insurance Program (NFIP) and divide land areas into four separate categories of risk in Table V-1. See Map V-1 of the FEMA FIRM Zones on the following page.

The potential impacts a flood can have on Charlotte County and its jurisdictions which includes The City of Punta Gorda would be large scale and have lasting effects. The County or its jurisdictions would incur many costs to respond to and recover from such an event. The costs incurred would be both short-term and long-term with lasting effects County-wide but especially on its vulnerable populations such as the elderly, fiscally constrained and agricultural depending on the affected areas. Flooding can have a detrimental effect on land, agriculture, property and, structures. There is also the risk of impact on County facilities and critical infrastructure that services the community which must be kept as operational as possible during an event. Flooding is a higher risk in the City of Punta Gorda where the elevation is lower than in other part of the county.

Table III.5-1. Definitions of FIRM Flood Zones

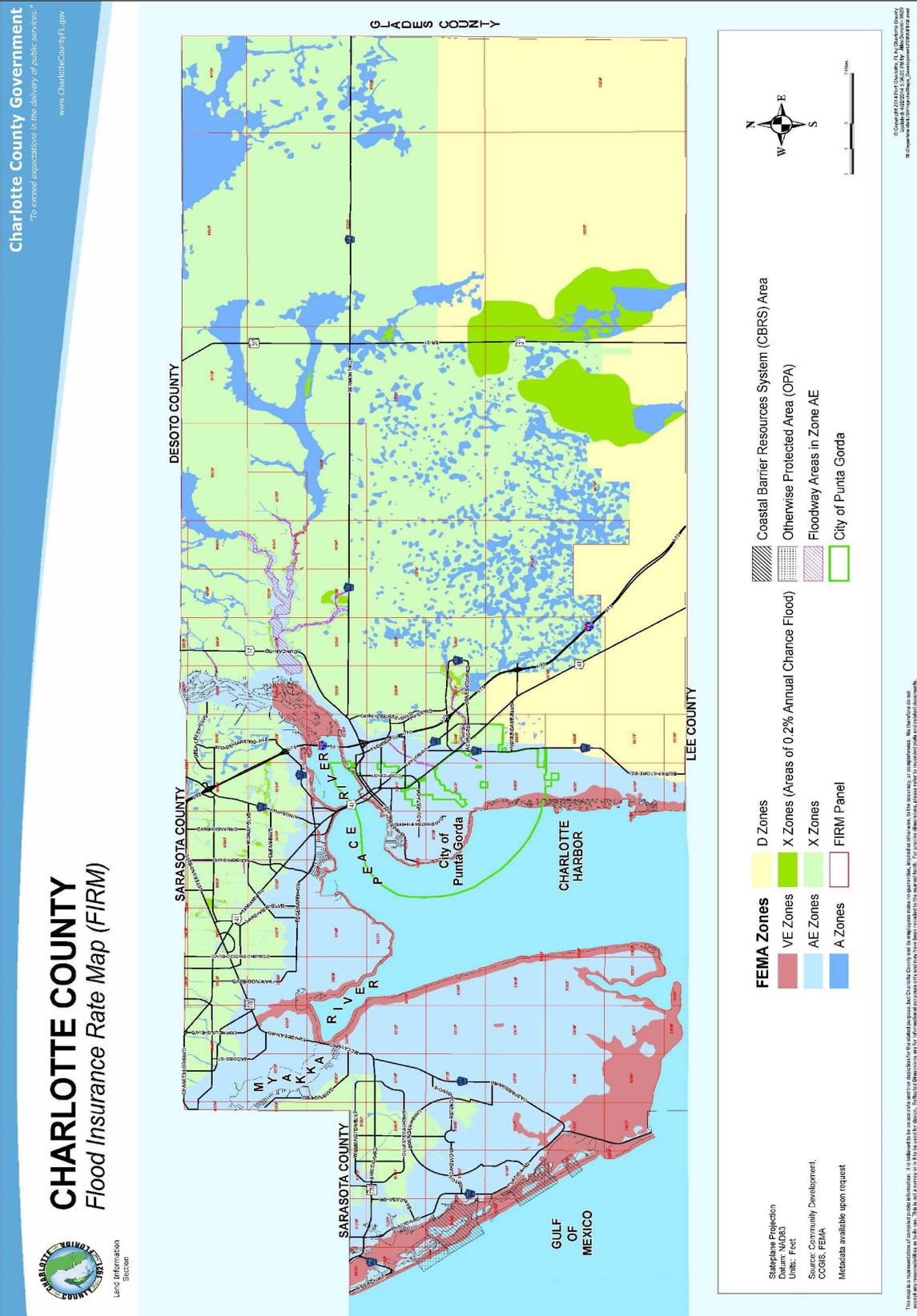
Risk Level	Zone Codes	Description
Medium to Low	B, C, and X	Areas outside the 1-percent annual chance floodplain, areas of 1% annual chance sheet flow flooding where average depths are less than 1 foot, areas of 1% annual chance stream flooding where the contributing drainage area is less than 1 square mile, or areas protected from the 1% annual chance flood by levees. No Base Flood Elevations (BFE) or depths are shown within this zone.
High	A	Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. This area is also known as the “100 year flood plain.”
High - Coastal	V	Coastal areas with a 1% or greater chance of flooding and an additional hazard associated with storm waves. These areas have a 26% chance of flooding over the life of a 30-year mortgage. No base flood elevations are shown within these zones.
Undetermined	D	. No flood hazard analysis has been conducted.

Source: FEMA Map Service Center

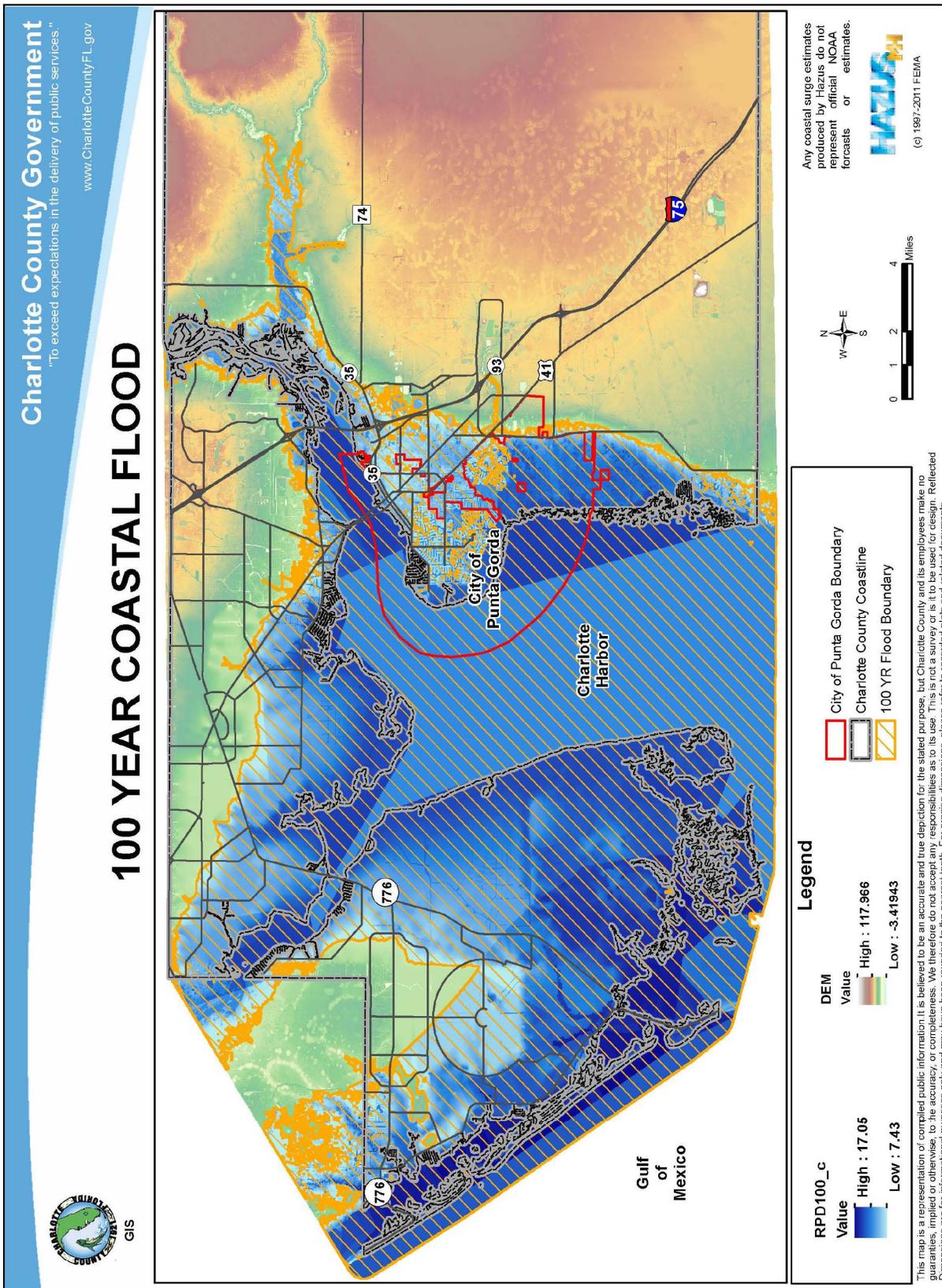
Please refer to Appendix D the Charlotte County Flood Warning Program for information pertaining to warning and evacuating residents. This annex will describe the various types of flooding that could occur, provide procedures for disseminating warning information, and for determining, assessing and reporting the severity and magnitude of impact on flooded areas. This document will also establish the concept under which the county government will operate in response to flood emergencies and create a framework for expeditious, effective and coordinated employment of local resources.

The following maps provide more acute information in regard to flooding effects and vulnerability for the county and its Jurisdictions. The first is a FIRM map showing the FEMA Zones and jurisdictional boundaries. The next two show the 100 and 500-Year flood zone maps for the area. The final two show substantial building damage per thousand square feet and the number of displaced population. This overlays the Jurisdictional boundaries as well.

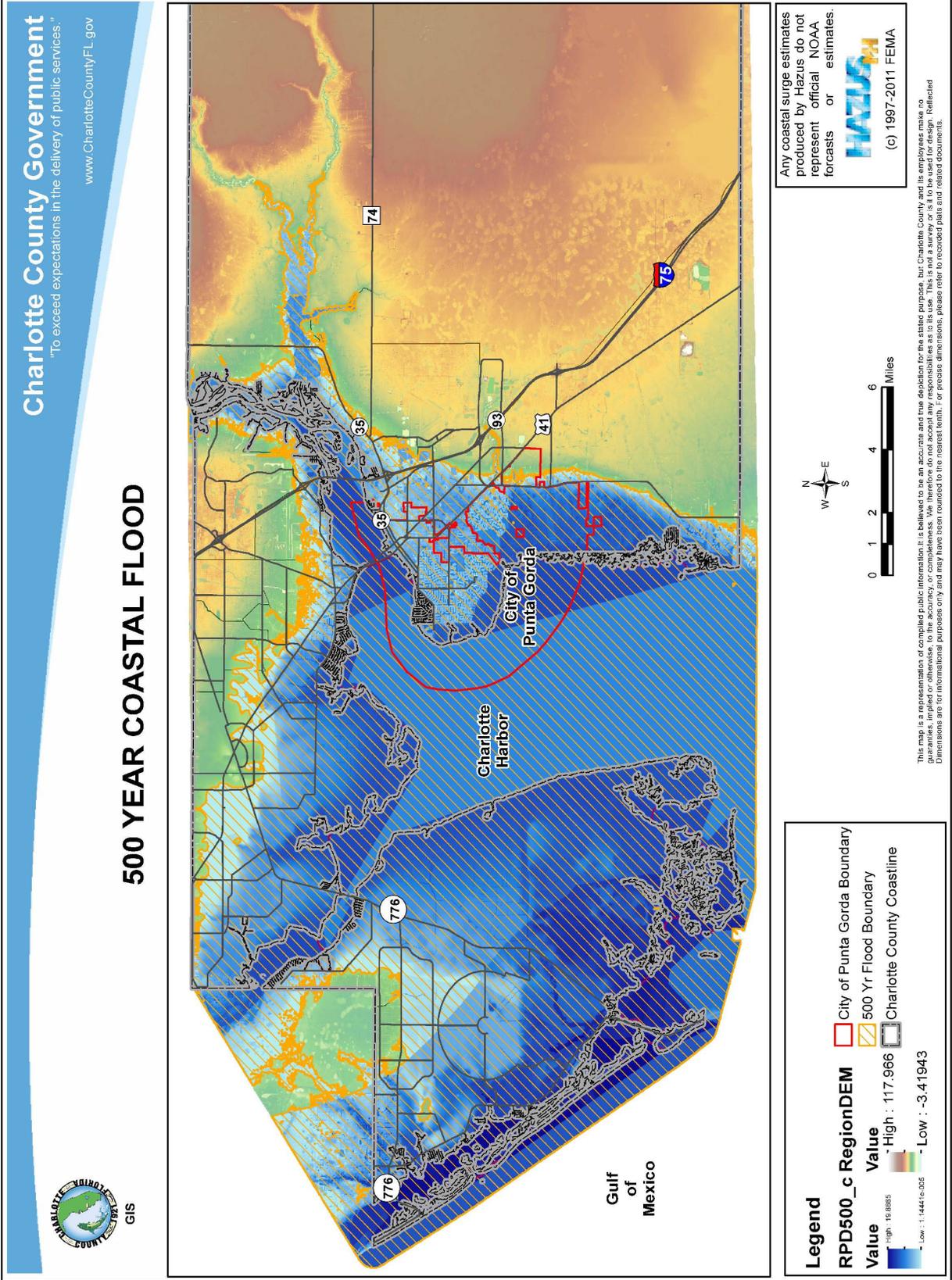
Map III.5-1. Flood Insurance Rate Map (FIRM)



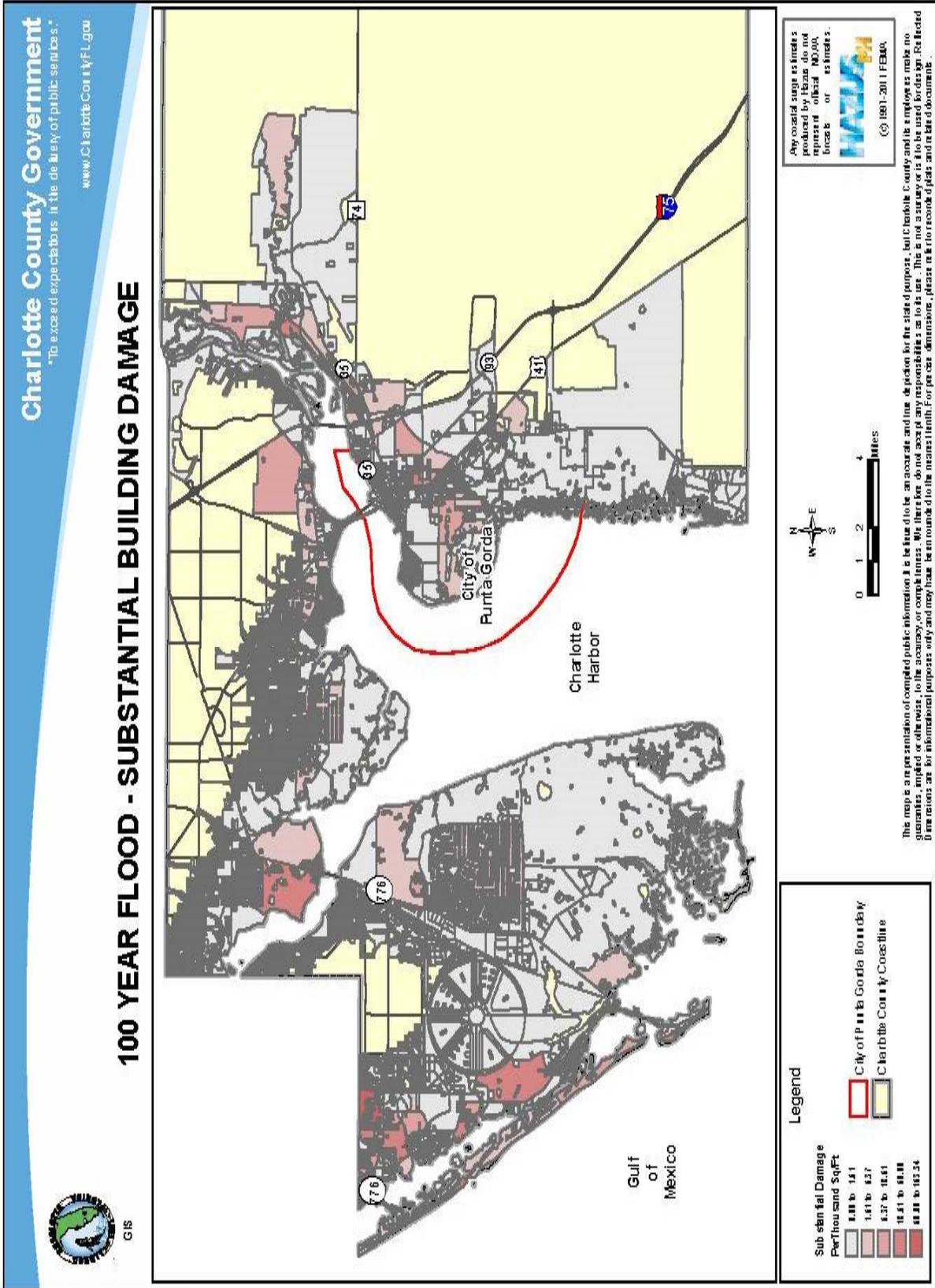
Map III.5-2. 100 Year Flood



Map III.5-3. 500 Year Flood



Map III.5-4. 100 Year Flood Substantial Building Damage



SECTION 6: WILDFIRE

HAZARD IDENTIFICATION

Fires are a natural part of the ecosystem in Florida. However, wildfires can present a substantial hazard to life and property in growing communities. There is a potential for losses due to wild land/urban interface (WUI) fires in Charlotte County.

A wildfire is an uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures. They often begin unnoticed, spread quickly, and are usually signaled by dense smoke that fills the area for miles around. Naturally occurring and nonnative species of grasses, brush, and trees fuel wildfires (FEMA guidebook).

A wildland fire is a wildfire in an area which development is essentially nonexistent, except for roads, railroads, power lines, and similar facilities. A wildland/urban interface fire is a wildfire in a geographical area where structures and other human development meet or intermingle with wild land or vegetative fuels (FEMA guidebook).

Wildfires are nature's way of managing wild plant life and regenerating growth. But, they also can be the result of other factors. Wildfires can be caused by lightning, campfires, uncontrolled burns, smoking, vehicles, trains, equipment use, and arsonists. People start more than four out of every five wildfires, usually as debris burns, arson, or carelessness. Lightning strikes are the next leading cause of wildfires (FEMA).

Wildfire behavior is based on three primary factors: fuel, topography, and weather. The type and amount of fuel, as well as its burning qualities and level of moisture affect wildfire potential and behavior. The continuity of fuels, expressed in both horizontal and vertical components is also a factor, in that it expresses the pattern of vegetative growth and open areas. Topography is important because it affects the movement of air (and thus the fire) over the ground surface. The slope and terrain can change the rate of speed at which fire travels. Weather affects the probability of wildfire and has a significant effect on its behavior. Temperature, humidity, and wind (both short and long term) affect the severity and duration of wildfires (FEMA guidebook).

WILDFIRE RISK ANALYSIS

HISTORY OF WILDFIRE IN CHARLOTTE COUNTY

According to the Florida Forest Service, there has been a total 8 wild/forest fire events officially reported in Charlotte County since 2019. These events resulted in no deaths and 1 injury. However, they did burn over 2,500 acres with over \$ 250,000 in property damage. The following is a brief description of significant wildfire events.

March 20, 2011, Punta Gorda:

A wildfire ignited from an unknown source and burned 205 acres of trees and brush.

April 28, 2011, Port Charlotte:

A wildfire ignited after a lightning strike. This fire consumed a total of 230 acres of trees and brush.

April 30, 2011, Punta Gorda:

A wildfire ignited after a lightning strike and burned 778 acres of trees and brush.

June 6, 2011, Babcock Ranch:

A wildfire ignited from an unknown source and burned 243 acres of trees and brush.

June 25, 2011, Punta Gorda:

A wildfire ignited after a lightning strike and burned 172 acres of trees and brush.

April 11, 2012, Punta Gorda:

A wildfire ignited from an unknown source and burned 164 acres of trees and brush.

March 6, 2013, Punta Gorda:

A wildfire ignited from an unauthorized debris burn and burned 500 acres of trees and brush.

April 5, 2015, Babcock Ranch:

A wildfire ignited from an unauthorized burn of pallets and burned 467 acres of trees and brush.

PROBABILITY OF WILDFIRE OCCURRENCE

Given the history of wildfire occurrences and the current low levels of development in the county, the probability of future wildfire occurrences is considered as medium. We could expect at least one wildfire a year burning at least 100 acres.

ESTIMATING POTENTIAL LOSSES

The Charlotte County Property Appraiser's Office has fire risk areas designated on a parcel level. The value for each structure was also provided by the Charlotte County Property Appraiser's Office.

Currently, there are no standard loss estimation tables in existence for calculating losses to structures, contents, or functional use as a result of a wildfire event (FEMA guidebook). Loss estimation for wildfire events is difficult because there are so many factors that will influence where damage will occur and the amount of damage that will occur.

The potential impacts a wildfire can have on Charlotte County and its jurisdictions which includes The City of Punta Gorda would be large scale and have lasting effects. The County or its jurisdictions would incur many costs to respond to and recover from such an event. The costs incurred would be both short-term and long-term with lasting effects County-wide but especially on its vulnerable populations such as the elderly, fiscally constrained and agricultural depending on the affected areas. Large scale wildfires can have a detrimental effect on land, agriculture, property and, structures. There is also the risk of impact on County facilities and critical infrastructure that services the community which must be kept as operational as possible during an event.

POTENTIAL FUTURE RISK

In assessing physical vulnerability, the most important factor is the extent to which structures get damaged when they are exposed to fire and heat. Structures located near the wildland/urban interface area are at the greatest risk for damage from wildfires. The history of wildfires in Charlotte County mainly shows the burning of brush and timber in comparison to the destruction of structures. However, as development pushes forward into areas that are currently brush and timber, more structures will face the risk of wildfire damage.

Locations for wildfires are sometimes hard to predict and can be dependent on exigent factors. However, Charlotte County does have areas that are more susceptible to wildfires and have wildfire events occur there on a frequent basis during dry seasons. These higher risk areas are heavily wooded areas in different locations throughout the county. The largest planning area at risk is The Fred C. Babcock/Cecil M. Webb Wildlife Management area due to its vast wooded areas, (spanning over 80,000 acres) and new home developments along Burmont Road. The Englewood Peninsula has the second largest planning area for at risk locations. Locations in Englewood that are prone to these fires include: South Gulf Cove and Placida. El Jobean is another high-risk area located just north of the South Gulf Cove area across the Myakka River. Tropical Gulf Acres is another high-risk area located in South County between Burnt Store Road and US 41.

SECTION 7: TORNADO

HAZARD IDENTIFICATION

The National Weather Service defines a tornado as “a violently rotating column of air in contact with the ground and extending from the base of a thunderstorm. A condensation funnel does not need to reach to the ground for a tornado to be present; a debris cloud beneath a thunderstorm is all that is needed to confirm the presence of a tornado, even in the total absence of a condensation funnel” (National Weather Service, 2003). Tornadoes are defined in terms of the Fujita Scale, which ranks tornadoes on the basis of wind speed and damage potential and separates them into six categories.

Table III.7-1 The Fujita Scale

Fujita Scale		Enhanced Fujita Scale* <small>* In use since 2007</small>	
F-0	40–72 mph winds	EF-0	65–85 mph winds
F-1	73–112 mph	EF-1	86–110 mph
F-2	113–157 mph	EF-2	111–135 mph
F-3	158–206 mph	EF-3	136–165 mph
F-4	207–260 mph	EF-4	166–200 mph
F-5	261–318 mph	EF-5	>200 mph

TORNADO RISK ANALYSIS

Using Charlotte County’s history of tornado events along with the National Oceanic Atmospheric Administration’s database the risk Charlotte County faces from high wind events was determined. Charlotte County has not experienced any historical tornado incidences greater than an F2. Being that tornadoes are unpredictable in nature Charlotte County could be susceptible to all six categories of tornado. However, an EF4 tornado is the greatest strength tornado that has affected the state of Florida according to the National Oceanic and Atmospheric Administration.

HISTORY OF TORNADOES IN CHARLOTTE COUNTY

There is no recorded history of a tornado with a classification greater than F2 striking in Charlotte County. Of the tornado events that have occurred in Charlotte County, 80% of them were F0 tornadoes and 12% of them were classified as F1 tornadoes. This means that the majority of the tornado events that occur in Charlotte County are events that cause only moderate damage. Since tornados are unpredictable this makes Charlotte County vulnerable to all 6 categories of tornados.

June 21, 2006, Port Charlotte:

A small but destructive tornado rapidly developed near the merger of the east and west coast sea breezes over Port Charlotte. One home was destroyed. Estimated damage was \$500,000.

June 21, 2006, Charlotte Harbor:

A weak waterspout moved onshore as a tornado in the Harbor View mobile home park along the Peace River. Damage was limited to aluminum car ports and small sheds. Estimated damage was \$30,000.

January 27, 2012, Charlotte Harbor:

A tornado touched down and caused significant roof damage to a single-family home and an apartment complex. Damage was estimated at \$30,000.

February 24, 2016, Punta Gorda & Port Charlotte:

An EF-1 tornado with 97 mph winds hit the Deep Creek area of Charlotte County and an EF-0 tornado hit the Murdock area of Charlotte County. A total of 34 homes were damaged in Deep Creek.

PROBABILITY OF TORNADO OCCURRENCE

While history shows that the probability of a tornado occurrence in Charlotte County is high, the probability of a severe tornado (F3 or higher) occurring is very low. On the other hand, even an F2 tornado has the potential to cause destruction wherever it touches down, and it could touch down anywhere in the county.

ESTIMATING POTENTIAL LOSSES

Identifying assets at risk for tornado damage is virtually impossible since tornadoes are so unpredictable. With that being said, it can be assumed that every structure has an equal chance of exposure to a tornado event. Therefore, all of the assets of Charlotte County should be included in the exposure zone. Please see the asset overview section (Part III, Section 2, Table III.2-1) of this report for a representation of Charlotte County and the city of Punta Gorda's Assets.

There is less than one recorded F3-F5 tornado per 3,700 mi² for Charlotte County. However, as FEMA points out, the nature of tornadoes is that they strike at random. The whole county is considered when looking at the probability and location of occurrence for any strength tornado. The LMS working group has been working on hardening of critical facilities to protect them against hazards such as tornados that could potentially affect our county and its residents.

POTENTIAL FUTURE RISK

The risk for tornado damage will increase as more and more people move to the area and more and more structures are built. The Land Uses and Development Trends section of this risk analysis addresses where some of this future growth is projected to occur. Due to the unpredictability of tornado events, it is not possible to make a reasonable extent scale for this hazard.

Most tornadoes form from thunderstorms. You need warm, moist air from the Gulf of Mexico and cool, dry air from Canada. When these two air masses meet, they create instability in the atmosphere. Charlotte County is a coastal county making it more vulnerable. The structures most susceptible to damage are older buildings, dilapidated housing, and other less hardened properties such as mobile homes. All populations may be impacted by these events, but those at highest risk are the elderly, the disabled, lower income, and the homeless. Charlotte County has 47961 homes built before the code change in 1992 and 11848 mobile homes. This would make 60% of the homes in Charlotte County vulnerable to tornados.

SECTION 8: HIGH WIND EVENTS

HAZARD IDENTIFICATION

While high wind events bring with them the threat of numerous individual hazards, the sole concern of this section of the LMS is with the high wind hazardous aspect of thunderstorms. Accordingly, the LMS Working Group ran multiple tropical cyclone models using HAZUS which simulated winds much higher than would be expected from a thunderstorm. This means that mitigation actions for tropical cyclone-type winds would also mitigate thunderstorm wind damage.

Thunderstorms result from the rapid upward movement of warm, moist air. They can occur inside warm, moist air masses and at fronts. As the warm, moist air moves upward, it cools, condenses, and forms cumulonimbus clouds that can reach heights of over 12.45 miles. As the rising air reaches its dew point, water droplets and ice form and begin falling towards the Earth's surface. As the droplets fall, they collide with other droplets and become larger. The falling droplets create a downdraft of cold air and moisture that spreads out at the Earth's surface, causing the strong winds commonly associated with thunderstorms.

HIGH WIND EVENT RISK ANALYSIS

The potential threat to Charlotte County was ascertained by using the National Oceanic Atmospheric Administration's database along with Charlotte County's history of thunderstorms and high wind events.

