Local Mitigation Strategy 2024

Palm Beach County
Public Safety Department
Division of Emergency Management

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RECORD OF CHANGES

This Record of Changes is used to record all published changes. All major changes will be routed to plan holders within 90 days of the promulgation of the change. In addition, *SOG PL-002 – Review and Maintenance of DEM Plans*, establishes a policy and procedures for the review and maintenance of all Division of Emergency Management Plans.

Change Number	Copy Number	Date Entered	Posted By

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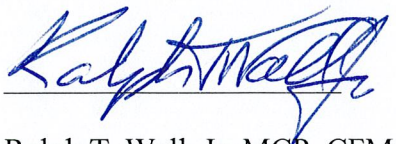
PROMULGATION STATEMENT

With this notice, we are pleased to promulgate the 2024 Palm Beach County (PBC) Unified Local Mitigation Strategy (LMS). This is one of the many documents published by PBC Public Safety Department's Division of Emergency Management (DEM). The LMS is the basis for countywide hazards, vulnerabilities, and mitigation strategy activities. It is the intent of the LMS to provide a structure for identifying hazards and vulnerabilities, assist municipalities and the County in planning for those hazards and vulnerabilities, and mitigating those hazards through the use of local, state, and federal funding sources, making our county more resilient.

Palm Beach County DEM shall be responsible for coordinating the preparation and updating of the LMS through the work of the LMS Working Group, Steering Committee, and other sub-committees, and will ensure that this document is consistent with similar federal, state, and municipal plans. The LMS 2024 will become effective upon official adoption by the PBC Board of County Commissioners (BCC) and effective for municipalities upon their individual adoption.



Ralph T. Wall, Jr. MCP, CFM
Chairperson
PBC Local Mitigation Strategy

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SECTION 1: PLANNING PROCESS

1.1 Introduction

The LMS was formally adopted by the County, municipalities, and the LMS Steering Committee in 1999. Initial development of the LMS was funded, in part, by the Florida Department of Community Affairs/Florida Division of Emergency Management (FDCA/FDEM) with Federal Emergency Management Agency (FEMA) funds earmarked for the development of comprehensive hazard mitigation planning.

The LMS was established and continues to operate in accordance with prevailing federal, state, and local guidelines and requirements. In 2004, the plan and program were substantially modified to enhance operational effectiveness and to comply with new federal guidelines established in response to the Disaster Mitigation Act of 2000.

1.2 Purpose

The purpose of the LMS is to develop and execute an ongoing strategy for reducing the community's vulnerability to identified natural, technological, and human-caused hazards. The strategy provides a rational, managed basis for considering and prioritizing hazard-specific mitigation options and for developing and executing sound, cost-effective mitigation projects. The LMS also provides a basis for justifying the solicitation and use of local, state, federal, and other funding to support hazard mitigation projects and initiatives.

1.3 Program Organization

This section addresses, in part, the following FEMA requirements:

Requirement: §201.6(c)(1) Documentation of the *planning process* used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

Requirement: §201.6(c)(4)(i) *A plan maintenance process that includes:* A section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

1.3.1 LMS Structure

The current structure meets federal guidelines and criteria established in response to the Disaster Mitigation Act of 2000 and Title 44 Code of Federal Regulations (See figure 1.1).

Local Mitigation Strategy Coordinator

The LMS Coordinator is a staff member within the Division of Emergency Management (DEM) and serves as the coordinator for all mitigation projects, committees, and mitigation funding designated for the County. The LMS Coordinator facilitates committee and sub-committee

meetings and represents the County on these committees. Specifically, the LMS Coordinator supervises revision and updates to the Local Mitigation Strategy every five (5) years. The LMS Coordinator will be responsible for including minor changes and additions to the LMS during interim periods. Those changes will be documented in the Record of Changes, which can be found on page 3. The LMS Coordinator monitors changes in federal, state, and local laws in the area of mitigation that may affect the County. The LMS Coordinator readies the LMS for approval to the FDEM, the LMS Steering Committee, the BCC, and local municipalities. The LMS Coordinator is responsible for the continued maintenance of the LMS as well as the storing and filing of all documents pertaining to mitigation issues. In addition, the LMS Coordinator is responsible for the coordination of the Project Prioritization List (PPL) that scores and ranks projects in the County that are eligible for federal funding. This process is conducted through the LMS Evaluation Panel. Panelists are solicited by the LMS Coordinator on behalf of the LMS Steering Committee based on LMS member recommendations and are subject to approval by the LMS Steering Committee. The LMS Coordinator interfaces with appropriate governmental and non-governmental agencies and offices to ensure LMS goals, objectives, and priorities are consistent with and cross-referenced with those articulated in other existing plans, namely the County's Comprehensive Emergency Management Plan (CEMP). In addition, the LMS Coordinator seeks opportunities at the regional, county, and municipal levels to:

- Update plans, policies, regulations, and other directives to include hazard mitigation priorities.
- Encourage the adoption of mitigation priorities within capital and operational budgets and grant applications.
- Share information on grant funding opportunities.
- Offer guidance for carrying out mitigation actions.
- Explore opportunities for collaborative mitigation projects and initiatives.
- Facilitate and coordinate the application process and serve as a primary communications link with funding agencies.

LMS Working Group

The LMS Working Group represents a broad cross-section of public sector and private sector organizations and individuals, including the general public, regional universities, neighboring emergency management departments, and state coordinators. The LMS Working Group serves as an umbrella organization for coordinating all mitigation programs and activities, supplies the staffing for all committees of the LMS, and is the primary mechanism and forum for exchanging information and mobilizing the vast expertise and resources of the community. The LMS Working Group also provides suggested updates to various portions of the LMS to be analyzed and considered for inclusion by the LMS Revisions Sub-Committee into the next LMS. The LMS Working Group is the overarching group that all other committees are derived and provides guidance, suggestions, research, and input into all aspects of the LMS program. The LMS Working Group is currently led by the Chairperson, the Management Analyst for the City of West Palm Beach, and is coordinated by the LMS Coordinator for DEM.

LMS Steering Committee

The LMS Steering Committee consists of 15 members composed of seven (7) municipal representatives, two (2) county/local government representatives, one (1) state/federal government representative, one (1) university/college representative, one (1) healthcare industry representative, one (1) non-profit representative, and two (2) representatives from the private sector. The LMS Steering Committee serves as the LMS program board of directors. As such, it is the primary decision and policy-making body for LMS sponsored mitigation activity. Members of the committee are replaced as needed with coordination of the committee and the committee chairperson. Each January an updated list is sent to FDEM to be compliant with Florida Statute 27P-22.004. The LMS Steering Committee provides the needed attention to ensure mitigation projects are more cost-effective and focused on threat-specific mitigation priorities and strategies. The LMS Steering Committee also monitors the implementation of the LMS annually and makes recommendations to jurisdictions and other LMS members regarding how to implement LMS strategies within their jurisdictions. The LMS Steering Committee is led by the Chairperson, the Management Analyst for the City of West Palm Beach, and is coordinated by the LMS Coordinator for DEM.

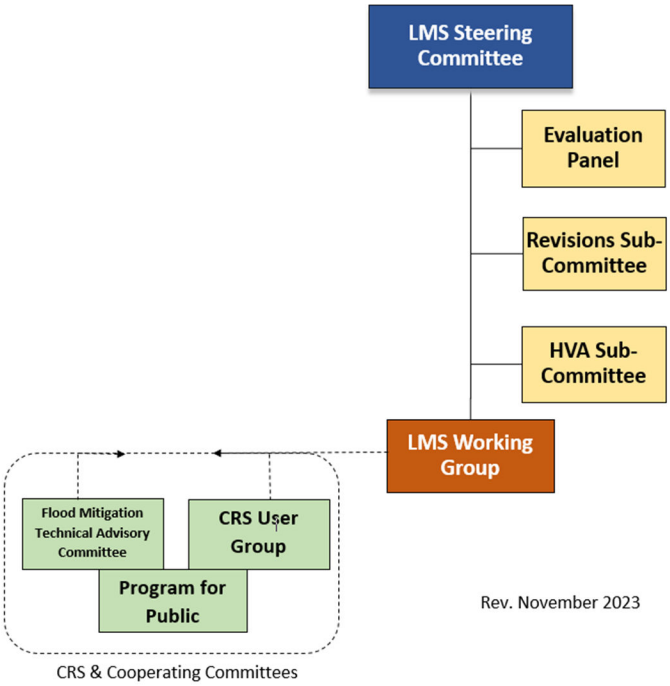

Figure 1.1 PBC LMS Structure

1.3.2 Standing Committees

- LMS Evaluation Panel - Designated to review, evaluate, score, and rank mitigation projects applying established local, state, and federal prioritization processes and criteria. The LMS Evaluation Panel is led by the Public Works Director for the City of Greenacres and coordinated by the LMS Coordinator for DEM.

- LMS Revisions Sub-Committee - Designated to review/monitor, update/evaluate, and verify/revise that subsequent LMS plans meet all federal guidelines and criteria. In addition, the revisions committee meets quarterly either in-person or virtually to evaluate the effectiveness of the plan, as well as to monitor and update the plan during the five (5) year cycle. The Revisions Sub-Committee has a standing meeting once per quarter. If no issues or concerns with the plan are proposed or presented, the committee can instead hold a virtual meeting. Eighteen (18) to 24 months before the plan is due for revisions, in person meetings are held regardless of whether changes need to be made. Biweekly and monthly meetings of the committee are held at least 24 months before the plan expires to ensure all sections in the crosswalk are being met, to review the document, and present suggested changes, updates, and revisions to the LMS Steering Committee. The LMS Revisions Sub-Committee is led by the Management Analyst for the City of West Palm Beach and is coordinated by the LMS Coordinator for DEM.

- LMS Hazard and Vulnerability Analysis (HVA) Sub-Committee - Provides a detailed assessment of hazards that may affect PBC and provides mitigation recommendations. Reviews research studies, reports, and technical information regarding possible changes in hazards within PBC and makes recommendations for revision. This sub-committee meets as needed within the revision cycle to provide input to the LMS Revisions Sub-Committee relating to hazards and vulnerabilities that may have changed since the last revision. The LMS HVA Sub-Committee is led by the Battalion Chief for the City of West Palm Beach, and is coordinated by the LMS Coordinator for DEM.

1.3.3 Community Rating System (CRS) Cooperating Committees

- Flood Mitigation Technical Advisory Committee - Comprised of flood mitigation engineers and experts from public and private sector organizations, is charged with assessing County-wide flood risks and vulnerabilities without regard to jurisdictional boundaries, and recommending flood mitigation priorities, strategies, plans, and projects for LMS consideration and action that optimally benefit to the greater community. CRS Committees are led and coordinated by the CRS Coordinator for DEM.

- Program for Public Information - Comprised of representatives from the county's active CRS communities, local business leaders, and members of the public, this group collaborates on a full range of Outreach Projects Strategy (OPS) initiatives and promote CRS participation. This CRS Committee is led and coordinated by the CRS Coordinator for DEM.

- CRS User Group – Comprised of representatives of the County's CRS communities, this group meets quarterly to discuss issues of the day regarding CRS updates, collaborates on best practices for achieving higher levels within various CRS activities, and shares information regarding CRS-related training.

While there is no regulation that requires the CRS committees to meet or coordinate, PBC has a very involved CRS user group that passes information and best practices and meets quarterly. Out of the 39 municipalities in PBC, 31 are involved in the CRS user group.

1.4 Participation Requirements

Since the LMS is written using input from all stakeholders, it is important to make sure that the entire PBC community is represented. Each group has different participation requirements; however, all groups are strongly encouraged to participate in the process.

Jurisdictions

Municipal and County participation is critical to the success of the LMS. In order to retain LMS voting rights, qualify for federal mitigation assistance consideration, and otherwise remain a member in good standing, the County and all municipal jurisdictions are expected to conform to the following standards:

- Participation of the representative or alternate in the four (4) annual LMS Working Group meetings; or
- Participation of the representative or officially designated alternate(s) in a majority of the LMS Steering Committee meetings, and
- Participation in a majority of sub-committee meetings; or
- Participation in special virtual meetings of the LMS Steering Committee or sub-committees; and
- Have an officially executed resolution adopting the revised LMS plan on file with the County. In order for a jurisdiction to be eligible for Hazard Mitigation Grant Program (HMGP), Flood Mitigation Assistance Program (FMAP), and Pre-Disaster Mitigation (PDM) funding programs, they must have an officially adopted resolution and a fully executed interlocal agreement.

More than two (2) absences of the LMS Working Group meetings will be cause for disqualification from the LMS and subject to appeal and review by the LMS Chair. All rights and privileges will be terminated during a period of disqualification and formal reapplication. All jurisdictions will be notified of meetings via email at least one (1) week in advance and will be updated with meeting summaries thereafter.

Non-Governmental Organizations (NGO) and other Governmental Entities

In order to qualify for LMS grant sponsorship, NGOs and other governmental entities must:

- Have a duly executed letter of commitment to the LMS on file with the County; and
- In the judgment of the LMS Steering Committee, actively participate in, and otherwise support LMS activities.

The Public and Private Sector

The LMS membership believes broad community support, including ongoing public and private sector involvement, is very important to the success of the program. While participation by private organizations and the public is strictly voluntary, their attendance, comments, contributions, and support are actively invited, sought, monitored, and fully documented.

In order to promote the opportunity for broad participation, at a minimum, notices and agendas for all general meetings of the LMS are posted through some combination of public service announcements through social media, postings on County and municipal websites, announcements in the County and municipal newsletters and calendars, and blast e-mailings to all previous participants. Additionally, the LMS Coordinator actively solicits new LMS members in private sector and/or non-profit organizations annually to encourage their participation in the LMS.

1.5 Jurisdictional Adoption

All jurisdictions wishing to participate in and share in the benefits deriving from the LMS program must complete and file a fully executed resolution which conforms to the adoption standards jointly established and amended by the PBC BCC and the LMS Steering Committee.

1.6 New Jurisdictions/Entities

In the event municipal jurisdictions are added, deleted, or merged within the County, the LMS will appropriately adjust its membership rolls as necessary and require any newly defined jurisdictions to provide documentation necessary for participation in the program.

1.7 Jurisdictional Participation

The County has 39 municipalities. In addition to jurisdictions being encouraged to participate, each member is provided minutes, via email and posted to the web, from the previous LMS Working Group or LMS Steering Committee meeting within one (1) week following the meeting. Participation is verified through sign-in sheets. The below table lists the names of the jurisdictions. A roster with the name and title of the primary LMS representative can be found in Appendix L. Also located in Appendix L are the minutes and sign-in sheets of the LMS Working Group, Steering Committee, HVA Sub-Committee, and Revisions Sub-Committee meetings.

Table 1.1 depicts jurisdictions that currently have LMS members. Agency name, primary contacts, and titles can be found in Appendix L, Table L-1:1, and in committee sign-in sheets. Members denoted by an asterisk (*) are integral members of the community whose voluntary participation in the LMS promotes a more collaborative community leading to greater resilience.

Table 1.1 Municipalities and Participating Jurisdictions in LMS

Municipalities

Atlantis, City of	Juno Beach, Town of	Palm Beach Gardens, City of
Belle Glade, City of	Jupiter, Town of	Palm Beach Shores, Town of
Boca Raton, City of	Jupiter Inlet Colony, Town of	Palm Springs, Village of
Boynton Beach, City of	Lake Clarke Shores, Town of	Riviera Beach, City of
Briny Breezes, Town of	Lake Park, Town of	Royal Palm Beach, Village of
Cloud Lake, Town of	Lake Worth Beach, City of	South Bay, City of
Delray Beach, City of	Lantana, Town of	South Palm Beach, Town of
Glen Ridge, Town of	Loxahatchee Groves, Town of	Tequesta, Village of
Golf, Village of	Manalapan, Town of	Wellington, Village of
Greenacres, City of	Mangonia Park, Town of	West Palm Beach, City of
Gulf Stream, Town of	North Palm Beach, Village of	Westlake, City of
Haverhill, Town of	Ocean Ridge, Town of	Unincorporated Palm Beach
Highland Beach, Town of	Pahokee, City of	
Hypoluxo, Town of	Palm Beach, Town of	

Participating Jurisdictions

Northern Palm Beach Improvement District	Palm Beach County Planning, Zoning & Building*	Business Development Board*
Treasure Coast Planning Council	Palm Beach County Environmental Resources Management*	Palm Beach County Medical Society*
South Florida Water Management District	Palm Beach County Library System*	Children's Home Society of South Florida*
Indian Trail Improvement District	Palm Beach County Housing & Economic Development*	West Gate Belvedere CRA*
Lake Worth Drainage District	Palm Beach County Administration Water Resources*	West Palm Beach Veteran's Administration Medical Center*
Florida Atlantic University*	Palm Beach County Fire/Rescue*	Collective Water Resources*
Palm Beach State College*	Florida Department of Law Enforcement*	Boynton Beach Community Redevelopment Agency*
Palm Beach County School District*	Urban League of Palm Beach County*	

After adoption of the LMS2024, the LMS Steering Committee and coordinator will continue to advocate for and seek engagement during the maintenance period to solidify mitigation efforts, increase awareness and participation. A grassroots effort to meet with each community and special district has been discussed and adopted to increase overall participation with emphasis on the

importance of stakeholder input in the fostering of a comprehensive mitigation strategy through collaboration.

1.8 Guiding Principles

The LMS guiding principles are an expression of the community's vision of hazard mitigation and the mechanisms through which it is striving to achieve that vision. The principles address concerns of the community relative to natural, technological, and human-caused hazards. The County's LMS prides itself on working to reduce hazards and vulnerability through well-designed and effective mitigation projects and activities.

1.9 Process

As part of the process, an online survey was published to understand the public's concerns. The LMS Steering Committee, along with the LMS Working Group, assessed existing plans, studies, and strategies. Using state and federal guidance on how an LMS update should be constructed, the LMS Steering Committee and LMS Working Group developed a comprehensive list of hazards of concern. From these defined hazards, the LMS Working Group identified areas of concern from existing plans and future considerations.

These areas of concern include:

- Loss of life
- Loss of property
- Community sustainability
- Health/medical needs
- Sheltering
- Adverse impacts to natural resources (e.g., beaches, water quality)
- Damage to public infrastructure (e.g., roads, water systems, sewer systems, stormwater systems)
- Economic disruption
- Fiscal impact
- Recurring damage
- Redevelopment/reconstruction
- Development practices/land use
- Intergovernmental coordination
- Public participation
- Repetitive flood loss properties
- Historical structures

1.10 Strategy

The strategy used for the development and revision process of the LMS, consisted of the following tasks:

- Public involvement to ensure a representative plan
- Coordination with other agencies or organizations
- Hazard area inventory
- Risk and Vulnerability Assessment
- Incorporating existing plans, reports, best practices, and technical information into the LMS
- Review and analysis of possible mitigation activities
- Evaluation of effectiveness of current LMS
- Local adoption following a public hearing
- Periodic review and update

1.11 Benefits

Adoption of this strategy will provide the following benefits to both County and municipal governmental entities:

- Compliance with Administrative Rules 9G-6, Florida Administrative Code (FAC), requirements for local Comprehensive Emergency Management Plans to identify problem areas and planning deficiencies relative to severe and repetitive weather phenomenon and to identify pre- and post-disaster strategies for rectifying identified programs.
- Universal points from the National Flood Insurance Program's (NFIP) CRS Program for developing a Floodplain Management Program, which may help further reduce flood insurance premium rates for property owners.
- Access to FEMA's Federal grant programs.
- Compliance with the Disaster Mitigation Act of 2000.
- Set forth the guiding principles that the County and municipal governmental entities of PBC will address the issue of all-hazard mitigation.
- Identify the known hazards that the County is exposed to, discuss their range of impacts, and delineate the individual vulnerabilities of the various jurisdictions and population centers within the County (**Section 2, Hazard Identification and Vulnerability Analysis**).
- Develop a detailed method by which PBC (municipalities and County government) can evaluate and prioritize proposed mitigation projects along with new federal requirements.
- Develop the process and schedule by which this entire LMS will be reviewed and updated to include public participation.

1.12 Criteria and Procedures for Revision

This section partially addresses the following FEMA requirements:

Requirement: §201.6(b)(1) *Planning process. An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to*

reducing the effects of natural disasters, the planning process must include: **(b)(1)** An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval.

Requirement: §201.6(c)(1) Documentation of the *planning process* used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

This document will be updated a minimum of every five (5) years by the LMS Coordinator with the assistance and input of the LMS Revision Sub-Committee, LMS Steering Committee, LMS Working Group, and approval of the LMS Steering Committee.

As many items have changed in the past five (5) years for PBC communities, the following is a description of the review process to show changes the development of several of the sections and priorities from the previous plan:

- Planning Introduction Section: This section includes an overview of the plan, an introduction, a discussion on the scope and purpose of the document, along with goals and objectives, and the participants in the planning process. This section was revised to reflect the most current approaches taken by the PBC LMS Working Group and standing committees.

- Hazard Identification and Vulnerability Analysis: All-hazards received a new review and identified as potential or emerging trends with other hazards classified as "threats" and not "hazards." Most of the historic occurrences were updated to include current events, facts, or figures since the previous update. Also, incidents older than ten (10) years were removed with the exception of incidents with significant impact to the County that were older than ten (10) years were retained. Other methodologies for a hazard and vulnerability tool were assessed. Extreme Heat and Harmful Algal Bloom (HAB) objectives received new emphasis which were incorporated into the LMS.

- Development of Mitigation Initiatives: Several LMS standing committee meetings and Working Group meetings were devoted to enhancing project submissions and revisions to the Project Priority List and Project Submission Form in order to more accurately rank older projects and receive information on new projects. Most of the information on funding sources and benefit cost ratios remains unchanged from its source information and remains a subject of detailed education efforts to stakeholder members in order to form well detailed project submissions.

- Implementation and Maintenance of the LMS: This remains important due to continuing turnover from the membership of the Working Group. New members have been identified and continue to act as stakeholders to the whole community.

- Appendices: These sections were updated accordingly based on new and relevant information. As PBC supports many LMS Committees, we utilized sample document outcomes from each group to detail actions taken to implement the LMS.

The public was given an opportunity to review this document and provide comments through the County website, public meetings and forums held during and after revisions were made, and offer insight through online surveys, a dedicated email address, and committee meetings. LMS Committee meetings are announced through County's Public Affairs Department as new releases (ADA compliant), County and Division social media platforms (LinkedIn, X, Instagram, Facebook, and Threads), and through email to LMS Working Group members. Working Group members then share with their stakeholders using their adopted communication plans. Focused and direct sharing of the announcements increased the span of reach to their vulnerable populations and underserved communities with the opportunities for input.

Ongoing revisions may also be made based upon experience from significant events such as a hurricane, tornado, sea level rise (SLR), hazardous materials spill, or any other occurrence where mitigation could benefit the community. Changes in federal, state, and local laws will also be reflected in the updated version of this document. The revisions will then be distributed to all affected parties by the LMS Coordinator. The Record of Changes, located at the front of this document, will be used to record ongoing maintenance of the plan during interim periods between complete revision cycles.

- The evaluation criteria which are used include:
    - New mandates from federal, state, or local agencies that require changes to the Local Mitigation Strategy, including new or changing laws, policies or regulations.
    - Societal developments or significant changes in the community that must be added to the current LMS.
    - Changes in the Comprehensive Plan or any other form of standard operating procedure.
    - The mitigation opportunities implemented. The priorities for implementation are the same.
    - Recommendations or lessons learned from major incidents that have occurred since last adoption.

During the revision process, each criterion was addressed to determine if they are still valid and adjustments were made as necessary. All existing mitigation opportunities that are determined to still be viable projects will be left standing. All those that are determined to be no longer workable will be set aside for further review and revision or eliminated as no longer feasible.

Once revisions are approved by the LMS Steering Committee, the LMS Coordinator will provide a copy to all members, post on the website, and sent to the State of Florida's Mitigation Bureau for approval. After approval by the State, the LMS Steering Committee and LMS Coordinator will hold a public showcase to allow a final chance for public input. Once the LMS Revisions Sub-Committee reviews public comment for possible inclusion, and makes any final revisions required by the State, the LMS Coordinator will distribute to members for final adoption by

governing bodies. Communities will then present the LMS to the public after adoption through the same public meetings/websites/etc. process used in the update cycle.

The following graphic shows the current LMS2024 Timeline, detailing the schedule and timeframe adopted by the LMS Steering Committee in 2023 for the 2024 revision cycle.

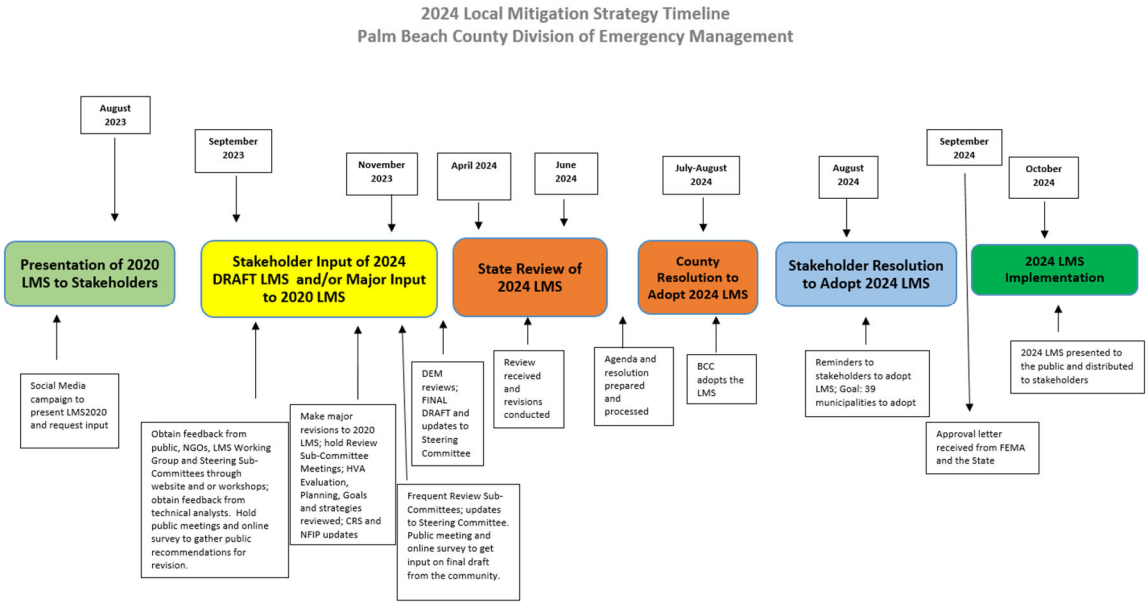

Figure 1.2 LMS2024 Timeline for PBC

1.13 Goals

1. Reduce the loss of life, property, and repetitive damage from the effects of natural, human-caused, and technological hazards from all sources but especially hurricanes, tornadoes, major rainfall, and other severe weather events.

2. Achieve safe and fiscally sound, sustainable communities through thoughtful long-range planning of the natural and man-made environment.

3. Take preventative actions to reduce the number of repetitive loss properties published annually by FEMA on the list of "Repetitive Loss Properties."

4. Qualify the county and jurisdictions for incremental improvements on the CRS classification in relation to flood insurance under the NFIP and to reduce flood hazard risk.

5. Optimize the effective use of all available resources by establishing public/private partnerships and encouraging intergovernmental coordination and cooperation.

6. Promote awareness and preparedness through the distribution of information on hazards and measures to mitigate them.

7. Increase the level of coordination of mitigation management concerns, plans and activities at the municipal, county, state, and federal levels of government in relation to all hazards.

8. Establish a program that facilitates orderly recovery and redevelopment and minimizes economic disruption following a disaster.

9. Ensure an enforceable commitment for the implementation of the local hazard mitigation strategy.

1.14 Objectives

The ultimate objectives of the LMS are to:

1. Improve the community's resistance to damage from known natural, human-caused, and environmental hazards.

2. Place PBC in a position to compete effectively and productively for pre- and post-disaster mitigation funding assistance.

3. Encourage strong jurisdictional, nongovernmental, and public participation and support of LMS activities.

4. Reduce the cost of disasters at all levels.

5. Facilitate community recovery when disasters occur.

6. Minimize recurrence of damage by incorporating mitigation into post-disaster rebuilding.

7. Promote intelligent development.

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SECTION 2: HAZARD IDENTIFICATION AND VULNERABILITY ANALYSIS

This section represents a hazard and vulnerability analysis, through a comprehensive HVA assessment commissioned by the County Division of Emergency Management, completed in 2021. As part of the LMS2024 revision, the LMS HVA Sub-Committee reviewed the following plans, studies, reports, and technical information, and provided updated information to be added to Section 2:

- Florida State Hazard Mitigation Plan (2023)
- *2016 Palm Beach County Supplemental Summary*, Statewide Regional Evacuation Study, Palm Beach County Appendix (technical data update report on demographics, regional hazard analysis, and regional vulnerability and population analysis)
- *The Favorability of Florida's Geology to Sinkhole Formation* (June 2017)
- State of Florida Mitigation Goals and Capabilities (2018 draft)
- Florida Repetitive Loss Strategy (2017 draft)

All other documents used in the creation of the comprehensive HVA assessment in 2021 are listed in Appendix A.

This section addresses, in part, the following FEMA requirements:

Requirement: §201.6(b)(3): The plan must include review and incorporation, if appropriate, of existing plans, studies, reports, and technical information were reviewed.

Requirement: §201.6(c)(2): The plan shall include a *risk assessment* that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.

Requirement §201.6(c)(2)(i): The risk assessment shall include a description of the type of all natural hazards that can affect the jurisdiction.

Requirement §201.6(c)(2)(i): The risk assessment must include a description of the type, location, and extent of all natural hazards that can affect the jurisdiction. The plan must include information on previous occurrences of hazard events and on the probability of future hazard events.

Requirement §201.6(c)(2)(ii): The risk assessment must include a description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description must include an overall summary of each hazard and its impact on the community. The risk assessment must also address National Flood Insurance Program (NFIP) insured structures that have been repetitively damaged by floods.

Requirement §201.6(c)(2)(ii): The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities in the identified hazard areas; an estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate; providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

Hazard Identification

Section 2.1 and Table 2.1 list the general hazards that PBC is vulnerable to and indicates their projected impact potential across the entire spectrum of community exposure and services. **Section 2.1, Hazard Identification** describes these hazards in detail and discusses countywide exposures and discusses specific vulnerabilities faced by the individual governmental entities, County and municipal, forming the PBC community. Vulnerability, probability, and risk assessments for the County and municipal jurisdictions, and a countywide impact analysis are contained in Appendix A**.** **2.5 Risk Assessment** describes the elements considered in the risk assessment process. Hazard & Risk Assessment Maps and potential loss values for PBC and each jurisdiction are located in Appendix G. The majority of hazards in PBC affect most areas of the county equally. However, there are a few that may be more concentrated in one (1) area of the county. For example, a Herbert Hoover Dike Breach would cause more severe damage to the western communities. For the purpose of this document, the County has been divided into four (4) geographical areas: Northern Palm Beach, Southern Palm Beach, Western Palm Beach, and Coastal PBC.

For most of the hazards identified and defined, a historical list of occurrences, as well as significantly impactful occurrences regardless of date, are listed in chronological order for the past ten (10) years.

In addition, the charts will show probability of occurrence and impact. These are rated as low – under 5% chance of occurring, medium – 5% to 15% chance of occurring, or high – greater than 15% chance. These ratings correspond with the information in the charts.

Each disaster affects PBC differently based on the severity and scope of the disaster and where it occurred within the County. While impacts to structures, infrastructure, people, and the environment will be addressed within each individual hazard, in most cases unless the disaster is significant (major or catastrophic) in duration and destruction, impact will be minimal and can be handled with resources within the County. If not specifically discussed within the hazard, it is assumed that there would be minimal or no impact to the to the County.

The Consequence Analysis charts within the hazards and in Appendix A will provide additional information on impacts.

Disasters are classified by the magnitude of their effect. The recognized classification system is as follows:

- Minor Disaster - Any disaster that is likely to be within the response capabilities of local government and results in only minimal need for state or federal assistance. The damage level to life and property is minimal and can be controlled and contained with resources within the municipality, or county in which they occurred.

- Major Disaster - As defined under the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C 5122) a major disaster is any natural catastrophe (earthquakes, explosion, fire, flood, high water, hostile actions, hurricanes, landslide, mudslide, storms, tidal wave, tornado, wind-driven water, snowstorms, or drought), or, regardless of cause, any fire, flood, or explosion, in any part of the United States, which in the determination of the President causes damage of sufficient severity and magnitude to warrant disaster assistance under this Act to supplement the effort and available resources of States, tribes, local governments, and disaster relief organizations in alleviating the damage, loss, hardship, or suffering caused thereby.

- Catastrophic Disaster – A disaster event that results in large numbers of deaths and injuries; causes extreme damage or destruction of facilities that provide and sustain human needs; produces an overwhelming demand on the state and local response resources and mechanisms: causes a severe long-term effect on general economic activity; and severely affects state; local, and private sector capabilities to begin and sustain response activities.

The hazards identified in *Table 2.1* and discussed in **Section 2.1** are organized based on their maximum projected impact potential. This means that hazards capable of producing the maximum community-wide impact, such as hurricanes and floods, are discussed first. This does not mean other identified hazards are less important or less worthy of mitigation. It simply means that their potential to affect the total community has been assessed to be less impactful.

Table 2.1 Identification and Projected Impact Potential for Hazards

Hazard Category	Projected Impact Potential																			
	Excessive Wind	Excessive Water	Damaging Hail	Soil/Beach Erosion	Electric Power Outage	Surface & Air Transportation	Navigable Waterway Impairment	Potable Water System Loss or Disruption	Sewer System Outage	Telecommunications System Outage	Human Health & Safety	Psychological Hardship	Economic Disruption	Disruption of Community Services	Agricultural//Fishery Damages	Damage to Critical Environmental Resources	Damage to Identified Historical Resources	Fire	Toxic Releases	Stormwater Drainage Impairment
NATURAL																				
Flood		✓		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Hurricanes/Tropical Storms	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Severe Thunder-storms/ Lightning	✓	✓	✓		✓	✓				✓	✓	✓	✓					✓		✓
Sea Level Rise		✓		✓		✓	✓	✓					✓	✓	✓	✓	✓			✓
Soil/Beach Erosion				✓			✓						✓			✓				✓
Tornadoes	✓				✓	✓				✓	✓	✓	✓							
Wildfires/Urban Interface Zone					✓	✓				✓	✓	✓	✓	✓	✓	✓		✓	✓	
Pandemic/Com-municable Diseases											✓	✓	✓	✓						
Drought													✓		✓	✓		✓		
Agricultural Pests & Diseases											✓	✓	✓		✓	✓				
Muck Fires						✓					✓		✓		✓	✓		✓	✓	
Seismic Hazards						✓													✓	
Geologic Hazards						✓	✓	✓					✓						✓	
Extreme Temperatures					✓						✓	✓	✓		✓	✓		✓		

Hazard Category	Projected Impact Potential																			
	Excessive Wind	Excessive Water	Damaging Hail	Soil/Beach Erosion	Electric Power Outage	Surface & Air Transportation	Navigable Waterway Impairment	Potable Water System Loss or Disruption	Sewer System Outage	Telecommunications System Outage	Human Health & Safety	Psychological Hardship	Economic Disruption	Disruption of Community Services	Agricultural//Fishery Damages	Damage to Critical Environmental Resources	Damage to Identified Historical Resources	Fire	Toxic Releases	Stormwater Drainage Impairment
TECHNOLOGICAL																				
Dam/Dike Failures		✓					✓		✓		✓	✓	✓	✓	✓	✓				✓
Hazardous Materials Accidents						✓					✓	✓	✓					✓	✓	
Radiological Incidents (Nuclear Power Plant)						✓	✓				✓	✓	✓	✓	✓		✓			✓
Communication Failures											✓			✓	✓					
Transportation System Accidents						✓	✓				✓		✓	✓				✓		
Wellfield Contaminations								✓	✓		✓	✓	✓	✓						
Power Failure (Outages)					✓	✓		✓	✓	✓	✓	✓	✓	✓						
Coastal Oil Spills											✓	✓	✓	✓		✓				
HUMAN-CAUSED																				
Civil Disturbances						✓					✓	✓	✓	✓			✓			
Domestic Security					✓	✓		✓		✓	✓	✓	✓			✓	✓	✓	✓	
Workplace/School Violence											✓	✓	✓	✓						
Harmful Algal Blooms								✓			✓	✓	✓		✓	✓	✓		✓	
Mass Migration Crises											✓	✓	✓	✓						

Vulnerability Assessment

The County is diversified. While all PBC residents are exposed to the hazards identified in Appendix A to some degree, geographic location and other factors greatly affect individual probabilities, vulnerabilities, exposure, overall risks, and impacts are illustrated in Appendix A for the County and each jurisdiction. Factors influencing vulnerability include community location, type of construction, demographics, and cultural characteristics. Appendix A tables summarize the

overall risks for each individual community within PBC. Appendix A tables also relate the probability of future hazard events for each identified hazard within PBC.

Hazards for local municipalities in Palm Beach County were assessed using the following considerations:

Probability	How often a known hazard produces an impact within the community?
Vulnerability	How quickly the municipality can recover from the results of the hazard?
Exposure	What is extent the hazard impacts life, property, and community resources?
Overall Risk	What is the overall risk for the hazard?

The following definitions were used:

Very Low	Event probability rarely ever occurs and there is zero to minimal impact from the hazard (less than 5%).
Low	Event probability occurs greater than every 11 years and there is not likely to have any measurable or lasting impact from the hazard (5%).
Medium	Event probability occurs approximately every two to ten years and there is a likelihood (between 5 to 14%) the hazard will have short-term to foreseeable impacts.
High	Event probability occurs annually and there is a strong likelihood (15% or more) the hazard will have lasting impacts on the community.

Appendix B includes mitigation initiatives to reduce the impacts of each jurisdiction risks for PBC in reference to the individual hazards identified in **Section 2.1.** Hazard and flood maps are located in Appendices G and N, respectively. These maps illustrate vulnerability areas of critical facilities potentially affected by hazard. The critical facilities will have a potential dollar loss figure.

With the assistance of the DEM, the LMS conducted impact analyses to assess the potential for detrimental impacts from all identified natural, technological, and human-caused hazards. Results of these analyses are summarized below. Impacts were categorized into the following groupings:

- Health and safety of the resident population in the affected area,
- Health and safety of incident responders,
- Impacts on the continuity of government and non-government operations,
- Impacts to property, facilities and infrastructure,

- Impacts to the critical community services,
- Impacts to the environment,
- Economic and financial impacts,
- Impacts on regulatory and contractual obligations,
- Impacts negatively affecting the PBC's reputation, image, and/or ability to attract public and commercial interests.

Most hazards in PBC affect the entire county equally. However, there are some that may be more likely in one area. For example, a Herbert Hoover Dike breach would cause more damage to the western communities. For the purpose of this document, the County has been divided into four (4) geographical areas: Northern PBC, Southern PBC, Western PBC, and Coastal PBC.

In addition, the charts show probability of occurrence and impact. These will be rated as low = under 5% chance of occurring, medium, 5% - 15% chances of occurring, or High, greater than 15%. These rating responds with the information of the charts presented.

- An impact rating of "Low" for any hazard type means the hazard is not likely to have any measurable or lasting detrimental impact of a particular type and consequences will likely be rectified promptly with locally available resources. Chances here are less than 5%.
- An impact rating of "Medium" means there will likely be a measurable detrimental impact which may require some time to rectify and may require outside resources and/or assistance. The chances here are between 5% - 15%. As such, the hazard is considered a threat to the whole community of PBC.

- An impact rating of "High" means the impact will likely be severe and of longer duration, and require substantial time, resources, and/or outside assistance to rectify. The chances are greater than 15%. As such, the hazard is considered a threat to the whole community of PBC.

- Multiple ratings indicate detrimental impacts might easily vary within the range indicated.

Impacts via Consequence Analysis

Appendix A also contains the impacts of identified hazards through the Consequence Analyses for Palm Beach County. Impacts were measured for:

- Health & Safety of Residents
- Health & Safety of Responders
- Continuity of Operations
- Property, Facilities, & Infrastructure
- Delivery of Critical Services
- Environmental Impact
- Economic and Financial Conditions
- Regulatory and Contractual Obligations

- County's Reputation, Impact and/or Ability to Attract Public and Commercial Interests

Consequence Rating	Consequence Analysis Detail
Very Low	Hazard is very unlikely to have any measurable or lasting detrimental impact of a particular type and consequences will likely be rectified promptly with locally available resources
Low	Hazard is not likely to have any measurable or lasting detrimental impact of a particular type and consequences will likely be rectified promptly with locally available resources
Medium	There will likely be a measurable detrimental impact, which may require some time to rectify and may require outside resources and/or assistance.
High	The impact will likely be severe and of longer duration, and require substantial time, resources, and/or outside assistance to rectify
Split Box	Hazard would have differing consequences between geographic locations within the county

Natural Hazards Impacts – Consequence Analysis Summary

Appendix A Table A-29: Consequence Analysis for Natural Hazards

Hazard	Health & Safety of Residents	Health & Safety of Responders	Continuity of Operations	Property, Facilities & Infrastructure	Historical Resources	Delivery of Services	Environment	Economic & Financial Conditions	Regulatory & Contractual Obligations	Reputation of County
Flood	Medium	Medium	Low	Medium	Medium	Medium	Medium	Medium	Low	Low
Hurricane Cat 1	Medium	Medium	Low	Medium	Medium	Medium	Medium	Medium	Low	Low
Hurricane Cat 2	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Low	Low
Hurricane Cat 3	Medium	Medium	Medium	Medium	Medium	Medium	High	Medium	Medium	Low
Hurricane Cat 4	High	High	High	High	High	High	High	High	High	Medium
Hurricane Cat 5	High	High	High	High	High	High	High	High	High	High
Tropical Storm	Medium	Medium	Low	Medium	Medium	Medium	Medium	Medium	Low	Low
Sea Level Rise	Low	Low	Low	Inland: Very Low; Coastal: Medium	Inland: Very Low; Coastal: Medium	Low	Inland: Very Low; Coastal: Medium	High	Low	High
Soil/Beach Erosion	Low	Low	Low	Inland: Very Low; Coastal: Medium	Low	Low	Inland: Very Low; Coastal: Medium	Inland: Very Low; Coastal: High	Low	Inland: Very Low; Coastal: Medium
Tornadoes	Low	Medium	Low	Low	Low	Low	Medium	Medium	Low	Low
Wildfire/Urban Interface Zone	Low	Medium	Low	Medium	Low	Low	Medium	Medium	Low	Low

Hazard	Health & Safety of Residents	Health & Safety of Responders	Continuity of Operations	Property, Facilities & Infrastructure	Historical Resources	Delivery of Services	Environment	Economic & Financial Conditions	Regulatory & Contractual Obligations	Reputation of County
Pandemic/ Communicable Diseases	Medium	Medium	High	Low	Low	Medium	Low	High	Low	High
Drought	Low	Low	Low	Low	Low	Low	Medium	High	Low	Low
Agricultural Pests and Diseases	Low	Low	Low	Low	Low	Low	Medium	High	Low	Low
Muck Fires	Low	Medium	Low	Medium	Low	Low	Medium	Medium	Low	Low
Seismic Hazards	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Geological Hazards	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Extreme Temperatures	Medium	Medium	Low	Low	Low	Low	Medium	Medium	Low	Low

Technological Hazards Impacts – Consequence Analysis Summary

Table A-30: Consequence Analysis for Technological Hazards

Hazard	Health & Safety of Residents		Health & Safety of Responders		Continuity of Operations		Property, Facilities & Infrastructure		Historical Resources		Delivery of Services		Environment		Economic & Financial Conditions		Regulatory & Contractual Obligations	Reputation of County
Dam/Dike Failures	Inland	Coastal	Inland	Coastal	Inland	Coastal	Inland	Coastal	Inland	Coastal	Inland	Coastal	Inland	Coastal	Inland	Coastal	Low	Low
	Medium	Very Low	Medium	Very Low	Low	Very Low	Medium	Very Low	Medium	Very Low	Low	Very Low	Medium	Very Low	Medium	Very Low		
Hazardous Materials Accidents	Medium		Medium		Low		Low		Low		Low		Medium		Low		Low	Low
Radiological Incidents	Low		Low		Low		Low		Low		Low		Low		Low		Low	Low
Communication Failures	Low		Low		Low		Low		Low		Low		Low		Low		Low	Low
Transportation System Accidents	Low		Low		Low		Low		Low		Low		Low		Low		Low	Low
Wellfield Contaminations	Low		Low		Low		Low		Low		Low		High		High		Low	Medium
Power Failure (Outages)	Medium		Low		Medium		Medium		Medium		Medium		Medium		Medium		Low	Low

Human-Caused Hazards Impacts – Consequence Analysis Summary

Appendix A Table A-31: Consequence Analysis for Human-Caused Hazards

Hazard	Health & Safety of Residents	Health & Safety of Responders	Continuity of Operations	Property, Facilities & Infrastructure	Historical Resources	Delivery of Services	Environment	Economic & Financial Conditions	Regulatory & Contractual Obligations	Reputation of County
Civil Disturbances	Low	Low	Low	Low	Low	Low	Low	Low	Low	Medium
Domestic Security	Medium	High	Medium	Low	Low	Medium	Low	High	Low	High
Cybersecurity*	Low	Low	High	High	Low	High	Low	High	High	Medium
Workplace/School Violence	Medium	Medium	Low	Low	Low	Low	Low	Low	Low	Medium
Mass Migration Crises	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low

*Included in Domestic Security

Climate Change

According to NOAA's National Centers for Environmental Information (NCEI), 2023 was the warmest year in NOAA's 174-year climate record. With the planet warming, the threats and impacts of climate change will need to be assessed and addressed. As of this writing, the County's Office of Resilience, through a Resilient Florida grant, is leading a vulnerability assessment (VA) that will assess climate threat impacts on the County's assets for the County's unincorporated and western areas and will develop a County-wide implementation strategy, identify resiliency priority projects, and create greenhouse gas reduction options that could achieve net zero emissions. The finished VA, covering seven (7) threats related to climate change, will not be completed before submission of this revision.

2.1. Natural Hazards

2.1.1 Flooding

Description

Frequencies from flooding associated with rain events other than tropical storms and hurricanes are more difficult to estimate. Eastern Florida shows an annual dry cycle stretching from early November through mid-May. During this part of the year, monthly rainfall rarely exceeds 2.5 to 4.0 inches per month. The wet season, beginning in mid-May and running through late October, shows monthly rainfall levels in the area to be 6.0 to 8.5 inches. Heaviest rainfall usually occurs in June and September. In PBC, the eastern or coastal section of the County receives more rain than the western section, however, all of PBC can be affected by flooding. This rainfall pattern coupled with the hurricane season (June through November) makes PBC particularly vulnerable to flooding associated with late season tropical storms and hurricanes because they typically occur when the water table is high and the ground is saturated. Based strictly on the historic flooding events presented below, the probability of even a minor flooding event somewhere in PBC over the past 10 years tends to lean towards at least once annually. More information is available through the DEM webpage accessible at: http://pbcgov.com/flood.

Flood Zone Explanation

The floodplain on Flood Insurance Rate Maps is identified as a Special Flood Hazard Area (SFHA). The SFHA is an area that could be inundated by a flood event with a 1 percent chance of reaching or exceeding base flood elevations in any given year. The 1 percent annual chance flood is also referred to as the base flood and you may also hear and see the term 100-year flood, however, see the below information about that term and the misconception associated with it.

"100-year Flood" Misconception - People sometimes hear the phrase "100-year" flood and think a flood happens only once in one hundred years. That old adage is not true. The Special Flood Hazard Area is an area that has a 1 percent chance, or a 1 in 100 chance, of a flood happening in any given year. That means a flood could happen this year and again the next year. It has nothing to do with calendar years. The phrase "1 percent annual chance flood" is more accurate.

X Zone Information - The X zone (also known as “low–risk flood zone”) is an area outside of the Special Flood Hazard Area. It’s important to know that just because an area is designated as X zone does not mean that the area will never flood. Floods do not read flood maps. Everyone lives in a flood zone — it's just a question of whether you live in a low, moderate, or high-risk area. Go to https:www.floodsmart.gov/flood-map-zone/find-yours for more information.

Special Flood Hazard Area (SFHA)

The land area that could be covered by the floodwaters of the base flood is where the NFIP's floodplain management regulations must be enforced and where the mandatory purchase of flood insurance applies for federally backed mortgages. The requirement also extends to private mortgage companies backed by the FDIC or other federal agencies. Therefore, many private mortgage companies also require flood insurance on properties in the SFHA.

Flood Zones

A Areas subject to inundation by the 1 percent annual chance flood event generally determined using approximate methodologies. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations (BFEs) or flood depths are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply. (In unincorporated Lee County, the county has estimated BFEs in these areas.)

AE Areas subject to inundation by the 1 percent annual chance flood event determined by detailed methods. Base Flood Elevations (BFEs) are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.

AH Areas subject to inundation by 1 percent annual chance shallow flooding (usually areas of ponding) where average depths are between one and three feet. Base Flood Elevations (BFEs) derived from detailed hydraulic analyses are shown in this zone. Mandatory flood insurance purchase requirements and floodplain management standards apply.

AO Areas subject to inundation by 1 percent annual chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1and 3 feet. Average flood depths derived from detailed hydraulic analyses are shown in this zone. Mandatory flood insurance purchase requirements and floodplain management standards apply. Some Zone AO areas have been designated in areas with high flood velocities such as alluvial fans and washes. Communities are encouraged to adopt more restrictive requirements for these areas.

AR Areas that result from the decertification of a previously accredited flood protection system that is determined to be in the process of being restored to provide base flood protection. Mandatory flood insurance purchase requirements and floodplain management standards apply.

A99 Areas subject to inundation by the 1 percent annual chance flood event, but which will ultimately be protected upon completion of an under-construction Federal flood protection system. These are areas of special flood hazard where enough progress has been made on the construction of a protection system, such as dikes, dams, and levees, to consider it complete for insurance rating purposes. Zone A99 may only be used when the flood protection system has reached specified statutory progress toward completion. No Base Flood Elevations (BFEs) or depths are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.

V Areas along coasts subject to inundation by the 1 percent annual chance flood event with additional hazards associated with storm-induced waves. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations (BFEs) or flood depths are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.

VE, V 1 – 30
Areas subject to inundation by the 1 percent annual chance flood event with additional hazards due to storm-induced velocity wave action. Base Flood Elevations (BFEs) derived from detailed hydraulic analyses are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.

Zones Outside of SFHA

Moderate flood hazard areas, labeled Zone B or Zone X (shaded) are also shown on the FIRM but are not considered part of the Special Flood Hazard Area. The areas of minimal flood hazard, which are the areas outside the SFHA and higher than the elevation of the 0.2 percent annual chance flood, are labeled Zone C or Zone X (unshaded).

X (shaded), B
An area of moderate flood hazard that is determined to be outside the Special Flood Hazard Area between the limits of the base flood and the 0.2 percent annual chance (or 500-year) flood.

X (unshaded), C
An area of minimal flood hazard that is determined to be outside the Special Flood Hazard Area and higher than the elevation of the 0.2 percent annual chance (or 500-year) flood.

Historical Flooding Events

Flood of Fall 1947 – This flood is generally considered to be the most severe flood recorded in southern Florida. Heavy rainfall, including the rains from two (2) hurricanes, occurred over a period of five (5) months. Many parts of PBC were flooded for months and there was extensive damage to dairy pastures and agriculture in general. Such a flooding event would be much more significant today because of the increase in land development.

Flood of October 1952 – This flood was preceded by five (5) months of heavier than normal rainfall, which included a tropical storm in October. June through October rainfall was approximately 48 inches. Damage was heaviest in the beef cattle industry, with extensive losses of improved pasture land that required supplemental feeding of cattle. Vegetable growers and dairy farmers also suffered significant losses as a result of this flood.

Rains of January 1957 – On January 21, 1957, PBC received 9 to 21 inches of rainfall within a 24-hour period. There was severe flooding in the vegetable garden areas of the County and much crop damage. Some fields had to be pumped out. Local crop damage was estimated at $1,000,000.

Flood of June 1959 – Heavy rains fell across most of central Florida from June 17th to 21st. These rains were associated with and followed a tropical depression, and caused extensive flooding in poorly drained, low-lying agricultural areas and some residential sections. Considerable pasture land and some citrus land in PBC were inundated. Some highways also sustained damage from these flood waters.

Rains of October 1966 – On October 22, 1966, heavy rains ranging from eight (8) to ten (10) inches over a 24-hour period destroyed approximately 4,200 acres of vegetable crops.

Rains of March 1982 – On March 28-29, 1982, PBC was subjected to a severe coastal storm with heavy rains and high winds. Lantana measured 16 inches of rain over a 24-hour period. High seas sunk a Haitian freighter and a total of 11 people were drowned.

The Great Thanksgiving Holiday East Coast Storm of 1984 – A strong low-pressure system developed east of Florida and coupled with a high-pressure system to produce an extremely strong pressure gradient leading to gale force winds and high seas along the entire Florida east coast. Heavy rains fell over most of central Florida, and this surface runoff, coupled with the wind packing of seawater along the coast resulted in extensive coastal erosion and flooding. Many coastal structures were damaged or destroyed, including several in PBC.

Flood of January 1989 – On January 21-22, 1989, PBC experienced a gale with subtropical storm characteristics that caused extensive beach erosion and dropped four (4) to six (6) inches of rain across the County. This caused ponding of water in low-lying areas. Several homes and a motel were damaged. Road flooding caused several accidents.

The Unnamed Storm of October 1995 – Almost exactly one (1) year after the Hurricane Gordon flooding incident in 1994, a stalled frontal system dropped over 15 inches of rain on PBC over a period of 29 hours. In the intervening year between these two (2) events, some communities in PBC had conducted a number of mitigation projects and initiatives designed to improve drainage and prevent flooding in known flood prone areas. These mitigation projects and initiatives undoubtedly reduced the extent of flooding and flood related damages during the 1995 flooding event, nevertheless, the County did experience significant flooding again in 1995.

Unnamed Storm of January 1999 – On Saturday, January 2, 1999, a cold front stalled over the northern part of PBC. Warm, moist air from the Bahamas became entrained in this frontal system and produced a localized, intense rain event in northern PBC. Initial reports indicated 21 inches of rain in a 12-hour period. This later turned out to be an erroneous reading from the recording instrument involved; however, it is generally recognized that between 18 and 22 inches of rain fell in the northern third of the County over a 12- to 18- hour period. Flooding was even more extensive than in the 1995 event, but it is interesting to note that many areas where flooding mitigation projects had been implemented remained dry or showed a minimum of damage compared to areas where planned mitigation had not yet been implemented. Hardest hit were the Riviera Beach and Lake Park jurisdictions with a total of over $6,000,000 damage between them. Flooding was extensive along Northlake Boulevard. Erosion caused the collapse of a portion of I-95 that was under construction.

Record Rainfall June - July 2002 – On July 14, 2002, a record 27 consecutive days of rain concluded. The combined June - July rainfall total was six (6) inches below the all-time record. June rainfall was 20.16" (12.5% above normal). The County experienced five (5) days of one (1) inch or more rain. The water level in Lake Okeechobee rose to 12.57 feet. Because this rainy period was preceded by an extended dry period and rains were spread over several days, flooding was limited to street flooding.

Hurricane Frances September 4, 2004 – A maximum storm-total rainfall amount of 12.56 inches was measured at West Palm Beach International Airport with 10.26 inches occurring in a 24-hour period. Unofficial storm-total rainfalls included 9.56 inches at Boynton Beach, eight (8) inches at Deerfield Beach and 7.18 inches at the Hillsboro Canal. Widespread storm-total amounts of three (3) to five (5) inches occurred in southeast and interior south Florida with southwest Florida averaging one (1) to three (3) inches. Rainfall flooding was mostly minor except for a few locations in PBC, which had up to three (3) feet of standing water. A section of I-95 in PBC was closed due to a large sinkhole. Within the confines of the Herbert Hoover Dike, water levels on Lake Okeechobee fluctuated up to five (5) feet above and below normal.

Hurricane Jeanne September 25, 2004 – A South Florida Water Management District (SFWMD) gauge measured a maximum storm-total rainfall amount of 10.22 inches over the eastern portion of Lake Okeechobee. A SFWMD gauge about four (4) miles west of West Palm Beach International Airport measured 9.10 inches with 8.79 inches of that occurring in a 24-hour period. At Moore Haven, 5.99 inches of rain was measured. Widespread storm-total amounts of one (1) to four (4) inches occurred in most of southeast and interior south Florida with Miami-Dade County and Collier County averaging one-half (1/2) to one (1) inch. Mostly minor rainfall flooding was observed except locally in Palm Beach Gardens, Jupiter and in the farmlands of western PBC where it was more severe. Within the confines of the Herbert Hoover Dike, water levels on Lake Okeechobee fluctuated up to seven (7) feet above and below normal causing severe flooding of some marinas.

Flood of June 5, 2005 – Eight (8) inches of rain in three (3) hours caused flooding in streets and businesses in Boca Raton and in Highland Beach. Cars were stalled and Federal Highway was closed for a nine-block section from NE 20 to NE 29 Street.

Hurricane Wilma October 24, 2005 – Rainfall amounts across South Florida generally ranged from two (2) to four (4) inches across southern sections of the peninsula to four (4) to six (6) inches across western Collier County and around Lake Okeechobee, with a maximum amount of 7.21 inches in Clewiston. There was scattered street flooding.

Flood of December 14, 2006 – A slow-moving low-pressure trough caused very heavy rains and significant flooding over parts of PBC. West Palm Beach International Airport received a total of 8.21 inches of rain ending at 7 PM on December 15. Other locations in Central and Southern PBC received between six (6) and eight (8) inches of rain. Northern Broward County received lesser amounts in the two (2) to three (3) inch range. Several streets and roads were closed in the city of West Palm Beach, with water reaching up to three (3) feet deep in some areas. Hardest hit was the neighborhood of Pineapple Park. Many vehicles were stranded in the deep water, with local police receiving about 120 calls for assistance. No significant damage was reported to property despite water entering homes and businesses. Florida Power and Light reported 20,000 customers without power during the afternoon and early evening hours. Shelters were opened for people left homeless by the floods, but only five (5) people arrived as of 8:20 PM.

Flood of January 22, 2008 – Intense rains affected Boynton Beach and the northwest section of Delray Beach during the late afternoon and evening hours of January 22. Maximum observed rainfall amounts were between four (4) and six (6) inches in Boynton Beach, although Doppler radar estimated as much as ten inches of rain fell in just over three (3) hours. Numerous reports of flooding were reported. A trained spotter reported water getting into houses in the corridor west of Federal Highway and east of Congress Avenue between Boynton Beach Boulevard and Woolbright Road. Water rose to as high as two (2) feet along sections of Congress Avenue. Significant flooding was reported at the parking lot of Boynton Beach mall. The I-95 on-ramp at Gateway Boulevard as well as sections of Boynton Beach Boulevard were closed due to the water depth. Dozens of vehicles stalled. Forty (40) traffic accidents were reported due to the rain and standing water. The combination of a mid and upper-level trough moving east across South Florida and a developing warm frontal boundary provided the necessary atmospheric conditions for intense rains and flooding in the Boynton Beach area on January 22.

March 22, 2008 – Heavy rain across the Wellington area produced multiple reports of knee-deep water in yards and across roadways. Heavy rain across central portions of PBC including the Wellington area produced flooded roads and water approaching a structure.

May 24, 2008 – Flooding reported at the intersection of Linton Boulevard and Congress Avenue making the intersection impassable. Flooding also reported along Nassau Street with water intruding into some homes. Flood waters were near two (2) feet deep at some locations. A shortwave moved across South Florida during the afternoon hours allowing multiple severe thunderstorms to develop across southeast Florida. A total of 8,200 customers lost power due to the severe thunderstorms in the three-county area of Palm Beach, Broward and Miami-Dade counties.

March 21, 2009 – A warm front lifted north through South Florida during the day of March 21. Unstable air south of the front combined with warm temperatures to produce strong and severe

thunderstorms over PBC. About 5,000 customers lost power. Significant flooding was reported in the Palm Beach Gardens and North Palm Beach areas. Flooding was most severe in the area of Pearl Street and Riverside Drive, and along US 1 near PGA Boulevard. Water reached the windows of cars in some cases. The flooding along US 1 was exacerbated by construction on the highway.

August 14, 2010 – Strong and slow-moving thunderstorms produced flooding in the Jupiter area due to light atmospheric flow and copious moisture. A spotter reported severe street flooding in Jupiter and the closing of Central Boulevard and Indian Creek Parkway. Rainfall of 2.75 inches reported within 45 minutes.

October 28, 2011 – A weak frontal boundary across South Florida, in combination with a flow of deep tropical moisture from the western Caribbean Sea associated with the remnant of Hurricane Rina, led to periods of very heavy rain and significant flooding lasting the better part of four (4) days. An estimated 2,000 customers lost power across South Florida due to the rain. Rainfall amounts of six (6) to nine (9) inches fell over southeastern PBC in less than six (6) hours, leading to numerous reports of flooded streets and some road closures. No reports were received of water entering structures.

August 26, 2012 – Tropical Storm Isaac moved west-northwest across the Florida Straits south of the Florida Keys on August 26. The northern edge of the wind and rain area associated with Isaac affected the South Florida peninsula throughout the day on the 26th. Isaac continued on a west-northwest track into the Gulf of Mexico on the 27th with winds, rain and flooding continuing over parts of South Florida. Moderate to severe flooding affected a large portion of metro PBC west of the Florida Turnpike. Hardest hit communities include The Acreage, Royal Palm Beach, Loxahatchee and Wellington. Canals were overtopped and communities were stranded by high water for several days after the rains stopped. Few homes suffered water damage, but major damage was sustained to infrastructure, including roads and water management structures. Rainfall amounts as high as 16 inches were measured in Royal Palm Beach and Loxahatchee, with estimates in excess of 18 inches in a two-day period.

August 27, 2012 – Flooding persisted over the western communities of PBC through the end of August as a result of torrential rains from Tropical Storm Isaac, which occurred on August 26 and 27.

It is important to note that many of the areas that experienced heavy flooding in both the 1994, 1995, and 2012 rainfall events were not in designated flood zones. For those areas where the Flood Insurance Rate Maps (FIRM) did indicate a flooding hazard, these two events both exceeded the 100-year storm levels and occurred back-to-back. The 1999 event was extremely localized, but rainfall exceeded all previous records in specific areas, and was beyond the design capacity of virtually all drainage systems in the County.

Often when these types of intense rainfall events occur, streams and drainage ditches tend to reach peak flood flow concurrently with tidal water conditions associated with coastal storm surge. This greatly increases the probability of flooding in the low-lying areas of the coastal zone. Areas along

the Intracoastal Waterway are particularly susceptible to flooding under these conditions. The most flood prone areas in the eastern portion of PBC poorly drained soils, a high water table, and relatively flat terrain; all of which contribute to their flooding problems. Flat terrain and heavily wooded areas aggravate flood problems by preventing rapid drainage in some areas.

January 9, 2014 – During the night of Thursday, January 9, 2014, several mesoscale meteorological factors combined to produce torrential rainfall across portions of coastal PBC over a rather short period. From roughly 8:00 p.m. until midnight, several locations received over 12 inches of rain in just those few hours, with one (1) mesonet site just west-southwest of Hypoluxo receiving an astonishing 22.21 inches during the same time frame according to National Oceanic and Atmospheric Administration (NOAA).

In addition, heavy rains continue for 12 hours causing major flooding in the Kings Point area, at Atlantic Avenue and Jog Road in suburban Delray Beach. Estimated rainfall totals in that area were almost 12 inches, according to the SFWMD. A number of homes sustained minor damages and a presidential declaration was sought but not granted due to the damage not meeting federal threshold guidelines.

October 21, 2014 – During the afternoon hours, portions of coastal PBC were inundated with flooding rains for the second time this year. Although this event was not near to the magnitude of the flood event in January, it did produce copious amounts of rainfall over a short period. Many roads were blocked which left motorists stranded. Portions of metro PBC received anywhere from one (1) to three (3) inches of rainfall while some coastal locales received nearly 10 inches. The worst impacted areas were between downtown West Palm Beach and Riviera Beach where many roads became flooded and impassable.

March 24, 2016 – A combination of daytime heating, deep moisture, and a passing upper-level system led to numerous afternoon showers and thunderstorms across South Florida, especially across the east coast metro areas. Heavy rainfall from training storms also brought flooding across southern PBC. Heavy rainfall fell across northern Broward and southern Palm Beach counties during the afternoon hours. Flooded roadways were reported in Boca Raton, including portions of US1//Federal Highway. Numerous cars were stalled along flooded roadways. Flood damages were sustained to several buildings including the library on the camps of Florida Atlantic University in Boca Raton. Flood damages were also sustained to the Boca Raton city hall where water came in through damages to the roof during the heavy rainfall and lead to a couple of inches of water in the first-floor main hallway. Water damage was also reported in the Town Center at Boca Raton. Rainfall amounts measured around five (5) to six (6) inches of rain in six (6) hours across the region.

June 3-9, 2017 – A disturbance meandered across the Gulf of Mexico and led to nearly a week of heavy rainfall across South Florida. The storm set a record rainfall in PBC, breaking the 1904 record set in West Palm Beach with 4.18 inches of rain. During the entire week, over 8.54 inches of rain fell, but only caused street flooding. The county did not experience flooding inside houses, as the flood control measures were successful in handling the rain amounts, although street flooding was common during this time.

Hurricane Irma September 10-11, 2017 – Hurricane Irma, while causing millions of dollars of damage to the State of Florida as it tracked through the Florida Keys, north across the Gulf coast, and then across the state towards Jacksonville, surprisingly did not cause an issue with flooding damage in PBC. It is acknowledged that mitigation efforts over the years are likely reducing the amount of flooding during these fast-moving rain events, and only wind damage was sustained.

Hurricane Nicole November 8-11, 2022 – Hurricane Nicole was a sprawling late-season Category 1 hurricane in November 2022. The fourteenth named storm and eighth hurricane of the 2022 Atlantic hurricane season. On November 10, it made landfall twice in Florida, south of Vero Beach and then northwest of Cedar Key, after briefly emerging over the Gulf of Mexico. Nicole then weakened to a depression while moving over the Florida Panhandle, and then was absorbed into a mid-latitude trough and cold front over extreme eastern Tennessee the following day. While this storm did not directly affect PBC, the County, and its municipalities were activated because of the proximity of the storm. Some minor flooding occurred on the barrier islands but no major incidents. Beach erosion was notable after this storm.

Flood Water Sources and Frequency of Occurrence

Sources of flood waters in PBC include:

- The Atlantic Ocean
- The Intracoastal Waterway
- Lake Okeechobee
- The West Palm Beach Canal
- The Hillsboro Canal
- The North New River Canal
- The Miami Canal

Major water retention areas include:

- Corbett Wildlife Management Area
- Loxahatchee Wildlife Refuge and WCA No. 2
- The Rotenberger/Holey Land Area

Floodplains designated on the FIRM are based on the 1% annual flood chance or the 100-year flood event. The 500-year flood event with a 0.2 % annual chance of occurrence is used to designate other areas of the community, which may have some vulnerability to flooding. The PBC Flood Insurance Rate Maps were updated and went into effect October 5, 2017.

As a relatively flat, low lying, heavily developed coastal county that experiences frequent intense rain events and periodic tropical storms, PBC is especially susceptible to flooding. Flooding in the County has historically taken one (1) of the following forms:

1. Flash flooding resulting in the rapid buildup of flood waters from intense localized precipitation that exceeds drainage capacities.

2. General flooding resulting from a buildup of water levels over time.
3. Water body overflows resulting from excessive rainfall or water management actions.
4. Coastal surge flooding driven by storm-force winds.
5. Dike breaches or overtopping related to major rain and tropical storm events.

Causes of Local Flooding

Significant factors contributing to inland flooding include rainfall intensity, rainfall frequency, rainfall duration, surface conditions, topography, and inadequate natural drainage.

The County's torrential rains, low and flat terrain, and large number of inland water bodies, conspire to create a significant probability for inland flooding. An additional, increasingly significant, contributing factor is rapid water runoff associated with the vast areas of impervious surfaces created by new development, creating flood prone areas where they did not previously exist.

In urban areas, grates and drains can become overtaxed or blocked with debris, leaving no space for excess water to enter drainage and sewer systems. According to the SFWMD, "Many new residents to PBC are alarmed when they see standing water in streets or driveway swales. In other places, that could be a cause for concern, but in our region, it's something you can expect to see after a soaking summer shower."

The County averages over 60 inches of rain a year and more than 130 rain days, with most of it coming between the months of June and November. Most developed areas are clustered along the coasts or near large waterways. Virtually flat, with most areas at or only slightly above sea level, even moderate rains can accumulate quickly.

The Water Management Challenge

Rainfall has been critical to South Florida's history, feeding its natural wetlands and refreshing surface-water and groundwater reservoirs. Its water management issues differ from those of most other areas in the country. Where most areas are concerned with protecting "scarce" water resources, South Florida's challenge is managing an overabundance of surface water. In order to drain and manage the excess water, hundreds of miles of canals, dikes, and levees have been built. Water management policies have created agricultural, tourism, and real estate industries whose success has fueled the state's population growth and taxed the seemingly abundant water supply. To consider sustainable population growth, environmental protection, and an adequate, safe water supply, water management, water resource and infrastructure decisions should include review of data that reflects projected future conditions such as higher volume rainfall events, increased SLR, and salinity issues related to water supply sources located in proximity to the coast.

The area's high hydrologic variation, low physical relief, and limited storage and conveyance capacities, make water management challenging. A delicate balance must be struck, dealing with extremes: flooding versus drought and open land versus crowded urban areas. Actions

range from enforcing water restrictions during dry periods to precautionary or emergency flood management during wet periods and storm events. With annual rainfall averaging over 60 inches (but varying widely), more than 50% occurring in four (4) months (June to September), and with the rainy season necessitating the movement of water away from populated areas for flood control, and the storage of excess water necessary to meet population needs and demands during dry periods, water management is a complex challenge.

County Elevations

Terrain throughout the County is relatively level. The mean elevation is 15 feet above sea level. Ocean coastal beachfront gradually slopes up to a dune line with top elevations of 12 to 23 feet. From the dune line there is a gradual downward slope to lake and inland waterway frontage with a width of a few hundred feet to a half mile. From there, land slopes upward to a coastal ridge then downward to elevations of five (5) to twelve feet in a drainage valley. Further inland, elevations remain relatively stable.

Primary Surface Water Areas

Lake Okeechobee, the largest freshwater lake after the great lakes, is South Florida's primary water reservoir. Approximately 250 square miles of the lake are within the geographical boundaries of PBC. Other sizeable bodies of water include Lake Mangonia (540 acres) and Clear Lake (401 acres) in West Palm Beach and Lake Osborne (356 acres) in southern Lake Worth Beach and northern Lantana. The West Palm Beach Canal connects Lake Okeechobee and Lake Worth Beach. A vast network of canals is interconnected with the West Palm Beach Canal. A system of lakes runs north and south within eight (8) miles of the east coast. The Loxahatchee River system is located in the northern section of the county and is interconnected with the Loxahatchee Slough.

The map on the following page shows the relative distribution of primary surface water areas within PBC.

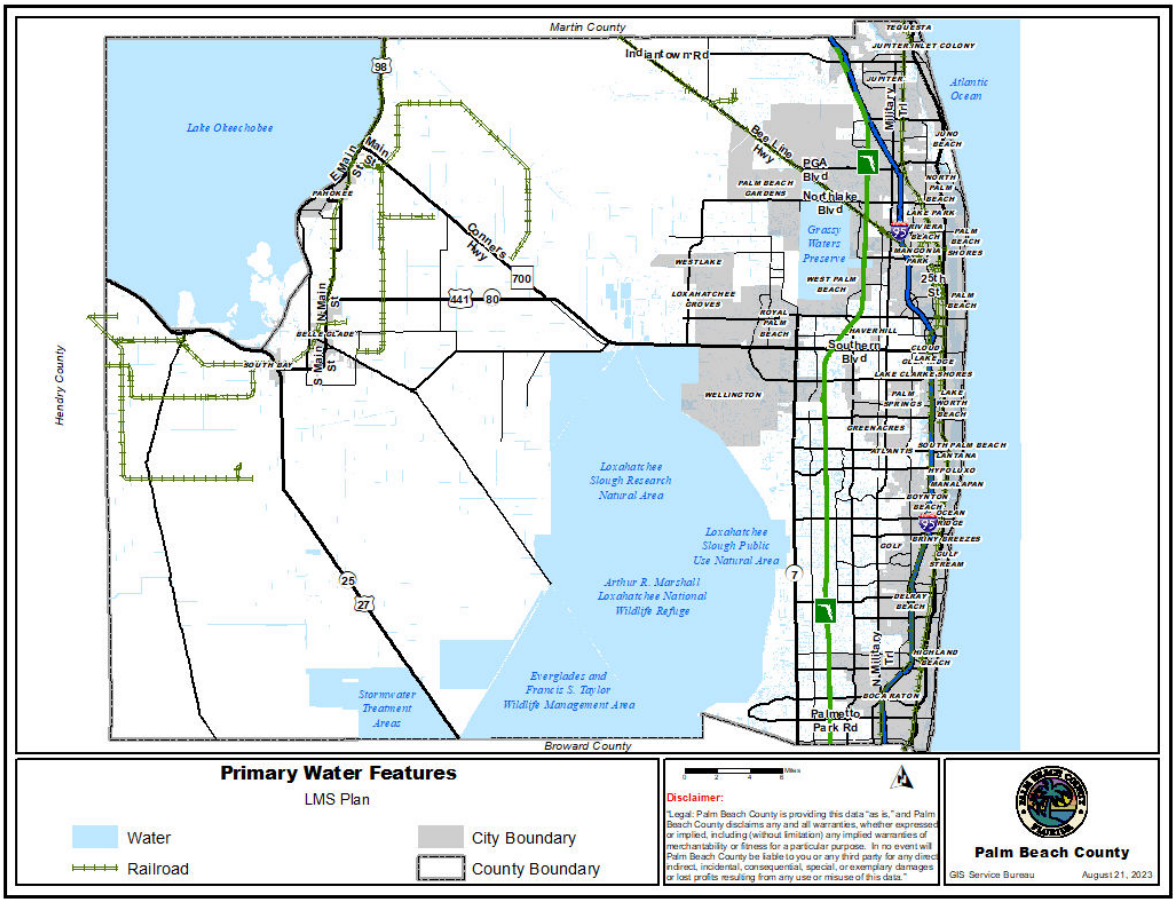


Figure 2.1 Surface Water Areas in PBC

Natural & Beneficial Flood Water Storage Areas

The following areas, designated as "Environmentally Sensitive lands" are undisturbed areas of PBC that act as natural storage areas for flood waters, reduce the possibility of flooding nearby residences, and help to recharge the groundwater aquifer.

Table 2.2 Environmentally Sensitive Lands/Natural Water Storage Areas in PBC

NAME	TOTAL ACRES
Acreage Pines Natural Area	115.61
Arthur R. Marshall Loxahatchee National Wildlife Refuge	143,953.77
Blazing Star Preserve	24.14
C-18 Triangle Natural Area	138.7
C-51 and L-8 Reservoir	1,263.73
Carlin Park	120.31

Coral Cove Park	31.42
Cypress Creek Natural Area	2,083.12
Cypress Creek/Loxahatchee	3547
Cypress Knee Slough Preserve	29.31
Delaware Scrub Natural Area	15.8
Delray Oaks Natural Area	24.5
DuBois Park	18.69
Dupuis Reserve	21891.61
East Coast Buffer	20,757.95
East Conservation Area	195.93
Everglades Agricultural Area	52,125.5
Everglades and Francis S. Taylor Wildlife Management Area	671,831
Florida Atlantic University Ecological Site	91.6
Frenchman's Forest	173.15
Gentle Ben Flowage Easement	334.81
Gopher Tortoise Preserve (City of Boca Raton)	8.8
Grassy Waters Preserve	12,800
Green Cay Nature Center and Wetlands	100
Gumbo Limbo Environmental Complex	20
Herbert Hoover Dike	774.8
High Ridge Scrub Natural Area	39.26
Holey Land Wildlife Management Area	35,350
Hungryland Slough Natural Area	2,895.29
Hungryland/SFWMD Parcels	7,859.99
Hypoluxo Scrub Natural Area	96.71
Indian Mounds	436.25
J. W. Corbett to Loxahatchee NWR Connector	35
J. W. Corbett Wildlife Management Area	60,348
Jackson Riverfront Pines Natural Area	3.01
John C.& Mariana Jones/Hungryland Wildlife & Environmental Area	12,735
John D. MacArthur Beach State Park	437.57
Jonathan Dickinson State Park	11,458.68
Juno Dunes Natural Area	577.7
Juno Park	18.2
Jupiter Beach Park	46.49
Jupiter Inlet Lighthouse Outstanding Natural Area	126.28
Jupiter Mangroves Natural Area	0.92
Jupiter Ridge Natural Area	271.32
Lake Harbor Tract	632

Lake Okeechobee Connector	7.73
Lake Park Scrub Natural Area	54.93
Leon M. Weekes Environmental Preserve	12
Limestone Creek Natural Area	51.62
Loggerhead Park	17.26
Loxahatchee Slough Natural Area	12,838.32
Loxahatchee Slough Public Use Natural Area	640
Loxahatchee Slough Research Natural Area	2,560
Lynn University Scrub	11.46
Morikami Museum and Japanese Gardens	188.53
North Jupiter Flatwoods Natural Area	146
North Ocean Ridge Mangroves Natural Area	8.69
Ocean Ridge Hammock Park	8.54
Ocean Ridge Natural Area	12.35
Okeeheelee Park North	900
Okeeheelee Park South	812
Pahokee Marina and Campground	30
Paw-Paw Preserve	3
Pine Glades Natural Area	6,641.98
Pine Jog Environmental Education Center	150
Pond Cypress Natural Area	1,736.18
Pondhawk Natural Area	78.7
Radnor	153.7
Red Reef Park	67
Riverbend Park	680
Rosemary Ridge Preserve	7.29
Rosemary Scrub Natural Area	13.59
Rotenberger Wildlife Management Area	29,297
Royal Palm Beach Pines Natural Area	773.23
Seacrest Scrub Natural Area	53.69
Serenoa Glade Preserve	9
Snook Islands Natural Area	117.65
South Beach Park	24.77
South County Regional Park	314.46
South Inlet Park	11.1
Spanish River Park	94.4
Stormwater Treatment Areas	47,605.32
Strazzulla Tract	2701
Sweetbay Natural Area	1094
Wellington/Acme Marsh	363.61

Winding Waters Natural Area	550.01
Yamato Scrub Natural Area	216.7
TOTAL AREA (in acres)	1,176,895.73

The map below shows these natural and beneficial flood water storage areas:

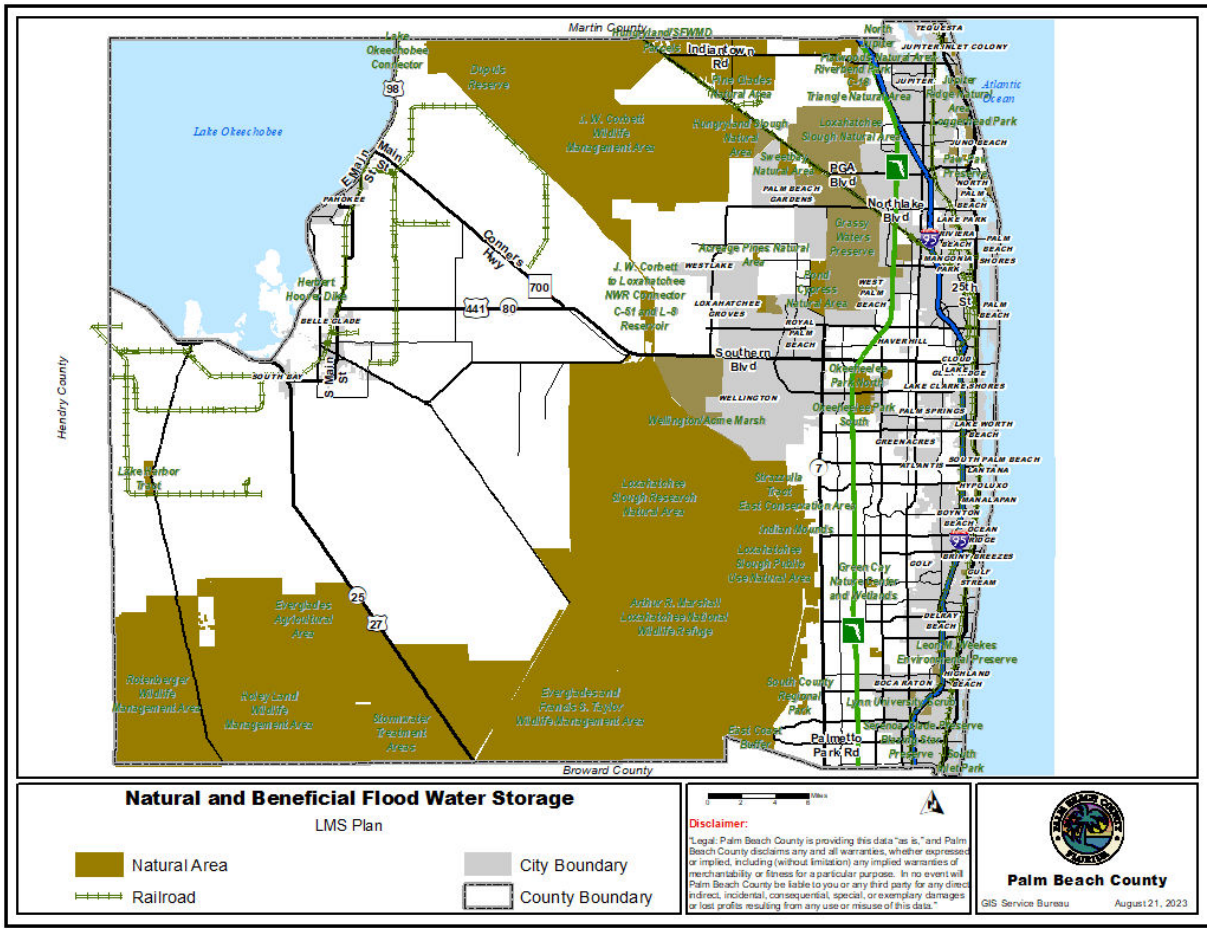


Figure 2.2 Natural and Beneficial Flood Water Storage

Flood Prone Areas

Flood prone areas are widely scattered throughout the county. Areas close to inland bodies of water and lower elevation areas in the northern and southern sections of the county are particularly susceptible to inland flooding.

The map below depicts Special Flood Hazard Areas within the county designated by FEMA as having a 1% chance of inundation in any given year. While some areas of the county might believe they are immune from flooding based upon recent history, published elevations, and/or designations on FIRMS, virtually the entire county has proven to be susceptible to short-term

localized flooding when extraordinary rain events have exceeded the capacity of natural runoff and absorption.

A review of recent flood events suggests that PBC significantly surpasses the national average of 25% of flooding occurring outside of Special Flood Hazard Areas (SFHA). Even a significant number of county properties designated as "repetitive flood loss list" by the NFIP lie outside SFHAs. The map below shows the SFHAs in PBC.

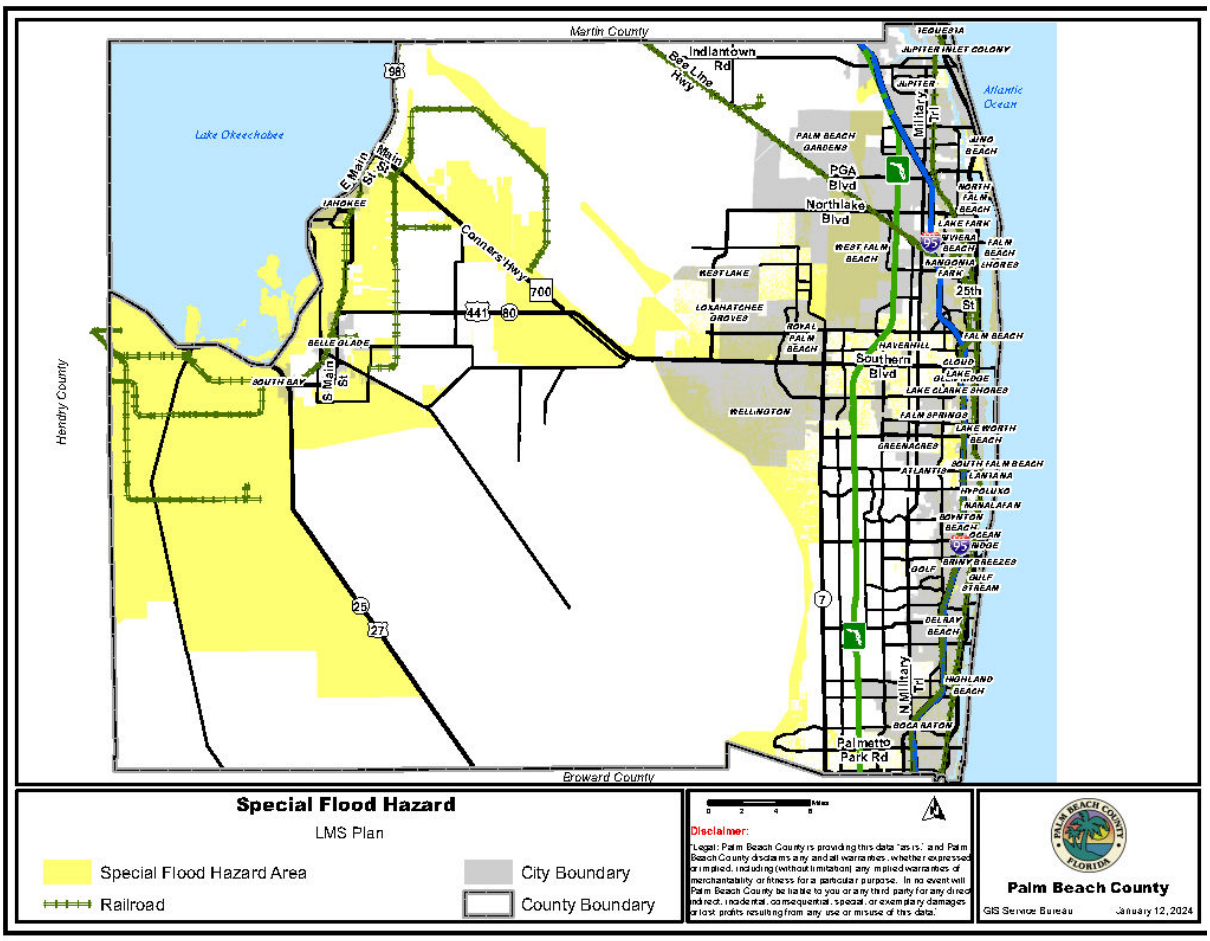


Figure 2.3 Special Flood Hazard Areas

Historically, the PBC rainfall area has the highest annual rainfall in South Florida, followed by Broward County and Miami-Dade. The county's east coast communities receive higher rainfall levels than the inland and western areas. Even during drought years, there have been instances where the coastal rainfall in eastern areas of the county were close to the average. Because there are no large impoundments in the eastern coastal rainfall areas, runoff has to be discharged into the Atlantic Ocean.