HISTORY OF THUNDERSTORMS AND HIGH WIND EVENTS

According to the National Climatic Data Center of NOAA, 2 significant thunderstorm/high wind events were recorded in Charlotte County in the last ten years. These events resulted in no deaths or injuries. An estimated \$105,000 thousand in property damage is attributed to these events. Following is a brief description of the thunderstorm/high wind events that have been recorded by NOAA in Charlotte County since 2004. Tropical cyclones always involve high winds.

April 12, 2004, Regional:

An unusually strong pressure gradient developed between small scale high and low-pressure systems across central and southern Florida. A 41-knot wind gust was recorded at the Charlotte County Airport in Punta Gorda. Damage estimates from this event in the region reached \$55,000.

June 10, 2012, South Charlotte:

Several trees were uprooted, and power poles knocked down. A mobile home sustained minor roof damage, and the roof of a shed was blown 150 feet away. A central pivot irrigation rig was also twisted and damaged by the wind. Damage estimates from this event in the region reached \$50,000.

PROBABILITY OF THUNDERSTORM ASPECT OF HIGH WIND EVENT OCCURRENCE

Considering the area's frequent past occurrence of events, along with the almost daily summer thunderstorm and seasonal tropical cyclones the county experiences, the probability of a thunderstorm or high wind event is high. The entire county is equally vulnerable to the effects of thunderstorms and/or high wind events.

Charlotte is a coastal county making it more vulnerable from the storms that come from the Gulf. This includes tropical cyclones, and high wind events. Damage from high winds, storm surge, and rain-induced flooding can impact all structures and utilities. The structures most susceptible to damage are older buildings, dilapidated housing, and other less hardened properties such as mobile homes. Widespread electrical outage is probable, as well as water and sewage backup in flooded areas. Depending on the intensity of the event, economic and environmental impacts can be severe. All populations may be impacted by these events, but those at highest risk are the elderly, the disabled, lower income, and the homeless. Charlotte County has 47,961 homes built before the code change in 1992 and 11,848 mobile homes. This would make 60% of the homes in Charlotte County vulnerable to high wind events.

ESTIMATING POTENTIAL LOSSES

Charlotte is a coastal county making it more vulnerable from the storms that come from the Gulf. This includes tropical cyclones, and high wind events. Damage from high winds, storm surge, and rain-induced flooding can impact all structures and utilities. The structures most susceptible to damage are older buildings, dilapidated housing, and other less hardened properties such as mobile homes. Widespread electrical outage is probable, as well as water and sewage backup in flooded areas. Depending on the intensity of the event, economic and environmental impacts can be severe. All populations may be impacted by these events, but those at highest risk are the elderly, the disabled, lower income, and the homeless.

Charlotte County has more than half the homes built before the code change in 1992 and over 12,000 mobile homes. This would make 60% of the homes in Charlotte County vulnerable to tropical cyclones or high wind events.

The potential impacts a high wind event can have on Charlotte County and its jurisdictions which includes The City of Punta Gorda could range from isolated to widespread with have lasting effects. The County and its jurisdictions populations are located mostly around the coastal areas of the county which increases the risk associated with this type of event. Both the county and its jurisdictions would incur costs to respond to and recover from such an event. The costs incurred could be both short-term and long-term with lasting effects County-wide but especially on its vulnerable populations such as the elderly, fiscally constrained and agricultural depending on the affected areas. There is also the risk of impact on County facilities and critical infrastructure that services the community which must be kept as operational as possible during an event.

SECTION 9: COASTAL EROSION

HAZARD IDENTIFICATION

Charlotte County spends millions of dollars each year on projects that work to enhance the coastal environment. Coastal erosion is one of the biggest problems Charlotte County's beaches encounters. Aside from the potential tourism dollars that may be lost, there are people's homes and businesses that could potentially be damaged from coastal erosion.

NOAA defines beach erosion as "The carrying away of beach materials by wave action, tidal currents, littoral currents, or wind." Coastal erosion is a natural process even in pristine environments. However, in areas where human activity negatively impacts the shoreline, coastal erosion can become a serious problem. It is estimated that coastal erosion in the U.S. costs \$700 million annually. (National Sea Grant Office).

COASTAL EROSION RISK ANALYSIS

Over the next 60 years, erosion may claim 1 out of 4 houses within 500 feet of the US shoreline (H. John Heinz Center Report, April 2000). This statistic helps form the basis of the 60-year Coastal Erosion Hazard Area. The 60-year Coastal Erosion Hazard Area represents the land expected to be lost to coastal erosion over the next 60 years. The Evaluation of Erosion Hazards Study prepared for FEMA by the H. John Heinz III Center for Science, Economics, and the Environment establishes this zone as land within 500 feet from the coastline.

Since the rate at which the beach erodes varies from place to place, for Charlotte County's analysis, all the properties located within the boundary of the Coastal Conservation Construction Line (CCCL) were designated as members of the Coastal Erosion Hazard Area. The value for each structure within this area was provided by the Charlotte County Property Appraiser's Office.

HISTORY OF COASTAL EROSION EVENTS IN CHARLOTTE COUNTY

The history of coastal erosion events in Charlotte County is not easy to document. However, there are events that can be recorded such as tropical storms, hurricanes, and/or tornadoes that lead to coastal erosion. The following events, documented through the National Climatic Data Center of NOAA, discuss coastal erosion for Charlotte County. The extent of erosion annually is 4.4 cubic feet of sand loss per year any major storm could increase sand loss to over 10,000 cubic feet.

August 13, 2004, Hurricane Charley:

Hurricane Charley made landfall on the Southwest coast of Florida as a category 4 hurricane. It caused minor beach erosion on Englewood Beach, Port Charlotte State Recreation Area, and on the North end of Gasparilla Island. Knight Island suffered the largest amount of damage which resulted in over \$3.7 million dollars worth of beach restoration.

September 5, 2004, Hurricane Frances:

Hurricane Frances struck Florida on its east coast. It caused a slight increase in the level of erosion in areas where Hurricane Charley had previously intensified the erosion process. Hurricane Frances caused major dune erosion on Don Pedro Island (FDEP).

September 23, 2004, Hurricane Jeanne:

Hurricane Jeanne caused further erosion damage to the Don Pedro Island dune system.

August 19, 2008, Tropical Storm Fay:

Tropical Storm Fay was the first storm in recorded history to make landfall four times in Florida. Even though she was only a tropical storm, Fay caused beach erosion to Knight Island which resulted in over \$3.0 million dollars worth of damage, and a loss of over 147,000 cubic yards of beach.

PROBABILITY OF COASTAL EROSION OCCURRENCE

There have been no events occur in the past five years, the probability of an erosion event is medium. Accordingly, the LMS Working Group both analyzed the assets at risk to this hazard and considered potential projects that would reduce the impacts of an occurrence of this hazard.

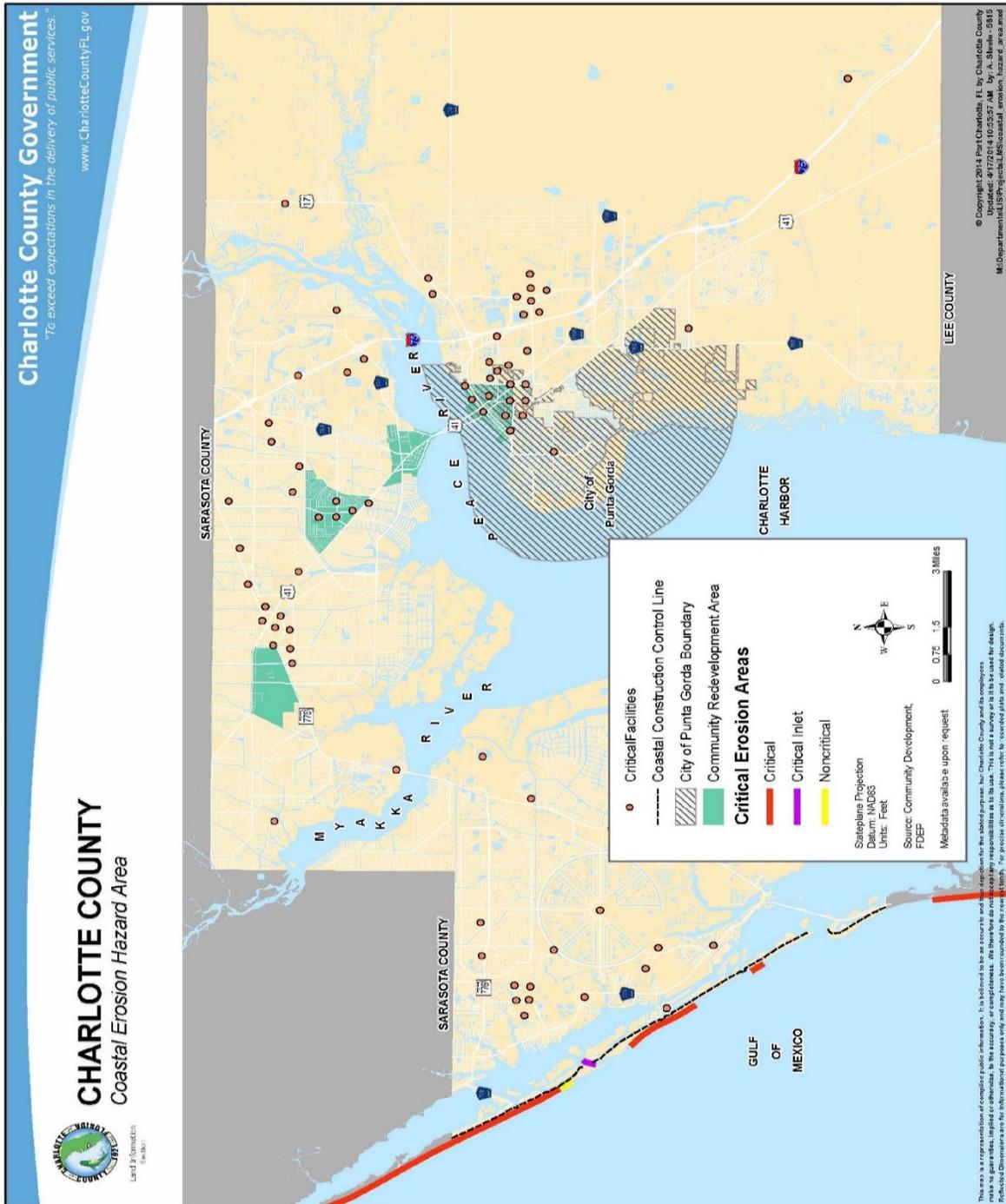
ESTIMATING POTENTIAL LOSSES

Over 2% of Charlotte County's structures are located in the coastal erosion hazard area. These structures account for 5.5% of the county's building value and 5.0% of the county's estimated value. Erosion of the beaches is measured by the cost per cubic yard of sand, and also includes the cost of contractors and mobilization and demobilization. As can be seen from Map III.9-2, all of the properties vulnerable to erosion are located in Charlotte County (there are none in Punta Gorda), and more specifically, all are on the islands in the Gulf Coast to the west of mainland Charlotte County. This hazard is costly overtime but not a direct hazard to residents.

POTENTIAL FUTURE RISK

While Charlotte County has several structures located in the Coastal Erosion Hazard Area, it is important to note that there are projects in the works to prevent erosion of Charlotte County's coastline. The primary vehicle for implementing the beach management planning recommendations is the Florida Beach Erosion Control Program. This is a program established for the purpose of working in concert with local, state, and federal governmental entities to achieve the protection, preservation, and restoration of the coastal sandy beach resources of the state. Under the program, financial assistance in an amount of up to 50 percent of project costs is available to Florida's county and municipal governments, community development districts, or special taxing districts for shore protection and preservation activities located on the Gulf of Mexico, Atlantic Ocean, or Straits of Florida. There are currently three critically eroded areas (5.2 miles), and one noncritical eroded area (0.4 mile) in Charlotte County (See Map III.9-1). Critically eroded meaning the highest affected areas in the County in this case (Noted as Critical on Map III.9-1).

Map III.9-1 Charlotte County Coastal Erosion Hazard Area



The above map shows our coastal erosion areas. The Coastal Construction Control Line (CCCL) is a program implemented to help preserve the beaches in the State. It is a standard for the design of property and buildings so that the coastal resources are not disrupted and lost. Red lines show where our most critical erosion has happened (areas that initiated EO's). The map also depicts the areas of the County/Jurisdiction that are community redevelopment areas.

SECTION 10: DROUGHT

HAZARD IDENTIFICATION

A drought is a period of unusually persistent dry weather that persists 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.

A prolonged drought can have a serious economic impact on a community. Increased demand for water and electricity may result in shortages of resources. Moreover, food shortages may occur if agricultural production is damaged or destroyed by a loss of crops or livestock. Heat related illness can be very serious for the elderly, small children, chronic invalids, overweight individuals, and those taking certain medications, drugs, or alcohol. A prolonged drought can have a serious economic impact on a community.

VULNERABILITY RISK ANALYSIS

HISTORY OF DROUGHT IN CHARLOTTE COUNTY

All areas of Charlotte County are equally susceptible to all types of droughts. This is especially the case during the dry season in January through May. However, Charlotte County has not experienced drought conditions since 2008. Below is

DROUGHT PROBABILITY

Charlotte County's probability of a drought occurrence is medium based on hydrological factors (precipitation). As noted on Table II.1-1 on page 25.

ESTIMATING POTENTIAL LOSSES

The Charlotte County assets that are most vulnerable to the threat of drought are agricultural. According to the Florida Department of Agriculture, Charlotte County contains 21,663 acres of citrus crops and over 19,000 head of livestock. Additionally, portions of the county's land are devoted to the production of other fruits and vegetables. Should a severe drought occur and persist, these assets will be hit the hardest, and the most severe consequence would be a long-term loss in revenue from citrus production. These are revenue and food lifelines within Charlotte County's land area primarily. Recovery from this type of hazard would be a long process that would be costly to those affected as well as detrimental to supply chain and commerce.

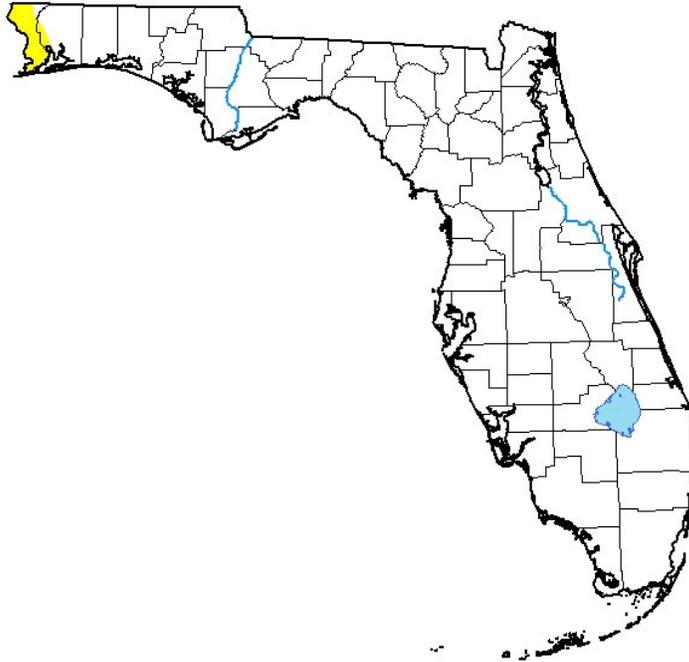
POTENTIAL FUTURE RISK

Charlotte County is, always has been, and always will be vulnerable to drought. When water levels are low in both the Peace and Myakka Rivers, water treatment plants and sewer treatment plants lose their ability to withdraw water from them. In the future, we can expect this problem to become more evident because of the increase in population and therefore a higher demand on water resources. A worst-case scenario for drought in Charlotte County would be a severe drought.

Graph III. 10-1 Florida Drought Severity

**U.S. Drought Monitor
Florida**

June 23, 2020
(Released Thursday, Jun. 25, 2020)
Valid 8 a.m. EDT



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	98.69	1.31	0.00	0.00	0.00	0.00
Last Week <i>06-16-2020</i>	97.41	2.59	1.12	0.00	0.00	0.00
3 Months Ago <i>03-24-2020</i>	11.53	88.47	4.94	1.07	0.00	0.00
Start of Calendar Year <i>12-31-2019</i>	75.86	24.14	8.59	0.00	0.00	0.00
Start of Water Year <i>10-01-2019</i>	56.91	43.09	23.58	6.18	0.61	0.00
One Year Ago <i>06-25-2019</i>	83.20	16.80	6.67	0.22	0.00	0.00

Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

Author:

Adam Hartman
NOAA/NWS/NCEP/CPC



droughtmonitor.unl.edu

The above graph shows a snapshot in time of the current drought conditions of Florida as found on the NOAA drought monitor. The key shows the severity scale for droughts and what could potentially affect the planning area.

Charlotte County and its Jurisdictions have the potential to be affected by up to a D4 scale drought which would cause serious impacts on the local environment which includes over 14,000 acres of citrus crops and 19,000 head of livestock. A drought of D4 magnitude would impact the whole planning area including the City of Punta Gorda with both short and long term affects to the environment and residents.

SECTION 11: EXTREME HEAT

HAZARD IDENTIFICATION

Temperatures that hover 10 degrees or more above the average high temperature of 92 °F for the region and last for several weeks are defined as extreme heat. Humid or muggy conditions, which add to the discomfort of high temperatures, occur when a "dome" of high atmospheric pressure traps hazy, damp air near the ground. A heat wave is an extended time interval of abnormally and uncomfortably hot and unusually humid weather. To be a heat wave, such a period should last at least one day, but conventionally it lasts from several days to several weeks (FDEM).

PROBABILITY OF AN EXTREME HEAT EVENT

While NOAA does not have any record of an extreme heat event in Charlotte County, the probability of an event occurring in the future should be considered as low. Lee County, just south of Charlotte, does have recorded extreme heat events. This, taken into account with the facts that the average summer high temperature in Charlotte County can already be considered very hot, and that the world's climate as a whole is very dynamic, should not allow us to discount the possibility of an extreme heat event in Charlotte County. An extreme heat event can occur equally throughout the county.

ESTIMATING POTENTIAL LOSSES

An extreme heat event would not have a direct impact on the county's physical assets. On the other hand, an event could entail potential negative impacts on the local economy. For example, loss of revenue from tourists whom the heat might deter from visiting the area.

The potential impacts an extreme heat incident can have on Charlotte County and its jurisdictions which includes The City of Punta Gorda would be wide spread. The County or its jurisdictions would not incur as many physical costs. The costs incurred would be both short-term and long-term on its vulnerable populations such as the elderly, fiscally constrained and agricultural depending on the affected areas. A large percentage of Charlotte County's population are 65+ who would be most affected by an extreme event because of their underlying health issues. The costs occurred because of this outcome would be costly.

POTENTIAL FUTURE RISK

The potential future risk that this hazard poses is expected to increase. As the county's population increases, it is obvious that the number of individuals exposed to and vulnerable to extreme heat will increase in kind.

HISTORY OF EXTREME HEAT IN CHARLOTTE COUNTY

There has not been any occurrence of extreme heat. The below chart illustrates the extent in the event of a high heat event. The highest recorded temperature in Florida was 109°F in 1931 therefore that is what Charlotte County could expect as the extent of extreme heat.

SECTION 12: EXOTIC PESTS AND DISEASE

HAZARD IDENTIFICATION

Because of its sub-tropical climate, unique animal and plant life, and robust \$6 billion agriculture industry, Florida is inherently susceptible to the introduction of foreign plant and animal pests and diseases. The State has been plagued by repeated outbreaks of exotic pests and diseases over the past few years.

Animal disease organisms can live for months in meat and meat products, such as sausage and many types of canned hams sold abroad. Foot-and-mouth disease, African swine fever, and classical swine fever (hog cholera) are a few of the several livestock diseases that could cost billions of dollars to eradicate if introduced to U.S. livestock. These diseases are not present in the United States but are known to occur in many foreign countries from which travelers and importers bring meat products (USDA).

EXOTIC PEST AND DISEASE RISK ANALYSIS

While exotic pest and disease infestations/outbreaks do not cause a direct impact on structures that can be measured in terms of numbers of buildings or total value, it can impact the County. The risk analysis for pest or disease outbreak focuses on the agricultural elements of the County.

HISTORY OF EXOTIC PEST AND DISEASE EVENTS IN CHARLOTTE COUNTY

Following is a brief description of three recent outbreaks of citrus canker as tracked by the Department of Agriculture and Consumer Services.

October 20, 2004, Charlotte County:

Citrus canker was confirmed positive in 2 areas in Punta Gorda and in a Hamlin orange grove located in Township 40S, Range 26E, and Section 12 in eastern Charlotte County, east of Highway 31, near the Desoto County line. Hurricane Charley caused a widespread infection throughout the grove.

January 25, 2005, Punta Gorda:

Citrus canker was confirmed on three trees in the Deep Creek area of Punta Gorda.

May 19, 2005, Charlotte County:

Citrus canker was confirmed in a commercial citrus grove.

July 2, 2005, Charlotte County:

Three new commercial canker finds involving approximately 1,022 acres.

August 6, 2005, Charlotte County:

Nine new positive finds located in 40S27E22, 40S27E23, 40S27E24, 41S27E18, 40S27E35, 41S27E18 and 41S27E08.

October 15, 2005, Charlotte County:

Two new positive finds located in 40S24E34 and 40S27E16.

October 16 to November 15, 2005, Charlotte County:

Two new positive finds located in 40S27E31 and 40S27E19.

November 2, 2005, Charlotte County:

An expanded quarantine replaced the Farabee Grade quarantine.

December 17, 2005 to January 14, 2006, Charlotte County:

One new positive find located in 40S24E22.

January 10, 2006, Charlotte County:

All Charlotte County Environmental Protection (CCEP) activity ended.

ESTIMATING POTENTIAL LOSSES

The Charlotte County assets that are most vulnerable to the threat of exotic pests and diseases are agricultural. According to the Florida Department of Agriculture, Charlotte County contains over 18,000 acres of citrus crops, and over 19,000 head of livestock. Additionally, portions of the county's land are devoted to the production of other fruits and vegetables. Should a severe pest or disease outbreak occur, these assets will be hit the hardest.

An exotic pest or disease outbreak in would cause a widespread impact throughout the county and its jurisdictions. The agricultural industry of more than 18,000 acres and 19,000 head of livestock located in Charlotte County would be the greatest area of impact. The citrus industry in Florida is a billion-dollar industry and over 14,000 acres of the 18,000 acres of agriculture throughout Charlotte County is Citrus fields. Losses of these crops would be a long-term effect on revenue, jobs, and supply chain in the area. The City of Punta Gorda would not feel as much of a direct impact due to their geographical location and lack of rural areas, but the long-term impacts of revenue and job loss would affect all jurisdictions.

POTENTIAL FUTURE RISK

Florida is a very popular travel destination and attracts visitors from all around the globe, visitors who could unintentionally be carrying objects like fruit infected with communicable diseases or hosting nonnative pests. Even with the increased population and risks the probability of a pest or disease outbreak is low.

SECTION 13: DAM FAILURE

HAZARD IDENTIFICATION

Dam failure can be caused by either floodwaters that raise the water level above the dam's capacity or by unsound dam construction leading to a breach in the dam. Residents and assets downstream from the dam are exposed to differing levels of risk to a dam failure depending on the dam's hazard potential classification and their distance from the failed dam.

DAM FAILURE RISK ANALYSIS

The closest dam to Charlotte County is located on the Peace River in Desoto County at a distance of about five miles to the nearest point in Charlotte County. The area is triangular in shape and it is bordered on the SE by 0.94 miles of Kings Highway (769); bordered on the SW by 0.91 miles of Interstate 75; and bordered on the N by 0.96 miles of the Charlotte County/ DeSoto County line. The hazard potential for this dam is considered as "high." All of the information in this section was found in the "Peace River/Manasota Regional Water Supply Authority Reservoir Emergency Action Plan."

HISTORY OF DAM FAILURE IN CHARLOTTE COUNTY

There is no record of a past occurrence of a dam failure in Charlotte County.

PROBABILITY OF A DAM FAILURE

Even though this is considered a high hazard risk dam, the probability of a failure actually occurring should be considered as low, given that a dam hazard risk analysis is determined relative to all other dams rather than all-natural hazards.

ESTIMATING POTENTIAL LOSSES

Should this new dam actually fail, the losses experienced in Charlotte County would be very minor. This is due to two circumstances: 1) only three buildings (all commercial) sit in the Charlotte County area predicted to be flooded by a dam failure; 2) the danger to the human population in the dam flood zone at the time of a breach is rather low since they would have sufficient time to be warned and evacuate (16 hours) before the flood water reaches one foot in the expected flood area. The three commercial properties in the exposure area are Wal-Mart, Murphy's Gas Station, and Wachovia Bank, and they amount to a total exposure value of \$3,778,627.

POTENTIAL FUTURE RISK

The potential future risk posed by this dam should be expected to increase if either the capacity of the reservoir increases, further development of the area, or it is discovered that the dam is structurally unsound. In the event of a dam failure the extent of damage would only affect the three commercial properties near that area and would be minimal.

SECTION 14: FREEZES

HAZARD IDENTIFICATION

A freeze is a condition that exists when, over a widespread area, the surface temperature of the air remains below freezing (32°F or 0°C) for a sufficient time to constitute the characteristic feature of the weather. A freeze is a term used for the condition when vegetation is injured by these low air temperatures, regardless if frost is deposited. Frost is a cover of ice crystals produced by deposition of atmospheric water directly on a surface at or below freezing.

FREEZE RISK ANALYSIS

While winter storms and freezes do not cause a direct impact on structures that can be measured in terms of numbers of buildings or total value, it can impact the county. The risk analysis for freezes focuses on the agricultural elements of the County.

HISTORY OF FREEZES IN CHARLOTTE COUNTY

According to the National Climatic Data Center of NOAA, three freeze events were reported in Charlotte County since 2010. A description of these events follows.

January 10, 2010 Charlotte County:

Charlotte County had below freezing temperatures for around 10 hours, with temperatures below 28 degrees for 2 to 3 hours. The lowest temperature across the county of 23 degrees was set at a station in Port Charlotte. The county has 21,663 acres of harvested farmland, which translates into approximately \$2.56 million in crop damages.

February 10, 2010 Charlotte County:

Charlotte County felt sub-freezing temperatures for 1 to 2 hours across mainly eastern portions of the county. It has 21,663 acres of harvested farmland, which is approximately \$34 thousand in crop damages.

December 15, 2010 Charlotte County:

Charlotte County recorded sub-freezing temperatures for around 4 hours across mainly eastern portions of the county. The ASOS station at the Charlotte County Airport experienced the coldest temperature across the county of 29 degrees, which was a new record low for the station. The county has 21,663 acres of harvested farmland, which is approximately \$1.59 million in crop damages.

PROBABILITY OF A SEVERE FREEZE

Charlotte County can expect a moderate freeze at least once every two years giving it a medium probability. A freeze can occur equally throughout the county. It is estimated that a severe freeze that can potentially destroy all crops can be expected once every 5-10 years on average. Freezes normally occur at night.

ESTIMATING POTENTIAL LOSSES

The Charlotte County assets that are most vulnerable to the threat of freezes are agricultural. According to the Florida Department of Agriculture, Charlotte County contains over 14,000 acres of citrus crops, and 19,000 head of livestock. Additionally, portions of the county's land are devoted to the production of other fruits and vegetables. Should a severe freeze occur, these assets will be hit the hardest, and the most severe consequence would be a long-term loss in revenue from citrus production.

While the greatest impact of freezes is to agricultural production located within Charlotte County, freezes may also affect people countywide and necessitate the opening cold weather shelters. These locations are opened to those seeking shelter when certain low temperatures and wind chill are reached. This requires the mobilization of personnel and resources for the protection of homeless persons or residents of sub-standard dwellings. The need for cold weather sheltering affects both Charlotte County and the City of Punta Gorda equally.

POTENTIAL FUTURE RISK

All crops are susceptible to freeze damage. The primary winter growing season is November through March. As the population increases, the demand placed on farmers becomes higher. Due to this larger demand, we can expect to have higher financial losses in the future.

In the winter months, Charlotte County often sees temperatures drop below 32 degrees for as long as 4 to 6 hours with the lowest temperature being 22.

SECTION 15: EARTHQUAKES

HAZARD IDENTIFICATION

An earthquake is a sudden, rapid shaking of the Earth caused by the breaking and shifting of rock beneath the Earth's surface. Earthquakes result from crust strain, volcanism, landslides, or the collapse of caverns. Earthquakes, which strike suddenly and without warning, can occur at any time of the year and at any time of the day or night.

Earthquakes are measured in terms of their magnitude. Magnitude is measured in terms of the Richter scale, an open-ended logarithmic scale that describes the energy release of an earthquake through a measure of shock wave amplitude (Table III.15-1).

Magnitude	Effect
0-2.0	Micro earthquakes, not felt.
2.0-2.9	Generally, not felt or recorded.
3.0-3.9	Often felt, but rarely causes damage.
4.0-4.9	Shaking and rattling of items but no significant damage caused.
5.0-5.9	Affects weak construction and causes mild damage to stronger construction.
6.0-6.9	Affects area up to 160 km from the epicenter, in populated areas.
7.0-7.9	"Major" earthquake, causes serious damage up to ~100 km
8.0-8.9	"Great" earthquake, great destruction, loss of life over several 100 km

POTENTIAL IMPACT:

Earthquakes can cause buildings and bridges to collapse; disrupt gas, electric, and phone service; and sometimes trigger landslides, avalanches, flash floods, fires, and huge, destructive ocean waves (tsunamis). The structures most susceptible to damage can depend on the material that the structure is made out of, the type of earthquake wave (motion) that is affecting the structure, and the ground on which the structure is built. Even though the entire county would be impacted in the event of an earthquake the damage (if any) would be minimal.

EARTHQUAKE RISK ANALYSIS

HISTORY OF HAZARD IN CHARLOTTE COUNTY

According to the U.S. Geological Survey (USGS), only two recorded earthquakes (both very minor) have occurred near Charlotte County: both in Lee County in 1948, and 1930. The USGS southwest Florida has a 10% chance of a 5.8 magnitude earthquake near Charlotte County.

PROBABILITY OF HAZARD OCCURRENCE

Florida is situated on the trailing (or passive) margin of the North American Plate. This is the fundamental reason that Florida has an extremely low incidence of earthquakes. Due to the historically low probability that the Charlotte County area will experience an earthquake, the potential damages caused by earthquakes will not be analyzed in the risk assessment portion of this document.

SECTION 16: SINKHOLES

HAZARD IDENTIFICATION

Sinkholes are common where the rock below the land surface is limestone, carbonate rock, salt beds, or rocks that can naturally be dissolved by groundwater circulating through them. As the rock dissolves, spaces and caverns develop underground. Sinkholes are dramatic because the land usually stays intact for a while until the underground spaces just get too big. If there is not enough support for the land above the spaces, then a sudden collapse of the land surface can occur. These collapses can be small, or, as this picture shows, or they can be huge and can occur where a house or road is on top.

The most damage from sinkholes tends to occur in Florida, Texas, Alabama, Missouri, Kentucky, Tennessee, and Pennsylvania.

SINKHOLE RISK ANALYSIS

HISTORY OF HAZARD IN CHARLOTTE COUNTY

Only one sinkhole has been recorded in Charlotte County and was repaired. Subsidence occurred in a roadway in a low density residential area in Englewood on April 28, 2010. There have been no other instances of sinkholes in Charlotte County.

PROBABILITY OF HAZARD OCCURRENCE

The probability of a sinkhole occurring in Charlotte County is very low but not impossible.

ESTIMATING POTENTIAL LOSSES

Due to the historically low probability that Charlotte County area will experience sinkholes, the potential damages caused by sinkholes will not be analyzed in the risk assessment portion of this document.

Even though the entire county is considered when looking at the probability and location of occurrence for a sinkhole the impact would be minimal. The extent of a sinkhole would be minimal since the only recorded sinkhole was less than five feet in diameter and depth and cause was a wash out.

Vulnerability

Sinkholes are a fact of life in Florida. They occur because the entire state of Florida is underlain by limestone, a type of rock that is slowly dissolved by weak natural acids found in rain and in the pore spaces in soil. The abrupt formation of sinkholes may follow extreme rain producing events such as tropical storms or hurricanes. This is because the weight of a large amount of rain water at the earth's surface may bring about the collapse of an underground cavity if its limestone "ceiling" has become thin. Any structure above a sinkhole would sustain damage.

SECTION 17: TSUNAMI

HAZARD IDENTIFICATION

Tsunamis, also called seismic sea waves or, incorrectly, tidal waves, are a series of traveling ocean waves of extremely long length. They are generally caused by earthquakes occurring below or near the ocean floor, less commonly by submarine landslides, infrequently by submarine volcanic eruptions, and very rarely by large meteorite impacts in the ocean.

Offshore and coastal features can determine the size and impact of tsunami waves. Reefs, bays, entrances to rivers, undersea features, and the slope of the beach all help to modify the tsunami as it approaches the coastline. When the tsunami reaches the coast and moves inland the water level can rise many feet. In extreme cases, water level has risen to more than 50 feet for tsunamis of distant origin and over 100 feet for tsunami waves generated near the earthquake's epicenter.

TSUNAMI RISK ANALYSIS

HISTORY OF HAZARD IN CHARLOTTE COUNTY

There is no historical record of a tsunami impacting any of Florida's coasts.

PROBABILITY OF HAZARD OCCURRENCE

According to MEMPHIS, Florida is located in a 500-year tsunami category which gives it a very low probability. The impact of such an event would be minimal and not a threat to life and property. The extent of the storm would be the same as high tide.

There are no significant earthquake sources within the Gulf of Mexico that are likely to generate tsunamis, despite recent seismic activity in the area. Tsunami propagation from significant earthquake sources outside the Gulf of Mexico, such as the northern Panama Convergence Zone, Northern South America, Cayman Trough, the Puerto Rico trench, or the Gibraltar area shows that wave amplitude is greatly attenuated by the narrow and shallow passages into the gulf, and as a result, these tsunami sources do not constitute a tsunami hazard to the Gulf of Mexico coast. (USGS <http://nws.weather.gov/nthmp/documents/GoM-Final01regionalAssessment.pdf>)

ESTIMATING POTENTIAL LOSSES

Due to the historically low probability that the Charlotte County area will experience a tsunami and its location in the 500-year tsunami risk zone, the potential damages caused by tsunamis will not be analyzed in the risk assessment portion of this document. In addition, many of the mitigation activities that would be done to mitigate for storm surge would simultaneously mitigate for potential tsunami damage. The entire county is considered when looking at the probability and location of occurrence for a tsunami, but the effect would be the same as high tide. Refer to the storm surge portion of this plan to address vulnerability of this type of hazard.

SECTION 18: HAZARDOUS MATERIALS

HAZARD IDENTIFICATION

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. 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.

Charlotte County is vulnerable to both transportation accidents involving hazardous materials and hazardous material spills from fixed facilities. Major transportation routes include I-75, US 41, S.R. 776, C.R. 74, Kings Highway, and Veterans Blvd. Hazardous materials carriers are not prohibited from traveling on these roads, so the threat of accidents involving hazardous materials is always present. Charlotte County also has the Seminole Gulf Railroad which runs through many residential areas in Punta Gorda. This route is used mainly for carrying cargo, including hazardous materials. This adds to the threat of hazardous materials spills in Charlotte County should an accident occur.

Hazardous material spills from fixed facilities also present a threat. Currently, Charlotte County has 18 facilities that are registered as carrying extremely hazardous substances (EHS).

HAZARDOUS MATERIALS RISK ANALYSIS

HISTORY/PROBABILITY OF OCCURRENCE OF HAZARD IN CHARLOTTE COUNTY

There have not been any major incidents involving hazardous materials. The threat of hazardous materials spills in Charlotte County is considered to be medium.

ESTIMATING POTENTIAL LOSSES

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, resulting in unknown costs.

SECTION 19: TERRORISM

HAZARD IDENTIFICATION

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.

Terrorism can originate from a number of sources, both international and domestic. The most common methods are the use of six different types: conventional (explosives), biological (Anthrax, etc.), radiological, cyber, chemical, and nuclear.

The critical infrastructures in Charlotte County 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. This is described further in the next Section below, Critical Infrastructure Disruption.

TERRORISM RISK ANALYSIS

HISTORY OF HAZARD IN CHARLOTTE COUNTY

There have not been any incidents caused by acts of terrorism.

PROBABILITY OF HAZARD OCCURRENCE

Terrorism vulnerabilities are low in Charlotte County; however, it is probable.

ESTIMATING POTENTIAL LOSSES

No location is immune from terrorism. Locations such as the Charlotte County Administration Building, the Charlotte County Justice Center, and the Punta Gorda City Hall can be defined as potential targets for terrorism, but no past or current indications have pointed to these being designated as known targets.

SECTION 20: CRITICAL INFRASTRUCTURE DISRUPTIONS

HAZARD IDENTIFICATION

Charlotte 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. This hazard may become present through an accident, sabotage, or terrorism. This hazard includes, but is not limited to, utility disruptions, cyber-attack, computer threat, and communications system failures.

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.

This hazard can cause other hazardous incidents to occur. These may include, but are not limited to, hazardous material spills, delay of medical operations, and loss of ability to provide power or communications, and loss of ability to provide utility services.

CRITICAL INFRASTRUCTURE DISRUPTION RISK ANALYSIS

HISTORY OF HAZARD IN CHARLOTTE COUNTY

There is no historical record of a tsunami impacting any of Florida’s coasts.

PROBABILITY OF HAZARD OCCURRENCE

The hazard of a Critical Infrastructure Disruption is a low threat in Charlotte County.

ESTIMATING POTENTIAL LOSSES

The actual extent of such a loss is dependent upon several factors including but not limited to type of disruption, scale, type of infrastructure affected, and the availability of resources to lessen the impact of the incident.

SECTION 21: CYBER INCIDENTS

HAZARD IDENTIFICATION

Cyber incidents are a growing threat that can affect a community on all levels. These incidents have a rapid onset and can be difficult to detect and mitigate. Cyber incidents are malicious attacks on a computer or computer run system aimed at disruption, damage or theft of confidential information and use of systems. These incidents are an unauthorized use of or exploitation of electronic information which undermines confidentiality, availability and integrity of many systems. In 2013 the United States intelligence community deemed cyber threats the top global threat followed closely by terrorism. The term Cyber incident is a broad designation that encompasses many types of cyber related attacks such as: Denial-of-service (DoS), Man-in-the-middle attack (MitM), Phishing, Drive-by attack, Password attack, SQL Injections, Cross-site scripting attack (XSS), Eavesdropping attacks and many other types of breaches.

CYBER INCIDENT RISK ANALYSIS

HISTORY OF CYBER INCIDENTS IN CHARLOTTE COUNTY

There is no historical record of large scale Cyber Incidents in Charlotte County.

PROBABILITY OF CYBER INCIDENT OCCURRENCE

The probability of Cyber Incident is High in Charlotte County.

ESTIMATING POTENTIAL LOSSES

The potential losses due to a Cyber Incident can vary from a short down time of systems to a major catastrophic event. A major catastrophic event due to a Cyber Incident would be devastating on the citizens and critical infrastructure in Charlotte County as well as Punta Gorda its jurisdiction. It would require major down time to assess and fix, paper backups for many processes that run solely on computer, and a halt of certain operations. Effects of such an incident could include, loss or release of confidential information, a loss in wages and productivity, a loss of critical systems, lower public safety and response to other incidents, as well as a loss of trusts and confidence.

POTENTIAL FUTURE RISK

Potential future risk of incidents like this occurring is high and on the rise. Multiple Cyber incidents have taken place in the United States and in the State of Florida in the past 10-15 years. It is a hazard unlike others that must be monitored and prepared for.

Part IV: Mitigation Strategy

SECTION 1: MITIGATION GOALS AND OBJECTIVES

GOALS AND OBJECTIVES

The mitigation strategy is made up of three main required components: mitigation goals, mitigation objectives, and mitigation actions. These provide the framework to identify, prioritize and implement actions to reduce risk to hazards. Mitigation goals are general guidelines that explain what the community wants to achieve with the plan. Mitigation actions are specific projects and activities that help achieve the goals. Objectives are broader than specific actions and connect goals with the actual mitigation actions.

The following numbered list reflects if the goal and the objectives are a short or long-term priority. Priorities among the following goals and objectives, as well as whether any or all of the goals and objectives are to appear in the completed Local Mitigation Strategy Document; will be determined by the Charlotte County/City of Punta Gorda LMS Working Group.

There are no new operational changes in the goals and objectives for mitigation in Charlotte County since the 2015 update cycle. The goals and objectives stay the same because the LMS working group agrees that these goals and objectives are the most viable to continue development and enhancement of all mitigation plans and outreach to better serve the county and its residents. The group continues to look at and prioritize mitigation projects to increase the resiliency of critical facilities through planning and mitigating against all hazards that can or do affect it. This is to ensure that when hazards strike the county and its jurisdictions are better prepared to withstand and respond to them.

SHORT TERM GOALS AND OBJECTIVES

GOAL 1: STRENGTHEN PLANS FOR POST-DISASTER, RECOVERY, AND MITIGATION PLANS.

Objective 1.1

Analyze, review, and update the Charlotte County post-disaster, recovery, and mitigation plans.

GOAL 2: IN ORDER TO ENHANCE HAZARD MITIGATION PLANNING AND SUBSEQUENT MITIGATION ACTIONS, THE CHARLOTTE COUNTY OFFICE OF EMERGENCY MANAGEMENT WILL TAKE A PROACTIVE LEAD TO ENSURE INTRA-GOVERNMENTAL COORDINATION WITHIN ITS OWN AGENCIES AND INTERGOVERNMENTAL COORDINATION BETWEEN OTHER AGENCIES.

Objective 2.1

Implement disaster training programs and exercises.

Objective 2.2

Pre-establish and update a network of state and local contacts to coordinate Charlotte County needs.

Objective 2.3

Establish and protect the essential flow of information before, during, and after a disaster.

Objective 2.4

Encourage cooperation and participation between and among all Charlotte County departments in mitigation planning.

Objective 2.5

Ensure that the Charlotte County Hazard Mitigation Plan incorporates appropriate hazard mitigation measures as reflected in each agency's Emergency Support Function or Departmental Standard Operating Procedures.

GOAL 3: IMPROVE COORDINATION OF EMERGENCY MANAGEMENT INFORMATION THROUGH THE MEDIA TO INCREASE PUBLIC AWARENESS AND PARTICIPATION IN PREPAREDNESS, RESPONSE, MITIGATION, AND RECOVERY.

Objective 3.1

Develop and maintain a comprehensive, multi-media/multi-lingual public education campaign on emergency preparedness, response, mitigation, and recovery.

Objective 3.2

Provide educational programs and research to meet local, state, and regional planning growth management and hazard mitigation needs.

Objective 3.3

Establish a standardized format for use in dissemination of information to the media during a disaster.

Objective 3.4

Establish coordinated information and procedures for public information officers and media working in disasters.

LONG TERM GOALS AND OBJECTIVES

GOAL 4: CHARLOTTE COUNTY SHALL REDUCE THE VULNERABILITY AND EXPOSURE OF THE PUBLIC BY PROTECTING LIVES AND PROPERTY FROM THE LOSSES OF NATURAL DISASTERS.

Objective 4.1

Maximize the protection of the public's health, safety, and welfare as they are related to natural disasters.

Objective 4.2

Reduce the loss of personal and public property due to natural disasters through wind retrofits; flood proofing, relocation, demolition reconstruction, elevation, and private property acquisitions.

Objective 4.3

Require the protection of natural resources (such as environmentally sensitive lands) in order to maximize their mitigative benefits and to safeguard them from damage caused by natural disasters.

Objective 4.4

Ensure that Charlotte County's code and ordinances are sufficient to protect public property and safety.

Objective 4.5

Develop advance plans for the safe evacuation of coastal residents and other high-risk flood areas.

Objective 4.6

Protect coastal resources, marine resources, and dune systems from the adverse effects of development.

Objective 4.7

Ensure mitigation measures are effectively incorporated in the comprehensive system of coordinated planning, management, and land acquisition.

Objective 4.8

Encourage land and water uses which are compatible with the protection of sensitive coastal resources having value and benefits as mitigative measures.

Objective 4.9

Prohibit development and other activities which disturb coastal dune systems and ensure and promote the restoration of coastal dune systems that have been damaged.

GOAL 5: REDUCE THE VULNERABILITY OF CRITICAL FACILITIES, PUBLIC FACILITIES, AND HISTORIC STRUCTURES FROM NATURAL DISASTERS.

Objective 5.1

Disaster-proof existing and proposed critical facilities and historic structures, in regard to location and construction (see the County Critical Facility Inventory in the Critical Facility Section of the Risk Analysis Part of this LMS document).

Objective 5.2

Develop and maintain energy preparedness plans that will be both practical and effective under circumstances of disrupted energy supplies.

Objective 5.3

Incorporate hazard mitigation measures in any rehabilitation or reuse of existing public facilities, structures, buildings, and historic structures.

GOAL 6: CHARLOTTE COUNTY SHALL PROTECT AND ACQUIRE UNIQUE NATURAL HABITATS AND ECOLOGICAL SYSTEMS (SUCH AS WETLANDS, HARDWOOD HAMMOCKS, PALM HAMMOCKS, AND VIRGIN LONGLEAF PINE FORESTS) AND RESTORE DEGRADED NATURAL SYSTEMS TO A FUNCTIONAL CONDITION IN ORDER TO MAXIMIZE HAZARD MITIGATION VALUES.

Objective 6.1

Conserve forests, wetlands, and coastal natural features to maintain their economic, aesthetic, and recreational values.

Objective 6.2

Acquire, retain, manage, and inventory public lands to provide conservation and related public benefits including hazard mitigation.

Objective 6.3

Promote the use of agricultural practices which are compatible with the protection of natural systems.

Objective 6.4

Encourage multiple use of forest resources, where appropriate, to provide for watershed protection, erosion control, and maintenance of water quality.

Objective 6.5

Protect and restore the ecological functions of wetland systems to ensure their long-term environmental, economic, and recreational values, including hazard mitigation practices.

Objective 6.6

Develop and implement a comprehensive planning, management, and acquisition program to ensure the integrity of Charlotte County's waterways.

Objective 6.7

Emphasize the acquisition and maintenance of ecologically intact systems in all land and water planning, management, and regulation.

SECTION 2: MITIGATION INITIATIVES

INTRODUCTION

Determining mitigation initiatives and prioritizing them is one of the most important functions of the LMS Working Group. By working together to determine which projects will provide the most benefit and what order they should be completed in, the LMS Working Group helps to maintain a focused effort to mitigate against natural hazard threats within the county.

This section outlines several mitigation strategies that can be pursued to address the identified risks to real property and structures. The short and long-term strategies identified in this section were reviewed by the Local Mitigation Strategy Working Group.

Charlotte County and City of Punta Gorda are involved in creating, implementing and participating in various programs that work towards achieving the goals and objectives identified as the LMS Guiding Principles. To further the understanding of specific hazards and their associated mitigation initiatives/actions, a brief description follows in alphabetical order.

1. Assessments- Planning tools and techniques are used to reduce the threat of damage and disasters. Mitigation actions need to be reviewed from both a planning and an operational perspective. Initiatives and processes will need to be evaluated and possibly redesigned according to these assessments. Long-term redevelopment can better direct resources to meet mitigation objectives such as acquiring lands with repetitive flood losses for public or appropriate uses.

2. Controlled and/or Prescribed Burns-Controlled burns and urban preventative fire programs in cooperation with the local fire departments and state forestry departments will assist in managing wildfires within the county. Additional citizen awareness programs will only serve to augment current programs implemented through city and county initiative.

3. Debris Movement and Management-The ability to clear debris from roads and lands is necessary for immediate and long-term recovery. Mitigating actions include equipping trucks with necessary equipment and coordinating efforts to dispose of debris. Associated with this initiative is the process of reviewing areas that may produce great quantities of debris from natural features, such as trees and other types of foliage. The County have implemented such programs; however, additional efforts in private homeowner techniques for private property will assist to an even greater extent.

4. Development Management- Development management refers to the use of planning tools and techniques to reduce the threat of damage from disasters. Such tools can also be used to help direct long-term development patterns in a manner that can help minimize future threats. For example, greenways and parks could be developed in flood prone areas to collect water and minimize flooding to surrounding structures. Facilities or structures which have undergone repetitive damage could be relocated to areas of less risk. Flood management plans can direct efforts to reduce the community's vulnerability to flooding. Through long-term redevelopment

plans, such as reducing density in higher risk areas, the city and county can help create neighborhoods that are more disaster-resistant.

5. Education/Coordination- Public and private-sector coordination is vital for the short and long-term success of hazard mitigation. Recent efforts have focused on the inventory of critical facilities and the needs and desires of the public departments/agencies within Charlotte County. Efforts are being made to pull in more private sector participation. Expos and web announcements educate the public and private sector to the purpose of Hazard Mitigation. Exposure through newspapers, government cable access channels, and county and city web pages will continue to keep interested parties informed and educated while new initiatives are being created and implemented.

6. Emergency Services/Emergency Management Enhancements- The coordination of emergency services is through the Office of Emergency Management's Emergency Operations Center. For many natural disasters the National Weather Service issues various types of warnings, which the Emergency Operations Center uses as indicators and then initiates community activities appropriate to the potential threat of the event. In addition, educating residents of what to do in case of an emergency can also help to mitigate potential loss of life in such incidents. For example, providing information to residents on what to do in the event of a hazardous materials incident and collection of unused hazardous chemicals could help reduce injuries and potential health consequences associated with airborne toxic chemicals.

7. Flood Control- Generally, flood control techniques involve improvements to the storm water and drainage facilities improving the flow of floodwaters in an attempt to reduce areas subject to periodic floods. These techniques involve the rehabilitation and expansion of conveyance systems and creation of retention areas.

8. Flood Prevention- Through the regulatory activities of the various planning agencies, the preservation of open space and the restriction of development in the floodplain is a priority. The various development codes (Land Development Code) provide regulations that restrict and manage development activity in the floodplain by limiting wetlands encroachment and preserving open space.

10. Flood Reduction/Protection- Flood reduction involves techniques for flood control and protection such as elevating homes or land on the property owner's side and storm water and drainage improvements from the government's side. Typical retrofits for flooding include elevating buildings above the flood hazard level, providing watertight closures for doors and windows, and using floodwalls around ground level openings. Alternatively, such openings could be eliminated. Also included is the use of water-resistant materials, structural reinforcements to withstand water pressures and placement of mechanical and electrical elements in the upper parts of the building. Storm water and drainage mitigation typically includes improvements to the facilities to better control the flow of floodwaters or reduce areas subject to periodic flooding. These techniques involve the rehabilitation and expansion of conveyance systems and creation of retention areas.

11. Hazardous Materials (HazMat)- Mitigation of hazardous material incidents includes techniques to reduce losses to emergency personnel, citizens, structures and the environment. These techniques require extensive training to personnel as well as notification and education of the public.

12. Wind Protection- Wind protection focuses on reducing the damage from wind by strengthening floors, foundations and wall/floor attachments of existing structures. Some common techniques that help prevent internal structural damage include the use of storm shutters and shatterproof glass or windows that are rated for the design speed of the site. Improving the way roofs are attached to the walls (i.e. using gable end bracing on frame gables, nail patterns, roof sheathing, hurricane straps, etc.) can keep roofs from lifting up in hurricane-force winds.

Prioritizing Mitigation Initiatives

Once the vulnerability assessment and risk analysis are complete and the hazard mitigation opportunities have been identified, proper priorities must be established concerning each proposed project's impact on life safety, quality of life, cost effectiveness, and value to the overall community. This includes, but is not limited to, value as compared to other similar projects especially during times of limited funding availability. If a project is proven to be not cost effective, it will be removed from the list.

The benefit-cost review model used to establish the ranking (along with the LMS Working Group individual member's ranking of preference) is provided below. The list of projects submitted with this 2014 updated LMS is in ranked order following the review model.

HAZARD MITIGATION PROJECT EVALUATION CRITERIA WORKSHEET

This worksheet is used, as a consistent approach, to assign a numeric value to each project. It allows the Charlotte County Local Mitigation Strategy Work Group to prioritize projects relative to one another based on several factors outlined below.

Project Information

Project Priority *	
Project Score	
Name of Project	
Brief Description of Project	
Hazard Mitigated*	
Hazard Mitigation Strategy*	
Hazard Mitigation Goals Achieved *	
Funding Source	
Jurisdiction(s) Project Benefit *	
Agency Responsible for Implementation	
Estimated Cost	
Timeframe for Project Completion	

* Refer to The Charlotte County Local Mitigation Strategy Project List Annex E.

Project Scoring

Cost or Cost Impact: This would refer to the actual cost of the project over the life of the project and/or the cost impact that would occur because of the project.

Score	Points	Description
	4	No quantifiable Cost or Cost Impact, or the Cost/Cost Impact is less than 50,000
	3	Cost/Cost Impact is between \$50,000 and \$250,000
	2	Cost/Cost Impact is between \$250,001 and \$1,000,000
	1	Cost/Cost Impact is between \$1,000,001 and \$5,000,000
	0	Cost/Cost Impact exceeds \$5,000,000

Probability of Funding: How likely is it that this project could get funded?

Score	Points	Description
	4	Funding is available through local short-term budgeting (less than two years) or a grant for this type of project is available and the likelihood of success is high.
	3	Funding is available through local long-term budgeting (more than two years) or grants for this type of project are available, but the likelihood of success is moderate.
	2	Funding could only be accomplished through matching local dollars with funds from other sources; or would require a blend of funding sources.
	1	Funding could only be accomplished through post-disaster funding options.
	0	No funding sources can be identified.

Probability of Community Acceptance:

Score	Points	Description
	4	This type of project would likely be endorsed by the entire community.
	3	This type of project would benefit only those directly affected and would not adversely affect the rest of the community.
	2	This type of project could place some burden of cost on the community but would likely be endorsed as an acceptable cost for the benefit received.
	1	This type of project would place a burden of cost on the community that might not win endorsement by residents and/or businesses.
	0	This type of project is not likely to be endorsed by the community.

Estimated Ratio of Benefit vs. Cost: The individual or entity proposing this project should have completed a “Consequence Analysis” to support the ration of benefit vs. cost.

Score	Points	Description
	4	Both quantitative and qualitative benefits make this a high priority project.
	3	The benefit of this project is 2 to 4, or more, times the cost and/or the qualitative benefits make the project one that should be given a relatively high priority.
	2	The benefit of this project is over 1, but less than 2 times the cost and/or the qualitative benefits make the project one that should be strongly considered.
	1	The benefit of this project is equal to or less than the cost and/or the benefits are difficult to quantify due to their qualitative nature.
	0	The ratio of benefits vs. cost cannot be quantified.

Complexity of Implementation: The following list shows examples of various items that can make a project more complex;

- Time involved for planning and/or completion.
- Involves numerous agencies and/or jurisdictions
- Permitting (Either the type of permitting required or the time period involved, or both)
- Difficulty in obtaining funding
- Requires a public vote
- Requires a public hearing

Score	Points	Description
	4	This project will be relatively easy to put in place in a short period of time.
	3	This project should not be very complex based on the items listed.
	2	This project will be somewhat complex due to one of the items listed.
	1	This is a complex project because it involves at least two of the items listed.
	0	This is a complex project because it involves three or more of the items listed.

Addressed in Plans, Programs, and Policies: The following list shows examples of various guiding principles that may affect, or be affected by, the project;

- Goals & Objectives of Sarasota LMS
- Comprehensive Growth Management Plans
- Comprehensive Emergency Management Plans
- Land Development Codes, Zoning Ordinances, or Building Codes
- Environmental, Conservation, Preservation and/or Reclamation plans, programs or policies.
- Statutes, Public Laws, other local laws, and/or other plans, programs, or policies.

Score	Points	Description
	4	This project is addressed in at least three of the items listed.
	3	This project is addressed in at least two of the items listed.
	2	This project is addressed in at least one of the items listed.
	1	Where this project is addressed in any plans, programs or policies is not clear.
	0	This project may not fall within the purview of Sarasota LMS.

Health and Safety:

Score	Points	Description
	4	This project could affect the Health & Safety of several jurisdictions (totaling over 250,000 people) and/or major portions of the county population.
	3	This project could affect the Health & Safety of between 50,000 and 250,000 people
	2	This project could affect the Health & Safety of between 1,000 and 50,000 people
	1	This project could affect the Health & Safety of less than 1,000 people.
	0	This project has no Health & Safety implications.

Compilation of Scores	
Scores	Issues
	Cost or Cost Impact
	Probability of Funding
	Probability of Community Acceptance
	Ration of Benefit vs. Cost
	Complexity of Implementation
	Consistency with other Plans, Programs, and Policies
	Health and Safety Considerations
	<u>Total Score</u>

This strategy will provide a compilation of hazard mitigation planning projects and programs from a range of preexisting resources, such as the SMART Charlotte 2050, the CEMP, and other related codes and ordinances. A project list table is provided in Table IV.1-1 and shows the status for each mitigation project. The deferred projects have been placed on hold until adequate funding becomes available.

The mitigation actions/projects are prioritized by the LMS Working Group based on several variables: the cost-benefit of each project, each local jurisdiction individual priority ranking of each project, and the frequency and level of damage sustained from events that each of the individual projects address. The major factor to the ranking of the LMS projects is based on the cost-benefit review as viewed by the LMS Working Group.