Flood Control

Flood control in PBC is dependent on a complex, integrated system of canals, waterways and flood control devices operated by the South Florida Water Management District, 20 drainage districts, and thousands of privately owned canals, retention/detention lakes and ponds.

The county's drainage system is designed to handle excess surface water in three (3) stages. The "neighborhood or tertiary drainage systems" (made up of community lakes, ponds, street and yard drainage grates or culverts, ditches, and canals) flow into the "local or secondary drainage system" (made up canals, structures, pumping stations, and storage areas) and then into the "primary flood control system" (consisting of South Florida Water Management District canals and natural waterways and rivers), ultimately reaching the Atlantic Ocean.

Table 2.3 Water Control Districts serving PBC

South Florida Water Management District	
Acme Improvement District	Pahokee Drainage District
East Beach Water Control District	Pelican Lake WCD
East Shore Water Control District	Pine Tree WCD
Gladeview Drainage District	Ritta WCD
Highland Glades Drainage District	Seminole WCD
Indian Trail Improvement District	Shawano Drainage District
Lake Worth Drainage District	South Florida Conservancy District
Loxahatchee Groves WCD	South Indian River WCD
North Palm Beach Heights WCD	South Shore Drainage District
Northern PBC Improvement District	WPB Water Catchment Area

South Florida Water Management District (SFWMD), an LMS member, has identified “areas of interest” within PBC, which are those places where frequent flash flooding and minor flooding events have been known to occur based upon reports that have been received and logged into a database over many years. The South Florida Flood Information Resource is being developed to provide the region with a repository to consolidate flood occurrence information. The map below illustrates the SFWMD Flood Repository which includes frequently flooded areas.

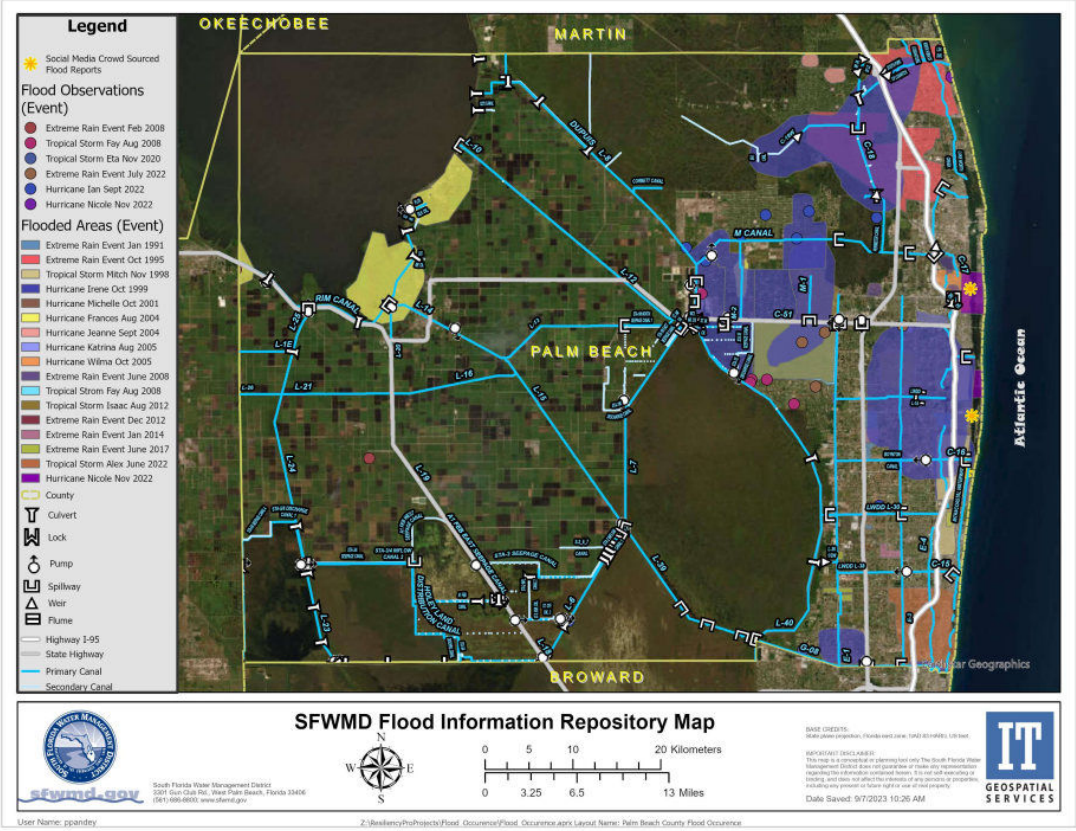


Figure 2.4 SFWMD Flood Repository Map

Drainage System Maintenance

The County's drainage systems consist of a combination of natural drainage ways and channels, engineered channels, storm sewers and ditches, and detention/retention basins contiguous to drainage systems. These systems can easily lose their carrying capacity with debris accumulation, sedimentation buildup and/or vegetation growth, becoming ineffective for flood prevention. Extensive maintenance is necessary to ensure flood preparedness.

Responsibility for inspection and maintenance of drainage systems falls to a variety of organizations depending on the type of system involved:

- SFWMD and the various water control districts provide oversight for the routine inspection of the drainage systems under their purview, and for debris clearance and other maintenance activities.
- Storm drain maintenance falls within the purview of the County's Road & Bridge Division, municipal public works departments, and the State Department of Transportation.

- Inspection, clearance, and maintenance of privately owned systems are the responsibilities of property owners and associations.

In rare instances, environmental regulations may prohibit removing natural debris and new growth from some drainage ways.

Maintenance activities most commonly include ongoing monitoring, debris and sediment removal, and the correction of problem sites and damaged systems by field crews. Quite often, maintenance actions are prompted by citizen complaints and reports. Given the sheer size of the County, the vigilance of citizens is a critical element in identifying potential drainage problems. The County has ongoing programs for structural and permanent changes to channels or basins (e.g. enlargement of openings, installation of grates to catch debris, installation of hard bank protection, construction of new retention basins, etc.) to reduce flooding and maintenance problems. Coastal communities commonly undertake a variety of maintenance measures including dune and mangrove preservation, bluff stabilization, and beach nourishment to protect coastal buildings, property, and coastal water bodies from flooding and erosion.

The county and municipalities work continuously to improve and maintain their stormwater management systems. Some of these projects are self-funded and others depend on grant support. Drainage improvement projects are among the most prevalent flood mitigation strategies reflected on the County's Local Mitigation Strategy Prioritized Project List (PPL).

Location

The entire county and its jurisdictions bear a high overall risk for flooding. The below table, also in Appendix A, illustrates the varying risk across jurisdictions.

Hazard Assessment H: High M: Medium L: Low V: Very Low	Unincorporated County	MUNICIPALITIES																																						
		Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
Vulnerability	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
Exposure	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
Overall Risk	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H

Impacts – Consequence Analysis Summary

As the climate continues to change, warmer temperatures and shifting rainfall patterns will be the result and will contribute to increases in rainfall severity and frequency. The consequence analysis for flooding has been determined as follows:

Low Consequence

- Continuity of Operations
- Regulatory & Contractual Obligations
- Reputation of County

Medium Consequence

- Health & Safety of Residents
- Health & Safety of Responders
- Property, Facilities & Infrastructure
- Historical Resources
- Delivery of Services
- Environment
- Economic & Financial Conditions

Flood Impacts on Life, Safety, Health

Being a coastal community in Palm Beach County, the deadly hazard associated with coastal flooding is ever present. According to the NOAA Storm Event Database since 1950, there were four (4) reported boating fatalities due to storm surge. Generally, the inland flood hazard in the County is not considered a serious risk to life. However, some risk does exist. During the rainfall flooding of January 2014, a driver and pedestrian lost their lives, in unrelated incidents, to roadway flooding in Delray Beach. Although there were only those two (2) recorded non-boating flood-related fatalities in Palm Beach County since the Hurricane of 1928 killed thousands in western Palm Beach County, the potential for loss of life and the importance of flood mitigation efforts remain vitally important.

Beyond loss of life, floods can bring a variety of health problems: disease and pollutants in the water; mold, mildew, and sediment left by the flood; and psychological impacts on flood victims.

Illness from Floodwater

Three (3) general types of health problems accompany floods. The first comes from the water itself. Floodwaters transport objects and pollutants including but not limited to dirt, oil, farm and industrial chemicals, fertilizers, animal waste, and trash and can saturate the ground. The contaminated water eventually flows into stormwater and sanitary sewer lines. Boil water notices may be ordered by the County if the potable water supply has been or is thought to have been contaminated. During floods, the overloaded sewer system can also back up into homes and low-lying areas, creating a hotbed for bacteria. All materials that are or have come into contact with floodwaters should be considered contaminated. Until the water recedes, the public is at immediate risk due to these unsanitary and unhealthy conditions.

The second type of health problem comes after the waters have receded. Stagnant pools of water become breeding grounds for mosquitoes, while mold and mildew can develop in parts of buildings that have not been cleaned and/or dried out.

Mosquitoes

Mosquitos in Florida have been known to carry the following diseases:

- Eastern Equine Encephalitis
- West Nile Virus
- St. Louis Encephalitis
- Zika Virus
- Malaria

The list may become longer in the future due to the tropical climate and international tourism that characterizes Florida's beaches. The possibility of the re-emergence or introduction of mosquito-borne diseases that had been eradicated or previously unreported in the United States is ever-present. In addition to recent reports by The Florida Department of Health confirming cases of dengue fever and chikungunya among those who had traveled internationally, there were over 1200 Zika cases reported in 2016. In 2023, there were also seven (7) locally acquired cases of Malaria reported along the west coast of Florida. These findings have experts concerned about the potential of Florida mosquitoes spreading previously considered foreign illnesses. Under the right conditions, this could lead to a potential outbreak of locally acquired mosquito-borne infections. Vector-borne diseases are also projected to spread further as a result of climate change.

Below is a table from the Florida Department of Health's Mosquito-Borne Disease Surveillance System:

Table 2.4 Mosquito-Borne Illnesses in Florida from 2014 - 2023

Mosquito-Borne Illness, Confirmed Cases	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
West Nile virus illness	15	11	6	4	33	3	79	5	5	9
St. Louis encephalitis (neuroinvasive)	2	0	0	0	0	0	0	0	0	0
Eastern equine encephalitis	0	0	0	1	3	0	0	0	0	2
Dengue fever (local)	6	1	2	0	1	16	71	0	65	176 (1 in PBC)
Dengue fever (imported)	80	82	43	18	73	295	49	27	823	569
Chikungunya fever (local)	11	0	0	0	1	0	0	0	0	0
Chikungunya fever (imported)	452	73	6	4	5	8	0	1	0	3
Malaria (imported)*	*	*	*	*	*	*	*	*	*	72
Malaria (local)*	*	*	*	*	*	*	*	*	*	7
Zika (imported)	*Not Tracked*	*Not Tracked*	1,016	207	97	36	0	0	0	0
Zika (local)	*Not Tracked*	*Not Tracked*	256	2	97	0	0	0	0	0

Source: Florida Department of Health's Mosquito-Borne Disease Surveillance System

**As 2023 was the first year for which locally acquired cases were reported, for purposes of this report, 2023 was the first year Malaria data was included*

According to the CDC, flooding caused by hurricanes can be severe. Although an increase in nuisance or floodwater mosquito populations is expected in the weeks following flooding, an increase in the number of people becoming ill from diseases spread by mosquitoes is not expected after flooding. This is because nuisance or floodwater mosquitoes do not spread viruses to people. However, in areas with pre-existing ongoing spread of chikungunya, dengue, West Nile, or Zika viruses, there is an increased risk of infection with a virus after a flood event as increased rainfall and floodwater may result in increased hatching of mosquito eggs.

Surveillance conducted by the CDC's Division of Vector-Borne Infectious Diseases indicates that in the absence of pre-storm epidemics, the risk of mosquito-borne illness does not usually increase after a flood or natural disaster. However, citing evidence of increased illness after the Red River flood of 1975 the CDC states:

> The three (3) viruses of primary concern (EEE, SLE, WEE) overlap in their distribution, but each has a distinct ecology, involving different mosquito species and avian amplifier hosts. Despite these differences, populations of primary or secondary vector species of each virus may increase significantly in response to heavy rainfall or flooding. Therefore, under certain circumstances, disasters might produce increases in disease risk.

The PBC Office of Environmental Resources Management (ERM) recommends the following measures to reduce the health risks associated with mosquitos:

- Remove standing water in old tires, buckets, drums, or any other containers.
- Check clogged gutters and flat roofs that may have poor drainage.
- Cover barrels and trash containers tightly with a lid or with 16-mesh screen.
- Empty plastic wading pools at least once a week. Store them indoors when not in use.
- Store boats covered or upside down.
- Treat standing water with the bacteria Bacillus thuringiensis, var. israelensis.
- Fill in tree holes and hollow stumps that hold water.
- Stock your ornamental water garden with mosquito-eating fish (e.g. minnows, Gambusia spp., goldfish, or guppies).
- Repair screening on windows, doors, porches, and patios.

The PBC ERM, Mosquito Control Division is tasked with providing countywide mosquito control and is available to respond to residents' mosquito related concerns. After a flood or natural disaster, the department will evaluate whether additional methods or more frequent pesticide application would be required to safeguard public health.

Mold and Mildew

Unless confined to a natural and beneficial area or removed by canals and storm drains, standing water left after a flood can be hazardous. While standing water outdoors can encourage mosquito breeding, standing water inside of a structure can also cause problems. A building that is not

thoroughly and properly cleaned and dried becomes a health hazard, especially for small children and the elderly. There are two (2) prerequisites to mold growth: moisture and nutrients.

Both of these are present in homes following a flood. The CDC's *Mold Prevention Strategies and Possible Health Effects in the Aftermath of Hurricanes and Major Floods; Recommendations and Reports* June 9, 2006 states:

> Although molds can be found almost anywhere, they need moisture and nutrients to grow. The exact specifications for optimal mold growth vary by the species of mold. However, mold grows best in damp, warm environments. The availability of nutrients in indoor environments rarely limits mold growth because wood, wallboard, wallpaper, upholstery, and dust can be nutrient sources. Similarly, the temperature of indoor environments, above freezing and below the temperature for denaturing proteins, can support mold growth, even if the actual temperature is not optimal.
>
> The primary factor that limits the growth of mold indoors is lack of moisture. Substantial indoor mold growth is virtually synonymous with the presence of moisture inside the building envelope. This intrusion of moisture might be from rainwater leaking through faulty gutters or a roof in disrepair, from a foundation leak, from condensation at an interface (e.g., windows or pipes), or between a cold and a warm environment. Water also can come from leaks in the plumbing or sewage system inside the structure. Studies of mold growth on building materials, such as plywood, have found that mold grows on materials that remain wet for 48 to 72 hours. Flooding, particularly when floodwaters remain for days or weeks, provides an almost optimal opportunity for mold growth.

In the warm, humid climate of Florida, any moisture that is not properly removed from walls, furniture, carpets and other absorbent surfaces after a flood can quickly begin harboring irritating, if not dangerous, strains of mold and mildew. Although proper remediation is recommended after a storm, many homeowners forgo the option. Some, unaware of the potential hazards and others deterred by the expense or inconvenience, opt for superficial fixes thereby compromising the long-term indoor air quality of their homes or businesses.

The CDC further emphasizes the potentially detrimental health effects of mold exposure in a study of post-Katrina homes, residents, and remediation workers that were tested for mold exposure and related illnesses:

> In 2004, the Institute of Medicine (IOM) reviewed the literature regarding health outcomes related to damp indoor spaces. In addition to the risk for opportunistic fungal infections in immunocompromised persons, IOM found sufficient evidence for an association between both damp indoor spaces and mold and upper respiratory symptoms (nasal congestion and throat irritation) and lower respiratory symptoms (cough, wheeze, and exacerbation of asthma). The findings of this report indicate that, in the New Orleans area post-hurricane, indoor environmental conditions and personal practices provided exposures that potentially put residents and remediation workers at risk for these negative health effects.

Finally, residents with asthma, the elderly, and those with compromised immune systems are more susceptible to mold-related breathing problems. The 2020 Census Estimates calculated 25.2% of the PBC residents are over the age of 65 (higher than the national average of 17.3%). Florida Health Charts indicate that 6.3% of adults, 7% of middle school students, and 7.1% of high school students currently have asthma in Palm Beach County illustrating that a significant percentage of the population (approximately 500,000 residents) is at increased risk from mold exposure.

For properties in Palm Beach County, data indicates that the majority of housing units are not insured against flood damage. It is probable that adjacent buildings affected by floodwaters were also uninsured. Due to the high cost of remediation, it is less likely that uninsured buildings were properly repaired after incidences of water damage. Consequently, the possibility exists that a significant number of residents may currently be exposed to mold growth as a result of previous floods. The County's efforts to educate the public about the dangers of flooding, including mold growth, and the importance of having flood insurance should help to reduce these numbers.

Psychological Impacts

In addition to the possibility of physical illness, there is the potential for long-term psychological impacts due to experiencing damage caused by flooding to one's home, business, personal belongings, etc. Unprepared and uninsured persons can often feel increased pressures that accompany the aftermath of a flood. There is also a long-term sense of insecurity that their homes could flood again.

The cost and labor needed to repair a flooded home puts a severe strain on people, specifically vulnerable populations and the unprepared, uninsured, displaced, or temporarily unemployed. Additionally, the cost allocated to re-building may reduce resources for other important needs, such as healthcare, personal maintenance and mental health. The psychological impact can be exacerbated when the flooding was the result of a community-wide or region-wide event that disrupts the local economy, interrupts the supply chain, upends normal schedules, cuts off lines of communication, and suspends necessary or helpful social services.

While adults who experience these traumatic events can suffer from post-traumatic stress disorder (PTSD) for years afterward, children are particularly susceptible to post-traumatic stress that can have lasting impacts into adulthood. Considered adverse childhood experiences (ACEs), natural disasters, like floods and hurricanes, can have lifelong effects on the health and wellbeing of children.

Secondary Safety Risks

The aforementioned health hazards associated with a flood may not become apparent for days or even months after the event. More immediate dangers include the risk of injury from electricity and the increased likelihood of being involved in an automobile or other storm-related accident.

When basic safety precautions such as evacuations and warnings are ignored, injuries and/or accidents are more common. A major potential for injuries from flooding results from people

walking or playing in or near flooded areas. During or after any flood event, care must be taken when entering the waters, whether in a vehicle or by foot.

Roads running through low-lying areas, or areas with poor drainage such as some of the older sections of Palm Beach County, can pose a serious threat. Roads covered with water may cause confusion to drivers and may affect vehicles' braking systems or leave cars disabled. Canals near roadways may become obstructed from view by flood waters on roadways with the canals resembling roads to drivers not familiar with the area. During the flooding of January 2014 for instance, two (2) residents of Palm Beach County lost their lives in Delray Beach. One (1) was a motorist whose car left the road and became submerged in a roadside lake. The other was a pedestrian, wading through flood waters, who fell into a canal that was not visible through the flood water.

In the case of storm surge flooding, motorists may attempt to drive through barricaded or flooded roadways. As less than 24 inches of rushing water can carry away most vehicles, floods can present significant potential safety risks. Emergency rescue assistance may be required to rescue an individual from a vehicle disabled by high flood waters, putting emergency responders at risk.

In addition to dangerous road conditions that may be obscured by flood waters, downed power lines may be in the flood waters, putting people at risk of electrocution. The combination of electricity and water can prove deadly. Further, snakes, venomous insects, and fire ant colonies can also be present in the water, posing a serious threat.

Other secondary effects on safety resulting from flooding, include damage to gas lines, structures, and bridges rendering emergency operations unsafe.

As Hurricane Dennis moved through south Florida in 2005, there was a singular known direct death. A man drowned in Hollywood Beach, likely from a rip current. An indirect death occurred in Fort Lauderdale when a man was electrocuted after stepping on a downed power line. Of the 32 deaths attributed to Hurricane Irma in southern Florida in 2017, all but one (1) were indirect. The only reported direct death was an 86-year-old man knocked down by a wind gust while opening his front door in Broward County. Most deaths occurred during cleanup after the storm or from carbon monoxide poisoning resulting from improper generator use.

In 2022, Hurricane Ian caused 149 deaths in Florida. Sixty-six (66) were considered directly caused by the storm (including 41 due to storm surge along the west coast of Florida). Twelve (12) were due to freshwater flooding throughout the State. The remaining 84 deaths were considered indirect. Of the 90 indirect deaths reported throughout the southeastern states due to Hurricane Ian, the leading causes were lack of access to timely medical care (18), accidents such a trip-and-fall during power outages (16), and cardiac events (16). Other causes included vehicular accidents, accidents related to storm preparations or clean up, carbon monoxide poisoning, suicide, and homicide.

The following are several actions that residents of flood hazard areas can take to decrease the potential of injury due to flooding:

- Know the flood warning procedures.
- Do not attempt to cross a flowing stream where water is above your knees.
- Keep children away from floodwaters, ditches, culverts and storm drains.
- If your vehicle stalls in high water, abandon it immediately and seek higher ground.
- Evacuate the flood hazard area in times of impending flood or when advised to do so by the police and fire departments.
- Cut off all electric circuits at the fuse panel or disconnect switches. If this is not possible, turn off or disconnect all electrical appliances.
- Shut off the water services and gas valves in your home
- Be aware of outdoor hazards. Watch out for loose or dangling power lines and report them immediately to proper authorities. It is not unusual in a disaster such as a flood for more people to be killed by carelessness in the aftermath than were killed by the event itself.
- Be sure all electric and gas services are turned off before entering buildings for the first time after a flood.
- Remove covers from all outlets and fuses or multi-breaker boxes and flush with clean water. Let dry and spray with contact cleaner/ lubricant.
- Watch for electrical shorts or live wires.
- Do not turn on any lights or appliances until an electrician has checked the system for short circuits.
- Electric motors in appliances that have been flooded should be thoroughly cleaned and reconditioned before they are put back into service.

Overall Vulnerability

Palm Beach County and its jurisdictions, as a whole, has a high vulnerability to flooding. However, not all parts of the County are susceptible to the same type of flooding. The coastal communities have a high vulnerability to coastal flooding whereas the inland communities are vulnerable to inland flooding. While damages caused by storm surge and dike failure can be extensive and costly, historical physical damages from inland structural flooding have been relatively minor and isolated. As a predominantly localized event, inland flooding does not pose a significant threat to the ability of the county, municipalities, and businesses to carry on normal operations.

People, structures, and infrastructure located within floodplains and areas with poor drainage are most susceptible inland flooding, particularly to flash flooding. However, flash flooding can and does affect all areas of the county. Continued development will certainly contribute to an increased frequency of runoff flooding.

For the most part, flooding depths are not sufficient to inundate large residential and commercial areas. Developed parcels tend to be elevated to a level limiting significant water intrusion from water build-up. Where water does intrude structures, damage can be costly for individual property owners. Beyond physical water damage, perhaps the greater issue is the potential for mold infestation which can create health problems for occupants and lead to costly cleanup and repairs.

Flooding can cause damage to cars and outdoor equipment, contaminate water systems, and interrupt water treatment. Sewage overflow raises health concerns.

Significant expanses of street flooding are common, can be costly in terms of loss of function for extended periods of time, and can create dangerous, even potentially deadly, driving conditions.

Post storm accidents, especially electrocutions, are not uncommon as people wander into flood waters where live wires or generators are present.

Flooding in PBC results from one (1) or a combination of both of the following meteorological events:

- Tidal surge associated with northeasters, hurricanes, and tropical storms,
- Overflow from streams and swamps associated with rain runoff.
- Coastal inundations from lakes and basins.

Major rainfall events occur in association with hurricanes, tropical storms, and thunderstorms associated with frontal systems.

When these types of intense rainfall events occur, streams and drainage ditches tend to reach peak flood flow concurrently with tidal water conditions associated with coastal storm surge. This greatly increases the probability of flooding in the low-lying areas of the coastal zone. Areas along the PBC coast are particularly susceptible to flooding under these conditions. The most flood prone areas in the eastern portion of the County feature poorly drained soils, a high water table, and relatively flat terrain, all of which contribute to their flooding problems. Flat, swampy terrain and heavily wooded areas in the western part of PBC aggravate flood problems by preventing rapid drainage in some areas.

In response to mounting losses from flooding nationwide, the United States Congress initiated the NFIP in 1968. The program is administered through FEMA. Under this program, FEMA produces FIRM maps which show areas subject to various levels of flooding under different conditions. This flood risk information is based on historic, meteorological, hydrologic, and hydraulic data, as well as open-space conditions, flood control works, and development.

Appendix G presents a generalized picture of the flood prone areas in PBC based on the 2017 version of the FIRM maps.
In addition to the FIRM maps there are two (2) numerical models, which predict the effects of storm surge in PBC. The older model, developed by NOAA, is called the Sea, Lake, and Overland Surges from Hurricanes model. Appendix G also illustrates the areas of PBC vulnerable to this type of flooding.

The State of Florida acquired another model for predicting hurricane storm surge as well as wind and property damage. This model, The Arbiter of Storms (TAOS) model, predicts storm surge height and wind field intensity for Category 1 through Category 5 hurricanes. Appendix G illustrates the areas of PBC subject to flooding during a Category 5 Hurricane. It is important to

remember that the TAOS model projections are based on a Maximum of Maximums or absolute worst-case scenario. For this analysis, we have considered the TAOS model projections as reflecting total, worst-case exposure for PBC.

2.1.2 Hurricanes/Tropical Storms

Description

For many years, the risk of significant loss of life and property due to hurricanes seemed small. Many, if not the majority, of existing homes and businesses along the U.S. Atlantic and Gulf Coasts were constructed during the 1970s and 1980s, a period of relatively inactive hurricane formation. Most of the people currently living and working in coastal areas have never experienced the impact of a major hurricane. Hurricanes that affected Florida during the 1970s and 80s were infrequent and of relatively low intensity. Homeowners, business interests, and government officials grew to regard hurricane risk as manageable by private insurance supplemented occasionally by federal disaster funding and subsidized flood insurance. The hurricane risk did not seem sufficient to warrant increased investment in mitigation. Two (2) major hurricanes, Hugo in 1989 and Andrew in 1992, forced a reevaluation of this risk assessment. While experts sometimes disagree on the annual cost of hurricane damage, many sources agree that Hurricane Andrew was one of the most costly hurricane events ever to affect the U.S. Insured losses from Hurricane Andrew topped $17 billion and most sources agree that the total cost of Hurricane Andrew exceeded $25 billion.

Florida is the most vulnerable state in the nation to the impacts of hurricanes and tropical storms. Southcentral Florida is particularly exposed to the dangers presented by hurricanes, due to its topography. The region is largely a flat, low-lying plain. The potential for property damage and human casualties in PBC has increased due to rapid growth over the last few decades, particularly along the coastline. Population risk has also been exacerbated by some complacency due to the recent period of reduced hurricane frequency. With Hurricanes Matthew (2016) and Irma (2017) striking close to PBC, renewed interest in hurricane safety and mitigation has been produced, as hurricanes may affect any jurisdiction within PBC.

Hurricanes are tropical cyclones with winds that exceed 74 mph and blow counterclockwise around their centers in the Northern Hemisphere. They are essentially heat pumping mechanisms that transfer the sun's heat energy from the tropical to the temperate and polar regions. Hurricanes are formed from thunderstorms that form over tropical oceans with surface temperatures warmer than 81° Fahrenheit (26.5° Celsius). The ambient heat in the sea's surface and moisture in the rising air column set up a low-pressure center and convective conditions that allow formation of self-sustaining circular wind patterns. Under the right conditions, these winds may continue to intensify until they reach hurricane strength. This heat and moisture from the warm ocean water is the energy source of a hurricane. Hurricanes weaken rapidly when deprived of their energy source by traveling over land or entering cooler waters.

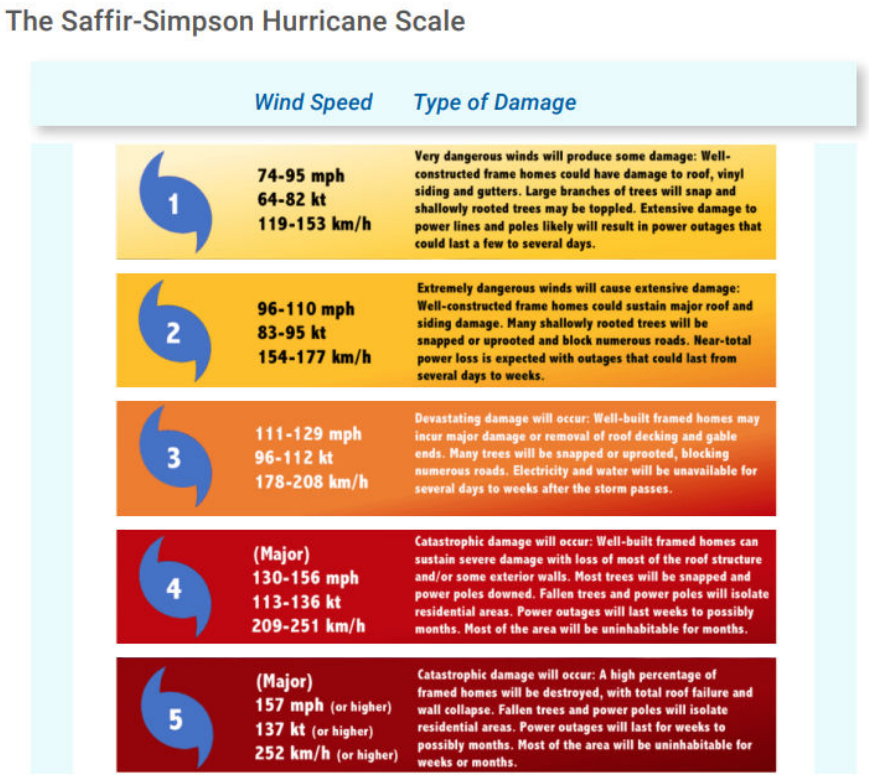


Figure 2.5 Saffir-Simpson Hurricane Scale

Since 1886, 59 storms of hurricane intensity have passed within 125 miles of PBC. This represents an average of one (1) hurricane every two years. The number of direct hits on the southeastern Florida coastline between 1899 and 2019 has been as follows:

- Category 1 Storms: 9 storms
- Category 2 Storms: 3 storms
- Category 3 Storms: 17 storms
- Category 4 Storms: 16 storms
- Category 5 Storms: 9 storms

A storm surge is a large dome of water often 50 to 100 miles wide and rising anywhere from four (4) to five (5) feet in a Category 1 hurricane up to 20 feet in a Category 5 storm. The storm surge arrives ahead of the storm's actual landfall and the more intense the hurricane, the sooner the surge arrives. Water rise can be very rapid, posing a serious threat to those who have waited to evacuate flood prone areas. A storm surge is a wave that has outrun its generating source and become a long period swell. The surge is always highest in the right-front quadrant of the direction the hurricane is moving in. As the storm approaches shore, the greatest storm surge will be to the north of the hurricane eye.

Such a surge of high water topped by waves driven by hurricane force winds can be devastating to coastal regions. The stronger the hurricane and the shallower the offshore water, the higher the

surge will be. In addition, if the storm surge arrives at the same time as the high tide, the water height will be even greater. The storm tide is the combination of the storm surge and the normal astronomical tide.

Damage during hurricanes may also result from tornadoes, inland flooding, and heavy rainfall that usually accompany these storms. Hurricane Andrew, a relatively "dry" hurricane, dumped ten inches of rain on south Florida and left many buildings extensively water damaged. Rainwater may seep into gaps in roof sheathing and saturate insulation and ceiling drywall, in some cases causing ceilings to collapse.

Aside from direct property damage, the potential for crop damage and economic disruption from hurricanes and tropical storms is significant. Tropical Storm Mitch dropped as much as ten (10) inches of rain in some south Florida areas, which resulted in approximately $20 million in direct crop damage in PBC. The largest monetary loss, however, was sustained by the sugar cane mills in the western part of the County, where contracted part-time help and union workers must be paid whether or not the mills run. The six (6) mills in PBC and the one (1) in Hendry combined lost about $500,000 a day in wages. The mills remained down until the fields dried out.

There are 671 listed farm proprietors with approximately 8,000 employees and a total annual payroll of $12,894,000 in PBC. It also has approximately 627,924 acres of farmland currently valued at $2,417,525.

Historic Hurricane/Tropical Storm Events

Hurricane of September 1928 – This hurricane made Florida landfall near the Town of Palm Beach as a strong Category 4 hurricane with one of the lowest barometric pressures ever recorded in this area (928.9 millibars/27.42 in). This was the fifth most intense hurricane ever to make landfall in U.S. territory. It reached Lake Okeechobee with very little diminished intensity and moved across the northern shoreline. This sent a massive storm surge southward flooding lower areas on the southern and western edge of the lake. In excess of, 2,500 people were killed during this storm's passage. Nearly all the loss of life was in the Okeechobee area and was caused by overflowing of the lake along its southwestern shore. While all of central Florida was affected by this killer storm, PBC mainly experienced wind damage and flooding from the associated rains.

Hurricane of August 1949 – This Category 2/Category 4 hurricane made landfall in Florida between Delray Beach and Palm Beach with winds of 120 mph and a barometric pressure of 954.0 millibars (28.17 in). As it moved inland, its center passed over the northern part of Lake Okeechobee, but the levees in that area held and no major flooding occurred. Damages were estimated at $45 million. Tides of 11.2 ft. at Fort Pierce, 8.5 ft. at Stuart, and 6.9 ft. at Lake Worth Beach were reported. Stuart sustained severe damages from this storm. Statewide, over 500 people lost their homes as a result of this storm.

Hurricane Donna of September 1960 – Hurricane Donna was the sixth most intense U.S. Hurricane at landfall. This storm crossed the Florida Keys into the Gulf of Mexico then turned back toward the northeast and struck the Florida mainland just south of Naples. It then turned

north moved across Ft. Myers, where it turned again to the northeast, moved across the state, and exited Florida at just north of Daytona Beach. Rainfall ranged from five (5) to ten inches in an 80- to 100-mile wide belt following this storm's track. Lakes and streams overflowed their banks and forced the evacuation of many homes throughout central Florida. The high water closed many roads and inundated considerable agricultural land. At least 12 people were killed statewide and more than 1,794 were injured.

Hurricane Agnes of June 1972 – Hurricane Agnes moved through the Gulf of Mexico off Florida's west coast. While it never struck central Florida mainland, it spawned the worst severe weather outbreak in Florida history. The outer rain bands covered virtually the entire peninsula and spawned numerous tornadoes. There were six (6) people killed and 40 injured in Okeechobee, one (1) killed and seven (7) injured in La Belle, 40 injured at Big Coppit Key, two (2) injured at Bassinger, three (3) injured in Haines City, four (4) at Crystal Springs, 11 in Malabar, and 12 in Cape Canaveral. Most of those injured lived in manufactured housing. Damage estimates totaled $5 million to public property and $26 million to private property.

Tropical Storm Gordon of October 1994 – Following a similar track to hurricane Donna of 1960, tropical storm Gordon crossed the Florida Keys into the Gulf of Mexico then turned back to the northeast and struck the mainland Florida Peninsula near Fort Myers on October 12, 1994. It moved across the state and exited Florida into the Atlantic just north of Vero Beach on October 16. Although the maximum sustained winds reported from Gordon were only 52 mph, the storm caused eight (8) deaths and 42 injuries.

The County had experienced a period of extensive growth during the 1970s and 1980s. Most of this growth took place in the form of residential and commercial land development in the eastern portion of PBC close to the Intracoastal Waterway and the beaches. The rain event associated with Tropical Storm Gordon in October of 1994 was the most significant rain event to occur after this period of development. Essentially, the County received 17+ inches of rain over a 2-day period. Rainfall was not evenly disbursed over the whole County.

Statewide damages associated with Gordon totaled over $400 million. Agricultural interests sustained $275 million in damages primarily from the widespread flooding. Vegetable and citrus crops were hit particularly hard. Exacerbating the flooding associated with Tropical Storm Gordon was the fact that prior to October 1994 had been a very wet year for PBC. Rainfall recorded through September of that year had reached 74 inches before the Gordon event occurred. Altogether, PBC received approximately 100 inches of rain in 1994, making that year the wettest year since 1912.

Hurricane Irene of October 1999 – Hurricane Irene weakened to Tropical Storm force winds by the time it tracked north through the Everglades, but it menaced South Florida and PBC with incessant rains and its sluggish pace. In the end, it dropped 10-20 inches of rain throughout the County, causing extensive flooding in some areas. By Friday evening (October 15), 125,000 homes in PBC were without power.

Hurricane Frances of September 4, 2004 – Hurricane Frances formed from a tropical depression in the deep tropical Atlantic on August 25, about 1400 miles east of the Lesser Antilles and reached hurricane strength on August 26. Frances became a Category 4 Hurricane on August 28, while about 700 miles east of the Lesser Antilles. Frances then moved generally west-northwest and weakened to a Category 2 hurricane while crossing the northwest Bahamas. After stalling for about 12 hours on September 4 in the Florida Straits between Grand Bahama Island and the southeast Florida coast, the center of the nearly 70-mile diameter eye crossed the Florida coast near Sewalls Point at 1 A.M. EDT September 5, with the southern eyewall affecting the extreme northeast portion of PBC. Frances moved farther inland just north of Lake Okeechobee and weakened to a tropical storm before crossing the entire Florida Peninsula and exiting into the Gulf of Mexico just north of Tampa. It made a second landfall as a tropical storm in the eastern Florida Panhandle.

Sustained tropical storm-force winds likely occurred in all six (6) south Florida counties. Although no sustained hurricane-force winds were officially observed in any of the six (6) south Florida counties, a National Weather Service (NWS) instrument on the eastern shore of Lake Okeechobee at Port Mayaca, just across the PBC border, measured a sustained wind of 85 mph. At West Palm Beach International Airport, the highest sustained wind was 64 mph with a peak gust of 82 mph and the lowest observed barometric pressure was 972 millibars. A SFWMD instrument measured a peak wind gust of 92 mph over the eastern portion of Lake Okeechobee. The estimated peak wind gust in the Palm Beach metro area was 91 mph at Jupiter Inlet with a peak wind gust of 87 mph measured by a Coastal-Marine Automated Network (C-MAN) station at Lake Worth Beach Pier. In Glades County near the western shore of Lake Okeechobee, the highest measured sustained wind was 60 mph with a peak gust of 90 mph. In Clewiston, a sustained wind of 60 mph with a gust of 80 mph was estimated.

A maximum storm-total rainfall amount of 12.56 inches was measured at Palm Beach International Airport with 10.26 inches of that occurring in a 24-hour period. Unofficial storm-total rainfalls included 9.56 inches at Boynton Beach, eight (8) inches at Deerfield Beach and 7.18 inches at Hillsboro Canal. Widespread storm-total amounts of three (3) to five (5) inches occurred in southeast and interior south Florida with southwest Florida averaging one (1) to three (3) inches. Rainfall flooding was mostly minor except for a few locations in PBC, which had up to three (3) feet of standing water. A section of I-95 in PBC was closed due to a large sinkhole. The maximum storm surge was estimated to have ranged from two (2) to four (4) feet along the northeast Palm Beach Coast to one (1) to two (2) feet along the northeast Broward Coast.

Within the confines of the Herbert Hoover Dike, water levels on Lake Okeechobee fluctuated up to five (5) feet above and below normal. Coastal beach erosion was moderate in Palm Beach and portions of Broward counties.

There were no confirmed tornadoes. There were no known direct deaths, but at least nine (9) people died in the aftermath. Six (6) of these deaths occurred in PBC, mainly as the result of vehicle-related accidents or from drowning. An unknown number of injuries occurred. Property damage at the coast occurred mainly to marinas, piers, seawalls, bridges and docks, as well as to boats. Inland structure damage included 15,000 houses and 2,400 businesses in PBC. Wind

damage to house roofs, mobile homes, trees, power lines, signs, screened enclosures and outbuildings occurred over much of southeast Florida including areas near Lake Okeechobee but was greatest in PBC. A preliminary damage estimate for Frances in south Florida was $620 million, including $500 million in Palm Beach, $80 million in Broward, and $24 million in Miami-Dade. Crop damage in PBC was estimated at an additional $70 million to sugar cane and vegetables and additional heavy losses occurred to nurseries. Florida Power and Light reported power outages for 659,000 customers in Palm Beach, 590,000 in Broward, 422,000 in Miami-Dade, 29,200 in Collier, 2,500 in Hendry and 1,700 in Collier. An estimated 17,000 persons sought refuge in public shelters in PBC and nearly 7,000 in Broward County.

Hurricane Jeanne of September 25, 2004 – Just three (3) weeks after Hurricane Frances, Hurricane Jeanne struck the same area of southeast Florida. Hurricane Jeanne formed from a tropical depression just east of the Leeward Islands on September 12. She moved across Puerto Rico and Hispaniola then turned north into the Atlantic and became a hurricane on September 20th. Jeanne made a clockwise loop for three (3) days in the Atlantic north of Hispaniola before moving west-northwest. It strengthened to a Category 2 Hurricane while over the northwest Bahamas and then made landfall around 11 P.M., September 25 near the south end of Hutchinson Island, nearly coincident with the landfall point of Hurricane Frances just three (3) weeks before. The 40-mile diameter eye was not quite as large as Frances, but the southern eyewall again affected northeast PBC. After landfall, Jeanne initially moved along a track similar to Frances, just north of Lake Okeechobee as it weakened to a tropical storm then turned to the northwest and moved over the northwest Florida Peninsula.

Although slightly smaller and stronger than Hurricane Frances, winds and pressures over southeast Florida were remarkably similar to Frances. Unfortunately, the Automated Surface Observing System (ASOS) at Palm Beach International Airport stopped sending data during the height of the hurricane. Sustained tropical storm-force winds likely occurred over most of Palm Beach and northeast Glades counties and portions of Broward, Hendry, and Collier counties. Although no sustained hurricane-force winds were officially observed in any of the six (6) south Florida counties, portions of northern PBC mostly likely experienced them. A SFWMD instrument in the Martin County portion of Lake Okeechobee measured a 15-minute sustained wind of 79 mph with a peak gust of 105 mph. In metropolitan Palm Beach, the highest official sustained wind speed was 60 mph with a peak gust of 94 mph from the C-MAN station at Lake Worth Beach Pier. An unofficial peak wind gust of 125 mph was measured in West Palm Beach at the Solid Waste Treatment Plant. Near Clewiston, the highest measured sustained wind was 21 mph with a peak wind gust of 72 mph from a SFWMD instrument. The lowest barometric pressure of 960.4 millibars was measured at a SFWMD site in the Martin County portion of Lake Okeechobee.

A SFWMD gauge measured a maximum storm-total rainfall amount of 10.22 inches over the eastern portion of Lake Okeechobee. A SFWMD gauge about four (4) miles west of West Palm Beach International Airport measured 9.10 inches with 8.79 inches of that occurring in a 24-hour period. At Moore Haven, 5.99 inches of rain was measured. Mostly minor rainfall flooding was observed except in Palm Beach Gardens, Jupiter and in the farmlands of western PBC where it was more severe.

The estimated maximum storm surge ranged from two (2) to four (4) feet along the northeast Palm Beach Coast to one (1) to two (2) feet along the northeast Broward Coast. Within the confines of the Herbert Hoover Dike, water levels on Lake Okeechobee fluctuated up to seven (7) feet above and below normal causing severe flooding of some marinas. Beach erosion was moderate in Palm Beach.

There were no confirmed tornadoes. There were no known direct deaths, but four (4) persons died in the aftermath. An unknown number of injuries occurred. Storm surge and winds at the coast caused damage to condominiums, marinas, piers, seawalls, bridges and docks, as well as to boats and a few coastal roadways. Inland wind damage to building roofs, mobile homes, trees, power lines, signs, and outbuildings occurred mainly over PBC and portions of eastern Glades and Hendry counties. Preliminary damage estimates for Jeanne in southeast Florida were $220 million, including $260 million in PBC, $50 million in Broward and $10 million in Miami-Dade. Agricultural Damage in PBC was estimated at $20 million. Florida Power and Light reported outages occurred to 591,200 customers in PBC, 165,900 in Broward, 25,100 in Miami-Dade, 5,200 in Collier, 2,000 in Hendry and 1,500 in Glades. An estimated 12,524 persons sought refuge in public shelters in PBC.

Hurricane Wilma October 24, 2005 – Wilma was a classic October hurricane, which struck South Florida as a Category 2 hurricane on October 24, 2005. Wilma developed from a tropical depression near Jamaica, a typical source region for October tropical cyclones, on the afternoon of October 15. It became the 21st named storm of the season during the morning hours of October 17, which tied the record for the most named storms in one (1) season originally set back in 1922. Wilma underwent a rapid intensification cycle, which began on October 18 and ended in the early morning hours of October 19, with a central pressure decrease of 88 millibars in only 12 hours. The central pressure reached 882 millibars, making Wilma the most intense hurricane ever in the Atlantic Basin, lower than Hurricane Gilbert in September 1988. Wilma went on to make landfall on Cozumel Island just off the Yucatan Peninsula as a strong Category 4 hurricane on October 21, then drifted erratically over the Yucatan Peninsula through the evening October 22. Wilma began to move off the northeast coast of the Yucatan Peninsula on the night of the 22nd, then gradually accelerated northeast over the southern Gulf of Mexico toward South Florida as a strong mid and upper-level trough over the central United States moved south and forced a southwesterly steering flow.

The hurricane made landfall as a Category 2 storm shortly before 7:00 a.m. Monday October 24 on the southwest Florida coast between Everglades City and Cape Romano with maximum sustained winds of 125 mph and an estimated minimum central pressure of 950 millibars. Wilma exhibited a very large 55- to 65-mile-wide eye while crossing the state, and the eye covered large portions of South Florida, including the eastern two-thirds of Collier County, extreme northwestern Miami-Dade County, the southern and eastern third of Hendry County, most of Broward County, and all of PBC. The eye also clipped the southeastern shore of Lake Okeechobee. The eye wall affected virtually all of South Florida. Around 10:20 a.m., a SFWMD meteorological station located at the south end of Lake Okeechobee reported sustained winds of 102 mph. The highest recorded gusts were in the 100-120 mph range. The winds on the back (south/west) side of the eye wall were as strong, if not stronger, than those on the front (north/east)

side. This goes against the common, but sometimes erroneous, belief that the strongest winds in a hurricane are always in the right-front quadrant of the storm. This occurred over much of South Florida, except for central and southern Miami-Dade County, which barely missed the southwestern portion of the eye wall and likely contributed to the heavier damage across Broward and Palm Beach counties compared to slightly lesser damage across much of Miami-Dade and Collier counties.

Wilma moved rapidly northeast across the state, with an average forward speed of 25 mph. Wilma exited the east coast over northeastern PBC near Palm Beach Gardens around 11:00 a.m. on Monday October 24 as a Category 2 hurricane with maximum sustained winds of around 105 mph. It traversed the southern peninsula in about four (4) hours. Rainfall amounts across South Florida generally ranged from two (2) to four (4) inches across southern sections of the peninsula to four (4) to six (6) inches across western Collier County and around Lake Okeechobee, with a maximum amount of 7.21 inches in Clewiston, Downtown Miami and Northeast Miami.

In Collier, Miami-Dade, Broward, and Palm Beach Counties, the winds killed five (5) people. Total damage estimates from all the effects ranged from $9 to $12 billion. Extensive damage to crops was reported, with an estimated $222 million in crop damage for Miami-Dade County alone. Damage was widespread, with large trees and power lines down virtually everywhere, causing over two (2) million customers to lose power. Structural damage was heaviest in Broward and Palm Beach counties where roof damage and downed or split power poles were noted in some areas. High-rise buildings suffered considerable damage, mainly in the form of broken windows. This was observed mainly along the southeast metro areas. An F1 tornado caused snapped power poles, uprooted large trees, and significant damage to mobile homes. Small swaths of greater damage elsewhere in South Florida have not been attributed to tornadoes but were instead likely caused by "mini-swirls", small vortices within the eye wall.

Tropical Storm Fay of August 15-22, 2008 – The center of Tropical Storm Fay moved across Key West early in the evening of August 18, and into the mainland of South Florida at Cape Romano shortly before 5:00 a.m. the next day. Minimum central pressure was 989 millibars at landfall but continued to decrease after landfall to 986 millibars at Moore Haven on the southwest shore of Lake Okeechobee.

Maximum sustained winds were estimated to be around 60 mph at landfall, however as the storm tracked across the western Everglades and Southwest Florida the radar presentation continued to organize and winds increased to around 65 mph around Moore Haven. A maximum wind gust of 79 mph was recorded on a South Florida Water Management gauge on Lake Okeechobee as the storm passed. Wind gusts of tropical storm force were felt area-wide, with sustained tropical storm force winds experienced over portions of mainland Monroe, Collier, Hendry and Glades counties as well as the immediate coastal sections of Miami-Dade, Broward, and Palm Beach Counties. Wind damage was most significant in the areas affected by tropical storm force sustained winds, primarily around Lake Okeechobee and interior sections of southwest Florida, with only minor wind damage elsewhere.

The storm caused over $10 million in beach erosion along PBC's coastline. A maximum rainfall total of 16.17 inches was reported with this event at Moore Haven in Glades County. Flooding from these rains produced total damage estimates of $280,000, primarily in Glades and Hendry counties. Rainfall elsewhere ranged from three (3) to six (6) inches in southeast Florida, and six (6) to eight (8) inches in southwest Florida, with isolated amounts up to ten inches in coastal PBC. All the associated effects of Tropical Storm Fay in South Florida resulted in one (1) fatality, four (4) injured, and $2.949 million in property damage. Two (2) tornadoes produced $1.25 million in damage but caused no injuries or fatalities. The one (1) fatality and three (3) of the injuries were indirectly caused by Fay, with a traffic accident in PBC. The direct injury occurred when a kite surfer on Fort Lauderdale Beach lost control during a squall and was slammed into a building along A1A. Fay caused tropical storm force winds, significant rainfall flooding in some areas and two (2) confirmed tornadoes.

Hurricane Irene of August 25–26, 2011 – Hurricane Irene passed over the western Bahamas about 170 miles east of the Florida coast. The western fringes of Irene affected southeast Florida with high surf and winds bordering on tropical storm force. Winds to marginal tropical storm force and high surf affected the PBC coast as the outer fringes of Hurricane Irene passed over the area. Sustained winds to 26 knots with gusts to 46 knots were measured near the coast from Jupiter through Boynton Beach associated with intermittent squalls. Wind damage was limited to a few uprooted trees and knocked down tree branches, causing minor power outages. High surf pounded the coast during the day, causing damage to Lake Worth Beach Pier totaling $2,000 and injuring eight (8) people at Boynton Inlet when a large wave crashed onto the jetty while onlookers were present. Maximum storm surge at Lake Worth Beach Pier was 1.28 feet with a maximum tide of 1.55 feet.

Tropical Storm Debby of June 22-27, 2012 – The outer bands from Tropical Storm Debby located in the Northeast Gulf of Mexico continued to move over South Florida. Severe thunderstorms developed during the late morning into the afternoon with severe wind gusts and eight (8) tornadoes occurring over a span of four (4) hours in Lake Worth Beach, Okeechobee Boulevard and east of I-95, a warehouse district just south of Okeechobee Boulevard, Tamarind Avenue, and Banyan Boulevard. Additional details related to the tornadoes is discussed below.

Hurricane Isaac of August 26, 2012 – The center of Tropical Storm Isaac moved over the Florida Straits south of the Florida Keys on Sunday, August 26, passing just south of Key West. Rain bands and winds on the north side of the circulation of Isaac affected Southeast Florida throughout the day of the 26th and part of the 27th. Highest winds over land were recorded along and near the southeast Florida coast where the highest sustained winds ranged from 40-45 mph, with 25-30 mph sustained winds over most inland areas as well as over southwest Florida. Highest wind gusts ranged from 50-60 mph over most land areas to as high as 65 mph along the Atlantic coast and just offshore. Three-day rainfall totals ending at 8:00 a.m. August 28 ranged from five (5) to seven (7) inches across southeast Florida to two (2) to five (5) inches over interior and southwest Florida. The primary exception was over northern metro Broward County and much of PBC where eight (8) to twelve (12) inches fell, with maximum amounts up to 15-18 inches from west of Boynton Beach to Wellington, The Acreage, Royal Palm Beach, and Loxahatchee. These areas of highest rainfall amounts experienced severe flooding with communities cut off for several days after the

storm. Maximum storm tide values were observed at 4.9 feet at Naples, with estimates of five (5) to seven (7) feet along the southern Collier County coast from Goodland to Everglades City. Highest estimated inundation values of up to two (2) feet above ground level were noted in Goodland and Everglades City. Major beach erosion was also observed along the Collier County beaches, with moderate beach erosion along the Atlantic beaches. All of the associated effects of Isaac in south Florida resulted in about $17.2 million in property damage. Specifically, Isaac's inland floodwaters resulted in about $10 million in damages, mostly in Palm Beach and Broward counties. Flooding caused by storm tides along the coast in Collier County resulted in about $400 thousand in damage. Damage from beach erosion in Collier and Broward counties was estimated at $6 million. Wind damage was estimated at $750,000. Approximately 112,000 customers lost power during the storm in South Florida.

Hurricane Sandy of October 25-26, 2012 – Hurricane Sandy began to affect the PBC coast and its adjacent Atlantic waters with tropical storm force winds during the evening of October 25 as it moved slowly north across the northwest Bahamas. Tropical storm force wind gusts were first observed along the coastal PBC region by early in the evening of October 25. Several Weather Flow sensors along and near the PBC coast recorded Tropical Storm Force wind gusts during the evening of October 25, with a peak wind gust of 67 mph observed at Jupiter. However, as Hurricane Sandy continued to move slowly north and then northeast over the Atlantic waters north of the Bahamas through October 28, the main effect along the PBC coast were large northeast swells generated by the storm, which pummeled the Southeast Florida coast with significant beach erosion and coastal flooding. Large breaking waves of possibly over 20 feet were estimated along the coast. As a result, major coastal flooding occurred with the most significant impacts experienced from central Palm Beach north, including the Manalapan area where beachfront structures were threatened by water intrusion. In all, there was an estimated $14 million in damage sustained in PBC. A total of 44,270 customers lost power. A maximum storm tide of 5.2 feet above mean lower low water (MLLW) was observed at Lake Worth Beach Pier on October 28 at 7:12 a.m. along with a maximum storm surge of 2.28 feet on October 28 at 2:26 a.m. Similar tide and surge levels were measured at the highest daily high tide during this period, generally between 7:00 and 9:00 a.m.

Tropical Storm Andrea of June 5-7, 2013 – During the early evening of June 5, 2013, Tropical Storm Andrea formed in the east-central Gulf of Mexico becoming the first named storm of the 2013 tropical season, and over the next 48 hours, Andrea would pummel portions of south Florida with heavy rainfall and major flooding. Andrea even spawned three (3) tornadoes including an EF-1 tornado that tore through portions of northeast PBC. Although Andrea never made landfall in south Florida, it had far-reaching impacts that mainly affected the east coastal areas. During the early morning hours of June 6, convective rain bands well to the southeast of the storm center streamed across the south Florida area spawning three (3) tornadoes. The first occurred just after 3:00 a.m. and affected the town of Belle Glade in PBC. Only minor damage to trees and power lines was sustained from this tornado and was rated as an EF-0. Just a few hours later, another tornado ripped through The Acreage community in north central PBC.

Hurricane Matthew of October 7, 2016 – Hurricane Matthew moved north along the east coast, previously hitting Cuba and Haiti, it moved into Florida as a much weaker hurricane than before.

Matthew never made landfall, as the eye barely missed Cape Canaveral. Matthew killed twelve people in the state, produced flooding and high winds, and knocked out power to 1.1 million people. Despite significant preparations, PBC was not directly impacted.

Hurricane Irma of September 10-11, 2017 – Tropical Storm Irma formed on August 30 and intensified into a Category 5 cyclone on September 5. Irma attained its peak intensity with winds of 185 mph later that day and maintained Category 5 intensity when it made landfall in Cuba on September 9. Land interaction disrupted the storm temporarily, but once again it strengthened to a Category 4 storm with winds of 130 mph when it made landfall in Cudjoe Key of the Florida Keys early on September 10. A few hours later, it struck Marco Island, Florida, with winds of 115 mph. Irma steadily weakened as it continued north and west. It was the strongest hurricane in terms of wind speed to hit Florida since Charley in 2004, and the most intense in terms of pressure since Andrew in 1992. Irma killed at least 82 people in Florida. Preliminary damage estimates for PBC were over 145 million dollars in damage. According to Florida Power and Light, 680,799 PBC customers lost power, and more than 20% of the County's customers remained without power four (4) days after the storm.

With peak winds of 185 mph, Irma was the strongest Atlantic storm outside of the Gulf of Mexico or Caribbean Sea on record and is the 11th most intense hurricane on record in the Atlantic basin. Maintaining peak intensity for 37 consecutive hours, Irma is the only tropical cyclone on record worldwide to have had winds that intense for such a long duration. Surprisingly, very little flood damage was reported, and almost all damage was wind related.

Tropical Storm Philippe of October 22, 2017 – Philippe made landfall over the Everglades in southwest Florida with winds of 45 mph. Effects were relatively minor in Florida, although Philippe brought moderate rain and spawned a few weak tornadoes, including one (1) in West Palm Beach. Some localized flooding was reported, mostly on streets with very few homes affected.

Hurricane Dorian August 24, 2019 – Hurricane Dorian was an extremely powerful and catastrophic Category 5 Atlantic hurricane, which became the most intense tropical cyclone on record to strike the Bahamas and tied for the strongest landfall in the Atlantic basin. The 2019 cyclone is regarded as the worst natural disaster in the Bahamas' recorded history. While this storm did not directly affect PBC, the County, and its municipalities were activated because of the proximity of the storm.

Both residents and government entities were able to provide support and relief efforts to the islands of the Bahamas. Because of the proximity, residents helped bring donations gathered throughout South Florida over to the islands to help those affected by the storm. Palm Beach County Emergency Management opened a shelter for those evacuating the Bahamas. The County sheltered approximately 120 civilians.

Hurricane Ian September 23-30, 2022 – Hurricane Ian was a deadly and extremely destructive Category 5 Atlantic hurricane, which was the third-costliest weather disaster on record, the deadliest hurricane to strike the state of Florida since the 1935 Labor Day hurricane, and the

strongest hurricane to make landfall in Florida since Michael in 2018. While this storm did not make direct landfall in PBC, the County, and its municipalities were activated because of the proximity of the storm. Because of the location of landfall, numerous tornadoes made touchdown throughout the county.

The PBC Division of Emergency Management as well as employees from multiple municipalities sent mutual aid and supplies over to the affected areas on the West Coast of Florida. This included EOC personnel, first responders, and donations.

Hurricane Nicole November 8-11, 2022 – Hurricane Nicole was a sprawling late-season Category 1 hurricane in November 2022. The fourteenth named storm and eighth hurricane of the 2022 Atlantic hurricane season. On November 10, it made landfall twice in Florida, south of Vero Beach and then northwest of Cedar Key, after briefly emerging over the Gulf of Mexico. Nicole then weakened to a depression while moving over the Florida Panhandle, and then was absorbed into a mid-latitude trough and cold front over extreme eastern Tennessee the following day. While this storm did not make direct landfall in PBC, the County, and its municipalities were activated because of the proximity of the storm. Some minor flooding occurred on the barrier islands but no major incidents. Beach erosion was notable after this storm.

Climate Change

As the climate continues to change, warmer temperatures and shifting weather patterns will increase hurricanes and tropical storms. As population and development increase in the County and its jurisdictions, the probability that hurricanes and tropical storms will cause property damage or human casualties also increases. With more people migrating to Palm Beach County and its jurisdictions, a larger percent of the land and population may become more vulnerable to hazards. The higher standards adopted by Florida's Building Code decrease vulnerability.

At-Risk Populations

- Older Adults
- Children
- Unhoused Individuals
- People with Disabilities
- Persons with Chronic Health Conditions
- Persons with Low Income
- Linguistically Isolated
- Responders

Vulnerable populations and populations located near the coast or in urban areas may face greater risk. Injury or death can be caused by the following:

- Car accidents because of flood waters, high winds, panic, traffic jams during evacuations, no power after storm
- Not receiving emergency response during storm

- Delayed emergency response because of blocked roads, high call volume, etc.
- Drowning in flood waters
- Dangerous debris
- Stranded on roof because of flooding
- Exposure to hazardous materials
- Illness from contaminated water
- Carbon monoxide poisoning from generator misuse
- Food, water, and shelter scarcity
- Pet and other animal deaths from all of the above

In addition to injury and death, the aftermath of a tropical cyclone can have an emotional or psychological toll as well.

- Delay in medical care or treatment, including access to medications
- Loved ones and friends being injured or dying
- Stress and anxiety in the aftermath, especially if one's home is lost
- Survivor's guilt
- Difficulty getting aid, especially financial aid
- Loss of job and income
- Losing a pet during the storm

Location

The entire county and its jurisdictions bear a high overall risk for hurricanes and tropical storms. Town of Palm Beach and City of West Palm Beach are old, historical communities on PBC's east coast. Their age alone makes them particularly vulnerable to hurricane damage. Both cities have old, historically significant structures whose loss would represent the loss of irreplaceable cultural resources. The age and construction type of much of the housing in West Palm Beach and to a lesser extent in many of the other coastal communities, suggests these communities would be hit very hard by a major storm. The below table, also in Appendix A, illustrates the varying risk across jurisdictions.

Hazard Assessment H: High M: Medium L: Low V: Very Low	Unincorporated County	MUNICIPALITIES																																					
		Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
Vulnerability	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
Exposure	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
Overall Risk	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H

Impacts – Consequence Analysis Summary

The entire county and its jurisdictions is subject to the effects of hurricanes and tropical storms. However, the coastal areas are much more vulnerable. This is due to the County's large span of coastal shorelines. Although all parts of the County and its jurisdictions are and can be impacted by hurricanes and tropical storms at different levels over time, the coastal areas of Boca Raton, Boynton Beach, Briny Breezes, Delray Beach, Gulf Stream, Highland Beach, Hypoluxo, Juno Beach, Jupiter, Jupiter Inlet Colony, Lake Park, Lake Worth Beach, Lantana, Manalapan, North Palm Beach, Ocean Ridge, Palm Beach, Palm Beach Shores, Riviera Beach, South Palm Beach, Tequesta, and West Palm Beach are more vulnerable to tropical storms and Category 1 hurricanes due to their proximity to the ocean, storm surge potential, urban development, and being more densely populated. Whereas, the inland communities of Atlantas, Belle Glade, Cloud Lake, Glen Ridge, Golf, Greenacres, Haverhill, Lake Clarke Shores, Loxahatchee Groves, Mangonia Park, Pahokee, Palm Beach Gardens, Palm Springs, Royal Palm Beach, South Bay, Wellington, and Westlake become more vulnerable when a storm reaches Category 3.

The consequence analysis from hurricanes and tropical storms has been determined as follows for each category of storm:

Category 1 Hurricane

Low Consequence
- Continuity of Operations
- Regulatory & Contractual Obligations
- Reputation of County

Medium Consequence
- Health & Safety of Residents
- Health & Safety of Responders
- Property, Facilities & Infrastructure
- Historical Resources
- Delivery of Services
- Environment
- Economic & Financial Conditions

Category 2 Hurricane

Low Consequence
- Regulatory & Contractual Obligations
- Reputation of County

Medium Consequence
- Continuity of Operations
- Health & Safety of Residents

- Health & Safety of Responders
- Property, Facilities & Infrastructure
- Historical Resources
- Delivery of Services
- Environment
- Economic & Financial Conditions

Category 3 Hurricane

Low Consequence
- Reputation of County

Medium Consequence
- Continuity of Operations
- Health & Safety of Residents
- Health & Safety of Responders
- Property, Facilities & Infrastructure
- Historical Resources
- Delivery of Services
- Economic & Financial Conditions
- Regulatory & Contractual Obligations

High Consequence
- Environment

Category 4 Hurricane

High Consequence
- Health & Safety of Residents
- Health & Safety of Responders
- Continuity of Operations
- Property, Facilities & Infrastructure
- Historical Resources
- Delivery of Services
- Environment
- Economic & Financial Conditions
- Regulatory & Contractual Obligations
- Reputation of County

Tropical Storm

Low Consequence
- Continuity of Operations
- Regulatory & Contractual Obligations

- Reputation of County

Medium Consequence

- Health & Safety of Residents
- Health & Safety of Responders
- Property, Facilities & Infrastructure
- Historical Resources
- Delivery of Services
- Environment
- Economic & Financial Conditions

Consequence Rating	Consequence Analysis Detail
Very Low	Hazard is very unlikely to have any measurable or lasting detrimental impact of a particular type and consequences will likely be rectified promptly with locally available resources
Low	Hazard is not likely to have any measurable or lasting detrimental impact of a particular type and consequences will likely be rectified promptly with locally available resources
Medium	There will likely be a measurable detrimental impact, which may require some time to rectify and may require outside resources and/or assistance.
High	The impact will likely be severe and of longer duration, and require substantial time, resources, and/or outside assistance to rectify
Split Box	Hazard would have differing consequences between geographic locations within the county

Overall Vulnerability

The entire area of Palm Beach County and its jurisdictions are highly vulnerable to hurricanes. The coastal communities will be impacted by tropical storms and all category of hurricanes while facing impacts from storm surge and storm tide as well as high winds. The inland communities will be impacted by Category 3 and higher hurricanes as they face high winds and inland flooding. From 1920 through 1959, a total of 58 hurricanes struck the U.S. mainland, 25 of which were Category 2 or higher (major storms). Between 1960 and 1989, 42 hurricanes struck the U.S. of which only 16 were Category 2 or stronger. Most hurricane experts feel we are entering a period of increased hurricane formation similar to the levels seen in the 1920s and 1940s. Current hurricane risk calculations are complicated by climatic factors suggesting the potential for even greater hurricane frequency and severity in the world's entire hurricane spawning grounds. Since 1995, there have been 220 Atlantic hurricanes, 15 of which occurred in 2005 alone. The below chart quantifies the activity in the Atlantic by classification. Climate change may cause changes in storm frequency and the precipitation rates associated with storms. A modest 0.9-degree Fahrenheit (0.5 degree centigrade) increase in the mean global temperature will add 20 days to the annual hurricane season and increase the chances of a storm-making landfall on the U.S. mainland

by 22%. The warmer ocean surface will also allow storms to increase in intensity, survive in higher latitudes, and develop storm tracts that could shift farther north, producing more U.S. landfalls.

Table 2.5 Atlantic Ocean Cyclone Activity Since 1995

Atlantic Tropical Cyclone Activity					
Year	Hurricanes	Tropical Storms	Subtropical Storms	Topical Depressions	Total Per Year
1995	11	8	0	2	21
1996	9	4			13
1997	3	5	1		9
1998	10	4			14
1999	8	4	4		16
2000	8	6	1	4	19
2001	9	6		2	17
2002	4	8		2	14
2003	7	10		4	21
2004	9	5	1	1	16
2005	15	12	2	2	31
2006	5	5			10
2007	6	8	1	2	17
2008	8	8		1	17
2009	3	6		2	11
2010	12	7		2	21
2011	7	12		1	20
2012	10	9			19
2013	2	11	1	1	15
2014	6	2		1	9
2015	4	7		1	12
2016	7	8		1	16
2017	10	7		1	18
2018	8	7		1	16
2019	6	10	2	2	20
2020	14	15	1	1	31
2021	7	13	1		21
2022	9	6		2	17
2023	3	9	1		13
Total Per Classification	220	222	16	36	494

Severe (Category 4 or 5 on the Saffir-Simpson scale) hurricanes strike the U.S. on the average of three (3) every five (5) years (0.60 per year) (see http://www.aoml.noaa.gov/hrd/tcfaq/E19.html). Annually, hurricanes are estimated to cause approximately $1.2 billion in damages. The proximity of dense population to the Atlantic Ocean, as well as the generally low coastal elevations, significantly increases the County's vulnerability. The potential for property damage and human casualties in PBC has increased over the last several decades primarily because of the rapid growth this county has experienced since 1970, particularly along the vulnerable coastline areas.

Hurricane damage is caused by two factors: high winds and storm surge (storm surge discussed in **2.1.1 Flooding**).

Hurricanes and Tropical Storms are prevalent throughout the state of Florida. In Palm Beach County, particularly, the threat of hurricanes exists county-wide. The Eastern portion of the County is particularly vulnerable due to the proximity to the coast. Hurricanes can affect the area and cause physical damage to buildings and infrastructure, damage to buildings due to flooding, large amounts of debris, and an economic impact on the area. Due to these factors, each city within the county places a high probability, vulnerability, exposure, and overall risk to hurricanes and tropical storms.

Wind that produces most of the property damage associated with hurricanes. The greatest threat to life is from flooding and storm surge. Although hurricane winds can exert tremendous pressure against a structure, a large percentage of hurricane damage is caused not by flying debris. Tree limbs, signs and signposts, roof tiles, metal siding, and other lose objects can become airborne penetrating the outer shells of buildings destroying their structural integrity and allowing the hurricane winds to act against interior walls not designed to withstand such forces. Once a structure's integrity is breached, the driving rains associated with hurricanes can enter the structure and completely destroy its contents. Hurricane winds are unique in several ways. They are:

- More turbulent than winds in most other type storms.
- Sustained for a longer period of time (several hours) than any other type of atmospheric disturbance.
- Change slowly in direction, thus they are able to seek out the most critical angle of attack on a given structure.
- Generate large quantities of flying debris as the built environment is progressively damaged, thus amplifying their destructive power.

Hurricane gusts of wind can be expected to exceed the sustained wind velocity by 25 to 50 %. This means a hurricane with sustained winds of 150 mph will have wind gusts exceeding 200 mph. The wind's pressure against a fixed structure increases with the square of the velocity. For example, a 100-mph wind will exert a pressure of approximately 40 lbs. per square foot on a flat surface, while a 190-mph wind will exert a force of 122 lbs. per square foot on the same structure. In terms of a four (4) by eight (8) foot sheet of plywood nailed over a window, there would be 1,280 lbs. of pressure against this sheet in a 100-mph wind, and 2,904 lbs. or 1.95 tons of pressure against this sheet in a 190-mph wind.

The external and internal pressures generated against a structure vary greatly with increases in elevation, building shape, openings in the structures, and the surrounding buildings and terrain. Buildings at ground level experience some reductions in wind forces simply because of the drag exerted by the ground against the lowest levels of the air column. High-rise buildings, particularly those located along the beachfront, will receive the full strength of a hurricane's wind on their upper stories. Recent studies estimate that wind speed increases by approximately 27 % just 15 feet above ground level.

The wind stream generates uplift as it divides and flows around a structure. The stream following the longest path around a building, generally the path over the roof, speeds up to rejoin the wind streams following shorter paths, generally around the walls. This is the same phenomena that generate uplift on an aircraft's wings. The roof, in effect, becomes an airfoil that is attempting to take off from the rest of the building. Roof vortexes generally concentrate the wind's uplift force at the corners of a roof. These key points can experience uplift forces of two (2) to five (5) times greater than those exerted on other parts of the roof.

Once the envelope of the building has been breached through the loss of a window, door, or roof damage, wind pressure on internal surfaces becomes a critical factor. Openings may cause pressurizing or depressurizing of a building. Pressurizing pushes the walls out, while depressurizing will pull the walls in. Internal pressure coupled with external suction adds to the withdrawal force on sheathing fasteners. Damages from internal pressure fluctuations may range from blowouts of windows and doors to total building collapse due to structural failure.

During Hurricane Andrew in 1992, catastrophic failure of one and two-story wood-frame buildings in residential areas was observed more than catastrophic failures in any other type of building. Single-family residential construction is particularly vulnerable because less engineering oversight is applied to its design and construction. As opposed to hospitals and public buildings which are considered fully engineered, and office and industrial buildings which are considered "marginally engineered," residential construction is considered "non-engineered." Historically, the bulk of wind damage experienced nationwide has occurred to residential construction. Fully engineered construction usually performs well in high winds due to the attention given to connections and load paths.

Hurricane winds generate massive quantities of debris, which can easily exceed a community's entire solid waste capacity by three (3) times or more. Debris removal is an integral first step toward recovery, and as such must be a critical concern of all those tasked with emergency management and the restoration of community services. The TAOS model predicts the following quantities of debris for PBC given the following hurricane strengths:

Table 2.6 The Arbitor of Storms (TAOS) Model

Storm Strength	Debris Generated
Tropical Storm	156,142 cubic yards/acre
Category 1 Hurricane	1,049,571 cubic yards/acre
Category 2 Hurricane	2,182,522 cubic yards/acre

Storm Strength	Debris Generated
Tropical Storm	156,142 cubic yards/acre
Category 3 Hurricane	7,421,401 cubic yards/acre
Category 4 Hurricane	16,289,149 cubic yards/acre
Category 5 Hurricane	44,874,888 cubic yards/acre

2.1.3 Severe Thunderstorms/Lightning

Description

Severe Thunderstorms

A severe thunderstorm is a rain shower during which one or more of the following phenomena: one (1) inch hail or greater, winds gusting in excess of 57.5 mph, and/or a tornado. Severe weather can include lightning, tornadoes, damaging straight-line winds, and large hail. Most individual thunderstorms only last several minutes; however, some can last several hours.

A supercell is a long-lived thunderstorm that has a persistent rotating updraft. This rotation maintains the energy release of the thunderstorm over a much longer time than typical, pulse-type thunderstorms, which occur in the summer months. Supercell thunderstorms are responsible for producing most of the severe weather, such as large hail and tornadoes (NOAA). Downbursts are also occasionally associated with severe thunderstorms. A downburst is a strong downdraft resulting in an outward burst of damaging winds on or near the ground. Downburst winds can produce damage similar to a strong tornado. Although usually associated with thunderstorms, downbursts can even occur with showers too weak to produce thunder (NOAA). Strong squall lines can also produce widespread severe weather, primarily very strong winds and/or microbursts.

Florida has more thunderstorm activity than any other US state. PBC residents are quite familiar with thunderstorms and the severe weather they can bring. When a severe thunderstorm approaches, the NWS will issue alerts. Two (2) possible alerts are:

- Severe Thunderstorm Watch - Conditions are favorable for the development of severe thunderstorms.
- Severe Thunderstorm Warning - Severe weather is imminent or occurring in the area.

Thunder is created when lightning passes through the air. The lightning discharge heats the air rapidly and causes it to expand. The temperature of the air in the lightning channel may reach as high as 50,000 degrees Fahrenheit, five (5) times hotter than the surface of the sun. Immediately after the flash, the air cools and contracts. Lightning occurs with all thunderstorms and is very dangerous. Most lightning strikes are cloud to cloud but some are cloud to ground. These are the ones that kill approximately 93 people per year in the U.S.

NOAA's National Weather Service Storm Prediction Center defines thunderstorm risk categories in the below graphic.

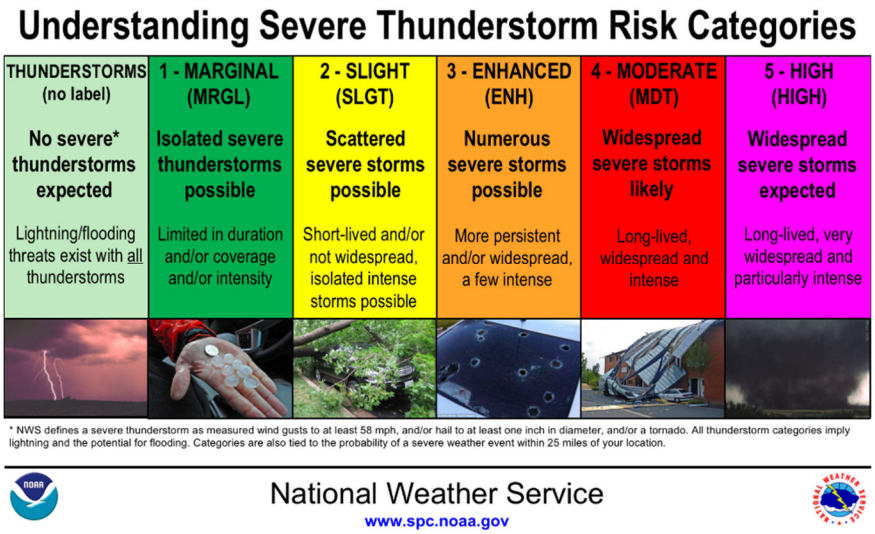


Figure 2.6 Severe Thunderstorm Risk Categories (NWS)

Lightning

Scientifically, lightning is an electrostatic discharge accompanied by the emission of visible light and other forms of electromagnetic radiation. It is a giant spark of electricity in the atmosphere between clouds, the air, or the ground. In the early stages of development, air acts as an insulator between the positive and negative charges in the cloud and between the cloud and the ground. When opposite charges build up sufficiently, the insulating capacity of the air breaks down causing a rapid discharge of electricity that we know as lightning. The flash of lightning equalizes the charge regions in the atmosphere until the opposite charges build up again (NOAA, 2023).

The risk of being struck by lightning is low, but the consequences of being struck are serious. According to the National Lightning Safety Council, Florida ranks #1 in lightning related deaths with 51 deaths statewide from 2013 to 2022. Florida is considered the "lightning capital" of the country with more than 2,000 lightning injuries over the past 50 years. The peak months for lightning strikes in Florida are June, July, and August, but no month is safe from lightning danger, and all of PBC is equally vulnerable to this hazard.

According to NOAA's storm events database, from January 2019 – August 2023, PBC experienced 60 thunderstorm events with winds gusts over 50 knts (<57 miles per hour). The highest wind gust during this time was 68 knts (78.3 miles per hour) on April 6, 2022, in Palm Beach Gardens in the northern part of the County.

Climate Change

Climate change affects the frequency, severity, and duration of thunderstorms thereby increasing the likelihood of lightning. As population and development increase in the County and its jurisdictions, the probability that severe thunderstorms and lightning will cause property damage or human casualties will also increase. With more people migrating to Palm Beach County and its

jurisdictions, a larger percent of the land and population may become more vulnerable to hazards. The higher standards adopted by Florida's Building Code decrease vulnerability.

At-Risk Populations

- Older Adults
- Children
- Pregnant Women
- Unhoused Individuals
- People with Disabilities
- Persons with Chronic Health Conditions
- Persons with Low Income
- Linguistically Isolated
- Responders

Populations in rural areas and vulnerable populations may face greater risk.

- Poor-driving conditions may cause accidents or individuals to become stranded
- Injury or death from strong winds, hail, flash flood, and/or tornadoes
- Indirect death from destruction post-storm, e.g., downed power lines, falling debris, structure collapses, driving through floodwaters, etc.
- Power outages may adversely threaten medically-dependent individuals

Location

The entire county and its jurisdictions are subject to the effects of both severe thunderstorms and lightning. However, the coastal areas are much more vulnerable. The below table, also in Appendix A, illustrates the varying risk across jurisdictions.

Hazard Assessment H: High M: Medium L: Low V: Very Low	Unincorporated County	MUNICIPALITIES																																					
		Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
Vulnerability	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Exposure	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Overall Risk	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M

Impacts – Consequence Analysis Summary

The consequence analysis for severe thunderstorms and lightning have been determined as follows:

Low Consequence

- Continuity of Operations
- Economic & Financial Conditions
- Delivery of Services
- Regulatory & Contractual Obligations
- Reputation of County

Medium Consequence

- Health & Safety of Residents
- Health & Safety of Responders
- Property, Facilities & Infrastructure
- Historical Resources
- Environment

Consequence Rating	Consequence Analysis Details
Very Low	Hazard is very unlikely to have any measurable or lasting detrimental impact of a particular type and consequences will likely be rectified promptly with locally available resources
Low	Hazard is not likely to have any measurable or lasting detrimental impact of a particular type and consequences will likely be rectified promptly with locally available resources
Medium	There will likely be a measurable detrimental impact, which may require some time to rectify and may require outside resources and/or assistance.
High	The impact will likely be severe and of longer duration, and require substantial time, resources, and/or outside assistance to rectify
Split Box	Hazard would have differing consequences between geographic locations within the county

Overall Vulnerability

The probability of severe thunderstorms and lightning is high throughout all of PBC and its jurisdictions, but many of the jurisdictions shown in the chart below, and Appendix A, have only moderate vulnerabilities and exposure relative to these hazards. This variation in relative levels of vulnerability is again due primarily to construction practices and community characteristics. Working communities have a higher vulnerability to economic impacts from lightning than residential or retirement communities. All other factors being equal, residential and retirement communities have a historically higher vulnerability in terms of lightning fatalities.

Florida has more thunderstorm activity than any other US state. PBC residents are quite familiar with thunderstorms and the severe weather they can bring. When a severe thunderstorm approaches, the NWS will issue alerts. During the wet season (mid-May to late October), residents of all cities within Palm Beach County have become accustomed to daily afternoon rainstorms.

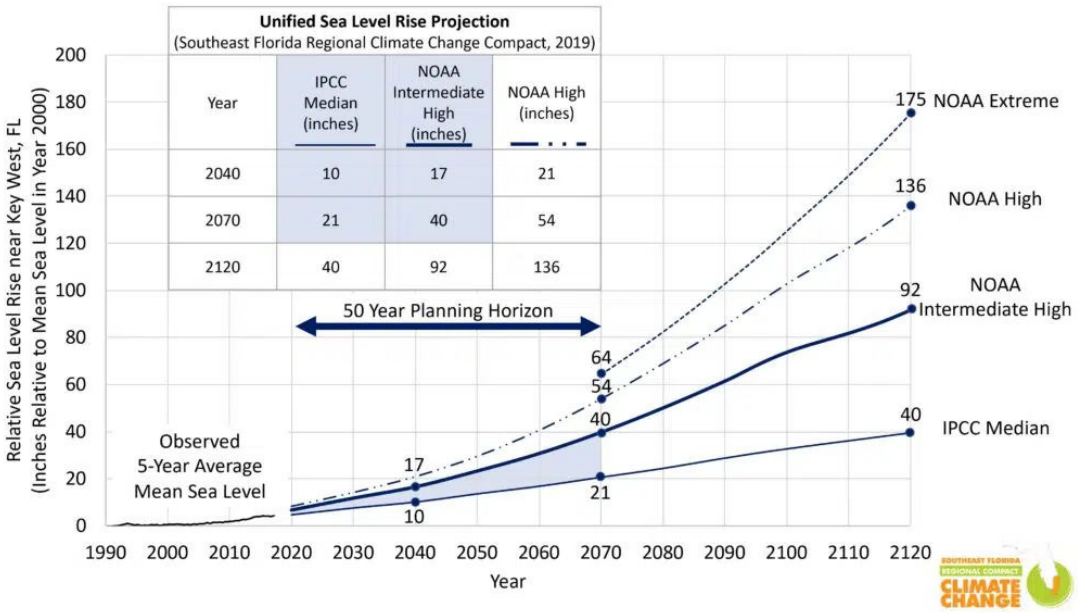
Most of these often become severe thunderstorms with the possibility of lightning. Due to the high frequency experienced by all cities, residents and city officials have prepared for the effects and avoid any added exposure to the threats associated with them. Due to these factors, the County and its jurisdictions place a high probability of occurrence, but a medium vulnerability and exposure to the threats.

2.1.4 Sea Level Rise

Description

Sea level rise is defined as a mean rise in sea level. Since 1870, global sea level has risen by about eight (8) inches. Nationally, sea level has risen 6.5 inches since 1950, and the rate of increase is accelerating with sea levels now rising by an average of one (1) inch every five (5) years (NOAA Tides and Currents). As coastal populations increase, vulnerability of those populations to sea level rise increases as well.

The curves below represent the 2019 Unified Sea Level Rise Projection. In the short term, sea level rise is projected to be 10 to 17 inches by 2040 and 21 to 54 inches by 2070 (above the 2000 mean sea level). In the long term, sea level rise is projected to be 40 to 136 inches by 2120. For critical infrastructure projects with design lives in excess of 50 years, use of the upper curve is recommended with planning values of 54 inches in 2070 and 136 inches in 2120. Projected sea level rise, especially by 2070 and beyond, has a significant range of variation as a result of uncertainty in future greenhouse gas emissions and their geophysical effects, the incomplete quantitative understanding of all geophysical processes that might affect the rate of sea level rise in climate models, and the limitations of current climate models to predict the future. For these reasons, the Sea Level Rise Work Group of the Southeast Florida Regional Climate Change Compact has produced a guidance document describing recommended planning applications of the Unified Sea Level Rise Projection (see https://southeastfloridaclimatecompact.org).



*These projections are referenced to mean sea level at the Key West tide gauge. The projection includes four global curves adapted for regional application: the median of the IPCC scenario as the lowest boundary (thin, solid blue curve), the NOAA Intermediate High curve as the upper boundary for the short term for use until 2070 (thick, solid blue line), the NOAA High curve as the uppermost boundary for medium- and long-term use (.. _ .. blue curve), and the new NOAA Extreme curve (dashed curve). The table lists the projection values at years 2040, 2070, and 2120.

Figure 2.7 Unified Sea Level Rise Projection

The Southeast Florida Regional Climate Change Compact defines the consequences associated with sea level rise to include the following direct physical impacts:

- Coastal inundation of inland areas
- Increased frequency of flooding in vulnerable coastal areas
- Increased flooding in interior areas resulting from impairment of the region's stormwater infrastructure (i.e., impacts to gravity drainage systems, saltwater intrusion into the aquifer and local water supply wells, and contamination of the land and ocean with pollutants and debris and hazardous materials released by flooding)

Consequences of sea level rise also include socio-economic impacts such as displacement, decreases in property values and tax base, increases in insurance costs, loss of services, and impaired access to infrastructure.

Sea Level Rise is a relatively new hazard for the County, some jurisdictions, and much of the Atlantic Coast resulting in increasing flooding frequency in coastal communities. High tide flooding which results in public inconveniences, often termed "nuisance flooding" or "sunny-day flooding," is increasing in frequency as sea level rises. Additionally, perigean spring tides, or tidal events which occur when a new or full moon are closest to the earth, are especially concerning to the public in South Florida. These tides, also known as "king tides," occur once or twice a year and produce slightly larger tidal ranges. In South Florida, we often see the effects of tidal flooding during the fall (September–December) with the highest tide of year usually occurring in October.

For example, according to the NOAA tide table below for the Lake Worth Beach Pier, highest predicted tides of 2023 were as follows:

Table 2.7 NOAA 2023 Tide Table, Lake Worth Beach Pier

Date Range	Highest Date	Prediction (Ft)
September 29 – October 2, 2023	September 30, 2023	3.96
October 27 – 31, 2023	October 29, 2023	4.05
November 26 - 27, 2023	November 26, 2023	3.8

When heavy rains or coastal storms coincide with high tide conditions, flooding can be exacerbated. Low-lying, coastal communities in PBC are most vulnerable to tidal flooding, and that risk is expected to increase as sea levels rise. Impacts include reduced access/egress to dwellings, businesses, parking lots and marinas; loss of business revenue; damage to vegetation and vehicles; and potential property damage.

Climate Change

As the climate continues to change, warmer temperatures and shifting weather patterns will increase sea level rise. As population and development increase in the County and its jurisdictions, the probability that sea level rise will cause property damage or human casualties also increases. With more people migrating to Palm Beach County and its jurisdictions, a larger percent of the land and population may become more vulnerable to hazards. The higher standards adopted by Florida's Building Code decrease vulnerability.