For each project, the LMS Working Group held discussions regarding the expected estimated dollars lost and structures damaged from past and future events addressed by each project, and then used these discussions as a means of prioritizing the projects.

2020 Charlotte County LMS Project List

Priority	Description of Project or Initiative	Goal for Hazards Mitigated	Mitigation Goals Achieved	Funding Source	Jurisdiction (Location)	Agency Responsible for Implementation	Estimated Costs	Status				Timeframe to Complete
								New	Ongoing	Deferred	If Deferred Why?	
The projects located in this color are completed projects or are currently in												
	Harold Avenue Rec Center Wind Retrofit	Hurricanes, Tornadoes, Tropical Storms	No	HMGP	Charlotte County	Charlotte County Facilities	\$118,629				This project is a high priority since the county's shelter deficit is very high. This project would allow for hardening of a community center that can be used as a shelter. This would include roof clips and shutters or impact windows for the	Current HMGP contract in progress
	Generator purchase and installation for Harold Avenue Rec	All Hazards	Yes	HMGP	All jurisdictions in Charlotte County	Charlotte County Facilities	\$391,035				This project is a high priority since the county's shelter deficit is very high. This would allow the county to use this structure as a shelter. Possibly a special needs shelter. At this time there is no funding for this project.	Current HMGP contract in progress
	Install a main distribution and transfer switch at Harold Avenue Rec	All Hazards	Yes	HMGP	All jurisdictions in Charlotte County	Charlotte County Facilities	\$115,000				This project will be completed only if the generator project is not completed. These generators will service critical lift stations where emergency pumping capability is necessary.	Current HMGP contract in progress
	Purchase generator for Kingsway Elementary	All Hazards	No	HMGP	All jurisdictions in Charlotte County	Charlotte County Facilities	\$711,807				This project is a high priority since the county's shelter deficit is very high. This would allow the county to use this structure as a shelter. At this time there is no funding for this project.	Current HMGP contract in progress
	Lift Station Generators	All Hazards		HMGP	All jurisdictions in Charlotte County	Charlotte County Utilities	\$1,242,899				These generators are mandated by DEP via Consent Order received February 28, 2018	2019
	Haverhill 4.84 Flood Control Culvert	Floods	Yes	County Sales Tax, SWFWM D, FMAP, HMGP	All jurisdictions in Charlotte County	Public Works	\$900,000				This is an ongoing project. There are 3 structures left to build. 2 are in design and one will be in design before the end of this fiscal year.	Construction scheduled for FY19
	Fire Station 10	Hurricanes, Tropical Storms, Tornadoes	Yes	RFP	All jurisdictions in Charlotte County	Charlotte County Fire/EMS	\$4,000,000				The station is currently on the list for capital improvement projects.	Within a five-year timeframe
1	Kingsway Elementary Wind Retrofit	Hurricanes, Tornadoes, Tropical Storms	Yes	HMGP	All jurisdictions in Charlotte County	Charlotte County Public Schools	\$30,077				This project is a high priority since the county's shelter deficit is very high. This would allow the county to use this structure as a shelter. Possibly a special needs shelter. At this time there is no	Within a ten-year timeframe.

2020 Charlotte County LMS Project List

Priority	Description of Project or Initiative	Goal for Hazards Mitigated	Mitigation Goals Achieved	Funding Source	Jurisdiction (Location)	Agency Responsible for Implementation	Estimated Costs	Status				Timeframe to Complete
								New	Ongoing	Deferred	If Deferred Why?	
The projects located in this color are completed projects or are currently in												
2	Corto Andra/ Boca Grande Area	Floods	No	City Tax, HMGP	City of Punta Gorda Public Works	City of Punta Gorda Public Works	\$4,200,000	The city is currently raising the funds for this project.				Within a ten-year timeframe.
3	Community Center Bisset Park	All Hazards	No	HMGP	South County	Charlotte County Facilities	\$5,000,000	The county has a shelter deficit of over 12000. This structure could be used as a shelter lessening the deficit.				Within a twenty-year timeframe.
4	Zemel Road Landfill Scale House	All Hazards	No	HMGP, CIP	Entire County, Region 6	Charlotte County Public Works	\$545,147	Currently there is not a structure at this location. The funding for this is a capital improvement project in 2022.				2022
5	Community Center Deep Creek Park	All Hazards	No	HMGP	Mid County	Charlotte County Facilities	\$5,000,000	The county has a shelter deficit of over 12000. This structure could be used as a shelter lessening the deficit.				Within a twenty-year timeframe.
6	Purchase generator for Liberty Elementary	All Hazards	No	HMGP	All jurisdictions in Charlotte County	Charlotte County Public Schools	\$300,000	This project is a high priority since the county's shelter deficit is very high. This would allow the county to use this structure as a shelter. At this time there is no funding for this project.				Within a ten-year timeframe.
7	Community Center Flatwoods Environmental	All Hazards	No	HMGP	South County	Charlotte County Facilities	\$5,000,000	This project is a high priority since the county's shelter deficit is very high. This would allow the county to use this structure as a shelter. At this time there is				Within a twenty-year timeframe.
8	Purchase generator for Punta Gorda Middle School	All Hazards	No	HMGP	All jurisdictions in Charlotte County	Charlotte County Public Schools	\$300,000	This project is a high priority since the county's shelter deficit is very high. This would allow the county to use this structure as a shelter. At this time there is				Within a ten-year timeframe.
9	Elevate 100+ electrical panels on the Wastewater	Floods	Yes	County Sales Tax, SWFWM	All jurisdictions in Charlotte County	Charlotte County Facilities	\$5,000 each	The completion of this project would mitigate possible sewage backups during a flood; by elevating 100+ electrical panels on the waste water lift stations.				Within a five-year timeframe
10	Live Oak Point	Shore Erosion	Yes	HMGP	Charlotte County	Charlotte County Facilities	\$165,306	This project is intended to reinforce shoreline against storm erosion and protect upland improvements from damage.				2020
11	Bayshore Live Oak Park Shoreline Restoration	Shore Erosion	Yes	HMGP	Charlotte County	Charlotte County Facilities	\$240,000	This project is intended to reinforce shoreline against storm erosion and protect upland improvements from damage.				2020
12	Elkcam 4.56 Flood Control Culvert	Floods	Yes	County Sales Tax, SWFWM	All jurisdictions in Charlotte County	Charlotte County Public Works	\$900,000	This is an ongoing project. There are 3 structures left to build. 2 are in design and one will be in design before the end of this fiscal year.				Completion scheduled for May 2020

2020 Charlotte County LMS Project List

Priority	Description of Project or Initiative	Goal for Hazards Mitigated	Mitigation Goals Achieved	Funding Source	Jurisdiction (Location)	Agency Responsible for Implementation	Estimated Costs	Status				Timeframe to Complete	
								New	Ongoing	Deferred	If Deferred Why?		
The projects located in this color are completed projects or are currently in													
13	Impact Resistant Windows South County	Hurricanes, Tornadoes, Tropical Storms	Yes	County Sales Tax, HMGP	Charlotte County	Charlotte County Facilities	\$174,000					The building has extension windows; this would be to replace existing standard windows with impact resistant windows.	Within a two-year timeframe
14	Haverhill 5.72 Flood Control Culvert	Floods	Yes	County Sales Tax, SWFWM D, FMAP, HMGP	All jurisdictions in Charlotte County	Charlotte County Public Works	\$900,000					This is an ongoing project. There are 3 structures left to build. 2 are in design and one will be in design before the end of this fiscal year.	Completion scheduled for Jan 2020
15	Security Fencing	Terrorism	Yes	HMGP	Charlotte County	Charlotte County Facilities	\$500,000					This will be a project to improve the resiliency of the Emergency Operations Center housing essential staff.	TBD
16	Punta Gorda Acquisitions	Floods	Yes	HMGP	City of Punta Gorda Planning	City of Punta Gorda Public Works	\$1,750,000					This project would be a continuation of a history of acquisitions in Punta Gorda high hazard and flood prone areas.	TBD
17	Purchase Generator for Human Services/Employee wellness center	All Hazards	Yes	HMGP, BRIC	All jurisdictions in Charlotte County	Charlotte County Facilities	\$671,000					This project is intended to provide backup power to the Charlotte County Human Services Building located at 1050 Loveland Ave. This location also houses the employee wellness center. This is critical because the Human services building is home to many public outreach and assistance programs as well as our 211 call center.	
18	Purchase Generator for Landfill Leachate Plant	All Hazards	Yes	HMGP, BRIC	All jurisdictions in Charlotte County	Charlotte County Facilities	\$1,100,000					This project is intended to provide backup power to the Charlotte County Landfill Leachate Plant. This facility cleanses the water that leeches out of the solid waste brought to the landfill. The Charlotte County Landfill serves the entire county including the City of Punta Gorda, Babcock Ranch, and parts of	
19	JB Yard Hub for transit and essential PW staff.	All Hazards	No	HMGP, CIP	Mid-County	Charlotte County Public Works	\$600,000					This project has been deferred until funding can be made available.	TBD

2020 Charlotte County LMS Project List

Priority	Description of Project or Initiative	Goal for Hazards Mitigated	Mitigation Goals Achieved	Funding Source	Jurisdiction (Location)	Agency Responsible for Implementation	Estimated Costs	Status				Timeframe to Complete
								New	Ongoing	Deferred	If Deferred Why?	
The projects located in this color are completed projects or are currently in												
20	Water Line Relocation from crossing on bridges to under waterways.	Floods	No	County Sales Tax, SWFWM D, FMAP, HMGP	All jurisdictions in Charlotte County	Charlotte County Utilities	\$50,000	This project has been deferred until funding can be made available.				TBD
21	Update water control mapping	Flooding	No	HMGP	West County	Charlotte County Public Works	\$75,000	This project has been deferred until funding can be made available.				TBD
22	Update water control mapping	Flooding	No	HMGP	Mid-County	Charlotte County Public Works	\$75,000	This project has been deferred until funding can be made available.				TBD
23	Update water control mapping	Flooding	No	HMGP	South County	Charlotte County Public Works	\$75,000	This project has been deferred until funding can be made available.				TBD
24	Wind Retrofit Douglas T. Nursing Home	Hurricanes, Tornadoes, Tropical	Yes	County Sales Tax,	All jurisdictions in Charlotte	Charlotte County Facilities	\$50,000	This project has been deferred until funding can be made available.				Within a five-year timeframe
25	Wind Retrofit Charlotte County	Hurricanes, Tornadoes, Tropical	Yes	HMGP	All jurisdictions in Charlotte	Charlotte County Facilities	\$50,000	This project has been deferred until funding can be made available.				Within a five-year timeframe
26	Wind Retrofit Rebecca Neal Owens Meal	Hurricanes, Tornadoes, Tropical	No	HMGP	All jurisdictions in Charlotte	Charlotte County Facilities	\$150,000	This project has been deferred until funding can be made available.				Within a five-year timeframe
27	Wind Retrofit Charlotte County Justice Center	Hurricanes, Tornadoes, Floods	No	HMGP	All jurisdictions in Charlotte County	Charlotte County Facilities	\$1,500,000	This project has been deferred until funding can be made available.				Within a five-year timeframe
28	Forensic Building Envelope Analysis for	All Hazards	No	County Sales Tax, HMGP	Charlotte County	Charlotte County Facilities	\$225,000	This project has been deferred until funding can be made available.				TBD
29	Relocate Public Works Complex	All Hazards	No	County Sales Tax, HMGP	Charlotte County	Charlotte County Facilities	\$5,000,000	This project has been deferred until funding can be made available.				TBD
	Public Education	Hurricanes and Floods	No	HMGP	All jurisdictions in Charlotte	Charlotte County Emergency	\$10,000	The Emergency Management and Community Development departments have many public education and				N/A
	Wildfire Mitigation	Wildfires	No	HMGP, State Forestry	All jurisdictions in Charlotte	Charlotte County Emergency	\$5,000	The county has several Firewise housing communities. It is a combined effort between the State Forestry Department				N/A
	Flood Control Culverts	Floods	Yes	County Sales Tax,	All jurisdictions in Charlotte	Charlotte County Public Works	\$3,600,000	This is an ongoing project. There are 3 structures left to build. 2 are in design and one will be in design before the end				N/A

SECTION 3: NFIP COMPLIANCE

Charlotte County and the City of Punta Gorda are active participants of the National Flood Insurance Program (NFIP). Both jurisdictions began participating in the NFIP in 1971. The current FIRM maps for the area took effect on May 5, 2003. The Floodplain Administrator is the County Building Official or his designee, and that individual is housed in the Building Construction Services Department. To ensure continued compliance with the program, each participating community will:

1. Continue to enforce their adopted Floodplain Management Ordinance requirements, which include regulating all new development and substantial improvements in Special Flood Hazard Areas (SFHAs).
2. Continue to maintain all records pertaining to floodplain development, which shall be available for public review.
3. Continue to notify the public when there are proposed changes to the floodplain ordinance or Flood Insurance Rate Maps (FIRMs).
4. Continue to promote flood insurance for all properties.

COMMUNITY RATING SYSTEM (CRS)

The Community Rating System (CRS) is a voluntary program for NFIP participating communities. The goals of the CRS are to reduce flood losses, to facilitate accurate insurance ratings, and to promote the awareness of flood insurance. The CRS has been developed to provide incentives for communities to go above and beyond the minimum floodplain management requirements to develop extra measures to provide protection from flooding. The incentives are in the form of premium discounts. Currently both Charlotte County and the City of Punta Gorda are NFIP compliant, with CRS rankings of class 5. Charlotte County and City of Punta Gorda residents receive a 25% discount on their flood insurance premiums.

The LMS Working Group also wants to keep the initiative of reducing or eliminating all losses in repetitive loss areas, which is an ongoing initiative that was listed in the previous LMS document.

REDUCING OR ELIMINATING ALL LOSSES IN REPETITIVE LOSS AREAS

The current planning for this initiative includes the following:

1. Continue to contact all repetitive loss properties on an annual basis to notify them of their flood risk.
2. Notify all repetitive loss property owners of ways that they can reduce flood losses.
3. Maintain database of property owners interested in reducing their flood losses.
4. Notify State of any interest in owners reducing flood losses and facilitate the search for the appropriate funding.
5. Seek possible mitigation funding for repetitive loss properties.
6. In a post-disaster scenario, funding from the Hazard Mitigation Grant Program may be sought.

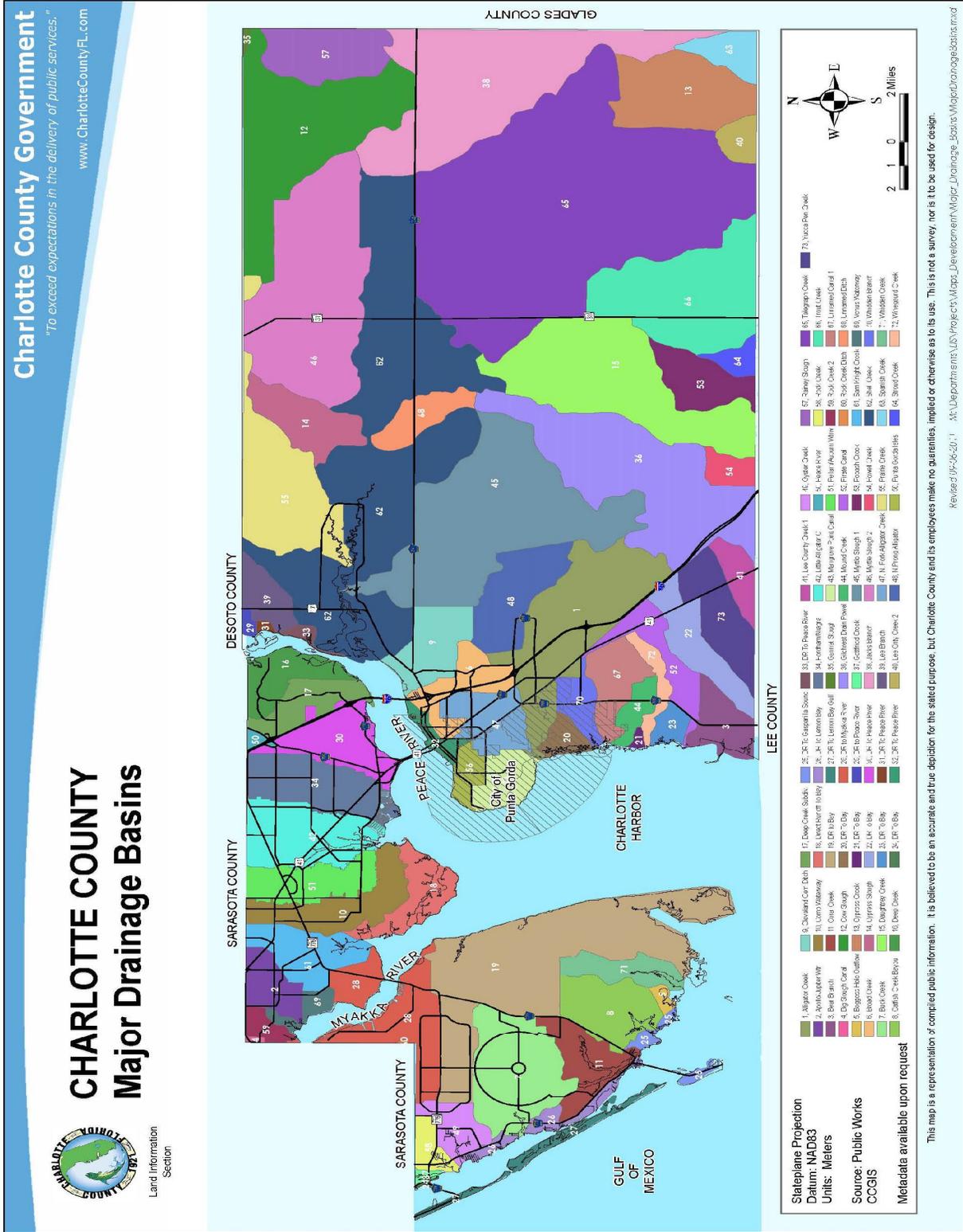
STORMWATER MANAGEMENT PLAN

Charlotte County has developed a Master Storm Water Management Plan (MSMP) and has begun implementation of the capital improvement projects identified as a result of the areas studied.

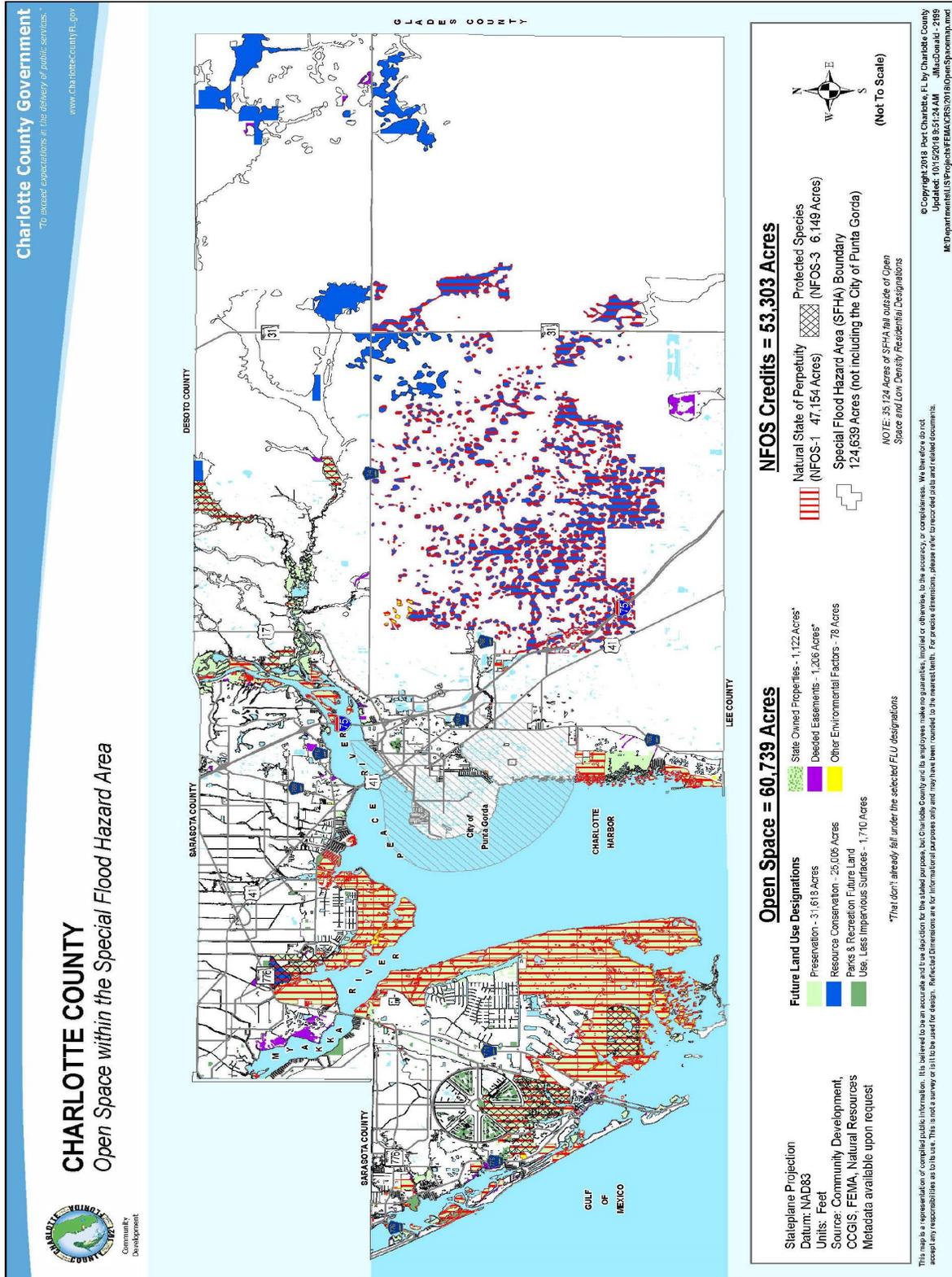
The Master Storm Water Management Plan (MSMP) was developed in two phases. Phase 1 included development, mapping, and delineation of the drainage basins in Charlotte County; ranking and prioritizing basins based on needs; and a pilot study. The pilot study affected two basins in western Charlotte County known as Oyster Creek and Direct to Myakka River. The study was later referred to as the Oyster Creek / Newgate Drainage Study. As a result of the pilot study, Charlotte County consulted with a technical contractor to perform a detailed hydrologic and hydraulic analysis of the Oyster Creek / Newgate Area. From this analysis, ten capital projects were recommended. Charlotte County has completed construction of these capital projects.

The Phase II MSMP focused on the top ten priority basins identified in Phase I, which included two basins in West County, five basins in Mid County, and three basins in South County. Of these ten, the following basins received a detailed analysis: two basins in West County (which were identified for the pilot study) Oyster Creek and Direct to Myakka River and three basins in Mid County: Pellam - Auburn Basin, Fordham - Niagara Basin, and the Little Alligator Basin. The three basins in South County, which were determined to be less dependent on structural controls, were identified as basins which conveyed overland flow to primary drainage ditches, creeks, or rivers, and therefore, any flooding associated within these basins was directly related to the need for a maintenance program. Maintenance of these primary drainage ditches in south Charlotte County can now be addressed and funded through the South Charlotte Storm Water Unit (MSBU).

Map IV. 3-1 Charlotte County Major Drainage Basins



Map IV.3-2 Charlotte County Open Space within the Flood Hazard Area



Part V: Plan Maintenance Process

SECTION 1: UPDATING THE PLAN

PLAN UPKEEP

The Florida Division of Emergency Management (DEM) Local Mitigation Strategy Contract with Charlotte County requires that the LMS Working Group establish an annual process/schedule for updating and revising the Local Mitigation Strategy document to reflect new information, revised goals, and/or new initiatives. The proposal is to revise and update the LMS document during one period each year or after a major disaster declaration in which new mitigation initiatives need to be proposed based on damage assessment. The department responsible for monitoring the plan is the Office of Emergency Management, and the person responsible is the LMS vice Chair. The plan is monitored for changes in policies, procedures, along with any changes that would affect the plan on an ongoing basis. The goals and objectives are considered during this process to ensure they are effective and current with information sources utilized in the following schedule would also be utilized by the workgroup in order to update the LMS. The LMS Chair will start the 5-year update 18 months prior to its expiration to revise and update information prior to submittal.

GENERAL UPDATING

SPRING UPDATE PERIOD

Hurricanes

As the annual hurricane season begins on June 1, updating hurricane-related sections of the LMS should be completed prior to May 1 (allowing one month for review/revision). The entire LMS Working Group should be involved in the update process because hurricanes should be considered “county-wide disasters” involving the whole community. Focus should be given to any changes/improvements to evacuation routes, shelter/equipment inventories, any new infrastructure or infrastructure concerns, and population growth. The update should reflect any lessons learned, or changes made to procedures after the previous hurricane season. Information sources include, but are not limited to, the current Regional Hurricane Evacuation Study Update, State/American Red Cross Shelter Guidelines, Census or BEBR data, information generated by the State’s annual hurricane exercise, and statewide experience from recent hurricane events.

Severe Thunderstorms

This category includes weather phenomena such as tornadoes, sleet or hail, high winds, lightning, and rainfall flooding. In Southwest Florida, these are typically late winter or spring events. Therefore, this section of the LMS should probably be updated prior to April 1. This would hopefully allow review/revision to be completed prior to work on the Hurricane portion. LMS members involved in this update should include building department officials, mobile home/RV park representatives, power and communications company representatives, campground/outdoor recreation area operators, storm water system operators, agricultural agents, and others as needed. The focus of the update should be on reducing future vulnerability to these types of natural hazards; as well as preparing local personnel and resources for periodic small-scale (less than county-wide) evacuations due to these events. Information utilized in the update would primarily be experience gained during the previous storm season.

Wildfires

This section refers to fires which arise (through natural or manmade events) in rural or wild areas, and which may or may not affect human lives and property. As many of these fires are started by lightning and tend to occur in the late winter or early spring, it may be prudent to update this section of the LMS document in conjunction with the Severe Thunderstorm Section (prior to April 1). LMS Working Group members involved in the update should include emergency management and fire personnel, forestry or wildlife officials, agricultural interests, GIS programmers, and residents of areas likely to be affected by wildfires. Focus should be on reducing the likelihood of fire occurrence or using such methods as controlled burns, debris removal activities, and other methods. Secondary focus should be given to improving response and containment methods. Information utilized in the update could include data gathered from the previous fire season and information derived from state and federal resources.

WINTER UPDATE PERIOD

Freezes

Charlotte County is generally subject to a moderate freeze once every two years. While the greatest economic impact of freezes is to agricultural production, freezes may also necessitate the opening of local shelters and mobilization of personnel and resources for the protection of homeless persons or residents of sub-standard dwellings. Since freezes tend to occur in January or February of each year, the update should probably be accomplished prior to December 1 (to allow review/revision time). LMS Working Group members involved in the update should include extension service agents, agricultural interests, shelter operators, social service agencies, police, fire and EMS personnel, and others as needed. The group's focus should be on improving responses to freeze events. Information utilized in the update effort would primarily be derived from review of the previous year's freeze occurrences, and critiquing of actions taken in response to those events.

Droughts

In Southwest Florida, drought is primarily a late winter occurrence. Its greatest impact is on agricultural production, with secondary impacts on public water supplies. To avoid impacting the spring update activities, the drought section update should be completed prior to February 1 of each year. The primary LMS members involved should include extension agents, forestry and fire officials (for the wildfire connection), agricultural interests, utility personnel, and representatives of the South West Florida Water Management District and/or storm water operators. Focus should be given to ameliorating drought conditions through water resource allocation, water supply rationing/restrictions, and the use of drought resistant crops (where feasible). Information utilized in the update could include experiences of LMS Working Group members, Water Management District records and knowledge, and data on utility operations.

Exotic Pests and Disease

Disease refers to diseases of plants and animals, as opposed to human diseases. Such diseases may affect native vegetation or wildlife (with possible spread to domestic plants or animals) or may be confined to domestic livestock or crops. In certain instances (such as rabies), these diseases may pose a threat to human beings. Occurrence of disease is not restricted to any particular time of year. This section will be updated in the winter because the spring update period is likely to be more concerned with storm event disasters. The LMS Working Group members assigned to this

update task could include agricultural interests, forestry or wildlife officials, extension services, South West Florida Water Management District, emergency management and public health officials, and/or veterinary interests. Focus should be given to improving disease tracking and prevention (both in the natural environment and in domestic crops and livestock), and in developing response procedures. Information sources include reports and written materials from all relevant agencies and interests, as well as member experience.