At-Risk Populations

- Older Adults
- Children
- Unhoused Individuals
- People with Disabilities
- Persons with Chronic Health Conditions
- Persons with Low Income
- Linguistically Isolated
- Responders

Populations county-wide, especially those in low-lying areas, within the floodplain, or along the coast, are at risk to the following:

- Drowning
- Vehicle accidents from floodwaters or flash floods and evacuations
- Becoming stranded from floodwaters
- Exposure to hazardous materials and wastewater in floodwaters
- Exposure to mold from flooded structures

Location

The coastal areas of Boca Raton, Boynton Beach, Briny Breezes, Delray Beach, Gulf Stream, Highland Beach, Hypoluxo, Juno Beach, Jupiter, Jupiter Inlet Colony, Lake Park, Lake Worth Beach, Lantana, Manalapan, North Pam Beach, Ocean Ridge, Palm Beach, Palm Beach Shores, Riviera Beach, South Palm Beach, Tequesta, and West Palm Beach are more vulnerable sea level rise due to their proximity to the ocean, storm surge potential, urban development, and being more densely populated. Inland communities of Atlantas, Belle Glade, Cloud Lake, Glen Ridge, Golf, Greenacres, Haverhill, Lake Clarke Shores, Loxahatchee Groves, Mangonia Park, Pahokee, Palm Beach Gardens, Palm Springs, Royal Palm Beach, South Bay, Wellington, and Westlake become more vulnerable when salt water is pushed inland. The below table, also in Appendix A, illustrates the varying risk across jurisdictions.

Hazard Assessment H: High M: Medium L: Low V: Very Low	Unincorporated County	MUNICIPALITIES																																						
		Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	M	V	V	H	H	H	V	H	V	V	V	H	V	H	H	H	H	H	V	H	H	H	V	H	V	H	H	V	H	L	H	V	H	V	V	H	H	V	V	H
Vulnerability	M	V	V	H	H	H	V	H	V	V	V	H	V	H	H	H	H	H	V	H	H	H	V	H	V	H	H	V	H	L	H	V	H	V	V	H	H	V	V	H
Exposure	M	V	V	M	M	M	V	M	V	V	V	M	V	M	M	M	M	M	V	M	M	M	V	M	V	M	M	V	M	L	M	V	M	V	V	M	M	V	V	M
Overall Risk	M	V	V	H	H	H	V	H	V	V	V	H	V	H	H	H	H	H	V	H	H	H	V	H	V	H	H	V	H	L	H	V	H	V	V	H	H	V	V	H

Impacts – Consequence Analysis Summary

While vulnerability to sea level rise varies considerably across the County and its jurisdictions, with many inland areas at higher elevations, sea level rise impacts will not be restricted to areas along the immediate coast. Further, as climate continues to change and sea level rise continues and accelerates, greater adaptation actions will be needed to minimize impacts and prepare communities for increased flood risks. Sea level rise can force sea water inland and flood coastal areas more frequently and for longer durations. Additionally, saltwater will infiltrate aquifers and canals pushing freshwater further inland, potentially changing the distribution of habitats and further reducing the supply of freshwater available for consumption.

The consequence analysis for sea level rise has been determined as follows:

Very Low Consequence

- Inland Property, Facilities, & Infrastructure (Split Box to differentiate between inland and coastal)
- Inland Historic Resources (Split Box to differentiate between inland and coastal)
- Inland Environment (Split Box to differentiate between inland and coastal)

Low Consequence

- Health & Safety of Residents
- Health & Safety of Responders
- Continuity of Operations
- Regulatory & Contractual Obligations
- Reputation of County

Medium Consequence

- Coastal Property, Facilities & Infrastructure (Split Box to differentiate between coastal and inland)
- Coastal Historical Resources (Split Box to differentiate between coastal and inland)
- Coastal Environment (Split Box to differentiate between coastal and inland)

High Consequence

- Economic & Financial Conditions
- Reputation of County

Consequence Rating	Consequence Analysis Detail
Very Low	Hazard is very unlikely to have any measurable or lasting detrimental impact of a particular type and consequences will likely be rectified promptly with locally available resources
Low	Hazard is not likely to have any measurable or lasting detrimental impact of a particular type and consequences will likely be rectified promptly with locally available resources
Medium	There will likely be a measurable detrimental impact, which may require some time to rectify and may require outside resources and/or assistance.
High	The impact will likely be severe and of longer duration, and require substantial time, resources, and/or outside assistance to rectify
Split Box	Hazard would have differing consequences between geographic locations within the county

Overall Vulnerability

Probability, vulnerability, exposure are varied through the County and its jurisdictions. Coastal communities (Boca Raton, Boynton Beach, Briny Breezes, Delray Beach, Gulf Stream, Highland Beach, Hypoluxo, Juno Beach, Jupiter, Jupiter Inlet Colony, Lake Park, Lake Worth Beach, Lantana, Manalapan, North Palm Beach, Ocean Ridge, Town of Palm Beach, Palm Beach Shores, Riviera Beach, South Palm Beach, Tequesta, and West Palm Beach) have high probability and vulnerability to seal level rise. Whereas, the more western communities (Atlantis, Belle Glade, Cloud Lake, Glen Ridge, Golf, Greenacres, Haverhill, Lake Clarke Shores, Loxahatchee Groves, Mangonia Park, Pahokee, Palm Springs, Royal Palm Beach, South Bay, Wellington, and

Westlake) have a very low risk of probability, vulnerability, and exposure. PBC completed an assessment of vulnerability due to sea level rise in a report entitled "Analysis of the Vulnerability of Southeast Florida to Sea Level Rise, Southeast Florida Regional Climate Change Compact Inundation, Mapping, and Vulnerability Assessment Work Group, August 2012." In this report, the County conducted an inundation analysis, identifying land at elevations below sea level, highlighted areas located near PBC's coastline and tidal waterways. The report concluded that limited physical infrastructure in PBC is at risk at the one (1), two (2) and three (3) foot sea level rise scenario. Initially low volume roads and parking areas may be impacted at one (1) foot and increase to up to 41 miles of roadways as the sea level continues to rise to three (3) feet. Property with a current taxable value of $396-557 million may become vulnerable at one (1) foot of sea level rise; properties valued at $3.6-4.5 billion may be vulnerable at three (3) feet of rise. One (1) school, one (1) landfill site, and one (1) hospital are estimated to be impacted at the higher three (3) foot sea level rise scenario.

An initiative conducted by Florida Department of Economic Opportunity in 2011 to analyze sea level rise integration utilized PBC as a pilot study (Statewide Post-Disaster Redevelopment Planning Initiative: Phase V). 2.1.1 Flooding, 2.1.2 Hurricanes/Tropical Storms, and 2.1.5 Soil/Beach Erosion may be intensified due to the condition of sea level rise altering the traditional elements of the natural and man building environment. 2.1.1 Flooding details the conditions under which flooding occurs within the County and provides an overview of historical flooding events sea level rise will likely exacerbate flooding in flood prone areas, because flow rates in low lying areas may be further inhibited. The traditional flood conditions due to severe rain events will be impacted by sea level rise. Section 2.1.1.2 addresses these vulnerabilities associated with hurricanes. It details the overall vulnerability of the state and region due to its topography. Due to dense population along the coast, the potential for property damage and human casualties continues to increase. Florida not only has the most people at risk from hurricanes, but it also has the most coastal property exposed to these storms. While there continues to be debate, global climate change is likely to impact the development, intensity, and frequency of hurricanes in the world. Similarly, the condition of a higher sea level will increase the total inundation resulting from the storm surge. 2.1.5 Soil/Beach Erosion addresses the vulnerability associated with beach and soil erosion stating that the natural forces of wind, waves, and longshore currents move the natural sand placement and change the beach shape and structure. However, this retreat is altered by man-made structures and creates a perceived need to protect the existing shoreline conditions. This condition will be vastly augmented by the increase of the sea level. Existing homes, businesses, roads, bridges, and other man-made structures will suffer more rapid beach erosion and eventual water intrusion.

Access to and from the barrier islands could be vulnerable due to bridges being inaccessible from local roadway inundation. Coastal marinas could also experience impacts. Natural habitats may also become increasingly vulnerable as water salinity levels and areas of inundation alter. Palm Beach County Assessment prioritizes saltwater ponds, saltwater marshes, and mangrove swamp as potential sensitive impacted habitats.

Generally, the areas in the southern parts of the County do not appear that they will suffer as much inundation in comparison with the central parts of the County, particularly along the Intracoastal

Waterway. In the northern part of the County, large areas of projected inundation occur around existing natural waterways including the Loxahatchee River, Admiral's Cove, and Frenchman's Harbor. Most of the areas in PBC that are impacted by sea level rise are already fully developed or consist of natural lands. The rise in sea level will result in losses of land and structures, impact on utilities and infrastructure, and cause a reduction in value of real estate.

Areas within PBC and its jurisdictions that may be most problematic consist of those already below sea level. Cities in the northern portions of the County that are most inundated include Juno Beach and the coastal areas of North Palm Beach and Palm Beach. These areas are designated as natural areas. The land use designations are the residential, commercial, and recreational. Further analysis of this area may be necessary to determine if future land uses may be changed over time in order to decrease vulnerability to hurricane storm surge augmented by sea level rise. Land uses in the southern portions of the County include residential and commercial designations.

2.1.5 Soil/Beach Erosion

Description

Soil Erosion

Soil erosion is the deterioration of soil by the physical movement of soil particles from a given site. Wind, water, animals, and the use of tools by humans may all be reasons for erosion. The two (2) most powerful erosion agents are wind and water; but in most cases these are damaging only after humans, animals, insects, diseases, or fire have removed or depleted natural vegetation. Accelerated erosion caused by human activity is the most serious form of soil erosion because the rate is so rapid that surface soil may sometimes be blown or washed away right down to the bedrock. While there is no scale of determination, magnitude of soil erosion affect may be determined by economic impact given to the area, agriculture type, or land development.

Undisturbed by humans, soil is usually covered by shrubs and trees, by dead and decaying leaves or by a thick mat of grass. Whatever the vegetation, it protects the soil when rain falls or wind blows. Root systems of plants hold the soil together. Even in drought, the roots of native grasses, which extend several feet into the ground, help tie down the soil and keep it from blowing away. With its covering of vegetation stripped away, soil is vulnerable to damage. Whether the plant cover is disturbed by cultivation, grazing, deforestation, burning, or bulldozing, the soil is bare to the erosive action of wind and water, greatly increases the rate of natural erosion. Losses of soil take place much faster than new soil can be created resulting in a deficit spending of topsoil begins.

Beyond coastal PBC, soil erosion has become less prevalent as sustained land zoning ordinances, regulated land development, wildfire mitigation efforts, university agricultural extension information practices, and long matured agricultural conservation efforts contribute greatly a diminished hazard.

Beach Erosion

The Florida Department of Environmental Protection (FDEP), pursuant to rule 62B-36.002(5), Florida Administrative Code (F.A.C.), defines "critically eroded shoreline" as, "

> a segment of the shoreline where natural processes or human activity have caused or contributed to erosion and recession of the beach or dune system to such a degree that upland development, recreational interests, wildlife habitat, or important cultural resources are threatened or lost. Critically eroded shorelines may also include peripheral segments or gaps between identified critically eroded areas which, although they may be stable or slightly erosional now, their inclusion is necessary for continuity of management of the coastal system or for the design integrity of adjacent beach management projects.

Wind, waves, and longshore currents are the driving forces behind coastal erosion. This removal and deposition of sand permanently changes beach shape and structure. Most beaches, if left alone to natural processes, experience natural shoreline retreat. As houses, highways, seawalls, and other structures are constructed upon or close to the beach, the natural shoreline retreat processes are interrupted. The beach jams against these man-made obstacles and narrows considerably as the built-up structures prevent the beach from moving naturally inland. When buildings are constructed close to the shoreline, coastal property soon becomes threatened by erosion. The need for shore protection often results in "hardening" the coast with a structure such as a seawall or revetment.

A seawall is a large, concrete wall designed to protect buildings or other man-made structures from beach erosion. A revetment is a cheaper option constructed with "rip rap" such as large boulders, concrete rubble, or even old tires. Although these structures may serve to protect beachfront property for a while, the resulting disruption of the natural coastal processes has consequences for all beaches in the area. Seawalls inhibit the natural ability of the beach to adjust its slope to the ever-changing ocean wave conditions. Large waves wash up against the seawall and rebound back out to sea carrying large quantities of beach sand with them. With each storm the beach narrows, sand is lost to deeper water, and the longshore current scours the base of the wall. Eventually large waves impact the seawall with such force that a bigger structure becomes necessary to continue to resist the forces of the ocean (Pilkey and Dixon, 1996).

The County, under the Department of Environmental Resources Management, has a shoreline enhancement and restoration program that anticipates the magnitude of beach soil erosion and shoreline areas and takes pro-active measures to protect the coastal areas. The plan is also adaptable to respond to disasters that may impact the shoreline.

The County's 46 miles of ocean shoreline has been subjected to coastal erosion for many years due to the stabilization of inlets, residential and commercial development, and natural forces. The coastal strand ecosystem is one of the most threatened natural systems in Florida due to over-development.

Presently, 33.6 of the County's 46 miles are listed as critically eroded by Florida's Department of Environmental Protection as of July 2023. They also list two (2) non-critically eroded areas (0.9 mile) and one (1) critically eroded inlet shoreline area (0.8 mile). While there is no one solution to beach erosion, several methods are utilized by PBC - each with its own merits and drawbacks. The first approach is to facilitate sand transfer at the inlets in order to restore the natural flow of sand. The second approach includes protecting the existing dunes and beaches and restoring the portions of shoreline that are already degraded. The last approach includes evaluating erosion control structures for use along beaches that may not qualify for a traditional beach fill project or may experience an erosional hot spot.

All approaches include environmental monitoring of the resources to ensure that our effort to restore sand is accomplished in a manner that protects the natural environment to the greatest extent possible. Through the Shoreline Enhancement & Restoration Program, the County is able to provide publicly accessible beaches, support the tourist-based economy, restore beach habitat and protect upland property. Funding for this capital improvement program is derived from a portion of "bed tax" fees administered through the Tourist Development Council, as well as funds from the state, the federal government and municipal partners. Modifications to natural tidal inlets and the creation and stabilization of artificial inlets affect the natural littoral transport of sediments. Therefore, efforts to maintain the natural sediment movement in and around all four (4) inlets in PBC are encouraged. Transfer of material from the north side of an inlet to the south prevents beach quality sand from being lost to the interior of an inlet or from becoming impounded within near shore shoals.

In 2011, the County constructed a new sand transfer plant (STP) and rehabilitated the north and south jetties. The STP is operated by the County and transfers approximately 70,000 cubic yards of material per year to the beaches south of the Inlet. The County also dredges the Inlet's interior sand trap approximately every six (6) years. Sand from the trap is pumped into the nearshore along the beach south of the Inlet.

Since the dissolution of the South Lake Worth Inlet District in 1996, the County has been responsible for the management of the South Lake Worth Inlet (Boynton Inlet) and the development of the Inlet's Management Plan.

PBC utilized a spatial impact for a hazard analysis by which the amount of geographic area is affected by either or both soil and beach erosion vulnerabilities and offset impacts may be felt by the municipality stakeholders.

- Very Low – Minimal geographic area affected,
- Low – Up to 25% of total area or jurisdiction affected,
- Medium – 26%-50% of total area or jurisdiction affected,
- High – 51% or more of total area or jurisdiction affected.

Historic Erosion Events

Hurricanes Frances & Jeanne (September 2004) – Both Hurricanes Frances and Jeanne in 2004 equaled or exceeded the 100-year return period for storm surge in St Lucie, Indian River and southern Brevard Counties when they made landfall on the Martin County shoreline. The highest measured surge level for Category 2 Hurricane Frances was 11.8' (NGVD). The highest surge level for Category 2 Hurricane Jeanne was 10.8' (NGVD). Surge levels in PBC were significantly lower. Both storms caused significant beach erosion along the coastline of PBC.

Tropical Storm Noel November 2007 – Between November 1 and November 4, 2007, high surf associated with Tropical Storm Noel battered the PBC coast. Hardest hit spots were beaches in Jupiter, Singer Island, and South Palm Beach/Lantana, where severe to locally extreme beach erosion occurred. A steel sea wall protecting the Condado condominium complex in Singer Island collapsed, causing cracks to form in the outer walls of the building. In some areas, the dune line was completely eroded, leaving oceanfront buildings sitting precariously on top of 15-foot cliffs looking straight down to the water. A sea wall at the Imperial House condominiums in South Palm Beach collapsed from the pounding surf, and the east portion of the building was evacuated. South of Lantana to Boca Raton, erosion was reported as moderate to severe. Total damage for the County (minus beach restoration costs) was estimated at $4 million. No tide measurements were available from PBC, but storm tide was estimated to have been as high as two (2) to three (3) feet over northern PBC. A strong pressure gradient between high pressure over the Mid-Atlantic States and Tropical Storm Noel over Hispaniola and eastern Cuba caused a prolonged period of strong easterly winds over Southeast Florida and the adjacent waters. As Noel moved north across the western Bahamas, the strong winds continued across southeast Florida. The event caused severe beach erosion, coastal flooding, and minor wind damage. The event began in the last week of October.

Hurricane Sandy of October 25, 2012 – The main impact of Hurricane Sandy to the Palm Beach coast was large northeast swells generated by the storm, which pummeled the Southeast Florida coast with significant beach erosion and coastal flooding. Large breaking waves of possibly over 20 feet were estimated along the coast. As a result, major coastal flooding occurred with the most significant impacts experienced from central Palm Beach north, including the Manalapan area where beachfront structures were threatened by water intrusion. In all, there was an estimated $14 million in damage sustained in PBC. A maximum storm tide of 5.2 feet above mean lower low water (MLLW) was observed at Lake Worth Beach Pier on October 28 at 7:12 a.m. along with a maximum storm surge of 2.28 feet on October 28th at 2:26 a.m. Similar tide and surge levels were measured at the highest daily high tide during this period, generally between 7:00 and 9:00 a.m.

Hurricane Irma of September 10-11, 2017 – Hurricane Irma, which centered over southwest Florida when it made landfall, caused an estimated $44 million dollars in damages from lost sand in PBC, according to County sources (http://cbs12.com/weather/hurricane-stories/hurricane-irma-causes-major-erosion-in-palm-beach-county). The hurricane removed enough sand from the area's 46-mile coastline to fill 380 Olympic-sized swimming pools. A nourishment project completed years ago was undone by the force of the waves and wind from Hurricane Irma. Some sand was also lost in the Town of Palm Beach as well.

Hurricane Nicole November 8-11, 2022 – Hurricane Nicole was a sprawling late-season Category 1 hurricane in November 2022. While beach erosion was notable after this storm, there was less beach erosion than expected in Palm Beach County, due to the wind direction and low tide at the time of Nicole's arrival. Recent dune projects also contributed to the lack of significant beach erosion.

Climate Change

Climate change will continue to impact soil and beach erosion through wild fires, sea level rise, storm surge, increased rainfall patterns, and increased storms. Greater mitigation actions will be needed to minimize impacts. As population and development increase in the County and its jurisdictions, the probability that soil or beach erosion will cause property damage or human casualties also increases. With more people migrating to Palm Beach County and its jurisdictions, a larger percent of the land and population may become more vulnerable to hazards. The higher standards adopted by Florida's Building Code decrease vulnerability.

At-Risk Populations

Those living near the coast:

- Older Adults
- Children
- Unhoused Individuals
- People with Disabilities
- Persons with Chronic Health Conditions
- Persons with Low Income
- Linguistically Isolated
- Responders

Populations living in or working near the coast may face greater risk.

- Injury or death if home/structure becomes unstable due to erosion, additional risk when visiting unsafe structure following the event.

Location

The coastal communities of Boca Raton, Boynton Beach, Briny Breezes, Delray Beach, Gulf Stream, Highland Beach, Juno Beach, Jupiter, Jupiter Inlet Colony, Lake Worth Beach, Lantana, North Palm Beach, Ocean Ridge, Palm Beach, Palm Beach Shores, Riviera Beach, South Palm Beach, and Tequesta have the highest overall risk. Portion of unicorporated Palm Beach County, Hypoluxo, Lake Park, Manalapan, and West Palm Beach have medium overall risk. Palm Beach Gardens has low risk. Atlantis, Belle Glade, Cloud Lake, Glen Ridge, Golf, Greenacres, Haverhill, Lake Clarke Shores, Loxahatchee Groves, Mangonia Park, Pahokee, Palm Springs, Royal Palm Beach, South Bay, Wellington, and West Lake have very low risk.

The below table, also in Appendix A, illustrates the varying risk across jurisdictions.

Hazard Assessment H: High M: Medium L: Low V: Very Low	Unincorporated County	MUNICIPALITIES																																								
		Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	M	V	V	H	H	H	V	H	V	V	V	H	V	H	M	H	H	H	V	M	H	H	V	M	V	H	H	V	H	L	H	V	H	V	V	H	H	V	V	M
Vulnerability	M	V	V	H	H	H	V	H	V	V	V	H	V	H	M	H	H	H	V	M	H	H	V	M	V	H	H	V	H	L	H	V	H	V	V	H	H	V	V	M
Exposure	M	V	V	M	M	M	V	M	V	V	V	M	V	M	M	M	M	M	V	M	M	M	V	M	V	M	M	V	M	L	M	V	M	V	V	M	M	V	V	M
Overall Risk	M	V	V	H	H	H	V	H	V	V	V	H	V	H	M	H	H	H	V	M	H	H	V	M	V	H	H	V	H	L	H	V	H	V	V	H	H	V	V	M

Impacts – Consequence Analysis Summary

Vulnerability to soil and beach erosion varies considerably across the County and its jurisdictions. Impacts will not be restricted to areas along the immediate coast.

As global sea levels are projected to rise, with a likely range of one to four feet by 2100, Florida's coastlines will face a consistent threat of erosion from nuisance flooding and extreme events. Without offsetting changes in natural sediment supply, Florida's sandy beaches will rapidly erode as the sea level rises. Additionally, it is expected that the frequency and intensity of extreme precipitation and droughts will increase, further destabilizing soils on the coast and inland. While changes to the frequency of higher intensity hurricanes is not certain, hurricane rainfall is expected to increase for Florida. Because of this, even lower category storms would have the potential to cause massive amounts of erosion. One example of this is Hurricane Nicole's impact on the east coast of Florida.

These events usually cause damage to structures located along the County's and its jurisdictions' beaches, especially if there are no dunes to slow wave action. Where structures are not present, the over wash when surge or waves top dune systems allows those systems to migrate inland. This further threatens the coastline and increases the potential for more damage during a future event. Beyond damage to the dune systems and coastlines, the survival of coastal wetlands is also threatened when they cannot adapt quickly enough to offset the rising sea. This could have disastrous consequences to fishery ecosystems, biodiversity, and ultimately the recreation tourism on which part of the County's and its jurisdictions economies rely. As population and development increase in the County and its jurisdictions, the probability that sea level rise will cause property damage or human casualties also increases.

The consequence analysis for soil/beach erosion has been determined as follows:

Very Low Consequence

- Inland Property, Facilities, & Infrastructure (Split Box to differentiate between inland and coastal)

- Inland Environment (Split Box to differentiate between inland and coastal)
- Inland Economic & Financial Conditions (Split Box to differentiate between inland and coastal)

Low Consequence

- Health & Safety of Residents
- Health & Safety of Responders
- Continuity of Operations
- Historic Resources
- Delivery of Services
- Regulatory & Contractual Obligations

Medium Consequence

- Coastal Property, Facilities & Infrastructure (Split Box to differentiate between coastal and inland)
- Coastal Environment (Split Box to differentiate between coastal and inland)
- Coastal Reputation of County (Split Box to differentiate between coastal and inland)

High Consequence

- Coastal Economic & Financial Conditions (Split Box to differentiate between coastal and inland)

Consequence Rating	Consequence Analysis Detail
Very Low	Hazard is very unlikely to have any measurable or lasting detrimental impact of a particular type and consequences will likely be rectified promptly with locally available resources
Low	Hazard is not likely to have any measurable or lasting detrimental impact of a particular type and consequences will likely be rectified promptly with locally available resources
Medium	There will likely be a measurable detrimental impact, which may require some time to rectify and may require outside resources and/or assistance.
High	The impact will likely be severe and of longer duration, and require substantial time, resources, and/or outside assistance to rectify
Split Box	Hazard would have differing consequences between geographic locations within the county

Overall Vulnerability

The County's and its jurisdictions' vulnerability to coastal and beach erosion is moderate along its entire coastline. The most significant areas of beach erosion are the areas south of the stabilized inlets where the natural flow of laterally transported sand has been artificially interrupted. Many areas in PBC have been the subject of major beach re-nourishment projects sponsored jointly by the County and U.S. Army Corps of Engineers. Inland communities report some erosion problems along major canals and around water control structures.

According to the FDEP Office of Resilience and Coastal Protection's Critically Eroded Beaches in Florida report, there are eight (8) critically eroded areas (33.6 miles), two non-critically eroded areas (0.9 mile), and one critically eroded inlet shoreline area (0.8 mile) in Palm Beach County (Figure 11).

At the north end of Palm Beach County, a 1.5-mile segment of Tequesta and Jupiter Inlet Colony (R1 – R10) is critically eroded, threatening private development in those communities as well as recreational interests at Coral Cove Park. A dune restoration project exists at Coral Cove Park and seawalls have been constructed along private development in Tequesta.

The north and south shorelines inside Jupiter Inlet have experienced critical erosion threatening development to the north and recreational interests to the south.

The 5.0 miles south of Jupiter Inlet is a critically eroded area (R12 – R38) that threatens Jupiter Beach County Park, Carlin Park, State Road AIA and development in the communities of Jupiter and Juno Beach. Inlet sand transfer has been conducted immediately south of Jupiter Inlet and beach restoration has been conducted at Carlin Park and Juno Beach.

At the south end of Juno Beach (R38 – R40) the erosion area continues south for 0.4 mile with no current threat. Another non-critically eroded segment (R58 – R60.5) extends 0.5 mile along John D. MacArthur Beach State Park.

Along northern Riviera Beach on Singer Island (R60.5 – R69) south of John D. MacArthur Beach State Park is 1.7 miles of critical erosion threatening private development and recreational interests at a county park.

Extending south of Lake Worth Inlet along the Town of Palm Beach (R76 – R128) are 10.9 miles of critical erosion threatening private development, local parks and State Road AIA. Most of this segment of coast has seawalls, bulkheads and revetments. There are also numerous groins, a 2.5-mile beach restoration project referred to as the Mid-Town project, and an inlet sand transfer project south of Lake Worth Inlet.

A 0.9-mile southern segment of the Town of Palm Beach (R128.8 – -R133.5) south of Lake Worth has been designated critically eroded for continuity of management of the coastal system. The town of South Palm Beach and Lantana Municipal Beach (R133.5 – R138.4) comprises 1.0 mile of critical erosion threatening private development and recreational interests at the public park.

The South Palm Beach portion of this critically eroded area has nearly continuous seawalls. Due to the severe impact of Florida Department of Environmental Protection, Critically Eroded Beaches in Florida July 2023, Page 40 of 89 Hurricane Sandy in 2012, much of the Town of Manalapan (R138.4 – R145.8) was added as critically eroded. At least 20 seawalls were destroyed by the storm along this 1.4-mile stretch.

Extending south of South Lake Worth Inlet for 3.3 miles is a critically eroded area (R152 – R168) that threatens development along the communities of Ocean Ridge, Briny Breezes, Boynton Beach and Gulf Stream. Inlet sand transfer is being conducted immediately south of South Lake Worth Inlet and beach restoration has been conducted at Ocean Ridge.

Along the city of Delray Beach (R176 – R190) is a 2.9-mile critically eroded area that threatened development and recreational interests as well as State Road AIA. This area is a beach restoration project.

The city of Boca Raton at the south end of Palm Beach County has critical erosion (R204 – R227.9) extending 5.0 miles to the Broward County line, which threatens recreation interests at Spanish River Park, Red Reef Park, and South Inlet Park, as well as State Road AIA and private development. Beach restoration has been constructed throughout Boca Raton, and inlet sand transfer and seawalls exist south of Boca Raton Inlet.

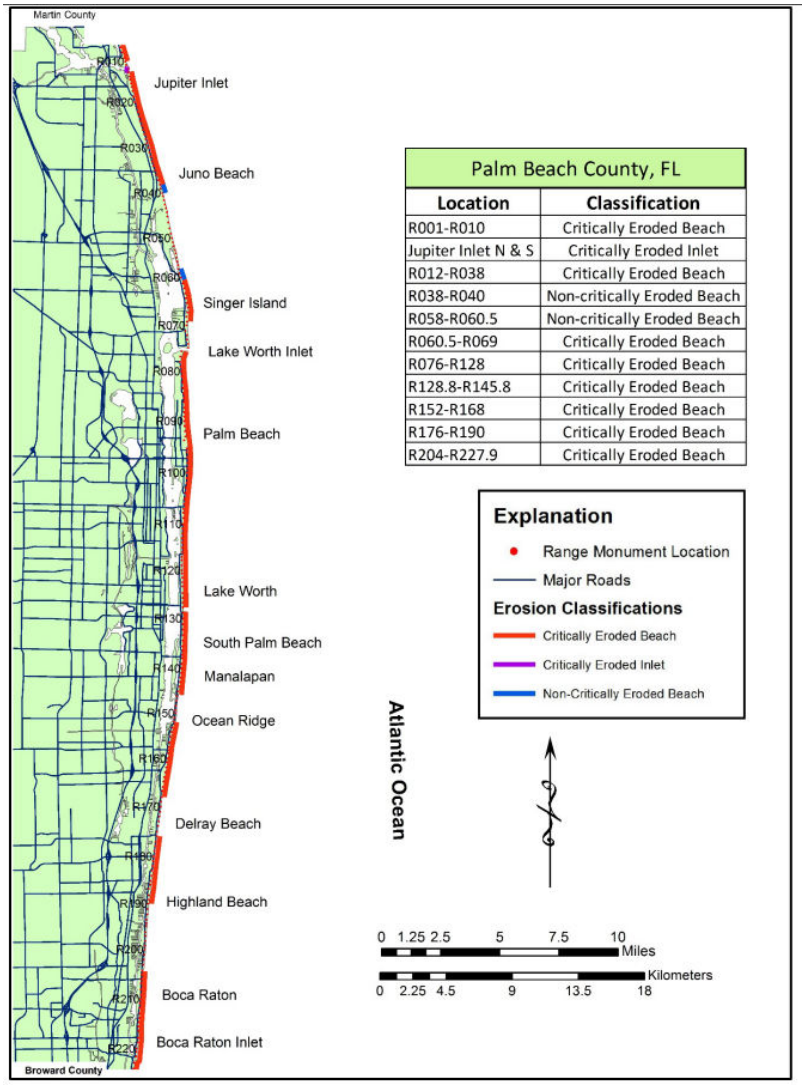


Figure 2.8 FDEP Critically Eroded Shoreline within Palm Beach County

2.1.6 Tornadoes

Description

According to NOAA, Florida ranks third in the United States in the average number of tornado strikes, and first in number of tornadoes per square mile according to Florida State University's Florida Climate Center. However, Florida tornadoes are generally weaker than those striking the Plains and other southern states.

Tornadoes are classified using the Enhanced Fujita (EF) Scale as follows:

Scale	Wind speed mph	Wind speed km/h	Relative frequency	Potential damage	
EF0	65–85	105–137	53.5%	Minor damage. Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over. Confirmed tornadoes with no reported damage (i.e., those that remain in open fields) are always rated EF0.	
EF1	86–110	138–178	31.6%	Moderate damage. Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.	
EF2	111–135	179–218	10.7%	Considerable damage. Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.	
EF3	136–165	219–266	3.4%	Severe damage. Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.	
EF4	166–200	267–322	0.7%	Extreme damage to near-total destruction. Well-constructed houses and whole frame houses completely leveled; cars thrown and small missiles generated.	
EF5	>200	>322	<0.1%	Massive Damage. Strong frame houses leveled off foundations and swept away; steel-reinforced concrete structures critically damaged; high-rise buildings have severe structural deformation. Incredible phenomena will occur.	

Figure 2.9 Enhanced Fujita Scale

A tornado is a violent windstorm characterized by a twisting, funnel-shaped cloud. It is generated by a thunderstorm (or sometimes because of a hurricane) and produced when cool air overrides a layer of warm air, forcing the warm air to rise rapidly. The damage from a tornado is a result of the high wind velocity and wind-blown debris. The most common type of tornado, the relatively weak and short-lived type, occurs in the warm season with June being the peak month. The strongest, most deadly tornadoes occur in the cool season, from December through April. All of PBC can be affected by a tornado.

According to the Tornado History Project, of the 191 tornadoes seen in PBC between 1950 and January 2023, 130 were classified as F0 tornadoes (68%), 50 (26%) were classified as F1, 10 (5%) were classified as F2, and 1 (0.5%) was classified as an F3 tornado. One (1) death and 102 injuries have been attributed to tornadoes in the County in this period, with total estimated damages of more than 150 million dollars.

When a tornado threatens, only a short amount of time is available for life-or-death decisions. The NWS issues two (2) types of alerts:

- A Tornado Watch means that conditions are favorable for tornadoes to develop.
- A Tornado Warning means that a tornado has actually been sighted.

Mobile home park residents represent the most vulnerable population as their structures are less durable than fixed residential homes and commercial buildings.

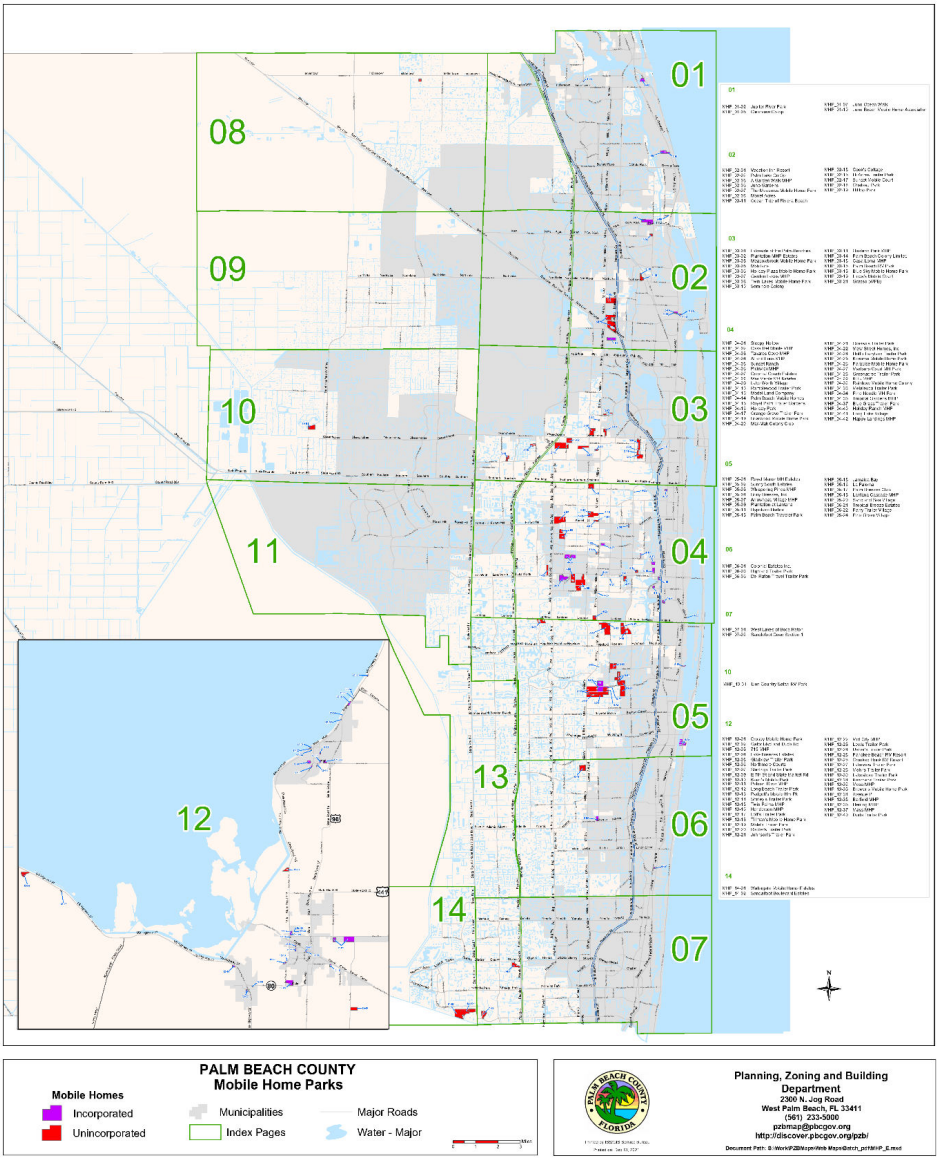


Figure 2.10 Mobile Home Parks in Palm Beach County

Historic Tornado Events

August 7, 2002 – On August 7, 2002, there was a Tornado Watch issued by the NWS. Two (2) tornadoes touched down later that evening in the northern part of PBC. Jupiter suffered damage to a shopping plaza. No injuries were reported. A second tornado touched down in unincorporated PBC in a mobile home park causing major damage in some areas. The tornado moved in the direction of east southeast toward Interstate 95. The tornado caused considerable damage to an industrial park located in unincorporated PBC/Riviera Beach. The tornado continued in the same direction damaging several neighborhoods in Riviera Beach. It continued through additional neighborhoods in Riviera Beach just north of Blue Heron Boulevard. The damage path was

narrower until it lifted or dissipated near the intersection of Blue Heron Boulevard and Old Dixie Highway.

From all of the evidence considered, including some damage that was very close to F2 damage, National Weather Service Weather Forecast Office (WFO) Miami classified the unincorporated PBC-Riviera Beach tornado as F1 on the Fujita scale, meaning that winds were approximately 72 to 112 mph. The worst damage was apparently caused by winds near the upper end of that range. Miami WFO meteorologists determined that the main path of the tornado was approximately 1/6-mile (200 yards) wide at its widest point and about four (4) miles long. There were no deaths, but 28 individuals suffered minor injuries. There were 22 dwellings destroyed and 226 suffered damage. The damage has been estimated to be $70 to $80 million dollars.

August 19, 2008, Wellington Tornado – At about 1:20 a.m. on August 19, a tornado associated with a spiral band of strong thunderstorms rotating around the circulation of Tropical Storm Fay moved through the Village of Wellington. The tornado began near Polo Mark Middle School near the intersection of Lake Worth Road and Isles View Drive and ended just southwest of Wellington High School. The tornado had an approximate damage path of 2.75 miles from the southeast to the northwest and was around 100 yards wide at its widest point but averaged 70 to 80 yards in width.

The tornado moved through a number of equine farms and polo grounds as well as two (2) subdivisions in Wellington. The most significant damage was to Palm Beach Equine Clinic, where stables were de-roofed, power poles snapped, and many trees fell in crisscrossing patterns. The Equine Veterinary lost more than 95% of its roof tiles; a heavy trailer was tossed about 40 yards from its previous location northwest of the International Polo Club; and an apartment home near Folkstone Circle lost about 70% of its roof tiles. There were no deaths or injuries to people or animals.

March 21, 2009, Palm Beach Gardens Tornado – A warm front lifted north through South Florida during the day of March 21. Unstable air south of the front combined with warm temperatures produced strong and severe thunderstorms over PBC. About 5,000 customers lost power. A tornado touched down in Palm Beach Gardens in the Ballenisles Golf Country Club near Holly and Seagrape Drives. The tornado moved southeast, across Military Trail and Lilac Street, and lifted near Palm Beach Gardens High School. Minor roof damage was noted to a few residential buildings, as well as uprooted trees and a damaged fence near Palm Beach Gardens High School. Final tornado rating was EF-0 based on an Emergency Management survey and analysis of damage photos.

March 21, 2009, Glen Ridge Tornado – A second tornado touchdown occurred in West Palm Beach near Palm Beach Lakes Boulevard and Australian Avenue. This is the same storm that produced the tornado in Palm Beach Gardens, but eyewitness reports and photographs indicate a likely second tornado touchdown in the West Palm Beach area. Damage was minor (EF-0) consisting of downed traffic signals, broken tree branches, and a flipped bus bench.

August 7, 2010 – A small and short-lived tornado moved through the West Boca area, with numerous reports received of trees down, overturned patio furniture, streetlights knocked down, some roofing shingles blown off houses, and downed power lines from around the intersection of Powerline Road and SW 18th Street to the Boca Point Golf Course. No major structural damage was reported. No damage assessment was performed by PBC officials, due to the minor nature of the damage.

April 12, 2010 – A brief tornado occurred two (2) miles northeast of Belle Glade. The PBC Sheriff's office reported a tornado two (2) miles northeast of the PBC Sheriff's Office substation along state road 80; however, no damages or injuries occurred.

January 25, 2011 – A small and brief tornado touched down in the Cameo Woods development of Boca Raton near the intersection of Camino Real and Military Trail. Damage was exclusively to vegetation, including an uprooted large avocado tree and several large branches snapped off or broken. About 20 trees in total were damaged by the tornado. Estimated wind speeds were in the 70-75 mph range, indicative of an EF-0 tornado.

June 24, 2012 – The outer bands from Tropical Storm Debby included severe thunderstorms with severe wind gusts and eight (8) tornadoes occurring over a span of four (4) hours. This event spawned the greatest number of tornadoes in one day over the southern Florida peninsula since October 14, 1964, when Hurricane Isbell also spawned eight (8) tornadoes. All of the tornadoes were of EF-0 intensity.

A brief tornado in Lake Worth Beach touched down and damage was confined to a few homes on North A Street and 15th Avenue, between US 1 and I-95. Damage was minor and consisted primarily of vegetation and debris from a nearby park.

The first report of damage was to a carport south of Okeechobee Boulevard and east of I-95. The tornado traveled through a warehouse district just south of Okeechobee Boulevard and east of Australian Avenue, damaging roofs and doors to a warehouse building. The tornado then crossed Okeechobee Boulevard and traveled between Australian and Tamarind Avenues, damaging trees and knocking down a large metal gate at the West Palm Beach train station. A railroad-crossing arm was broken at Tamarind Avenue and Banyan Boulevard. The tornado followed a discontinuous path of 1.2 miles and its width of probably no more than 20 yards. Maximum winds were likely in the upper end of EF-0 scale (75-85 mph), with most areas along the path probably experiencing low-end EF0 winds (65-75 mph).

June 6, 2013 – Convective rain bands associated with Tropical Storm Andrea streamed across South Florida spawning three (3) tornadoes that affected PBC. The first (EF-0) affected the town of Belle Glade with minor damage to trees and power lines. Another tornado (EF-1 with maximum sustained winds of 100 mph) ripped through The Acreage community damaging several homes and snapped trees and power lines as it tracked across a residential area just west of 130th Avenue between 69th Street and 87th Street. Most damage was to roofs; the garage door of one (1) home was damaged leading to the roof being completely punctured above the garage. A few vehicles were also moved from their original locations and a 30-foot boat was flipped on its side. There

was one (1) serious injury from this tornado when an 85-year-old woman was struck by flying debris from a large oak tree that broke through her bedroom window. A third (EF-0) tornado touched down across inland Broward County just east of U.S. Highway 27 about six (6) miles north of Alligator Alley and tracked north, likely crossing over into southern PBC.

January 28, 2016 – A line of strong storms moved onto the Gulf Coast just after 5:00 a.m. and moved across the South Central Florida peninsula. A small area of rotation quickly developed at the northern end of the line as it approached the PBC coast. A brief EF-0 tornado touched down in Delray Beach and Boynton Beach.

January 23, 2017 – A strong squall line intensified well ahead of a cold front over the eastern Gulf of Mexico during the early morning hours of January 23. The line produced tornadoes in Palm Beach and Miami-Dade counties. Tornado damage was first noted in the Mirabella neighborhood of Palm Beach Gardens west of the Florida Turnpike between PGA Boulevard and Donald Ross Road, then followed a somewhat discontinuous path ENE across Palm Beach Gardens to Juno Beach where it moved offshore at the Juno Beach Pier.

At Dwyer High School, the tornadic winds as well as flying debris broke windows, damaged a softball field and caused a small hole in the ceiling over a classroom in the school's main building. It continued into Juno Beach Condo Mobile Home Park where eight (8) units sustained damage. The tornado moved offshore at the Juno Beach Pier around 1:49 a.m. where a wind gust of 87 mph was recorded at Juno Beach Pier at 1:50 a.m. The roof was lifted off of one (1) lifeguard stand near the pier, and wood railings were damaged at the north side of the pier.

May 14, 2018 – A severe thunderstorm along a band of convection spawned a brief EF-0 tornado over The Acreage in Palm Beach County touched down. The tornado lasted approximately 4 minutes and was 1.5 miles long. Damage consisted primarily of snapped tree branches, uprooted trees, downed fences, and power lines along the tornado's path. Several homes suffered minor roof damage in the form of shingles being blown off. Two homes sustained damage to side doors, and one home had a set of windowpanes blown out. Several sheds were damaged, a few horse stables lost their covering, and a chicken coop was destroyed. The estimated peak wind was in the 75-80 mph range.

July 25, 2019 – Deep tropical moisture with light wind flow across the region. A stalled front across north central Florida and a mid-upper-level shortwave moving through the region with cold temperatures aloft. 500 mb temperatures were around -8 C, which allowed for some robust convection to be able to develop across the east coast metro. Storms produced hail across Miami-Dade and a brief tornado in Palm Beach County.

An NWS storm survey team found tree damage consistent with a weak EF-0 tornado in the Haverhill area including Haverhill Park along Club Road. Damage consisted of downed tree limbs and a broken mailbox.

April 17, 2020 – A warm front moving north across South Florida, along with a warm and moist local atmosphere, provided support for the development of thunderstorms. Several outflow boundary collisions from nearby storms helped produce a short-lived Palm Beach County tornado.

The NWS storm survey team found damage consistent with an EF-0 tornado in the San Castle neighborhood in Palm Beach County. This area is east of I-95 tucked right between the Boynton Beach and Hypoluxo city limits. Track began near Miner Road and Summit Road, and tracked N-NE between Summit and Grove Road, with the heaviest damage along Brown Road. The track then shifted east of Summit Road from Wilkinson Road to Overlook Road where it lifted near Monroe Boulevard. Damage consisted of multiple downed tree limbs and minor damage to home roofs and fences.

April 6, 2022 – A strong thunderstorm developed over northern Palm Beach County along outflow from a previous thunderstorm. The storm moved south along that boundary while the boundary itself moved slowly eastward towards the Atlantic coast. The combination of the existing storm ingesting the boundary and a newly developing storm merging with the existing one resulted in the development of low-level rotation. A funnel cloud persisted for a while across the Palm Beach Gardens and North Palm Beach communities before eventually producing a short-lived EF-0 tornado centered between Military Trail and I-95, just south of PGA Boulevard. The tornado then lifted and the storm eventually went on to produce a waterspout over the Intracoastal Waterway near West Palm Beach. Lightning from this storm also sparked a couple of small brush fires in the vicinity of PGA Boulevard. It was determined to be a high-end EF-0 with maximum winds estimated around 85 mph. The damage path primarily consisted of tree and branch damage, with isolated more substantial damage to light poles, awnings, and structures. A measured wind gust of 78 mph was reported within the damage path at Palm Beach Gardens High School. The damage was primarily confined along Military trail from Burns Road to just south of Holly Drive.

September 27, 2022 – A strong tornado affected portions of Boca Raton and unincorporated Delray Beach on the evening of September 27, 2022. The beginning of the identified damage was at the Florida Atlantic University Campus in Boca Raton, where siding was torn off a building. Doppler radar showed evidence of strong rotation along the track; however, damage reports are unavailable for the remainder of the Boca Raton portion of the track. EF-0 damage was noted at the American Heritage School just south of Linton Blvd where trees were uprooted, and fences were damaged. The tornado intensified after crossing Linton Blvd and entered the Kings Point community. Considerable damage to condominium buildings, trees, and vehicles was noted. EF-1 and EF-2 damage was common in Kings Point. The roof was completely lifted off a small two-story building complex, with an adjacent larger two-story building complex having about 25% of its roof lifted. Several palm trees were snapped in the middle, and one of the snapped palm trees crashed into a second-story unit and tore a large hole into the wall. A few cars were flipped and moved, and many large tree branches were snapped at the top of the tree canopies. In Kings Point, two (2) people were injured in their homes when their roofs collapsed. One person was rescued from her bathroom after her roof collapsed. A total of about 30 people were evacuated. Just north of the Kings Point community, large tree branches were broken off trees at a Home Depot parking lot at Jog Road and Atlantic Avenue. The tornado continued north of Atlantic Avenue and entered

the Villages of Oriole where EF-1 damage was observed to a few homes, mainly in the form of roof uplift and loss of roof covering/shingles. The tornado lifted in the area of Jog Road.

A tornado began in Wellington just north of Greenbriar Park, causing EF-0 to EF-1 damage in the form of torn roof tiles and many broken tree branches in the Wanderer's Golf Course community. The tornado moved northwest into the Lakefield West and Meadow Wood of the Landings communities, causing minor roof damage before crossing Flying Cow Ranch Road and moving over open land south of Southern Boulevard. Damage totals were estimated based on at least 2 dozen homes sustaining roof damage. The tornado crossed Southern Boulevard near Lion Country Safari Road, causing significant tree damage, then passed just west of Lion Country Safari into Loxahatchee where tree trunks were snapped in the Buck Ridge Trail and Hanover Circle area. The last reported damage was fencing damage at Hanover Circle and Duellant Road.

A brief tornado moved through western sections of Loxahatchee at around the same time that another tornado was occurring in the same general area west of Lion Country Safari. The tornado started near Dellwood Road and produced EF1 tree damage as well as roof damage to a single-family home. The last damage point available was along Capet Creek Court where significant damage to the roof of a stable was observed.

April 29, 2023 – Following ample sunshine, mesoscale boundary collisions created afternoon and evening showers and strong thunderstorms across South Florida, especially around Lake Okeechobee and Palm Beach County. A cell merger that began in Palm Beach Gardens was able to take advantage of a favorable environment for tornadoes and spawned an EF-2 tornado in Palm Beach County.

The tornado began in eastern Palm Beach Gardens, just east of Interstate 95, and moved northeast across A1A, passing just south of the Palm Beach Gardens Medical Center. As it moved through the Sanctuary Cove community, it crossed State Road 786 (PGA Boulevard) near the intersection with US-1. After a short trek up US-1, the tornado dissipated before reaching Juno Beach. Light tree damage consistent with an EF-0 was noted near the determined starting point of the tornado. The tornado strengthened quickly to an EF-1 as it moved through the Gardens East apartment complex. Significant tree damage ranging from uprooted trees to snapped trunks were noted in this community. The tornado then moved through the Sandalwood Estates |community off Burns road. Quite a bit of tree debris was scattered throughout this community, with several large trees completely uprooted. One notable damage indicator was a greater than 3-inch diameter branch that pierced the metal roof of a |residence. A countless number of large branches were stripped from trees throughout the community with a few snapped trunks near the worst of the damage in this area. The tornado then moved through the Rainwood community where a home suffered broken windows and had many shingles removed. Similar tree damage continued into this neighborhood. When the tornado crossed Prosperity Farms Road and entered the Sanctuary Cove community, this was where it strengthened to EF-2 intensity reaching an estimated peak wind of 130 mph. Some of the most substantial structural damage was noted here with collapsed roofs, broken windows, removed roofing material, and debarking of trees. The EF-2 tornado then cross the North Palm Beach Waterway where it completely destroyed a manufactured home along the canal bank. As the tornado moved NNE, it crossed into the Point at Palm Beach Gardens community where it

created minor structural damage to the complex but had some of its most photographed moments as cars were displaced, flipped, and stacked on each other. The tornado then moved through the City Centre where considerable tree, light post, and street sign damage was noted. As it crossed PGA Blvd the tornado destroyed a dry cleaners business, collapsed large light posts, and even caused a concrete electrical pole to lean. The last notable damage was still at EF-2 strength when the tornado crossed US 1 and caused two cars to be flipped and displaced on the opposite side of US 1. Several videos of the |incident were witnessed, as well as one from inside the vehicle, and the survey crew was able to interview one of the drivers. The tornado quickly lifted after crossing US 1 where it caused minor tree damage in a shopping center.

Climate Change

Climate change will affect the frequency and power of tornadoes through changing weather patterns and increases in frequency and duration of severe weather. As population and development increase in the County and its jurisdictions, the probability that tornadoes will cause property damage or human casualties will also increase. With more people migrating to Palm Beach County and its jurisdictions, a larger percent of the land and population may become more vulnerable to hazards. The higher standards adopted by Florida's Building Code decrease vulnerability.

At-Risk Populations

- People Living in Impacted Areas
- Mobile Home Residents
- Older Adults
- Children
- Teens
- Unhoused Individuals
- People with Disabilities
- Persons with Chronic Health Conditions
- Persons with Low Income
- Linguistically Isolated
- Responders

Populations in rural areas and vulnerable populations may face greater risk.

- Poor-driving conditions may cause accidents or individuals to become stranded
- Injury or death from strong winds, hail, flash flood, and/or tornadoes
- Indirect death from destruction post-storm, e.g., downed power lines, falling debris, structure collapses, driving through floodwaters, etc.
- Power outages may adversely threaten medically-dependent individuals

Location

Tornadoes can occur anywhere throughout the County and its jurisdictions. The below table, also in Appendix A, illustrates the varying risk across jurisdictions.

Hazard Assessment H: High M: Medium L: Low V: Very Low	Unincorporated County	MUNICIPALITIES																		
		Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park
Probability	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Vulnerability	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Exposure	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Overall Risk	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L

Hazard Assessment	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Vulnerability	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Exposure	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Overall Risk	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L

Impacts – Consequence Analysis Summary

The consequence analysis for tornadoes has been determined as follows:

Low Consequence

- Health & Safety of Residents
- Continuity of Operations
- Property, Facilities & Infrastructure
- Historic Resources
- Delivery of Services
- Regulatory & Contractual Obligations
- Reputation of County

Medium Consequence

- Health & Safety of Responders
- Environment
- Economic & Financial Conditions

Consequence Rating	Consequence Analysis Detail
Very Low	Hazard is very unlikely to have any measurable or lasting detrimental impact of a particular type and consequences will likely be rectified promptly with locally available resources

Low	Hazard is not likely to have any measurable or lasting detrimental impact of a particular type and consequences will likely be rectified promptly with locally available resources
Medium	There will likely be a measurable detrimental impact, which may require some time to rectify and may require outside resources and/or assistance.
High	The impact will likely be severe and of longer duration, and require substantial time, resources, and/or outside assistance to rectify
Split Box	Hazard would have differing consequences between geographic locations within the county

Overall Vulnerability

Historical data indicates the frequency of tornadoes in PBC and its jursidictions is relatively low. However, the vulnerability does exist as proven in April of 2023 when parts of PBC were affected by a tornado. All communities have a vulnerability to this hazard. The probability of tornadoes in PBC and its jurisdictions is medium with the vulnerability and exposure being low.

2.1.7 Wildfires/Urban Interface Zone

Description

The Wildland/Urban Interface is defined as the area where human development meets or intermingles with undeveloped wildland or vegetative fuels that are both fire-dependent and fire-prone (FEMA, 2022). As residential areas expand into relatively untouched wildlands, people living in these communities are increasingly threatened by wildfires.

There are three (3) different classes of wildland fires. A surface fire is the most common type and burns along the floor of a forest, moving slowly and killing or damaging trees. A ground fire is usually started by lightning and burns on or below the forest floor. Crown fires spread rapidly by wind and move quickly by jumping along the tops of trees. Wildland fires are usually identified by dense smoke that fills the area for miles around.

Rural and large tracts of unimproved lands are susceptible to brush and forest fires capable of threatening life, safety, and property loss in adjacent developed areas if not effectively controlled. Wildfires are caused by numerous sources including arson, carelessness by smokers, individuals burning debris, operating equipment that throws sparks, and children playing with matches. However, the largest number of fires is caused by lightning strikes, which coincides with the height of the thunderstorm season. A major wildland fire can leave a large amount of scorched and barren land, and these areas may not return to pre-fire conditions for decades. If the wildland fire destroys the ground cover, other potential hazards, such as erosion, may develop (FEMA, 2022).

Structures in the wildland/urban interface zone are vulnerable to ignition in three (3) different ways: radiation, convection, and firebrands (National Wildland/Urban Interface Fire Protection Program). Radiating heat from a wildfire can cause ignition by exposure to the structure. The

chances of ignition increase as the size of the flames increases, surface area exposed to flames increases, length of exposure time increases, and distance between the structure and the flames decreases. Another source of ignition by wildfire is convection. Ignition of a structure by convection requires the flame to come in contact with the structure. Contact with the convection column is generally not hot enough to ignite a structure. Clearing to prevent flame contact with the structure must include any materials capable of producing even small flames. Wind and steep slopes will tilt the flame and the convection column uphill increasing the chance of igniting a structure. Structures extending out over a slope have the greatest likelihood of ignition from convection.

Firebrands also pose a threat to structures in the wildland/urban interface. A firebrand is a piece of burning material that detaches from a fire due to strong convection drafts in the burning zone. They can be carried a long distance [approximately one (1) mile] by fire drafts and winds. The chance of these firebrands igniting a structure depends on the size of the firebrand, how long it burns after contact, and the materials, design, and construction of the structure.

The LMS Revisions Sub-Committee based Wildfire and Muck Fire (below) impacts on a severity scale based on the magnitude of the hazard and the on-going mitigation measures in place to counteract those hazards. The severity describes how intense a hazard may be felt and comprised of its impacts, as well as any mitigation actions to offset the impacts.

- Magnitude – the degree to which impacts may be felt or a measured intensity: Human Impacts – Possibility of death or injury to the population.
    - Very Low – Minimal possibility of death or injury.
    - Low – Less than 2 deaths or 10 injuries reported or expected.
    - Medium – Between 2 – 5 deaths or 10 – 25 injuries reported or expected.
    - High – More than 5 deaths or 25 injuries reported or expected.

- Property Impacts – Physical losses and damages to property, buildings, or other critical infrastructure.
    - Very Low – Minimal possibility of physical loss and/or damage.
    - Low – Physical losses and/or damages are reported or expected to be less than $10,000.
    - Medium – Physical losses and/or damages are reported or expected to be between $10,000 and $1,000,000.
    - High – Physical losses and/or damages are reported or expected to be greater than $1,000,000.

- Spatial Impacts – Amount of geographic area affected.
    - Very Low – Minimal geographic area affected.
    - Low – Up to 25% of total area or jurisdiction affected.
    - Medium – 26%-50% of total area or jurisdiction affected.
    - High – 50% or more of total area or jurisdiction affected.

- Economic Impacts (Interruption of businesses, infrastructure, or government services).
    - Very Low – Minimal interruption of services or no more than 12 hours.
    - Low – Interruption of services between 1 – 3 days.
    - Medium – Interruption of services between 3 – 7 days.
    - High – Interruption of services greater than 7 days.

Historic Wildfire Events

May 27, 2000 – Holyland Fire – 25,000 Final Acres

June 12, 2001 – KOA Fire – 12,000 Final Acres

May 9, 2006 – Berg Fire – 29,250 Final Acres

June 20, 2006 – Deer Fly Fire – 16,000 Final Acres

April 1, 2007 – April Fool Fire – 11,600 Final Acres

May 22, 2014 – L-4 Cutout Fire – 10,000 Final Acres

May 15, 2015 – Pump House Fire – 13,000 Final Acres

July 1, 2015 – Holy Land Fire – 11,400 Final Acres

May 19, 2017 – Three Mile Fire – 19,600 Final Acres

June 4, 2018 – G-205 Fire – 10,598 Final Acres

The five (5) federal agencies managing forest fire response and planning for almost 10 million acres in Florida are the United States Forest Service, the Bureau of Land Management, Bureau of Indian Affairs, the National Park Service, and the United States Fish and Wildlife Services. There are other State agencies that have a significant number of wildfires but conduct a lot of prescribed fires, namely the Florida Forest Service. They determine the magnitude of size, intensity, acreage, and potential for evacuations. The county has over 587,649 acres of vegetation and trees that could be potentially destroyed or damaged in an uncontrolled muck or wildfire. The majority of these areas are in the western and southwestern part portion of county. These acres are under contract with the Florida Department of Agriculture and Consumer Services (FDACS) to be protected in case of fire in coordination with Palm Beach Country Fire Rescue.

Climate Change

Changing climate can increase frequency or intensity of extreme heat or drought events, in addition to increasing existing fuel flammability, could affect wildfire behavior. Reducing moisture of living vegetation, soils, and decomposing organic matter during drought or extreme heat events is associated with increased incidence of wildfires. Furthermore, changes over time in vegetation

types could change the mixture and flammability of fuels. As these transitions occur, wildfire occurrences and severity could increase with the introduction of more flammable vegetation types or decrease with the introduction of more fire-resistant species. Palm Beach County has weather patterns that lead to both dry and wet periods each year. Climate change may cause one or the other, or both to increase in occurrence and magnitude. As population and development increase in the County and its jurisdictions, the probability that wildfires will cause property damage or human casualties will also increase. With more people migrating to Palm Beach County and its jurisdictions, a larger percent of the land and population may become more vulnerable to hazards. The higher standards adopted by Florida's Building Code decrease vulnerability.

At-Risk Populations

- People with Asthma or Respiratory Conditions
- Older Adults
- Children
- Unhoused Individuals
- People with Disabilities
- Persons with Chronic Health Conditions including Cardiovascular Disease
- Persons with Low Income
- People with Outdoor Employment
- Linguistically Isolated
- Responders

Populations located in the wildland urban interface may face greater risk. Vulnerable populations located in the same areas may face greater risk.

- Possibility of evacuation
- Injury or death from fire or smoke inhalation
- Vehicle accidents due to decreased visibility or evacuation
- Loss of income for agriculture professionals

Location

Portions of unincorporated Palm Beach County, Belle Glade, Boca Raton, Loxahatchee Groves, Pahokee, South Bay, and Wellington are at highest risk for wildfires. The remaining communities are at low risk.

The below table, also in Appendix A, illustrates the varying risk across jurisdictions.

Hazard Assessment H: High M: Medium L: Low V: Very Low	Unincorporated County	MUNICIPALITIES Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clark Shores	Lake Park
Probability	H	L	H	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Vulnerability	H	L	H	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Exposure	H	L	H	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Overall Risk	H	L	H	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L

Hazard Assessment	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	L	L	H	L	L	L	L	H	L	L	L	L	L	L	H	L	L	H	L	L
Vulnerability	L	L	H	L	L	L	L	H	L	L	L	L	L	L	H	L	L	H	L	L
Exposure	L	L	H	L	L	L	L	H	L	L	L	L	L	L	H	L	L	H	L	L
Overall Risk	L	L	H	L	L	L	L	H	L	L	L	L	L	L	H	L	L	H	L	L

Impacts – Consequence Analysis Summary

The consequence analysis for wildfires and urban interface has been determined as follows:

Low Consequence

- Health & Safety of Residents
- Continuity of Operations
- Historic Resources
- Delivery of Services
- Regulatory & Contractual Obligations
- Reputation of County

Medium Consequence

- Health & Safety of Responders
- Property, Facilities & Infrastructure
- Environment
- Economic & Financial Conditions

Consequence Rating	Consequence Analysis
Very Low	Hazard is very unlikely to have any measurable or lasting detrimental impact of a particular type and consequences will likely be rectified promptly with locally available resources
Low	Hazard is not likely to have any measurable or lasting detrimental impact of a particular type and consequences will likely be rectified promptly with locally available resources
Medium	There will likely be a measurable detrimental impact, which may require some time to rectify and may require outside resources and/or assistance.
High	The impact will likely be severe and of longer duration, and require substantial time, resources, and/or outside assistance to rectify

Split Box	Hazard would have differing consequences between geographic locations within the county

Overall Vulnerability

Less urbanized communities and areas within the County are more vulnerable to wildfires than the more developed communities. Large areas in the western part PBC and many isolated unincorporated pockets of residential development are quite vulnerable to wildfire. The southern and western portion of the Village of Wellington, the unincorporated areas west of Boca Raton, South Bay, Pahokee, and Belle Glade, and virtually all of PBC's unincorporated areas have a high vulnerability to wildfire during the dry season each year. The problems in the Village of Wellington, west Boca Raton area, and in the various unincorporated pockets of development such as Jupiter Farms, Loxahatchee, and the Lion Country Safari area arise from the fact that these areas have an extensive canopy of slash pine (Pinus elliotii) and sand pines (Pinus clausa), and numerous undeveloped lots interspersed with residences.

Upland pine communities in South Florida are adapted for periodic episodes of fire, and they burn very easily. They also generate large quantities of flammable leaf litter and other combustible by-products, which catch fire easily and generate a very hot, if short-lived fire. Clearing of vacant lots, periodic removal of accumulated leaf litter, maintained firebreaks, and controlled burns in the undeveloped or rangeland areas of PBC, are the best mitigation measures that can be applied for this hazard.

Although the County and its jurisdictions as a whole has placed a low probability, vulnerability, and exposure to wildfires/urban interfaces, there are some cities that have placed a high probability, vulnerability, and exposure to these threats. This is due to the larger wooded areas that exist within the cities and their proximity to households and businesses. The cities that could face the most effects from wildfires would be Belle Glade, Boca Raton, Loxahatchee Groves, Pahokee, South Bay, Wellington, and portions of unincorporated PBC.

2.1.8 Pandemic/Communicable Diseases

Description

Infectious diseases emerging throughout history have included some of the most feared plagues of the past. New infections continue to emerge today, while many of the old plagues are still with us. As demonstrated by influenza pandemics, under suitable circumstances, a new infection first appearing anywhere in the world could travel across entire continents within days or weeks (Morse, 1996). Due to the potential of complex health and medical conditions that can threaten the general population, Florida's vulnerability to a pandemic is continually monitored. With millions of tourists arriving and departing the state annually, disease and exposure (airborne, vector, and ingestion) are constantly evaluated and analyzed.

Primarily as a result of the entrance of undocumented noncitizens into south Florida, and the large number of small wildlife, previously controlled or eradicated diseases have surfaced. Health

officials closely monitor this potential threat to the public health. The emphasis upon preventive medical measures such as school inoculation, pet licensing, rodent/insect eradication, water purification, sanitary waste disposal, health inspections, and public health education mitigate this potential disaster.

Another potential threat to south Florida's population is food contamination. Frequent news stories document that *E.coli* and botulism breakouts throughout the country are not that uncommon.

While this plan addresses all potential pandemic diseases, those that have actually affected PBC will be addressed in that disease discussion.

Avian (Bird Flu) H5N1

Although there are many forms of bird flu, the form that has most recently concerned health officials is the H5N1 flu virus carried by wild birds. While wild birds seldom get sick from the virus, they can easily pass the virus to farm birds such as chickens, ducks, and turkeys being raised for food. There have been very few rare cases of H5N1 being transmitted to humans, mostly in Asia. The Centers for Disease Control (CDC) recommends if you work closely with birds such as poultry farms, and develop conjunctivitis or flu-like symptoms, to seek medical attention to rule out H5N1.

Swine Flu A (H1N1)

One way an antigenic shift can occur is through pigs. Pigs can be infected with both avian and human influenza viruses. If pigs become infected with viruses from different species at the same time, it is possible for genes of the viruses to mix and create a new virus for which humans have no natural immunity. This is termed by the CDC as a "variant" virus.

According to the CDC, estimating the number of individual flu cases in the United States is very challenging because many people with flu don't seek medical care and only a small number of those that do seek care are tested. More people who are hospitalized or die of flu-related causes are tested and reported, but under-reporting of hospitalizations and deaths occur as well. For this reason, CDC monitors influenza activity levels, trends, and virus characteristics through a nationwide surveillance system and uses statistical modeling to estimate the burden of flu illness (including hospitalizations and deaths) in the United States.

Influenza viruses that normally circulate in pigs are called "variant" viruses when they are found in people. Influenza A H3N2 variant viruses (also known as "H3N2v" viruses) with the matrix (M) gene from the 2009 H1N1 pandemic virus were first detected in people in July 2011. The viruses were first identified in U.S. pigs in 2010. In 2011, 12 cases of H3N2v infection were detected in the United States (Indiana, Iowa, Maine, Pennsylvania, and West Virginia). In 2012, 309 cases of H3N2v infection across 12 states were detected. In 2013, 19 cases of H3N2v across five (5) states were detected.

The CDC assessment from 2017 states that it is possible that sporadic infections and even localized outbreaks among people with this virus may occur. While there is no evidence at this time that sustained human-to-human transmission has occurred, all influenza viruses have the capacity to change. It is possible that this virus may change and become widespread in people. Illness associated with H3N2v infection so far has been mostly mild with symptoms similar to those of seasonal flu. Like seasonal flu, however, serious illness, resulting in hospitalization and death is possible.

There have been no documented cases of any of the H1N1 or variants in the state of Florida since 2011.

MERS-CoV

MERS-CoV is a novel corona virus causing severe acute respiratory illness. Corona viruses are transmitted by close person-to-person contact. Corona viruses are thought to be transmitted most readily by respiratory droplets produced when an infected person coughs or sneezes or through living with or caring with someone who has a confirmed case of MERS. The virus can also spread when a person touches a surface or object contaminated with infectious droplets and then touches his or her mouth, nose, or eye(s). Signs and symptoms of MERS-CoV are fever, cough, and shortness of breath. The death rate is 30-40% of all people who have reported with MERS.

West Nile Virus

The PBC Health Department reported cases of the West Nile Virus in 2002, 2002, 2010, and 2011. This disease is transmitted by mosquitoes. Health notifications were given throughout the County both years to alert and caution the public. Individuals were advised to take precautions when outdoors and to try to avoid being outside after dusk.

The West Nile Virus is an arthropod-borne virus (arbovirus) most commonly spread through infected mosquitoes. In a very small number of cases, the virus has been transmitted through blood transfusions, organ transplants, and from mother to baby during pregnancy, delivery, or breastfeeding. Most people (70-80%) who contract West Nile Virus never develop symptoms. Those with symptoms include a fever with headache, body aches, joint pains, vomiting, diarrhea, or rash. Some severe symptoms (less than 1% will exhibit) are serious neurologic illness such as encephalitis or meningitis.

SARS

Severe Acute Respiratory Syndrome (SARS) is a viral respiratory illness caused by a corona virus, called SARS-associated corona virus (SARS-CoV). It is transmitted by close person-to-person contact. The virus that causes SARS is thought to be most readily spread by respiratory droplets produced when an infected person coughs or sneezes, or when a person touches a surface or object contaminated with infectious droplets and then touches his/her nose, mouth, or eyes. Signs and symptoms of SARS generally begins with a high fever (greater than 100.4 degrees Fahrenheit) and

may include headache, overall feeling of discomfort, and body aches. Some people will also have mild respiratory symptoms.

Malaria

Malaria is a parasite (*P.faliciparum, P.vivax, P.malariae,* and *P.ovale*) that infects humans primarily after being bitten by an infected mosquito. It also can be transmitted from infected mothers to their babies during pregnancy or during delivery, and in rare cases, through blood transfusions. Malaria was eradicated from the US in the early 1950's, and nearly all cases today in the US are from recent overseas travelers. On June 26, 2023, the Florida Department of Health issued a statewide mosquito-borne illness advisory following the detection of seven (7) local cases of malaria in Sarasota County.

Symptoms of malaria include fever and flu-like illness, including chills, headache, muscle aches, and tiredness. Nausea, vomiting, and diarrhea may also occur. For most people, symptoms begin ten (10) days to four (4) weeks after infection, although a person may feel ill as early as eight (8) days or as late as one (1) year later.

Dengue

Dengue fever is caused by any of four (4) closely related viruses, or serotypes of dengue 1-4. Dengue is transmitted by the bite of infected mosquitoes (*Aedes aegypti* and *Aedes albopictus*) which are found throughout the world, including PBC. Signs and symptoms include severe headache, high fever, severe eye pain (behind the eyes), muscle, bone, and joint pain, low white cell count, mild bleeding manifestation (e.g., nose or gum bleed, petechiae, or easy bruising), and rash. In 2022, there were 750 travel-associated and 57 locally transmitted cases of Dengue in the state.

Dengue hemorrhagic fever is a similar illness but also occurring with hemorrhagic manifestations. A person can be infected separately by all four (4) dengue fever serotypes, and research has shown that infection by more than one increases the chances of developing dengue hemorrhagic fever.

Ebola

Ebola Virus Disease is a rare and deadly disease most commonly affecting people and nonhuman primates (monkeys, gorillas, and chimpanzees). It is caused by an infection of one (1) of five (5) known Ebola virus species, four (4) of which can cause disease in people: Ebola virus, Sudan virus, Tai Forest virus, Bundibugyo virus, and Reston virus (only nonhuman primates and pigs, not humans). Ebola spreads to people through direct contact with bodily fluids of a person who is sick or who has died from the virus. It enters through broken skin or mucous membranes in the eyes, nose, or mouth. In 2014, the Ebola virus drew national attention with one (1) suspected case in the County. DEM worked with Florida Health and other key stakeholders to develop the Port of Entry sections of this plan that would mitigate against passengers coming into PBC affected with any communicable disease. As of March 29, 2016, the World Health Organization terminated the Public Health Emergency of International Concern for the Ebola outbreak in West Africa. There have been no cases in the US since before that time.

Zika

Zika is a virus which spreads to people primarily through the bite of an infected *Aedes* species mosquito. It can also be passed through sex from a person who has Zika to his or her sex partners, and it can be spread from a pregnant woman to her fetus. In 2015, Zika was not a nationally reportable disease however, nine (9) cases, representing 15% of all US cases of symptomatic infections, occurred in the State of Florida. In 2016, Florida reported 1,115 cases, representing 22% of all US cases of infections. In 2017, this number dropped significantly to 110 cases, and in 2018 dropped again to 14. As of this writing, there have been no reported cases in Florida in 2019. This is due to efforts by local, state, federal, health, and government officials identifying outbreaks and using mitigation strategies (i.e. mosquito spraying) to reduce the chances of infected mosquitoes transmitting the virus.

The County has a very active mosquito spraying program which has likely limited the spread of Zika from the *Aedes* species mosquito.

Coronavirus

Covid-19 also known as the coronavirus disease, originated in late 2019 in China. It is caused by the SARS-Cov-2 virus. The disease quickly spread globally, leading to a pandemic. Covid-19 has had a significant impact on public health, economies, and daily life. Efforts to control the spread of the virus have included lockdowns, social distancing, mask wearing, and vaccination campaigns. It is transmitted by close person-to-person contact. The virus that causes Covid-19 is thought to be most readily spread by respiratory droplets produced when an infected person coughs or sneezes, or when a person touches a surface or object contaminated with infectious droplets and then touches his/her nose, mouth, or eyes. Signs and symptoms of Covid-19 generally begins with a high fever (greater than 100.4 degrees Fahrenheit) and may include headache, overall feeling of discomfort, and body aches. Some people will also have mild respiratory symptoms.

PBC bases Pandemic Diseases on a probability scale of occurrence. This scale takes into effect the likelihood that PBC will be impacted by disease hazards within a given period of time or the return rate of a hazard and is based on the historical data, estimated return periods, recurrence, or chance of occurrence.

Very Low	Although the hazard is noted, no previous occurrence has been recorded; or less than a 0.1% chance of occurrence; or a 100-year event or greater.
Low	The hazard has occurred 10 years or more ago; or greater than 0.1% to 1.0% chance of occurrence; or a 100-year event.
Medium	The hazard has occurred in the past 6 to 10 years; or greater than 1.0% to 2.0% chance of occurrence; or a 50-year event.

High	The hazard to occurred in the past 1-5 years; or greater than 2.0% chance of occurrence; or less than a 50-year event.

Climate Change

Climate change has forced some animal species into new habitats as their natural habitats disappear, and it has expanded the habitats of other animals. This movement of animals into new areas increases opportunities for contact between humans and animals and the potential spread of zoonotic diseases. Rising temperatures allow certain disease-causing fungi to spread to new areas that previously were too cold for them to survive. The risk for natural disasters and flooding have increased, therefore the risk for mold to grow in homes increases. As population and development increase in the County and its jurisdictions, the probability that pandemic and communicable diseases will cause economic damage or human casualties also increases. With more people migrating to Palm Beach County and its jurisdictions, a larger percent of the land and population may become more vulnerable to hazards. The higher standards adopted by Florida's Building Code decrease vulnerability.

At-Risk Populations

- Racial and Ethnic Minorities
- Older Adults
- Children
- Unhoused Individuals
- People with Disabilities
- Persons with Chronic Health Conditions
- Persons with Low Income
- Linguistically Isolated
- Responders

Populations located in urban areas may face a greater risk. Vulnerable populations in the same areas may face a greater risk.

Location

The entire county and its jurisdictions has been deemed as medium risk for pandemic and communicable diseases. The below table, also in Appendix A, illustrates the varying risk across jurisdictions.

Hazard Assessment H: High M: Medium L: Low V: Very Low	Unincorporated County	MUNICIPALITIES																																					
		Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Vulnerability	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Exposure	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Overall Risk	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M

Impacts – Consequence Analysis Summary

The consequence analysis for pandemic/communicable diseases has been determined as follows:

Low Consequence

- Property, Facilities & Infrastructure
- Historic Resources
- Regulatory & Contractual Obligations

Medium Consequence

- Health & Safety of Residents
- Health & Safety of Responders
- Delivery of Services
- Environment

High Consequence

- Continuity of Operations
- Economic & Financial Conditions
- Reputation of County

Consequence Rating	Consequence Analysis
Very Low	Hazard is very unlikely to have any measurable or lasting detrimental impact of a particular type and consequences will likely be rectified promptly with locally available resources
Low	Hazard is not likely to have any measurable or lasting detrimental impact of a particular type and consequences will likely be rectified promptly with locally available resources
Medium	There will likely be a measurable detrimental impact, which may require some time to rectify and may require outside resources and/or assistance.

High	The impact will likely be severe and of longer duration, and require substantial time, resources, and/or outside assistance to rectify
Split Box	Hazard would have differing consequences between geographic locations within the county

Overall Vulnerability

Florida is more vulnerable than many other states to possible outbreaks of infectious diseases due to the large number of international and U.S. tourists it attracts and the elder population. In addition, vulnerability to disease hazards has increased by the number of undocumented noncitizens reaching U.S. shores. The County's and its jurisdictions' vulnerability to pandemic outbreaks, while higher than some other Florida counties due to its large immigrant and elder populations is still considered only moderate. Medical facilities are adequate for current needs, but would be stressed if forced to deal with a major disease outbreak.

2.1.9 Drought

Description

The U.S. Drought Monitor (USDM) identifies areas in drought and labels them by intensity using four categories of drought, from D1—the least intense—to D4, the most.

Category	Description	Example Percentile Range for Most Indicators	Values for Standard Precipitation Index and Standardized Precipitation-Evapotranspiration Index
None	Normal or wet conditions	30.01 or Above	-0.49 or above
D0	Abnormally Dry	20.01 to 30.00	-0.5 to -0.79
D1	Moderate Drought	10.01 to 20.00	-0.8 to -1.29
D2	Severe Drought	5.01 to 10.00	-1.3 to -1.59
D3	Extreme Drought	2.01 to 5.00	-1.6 to -1.99
D4	Exceptional Drought	0.00 to 2.00	-2.0 or less

Figure 2.11 US Drought Monitor (USDM)

Drought is a normal, recurrent feature of climate, although many perceive it as a rare and random event. In fact, each year some part of the U.S. has severe or extreme drought. Even in Florida, where annual rainfall averages about 54 to 56 inches, drought is a regular part of the climate. Although drought is generally defined as a "deficiency of precipitation over an extended period of time (usually a season or more) resulting in a water shortage". Droughts can lead to a wide range of environmental, social, and economic impacts. Droughts are second to hurricanes in terms of damage costs when they occur (Drought.gov 2023).

Drought produces a complex web of impacts that spans many sectors of the economy and reaches well beyond the area producing physical drought. This complexity exists because water is essential to our ability to produce goods and provide services (National Drought Mitigation Center, 1998).

A few examples of direct impacts of drought are reduced crop, rangeland, and forest productivity; increased fire hazard; reduced water levels; increased livestock and wildlife mortality rates; and damage to wildlife and fish habitats. Social impacts include public safety; health issues; conflicts between water users; reduced quality of life; and inequities in the distribution of impacts and disaster relief. Income loss is another indicator used in assessing the impacts of drought; reduced income for farmers has a ripple effect throughout the region's economy (National Drought Mitigation Center, 1998).

The impact is so diffuse that it is difficult to come up with financial estimates of damages. However, FEMA estimates $6-8 billion in losses as the annual average. The worst drought in recent history occurred in 1987-1989, and the National Climatic Data Center reports the estimated cost as $40 billion (National Drought Mitigation Center, 1998).

In PBC, the primary sources of water are Lake Okeechobee, watershed areas, and the County's wellfields. Normally, excess water from an interconnected series of lakes, rivers, canals, and marshes flows into Lake Okeechobee via the Kissimmee River. When this cycle is disrupted by periods of drought, one of the potentially most damaging effects is substantial crop loss in the western agriculture areas of the County. In addition to obvious losses in yields in both crop and livestock production, drought in PBC is associated with increases in insect infestations, plant disease, and wind erosion. The incidence of wildfires increases substantially during extended droughts, which in turn places both human and wildlife populations at higher levels of risk.

The county averages between 50 and 60 inches of rain per year, with annual rainfall varying up to 20 inches above or below the annual average. The SFWMD and County staff manage the County's water resources. A countywide, uniform, forceful, contingency plan is in place to effectively restrict the use of water that complements the District's water management efforts during periods of critical water shortage.

The worst drought on record for PBC was from November 2000 to February 2001. Lake Okeechobee dropped from 18 feet after Hurricane Irene in October of 1999 to nine (9) feet by May of 2001. Lake Okeechobee's average is about 12 feet. The year 2000 was also the driest year on record for the State of Florida.

The graph below shows periods of drought for PBC from January 2000 through January 2024. The y-axis is the percentage of PBC covered by drought conditions, and the colors indicate the drought levels as defined by the US Drought Monitor in the legend below the graph. According to this data, exceptional drought occurred in the County in the winters of 2001 and 2011, extreme drought conditions occurring in 2007 and 2009, and 2023 as one of the driest years recorded.

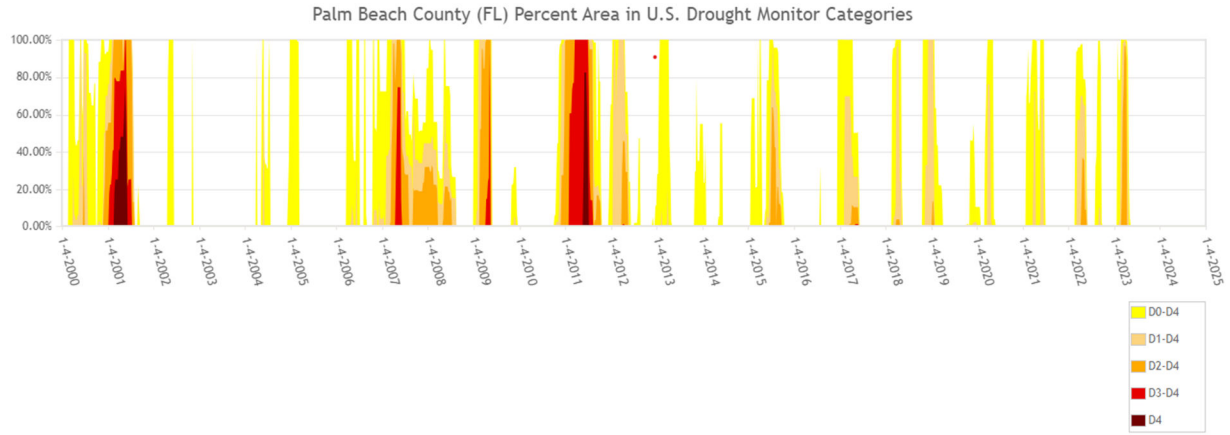


Figure 2.12 PBC Droughts January 2000 through January 2024

Historic Drought Events

The following are significant droughts that have affected PBC since 1970 but did not result in major negative impacts to the county.

1980 – 1982 Drought – The 1980–1982 Drought was one of the most severe droughts ever in South Florida. A more than 20-inch rainfall deficit over two (2) years resulted in the decline of the Lake Okeechobee stage from 17.46 feet NGVD on January 1, 1980, to 9.79 feet NGVD on July 21, 1981. The 7.7-foot drop in water level was attributed to a decrease in rainfall and increases in evaporation and water use. The drought for the Lower East Coast and Water Conservation Areas was relieved in 1981 by Tropical Storm Dennis.

1988 – 1989 Drought – South Florida experienced a severe drought from September 1988 to August 1989, during which there was a 21-inch rainfall deficit in the Everglades Agricultural Area and the Lower East Coast. The Lake Okeechobee water level declined from 15.95 feet NGVD on September 1, 1988, to 11.06 feet NGVD on August 8, 1989. During the same period, record storage depletion was reported for Lake Okeechobee and the Water Conservation Area.

1990 Drought – The 1990 drought was a continuation of the 1988–1989 drought. From June 1989 through May 1990, a nine-inch rainfall deficit occurred District-wide and was most severe in Everglades National Park. Lake Okeechobee supply-side management and water restrictions were implemented to conserve lake water. The Lake Okeechobee water level declined from 12.25 feet NGVD on January 1, 1990, to 10.47 feet NGVD on June 21, 1990.

2000 - 2001 Drought – A new low water level record of 8.97 feet NGVD was set for Lake Okeechobee on May 24, 2001, during the 2000–2001 drought in South Florida. This is considered the worst drought on record for PBC, and also the driest year on record for the State of Florida.

2007 Drought – A severe drought affected the region from late 2006 through 2007, following back-to-back years of unprecedented hurricane activity and higher-than-normal rainfall. On July 2, 2007, water levels in Lake Okeechobee reached an all-time record low of 8.82 feet, eclipsing

the mark of 8.97 feet set during the 2001 drought. Rainfall directly over the lake was low enough to qualify the 2007 drought as a 1-in-100-year event. Only 40 inches of rain fell on the region in an 18-month period, about half the average. More than 200 days passed without water flowing from the Kissimmee River into Lake Okeechobee. This also marked the first time SFWMD experienced a situation where all three (3) major water storage areas of the system – the Upper Kissimmee Chain of Lakes, Lake Okeechobee, and the Water Conservation Areas – simultaneously had substantially below normal water levels approaching record lows.

A combination of voluntary and mandatory water use restrictions were enacted by the SFWMD in early 2007. Widespread drought conditions continued into late 2007, particularly in the Lake Okeechobee watershed.

A wetter than normal spring and summer of 2008 finally interrupted the extended drought. Water use restrictions continued into 2009 and beyond, in order to balance longer-term regional water availability and supply needs.

August 2011 Drought – Rainfall amounts in August ranged from four (4) to six (6) inches over parts of interior southwest Florida to over ten (10) inches over parts of southeast Florida. Overall, rainfall averaged near to above average over most areas, leading to gradually improving drought conditions. Lake Okeechobee remained over two (2) feet below the normal level for this time of year. Underground water levels remained below normal over much of south Florida, especially over the metro east coast sections.

According to the US Drought Monitor, there have been no significant droughts since 2011.

Climate Change

Similar to many other extreme events, droughts are affected by climate change through a combination of thermodynamic and dynamic processes. Thermodynamic processes contributing to drought are mostly related to heat and moisture exchanges and are also partly influenced by plant coverage and physiology. These processes affect atmospheric humidity, temperature, radiation, precipitation, and evapotranspiration. Dynamic processes help to explain drought variability on different time scales.

Some of the main drivers of drought conditions include precipitation deficits, atmospheric evaporative demand, soil moisture deficits, and hydrological deficits (shown in the figure to the right). Lack of precipitation is generally the main factor controlling the onset of drought. Atmospheric evaporative demand is the maximum amount of evapotranspiration that can happen from land surfaces if water availability is not scarce. For instance, increased demand under low soil moisture conditions can increase the severity of agricultural and ecological droughts. Soil moisture directly affects stress on plants and evapotranspiration. Less soil moisture can lead to less evapotranspiration, which can lead to flash-droughts (quick onset droughts). Climate change can have an effect on the frequency and duration of droughts. Drought, consequently, can affect wildfires, increase risk to agriculture, and public health and safety. As population and development increase in the County and its jurisdictions, the probability that drought will cause

loss of agriculture, habitat damage, or human casualties will also increase. With more people migrating to Palm Beach County and its jurisdictions, a larger percent of the land and population may become more vulnerable to hazards. The higher standards adopted by Florida's Building Code decrease vulnerability.

At-Risk Populations

- People with Asthma or Respiratory Conditions
- Older Adults
- Children
- Unhoused Individuals
- People with Disabilities
- Persons with Low Income
- People with Outdoor Employment
- Linguistically Isolated
- Responders

Populations in rural areas, wildland-urban interface (WUI) areas, and vulnerable populations may face greater risk. Impacts may include:

- Lack of water or water restrictions for personal use
- Injury or death from wildfire, as a result of drought conditions

Location

Due to the impacts of a drought being seen primarily in the farming industry, the following cities have placed higher vulnerability and exposure to the effects of drought: Belle Glade, Pahokee, South Bay, and the unincorporated parts of the County. The below table, also in Appendix A, illustrates the varying risk across jurisdictions.

Hazard Assessment H: High M: Medium L: Low V: Very Low	Unincorporated County	MUNICIPALITIES																																									
		Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	M	L	M	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	M	L	L	L	L	L	L	M	L	L	L	L	L
Vulnerability	H	L	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	L	L	L	L	L	L	H	L	L	L	L	M
Exposure	H	L	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	L	L	L	L	L	L	H	L	L	L	L	M
Overall Risk	H	L	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	L	L	L	L	L	L	H	L	L	L	L	M

Impacts – Consequence Analysis Summary

Palm Beach County and its jurisdictions experience cyclical drought on a regular basis. Analyzing past events, as well as the current drought conditions, has proven that the conditions have been variable over the years, affecting the County randomly and somewhat equally.

The consequence analysis for drought has been determined as follows:

Low Consequence

- Health & Safety of Residents
- Health & Safety of Responders
- Continuity of Operations
- Property, Facilities & Infrastructure
- Historic Resources
- Delivery of Services
- Regulatory & Contractual Obligations
- Reputation of County

Medium Consequence

- Environment

High Consequence

- Economic & Financial Conditions

Consequence Rating	Consequence Analysis
Very Low	Hazard is very unlikely to have any measurable or lasting detrimental impact of a particular type and consequences will likely be rectified promptly with locally available resources
Low	Hazard is not likely to have any measurable or lasting detrimental impact of a particular type and consequences will likely be rectified promptly with locally available resources
Medium	There will likely be a measurable detrimental impact, which may require some time to rectify and may require outside resources and/or assistance.
High	The impact will likely be severe and of longer duration, and require substantial time, resources, and/or outside assistance to rectify
Split Box	Hazard would have differing consequences between geographic locations within the county

Overall Vulnerability

The County and its jurisdictions overall have a moderate vulnerability to the impacts from drought due to the County's large agricultural land use in the west and extensive urbanization in the east. PBC has a narrow reserve of potable water and this could become a significant problem during a long-term drought. The western area of the County (Belle Glade, Pahokee, South Bay and portions of unincorporated Palm Beach County) is most vulnerable to the impacts of drought because this area is extensively involved in farming and ranching. The urbanized communities along PBC's coast (Boca Raton, Boynton Beach, Briny Breezes, Delray Beach, Gulf Stream, Highland Beach, Hypoluxo, Juno Beach, Jupiter, Jupiter Inlet Colony, Lake Park, Lake Worth Beach, Lanatana, Manalapan, North Palm Beach, Ocean Ridge, Palm Beach, Palm Beach Shores, Riviera Beach, South Palm Beach, Tequesta, and West Palm Beach) are less vulnerable economically due to their location and non-agricultural economic base. Potential impacts to PBC's potable water supply by saltwater intrusion during drought conditions are generally low, with the exception of the City of West Palm Beach, which draws its water from surface supplies.

Overall, the threat of a drought is low throughout the County and its jurisdictions. A few examples of direct impacts of drought are reduced crop, rangeland, and forest productivity; increased fire hazard; reduced water levels; increased livestock and wildlife mortality rates; and damage to wildlife and fish habitats. Social impacts include public safety; health issues; conflicts between water users; reduced quality of life; and inequities in the distribution of impacts and disaster relief. Income loss is another indicator used in assessing the impacts of drought; reduced income for farmers has a ripple effect throughout the region's economy.

2.1.10 Agricultural Pests and Diseases

Description

According to FDACS, Florida ranks 15th among all states in number of farms and 30th in land farms. Florida agriculture generated farm cash receipts totaling $7.41 billion in 2020. All crops accounted for 80.3% of total cash receipts. The market value of agricultural products sold, including food and marketing practices and value-added products was $901 million in 2017. The USDA's Ag Census will be updated later in 2024. The industry is susceptible to many hazards including freezes, droughts, and exotic pests or diseases. Agricultural crops grown throughout the state and every region are vulnerable to the effects of an exotic pest or disease infestations.

According to PBC Cooperative Extension, the County is one of the 10 largest agricultural counties in the United States and leads the state of Florida in total agricultural sales with an estimated $1.397 billion in 2019-2020. Palm Beach County leads the nation in the production of sugarcane, fresh sweet corn, and sweet bell peppers. It leads the State in the production of rice, lettuce, radishes, Chinese vegetables, specialty leaf, and celery. The main threats to the PBC agriculture industry are Citrus Canker, HLB (greening disease), the Mediterranean Fruit Fly (Medfly), and sugarcane pests.

However, as it relates to PBC, we have not experienced or had any issues as it relates to Agricultural Pest and Disease over the past 20 years.

Citrus Canker

Citrus Canker was found in PBC in numerous locations in 2002. The FDACS reported cases of orange and grapefruit trees infected in the southern and northern parts of the County. Citrus Canker is a bacterial disease that causes premature leaf and fruit drop. It affects all types of citruses; including oranges, sour oranges, grapefruit, tangerines, lemons, and limes. Symptoms found on leaves and fruit are brown, raised lesions surrounded by an oily, water-soaked area and a yellow ring or halo.
There is no known chemical compound that will destroy the Citrus Canker bacteria. In order to eradicate the disease, infected trees must be cut down and disposed of properly. In 2002, legal cases over the cutting down of infected and exposed trees began when citrus canker was discovered in PBC. The FDACS wanted to search a 70-square-mile area of PBC for diseased trees. It is a highly contagious disease that can be spread rapidly by windborne rain, lawnmowers and other landscaping equipment, animals and birds, people carrying the infection on their hands or clothing, and moving infected or exposed plants or plant parts. There is great potential to affect Florida's $785 million citrus industry.

Huanglongbing (HLB)/Citrus Greening Disease

Huanglongbing (HLB), also known as citrus greening or yellow dragon disease, is one of the most serious citrus diseases in the world. It is widespread in Asia, Africa, and the Saudi Arabian Peninsula. In July 2004, it was reported in Brazil, and in August 2005, it was found for the first time in the U.S. in south Miami-Dade County. Huanglongbing is a bacterial disease that attacks the vascular system of plants. Once infected, there is no cure for the disease, and in areas where the disease is endemic, citrus trees decline and die within a few years. There are three (3) known forms: Asian, African and Brazilian. The HLB bacteria is transmitted primarily by insect vectors (Asian citrus psyllids) but can also be spread through plant grafting and movement of infected plant material. Even though the pathogens are bacteria, the disease does not spread by casual contamination of personnel and tools or by wind and rain. Though citrus is the primary plant host for HLB, other citrus relatives can also get the disease. Common HLB host plants include the Chinese box orange (Severinia buxifolia) and the curry leaf (Murraya koenigii). While HLB disease and the Asian psyllid share many of the same host plants, some host plants are specific to the disease and others to the psyllid.

The entire State is under Federal quarantine for citrus greening and Asian citrus psyllid. Federal law restricts the movement of live citrus plants, plant parts, budwood, or cuttings outside of Florida. Subsequent U.S. detections of the disease have occurred in numerous citrus-producing States and U.S. Territories.

The map on the following page from FDACS indicates instances of citrus canker and citrus greening in South Florida, including PBC.

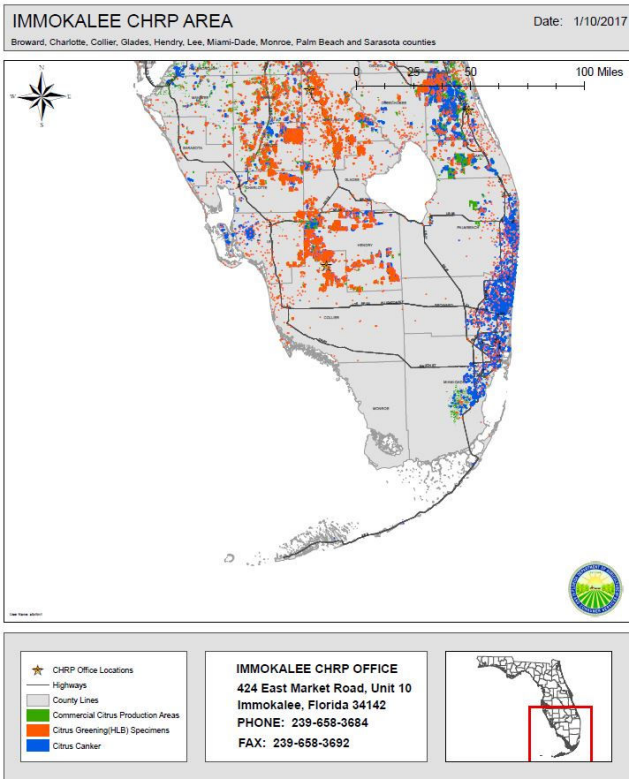


Figure 2.13 Citrus Canker and Citrus Greening in South Florida

Mediterranean Fruit Fly (Medfly)

Another possible threat to PBC's agriculture industry has been the Medfly. It is one of the world's most destructive pests and infests more than 250 different plants that are important for U.S. food producers, homeowners, and wildlife. It had been considered one of the greatest pest threats to Florida's $785 million citrus industry, as well as endangering many other economically significant crops. For example, a Medfly outbreak in 1997 cost an estimated $26 million to eradicate. Florida growers were not permitted to ship numerous fruit and vegetable crops to many foreign and domestic markets. The movement of fruits and vegetables, even within the state if affected, would be disrupted, which could lead to higher prices in the supermarket.

Adult Medflies are up to 1/4 inch long, black with yellow abdomens, and have yellow marks on their thoraxes. Their wings are banded with yellow. The female Medfly damages produce by laying eggs in the host fruit or vegetable. The resulting larvae feed on the pulp, rendering the produce unfit for human consumption. In addition to citrus, Medflies will feed on hundreds of other commercial, backyard fruit, and vegetable crops.

Because Medflies are not strong fliers, the pest is spread by the transport of larval-infested fruit. The major threats come from travelers, the U.S. mail, and commercial fruit smugglers. Several steps had been taken to prevent new infestations. State and federal officials working with postal authorities, continue to inspect packages suspected of potentially carrying infested fruit.

Eradication efforts and close inspections have allowed the USDA to report no known Medfly infestations in PBC nor Florida in over 20 years. https://www.invasivespeciesinfo.gov/profile/mediterranean-fruit-fly

The USDA continues to apply Integrated Pest Management to determine the magnitude of pest infestations and crop diseases. It applies an ecosystem-based strategy that focuses on long-term prevention of pests or their damage through a combination of techniques such as biological control, habitat manipulation, modification of cultural practices, and use of resistant varieties.

The PBC LMS Committees have tried to provide the most comprehensive information possible for each potential hazard. In some instances, the information was incomplete or there was only partially available data. Our Committees will continue its research, seek out further analytical tools or databases, and include new information in the LMS whenever possible as part of its annual monitoring.

We based the Medfly hazard on a probability scale of occurrence. This scale takes into effect the likelihood that PBC will be impacted by the hazard within a given period of time or the return rate of a hazard, and is based on the historical data, estimated return periods, recurrence, or chance of occurrence.

Very Low	Although the hazard is noted, no previous occurrence has been recorded; or less than a 0.1% chance of occurrence; or a 100-year event or greater.
Low	The hazard has occurred 10 years or more ago; or greater than 0.1% to 1.0% chance of occurrence; or a 100-year event.
Medium	The hazard has occurred in the past 6 to 10 years; or greater than 1.0% to 2.0% chance of occurrence; or a 50-year event.
High	The hazard to occurred in the past 1-5 years; or greater than 2.0% chance of occurrence; or less than a 50-year event.

Sugarcane Pests and Diseases

Florida is the nation's largest producer of cane sugar accounting for one in every five teaspoons consumed. The Florida sugar industry has a $2 billion economic impact and generates tens of thousands of jobs. Most of the commercial sugarcane industry is located in South Florida around the southern tip of Lake Okeechobee. Palm Beach County accounts for approximately 75% of the commercial sugarcane acreage. The remainder is grown in the adjacent counties of Hendry, Glades, and Martin. The crop is harvested from late-October through mid-April.

As a tropical grass, sugarcane has evolved to resist many pests that are common in semi-tropical environments, but there are still key pests for the crop. These pests include sugarcane borer, white grubs, wireworms, yellow sugarcane aphid, and lesser cornstalk borer on the sugarcane grown on sand. Insect problems vary during the growing season and from one season to the next because of varying factors such as the weather and cultural practices.

There are a number of sugarcane diseases known throughout the world. However, very few have affected Florida sugarcane historically. Until 2008, no fungicides were used in this crop and varietal resistance to brown rust kept this disease under economic thresholds. However, orange rust was found in Florida in 2007, and again, varietal adjustments and several cultivars use fungicides to maintain economically acceptable yields.

We also based the Sugarcane Pests and Diseases hazard on a similar probability scale of occurrence as the Medfly. This scale takes into effect the likelihood that PBC will be impacted by the hazard within a given period of time or the return rate of a hazard and is based on the historical data, estimated return periods, recurrence, or chance of occurrence.

Very Low	Although the hazard is noted, no previous occurrence has been recorded; or less than a 0.1% chance of occurrence; or a 100-year event or greater.
Low	The hazard has occurred 10 years or more ago; or greater than 0.1% to 1.0% chance of occurrence; or a 100-year event.
Medium	The hazard has occurred in the past 6 to 10 years; or greater than 1.0% to 2.0% chance of occurrence; or a 50-year event.
High	The hazard to occurred in the past 1-5 years; or greater than 2.0% chance of occurrence; or less than a 50-year event.

There have been no measurable outbreaks recorded for PBC or surrounding counties.

Climate Change

Climate change will affect agriculture via natural hazards in Palm Beach County and its jurisdictions. Forestry products and farms for crops and livestock will be affected by flooding, droughts, and freeze occurrences. The higher temperatures will affect crops in a variety of ways due to the complexities of the species, from issues with pollen viability, fertilization, to grain or fruit formation. Hotter temperatures affect cattle immune systems, making the herds more vulnerable to parasites and diseases. Rising sea level will create salt-water intrusion, substantially infuses the soil with salt and causes plants to stress due to decreased freshwater availability. Overall, this will make the agricultural industry suffer in the County due to the rising temperatures and sea level rising and the stress put on the ecosystem. As population and development increase

in the County and its jurisdictions, the probability that agricultural pests and diseases rise will cause property and crop damage or human casualties also increases. With more people migrating to Palm Beach County and its jurisdictions, a larger percent of the land and population may become more vulnerable to hazards. The higher standards adopted by Florida's Building Code decrease vulnerability.

At-Risk Populations

- Farm Owners
- Persons with Low Income
- People with Outdoor Employment
- Linguistically Isolated
- Responders

Populations located in rural areas may face a greater risk and those with jobs involved in agricultural. Vulnerable populations may face a greater risk to possible socio-economically disadvantaged, chronic illnesses, and those who take certain medications.

Location

Portions of unicorporated Palm Beach County, Belle Glade, Pahokee, and South Bay are at medium risk while the rest of the County is at low risk of agricultural pests and diseases. The below table, also in Appendix A, illustrates the varying risk across jurisdictions.

Hazard Assessment H: High M: Medium L: Low V: Very Low	Unincorporated County	MUNICIPALITIES																																						
		Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	M	L	M	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	M	L	L	L	L	L	L	M	L	L	L	L	L
Vulnerability	M	L	M	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	M	L	L	L	L	L	L	M	L	L	L	L	L
Exposure	M	L	M	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	M	L	L	L	L	L	L	M	L	L	L	L	L
Overall Risk	M	L	M	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	M	L	L	L	L	L	L	M	L	L	L	L	L

Impacts – Consequence Analysis Summary

The consequence analysis for agricultural pests and diseases has been determined as follows:

Low Consequence

- Property, Facilities & Infrastructure
- Historic Resources
- Regulatory & Contractual Obligations

Medium Consequence

- Health & Safety of Residents
- Health & Safety of Responders
- Delivery of Services
- Environment

High Consequence

- Continuity of Operations
- Economic & Financial Conditions
- Reputation of County

Consequence Rating	Consequence Analysis
Very Low	Hazard is very unlikely to have any measurable or lasting detrimental impact of a particular type and consequences will likely be rectified promptly with locally available resources
Low	Hazard is not likely to have any measurable or lasting detrimental impact of a particular type and consequences will likely be rectified promptly with locally available resources
Medium	There will likely be a measurable detrimental impact, which may require some time to rectify and may require outside resources and/or assistance.
High	The impact will likely be severe and of longer duration, and require substantial time, resources, and/or outside assistance to rectify
Split Box	Hazard would have differing consequences between geographic locations within the county

Overall Vulnerability

Agricultural pests and disease are a more significant hazard in those areas of PBC where agriculture is a more significant element in the economic base. The western portion of PBC is a major ranching and farming area and there are numerous nurseries and smaller agriculture related businesses located throughout the County and its jurisdictions. Belle Glade, Pahokee, South Bay, and portions of unincorporated PBC are the most vulnerable to agricultural pests and diseases.

2.1.11 Muck Fires

Description

A muck fire is a fire that consumes all the organic material of the forest floor and burns into the underlying soil. It differs from a surface fire by being invulnerable to wind. If the fire gets deep into the ground, it could smolder for several years. In a surface fire, the flames are visible and burning is accelerated by wind, whereas in a muck fire, wind is not generally a serious factor

(Canadian Soil Information System, 1996). Another extraordinary fact about muck fires has to do with their release of carbon dioxide. A peat bog that is on fire can release more carbon dioxide into the atmosphere than all the power stations and car engines emit in Western Europe in one year (New Scientist, 1997). This type of fire could have a significant impact on the overall climate. Much like wildfires, we based this hazard on a severity scale as indicated above.

Muck fires are not a frequent threat to Florida. However, during a drought in the 1980s, fires in the Everglades consumed the rich, dried out muck that had once been the bottom of the swamp. These fires burned deep into the ground and required specialized, non-traditional firefighting techniques.

In PBC, most of the muck area is owned by the sugar cane industry and not owned by the county. The corporation conducts controlled burns each year to over 300,000 acres of muck area to prepare the land for seasonal growth. These areas are monitored very closely. The National Park Service or the Florida Forest Service may determine the magnitude of size, intensity, acreage, and potential for evacuations. If a muck fired occurred that required Country resources, they would be provided with coordination.

The LMS Revisions Sub-Committee based wildfire (above) and muck fire impacts on a severity scale based on the magnitude of the hazard and the on-going mitigation measures in place to counteract those hazards. The severity describes how intense a hazard may be felt and comprised of its impacts, as well as any mitigation actions to offset the impacts.

- Magnitude – the degree to which impacts may be felt or a measured intensity: Human Impacts – Possibility of death or injury to the population.
    - Very Low – Minimal possibility of death or injury.
    - Low – Less than 2 deaths or 10 injuries reported or expected.
    - Medium – Between 2 – 5 deaths or 10 – 25 injuries reported or expected.
    - High – More than 5 deaths or 25 injuries reported or expected.

- Property Impacts – Physical losses and damages to property, buildings, or other critical infrastructure.
    - Very Low – Minimal possibility of physical loss and/or damage.
    - Low – Physical losses and/or damages are reported or expected to be less than $10,000.
    - Medium – Physical losses and/or damages are reported or expected to be between $10,000 and $1,000,000.
    - High – Physical losses and/or damages are reported or expected to be greater than $1,000,000.

- Spatial Impacts – Amount of geographic area affected.
    - Very Low – Minimal geographic area affected.
    - Low – Up to 25% of total area or jurisdiction affected.
    - Medium – 26%-50% of total area or jurisdiction affected.
    - High – 50% or more of total area or jurisdiction affected.

- Economic Impacts (Interruption of businesses, infrastructure, or government services).
    - Very Low – Minimal interruption of services or no more than 12 hours.
    - Low – Interruption of services between 1 – 3 days.
    - Medium – Interruption of services between 3 – 7 days.
    - High – Interruption of services greater than 7 days.

Historic Muck Fire Events

A muck fire occurred in June of 1999. There were about 20,000 acres of muck, brush, and sawgrass on fire in the Rotenberger Wildlife Management Area located in Southwestern PBC.

In May 2008, a muck fire, spawned by an extended drought, scorched the dried edges of Lake Okeechobee between Moore Haven and Clewiston covering an area of over 5,800 acres.

There have been no reported muck fires in the County since 2008.

Climate Change

Changing climate can increase frequency or intensity of extreme heat or drought events, in addition to an increase in existing fuel flammability, could affect muck fire behavior. Reducing moisture of living vegetation, soils, and decomposing organic matter during drought or extreme heat events is associated with increased incidence of muck fires. Furthermore, changes over time in vegetation types could change the mixture and flammability of fuels. As these transitions occur, muck fire occurrences and severity could increase with the introduction of more flammable vegetation types or decrease with the introduction of more fire-resistant species. Palm Beach County and its jurisdictions has weather patterns that lead to both dry and wet periods each year. Climate change may cause one or the other, or both to increase in occurrence and magnitude. As population and development increase in the County and its jurisdictions, the probability that muck fires will cause property damage or human casualties will also increase. With more people migrating to Palm Beach County and its jurisdictions, a larger percent of the land and population may become more vulnerable to hazards. The higher standards adopted by Florida's Building Code decrease vulnerability.

At-Risk Populations

- People with Asthma or Respiratory Conditions
- Older Adults
- Children
- Unhoused Individuals
- People with Disabilities
- Persons with Chronic Health Conditions including Cardiovascular Disease
- Persons with Low Income
- People with Outdoor Employment
- Linguistically Isolated
- Responders

Populations located in the muck fire prone areas may face greater risk. Vulnerable populations located in the same areas may face greater risk.

- Possibility of evacuation
- Injury or death from fire or smoke inhalation
- Vehicle accidents due to decreased visibility or evacuation
- Loss of income for agriculture professionals

Location

Although the County and its jurisdictions as a whole have placed a low probability, vulnerability, and exposure to muck fires, there are some cities that have placed a high probability, vulnerability, and exposure to the threat. This is due to the larger wooded areas that exist within these cities and their proximity to households and businesses. The cities that could face the most effects from muck fires would be Belle Glade, Boca Raton, Loxahatchee Groves, Pahokee, South Bay, Wellington, and portions of unincorporated PBC. The below table, also in Appendix A, illustrates the varying risk across jurisdictions.

Hazard Assessment H: High M: Medium L: Low V: Very Low	Unincorporated County	MUNICIPALITIES																																				
		Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Vulnerability	M	L	M	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	M	L	L	L	L
Exposure	M	L	M	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	M	L	L	L	L
Overall Risk	M	L	M	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	M	L	L	L	L

Impacts - Consequence Analysis Summary

The consequence analysis for muck fires has been determined as follows:

Low Consequence

- Health & Safety of Residents
- Continuity of Operations
- Historic Resources
- Delivery of Services
- Regulatory & Contractual Obligations
- Reputation of County

Medium Consequence

- Health & Safety of Responders
- Property, Facilities & Infrastructure
- Environment
- Economic & Financial Conditions

Consequence Rating	Consequence Analysis
Very Low	Hazard is very unlikely to have any measurable or lasting detrimental impact of a particular type and consequences will likely be rectified promptly with locally available resources
Low	Hazard is not likely to have any measurable or lasting detrimental impact of a particular type and consequences will likely be rectified promptly with locally available resources
Medium	There will likely be a measurable detrimental impact, which may require some time to rectify and may require outside resources and/or assistance.
High	The impact will likely be severe and of longer duration, and require substantial time, resources, and/or outside assistance to rectify
Split Box	Hazard would have differing consequences between geographic locations within the county

Overall Vulnerability

Muck fires are not a frequent threat to Palm Beach County and its jurisdictions. In PBC, most of the muck area is owned by the sugar cane industry and not by the County. The corporation conducts controlled burns each year on over 300,000 acres of muck area to prepare the land for seasonal growth. These areas are monitored very closely. The National Park Service or the Florida Forest Service may determine the magnitude of size, intensity, acreage, and potential for evacuations. Due to these factors, the County and its jurisdictions places muck fires overall as a low risk. The areas that face a medium risk would be Belle Glade, South Bay, and some unincorporated parts of the County due to their proximity to the Everglades and farmland.

2.1.12 Seismic Hazards

Description

Tsunamis

Tsunamis are giant waves caused by earthquakes or volcanic eruptions under the sea. Out in the depths of the ocean, tsunami waves do not dramatically increase in height. But as the waves travel inland, they build up to higher and higher heights as the depth of the ocean decreases. The speed of tsunami waves depends on ocean depth rather than the distance from the source of the wave. Tsunami waves may travel as fast as jet planes over deep waters, only slowing down when reaching

shallow waters. While tsunamis are often referred to as tidal waves, this name is discouraged by oceanographers because tides have little to do with these giant waves (NOAA, 2014).

Recent, widely published, research by British and American scientists warned of potential catastrophic destruction of coastal areas of the Atlantic, including the Florida east coast, by mega tsunami waves generated by a future volcanic collapse in the Canary Islands. The research predicted a gigantic wave would traverse the Atlantic at jet aircraft speeds and devastate the Florida coast as far as 10 miles inland. Such an event would present a tremendous warning challenge and a virtually impossible evacuation response. Subsequent research by the Tsunami Society, a body of scientists solely dedicated to the study of tsunamis, has concluded the threat has been grossly overstated. The society challenged many of the assumptions made relative to the probability and magnitude of a collapse on La Palma and the characteristics of waves should such a collapse occur. The Society notes that there have been no such mega-tsunami events in the Atlantic or Pacific oceans in recorded history.

The threat of a tsunamis impacting PBC is considered to be extremely low (approximately 5% or less per century). Tsunamis are most often generated by earthquake-induced movement of the ocean floor. Landslides, volcanic eruptions, and even meteorites can also generate a tsunami. They are often incorrectly referred to as tidal waves, but a tsunami is actually a series of waves that can travel at speeds averaging 450 (and up to 600) miles per hour in the open ocean. In the open ocean, tsunamis are not felt by ships because the wavelength is hundreds of miles long, while the amplitude is only a few feet. This would also make them unnoticeable from the air. As tsunami waves approach a coast, their speed decreases, and their amplitude increases. Unusual wave heights have been known to be over 100 feet high. However, waves that are 10 to 20 feet high can be very destructive and cause many deaths or injuries.

There have been no reported or recorded Tsunamis in PBC history.

Earthquakes

An earthquake is caused by a sudden slip on a fault. The tectonic plates are always slowly moving, but they get stuck at their edges due to friction. When the stress on the edge overcomes the friction, there is an earthquake that releases energy in waves that travel through the earth's crust and cause the shaking that we feel (USGS, 2024).

Magnitude scales, like the moment magnitude, measure the size of the earthquake at its source. An earthquake has one magnitude. The magnitude does not depend on where the measurement is made. Often, several slightly different magnitudes are reported for an earthquake. This happens because the relation between the seismic measurements and the magnitude is complex and different procedures will often give slightly different magnitudes for the same earthquake, (USGS, 2024).

Intensity scales, like the Modified Mercalli Scale and the Rossi-Forel scale, measure the amount of shaking at a particular location. An earthquake causes many different intensities of shaking in the area of the epicenter where it occurs. So the intensity of an earthquake will vary depending on

where you are. Sometimes earthquakes are referred to by the maximum intensity they produce (USGS, 2024).

In the United States, we use the Modified Mercalli (MMI) Scale. The Mercalli Scale is based on observable earthquake damage. From a scientific standpoint, the magnitude scale is based on seismic records while the Mercalli is based on observable data which can be subjective. Thus, the magnitude scale is considered scientifically more objective and therefore more accurate. For example, a level I-V on the Mercalli scale would represent a small amount of observable damage. At this level doors would rattle, dishes break and weak or poor plaster would crack. As the level rises toward the larger numbers, the amount of damage increases considerably. Intensity X (10) is the highest value on the MMI (USGS, 2024). Florida is not located near tectonic plate boundaries and has the fewest earthquakes of any state and will not be fully profiled in the LMS. Some minor shocks have occurred causing little if any damage. Should an earthquake occur in the County or its jurisdictions, the scale will be applied as described below.

Intensity	Shaking	Description/Damage
I	Not felt	Not felt except by a very few under especially favorable conditions.
II	Weak	Felt only by a few persons at rest,especially on upper floors of buildings.
III	Weak	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV	Light	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Moderate	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Strong	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Very strong	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Severe	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Violent	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Extreme	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.

Figure 2.14 USGS Modified Mercalli Intensity Scale

Historic Earthquake Events *near* PBC

A 4.4 magnitude earthquake struck 99 miles south, southeast from Key West on July 29, 2017.

A 7.7 magnitude earthquake occurred off the coast of Jamaica and was felt on the east coast of South Florida on January 28, 2020. Several buildings in Miami had to be evacuated.

A magnitude 4.7 earthquake occurred 143 miles south-southwest from Key West on June 29, 2021.

A magnitude 4.0 earthquake occurred 101 miles east of Cape Canaveral on February 7, 2024.

Climate Change

According to USGS, the only correlation that has been noted between seismic hazards and climate is that large changes in atmospheric pressure caused by major storms like hurricanes have been shown to occasionally trigger what are known as "slow earthquakes". These slow earthquakes release energy over comparatively long periods of time and do not result in ground shaking like traditional earthquakes. They note that while such large low-pressure changes could potentially be a contributor to triggering a damaging earthquake, the numbers are small and are not statistically significant. There is low correlation between climate change and seismic activity. As population and development increase in the County and its jurisdictions, the low probability that seismic hazards will cause property damage or human casualties also increases. With more people migrating to Palm Beach County and its jurisdictions, a larger percent of the land and population may become more vulnerable to hazards. The higher standards adopted by Florida's Building Code decrease vulnerability.

Vulnerable populations may experience greater risk.

At-Risk Populations

- Older Adults
- Children
- Unhoused Individuals
- People with Disabilities
- Persons with Low Income
- Linguistically Isolated
- Responders

Populations in urban areas may face greater risk, but there is statewide exposure to earthquake impacts. Based on previous occurrences, typical impacts include:

- Some shaking may be felt
- No injuries expected

Location

The probability of a tsunami is low in Palm Beach County and its jurisdictions. However, the coastal communities (Boca Raton, Boynton Beach, Briny Breezes, Delray Beach, Gulf Stream, Highland Beach, Hypoluxo, Juno Beach, Jupiter, Jupiter Inlet Colony, Lake Park, Lake Worth Beach, Lantana, Manalapan, North Palm Beach, Ocean Ridge, Town of Palm Beach, Palm Beach Shores, Riviera Beach, South Palm Beach, Tequesta, and West Palm Beach) have high vulnerability and exposure. The below table, also in Appendix A, illustrates the varying risk across jurisdictions.

Hazard Assessment H: High M: Medium L: Low V: Very Low	MUNICIPALITIES																																							
	Unincorporated County	Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
Vulnerability	M	V	V	H	H	H	V	H	V	V	V	H	V	H	H	H	H	H	M	H	H	H	V	H	M	H	H	V	H	M	H	V	H	V	V	H	H	V	V	H
Exposure	M	V	V	H	H	H	V	H	V	V	V	H	V	H	H	H	H	H	M	H	H	H	V	H	M	H	H	V	H	M	H	V	H	V	V	H	H	V	V	H
Overall Risk	L	V	V	L	L	L	V	L	V	V	V	L	V	L	L	L	L	L	L	L	L	L	V	L	L	L	L	V	L	L	L	V	L	V	V	L	L	V	V	L

Impacts – Consequence Analysis Summary

The consequence analysis for tsunamis and earthquakes both have been determined as follows:

Very Low Consequence

- Health & Safety of Residents
- Health & Safety of Responders
- Continuity of Operations
- Property, Facilities & Infrastructure
- Historic Resources
- Delivery of Services
- Environment
- Economic & Financial Conditions
- Regulatory & Contractual Obligations
- Reputation of County

Consequence Rating	Consequence Analysis
Very Low	Hazard is very unlikely to have any measurable or lasting detrimental impact of a particular type and consequences will likely be rectified promptly with locally available resources
Low	Hazard is not likely to have any measurable or lasting detrimental impact of a particular type and consequences will likely be rectified promptly with locally available resources
Medium	There will likely be a measurable detrimental impact, which may require some time to rectify and may require outside resources and/or assistance.
High	The impact will likely be severe and of longer duration, and require substantial time, resources, and/or outside assistance to rectify
Split Box	Hazard would have differing consequences between geographic locations within the county

Overall Vulnerability

Tsunamis

While there have been no recorded tsunamis to have ever affected PBC or its jurisdictions, scientists have been studying La Palma Island in the Canaries as a possible site where a tsunami could originate if a massive landslide were to occur. Research published in 2001 by two (2) prominent geologists (Ward & Day) created a major debate and concern over whether a predicted volcanic collapse in the Canary Islands could generate a mega tsunami, which could traverse the Atlantic Ocean at jet aircraft speeds (eight (8) to nine (9) hours) and devastate the eastern coast of the U.S., including Florida. It was postulated that the wave, at impact on the Florida coast, could be Local Mitigation Strategy 2020 111 approximately 50 meters high and cause damage inland as far as 20 km. This mega tsunami would cause unprecedented destruction and loss of life.

Subsequently, more comprehensive and rigorous research published by several scientists of the Tsunami Society has taken exception with the original research. The original research, they argue, was based on several erroneous assumptions regarding a structural weakness observed in the western flank of the Cumbre Vieja volcano on island of La Palma in the Canary Islands, the probability of a gravitation collapse of a massive land mass of the ocean bottom, and the magnitude and traveling distance of a wave that might be generated should such a collapse occur.

The mega tsunami was postulated to occur sometime in the next 1500 years. The weight of scientific evidence suggests there is no discernible tsunami threat to the coast of Florida as a result of geological activity in the Canary Islands. The probability of a tsunami is low.

The threat of a tsunami impacting Palm Beach County and its jurisdictions is considered to be extremely low (approximately 5% or less per century). Due to this, the probability of it occurring is very low. There have been no reported or recorded Tsunamis in PBC history. If one were to occur, the coastal cities of the county have a high exposure and vulnerability to the effects of one. The coastal cities that have a higher vulnerability and exposure are Boca Raton, Boynton Beach, Briny Breeze, Delray Beach, Gulf Stream, Highland Beach, Hypoluxo, Juno Beach, Jupiter, Jupiter Inlet Colony, Lake Park, Lake Worth Beach, Lantana, Manalapan, North palm beach, Ocean Ridge, Palm Beach, Palm Beach Shores, Riviera Beach, South Palm Beach, Tequesta, and West Palm Beach.

Earthquakes

There have been no confirmed earthquakes since the LMS2020 was adopted. Unconfirmed tremors have occurred in Martin, Port St. Lucie, and Orange Counties. The most recent tremor, 4.0 confirmed magnitude, occurred off the coast of Cape Canaveral at a depth of 10 km in February 2024. The quake was not felt nor reported in Palm Beach County. The County's and its jurisdictions vulnerability and overall risk to earthquakes are very low.

2.1.13 Geologic Hazards

Sinkholes and Subsidence

Description

Sink holes

A sinkhole is a depression in the ground that has no natural external surface drainage. This means that when it rains, all of the water stays inside the sinkhole and typically drains into the subsurface. Sinkholes are most common in what geologists call, "karst terrain." These are regions where the types of rock below the land surface can naturally be dissolved by groundwater circulating through them. Soluble rocks include salt beds and domes, gypsum, limestone and other carbonate rock. Florida, for instance, is an area largely underlain by limestone and is highly susceptible to sinkholes. When water from rainfall moves down through the soil, these types of rock begin to dissolve. This creates underground spaces and caverns. Sinkholes are dramatic because the land usually stays intact for a period of time 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 (USGS, 2024).

Sinkholes are a common feature of Florida's landscape. They are only one (1) of many kinds of karst landforms, which include caves, disappearing streams, springs, and underground drainage systems, all of which occur in Florida. Karst is a generic term, which refers to the characteristic terrain produced by erosion processes associated with the chemical weathering and dissolution of limestone or dolomite, the two most common carbonate rocks in Florida. Dissolution of carbonate rocks begins when they are exposed to acidic water. Most rainwater is slightly acidic and usually becomes more acidic as it moves through decaying plant debris. Limestone in Florida is porous, allowing the acidic water to percolate through it, dissolving some and carrying it away in solution. Over time, this persistent erosion process has created extensive underground voids and drainage systems in much of the carbonate rocks throughout the state. Collapse of overlying sediments into the underground cavities produces sinkholes (Florida Geological Survey, 1998). Sink holes vary in size, length and depth.

We based Geological Hazards on a probability scale of occurrence. This scale takes into effect the likelihood that PBC and its jurisdictions will be impacted by this hazard within a given period of time or the return rate of a hazard and is based on the historical data, estimated return periods, recurrence, or chance of occurrence and is used across all jurisdictions. It is very unlikely to occur through the County and its jurisdictions.

Very Low	Although the hazard is noted, no previous occurrence has been recorded; or less than a 0.1% chance of occurrence; or a 100-year event or greater.
Low	The hazard has occurred 10 years or more ago; or greater than 0.1% to 1.0% chance of occurrence; or a 100-year event.

Medium	The hazard has occurred in the past 6 to 10 years; or greater than 1.0% to 2.0% chance of occurrence; or a 50-year event.
High	The hazard to occurred in the past 1-5 years; or greater than 2.0% chance of occurrence; or less than a 50-year event.

Subsidence

Land subsidence is a gradual settling or sudden sinking of the Earth's surface due to removal or displacement of subsurface earth materials. The principal causes include:

- aquifer-system compaction associated with groundwater withdrawals
- drainage of organic soils
- underground mining
- natural compaction or collapse, such as with sinkholes or thawing permafrost

More than 80 percent of known land subsidence in the U.S. is a consequence of groundwater use, and is an often overlooked environmental consequence of our land and water-use practices. Increasing land development threatens to exacerbate existing land-subsidence problems and initiate new ones (USGS, 2024).

There have been no reported occurrences in Palm Beach County and its jursidictions.

Climate Change

Climate change has been confirmed to lead to an increase in sinkhole collapse events in Florida over the past 50 years, which is of significance for studying the occurrence and prediction of other sinkhole collapse events and climate change on an international scale. As population and development increase in the County and its jurisdictions, the probability that geologic hazards will cause property damage or human casualties also increases. With more people migrating to Palm Beach County and its jurisdictions, a larger percent of the land and population may become more vulnerable to hazards. The higher standards adopted by Florida's Building Code decrease vulnerability.

At-Risk Populations

- Older Adults
- Children
- Unhoused Individuals
- People with Disabilities
- Persons with Low Income
- Linguistically Isolated
- Responders

Individuals located in densely populated areas and in areas favorable to sinkhole development and occurrence are more at-risk.

- Injury or death from unstable structures or falling into a sinkhole

Location

The entire county and its jursidictions has been deemed at very low risk for geologic hazards. The below table, also in Appendix A, illustrates the varying risk across jurisdictions.

Hazard Assessment H: High M: Medium L: Low V: Very Low	Unincorporated County	MUNICIPALITIES																																									
		Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
Vulnerability	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
Exposure	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
Overall Risk	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V

Impacts – Consequence Analysis Summary

Research shows that water pumping and related drawdown is the most important factor in sinkhole development, but also shows a link between global warming and increased sinkholes occurrences. There is a strong correlation between sinkhole collapse and peak drought periods. Three (3) distinct drought and sinkhole collapse phases are evident between 1965 and 2020, along with eight (8) peak periods of sinkhole collapses that lag slightly behind eight peak 15 drought periods.

The consequence analysis for sinkholes and subsidence both have been determined as follows:

Very Low Consequence

- Health & Safety of Residents
- Health & Safety of Responders
- Continuity of Operations
- Property, Facilities & Infrastructure
- Historic Resources
- Delivery of Services
- Environment
- Economic & Financial Conditions
- Regulatory & Contractual Obligations
- Reputation of County

Consequence Rating	Consequence Analysis
Very Low	Hazard is very unlikely to have any measurable or lasting detrimental impact of a particular type and consequences will likely be rectified promptly with locally available resources
Low	Hazard is not likely to have any measurable or lasting detrimental impact of a particular type and consequences will likely be rectified promptly with locally available resources
Medium	There will likely be a measurable detrimental impact, which may require some time to rectify and may require outside resources and/or assistance.
High	The impact will likely be severe and of longer duration, and require substantial time, resources, and/or outside assistance to rectify
Split Box	Hazard would have differing consequences between geographic locations within the county

Overall Vulnerability

Sink Holes and Subsidence

The County's and its jursidictions probability, vulnerability, and exposure to sinkholes and/or subsidence are considered very low. There are areas in PBC and its jurisdictions where canal bank failures could cause or exacerbate flooding during heavy rain events or storms. This problem is, however, more related to soil erosion. There has never been any seismic activity, soil failures, or sinkhole activity in PBC and its jurisdictionsdue to our location and the lack of limestone deposits that provide an opportunity for acidic decay to occur. While these hazards may exist, County's and its jurisdictions' vulnerability to them at this time must be considered very low. As such, PBC does not have a Hazard Specific Plan to address sinkholes.

The County and some jurisdicitons do have a major vulnerability to levee failure around the eastern boundary of Lake Okeechobee. Extensive diking of Lake Okeechobee has taken place since the hurricane of 1928 when about 2,500 people were killed from surge in western PBC. The county has the dubious distinction of having had the second highest number of fatalities (following Galveston, Texas) of any county in the United States. The U.S. Army Corps of Engineers maintains the levees around Lake Okeechobee and they are considered to be sound. A levee failure with today's population would be a catastrophic disaster for PBC and its jurisdicitons.

We based Geological Hazards on a probability scale of occurrence. This scale takes into effect the likelihood that Palm Beach County and its jurisdictions will be impacted by this hazard within a given period or the return rate of a hazard and is based on the historical data, estimated return periods, recurrence, or chance of occurrence. Due to the landscape, the County and its jurisdicitons as a whole places this threat as very low. It is very unlikely to occur throughout the County and its jurisdictions.

2.1.14 Extreme Temperatures

Description Freezing Temperatures

The National Weather Service defines a winter weather event as a winter weather phenomenon that impacts public safety, transportation, and/or commerce. Winter weather includes extreme cold, snowfall, ice storms, winter storms, and/or strong winds, and affects every state in the continental United States. Winter storm formation requires below-freezing temperatures, moisture, and lift to raise the moist air to form the clouds and cause precipitation. These storms move easterly or northeasterly and use both the southward plunge of cold air from Canada and the northward flow of moisture from the Gulf of Mexico to produce ice, snow, and sometimes blizzard conditions. These fronts may push deep into the interior regions of the U.S. and sometimes as far south as Florida.

A freeze is when the surface air temperature is expected to be 32F or lower over a widespread area for a climatologically significant period of time. The freezing point (32°F) is a critical temperature threshold for many aspects of life. The number and timing of days with temperatures below freezing affect ecosystems and many sectors of the economy. For example, many crops only grow during periods when they are not limited by frost damage.

According to the FDACS, a moderate freeze may be expected in the state every one (1) to two (2) years on average, and severe freezes every 15 to 20 years. Florida has experienced a number of severe or disastrous freezes, where the majority of the winter crops are lost. According to the Florida Climate Center, there have been 12 significant "impact freezes" in the state since 1894, the most recent being in 1996, when a Presidential Disaster Declaration was issued for crop losses exceeding $90 billion dollars. During this event, there was an extensive loss of citrus trees with the majority not being replanted. Freezes pose a major hazard to the agriculture industry in PBC on a recurring basis and are a significant threat to the economic vitality of the County's agriculture industry. The county has experienced seven (7) significant freezes between 1970 and the present.

Freezing conditions primarily affect agriculture and homeless people in PBC. While PBC enjoys warm weather throughout the year, freezing does occur, primarily in the months late December and January. During the nighttime hours, temperatures can dip to as low as 35 degrees, but this normally is not sustained for more than three (3) hours before the temperatures rises above 40 degrees. The County's *Cold Weather Shelter Plan* may be implemented when the nighttime temperature is forecast to fall to ≤40˚F and/or ≤45˚F during forecast precipitation and/or the wind chill factor is ≤35˚F for periods of four (4) consecutive hours or more in PBC. In the past five (5) years, the shelters have only been activated four (4) times for one (1) day each and once for two (2) days. When conditions are predicted to fall below thresholds, the Duty Officer is alerted by the County Warning Point.

Throughout Palm Beach County, the population has increased dramatically. Even though the population has grown throughout this area, there are more new developments concentrated along the coast. During winter months, Palm Beach County still records freezing temperatures with

widespread frost across the region. Historically colder temperatures and freezing durations last longer inland closer to the Lake Okeechobee area. Average freeze durations were five to seven hours across the interior, to two hours or less closer to the coast.

Historic Freeze Events

1977 Freeze – Climaxing one of the coldest winters ever recorded in the eastern United States, a severe cold outbreak of arctic air swept into Florida January 18 through 21, 1977. Snow was reported as far south as Homestead and a severe freeze affected all of the State's citrus and vegetable crops.

In South Florida agricultural areas, the freeze was one of the most severe of this century. Temperatures were below freezing for l0 to l4 hours, and 28°F or colder for four (4) to eight (8) hours. An unusually heavy frost accompanied these freezing temperatures and extended to the coast. West Palm Beach recorded an all-time low of 27°F. Some farmers in the area reported temperatures near 20°F. A USDA report indicated the following crop losses statewide: Citrus 25%, vegetables 95-l00%, commercial flowers 50-75%, permanent pastureland 50%, sugar cane 40%. It is estimated the 1977 freeze cost the Florida economy $2 billion (1977 dollars).

1989 Freeze – Tens of millions of dollars, if not hundreds of millions of dollars, in losses are possible. A second freeze occurred two (2) weeks later causing some additional crop damage but was not as severe.

2009 Freeze – When agricultural damages from a January 2009 freeze were assessed, 70 million citrus trees and tens of thousands of acres of fresh fruits and vegetables were in regions where temperatures remained below 20°F for several hours for two (2) consecutive days. In the Glades area, freezing temperatures lasted as long as 12 hours. Early estimates indicated that the bean crop was destroyed and as much as 85% of the corn crop was lost. Sugar cane also took a hit, but damage was not known until harvest time. This event was the most destructive since the 1989 freeze. Tens of millions of dollars, if not hundreds of millions of dollars, in losses are possible. A second freeze occurred two (2) weeks later causing some additional crop damage, but was not as severe.

January 2010 Freeze – A historic cold snap of both duration and magnitude began on New Year's Night when the first of two (2) arctic cold fronts moved through south Florida. After a brief warm-up on Friday, January 8, a stronger arctic front moved through during the pre-dawn hours of Saturday, January 9. Several daily low and low maximum temperature records were either tied or broken during this period. West Palm Beach had an average 12-day temperature of 49.9 degrees between Jan 2 and Jan 13, the lowest on record for any 12-day period (previous record 50.9 degrees set from January 16-27, 1977). Impacts were significant, particularly to the agricultural industry with statewide estimated crop losses in the $500 million range. Heavily agricultural areas west and southwest of Lake Okeechobee, primarily over Glades, Hendry, and inland Collier counties, registered anywhere from five (5) to seven (7) days of freezing temperatures.

March 4, 2013 Freeze – Temperatures in the low to mid 30s in western Palm Beach County led to frost formation during the early morning hours of March 4th, leading to some crop damage. Damage was mainly to corn, with less than 20% of the crop damaged. Crop damage is estimated and based on total number of acres damaged, which was approximately 3,000-4,000 acres. Unofficial temperature readings in some of the fields were as low as the mid-20s, but these values were likely not representative of the larger area.

March 2014 Freeze – A cold late-season air mass settled over South Florida, causing temperatures to drop to near or slightly below freezing on the morning of March 4th across the Lake Okeechobee and interior areas of southern Florida. Temperatures in the low to mid 30s in western PBC led to frost formation during the early morning hours of March 4, leading to some crop damage. Damage was mainly to corn, with less than 20% of the crop damaged. Crop damage is estimated and based on total number of acres damaged which was approximately 3,000-4,000 acres. Unofficial temperature readings in some of the fields were as low as the mid-20s, but these values were likely not representative of the larger area. PBC estimated crop losses were over $3 million dollars.

February 4, 2021 Frost/Freeze - Widespread frost produced damage to bean crops and pasture lands.

January 29 – 31, 2022 Freeze – Sweet corn and green bean crops suffered the most damage in inland Palm Beach County.

December 23 – 26, 2022 Freeze – Hazardous weather outlook was issued for South Florida.

Climate Change

Florida homes often lack adequate heating and insulation. Florida's outdoor lifestyle can lead to danger for those not prepared for freezing temperatures. In addition, freezing temperatures in Palm Beach County can cause widespread damage to sensitive plants and crops (NWS). Like other seasons, winters have been getting warmer due to climate change. Warmer winters can affect water supplies, energy use, fruit and crop yields and growing seasons, disease-carrying pests, and winter recreation. Overall, climate change is not expected to increase occurrences or magnitude of winter storms and freezes in the County and its jurisdictions. However, that does not mean that winter storms and freezes will not occur. Climate variability will continue to influence daily temperature variability, and isolated or prolonged winter freeze events can be expected to continue to occur in the future. As population and development increase in the County and its jurisdictions, the probability that freezing temperatures will cause environmental damage or human casualties also increases. With more people migrating to Palm Beach County and its jurisdictions, a larger percent of the land and population may become more vulnerable to hazards. The higher standards adopted by Florida's Building Code decrease vulnerability.

At-Risk Populations

- Older Adults

- Children
- Unhoused Individuals
- People with Disabilities
- Persons with Low Income
- People with Outdoor Employment
- Linguistically Isolated
- Responders

Populations in inland areas and vulnerable populations may face greater risk. Impacts may include:

- Injury or death from frostbite or hypothermia
- Carbon monoxide poisoning from heaters
- Stranded or car accidents from poor-driving conditions or ice accumulation

Location

The entire county and its jurisdictions have been deemed as low risk for freezing temperatures. The below table, also in Appendix A, illustrates the varying risk across jurisdictions.

Hazard Assessment H: High M: Medium L: Low V: Very Low	Unincorporated County	MUNICIPALITIES																																						
		Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Vulnerability	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Exposure	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Overall Risk	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L

Impacts – Consequence Analysis Summary

The consequence analysis for extreme temperatures has been determined as follows:

Low Consequence

- Continuity of Operations
- Property, Facilities & Infrastructure
- Historic Resources
- Delivery of Services
- Regulatory & Contractual Obligations
- Reputation of County

Medium Consequence

- Health & Safety of Residents
- Health & Safety of Responders
- Environment
- Economic & Financial Conditions

Consequence Rating	Consequence Analysis
Very Low	Hazard is very unlikely to have any measurable or lasting detrimental impact of a particular type and consequences will likely be rectified promptly with locally available resources
Low	Hazard is not likely to have any measurable or lasting detrimental impact of a particular type and consequences will likely be rectified promptly with locally available resources
Medium	There will likely be a measurable detrimental impact, which may require some time to rectify and may require outside resources and/or assistance.
High	The impact will likely be severe and of longer duration, and require substantial time, resources, and/or outside assistance to rectify
Split Box	Hazard would have differing consequences between geographic locations within the county

Overall Vulnerability – Freezing Temperatures

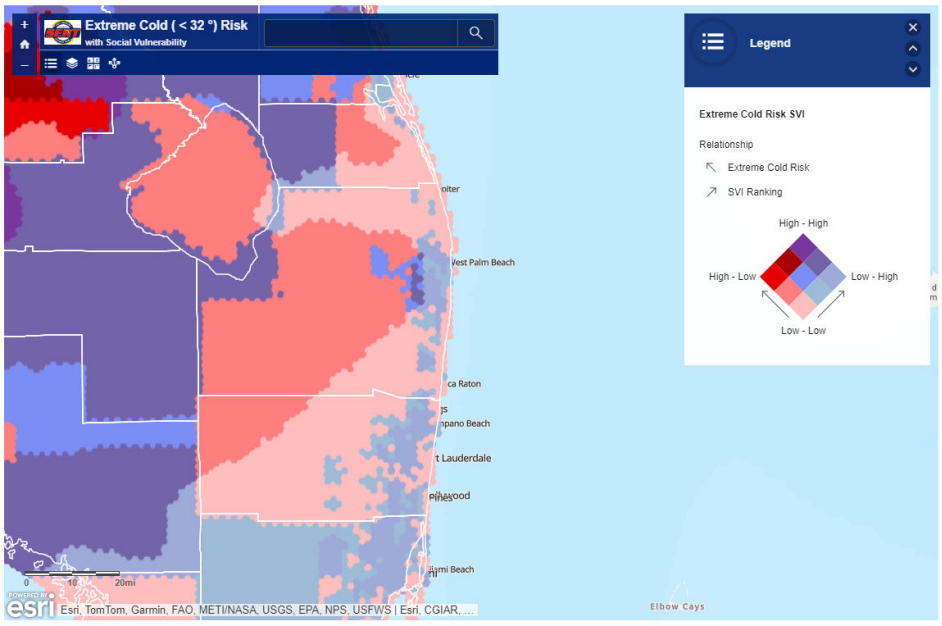


Figure 2.15 SERT Extreme Cold Social Vulnerability Chart for Palm Beach County

Extreme temperatures, both freezes and periods of excessive heat, impact communities with a larger senior population to a greater extent than those with younger populations. As depicted in

the above social vulnerability chart, inland communities (Belle Glade, Pahokee, and South Bay) away from the moderating influence of the ocean or the estuary are more vulnerable to temperature extremes, as are areas with significant agricultural assets.
The increase in temperature across the U.S. in this century is slightly smaller, but of comparable magnitude to the increase of temperature that has characterized the world as a whole. The increase in minimum temperature and the related increase in area affected by much above normal minimum temperatures are also found in many other countries of the northern hemisphere. Worldwide precipitation over land has changed little through the twentieth century; increases noted in high latitudes have been balanced by low-latitude decreases. By comparison, the change in precipitation in the U.S. is still relatively moderate compared to some of the increases and decreases at other latitudes. Decreases in the day-to-day differences of temperature observed in the U.S. are also apparent in China and Russia, the only other large countries analyzed as of this date. The persistent increase in the proportion of precipitation derived from extremely heavy precipitation has not been detected in these other countries.

A Climate Extremes Index (CEI), defined by an aggregate set of conventional climate extremes indicators, supports the notion that the climate of the U.S. has become more extreme in recent decades, yet the magnitude and persistence of the changes are not now large enough to conclude that the climate has systematically changed to a more extreme state. Similarly, a U.S. Greenhouse Climate Response Index (GCRI), composed of indicators that measure the changes that are expected to follow increased emissions of greenhouse gases, reflects in recent years the very changes that are predicted. Still, the rate of change of the GCRI, as with the CEI, is not large enough to unequivocally reject the possibility that the increase in the GCRI may have resulted from other factors, including natural climate variability, although statistically this is but a 5 to 10% chance. Both indices increased rather abruptly during the 1970s, at a time of major circulation changes over the Pacific Ocean and North America. There is little doubt that the increase in the indices is at least partially related to these circulation variations, although the role of increased anthropogenic greenhouse gas concentrations in such circulation variations is poorly known.

Since the indices are influenced by natural changes and variations that can either add to or subtract from any underlying long-term anthropogenic-induced change it will be important to carefully follow their behavior over the next decade to see if they sustain their incipient trends or return to previous levels. Such an effort is critical for a better understanding of climate itself, how it changes, and how these changes can affect our own lives and well-being.

Description Extreme Heat

Extreme heat is defined as a period of high heat and humidity with temperatures above 90 degrees for at least two to three days. Extreme heat events occur across the state each year. During the summer months of 2021, there were five (5) heat-related deaths and 242 heat-related emergency room visits in the County. (Florida Department of Health Tracking Data)

The Heat Index is a measure of how hot the temperature feels when humidity is factored in with the actual temperature. In the Heat Index chart shown below, the red area indicates extreme danger.

Alerts will be issued when the heat index is expected to exceed 105-110 degrees Fahrenheit for at least two consecutive days.

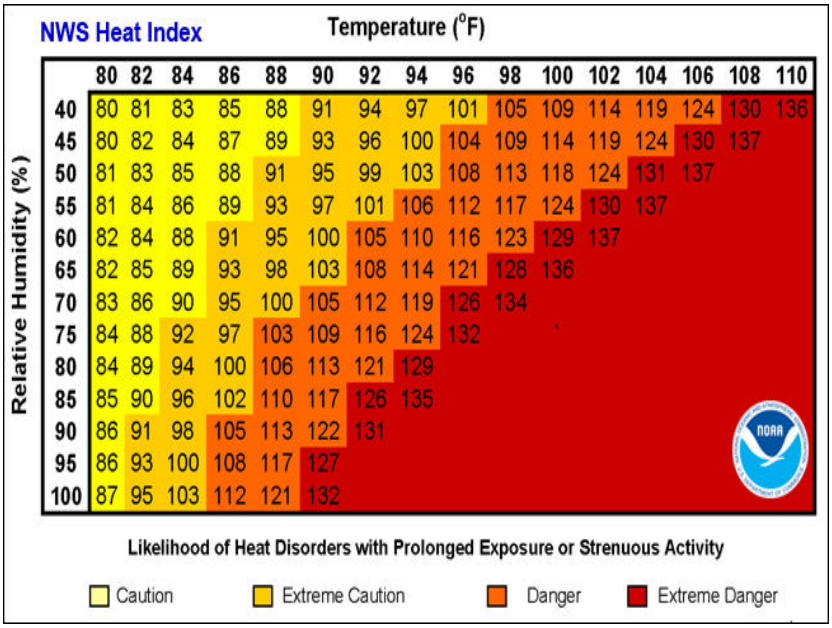


Figure 2.15 National Weather Service (NWS) Heat Index

Table 2.8 National Weather Service Heat-Related Advisories

Excessive Heat Warning—Take Action	An Excessive Heat Warning is issued within 12 hours of the onset of extremely dangerous heat conditions. The general rule of thumb for this Warning is when the maximum heat index temperature is expected to be 105° or higher for at least 2 days and nighttime air temperatures will not drop below 75°; however, these criteria vary across the country, especially for areas not used to extreme heat conditions. If you don't take precautions immediately when conditions are extreme, you may become seriously ill or even die
Excessive Heat Watches—Be Prepared!	Heat watches are issued when conditions are favorable for an excessive heat event in the next 24 to 72 hours. A Watch is used when the risk of a heat wave has increased but its occurrence and timing is still uncertain.

Heat Advisory—Take Action!	A Heat Advisory is issued within 12 hours of the onset of extremely dangerous heat conditions. The general rule of thumb for this Advisory is when the maximum heat index temperature is expected to be 100° or higher for at least 2 days, and nighttime air temperatures will not drop below 75°; however, these criteria vary across the country, especially for areas that are not used to dangerous heat conditions. Take precautions to avoid heat illness. If you don't take precautions, you may become seriously ill or even die.
Excessive Heat Outlooks—Be Aware!	The outlooks are issued when the potential exists for an excessive heat event in the next 3-7 days. An Outlook provides information to those who need considerable lead-time to prepare for the event.

Human bodies dissipate heat in one of three ways: by varying the rate and depth of blood circulation; by losing water through the skin and sweat glands; and by panting. As the blood is heated to above 98.6°F, the heart begins to pump more blood, blood vessels dilate to accommodate the increased flow, and the bundles of tiny capillaries penetrating through the upper layers of skin are put into operation. The body's blood is circulated closer to the surface, and excess heat is released into the cooler atmosphere. Water diffuses through the skin as perspiration. The skin handles about 90% of the body's heat dissipating function.

Heat disorders generally have to do with a reduction or collapse of the body's ability to cool itself by circulatory changes and sweating, or a chemical (salt) imbalance caused by too much sweating. When the body cannot cool itself or when it cannot compensate for fluids and salt lost through perspiration, the temperature of the body's inner core begins to rise and heat-related illness may develop. Studies indicate that, other factors being equal, the severity of heat disorders tend to increase with age. Heat cramps in a 17-year-old may be heat exhaustion in someone 40 and heat stroke in a person over 60.

When the temperature gets extremely high, the NWS has increased its efforts to alert the public as well as the appropriate authorities by issuing Special Weather Statements. Residents should heed these warnings to prevent heat related medical complications. As a result of the latest research findings, the NWS has devised the "Heat Index" (HI). The HI, given in degrees Fahrenheit, is an accurate measure of how hot it feels when relative humidity is added to the actual air temperature.

The NWS will initiate alert procedures when the HI is expected to exceed 105°F for at least two (2) consecutive days. Possible heat disorders related to the corresponding HI are listed below.

In most cases, extreme heat affects those who do not have the ability to stay inside during extreme heat. The county does not have a significant population of people that experience heat related injuries. Although the County does have a sheltering program, shelters have never been activated due to heat. This below chart represents the averages and potential extreme temperatures of the County.

Table 2.9 Palm Beach County Monthly Averages (Degrees Fahrenheit)

	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Avg Temp	66°	68°	71°	75°	79°	82°	83°	83°	82°	79°	73°	69°
Record High	89°	90°	95°	99°	99°	100°	101°	99°	97°	95°	92°	90°
Record Low	26°	27°	26°	38°	45°	60°	64°	65°	61°	46°	36°	24°
Avg Rain	3.5"	2.6"	3.3"	3.7"	4.9"	8.5"	5.6"	8.7"	8.0"	5.9"	3.6"	3.5"

Historic Extreme Heat Events

Data from the Palm Beach International Airport weather station, acquired from the Florida Climate Center, indicate:

July 1938 and December 2023 – There were 137 days with maximum temperatures above 95 degrees Fahrenheit, of which 19 were above 97 degrees.

July 21, 1942 – The highest temperature ever recorded at the station was 101 degrees Fahrenheit.

March 2022 – During the 25-day period from February 27 through March 23, 18 daily heat records were set in southeast Florida. The entire month of March was the warmest on record at West Palm Beach.

Climate Change

Vulnerable populations are more at risk due to extreme temperatures. Climate change threatens habitats, tourism, and environmental effects such as harmful algal blooms. As population and development increase in the County and its jurisdictions, the probability that extreme temperatures will cause loss of agriculture, habitat damage, or human casualties will also increase. With more people migrating to Palm Beach County and its jurisdictions, a larger percent of the land and population may become more vulnerable to hazards. The higher standards adopted by Florida's Building Code decrease vulnerability.

Rising temperatures are likely to increase the frequency of unpleasantly hot days. These gases, along with other heat-trapping greenhouse gases, have warmed the surface and lower atmosphere

of our planet by about 1.8 degrees Fahrenheit (one degree Celsius) since the pre-industrial period. As the atmosphere warms, evaporation increases causing a rise in humidity, average rainfall, and the frequency of heavy rainstorms in many places, including Florida.
Certain populations are especially vulnerable to stressors caused by extreme heat, including but not limited to, children, the elderly, individuals with underlying health issues, socioeconomically disadvantaged individuals, and the unhoused. High air temperatures can cause heat stroke and dehydration and can negatively affect cardiovascular and nervous systems. Seventy years from now, most of the state is likely to experience temperatures above 95°F between 45 and 90 days per year, compared to less than 15 days per year today. Higher humidity will further increase the heat index and associated impacts on health.

At-Risk Populations

- Older Adults
- Children
- Unhoused Individuals
- People with Disabilities
- Persons with Low Income
- People with Outdoor Employment
- Linguistically Isolated
- Responders

Populations in urban areas, vulnerable populations, and individuals that have outdoor professions may face greater risk to the following:

- Heat cramps, nausea, and/or sunburn
- Injury or death from heat-related illness, such as dehydration, heat exhaustion, and stroke

Location

Palm Beach County and its jurisdictions have been deemed to have medium overall risk for extreme heat with high probability and vulnerability. The below table, also in Appendix A, illustrates the varying risk across jurisdictions.

Hazard Assessment H: High M: Medium L: Low V: Very Low	Unincorporated County	MUNICIPALITIES																																					
		Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glenn Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
Vulnerability	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
Exposure	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Overall Risk	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M

Impacts – Consequence Analysis Summary

The consequence analysis for extreme temperatures has been determined as follows:

Low Consequence
- Continuity of Operations
- Property, Facilities & Infrastructure
- Historic Resources
- Delivery of Services
- Regulatory & Contractual Obligations
- Reputation of County

Medium Consequence
- Health & Safety of Residents
- Health & Safety of Responders
- Environment
- Economic & Financial Conditions

Consequence Rating	Consequence Analysis
Very Low	Hazard is very unlikely to have any measurable or lasting detrimental impact of a particular type and consequences will likely be rectified promptly with locally available resources
Low	Hazard is not likely to have any measurable or lasting detrimental impact of a particular type and consequences will likely be rectified promptly with locally available resources
Medium	There will likely be a measurable detrimental impact, which may require some time to rectify and may require outside resources and/or assistance.
High	The impact will likely be severe and of longer duration, and require substantial time, resources, and/or outside assistance to rectify
Split Box	Hazard would have differing consequences between geographic locations within the county

Overall Vulnerability – Extreme Heat

Extreme heat is a pressing public health risk, particularly for socio-economically disadvantaged and elderly communities living in developed areas with low tree canopy cover. In the more densely populated and heavily developed areas, man-made structures such as buildings and roadways trap heat and contribute to what is known as the Heat Island Effect. Extreme heat is a serious threat as it can worsen air quality, exacerbate public health issues, negatively impact crop production, and increase stress on the local economy.

Due to Florida's subtropical climate, the County and its jurisdictions has historically been vulnerable to extreme heat events. Due to the proximity of Lake Okeechobee, the Intracoastal, and Atlantic Ocean, the County typically experiences fewer days when the temperature reaches 100 degrees Fahrenheit or greater. However, the proximity to the above-mentioned bodies of water also increases the humidity, which decreases the body's ability to dissipate the heat.

The County's urban areas (Boca Raton, Boynton Beach, Briny Breezes, Delray Beach, Gulf Stream, Highland Beach, Hypoluxo, Juno Beach, Jupiter, Jupiter Inlet Colony, Lake Park, Lake Worth Beach, Lantana, Manalapan, North Palm Beach, Ocean Ridge, Palm Beach palm Beach Shores, Riviera Beach, Royal Palm Beach, South Palm Beach, Tequesta, West Palm Beach, and Wellington) are usually warmer than their rural surroundings because of the "urban heat island" effect. As cities develop, the amount of green space tends to be replaced by increasing amounts of impervious surfaces. In addition, these locations usually experience higher maximum daytime temperatures and less nighttime cooling.

The expansion of urban development has increased the magnitude of the urban heat island effect. Other factors that exacerbate the heat island effect are dryer surfaces due to draining wetlands and exceptionally dry soils during periods of drought.

2.2 Technological Hazards

2.2.1 Dam/Dike Failures

Description

According to the National Inventory of Dams and the National Levee Database, Palm Beach County has 10 dams, 22 levee systems, and 1 dike partially within the County (as of July 2023). A dam is any artificial barrier, which impounds or diverts water on a temporary or long-term basis. Dams can be constructed of concrete or masonry in a variety of ways or can be constructed of natural or waste materials in the form of an embankment. There are many types of dams but the most common include embankment, gravity, buttress, and arch, with 98 percent of dams in Florida being earthen embankment dams. While one of the most important benefits of dams is flood control and water storage, other benefits include electric generation and renewable energy, irrigation, navigation, and recreation. Another benefit of the dam reservoirs is to improve water quality and remove nutrients.

The below table lists the dams, hazard potential classification, and if there is an active emergency action plan.

Table 2.10 Palm Beach County Dam Classification

Dam	Hazard Potential Classification	Emergency Action Plan	Ownership	Owner/Agency	Office	Position

C-18	Low	No	State	SFWMD - West Palm Beach	West Palm Beach	Dam Safety Program Mgr
C-51	Low	No	State	SFWMD - West Palm Beach	West Palm Beach	Dam Safety Program Mgr
Corbett Levee	Low	No	State	SFWMD - West Palm Beach	West Palm Beach	Dam Safety Program Mgr
G-92	Low	No	State	SFWMD - West Palm Beach	West Palm Beach	Dam Safety Program Mgr
Herbert Hoover Dike	High	Yes	Federal	USACE - Jacksonville District	Jacksonville District	Dam Safety Program Mgr
S-40	Significant	No	State	SFWMD - West Palm Beach	West Palm Beach	Dam Safety Program Mgr
S-41	Significant	No	State	SFWMD - West Palm Beach	West Palm Beach	Dam Safety Program Mgr
S-46	Significant	No	State	SFWMD - West Palm Beach	West Palm Beach	Dam Safety Program Mgr
S-44	High	No	State	SFWMD - West Palm Beach	West Palm Beach	Dam Safety Program Mgr
S-155	Significant	No	State	SFWMD - West Palm Beach	West Palm Beach	Dam Safety Program Mgr

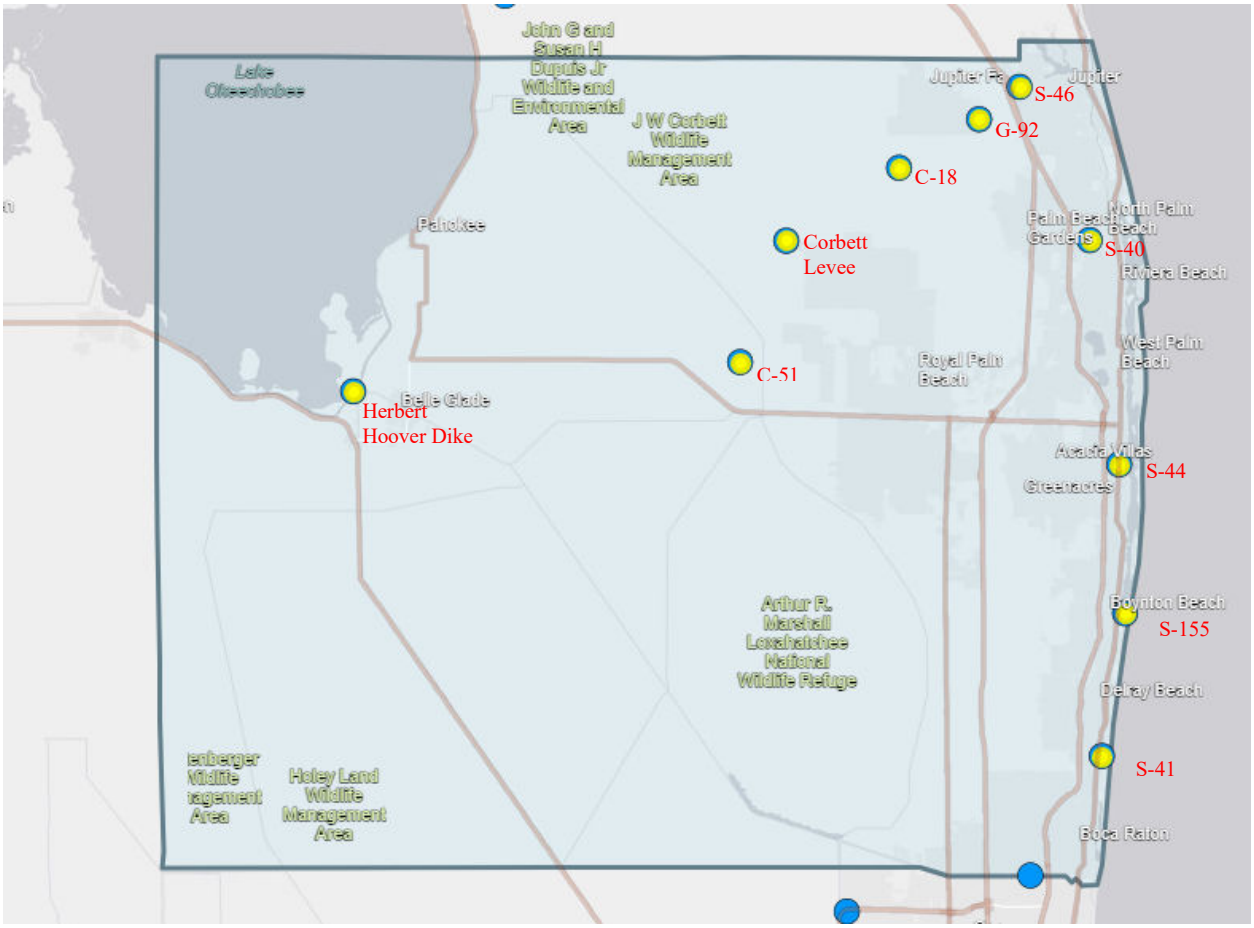


Figure 2.17 National Inventory of Dams in Palm Beach County, accessed June 20, 2024

DAM HAZARD POTENTIAL CLASSIFICATION	LOW HAZARD POTENTIAL	SIGNIFICANT HAZARD POTENTIAL	HIGH HAZARD POTENTIAL
LOSS OF HUMAN LIFE	None Expected	None Expected	Probable
ECONOMIC LOSSES	Low and generally limited to owner	Yes	Yes *(but not necessary for this classification)*
ENVIRONMENTAL DAMAGES	Low and generally limited to owner	Yes	Yes *(but not necessary for this classification)*
LIFELINE INTERESTS IMPACTED	No	Yes	Yes *(but not necessary for this classification)*

Figure 2.18 Dam Hazard Potential Classification (NID, accessed June 20, 2024)

Levees are typically earthen embankments that are designed to control, divert, or contain the flow of water to reduce flood risk.

A dike has water only on one (1) side, whereas a dam has water on both sides. The main purpose of a dike is to protect the land behind it from flooding. Dikes may form naturally through large rocks and sediment, but are more often constructed. The Herbert Hoover Dike (HHD) surrounds Lake Okeechobee, consisting of 143 miles of earthen dam, levee, hurricane gates, and other water control structures.

Dam/levee/dike failure poses a threat to population and property in several areas of PBC. All are earthen structures and are state, regionally, locally, or privately controlled. The most significant risk related to dam/levee failure is flooding due to substantial rainfall and its eastward migration to final discharge in the Indian River Lagoon. Structural and non-structural techniques to slow and contain this runoff incorporate several drainage systems, some dating back to 1919. Rainfall in excess of designed capacities could cause erosion of constructed drainage facilities and flooding of many areas including primary roadway evacuation routes (CEMP, 2020).

Historic Dam/Dike Failure Events

The hurricane in September 1928 made Florida landfall near the Town of Palm Beach as a strong Category 4 hurricane with one of the lowest barometric pressures ever recorded in this area (928.9 millibars/27.42 in). This was the fifth most intense hurricane ever to make landfall in U.S. territory. It reached Lake Okeechobee with very little diminished intensity and moved across the northern shoreline. This sent a massive storm surge southward flooding lower areas on the southern and western edge of the lake. In excess of, 2,500 people were killed during this storm's passage. Nearly all the loss of life was in the Okeechobee area and was caused by overflowing of the lake along its southwestern shore. While all of central Florida was affected by this killer storm, PBC mainly experienced wind damage and flooding from the associated rains.

No other dam/dike failures have been reported through 2023.

Climate Change

Changes in climate factors, like variations in extreme temperatures or higher frequency of heavy precipitation, are likely to affect the different factors driving dam risks. Climate change impacts may influence failure by typical modes, e.g., overtopping, sliding, and internal erosion (piping). The structural behavior of concrete dams is directly influenced by temperature and solar exposure. Therefore, as average temperatures are expected to increase, this will cause more stress to the components of concrete dams. Additionally, there is more potential variation in water storage in the reservoir, meaning water levels may increase or decrease more often. This would cause greater temperature peaks in the surface of the exposed concrete, leading to additional mechanical stresses and making it more susceptible to failure from the reservoir water.

Similar to the effects on concrete dams, the increasing variation of reservoir water levels may also negatively affect embankment dams (earth dams). Internal erosion occurs when water seeps through the dam, carrying soil away. Extended reduced water levels during drought will reduce the soil moisture and increase the vulnerability to internal erosion. Changes in soil moisture can

also lead to a loss of vegetation cover. The loss of vegetation cover may result in changes to the soil structure leaving it more susceptible to internal erosion. Additionally, reduced vegetation cover will decrease resistance to surface flow in the case of an overtopping event. As population and development increases in the County and its jurisdictions, the probability that dam and dike failures could cause loss of agriculture, habitat damage, or human casualties will also increase. As population and development increase in the County and its jurisdiction, the probability that dam/dike failure will cause property damage or human casualties also increases. With more people migrating to Palm Beach County and its jurisdictions, a larger percent of the land and population may become more vulnerable to hazards. The higher standards adopted by Florida's Building Code decrease vulnerability.

At-Risk Populations

- Residents Living in Inundation Zones
- Older Adults
- Children
- Unhoused Individuals
- People with Disabilities
- Persons with Low Income
- People with Outdoor Employment
- Linguistically Isolated
- Responders

Populations in urban and rural areas located in inundation zones may face greater risk to the following:

- Drowning
- Vehicle accidents
- Exposure to hazardous materials or wastewater
- Becoming trapped while waiting for rescue

Populations in surrounding areas may experience the following:

- Congested traffic from evacuation
- Accidents from driving through flooded roads

Location

The western communities of Belle Glade, Pahokee, and South Bay have the highest overall risk in a dam/dike failure. Portions of unicorporated Palm Beach County, Royal Palm Beach, and Wellington have medium overall risk. The rest of Palm Beach County is at low overall risk. The below table, also in Appendix A, illustrates the varying risk across jurisdictions.

Hazard Assessment H: High M: Medium L: Low V: Very Low	Unincorporated County	MUNICIPALITIES																																					
		Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Vulnerability	M	L	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	L	L	L	L	L	M	H	L	L	M	L	L
Exposure	M	L	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	L	L	L	L	L	M	H	L	L	M	L	L
Overall Risk	M	L	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	L	L	L	L	L	M	H	L	L	M	L	L

Impacts – Consequence Analysis Summary

Vulnerability to soil and beach erosion varies considerably across the County and its jurisdictions. Impacts will not be restricted to areas along the immediate coast.

The consequence analysis for dam/dike failure has been determined as follows:

Very Low Consequence

- Coastal Health & Safety of Residents (Split Box to differentiate between coastal and inland)
- Coastal Health & Safety of Responders (Split Box to differentiate between coastal and inland)
- Coastal Continuity of Operations (Split Box to differentiate between coastal and inland)
- Coastal Property, Facilities & Infrastructure (Split Box to differentiate between coastal and inland)
- Coastal Historic Resources (Split Box to differentiate between coastal and inland)
- Coastal Delivery of Services (Split Box to differentiate between coastal and inland)
- Coastal Environment (Split Box to differentiate between coastal and inland)
- Coastal Economic & Financial Conditions (Split Box to differentiate between coastal and inland)

Low Consequence

- Inland Continuity of Operations (Split Box to differentiate between inland and coastal)
- Inland Delivery of Services (Split Box to differentiate between inland and coastal)
- Regulatory & Contractual Obligations
- Reputation of County

Medium Consequence

- Inland Health & Safety of Residents (Split Box to differentiate between inland and coastal)

- Inland Health & Safety of Responders (Split Box to differentiate between inland and coastal)
- Inland Property, Facilities, & Infrastructure (Split Box to differentiate between inland and coastal)
- Inland Historic Resources (Split Box to differentiate between inland and coastal)
- Inland Environment (Split Box to differentiate between inland and coastal)
- Inland Economic & Financial Conditions (Split Box to differentiate between inland and coastal)

Consequence Rating	Consequence Analysis Detail
Very Low	Hazard is very unlikely to have any measurable or lasting detrimental impact of a particular type and consequences will likely be rectified promptly with locally available resources
Low	Hazard is not likely to have any measurable or lasting detrimental impact of a particular type and consequences will likely be rectified promptly with locally available resources
Medium	There will likely be a measurable detrimental impact, which may require some time to rectify and may require outside resources and/or assistance.
High	The impact will likely be severe and of longer duration, and require substantial time, resources, and/or outside assistance to rectify
Split Box	Hazard would have differing consequences between geographic locations within the county

Overall Vulnerability

The County and some jurisdictions do have a high vulnerability for levee failure around the eastern boundary of Lake Okeechobee in the communities of Belle Glade, Pahokee, and South Bay and medium vulnerability in Royal Palm Beach, Wellington, and portion of unincorporated Palm Beach County. Extensive diking of Lake Okeechobee has taken place since the hurricane of 1928 when about 2,500 people were killed from surge in western PBC. The County has the dubious distinction of having had the second highest number of fatalities (following Galveston, Texas) of any county in the United States. The U.S. Army Corps of Engineers maintains Herbert Hoover Dike as well as the levees around Lake Okeechobee and are considered to be sound.

SFWMD maintains the other nine (9) dams in PBC and works directly with the USACE to inspect their dams and levee systems through their nationwide program. The risks are unknown at this time. In 2006, SFWMD established a 50-year operations and maintenance plan to ensure regular, timely maintenance. Planned renovations and upgrades identified under the 50-year plan were projected to cost approximately $2 billion dollars. Over the last five (5) years, SFWMD has invested $240 million in essential maintenance work as part of their capital investment plan. Their Operations and Maintenance staff has conducted inspections at least once per year on 1,200

structures, 2,800 miles of levees, canals, and berms to prioritize projects necessary for continued operation of the regional system. SFWMD reports that they are on time or ahead of schedule on all projects. Although SFWMD maintains their own water management system, they work collaboratively with the LMS Working Group and submit their projects to the LMS Prioritized Project List (PPL). The LMS Working Group and coordinator work collaboratively with SFWMD on their projects and resiliency forums.

The Director of PBC DEM participates in regularly scheduled dam safety briefings with the USACE and SFWMD and is made aware, in real-time, of any changes or concerns. The LMS Steering Committee Chair and Coordinator actively participate in SFMWD meetings and forums. Reciprocally, SFWMD is an active member of the LMS Working Group and has members appointed to the Steering Committee and PPL Evaluation Panel.

As the dams/dikes in Palm Beach County are owned and operated by either the USACE or SFWMD, the LMS Steering Committee and Working Group do not assess their deficiencies and capabilities. Rather, the LMS supports the dam owners in their assessments, prioritization process, and action plans. Should assistance from the County be requested, the DEM Director, LMS Working Group chair, and Coordinator will facilitate their requests through available resources and according to policies and procedures.

A levee failure with today's population would be a catastrophic disaster for PBC. However, the overall risk is very low.

Herbert Hoover Dike Rehabilitation

The Herbert Hoover Dike (HHD) was initially created using earthen materials in 1916. Construction that is more sophisticated began in the 1930s to protect PBC citizens from experiencing another flooding event similar to the occurrence in 1928. The flooding derived from the 1928 hurricane, which resulted in over 2,500 deaths and thousands more injured in the western portion of PBC. The dike protects from major flooding events occurring in the Belle Glade, Pahokee, and South Bay municipalities. In addition, there is potential for flooding in The Village of Wellington, Royal Palm Beach, West Palm Beach, Palm Beach Gardens, and unincorporated PBC. The HHD is continuously monitored by the Army Corps of Engineers in partnership with the SFWMD.

In 2016, the U.S. Army Corps of Engineers finalized a key report that authorized additional rehabilitation work on the HHD that surrounds Lake Okeechobee in south Florida. The Corps' Jacksonville District received notification in 2017 that the dam safety modification report had been approved, marking the culmination of a four-year effort to conduct a risk assessment of the 143-mile earthen structure and develop alternatives for its rehabilitation.

The report, known as HHD Dam Safety Modification Study Environmental Impact Statement focused on extending embankment repairs over 28 miles on the south and west sides of the structure.

The approved repairs included installing 24 miles of seepage barrier, commonly known as a partial cutoff wall from Moore Haven to Lake Harbor (including the installation of 6.8 miles of seepage barrier between Lake Harbor and Belle Glade approved in a 2015 report). The Corps installed four (4) miles of cutoff wall near Lakeport. Armoring the embankment around the State Route 78 Bridge near the Harney Pond Canal and installation of a floodwall near water control structures on the Harney Pond and Indian Prairie Canals were also completed.

The rehabilitation efforts were estimated to be continue through 2025. However, the rehabilitation was completed in early 2023 at a cost of $1.6 billion.

A catastrophic failure of the HHD could pose a significant danger to the residents, local economies, and environment of PBC and South Florida. Completion of the HHD rehabilitation projects will serve to better protect the PBC communities of Belle Glade, Pahokee, and South Bay.

Dam/levee/dike failure poses a threat to population and property in several areas of Palm Beach County. The most significant risk related to dam/levee failure is flooding due to substantial rainfall and its eastward migration to final discharge in the Indian River Lagoon. Structural and non-structural techniques to slow and contain this runoff incorporate several drainage systems, some dating back to 1919. Rainfall in excess of designed capacities could cause erosion of constructed drainage facilities and flooding of many areas including primary roadway evacuation routes. The cities in the county that are the most vulnerable and have the highest exposure would be Belle Glade, Pahokee, and South Bay due to their proximity to the dams. The majority of the county has a low overall rating.

2.2.2 Hazardous Materials Accidents

Description

Hazardous materials accidents can occur anywhere there is a road, rail line, pipeline, or fixed facility storing hazardous materials. Virtually the entire state is at risk to an unpredictable accident of some type. Most accidents are small spills and leaks, but some result in injuries, property damage, environmental contamination, and other consequences. These materials can be poisonous, corrosive, flammable, radioactive, or pose other hazards and are regulated by the Department of Transportation. According to the U.S. Department of Transportation's data from 2020 to 2023, there have been over 96,000 hazardous materials incidents nationwide with the majority occurring during unloading (over 44,000). There were 60 injuries requiring hospitalization and 18 fatalities.

Emergencies involving hazardous materials can be expected to range from a minor accident with no off-site effects to a major accident that may result in an off-site release of hazardous or toxic materials. The overall objective of chemical emergency response planning and preparedness is to minimize exposure for a wide range of accidents that could produce off-site levels of contamination in excess of Levels of Concern (LOC) established by the U.S. Environmental Protection Agency. Minimizing this exposure will reduce the consequences of an emergency to

people in the area near to facilities, which manufacture, store, or process hazardous materials (TCRPC).