New Regulations

New regulations can be referred to as a change in City/County code in regard to building restrictions. This section could be updated in the winter or spring update period, whichever one allows for more time. The LMS Working Group members assigned to this update task could include building officials, zoning officials, and emergency management.

Annual LMS Update Requirement

Chapter 27p-22 (Hazard Mitigation Grant Program) requires submittal of an Annual LMS Update to the Florida Division of Emergency Management by the last working weekday of each January. To meet this deadline, the following items will be updated in late December/early January of each year. This update will be completed by Office of Emergency Management staff (or their designee) with input from Working Group members.

- Working Group membership- will be updated to incorporate changes.
- Goals and Objectives- will be reviewed for changes.
- Mitigation Initiatives- projects will be monitored and reprioritized as needed.
- Existing Planning Mechanisms- will be monitored and changed as needed.
- Changes to the Working Group Organization and/or Planning Process- as needed.
- Refer to general updating section to review process.

5-Year LMS Update Requirement

To meet the 5-year LMS Update requirement, Office of Emergency Management staff (or their designee) with input from Working Group members will review the entire document to be sure that the information included accurately reflects the status of Charlotte County and the City of Punta Gorda. The process will include a thorough revision of every section of the plan and will seek to actively involve the LMS Working Group and the public throughout the entire update process. All sections of the LMS document will be updated as necessary. This will allow the public and other organizations to have opportunities for involvement and input for the update.

The Working Group strives to include the public in its LMS process. To that end, efforts to reach out to more sectors of public are underway. Some of these efforts are as follows:

- Make the Charlotte County/City of Punta Gorda Local Mitigation Strategy document available for review at local libraries and governmental offices.
- Place the LMS document and/or links to it on several websites to increase exposure. These websites include, but are not limited to, the Charlotte County official website, the City of Punta Gorda official website, and the Southwest Florida Regional Planning Council website.
- Place announcements of future LMS Working Group meetings on websites, in newspapers, and emails to increase exposure.

- Place the mitigation pamphlet that was developed during this current five-year update process at local institutions, available free to the public.

While these efforts to include the public in the overall LMS process are important, it is not an easy task. Interest in hazard mitigation increased due to the impacts of the 2004 hurricane season but has since begun to wane. Some individuals fallaciously believe, in fact, that since the devastation Charlotte County suffered in 2004 was so profound that it must be a very long time before something similar happens again. It is one of the tasks of the LMS Working Group to overcome such obstacles in obtaining and maintaining public involvement.

LMS Changes and Modifications

This plan is a living document that is subject to changes in defining procedural methods and techniques. A change to the plan does not require ratification by the Charlotte County Board of County Commissioners unless there is a major change in policy. Authority for changes to this plan is delegated to the Charlotte County Division of Emergency Management. The Charlotte County Emergency Management Director is responsible for the coordination of changes with affected agencies, and after concurrence, may make changes to this plan. All changes will be applied electronically, and the updates will be available automatically. A notification of the changes will be sent to all stakeholders.

EVALUATING THE PLAN

The local hazard mitigation plan is to be evaluated on an annual basis by the Office of Charlotte County Emergency Management. The Office of Charlotte County Emergency Management was selected as the organization to evaluate the mitigation plan since the Office serves as support staff for LMS working group, a committee with representatives from all of the participating jurisdictions and organizations. In this role, the Office of Emergency Management has responsibility for maintaining the master copy of the LMS, for scheduling and facilitating meetings of the LMS working group, and collaborating with adjacent counties, the State of Florida and the Federal Emergency Management Agency regarding the mitigation plan. In addition, frequently, the Office of 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.

SECTION 2: INCORPORATION OF THE LMS INTO OTHER PLANNING MECHANISMS

The fact that there was a markedly increased level of participation by individuals representing many different divisions of local government during the current update period bodes well for the prospect of the approved LMS being meaningfully incorporated into other local planning mechanisms. These planning mechanisms can be improved alongside the LMS document as hazards and information change or evolve. Keeping the LMS updated and accurate is imperative to the ability for these plans to change and expand because the following plans utilize LMS data to help with their annual updates. As population, demographics, and other factors change in the LMS they will also be reflected within the following plans through coordination with the LMSWG.

- Comprehensive Emergency Management Plan: The CEMP has been approved from the state. Once the LMS is approved the CEMP will be updated to reflect the most current data. The CEMP has since been renewed with updated LMS information over the last 5 years.
- Charlotte County Standard Building Code: It is hoped that the individuals in charge of maintaining the building codes will review the LMS for potential hazard vulnerabilities that the code as it stands might not sufficiently address. A copy of this approved LMS will be provided on the counties website for review. This plan has been updated to incorporate new information from the LMS in the past 5 years.
- Long Range Transportation Plan (LRTP): The current LRTP (2030) contains very few elements directly related to natural hazard mitigation. Aspects of goal 3, of the LMS (Reduce the vulnerability of critical facilities, public facilities, and historic structures from natural hazards.) are particularly relevant to the LRTP and the Charlotte County Emergency Management office will work with the MPO in incorporating it into the 2035 LRTP. This plan has been updated to incorporate new information from the LMS in the past 5 years.
- Article 14, City of Punta Gorda Land Development Regulations, Flood Damage Prevention: This article addresses building codes and other regulations for structures located in all areas of special flood hazard within the City of Punta Gorda's jurisdiction. Included under this regulation are a minimum finished floor elevation and a requirement to obtain a flood proofing certificate. Decisions informed by the updated flood hazard evaluation in this LMS could result in further additions to this article. This plan has been updated to incorporate new information from the LMS in the past 5 years.
- City of Punta Gorda Emergency Plan: Just as the county's CEMP could benefit from updated hazard information in the LMS, Punta Gorda's stands to as well. Since this LMS is a Charlotte County-Punta Gorda multijurisdictional plan, the city has actively participated in the update process. This plan has been updated to incorporate new information from the LMS in the past 5 years.

- City of Punta Gorda Comprehensive Plan: This document in its present form contains extensive hazard mitigation initiatives. Nevertheless, the city will examine the approved LMS update to further improve the hazard mitigation aspect of its comprehensive plan. This plan has been updated to incorporate new information from the LMS in the past 5 years.
- City of Punta Gorda Downtown Redevelopment Plan: During the ongoing annual update process, the city has the potential to strengthen this plan by proposing mitigation initiatives, informed by content in the LMS, which will harden vulnerable downtown structures against disaster. This plan has been updated to incorporate new information from the LMS in the past 5 years.

Appendix A Local
Mitigation Strategy Working
Group Meeting

2015 Work Group



The Charlotte County/ Punta Gorda Local Mitigation Strategy Working Group will hold its annual public meeting at 10:00 a.m on December 16 at the Charlotte County Public Safety Building located at 26571 Airport Road in Punta Gorda. The Local Mitigation Strategy is designed to lessen the human environmental and economic costs of disaster events. The public is invited to the meeting, and may provide input. For more information contact the Charlotte County Office of Emergency Management at 941.833.4000.

LMS Working Group Sign In
December 15, 2015

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*Friday
December 16th, 2015
10:00 AM
CHARLOTTE
COUNTY EOC*

*Charlotte
County/City of
Punta Gorda
Local Mitigation
Strategy (LMS)
Working Group*



AGENDA

- *Welcome & Introductions*

- *What is the Local Mitigation Strategy?*
 - *What projects were funded because Charlotte County had an approved LMS?*
 - *How does this process work?*

- *Work Group*
 - *Project proposals*
 - *Sections Update*

- *Final project submission January 1st*

- *Adjournment*

Small businesses deserve federal tax relief

The American economy is in a funk. We are seeing the slowest economic growth since 1949. Millions of able-bodied Americans are no longer in the workforce. College graduates are struggling to repay student loans in a brutal job market. Older Americans are putting off retirement because they haven't saved enough.

Welcome to the new American economy. Millions of people are living on the edge. An alarming 29 percent of all adults have no savings set aside for emergencies. It doesn't need to be this way. There is reason to hope that new policies in Washington can turn the economy around and restore jobs and opportunity. Chief among these is sweeping tax reform to lower high rates on individuals and businesses and simplify a



Vern Buchanan

complex tax code that no ordinary person can decipher. For the first time in 30 years, we have a rare and golden moment to reshape the tax code and bring prosperity back to America. In 1986, President Ronald Reagan undertook the last sweeping reform of the tax code, and in the years that followed, our economy grew, the unemployment rate dropped and the federal deficit shrunk. We can achieve this success today. Earlier this year, Republicans in the U.S. House produced a fundamental tax reform plan that

includes my proposal to ensure that mom-and-pop businesses never face a higher tax rate than large corporations. Economists at the nonpartisan Tax Foundation estimate that adopting this tax plan would create 1.7 million new jobs and economic growth of 9.1 percent over the next decade. To achieve growth, our tax code must support the engine of our economy: small business. The 28 million American small businesses are responsible for two-thirds of all new jobs created since the 1970s. When these firms grow, more people get jobs. But the vast majority of small businesses currently face higher top tax rates than big corporations, which puts Main Street at a huge disadvantage compared with Wall Street. Corporations are taxed at a

35 percent rate, while small businesses pay out at the individual rate of 39.6 percent. When state and local taxes are figured in, some small businesses can pay more than half of their income in taxes.

That's why tax reform needs to include the simple principle laid out in my Main Street Fairness Act: No small business should ever have to pay a higher tax rate than the biggest businesses in our country. When we unleash the power of America's small businesses, which account for nearly 60 million jobs, by taxing them fairly, our economy will get a huge boost.

The bill will establish that businesses that file taxes as so-called pass-throughs, such as sole proprietorships, partnerships, LLCs and S corporations, will pay a higher rate than a corporation.

According to the Tax Policy Center, about 93 percent of small businesses are organized as pass-throughs. That means nearly all small businesses will finally be able to compete on a level playing field if my proposal is enacted.

The National Federation of Independent Business is the latest group to announce its support for my bill. Others include the National Association of Manufacturers, Associated Builders and Contractors, the National Retail Federation, Americans for Tax Reform, the Florida Chamber of Commerce and Florida TaxWatch.

But simply lowering rates is not enough. The U.S. tax code is complicated, unfair and punitive. At almost 4 million words, the tax code is five times longer than

the King James Bible. Americans spend 6.1 billion hours per year trying to make sure that they pay their taxes correctly.

The cost of all that wasted effort? Nearly \$170 billion. Imagine if all this time, money and energy were put into job creation and getting Americans back to work.

I'm pushing hard for Congress to make tax reform a top priority under the new presidential administration in January.

It's painfully obvious that the tax code isn't working for most people, so let's bring Washington together to fix it.

Rep. Vern Buchanan, R-Longboat Key, represents Florida's 16th District. He is a senior member of the House Ways Committee and is the co-chairman of the Bipartisan Florida delegation.

And a 'Wonderful Winter Solstice' to you ...

In a recent column, I acknowledged my children's observation that I tend to tell my stories over and over.

This remind me of that, over and over. This is seldom truer than in that period from Thanksgiving to New Year's.

It began last week with my annual repeat of Dad's "Unless you are a turkey" Thanksgiving column from 50-plus years ago.

It continues today with a plea that we make the word "Christmas" politically correct again. Over the next few weeks, the airwaves will ring out with choruses of "Happy Holidays" or "Season's Greetings." It is a thoughtful gesture, a sentiment diluted by Political Correctness.

We will respond courteously, because we are too well-mannered to ask: "Which holidays or season would that be?"



S.L. Frisbie

And we will grimace silently when we receive written messages wishing us a "Merry Xmas."

Thanksgiving is a few days behind us, so that holiday is history for another year. The season (winter, if you wish) is either generic or religious.

Since nobody has ever wished me a Happy Spring, Summer, or Fall, I have to believe that nobody will be wishing me a Happy Winter.

In our Judeo-Christian culture, the holidays we are observing are Hanukkah and Christmas, followed soon after by that day on which the odometer rolls over to 2017, New Year's.

I will enthusiastically wish my Jewish friends and colleagues a Merry Christmas, and if they respond by wishing me a Happy Hanukkah, I will be proud that they have chosen to include me in the observance of a major holiday on their calendar.

Further, if they want to put up a menorah next to a crèche in a public place, I will rejoice in a shared celebration of religious heritage.

I am less tolerant of those who wish me of Merry Xmas. This is not a new theme for me. While there may be religious overtones to my message, I willingly acknowledge that this is a time of joy shared by persons of many faiths, or no faith. That is part of the magic of Christmas.

And though I am aware of the liturgical shorthand in which the Bible or the Book of Common Prayer.

The abbreviation of Christ's name with the letter X comes from the Greek letter Chi. I would gladly accept its usage if the entire message were conveyed to me in Greek; that has never been the case.

My name is Frisbie (with an ie), not Xbie. Our first president

was Washington, not Xington.

Substitute an X for the first few letters in your surname, and perhaps you will be similarly unimpressed with the result.

And when schools and other public institutions take a few days off, I shall insist on calling them Christmas holidays, not the politically correct

"Winter holidays."

This special season has a name. Several names, in fact. It is Merry Christmas. Happy Hanukkah. And if all else fails, have a Wonderful Winter Solstice.

S.L. Frisbie is the retired publisher of The Polk County Democrat in Bartow. He also writes News and The Fort Meade Leader.

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THE CHARLOTTE COUNTY/PUNTA GORDA LOCAL MITIGATION STRATEGY WORKING GROUP

will hold its annual public meeting at 10:00 a.m. on December 1 at the Charlotte County Public Safety Building located at 26571 Airport Road in Punta Gorda. The Local Mitigation Strategy is designed to lessen the human environmental and economic costs of disaster events.

The public is invited to the meeting, and may provide input. For more information contact the Charlotte County Office of Emergency Management at 941.833.4000.

Thomas Orsley, M.D.

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NOTICE OF PUBLIC REVIEW AND COMMENT PERIOD FOR THE CITY OF PUNTA GORDA'S CONSOLIDATED ANNUAL PERFORMANCE AND EVALUATION REPORT OCTOBER 1, 2015 THROUGH SEPTEMBER 30, 2016

Notice is hereby given that the City of Punta Gorda has completed a performance report for the Community Development Block Grant (CDBG) Program for Fiscal Year 2016. The Consolidated Annual Performance and Evaluation Report (CAPEER) is available for public review and comment prior to its submission to the U.S. Department of Housing and Urban Development.

The CAPEER represents the 1st year of the City's Five-Year Consolidated plan covering the period 2015-2019, and covers the accomplishments under the CDBG program for the period October 1, 2015 to September 30, 2016.

Public Review and Comment Period: The CAPEER will be available for public review and comment for a 15-day period, beginning on Thursday, December 1, 2016 and concluding at 4:30PM on Friday, December 16, 2016. Written comments may be submitted during the review period and should be sent to the City of Punta Gorda, Urban Design Division, 326 W. Marion Avenue, Punta Gorda, Florida, 33950. Comments may also be submitted via e-mail to urban@punta.org.

To Obtain a Copy of the CAPEER: Copies are available at the City of Punta Gorda Urban Design Division, 326 W. Marion Avenue, Punta Gorda, Florida, 33950, during regular business hours (8:00AM - 4:30PM, Monday-Friday), or by visiting the City website www.punta.org. Persons wishing to receive a copy of the CAPEER or to review the CAPEER in an alternative format should contact Urban Design at 941-575-3372.

In accordance with the Americans with Disabilities Act and Florida Statute 286.26, the location is accessible to persons with disabilities. If you are a person with disability who needs any accommodations in order to participate, you are entitled, at no cost to you, to the provision of certain assistance. Interpreters for the hearing impaired (TTY: 941-575-5013) or non-English speaking citizens and any other special accommodations can be requested by contacting the Human Resources Manager/Non-Discrimination Coordinator whose address is 326 W. Marion Avenue, Punta Gorda, FL 33950, whose telephone number is 941-575-3308, and whose email address is hrmcc@punta.org.

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①

LMS Working Group Sign In
December 1, 2016

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6	JASON FAIR	Public Safety Fire/EMS	941.885.5603	JASON.FAIR@CHARLOTTECOUNTYFL.GOV

LMS Working Group Sign In
December 1, 2016

	PRINTED NAME	AGENCY	CONTACT #	EMAIL
26	MARK GERING	City of Punta Gorda	941 575 5030	mgering@pgorda.us
27	Karen Bliss	Engineering - Stormwater	941 575 3142	Karen.Bliss@CharlotteCountyFl.gov
28	LORENZO DAETZ	SOLID WASTE DIVISION	941.764.4348	LORENZO.DAETZ@CHARLOTTECOUNTYFL.GOV
29	Richard Allen	Solid waste Division	941.764-4393	Richard.Allen@CharlotteCountyFl.com
30	MAGGIE HORTON	COMDSU	941-743-1923	MAGGIE.HORTON@CHARLOTTECOUNTYFL.GOV
31	JOHN McDONALD	COMDEV	941-743-1925	JOHN.MCDONALD@CHARLOTTECOUNTYFL.GOV

LMS Working Group Sign In
December 1, 2016

	PRINTED NAME	AGENCY	CONTACT #	EMAIL
51	MICHAEL DALLENBACH	CC PUBLIC WORKS	575-3635	MIKE.DALLENBACH@CHARLOTTECOUNTYFL.GOV
52	Tom Scott	CC Facilities	764-4922	Thomas.Scott@CharlotteCountyFl.gov
53	Ray Briggs	Punta Gorda Fire (city of P.G)	941 628 4616	rbriggs@pgorda.us
54	BILL VANHELDEN	CHAR. COUNTY Fire/EMS	941-833-5604	BILL.VANHELDEN@CHARLOTTECOUNTYFL.GOV
55				
56				
57				

AGENDA

Local Mitigation Strategy Working Group Meeting

December 1, 2016

10:00 – 11:00



Meeting called by Ellen Pinder- LMS Chair
Attendees: LMS Working Group 2016
Please read: Project List, Project Notes, Project Evaluation Sheet
Please bring: Updates on current project and new projects

10:00 – 10:15

Introduction

What is the LMS
How it affects you
Benefits- CRS/Funding

10:15 – 10:30

Your Role

Projects
Ranking
Plan Update

10:30 – 10:40

Plan Updates

Review Most Recent Changes to Plan
Electronic Copy has been uploaded for full review

10:40 – 11:00

Project List up Date

Current Projects
New Projects
Deferred Projects
Ranking

Additional Instructions:

Deadline for project submittal and plan review is December 30th at 5pm. If you have any [questions](#) please feel free to contact my office at 941-833-4003. Ellen.Pinder@charlottecountyfl.gov

2017 Work Group

12/13/2017

Main



**The Charlotte County/
Punta Gorda Local
Mitigation Strategy
Working Group will
hold its annual public meeting at
3:00 p.m on December 15 at the
Charlotte County Public Safety
Building located at 26571 Airport
Road in Punta.**

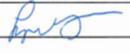
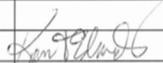
**The Local Mitigation Strategy is designed
to lessen the human environmental and
economic costs of disaster events.**

**The public is invited to the meeting, and
may provide input. For more information
contact the Charlotte County Office of
Emergency Management at 941.833.4000.**

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Table I-1 Charlotte County/City of Punta Gorda Local Mitigation Strategy Working Group Members 2017						
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Name	Position/Agency	CRS Step 7 Categories	Email Address	Address	Phone	Signature
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Tim Walker	Southwest Regional Florida Planning Council	Public Information	info@swfpc.org	1926 Vistoria Ave Fort Myers, FL 33901	238-338-2550	
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Name	Position/Agency	CRS Step 7 Categories	Email Address	Address	Phone	Signature
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AGENDA

Local Mitigation Strategy Working Group Meeting

December 15, 2017

3:00 – 4:00

Meeting called by Ellen Pinder- LMS Chair
Attendees: LMS Working Group 2017
Please read: Project List, Project Notes, Project Evaluation Sheet
Please bring: Updates on current project and new projects

Introduction

What is the LMS
How it affects you
Benefits- CRS/Funding

Your Role

Projects
Ranking
Plan Update

Plan Updates

Review Most Recent Changes to Plan
Electronic Copy has been uploaded for full review

Project List up Date

Current Projects
New Projects
Deferred Projects
Ranking

Additional Instructions:

Deadline for project submittal and plan review is December 30th at 5pm. If you have any [questions](#) please feel free to contact my office at 941-833-4003. Ellen.Pinder@charlottecountyfl.gov

2018 Work Group



The Charlotte County/Punta Gorda Local Mitigation Strategy Working Group will hold its annual public meeting at 3:00 p.m on December 14 at the Charlotte County Public Safety Building located at 26571 Airport Road in Punta Gorda. The Local Mitigation Strategy is designed to lessen the human environmental and economic costs of disaster events.

The public is invited to the meeting, and may provide input. For more information contact the Charlotte County Office of Emergency Management at 941.833.4000.

sdno-363682-1

Table L-1 Charlotte County/City of Punta Gorda Local Mitigation Strategy Working Group Members 2018						
Name	Position/Agency	CRS Step 7 Categories	Email Address	Address	Phone	Signature
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Holden Gibbs	Punta Gorda Fire Department	Emergency Services	hgibbs@pgorda.us	1410 Tamiami Trail Punta Gorda, FL 33950	941-575-5529
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Tim Walker	Southwest Regional Florida Planning Council	Public Information	inf@swfrpc.org	1926 Vistoria Ave Fort Myers, FL 33901	239-338-2550
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Diana Belle	Grants Analyst County Utilities	Preventive & Property Protection	Diana.Belle@charlottefl.com	25550 Harborview rd. Port Charlotte, FL 33980	941-764-4512
Dave Watson	Director Operations Manager Charlotte County Utilities	Preventive & Property Protection	Dave.Watson@charlottefl.com	25550 Harborview rd. Port Charlotte, FL 33980	941-883-3555
Josh Overmyer	Floodplain Coordinator	Community Development	josh.overmyer@charlottecountyfl.gov	18400 Murdock Circle Pt. Charlotte, FL 33948	941-623-1080

EM ADVISORY COMMITTEE AGENDA

Location: 26571 Airport Road Punta Gorda, FL 33982
Date: 12/14/2018
Time: 3:00pm
Facilitator: Patrick Fuller & Ellen Pinder

Agenda Items

Welcome & Introductions – Ellen Pinder

Local Mitigation Strategy

Deadlines:

Future Project Submittal project list:
January 4th 2019 5:00pm

Local Mitigation Strategy update-

Goals & Strategies March 2019

Project Review Process May 2019

Hazard Analysis September 2019

Final Plan Review December 2019

MYTEP – Patrick Fuller

CEMP – Lynne Sticklely

AGENDA

Local Mitigation Strategy Working Group Meeting

December 14, 2018

3:00 – 4:00

Meeting called by Ellen Pinder- LMS Chair
Attendees: LMS Working Group 2018
Please read: Project List, Project Notes, Project Evaluation Sheet
Please bring: Updates on current project and new projects

Introduction

What is the LMS
How it affects you
Benefits- CRS/Funding

Your Role

Projects
Ranking
Plan Update

Plan Updates

Review Most Recent Changes to Plan
Electronic Copy has been uploaded for full review

Project List up Date

Current Projects
New Projects
Deferred Projects
Ranking

Additional Instructions:

Deadline for project submittal and plan review is December 30th at 5pm. If you have any questions please feel free to contact my office at 941-833-4003. Ellen.Pinder@charlottecountyfl.gov

2019 Work Group



Charlotte County Emergency Management

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December 2 at 6:00 AM · 🌐

We Want To Hear From You! The Local Mitigation Strategy (LMS) is a multi-jurisdictional plan to reduce or eliminate the risk associated with man-made and natural hazards. To remain compliant with FEMA statutes, the LMS must be updated every five years. Without an approved LMS, Charlotte County and The City of Punta Gorda, would be unable to apply for many Federal grants to cover expense of mitigation projects. Email us or join us on December 13th. See attached flyer for details.

**LOCAL MITIGATION STRATEGY
2019 UPDATE MEETING**

December 13th @ 3:00 pm

Charlotte County Public Safety Building
26571 Airport Road, Punta Gorda



The Local Mitigation Strategy (LMS) is a multi-jurisdictional plan to reduce or eliminate the risk associated with man-made and natural hazards. To remain compliant with FEMA statutes, the LMS must be updated every five years. Without an approved LMS, Charlotte County and The City of Punta Gorda, would be unable to apply for many Federal grants to cover expense of mitigation projects.

*We are seeking public involvement with the five year update. If you are unable to attend the meeting please email your ideas to:
Emergency.Management@CharlotteCountyFL.gov*



Table I-1 Charlotte County/City of Punta Gorda ncy Management Advisory Group - LMS Working Group					
Position/Agency	CRS Step 1 Categories	Email Address	Address	Phone	Signature
EM Coordinator/ LMS Chair Charlotte County Emergency Management	Emergency Services	ellen.pinder@charlottecountyfl.gov	26571 Airport Road. Punta Gorda, FL 33982	941-833-4002	
EM Director / LMS Vice Chair Charlotte County Emergency Management	Emergency Services	patrick.fuller@charlottecountyfl.gov	26571 Airport Road. Punta Gorda, FL 33982	941-833-4001	
Mitigation Planner Charlotte County Emergency Management	Emergency Services	brad.geelen@charlottecountyfl.gov	26571 Airport Road. Punta Gorda, FL 33982	941-833-4003	
Emergency Planning Specialist Charlotte County Emergency Management	Emergency Services	lynn.stickley@charlottecountyfl.gov	26571 Airport Road. Punta Gorda, FL 33982	941-833-4004	
Fire Chief - Public Safety Director Charlotte County Fire & EMS	Emergency Services	bill.vanhelden@charlottecountyfl.gov	26571 Airport Road. Punta Gorda, FL 33982	941-833-5600	
Director Charlotte County Facilities	Preventive & Property Protection	anthony.maddox@charlottecountyfl.gov	18500 Murdock Circle Pt. Charlotte, FL 33948	941-743-1398	
Manager Charlotte County Facilities	Property Protection	roger.warner@charlottecountyfl.gov	18500 Murdock Circle Pt. Charlotte, FL 33948	941-743-1905 941-743-7002	
Public Works Engineering Division Storm water Management	Structural Projects	karen.bliss@charlottecountyfl.gov	410 Taylor Road Punta Gorda, FL 33950	941-575-3642	
Urban Planner City of Punta Gorda	Preventive & Property Protection	maustin@pgorda.us	326 W Marian Ave Punta Gorda, FL 33950	941-575-3302	
Community Development Engineering Division City of Punta Gorda	Preventive & Property Protection	shaun.cullinan@charlottecountyfl.gov	18500 Murdock Circle Pt. Charlotte, FL 33948	941-743-1922	
	Preventive & Property Protection	jsmith@pgorda.us	326 W Marian Ave Punta Gorda, FL 33950	941-575-3302	
Punta Gorda Fire Department	Emergency Services	hgibbs@pgorda.us	1410 Tamiami Trail Punta Gorda, FL 33950	941-575-5529	
Forest Area Supervisor Myakka River District	Emergency Services	richard.christman@freshfromflorida.com	2000 South River Road Englewood, FL 34223	863-491-7589	
District Security/ Emergency Management Charlotte County Public Schools	Emergency Services	dave.lupinetti@yourcharlotteschools.net	1445 Education Way Port Charlotte, FL 33948	941-255-0808	
Charlotte County Schools	Emergency Services	michael.desjardins@yourcharlotteschools.net	1445 Education Way Port Charlotte, FL 33948	941-255-0808	
ER Director Port Charlotte Bayfront	Emergency Services	janet.huss@bayfronthealth.com	2500 Harbor Blvd, Port Charlotte, FL 33952	941-766-4554	
Grants Analyst/Project Manager Charlotte County Utilities Capital	Preventive & Property Protection	Diana.Bello@charlottecountyfl.gov	25550 Harborview rd, Port Charlotte, FL 33980	941-764-4512	
Operations Manager Charlotte County Utilities	Preventive & Property Protection	Dave.Watson@charlottecountyfl.gov	25550 Harborview rd, Port Charlotte, FL 33980	941-883-3555	
Floodplain Coordinator	Community Development	josh.overmyer@charlottecountyfl.gov	18400 Murdock Circle Pt. Charlotte, FL 33948	941-623-1080	

DEPUTY CHIEF - CCPMS EMERGENCY SERVICES.