Large volumes of hazardous materials are transported to and through the county by railroad, highway, air, water, and pipeline daily. Within PBC, there are a number of both public and private fixed facilities, which produce or use hazardous materials. Coordinating procedures for hazardous material response are found within the County's *Hazardous Materials Hazard Specific Plan*.

In addition to the County's *Hazardous Materials Hazard Specific Plan*, as well as other hazardous materials plans, Local Emergency Planning Committee (LEPC) officials have prepared a plan for use in responding to and recovering from a release of hazardous or toxic materials. This plan addresses the range of potential emergency situations and the appropriate measures to be implemented to minimize exposure through inhalation, ingestion, or direct exposure.
Mishandling and improper disposal or storage of medical wastes and low-level radioactive products from medical use are also a hazard to PBC. For example, a few years ago an incident occurred in New Jersey when improper disposal of medical wastes resulted in some of the used products ending up on Atlantic Ocean beaches.

Since 2020 three (3) facilities in Palm Beach County have reported chemical emergencies which have met the Environmental Protection Agency's (EPA) Emergency Planning Right-to-Know Act (EPCRA) criteria (section 304) for release of toxic inhalation chemicals:

- Pre-cooler incident March, 2023 - Belle Glade
    - A malfunction in an anhydrous ammonia based agricultural cooling system triggered the release of Chlorine dioxide into the atmosphere. A total of 25 patients were transported to local area hospitals for evaluation & treatment of minor exposure.

- Ice rink incident October, 2023 – Boca Raton
    - A malfunction in an anhydrous ammonia based cooling system used for ice skating triggered the release of anhydrous ammonia into the atmosphere. No injuries were reported.

- Water Treatment Plant incident May, 2022 - Palm Beach Gardens
    - A mechanical failure in a tank valve at a water treatment plant, caused the release of sulfuric acid to spill into the tank's secondary containment system. No injuries were reported.

While notable, none of the incidents cited required the use of additional resources (to be ordered), additional operational periods, or activation of the Emergency Operations Center in the course of the response. They could therefore be classified according the national incident management system (NIMS) as type 4 incidents, e.g. local, non-routine.

Location

The below table, also in Appendix A, illustrates the varying risk across jurisdictions.

Hazard Assessment H: High M: Medium L: Low V: Very Low	Unincorporated County	MUNICIPALITIES																																									
		Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Vulnerability	M	M	M	H	H	M	M	H	M	M	M	M	M	M	H	M	H	M	M	H	H	H	M	M	M	M	M	M	M	H	M	M	H	M	M	M	H	M	M	H
Exposure	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Overall Risk	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M

Overall Vulnerability

A community's vulnerability to hazardous materials accidents depends on three (3) factors:

- Major transportation routes that pass through the community.
- Hazardous material generators located in or near the community.
- Resources in terms of people and property that are in an area of possible impact from a hazardous materials release.

Overall, unincorporated PBC has a low vulnerability to impacts from hazardous materials releases. There are relatively few existing major generators within the County that are generally away from major population centers.

Specific areas with higher vulnerability for hazardous materials accidents are along the transportation network (both highway and rail) that pass through the County. All the jurisdictions along the eastern sand ridge (Boca Raton, Delray Beach, Boynton Beach, Hypoluxo, Lantana, Lake Worth Beach, West Palm Beach, Riveria Beach, Lake Park, Palm Beach Gardens, Jupiter, and Tequesta) are extremely vulnerable to toxic material spills and releases from transportation system accidents, primarily rail. The Florida East Coast Railroad runs through all of these areas. Toxic material spills have occurred along the rail line. Given the right set of circumstances, such releases could produce significant detrimental effects on life and property in these communities.

2.2.3 Radiological Incidents (Nuclear Power Plant Accidents)

Description

While an actual release of radioactive material is extremely unlikely and the immediate threat to life extremely low, vulnerability to a nuclear plant disaster could consist of long-range health effects with temporary and permanent displacement of populations from affected areas. The

potential danger from an accident at a nuclear power plant is exposure to radiation. This exposure could come from the release of radioactive material from the plant into the environment, usually characterized by a plume (cloud-like) formation. The area the radioactive release might affect is determined by the amount released from the plant, wind direction, and speed and weather conditions (e.g., rain, etc.) which would quickly drive the radioactive material into the ground, causing increased deposition of radionuclides, which would result in widespread agricultural contamination and the negative consequences thereof.

The levels of response to the release of radioactive materials are as follows:

- Notification of Unusual Event - The event poses no threat to plant employees, but emergency officials are notified. No action by the public is necessary.
- Alert - An event has occurred that could reduce the plant's level of safety, but back- up systems still work. Emergency agencies are notified and kept informed, but no action by the public is necessary.
- Site Area Emergency - The event involves major problems with the plant's safety and has progressed to the point that a release of some radioactivity into the air or water is possible but is not expected to exceed Environmental Protection Agency Protective Action Guidelines (PAGs). Thus, no action by the public is necessary.
- General Emergency - The event has caused a loss of safety systems. If such an event occurs, radiation could be released that would penetrate the site boundary. State and local authorities will take action to protect the residents living near the plant. The alert and notification system will be sounded. People in the affected areas could be advised to evacuate, or in some situations, to shelter in place. When the sirens are sounded, radio and television alert will have site-specific information and instructions.

Thirty of the 67 counties in the State of Florida are involved in preparedness planning for a commercial nuclear power plant emergency.

The St. Lucie nuclear power plant is located on Hutchinson Island approximately four (4) miles east-northeast of the City of Port St. Lucie, approximately 5.5 miles north of Martin County/St. Lucie County boundary line. This facility is owned and operated by the Florida Power & Light Company. The county is located more than 20 miles from the plant and is well outside the ten (10) mile Emergency Planning Zone/potential plume area, so there is not a risk to direct radiation exposure. Therefore, PBC would provide assistance to St. Lucie and Martin Counties in the unlikely chance of an accident at the plant. The County municipalities located in part or whole within 50 miles of the power plant (Tequesta, Jupiter Inlet Colony, Jupiter, Juno Beach, Palm Beach Gardens, North Palm Beach, Lake Park, Riviera Beach, Mangonia Park, West Palm Beach, Palm Beach, Pahokee, Royal Palm Beach, Haverhill, Glen Ridge, Wellington, Palm Springs, Greenacres and Lake Clarke Shores) fall within the ‘Ingestion Pathway Zone’ meaning if there is a major release at the power plant, radioactive contamination could be deposited as far as 50 miles affecting food and water supplies.

The purpose of the County radiological emergency preparedness program is to prepare to receive, offer Potassium Iodide to, decontaminate (if necessary), and offer shelter to potentially

contaminated evacuees from an accident at the St. Lucie nuclear power plant. A radiological emergency response plan has been developed and is exercised following federal regulations in order for federal officials to have reasonable assurance that adequate protective measures can be taken in the event of a nuclear power plant emergency.

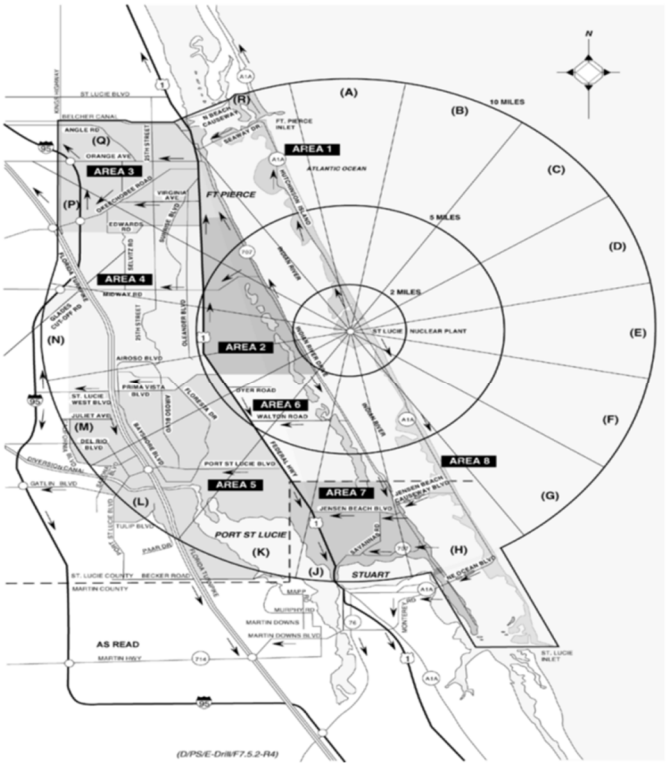


Figure 2.19 St. Lucie Nuclear Power Plant 10 Mile EPZ

Overall Vulnerability

The Florida Power and Light St. Lucie Nuclear Power plant is located on south Hutchinson Island in St. Lucie County. In the U.S., federal regulations define two (2) distinct planning zones with regard to commercial nuclear power plant emergency planning. The Plume Exposure Pathway Emergency Planning Zone, commonly known as the EPZ, has a radius of 10 miles (16 km). The focus of the EPZ defines the geographic area for the management of protective actions related to the direct exposure to and inhalation of airborne radioactive contamination in citizens. The Ingestion Planning Zone, commonly known as the IPZ, has a radius of 50 miles (80 km). The focus of the IPZ is to define the geographic area for the management of protective actions related to the ingestion of food and liquid contaminated by radioactivity that may reach the food supply and surface-sourced drinking water reservoirs. Approximately 45% of PBC falls within the 50-mile radius IPZ for the St. Lucie Nuclear Power plant. This means that a significant portion of PBC is vulnerable to a nuclear power plant accident. Fortunately, the frequency with which actionable nuclear power plant accidents occur is extremely low. The overall risk to the citizens of PBC is therefore considered very low.

FEMA's Radiological Emergency Preparedness (REP) program provides clearly defined regulations relative to nuclear power plant emergency preparedness, response, and recovery. Drills are held routinely. Additionally, extensive documentation is required by the Nuclear Regulatory Commission and FEMA. Of greater risk to the citizens of PBC is the transport of fissionable material to and from the plant. Such material transfers are handled with a great deal of care and there has never been a significant accident during any such transfer. Again, while PBC's vulnerability to such accidents is high, the risk that this hazard will produce an impact within the community appears to be low. Some risks to PBC include:

- Potential physical injury (including long-term effects such as cancer).

- Loss of property (displacement from homes and agricultural lands).

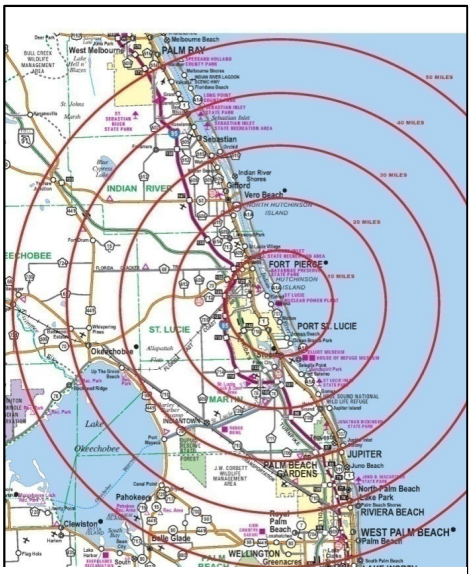


Figure 2.20: 50 Mile Ingestion Pathway Map for St. Lucie Nuclear Power Plant (Copyright © 2010 GIS Dolph Map LLC – Used with Permission

The county is within the 50-mile IPZ making contamination of food supplies and drinking water a possibility. Exaggerated media reporting could lead to heightened public alarm. Impacts to tourism industry are possible. In the event of an accidental release of radioactive materials from the St. Lucie Nuclear Plant, evacuation areas would depend on several metrological factors such as wind direction and wind speed. According to the 2020 Census data, there are approximately 245,144 people living within the 10-mile EPZ of the St Lucie Nuclear Power Plant. If an accident at the plant took place during tourist season, PBC could expect half of this population to evacuate into PBC (approximately 125,000 evacuees). The County must be prepared to shelter 10 % (12,500 people) of the evacuating population. All evacuees will be sheltered in Palm Beach, Indian River, and/or Brevard Counties.

There are several safety design measures at the plant. Stringent federal safety standards govern plant operations (e.g. plants have multiple layers of protective barriers which are designed to withstand aircraft attack, tornados, severe accidents, and earthquakes). It is most likely that an accident would slowly progress from one (1) stage of emergency classification to the next over an extended period of time. A "fast breaker" accident is very unlikely. However, the plant can shut down operations within two (2) seconds if needed. Most likely, an accident would slowly progress providing time to warn the public and implement protective measures. In the case of a radioactive release, Florida Power and Light and the American Nuclear Insurers organization would reimburse evacuees for nuclear property damage and nuclear bodily injury in accordance with the Price Anderson Act which governs financial reimbursement in the event of a commercial nuclear power plant emergency.

In 1986, the United States Congress enacted the Emergency Planning and Community Right-to-Know Act (EPCRA). It imposed upon state and local governments planning and preparedness requirements for emergencies involving the release of hazardous materials. The role of the federal government in response to an emergency involving the release of hazardous materials is to support local and state emergency operations. Activation of the Federal Regional Response Team provides access to federal resources not available at the state and local levels. An on-scene coordinator is designated to manage federal resources and support.

Location

The below table, also in Appendix A, illustrates the varying risk across jurisdictions.

Hazard Assessment H: High M: Medium L: Low V: Very Low	Unincorporated County	MUNICIPALITIES Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
Vulnerability	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Exposure	M	L	L	L	L	L	L	L	L	L	L	L	M	L	L	M	M	M	M	L	M	L	L	L	L	M	L	L	M	M	M	L	M	L	L	L	L	L	L	M
Overall Risk	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L

2.2.4 Communication Failures

Description

Perhaps the most common cause of communications failures during disasters is the physical damage to devices or components that make up a network infrastructure. Hurricane-force winds, floodwaters, terroristic or cyber activity can all create physical disturbances that have the power to do significant damage to cities and the vulnerable communications equipment that is responsible for supporting these areas.

Disruptions caused by physical damage have the potential to be incredibly costly and time consuming to restore, as they require maintenance or sometimes replacement of complex network hardware to re-establish communications. This is especially problematic if major installations such as cell towers or fiber-optic cables are involved. If a cell tower is severely damaged or even knocked down, it not only causes major disruptions in the area's wireless communications but is extremely expensive to replace and will remain a significant problem until the service provider is able to get a repair crew into the affected area.

Likewise, damage to fiber-optic cables can be an even greater challenge to repair. Because the cables are concealed underground, large portions of earth and roadway may need to be excavated just to pinpoint the exact location of the damage.

Wireless links are also susceptible to disruption or damage during disasters, as different wavelength signals can be cut off by heavy rain, or high winds. The transmitter itself can also receive damage or be knocked out of alignment with its receiver. While these issues are sometimes cheaper and less difficult to correct than damage to wired infrastructure, it nonetheless remains a serious obstacle to rescue efforts if knocked offline during a disaster.

Location

The below table, also in Appendix A, illustrates the varying risk across jurisdictions.

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Probability	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Vulnerability	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Exposure	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Overall Risk	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M

Overall Vulnerability

Communication failures have a greater potential to produce adverse economic impacts in business-based rather than retirement or residential communities. On the other hand, communication system failures in residential and retirement communities may put more human lives at risk. The County's vulnerability to communication system failures is generally considered moderate. Basically, PBC's vulnerability to this hazard is no greater or less than most other Florida coastal counties.

2.2.5 Transportation System Accidents

Description

Florida has a large transportation network consisting of major highways, airports, marine ports, and passenger railroads. The heavily populated areas of PBC are particularly vulnerable to serious accidents, which are capable of producing mass casualties. With the linear configuration of several major highways in PBC, such as Interstate highways and the Florida Turnpike, major transportation accidents could occur in a relatively rural area, severely stressing the capabilities of local resources to respond effectively. A notorious regional example is the crash in the Everglades of the Value Jet Flight 592 on May 11, 1996, which resulted in 110 fatalities and cost millions of dollars to respond, severely taxing the financial and public safety resources of Miami-Dade County. Similarly, a major transportation accident could involve a large number of tourists and visitors from other countries, given Florida's popularity as a vacation destination, further complicating the emergency response to such an event.

Location

The below table, also in Appendix A, illustrates the varying risk across jurisdictions.

Hazard Assessment H: High M: Medium L: Low V: Very Low	Unincorporated County	MUNICIPALITIES																																				
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Probability	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Vulnerability	M	L	M	M	M	L	L	M	M	L	L	L	M	L	M	L	M	L	L	M	M	M	M	L	M	L	L	M	L	M	L	L	M	L	M	L	M	L	M	M
Exposure	M	L	M	M	M	L	L	M	M	L	L	L	M	L	M	L	M	L	L	M	M	M	M	L	M	L	L	M	L	M	L	L	M	L	M	L	M	L	M	M
Overall Risk	M	L	M	M	M	L	L	M	M	L	L	L	M	L	M	L	M	L	L	M	M	M	M	L	M	L	L	M	L	M	L	L	M	L	M	L	M	L	M	M

Overall Vulnerability

Palm Beach International Airport (PBI) is a major commercial air transportation hub, with extensive commercial passenger and freight business as well as a significant amount of private or general aviation activity as well. The airport is located directly to the south and west of the City of West Palm Beach and the runway approaches pass directly over both the Town of Palm Beach and the City of West Palm Beach. Aviation is an important element of the economy in PBC, and this activity raises the County's vulnerability to aviation-associated accidents. Another busy airport for general aviation is the Lantana airport, which has been a source of many non-commercial incidents over the years.

Vulnerability to transportation system accidents is also associated with the highway and rail systems that run through PBC. Individual community and population center vulnerabilities to this hazard are entirely dependent upon location. The communities built on the eastern sand ridge of the County are most vulnerable. Major transportation hubs, rail yards, trucking centers, and the Port of Palm Beach all raise these communities' vulnerabilities to transportation system accidents and breakdowns. Transportation accidents have occasioned blockages on the major highways throughout PBC. The Town of Palm Beach and the City of West Palm Beach are also more vulnerable to plane crashes due to their location relative to PBI. The east-central portion of the County has a higher vulnerability to major highway accidents due to the presence of Interstate 95 and the Florida Turnpike.

Due to their locations along the rail line, the eastern cities have higher vulnerabilities to rail system accidents. The Brightline express train, with service from Miami to Orlando, has a potential top speed of 125 mph traveling at a much faster speed than other regional commuter trains. It is anticipated by the LMS HVA Sub-Committee that there will be additional people struck while ignoring rail crossing warning devices and to the high speeds that the public is not accustomed to in the area.

2.2.6 Wellfield Contaminations

Description

As communities become more aware of both the potential health risks and the economic effects of ground water contamination, they are beginning to look increasingly toward preventative efforts. Even when no immediate hazard appears to exist, a community should be concerned about protecting its drinking water supply for three (3) reasons:

- To reduce potential risks to the health of the community,
- To avoid the costs of cleaning up contamination and providing alternative water supplies,
- To prevent the negative economic impacts on community development that ground water contamination can cause.

The development of wellfield protection programs is a major preventative approach for the protection of community drinking water supplies. Wellfield protection is a means of safeguarding public water supply wells by preventing contaminants from entering the area that contributes water to the well or wellfield over a period of time. Management plans are developed for the wellfield protection area that include inventorying potential sources of groundwater contamination, monitoring for the presence of specific contaminants, and managing existing and proposed land and water uses that pose a threat to groundwater quality.

Ground water is a vitally important natural resource. It is a source of drinking water for more than half of the U.S. population and more than 95 % of the rural population. In addition, ground water is a support system for sensitive ecosystems, such as wetlands or wildlife habitats.

Between 1971 and 1985, there were 245 ground water related outbreaks of disease nationwide, resulting in more than 52,000 individuals being affected by associated illnesses (Browning). While most of these diseases were short-term digestive disorders caused by bacteria and viruses, hazardous chemicals found in wells nationwide also pose risks to public health.

The 1986 Amendments to the Federal Safe Drinking Water Act require states to implement wellfield protection programs for public water wells. Prevention strategies include maintaining the isolation distances from potential contamination sources, reporting to the state violations of the isolation distance to the state and asking a local governmental unit to regulate these sources.

Cleaning up contaminated ground water can be technically difficult, extremely expensive, and sometimes cannot be done. Contaminated ground water also affects the community by discouraging new businesses or residents from locating in that community.

Location

The below table, also in Appendix A, illustrates the varying risk across jurisdictions.

Hazard Assessment H: High M: Medium L: Low V: Very Low	Unincorporated County	MUNICIPALITIES																																				
		Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	M	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Vulnerability	M	L	L	M	M	L	L	M	L	L	L	M	L	L	L	L	M	L	L	M	L	L	M	L	M	L	L	L	L	M	L	L	L	L	L	L	M	M	M
Exposure	M	L	L	M	M	L	L	M	L	L	L	M	L	L	L	L	M	L	L	M	L	L	M	L	M	L	L	L	L	M	L	L	L	L	L	L	M	M	M
Overall Risk	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L

Overall Vulnerability

Wellfield contamination has not been a major problem for most of PBC. There is some potential exposure to this hazard in the eastern portion of the County. However, the vulnerability to this hazard is considered low at this time.

2.2.7 Power Failure (Outages)

Description

In the U.S., from July 2 to August 10, 1996, the Western States Utility Power Grid reported widespread power outages that affected millions of customers in several western states and adjacent areas of Canada and Mexico. These problems resulted from a variety of related causes, including sagging lines due to hot weather, flashovers from transmission lines to nearby trees, and incorrect relay settings. According to the electric utility industry's trade association, the potential for such disturbances is expected to increase with the profound changes now sweeping the electric utility industry.

On August 14, 2002, the largest power outage occurred in the Northeast and Midwest states. The power outage started around 2:00 p.m. in the afternoon and was out in some places until August 18. There were major cities without power for an extended period of time. Some of the cities included: New York, Cleveland, Detroit, Buffalo, and Toronto. The power outage affected millions of people across states and Canada. The source of the outage is unclear at this time. The entire northeast power grid was affected.

In February 2021, the state of Texas experienced a major power crisis as a result of three (3) severe winter storms that swept across the nation. The storms caused the worst energy infrastructure failure in Texas state history. Residents experienced water, food, and heat shortages. For several days, more than 4.5 million homes and businesses were left without power. Approximately 246 people were killed directly or indirectly with some estimates citing over 70 killed as a result of the power failure.

In PBC, the major causes of a power failure are lightning and trees. Lightning strikes and trees falling onto power lines can shut down power for hundreds of people. Other factors that can cause a power failure are:

- Age of facility (transmission and distribution).
- Community growth.
- High winds.

The location of power lines underground or above ground also has significance. Lines underground have the advantage of being less vulnerable to tree foliage; however, they are still at risk from other underground hazards such as tree roots.

To address times when generating capacity is tight or falls below consumer demand due to state or local emergencies, the Florida Electrical Emergency Contingency Plan was developed. Alerts have been created to give early warning of potential electricity shortfalls and bring utilities, emergency management officials, and the general public to a state of preparedness. The Contingency Plan has four (4) stages (Florida Reliability Coordinating Council):

- **Generating Capacity Advisory** – A Generating Capacity Advisory is primarily for information purposes. It starts utility tracking activities, and it initiates inter-utility and inter-agency communication. No action by the public is required. General information may be distributed to consumers to forewarn them of conditions if necessary.
- **Generating Capacity Alert** – A Generating Capacity Alert starts actions to increase reserves. Available emergency supply options will be explored. When reserves fall below the size of the largest generating unit in the state, loss of that size unit to an unexpected mechanical failure could lead to blackouts somewhere since insufficient backup is available.
- **Generating Capacity Emergency** – A Generating Capacity Emergency occurs when blackouts are inevitable somewhere in Florida. Every available means of balancing supply and demand will be exhausted. Rolling blackouts, manually activated by utilities are a last resort to avoid system overload and possible equipment damage. Frequent status reports are provided to agencies and the media. The Division of Emergency Management will consider using the Emergency Broadcast System to inform citizens of events and to direct them to available shelters if conditions warranted. Recognizing the consequences of a loss of electricity, individual utility emergency plans include provisions for special facilities critical to the safety and welfare of citizens.
- **System Load Restoration** – System Load Restoration is instituted when rolling blackouts have been terminated and power supply is adequate. It is the recovery stage, and efforts are made to provide frequent system status reports.

Location

The below table, also in Appendix A, illustrates the varying risk across jurisdictions.

Hazard Assessment H: High M: Medium L: Low V: Very Low	Unincorporated County	MUNICIPALITIES																																					
		Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Vulnerability	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Exposure	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Overall Risk	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M

Overall Vulnerability

Power failures have the same potential impacts in all PBC communities. The vulnerabilities of all communities to power failures are considered moderate. The power grid throughout PBC is diversified. There is no single choke point or distribution node whose failure would disrupt power distribution to the entire community.

2.2.8 Coastal Oil Spills

Description

As a major industrial nation, the United States produces, distributes, and consumes large quantities of oil. Petroleum-based oil is used as a major power source to fuel factories and various modes of transportation and in many everyday products, such as plastics, nylon, paints, tires, cosmetics, and detergents. At every point in the production, distribution, and consumption process, oil is invariably stored in tanks. With billions of gallons of oil being stored throughout the country, the potential for an oil spill is significant, and the effects of spilled oil can pose serious threats to the environment.

In addition to petroleum-based oil, the U.S. consumes millions of gallons of non-petroleum oils, such as silicone and mineral-based oils, and animal and vegetable oils. Like petroleum products, these non-petroleum oils are often stored in tanks that have the potential to spill, causing environmental damages that are just as serious as those caused by petroleum-based oils. To address the potential environmental threat posed by petroleum and non-petroleum oils, the U.S. Environmental Protection Agency has established a program designed to prevent oil spills. The program has reduced the number of spills to less than 1 % of the total volume handled each year (Environmental Protection Agency, 1998). Spilled oil poses serious threats to fresh water and marine environments, affecting surface resources and a wide range of subsurface organisms. Most oils tend to spread horizontally into a smooth and slippery surface, called a slick, on top of the water. However, once the oil reaches the shoreline it can escape downward into sand, making it difficult to clean up and reducing its ability to degrade. Spilled oil can harm the environment in several ways, including the physical damages that directly impact wildlife and their habitats (such

as coating birds or mammals with a layer of oil) and the toxicity of the oil itself, which can poison exposed organisms.

Not only would an oil spill adversely affect the environment, but also the economy would suffer due to a decrease in tourism. Depending on the severity of the spill, the economy could suffer mild, short-term effects to devastating, long-term effects.

The County has 46 miles of Atlantic Ocean coastline that is subject to contamination caused by an oil spill. By Executive Order, the responsibility for preparing response plans for coastal oil spills is designated to the Department of Environmental Protection, Division of Florida Marine Patrol. There are two (2) active oil field regions in Florida: in Escambia and Santa Rosa counties in the Panhandle, and Collier, Hendry, and Lee counties in southwest Florida.

On April 20, 2010, an explosion on the Deepwater Horizon/BP MC252 drilling platform in the Gulf of Mexico killed 11 workers and caused the rig to sink. As a result, oil began leaking into the Gulf creating one of the largest spills in American history. During the next 87 days an estimated 4.9 million barrels (210 million gallons) of oil were released. While the spill did not affect the waterways or coastal communities of PBC, it did put DEM and other supporting agencies throughout the County on alert. Extensive plans were coordinated to prepare for a potential containment and oil clean up response.

Overall Vulnerability

Many advanced response mechanisms are available for controlling oil spills and minimizing their impacts on human health and the environment. Mechanical containment or recovery is the primary line of defense against oil spills. This type of equipment includes a variety of booms, barriers, and skimmers. Natural and synthetic sorbent materials are used, as well, to capture and store the spilled oil until it can be disposed of properly. Chemical and biological methods can be combined with mechanical means for containing and cleaning up spills. Dispersants and gelling agents are most useful in helping to keep oil from reaching shorelines and other sensitive habitats. Physical methods are used to clean up shorelines. Wiping with sorbent materials, pressure washing, raking, and bulldozing can be used to assist natural environmental recovery processes. Scare tactics are used to protect birds and animals by keeping them away from oil spill areas.

2.3 Human-Caused Hazards

2.3.1 Civil Disturbances

Description

As in any other area, PBC is subject to civil disturbances in the form of riots, mob violence, and a breakdown of law and order in a localized area. Although they can occur at any time, civil disturbances are often preceded by periods of increased tension caused by questionable social and/or political events such as controversial jury trials or law enforcement actions. Police services are responsible for the restoration of law and order in any specific area of the County.

With the election of President Donald Trump in 2016, and his properties located in PBC, there was a marked escalation of protests and civil disturbances. These were most evident in the winter months when the president spent many weekends at his home in the Town of Palm Beach. Agencies throughout PBC spent a great deal of time and resources to ensure the safety of the President and his family when they were in the area, as well as the safety of protesters in the areas surrounding his home in Palm Beach. The PBC LMS HVA Sub-Committee recognized the increased likelihood of civil disturbances in the analyses of probabilities located in Appendix A. Additionally, Presidential visits, while bringing civil disturbance issues, are also, by nature, domestic security hazards. Therefore, the planning process for Presidential visits is contained in the PBC *Domestic Security Plan*.

May 31- June 6, 2020 – The national protests initially started after the murder of George Floyd during his arrest by Minneapolis police officers on May 25, 2020. The Palm Beach County protests started in downtown West Palm Beach on May 31 and eventually turned into a march that shut down I-95 in both directions. Law enforcement was able to reopen the interstate. A standoff with protestors started in the evening and turned into crowds vandalizing the Palm Beach County Courthouse and area businesses. More protests endured the following days in Belle Glade, Boca Raton, Boynton Beach, Delray Beach, and Lake Worth Beach. For the most part, these protests were peaceful.

Location

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Probability	L	L	L	L	M	L	L	M	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	M	L	L	L	M	L	L	L	L	L	L	M
Vulnerability	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Exposure	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Overall Risk	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L

Overall Vulnerability

The overall potential for civil disturbance in PBC is considered moderate. The municipalities of West Palm Beach, Delray Beach, Boynton Beach, Palm Beach, and Riviera Beach are considered to have relatively high vulnerability to this hazard. There has been significant civil unrest in certain areas of these cities in the past and a significant potential for such unrest remains. Within the past two (2) years, particularly with the election of the U.S. President who owns and frequents a home in PBC, the numbers of civil disturbance activities have increased significantly. However, they

are most often considered peaceful in nature. This is expected to continue through 2020 and possibly 2024. The LMS HVA Sub-Committee has recognized and elevated the level of vulnerability to civil disturbance for the Town of Palm Beach due to the civil disturbances that they have in the area of the former President's Palm Beach home.

2.3.2 Domestic Security

Description

Terrorism

The FBI defines terrorism as, "the unlawful use of force or violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof in furtherance of political or societal objectives." A terrorist incident could involve the use of a Weapon of Mass Destruction (WMD) that would threaten lives, property and environmental resources by using explosives or incendiary devices and/or by contamination with chemical, biological, and/or radiological materials.

It is recognized that the state has many critical and high-profile facilities, high concentrations of population and other potentially attractive venues for terrorist activity that are inherently vulnerable to a variety of terrorist methods. Governmental/political, transportation, commercial, infrastructure, cultural, academic, research, military, athletic, and other activities and facilities constitute ideal targets for terrorist attacks, which may cause catastrophic levels of property and environmental damage, injury and loss of life. Furthermore, some extremist groups are known to be present within Florida. Terrorist attacks may take the form of the hazards described in this section. When incidents of these types are executed for criminal purposes, such as induced dam or levee failures, hazardous materials could be used to injure or kill or biological weapons could be used to create a pandemic. Terrorists have the potential to create disasters, which threaten the safety of a large number of citizens.

In the recent years, terrorist acts have become a reality for the nation. The County is not immune from acts of terrorism. The 2001 World Trade Center bombing was the largest terrorist attack the United States has ever experienced. After the World Trade Center attack, it was learned that the (terrorists) pilots took flight lessons in PBC and many of the perpetrators resided in the County. In addition, Anthrax, which was dispersed via the postal system in late 2001, claimed the lives of five (5) US citizens including one (1) person from PBC. It was determined that he became infected with the disease at his place of employment, American Media Incorporated (AMI), in Boca Raton. A second employee became infected and survived.

In the past two (2) decades, terrorism has had a significant influence on the daily lives of Americans. The consistent attacks abroad and intermittent attacks within the United States have made most communities more conscious of the growing risks and vulnerabilities in a free environment. The advancement of technologies has made our communities more vulnerable to the impacts from these hazards. It should be noted that the impact of a terrorist attack can extend well beyond the immediate targeted facility. The effects of terrorism include:

- Direct Result: Injury, illness, or death,
- Psychological Reactions: fear, anxiety, stress, shock, revulsion, long-term emotional effects, post-traumatic stress,
- Economic, Political, and Social Impacts.

The terrorism incident at the Pulse Night Club in Orlando on June 12, 2016, is a prime example of other acts of terrorism that are emerging in society today. A heavily armed man entered the nightclub and killed 49 victims and injured over 50 more. While no incidents of terrorism to this scale have occurred in PBC, the regional Fusion Center and local law enforcement work together on a daily basis to be on alert for signs of impending terrorist activity in the South Florida region.

Terrorism, Sabotage, and Cyber Attacks

With the growth of a computer-literate population, increasing numbers of people possess the skills necessary to attempt such a cyber-attack. The resources to conduct a cyber-attack are now easily accessible everywhere. A personal computer and an internet service provider anywhere in the world are enough to cause a great deal of harm.

Cyberspace is particularly difficult to secure due to a number of factors: the ability of malicious actors to operate from anywhere in the world, the linkages between cyberspace and physical systems, and the difficulty of reducing vulnerabilities and consequences in complex cyber networks. Implementing safe cybersecurity best practices is important for individuals as well as organizations of all sizes. Basic "cyber hygiene" can drastically improve online safety. Cybersecurity basics apply to both individuals and organizations. For both government and private entities, developing and implementing tailored cybersecurity plans and processes is key to protecting and maintaining operations. As information technology becomes increasingly integrated with all aspects of our society, there is increased risk for wide scale or high-consequence events that could cause harm or disrupt services upon which our economy and the daily lives of millions of Americans depend (CISA, 2024).

Sophisticated cyber actors and nation-states exploit vulnerabilities to steal information and money and are developing capabilities to disrupt, destroy, or threaten the delivery of essential services. Defending against these attacks is essential to maintaining the nation's security. Protecting cyber space is the responsibility of individuals; families; small and large businesses; and state, local, tribal, territorial, and federal governments. By preventing attacks or mitigating the spread of an attack as quickly as possible, cyber threat actors lose their power. Any cyber-attack, no matter how small, is a threat to our national security and must be identified, managed, and shut down. Every mitigated risk or prevented attack strengthens the cybersecurity of the nation (CISA, 2024).
Threats include:

- Human error,
- Insider use of authorized access for unauthorized disruptive purposes,
- Recreational hackers – with or without hostile intent,
- Criminal activity – for financial gain, to steal information or services, organized crime.
- Industrial espionage,

- Terrorism – including various disruptive operations,
- National Intelligence – information warfare, intended disruption of military operations.

As the internet becomes more and more important, the loss of its services, whether by accident or intent, becomes a greater hardship for those relying on this form of communication. The outcomes of such activities may take the form of disruption of air traffic controls, train switches, banking transfers, police investigations, commercial transactions, defense plans, power line controls, and other essential functions. Computer failures could affect emergency communications as well as routing civilian applications, such as telephone service, brokerage transactions, credit card payments, Social Security payments, pharmacy transactions, airline schedules, etc.

There have been multiple cyber-attacks in recent years involving the theft of citizen's private information such as bank account numbers, social security numbers, etc. The PBC LMS HVA Sub-Committee recognizes the potential impacts. In their most recent update to the hazard profile of the LMS, they advised that the threat will only become greater as we continue to transition the bulk of our financial transactions over to online platforms.

Location

The below tables, also in Appendix A, illustrate the varying risk across jurisdictions.

Domestic Security – Terrorism/Sabotage

Hazard Assessment H: High M: Medium L: Low V: Very Low	Unincorporated County	MUNICIPALITIES																																						
		Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	M	L	L	L	L	L	L	L	L	L	L	L
Vulnerability	M	L	M	M	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	M	M	M	L	L	M	L	M	L	L	L	L	M
Exposure	M	L	M	M	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	M	M	M	L	L	M	L	M	L	L	L	L	M
Overall Risk	M	L	M	M	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	M	M	M	L	L	M	L	M	L	L	L	L	M

Cybersecurity

Hazard Assessment H: High M: Medium L: Low V: Very Low	Unincorporated County	MUNICIPALITIES																																					
		Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Vulnerability	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
Exposure	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Overall Risk	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M

Overall Vulnerability

Terrorism, Sabotage, and Cyber Attacks

The possibility for terrorism, sabotage, and cyber-attacks in PBC does exist. The County's vulnerability to this hazard is moderate and thus is considered a threat to the PBC community. The City of West Palm Beach has a slightly higher vulnerability to terrorism as it is the center of government and also by the role played by aviation in the local economy. This vulnerability is still considered only moderate. The Town of Palm Beach, as well as many other wealthy enclaves within PBC, has a slightly higher vulnerability to celebrity terrorism since so many well-known and wealthy personalities make their residence there. While this vulnerability exists, it is considered to be no greater than that faced by many other communities around the country where the rich and famous live.

The warm temperatures, onshore winds, high rate of sunshine (UV exposure), and rainfall in PBC make this area a less favorable target for biological or chemical terrorism than many other areas of the United States. The population here is dispersed when compared to major cities in the northeastern U.S. The transportation system infrastructure is highly dependent upon individual vehicles. Both of these features make PBC a less desirable target for transportation system or conventional type (bomb related) terrorist acts.

Crime/terrorism hazards will damage or impair the County's infrastructure, disrupt commerce, and possibly result in large-scale health emergencies, disease outbreaks, and/or epidemics. Public awareness of terrorist incidences worldwide has increased since 2001. The percentage of terrorist events resulting in fatalities continues to grow. As a metropolitan area and a key tourist/economic component of the U.S., PBC could be a possible target for terrorist activities. Government buildings, large market sectors, critical infrastructure, tourist attractions, and large-scale events are all prime targets for terrorist organizations. Additional vulnerabilities include:

- Transportation Systems – highways, railways, waterways, and airports are vital to the transportation of materials, goods, services, and people.

- Population – an attack on a large population is attractive to gain large media attention.
- Industry – large manufacturers and companies house hazardous materials. Disruption of these facilities can have an economic impact and cause physical damages to property and loss of lives due to the large volume of hazardous materials housed.
- Utilities – there is a large dependency on telecommunications, power, water, wastewater, and pipeline services for daily activities and operations.
- Government Buildings – an attack on government buildings is attractive in order to deliver a political statement.
- Entertainment/Recreation – anywhere that attracts large populations is an attractive target.

The Threat and Hazard Identification and Risk Assessment (THIRA) provides detailed information regarding the crime/terrorism hazards mentioned below that could affect PBC.

- Terrorism (see *Domestic Security HSP*)
- Bomb Threat Incident
- Cyber-Security Incident (see also *PBC Information Systems Services (ISS) Department Business Continuity and Disaster Recovery Plan* and *IT Security Policy Manual*).

2.3.3 Workplace/School Violence

Description

A workplace/school violence incident could occur without warning in a number of settings. The workplace will be defined as a place of business or government offices where commerce occurs. Schools are educational settings which can be both public and private. Acts of violence in the workplace are handled by municipal or county law enforcement, dependent upon jurisdictional boundaries. Palm Beach County School District Police Department would have a large role in the response to an act of violence in a school.
Due to the current international climate and following the rising trend of active shooter/assailant incidents, public safety agencies have remained at a level of heightened awareness. The number of active shooter/assailant incidents are on the rise with less use of traditional weaponry, making it difficult for law enforcement agencies to detect would-be attackers.

In 2014, the Federal Bureau of Investigation (FBI) published a study and defined an active shooter as, “an individual actively engaged in killing or attempting to kill people in a populated area” (Blair, P., Schweit, W., 2014). The County and its jurisdictions will adopt the FBI’s definition of an active shooter/assailant with one adjustment to the verbiage. Within this plan, the word “shooter” will be accompanied by the word “assailant”, as "active shooter/assailant" to coincide with an international trend of the word “assailant", stated in the aforementioned FBI report. “Assailant” was defined by the report as “those (who) commit violence in the workplace or schools, using weapons other than firearms to commit killings or attempted killings.” (Blair, P., Schweit, W., 2014). These weapons include but is not limited to the use of knives, hatchets, vehicles, explosives, and blunt objects (e.g., baseball bats, metal pipes).

The school violence incident at the Marjory Stoneman Douglas High School in Parkland, Florida (Broward County) on February 14, 2018, resulted in 17 deaths and 14 injuries. This further emphasizes the importance of planning for these types of incidents. Due to the nature of the incident being in an adjacent county to PBC, special attention will be paid to the outcomes identified in the after-action report to assist in continued planning in the unfortunate event such an incident occurs in PBC. Planning for such an incident is not limited to the incident itself, but should include planning for memorials/vigils, reunification and survivor care, as well as many other considerations. The *Workplace/School Violence HSP* addresses the County's response to such an incident.

Location

The below table, also in Appendix A, illustrates the varying risk across jurisdictions.

Hazard Assessment H: High M: Medium L: Low V: Very Low	Unincorporated County	MUNICIPALITIES																																						
		Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Vulnerability	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Exposure	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Overall Risk	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M

Overall Vulnerability

While a workplace/school violence incident statistically ends within five (5) minutes, the consequences of the attack could last well beyond a single operating period (deemed to be 12 hours in duration per the CEMP) 70% of the time (Blair, P., Schweit, W., 2014), including many years, as these types of incidents create a detrimental psychological impact on the community. The County's vulnerability to this hazard is moderate. Therefore, this hazard is considered a threat to the PBC community.

A workplace/school violence incident tends to occur with the following actions:

1. An assault is acted upon by an active shooter/assailant.
2. Law enforcement moves into the scene to neutralize the assailant.
3. Fire rescue moves into the scene to assist wounded victims.
4. Victims are transported to health care facilities (e.g., hospitals).
5. Services are provided to victims and/or victims' families, such as victim and family mental health counseling.
6. Economic consequence management occurs.
7. Coordinated public messages and press releases are conducted.

8. Other numerous foreseen and unforeseen consequences may emerge.

Due to the majority of these type of incidents ending within five (5) minutes, planning will strongly focus on preparedness and mitigation, including the practice of educating the public on recommended actions they can take prior to an incident.

2.3.4 Harmful Algal Blooms

Description

Algae are a group of plants that can be found in all types of waters, including salt water, fresh water, and brackish water (a mix of salt and freshwater). Algae that live in the water can be grouped into two categories: seaweed and phytoplankton. Seaweed are large plants made up of many cells. Phytoplankton are small, single-celled plants. Both seaweed and phytoplankton can rapidly grow out of control or "bloom" when water is warm, slow moving, and full of nutrients such as nitrogen and phosphorus. These "blooms" can be harmful to people, animals, or the environment if they produce toxins, become too dense, deplete oxygen in the water, or release harmful gases as they decay. Most harmful blooms that make people and animals sick are caused by phytoplankton. They can also discolor water, contaminate drinking water, and form huge, smelly piles on beaches. Collectively, these events are referred to as harmful algal blooms, or HABs.

HABs occur naturally. However, human activities that disturb ecosystems play a role in increasing the frequency and intensity of occurrence. Increased nutrient loadings and pollution, food web alterations, introduced species, water flow modifications, and climate change all play a role. For example, overfishing the waters near coral reefs removes the primary algae-eaters from the environment, allowing populations of fleshy algae to explode. In areas with large human populations, pollution often exacerbates the problem by stimulating these algae. Fleshy algae on reefs release copious amounts of nutrients known as dissolved organic carbon that microbes eat. These microbes then endanger corals by depleting oxygen from the environment or by introducing diseases. As the reefs die, the algae have even more space to take over leading to further coral mortality. Millions of people around the world depend on coral reefs for productive fisheries. Reefs play an important role in global environmental health. HABs have caused an estimated $1 billion in losses over the last several decades to coastal economies in the United States that rely on recreation, tourism, and seafood harvesting.

Natural Causes

Although all coastal states experience HABs, different organisms live in different places and cause different problems. Factors such as the structure of the coast, runoff, oceanography, and the presence of other organisms can change the scope and severity of HAB impacts. Some HABs appear in the aftermath of natural phenomena like sluggish water circulation, unusually high-water temperatures, and extreme weather events like hurricanes, floods, and drought.

Anthropogenic Causes

Eutrophication, also known as nutrient pollution, describes the excess accumulation of nutrients (primarily nitrogen and phosphorus) in bodies of water. Like people, plants need nutrients. However, excessive amounts can become a problem. Although nutrients occur naturally, most of the nutrients in our waterways come from human activities like agricultural practices, fossil fuel emissions, landscaping, and stormwater and wastewater runoff. Nutrient pollution can exacerbate algae blooms leading to more severe blooms that occur more frequently.

Blue-Green Algae (Cyanobacteria)

Cyanobacteria, commonly referred to as blue-green algae, are a type of phytoplankton common to Florida's freshwater environments. Cyanobacteria can make the water different colors including green, blue, red, or brown and look like foam, scum, mats, or paint floating on the water's surface.

Exposure to blue-green algae blooms can cause negative health effects to both people and animals. Cyanotoxins can be released into the air from splashing in the water or from boat wakes. Direct contact or breathing airborne droplets containing high levels of algae toxins when swimming or showering can cause irritation of the skin, eyes, nose, and throat. Sometimes, high exposures of toxin can affect the liver and nervous system.

Bloom Monitoring

NOAA issues forecasts to monitor bloom conditions and the potential for impacts. The Harmful Algal Bloom Forecasting Branch (HAB FB) of the National Centers for Coastal Ocean Science (NCCOS) produces several remote sensing products to aid resource managers and public health officials in responding to fresh and saltwater HABs. NOAA currently uses a combination of satellite imagery and water samples of the algae (specifically Karenia brevis) collected from the field by local partners to forecast the location and intensity of red tide events. Additionally, this allows them to test potentially affected shellfish beds more precisely and for shorter periods of time and, if necessary, post advisories in coastal areas where there is a direct health risk. More information about monitoring can be found below in *Location*.

In 1999, the Florida Fish and Wildlife Conservation Commission (FWC) established the Harmful Algal Bloom Task Force. Due to a lack of funding, the Task Force became inactive for over 15 years. In 2019, Governor DeSantis reorganized the group as the Red Tide Task Force to "focus on causes of Red Tide" and find solutions and empower our brightest minds to help protect our environment" said DeSantis in a press conference announcing the reorganization. The Task Force will also work with Mote Marine Laboratory's Florida Red Tide Mitigation and Technology Development Initiative.

Similarly, Governor DeSantis signed Executive Order 19-12 titled Achieving More Now for Florida's Environment, establishing the Blue-Green Algae Task Force. The Task Force is made up of five (5) members from various academic institutions who are charged with focusing on

expediting progress toward reducing the adverse impacts of blue-green algae blooms now and over the next five (5) years (starting in 2019).

Emerging Technology

Private industry is working on new and exciting projects and searching for ways to mitigate and remove harmful algal blooms. For example, AECOM recently conducted the first ever field-scale algae to biocrude oil demonstration project in the U.S. The project utilized Hydrothermal Processing which transforms recovered algae biomass (wet waste) into carbon neutral energy, biocrude oil, and Renewable Natural Gas (RNG) to help reduce our dependence on fossil fuels. This process applies immense heat and pressure, similar to how crude oil is formed naturally, but does so in 30 minutes instead of millions of years. The result is a carbon neutral biofuel that functions like its fossil counterparts. It was proven highly effective and demonstrated how innovative technologies can be used to deliver a sustainable solution to HABs with little to no waste.

Another algae mitigation strategy is algae extraction using Hydronucleation Flotation Technology (HFT). This process separates and extracts algae from the water and returns clean clarified water to its source, safely and sustainably. By physically removing algae without damaging the cells, the key nutrients that fuel algae growth (phosphorus and nitrogen) are also removed, along with any carbon and algae toxins that might be present. Minimizing these nutrients can reduce and potentially eliminate the threat of future HABs.

Location

In Florida, HABs can be found in and along saltwater, freshwater, and brackish water bodies, especially south of Lake Okeechobee. While these events are most frequent in coastal regions of southwest Florida, they occur to a lesser extent throughout the Gulf region. Some of the more susceptible water bodies in Florida include Lake Okeechobee, the St. Lucie and Caloosahatchee estuaries, St. Johns River, Biscayne Bay, Florida Bay, Apalachicola Bay, and others. Additionally, harmful algae can easily thrive in still bodies of water. HABs are most common in late summer or early fall months. However, other events like hurricanes can spark a bloom due to the stormwater and pollution runoff.

NOAA's NCCOS monitors conditions daily and issues regular forecasts for red tide blooms in the Gulf of Mexico and East Coast of Florida. NCCOS has a number of products that forecast and monitor HABs that can be found on the website here. These products also include a compilation of products from other sources including current conditions, respiratory forecast, intensification forecast, satellite imagery, beach conditions reporting system (MOTE Marine Lab), and State of Florida observations (FWC). The FWC red tide map can be viewed on their website here.

FDEP has an Algal Bloom Sampling Status Dashboard that shows cyanobacteria (blue-green algae) samplings from across Florida. The interactive dashboard features information and real-time sampling updates from FDEP, South Florida Water Management District (WMD), Southwest Florida WMD, FWC, and Lee County. Additional entities can join sampling efforts as needed.

Along with the dashboard, FDEP creates and disseminates weekly updates that includes reported HABs, sites, and other information that can also be found on the dashboard. Subscribe to the weekly updates here.

Historic Algal Bloom Events

2013 Lake Okeechobee Release – Heavy rains in the summer of 2013 resulted in high water levels for Lake Okeechobee. To avoid jeopardizing the integrity of the Herbert Hoover Dike, U.S. Army Corps of Engineers (USACE) released large volumes of polluted water from the lake into the region's rivers and estuaries including the St. Lucie River estuary to the east, Caloosahatchee River estuary to the west, St. Johns River to the north, and Biscayne Bay to the south. The bloom caused 100% of the oysters and 120 manatees in the St. Lucie River to die, leading to restoration efforts along the estuary. This event led to some lawmakers forming the Select Committee on Indian River Lagoon and Lake Okeechobee Basin, and a report outlining actions and $220 million in proposed funding initiatives.

2016 Blue-Green Algae Bloom – In May 2016, 33 square miles (85 km2) of the southern portion of Lake Okeechobee were affected by an algae bloom. The bloom grew large early in the season and affected more people than usual, presenting far beyond the confines of the lake. Lake discharges through the St. Lucie Canal caused impacts throughout the estuary and east to Stuart where the water runs into the Atlantic Ocean. Water samples collected from the lake and from the river near Stuart tested positive for high levels of toxins produced by the algae. On June 29th, the Governor declared a state of emergency in Martin and St. Lucie counties after the blooms appeared in local waterways. The state of emergency allowed state and local government agencies to reduce the flow of water into Lake Okeechobee and directed FDEP and FWC to take action. A study by NOAA showed that impacts along the Treasure Coast cost the local economy $237 million in lost sales and 3,000 jobs.

2018 Blue-Green Algae Event – While blue-green algae are naturally occurring in Lake Okeechobee, they can become harmful if found in large concentrations. In 2018, NOAA first observed a blue-green algae bloom in Lake Okeechobee by satellite imagery in June, caused by surrounding nutrient influx, record-setting rainfall, and resuspension of sediments caused by Hurricane Irma. By mid-July, 90% of the lake was covered in blue-green algae. Following heavy periods of rainfall, USACE performed water releases into the St. Lucie and Caloosahatchee estuaries, including about 83 billion gallons of water discharged to the St. Lucie allowing disastrous algae bloom conditions to cripple the Caloosahatchee River. The overall event across the three (3) locations lasted for several months and caused "mats" of algae with an unpleasant smell along the water's surface, massive fish kills, and mitigating behavior by the public. On July 9, 2018, the Governor issued Executive Order 18-191 declaring a state of emergency for Glades, Hendry, Lee, Martin, Okeechobee, Palm Beach, and St. Lucie counties. The declared counties received $3 million [split between the seven (7) counties] for cleanup and disposal efforts. To learn more about the economic and socio-economic impacts of this event, see the following University of Florida report.

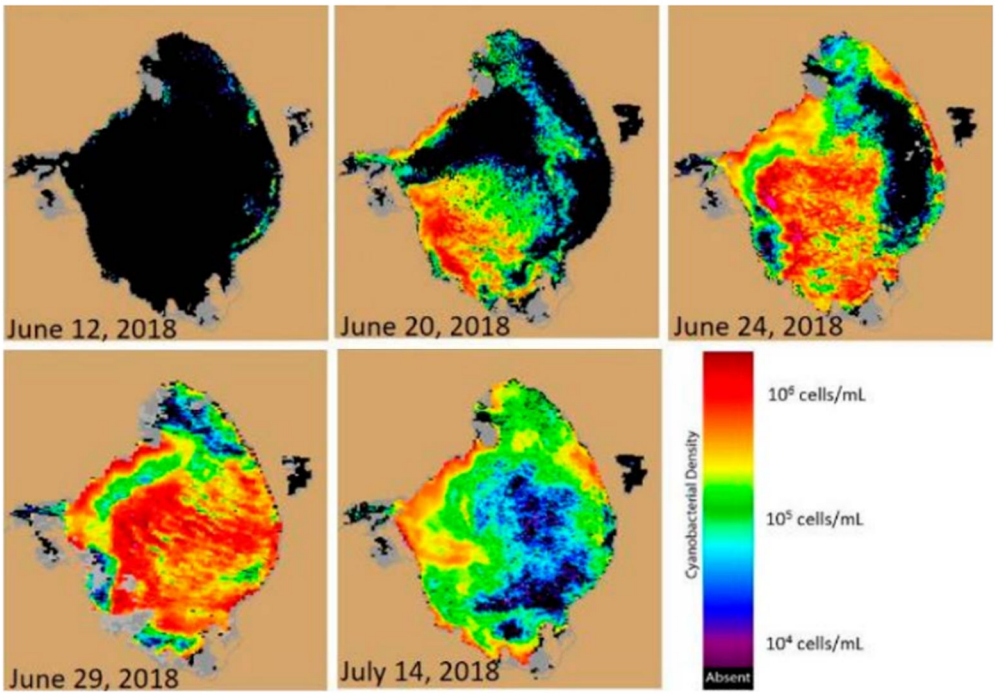

Figure 2.21 HAB Socio-Economic Impact (University of Florida)

2022 Hurricane Ian Concerns – Within a month after Hurricane Ian, medium levels of red tide were documented along the Gulf Coast outside of Sarasota. The bloom spread from Collier County to Pinellas County, causing thousands of pounds of dead fish to wash ashore and threatening manatee populations in Sarasota and Charlotte counties. While the storm did not directly cause the bloom because red tide is typical for that time of year, it likely pushed the red tide inland. The hurricane also destroyed man-made reefs as far as 30 miles away from the coast of Southwest Florida. Beginning in January 2023, USACE began releasing water from Lake Okeechobee into the St. Lucie Estuary for the first time in nearly two (2) years. The releases were due to water levels after Hurricane Ian. The absence of releases has led to ecological rehabilitation for the estuary, including clearer water and seagrass restoration. As releases continue, there are concerns of blue-green algae impacts along the estuaries, but no blooms were detected ahead of the summer months.

Overall Vulnerability

Blue Green Algae

Blue-green algae have had a significant impact on Palm Beach County's water bodies in recent years. In the summer of 2016, toxic blooms of blue-green algae affected Lake Okeechobee, which is connected to the St. Lucie Estuary and the Caloosahatchee River. These blooms led to the release of harmful toxins causing environmental and public health concerns. The blue-green algae blooms in PBC were primarily fueled by excess nutrient runoff, particularly from agricultural activities and urban areas. To mitigate the impact of blue-green algae blooms, various measures have been taken. These include improving water management practices, implementing stricter nutrient

regulations, increasing monitoring efforts, and promoting public awareness about the importance of water quality and conservation. Efforts are ongoing to address the underlying causes of blue-green algae blooms and protect the health of Palm Beach County's water bodies.

2.3.5 Mass Migration Crises

Description

Florida's location, as the nearest United States land mass bordering the Caribbean, basin makes it a chosen point of entry for many migrants attempting to enter the country illegally. A major consequence of a mass arrival of undocumented noncitizens could be disruptive to the routine functioning of the impacted community, resulting in significant expenditures that are related to the situation. An example of this threat occurred in 1994, when the state responded to two (2) mass migration incidents. In May 1994, there was an unexpected migration of approximately 100 Haitian refugees. In August 1994, there was an influx of 700 Cubans. These events are typically preceded by periods of increasing tension abroad, which can be detected and monitored. Enforcement of immigration laws is a federal responsibility. However, it is anticipated that joint jurisdictional support of any operation will be required from the state and local governments.

The Atlantic shore of PBC is the frequent scene of the arrival of undocumented noncitizens, commonly Haitian or Cuban. The County has both the history and potential for the unannounced arrival of a large number of undocumented noncitizens. Until relieved of the responsibility by the state and federal governments, PBC must be capable of providing mass refugee care to include shelter, food, water, transportation, medical, police protection, and other social services. The County's *Mass Migration Hazard Specific Plan* addresses the response to this hazard should it occur in PBC.

The LMS HVA Sub-Committee recognizes that natural hazards (such as hurricanes) have the potential to influence other hazards such as Mass Migration. An example of this is the influx of American citizens from Puerto Rico into Florida following the devastation from Hurricane Maria in September of 2017. While not illegal, the burden of such a sudden migration of persons from one area of the U.S. to another can severely strain local and state resources.

Overall Vulnerability

Data on past mass migration and population movements, such as the Haitian influx and Cuban raft incidents of the 1980s, indicates that mass migration has never reached a crisis state for the local authorities in PBC. The county's vulnerability to this hazard is moderate, however, due to demographic features. Thus, mass migration is a threat to the public. The cities of West Palm Beach, Delray Beach, Boynton Beach, Rivera Beach, South Bay, Pahokee, and Belle Glade all have a slightly higher vulnerability to mass migration impacts due their larger populations of Latin American and Caribbean immigrants.

2.4 Vulnerability of Critical Facilities

Appendix G maps demonstrate the vulnerability of each hazard in relation to the County and each jurisdiction's location of critical facilities and/or infrastructure. Structures have been identified for each hazard with jurisdictional boundaries. An estimated dollar figure in relation to potential dollar losses has been identified and summarized in a narrative for each identified hazard by jurisdiction.

The County determined a criticality based on the relative importance of its various assets for the delivery of vital services, the protection of special populations, and other important functions. The types of critical facilities and infrastructure identified within these risk assessment maps are: schools, police stations, fire stations, specific government buildings, nursing homes, assisted living facilities, hospitals, shelters, Herbert Hoover Dike, Turnpike, I-95, water treatment facilities, utility stations, draw bridges, seaports, and airports. These facilities can be located on the risk assessment maps and a potential dollar loss will be correlated in the charts broken down by municipality and unincorporated PBC. The estimated costs are based upon information from the County Auditor's Office. The dollar figures specific to each hazard by municipality or unincorporated area express the potential human and economic impacts within PBC. Appendix M specifically addresses critical facilities in PBC.

2.5 Risk Assessment

In order to effectively plan hazard mitigation projects and allocate scarce financial resources, a community's vulnerability to a specific hazard must be coupled with other critical factors to perform a risk assessment.

Risk, or the probability of loss, depends on three (3) elements:

- Frequency – How frequently does a known hazard produce an impact within the community?
- Vulnerability – How vulnerable is a community to the impacts produced by a known hazard?
- Exposure – What is the community's exposure in terms of life and property to the impacts produced by a specific hazard?

Once these three (3) factors are established, the risk level faced by a community with regard to any specific hazard can be calculated using the Risk Triangle approach (Crichton, 1999).

In this approach, these three (3) factors become the sides of a triangle. The risk or probability of loss is represented by the triangle's area (Figure 2.14a). The larger the triangle's area, the higher the community's risk with respect to a given hazard. If a community wishes to reduce its potential for loss or risk of impacts from any given hazard, it can attack the problem by reducing any one of the three (3) elements forming the sides of this triangle, the frequency of a hazard's occurrence, the vulnerability of the community, or the exposure of the community.

For example, if a community wishes to reduce its exposure to hurricanes, it could move off of the barrier islands. This actually happened in the 1870s when an entire community on the North Carolina barrier islands moved to the mainland after suffering two (2) devastating hurricanes in three (3) years. By moving out of harm's way, a community drastically reduces its exposure and its potential for loss from a given natural hazard (Figure 2.14b).

In today's world, the potential to relocate an entire community off the barrier islands is, to say the least, remote. A community may, however, reduce its vulnerability to hurricanes by strengthening its buildings. If buildings are hardened, vulnerability is reduced and there is a corresponding reduction in a community's probability of loss (Figure 2.14c).

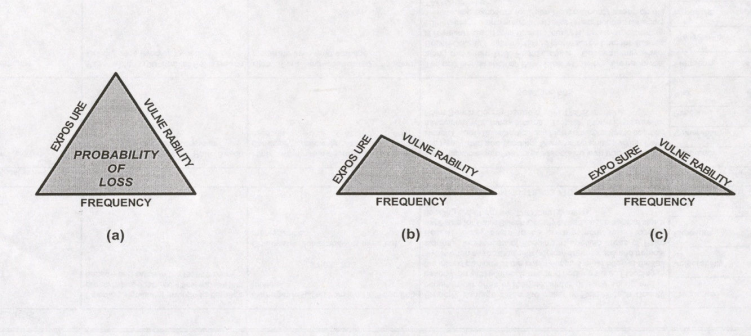

Figure 2.22 a, b, c Risk Triangles

In terms of natural hazards, there is very little, if anything, that can be done to change the frequency with which they produce impacts in a community. Mitigation planning relative to those hazards must therefore focus on reducing the community's vulnerability or exposure. In terms of technological and human-caused hazards, the most cost-effective type of mitigation is to limit or reduce the frequency with which such hazards actually occur. Appendix A tables summarize the County's potential for loss relative to each of the hazards identified by jurisdiction. In addition, Appendix A will include a risk assessment by jurisdiction. The risk assessments will be illustrated by means of maps located in Appendix G by hazard. This is to give a clear image of potential risk throughout PBC, hazard specific, with potential dollar losses estimated tied to assessed property values. This assessment refers to Appendix B and Appendix G illustrating mitigation actions being addressed in the PBC comprehensive plans. The overall strategy is to mitigate to reduce damage of a potential hazard.

SECTION 2A: VULNERABILITY OF CRITICAL FACILITIES

This subsection assesses the vulnerability of critical facilities by jurisdiction in terms of the dollar values of property at risk from key hazards. It addresses, in part, the following FEMA requirement:

Requirement §201.6(c)(2)(ii)(A): The risk assessment include the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas.

Numbers and types of existing residential, commercial, and critical service facilities and infrastructure are referenced in Appendix J:

With regard to future facilities, the following should be considered:

- Developable coastal areas of the County are substantially built out. Future development is likely to be replacement and upgrading of existing facilities.

- Development in the Coastal High Area is strictly limited and managed by local ordinances and codes which tend to meet or exceed those recommended of the State.

- Future growth throughout the County is guided by the managed growth tiers which consider hazard vulnerability.

- Virtually the whole County is potentially vulnerable to isolated flooding during excessive rain events, even areas lying outside Special Flood Hazard Areas. Repetitive flood loss properties are widely scattered - not clustered - because PBC has no riverine or significant elevation variations to speak of.

- All new residential, commercial, and critical service facilities will be built to meet or exceed South Florida Building hurricane standards. Several local developers are now building Category 5 type structures.

- Wildfire mitigation practices are being promoted for development in the wildland-urban interface areas.

As the State of Florida and the U.S. as a whole are currently experiencing economic growth, the current trend for PBC is increased values year over year. The PBC Property Appraiser's 2022-2023 Property Value Trends by City in PBC continued to indicate a modest to significant rise in values. County property values increased 17% in 2023 over 2022. This trend may be indicative of longer-term stabilization and economic growth throughout the Florida real estate markets. The Table below details the 2022 – 2023 property value trends by city.

Table 2A. 1 2022-2023 Property Value Trends by City in PBC

Community	Final 2022 Taxable Value	Preliminary 2023 Taxable Value	Percent Change
Atlantis	$671,880,693	$727,601,762	8.29
Belle Glade	$446,312,405	$547,653,535	22.71
Boca Raton	$30,905,680,812	$34,725,434,930	12.36
Boynton Beach	$8,066,818,280	$9,128,934,918	13.17
Briny Breezes	$74,427,529	$85,593,422	15
Cloud Lake	$9,326,634	$12,946,276	38.81
Delray Beach	$14,404,201,390	$16,375,692,423	13.69
Glen Ridge	$24,356,920	$31,827,469	30.67
Greenacres	$2,537,488,909	$2,888,498,573	13.83
Gulf Stream	$1,432,776,368	$1,654,422,761	15.47
Haverhill	$130,673,297	$154,881,178	18.53
Highland Beach	$3,124,267,506	$3,540,688,114	13.33
Hypoluxo	$458,727,547	$517,262,904	12.76
Juno Beach	$1,933,658,037	$2,268,172,958	17.3
Jupiter	$14,073,619,777	$15,862,964,529	12.71
Jupiter Inlet Colony	$476,668,815	$554,008,057	16.22
Lake Clarke Shores	$338,121,344	$373,122,912	10.35
Lake Park	$910,468,649	$1,033,139,661	13.47
Lake Worth Beach	$2,696,797,002	$3,132,298,706	16.15
Lantana	$1,531,436,404	$1,800,604,585	17.58
Loxahatchee Groves	$442,024,556	$527,090,691	19.24
Manalapan	$1,876,286,858	$2,158,139,772	15.02
Mangonia Park	$273,564,381	$339,576,109	24.13
North Palm Beach	$2,953,009,292	$3,375,264,084	14.3
Ocean Ridge	$1,355,615,977	$1,534,096,503	13.17
Pahokee	$105,003,951	$117,874,236	12.26
Palm Beach	$25,516,602,944	$29,079,603,728	13.96
Palm Beach Gardens	$15,543,339,584	$17,958,104,486	15.54
Palm Beach Shores	$698,275,731	$772,244,782	10.59
Palm Springs	$1,675,867,657	$1,902,659,981	13.53
Riviera Beach	$7,177,322,778	$7,740,052,469	7.84
Royal Palm Beach	$3,837,144,094	$4,265,762,006	11.17
South Bay	$86,136,292	$99,608,594	15.64
South Palm Beach	$515,877,617	$587,682,378	13.92
Tequesta	$1,489,569,323	$1,877,298,569	26.03
Village of Golf	$251,582,137	$307,944,236	22.4
Wellington	$10,321,781,544	$11,575,031,655	12.14

West Palm Beach	$18,300,968,069	$21,159,900,038	15.62
Westlake	$608,049,797	$944,251,483	55.29

Source: Palm Beach County Property Appraiser

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SECTION 2B: VULNERABILITY OF RESIDENTIAL & COMMERCIAL PROPERTIES

This subsection assesses the structural vulnerability of residential and commercial properties by jurisdiction in terms of the dollar values of property at risk from key hazards, in partial fulfillment of the following FEMA requirement:

Requirement §201.6(c)(2)(ii)(A): The risk assessment include the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas.

Numbers, types and characteristics of existing residential, commercial and critical service facilities and infrastructure are referenced in Appendix C.

According to ConstructConnect, there was a $49.2 billion increase of 4.3% in volume of non-residential construction starts from 2022 to 2023. May 2023 compared with May 2022 showed -30.1% due to less mega project work. (https://www.constructconnect.com/hubfs/Industry%20Snaphot%20Packages%20(PDF)/Construction_Industry_Snapshot_Package-June_2023.pdf). However, there is still a cloud of uncertainty in the marketplace. Higher demand for housing, more occupancy in apartments, and retail are providing lifts to the industry. Since the last update of the LMS in 2020, there has been significant growth in residential and commercial property spending throughout the State of Florida.

The following observations are offered with regard to future facilities:

- Developable coastal areas of the County are substantially built out. Future development in these areas will likely be replacement and upgrading of existing facilities.
- Development in the Coastal High Area is strictly limited by local ordinances and codes which tend to meet or exceed those recommended by the State of Florida Building Code (8^{th} edition).
- Future growth throughout the County is guided by the managed growth tiers which consider hazard vulnerability.
- Nearly the whole County is potentially vulnerable to isolated flooding during excessive rain events, even areas outside Special Flood Hazard Areas (SFHA). Repetitive flood loss properties are widely scattered - not clustered - as the County has only one (1) river and no significant elevation variations.
- All new residential, commercial and critical service facilities will be built to meet or exceed South Florida Building hurricane standards. Several local developers are now building Category 5 type structures.
- Wildfire mitigation practices are being promoted for development in the wildland-urban interface areas.

Florida Building Code requires one (1) foot of Freeboard for new construction or Substantial Damage/Substantial Improvement (SD/SI) in the SFHA. This change in development in hazard-prone areas decreases vulnerability. However, the County adopted and enforces a requirement for

new development to obtain a MT-2 map amendment as a prerequisite for approval when more than five (5) acres or 50 lots are proposed in a SFHA. [The term MT-2 refers to the Letter of Map Revision (LOMR) process used by the Federal Emergency Management Agency (FEMA) for revising Flood Insurance Rate Maps (FIRMs) and Flood Insurance Study (FIS) reports. When significant changes occur in Special Flood Hazard Areas (SFHAs) or Base Flood Elevations (BFEs), the MT-2 process allows for due process and official incorporation of these changes into the effective FIRM.]

Some jurisdictions (e.g. West Palm Beach) have adopted higher standards in SD/SI such as the 5-year cumulative calculation that decreases vulnerability in hazard prone areas. The State of Florida developed a statewide matrix of the adoption of these higher standards. The LMS Steering Committee is in the process of inventorying local governments on their adoption of the higher standards which will be finished after submission of this document.

The following pages provide assessments of the dollar values of existing properties at risk as of this writing, by hazard, by jurisdiction.

Methodology for Assessing Vulnerability of Existing Structures

It was decided to use local property appraisal databases, Geographic Information System (GIS) capabilities, and hazard environment profiles as the basis for identifying and quantifying property and dollars at risk from key hazards.

Analyses of the types and numbers of existing buildings in PBC are complicated by the County's size, diversity, highly variable and incompatible databases, and inconsistent record keeping practices. The primary data source is the Property Appraiser Database (PAPA). The PAPA database is not well suited for purposes of vulnerability assessments, but it continues to be the best data available.

A comprehensive profile of PBC's built environment is contained in the Special Appendix. It describes the residential, commercial, industrial, government, education, healthcare, religious, and other building stocks.

The paragraphs below provide a brief summary of existing residential and commercial properties.

Residential Units

According to Property Appraiser data, there are an estimated 596,805 residential parcels and 613,141 structures in PBC. The residential housing stock is well distributed throughout the eastern portion of the County. Forty-four (44) percent of residential units reside in the unincorporated areas of the County. The seven (7) municipalities of West Palm Beach, Boca Raton, Boynton Beach, Palm Beach Gardens, Jupiter, Wellington and Delray Beach collectively have about 36.6% of PBC's residential units, up 34% from LMS2020.

The overwhelming majority of residential structures (85.38%) are of CB Stucco construction. Less than 4% have exterior walls composed of wood in the form of wood siding, wood frame stucco, or board batten. The remaining structures are constructed of a variety of other materials. The PAPA database consists of approximately 50 categories, many of which have a multiplicity of variations.

We have summarized the Property Appraiser Residential Dwelling Data in the following tables:

Table 2B. 1 Summary Table of Property – Palm Beach County Property Appraiser's Office

Community	Count of Parcels	# of Buildings	# of Buildings as a % of Total	Total Reconstruction Cost NEW
Atlantis	1257	1258	0.21	$399,981,431
Belle Glade	2652	2970	0.48	$496,529,014
Boca Raton	40185	40287	6.57	$19,964,099,864
Boynton Beach	31119	31192	5.09	$6,650,514,883
Briny Breezes	479	480	0.08	$18,179,859
Cloud Lake	50	61	0.01	$9,661,877
Delray Beach	30303	30710	5.01	$10,276,710,164
Glen Ridge	80	101	0.02	$19,283,454
Greenacres	14679	14746	2.4	$2,841,052,447
Gulf Stream	655	690	0.11	$894,186,466
Haverhill	631	660	0.11	$133,956,671
Highland Beach	4142	4149	0.68	$3,620,235,629
Hypoluxo	2105	2112	0.34	$595,591,883
Juno Beach	3016	3028	0.49	$1,740,632,593
Jupiter	28848	28890	4.71	$11,649,796,446
Jupiter Inlet Colony	222	223	0.04	$129,621,875
Lake Clarke Shores	1456	1460	0.24	$360,165,922
Lake Park	2552	2603	0.42	$467,589,981
Lake Worth Beach	11647	12426	2.03	$1,961,122,068
Lantana	4109	4230	0.69	$851,355,465
Loxahatchee Groves	1192	2053	0.33	$295,156,783
Manalapan	301	329	0.05	$583,778,501
Mangonia Park	607	613	0.1	$84,732,224
North Palm Beach	7393	7409	1.21	$2,817,401,557
Ocean Ridge	1396	1412	0.23	$994,718,068
Pahokee	1089	1187	0.19	$185,920,089
Palm Beach	8799	9248	1.51	$13,063,763,774
Palm Beach Gardens	27132	27214	4.44	$11,488,441,948

Palm Beach Shores	939	942	0.15	$632,556,798
Palm Springs	7433	7643	1.25	$1,264,413,163
Riviera Beach	14676	14822	2.42	$5,673,253,164
Royal Palm Beach	13757	13777	2.25	$3,085,166,841
South Bay	670	698	0.11	$114,227,539
South Palm Beach	1899	1899	0.31	$848,834,974
Tequesta	3256	3324	0.54	$1,439,134,104
Unincorporated PBC	261346	270041	44.04	$70,346,177,011
Village of Golf	166	189	0.03	$119,276,256
Wellington	21375	23032	3.76	$7,659,878,225
West Palm Beach	41263	43104	7.03	$13,061,162,304
Westlake	1929	1929	0.31	$483,316,062
Grand Total	**596805**	**613141**	**99.99**	**$197,321,577,377**

Table 2B. 2 Residential Structures by Exterior Wall Type in PBC

Exterior Wall Type	# of Buildings	# of Buildings as a % of Total
MSY: CB STUCCO	523,498	85.38
WSF: STUCCO	27,167	4.43
WSF: WOOD SIDING	22,934	3.74
Data Not Available	9,194	1.5
MSY: PRECAST PNL/REIN. CONC	8,467	1.38
Aluminum	4,485	0.73
WSF: VINYL/STL/ALUM	4,383	0.71
MSY: CONC. BLOCK	3,340	0.54
WSF: BRICK	2,355	0.38
WSF: CEMENT FIBER SIDING	1,458	0.24
WOOD SIDING	1,247	0.2
CONCRETE BLOCK STUCCO	1,204	0.2
WSF: PLYWD/STL/ALUM SHTH	1,040	0.17
OPEN POSTS OR COLUMNS	501	0.08
Plywood siding	397	0.06
MSY: VINYL/STL/ALUM	369	0.06
WSF: PREFAB PNL	158	0.03
ALUMINUM/STEEL SIDING/PANELS	134	0.02
Hardboard siding	128	0.02
WSF: WOOD SHINGLE	101	0.02
Vinyl Siding	99	0.02
CONCRETE BLOCK	95	0.02

WOOD FRAME STUCCO	82	0.01
PLYWOOD	56	0.01
WSF: COMP OR HARD BD	38	0.01
NONE	29	0
WSF: STONE	22	0
Stucco siding	21	0
VINYL SIDING	20	0
ADOBE/HOLLOW CLAY BLK	19	0
PREFAB PANEL, STEEL/ALUMINUM	17	0
GLASS	12	0
MSY: CEMENT FIBER SIDING	12	0
MSY: WOOD SIDING	7	0
SANDWICH PANEL, STEEL/ALUMINUM	7	0
LOG	6	0
Masonry Veneer	6	0
Wood Single/Shake	5	0
CEMENT FIBER SIDING/SHINGLES	5	0
MSY: CONC. SIP FORMING	5	0
MSY: BRICK	4	0
BRICK, BLOCK BACKUP	3	0
PRECAST PANELS	2	0
BRICK VENEER	2	0
REINFORCED CONCRETE	2	0
WSF: LOG VENEER	1	0
Cement fiber siding	1	0
WOOD SHINGLES/SHAKES	1	0
CEADAR/REDWOOD	1	0
STONE, BLOCK BACKUP	1	0
Grand Totals	**613,141**	**99.96**

Commercial Properties

Property Appraiser data indicates that there are approximately 18,769 commercial parcels with 2725 commercial structures countywide. The cost of reconstruction for those structures is estimated at $66 billion. These data are summarized as follows:

Table 2B. 3 Palm Beach County Property Appraiser Commercial Parcels, Buildings, and Reconstruction Costs

Building Structure	Count of Parcels	# of Buildings	Total Reconstruction Cost "NEW"
APARTMENTS	153	565	$226,498,080
APARTMENTS - SENIOR	57	153	$1,329,093,560
APARTMENTS - TOWNHOUSE	63	270	$553,246,390
APARTMENTS HIGH RISE	86	153	$3,699,189,600
APARTMENTS LOW RISE	888	2621	$5,061,719,820
ARENA	17	23	$87,923,040
AUDITORIUM	46	51	$269,096,950
AUTO DEALER/F-SERVICE	121	216	$616,123,240
AUTO SERVICE GARAGE	448	537	$375,476,240
BANK/MAIN OFFICE	47	47	$129,475,590
BAR/TAVERN	44	47	$15,388,390
BARNS	39	74	$30,410,320
BIOTECH RESEARCH DEVELOPMENT	4	6	$172,006,720
BOWLING ALLEY	5	5	$14,085,300
CAR WASH - AUTOMATIC	72	73	$49,702,780
CAR WASH - MANUAL	22	24	$8,239,920
CAR WASH SERVICE STATION	57	57	$9,304,850
CINEMA/THEATER	23	24	$173,332,550
CLUBHOUSE	1677	2167	$992,227,670
COCKTAIL LOUNGE	12	14	$19,208,770
COLD STORAGE	30	43	$58,659,580
COLLEGES / UNIVERSITY	10	122	$658,731,450
COMM SHOPPING CENTER	245	548	$2,342,567,430
COMMERCIAL CONDO (INCOME USE)	0	0	
COMMERCIAL MIXED USE	11	12	$70,977,350
CONDO COMMON ELEMENT	0	0	
CONDO FEE SIMPLE	0	0	
CONVENIENCE FOOD MKT	367	368	$236,839,720
CORRECTIONAL	2	4	$30,139,470
COUNTRY CLUB	31	45	$146,786,010
COUNTRY CLUB/W GOLF CRSE	121	224	$845,982,300
CULTURAL FACILITIES	16	19	$98,166,370
DAY CARE CENTER	234	290	$252,099,040
DEPARTMENT STORES	24	24	$35,629,100
DISCOUNT DEPT STORE	159	200	$715,504,050

DOG/HORSE TRACK	1	2	$16,414,430
DORMITORY	75	164	$333,007,570
DOWNTOWN ROW TYPE	171	244	$1,046,322,160
DRUG STORE FREESTANDING	100	100	$264,292,780
EDUCATION/RELIGIOUS	324	695	$1,079,198,920
EFFICIENCY APARTMENT	57	145	$16,144,880
FRANCHISE FOOD	311	324	$246,440,290
FUNERAL HOME	47	52	$62,196,790
FURNITURE STORE	38	41	$153,218,070
GARAGE STORAGE	160	248	$40,144,950
GOLF COURSE (INCOME USE)	0	0	
GOVERNMENTAL	134	221	$1,782,197,490
GUARDHOUSE	192	203	$20,232,410
GYMNASIUM	75	76	$224,258,040
HANGAR	12	117	$203,031,120
HEALTH CLUB	22	22	$144,274,160
HEAVY MANUFACTURING	4	8	$29,201,760
HOME IMPROVEMENT	18	18	$159,774,850
HOSPITALS	21	53	$2,632,788,020
HOTEL- HI RISE	72	75	$1,366,681,390
HOTEL/MOTEL BUSINESS	81	162	$78,923,130
HOTEL/MOTEL LO RISE	40	70	$177,357,780
KWIK LUBE	22	22	$9,803,760
LIBRARY	16	16	$62,929,450
LIGHT MANUFACTURING	211	269	$480,881,430
LUMBER STORAGE	0	0	
MEDICAL OFFICE BLDG	482	537	$1,482,595,150
MEGA WAREHOUSE DISCOUNT	6	6	$79,392,190
MINI WAREHOUSE	178	881	$1,528,926,670
MOBILE HOME PARID (INCOME USE)	0	0	
NEIGHBORHOOD BANK	294	310	$334,940,740
NURSING HOME	145	209	$1,386,297,480
OFFICE BLDG L/R 1-4S	2074	2412	$6,231,224,970
OFFICE CONDOMINIUM	0	0	
OFFICE H-R 5ST	88	102	$3,074,220,720
OFFICE/WAREHOUSE	378	443	$1,354,555,620
PARKING GARAGE/DECK	139	151	$2,061,281,720
POLICE/FIRE STATIONS	116	135	$249,666,010
PREFAB AGR STORAGE	4	4	$2,396,110
PREFAB WAREHOUSE	4	4	$736,490

PRIVATE CLUB	14	30	$94,827,980
RACETRACK	0	0	
RADIO/TV TRANSMITTER BLD	11	12	$5,593,430
RADIO/TV/ PIC STUDIO	4	4	$32,329,070
RAIL/BUS/AIR TERMINAL	17	29	$207,499,140
REGIONAL SHPMALL/CNT	3	15	$271,959,900
RELIGIOUS	666	740	$1,066,421,070
RESIDENTIAL 1 FAMILY	0	0	
RESIDENTIAL 2 FAMILY	0	0	
RESIDENTIAL 3 FAMILY	0	0	
RESIDENTIAL 4 FAMILY	0	0	
RESIDENTIAL BARNS	3	4	$3,096,360
RESORT HOTEL	16	36	$1,169,441,920
RESTAURANT	371	394	$387,364,740
RETAIL CONDOMINIUM	0	0	
RETAIL DRIVE-UP	0	0	
RETAIL MULTI OCCUP	216	255	$408,513,210
RETAIL SINGLE OCCUP	1031	1095	$724,279,750
SCHOOL	224	765	$3,874,999,900
SERVICE STATION NO BAYS	102	107	$34,786,490
SERVICE STATION W/BAYS	40	40	$13,313,050
SFR CONVERT TO COMM	387	443	$124,647,310
SKATING RINK	3	4	$19,322,110
SOCIAL/FRATERNAL HALL	71	86	$47,163,620
STADIUM	3	5	$96,937,900
STRIP SHOPPING CNTR	829	1009	$1,593,349,520
SUPER REG SHOPMALL	4	7	$1,230,064,810
SUPERMARKET	124	140	$636,511,640
TECHNICAL MANUFACTURING	23	37	$403,955,980
TELECOMMUNICATION EQUIPMENT	23	29	$70,955,830
TRUCK TERMINAL	0	0	
VETERINARY CLINIC	63	71	$70,135,570
WAREHOUSE DISCOUNT STORE	9	9	$77,775,750
WAREHOUSE DISTRIBUTION	193	232	$1,746,218,940
WAREHOUSE SINGLE TENANT	2	2	$1,312,570
WAREHOUSE STORAGE	3074	4558	$3,933,444,450
Grand Totals	**18769**	**27725**	**$66,086,003,160**

Number & Assessed Values of Residential & Commercial Property at Risk

Deriving an accurate estimate of residential property values at risk from hazards is complicated by multiple factors. However, the Property Appraiser does calculate the estimated cost of reconstruction based upon its knowledge of the building and its construction, as well as estimated costs of construction. This value is provided the RCN ("reconstruction value new") which is used above.

The methodology used to estimate the value of residential property at risk involved a number of compromises using best available data. Parcel data was extracted from the Property Appraiser database. It was sorted by jurisdiction and hazard boundaries. A derived factor for land values was backed out of loss estimates to concentrate only on improved parcels.

Estimating the Value of Property Contents

Based on analyses of property records, values for residential contents at risk are assumed to be approximately 80% of the appraised value of the structure. Values for commercial contents and inventory at risk are assumed to be 175% of the appraised value of the structure. A countywide summary of property values at risk, including contents, is presented at the end of this Section.

Critical Facilities

For the purpose of the LMS, critical facilities are defined as any facility that would have a major negative effect on a large percentage of the population of a community if impacted. Considerations include the nature of the service (s) provided to the community or negative impact that would occur to that same community if the facility became damaged, destroyed, or non-functional. These facilities include but are not limited to law enforcement and fire rescue facilities, schools, government facilities, utility facilities, seaports and airports, hospitals, and other critical medical facilities, shelters, adult living facilities, etc. For security reasons and their sensitive nature, critical facility listings are excluded from publicly distributed copies of the LMS plan. A list is maintained by DEM and made available to authorized personnel.

The table below from FEMA's National Risk Index (NRI) clarifies the number of and type of buildings affected.

Table 2B. 4 National Risk Index Data for Palm Beach County

Palm Beach County Data from the National Risk Assessment
https://hazards.fema.gov/nri/map
https://hazards.fema.gov/nri/data-resources#csvDownload

County Data Points	Data Abv.	Palm Beach County	County Risk Assessment	Data Abv.	National Risk Index	Expected Annual Loss	Expected Annual Loss Rate	Social Vulnerability	Community Resilience
OBJECTID	OID_	571	Value - Composite	RISK_VALUE	1,069,699,790.09				
National Risk Index ID	NRI_ID	C12099	Score - Composite	RISK_SCORE	99.71	99.72		78.84	23.65
State Name	STATE	Florida	Rating - Composite	RISK_RATNG	Very High	Very High		Relatively High	Relatively Low
State Name Abbreviation	STATEABBRV	FL	State Percentile - Composite	RISK_SPCTL	97.01	97.01		0.80	0.45
State FIPS Code	STATEFIPS	12	Total - Composite	EAL_VALT		905,373,080.08			2.49
County Name	COUNTY	Palm Beach	Building Value - Composite	EAL_VALB		820,336,872.03	0.00		
County Type	COUNTYTYPE	County	Population - Composite	EAL_VALP		5.78	0.00		
County FIPS Code	COUNTYFIPS	99	Population Equivalence - Composite			67,029,777.26			
State-County FIPS Code	STCOFIPS	12099	Agriculture Value - Composite	EAL_VALA		17,997,110.79	0.02		
Population (2020)	POPULATION	1489461	National Percentile - Composite	NPCTL			92.54		
Building Value ($)	BUILDVALUE	2.38568E+11	Social Vulnerability and Community Resilience Adjusted Expected Annual Loss Rate - National Percentile - Composite	VRA_NPCTL			94.46		
Agriculture Value ($)	AGRIVALUE	1034305981							
Area (sq mi)	AREA	2407.352806							

County Hazard Assessment	Data Abv.	Avalanche	Coastal Flooding	Cold Wave	Drought	Earthquake	Hail	Heat Wave	Hurricane	Ice Storm
Number of Events	EVNTS			4.06	529.00		29.00	-	70.00	
Annualized Frequency	AFREQ		2.91	0.30	13.77	0.00	1.02	-	0.33	
Exposure - Impacted Area (sq mi)	EXP_AREA		13.87	2,006.36	2,006.36	2,006.36	2,006.36	2,006.36	2,006.36	
Exposure - Building Value	EXPB		20,806,411,804.57	238,352,446,743.87		238,584,103,000.00	238,567,827,580.00	-	238,563,730,751.66	
Exposure - Population	EXPP		80,516.83	1,488,843.99		1,492,191.00	1,489,461.00	-	1,489,405.73	
Exposure - Population Equivalence	EXPPE		988,795,247,952.56	17,288,270,315,947.50		17,309,415,800,000.00	17,277,747,800,000.00	-	17,277,100,888,224.80	
Exposure - Agriculture Value	EXPA			1,034,305,977.82	799,831,335.36		1,034,305,981.00	-	971,447,915.87	
Exposure - Total	EXPT		989,601,859,757.12	17,507,857,088,884.10	799,831,335.36	17,547,979,703,000.00	17,517,349,733,541.00	-	17,516,835,861,902.10	
Historic Loss Ratio - Buildings	HLRB		0.00007853	0.00000056		0.00749155	0.00000003	0.00000054	0.00979943	
Historic Loss Ratio - Population	HLRP		0.00000736	0.00000004		0.00004008	0.00000000	0.00000135	0.00000848	
Historic Loss Ratio - Agriculture	HLRA			0.00174765	0.00049714		0.00000444	0.00000801	0.01690318	
Historic Loss Ratio - Total Rating	HLRR	Not Applicable	Very Low	Very Low	Relatively Moderate	Very Low	Very Low	No Rating	Very High	Not Applicable
Expected Annual Loss - Building Value	EALB		48,047.99	35,485.00		206,146.80	7,037.09	-	802,168,974.76	
Expected Annual Loss - Population	EALP		0.01	0.01		0.01	0.01	-	4.87	
Expected Annual Loss - Population Equivalence	EALPE		158,856.32	167,031.85		80,313.88	61,165.37	-	56,443,048.91	
Expected Annual Loss - Agriculture Value	EALA			557,812.37	7,387,282.42		4,936.39	-	5,199,872.99	
Expected Annual Loss - Total	EALT		206,904.31	760,329.22	7,387,282.42	286,460.48	73,138.75	-	863,810,896.65	
Expected Annual Loss Score	EALS		57.95	91.40	99.10	67.58	46.50	-	99.91	
Expected Annual Loss Rating	EALR	Not Applicable	Relatively Low	Relatively High	Relatively High	Relatively Low	Relatively Low	No Expected Annual Losses	Very High	Not Applicable
Expected Annual Loss Rate - Building	ALRB		0.00	0.00		0.00	0.00	-	0.00	
Expected Annual Loss Rate - Population	ALRP		0.00	0.00		0.00	0.00	-	0.00	
Expected Annual Loss Rate - Agriculture	ALRA			0.00	0.01		0.00	-	0.01	
Expected Annual Loss Rate - National Percentile	ALR_NPCTL		48.38	57.78	91.07	8.08	7.01	-	94.80	
Hazard Type Risk Index Value	RISKV		201,494.95	877,435.10	8,468,024.92	336,727.82	91,001.45	-	1,017,083,783.98	
Hazard Type Risk Index Score	RISKS		56.34	91.31	98.95	65.86	46.10	-	99.87	
Hazard Type Risk Index Rating	RISKR	Not Applicable	Relatively Low	Relatively High	Relatively High	Very Low	Relatively Low	No Rating	Very High	Not Applicable

County Hazard Assessment	Data Abv.	Landslide	Lightning	Riverine Flooding	Strong Wind	Tornado	Tsunami	Volcanic Activity	Wildfire	Winter Weather
Number of Events	EVNTS	-	3,349.00	37.00	30.00	117.00				-
Annualized Frequency	AFREQ	0.01	182.83	1.33	1.03	1.11			0.01	-
Exposure - Impacted Area (sq mi)	EXP_AREA	3.44	2,006.36	356.57	2,006.36	2,407.36			51.70	2,006.36
Exposure - Building Value	EXPB	5,972,832,348.94	238,567,827,580.00	27,419,940,028.84	238,567,827,580.00	238,567,827,580.00			7,284,377,087.17	-
Exposure - Population	EXPP	35,470.87	1,489,461.00	153,761.50	1,489,461.00	1,489,461.00			40,086.97	-
Exposure - Population Equivalence	EXPPE	295,462,046,133.03	17,277,747,800,000.00	1,783,633,416,090.91	17,277,747,800,000.00	17,277,747,800,000.00			464,776,847,128.80	-
Exposure - Agriculture Value	EXPA			491,788,089.43	1,034,305,981.00	1,034,305,981.00			55,102,388.37	-
Exposure - Total	EXPT	301,434,878,481.96	17,516,315,427,580.00	1,811,545,144,208.18	17,517,349,733,541.00	17,517,349,733,541.00			472,116,336,581.35	-
Historic Loss Ratio - Buildings	HLRB	0.00175796	0.00000002	0.00008776	0.00000011	0.00002370			0.40000000	0.00000492
Historic Loss Ratio - Population	HLRP	0.00000589	0.00000000	0.00000070	0.00000004	0.00000006			0.00000547	0.00000013
Historic Loss Ratio - Agriculture	HLRA			0.00738854	0.00000011	0.00000793			0.01357903	0.00000251
Historic Loss Ratio - Total Rating	HLRR	Relatively Low	Relatively Low	Very Low	Very Low	Very Low	Insufficient Data	Not Applicable	Very Low	No Rating
Expected Annual Loss - Building Value	EALB	105,000.00	734,061.84	3,025,702.49	25,299.23	6,285,850.55			7,895,266.88	-
Expected Annual Loss - Population	EALP	0.00	0.67	0.04	0.06	0.10			0.00	-
Expected Annual Loss - Population Equivalence	EALPE	17,400.00	7,800,470.55	483,949.52	839,001.04	1,183,825.52			5,481.30	-
Expected Annual Loss - Agriculture Value	EALA	122,400.00	8,524,482.19	4,831,679.95	118.44	9,116.90			6,291.43	-
Expected Annual Loss - Total	EALT	84.27	99.84	8,341,331.96	864,418.71	7,478,582.98			7,907,022.41	-
Expected Annual Loss Score	EALS			96.26	73.84	97.06			97.33	-
Expected Annual Loss Rating	EALR	Relatively Moderate	Very High	Relatively High	Relatively Moderate	Relatively High	Insufficient Data	Not Applicable	Relatively High	No Expected Annual Losses
Expected Annual Loss Rate - Building	ALRB	0.00	0.00	0.00	0.00	0.00			0.00	-
Expected Annual Loss Rate - Population	ALRP	0.00	0.00	0.00	0.00	0.00			0.00	-
Expected Annual Loss Rate - Agriculture	ALRA			0.00	0.00	0.00			0.00	-
Expected Annual Loss Rate - National Percentile	ALR_NPCTL	13.22	75.80	61.16	8.44	21.34			68.07	-
Hazard Type Risk Index Value	RISKV	138,000.37	10,554,219.15	10,780,818.37	857,208.84	8,871,578.31			6,987,966.88	-
Hazard Type Risk Index Score	RISKS	85.39	99.84	96.40	75.02	97.62			96.79	-
Hazard Type Risk Index Rating	RISKR	Relatively Moderate	Very High	Relatively High	Relatively Moderate	Relatively High	Insufficient Data	Not Applicable	Relatively High	No Rating

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*Grayed cells are cells that were not included in NRI report but were added to preserve row alignment

SECTION 3: MITIGATION STRATEGY

3.1 Governmental

Local Mitigation Strategies take into account an abundance of information from the Federal and State levels, as each has their own mitigation strategy as well. For example, the Federal Government has the National Mitigation Framework, and the State of Florida has the State Hazard Mitigation Plan. Strategies, goals, and objectives from these are very beneficial for local LMS officials to use in the formulation of their own strategies as they help align the overall mitigation goals with each other, in order to make all communities more resilient after a disaster has occurred.

This section, in part, addresses the following FEMA requirements **Plan Content**. The plan must include the following:

Requirement 44CFR 201.6(c)(2)(i): A description of the type, location, and extent of all natural hazards that affect the jurisdiction. The plan must include information on previous occurrences of hazard events and on the probability of future hazards.

Requirement 44CFR 201.6(c)(2)(ii): A description of the jurisdiction's vulnerability to the hazards escribed in paragraph (c)(2)(i) of this section. This description must include an overall summary of each hazard and its impact on the community.

Requirement 44CFR 201.6(c)(2)(ii): All plans approved after October 1, 2008, must also address NFIP insured structures that have been repetitively damaged by floods. The plan should describe vulnerability in terms of:

A) The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazards areas.
B) An estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate.
C) Providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decision.

Requirement 44CFR 201.6(c)(3)(i): The Plan must include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

Requirement 44CFR 201.6(c)(3)(ii) and 201.6(c)(3)(iv): The Plan must include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure. For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.

Requirement 44CFR 201.6(c)(4)(ii): A plan maintenance process that includes a process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate**.**

3.1.1 Federal

The National Mitigation Framework establishes a common platform and forum for coordinating and addressing how the Nation manages risk through mitigation capabilities. This Framework describes mitigation roles across the whole community. The Framework addresses how the Nation will lessen the impact of disaster by developing, employing, and coordinating core mitigation capabilities to reduce loss of life and property. Building on a wealth of evidence-based knowledge and community experience, the Framework seeks to increase risk awareness and promote resilience building by leveraging mitigation enhancing products, services, and assets across the whole community. The National Mitigation Framework discusses seven (7) core capabilities required for all entities involved in mitigation:

- Threats and Hazards Identification
- Risk and Disaster Resilience Assessment
- Planning
- Community Resilience
- Public Information and Warning
- Long-term Vulnerability Reduction
- Operational Coordination

3.1.2 State

The FDEM, under the Executive Office of the Governor, has primary responsibility in disaster response and mitigation. The FDEM developed the Enhanced State Hazard Mitigation Plan (SHMP) to establish a comprehensive program to effectively and efficiently mobilize and coordinate the state's services and resources to make Florida's communities more resistant to the human and economic impacts of disasters. The Florida Enhanced SHMP achieves this purpose through the following goals and objectives:

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

- Objective 1.1: Engage technology to continually advance and expand the statewide hazard mitigation program.
- Objective 1.2: Support the development of comprehensive mitigation initiatives that will enhance mitigation successes and build resiliency.
- Objective 1.3: Prioritize engagement with underserved and vulnerable populations to ensure that social equity issues are integrated into Florida's hazard mitigation program.
- Objective 1.4: Integrate mitigation practices throughout all state plans, programs, and policies.
- Objective 1.5: Evaluate risk to all hazard in the State of Florida to be able to leverage available mitigation funding, including HMA, FMAG, and HHPD grant programs.

Goal 2: Increase Whole Community awareness and support for hazard mitigation in Florida.

- Objective 2.1: Engage and collaborate with a broad range of stakeholders in hazard mitigation planning efforts.
- Objective 2.2: Work with state and regional entities throughout Florida to incorporate mitigation concepts and information into their outreach efforts.
- Objective 2.3: Educate Florida's public, private, and non-profit sectors about mitigation concepts and opportunities.
- Objective 2.4: Support hazard mitigation research and development, with an emphasis on equitable solutions for underserved and vulnerable communities.

Goal 3: Support local and regional mitigation strategies

- Objective 3.1: Support local mitigation strategy planning process and maintenance.
- Objective 3.2: Maintain up-to-date risk assess information in coordination with local communities.
- Objective 3.3: Support the integration of hazard mitigation concepts into other local and regional planning efforts such as comprehensive plans, local mitigation strategies, and comprehensive emergency management plans.
- Objective 3.4: Ensure all communities are aware of available mitigation funding opportunities and resources.
- Objective 3.5: Promote strategic planning for climate change and sea level rise resilience at state, regional, and local levels.

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

- Objective 4.1: Support flood reduction activities to reduce or eliminate potential future losses due to hazards while protecting natural and cultural resources.
- Objective 4.2: Promote restoration and conservation of natural resources whenever possible.
- Objective 4.3: Seek mitigation opportunities that reduce losses and promote responsible growth of the economy and built environment.
- Objective 4.4: Coordinate effective partnerships between stakeholders for floodplain management.

Goal 5: Support mitigation initiatives and policies that increase Florida's climate resilience

- Objective 5.1: Integrate climate resilience education into Florida's hazard mitigation program.
- Objective 5.2: Increase visibility of evolving climate change and sea level rise research to further the state and local government's ability to decrease hazard vulnerability.
- Objective 5.3: Create effective partnerships and collaborate with experts in the field of climate resilience.
- Objective 5.4: Promote the integration of equitable climate resilience efforts into statewide planning, initiatives, and policies, emphasizing underserved and vulnerable populations.

The SHMP provides the FDEM with operational and programmatic guidance to promote the goals and objectives of the nationally based National Mitigation Strategy as coordinated by FEMA.

The FDEM has the lead role in coordinating state resources to support local government unless the scope of the emergency warrants a higher degree of state involvement. This may occur when emergencies involve multi-jurisdictional hazards, when local governments believe the emergency is beyond the capabilities of local resources, or when the Governor determines there is an overriding concern for the safety of the public. For these situations, the Governor can designate the primary responsibility for emergency response to the state by issuing an Executive Order under the provisions of Section 252.36, Florida Statutes (F.S.).

The FDEM is the designated State Watch Office as the notification point in the event of a hazardous materials incident. As such, the FDEM is responsible for receiving notification of an emergency from the County Communications Coordinator (i.e., County Warning Point), and coordinating the request(s) for County support, if requested. The DEM is responsible for assisting LEPC's in providing warnings and instructions to the general public.

The FDACS Florida Forest Service has major responsibility for protecting forest lands and the public from the effects of wildfire. Local fire-rescue departments have primary responsibility for structural fires. They also are the first responders to all fires. If the local fire-rescue department has determined that the wildfire event is beyond its capacity to fight, the local fire-rescue department can request assistance from the Florida Forest Service. When that occurs, an incident command control is established with state and local fire-rescue departments working together to extinguish the wildfire.

3.1.3 Regional

3.1.3.1 Treasure Coast Regional Planning Council (TCRPC)

The TCRPC was created under Section 186.501, F.S. The TCRPC is multi-county entity encompassing Indian River, Martin, Palm Beach, and St. Lucie counties. It has responsibility for addressing growth management issues that are multi-jurisdictional in scope. This includes working in cooperation with federal and state agencies planning for emergency management issues as described in Section 252.34(4) F.S. The TCRPC provides full-time staffing for the District X LEPC. The LEPC is charged with administering regional compliance with hazardous materials reporting and training laws. Its many initiatives include the State Hazardous Materials Training Task Force; District X Hazardous Materials Emergency Plan; training for emergency first response personnel; hospital and hazardous materials response team needs; public hazardous chemical awareness and reporting seminars; public and private sector hazardous materials emergency exercises; and assisting public and private facilities with chemical emergency preparedness planning.

Section 186.507, F.S. directs regional planning councils to prepare strategic regional policy plans. One of the elements that the plan must address is emergency preparedness. The TCRPC promotes

mitigation initiatives within Section 5.0, Emergency Preparedness, of its "Strategic Regional Policy Plan". (Appendix B).

- **Strategy 5.1.1** Direct development away from areas most vulnerable to the effects of natural and man-made disasters.
- **Strategy 5.2.1** Utilize land use, transportation, and community planning processes to address vulnerability issues.
- **Strategy 5.3.1** Provide shelter space for residents of areas susceptible to flooding from the effects of hurricanes and other storms.
- **Strategy 5.4.1** Develop the mechanisms necessary to ensure that emergency planning agencies have input into the local government decision-making process.
- **Strategy 5.5.1** Initiate disaster preparedness activities which will protect lives and property and reduce evacuation times.
- **Strategy 5.5.2** Establish mechanisms and regulations necessary for post-disaster reconstruction to occur in a consistent manor making future disasters less destructive to life and property.

3.1.3.2 South Florida Water Management District

The creation of the South Florida Water Management District (SFWMD) along with the four (4) other water management districts were enabled under Section 373.069, F.S. As required under Section 373.036(2), F.S., each district has prepared a district water management plan. The SFWMD oversees the water resources in the southern half, and most dense region of the State. It covers 16 counties from Orlando to the Florida Keys and serves around 9 million residents. SFWMD is the oldest and largest of the state's five water management districts.

The plan provides the overarching vision for the districts. The key elements of the plans are:

- Flood Protection
- Restoration of Water Resources and Ecosystems
- Water Supply
- Public Engagement and Administration

One of the purposes of the plan is to provide a blueprint to successfully achieve balanced regional water resource management, addressing issues of water conservation, extreme drought and flooding. Focused on the agency's core mission to safeguard and restore South Florida's water resources and ecosystems while protecting communities from flooding and meeting the region's present and future water supply needs. The SFWMD administers several programs that achieve hazard mitigation relative to flooding, hurricanes, and drought.

To fulfill the need of long-term flood protection for basins throughout the 16-county region, the flood protection level of service (FPLOS) program has been established since 2015. The mission of this program is to identify and prioritize long-term infrastructure improvement needs, and to develop an implementation strategy to assure that each basin can maintain its designated FPLOS, in a technical and cost-effective manner, in response to population growth, land development, and

climate change, including sea level rise. Results of the FPLOS flood vulnerability assessments and adaptation planning studies have been integrated into the SFWMD Sea Level Rise and Flood Resiliency Plan. The plan, updated annually, is the first District Initiative to compile a comprehensive list of priority resiliency projects with the goal of reducing the risks of flooding, sea level rise, and other climate impacts on water resources and increasing community and ecosystem resiliency in South Florida. Throughout the year, SFWMD conducts an active inspection and maintenance program on its flood control system and critical facilities and structures with regional significance. They schedule regular canal clearing maintenance in preparation for hurricanes or other storm events. This mitigates against flooding that could be caused by canal debris inhibiting water flow. The District also performs vegetation control and canal bank enhancements to ensure maximum conveyance of the flood control system.

SFWMD, through its Capital Improvement Plan, has built and maintained infrastructure and acquired land needed to support flood control, protect South Florida's water supply sources, and restore the region's impaired ecosystems. SFWMD implements its CIP based on these inspection results and other operation and maintenance needs, including expenditures for (1) basic construction costs including design, engineering, permits, inspections, and site development; and (2) other project costs including land acquisition and associated costs, surveys, and facility acquisition.

To meet Florida's future water demands, the state's water management districts are working with water users to best use the state's traditional water sources while also promoting the development and use of alternative sources. Water supply management strategies include sound planning and permitting; demand reduction through water conservation; development of alternative water sources such as new surface water storage, reclaimed water and desalination of brackish and saline water; and Everglades restoration. SFWMD is also initiating the development of Water Supply Vulnerability Assessments to evaluate the impacts of climate changing conditions, including sea level rise, in its water supply sources. The District submits local and regional projects, provides representatives, and collaborate with the counties' LMS working groups to assist in pre-identifying and ranking various mitigation projects. Also, collaborating local governments, with the support of FDEM Watershed Planning Initiative, to develop Watershed Master Plans, leveraging data, tools and models from its FPLOS Program, and assist with awarding Community Rating Systems (CRS) credits and respective discount on flood insurance premiums.

The District is strongly committed to addressing the impacts of climate change, including rising sea levels, changing rainfall and flooding patterns. Current SFWMD resiliency efforts focus on assessing how sea level rise and extreme events happen under current and future climate conditions and how they affect water resource management. The District's resiliency efforts also focus on understanding the impacts of future climate conditions on ecosystems and restoration efforts. The District is making infrastructure adaptation investments that are needed to successfully implement its mission of safeguarding and restoring water resources and ecosystems, protecting communities from flooding, and also ensuring an adequate water supply for people and the environment with special attention to natural and green infrastructure solutions.

3.1.4 Local

3.1.4.1 Palm Beach County

Not counting Lake Okeechobee, the County occupies approximately 1971 square miles on Florida's southeastern Atlantic coast. It is the second largest county in the state in terms of land area. It has approximately 47 miles of coastal shoreline that fronts the Atlantic Ocean.

The county is the third most populated county in the state. In 2020, the countywide population was listed as 1,492,191 (US Census). That is an increase of nearly 172,057 people from the 2010 census. It is projected that by the year 2030, the population will increase by over another 150,000 to about 1,643,900. The majority of the growth is expected between the coastal ridge and Water Conservation Areas.

Thirty-nine (39) municipalities exist in the County. In terms of population, they vary significantly. The City of West Palm Beach is the largest (117,415) while the City of Westlake (906) is the smallest (see Table 3.1). There are three (3) urban centers of population along the coast: in south PBC, the Boca Raton/Delray Beach/Boynton Beach area (combined population – 244,648); the West Palm Beach/Lake Worth Beach/Riviera Beach area (combined population – 197,238) in central PBC; and in north PBC, the Palm Beach Gardens/Jupiter area (combined population – 120,229). Two (2) other centers of population exist in the County. One (1) is the Glades agricultural communities of Belle Glade, Pahokee, and South Bay that border Lake Okeechobee, (combined population – 27,082). This area has unique needs because of its relative physical isolation from the highly urban areas along the Atlantic coast. The other area, rapidly urbanizing, is the Royal Palm Beach/Wellington/Greenacres (combined population – 144,559) area. Based upon the figures provided by the U.S. Census Bureau, the City of West Palm Beach has experienced the largest population growth amongst the municipalities of PBC, with an increase in population of 17,496 during the period of 2010 through 2020.

As growth has occurred and PBC has become more and more urbanized, large portions of the County have experienced shifting land use patterns, moving from rural, agricultural areas to emerging residential communities, industrial and business employment centers. Land in PBC is used for three (3) major purposes: urban uses, agriculture, and protecting environmentally sensitive resource areas (e.g., water conservation areas, Corbett Wildlife Refuge, beach areas). Table 3.2 provides a synopsis of each municipality.

From a hazards perspective, transportation is an important component shaping the overall development pattern. Being a major urban county, the residents and businesses are serviced by many suppliers that depend upon the air, rail, and trucking industries that distribute goods throughout the region. Key major modes of transportation traverse throughout PBC. The area is served by major transportation corridors (e.g., Interstate 95, Florida Turnpike), four (4) rail lines (Florida East Coast Railroad, CSX Railroad, Tri-Rail, and Brightline), the Port of Palm Beach, and Palm Beach International Airport. Brightline is a high-speed, inter-city rail route operating between Miami and Orlando with two (2) stations in Palm Beach County, Boca Raton and West

Palm Beach. As the area becomes more urban and more congested, the potential for transportation accidents will increase.

Within PBC, the SFWMD operates six (6) major drainage canals: C-18, C-17 (Earman River), C-51 (West Palm Beach Canal), C-16 (Boynton Canal), C-15 canal, and the Hillsboro Canal. Secondary stormwater drainage canals drain into these regional conveyance system drains. Prior to the construction of the extensive SFWMD canal system, flooding was a common occurrence after significant rainfall events, and served as a limiting factor to growth. In addition to providing drainage relief, the regional drainage facilities also benefit the area's water resources. Eastern PBC generally relies upon local rainfall and water stored in Lake Okeechobee and the Water Conservation Areas for its water. The regional SFWMD system can move water from Lake Okeechobee, the Water Conservation Areas, and then to eastern PBC where the water helps supplement local recharge of urban wellfields. The county's connection to the SFWMD regional system makes it less vulnerable to drought conditions than if it depended solely upon local supplies. In general, the south County wellfields would be seriously impacted by the loss of recharge from surface water systems.

It is the goal of PBC to protect human life and property by limiting public expenditures in areas subject to destruction by natural disasters (especially within the coastal high hazard area), maintaining and implementing an effective emergency management program, and providing for orderly recovery and redevelopment in a post-disaster period. Toward this end, PBC and its 39 municipalities maintain a series of coordinated, interlinked preparedness and recovery plans including, but not limited to:

Comprehensive Plans at County and municipal levels which focus on environmental resources management, managed avoidance of development in high hazard areas, and responsible post disaster redevelopment;
Comprehensive Emergency Management Plan (CEMP) and Local Emergency Plans establish the framework to ensure that PBC and the municipalities will be adequately prepared to deal with the all-hazards threatening the lives and property of citizens and details pre- and post-disaster hazard mitigation strategies, policies and activities;
Local Mitigation Strategy (LMS) describes county-wide strategies and projects for mitigating the effects of identified vulnerabilities to natural, technological and human-caused hazards;

Continuity of Operations Plan (COOP) ensures the continuance of essential governmental functions during any emergency or situation that, might otherwise disrupt normal operations.
Hazard Specific Plans (HSP) reference and include the LMS in their implementation and updates. HSPs are updated every three (3) years. (Agricultural Pests and Diseases, Dike Failure, Domestic Security, Fire, Floods, Hazardous Materials, Nuclear Power Plant Emergency, Severe Weather, Transportation, and Workplace/School Violence)
Other DEM Plans reference and include the LMS in their implementation and updates. Plans are updated every three (3) years. (Command Staff Coordinating Procedures, Continuity of Government – COG, and Post Disaster Recovery Plan – PDRP.

Through sub-committees of the LMS, these and other plans relevant to the protection of life and property are closely monitored in an effort to ensure their language, policies, procedures, and practices are compatible, consistent, coordinated, and mutually beneficial with the LMS.

The County, the 39 municipalities, and special districts participate in a full complement of federal, state, and local mitigation programs and initiatives. Representatives of these programs and initiatives are the LMS, CRS, NFIP, FMAP, Community Emergency Response Team (CERT), Continuity of Operations (COOP), counterterrorism, radiological emergency preparedness initiatives, and hazardous materials. The collective purpose of these activities is the elimination or mitigation of hazards presenting significant risk to PBC and its residents, with a focus on new and existing buildings and infrastructure. Further, adoption of the LMS by each local government and special district is required and reinforces countywide mitigation efforts and cross-county collaboration.

Table 3.1 PBC Population Estimates as of April 1, 2022

County and City	April 1 2022 Estimate	Total Change	April 1 2020 Census	Inmates	Estimates less Inmates April 1, 2022
Palm Beach County	1,518,152	25,961	1,492,191	2,587	1,515,565
Atlantis	2,145	3	2,142	0	2,145
Belle Glade	17,213	515	16,698	0	17,213
Boca Raton	99,542	2,120	97,422	0	99,542
Boynton Beach	81,748	1,368	80,380	0	81,748
Briny Breezes	498	-4	502	0	498
Cloud Lake	139	5	134	0	139
Delray Beach	67,073	227	66,846	0	67,073
Glen Ridge	217	0	217	0	217
Golf	260	5	255	0	260

Greenacres	44,797	807	43,990	0	44,797
Gulf Stream	957	3	954	0	957
Haverhill	2,190	3	2,187	0	2,190
Highland Beach	4,302	7	4,295	0	4,302
Hypoluxo	2,686	-1	2,687	0	2,686
Juno Beach	3,869	11	3,858	0	3,869
Jupiter	61,341	294	61,047	0	61,341
Jupiter Inlet Colony	406	1	405	0	406
Lake Clarke Shores	3,565	1	3,564	0	3,565
Lake Park	9,030	-17	9,047	0	9,030
Lake Worth Beach	42,637	418	42,219	0	42,637
Lantana	12,132	628	11,504	21	12,111
Loxahatchee Groves	3,375	20	3,355	0	3,375
Manalapan	422	3	419	0	422
Mangonia Park	2,134	-8	2,142	0	2,134
North Palm Beach	13,166	4	13,162	0	13,166
Ocean Ridge	1,831	1	1,830	0	1,831
Pahokee	5,579	55	5,524	378	5,201
Palm Beach	9,218	-27	9,245	0	9,218
Palm Beach Gardens	60,675	1,493	59,182	0	60,675
Palm Beach Shores	1,309	-21	1,330	0	1,309
Palm Springs	26,924	34	26,890	0	26,924
Riviera Beach	38,613	1,009	37,604	0	38,613
Royal Palm Beach	39,345	413	38,932	0	39,345
South Bay	5,015	155	4,860	1,934	3,081
South Palm Beach	1,472	1	1,471	0	1,472
Tequesta	6,152	-6	6,158	0	6,152
Wellington	61,807	170	61,637	0	61,807
Westlake	2,981	2,075	906	0	2,981
West Palm Beach	119,971	2,556	117,415	26	119,945
UNINCORPORATED	661,416	11,640	649,776	228	661,188

Sources: US Census Bureau (2020 Census) and University of Florida, Bureau of Economic and Business Research (2022 Estimates).

Table 3.2 Characterization of Municipalities in Palm Beach County

Municipality	***Location***	***Urban/Rural***	***Community Character (Residential/Working/ Retirement)***	***Percent Built Out***	***Source Year***	***Economic Base (Agricultural/Business/Industrial/ Residential/Retirement)***
Atlantis	Inland	Urban	Residential	NI		Residential/Retirement
Belle Glade	Lakefront	Rural	Working	75	89	Agricultural
Boca Raton	Coastal	Urban	Working	97	2014	Business/Residential
Boynton Beach	Coastal	Urban	Residential	NI		Business/Residential
Briny Breezes	Coastal	Urban	Retirement	100	89	Retirement
Cloud Lake	Inland	Urban	Residential	94	89	Retirement/Residential
Delray Beach	Coastal	Urban	Residential/Working	98.9	08	Business
Glen Ridge	Inland	Urban	Residential	86.3	89	Residential/Commercial
Golf	Inland	Urban	Residential	NI		Residential
Greenacres	Inland	Urban	Residential	97	06	Residential/Commercial
Gulfstream	Coastal	Urban	Residential	NI		Residential
Haverhill	Inland	Rural/Urban	Residential	96	89	Residential/Commercial
Highland Beach	Coastal	Urban	Residential/ Retirement	98	08	Residential/Retirement
Hypoluxo	Coastal	Urban	Residential	NI		Retirement
Juno Beach	Coastal	Urban	Residential	90	2014	Residential/Commercial
Jupiter	Coastal	Urban	Residential/Working	90	2014	Business/Residential
Jupiter Inlet Colony	Coastal	Urban	Residential	99	08	Residential/Retirement
Lake Clark Shores	Inland	Urban	Residential	96	2014	Residential/Commercial
Lake Park	Coastal	Urban	Working	95	08	Business
Lake Worth Beach	Coastal	Urban	Residential	NI		Commercial
Lantana	Coastal	Urban	Residential	NI		Residential/Commercial

Loxahatchee Groves	Inland	Rural	Residential	NI	09	Residential
Manalapan	Coastal	Urban	Residential	NI		Residential
Mangonia Park	Inland	Urban	Working	85	2014	Working/Residential
North Palm Beach	Coastal	Urban	Residential	98	89	Residential/Commercial
Ocean Ridge	Coastal	Urban	Residential	NI		Residential/Retirement
Pahokee	Lakefront	Rural	Working	NI		Agricultural
Palm Beach	Coastal	Urban	Residential	97	2014	Residential/Commercial
Palm Beach Gardens	Inland	Urban/Rural	Residential/Working	95%	2014	Agricultural/Business
Palm Beach Shores	Coastal	Urban	Residential	NI		Residential/Retirement
Palm Springs	Inland	Urban	Residential	96	2014	Residential/Commercial
Riviera Beach	Coastal	Urban	Working	94		Industrial
Royal Palm Beach	Inland	Urban	Residential	90		Business/Industrial/Residential
South Bay	Inland	Rural	Residential/Working	91	89	Agricultural/Industrial
South Palm Beach	Coastal	Urban	Residential	100	89	Residential/Retirement
Tequesta	Coastal	Urban	Residential	95	89	Residential/Retirement
Wellington	Inland	Urban	Residential	NI		Residential
Westlake	Inland	Rural	Residential	1	2017	Residential
West Palm Beach	Coastal	Urban	Residential	NI		Business

County Agencies with Key Roles in Mitigation

Within the existing county organizational structure, there are a number of departments that play key roles in hazard mitigation. They are as follows:

Public Safety Department (PSD). The PSD is composed of six (6) divisions: 9-1-1 Program Services, Animal Care and Control, Consumer Affairs, Emergency Management, Finance and Administration, and Justice Services, and Victim Services. During emergency events (e.g., hurricanes), the DEM has the lead role in coordinating the resources and key agencies, non-profits, and private sector entities involved in the emergency situation.

Department of Planning, Zoning & Building (PZ&B). The PZ&B is comprised of three (3) divisions: Planning, Zoning and Building. The PZ&B has primary responsibility for administering the PBC Comprehensive Plan and appraising and updating it from time to time. In addition to its long-range planning role, PZ&B is responsible for processing development petitions (i.e., rezoning petitions, site plans). The Building Division issues and oversees compliance with all building permits. The Zoning Division administers the Zoning Ordinance and Lot Clearing Ordinance. The County also issues building permits for one (1) municipality Gulf Stream.

Department of Environmental Resource Management (ERM). The ERM is involved in the evaluation and assessment of environmental projects (e.g., shoreline stabilization projects, beach erosion initiatives), and administering various environmental ordinances (i.e., Irrigation & Water Conservation, Sea Turtle Protection/Sand Preservation Ordinance, Stormwater Pollution Prevention, Vegetation Protection and Preservation, Turnpike Wellfield Protection). To mitigate erosion and enhance and restore the beaches and dunes along its coastal shorelines, the County has developed a Shoreline Protection Plan. The County avoids the use of shoreline armoring (except as a measure of last resort). Preferred alternatives include beach nourishment, dune restoration, and inlet sand transfer.

Facilities Development and Operation (FD&O). FD&O's responsibilities are varied and include siting and land acquisition, designing, constructing, managing, and providing audio visual, radio and security services to 707 County facilities and its fleet of 3000 vehicles and equipment for the Board of County Commissioners and its departments, Constitutional Officers, Palm Beach County Sheriff's Office and the 15th Judicial Circuit Court.

Engineering and Public Works Department (EPW). The Engineering & Public Works Department is responsible for administering the County's Five-Year Road Program and for Operation and maintenance of the County-owned roads, bridges, and the north and south inlet sand transfer plants.

PBC Fire Rescue (PBCFR). Palm Beach County Fire Rescue provides fire suppression, emergency medical services, fire prevention, and community education programs throughout PBC. The department not only serves the unincorporated County but also 19 municipalities including Belle Glade, Cloud Lake, Glen Ridge, Haverhill, Juno Beach, Jupiter, Lake Clarke

Shores, Lake Park, Lake Worth Beach, Lantana, Loxahatchee Groves, Manalapan, Pahokee, Palm Springs, Royal Palm Beach, South Bay, South Palm Beach, Wellington, and Westlake. The County also provides fire-rescue dispatch service to 13 municipalities. Besides emergency services, the Department provides other types of services. The Bureau of Safety Services is responsible for ensuring that buildings comply with appropriate fire codes. The department also offers public education programs which focus on fire safety guidelines for schools, community groups, and individuals. In addition, the department has responsibility for coordination of fire protection, hazardous materials mitigation, and advance life support services.

Palm Beach County Sheriff's Office (PBSO). Besides their responsibilities for crowd and traffic control during emergency events such as hazardous waste truck spills, the Sheriff's Department is responsible for enforcing PBC's dumping ordinance.

Mitigation Policies and Ordinances

Policy Plans. The two (2) key policy plans that address issues related to natural, human-caused and technological hazards identified in the LMS include: the County Comprehensive Plan (PZB) and the County Comprehensive Emergency Management Plan (DEM). Figure 3.1 below illustrates the interdependence and interoperability of the three (3) plans.

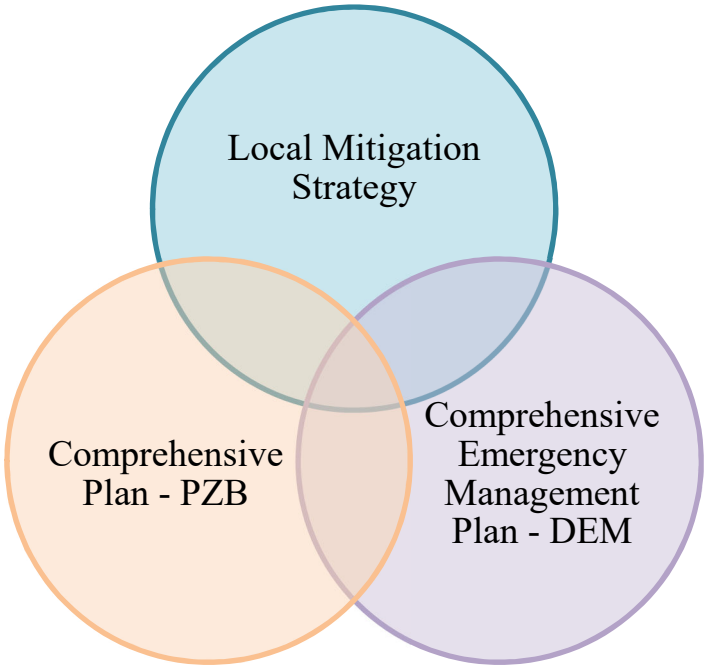

Figure 3.1 County Plan Continuity

The two (2) County Comprehensive Plans are described, briefly below.

- County Comprehensive Plan

  The County's Comprehensive Plan (Planning, Zoning, and Building) provides the framework for future development (3.4 Future Land Use) within the unincorporated area and provides mechanisms and standards through which changes could occur. The directives include implementing countywide growth management strategies while providing the opportunities for flexibility that recognize and maintain the diversity of lifestyles. The Comprehensive Plan contains the ten (10) required plan elements, as set out in Section 163.3177, F.S. They include Conservation, Coastal Management, Utilities (i.e., potable water, sanitary sewer, stormwater management, solid waste, and natural aquifer recharge), Future Land Use, Housing, Recreation and Open Space, Transportation, Intergovernmental Coordination, Capital Improvement, and Property Rights. In addition, the County has added several optional elements to the Comprehensive Plan. This plan addresses Library Services, Historic Preservation, Fire-Rescue Services, and Health and Human Services. Hazard Mitigation is addressed in the Conservation and Coastal Management Elements. A listing of relevant hazard mitigation objectives and policies for PBC is located in Appendix B.

  Mitigation of natural hazards such as flooding, hurricanes, drought, and beach erosion is a focus of the Coastal Management Element in the Comprehensive Plan. Technological and societal hazards are also addressed in the plan Coastal Management Element.

  Effective October 8, 2022, by Ordinance 2022-22, PBC's Comprehensive Plan contains specific language that recognizes, concurs with, and links the County's LMS objectives, processes, and project prioritization criteria with mitigation initiatives, capital improvement, and coastal management policies and priorities. Key references can be found in Policy 1.4 of the Capital Improvement Element; and Section 2, Objective 2.4 and Policies 2.4-e and 3.1-c of the Coastal Management Element. By virtue of their intended purpose to mitigate public hazards, projects carried on the LMS Prioritized Project List are considered to meet the County's standards for categorization as "Essential." The Comprehensive Plan also recognizes that the governing body of the LMS program shall comprise representatives assigned by each of the 39 municipalities and PBC and be governed by appropriate policies, procedures and/or either interlocal agreements or resolutions.

  The PZB Planning Commision, serving as the Local Planning Agency, meets every second Friday of each month and advises the BCC on matters pertaining to the Comprehensive Plan. The last update was in 2022. The LMS2020's risk and threat assessments and vulnerability analyses were reviewed. Changes germane to the Comprehensive Plan were incorporated into the 2022 update. The next update is scheduled for 2026. The LMS2024's updates and current risk assessment will be reviewed and incorporated into the Comprehensive Plan for county continuity.

Appendix B

Conservation Element: Policy 1.3-e: The County shall pursue opportunities, such as State Hazard Mitigation Grant Funding, to preserve lands for natural resources (e.g. beaches and dunes, native vegetation, wetlands and barrier islands). A benefit of preserving lands for natural resources is hazard mitigation aimed at protecting development from natural disasters.

Coastal Management Element: Policy 2.5-d: The County shall continue to enforce regulations and codes, which provide for hazard mitigation. These include land use, building construction, flood elevation, septic and sanitary sewer, coastal construction setback, and stormwater facility regulations. These regulations shall also be applied to eliminate unsafe conditions and inappropriate uses.

Coastal Management Element: Policy 2.5-e: The County shall, pursuant to the Comprehensive Emergency Management Plan, continue recommended hazard mitigation activities, including land development regulations and construction law administration. Post-disaster recommendations contained in Hazard Mitigation Plans shall be incorporated to avoid future destruction and loss of life.

- Comprehensive Emergency Management Plan (CEMP)

The BCC has adopted the CEMP. It is an operations-oriented document that establishes the framework for effective management of emergencies and disasters for PBC. The CEMP addresses LMS identified and profiled hazards and threats, some of which include:

  - Severe Weather
  - Flooding
  - Fire
  - Agricultural Pests and Diseases
  - Hazardous Materials
  - Nuclear Power Plant
  - Dike Failure
  - Domestic Security
  - Mass Migration
  - Communicable Diseases
  - Transportation
  - Workplace/School Violence

The CEMP addresses evacuation in terms of local and regional evacuation, public shelter, disaster response and recovery, rapid deployment of resources, communications and warning systems, training exercises, and agency responsibilities. These responsibilities constitute Emergency Support Functions (ESF). Each ESF is headed by a lead agency that has been selected based on its authorities, resources, and

capabilities in the functional area. The ESFs serves as the primary mechanism through which outside assistance to PBC is coordinated.

In the Mitigation section of the CEMP, there is extensive language stating the objectives and details of the LMS. The mitigation techniques within the both the CEMP and LMS include projects, policies, or programs which will reduce, eliminate, or alleviate damage caused by disasters. Moreover, the CEMP and the LMS work collectively to improve the community's resistance to damage from known natural, technological, and human-caused hazards.

Ordinances. Hazard-related ordinances are administered primarily by the PZ&B, ERM, or Fire-Rescue departments. The list of relevant ordinances includes:

- Irrigation & Water Conservation
- Sea Turtle Protection/Sand Preservation
- Stormwater Pollution Prevention
- Countywide Wellfield Protection
- Turnpike Wellfield Protection
- Lot Clearing
- Zoning
- Building Code
- Fire Prevention Code
- Vegetation Protection and Preservation

County Mitigation Plans, Programs, Projects/Initiatives

There are a number of projects and initiatives PBC has implemented to mitigate potential damage resulting from various hazards.

The County has also made a statement of the importance of hazard mitigation, by incorporating within its Comprehensive Plan policy statements regarding the development of a countywide Local Mitigation Strategy. In addition to its CEMP, there are special hazard plans that apply to unique situations. They address hazards such as dike failure, hazardous materials, and severe weather to name a few. In addition, in a county that experiences substantial development each year, Fire-Rescue actively participates on the County development review committee. The Fire-Rescue staff reviews and comments on whether there is adequate access to buildings by both personnel and apparatus, and whether there is adequate vehicle ingress and egress.
The Fire-Rescue Department has a significant role relative to hazardous materials. Fire-Rescue staff pre-identifies hazardous chemical waste facilities and pre-plans emergency response. In addition, staff works with the facility managers by assisting in writing their emergency operations/evacuation plans.

In addition, as many other counties have done since Hurricane Andrew, PBC has upgraded its building code. It requires that all structures be able to withstand 140 mph wind load. The code now requires a finished floor elevation at six (6) inches above minimum 100-year flood level. The

County's building code also requires corrosion resistant hurricane clips, water resistant adhesives for shingles, and trusses manufactured in accordance with local wind models. Unlike many counties in Florida, PBC also requires shutters for all new single-family homes and glazing of exterior windows to achieve impact resistance from windborne debris.

Another mitigation activity of Fire-Rescue involves pre-planning for hurricanes. This involves identifying "target hazards." These are buildings/developments that are highly vulnerable to damage during a hurricane. In pre-storm stage, Fire-Rescue personnel identify residents that did NOT evacuate and where they live in the event Fire-Rescue staff has to search for individuals following the storm event.

All fire stations have been fitted with shutters and have emergency generator and LP gas power sources. In addition, all new facilities are being built to updated standards and have fire sprinkler/alarms.

National Flood Insurance Program (NFIP)

The function of NFIP is to provide flood insurance to homes and businesses located in floodplains at a reasonable cost and to encourage the location of new development away from the floodplain. The program is based upon mapping areas of flood risk and requiring local implementation to reduce that risk, primarily through guidance of new development in floodplains.

Congress created the NFIP in 1968 to minimize response and recovery costs and to reduce the loss of life and damage to property caused by flooding. FEMA administers the NFIP. The two (2) main policy goals of NFIP are to:

1. Provide access to primary flood insurance, thereby allowing for the transfer of some of the financial risk of property owners to the federal government.
2. Mitigate and reduce the nation’s comprehensive flood risk through the development and implementation of floodplain management standards.

The objectives of the NFIP are to:

1. Ensure reasonable insurance premiums for all.
2. Have risk-based premiums that would make people aware of and bear the cost of their floodplain location choices.
3. Secure widespread community participation in the NFIP and substantial numbers of insurance policy purchases by property owners.
4. Earn premium and fee income that, over time, covers claims paid and program expenses.

The County and 31 municipalities participate in the NFIP **(**Appendix J**)**. In return for NFIP making flood insurance available to property owners, the County and municipalities are required to adopt ordinances to manage development within 100-year floodplains to prevent increased flooding and minimize future flood damage. Palm Beach County Flood Insurance Rate Maps, published by

FEMA and updated in 2017 are used as the basis for delineating the 100-year floodplain and identifying regulated land. New FIRMs are projected to become effective in December 2024.

Flood Damage Prevention Ordinances

The County's Flood Damage Prevention Ordinance, covering the unincorporated areas of the County, can be accessed through the County's website (https://discover.pbcgov.org/pzb/building/BuildingCodes/ULDC%20Article%2018,%20Flood%20Damage%20Prevention.pdf). Municipal residents should contact their respective building department officials to determine what requirements are in effect for their jurisdictions.

Floodplain Permitting

The NFIP requires participating counties and municipalities to issue permits for all development in the 100-year floodplain. Development is broadly defined by NFIP to include any man-made change to land, including grading, filling, dredging, extraction, storage, subdivision of land, as well as the construction or improvement of structures. Proposed development must not increase flooding or create a dangerous situation during flooding, especially on neighboring properties. If a structure is involved, it must be constructed to minimize damage during flooding. Permitting officials work with applicants to discourage development in the floodplain wherever possible. When unavoidable, the effects of development must be minimized.

The permitting review process is a requirement for continued community participation in the NFIP. Violations cannot only jeopardize a community's standing in the NFIP; moreover, they can impact the ability of residents to obtain flood insurance. Residents witnessing development occurring without permits are asked to protect their rights by reporting violators to the local permit office.

Map Modernization Program

The County is an active participant in the Map Modernization Program. Since September 2000, PBC and its 39 municipalities have been working with FEMA, their contract consultants, local engineering agencies, the SFWMD, and the County's contract consultant in the development of a complete new set of FIRM maps. The data provided to FEMA's contractor included new accurate Light Detection and Ranging (LIDAR) developed elevation data obtained from the U.S. Army Corps of Engineers and from a PBC contract with Florida International University.

On October 5, 2017, the complete set of FIRM maps for all of PBC became effective. The new FIRMs are projected to become effective in December 2024. The coordination process established between all of the agencies listed above will continue to provide for faster coordination of future changes with FEMA, to ensure continued improvement in the currency and accuracy of the FIRMs. The County also produced more layperson-friendly flood maps for each municipality and are located in Appendix N.

Community Rating System (CRS)

In 1991, the NFIP implemented the CRS for encouraging and recognizing community flood plain management activities that "exceed" these minimum NFIP standards. Today more than 1500 communities across the nation participate in CRS, including PBC and most of its municipalities. The County joined the CRS program in October of 1991.

As an incentive and reward for participation, the flood insurance rates of residents in CRS communities may be reduced by up to 45% to reflect the reduced flood risk resulting from activities that meet CRS's three (3) goals: reducing flood losses, facilitating accurate insurance ratings, and promoting the awareness of flood insurance.

Communities can earn points in creditable activity areas grouped into four (4) areas of emphasis: promoting public awareness, reduction of flood damage, improved mapping and regulations; and enhanced flood preparedness. Based on the number of points earned, each CRS community is ranked in one of ten (10) classes (with Class 1 requiring the most points). In turn, a community's class rating determines the amount of flood premium reduction its residents are eligible to receive. Communities are encouraged to improve their class ratings. Property owners residing within a Special Flood Hazard Area, an area subject to the 1 % chance a year, may qualify for anywhere between 5% and 45% discount. Property owners outside the Special Flood Hazard Area qualify for a standard discount of 5%. The County strongly encourages all of its communities to take part in the CRS program.

The County and its CRS participating municipalities track repetitive loss properties countywide on an ongoing basis using information gathered annually from FEMA and state Focus reports. For analysis, LMS GIS maps and databases are updated using these inputs to reflect repetitive loss property locations relative to historical flood areas and designated Special Flood Hazard Areas.

In accordance with CRS guidelines, letters are mailed annually to repetitive loss property owners by the County and municipalities explaining NFIP program benefits, the availability of mitigation assistance funding through the FMAP and other mitigation assistance programs. Repetitive loss properties are an ongoing discussion and planning priority for the LMS. These Committees, comprised of public and private sector representatives, are encouraged to develop and promote mitigation project ideas and strategies.

Table 3.3 outlines the communities involved in the CRS program. All the communities involved in the CRS program have program activities that follow the same strategies. The County's CRS program activities overlap and are inextricably interlinked with the activities of the LMS program. While the objectives of the CRS program are many, its key strategic objectives include:

1. Heightening public awareness of flood threats in PBC
2. Discouraging/managing development in flood plains
3. Minimizing flood losses in the community
4. Mitigating to eliminate repetitive loss properties
5. Ensuring residents have access to the most cost affordable flood insurance possible

Some of these goals were met through the Education and Outreach Sub-Committee formed during the development of the PBC Local Mitigation Strategy. Today, a countywide CRS committee's purpose is to provide information to the community and involve the community in mitigation efforts. The countywide CRS Committee has been organized and adopted by PBC as a Program for Public Information. One major effort of this committee has been to encourage countywide participation in the CRS program by providing technical assistance to communities wishing to enter the CRS program and assisting those communities already participating in the CRS program to improve their CRS ratings. Most communities in PBC are already participants in the program.

These objectives are met by encompassing County and municipal plans and programs including FMA, CRS, CEMP, Comprehensive Plan, Capital Improvement Plan and the LMS. All have the objective to ensure the successful mitigation activities to reduce repetitive loss properties throughout the County and its municipalities.

Outreach & Education

The LMS administers and supports a range of community Outreach and Education initiatives. Detailed descriptions of these activities and initiatives are contained in the County's Multi Year Training and Exercise Plan, Comprehensive Emergency Management Plan, the Five (5) Year Strategic Plan, documentation associated with Community Rating System recertification, DEM website, etc. Outreach activities take many forms, including (but not limited to): presentations, workshops, courses, multilingual brochures, flyers, websites, media releases, plans, telephone directory postings, mailings and inserts, expos, on-site briefings, special websites and website postings, and library holdings. Many of these activities are done in cooperation with private-public partners and sponsors.

Another significant part of mitigation outreach education are the community outreach presentations that are conducted throughout the Palm Beach Community. These presentations provide local governments, schools, neighborhood associations, not-for-profit organizations, and residents' information on mitigation, mitigation projects, disaster preparedness, and hazards that may affect the County. More than 100 presentations are conducted each year.

As part of its participation in the Community Rating System program, the County maintains a collaborative Outreach Project Strategy Program under a PPI, which encompasses a number of major outreach activities that are updated and reported to the Insurance Services Office as part of the annual recertification process.

A representative listing of some of the more significant outreach and education activities includes:

- Annual publication of a Hurricane & Flood Survival Guide (3 languages)
- Annual Hurricane & Flood Awareness Expo(s)
- Preparation/distribution of hazard and audience-specific brochures
- Business preparedness and post-disaster needs posting websites
- Business disaster planning guide - CD

- Flood Information website
- Emergency Information website
- Social Media (Twitter/Facebook)
- LMS meetings open to the public
- Library holdings through the County Library System
- Special programs for association represented communities
- On-site presentations, structural evaluations, and planning assistance for special-interest groups such as homeowner associations, property management firms, businesses, churches & synagogues, public gathering facilities, etc.
- Participation in numerous fairs and expos hosted by public and private sector groups
- Course offerings (certified and not) on safety and preparedness topics
- Participation as presenters/instructors at the National and Governor's hurricane conferences
- Published articles, papers

Most of the activities above are provided on an ongoing or seasonal basis. Details of most activities are documented in one or more of the following forms: in program specific reports, recertification packages, post-activity reports, monthly status reports, and in plan updates. The County and municipal jurisdictions maintain and distribute government and not-for-profit publications as appropriate. Lists of most distributed and held government and not-for-profit publications are contained in PBC's CEMP and relevant Community Rating System documentation.

Flood Mitigation Assistance Program (FMAP)

The FMAP is an NFIP initiative administered by the FDEM to help communities identify and implement measures to reduce or eliminate the long-term risk of flood damage to homes and other structures insurable under the NFIP.

Presently PBC offers the program on a limited basis to owners of "repetitive flood loss" properties based on the availability of federal and state funds and the availability of local resources to administer the program. The program provides homeowners with reasonable, cost-effective hazard mitigation options and potential public and private financing alternatives.
The FEMA contributes 75% of eligible mitigation costs. The remaining 25% must come from non-federal sources. The homeowner must contribute at least 12.5%. At the present time, PBC requires the homeowner to contribute the full non-federal share.

Examples of flood mitigation projects that might qualify for FMA funding assistance include:

- Elevation of flood prone structures
- Relocation of flood prone structures
- Demolition (with or without rebuilding at higher elevation)
- Acquisition
- Various flood proofing measures.

Information and support are provided in a variety of forms to potential FMA applicants to assist them in developing projects and preparing application packages. Through the County's LMS committee structure, the Hazard Vulnerability Analysis Sub-Committee, as well as FDEM, is available to offer technical and administrative guidance and assistance to applicants, including assistance with benefit-cost computations.

Table 3.3 Summary of Repetitive Loss Properties by Local Government and Community Rating System (CRS) (2023)

Community Number	Community Name	Number of Repetitive Loss Properties	Number of Claimed Repetitive Losses	CRS Rating	% Reduction in NFIP Rates
120192	PBC - Unincorporated	177	266	5	25%
120193	City of Atlantis	1	2	10	0%
120194	City of Belle Glade	0	0	NP	0%
120195	City of Boca Raton	24	40	7	15%
120196	City of Boynton Beach	40	66	5	25%
120197	Town of Briny Breezes	0	0	NP	0%
120198	Town of Cloud Lake	1	2	7	15%
125102	City of Delray Beach	38	61	6	20%
120200	Town of Glen Ridge	0	0	10	0%
120201	Village of Golf	1	2	NP	0%
120203	City of Greenacres	1	2	9	5%
125109	Town of Gulf Stream	5	9	10	0%
120205	Town of Haverhill	3	4	NP	0%

Community Number	Community Name	Number of Repetitive Loss Properties	Number of Claimed Repetitive Losses	CRS Rating	% Reduction in NFIP Rates
125111	Town of Highland Beach	1	2	10	0%
120207	Town of Hypoluxo	0	0	7	15%
120208	Town of Juno Beach	7	12	5	25%
125119	Town of Jupiter	32	51	5	25%
120162	Town of Jupiter Inlet Colony	0	0	NP	0%
120211	Town of Lake Clark Shores	0	0	8	10%
120212	Town of Lake Park	5	7	6	20%
120213	City of Lake Worth Beach	24	40	6	20%
120214	City of Lantana	12	27	8	10%
120309	Loxahatchee Groves	1	2	NP	0%
120215	Town of Manalapan	6	12	8	10%
120216	Town of Mangonia Park	3	10	10	0%
120217	Village of North Palm Beach	10	13	5	25%

Community Number	Community Name	Number of Repetitive Loss Properties	Number of Claimed Repetitive Losses	CRS Rating	% Reduction in NFIP Rates
125134	Town of Ocean Ridge	40	58	6	20%
120219	City of Pahokee	1	2	NP	0%
120220	Town of Palm Beach	253	375	6	20%
120221	City of Palm Beach Gardens	14	19	10	0%
125137	Town of Palm Beach Shores	8	11	7	15%
120223	Village of Palm Springs	2	3	6	20%
125142	City of Riviera Beach	24	35	8	10%
120225	Village of Royal Palm Beach	2	3	6	20%
120226	City of South Bay	0	0	NP	0%
120227	City of South Palm Beach	16	27	8	10%
120228	Village of Tequesta	7	11	6	20%
125157	Village of Wellington	0	0	5	25%
120018	City of Westlake	0	0	NP	0%
120229	City of West Palm Beach	54	89	5	25%

• Based on the FEMA Florida Repetitive Loss List • NP Non-Participant in the CRS Program

Elevation of New and Substantially Improved Structures

According to FEMA,

> "Substantial damage" applies to a severely damaged home or other structure in a Special Flood Hazard Area in National Flood Insurance Program participating communities. If the cost of repairing the structure is 50 percent or more of its market value before the disaster, it is considered substantially damaged.
>
> For example, if your home's market value before a disaster – as determined by local officials – was $200,000 and repairs are estimated to cost more than $100,000, the home is determined to be substantially damaged. Land value is not considered when determining if the home is substantially damaged.
>
> The same rules apply for "substantial improvement," where the cost of improvements would equal or exceed 50 percent of the market value of the structure.
>
> Rebuilding a substantially damaged structure in a floodplain or making substantial improvements to one requires that the property be brought into compliance with local floodplain management regulations. In order to this you may need to:
>
> - Elevate the building to a height determined by local officials.
> - Relocate the structure outside the floodplain.
> - Demolish the home.
> - Floodproof a non-residential structure.

Damage to "new" and "substantially improved" floodplain structures is minimized by elevating the lowest floor of occupied areas a specified amount above the 100-year flood elevation. Substantially improved structures are those where the cost of reconstruction, rehabilitation, additions or other improvements equals or exceeds 50% of the building's market value. Substantially improved structures are subject to the same elevation standards as new structures.

Florida Building Code requires one (1) foot of Freeboard for new construction and for Substantial Damage/Substantial Improvement (SD/SI) in the SFHA. This change in development in hazard-prone areas decreases flooding vulnerability. However, the County adopted and enforces a requirement for new development to obtain a MT-2 map amendment as a prerequisite for approval when more than five (5) acres or 50 lots are proposed in a SFHA. [The term MT-2 refers to the Letter of Map Revision (LOMR) process used by the Federal Emergency Management Agency (FEMA) for revising Flood Insurance Rate Maps (FIRMs) and Flood Insurance Study (FIS) reports. When significant changes occur in Special Flood Hazard Areas (SFHAs) or Base Flood Elevations (BFEs), the MT-2 process allows for due process and official incorporation of these changes into the effective FIRM.]

Some jurisdictions (e.g. West Palm Beach) have adopted higher standards in SD/SI such as the 5-year cumulative calculation that decreases vulnerability in hazard prone areas. The State of Florida

developed a state-wide matrix of the adoption of these higher standards. The LMS Steering Committee is in the process of inventorying local governments on their adoption of the higher standards which will be finished after submission of this document.

With domestic and international migration as well as corporate relocation and expansion to Palm Beach County remaining steady for the past five (5) years, regulatory compliance has and continues to reduce flood risk vulnerability in flood prone areas.

Each jurisdiction's building officials or permit offices determine which permits for repairs are required and implement their processes for post-disaster SD/SI. FEMA's "Substantial Improvement Checklist" and "Substantial Improvement/Damage Checklist" are utilized to determine structure value and improvement costs. If the property is in a SFHA, the Planning, Zoning, and Building staff of the local government are required to determine if the proposed work is Substantial Improvement (SI). The Cost of Improvement (CI) is based on the cost of the proposed work listed in the initial application and any work conducted on the same structure within the last year. Market Value (MV) is initially calculated from the County Property Appraiser's office. If the initial SI calculation is over 40%, an independent appraisal of the market value (structure only) may be requested. The "cost approach" method will be used to ensure that the structure value is separated from the land value. The appraisal will be prepared and signed by the designated appraiser no earlier than 90 days before the building permit application is submitted. The permit will be issued within 180 days of the application. If the final SI calculation for the proposed work equals or exceeds 50%, then the floodplain development standards will apply. The structure must be elevated (or flood proofed if non-residential) to at least 1-foot above the Base Flood Elevation (BFE) and meet other applicable requirements listed in the local government's Floodplain Management Ordinance and Florida Building Codes.

Elevation Certificates

To verify that a building has been properly elevated, building officials require the completion of an Elevation Certificate by a professional engineer or surveyor. After the lowest floor is in place, its elevation above sea level is determined by a survey. The Elevation Certificate is part of the permit record and must be submitted before the building may be occupied.

Further information on the requirements for floodplain development, the permitting process and Elevation Certificates can be obtained from your local permit office.

Documented Repetitive Losses

The County adheres to FEMA's definition of repetitive loss properties (RLP), that is, properties whose owners have received payment for more than one (1) claim within a 10-year period of their flood insurance policies as recorded by the NFIP. Severe Repetitive Loss Properties (SLRP) are defined as any building that has incurred flood damage for which:

- Four (4) or more separate claim payments have been made under a Standard Flood Insurance Policy issued pursuant to this title, with the amount of each such claim exceeding $5,000, and with the cumulative amount of such claims payments exceeding $20,000; or

- At least 2 separate claims payments have been made under a Standard Flood Insurance Policy, with the cumulative amount of such claim payments exceed the fair market value of the insured building on the day before each loss.

Table 3.3 summarizes the repetitive losses from PBC and the incorporated areas. Also, present data on each community's CRS score indicates the percent reduction in National Flood Insurance rates each community's residents receive if they participate actively in the CRS program. Appendix H contains repetitive loss properties and evaluates its continued vulnerability to flooding damage.

Currently, FEMA records reports 432 repetitive loss properties within unincorporated PBC and its jurisdictions as of January 12, 2024. The number has grown steadily with the increased tropical activity and extraordinary rain events the County has experienced. A significant percentage of these repetitive loss properties lie outside of PBC's recognized special flood hazard areas.

The PBC LMS's goal is to reduce the number of repetitive loss properties throughout the County and prevent new properties from being added to the list. The County takes great strides in trying to reduce and prevent repetitive loss properties. The County takes part in various programs to reduce and prevent repetitive losses such as FMA and CRS as demonstrated above. The LMS also has various plans incorporated into it to ensure it correlates with the other objectives throughout the County and its jurisdictions. The LMS is referenced throughout the Mitigation section of the Comprehensive Emergency Management Plan as the guiding source for mitigation activities pre and post disasters. In addition, the Capital Improvement Plans reflect mitigation objectives to prevent repetitive loss properties.

Since its inception, PBC's LMS has placed a major emphasis on drainage improvement projects as a major flood mitigation strategy. Indeed, drainage improvement projects have had a predominant representation on the LMS prioritized project list. Some large-scale drainage improvement projects, perceived to be beyond the threshold for funding assistance applications, have historically been handled locally by Capital Improvement Plans rather than through the LMS. The LMS drainage projects are often coordinated with larger self-funded community drainage improvement projects.

Drainage improvement projects; however, are often not the answer for isolated repetitive flood loss properties. Increasingly, the LMS has been moving toward a more comprehensive program of mitigation directed at repetitive loss problems.

The County's network of CRS communities provides an excellent mechanism for identifying repetitive flood loss properties and coordinating comprehensive activities to launch mitigation initiatives. The LMS program not only provides the strategic guidance necessary to coordinating

flood mitigation initiatives, but it also helps in translating those strategies into viable flood mitigation projects. The final component in PBC's multi-program strategy is participation in the FMAP.

Mitigation Projects to Repetitive Loss Properties

The County first submitted project applications for FMAP assistance in 1999. It was not until 2002 that the initial two (2) projects were approved for FMAP funding. The projects were completed in 2003. These projects provided all jurisdictions an opportunity to learn about the program and information that would be useful in planning their own programs. These two (2) completed projects have been successful since two (2) properties have been taken off the repetitive loss properties list.

Project #1 - Elevation Project
The first project involved a home in the unincorporated area of PBC referred to as "The Acreage." The property has amassed four (4) insurance losses since 1988 despite, the fact that the property does not reside in Special Flood Hazard Area.

The elevation involved raising a slab on grade structure with the slab intact and placing it on extended foundation walls. A series of coordinated hydraulic jacks were used to achieve the target elevation above the base flood elevation. Openings for equalization of flood forces were included per FEMA specifications.

Project #2 – Flood Wall Project
The second FMAP project involved a multiple flood loss property located in a residential community in the Lake Park area. The property did not suffer from floodwater build up. Instead, floodwater runoff from neighboring properties tended to enter the slab at grade level structure, flowing through the house before exiting to lower elevations on the opposite side of the home. The project involved a combination of mitigation measures, including construction of a deflection wall, creation of swales, and the installation of improved drainage systems. These measures permit floodwater runoff to be redirected around the structure rather than through it.

These projects served two important purposes. First, they gave the county's CRS participating communities the opportunity to observe and learn about the requirements and procedures of the FMAP and what will be required to organize and manage their local initiatives. Second, they also provided lessons learned that will be valuable in developing a model for County jurisdictions and residents seeking FMA assistance.

3.1.4.2 Municipalities

Within PBC, there are 39 municipalities (see Table 3.2). There is wide variation among the jurisdictions in terms of community character. Community character is shaped by factors such as land use mix, density, size of population, and location (e.g., on the Atlantic Ocean, adjacent to Lake Okeechobee, inland). Due to the differences, it is not unusual for local governments to have

different perspectives relative to the significance various hazards have on their community. Certainly, there are hazards that all jurisdictions, regardless of the community character, have concern over such as flooding, hurricanes, tornadoes. In agricultural communities like Pahokee, South Bay and/or Belle Glade, agricultural pests, freezes, and drought are more likely to be of greater concern, while in communities bordering the Atlantic Ocean (e.g., Ocean Ridge, Palm Beach, and Jupiter), hazards such as beach erosion and shoreline stabilization generate considerable concern among the residents.

The information in the section below was reviewed, inserted, and agreed upon by PBC and its participating jurisdictions as a way to demonstrate examples of how mitigation has been incorporated for each jurisdiction within the scope of the PBC Unified Local Mitigation Strategy.

Table 3.2 delineates the location, type, community character, economic base, and degree to which each of the participating municipalities within PBC is "built-out" at the present time. The following defines the headings displayed in the table:

- Location
  - Coastal - Municipality borders on the Atlantic Ocean.
  - Inland - Municipality does not border on the Atlantic Ocean or Lake Okeechobee.
  - Lakefront - Municipality borders on Lake Okeechobee.

- Urban/Rural
  - Urban - Area characterized by activities predominantly based on the manufacture, production, distribution, or provision of goods and services in a setting which typically includes residential and nonresidential development uses other than those which are characteristic of rural areas.
  - Rural - Areas characterized by activities which are largely based on agricultural uses or the extraction of natural resources, or areas containing large proportions of undeveloped, unimproved, or low-density property.

- Community Character
  - Residential - Land use is primarily for housing.
  - Retirement - Land use is primarily for adult housing communities.
  - Working - Land use is primarily connected with the sale, rental, and distribution of products or performance of services.

- Percent Built Out

- Economic Base
  - Agricultural - Main source of income is activities within land areas which are predominantly used for the cultivation of crops and livestock.
  - Business - Main source of income is primarily connected with the sale, rental, and distribution of products or performance of services.
  - Industrial - Main source of income is activities predominantly connected with manufacturing, assembly, processing, or storage of products.

- Residential/Retirement - Main source of income is primarily connected with real estate.

Listing of Municipal Agencies

The organizational structure of each municipality within the County differs in terms of organizational complexity and functional responsibility. A city like West Palm Beach (population – 117,415) has an organizational structure that is considerably more complex than some of the smaller communities like Atlantis, Cloud Lake, or Jupiter Inlet Colony.

The following is a brief discussion of typical agencies within the municipal organizational structure having hazard mitigation functional responsibilities.

Emergency Management. Emergency management responsibilities generally fall within the purview of public safety, fire, and/or police departments. West Palm Beach is one of the few municipalities that have a staff person whose sole responsibility is emergency management. It is not unusual that in many cities, emergency management is an individual's secondary responsibility. During emergency events, such as hurricanes, each local government has an "executive group" (e.g., Mayor, city manager, police chief, fire chief) which coordinates the city's efforts with the County Division of Emergency Management.

Planning. The larger jurisdictions such as West Palm Beach, Boca Raton, Jupiter, Boynton Beach, Delray Beach, and Palm Beach Gardens operate planning departments with professional staffs. Some of the smaller jurisdictions have single-person staffs, while the smallest assign those duties to a lay planning and zoning board and provide staff support by a building official or comparable staff person. The community development departments review zoning petitions, site plans, and other development orders (e.g., variances and special exceptions), as well as administer their local comprehensive plan.

Building. Most municipalities issue their own building permits. However, for one (1) municipal government, the County Building Division reviews and issues their permits. The community is the Town of Loxahatchee Groves. All communities in the state operate under the *Florida Building Code.* Modifications can be made to the administrative / enforcement provisions (e.g., what requires a permit, what inspections are required, etc...) of the Code, as long as the administrative provisions are equal or more stringent than the "base" version of the Code; however, municipalities may not amend their local building code to be less stringent, or make changes to the technical provisions of the Florida Building Code without going through a formal technical amendment process which requires demonstration of unique local geographical need for the amendment and an analysis of the cost impact of the proposed technical amendment. If local technical amendments are enacted and adopted by a community, then the amendments automatically sunset during the next statewide code adoption (unless the local technical amendment is adopted statewide by the Florida Building Commission).

Public Works and Engineering. While not all municipalities have a public works and engineering department, all generally perform this function in some manner. If it is under a contractual

arrangement, there is someone in the jurisdiction responsible for overseeing the consultant. The group having responsibility for public works and engineering has the responsibility for implementing structural improvements (e.g., stormwater facility retrofit, shuttering buildings, constructing new Emergency Operations Centers (EOCs).

Fire Departments. While many cities contract with the PBC Fire Rescue Department, there are others that operate their own fire-rescue departments. In some instances, smaller jurisdictions contract with a larger municipal neighbor.

Municipal Mitigation Policies, Ordinances, and Plans

Policy Plans

- Municipal Comprehensive Plans

  Like the County, each city has an adopted Comprehensive Plan. It serves as a policy instrument for each city and defines that particular city's development and redevelopment policies. All comprehensive plans are required by Section 163.3161, F.S. to contain eight (8) plan elements: Conservation, Infrastructure (i.e., potable water, sanitary sewer, stormwater management, solid waste, and natural aquifer recharge), Future Land Use, Housing, Recreation and Open Space, Transportation, Intergovernmental Coordination, and Capital Improvement. For units of local government abutting the Atlantic Ocean, they must also prepare a Coastal Management Element. In PBC, 19 municipalities border the Atlantic Ocean coastline.

  There is considerable variation among local governments in the depth to which hazards are addressed in their comprehensive plans. Certainly, the population size, geographic spatial limits, diversity in mix of land uses, and depth of understanding of hazard mitigation affects the level of detail local governments apply to the issue of hazards. Any extended discussion of hazards occurs, for the most part, are in the Conservation, Coastal Management, and Infrastructure elements.

- Local Emergency Management Plans

  A number of municipalities have adopted emergency management plans. Most follow the content of the PBC CEMP. Their focus is on emergency response versus long-term hazard mitigation.

Ordinances and Other Plans

Other types of ordinances and plans municipalities that have adopted that are relevant to hazard mitigation include:

- Incorporating the Florida Building Code 2023 (8^{th} edition) complete with Appendices A,B,C,D,E,F,G,H,I,J and K
- Adding window glazing and/or shuttering requirements to their building codes

- Becoming affiliated with the CRS program (*currently 29 out of 39 local governments are CRS qualified)*
- Emergency Water Restriction ordinances
- Stormwater Master Plan
- Repetitive Loss Area Analysis
- Flood Damage Prevention and Protection Ordinance
- Adoption of FDEM Model Floodplain Ordinance which 1) eliminates the possibility of having conflicting or duplicative regulations for buildings, 2) keeps local programs consistent with the Florida Building Code even when it changes over time, and 3) incorporates clarifying language from FEMA guidance documents to address problems DEM has observed in the field.

Mitigation Projects/Initiatives/Outreach

A LMS Survey was prepared and distributed to all participating local governments as a means to inventory and assemble data on mitigation projects and initiatives each governmental entity had or was implementing. Projects are defined as capital facilities. Initiatives can be anything from purchase of property and relocation of homes or businesses, to upgraded building codes, to incentives, to public information campaigns, to preparedness training and drills, to professional development seminars. *Thirty-six municipalities responded*. There is wide variation; while a number of municipalities have not undertaken any mitigation projects, others have been highly proactive, completing multiple projects/initiatives. The following provides a general discussion of what is being accomplished by municipal governments in PBC. In addition, there are a few communities that already have well-developed hazard mitigation programs in place. A brief discussion of each is included.

Projects. Shuttering public facilities and upgrading or correcting drainage facility deficiencies are the two most common types of hazard mitigation projects undertaken by PBC municipalities. Other types of projects reported in the local government LMS Survey are:

- Glazing exterior windows on public facilities to achieve impact resistance from windborne debris.
- Replacing and/or upgrading drainage pumps.
- Installing emergency power generators.
- Installing a radio telemetry monitoring system for public utilities.
- Sirens/loudspeaker warning system used for severe storms/lightning.

Codes/Ordinance Amendments. Many municipalities incorporated the Florida Building Code 2023 (8th Edition). Some of the more important features include:

- Modifying building codes to require floor slab or wood joists be above the 100-year floodplain and a minimum of 18 inches above the crown of the road.
- Establishing increased freeboard of one (1) to two (2) feet above the Base Flood Elevation in Special Flood Hazard Areas (SFHAs).
- Addition of a specified accumulation of modification and repair costs (e.g. 5 years) for substantially damaged or substantially improved structures in the SFHAs.
- Requiring the elevation of structures.
- Trusses manufactured in accordance with local wind models.

Other actions municipalities have taken include:

- Modifying existing Local Development Regulation (LDR) to incorporate windborne debris impact standards.
- Amending LDR to include section titled, "Building and Property Maintenance: Hurricane Precautions.
- Professional Development Training. *Twenty-three* municipalities reported that their staff received professional development training over the course of a year. The amount of training staffs received differed by jurisdiction.
- Computer-Aided Management of Emergency Operations (CAMEO) is a system of software applications used to plan for and respond to chemical emergencies. Developed by EPA and the National Oceanic and Atmospheric Administration to assist front-line chemical emergency planners and responders, CAMEO can access, store, and evaluate information critical for developing emergency plans.
- Amending LDR to include section titled, “Building and Property Maintenance: Hurricane Precautions”.
- Orientation to disaster assistance programs.
- Radiological emergency management.
- Annual state hurricane conference training sessions.
- Natural hazards mitigation and recovery.
- Yearly conference of National Fire Protection Association.
- Yearly conference of Building Officials Association of Florida.
- Training sessions with Federal Emergency Management Agency.
- Building Inspector courses on topics like hurricane resistant structural design, roofing updates, wood construction, and fire resistance and egress.

Preparedness Training

Fourteen (14) local governments reported that they conduct preparedness training and drills for emergency situations. They carry out hurricane exercises and other types of preparedness training based on their Municipal CEMP or EAP as reported to the LMS Coordinator:

- Structural fire drills
- Tornado drill
- Chemical spills
- Terrorist response
- Chlorine leak drills
- Communication tests
- Generator tests

Education/Public Awareness

It is common practice among local governments to distribute informational materials to its citizens, especially as it relates to hurricanes. Among the 18 local governments reporting, the scope of their programs varied. The following are methods municipalities in PBC use to disseminate information about hazards or an impending emergency event:

- Annual correspondence mailed to the residents reminding them of the need to be prepared for a hurricane
- Hurricane Survival Guide
- A Homeowner's Guide to Hurricane Retrofit
- Classes on Emergency Response Training and Community Emergency Response Team
- Discussions with residents about hurricane preparedness
- Hurricane preparation video shown on city cable station
- StormWatch, a preparedness series on the County Cable TV channel produced by DEM
- Brochures on variety of disaster/emergency topics, including insurance, pet care, business interests, children and disasters, lightning and tornado safety
- FAX-back system with a menu of public safety information
- Emails to residents
- Everbridge or a similar system which automatically dials and plays recorded information regarding imminent emergencies, as well as sending out blast text messages to subscribers of the service.
- City newsletter and County's "LMS Times" mitigation newsletter
- Various social media outlets

3.1.5 Intergovernmental Coordination

An essential element of the hazard mitigation process is intergovernmental coordination. Disasters know no boundaries. Governments and service providers increasingly must work together to strengthen communities against the loss of life and property. Coordination is important not only horizontally at the local level between county, municipalities, non-profit organizations, and the private sector, but also vertically with key state and federal agencies. Besides the potential of the LMS initiative, there are several other coordination mechanisms that already exist. They are described briefly below.

Metropolitan Planning Organization

The Metropolitan Planning Organization of PBC, commonly known as the MPO, coordinates local, state, and federal funding for thoroughfare improvements. The policy board is comprised of 18 voting members (i.e., five (5) representatives of the BCC, 13 representatives from the municipalities), and one (1) non-voting member (i.e., Secretary of the Florida Department of Transportation, District IV). Two key policy documents of the MPO are the long-range transportation plan, and the five-year transportation improvement plan (TIP). The TIP identifies and schedules all future roadway improvements in the near-term.

Local Government Comprehensive Plans

One mechanism to achieve intergovernmental coordination is the local comprehensive plan. Each comprehensive plan contains an intergovernmental coordination plan element.

Palm Beach County Comprehensive Emergency Management Plan

The County's CEMP, as described in the section titled Mitigation Policies and Ordinances, is very important in terms of coordination. It identifies coordination of the responsibilities and functions of agencies and organizations during disaster situations and is the operational plan of the LMS.

District X Local Emergency Planning Committee

The LEPC is an important vehicle to coordinate administering regional compliance with hazardous materials reporting and training laws. The TCRPC provides full-time staff to administer the activities of the Committee.

State Emergency Management Plan

The State of Florida CEMP establishes the framework of a coordination system to ensure that the State of Florida is prepared to respond to the occurrence of emergencies and disasters. The plan describes roles and responsibilities of state agencies, special districts, local governments, and voluntary organizations, unites the efforts of these groups for a comprehensive approach. The plan is divided into three (3) sections.

Basic Plan	Outlines how the state will assist counties in response, recovery, and mitigation of disasters; details responsibility at various levels of government; describes method of operations and financial management policies; ensures continuity of government; and addresses recovery issues.
Specific Response/Recovery Actions	Actions that are unique to a specific hazard, and are described in the Basic Plan and Response Functions sections.

Response Functional Annexes	Present the State's strategies for disaster response by outlining ESF. ESF's are structured from the Federal Response Plan.

Comprehensive Plan Amendment Coordinated Review Committee

The Comprehensive Plan Amendment Coordinated Review Interlocal Agreement establishes a countywide Comprehensive Plan Coordinated Review Process. It is designed to provide coordination of proposed plan amendments, cooperation between affected local governments and service providers, and opportunities to resolve conflicts only within the Plan Amendment Process. This process includes the following actions:

- Proposed plan amendments must have sufficient distribution and dissemination to ensure that initial transmittal and final approval do not occur without adequate notice to local governments and service providers who may be adversely affected by the action.
- An avenue for discussion and evaluation of the proposed plan amendments is created so that the governing body is aware of objections, the basis for them, and the reasonableness of the objection.
- An opportunity is created for conflict resolution of an item that, if approved, may result in a potential problem for another local government or service provider.
- The Comprehensive Plan Amendment Coordinated Review Process does not diminish or transfer existing authority with respect to planning and implementation decision of the participants.

The Multi-Jurisdictional Issues Coordination Forum

The forum has been established through a resolution/interlocal agreement. The primary goal of this entity is to establish a mechanism that will provide a means of communication and education between the various local governments and service providers. This is accomplished through the receipt and review of reports; through presentations of items of multi-jurisdictional impact; and through the review of actions taken by the Executive Committee. All members of this forum must be participants in the Comprehensive Plan Amendment Coordinated Review Interlocal Agreement.

Emergency Management (EM) Team

Emergency Management Team is an organization of professionals from agencies and municipalities throughout PBC who share a mutual interest in emergency management issues. The EM Team meets bi-monthly. Meeting notices of related interest and other information are distributed in advance of the scheduled meeting date. Members of EM Team benefit by:

- Receiving the latest information from federal, state, and local levels of government concerning all issues relating to comprehensive emergency management.
- Strengthening ties and sharing information with the County, neighboring municipalities and other agencies in the area.

- Exchanging ideas and receiving information regarding training opportunities in emergency management (many of which are free or involve minimal costs).
- Meeting the managers and officials they may need to call on in times of emergency or disaster.

3.2 Private Sector

3.2.1 Background

Major disasters have repeatedly demonstrated that all components of the community can be significantly impacted, either directly or indirectly by the event. It is therefore important that mitigation and redevelopment planning efforts also involve the entire community. Involvement of the private sector in the LMS process was given high priority from the outset of the program by the DEM. Besides receiving funding from the FDEM to prepare the LMS, FDEM also awarded PBC a grant pursuant to Chapter 9G-19, Florida Administrative Code, to develop a Business Community Recovery and Redevelopment Strategy program. Since private sector involvement was important in both efforts, a committee for education and outreach was created. In addition, staff from the DEM and the PBC Office of Economic Development coordinated with each other on all relevant issues of mutual interest to both programs.

The Palm Beach County Disaster Recovery Plan provides an operational overview and organizational framework that will be implemented during the four (4) phases of the disaster recovery process. The Disaster Recovery Plan details a coordinated system for recovery operations; identifies the operational concepts and provides an overview of organizational structures that will bridge the gap between the Comprehensive Emergency Management Plan (2020) and the Post-Disaster Redevelopment Plan (2022). The plan addresses policies that promote an expedited, all-hazards disaster recovery process among all stakeholders.

The following groups have participated actively in the program:

- Business Alliance
- Business Loan Funds of the Palm Beaches
- Florida Light & Power Company
- Palm Beach State College
- Florida Insurance Council
- Black Business Investment, Inc.
- Brown Distributing
- Home Depot
- Tourist Development Board
- Motorola
- Farm Bureau West
- Port of Palm Beach
- Palm Beach County Purchasing Department
- Delray Beach Chamber of Commerce
- Delray Beach Community Development Agency
- WPBF Channel 25
- PBC Information System Services Department
- The Boynton Beach Mall
- Palm Beach County Economic Office

- Fidelity Federal of the Palm Beaches
- Poe & Brown, Inc.
- The Northern Palm Beach Chamber of Commerce
- Small Business Bank
- Truist Bank
- Marine Industries Association of Palm Beach County, Inc.
- Pratt & Whitney
- Bank Atlantic

Perhaps the greatest accomplishment, beyond the specific accomplishments outlined in this section, has been special collaborative relationships now established between the private sector and public sector entities. Cornerstone partnerships in this endeavor now exist between the DEM and Economic Development Divisions, and participating municipalities on the public side and a network of participating Chambers of Commerce.

The initiatives outlined in this section are an integral part of the ongoing local disaster mitigation strategy. In the private sector, efforts are directed at minimizing private sector losses, improving business survival rates, protecting and preserving the economic base provided by businesses, and speeding the overall community recovery process.

Four (4) key objectives were addressed:

Objective 1	Establish improved intergovernmental and private sector coordination.
Objective 2	Refine the hazard and vulnerability analysis for the economic sector.
Objective 3	Evaluate local available resources, identify gaps, and develop appropriate funding mechanisms and strategies to fill any gaps.
Objective 4	Create a public education program focusing on educating the business community to be prepared for disasters and able to recover quickly.

3.2.2 Accomplishments

The following summarizes the improved accomplishments of the private sector work effort of the Outreach and Education Committee by objective:

3.2.2.1 Objective 1 Establish improved intergovernmental and private sector coordination.

Three (3) tasks related to this objective represent the beginning points for an ongoing, long-range program to improve intergovernmental and private sector collaboration, coordination and relations.

Task 1

Prepare a comprehensive vendor list and inventories of equipment and supplies. The primary thrust of this task was to create a system whereby businesses victimized by disasters could access vendors and suppliers to procure goods and services necessary to rebuild and resume normal business operations.

Early in the project, the Economic Development Specialist met with the purchasing staff of several County and municipal agencies relative to the characteristics of their databases and their potential suitability for business disaster applications. With the assistance of representatives from the PBC Information Systems Services Department (ISS), the idea was conceived of housing the vendor database in the business section of the PBC Emergency Management web site.

Upon further discussion, the idea eventually evolved to the creation of a reverse vendor database, an emergency need posting system for disaster-impacted businesses. This approach avoids most of the maintenance costs and burdens that are associated with traditional vendor databases.
ISS was subsequently commissioned to develop this system, eventually dubbed the "Emergency Business Buyers' Database." Development and testing were successfully accomplished in early July; the system awaits activation if and when a local disaster occurs.

Task 2

Develop a comprehensive list of needs for emergency contracts and agreements, and secure sources for items needed by the response community which are usually not needed in day-to-day operations. Research determined that the PBC Purchasing Department has in place item lists, source lists, and systems and procedures necessary for fully meeting the needs of the County's response community and to satisfy the assistance requirements spelled out by the mutual aid agreement with Orange County. Efforts to publicize the existence of this list to the local community are being made through the Chambers of Commerce to facilitate local involvement, when possible.

Task 3

Establish Business Hotlines, Business Aid and Redevelopment Assistance Centers. An important element in the support of private sector preparedness and timely recovery is the ability of businesses to stay abreast of critical information. An objective in this project was to provide the business community with a single-point contact for accessing important business-related information to assist pre-disaster preparations and post-disaster recovery activities. As part of its partnership agreements with various Chambers of Commerce throughout the County, PBC Emergency Management is encouraging chambers to dedicate one or more telephone lines to serve as an emergency "hot line" service for community businesses.

3.2.2.2 Objective 2 Refine hazard and vulnerability analysis for the economic sector.

The LMS definition (as described earlier) of critical facilities includes several economic sector facilities, notably nursing and convalescent centers, and public communication facilities in what are designated as primary critical facilities, and financial institutions, pharmacies, reconstruction material suppliers, medical clinics,

and food distribution centers in what are designated as secondary critical facilities. Private sector primary critical facilities are included in the ArcView database, and, when the Property Appraiser's office completes the automated inventory conversion of commercial and industrial properties into an ArcView database, secondary critical facility information will be merged with the database file.

The vulnerability of the business community to potential disasters was analyzed. Mapping and tabular products were developed that may be used by commercial/industrial property owners for performing self-analysis of hazard vulnerabilities. These products also provide a better understanding of the various hazards that could potentially impact segments of business community.

An Economic Disaster Management Information System (EDMIS) was developed and designed. Unfortunately, this product cannot be used until database conversion is completed by the Property Appraiser's Office. Once on-line, however, EDMIS will be used to explore mitigation opportunities more fully in the private sector.

3.2.2.3 Objective 3 Evaluate local available resources, identify gaps, and develop appropriate funding mechanisms and strategies to fill the gaps.