AGENDA

Local Mitigation Strategy Working Group Meeting

December 13, 2019

2018 3:00 – 4:00

Meeting called by Ellen Pinder- LMS Chair
Attendees: LMS Working Group 2019
Please read: Project List, Project Notes, Project Evaluation Sheet
Please bring: Updates on current project and new projects

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Additional Instructions:

Deadline for project submittal and plan review is December 30th at 5pm. If you have any questions please feel free to contact my office at 941-833-4000. Ellen.Pinder@charlottecountyfl.gov

Appendix B: Hazard Summary Sheets

List of Hazard Summary Sheets

Flooding B.2
Tropical Storm/ Category 1 Hurricane..... B.3
Category 2 Hurricane B.4
Category 3 Hurricane B.5
Category 4 Hurricane B.6
Category 5 Hurricane B.7
Severe Weather and Tornadoes..... B.8
Wildfire B.9
Drought..... B.10
Extreme Heat..... B.11
Winter Storms/ Freezes B.12
Erosion / Coastal Oil Spill B.13
Sinkholes..... B.14
Seismic Events B.15
Tsunami B.16
Major Traffic Accidents..... B.17
Technological Hazards B.18
Hazardous Materials B.19
Nuclear Power Plant B.20
Mass Migration / Epidemic B.21
Terrorism/ Civil Disturbance B.22

Hazard Summary

<i>Hazard</i>	<i>Frequency of Occurrence</i>
Flooding	<input type="checkbox"/> Annual event <input checked="" type="checkbox"/> Every 5 years or less <input type="checkbox"/> Every 10 years or less <input type="checkbox"/> Every 30 years or less <input type="checkbox"/> Greater than 30 years

Flooding occurs in the county when there is severe weather or is cyclone-related.

<i>Impacts</i>	
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<i>Public and Responders</i>	<ul style="list-style-type: none"> • High risk to loss of life and injury, displacement, increased distress • May affect drinking water; can increase risks to health • Risk to life and safety while responding to populations affected by flooding
<i>Continuity of Operations and Program Operations</i>	<ul style="list-style-type: none"> • Operations may be interrupted if affected by flooding • Staffing difficulties are possible (personnel unable to drive to work)
<i>Property, Facilities, and Infrastructure</i>	<ul style="list-style-type: none"> • High impact • Utility outages, transportation infrastructure closures, and isolated populations • Varying levels of damage to structures in low-lying areas
<i>Delivery of Services</i>	<ul style="list-style-type: none"> • High risk to disruption of basic life support systems, typically for short duration
<i>Public's Confidence in Jurisdiction's Governance</i>	<ul style="list-style-type: none"> • The public's confidence in the county's ability to respond to a flooding situation would be based on our ability to restore services in a timely manner.
<i>Economic Condition</i>	<ul style="list-style-type: none"> • Impact dependent on severity of flooding • High impact on insurance industry
<i>Environment</i>	<ul style="list-style-type: none"> • Increased risk of exposure to hazardous materials • Displacement of wildlife may increase public health and safety issues • Increased arboviral vectors

Hazard Summary

<i>Hazard</i>	<i>Frequency of Occurrence</i>
Tropical Storm/Category 1 Hurricane	<input checked="" type="checkbox"/> Annual event <input type="checkbox"/> Every 5 years or less <input type="checkbox"/> Every 10 years or less <input type="checkbox"/> Every 30 years or less <input type="checkbox"/> Greater than 30 years
<p>Forty-four land-falling Category 1 hurricanes have affected the state since 1851. 136 tropical storms have affected the state since 1900.</p>	
<i>Impacts</i>	
<i>Public and Responders</i>	<ul style="list-style-type: none"> • Injuries or casualties caused by preventable circumstances • Increased fatigue and distress • Food and water issues if residents are unprepared to shelter in place for duration of event • Injuries/fatalities possible when responding to calls for service during the event • Increased fatigue and stress from hazardous conditions • Status of responder’s family will affect the responder’s ability to perform his/her duties
<i>Continuity of Operations and Program Operations</i>	<ul style="list-style-type: none"> • Local governments may have to shut down non-essential functions for duration of event • Charlotte County EOC is rated to withstand the winds of a Category 5 hurricane
<i>Property, Facilities, and Infrastructure</i>	<ul style="list-style-type: none"> • Minor damage to buildings and structures • Damage primarily to unanchored mobile homes; some damage to poorly constructed signs • Also, some coastal road flooding and minor pier damage
<i>Delivery of Services</i>	<ul style="list-style-type: none"> • Minor disruption in the service delivery. • Some operations may choose to continue business while others may suspend actions
<i>Public’s Confidence in Jurisdiction’s Governance</i>	<ul style="list-style-type: none"> • The public’s confidence in the county’s ability to respond to a hurricane would be based on our ability to restore services in a timely manner.
<i>Economic Condition</i>	<ul style="list-style-type: none"> • Highly unlikely to affect the overall economic condition; however, uncontrolled rumors could worsen the situation
<i>Environment</i>	<ul style="list-style-type: none"> • Negligible damage to environment

Hazard Summary

<i>Hazard</i>	<i>Frequency of Occurrence</i>
Category 2 Hurricane	<input type="checkbox"/> Annual event <input checked="" type="checkbox"/> Every 5 years or less <input type="checkbox"/> Every 10 years or less <input type="checkbox"/> Every 30 years or less <input type="checkbox"/> Greater than 30 years
Thirty-four land falling Category 2 hurricanes have affected the state since 1851.	
<i>Impacts</i>	
<i>Public and Responders</i>	<ul style="list-style-type: none"> • Evacuation of homes near coast that cannot withstand Category 1 hurricane conditions • Injuries/fatalities caused from preventable circumstances. • Injuries/fatalities possible when responding to calls for service after the event • Increased fatigue and stress from hazardous conditions • Status of responder’s family will affect the responder’s ability to perform his/her duties
<i>Continuity of Operations and Program Operations</i>	<ul style="list-style-type: none"> • Local governments will shut down non-essential functions for duration of event • Implementation of continuity of operations (COOP) for essential functions. • County EOC is rated to withstand the winds of a Category 5 Hurricane
<i>Property, Facilities, and Infrastructure</i>	<ul style="list-style-type: none"> • Considerable damage to mobile homes, poorly constructed signs, and piers • Some roofing material, door, and window damage of buildings • Coastal and low-lying escape routes flood 2–4 hours before arrival of the hurricane center • Small craft in unprotected anchorages break moorings
<i>Delivery of Services</i>	<ul style="list-style-type: none"> • Disruption in the delivery of services for the duration of the event • Non-essential services are suspended for several days to a week until recovery functions are implemented
<i>Public’s Confidence in Jurisdiction’s Governance</i>	<ul style="list-style-type: none"> • The public’s confidence in the county’s ability to respond to a hurricane would be based on our ability to restore services in a timely manner.
<i>Economic Condition</i>	<ul style="list-style-type: none"> • Low impact to the industries in the area of storm’s path; however, could also affect industries in other areas if import/export schedules are interrupted • Uncontrolled rumors could worsen the situation
<i>Environment</i>	<ul style="list-style-type: none"> • Considerable damage to shrubbery and trees, with some trees blown down

Hazard Summary

<i>Hazard</i>	<i>Frequency of Occurrence</i>
Category 3 Hurricane	<input type="checkbox"/> Annual event <input checked="" type="checkbox"/> Every 5 years or less <input type="checkbox"/> Every 10 years or less <input type="checkbox"/> Every 30 years or less <input type="checkbox"/> Greater than 30 years
Twenty-nine land falling Category 3 hurricanes have impacted the state since 1851, with 4 occurring in the 2004 and 2005 seasons (2004: Ivan, Jeanne; 2005: Dennis, Wilma).	
<i>Impacts</i>	
<i>Public and Responders</i>	<ul style="list-style-type: none"> • Evacuation of low-lying residences within several blocks of the shoreline may be required • Increased fatigue and distress • Food and water issues if residents are unprepared to shelter in place for duration of event • Injuries/fatalities caused from hazardous conditions • Injuries/fatalities possible when responding to calls for service after the event • Increased fatigue and stress from hazardous conditions • Status of responder’s family will affect the responder’s ability to perform his/her duties
<i>Continuity of Operations and Program Operations</i>	<ul style="list-style-type: none"> • May have to relocate if government offices are damaged • Implementation of COOP for essential functions • County EOC is rated to withstand the winds of a Category 5 Hurricane.
<i>Property, Facilities, and Infrastructure</i>	<ul style="list-style-type: none"> • Some structural damage to small residences and utility buildings, with a minor amount of curtain wall failures • Low-lying escape routes are cut by rising water 3–5 hours before arrival of the center of the hurricane • Debris
<i>Delivery of Services</i>	<ul style="list-style-type: none"> • Disruption in the delivery of services for the duration of the event • Non-essential services are suspended for several weeks to a month until recovery operations are implemented
<i>Public’s Confidence in Jurisdiction’s Governance</i>	<ul style="list-style-type: none"> • The public’s confidence in the counties ability to respond to a hurricane would be based on our ability to restore services in a timely manner.
<i>Economic Condition</i>	<ul style="list-style-type: none"> • Low to moderate impact to the industries in the area of storm’s path; however, could also affect industries in other areas if import/export schedules are interrupted • Uncontrolled rumors could worsen the situation
<i>Environment</i>	<ul style="list-style-type: none"> • Damage to shrubbery and trees, with foliage blown off trees and large trees blown down. • Terrain continuously lower than 5 feet above sea level may be flooded inland 8 miles • Increase in debris and hazardous materials

Hazard Summary

<i>Hazard</i>	<i>Frequency of Occurrence</i>
Category 5 Hurricane	<input type="checkbox"/> Annual event <input type="checkbox"/> Every 5 years or less <input type="checkbox"/> Every 10 years or less <input type="checkbox"/> Every 30 years or less <input checked="" type="checkbox"/> Greater than 30 years
The Labor Day Hurricane in 1935 and Hurricane Andrew in 1992 are the only land falling Category 5 storms in a 100-year period for the state.	
<i>Impacts</i>	
<i>Public and Responders</i>	<ul style="list-style-type: none"> • Massive evacuation of residential areas on low ground within 5–10 miles of the shoreline may be required • Injuries/fatalities possible when responding to calls for service after the event • Increased fatigue and stress from hazardous conditions • Status of the responder’s family will affect the responder’s ability to perform his/her duties
<i>Continuity of Operations and Program Operations</i>	<ul style="list-style-type: none"> • May have to relocate if local government offices are damaged • Implementation of COOP for essential functions • County EOC is rated to withstand the winds of a Category 5 hurricane
<i>Property, Facilities, and Infrastructure</i>	<ul style="list-style-type: none"> • Complete roof failure on many residences and industrial buildings • Some complete building failures, with small utility buildings blown over or away • Complete destruction of mobile homes • Major damage to lower floors of structures located less than 15 feet above sea level and within 500 yards of the shoreline
<i>Delivery of Services</i>	<ul style="list-style-type: none"> • Disruption in the delivery of services for the duration of the event • Non-essential services are suspended for a month to several months until recovery operations are implemented
<i>Public’s Confidence in Jurisdiction’s Governance</i>	<ul style="list-style-type: none"> • The public’s confidence in the county’s ability to respond to a hurricane would be based on our ability to restore services in a timely manner.
<i>Economic Condition</i>	<ul style="list-style-type: none"> • Extensive to catastrophic impact to the industries in the area of storm’s path; however, could also affect industries in other areas if import/export schedules are interrupted • Uncontrolled rumors could worsen the situation
<i>Environment</i>	<ul style="list-style-type: none"> • All shrubs, trees, and signs blown down • Contamination of inland environment with seawater mixed with debris and other hazardous materials could affect aquifer

Hazard Summary

<i>Hazard</i>	<i>Frequency of Occurrence</i>
Severe Weather and Tornadoes	<input checked="" type="checkbox"/> Annual event <input type="checkbox"/> Every 5 years or less <input type="checkbox"/> Every 10 years or less <input type="checkbox"/> Every 30 years or less <input type="checkbox"/> Greater than 30 years
Severe weather affects Florida every day during the summer season. However, extensive severe weather events occur an average of five times annually, most often in the spring and fall. Extreme strong winds level tropical storm force and intense lengthy period of lightning. Annually, fatalities occur as a result of tornadoes.	
<i>Impacts</i>	
<i>Public and Responders</i>	<ul style="list-style-type: none"> • Potential for minimal loss of life and injuries resulting from severe weather • Potential for mass fatalities and large number of injuries resulting from tornadoes • Requires shelter operations • Major impact on mental and physical health • Injuries/fatalities possible in areas affected by tornadoes • Protective actions required for responders from hazards; personal protective equipment (PPE) is required for emergency worker safety from downed utility line, hazardous materials, and debris; basic responder needs must be met. • Status of responder's family will affect the responder's ability to perform his/her duties
<i>Continuity of Operations and Program Operations</i>	<ul style="list-style-type: none"> • Impact unlikely to cause relocation of government operations as a result of severe weather; locally affected government agencies may be forced to relocate to continue essential operations as a result of impact from tornadoes
<i>Property, Facilities, and Infrastructure</i>	<ul style="list-style-type: none"> • Severe weather may cause utility outages and transportation infrastructure closures • Tornadoes may cause massive failures in electrical, communications, and other critical infrastructures
<i>Delivery of Services</i>	<ul style="list-style-type: none"> • Local disruption in services, typically of short duration. • With regard to tornadoes, the area impacted may have widespread disruptions • 911 systems may be overwhelmed
<i>Public's Confidence in Jurisdiction's Governance</i>	<ul style="list-style-type: none"> • The public's confidence in the counties ability to respond to a tornado would be based on our ability to restore services in a timely manner.
<i>Economic Condition</i>	<ul style="list-style-type: none"> • Moderate to extensive impact on affected area's economy depending on the type of hazard
<i>Environment</i>	<ul style="list-style-type: none"> • Moderate impact • Impact on environmental tolerances can easily be overwhelmed from any of the hazards classified under severe weather • Debris and hazardous materials could be released into the environment

Hazard Summary

<i>Hazard</i>	<i>Frequency of Occurrence</i>
Wildfire	<input checked="" type="checkbox"/> Annual event <input type="checkbox"/> Every 5 years or less <input type="checkbox"/> Every 10 years or less <input type="checkbox"/> Every 30 years or less <input type="checkbox"/> Greater than 30 years
Wildfires occur annually in Florida. Since 2009, there have been 284 fires and 5150 acres burned in Charlotte County.	
<i>Impacts</i>	
<i>Public and Responders</i>	<ul style="list-style-type: none"> • Health affected from smoke inhalation • Displacement possible • Special needs populations will require more attention • Increased distress • Increased exposure to smoke inhalation • High risk to health and safety of responders
<i>Continuity of Operations and Program Operations</i>	<ul style="list-style-type: none"> • If affected, operations may have to be relocated or suspended
<i>Property, Facilities, and Infrastructure</i>	<ul style="list-style-type: none"> • Moderate impact to the transportation and utility infrastructure, damage to properties
<i>Delivery of Services</i>	<ul style="list-style-type: none"> • Moderate impact to the delivery of services • Services likely to be temporarily interrupted in affected areas
<i>Public's Confidence in Jurisdiction's Governance</i>	<ul style="list-style-type: none"> • Extensive impact to wildlife and vegetation
<i>Economic Condition</i>	<ul style="list-style-type: none"> • Impact on Florida's agricultural and timber industry • High impact on insurance industry
<i>Environment</i>	<ul style="list-style-type: none"> • The public's confidence is reflected in the Governor's approval rating. The Governor kept a high approval rating during the 2007 wildfires.

Hazard Summary

<i>Hazard</i>	<i>Frequency of Occurrence</i>
Drought	<input type="checkbox"/> Annual event <input type="checkbox"/> Every 5 years or less <input checked="" type="checkbox"/> Every 10 years or less <input type="checkbox"/> Every 30 years or less <input type="checkbox"/> Greater than 30 years
Since 1900, nine drought cycles (typically of two-year periods) have occurred in Florida. Most often, the area of impact was regional rather than Statewide. Most summer seasons have micro-heat waves based on a geographic area of Florida. Florida averages 12 heat-related fatalities annually.	
<i>Impacts</i>	
<i>Public and Responders</i>	<ul style="list-style-type: none"> • Drought conditions may require water use restrictions, which could cause distress to agricultural concerns • Increase in heat-related illnesses • Infants and children, elderly and access and functional needs populations, and pets may require more attention • Increased risk of dehydration • Prolonged exposure to severe conditions • Overexertion required by job will increase risk of heat-related illness
<i>Continuity of Operations and Program Operations</i>	<ul style="list-style-type: none"> • Low impact to government • Prolonged drought periods may require the suspension of services
<i>Property, Facilities, and Infrastructure</i>	<ul style="list-style-type: none"> • Low impact to property, facilities, and infrastructure • Heat-sensitive components may be compromised
<i>Delivery of Services</i>	<ul style="list-style-type: none"> • Low impact to the delivery of services • Non-essential services (e.g., park and recreational area watering, public property watering) may be suspended
<i>Public's Confidence in Jurisdiction's Governance</i>	<ul style="list-style-type: none"> • Extensive impact to wildlife and vegetation
<i>Economic Condition</i>	<ul style="list-style-type: none"> • High impact to agri-business, public utilities, and other industries reliant upon water for production or services
<i>Environment</i>	<ul style="list-style-type: none"> • Low impact • A reduction in ground water supplies creates a situation conducive to sinkholes • Non-domesticated animals will be directly impacted Flora may die off

Hazard Summary

<i>Hazard</i>	<i>Frequency of Occurrence</i>
Extreme Heat	<input checked="" type="checkbox"/> Annual event <input type="checkbox"/> Every 5 years or less <input type="checkbox"/> Every 10 years or less <input type="checkbox"/> Every 30 years or less <input type="checkbox"/> Greater than 30 years
While extended extreme heat events are not as common, the State of Florida routinely experiences excessive heat outlooks, watches, and warnings/advisories throughout the State.	
<i>Impacts</i>	
<i>Public and Responders</i>	<ul style="list-style-type: none"> • Extreme heat leads to an increase in heat-related illnesses • Infants and children, elderly and access and functional needs populations, and pets may require more attention • Increased risk of dehydration • Prolonged exposure to severe conditions • Overexertion required by job will increase risk of heat-related illness
<i>Continuity of Operations and Program Operations</i>	<ul style="list-style-type: none"> • Negligible impact to government
<i>Property, Facilities, and Infrastructure</i>	<ul style="list-style-type: none"> • Negligible impact to property, facilities and infrastructure
<i>Delivery of Services</i>	<ul style="list-style-type: none"> • Low impact to the delivery of services • Non-essential services (e.g., outdoor government activities) may be suspended to mitigate impacts to staff and attendees.
<i>Public's Confidence in Jurisdiction's Governance</i>	<ul style="list-style-type: none"> • Extensive impact to wildlife and vegetation
<i>Economic Condition</i>	<ul style="list-style-type: none"> • High impact to tourism, agri-business, public utilities, and other industries tasked with caring for the population or providing services for comfort
<i>Environment</i>	<ul style="list-style-type: none"> • Low impact • A reduction in ground water supplies creates a situation conducive to sinkholes • Non-domesticated animals will be directly impacted Flora may die off

Hazard Summary

<i>Hazard</i>	<i>Frequency of Occurrence</i>
Erosion / Coastal Oil Spill	<input checked="" type="checkbox"/> Annual event <input type="checkbox"/> Every 5 years or less <input type="checkbox"/> Every 10 years or less <input type="checkbox"/> Every 30 years or less <input type="checkbox"/> Greater than 30 years
<p>During the 2004 and 2005 hurricane seasons, tropical storms and hurricanes made landfall along the counties coastline. Nearly all of the counties sandy beach shorelines were affected.</p>	
<i>Impacts</i>	
<i>Public and Responders</i>	<ul style="list-style-type: none"> • Low impact on majority of public • There may be isolated incidents of distressed citizens • Public may not be able to visit beaches while erosion repair is underway • Low impact to responders • There may be isolated incidents of responding to calls
<i>Continuity of Operations and Program Operations</i>	<ul style="list-style-type: none"> • Minimal impact on operations
<i>Property, Facilities, and Infrastructure</i>	<ul style="list-style-type: none"> • Moderate impact on property near or on the coastlines • Facilities and infrastructure near the coast could be impacted
<i>Delivery of Services</i>	<ul style="list-style-type: none"> • Low impact • Services normally provided in the areas near the coast may be shut down during repairs
<i>Public's Confidence in Jurisdiction's Governance</i>	<ul style="list-style-type: none"> • Coastal erosion is a concern within the county. How erosion is prevented and corrected can affect public confidence. Residents on the coast, whose property value declines because of erosion, may lose confidence if no actions are taken to restore the coastline of their property
<i>Economic Condition</i>	<ul style="list-style-type: none"> • \$3 million and \$5 million per mile to restore a coastal shore
<i>Environment</i>	<ul style="list-style-type: none"> • Moderate impact to coastline. Beaches serve as a natural barrier

Hazard Summary

<i>Hazard</i>	<i>Frequency of Occurrence</i>
Sinkholes	<input type="checkbox"/> Annual event <input type="checkbox"/> Every 5 years or less <input type="checkbox"/> Every 10 years or less <input type="checkbox"/> Every 30 years or less <input checked="" type="checkbox"/> Greater than 30 years
<p>There is only one known sinkhole in Charlotte County. Sinkholes are a common naturally occurring geological phenomenon and one of the predominant landforms in Florida.</p>	
<i>Impacts</i>	
<i>Public and Responders</i>	<ul style="list-style-type: none"> • Low impact on public outside of immediate collapse • Risk to health if drinking water is contaminated due to sinkhole encroaching into the aquifer • Low impact to emergency workers
<i>Continuity of Operations and Program Operations</i>	<ul style="list-style-type: none"> • Minimal effect on the state's COOP
<i>Property, Facilities, and Infrastructure</i>	<ul style="list-style-type: none"> • Minimal impact overall, but isolated homes or businesses may be affected • Sinkholes can affect the infrastructure by draining unfiltered water from streams, lakes, and wetlands directly into the aquifer. If a sinkhole directly affects a structure, it could be extremely costly to repair.
<i>Delivery of Services</i>	<ul style="list-style-type: none"> • Low impact on delivery of services
<i>Public's Confidence in Jurisdiction's Governance</i>	<ul style="list-style-type: none"> • Residents affected by sinkholes may look to local and state governments for assistance.
<i>Economic Condition</i>	<ul style="list-style-type: none"> • Low impact to all industries
<i>Environment</i>	<ul style="list-style-type: none"> • Moderate impact to the environment; sinkholes can affect the environment by threatening water supplies by draining water from streams, lakes, and wetlands directly into the aquifer; this could affect wildlife habitats

Hazard Summary

<i>Hazard</i>	<i>Frequency of Occurrence</i>
Seismic Events	<input type="checkbox"/> Annual event <input type="checkbox"/> Every 5 years or less <input type="checkbox"/> Every 10 years or less <input type="checkbox"/> Every 30 years or less <input checked="" type="checkbox"/> Greater than 30 years
<p>Seismic events were more common approximately 30–100 years ago, ranging from slight tremors to a 6 on Modified Mercalli intensity scale.</p>	
<i>Impacts</i>	
<i>Public and Responders</i>	<ul style="list-style-type: none"> • Moderate impact • Risk to health and safety from falling debris • Stress and fatigue are also possible if incident is severe enough • Risk to life and safety while responding to affected populations • Stress and fatigue from working long hours • Status of responder's family will affect the responder's ability to perform his/her duties
<i>Continuity of Operations and Program Operations</i>	<ul style="list-style-type: none"> • Moderate impact • Alternate facilities may be unusable; COOP of last resort will be used • Resources to continue operations may be limited (i.e., phones, Internet)
<i>Property, Facilities, and Infrastructure</i>	<ul style="list-style-type: none"> • High impact • Major damage to property, facilities, and infrastructure
<i>Delivery of Services</i>	<ul style="list-style-type: none"> • High impact on services if infrastructure is disrupted
<i>Public's Confidence in Jurisdiction's Governance</i>	<ul style="list-style-type: none"> • Public's confidence will be reflected in the response to the situation.
<i>Economic Condition</i>	<ul style="list-style-type: none"> • High impact on overall economic condition if seismic event is severe enough
<i>Environment</i>	<ul style="list-style-type: none"> • High impact • Fallen trees and debris could be hazardous for wildlife

Hazard Summary

<i>Hazard</i>	<i>Frequency of Occurrence</i>
Solar Storm	<input type="checkbox"/> Annual event <input type="checkbox"/> Every 5 years or less <input type="checkbox"/> Every 10 years or less <input type="checkbox"/> Every 30 years or less <input checked="" type="checkbox"/> Greater than 30 years
<p>An emerging threat with potential impacts to the electric grid, satellites, and technology.</p>	
<i>Impacts</i>	
<i>Public and Responders</i>	<ul style="list-style-type: none"> • More frequent, minor solar storms have a low impact on the overall population. • Rare, major solar storms would have a high impact on the overall population • Responders may have difficulty due to widespread disruptions in the electric grid and lack of fuel
<i>Continuity of Operations and Program Operations</i>	<ul style="list-style-type: none"> • Low impact to COOP for more frequent minor solar storms • Rarer, major solar storms would severely disrupt COOPs because of widespread disruptions to the electric grid, and communications
<i>Property, Facilities, and Infrastructure</i>	<ul style="list-style-type: none"> • Minor impacts for more frequent solar storms because the infrastructure can handle small energy fluctuations • Major solar storms could severely affect Infrastructure on a regional level if there are disruptions to the electric grid
<i>Delivery of Services</i>	<ul style="list-style-type: none"> • Low impacts to deliver of service from more frequent solar storms • Potential for high impact on delivery of services if wide spread disruption to power. • Communications, and GPS services could also be disrupted lading to difficulties in delivery of services
<i>Public's Confidence in Jurisdiction's Governance</i>	<ul style="list-style-type: none"> • High confidence in handling minor, more frequent solar storms • Low confidence in handling rare, major solar storms
<i>Economic Condition</i>	<ul style="list-style-type: none"> • Potential for high to catastrophic impact on industries if the electricity grid fails.
<i>Environment</i>	<ul style="list-style-type: none"> • Low impact to the environment overall

Hazard Summary

<i>Hazard</i>	<i>Frequency of Occurrence</i>
Technological Hazards	<input type="checkbox"/> Annual event <input checked="" type="checkbox"/> Every 5 years or less <input type="checkbox"/> Every 10 years or less <input type="checkbox"/> Every 30 years or less <input type="checkbox"/> Greater than 30 years
The State Watch Office receives information regarding technological hazards on a daily basis. The type and magnitude vary.	
<i>Impacts</i>	
<i>Public and Responders</i>	<ul style="list-style-type: none"> • Low impact on the overall population. Risk to health and safety in areas of occurrence • Shelter-in-place may cause distress and fatigue • Low impact to health and safety of responders as long as training and PPE are up-to-date and meet specifications • Critical Incident Stress Debriefing may be required
<i>Continuity of Operations and Program Operations</i>	<ul style="list-style-type: none"> • Low impact to COOP • Operations within the vicinity areas affected
<i>Property, Facilities, and Infrastructure</i>	<ul style="list-style-type: none"> • Facilities near the affected areas may have to shut down • Properties may have to undergo decontamination • Infrastructure on a regional level could be severely affected if shut down
<i>Delivery of Services</i>	<ul style="list-style-type: none"> • Low impact on delivery of services
<i>Public's Confidence in Jurisdiction's Governance</i>	<ul style="list-style-type: none"> • High confidence in the county governance based on compliance of regulations. Florida has many facilities that house extremely hazardous materials per the EPA's listing of said chemicals all year round.
<i>Economic Condition</i>	<ul style="list-style-type: none"> • Low impact on the overall economic condition • Plenty of facilities in the State of Florida with duplicative nature can ensure there would never be a shortage of materials
<i>Environment</i>	<ul style="list-style-type: none"> • Low impact to the environment overall; however, the areas affected could have moderate impact depending on the type of hazard

Hazard Summary

<i>Hazard</i>	<i>Frequency of Occurrence</i>
Nuclear Power Plant	<input type="checkbox"/> Annual event <input type="checkbox"/> Every 5 years or less <input type="checkbox"/> Every 10 years or less <input type="checkbox"/> Every 30 years or less <input checked="" type="checkbox"/> Greater than 30 years
The closest nuclear power plant is located 115 miles away on the opposite coast of Charlotte County.	
<i>Impacts</i>	
<i>Public and Responders</i>	<ul style="list-style-type: none"> • Low impact to the health and safety of personnel. • Protective actions required to protect responders from radiation exposure
<i>Continuity of Operations and Program Operations</i>	<ul style="list-style-type: none"> • Low impact to COOP
<i>Property, Facilities, and Infrastructure</i>	<ul style="list-style-type: none"> • Low impact to property, facilities, and infrastructure
<i>Delivery of Services</i>	<ul style="list-style-type: none"> • Low impact to the delivery of services
<i>Public's Confidence in Jurisdiction's Governance</i>	<ul style="list-style-type: none"> • Due to the location of the tow power plants in Florida the publics confidence is high.
<i>Economic Condition</i>	<ul style="list-style-type: none"> • Low impact to the economic and financial community of the impacted area
<i>Environment</i>	<ul style="list-style-type: none"> • Low impact to the areas of highest concentration of radiological particulate