Exploratory initiatives were explored relating to ensuring post-disaster cash flow, creating emergency loan programs and community credit programs, expediting the processing of post-disaster loans, and establishing a "bridge loan" capability. The policies and programs of area banks were reviewed, various loan funds examined, and state and federal agency programs, including "Operation Open for Business," were reviewed. Among the most glaring "gaps" uncovered that could impact PBC businesses were the following:

- Meeting the managers and officials they may need to call on in times of emergency or disaster.
- Insurance typically does not cover all business losses.
- Banks will not necessarily loan money to victimized businesses and may not relax their requirements for financial documentation and credit status in emergency periods.
- Business interruption insurance is seldom purchased by businesses because it is so costly.
- Low interest loans for mitigation projects are not yet available in PBC.

The challenge of dealing with these issues, however, is indeed complex. The decision authority for creating policies and programs dealing with these issues invariably resides at levels outside PBC. Creation of emergency business assistance programs will likely require legislative initiatives and corporate lobbying beyond the influence of even regional interests. Even so, the need for creative funding mechanisms and

strategies was a consistent theme throughout the project and was a common speaking point at private sector and public sector forums.

The project team of a year 1999-2000 grant funded to PBC, entitled Businesses Addressing Readiness & Recovery (BARR), will continue efforts to mobilize sufficient support to positively influence private sector and public sector decision makers to institute meaningful emergency assistance programs for businesses. It will support other related initiatives underway at the state level. The BARR program will also pattern many of programs and initiatives after those of *Project Impact* and the City of Deerfield Beach's *Operation Open for Business*.

3.2.2.4 Objective 4 Create a public education program focusing on educating the business community to be prepared for a disaster and able to recover quickly.

Two (2) tasks of this objective address a program to enable the business community to educate and prepare itself, reaching the greatest number of businesses in the shortest time possible.

Task 1

Train Chamber of Commerce staff and the business community. During the course of the project, staff members attended, participated in, and led a variety of business-related forums on disaster issues, including disaster conferences, workshops, professional association meetings, expos and trade shows, and community planning sessions. They also worked closely with private and public sector experts on a number of significant community initiatives and reviewed extensive literature from FEMA, state, federal and non-government organization sources. Among the many methods employed to reach and educate the business community throughout PBC were:

- Insurance typically does not cover all business losses
- Distribution of specially designed BARR pamphlets and business cards
- "Business" location on the County's Emergency Management web site
- Booths in expos, fairs, trade shows
- Presentations to business, professional and public sector groups
- Media interviews and articles
- Presentations at the National and Florida Governor's Hurricane Conference
- Participation in other initiatives

One-on-one contingency planning assistance for larger businesses. In this task, members of several Chambers of Commerce and mentors from large and medium-sized businesses have been trained to train others and make presentations raising the business community's awareness of preparedness issues and options. These efforts will continue.

Task 2

Develop a written business contingency planning guide. It was reasoned that preparation and distribution of a business contingency planning workbook and a business contingency plan template would be practical and productive contributions to building a more disaster resistant business community. The workbook that has been developed serves as the primary text for Emergency Management's ongoing series of contingency planning workshops. Following the template, small- to middle-sized businesses are able to easily prepare contingency plans tailored to their specific needs.

More information regarding business survival and recovery can be found on DEM's website at http://discover.pbcgov.org/publicsafety/dem/HurricanePlanning/Protecting-Business.aspx.

3.3 Strengthening the Role of Local Governments

As has been described earlier in this document, local governments in PBC have taken steps to strengthen themselves both in terms of capital facility improvements and ordinances, regulations, and programs. Becoming more disaster-resistant is not limited to just hardening of structures. There are a number of activities that the County and municipalities can undertake to strengthen the role of local governments to lessen the impacts resulting from emergency events that do not require expending money on capital projects. Plans can be modified, laws and regulations can be amended, informational materials published and distributed, and professional training augmented. Ideas were generated from a variety of sources: interviews with local jurisdictions, and information generated from LMS Survey forms, the LMS Steering Committee and sub-committees, and discussions with local governments. The suggestions for countywide projects resulting from the various discussions with local government include:

1. Projects on the LMS PPL should be incorporated in local government comprehensive plans, capital improvement elements (CIE), at the time the CIEs are on an annual basis in accordance with Section 163.3177 (3) (a), Florida Statutes (F.S.).

2. As permitted under Section 163.3177 (7) (h) & (l), F.S., local governments could incorporate optional comprehensive plan element for public safety, or a hazard mitigation/post-disaster redevelopment plan.

3. Integrate the LMS into the PBC CEMP as appropriate and within the state specified guidelines.

4. Assess existing CRS programs to determine ways to strengthen and improve the local jurisdiction's CRS rating and support non-CRS communities to join the program.

5. Recommend that public building construction, whether it be new construction or renovation of older public structures, incorporate hazard mitigation building practice, whenever financially feasible.

6. Recommend to the appropriate authorities, the incorporation of safe room requirements in the local building code.

7. Update existing PBC post-disaster redevelopment plans and prepare a model plan as a guide for local jurisdictions.

8. Support BARR in the continuing effort of coordination and mutual support between the PBC, local, and business community, before, during, and after a disaster event.

9. The LMS Steering Committee should work with the partner communities and the County to continue ongoing funding and staffing for the continuation of LMS.

10. Recommend emergency building permit procedures to local authorities and jurisdictions.

11. Seek avenues to provide technical assistance in grant writing and engineering for local jurisdictions in the support of LMS projects.

12. Develop a model CEMP mitigation element as a guide for local jurisdictions in mitigation plan development.

13. Seek opportunities and potential funding sources to bury electrical wires, especially in multi-jurisdictional projects.

14. In order to increase shelter capacity countywide, support the retrofitting of all appropriate structures suitable for use as shelters.

Develop and disseminate multi-media outreach program countywide that will support the goals of LMS.

Capability assessments examine existing gaps or weaknesses within ongoing government activities that could preclude mitigation activities and possibly exacerbate community hazard vulnerabilities. Each municipality is unique in its planning, regulatory, fiscal, political, and outreach capabilities; however, each city has adopted the county Comprehensive Emergency Plan, Emergency Operations Plan and Floodplain Management to expand on and improve their existing capabilities and identify mitigating actions. The capabilities and gaps have been identified for each municipality identified in the table below.

Table 3.4 Palm Beach County Municipal Capabilities

Palm Beach County Capabilities

Plan/Ordinance	Unincorporated County	MUNICIPALITIES																																							
		Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Local Mitigation Strategy	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Comprehensive Plan	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Zoning Ordinance	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Subdivision Ordinance	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Floodplain Ordinance	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Erosion, Sedimentation, and Pollution Control Ordinance	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Other Special Purpose Ordinance	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Building Code	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Fire Department ISO Rating	1	2	1	1	2	1	1	1	1	1	2	1	1	1	1	1	1		1	1	1	1	1	1				1	1			1		1	1	1		1	1	
Stormwater Management Plan	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Site Plan Review Requirements	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Capital Improvement Plans	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Local Emergency Operations Plan	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Flood Insurance Study	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Elevation Certificates	✓	✓		✓	✓		✓	✓	✓		✓	✓		✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		✓	✓	✓		✓

- Greenacres Fire and Rescue Department services the municipality of Atlantis.
- Palm Beach County Fire and Rescue services the municipalities of Belle Glade, Cloud Lake, Glen Ridge, Haverhill, Juno Beach, Jupiter, Lake Clarke Shores, Lake Park, Lake Worth Beach, Lantana, Loxahatchee Groves, Manalapan, Pahokee, Palm Springs, Royal Palm Beach, South Bay, South Palm Beach, Wellington, and Westlake

3.4 Future Land Use

Land use in Palm Beach County is managed by the Department of Planning, Zoning, and Building (PZB). The Comprehensive Plan has been prepared to meet the requirements of Chapter 163, F.S. that includes future land use. The Goals, Objectives and Policies presented in the Plan Elements reflect the directives of the citizenry and the Board of County of Commissioners. These directives, which are discussed in greater detail in the Land Use Element, are:

A. Redirect growth to the East where services and facilities can be provided and encourage the revitalization/redevelopment of the coastal communities,

B. Through the implementation of a concurrency management system provide for orderly growth and provision of facilities and services to maintain the existing quality of life in an economical manner,

C. Implement County-wide growth management strategies while providing the opportunities for flexibility within the Plan that recognize and maintain the diversity of lifestyles.

GOAL 2 LAND PLANNING

It is the GOAL of Palm Beach County to create and maintain livable communities, promote the quality of life, provide for a distribution of land uses of various types, and at a range of densities and intensities, and to balance the physical, social, cultural, environmental and economic needs of the current and projected residents and visitor populations. This shall be accomplished in a manner that protects and improves the quality of the natural and manmade environment, respects and maintains a diversity of lifestyle choices, and provides for the timely, cost-effective provision of public facilities and services.

OBJECTIVE 2.1 Balanced Growth

Palm Beach County shall designate on the Future Land Use Atlas sufficient land area in each land use designation to manage and direct future development to appropriate locations to achieve balanced growth. This shall be done to plan for population growth and its need for services, employment opportunities, and recreation and open space, while providing for the continuation of agriculture and the protection of the environment and natural resources through the long-range planning horizon.

OBJECTIVE 2.2 Future Land Use Provisions - General

Palm Beach County shall ensure development is consistent with the County's diverse character and future land use designations. All public and private activities concerning the use, development and redevelopment of a property, and the provision

of facilities and services shall be consistent with the property's future land use designation, and the applicable Goals, Objectives and Policies of this Element.

GOAL 3 SERVICE AREAS AND PROVISION OF SERVICES

It is the GOAL of Palm Beach County to define graduated service areas for directing services to the County's diverse neighborhoods and communities in a timely and cost-effective manner, reflective of the quality of life associated with each respective Tier.

OBJECTIVE 3.1 Service Areas - General

Palm Beach County shall establish graduated service areas to distinguish the levels and types of services needed within a Tier, consistent with sustaining the characteristics of the Tier. These characteristics shall be based on the land development pattern of the community and services needed to protect the health, safety and welfare of residents and visitors; and, the need to provide cost effective services based on the existing or future land uses

GOAL 4 COMMUNITY PLANNING AND DESIGN

It is the GOAL of Palm Beach County to develop and implement strategies that will enhance the quality of life within its neighborhoods and communities by ensuring that these areas are well planned, visually pleasing, safe, and devoid of substandard housing and blight. Neighborhoods and communities shall also be accessible to all of the residents of Palm Beach County through an emphasis on the provision of a variety of housing opportunities through the continuous development of affordable housing.

OBJECTIVE 4.1 Community and Neighborhood Planning

Palm Beach County shall develop and implement a Community Planning and Neighborhood Planning program to allow consideration of Community and Neighborhood Plans and strategic actions to create, enhance, and maintain more livable communities, which provide a strong sense of place and identity for the various regions within the County.

GOAL 5 NATURAL AND HISTORIC RESOURCE PROTECTION

It is the GOAL of Palm Beach County to provide for the continual protection, preservation, and enhancement of the County's various high quality environmental communities and historic resources for the benefit of its current and future residents and visitors.

OBJECTIVE 5.1 Protection of Natural Resources and Systems

Palm Beach County shall ensure the protection of natural resources and systems by enforcing and monitoring existing environmentally related ordinances and

developing ordinances, as needed, pursuant to the goals and policies of the Conservation Element.

As development increases in the County and its jurisdictions, the probability of identified threats and hazards will cause property damage or human casualties also increases. With more people migrating to Palm Beach County and its jurisdictions, a larger percent of the land and population may become more vulnerable to hazards. The higher standards adopted by Florida's Building Code decrease vulnerability.

3.5 Population Allocation Model

3.5.1 Introduction

The County prepares the Population Allocation Model every other year as a tool for long-range service delivery planning in Palm Beach County. Ch. 163.3177(1)(f)3, F.S., requires that each comprehensive plan be based upon population projections published by the Office of Economic and Demographic Research (OEDR) or generated by the local government based upon professionally acceptable methodology. The OEDR publishes the projections prepared by the University of Florida's Bureau of Economic and Business Research (BEBR). Palm Beach County utilizes the OEDR/BEBR medium range projections for the County's Population Allocation Model.

Each year, OEDR /BEBR issues population projections in five-year increments for every Florida County. Since these projections are countywide figures, each municipality within the County is responsible for devising an allocation strategy to describe its own future growth. Technically, therefore, the County is only responsible for unincorporated lands. However, since many County agencies provide services beyond the unincorporated boundaries, Palm Beach County has developed a Population Allocation Model to allocate the countywide figures to smaller geographies called Traffic Analysis Zones (TAZs) throughout the County for localized planning efforts, providing population projections for these TAZs through 2045.

The Population Allocation Model incorporates:

- 2010 Census populations and related information (Summary File 1, released in August 2011) such as persons per household, group quartered populations, vacancy and seasonal rates by TAZs. Henceforth the baseline for future population models will be the year 2010.

- OEDR projections, released in 2020. These projections are based on the 2010 Census released in late March of 2011, and the OEDR population estimates released in 2020.

- Land use densities changes, approved or expired residential projects, annexations, and Municipal population estimates.

- 2010 MPO Traffic Analysis Zones, adding over 500 zones in the urban area and enabling a finer breakdown of geography and calibration of population estimates.

3.5.2 Historical Population Growth

The 2010 Census indicates that the County population grew 16.7% from 2000, averaging 1.7% or 18,895 people each year for the last ten years. Unincorporated County grew 12.7%, averaging 1.3% or 6,600 people each year. Both Countywide and Unincorporated growth rates have declined since 1980.

The County grew rapidly in the 80's and 90's, with a net growth of 20,000-30,000 people per year, and annual growth rate surpassing the rest of Florida. The surge continued in the early 2000's, until 2007 when annual growth rate fell behind Florida, with only 5,000-10,000 people annually. In 2008-2012 when the County was so negatively affected by the slump of construction activities, population almost came to a standstill. 2013-2014 saw its comeback, with annual growth bouncing beyond the 10,000 level, though not at a rate as before the recession.

3.5.2.1 Components of Population Change

As of July 1 of each year, the Bureau of Census also publishes population estimates for the nation's counties. The methodology differs from BEBR, however, as it employs sources such as vital statistics, tax records, school enrollment and other administrative records.

In addition, the Bureau provides a breakdown of components of population changes. For this County, in-migration has always been the strongest component of population growth. After two decades of rapid growth, however, net in-migration (both domestic and international) declined from an annual average of 25,000 people during 2000-2005 to an average of only 2,700 between Palm Beach County Population Allocation Model Page 4 2006 and 2008. In particular, domestic migration has even dwindled to a net loss of population of 11,364 people to other counties in Florida or other states. The County subsequently is experiencing a healthy resurgence of in-migration averaging a net migration of around 16,000 residents per year in the last few years.

3.5.2.2 Building Permit Activities

Historically in the County, there has been a direct correlation between building activity and population growth. Building permits continue to hold steady, and growth in the cities exceeds the county's growth. The last five years witness an average growth of 5,400 units per year.

3.5.2.3 BEBR Palm Beach County Population Projections

Chapter 163.3177(1)(f)3, F.S., stipulates that local government comprehensive plans shall be based upon permanent and seasonal population estimates and projections, which shall either be those provided by the Office of Economic and Demographic Research (ODER) or generated by the local government based upon a professionally acceptable methodology. The

ODER issues the projections generated by the Bureau of Economic and Business Research (BEBR).

Since 1973, BEBR has developed, and published annually, population projections (low, medium, and high) in five-year increments for all Florida counties. The BEBR mid-range projections are derived from the average of ten projections using four techniques (linear, exponential, share-of growth, and shift-share) and three different historical base periods, which essentially mitigates the effects of rapid or slow growth, and are considered the most reliable of the three sets of figures.

Projections issued by ODER/BEBR for Palm Beach County have historically varied significantly from year to year, as shown in Table 5. Following the release of the 2000 Census figures in 2001, BEBR's projection levels for the County sharply increased. For example, the 2000's projection of 2030 population was over 1.6 million, yet 2001's projection of the same year had climbed by 236,300 to 1.873 million and 2005's reached an all-time high of nearly 1.9 million. However, subsequent projections have now fallen, and now have returned to the levels anticipated in 2000.

3.5.3 Historical Unincorporated County Population Growth

Historical Population Growth

Since the incorporation of the County in 1909, the municipalities, which developed much earlier along the eastern coast, have held the bulk of the County's population. Starting in the 1960's, population growth began to move westward into the unincorporated land. Consequently, the municipal population share began to drop steadily through the 1990's, at which time it reached a plateau of approximately 53%.

Over the past 20 years, municipal population growth has begun to increase. Through active annexations and downtown development or redevelopment, together with the incorporation of the Village of Wellington in 1995, the Village of Loxahatchee Groves in 2006, and the City of Westlake in 2016, the municipal share of the population has crept up to 56%, an increase in over 2 percentage points over the 2000's share.

3.5.4 Projected Population

Based on the ODER/BEBR projections for the County, the current distribution of existing housing developments and availability of developable residential lands, the 2020 Population Allocation Model shows the projected Unincorporated County populations as follows:

Projected County Populations, 2020 - 2045

	2020	2025	2030	2035	2040	2045
Unincorporated	638,552	667,670	691,997	713,652	734,207	751,909
	43.0%	42.6%	42.4%	42.3%	42.3%	42.3%
Incorporated	827,942	879,530	924,503	962,948	995,293	1,023,291
	57.0%	57.4%	57.6%	57.7%	57.7%	57.7%
County Total	**1,466,494**	**1,547,200**	**1,616,500**	**1,676,600**	**1,729,500**	**1,775,200**

	2020	2025	2030	2035	2040	2045
East County	1,431,473	1,511,239	1,578,069	1,635,264	1,684,882	1,725,534
	97.6%	97.6%	97.7%	97.6%	97.5%	97.4%
West County	35,021	35,961	38,431	41,336	44,618	49,666
	2.4%	2.4%	2.3%	2.4%	2.5%	2.6%
County Total	**1,466,494**	**1,547,200**	**1,616,500**	**1,676,600**	**1,729,500**	**1,775,200**

3.5.5 Population Allocation Model Methodology

Local governments and service providers require small area projections for the planning of future service needs. In particular, the BEBR Countywide total is inadequate for planning public services (parks, libraries, schools), emergency services (Fire-Rescue, Sheriff), and infrastructure (transportation, water and wastewater, solid waste). To this end, the Planning Division developed the Population Allocation Model to distribute BEBR's projections to smaller geographies, namely, the traffic analysis zones (TAZ). Using TAZs, population growth can be summarized into areas such as census tracts, zip codes, or neighborhoods. By modeling projected population in local areas, the Planning Division provides insight into the direction and location of future growth within the County.

In keeping with the methodology used in previous years, the Model incorporates significant land use changes over the past two years, including the following:

- Newly built residential developments
- Land use amendments
- Environmental land purchases
- Adopted neighborhood or redevelopment plans
- New development approvals

- Municipal annexations

The methodology used for the Allocation Model is a housing unit method in which population growth is assumed to occur where houses are being built. Changes in population will be reflected by changes in occupied housing units. (The US Census Bureau has conducted surveys showing that a majority of local government agencies make local population estimates utilizing some form of housing unit method.) Therefore, the assignment of population growth to a locality would depend on the locality's present housing, past growth history, and the capacity for new housing units based on land use policies which either deter or encourage residential development.

The building blocks of the Allocation Model are the 1,447 Traffic Analysis Zones in which residential units are built and/or potentially available. For TAZs with units available, the units are allocated across the years according to the project's projected build-out date. The individual TAZs are then aggregated to arrive at a total County housing stock totals for each year to 2045.

Potential capacity is determined by the amount of developable residential land and the specified density in each jurisdictions' Comprehensive Plans. Considerations for density designations are described in the Housing Supply Section.

The methodology steps for the Population Allocation Model are as follows:

Step One: Converting Population to Occupied Residential Units

The first step in the allocation process is to convert the County's BEBR population estimates/projections to occupied housing units, or the number of households. This is done by subtracting the "group quarters" population from the population totals, and dividing the results by the 2010 Census average person per household (PPH) rate of 2.39. For projections, the PPH is expected to steadily increase to 2.50 by 2035. This constitutes the demand for permanent housing based on BEBR's medium projections.

Person per Household Rate

The Person per Household (PPH) rate for the County has been steadily increasing, from 2.32 in 1990, to 2.34 in 2000 and 2.39 in 2010. The population model assumes this trend to continue, so that by 2035, the PPH in Palm Beach County will be 2.50. For individual TAZs, the PPH continues to rely on the 2010 Census; they will, however, adjust themselves during the normalization process. The Census 2010 average household size nationwide is 2.58, and for Florida it is 2.48. While one may purport smaller household size in South Florida in the future because of the influx of retirees, such conjecture could be countered by a steady influx of immigrants (with historically larger households) and younger families in recent years. Therefore, it is reasonable to expect that the County's PPH, which is well below the state and national average, will rise in the future. As an urban County approaching build-out, our neighboring Broward County's PPH was 2.45 in 2000, which increased to 2.52 in 2010.

Group-Quartered Population

According to the 2010 Census, Countywide group-quartered population (institutionalized and non-institutionalized population) has remained around the same percentage as the reported in Census 2000. The 19,972, group population constitutes 1.51% of the total population in the County.

As South Floridians age, demand for group homes will increase. The 2020 publication of "Population Projections by Age, Sex and Race and Hispanic Origin for Florida and Its Counties, 2020-2045" indicates that the 65+ age group will increase by 35% by 2035. Census 2010 showed that of this age group, only 1.9% live in assisted living facilities or other group quarters. Table 8 below shows the projected share of Group Population to the total population.

Group Population as % of Total Permanent Population

	2010 Census	2020	2025	2030	2035	2040	2045
2020 BEBR projected Population	1,320,134	1,465,835	1,547,210	1,616,487	1,676,582	1,729,472	1,775,242
2020 BEBR projections of 65+	285,155	350,002	399,372	447,102	477,633	493,340	496,948
Seniors in Group Quarters (1.9% of all 65+)	5,434	6,650	7,588	8,495	9,075	9,373	9,442
Others in Group Quarters (1.1% of total pop.)	14,538	16,124	17,019	17,781	18,442	19,024	19,528
Total Group Population	19,972	22,774	24,607	26,276	27,517	28,397	28,970
Group Population as % of Total Pop	1.51%	1.55%	1.59%	1.63%	1.64%	1.64%	1.63%

Step Two: Building Growth Models for Individual TAZs

As the County matures, many small areas have established distinct growth patterns. Some are already built out, while many areas have approved projects with projected completion dates. The current methodology examines the growth trend of each individual TAZ, extrapolating it into the future either linearly or logistically (if the TAZ is near build-out). The model also considers project completion dates to depict realistic growth spurts. In all cases, the build-out capacity must be determined, and the historical trends of total built units by year established from the Property Appraiser Data Base.

Step Three: Determining Total Countywide Housing Stock, 2020-2045

The sum total of the extrapolated, year-by-year, built residential developments of these TAZs constitutes the County housing stock to 2045. This constitutes the total supply of housing units for the County for the period.

Step Four: Determining Seasonal Housing Units for TAZs

For the estimation of seasonal housing units for the TAZs, the model again relies on the 2010 Census estimates. The growth of this sector has been surprisingly minimal, from 51,875 units Countywide in 1990, to 53,124 in 2000, to 59,440 in 2010. Its share of housing units has declined from 9.5% in 2000 to 9.05% in 2010. The bulk (over 60%) of seasonal housing is located in the municipalities in the coastal areas. In the unincorporated County, seasonal housing only constitutes about 7.4% of the total housing units.

Growth of seasonal housing has slowed from a 13% share of new housing units in 1990-2000 to 10% in 2000-2010. Maintaining this current share, the Model shows a total 65,000 seasonal units in the County by 2035. As the County's land supply decreases, it is likely that seasonal units will be absorbed by permanent population growth.

Step Five: Determining Market Vacancy Rates for the County and Individual TAZs

Market vacancies for the years through 2045 are determined by taking the difference between total housing units, total seasonal units, and occupied housing units in Step One. They are apportioned to the individual TAZ according to the 2010 Census vacancy rate. Because of the aggressive development activities in the last decade, market vacancies were very high in 2010 (9% countywide), with some zones having a vacancy rate over 20-30%. Information from the annual American Community Survey and the USPS Vacant Address Data provided by the U.S. Department of Housing and Urban Development are used to update and modify these vacancy rates.

Step Six: Conversion Back to Population Estimates

Once the dwelling units have been distributed to the TAZs, they are converted back to population estimates. This is done by subtracting seasonal units and market vacancies from the total built units and multiplying the remaining units (i.e. occupied units) by the TAZ-specific PPH rate. Finally, "group quarters" population is added to reflect the total permanent population for each TAZ. These TAZ specific populations are normalized to add up to the total Unincorporated County and Municipal population estimates for the current year and the BEBR total County projections to 2045.

3.5.5.1 Housing Supply Assumptions

The Allocation Model, with an individual growth curve for each TAZ, is a realistic way of portraying future housing trends in the County. The Model closely follows the BEBR methodology of using housing units (for which detailed records are available) rather than population as the object of projection. More importantly, the Model takes on local characteristics such as availability of vacant land, approved projects and project completion date, and adopted Comprehensive Plans, etc.

The projections of housing supply year by year differ from forecasts. The former are mere extrapolations (linear or nonlinear) of what went on before. The latter utilize various exogenous economic variables to produce a probable picture of the housing market. In effect, the model utilizes housing units as "weights" to allocate BEBR's countywide population projections to small geographies. Using these "weights," the final normalization process forces the individually derived TAZ populations to sum up to the independent BEBR medium County totals. The current and potential housing supply utilizes the following inputs:

1. 2020 Existing Residential Units Calibration

a. Property Appraiser Public Access (PAPA) Parcel Data, with the following corrections:
   i. PAPA often identifies an accessory unit as a unit, even when it is obviously a garage or guesthouse. These are not included in the population model. Only when the accessory unit has separate entrance and driveway or identified as a grandparent unit (additional tax exemption), it is included in the model.
   ii. Obvious dilapidated (not inhabitable) houses are treated as vacant.
   iii. Housing units in agricultural production or nursery parcels are considered only when there is a homestead associated with the parcel. Otherwise, they are counted as storage.
   iv. Ortho-digital aerials (Source: PBC MyGeoNav), or pictometry are utilized to clarify existing conditions whenever necessary.

b. The 2010 Census PL94-171

During 2009-2010, the Bureau of Census expended much effort to ascertain local addresses and promote residents' response (overall County response rate was 74%). Besides population, it provided valuable housing tenure (occupied, vacant, seasonal, etc.) information by census blocks, which in turn were aggregated into TAZs. These are the base data for all future allocation models until the next census in 2020. Attempts are made to update market vacancies by the 2009-2013 American Community Survey (available by census block groups) and the HUD_US Postal Service Quarterly Vacancy Data (available by census tracts).

2. Developable and Underutilized lands

All developable unsubdivided parcels of land will be built out to the maximum dwelling unit potential according to each parcel's future land use designation. A parcel is considered developable according to the following criteria:

a. Some vacant parcels are not developable even with a residential Future Land Use (FLU) designation, because they are buffers, golf courses, or water.
b. Parcels owned by tax-exempt organizations (such as religious organizations) are not given any residential potential when the parcel is exempted from

property tax (This indicates that the organization has initiated development process on the parcel.)

c. All vacant school board properties are not given any residential potential.
d. All publicly owned lands outside the Urban Service Area (USA) are not given any residential potential. Neither are the urban lands owned by the South Florida Water Management District.
e. Municipal EARs and Comprehensive Plans are consulted

Potential units yielded by vacant, developable parcels:

a. Potential units are calculated as max density multiplied by legal parcel acres.
b. For parcels that may have split FLU designations, potential units are calculated accordingly.
c. For parcels with a nonresidential/underlying residential FLU, no potential units are assigned, except in the Westgate CRA (where FLU is generally CH/8). Even in this area, parcels along major roads such as Okeechobee Blvd, and Westgate Blvd are considered commercial.
d. Urban Redevelopment Area (URA) and County Community Revitalization Team Area (CCRT) - Since most of the vacant land in these areas are small parcels, to encourage development in the URA and CCRT areas, maximum permitted Planned Unit Development (PUD) density is applied even if the size of the parcels does not meet the PUD threshold. Impacts on total capacity due to this change are minimal.
e. The Acreage's future land use designation is Rural Residential, 1 unit per 2.5 acres (RR-2.5). However, the Acreage is composed nearly entirely of 1-1/4 acre or less single-family lots, and development is permitted on each platted parcel. Hence, the potential units assigned to the Acreage are consistent with the number of platted lots in addition to the density pursuant to the RR-2.5 designation for larger unplatted tracts.

Potential units yielded by underutilized parcels:

a. Un-subdivided Parcels which are built under the maximum residential density are given additional capacity according to their FLU density.
b. Surrounding parcels' existing density is also considered to maintain consistency and compatibility with surrounding neighborhoods. For example, if the entire area is built under its max potential, no additional unit is assigned.
c. Some developed equestrian parcels with residential FLUs are not given any residential potential, especially those in Wellington within their equestrian protection boundary, and those owned by equestrian companies. Some equestrian parcels are developable if they are amidst single family neighborhoods.
d. A few nonconforming nonresidential developments with residential FLU designations are not given residential potential.
e. Nurseries within the urban service area only are given residential potential according to their designated FLUs.

Transfer of Development Rights (TDR) potentials for Unincorporated vacant and underutilized parcels:

The balance in the TDR bank is apportioned to each vacant and underutilized parcel according to:

a. du/acre if in CCRT or
b. 3 du/acre if east of turnpike, within USA
c. 2 du/acre if west of turnpike, within USA

Agricultural Reserve Development Potential:

a. Consistent with the Comprehensive Plan, the Model primarily assumes a 1 unit per acre development potential to establish the total development potential within the Agricultural Reserve.
b. For isolated pockets of low-density residential development, such as areas with single-family homes built on 5-acre tracts, a development potential of 1 unit per 5 acres is assumed.
c. Pursuant to the Ag Reserve Master Plan, and planned purchases by the South Florida Water Management District (SFWMD), the model shifts future units away from the Loxahatchee National Wildlife Refuge and concentrates the bulk of the future growth between the Florida Turnpike and State Road 7.
d. The Model does not assign development potential to the properties currently owned by SFWMD or by the County.

Land Owned by Districts, State and Local Governments

The Florida Department of Environmental Protection, SFWMD, Lake Worth Drainage District, Indian Trail Improvement District, and various local government entities have acquired land in the County with residential development rights. The Model retains their residential potential only if these tracts of land lie inside the Urban Service Area, east of the 20 Mile Bend and/or have not received a Conservation future land use designation.

Other Additional Development Capacities

These are added at the TAZ level whenever the provision for potential development is not parcel specific. These are:

a. Approved Unbuilt and unplatted residential projects. Expired projects are taken out, and regular potential units according to the land's FLUs are included.
b. Adopted Redevelopment plans, Boca Raton DRI, Municipal TCEAs, URA (Congress, Military and Lake Worth Corridors).

Inland Port in the Glades

Population growth in the West County has been essentially flat for decades. This is despite thousands of acres designated for urban residential uses. The approval of the Inland Logistics Center in the Unincorporated County, between Belle Glade and South Bay, has added 850 acres of industrial land to the West County, having amended the land use from LR-3 to IND. The Center, however, will be a major source of employment, which will in turn encourage residential developments in the proximity areas.

3.5.6 Future Updates of the Model

The Model is kept dynamic by updates every other year, accounting for density changes, newly approved development or redevelopment projects, annual BEBR population estimates, and any demographic shifts depicted by the annual American Community Survey. The County's Model is based on BEBR medium projections and the supply of housing as specified from the County's currently adopted land use policies.

As population increases in the County and its jurisdictons, the probability of identified threats and hazards will cause property damage or human casualties also increases. With more people migrating to Palm Beach County and its jurisdictions, a larger percent of the land and population may become more vulnerable to hazards. The higher standards adopted by Florida's Building Code decrease vulnerability.

3.6 LMS Action Plans

The vulnerability, risk and hazard assessments, coordination with other agencies, review of existing plans and documents, as well as establishment of goals and objectives, completed by the LMS Working Group, Revisions Committee and Steering Committee, and described in the previous sections, culminated in the creation of a two-pronged Action Plan made up of County-wide Action Items and Prioritized Project List.

The County-wide Action Plan: contains county-wide and multi-jurisdictional action items from several CRS credited mitigation categories such as public information, floodplain management, natural resource protection, emergency management, regulatory, and post disaster, most of which are expected to remain unchanged throughout the 5-year life of the plan.

The Prioritized Project List: contains finite, grant funded, primarily structural projects that are community and problem specific. This list is expected to be changed and updated many times throughout the 5-year cycle of the LMS.

3.6.1 Review of Possible Activities

In order to select the most appropriate, feasible and effective mitigation action items for both the Countywide Action Items and Prioritized Project List, the respective committees for each conducted a Review of Possible Activities in accordance with the CRS 10-Step Planning Process. The reviews are described in the following sections.

3.6.1.1 Review of Possible Activities for the County-wide Action plan

During this 2024 update of the Local Mitigation Strategy, the LMS Revisions Sub-Committee, made up of representatives of the County and LMS participating municipalities as well as local stakeholders, not only reviewed the Action Items from the 2020 Local Mitigation Strategy, but also considered numerous additional possible activities. The review process took place during two meetings starting in October 2023 and finishing in November 2023. The activities that were chosen were then drafted into an Action Plan in January 2024 and posted for public review in March 2024.

During this thorough review of possible activities, some previous and possible activities were removed from the list because they had been completed, were determined to be too vague or redundant, were already required, or were not considered a priority. Other possible activities were either accepted as stated, combined with other activities, revised or removed from the list. Additional action items were proposed at the beginning of each meeting and new ones arose during the meetings as a result of Committee suggestions and group discussion. Many of the new action items pertain to the County's recent efforts related to watershed planning and vulnerability assessment.

The Committee reviewed possible activities for each of the following categories:

- Floodplain Management
- Regulatory/Current & Future Conditions
- Preventive Measures
- Property Protection
- Natural Resource Protection
- Emergency Services
- Structural Flood Control Projects
- Public Information
- Post Disaster Planning

The review performed by the Committee is detailed in table form and included in Appendix J. The table lists the Action Plan items, states the results of the review and explains why each decision was made. It also identifies the goals and addresses whether or not the ongoing activities are achieving expectations. For each action item that will be included in the Action Plan, possible funding, responsible parties, timeframes, and priority ranking are identified. All excluded items are noted in the table. Records of the Committee meetings, included in Appendix L, document the thorough review process.

In addition to specific proposed Action Items, County staff separately reviewed relevant components of the County's Comprehensive Plan, building codes and zoning ordinances. The County CRS Coordinator has also requested that all participating municipalities also conduct policy and regulation reviews and report any findings, recommendations or regulation changes to the County so that an attempt can be made to coordinate and align efforts and regulations across all jurisdictions in Palm Beach County.

3.6.1.2 Review of Possible Activities for the Prioritized Project List

A separate committee, the LMS Evaluation Panel, reviews possible projects for the Prioritized Project List and updates the list twice per year. Additional details about the procedures related to this review can be found in **Section 4: Prioritized Project List Procedures.** The meeting details can be found in Appendix L and the resulting project list can be found in Appendix E.

3.6.2 County-Wide Action Plan

For each action item selected for inclusion in the Countywide Action Plan, possible funding, responsible parties, timeframes, have been identified and the items have been ranked according to priority. The resulting Action Plan can be found in Appendix J.

3.6.2.1 Implementation, Evaluation and Revision of the County-wide Action Plan

As implementation of the Countywide Action Plan proceeds, it is important that it be periodically evaluated and updated. Not only does this assure that the plan remains current and relevant, but it also assures the implementation of the Action Plan. To ensure that there is a continuing and responsive planning process, the planning committee will institute the following procedures:

Annual Evaluation

The LMS Steering Committee, responsible for the development of this plan, or a successor committee similar in membership that is created to replace the original committee, shall meet quarterly to review the progress of the Plan. The Committee will complete an annual evaluation. Because the Committee is composed of both staff members as well as stakeholders, the quarterly reviews and annual evaluation will include community input.

The LMS Working Group meetings will typically take place in March, June, September, and December, and the LMS Steering Committee meetings will typically take place in February, May, August, and October with the annual review taking place during the last meeting of the year. The documentation of these meetings, including advertisements inviting the public, minutes, and sign-in sheets will be collected by the Committee Chair for submission to the CRS program. The LMS Steering Committee Chair is responsible for overseeing and monitoring implementation of the Plan and may call meetings or contact members more often as deemed necessary.

Prior to the annual meeting, the Committee Chair is responsible for preparing a draft LMS Evaluation Report (progress report) that will be presented at the meeting. The Committee will review and discuss the report, after which it may be revised before the Committee approves it.
The report shall include:

- How the reader can obtain a copy of the original plan.
- A review of each action item in the Action Plan, including a statement on how much was accomplished during the previous year, or why implementation is behind schedule.
- A discussion of why any objectives were not reached or why implementation is behind schedule.
- Recommendations for new projects or revised action items. Such recommendations shall be subject to approval by the County Commission as amendments to the adopted plan.

Following approval of the annual LMS Evaluation Report by the committee, it will be released to the media and made available to the public. The CRS Coordinator must submit a copy of the annual evaluation report with the County's CRS recertification by May 1st of each year.

3.6.3 Prioritized Project List

For each action item selected for inclusion in the Prioritized Project List, possible funding, responsible parties, timeframes, have been identified and the items have been ranked according to priority. The process is further described in **Section 4: Procedures** and the most recent resulting Prioritized Project List can be found in Appendix E.

3.6.3.1 Implementation, Evaluation and Revision of the Prioritized Project List

The Prioritized Project List is updated twice per year according to the procedures described in **Section 4: Procedures.**

SECTION 4: PROCEDURES

4.1 Project Prioritization Methodology

This section satisfies, in part, the following FEMA requirements:

Requirement §201.6(c)(3)(ii): The mitigation strategy must include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

Requirement: §201.6(c)(3)(ii): The mitigation strategy must also address the jurisdiction's participation in the NFIP, and continued compliance with NFIP requirements, as appropriate.

Requirement §201.6(c)(3)(iii): The mitigation strategy section must include an Action Plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization will include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

Requirement §201.6(c)(3)(iv): For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.

4.1.1 Development and Rationale

The Goals and Objectives of the LMS were reviewed by the Working Group, Steering Committee, and specifically the Revisions Sub-Committee in 2023. Two of the guiding principles of the LMS effort are sustainability and resilience. Our project prioritization methodology ensures that mitigation efforts are in alignment with community needs and reduce the impacts of disasters, ease response, and accelerate recovery. Projects are submitted by local governments or special districts. Submitting entities must comply with PBC's LMS participation requirement set forth in **Section 1.4** Participation Requirements and remain in good standing. The LMS Evaluation Panel reviews, scores, and ranks projects then recommends the county-wide consolidated list to the LMS Steering Committee who adopts and approves for dissemination to the Working Group, local municipalities and special districts, and FDEM. The current Prioritized Project List (PPL) can be found in Appendix E.

The County established a scoring procedure when the plan was first written in 1999. The scoring procedure is detailed below along with examples in Appendix I. This procedure remains in place resulting in a structured scoring process for projects seeking alternative funding sources other than federal programs. Changes were made to comply with new Federal regulations.

FEMA requires all hazard mitigation projects to be cost-effective. The LMS has been proactive in providing participants with the information necessary to perform a Benefit/Cost Analysis federal funding eligibility. Projects with a total cost of less than $1,000,000 may submit a narrative including qualitative and quantitative data demonstrating the benefits and cost-effectiveness of the project in lieu of a formal Benefit/Cost Analysis. Projects totaling over $1,000,000 require a Benefit/Cost Analysis. The objective is to create an adequate strategy for PBC to prioritize projects for possible funding sources other than federal funds. Appendix F is a list of potential funding sources.

Changes in the evaluation process since the last LMS update include:

- Alignment with State Goals and Objectives

- Awareness and planned implementation (once complete) of county-wide vulnerability assessments related to climate change

- Inclusion of an additional tie-break question when ranking projects for the Prioritized Project List
    - What project has the highest Benefit/Cost Ratio?
        - This question was added then moved to #1 to adhere to FEMA's requirement of all hazard mitigation projects to be cost-effective.
        - The inaugural utilization of this new ranking criterion will be Spring 2024 that will be adopted by the Steering Committee in June, 2024.

As the dams in PBC are operated by either USACE or SFWMD, projects submitted for dams/dikes are scored and ranked in the same manner as all other mitigation projects. Any projects for dams/dikes would naturally fall under "Damage Reduction" for *Community Benefit* for five (5) points, the highest points possible in that scoring criterion. Further, dam/dike projects would also be categorized as "Storm Water/Flooding" under *Project Benefit* for eight (8) points, the second highest points possible in that scoring criterion.

Since the last revision, the COVID-19 pandemic was experienced world-wide. Unfortunately, mitigation efforts within the whole County (including local governments and special districts) had to reprioritize resulting in some projects expiring or removed from plans. Additionally, the cost of materials and a compromised supply chain have caused delays with implementation of projects. Conversely, the down-time during the pandemic also fostered opportunities to rethink and revise mitigation efforts resulting in longer-term plans, new and "green" projects being added, and some realigned or combined to maximize effectiveness to the communities and County.

To be effective and gain the support of all the communities involved, the instrument used to rank and prioritize proposed mitigation projects must accomplish the following objectives. The criteria must:

- ***Be fair and objective.*** Projects proposed by small communities must have equal opportunity to achieve as high or higher priority than mitigation projects proposed by larger communities or the County. Likewise, mitigation projects proposed by economically disadvantaged communities must have the opportunity to achieve as high a priority as those projects proposed by more affluent communities.

- ***Be flexible enough to effectively rank projects mitigating for a variety of hazards.*** The LMS is an "all-hazards" program. Ranking criteria must be capable of categorizing individual mitigation projects with diverse goals such as, but not limited to, flood mitigation, sea level rise, impacts from climate change, wildfire protection, or hazardous waste spill prevention.

- ***Be functional and tied to real-world considerations such as competitive grant funding requirements.*** The County will be developing a list of prioritized mitigation projects that will have to compete with a prioritized list of similar type projects from other counties in the state.

- ***Be simple, easily understood, and relatively easy to apply.*** The LMS Evaluation Panel members will be scoring many projects. These individuals must be able to perform the project scoring process expeditiously for each project.

- ***Be well defined and specific.*** Each scoring criterion must be well defined with the points matrix detailed to eliminate scoring divergence within categories.

The LMS Steering Committee, in collaboration with the Evaluation Panel, are currently in a grassroots effort to capitalize on the benefits of submitting projects to the PPL. Although each local government does not currently have a project that is scored and ranked, the LMS Working Group chair and the coordinator have begun meeting with noncompliant communities and special districts to review their CIPs and identify projects eligible for submission to the PPL. The LMS Working Group chair has stressed the importance at each Working Group meeting and hosted FDEM Mitigation Bureau members to Working Group meetings to clarify requirements and to answer any questions from the stakeholders. The LMS Working Group chair and coordinator have also been meeting with different departments and divisions within the County to identify county-wide projects that mitigate our identified threats and hazards. It has been found that each agency or jurisdiction has planned, ongoing, and completed mitigation projects that were simply not submitted to the PPL.

4.2 Scoring Criteria

The prioritization process is an ongoing process as the LMS is continually refined and updated. The criteria will be applied in a consistent manner with a minimal learning curve. These scoring categories are as follows:

- **Community Benefit** The single most important consideration for any mitigation project is "What benefit does the community derive from this effort? How and to what extent does this mitigation project benefit the citizens of a community?"

- **Project Implementation** Is this project technically, financially, and legally feasible? This requirement addresses the ease with which a project can be implemented, how easily can required permits be obtained, and the time frame for project accomplishment. It also identifies any technical problems that must be overcome to implement this project.

- **Community Commitment** What is the community's level of commitment that is proposing this mitigation project? All mitigation projects have to compete for funding. If the community or governmental entity proposing a given project is not willing to commit substantial time, effort, and funding, the project has less chance of ever being accomplished even if it is a worthy project. There is no point in ranking a project highly that may never be accomplished even if funds are made available.

The rationale for each scoring criterion on the Project/Initiative Evaluation Score Sheet, its connections to known funding sources, and directions on specific numbers of points to award are discussed below.

4.2.1 Community Benefit

4.2.1.1 Community Benefit

What benefit does the community derive from this effort? How and to what extent does this mitigation project benefit the citizens of a community?

Mitigation Benefit	Points Awarded (maximum of 5)
Damage Reduction	5
Mapping and Regulatory	4
Preparedness Against Hazard	3
Public Information	2
Other	1
No Benefit	0

4.2.1.2 Project Benefit

Does the project address critical elements of the community infrastructure?

The critical question addressed is, "Does the proposed project protect the community by hardening some critical element within the community's infrastructure that will reduce the potential loss of life or property damage if a disaster strikes"?

Points under this criterion are awarded based upon the nature of the facility or infrastructure element being hardened or protected. If the proposed projects mitigate a problem in a primary critical facility such as a hospital, EOC, or emergency shelter it would receive ten (10) points under this criterion. Primary critical facilities are defined as "Facilities critical to the immediate support of life and public safety." These are the facilities that the community cannot afford to have any loss of function for any period of time.

Flooding produces widespread direct and indirect dangers to large segments of the community including damage or potential damage to critical infrastructure such as roads and stormwater drainage systems. Therefore, a project reducing or preventing stormwater accumulation and flooding would receive eight (8) points under this criterion.

Secondary critical facilities are defined as, "Facilities that will be critical for community recovery and restoration of services." Projects that help protect these types of facilities will be awarded six (6) points.

Public convenience facilities are quality of life facilities such as parks, recreation areas, and non-essential public buildings. Projects protecting these types of public property will be awarded four (4) points under this criterion.

Residential structures are defined as private homes. Projects protecting these types of property will be awarded two (2) points under this criterion.

Project Benefit	Points Awarded (maximum of 10)
Primary Critical Facilities	10
Stormwater/flooding	8
Secondary critical facilities	6
Public Convenience facilities	4
Residential Structures	2
No Benefit	0

4.2.1.3 Community Exposure

Does the project mitigate a frequently occurring problem or a problem to which a community is particularly vulnerable?

This criterion attempts to balance the actual risk of a specific disaster versus the community's exposure in terms of life and property damage. For example, a nuclear power plant meltdown would be catastrophic, but the frequency with which meltdowns occur is unknown in the U.S. and optimistically extremely low. Therefore, a project proposing to mitigate for possible nuclear power plant meltdown by providing lead-lined emergency shelters would score lower than a project that mitigates for a more frequent, but less catastrophic, type of disaster such as the flooding of a library.

Data for this evaluation will come from the HVA portion of the LMS project and will be community-specific. For example, communities on the coastline experience thunderstorms, lightning, and frequent localized short-term flooding but loss of life and property damage are relatively low. Some specific communities (e.g. mobile home parks or areas with existing drainage problems) have higher exposure to the effects of thunderstorm hazards. The coastline has high exposure to damage from tropical storms and hurricanes. Category 1 and 2 hurricanes occur with relatively higher frequency than Category 3, 4, and 5 hurricanes. All of these factors must be considered when evaluating the projects.

Frequency is determined as:

Low – One time per year
Medium – 1 to 2 times per year
High – At least 3 times per year

Specific guidelines for assigning points under this evaluation criterion are as follows:

Community Exposure # of People or $ Value of Property	Frequency or Risk of Occurrence	Points Awarded (maximum of 10)
High	High	10 Points
Moderate	High	8 Points
Low	High	6 Points
High	Moderate	9 Points
Moderate	Moderate	7 Points
Low	Moderate	4 Points
High	Low	5 Points
Moderate	Low	2 Points
Low	Low	1 Points

4.2.1.4 Cost Effectiveness

What is the benefit/cost ratio of the project applying the following Benefit/Cost Ratio (Analysis) formula:

(Loss Exposure ($) Before Project - Loss Exposure ($) After Project) ÷ Cost of the Project

FEMA requires all hazard mitigation projects to be cost-effective. While a positive Benefit/Cost Ratio, also called Benefit/Cost Analysis (Ratio), is a requirement for projects of $1,000,000, it should be a primary consideration in evaluating projects. For this reason, it is the single most highly valued component of the prioritization process.

Depending upon the complexity of the proposed project and the amount of funding required, the Benefit/Cost ratio may require engineering drawings and/or evaluation of alternatives. Such a detailed analysis is beyond the scope of the LMS and in most cases beyond FEMA

requirements. The formula above was developed to allow administrators to screen projects using a three (3) step process:

1. Screen the project by reviewing the application data.

2. Conduct a quick Benefit/Cost Ratio.

3. Continue processing the project if the Benefit/Cost Ratio is greater than one (1).

If the Benefit/Cost analysis is less than one (1), request additional information from the municipality/special district.

The higher the Benefit/Cost Ratio, the better return per dollar invested is achieved. Points under this criterion will be awarded as follows:

Benefit/Cost Ratio	Points (maximum of 20)
4.0 or greater	20 Points
3.0 to 3.9	16 Points
2.0 to 2.9	12 Points
1.0 to 1.9	8 Points
<1.0	0 Points

4.2.1.5 Area Benefit

How many people stand to benefit from the project implementation?

Area Benefit	Points (maximum of 5)
Multiple Jurisdictions	5 Points
Community	3 Points
Neighborhood	1 Point
No Benefit	0 Points

4.2.2 Project Implementation

4.2.2.1 Containment within the Existing Comprehensive Growth Mgmt Plan or Equivalent Plan?

Is the project or initiative consistent with or incorporated within the existing Comprehensive Growth Management Plan or equivalent document?

Contained Within the Existing Comprehensive Growth Management or Equivalent Plan	Points (maximum of 10)
Contained within a specific Policy/Plan	10 Points
Contained in "Goal" with proposed Policy/Plan amendment	8 Points
Contained within a broad "Goal"	5 Points
Contained in a proposed Amendment	3 Points
Not in conflict with any plan	1 Point
No Plan	0 Points

4.2.2.2 Contained Within an Existing Emergency Management Plan / Other Functional Plan Developed by an Official Local Governmental Entity / Organization

Has this project or initiative already been proposed as a management initiative or structural improvement in any emergency plan or proposed or adopted by County/local jurisdictions or entity?

This applies to both officially adopted plans and plans or amendments to plans that have been proposed but not yet officially adopted. One of the objectives of the LMS is to encourage local governments to officially adopt mitigation measures into their Comprehensive and Emergency Management Plans. If a community wants to improve the score of a proposed project or initiative, it can propose an amendment to its CGMP or CEMP containing the measure.

Contained within an Existing Emergency Management Plan (or other functional plan)	Points (maximum of 20)
Officially adopted	10 Points
Proposed/Not officially adopted	6 Points
Not in conflict with any plan	2 Points
No Plan	0 Points

4.2.2.3 Consistency with Existing Regulatory Framework

Is the project consistent with existing legal, regulatory, and environmental/cultural framework?

Does the proposed project require changes or waivers to existing building, zoning, or environmental statutes or ordinances? Projects that are consistent with existing legal and regulatory frameworks will receive five (5) points. Projects that are in conflict with some aspect of the existing regulatory framework will receive fewer points depending upon the seriousness and number of regulatory barriers in implementing the proposed project.

Consistency with Regulatory Framework	Points (maximum of 5)
No regulatory issues	5 Points
Local issues	4 Points
Regional issues	3 Points
State issues	2 Points
Federal issues	1 Point
No Consistency	0 Points

4.2.3 Community Commitment

4.2.3.1 Public Support

Is there demonstrated public support for this project or recognition of this problem?

Public Support is determined as follows:

Public Support	Points (maximum of 5)
Has this project or problem been the subject of:	
A) An Advertised Public Meeting	3 Points
B) Written evidence of public support	2 Points
Both A) and B)	5 Points
No evidence of public support	0 Points

Sub-section B can be letters from affected citizens, minutes from a public meeting addressing the concern by stakeholders, etc.

4.2.3.2 Funding Availability

Is there a funding source currently available for this particular project?

Funding Availability	Points (maximum of 10)
Funds available now	10 Points
Available in 1 year	8 Points
Available in 2 years	6 Points
Available in 3 years	4 Points

Available in 4 years	2 Points
Available in 5 years	1 Point
5+ years	0 Points

4.2.3.3 Matching Funds

Are matching funds or in-kind services available for this project?

Matching Funds/In-Kind Services	Points (maximum of 5)
Match of 50% or more	5 Points
40 to 49%	4 Points
30 to 39 %	3 Points
20 to 29 %	2 Points
1 to 20 %	1 Point
0%	0 Points

4.2.3.4 Timeframe for Accomplishing Objectives

How long will it take for the proposed mitigation project to accomplish its stated goals?

Projects that can be accomplished quickly have an inherent advantage over long-term projects, although long-term projects may ultimately be more beneficial to the community. The following weighted scale assigns points to proposed projects based on the length of time that will be required before a community begins to receive benefits from the project.

Timeframe for Accomplishing Objectives	Points (maximum of 5)
1 Year	5 Points
2 Years	4 Points
3 Years	3 Points
4 Years	2 Points
5 Years	1 Point
5+ Years	0 Points

In order for the LMS Evaluation Panel to score adequately and in a meaningful time frame, it is critical that municipalities/special districts provide as much of the critical information required when submitting their projects. Appendix I contains examples demonstrating the scoring process and ranking of the projects.

4.3 Tie-Break Procedure

Should projects receive the same scores, the following four (4) questions will be applied to break the tie.

When ties are broken, projects will be ranked and are not subject to the remaining questions. Ties will continue through the questions until broken.

Question #1: Which project has the highest Benefit/Cost Ratio?

Question #2: Which project has the highest Community Benefit score?

Question #3: Which project has the highest Community Commitment score?

Question #4: Which project mitigates for the most frequently occurring hazard?

4.4 LMS Evaluation Panel

The LMS Evaluation Panel is responsible for reviewing and scoring proposed projects submitted to the LMS as a basis for prioritization. Panelists are solicited by the LMS Coordinator on behalf of the LMS Steering Committee based upon LMS member recommendations and are subject to approval by the LMS Steering Committee. Volunteers are also eligible for consideration.

Candidates should possess a technical and administrative understanding of the LMS and its goals and objectives. In addition, candidates are expected to exercise objectivity and independent judgment in their evaluations and scoring. LMS Evaluation Panel members will notify the LMS Coordinator and recuse themselves from evaluating any projects submitted by their own agency or any agency they may have been employed by in the past. This is to eliminate any potential conflict of interest or bias. An alternate evaluator, usually the LMS Coordinator or DEM Planning Manager, will evaluate those projects on a case-by-case basis.

4.5 Eligibility for Federal Funding

In order to be deemed eligible for federal monies projects must:

- Produce a Benefit/Cost Ratio greater than one (1), and
- Meet additional program requirements, including being judged to be "environmentally sound" and "technically feasible."

Federal funding may require additional applications or supporting documents which will be requested based upon each individual federal program.

The LMS Coordinator from the County's Division of Emergency Management staff serves on the LMS Evaluation Panel. They will serve as an alternate evaluator for potential conflicts as well as in the place of any primary evaluator who may be sick or unavailable for scoring during an evaluation period. Also, any employee of the Division of Emergency Management may be called upon to act as an alternate evaluator if one is not available at the time of project scoring or if multiple primary evaluators have conflicts on a project.

4.6 Project Prioritization Updating Process

Each year after the Spring and Fall Submission/Evaluation periods, the existing countywide PPL will be updated. The approved PPL will be in effect until a new PPL has been adopted by the PBC LMS Steering Committee.

PPL Procedure	
STEP 1	The County's LMS Coordinator will activate the update process by notifying all LMS members of the beginning and ending dates for the submission period and by notifying all LMS Evaluation Panel members that the PPL ranking process is being initiated along with deadlines for submission and the evaluation timeframe. The notification will include instructions on the location of project submission forms in the DEM electronic LMS project tracking system and provided with a guidance document explaining each requested item on the submission form. All applicants must submit their proposed projects/initiatives by the submission deadline in order for their projects to be considered for inclusion in the updated PPL. Additionally, LMS members will be asked to review the current PPL and notify the LMS Coordinator of any projects that have been initiated or completed. All projects must be submitted electronically by the published deadline in the original notification. For a project/initiative to be considered, online forms must be completed thoroughly. The contact person and phone number on the online proposal will serve as the official point-of-contact for the application. As Federal grants are primarily awarded to governmental and private non-profits, a private citizen cannot be an applicant for these funds. With a viable and eligible project, a private citizen can request sponsorship from their jurisdiction, but must remain a subapplicant, with the jurisdiction being the applicant and retaining responsibility for all required documentation. Projects expire after five (5) years if not funded, initiated, or completed. Municipalities/special districts will be notified, via email, of expiring

	projects and asked to resubmit in the next submission period. Expired projects will be removed from the PPL and noted on the PPL Changes.
STEP 2	Once the proposals have been received, the LMS Coordinator will review each proposal for completeness and notify the LMS Evaluation Panel of which project submission are not complete. The Evaluation Panel will decide whether to score or reject the project. The LMS Coordinator will notify the submitting party, via email, that their project was rejected by the Evaluation Panel as incomplete and will not be eligible for inclusion on the PPL during this cycle and encourage them to resubmit during the next submission/evaluation period.
STEP 3	The LMS Coordinator will notify LMS Evaluation Panel members that all projects are ready to be scored.
STEP 4	Each LMS Evaluation Panel member will score the proposals and notify the LMS Coordinator, via email, when completed no later than the last day of the period. In the unlikely event that the online platform malfunctions or will not accept the evaluator's scores, a paper form will be used to complete the scoring process and emailed to the LMS Coordinator.
STEP 5	The LMS Coordinator will check the average attribute scores for each project. A comprehensive spreadsheet will be provided to the Evaluation Panel at their scheduled meeting.
STEP 6	The LMS Evaluation Panel Meeting is open to the public. Proposers may attend but will not be allowed to present or provide additional information or documentation.
STEP 7	The LMS Evaluation Panel will hold a meeting to review/finalize all scores and create the Draft PPL. A quorum of the Evaluation Panel must be present during the meeting. Panel members will discuss possible inaccuracies and/or reliability of information used by proposers, such as obsolete cost data, questions regarding project feasibility, and project tie-breakers (see Tie-Break Procedure). Before the meeting concludes, a vote will be conducted to approve the "new" Draft PPL. DEM staff will provide a copy of the approved Draft PPL to the LMS Steering Committee for approval.

STEP 8	DEM staff will schedule a meeting of the LMS Steering Committee. One (1) week in advance of the scheduled meeting, the "new" Draft PPL will be distributed to the LMS Steering Committee membership.
STEP 9	At the scheduled LMS Steering Committee meeting, the Draft PPL will be presented. Project applications received after the submission deadline, but before the next project prioritization updating process, may be accepted by the LMS Steering Committee as UNRANKED projects. Prior to the PPL adoption vote, such projects will be presented for consideration. The LMS Steering Committee may vote to include any or all of these projects on the draft PPL as "unranked". Unranked projects will be listed on the PPL under the sub-heading of Unranked Projects which will appear immediately following the list of ranked projects. Unranked projects will automatically be ranked in the next ranking cycle. Following discussion of the Draft PPL, the LMS Steering Committee will adopt as submitted or with modifications. Specific justification is required for any modification to the ranking of the projects as submitted by the LMS Evaluation Panel, excluded are unranked projects.
STEP 10	DEM staff will distribute copies of the new revised PPL to all appropriate entities.

4.7 Conflict Resolution Procedures

4.7.1 Background

With multiple local governments involved in the development of the PBC LMS, differences of opinions may arise over the course of the program with regard to goals, objectives, policies, and projects. In cases where an impasse occurs, a procedure is needed that can be activated to resolve such conflicts. This section describes the procedure that will be used to resolve conflicts arising among the participating governmental entities in the development and implementation of the PBC LMS.

The two types of conflicts that may arise are issues and disputes. Issues are technical problems that are susceptible to informal resolution by DEM staff. Disputes are problems that require formal resolution by neutral third parties. In either case, resolution and settlement are best settled through mutually agreed-upon understanding between the disputing parties. When that is not possible, some form of binding resolution is needed.

A Conflict Resolution Sub-Committee will be activated and comprised of three (3) people:

- One (1) member will be appointed by the LMS Steering Committee Chair
- One (1) member will be appointed by the DEM Director from the PBC DEM
- One (1) member of the LMS Steering Committee mutually selected by the LMS Steering Committee Chair and the Director of DEM.

No Conflict Resolution Sub-Committee member can be involved professionally or personally with the dispute or disputing parties.

Once the Sub-Committee has been activated, DEM will serve as the lead agency and will prepare a memorandum outlining the dispute, include supporting documentation, and schedule the Sub-Committee meeting.

If no resolution could be reached, the issue would then be heard by the entire LMS Steering Committee. The vote of the LMS Steering Committee would be binding. Other DEM staff shall provide support to the committee.

4.7.2 Procedure

The following provides a detailed, step-by-step procedure that would be followed should a dispute arise under the LMS.

Objective To institute a fair, effective, and efficient process to resolve conflicts among local governments during the development and implementation of the LMS.

During the development or implementation of the LMS, a local government(s) may reach an impasse on a particular issue or position. The local government has an opportunity to exercise the following LMS Conflict Resolution Procedure.

Dispute Initiation	
STEP 1	The local government submits a letter of dispute (LOD) to the DEM Director explaining in as much detail as possible, describing their concern and position along with documentation to support their position. Also, they should offer alternative solutions.
STEP 2	DEM Director reviews the LOD ensuring the position of the local government(s) and sufficient information supporting their position has been provided. If the DEM Director determines that additional information is needed, a written request for clarifying information will be sent to the disputing party.

Conflict Resolution Sub-Committee Activation	
STEP 3	Within seven (7) days of the LOD completeness determination, the LMS Coordinator will notify and arrange a virtual or in-person meeting of the LMS Steering Committee Chair and DEM Director to select individuals to serve on the LMS Conflict Resolution Sub-Committee. Only voting members of the LMS Steering Committee are eligible to serve on the Sub-Committee. Before the selection process is completed, a verification of willingness to serve will have been determined.
STEP 4	Within one (1) day of the Sub-Committee selection, (see STEP 3), the LMS Coordinator will email each Sub-Committee member confirming their appointment. The email will include the LOD and all submitted supporting documentation.
STEP 5	The LMS Coordinator will schedule the meeting within two (2) calendar weeks from the date the LOD was determined to be complete.
Conflict Resolution Sub-Committee Meeting Proceedings	
STEP 6	During the Conflict Resolution meeting, DEM will provide staff to document the proceedings. Every effort on the part of the two parties will attempt to resolve the impasse at the meeting.
STEP 7	If resolution is achieved, the LMS Coordinator will prepare a memorandum documenting the issue and the mutually agreed upon resolution. The memorandum will contain three (3) signature blocks; one (1) for the Chair of the Sub-Committee and two (2) for the representatives of the disputing parties. By their signature, all parties will formally agree to the mediated result. A copy will be provided to each party with an additional copy filed at the DEM.
If resolution is still not achieved, the process will move to STEP 8.	
LMS Steering Committee Conflict Resolution Proceedings	
STEP 8	If no resolution is achieved at the meeting, the Sub-Committee will develop an alternative proposal which will be presented to the disputing party within seven (7) days following the conclusion of the Conflict Resolution meeting.

STEP 9	If the dispute cannot be resolved through the Sub-Committee, the LMS Coordinator will schedule a meeting with the entire LMS Steering Committee membership within two (2) weeks. Each LMS Steering Committee member will be sent a copy of the LOD and any supportive materials provided by the disputing party. The disputing party will be notified of the meeting date and time.
STEP 10	During the meeting of the LMS Steering Committee, each disputing party representative will present their positions. The Conflict Resolution Sub-Committee present the Conflict Resolution Sub-Committee proceedings. If no mutually acceptable resolution is agreed upon, the LMS Steering Committee will vote to accept one (1) solution from among the offered solutions or develop their own solution. The determination of the LMS Steering Committee will be final.

The LMS Coordinator will craft a Memorandum of Understanding detailing the outcome of the meeting that will be signed by the LMS Steering Committee Chair. Thereafter, a disputing party can exercise the legal remedy of going to court.

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ACRONYMS

BCC	Board of County Commissioners
C-MAN	Coastal-Marine Automated Network
CDC	Centers for Disease Control
CEI	Climate Extremes Index
CEMP	Comprehensive Emergency Management Plan
CERT	Community Emergency Response Team
CI	Cost of Improvement
CISA	Cybersecurity & Infrastructure Security Agency
COOP	Continuity of Operations
CRS	Community Rating System
DEM	Palm Beach County Division of Emergency Management
EDMIS	Economic Disaster Management Information Systems
EM	Emergency Management
EOC	Emergency Operations Center
ERM	Environmental Resource Management
ESF	Emergency Support Function
FBI	Federal Bureau of Investigation
FDACS	Florida Department of Agriculture and Consumer Services
FDEM	Florida Division of Emergency Management
FDEP	Florida Department of Environmental Protection
FEMA	Federal Emergency Management Agency
FFS	Florida Forest Service
FIRM	Flood Insurance Rate Maps
FMAP	Flood Mitigation Assistance Program
FWC	Florida Fish & Wildlife Conservation Commission
GCRI	Greenhouse Climate Response Index
GIS	Geographic Information System
HAB	Harmful Algal Bloom
HAB FB	Harmful Algal Bloom Forecasting Branch
HFT	Hydronucleation Flotation Technology
HHD	Herbert Hoover Dike
HLB	Huanglongbing disease
HMGP	Hazard Mitigation Grant Program
IPZ	Ingestion Pathway Zone
LMS	Local Mitigation Strategy
LDR	Local Development Regulations
LEPC	Local Emergency Planning Committee
LOD	Letter of Dispute
MAT	Mitigation Assessment Team
MPO	Metropolitan Planning Organization
NCCOS	National Centers for Coastal Ocean Science
NFIP	National Flood Insurance Program
NGO	Non-Governmental Organization
NGVD	National Geodetic Vertical Datum
NOAA	National Oceanic Atmospheric Administration
MV	Market Value of Existing Structure
NRI	National Risk Index
NWS	National Weather Service

PAPA	Property Appraisers Database
PBI	Palm Beach International Airport
PCCIP	President's Commission on Critical Infrastructure Protection
PPL	Project Prioritization List
PZ&B	Department of Planning, Zoning, & Building
RLP	Repetitive Loss Property
RNG	Renewable Natural Gas
SARS	Severe Acute Respiratory Syndrome
SD	Substantial Damage
SFHA	Special Flood Hazard Area
SFWMD	South Florida Water Management District
SHMP	State Hazard Mitigation Plan
SI	Substantial Improvement
SLR	Sea Level Rise
SRLP	Severe Repetitive Loss Property
STP	Sand Transfer Plant
TAOS	The Arbiter of Storms
TCRPC	Treasure Coast Regional Planning Council
USACE	US Army Corps of Engineers
USGA	US Geological Survey
VA	Vulnerability Assessment
WMD	Weapons of Mass Destruction
WFO	NWS Weather Forecast Office

APPENDIX A -K

Palm Beach County Local Mitigation Strategy Hazard Identification and Risk Assessment/Consequence Analysis 2021 for LMS2024

Contents

Appendix A: Introduction

The risk and vulnerability data presented in this Appendix addresses, in part, the following FEMA requirements:

> **RISK ASSESSMENT: §201.6(c)(2):** The plan must include a risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.
>
> **Requirement §201.6(c)(2)(iii):** For multi-jurisdictional plans, the risk assessment must assess each jurisdiction's risks where they vary from the risks facing the entire planning area.
>
> **Requirement §201.6(c)(2)(i):** The risk assessment shall include a description of the type, location, and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.
>
> **Requirement §201.6(c)(2)(ii):** The risk assessment must include a description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description must include an overall summary of each hazard and its impact on the community.

The Palm Beach Hazard Identification and Risk Assessment covers the following 24 hazards:

Natural	Technological	Human-Caused
Floods	Dam/Dike Failure	Civil Disturbances
Hurricane/Tropical Storms	Hazardous Materials Accident	Domestic Security
Severe Thunderstorm/Lightning	Radiological Incidents (Nuclear Power Plant)	Cybersecurity
Sea Level Rise	Communication Failures	Workplace/School Violence
Soil/Beach Erosion	Transportation System Accidents	Harmful Algal Bloom
Tornadoes	Wellfield Contaminations	Mass Migration
Wildfires/Urban Interface Zone	Power Failure (Outages)	
Pandemic/Communicable Diseases		
Drought		
Agricultural Pests & Diseases		
Muck Fires		
Seismic Hazards		
Geologic Hazards		
Extreme Temperatures		

Methodology for Hazard Identification and Risk Assessment

Hazards for local municipalities in Palm Beach County were assessed using the following considerations:

Probability	How often a known hazard produces an impact within the community?
Vulnerability	How quickly the municipality can recover from the results of the hazard?
Exposure	What is extent the hazard impacts life, property, and community resources?
Overall Risk	What is the overall risk for the hazard?

The following definitions were used:

Very Low	Event probability rarely ever occurs and there is zero to minimal impact from the hazard (less than 5%).
Low	Event probability occurs greater than every 11 years and there is not likely to have any measurable or lasting impact from the hazard (5%).
Medium	Event probability occurs approximately every two to ten years and there is a likelihood (between 5 to 14%) the hazard will have short-term to foreseeable impacts.
High	Event probability occurs annually and there is a strong likelihood (15% or more) the hazard will have lasting impacts on the community.

This assessment yielded an overall risk rating for each individual hazard. While Unincorporated Palm Beach County is considered all that is not incorporated as a municipality for the purpose of this assessment, it accounts for the entirety of the county.

Hazard Identification and Risk Assessment for Municipal Governments (Natural Hazards)

Table A-1: Flooding

2024 Local Mitigation Strategy Section 2.1.1

Hazard Assessment H: High M: Medium L: Low V: Very Low	Unincorporated County	MUNICIPALITIES																																										
		Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach				
Probability	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H				
Vulnerability	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H				
Exposure	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H				
Overall Risk	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H				

Table A-2: Hurricanes/Tropical Storms
2024 Local Mitigation Strategy 2.1.2

Hazard Assessment H: High M: Medium L: Low V: Very Low	MUNICIPALITIES																																							
	Unincorporated County	Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
Vulnerability	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
Exposure	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
Overall Risk	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H

Table A-3: Severe Thunderstorms/Lightning
2024 Local Mitigation Strategy Section 2.1.3

Hazard Assessment H: High M: Medium L: Low V: Very Low	MUNICIPALITIES																																							
	Unincorporated County	Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
Vulnerability	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Exposure	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Overall Risk	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M

Table A-4: Sea Level Rise
2024 Local Mitigation Strategy Section 2.1.4

Hazard Assessment H: High M: Medium L: Low V: Very Low	Unincorporated County	MUNICIPALITIES																																						
		Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	M	V	V	H	H	H	V	H	V	V	V	H	V	H	H	H	H	H	V	H	H	H	V	H	V	H	H	V	H	L	H	V	H	V	V	H	H	V	V	H
Vulnerability	M	V	V	H	H	H	V	H	V	V	V	H	V	H	H	H	H	H	V	H	H	H	V	H	V	H	H	V	H	L	H	V	H	V	V	H	H	V	V	H
Exposure	M	V	V	M	M	M	V	M	V	V	V	M	V	M	M	M	M	M	V	M	M	M	V	M	V	M	M	V	M	L	M	V	M	V	V	M	M	V	V	M
Overall Risk	M	V	V	H	H	H	V	H	V	V	V	H	V	H	H	H	H	H	V	H	H	H	V	H	V	H	H	V	H	L	H	V	H	V	V	H	H	V	V	H

Table A-5: Soil/Beach Erosion
2024 Local Mitigation Strategy Section 2.1.5

Hazard Assessment H: High M: Medium L: Low V: Very Low	Unincorporated County	MUNICIPALITIES																																						
		Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	M	V	V	H	H	H	V	H	V	V	V	H	V	H	M	H	H	H	V	M	H	H	V	M	V	H	H	V	H	L	H	V	H	V	V	H	H	V	V	M
Vulnerability	M	V	V	H	H	H	V	H	V	V	V	H	V	H	M	H	H	H	V	M	H	H	V	M	V	H	H	V	H	L	H	V	H	V	V	H	H	V	V	M
Exposure	M	V	V	M	M	M	V	M	V	V	V	M	V	M	M	M	M	M	V	M	M	M	V	M	V	M	M	V	M	L	M	V	M	V	V	M	M	V	V	M
Overall Risk	M	V	V	H	H	H	V	H	V	V	V	H	V	H	M	H	H	H	V	M	H	H	V	M	V	H	H	V	H	L	H	V	H	V	V	H	H	V	V	M

Table A-6: Tornadoes
2024 Local Mitigation Strategy Section 2.1.6

Hazard Assessment H: High M: Medium L: Low V: Very Low	MUNICIPALITIES																																								
	Unincorporated County	Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Vulnerability	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Exposure	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Overall Risk	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L

Table A-7: Wildfires/Urban Interface
2024 Local Mitigation Strategy 2.1.7

Hazard Assessment H: High M: Medium L: Low V: Very Low	Unincorporated County	MUNICIPALITIES																																						
		Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clark Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	H	L	H	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	L	L	L	L	H	L	L	L	L	L	L	H	L	L	H	L	L
Vulnerability	H	L	H	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	L	L	L	L	H	L	L	L	L	L	L	H	L	L	H	L	L
Exposure	H	L	H	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	L	L	L	L	H	L	L	L	L	L	L	H	L	L	H	L	L
Overall Risk	H	L	H	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	L	L	L	L	H	L	L	L	L	L	L	H	L	L	H	L	L

Table A-8: Pandemic/Communicable Diseases
2024 Local Mitigation Strategy Section 2.1.8

Hazard Assessment H: High M: Medium L: Low V: Very Low	Unincorporated County	MUNICIPALITIES																																						
		Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Vulnerability	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Exposure	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Overall Risk	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M

Table A-9: Drought
2024 Local Mitigation Strategy Section 2.1.9

Hazard Assessment H: High M: Medium L: Low V: Very Low	Unincorporated County	MUNICIPALITIES																																						
		Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	M	L	M	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	M	L	L	L	L	L	L	M	L	L	L	L	L
Vulnerability	H	L	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	L	L	L	L	L	L	H	L	L	L	L	M
Exposure	H	L	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	L	L	L	L	L	L	H	L	L	L	L	M
Overall Risk	H	L	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	L	L	L	L	L	L	H	L	L	L	L	M

Table A-10: Agricultural Pests and Diseases
2024 Local Mitigation Strategy Section 2.1.10

Hazard Assessment H: High M: Medium L: Low V: Very Low	MUNICIPALITIES																																								
	Unincorporated County	Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	M	L	M	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	M	L	L	L	L	L	L	M	L	L	L	L	L
Vulnerability	M	L	M	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	M	L	L	L	L	L	L	M	L	L	L	L	L
Exposure	M	L	M	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	M	L	L	L	L	L	L	M	L	L	L	L	L
Overall Risk	M	L	M	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	M	L	L	L	L	L	L	M	L	L	L	L	L

Table A-11 Muck Fires
2024 Local Mitigation Strategy Section 2.1.11

Hazard Assessment H: High M: Medium L: Low V: Very Low	Unincorporated County	MUNICIPALITIES																																						
		Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Vulnerability	M	L	M	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	M	L	L	L	L	L
Exposure	M	L	M	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	M	L	L	L	L	L
Overall Risk	M	L	M	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	M	L	L	L	L	L

Table A-12: Seismic Hazards – Tsunamis and Earthquakes
2024 Local Mitigation Strategy Section 2.1.12

Hazard Assessment H: High M: Medium L: Low V: Very Low	MUNICIPALITIES																																								
	Unincorporated County	Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
Vulnerability	M	V	V	H	H	H	V	H	V	V	V	H	V	H	H	H	H	H	M	H	H	H	V	H	M	H	H	V	H	M	H	V	H	V	V	H	H	V	V	H
Exposure	M	V	V	H	H	H	V	H	V	V	V	H	V	H	H	H	H	H	M	H	H	H	V	H	M	H	H	V	H	M	H	V	H	V	V	H	H	V	V	H
Overall Risk	L	V	V	L	L	L	V	L	V	V	V	L	V	L	L	L	L	L	L	L	L	L	V	L	L	L	L	V	L	L	L	V	L	V	V	L	L	V	V	L

Table A-13: Geologic Hazards – Sinkholes and Subsidence
2024 Local Mitigation Strategy 2.1.13

Hazard Assessment H: High M: Medium L: Low V: Very Low	Unincorporated County	MUNICIPALITIES																																						
		Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
Vulnerability	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
Exposure	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
Overall Risk	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V

Table A-14: Extreme Temperatures

2024 Local Mitigation Strategy Section 2.1.14

Freezing Temperatures

Hazard Assessment H: High M: Medium L: Low V: Very Low	Unincorporated County	MUNICIPALITIES																																										
		Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glenn Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach				
Probability	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L				
Vulnerability	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L				
Exposure	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L				
Overall Risk	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L				

Extreme Heat

Hazard Assessment H: High M: Medium L: Low V: Very Low	Unincorporated County	MUNICIPALITIES																																											
		Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glenn Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach				
Probability	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H				
Vulnerability	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H				
Exposure	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M				
Overall Risk	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M				

Hazard Identification and Risk Assessment for Municipal Governments (Technological Hazards)

Table A-15: Dam/Dike Failures (Herbert Hoover Dike)

2024 Local Mitigation Strategy Section 2.2.1

Hazard Assessment H: High M: Medium L: Low V: Very Low	Unincorporated County	MUNICIPALITIES																																									
		Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach			
Probability	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L			
Vulnerability	M	L	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	L	L	L	L	L	M	H	L	L	M	L	L			
Exposure	M	L	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	L	L	L	L	L	M	H	L	L	M	L	L			
Overall Risk	M	L	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	L	L	L	L	L	M	H	L	L	M	L	L			

Table A-16: Hazardous Materials Accidents
2024 Local Mitigation Strategy Section 2.2.2

Hazard Assessment H: High M: Medium L: Low V: Very Low	MUNICIPALITIES																																							
	Unincorporated County	Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Vulnerability	M	M	M	H	H	M	M	H	M	M	M	M	M	M	H	M	H	M	M	H	H	H	M	M	M	M	M	M	M	H	M	M	H	M	M	M	H	M	M	H
Exposure	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Overall Risk	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M

Table A-17: Radiological Incidents (Nuclear Power Plant Accidents)
2024 Local Mitigation Strategy 2.2.3

Hazard Assessment H: High M: Medium L: Low V: Very Low	MUNICIPALITIES																																						
	Unincorporated County	Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
Vulnerability	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Exposure	M	L	L	L	L	L	L	L	L	L	L	L	M	L	L	M	M	M	M	L	M	L	L	L	L	M	L	L	M	M	M	L	M	L	L	L	L	L	M
Overall Risk	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L

Table A-18: Communication Failures
2024 Local Mitigation Strategy Section 2.2.4

Hazard Assessment H: High M: Medium L: Low V: Very Low	Unincorporated County	MUNICIPALITIES																																						
		Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Vulnerability	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Exposure	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Overall Risk	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M

Table A-19: Transportation System Accidents
2024 Local Mitigation Strategy Section 2.2.5

Hazard Assessment H: High M: Medium L: Low V: Very Low	Unincorporated County	MUNICIPALITIES																																						
		Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Vulnerability	M	L	M	M	M	L	L	M	M	L	L	L	M	L	M	L	M	L	L	M	M	M	M	L	M	L	L	M	L	M	L	L	M	L	M	L	M	L	M	M
Exposure	M	L	M	M	M	L	L	M	M	L	L	L	M	L	M	L	M	L	L	M	M	M	M	L	M	L	L	M	L	M	L	L	M	L	M	L	M	L	M	M
Overall Risk	M	L	M	M	M	L	L	M	M	L	L	L	M	L	M	L	M	L	L	M	M	M	M	L	M	L	L	M	L	M	L	L	M	L	M	L	M	L	M	M

Table A-20: Wellfield Contaminations
2024 Local Mitigation Strategy Section 2.2.6

Hazard Assessment H: High M: Medium L: Low V: Very Low	Unincorporated County	MUNICIPALITIES																																						
		Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	M	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Vulnerability	M	L	L	M	M	L	L	M	L	L	L	M	L	L	L	L	M	L	L	M	L	L	M	L	M	L	L	L	L	M	L	L	L	L	L	L	M	M	M
Exposure	M	L	L	M	M	L	L	M	L	L	L	M	L	L	L	L	M	L	L	M	L	L	M	L	M	L	L	L	L	M	L	L	L	L	L	L	M	M	M
Overall Risk	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L

Table A-21: Power Failure (Outages)
2024 Local Mitigation Strategy Section 2.2.7

Hazard Assessment H: High M: Medium L: Low V: Very Low	MUNICIPALITIES																																							
	Unincorporated County	Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Vulnerability	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Exposure	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Overall Risk	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M

Hazard Identification and Risk Assessment for Municipal Governments (Human-Caused Hazards)

Table A-22: Civil Disturbances

2024 Local Mitigation Strategy Section 2.3.1

Hazard Assessment H: High M: Medium L: Low V: Very Low	MUNICIPALITIES																																								
	Unincorporated County	Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	L	L	L	L	M	L	L	M	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	M	L	L	L	M	L	L	L	L	L	L	M
Vulnerability	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Exposure	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Overall Risk	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L

Table A-23: Domestic Security (Terrorism/Sabotage)
2024 Local Mitigation Strategy Section 2.3.2

Hazard Assessment H: High M: Medium L: Low V: Very Low	MUNICIPALITIES																																							
	Unincorporated County	Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	M	L	L	L	L	L	L	L	L	L	L	L
Vulnerability	M	L	M	M	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	M	M	M	L	L	M	L	M	L	L	L	L	M
Exposure	M	L	M	M	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	M	M	M	L	L	M	L	M	L	L	L	L	M
Overall Risk	M	L	M	M	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	M	M	M	L	L	M	L	M	L	L	L	L	M

Table A-24: Cybersecurity
2024 Local Mitigation Strategy Section 2.3.2

Hazard Assessment H: High M: Medium L: Low V: Very Low	Unincorporated County	MUNICIPALITIES																																						
		Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Vulnerability	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
Exposure	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Overall Risk	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M

Table A-25: Workplace/School Violence (Active Assailant)
2024 Local Mitigation Strategy Section 2.3.3

Hazard Assessment H: High M: Medium L: Low V: Very Low	Unincorporated County	MUNICIPALITIES																																						
		Atlantis	Belle Glade	Boca Raton	Boynton Beach	Briny Breezes	Cloud Lake	Delray Beach	Glen Ridge	Golf	Greenacres	Gulf Stream	Haverhill	Highland Beach	Hypoluxo	Juno Beach	Jupiter	Jupiter Inlet Colony	Lake Clarke Shores	Lake Park	Lake Worth Beach	Lantana	Loxahatchee Groves	Manalapan	Mangonia Park	North Palm Beach	Ocean Ridge	Pahokee	Palm Beach	Palm Beach Gardens	Palm Beach Shores	Palm Springs	Riviera Beach	Royal Palm Beach	South Bay	South Palm Beach	Tequesta	Wellington	Westlake	West Palm Beach
Probability	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Vulnerability	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Exposure	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Overall Risk	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M

Methodology for Hazard Identification and Risk Assessment for Palm Beach County

Based on the probability, vulnerability, and exposure of all possible hazards that could impact Palm Beach County's municipalities in tables A-1 through A-24, an analysis was made to determine the risk these hazards pose. This next section will determine the risk to the entire county and its operations.

The following scale was used to assess the risk potential to people, property, environment, and government operations:

Low:
A hazard with a "low" risk rating indicates that it is not likely to have any measurable or lasting impact. The hazard will easily be managed with local resources and not be considered a threat to the whole community.

1. People: The damage level to life is minimal (i.e., deaths and injuries) or there are no reported deaths and/or injuries.
2. Property: Damage to property is minimal or non-existent.
3. Environment: No damage was reported to the environment and/or natural resources.
4. Government Operations: Local and county governments were not interrupted by the hazard or impacts required minimal state and/or federal government assistance.

Medium:
A hazard with a "medium" risk indicates that is has a 5 to 15% chance of occurring and could result in a "Major Disaster" as defined under the Robert T. Staff Disaster Relief and Emergency Assistance Act (42 U.S.C. 5122).

1. People: The damage to life is significant (i.e., deaths and injuries). Report numbers of victims meet the classification of a Mass Casualty Incident (MCI) Level 1 from the Mass Casualty/Mass Fatality Plan at a minimum[1].
2. Property: Reported damage to property is significant enough to warrant disaster assistance from the federal government under a Presidential Disaster Declaration[2].
3. Environment: Reported damage to the environment is significant enough to warrant disaster assistance from the federal government under a Presidential Disaster Declaration.
4. Government Operations: The economy and local and county government operations are partially or completely interrupted for some time by the disaster and results requires assistance from state or federal partnering agencies. Public confidence in the jurisdiction's governance is detrimentally impacted.

1 An MCI Level 1 is defined as an emergency involving 5-10 victims, 2 closest hospitals, and at least 1 Trauma Center.
2 In order for a Presidential Disaster Declaration to be made, the Florida Division of Emergency Management must determine the need for federal assistance by reporting a threshold of the loss of governmental properties and need for individual assistance through a Preliminary Damage Assessment.

High

The hazard with a "High" risk rating indicates that it has more than 15% chance of occurring and will likely cause a catastrophic disaster.

1. People: A disaster caused by the hazard produces a substantial number of deaths and/or injuries.
2. Property: The hazard will likely cause extreme damage or destruction to facilities that provide and sustain human needs (e.g., hospitals, schools).
3. Environment: The hazard will likely cause a major detrimental impact on the environment (e.g., severe erosion of beaches).
4. Government Operations: The hazard will likely cause an overwhelming demand on state and local response resources and mechanisms. Local and private sector capabilities will have difficulties starting or sustaining and delivering governmental and community services.

An overall high-risk rating indicates that the hazard has a probability of occurrence greater than 15% and is considered a significant threat to the community. Detrimental impacts from the hazard will require substantial time, resources, and/or outside assistance to rectify damages. More than likely, there will be long-term effects on the general economy, the private sector, and public confidence in the jurisdiction's governance.