Hazard Summary

<i>Hazard</i>	<i>Frequency of Occurrence</i>
Mass Migration / Epidemic	<input type="checkbox"/> Annual event <input type="checkbox"/> Every 5 years or less <input type="checkbox"/> Every 10 years or less <input checked="" type="checkbox"/> Every 30 years or less <input type="checkbox"/> Greater than 30 years
<p>The State of Florida’s refugee program is the largest in the nation, resettling more than 25,000 refugees and Cuban/Haitian entrants each year. Florida also becomes home to more than 2,000 asylum-seekers eligible for services each year.</p>	
<i>Impacts</i>	
<i>Public and Responders</i>	<ul style="list-style-type: none"> • Mass influx to population density will affect the public, most likely in the southern part of the state and along major transit routes • Possible increase in crime rate • Civil disturbances may occur if presence of migrating population upsets the current residents of the area • Moderate impact on responders • Responders may be overwhelmed by increased calls to service • Epidemic's spread faster if there is mass migration.
<i>Continuity of Operations and Program Operations</i>	<ul style="list-style-type: none"> • Civil unrest could lead to disruption in operations in affected areas
<i>Property, Facilities, and Infrastructure</i>	<ul style="list-style-type: none"> • Moderate impact to property, facilities, and infrastructure • Influx in population could overtax these resources
<i>Delivery of Services</i>	<ul style="list-style-type: none"> • Moderate impact on services due to overwhelming demand caused by population influx • Medical services, in particular, may be unable to meet the demand. Especially if there is a epidemic
<i>Public’s Confidence in Jurisdiction’s Governance</i>	<ul style="list-style-type: none"> • How the county responds to incidents of mass migration will affect the public’s confidence. Members of the public may be of the same background as the people who migrate and may react to how the migrants are treated.
<i>Economic Condition</i>	<ul style="list-style-type: none"> • Moderate impact • Increased demands of deliverable goods • Increased crime in the affected areas could affect the tourism industry • An epidemic could decrease tourism affecting the economy
<i>Environment</i>	<ul style="list-style-type: none"> • Massive increase in population could strain environment

Hazard Summary

<i>Hazard</i>	<i>Frequency of Occurrence</i>
Terrorism/ Civil Disturbance	<input type="checkbox"/> Annual event <input type="checkbox"/> Every 5 years or less <input type="checkbox"/> Every 10 years or less <input checked="" type="checkbox"/> Every 30 years or less <input type="checkbox"/> Greater than 30 years
<p>On September 11, 2001, the United States was attacked by terrorists. Florida has many targets of opportunity for terrorists—political, industrial, historical, and military. South Florida experienced an Anthrax outbreak in 2001. In addition, several terrorist plots directed at Florida residents have been thwarted in recent years.</p>	
<i>Impacts</i>	
<i>Public and Responders</i>	<ul style="list-style-type: none"> • Moderate impact to the health and safety of people as the result of a CBRNE dispersal • Low impact if a result from a cyber-attack on an industry (identity theft or banking attack) • This could increase stress and fatigue • Localized higher impacts near any attacks involving explosives • Protective actions required to protect responders from hazardous exposure • Increase in stress and fatigue
<i>Continuity of Operations and Program Operations</i>	<ul style="list-style-type: none"> • High impact on the COOP if CBRNE dispersal is in vicinity
<i>Property, Facilities, and Infrastructure</i>	<ul style="list-style-type: none"> • High impact to property, facilities, and infrastructure depending on what is targeted
<i>Delivery of Services</i>	<ul style="list-style-type: none"> • High impact to the delivery of services if either form of terrorism is conducted; a cyber attack on the mail system could result in delays; a delay in receiving mail financially affects the state
<i>Public's Confidence in Jurisdiction's Governance</i>	<ul style="list-style-type: none"> • National and state security have become important topics in light of current events. Poor prevention and response to an attack within the state could result in low public confidence.
<i>Economic Condition</i>	<ul style="list-style-type: none"> • High impact to the economic condition of the impacted area, since terrorism attempts to change the operations of a target • Industries, infrastructure, and/or the delivery of services could be shut down from the incident
<i>Environment</i>	<ul style="list-style-type: none"> • High impact to environment if CBRNE dispersal • Florida's aquifer system is close to the surface, which results in extremely low tolerances for the notification of spills

Appendix C: HAZUS Reports

One Hundred Year Flood



Hazus: Flood Global Risk Report

Region Name: Charlotee_5mi_100

Flood Scenario: 100_5mi

Print Date: Tuesday, April 2, 2019



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General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Florida

Note:

Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is approximately 710 square miles and contains 8,408 census blocks. The region contains over 73 thousand households and has a total population of 159,978 people (2010 Census Bureau data). The distribution of population by State and County for the study region is provided in Appendix B .

There are an estimated 105,916 buildings in the region with a total building replacement value (excluding contents) of 21,163 million dollars. Approximately 94.01% of the buildings (and 80.13% of the building value) are associated with residential housing.



Building Inventory

General Building Stock

Hazus estimates that there are 105,916 buildings in the region which have an aggregate total replacement value of 21,163 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure (\$1000)	Percent of Total
Residential	16,957,962	80.1%
Commercial	2,383,514	11.3%
Industrial	280,730	1.3%
Agricultural	173,131	0.8%
Religion	250,587	1.2%
Government	635,651	3.0%
Education	481,254	2.3%
Total	21,162,829	100%

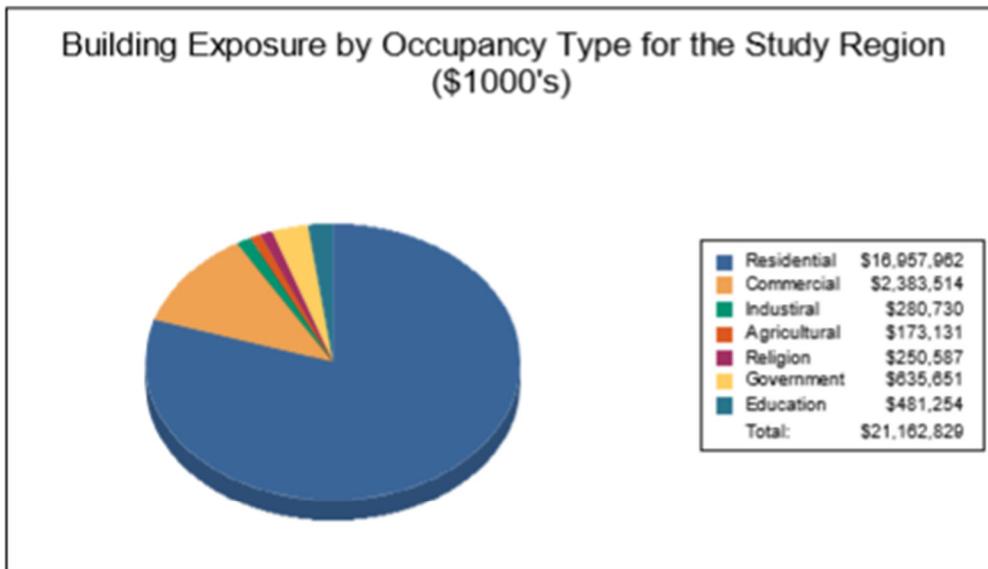
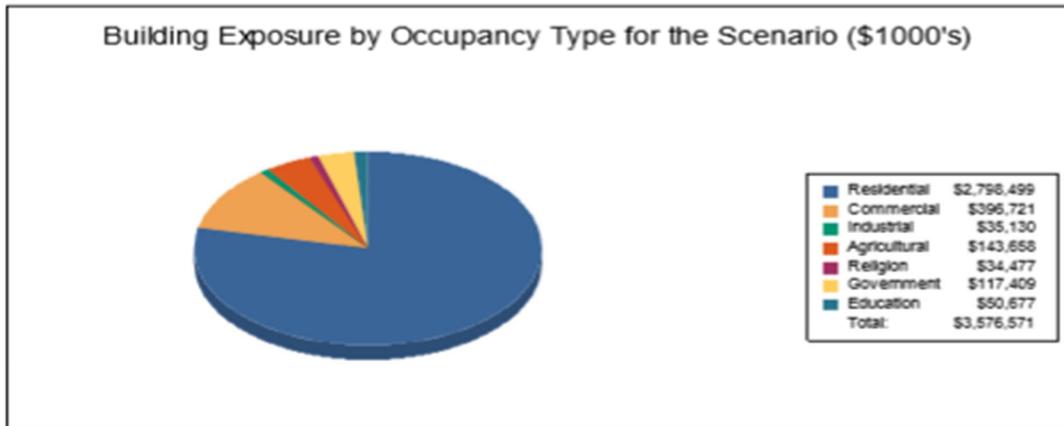




Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure (\$1000)	Percent of Total
Residential	2,798,499	78.2%
Commercial	396,721	11.1%
Industrial	35,130	1.0%
Agricultural	143,658	4.0%
Religion	34,477	1.0%
Government	117,409	3.3%
Education	50,677	1.4%
Total	3,576,571	100%



Essential Facility Inventory

For essential facilities, there are 3 hospitals in the region with a total bed capacity of 699 beds. There are 23 schools, 23 fire stations, 5 police stations and 1 emergency operation center.





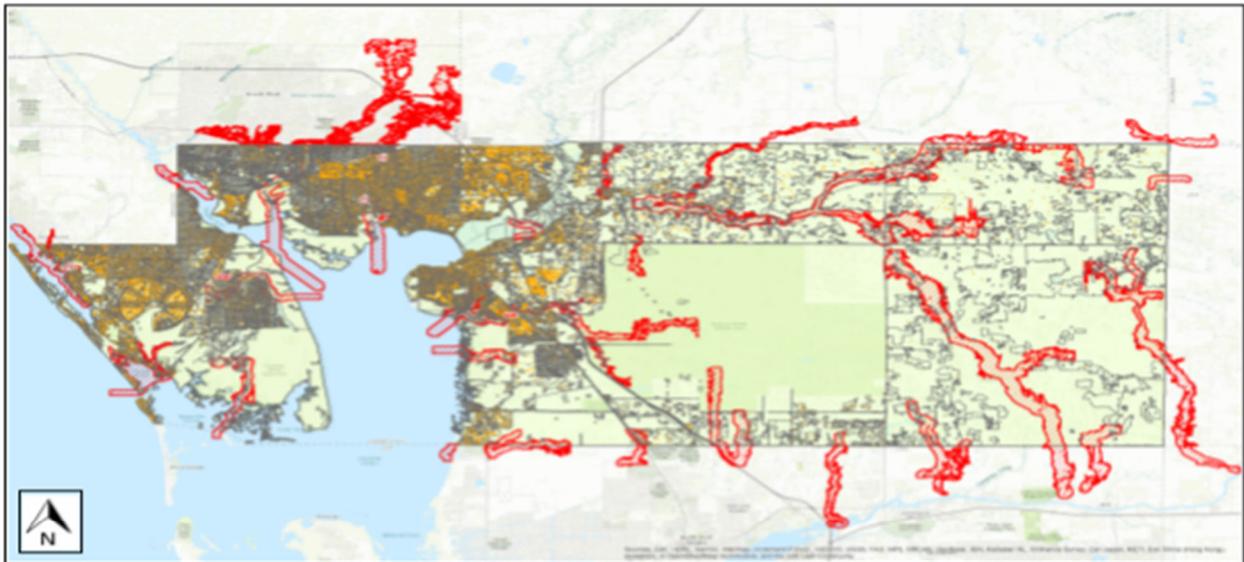
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Charlotee_5mi_100
Scenario Name:	100_5mi
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure





Building Damage

General Building Stock Damage

Hazus estimates that about 1,885 buildings will be at least moderately damaged. This is over 61% of the total number of buildings in the scenario. There are an estimated 15 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = \$300K) Overview Map





Table 3: Expected Building Damage by Occupancy

Occupancy	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	18	100	0	0	0	0	0	0	0	0	0	0
Commercial	52	73	19	27	0	0	0	0	0	0	0	0
Education	12	100	0	0	0	0	0	0	0	0	0	0
Government	5	83	1	17	0	0	0	0	0	0	0	0
Industrial	11	85	2	15	0	0	0	0	0	0	0	0
Religion	12	92	1	8	0	0	0	0	0	0	0	0
Residential	834	31	1,296	48	463	17	65	2	23	1	15	1
Total	942		1,319		463		65		23		15	

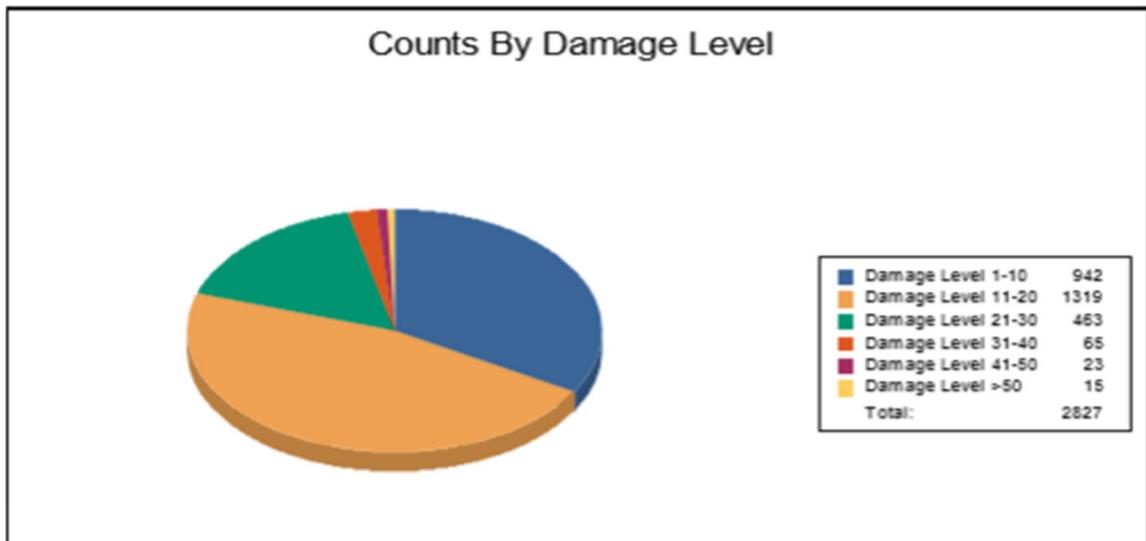




Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)										
Concrete	28	48	26	45	4	7	0	0	0	0	0	0
Manuf/Housing	5	10	16	33	17	35	0	0	2	4	9	18
Masonry	570	32	855	48	303	17	49	3	14	1	5	0
Steel	47	76	15	24	0	0	0	0	0	0	0	0
Wood	280	33	404	48	137	16	16	2	7	1	1	0



Essential Facility Damage

Before the flood analyzed in this scenario, the region had 699 hospital beds available for use. On the day of the scenario flood event, the model estimates that 699 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

Classification	# Facilities			
	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	23	2	0	1
Hospitals	3	0	0	0
Police Stations	5	0	0	0
Schools	23	3	0	3

If this report displays all zeros or is blank, two possibilities can explain this.

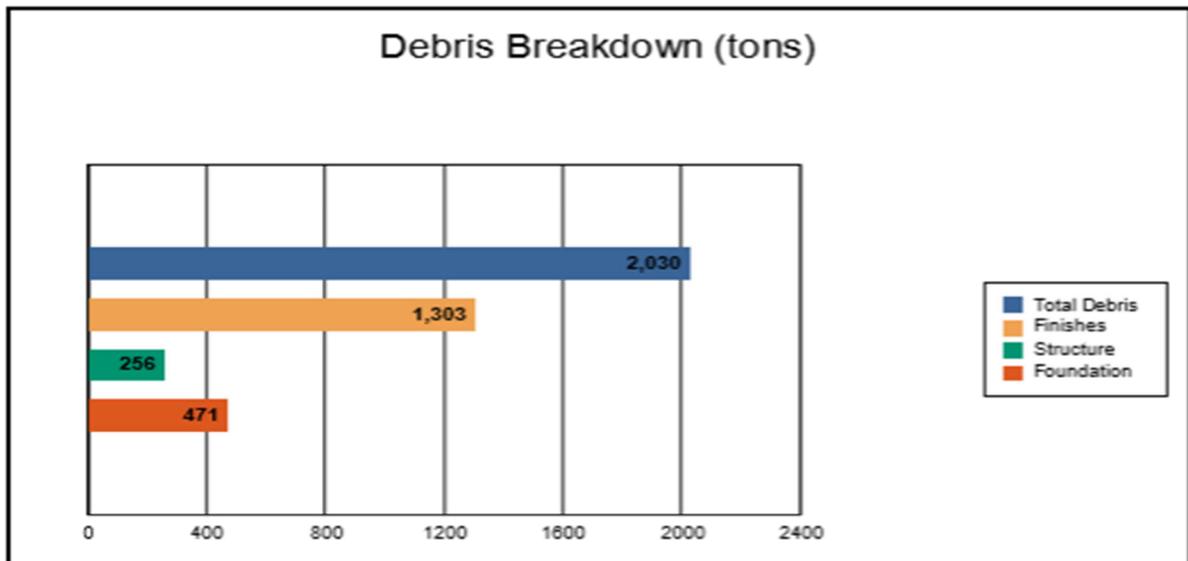
- (1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.
- (2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.



Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.



The model estimates that a total of 2,030 tons of debris will be generated. Of the total amount, Finishes comprises 64% of the total, Structure comprises 13% of the total, and Foundation comprises 23%. If the debris tonnage is converted into an estimated number of truckloads, it will require 82 truckloads (@25 tons/truck) to remove the debris generated by the flood.

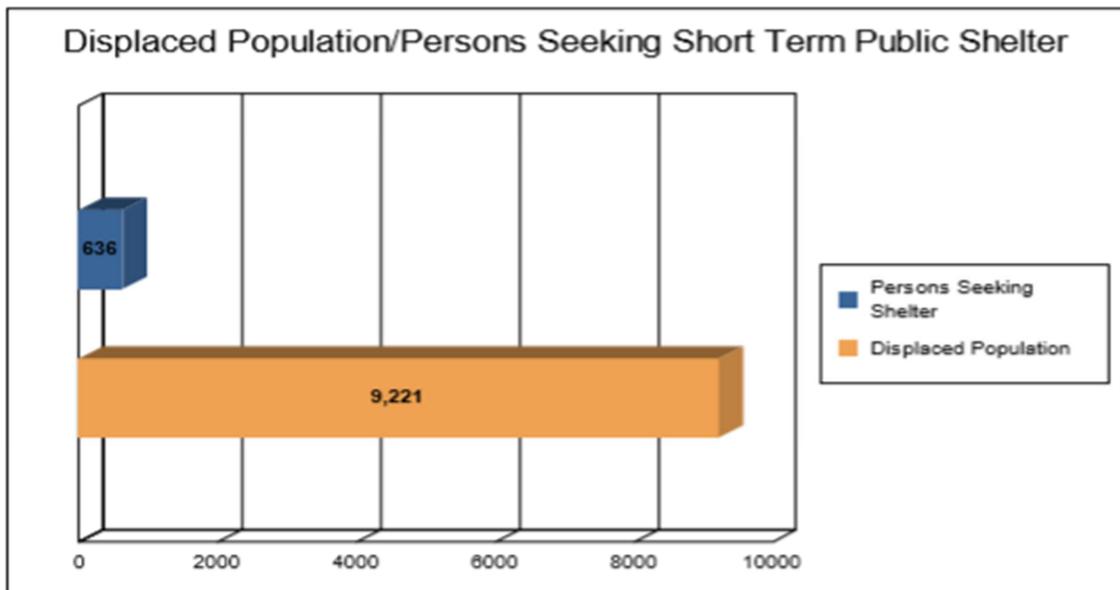




Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 3,074 households (or 9,221 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 636 people (out of a total population of 159,978) will seek temporary shelter in public shelters.





Economic Loss

The total economic loss estimated for the flood is 472.80 million dollars, which represents 13.22 % of the total replacement value of the scenario buildings.

Building-Related Losses

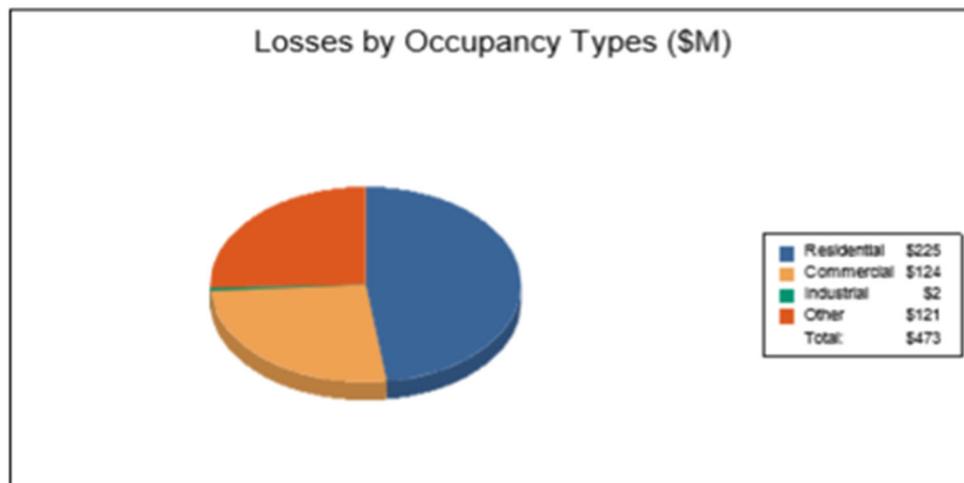
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 185.98 million dollars. 61% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 47.66% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.



Table 6: Building-Related Economic Loss Estimates
(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	79.15	9.47	0.57	4.26	93.45
	Content	44.83	15.36	0.39	11.71	72.30
	Inventory	0.00	19.63	0.28	0.33	20.24
	Subtotal	123.98	44.46	1.24	16.30	185.98
Business Interruption						
	Income	2.48	26.93	0.17	19.47	49.05
	Relocation	71.17	14.19	0.40	11.51	97.26
	Rental Income	21.82	10.41	0.06	1.39	33.68
	Wage	5.90	28.51	0.27	72.16	106.84
	Subtotal	101.36	80.04	0.89	104.53	286.82
ALL	Total	225.35	124.49	2.14	120.83	472.80





Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Florida				
Charlotte	159,978	16,957,962	4,204,867	21,162,829
Total	159,978	16,957,962	4,204,867	21,162,829
Total Study Region	159,978	16,957,962	4,204,867	21,162,829

Five Hundred Year Flood



Hazus: Flood Global Risk Report

Region Name:	Charlotee_5mi_500
Flood Scenario:	Charlotte 500_5mi
Print Date:	Tuesday, April 2, 2010



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General Description of the Region

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Florida

Note:

Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 710 square miles and contains 8,406 census blocks. The region contains over 73 thousand households and has a total population of 159,978 people (2010 Census Bureau data). The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 105,916 buildings in the region with a total building replacement value (excluding contents) of 21,163 million dollars. Approximately 94.01% of the buildings (and 80.13% of the building value) are associated with residential housing.



Building Inventory

General Building Stock

Hazus estimates that there are 105,916 buildings in the region which have an aggregate total replacement value of 21,163 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

**Table 1
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Agricultural	173,131	0.8%
Religion	250,587	1.2%
Government	635,651	3.0%
Education	481,254	2.3%
Total	21,162,829	100%

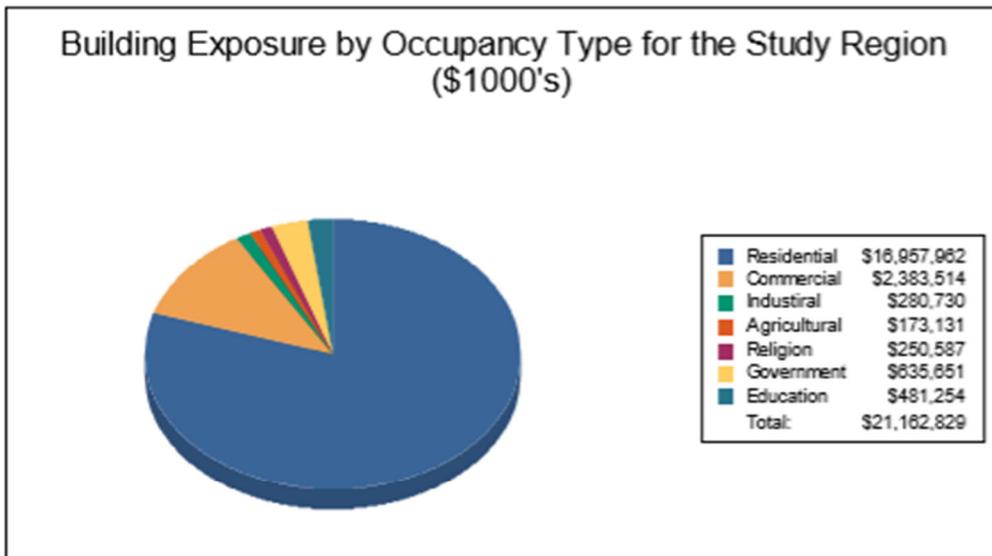
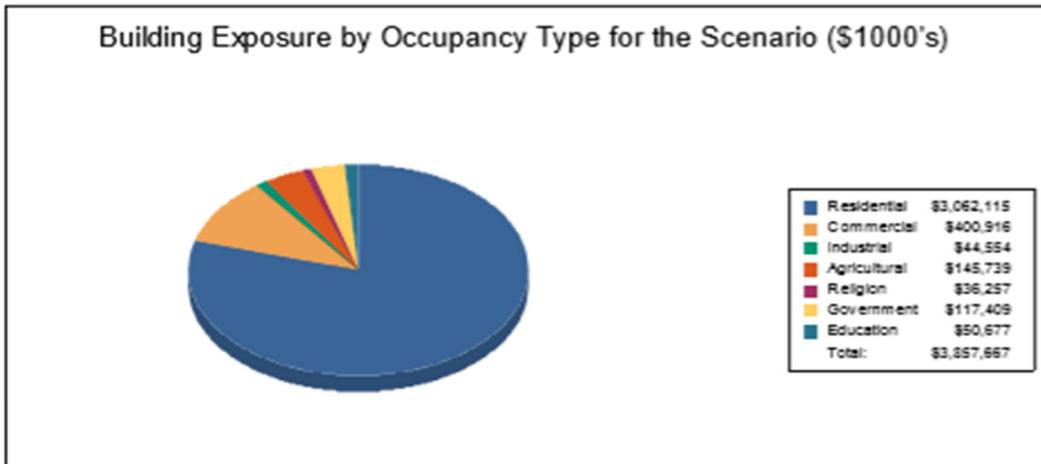




Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure (\$1000)	Percent of Total
Residential	3,062,115	79.4%
Commercial	400,916	10.4%
Industrial	44,554	1.2%
Agricultural	145,739	3.8%
Religion	36,257	0.9%
Government	117,409	3.0%
Education	50,677	1.3%
Total	3,857,667	100%



Essential Facility Inventory

For essential facilities, there are 3 hospitals in the region with a total bed capacity of 699 beds. There are 23 schools, 23 fire stations, 5 police stations and 1 emergency operation center.





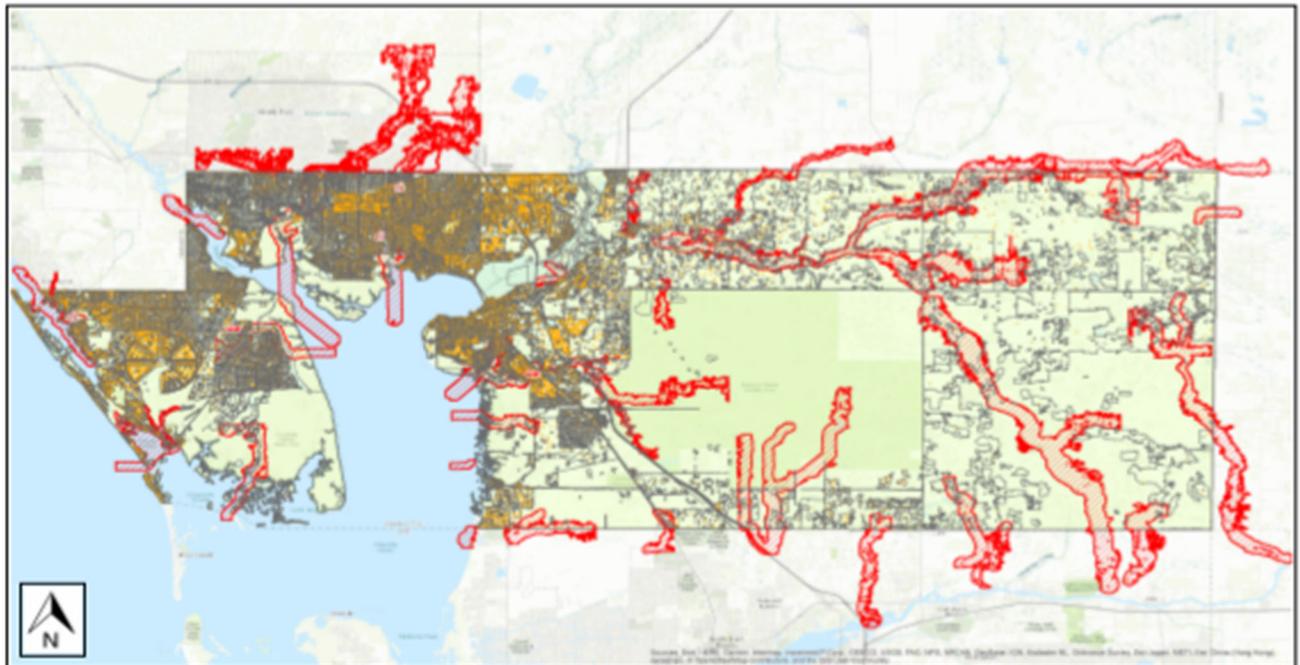
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Charlottee_5mi_500
Scenario Name:	Charlotte 500_5mi
Return Period Analyzed:	500
Analysis Options Analyzed:	No What-ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Flood Global Risk Report



Page 6 of 16



Building Damage

General Building Stock Damage

Hazus estimates that about 2,589 buildings will be at least moderately damaged. This is over 65% of the total number of buildings in the scenario. There are an estimated 44 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = \$300K) Overview Map

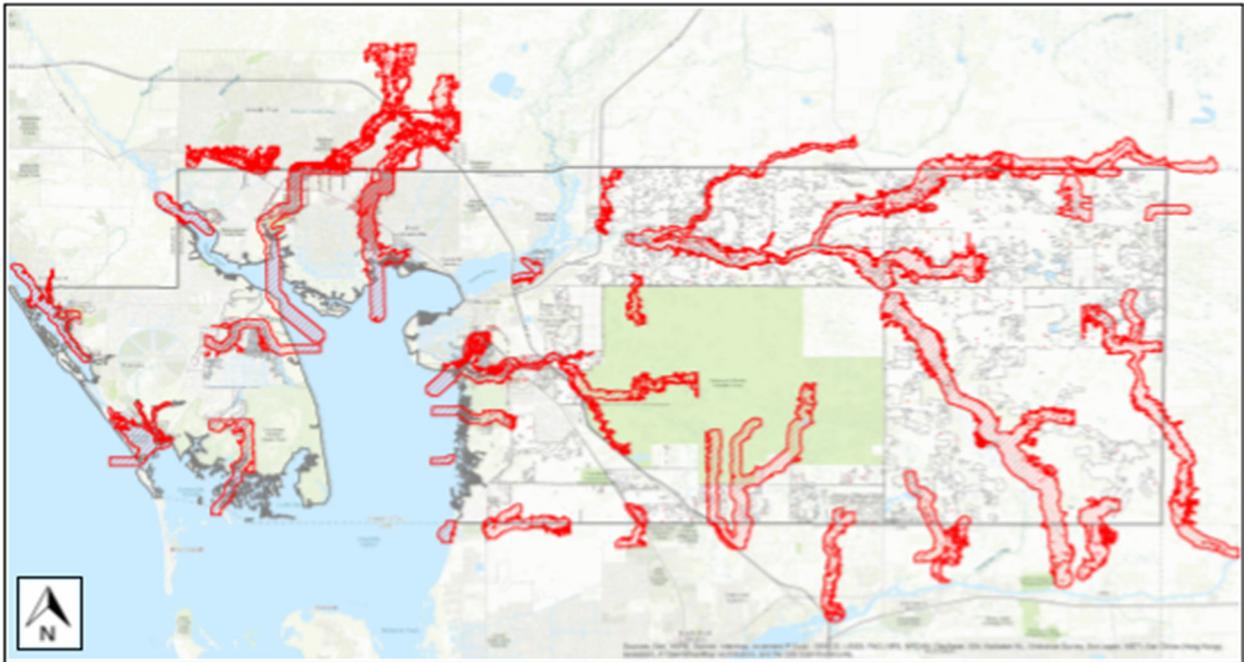




Table 3: Expected Building Damage by Occupancy

Occupancy	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	30	81	7	19	0	0	0	0	0	0	0	0
Commercial	50	56	40	44	0	0	0	0	0	0	0	0
Education	18	100	0	0	0	0	0	0	0	0	0	0
Government	13	93	1	7	0	0	0	0	0	0	0	0
Industrial	10	83	2	17	0	0	0	0	0	0	0	0
Religion	10	91	1	9	0	0	0	0	0	0	0	0
Residential	953	27	1,551	44	741	21	164	5	38	1	44	1
Total	1,084		1,602		741		164		38		44	

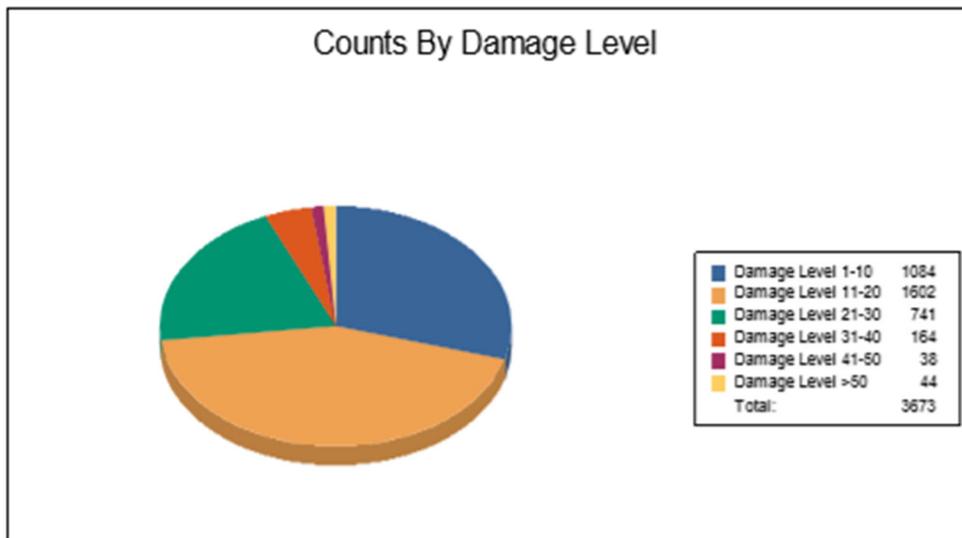




Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)										
Concrete	29	46	28	44	5	8	1	2	0	0	0	0
Manuf-Housing	12	10	12	10	58	47	0	0	4	3	37	30
Masonry	641	28	1,012	45	459	20	116	5	25	1	7	0
Steel	57	67	28	33	0	0	0	0	0	0	0	0
Wood	324	29	509	46	212	19	46	4	9	1	0	0



Essential Facility Damage

Before the flood analyzed in this scenario, the region had 699 hospital beds available for use. On the day of the scenario flood event, the model estimates that 699 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	23	2	0	2
Hospitals	3	0	0	0
Police Stations	5	0	0	0
Schools	23	3	0	3

If this report displays all zeros or is blank, two possibilities can explain this.

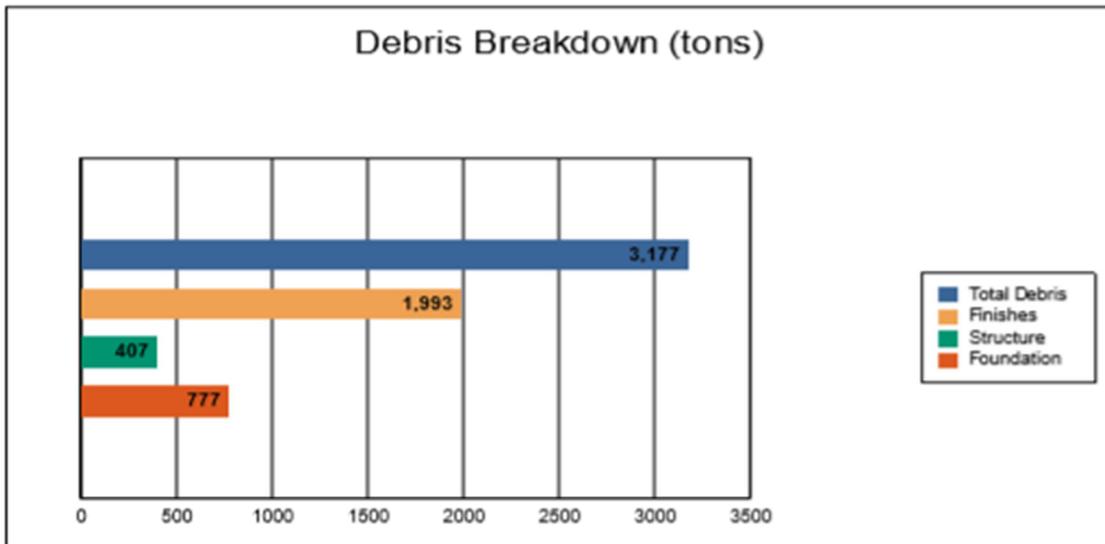
- (1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.
- (2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.



Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.



The model estimates that a total of 3,177 tons of debris will be generated. Of the total amount, Finishes comprises 63% of the total, Structure comprises 13% of the total, and Foundation comprises 24%. If the debris tonnage is converted into an estimated number of truckloads, it will require 128 truckloads (@25 tons/truck) to remove the debris generated by the flood.

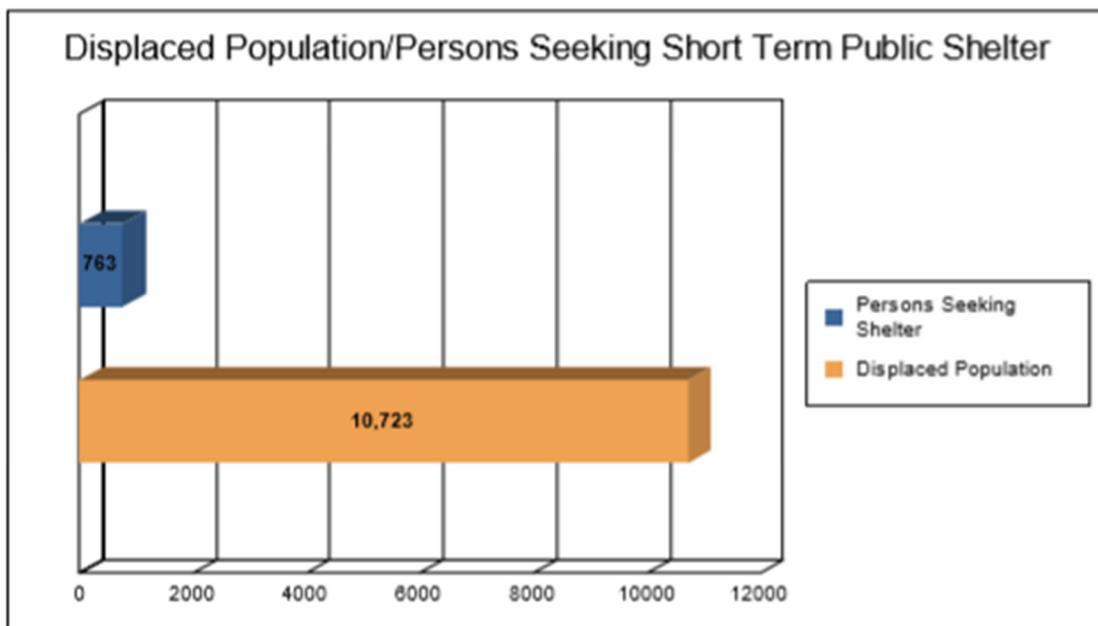




Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 3,574 households (or 10,723 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 763 people (out of a total population of 150,978) will seek temporary shelter in public shelters.





Economic Loss

The total economic loss estimated for the flood is 612.18 million dollars, which represents 15.87 % of the total replacement value of the scenario buildings.

Building-Related Losses

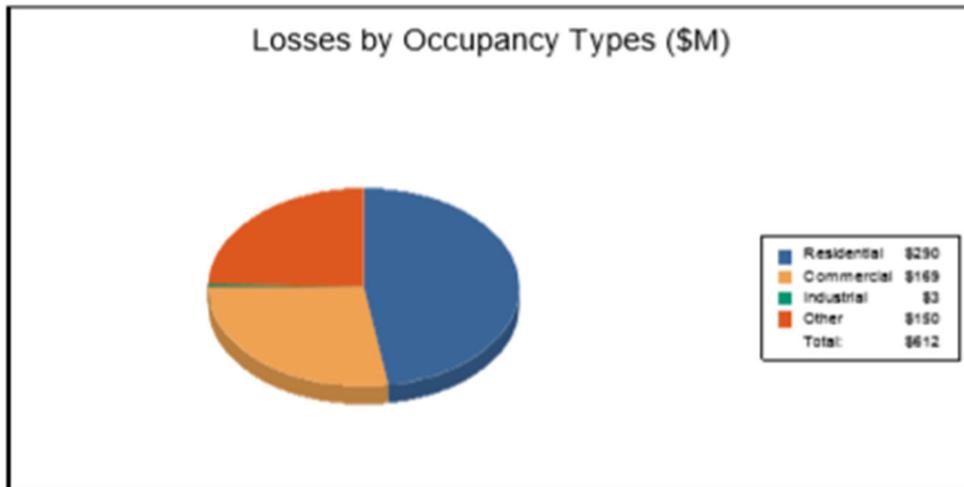
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 268.18 million dollars. 56% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 47.37% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.



Table 6: Building-Related Economic Loss Estimates
(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	107.91	14.84	0.93	6.70	130.39
	Content	61.13	24.37	0.71	18.10	104.30
	Inventory	0.00	32.44	0.38	0.67	33.49
	Subtotal	169.04	71.66	2.02	25.47	268.19
Business Interruption						
	Income	3.30	32.06	0.20	22.52	58.07
	Relocation	83.58	17.56	0.46	13.43	115.03
	Rental Income	26.27	12.83	0.07	1.72	40.89
	Wage	7.83	34.53	0.32	87.33	130.01
	Subtotal	120.98	96.98	1.04	123.00	342.00
ALL	Total	290.02	168.64	3.06	160.47	612.19





Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Florida				
Charlotte	159,978	16,957,962	4,204,867	21,162,829
Total	159,978	16,957,962	4,204,867	21,162,829
Total Study Region	159,978	16,957,962	4,204,867	21,162,829

Appendix D: Charlotte County Flood Warning Plan

Introduction

Purpose

The Charlotte County Flood Warning Program establishes a framework through which Charlotte County may prevent, prepare for, respond to, and recover from salt water or freshwater flooding conditions that could adversely affect the health, safety and general welfare of Charlotte County's residents or visitors.

Provisions are made within this program for the needed flexibility of direction, coordination and method of operation to enable both government and non-government entities to accomplish their objectives of mitigation, preparedness, response and recovery, before, during and after a flood event has impacted the County. This plan also provides the framework for rendering support to other counties, municipalities and states as well as the federal government in their respective flood management efforts.

Scope

This annex will describe the various types of flooding that could occur, provide procedures for disseminating warning information, and for determining, assessing and reporting the severity and magnitude of impact on flooded areas. This document will also establish the concept under which the county government will operate in response to flood emergencies and create a framework for expeditious, effective and coordinated employment of local resources.

Assumptions

The state agencies of Florida have certain expertise and resources at their disposal that may be used in relieving emergency or disaster related problems that are beyond the County's capabilities. When the County declares a local state of emergency and requests state assistance following a flood disaster, the Governor will declare a state of disaster emergency, and the State Emergency Operations Center (SEOC) will be activated should conditions warrant such action. Should state assistance be inadequate to cope with the flooding event, the Governor will request federal government assistance under a presidential disaster declaration.

The National Weather Service Office (NWSO) Tampa, will issue flood advisory, watches and warning information to both Government and the citizens. The State Watch Office will follow-up the NWSO's warning information with direct contact with the Charlotte County Emergency Management Office.

The only flooding which poses a large-scale threat of loss of life stems from storm surge flooding. Flooding due to rainfall is typically nuisance flooding and may present only a threat to property.

Concept of Operations

This program is based on the principle that the County bears the initial responsibility for disaster response and recovery. As a corollary to this principle, each level within local government will accomplish the functions for which it is responsible, requesting relief from the next higher level of government only after resources at that level prove inadequate to respond to the flood emergency or disaster. Requests for assistance will be made to the Florida Division of Emergency Management only after a state of local emergency has been adopted by the Board of County Commissioners.

Should both state and local resources be deemed inadequate to respond to the flood emergency, the Governor will request assistance through the Federal Emergency Management Agency (FEMA). The request will be based on local and state damage assessment and expenditure reports which are to be maintained and supplied by the County and/or state for each flood disaster related activity.

When conditions are favorable for flooding from either hurricane-induced storm surge flooding or from fresh water flooding caused by more than normal amounts of rainfall in a short period of time, the following actions will be taken by the agencies and organizations listed below:

Emergency Management

- Operate the Emergency Operation Center as the situation dictates.
- Notify all primary respondents as the situation dictates.
- Advise the public of the situation through local radio, television, the Emergency Management website emergency bulletins, and the Alert Charlotte system.
- Request activation of the Emergency Alert System if required.
- Keep the Florida Division of Emergency Management and other state agencies informed of the situation throughout the event.
- Activate the IPAWS (Integrated Public Alerting & Warning System) when an imminent life or property threatening flooding situation exists.
- To alert and coordinate Community Emergency Response Team (CERT) responses.

School Board

- Provide shelter facilities and bus transportation

Charlotte County Community Services

- Provide manpower and supplies for opening and operation of evacuation shelters and to coordinate with Emergency Management regarding the timing of such openings consistent with the dangers facing the people who will occupy the shelter.

Charlotte County Sheriff's Office

- Provide traffic control and security for those in the flood threatened areas.

Fire & EMS- Charlotte County, Punta Gorda, Englewood

- Provide fire control and suppression throughout the County.
- Provide rescue service as needed
- Provide fire safety control at each shelter
- To provide ambulance/rescue service
- Provide first-aid support at shelters if available.

Public Works/Maintenance & Operations

- Assist in traffic control by erecting barricades to guide persons in threatened areas to places of safe refuge.
- Assist performing flood control measures.

Florida Department of Health in Charlotte County

- Provide health and environmental health-related services.

Charlotte County Human Services

- Provide welfare services in support of the efforts
- Operates 211 call center 24/7 before, during, and after a storm to provide constant communication to the public.

Charlotte County Utilities

- Provide emergency maintenance of utilities in the flood damaged areas.

CCFLARES

- Provide communications support between the EOC, hospitals, public shelters and other critical facilities if required.

CERT

- Provide volunteers to support the EOC call center answering phones.
- Provide volunteers to support the shelter staffing.

Civil Air Patrol

- Provide communications, search and rescue, and damage assessment support.

National Hurricane Center & National Weather Service - NOAA

- Meteorological information for Charlotte County for all flood threats resulting from tropical storms and hurricanes.
- Local advisories pertaining to Charlotte County will be issued by the NWS Tampa Office in Ruskin.

Execution

The Office of Emergency Management may activate portions of the County Flood Warning Program if a flood disaster/emergency threatens prior to the Board of County Commissioners declaring a state of local emergency. In this situation, Emergency Management will coordinate increased readiness procedures and such emergency response actions as might be necessary for the immediate protection of life and property.

Level Three Activation, Monitoring

Emergency Management will:

Daily, review the day's short-term forecast reports from the National Weather Service and National Hurricane Center.

If a flood threat presents itself, disseminate the information to those most affected via Charlotte Alert mass notification system

Flood Threat Recognition Phase

Saturated grounds due to prolonged rainy periods whereby absorption into the soil is hindered or a period of three to five inches of rain has fallen within 48 hours and more rain is anticipated. High tides occurring during the heaviest rainy periods. A series of rain clouds producing a "training effect" over an area.

Storm Surge Threat Recognition Phase

Regarding the flood threats from storm surge, the graphic below depicts the timeline and the modeling tools from the National Hurricane Center (NHC) that the local emergency management office uses to estimate and refine potential storm surge impacts. (For more information about storm surge, go to: <http://www.nhc.noaa.gov/ssurge/index.shtml>). Then as the NHC makes computer runs associated with a storm, they will make the “REX-files” available to the local emergency management office to better approximate the flooding potential. Ultimately, within, 24 hours of a landfall, the local Tampa Weather Forecast Office will provide the most precise surge impacts to the local jurisdiction in the form of probability statements and graphics.

Joint Information Center will:

Increasing the public's awareness of flood hazards and the methods they can use for protecting themselves from the effects of these hazards is a necessary part of reducing disaster potential, preparing for disasters as well as a continuing responsibility of public officials. In addition, providing accurate information immediately before, during and after a flood emergency or disaster is very important for saving lives, minimizing property damage, and informing people of various assistance programs. This Annex describes the organization and procedures for providing accurate information to the public.

Responsibilities:

The Emergency Management Department is responsible for coordinating public information programs and related activities with regard to flood emergencies or disasters. This responsibility includes public awareness programs in schools, civic and fraternal organizations, community subdivisions and other organized groups including radio and television when requested.

The Public Information Network, comprised of members of the following agencies, will meet periodically before, during and after a flood emergency to minimize conflicting information being disseminated. Members of the network who have assigned public relations tasks include but are not limited to the following:

1. Board of County Commissioners
2. County Manager or his representative
3. Emergency Management Director
4. Public Works
5. SFWMD
6. Superintendent of Schools or his representative
7. Growth Management Division Administrator
8. Sheriff or his representative
9. Charlotte County Fire & EMS
10. Communications & Customer Relations representative

An "All Hazards Guide" is updated and reprinted during May of each year for distribution to residents and guests of Charlotte County. Approximately 40,000 copies of this pamphlet are printed and distributed annually. Every effort is made to deliver this information to people living in flood-prone areas. Disaster related information is also provided to recipients of the local telephone system in their books.

Special information programs have been established for people with special needs such as the elderly and the handicapped. These individuals are encouraged to pre-register with the Emergency Management Department who will advise them of their vulnerability to flooding and items that they should bring to a shelter in the event of an evacuation. The Emergency Management Department will also arrange for transportation to shelter if needed.

During an emergency/disaster that might result in flooding over parts of the community, a team of telephone operators will be assembled near the EOC to provide information to the public. At least one of the operators will be bilingual (English-Spanish).

Activate the Charlotte Storm Spotter/Skywarn network either based on the daily Hazardous Weather Outlook product of the National Weather Service or when weather situations deteriorate. Initiate conference calls with the various fire districts, as needed.

During this phase the National Weather Service Office, Tampa has issued a "Flood Watch" and the conditions cited above are the most unfavorable for the grounds absorbing a heavy rainfall amount and therefore roadway flooding, etc., will present hazardous/adverse conditions to the public.

Level Two, Partial EOC Activation

Emergency Management will:

Continue with all activities in the Threat Recognition Stage.

Critical Facilities: The Charlotte County Emergency Management Department maintains a listing of Critical Facilities which could be affected by flooding in the County. This listing is considered sensitive and is protected under HSPD 5 and is available For Official Use Only. In the event of a flooding risk to one or more of these facilities, they will be notified as soon as possible in advance of the risk in accordance with the emergency notification protocols outlined in the CEMP and Emergency Management Department SOGs. Due to the critical nature of the function or service provided by these facilities, every attempt will be made to give as much advanced warning as possible so that preventative measures can be taken to protect the facilities.

- 1) Provide regular updates via E-mail//Web Page to staff and the local governmental agencies and Critical Facilities.

- 2) Assemble complete EOC staff and brief at the initial stages of Level 2 Activation, depending on the anticipated severity of the event.
- 3) Consider activating the Charlotte Information Center.
- 4) Monitor the flooding event and disseminate details of the impacts via all means identified in the “Basic Plan”.
- 5) Continue to collaborate with both the National Weather Service Office in Tampa, SFWMD and the State Watch Office on the flooding event potential and adjacent counties.
- 6) Activate the SkyWarn Weather Spotter Network to report rainfall impacts.
- 7) Pre-identify and coordinate shelter openings, as required.
- 8) Initiate actions for a Local State of Emergency, if warranted.
- 9) Requests for state assistance must be forwarded to the State EOC for assessment and approval before deployment of state resources. Prior to requesting state assistance, the current situation must be identified, the current and projected resource needs must be assessed, and a timeframe indicating how long state resources would be needed must be identified.

Transportation Division will: maintain 24-hrs X 7-day capability to respond to public regarding roadway concerns.

City of Punta Gorda will: be requested to monitor the event’s impact on their jurisdiction from the EOC.

Charlotte Schools will: be asked to remain at the EOC while school delay/closing decisions are anticipated/made.

Charlotte Sheriff will: will remain at the EOC and coordinate any public safety needs.

Public Works will:

1. Provide a liaison to the EOC to maintain an accurate, current listing of affected roadways.
2. Take reports from the public regarding flooding and maintain flooding records.
3. Blockade flooded roadways as necessary.
4. Submit projects and mitigation initiatives to the Local Mitigation Strategy Working Group when called.

Other Response Elements:

1. Skywarn Spotter Network: In support of the National Weather Service Office, Tampa, Charlotte County conducts hazardous weather spotter training to residents annually, or upon special request of the Emergency Management Office. At this

time, there are over 150 trained spotters. The spotters receive regular weather information updates from the EOC, via E-mail, and through the other media.

2. Emergency Email Network (www.emergencyemail.org): This service automatically retransmits the NWS's text weather warning products related to Charlotte County. Recipients of this free service can subscribe any or all their electronic instruments to it. Additionally, the EOC has the ability to transmit special statements via this service to all subscribers.
3. Emergency Alerting System: The EOC has drafted an operating procedure, agreed upon by the NWS, Tampa, for activating the Emergency Alerting System and thereby transmits warning and instructions via the weather radio, TV, radio, and cable media. Not only is the general public alerted, so are the specialized teams, e.g., SkyWarn and Amateur radio, CERTs.

VI. Authorities and References

1. Public Law 91-606, Disaster Relief Act of 1970
2. Public Law 93-288, Disaster Relief Act of 1984
3. Public Law 100-707, Robert T. Stafford Act
4. Chapter 252, Florida State Statutes, as amended
5. Charlotte County Resolution 71-34
6. Charlotte County Resolution 75-65
7. Charlotte County Resolution 89-46
8. Mutual Aid Agreement, BCC/City of Punta Gorda, 1977
9. Mutual Aid Agreement, Southwest Florida Counties, 1985
10. Statewide Mutual Aid Agreement, State of Florida, 2010

Appendix E: Project List Notes

These notes are used to help the LMS Working Group prioritize mitigation initiatives.

Note 1

Priority- Priority ranking is determined by the Hazard Mitigation Project Evaluation Criteria Worksheet. The project priority is rated in the following table for short and long-term mitigation initiatives. These priorities correspond to the goals and objectives set by the LMS Working Group.

Priority	Project Score
Immediate	21 - 28
Intermediate	11 - 20
Long Term	0 - 10
N/A	Deferred or Completed

Note 2

Hazard	Number	Hazard	Number
Coastal Erosion	1	Hurricane	9
Coastal Storm	2	Land Subsidence	10
Dam Failure	3	Severe Weather	11
Drought	4	Tornado	12
Earthquake	5	Tsunami	13
Levee Failure	6	Wildfire	14
Flood	7	Windstorm	15
Hailstorm	8	Deleted Project	N/A

Note 3

The Hazard Mitigation Strategies are based upon Goal 4, 5, and 6 of the Local Hazard Mitigation Goals and is described in the following table.

Hazard Mitigated	Description
1	Acquisition of hazard prone property & conversion to open space
2	Retrofitting existing buildings and facilities
3	Elevation of flood prone structures
4	Vegetative management & soil stabilization
5	Infrastructure protection measures
6	Storm water management
7	Minor structural flood control projects
8	Post-disaster code enforcement activities

Note 4

The Mitigation Goals Achieved are described in the following table and are based upon all of the goals and objectives of the Local Hazard Mitigation Goals within the Mitigation Strategy section of the basic plan.

Mitigation Goal Achieved	Description
1	Prevention
2	Property Protection
3	Public Education and Awareness
4	Natural Resource Protection
5	Structural Protection
N/A	Deleted

Note 5

The jurisdiction abbreviation is described in the following table.

Jurisdiction	Abbreviation	Number
Charlotte County	CC	1
City of Punta Gorda	PG	2
		3
		4
		5
		6
		7
		8
		9
		N/A

Note 6

The project status is described in the following table.

Project Status	Description
New	Project added from previous project list submission
Complete	Project completed during period or construction has begun from previous project list submission
In-Progress	Project is in design and no construction has begun
Deleted	Project will be identified as deleted and remain on the project list for one annual cycle of reporting for administrative continuity of project tracking for local, state, and Federal agencies.
Deferred	Project is being deferred by jurisdiction