Table A-26: Hazard Identification and Risk Assessment for <u>all of</u> Palm Beach County (Natural Hazards)

NATURAL HAZARDS					
HAZARDS	**PEOPLE:** Health and safety of residents, visitors, and responders	**PROPERTY:** Private/Public ownded, facilities, historical resources, and infrastructure	**ENVIRONMENT:** Natural Resources	**GOVERNMENT OPERATIONS:** Delivery of services, continuity of government/operations, economy, public confidence	**OVERALL RISK**
Flood	High	High	High	High	High
Hurricanes/Tropical Storms	High	High	High	Medium	High
Severe Thunderstorms/Lightning	Medium	Medium	Low	Low	Medium
Sea Level Rise	Low	High	High	Medium	Medium
Soil/Beach Erosion	Low	Medium	Medium	Low	Medium
Tornadoes	Medium	Medium	Low	Low	Medium
Wildfires/Urban Interface	Medium	Medium	High	Medium	Medium
Pandemic/Communicable Diseases	High	Low	Low	Medium	Medium
Drought	Low	Medium	Medium	Medium	Medium
Agricultural Pests and Diseases	Medium	Medium	Medium	Medium	Medium
Muck Fires	Low	Low	Low	Low	Low
Seismic Hazards	Low	Low	Low	Low	Low
Geologic Hazards	Low	Low	Low	Low	Low

Table A-27: Hazard Identification and Risk Assessment for all of Palm Beach County (Technological Hazards)

TECHNOLOGICAL HAZARDS					
HAZARDS	**PEOPLE:** Health and safety of residents, visitors, and responders	**PROPERTY:** Private/Public owned, facilities, historical resources, and infrastructure	**ENVIRONMENT:** Natural Resources	**GOVERNMENT OPERATIONS:** Delivery of services, continuity of government/operations, economy, public confidence	**OVERALL RISK**
Dam/Dike Failures	Medium	Medium	Medium	Low	Medium
Hazardous Materials Accidents	Medium	Medium	High	Low	Medium
Radiological Incidents	Medium	Low	High	Low	Medium
Communication Failures	Medium	Low	Low	Medium	Medium
Transportation System Accidents	Medium	Medium	Low	Low	Medium
Wellfield Contaminations	Medium	Medium	High	Low	Medium
Power Failure (Outages)	Medium	Low	Low	Medium	Medium

Table A-28: Hazard Identification and Risk Assessment for all of Palm Beach County (Human-Caused Hazards)

HUMAN-CAUSED HAZARDS					
HAZARDS	**PEOPLE:** Health and safety of residents, visitors, and responders	**PROPERTY:** Private/Public ownded, facilities, historical resources, and infrastructure	**ENVIRONMENT:** Natural Resources	**GOVERNMENT OPERATIONS:** Delivery of services, continuity of government/operations, economy, public confidence	**OVERALL RISK**
Civil Disturbances	Low	Low	Low	Low	Low
Domestic Security	Medium	Medium	Low	Low	Medium
Cybersecurity*	Low	Medium	Low	High	Medium
Workplace/School Violence	Medium	Medium	Low	Medium	Medium

*Included in Domestic Security

Methodology for Consequence Analysis for Palm Beach County

A consequence analysis was conducted to assess the potential of detrimental impacts from all natural, technological, and human-caused hazards in Palm Beach County. Consequences were measured against the following groupings:

1. Health and safety of residents
2. Health and safety of responders
3. Continuity of government
4. Property, facilities, and infrastructure
5. Delivery of critical services
6. Environmental impact
7. Economic and financial conditions
8. Regulatory and contractual obligations
9. County's reputation, impact and/or ability to attract public and commercial interests

The consequence rating of very low indicates that there would be little or no measure effects from the hazard. A consequence rating of "Low" for any hazard type means the hazard is not likely to have any measurable or lasting detrimental impact of a particular type and consequences will likely be rectified promptly with locally available resources. A consequence rating of "Medium" means there will likely be a measurable detrimental impact, which may require some time to rectify and may require outside resources and/or assistance. A consequence rating of "High" means the impact will likely be severe and of longer duration, and require substantial time, resources, and/or outside assistance to rectify.

A split box will be used if the hazard would have differing consequences between geographic locations in the county.

Table A-29: Consequence Analysis for Natural Hazards

Hazard	Health & Safety of Residents	Health & Safety of Responders	Continuity of Operations	Property, Facilities & Infrastructure	Historical Resources	Delivery of Services	Environment	Economic & Financial Conditions	Regulatory & Contractual Obligations	Reputation of County
Flood	Medium	Medium	Low	Medium	Medium	Medium	Medium	Medium	Low	Low
Hurricane Cat 1	Medium	Medium	Low	Medium	Medium	Medium	Medium	Medium	Low	Low
Hurricane Cat 2	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Low	Low
Hurricane Cat 3	Medium	Medium	Medium	Medium	Medium	Medium	High	Medium	Medium	Low
Hurricane Cat 4	High	High	High	High	High	High	High	High	High	Medium
Hurricane Cat 5	High	High	High	High	High	High	High	High	High	High
Tropical Storm	Medium	Medium	Low	Medium	Medium	Medium	Medium	Medium	Low	Low
Sea Level Rise	Low	Low	Low	Inland: Very Low / Coastal: Medium	Inland: Very Low / Coastal: Medium	Low	Inland: Very Low / Coastal: Medium	High	Low	High
Soil/Beach Erosion	Low	Low	Low	Inland: Very Low / Coastal: Medium	Low	Low	Inland: Very Low / Coastal: Medium	Inland: Very Low / Coastal: High	Low	Inland: Very Low / Coastal: Medium
Tornadoes	Low	Medium	Low	Low	Low	Low	Medium	Medium	Low	Low
Wildfire/Urban Interface Zone	Low	Medium	Low	Medium	Low	Low	Medium	Medium	Low	Low

Hazard	Health & Safety of Residents	Health & Safety of Responders	Continuity of Operations	Property, Facilities & Infrastructure	Historical Resources	Delivery of Services	Environment	Economic & Financial Conditions	Regulatory & Contractural Obligations	Reputation of County
Pandemic/ Communicable Diseases	Medium	Medium	High	Low	Low	Medium	Low	High	Low	High
Drought	Low	Low	Low	Low	Low	Low	Medium	High	Low	Low
Agricultural Pests and Diseases	Low	Low	Low	Low	Low	Low	Medium	High	Low	Low
Muck Fires	Low	Medium	Low	Medium	Low	Low	Medium	Medium	Low	Low
Seismic Hazards	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Geological Hazards	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Extreme Temperatures	Medium	Medium	Low	Low	Low	Low	Medium	Medium	Low	Low

Table A-30: Consequence Analysis for Technological Hazards

Hazard	Health & Safety of Residents		Health & Safety of Responders		Continuity of Operations		Property, Facilities & Infrastructure		Historical Resources		Delivery of Services		Environment		Economic & Financial Conditions		Regulatory & Contractural Obligations	Reputation of County
Dam/Dike Failures	Inland	Coastal	Inland	Coastal	Inland	Coastal	Inland	Coastal	Inland	Coastal	Inland	Coastal	Inland	Coastal	Inland	Coastal	Low	Low
	Medium	Very Low	Medium	Very Low	Low	Very Low	Medium	Very Low	Medium	Very Low	Low	Very Low	Medium	Very Low	Medium	Very Low		
Hazardous Materials Accidents	Medium		Medium		Low		Low		Low		Low		Medium		Low		Low	Low
Radiological Incidents	Low		Low		Low		Low		Low		Low		Low		Low		Low	Low
Communication Failures	Low		Low		Low		Low		Low		Low		Low		Low		Low	Low
Transportation System Accidents	Low		Low		Low		Low		Low		Low		Low		Low		Low	Low
Wellfield Contaminations	Low		Low		Low		Low		Low		Low		High		High		Low	Medium
Power Failure (Outages)	Medium		Low		Medium		Medium		Medium		Medium		Medium		Medium		Low	Low

Table A-31: Consequence Analysis for Human-Caused Hazards

Hazard	Health & Safety of Residents	Health & Safety of Responders	Continuity of Operations	Property, Facilities & Infrastructure	Historical Resources	Delivery of Services	Environment	Economic & Financial Conditions	Regulatory & Contractural Obligations	Reputation of County
Civil Disturbances	Low	Low	Low	Low	Low	Low	Low	Low	Low	Medium
Domestic Security	Medium	High	Medium	Low	Low	Medium	Low	High	Low	High
Cybersecurity*	Low	Low	High	High	Low	High	Low	High	High	Medium
Wokplace/School Violence	Medium	Medium	Low	Low	Low	Low	Low	Low	Low	Medium
Mass Migration Crises	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low

*Included in Domestic Security

Palm Beach County
Hazard Identification and Risk Assessment
Reference Sources (February 2021)

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Treasure Coast Regional Planning Commission	Palm Beach County Appendix, 2016 Supplemental Summary, Statewide Regional Evacuation Summary
Florida Department of Environmental Protection	The Favorability of Florida's Geology to Sinkhole Formation (2017)
Florida Division of Emergency Management	Mitigation Goals and Capabilities (2018 Draft)
Florida Division of Emergency Management	Florida Repetitive Loss Strategy (2017 Draft)

The above referenced plans and studies were used throughout this document as a review and incorporation of existing plans, studies, reports, and technical information in order to bolster this LMS plan.

Palm Beach County
Hazard Identification and Risk Assessment
Reference Sources (2021)

References Table A-32 (2021)

Source	Data Type
Natural Hazards	
Hurricanes and Severe Storms (Includes Tropical Storms and Northeasters)	
Natural Hazards Research Center	Historical and current data on all types of natural hazards
Atlantic Hurricane Tracking Database	Historical data on hurricane tracks and intensities
NOAA Tropical Cyclone Database	Historical hurricane data
Colorado State University (Dr. Gray online site)	Hurricane probability
NASA Natural Disaster Reference Database	Historical data on all types of natural hazards
National Weather Service	Weather statistics
National Climate Data Center - On-Line Data Base	Weather statistics
Atlantic Ocean and Meteorological Laboratory, Hurricane Research Division	Hurricane forecast models
Federal Emergency Management Agency	Emergency management procedures
Tropical Storm Watch Database	Tropical storm data worldwide
Flood Insurance Rate Maps and Community Status Book	Areas vulnerable to potential rising water
Storm Surge Atlas for Palm Beach County (SLOSH model)	Areas vulnerable to storm surge flooding based on the SLOSH model
U. S. Geological Survey	Base maps and historical flood plain and elevation data
Florida State University (Meteorology Department)	Data and expertise concerning all Florida natural hazards
Florida Atlantic University	Data and expertise concerning all Florida natural hazards
National Severe Storms Laboratory	Storm effects data

Source	Data Type
Independent Insurance Agents of America (Natural Disaster Risk Database)	Probability data and estimated exposure Building code recommendations to reduce exposure
Florida Division of Emergency Management	*The Arbiter of Storms (TAOS)*@ maps and computer model projections as well as technical support and data
Florida Department of Environmental Protection	Environmental risk, exposure to hurricanes, environmental effects and hazards
Florida Game and Fresh Water Fish Commission	Hurricane effects of fish and wildlife
Florida Department of Corrections	Prison statistics and emergency management plans
Florida Department of Education	School and Board of Education emergency guidelines
South Florida Water Management District	Climatic and weather data, hydrologic data, water release schedules, and emergency management plans
Treasure Coast Regional Planning Council	Building codes and impacts of proposed statewide unified building code
Palm Beach County Airports Department	Weather data and hurricane protection procedures
Palm Beach County Comprehensive Growth Management Plan	Land management, zoning, and hurricane mitigation related ordinances
Palm Beach County Planning, Zoning, and Building Department	Building codes and zoning ordinances
Palm Beach County Property Appraiser	Tax assessor records for use in determining dollar value of exposed property
Palm Beach County Automated Information Management	Map products and GIS data
Palm Beach County Engineering and Public Works Department	Engineering, drainage, road elevations, and storm water data
Palm Beach County Environmental Resources Management Department	Environmental and beach erosion data
Palm Beach County Fire and Rescue	Critical facilities locations and emergency management plans
Palm Beach County Health Department	Critical facilities and health risk data

Source	Data Type
Palm Beach County School Board	Schools, shelter, and critical facilities data and emergency management plans
Palm Beach County Law Library	Building codes and ordinances
Palm Beach County Parks & Recreation Department	Environmental and recreational data and potential impacts data
Palm Beach County Public Safety Department Division of Emergency Management	Emergency management plans, historical data, critical facilities, special needs, and general guidance
Palm Beach County Division of Criminal Justice	County prison population and emergency management plans
Division of Animal Regulation	Animal protection, regulation, and control plans following natural disasters (hurricanes)
Palm Beach County Sheriff Department	Emergency management plans and law enforcement procedures following a natural disaster
Palm Beach County Tourist Development Council	Potential economic loss and specific areas of economic vulnerability
Palm Beach County Water Utilities	Critical facilities locations and emergency management procedures
Palm Beach County Red Cross	Historical data, shelter data, and emergency management plans
Florida Power and Light and Other Municipal/Private Power Companies (Lake Worth Utilities, etc.)	Power grid vulnerabilities, structure, and emergency management plans
Home Depot/Lowes	Emergency management supply plans for preparation and recovery
Publix/Winn Dixie	Emergency food supply plans
Southern Bell	Emergency communication maintenance plans
AT&T Wireless Services	Emergency communication maintenance plans
U. S. Cellular Wireless Communications	Emergency communication maintenance plans
The Palm Beach Post	Historical hurricane data
Local Radio and Television Stations	Critical facilities location and emergency management plans (operating plans) during natural disaster

Source	Data Type
Tornadoes and Thunderstorms	
Natural Hazards Research Center	Historical and current data on all types of natural hazard
The Tornado Project On-Line	Historical data
Optical Transient Detector Data Base	Lightning associated with thunder storms (lightning statistics)
NASA Natural Disaster Reference Database	Historical data all types of natural hazards
National Weather Service	Weather statistics
National Climate Data Center - On-Line Data Base	Weather statistics
NOAA Wind Related Fatalities Data Base	Wind related fatalities
NOAA Tropical Prediction Center	Storm predictions
Florida State University	Data and expertise concerning all Florida natural hazards
Florida Atlantic University	Data and expertise concerning all Florida natural hazards
National Severe Storms Laboratory	Storm and tornado statistics and storm effects
Independent Insurance Agents of America (Natural Disaster Risk Database)	Financial data concerning losses resulting from thunder storms and tornadoes
Florida Division of Emergency Management	Incident reports and historical data
South Florida Water Management District	Climatic data
Palm Beach County Airports Department	Weather data and protection plans and procedures during thunderstorms and tornadoes
Palm Beach County Fire and Rescue	Thunderstorm and tornado fire and fatality data
Palm Beach County Public Safety Department Division of Emergency Management	Thunderstorm and tornado historical data
Palm Beach County Division of Emergency Management	Historical data on thunderstorm and tornado related medical emergencies
Palm Beach County Red Cross	Historical data on impacts
Florida Power and Light and Other Municipal/Private Power Companies (Lake Worth Utilities, etc.)	Historical data on impacts to the power grid
Southern Bell	Historical data on communication impacts

Source	Data Type
AT&T Wireless Services	Historical data on communications disruptions
U. S. Cellular Wireless Communications	Historical data on communications disruptions
The Palm Beach Post	Historical data general
Local Radio and Television Stations	Historical data on losses and possible future losses
NASA Natural Disaster Reference Database	Lightning statistics
National Weather Service	Lightning strike data
National Climate Data Center - On-Line Data Base	Lightning strike data
NOAA Lightning Related Fatalities Data Base	Lightning fatalities
National Lightning Safety Institute (NLSI)	Lightning research and protection measures
Florida State University	Data and expertise concerning all natural hazards
Florida Atlantic University	Data and expertise concerning all natural hazards
University of Florida Lightning Research Laboratory	Current research on lightning causes and effects
National Severe Storms Laboratory	Lightning statistics
Independent Insurance Agents of America (Natural Disaster Risk Database)	Financial losses attributable to lightning and related electromagnetic discharges
Florida Department of Community Affairs, Division of Emergency Management	Data on major fires caused by lightning
Florida Fire Chief's Association	Data on fires caused by lightning
South Florida Water Management District	Data on lightning related losses
Palm Beach County Airports Department	Lightning data and protective measures
Palm Beach County Fire and Rescue	Lightning related fires and injuries
Palm Beach County Parks & Recreation Department	Data on lightning related losses
Palm Beach County Public Safety Department Division of Emergency Management	Lightning protection procedures
Palm Beach County Sheriff Department	Data on communication disruption
Florida Power and Light	Financial losses and power grid disruptions due to lightning

Source	Data Type
Southern Bell	Financial losses and communications disruptions due to lightning
AT&T Wireless Services	Financial losses and communications disruptions due to lightning
U. S. Cellular Wireless Communications	Financial losses and communications disruptions due to lightning
The Palm Beach Post	Historical data on significant lightning related events
Flooding	
Association of State Floodplain Managers	Floodplain data, flooding statistics, and mitigation approaches
Natural Hazards Research Center	Technical data on all natural hazards
NOAA Flood Related Fatalities Data Base	Flood related fatalities
NOAA Hydrologic Information Center	Hydrologic data
NOAA Tropical Cyclone Database	Rainfall associated with storm type events
NASA Natural Disaster Reference Database	Specific flooding and mitigation data nationwide
NASA Flood Hazard Research Center	Flood research and mitigation approaches
National Weather Service	Climatic data
National Climate Data Center - On-Line Data Base	Weather/rain fall historical data
National Flood Proofing Committee Data Base	Mitigation procedures
National Association of Flood and Storm Water Management Agencies	Storm water management data and procedures
Atlantic Ocean and Meteorological Laboratory, Hurricane Research Division	Historical meteorological data
Federal Emergency Management Authority	Historical flooding data
Tropical Storm Watch Database	Rainfall events and flooding data
Flood Insurance Rate Maps and Community Status Book	Identification of properties within the flood plane
U. S. Geological Survey	Topographic maps
U. S. Army Corps of Engineers	Historical flooding data and flood prevention projects
Dartmouth Flood Observatory	Flooding research
Earth Satellite Corporation (EarthSat) Flood watch Data Base	Historical flooding data

Source	Data Type
Florida State University	Data and expertise concerning all Florida natural hazards
Florida Atlantic University	Data and expertise concerning all Florida natural hazards
National Severe Storms Laboratory	Rainfall data and related flooding events
Independent Insurance Agents of America (Natural Disaster Risk Database)	Property and financial losses as a result of flooding
Florida Department of Community Affairs, Division of Emergency Management	Historical data on flooding events in Palm Beach County
Florida Association of Floodplain Managers	Flooding data specific to Florida
Florida Department of Environmental Protection	Environmental parameters and risk associated with flooding
Florida Game and Fresh Water Fish Commission	Wildlife resources impacted by flooding
South Florida Water Management District	Water management, hydrology, and flood prevention procedures
Palm Beach County Planning, Zoning, and Building Department	Zoning ordinances and building codes that affect flood protection
Palm Beach County Property Appraiser	Property value within flood zones
Palm Beach County Automated Information Management	Historical flooding and critical facilities in flood zones
Palm Beach County Engineering and Public Works Department	Highway and storm water management procedures
Palm Beach County Environmental Resources Management Department	Water resources and flooding data
Palm Beach County Fire and Rescue	Flooding associated fires and injuries
Palm Beach County Health Department	Disease risk and contamination potential associated with flooding
Palm Beach County Parks & Recreation Department	Recreational resources at risk due to flooding
Palm Beach County Public Safety Department Division of Emergency Management	Historical flooding data and emergency management procedures
Division of Animal Regulation	Animal control problems associated with flooding
Palm Beach County Sheriff Department	Emergency management procedures associated with flooding
Palm Beach County Water Utilities	Critical facilities at risk due to flooding and potential impacts

Source	Data Type
Independent Drainage Districts	All independent drainage districts will be contacted for historical data and identified areas at risk
Palm Beach County Red Cross	Historical flooding data and repetitively damaged structures data
Florida Power and Light	Flooding emergency plans and critical facilities at risk
The Palm Beach Post	Historical data on flooding incidents
Freezing Temperatures	
National Climate Data Center - On-Line Data Base	Historical records on freezing temperatures
National Weather Service	Historical records on freezing temperatures
U. S. Department of Agriculture - County Extension Agents	Local agricultural data on frequency, impacts, and financial losses due to freezing temperatures
Florida Citrus Commission	Frequency and amount of financial losses to citrus crops due to freezing temperatures and long term industry impacts
Florida Department of Citrus	Frequency and amount of financial losses to citrus crops due to freezing temperatures and current mitigation strategies
Florida Department of Agriculture & Consumer Services	Frequency and amount of financial losses to all agricultural business as a result of freezing temperatures
Florida Farm Bureau	Frequency and amount of financial losses to all agricultural business as a result of freezing temperatures and current mitigation and risk reduction strategies
Florida State University	Agricultural research and new mitigation strategies to reduce freeze impacts
Florida Atlantic University	Freeze impacts to aquaculture industry
University of Florida	Agricultural research and new mitigation strategies to reduce freeze impacts

Source	Data Type
University of Miami	Agricultural research and new mitigation strategies to reduce freeze impacts
Florida Department of Environmental Protection	Environments at risk from freezing and environmental consequences of current agricultural mitigation strategies
South Florida Water Management District	Climate records and water demands associated with freeze mitigation
Palm Beach County Department of Agriculture	Historical impact and financial losses resulting from freezing temperatures in Palm Beach County
Palm Beach County Citrus and Farming Interest	Historical freeze losses and current mitigation strategies
Palm Beach County Red Cross	Impacts to poor and homeless due to freezing temperatures
Wildfires/Urban interface Zone and Muck Fires	
National Weather Service	Climate data/drought predictions
National Interagency Coordination Center Reports	Wildfire repots
National Climate Data Center - On-Line Data Base	Climate data
U. S. Forest Service	Wildfire reports and preventative measures
U. S. Department of Agriculture - County Extension Agents	Controlled burning/muck deposits
U. S. Geological Survey	Soil types/muck deposits
Florida Geological Society	Soil types/muck deposits
The Wildfire Assessment System	Wildfire statistics and containment procedures
Florida Forest Protection Bureau	Florida specific wildfire statistics and current preventative practices
Florida Department of Environmental Protection	Natural resources at risk and protective measures
Florida Fire Chief's Association	Florida specific wildfire statistics, firefighting technology, and potential mitigation measures for Florida communities
South Florida Water Management District	Water resources and right of way management practices

Source	Data Type
Palm Beach County Department of Agriculture	Land use patterns in Palm Beach County to establish areas at risk
Palm Beach County Planning Zoning & Building Department	Land use patterns in Palm Beach County to establish areas at risk
Palm Beach County Parks & Recreation Department	Land use patterns in Palm Beach County to establish areas at risk
Palm Beach County Fire Rescue - Fire Prevention Bureau	Land use patterns in Palm Beach County to establish areas at risk and current or in-place protective measures
Wildfire Magazine Data Base	Wildfire statistics
Palm Beach Post	Historical data on Palm Beach County wildfires/muck fires
Drought and High Temperatures	
National Weather Service	Climate data and drought predictions
National Climate Data Center - On-Line Data Base	Climate data
U.S.G.S. Historical and Real Time Data on Water Resources of South Florida	Water resources
U. S. Department of Agriculture - County Extension Agents	Historical data on droughts and the economic impacts to local agriculture
Florida Citrus Commission	Economic losses to the citrus industry from droughts
Florida Department of Citrus	Economic losses to the citrus industry from droughts and current irrigation technology
Florida Forest Protection Bureau	Drought statistics
Florida Department of Environmental Protection	Environmental impacts of droughts to natural ecosystems
Florida Department of Agriculture & Consumer Services	Agricultural losses due to droughts and current irrigation technology
South Florida Water Management District	Water allocations during drought conditions
Palm Beach County Department of Agriculture	County specific economic losses from drought and current economic vulnerability
Palm Beach County Parks & Recreation Department	Recreational resources impacted by droughts

Source	Data Type
Palm Beach County Water Utilities	Impacts from droughts of the potable water supplies and impacts in urban areas Water rationing plans
Municipal water utilities	Impacts of and water allotment plans during times of droughts in cities Water rationing plans
Coastal & Beach Erosion	
Florida Inland Navigational District	Maintenance records for the Intracoastal Waterway and other Palm Beach County navigable waters
South Florida Water Management District	Canal maintenance and erosion
Palm Beach County Environmental Resources Department	Environmental problems associated with erosion control and natural resources threatened by erosion
Palm Beach County Engineering and Public Works Department	Current erosion prevention measures
Palm Beach County Parks & Recreation Department	Current erosion prevention measures
Palm Beach County Coastal Municipalities	Current erosion prevention measures
Jupiter Inlet District	Information on beach erosion in and around Jupiter Inlet
Port of Palm Beach	Information on beach erosion in and around channel and inlet
Agricultural Pest and Diseases	
U. S. Forest Service	Forest diseases and current problem/preventative measures
U. S. Dept. of Agriculture - County Extension Agents	Local agricultural pest and potential exotic treats
U. S. Customs	Current programs to prevent introduction of agricultural pest and diseases
Florida Farm Bureau	Economic losses due to agricultural pest and diseases
Florida Citrus Commission	Citrus losses due to agricultural pest and diseases
Florida Forest Protection Bureau	Forest diseases and current problem/preventative measures
Florida State University	Agricultural research and pest control

Source	Data Type
Florida Atlantic University	Agricultural research and pest control
University of Florida	Agricultural research and pest control
University of Miami	Agricultural research and pest control
Florida Department of Environmental Protection	Environmental resources at risk and environmental consequences of current or proposed control measures
Florida Department of Agriculture & Consumer Services	Economic losses from agricultural pest and diseases and current control technology
Palm Beach County Department of Agriculture	Economic losses and current control programs
Palm Beach County Parks & Recreation Department	Pest control programs on public lands
Seismic Hazards	
U. S. Geological Survey	Geologic structure and seismic risk
Florida Geological Society	Geologic structure and soil characteristics
Technological Hazards	
Radiological Hazards	
U. S. Nuclear Regulatory Commission	Nuclear power plant regulation, accident statistics, and emergency procedures
Federal Emergency Management Agency	Nuclear power plant accident statistics, and emergency procedures
National Emergency Management Agency	Nuclear power plant and radiological emergency management procedures
Florida Division of Emergency Management	Nuclear power plant and radiological emergency management procedures
Florida Emergency Preparedness Association	Radiological emergency management procedures
State & Local Emergency Data Users Group Data Base	Radiological accident management database
Florida Power and Light Emergency Plan	Industry emergency management plans
Palm Beach County Division of Emergency Management Comprehensive Emergency Management Plan (CEMP)	Local radiological emergency management plan
Hospital Plans - Both Radiological Materials Disposal (Hazardous Waste) and Mass Radiation Casualties or Nuclear Accident Plans	Local radiological emergency plans and safeguards

Source	Data Type
Hazardous Materials	
Federal Emergency Management Agency	Hazardous material emergency management guideline
National Transportation Safety Board	Hazardous material transport regulation, spill cleanup procedures, and spill statistics
Occupational Safety and Health Agency	Hazardous material handling requirements
U. S. Environmental Protection Agency	List of hazardous materials
Hazardous Chemicals Database (On-line)	Hazardous materials data
Material Safety Data Sheets (On-line)	Specific chemical facts
State Emergency Response Commission (SERC) Emergency Plan for Hazardous Materials	Spill response procedures
Florida District and Local Emergency Planning Committee (LEPC) Emergency Plan for Hazardous Materials	Local sources and emergency management plans (vulnerabilities)
Facilities Database for Users of Extremely Hazardous Substances (EHS) and Hazardous Materials	Geo-referenced local database of users
Florida Division of Emergency Management	Methodology for handling hazardous material releases
Florida Emergency Preparedness Association	Methodology for handling hazardous material releases
Florida Department of Transportation	Highway spill data for hazardous material spill data Methodology for handling hazardous material releases
State & Local Emergency Data Users Group Database	Spill and release of hazardous materials statistics
Florida Fire Chiefs Association	Hazardous material emergency plans and containment procedures Spill/release statistics
Palm Beach County Division of Emergency Management	Methodology for handling hazardous material releases
Palm Beach County Fire Rescue	Methodology for handling hazardous material releases
Municipal Fire and Police Departments	Methodology for handling hazardous material releases

Source	Data Type
Palm Beach County Health Department	Methodology for handling hazardous material releases and emergency treatment procedures
Identified Users of EHS Emergency Plans	Industry control and emergency management plans for hazardous material
Local Gasoline and Natural Gas Companies	Location of critical facilities/infrastructure elements
Transportation System Accidents	
Federal Aeronautical Administration	Aircraft accident statistics and airport safety procedures
National Transportation Safety Board	Aircraft accident statistics
U. S. Coast Guard	Boating/shipping accidents (including oil and hazardous materials releases) and spill containment procedures
Florida Department of Transportation - Motor Carrier Compliance Division	Truck accidents (including oil and hazardous materials releases)
Florida Highway Patrol	Truck accidents (including oil and hazardous materials releases)
Florida Marine Patrol	Boating/shipping accidents (including oil and hazardous materials releases) and spill containment procedures
Palm Beach County Airports Department	Aircraft accident statistics and airport safety procedures
Palm Beach International Airport	Aircraft accident statistics and airport safety procedures
Port of Palm Beach Port Authority	Port management, accident statistics, and emergency management procedures
Palm Beach County Sheriff's Department - Marine Unit and Environmental Crimes Unit	Boating/shipping accidents (including oil and hazardous materials releases), spill containment procedures, and environmental crimes statistics
Florida East Coast Railway	Railway accident statistics (including oil and hazardous materials releases), and safety procedures
CSX Rail	Railway accident statistics (including oil and hazardous materials releases), and safety procedures
Palm Beach County Fire Rescue	Accident statistics involving injuries in Palm Beach County

Source	Data Type
Municipal police and fire departments	Accident statistics involving injuries in the cities
Power/Communications/Computer Grid System Failures	
Florida Power and Light Emergency Management Plans and Historical Database	Historical data and emergency management plans
Bell South Emergency Management Plan and Historical Database	Historical data and emergency management plans
Cellular and Satellite Communication Companies	Historical data and emergency management plans
The Banking Industry (Large Area Network - LANs Protection and Emergency Restoration Plans, as well as historical data on system failures)	Historical data and emergency management plans
Human Caused Hazards	
Civil Disturbance	
Federal Bureau of Investigation Database	Historical data
National Security Council Database	Historical data and risk analysis
Drug Enforcement Agency Database	Historical data
Immigration and Naturalization Service Database	Historical data
U. S. Customs Service	Historical data
U. S. Census Database	Population demographics
Florida Department of Law Enforcement	Historical data and situation plans
Florida Department of Health Education and Welfare	Historical data
Palm Beach County Sheriff's Department	Historical data and situation plans
Municipal Police Departments	Historical data and situation plans
Palm Beach County Fire Rescue	Historical data and situation plans
Palm Beach County Division of Emergency Management	Historical data and situation plans
Domestic Security: Terrorism, Sabotage, and Cyber Attacks	
Federal Bureau of Investigation Database	Historical data, situation plans, and risk analysis
National Security Council Database	Historical data, situation plans, and risk analysis
Drug Enforcement Agency Database	Historical data

Source	Data Type
Immigration and Naturalization Service Database	Historical data and preventative measures
U. S. Census Database	Population demographics
Florida Department of Law Enforcement	Historical data, situation plans, and risk analysis
Florida Department of Health Education and Welfare	Population demographics
Palm Beach County Sheriff Department	Historical data, situation plans, and risk analysis
Municipal Police Departments	Historical data, situation plans, and risk analysis
Palm Beach County Fire Rescue	Historical data, situation plans, and risk analysis
Palm Beach County Division of Emergency Management	Historical data on injuries
American Society for Industrial Security	Risk analysis techniques and database
Mass Migration	
U. S. Coast Guard	Historical data and situation plans
Immigration and Naturalization Service	Historical data, situation plans, and risk analysis
Florida Marine Patrol	Situation plans and interagency coordination
Florida Department of Law Enforcement	Historical data, situation plans, risk analysis, and interagency coordination
Florida Department of Health, Education and Welfare	Population demographics
Palm Beach County Sheriff Department	Historical data, situation plans, risk analysis, and interagency coordination
Municipal Police Departments	Historical data, situation plans, risk analysis, and interagency coordination
Palm Beach County Fire Rescue	Situation plans and interagency coordination
Palm Beach County Division of Emergency Management	Historical data and medical risk analysis

Source	Data Type
Workplace/School Violence	
Palm Beach County Division of Emergency Management	Workplace/School Violence Hazard Specific Plan
Miscellaneous Data Sources	
Federal Bureau of Investigation Database	Historical data
National Security Council Database	Historical data
Drug Enforcement Agency Database	Historical data
Immigration and Naturalization Service Database	Historical data
U. S. Census Database	Population demographics
U. S. Public Health Service	Disease risk
Florida Department of Law Enforcement	Historical data
Florida Department of Health Education and Welfare	Historical data
Florida Department of Labor	Historical data
Palm Beach County Sheriff Department	Historical data
Municipal Police Departments	Historical data
Palm Beach County Fire Rescue	Historical data
Palm Beach County Health Department	Historical data

Appendix B: Countywide Mitigation Initiatives

Appendix B provides a description of representative mitigation programs and initiatives undertaken by PBC and its jurisdictions, and the principles guiding intergovernmental coordination. These programs and initiatives served as the basis for the mitigation projects outlined in Appendix E. This appendix includes:

Section B-1 Mitigation Initiatives of PBC

This sections addresses, in part, the following FEMA requirements:

> **Requirement §201.6(c)(3)(i):** The hazard mitigation strategy shall include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.
>
> **Requirement §201.6(c)(3)(ii):** The mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure. The mitigation strategy must also address the jurisdiction's participation in the National Flood Insurance Program (NFIP), and continued compliance with NFIP requirements, as appropriate.
>
> **Requirement: §201.6(c)(3)(iii):** The mitigation strategy section shall include an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization *shall* include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

B-1: PBC Initiatives

Palm Beach County and its 39 municipalities participate in a full range of federal, state, and local mitigation programs and initiatives. Representative of these programs and initiatives are the LMS, Community Rating System (CRS), National Flood Insurance Program (NFIP), Flood Mitigation Assistance Program (FMA), Pre-Disaster Mitigation Program (PDM), Hazard Mitigation Grant Program (HMGP), Emergency Management Preparedness & Assistance Program (EMPA), CERT, Continuity of Operations, Post Disaster Redevelopment Plan (PDRP), ESF18, Private-Public Partnerships, counter-terrorism, radiological emergency preparedness initiatives, hazardous materials, etc. The overarching purpose of these activities is the elimination or mitigation of hazards presenting significant risk to PBC and its residents.

The LMS program and its companion mitigation programs are described in detail in Section 4.1.4.

A major mitigation priority of the LMS is the reduction of repetitive flood losses to properties. The County and its CRS participating municipalities track repetitive loss properties countywide on an ongoing basis using data gathered annually from FEMA and the State's Focus reports. For mitigation planning and strategy development purposes, LMS maintains updated GIS maps and informational databases of repetitive loss property locations relative to historical flood areas and designated Special

Flood Hazard Areas. Repetitive loss properties are an ongoing discussion and planning priority for the LMS, CRS, and Flood Mitigation Technical Advisory committees. These committees, comprised of public and private sector representatives, are encouraged to develop and promote mitigation project ideas and strategies. As a result, a majority of the projects on the Prioritized Project List (PPL) are flood mitigation projects.

In accordance with CRS guidelines, letters are mailed annually to repetitive loss property owners by PBC and municipalities, explaining NFIP program benefits, the availability of mitigation assistance funding through the FMA and other mitigation assistance programs. Non-CRS members of the LMS are encouraged to stay in compliance with NFIP standards.

Information and support is provided in a variety of forms to potential FMA applicants to assist them in developing projects and preparing application packages. Through PBC's LMS committee structure, members of the Technical Advisory Committee is available to offer technical guidance and assistance to applicants, including assistance in preparing benefit-cost analyses.

Mitigation projects are prioritized and implemented according to their direct potential for loss reduction or for their potential in contributing to longer-term, comprehensive plans and strategies for loss reduction. Once projects are underway, it is the responsibility of each jurisdiction to support and monitor performance in accordance with FEMA, state and local guidelines and codes, and to oversee and coordinate documentation and funding processes.

In addition to support of projects, mitigation is encouraged and promoted through a variety of community awareness and education activities including presentations, workshops, expos, panel discussions, plan reviews, publications, websites, etc. prepared and presented utilizing networks of public-private sector partners. As opportunities present themselves, lending institutions and insurers are urged to provide financial incentives for mitigation. Jurisdictions are urged to accelerate permitting and inspections and, if allowable, to waive or reduce fees for mitigation projects. In addition to mitigation incentives, millions of dollars of annual insurance premium savings are realized by a significant segment of PBC residents residing within the County's CRS participating jurisdictions.

Involvement of Planning, Zoning, and Building, Fire-Rescue, and other departments in LMS activities, including committee participation, bolsters communication among key agencies and the LMS. This ensures that mitigation interests are appropriately represented in local building codes, fire codes, land-use ordinances, flood loss prevention ordinances, and other governing documentation.

The PBC LMS plan articulates the goals and objectives of the County and its municipalities to avoid and/or reduce long-term vulnerability to hazards identified by the hazard identification and risk assessment processes. More detailed descriptions of the strategies, programs, and actions are contained in the body of the plan and reflected in the list of prioritized projects in Appendix E. Under the committee structure of the LMS program, increased attention is given to expanding and refining hazard-specific mitigation strategies exclusive of jurisdictional boundaries, capabilities, and interests, and to giving appropriate attention to mitigation in planning future land uses (see Appendix C).

The process and criteria employed for ranking mitigation projects and initiatives are described in detail in Section 4.0 of the LMS plan. In response to federal guidelines applying to grant awards through the

Pre-Disaster Mitigation, Flood Mitigation Assistance, and HMGPs, particular emphasis is given to technically feasible and environmentally responsible projects having attractive ratios of loss reduction benefits to cost. Projects involving worthy benefits that are difficult to quantify are given serious consideration, in light of different sets of criteria and are referred to appropriate alternative funding sources not requiring stringent benefit-cost justifications.

Short-term and long-term recovery strategies are addressed by the County and municipal Continuity of Operations Plans, the CEMP, the Post-Disaster Redevelopment Plan, and specialized plans and procedures covering key recovery issues such as debris removal, public services resumption, temporary housing, unmet needs, etc. These plans, procedures, and projects address and provide guidance on priorities, processes, schedules, resource requirements, restoration, and redevelopment of critical facilities, infrastructure, services, and economic redevelopment.

The PBC Comprehensive Plan (COMP) includes the following elements: Land Use, Transportation, Housing, Utility, Recreation and Open Space, Conservation, Coastal Management, Intergovernmental Coordination, Capital Improvement, Economic, Fire-Rescue, Public School Facilities, Health and Human Services, Library Services and Historic Preservation. These elements define the components of the community and the inter-relationship among them, integrating the complex relationships of each of these elements in reference to the people who live, work, and visit PBC. Linkages of the COMP plan and LMS have been incorporated into the COMP plan.

Post-disaster mitigation initiatives are developed in response to needs and opportunities identified through collective federal, state, and local inputs following the guidance offered by the Post Disaster Redevelopment Plan. The County and LMS members are also available to work state and federal Mitigation Assessments Teams. It is PBC's goal following disasters to rebuild to a higher standard (meeting or exceeding codes) and, whenever practicable, to apply sound mitigation practices to reduce future risk.

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Appendix C: Incorporation into Other Planning Mechanisms

This appendix addresses the following FEMA requirement:

Requirement §201.6(c)(4)(ii): A *plan maintenance process* that includes**:** A process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, where appropriate.

Under the direction of the LMS Steering Committee and the LMS Coordinator, the ad hoc Plan Integration Committee interfaces with appropriate governmental and non- governmental agencies and offices to ensure LMS goals, objectives, data, and priorities are consistent with and cross-referenced with those articulated in other existing plans. This is done with coordination of all 39 municipalities. In addition, the LMS will seek opportunities at the regional, county, and municipal levels to:

- Update plans, policies, regulations, and other directives to include hazard mitigationpriorities
- Encourage the adoption of mitigation priorities within capital and operationalbudgets and grant applications
- Share information on grant funding opportunities
- Offer guidance for carrying out mitigation actions
- Explore opportunities for collaborative mitigation projects and initiatives

Municipalities

Through our dedicated LMS Working Group meetings, all jurisdictions, including unincorporated PBC, consistently incorporate lessons learned and mitigation actions taken into their local plans, including the Comprehensive Plan, LMS, CEMPs, Capital Improvement Plan, and other local plans in which mitigation can play a role in the planning process. This plan is able to describe each community's process to integrate the data, information, and hazard mitigation goals and actions into other planning mechanisms in some of the following examples:

- The municipalities have established basic Emergency Management Plans that produces the procedures for all activities of the municipality before, during, and afterrecognized emergencies.
- A Storm Water Management Plan, which is focused on flood-related hazards and de- fines the relevant mitigation goals, evaluates appropriate and feasible mitigation measures and prioritizes such measures into an Action Plan for systematic implementation.
- A Floodplain Management Plan manages land and building development in the floodplain. All cities within the county are striving to establish a floodplain management plan and participate in the CRS. The NFIP has stated that the LMS mayserve as a floodplain management plan for its participants. All our

municipalities and water management districts utilize the LMS as the floodplain management plan.
- A Comprehensive Growth Management Plan controlling growth and developmentwithin the municipality.

Municipal and County Agencies and Mitigation Functions

PBC municipalities and water management districts each have within their structure certain departments and agencies which affect and promote mitigation. While these agencies may have slightly different names from village to town to city, the role they perform in the mitigation function remains similar.

*Public Works and Engineering***.** While not all municipalities have a public works and engineering department, all generally perform this function in some manner. If it is under a contractual arrangement, there is someone in the jurisdiction responsible for overseeing the consultant. The group having responsibility for public works and engineering has the responsibility for implementing structural improvements (e.g., stormwater facility retrofit, shuttering buildings, constructing new Emergency Operations Centers (EOCs).

PBC Fire Rescue (PBCFR). Palm Beach County Fire Rescue provides fire suppression, emergency medical services, fire prevention, and community education programs throughout PBC. The department not only serves the unincorporated County but also 19 municipalities including Belle Glade, Cloud Lake, Glen Ridge, Haverhill, Juno Beach, Jupiter, Lake Clarke Shores, Lake Park, Lake Worth Beach, Lantana, Loxahatchee Groves, Manalapan, Pahokee, Palm Springs, Royal Palm Beach, South Bay, South Palm Beach, Wellington, and Westlake. The County also provides fire-rescue dispatch service to 13 municipalities. Besides emergency services, the Department provides other types of services. The Bureau of Safety Services is responsible for ensuring that buildings comply with appropriate fire codes. The department also offers public education programs which focus on fire safety guidelines for schools, community groups, and individuals. In addition, the department has responsibility for coordination of fire protection, hazardous materials mitigation, and advance life support services.

Department of Planning, Zoning & Building (PZ&B). The PZ&B is comprised of three (3) divisions: Planning, Zoning and Building. The PZ&B has primary responsibility for administering the PBC Comprehensive Plan and appraising and updating it from time to time. In addition to its long-range planning role, PZ&B is responsible for processing development petitions (i.e., rezoning petitions, site plans). The Building Division issues and oversees compliance with all building permits. The Zoning Division administers the Zoning Ordinance and Lot Clearing Ordinance. The County also issues building permits for one (1) municipality Gulf Stream.

Palm Beach County Sheriff's Office (PBSO). Besides their responsibilities for crowd and traffic control during emergency events such as hazardous waste truck spills, the Sheriff's Department is responsible for enforcing PBC's dumping ordinance.

Department of Environmental Resource Management (ERM). The ERM is involved in the evaluation and assessment of environmental projects (e.g., shoreline stabilization projects, beach erosion initiatives), and administering various environmental ordinances (i.e., Irrigation & Water Conservation, Sea Turtle Protection/Sand Preservation Ordinance, Stormwater Pollution Prevention, Vegetation Protection and Preservation, Turnpike Wellfield Protection). To mitigate erosion and enhance and restore the beaches and dunes along its coastal shorelines, the County has developed a Shoreline Protection Plan. The County avoids the use of shoreline armoring (except as a measure of last resort). Preferred alternatives include beach nourishment, dune restoration, and inlet sand transfer.

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Appendix D: Public Involvement in the LMS Planning Process

This appendix addresses the following FEMA requirements:

§201.6(b)(1) and §201.6(c)(1): The planning process must include: An opportunity for the public to comment on the plan during the drafting stage and prior to the plan approval.

§201.6(c)(1): The plan must include: Documentation of the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

§201.6(c)(4)(iii): The plan must include discussion on how the community will continue to participate in the plan maintenance process.

The PBC LMS Steering Committee, Working Group, and Revisions Sub-Committee worked extensively to gather public interest in reviewing the current plan and providing suggestions or input on the future draft of the plan that you are now reading. An electronic public request was made to review the existing LMS (2020) and a dedicated email address (LMS-PBC@pbcgov.org) was created to solicit public input. These were also advertised through press releases, the LMS Times (LMS's quarterly newsletter that is distributed to the public through municipalities and the DEM website), social media (Facebook, Twitter, and X), the DEM webpage, and through our LMS membership through their public interface in other outreach programs being conducted in the lead-up to the meetings.

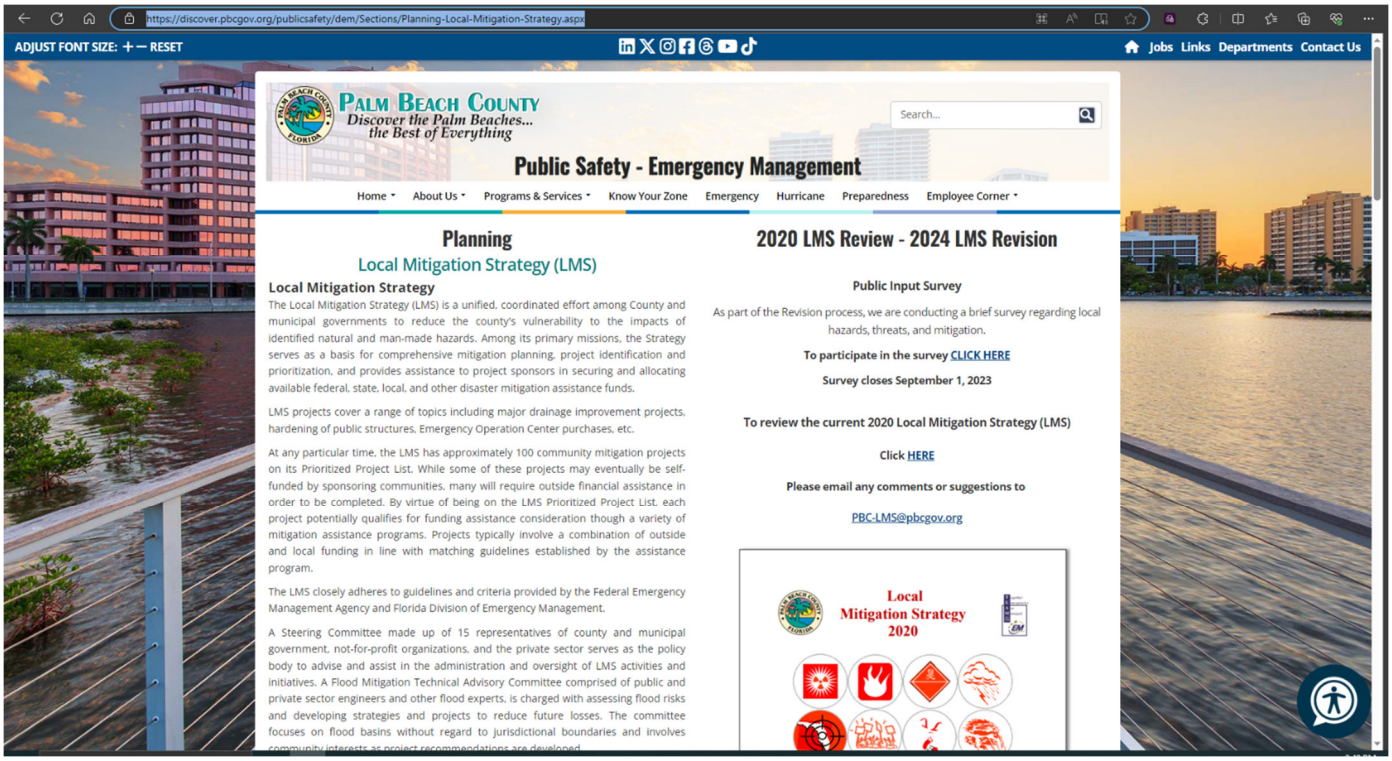
A Public Input forum on the First Draft, published to the DEM webpage, was held on September 13, 2023 after-hours (6:00pm) in order to maximize availability to interested citizens. Unfortunately, even with all the effort to gain public interest, very few members of the public attended. Those that did attend did not provide any new information that was not already included in the current LMS document or that had already been identified in the future draft that was being written.

The LMS Coordinator, at the direction of the LMS Revisions Sub-Committee, also produced an online survey to gather information from members of the public as to hazards, vulnerabilities,and mitigation prior to the first draft being produced. This online survey was advertised via the DEM website, various municipality webpages, social media, the SFWMD Resilience Coordination Forum & LMS Open House, and word of mouth. The survey received several responses. The results of those responses were forwarded to the Revisions Sub-Committee for possible inclusion into the LMS2024 draft document. However, many of the responses were not useful, were for other community-based inconveniences, or did not provide any new usable information for the LMS2024 draft.

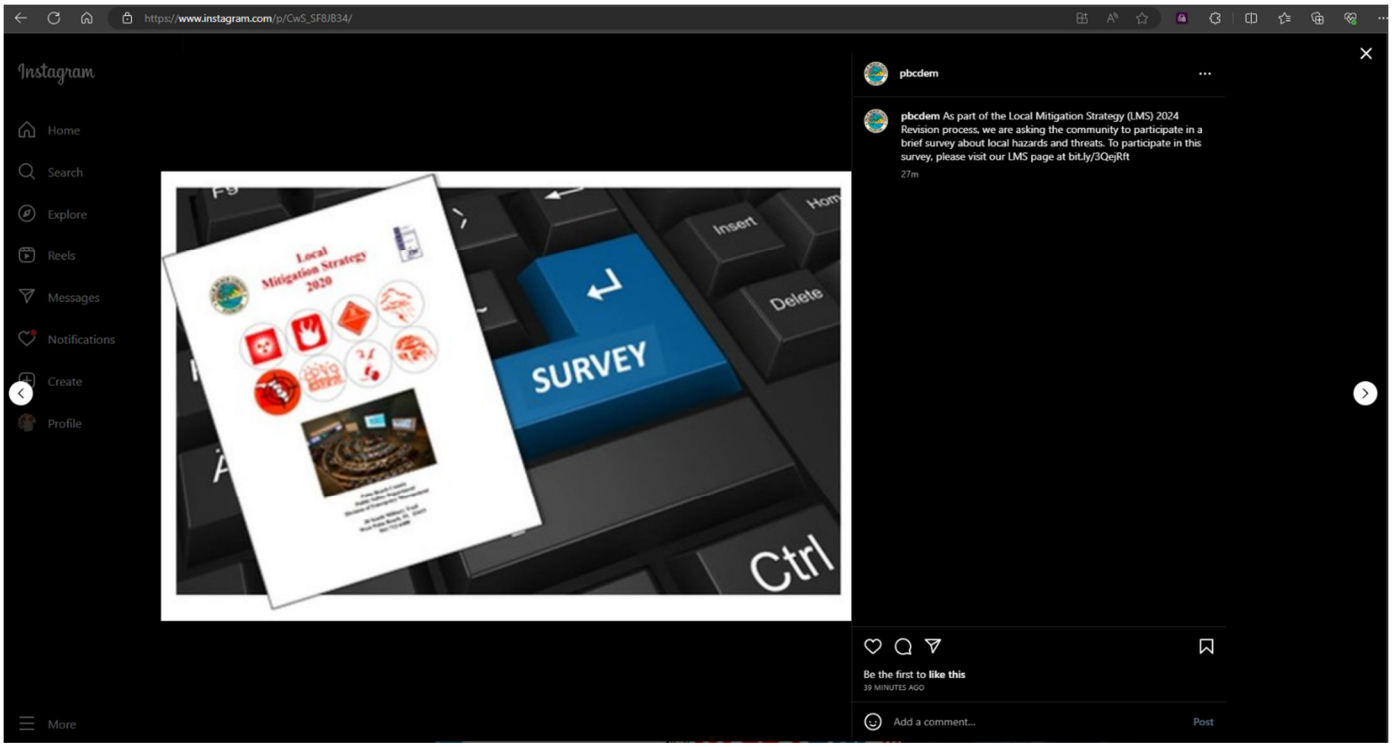
A second Public Forum on the final draft was held on March 13, 2024, prior to the regularly scheduled LMS Working Group meeting, at 9:00am at the Wellington Community Center. The second Public Forum was advertised via press releases, the LMS Times (LMS's quarterly newsletter that is distributed to the public through municipalities and the DEM website), social media (Facebook, Twitter, and X), the DEM webpage, and through our LMS membership through their public interfaces leading up to the meeting.

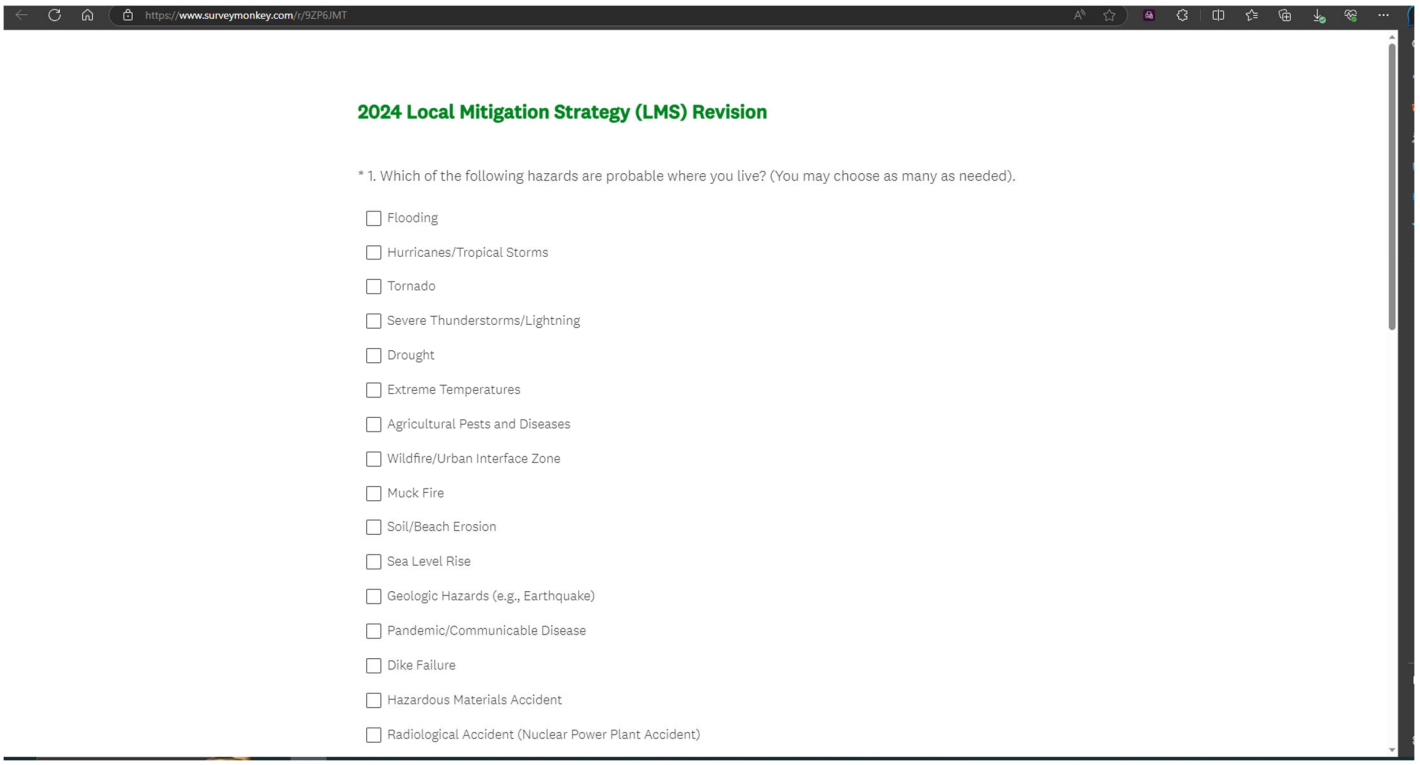
The following pages present documentation from the public input outreach that was conducted for the LMS2024 update. The first set of pages deal with the public meetings.

LMS2020 Review Request



LMS Survey Request



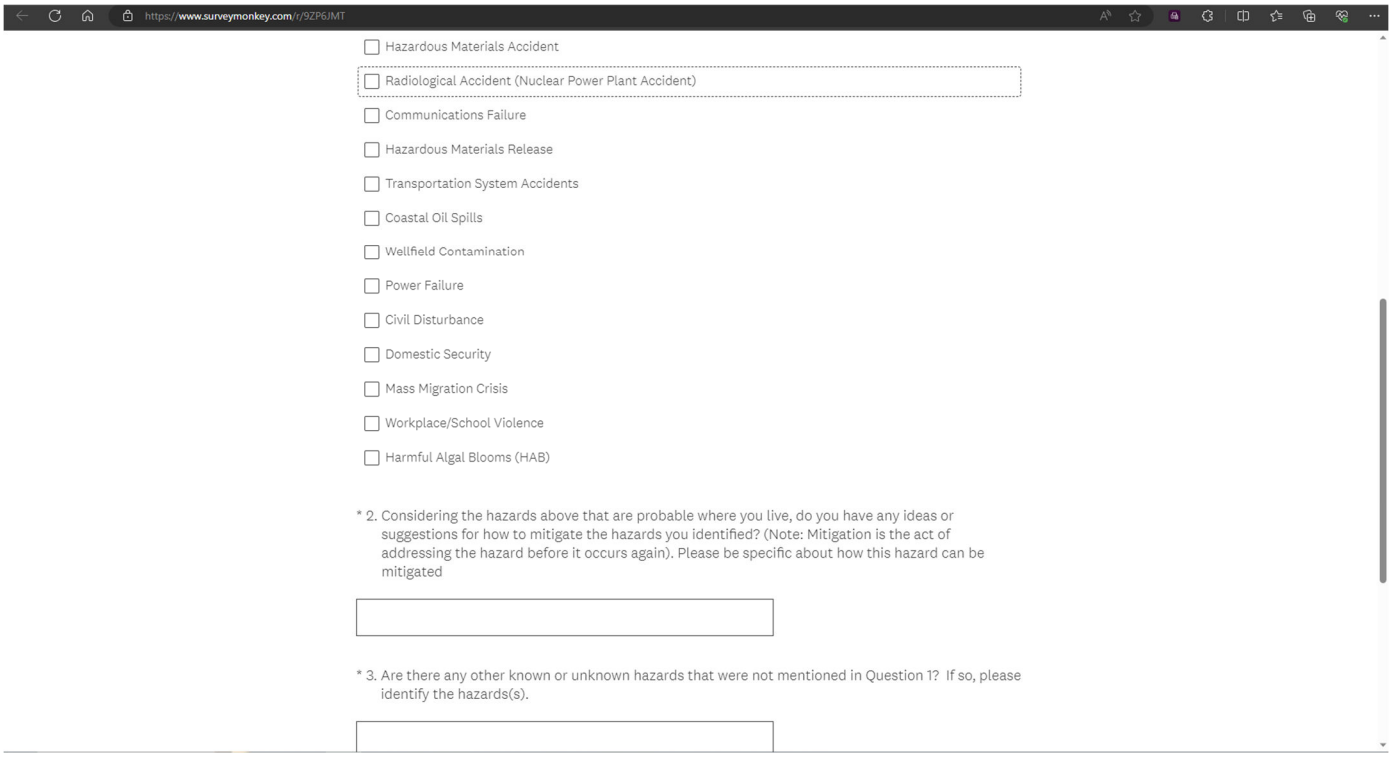


https://www.surveymonkey.com/r/9ZP6JMT

2024 Local Mitigation Strategy (LMS) Revision

* 1. Which of the following hazards are probable where you live? (You may choose as many as needed).

- [ ] Flooding
- [ ] Hurricanes/Tropical Storms
- [ ] Tornado
- [ ] Severe Thunderstorms/Lightning
- [ ] Drought
- [ ] Extreme Temperatures
- [ ] Agricultural Pests and Diseases
- [ ] Wildfire/Urban Interface Zone
- [ ] Muck Fire
- [ ] Soil/Beach Erosion
- [ ] Sea Level Rise
- [ ] Geologic Hazards (e.g., Earthquake)
- [ ] Pandemic/Communicable Disease
- [ ] Dike Failure
- [ ] Hazardous Materials Accident
- [ ] Radiological Accident (Nuclear Power Plant Accident)

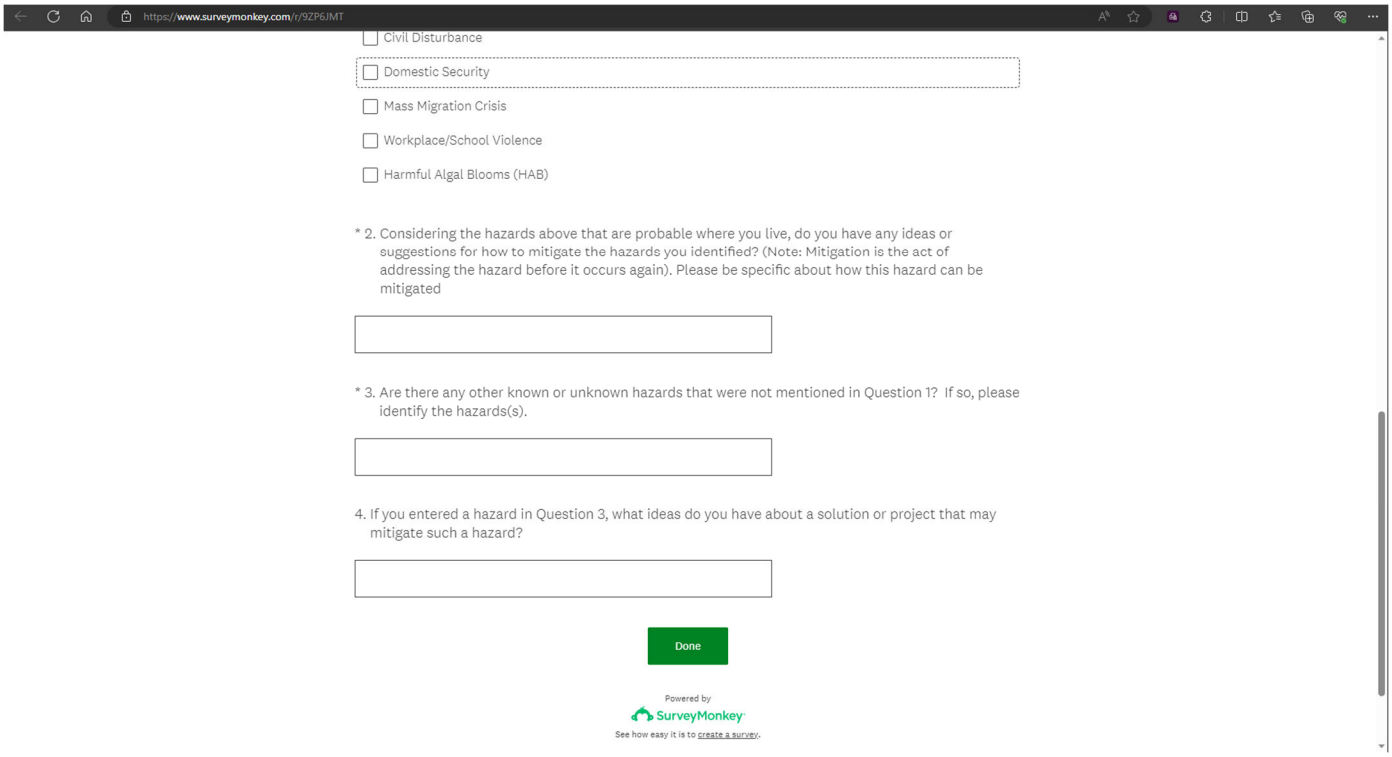


https://www.surveymonkey.com/r/9ZP6JMT

- [ ] Hazardous Materials Accident
- [ ] Radiological Accident (Nuclear Power Plant Accident)
- [ ] Communications Failure
- [ ] Hazardous Materials Release
- [ ] Transportation System Accidents
- [ ] Coastal Oil Spills
- [ ] Wellfield Contamination
- [ ] Power Failure
- [ ] Civil Disturbance
- [ ] Domestic Security
- [ ] Mass Migration Crisis
- [ ] Workplace/School Violence
- [ ] Harmful Algal Blooms (HAB)

* 2. Considering the hazards above that are probable where you live, do you have any ideas or suggestions for how to mitigate the hazards you identified? (Note: Mitigation is the act of addressing the hazard before it occurs again). Please be specific about how this hazard can be mitigated

* 3. Are there any other known or unknown hazards that were not mentioned in Question 1? If so, please identify the hazards(s).

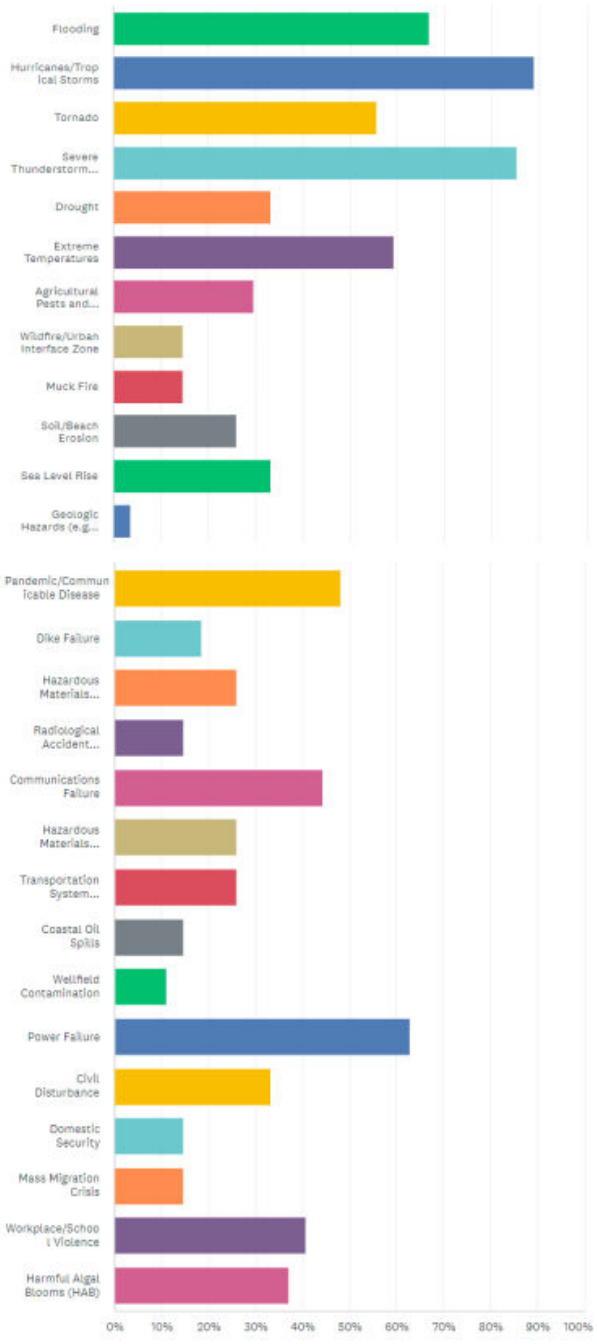

https://www.surveymonkey.com/r/9ZP6JMT
Civil Disturbance
Domestic Security
Mass Migration Crisis
Workplace/School Violence
Harmful Algal Blooms (HAB)
* 2. Considering the hazards above that are probable where you live, do you have any ideas or suggestions for how to mitigate the hazards you identified? (Note: Mitigation is the act of addressing the hazard before it occurs again). Please be specific about how this hazard can be mitigated
* 3. Are there any other known or unknown hazards that were not mentioned in Question 1? If so, please identify the hazards(s).
4. If you entered a hazard in Question 3, what ideas do you have about a solution or project that may mitigate such a hazard?
Done
Powered by
SurveyMonkey
See how easy it is to create a survey.

Q1

Customize Save as

Which of the following hazards are probable where you live? (You may choose as many as needed).

Answered: 27 Skipped: 0



1. Education on what to expect from the disaster, when it could happen, and how it could affect me.
2. Earlier warnings and better forecasting products
3. Education the community on preparedness and recovery resources
4. We can plan, prepare and be alert for any hazard. React calmly.
5. More tax dollars to support the mitigation efforts.
6. Preparation, education, increased local drainage, man-made reefs,
7. Continued training and exercises
8. Improved drainage systems along roadways.
9. N/A
10. Plan and mitigate
11. Have more education and peaceful conversations to get along with others, instead aggressive escalation without any compromise being made to resolve an issue.
12. Public education is one of the most important methods of mitigating these hazards. It is also important to come up with a framework strategy that all local government entities can review and incorporate into their strategic planning.
13. Upgrades to power supply, improvements or improved maintenance of storm water management system,
14. Flooding - Open the gates to canal and NOT after the fact
15. Green harvest instead of archaic practices
16. Address global warming at every level of government & society
17. More patrol from the Police Department for neighborhood robberies (people coming from other neighborhoods nearby).
18. Better storm water and drainage systems. Stronger buildings. Water conversation. Underground power lines.
19. Designate certain local large box retailers and government centers as disaster recovery/resource areas that will always have electricity, water and a go to place for emergency supplies
20. Na
21. Have the county commissioners believe in climate change, and be willing to spend dollar to mitigate the risks.
22. Green harvesting sugar cane vs burning
23. In my community sugarcane burning is a minor hazard and green harvesting can help eliminate those hazards.
24. Follow the emergency Operations plan.
25. Address climate change
26. No.
27. Flooding - Storm drains need to be opened so that flooding does not happen.

Q3

Save as

Are there any other known or unknown hazards that were not mentioned in Question 1? If so, please identify the hazards(s).

Answered: 27 Skipped: 0

1. No
2. Airplane accidents. I know there is a transportation accidents, but not sure that includes airplanes. as there are lots of small planes flying around
3. N/A
4. None
5. No
6. most were covered
7. Space weather
8. N/A
9. Sugar cane burning
10. No
11. Sugarcane Burning
12. Not that I can think of.
13. None
14. Mosquito spraying
15. Sugarcane burning
16. Sugar cane field burning
17. Unsafe driver's vehicular accidents.
18. N/A
19. NO
20. N/A
21. Tallahassee exerting too much control over local governmental affairs. We should be able to ban plastic bags, require solar on new construction, and put EV chargers on every corner if it is what we deem important to our community.
22. Sugar Cane Burning
23. Sugarcane Burning
24. No
25. Dangerous air pollution due to sugarcane burning.
26. Sugar Cane burning smoke and toxic chemical exposure, plus the burning contributes to global warming.
27. No

Q4

Save as

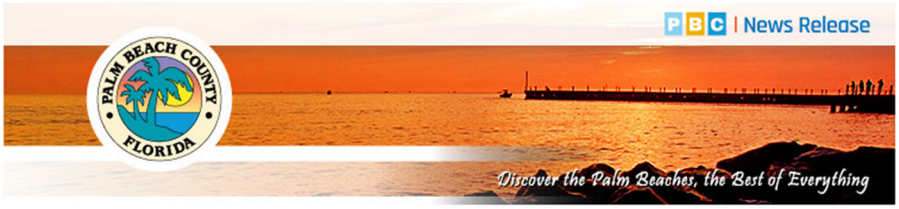
If you entered a hazard in Question 3, what ideas do you have about a solution or project that may mitigate such a hazard?

Answered: 18 Skipped: 9

1. N/A
2. Not sure what I can do to mitigate this
3. N/A
4. Not sure
5. Green harvesting alternative provides sustainability and can promote economic opportunity to surrounding communities
6. Awareness
7. Stop utilizing sugarcane burnings as the means of harvesting and transition into greener alternatives.
8. N/A
9. Municipality/ District- keep posted on current weather conditions
10. Green harvesting
11. Stop burning and go to green harvesting. Most sugar producing countries have outlawed or strongly regulate sugar cane field burning. In 2008 during negotiations to sell land to the state of FL for Everglades restoration, US Sugar put out a press release stating even with a loss of half their land they could create more jobs by going to green harvesting. There is much here to be examined.
12. Traffic turn signals at every intersection. More traffic patrol the drivers in this county are terrible they do not know the rules of the road. Merge into closest lane not wait to cross 3 lanes impeding traffic. Signs to be polite to other drivers and to stay off of the phones while driving. Pay Attention.
13. N/A
14. N/A
15. Green Harvesting
16. Green Harvesting
17. Green harvesting
18. Stop the burn. Use green harvesting

LMS2024 First Draft Posting Public Forum Notification

From: Press Release <PressRelease@pbcgov.org>
Sent: Tuesday, September 12, 2023 1:13 PM
To: Press Release <PressRelease@pbcgov.org>
Subject: Local Mitigation Strategy 2024 public input forum 9-13-23, 6 p.m.



For release Sept. 12, 2023
Contact Jerri L. Clairday (561) 712-6481

Local Mitigation Strategy LMS2024 Revision Review & Public Forum

The Local Mitigation Strategy (LMS) is a Palm Beach County document which identifies hazards to the community and strategies to address those hazards. The LMS document is required to be updated/revised every five years. Its purpose is to prepare and promote local strategies and projects that will reduce long-term risks to life and property from natural, technological and human-caused hazards. The Public Safety Department's Division of Emergency Management has completed the first draft and has posted it to the Palm Beach County LMS web page (link below) and is asking the community to review the document.

The county is seeking review of the LMS2024 first draft revision. A public input forum will be held on Wednesday, Sept. 13, 2023, at 6 p.m., in the Operations Room of the Palm Beach County Emergency Operations Center, 20 S. Military Trail, West Palm Beach.

The LMS2024 first draft can be found at:

https://discover.pbcgov.org/publicsafety/dem/Sections/Planning-Local-Mitigation-Strategy.aspx

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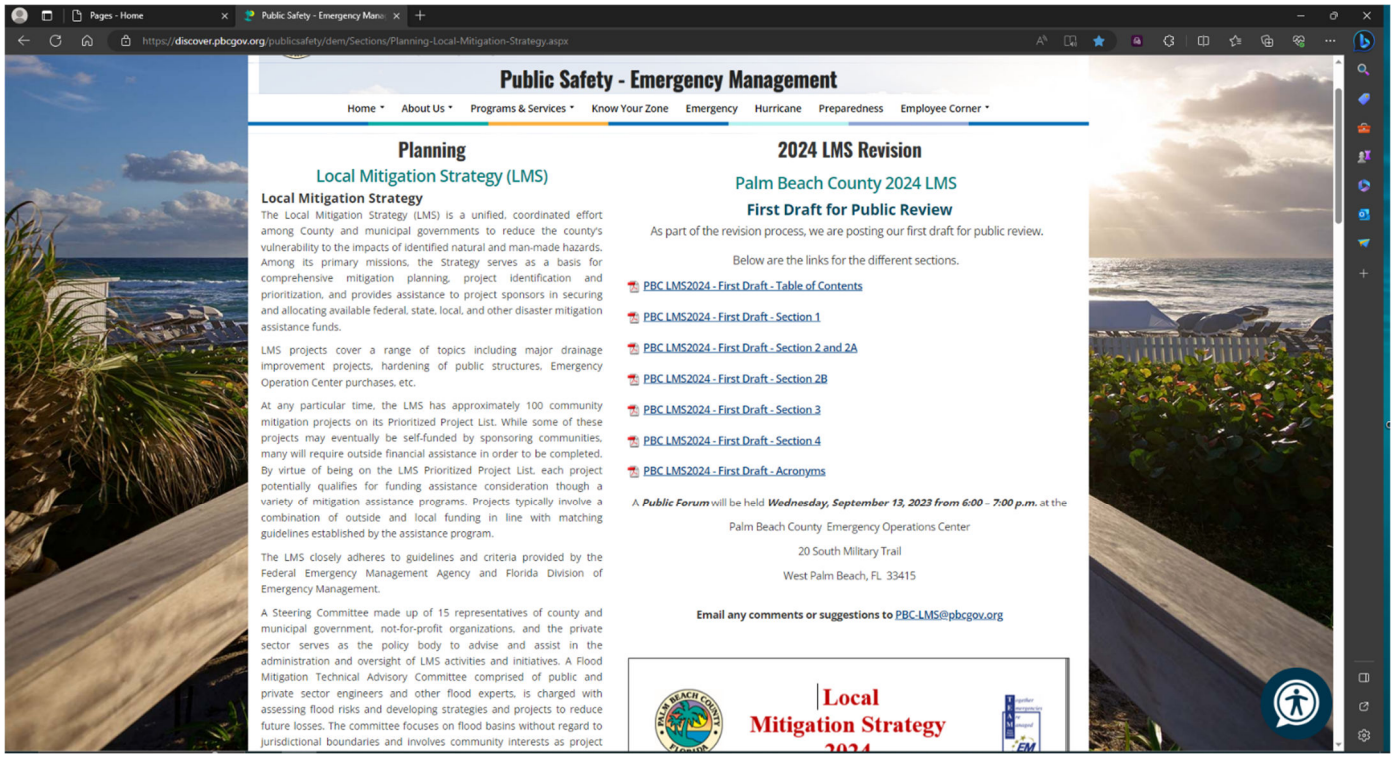
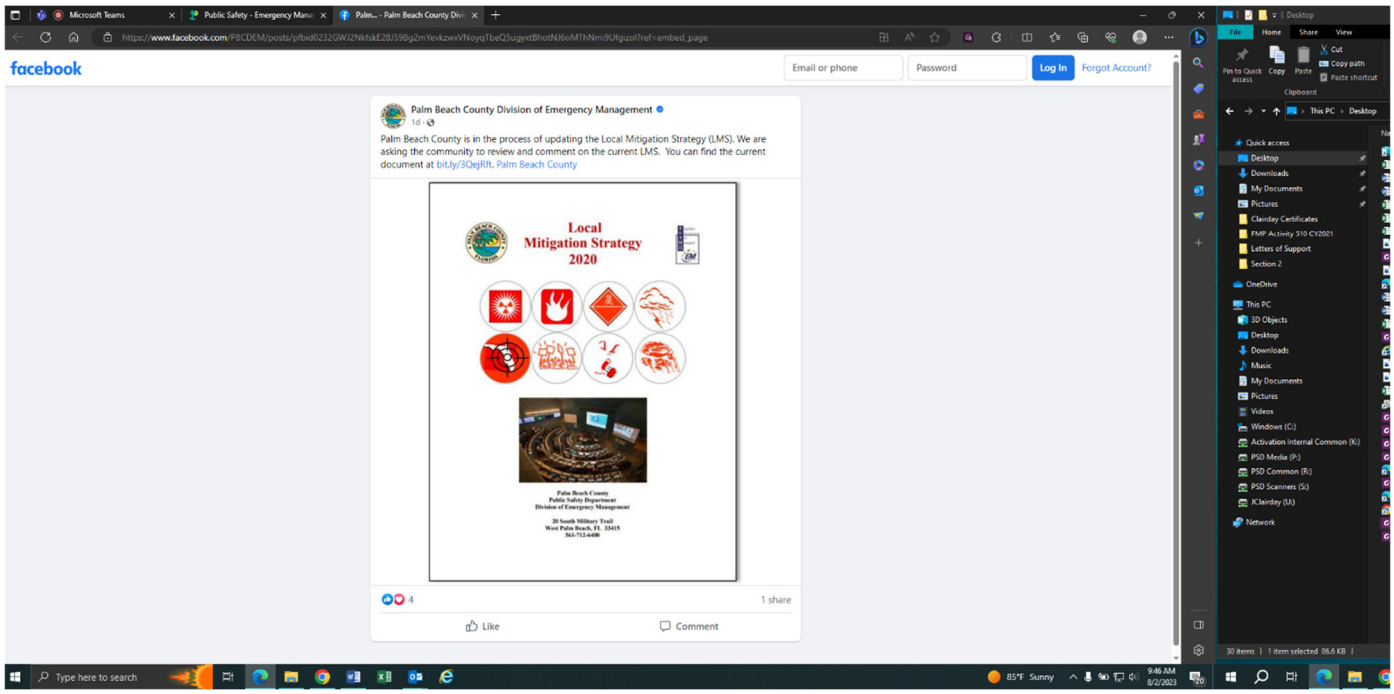

Public Safety - Emergency Management
Home
About Us
Programs & Services
Know Your Zone
Emergency
Hurricane
Preparedness
Employee Corner
Planning
Local Mitigation Strategy (LMS)
Local Mitigation Strategy
The Local Mitigation Strategy (LMS) is a unified, coordinated effort among County and municipal governments to reduce the county's vulnerability to the impacts of identified natural and man-made hazards. Among its primary missions, the Strategy serves as a basis for comprehensive mitigation planning, project identification and prioritization, and provides assistance to project sponsors in securing and allocating available federal, state, local, and other disaster mitigation assistance funds.
LMS projects cover a range of topics including major drainage improvement projects, hardening of public structures, Emergency Operation Center purchases, etc.
At any particular time, the LMS has approximately 100 community mitigation projects on its Prioritized Project List. While some of these projects may eventually be self-funded by sponsoring communities, many will require outside financial assistance in order to be completed. By virtue of being on the LMS Prioritized Project List, each project potentially qualifies for funding assistance consideration though a variety of mitigation assistance programs. Projects typically involve a combination of outside and local funding in line with matching guidelines established by the assistance program.
The LMS closely adheres to guidelines and criteria provided by the Federal Emergency Management Agency and Florida Division of Emergency Management.
A Steering Committee made up of 15 representatives of county and municipal government, not-for-profit organizations, and the private sector serves as the policy body to advise and assist in the administration and oversight of LMS activities and initiatives. A Flood Mitigation Technical Advisory Committee comprised of public and private sector engineers and other flood experts, is charged with assessing flood risks and developing strategies and projects to reduce future losses. The committee focuses on flood basins without regard to jurisdictional boundaries and involves community interests as project
2024 LMS Revision
Palm Beach County 2024 LMS
First Draft for Public Review
As part of the revision process, we are posting our first draft for public review.
Below are the links for the different sections.
PBC LMS2024 - First Draft - Table of Contents
PBC LMS2024 - First Draft - Section 1
PBC LMS2024 - First Draft - Section 2 and 2A
PBC LMS2024 - First Draft - Section 2B
PBC LMS2024 - First Draft - Section 3
PBC LMS2024 - First Draft - Section 4
PBC LMS2024 - First Draft - Acronyms
A Public Forum will be held Wednesday, September 13, 2023 from 6:00 - 7:00 p.m. at the
Palm Beach County Emergency Operations Center
20 South Military Trail
West Palm Beach, FL 33415
Email any comments or suggestions to PBC-LMS@pbcgov.org
Local
Mitigation Strategy


facebook
Email or phone
Password
Log In
Forgot Account?
Palm Beach County Division of Emergency Management
1d
Palm Beach County is in the process of updating the Local Mitigation Strategy (LMS). We are asking the community to review and comment on the current LMS. You can find the current document at bit.ly/3QejRft. Palm Beach County
Local
Mitigation Strategy
2020
Palm Beach County
Public Safety Department
Division of Emergency Management
20 South Military Trail
West Palm Beach, FL 33415
561-712-6400
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Local
Mitigation Strategy
2024
DRAFT
pbcdem
pbcdem As part of the Local Mitigation Strategy (LMS) Revision process, the first draft of the 2024 LMS is posted for public review and input. A Public Forum will be held on Wednesday, September 13, 2023 from 6:00-7:00 p.m. at the Palm Beach County EOC. Please visit our LMS webpage at bit.ly/3QejRft. @palmbeachcountyfl
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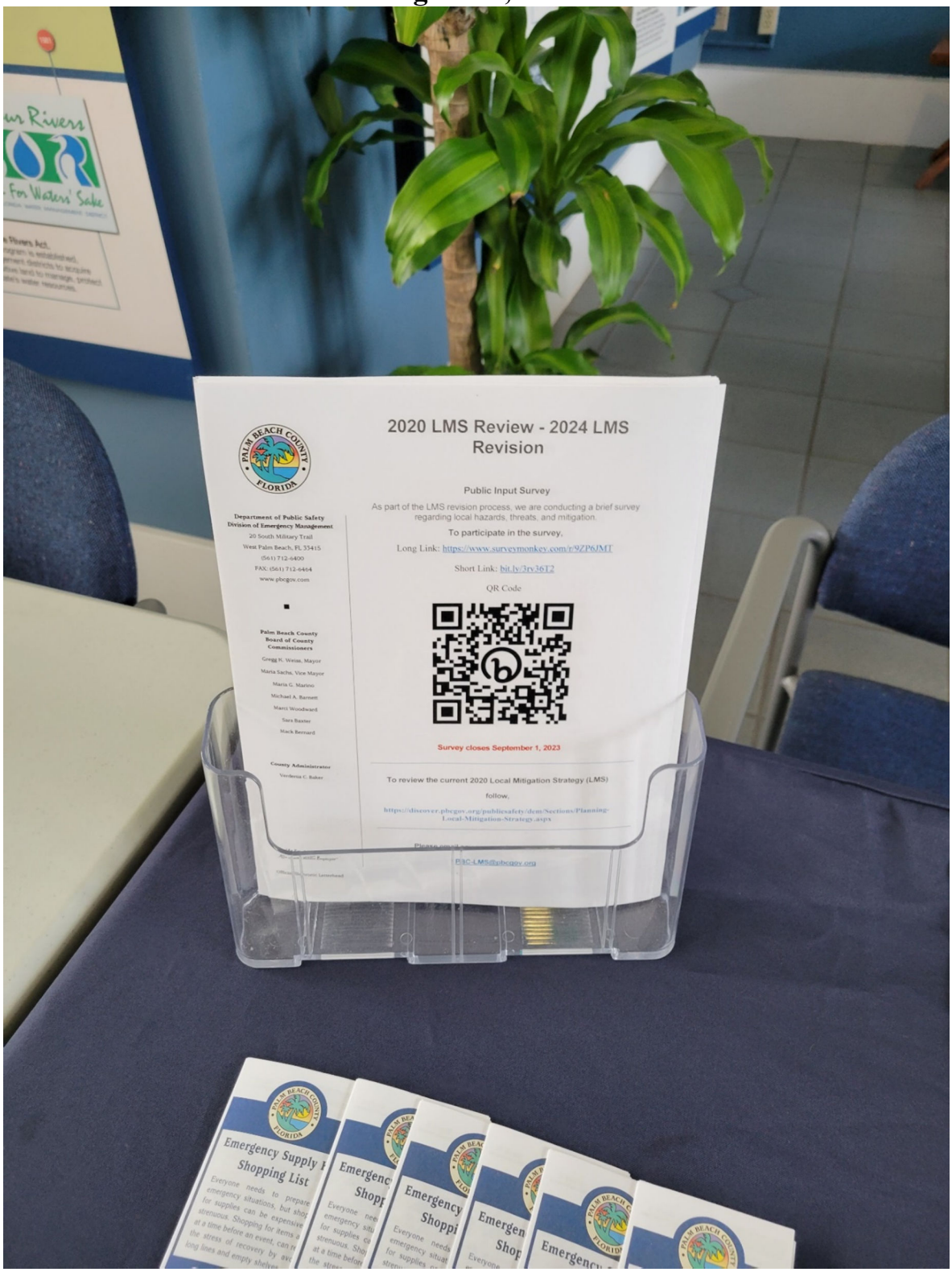
SFWMD Resiliency Coordination Forum & LMS Open House
August 30, 2023




AND MEET THE REGION'S WATER NEEDS
WHILE CONNECTING WITH THE PUBLIC AND STAKEHOLDERS.
Palm Beach County
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Palm Beach County Local Mitigation Strategy—Division of Emergency Management

LMS TIMES

Volume 21

Summer: Jul/Aug/Sep 2023

This Issue:

Department of Public Safety
Division of Emergency Management
20 South Military Trail
West Palm Beach, FL 33415

PH: 561-712-6400
Fax: 561-712-6464

Director's Corner

By Mary Blakeney, FPEM, Director, PBCDEM

As we head into the heart of the 2023 Atlantic Hurricane Season we must remain vigilant of all the risks associated with each and every hurricane independently as they make landfall anywhere in Florida. Seeing the impacts Hurricane Ian had on our peers around the state was overwhelming. Whether we are confronted with a direct landfall or are hundreds of miles away from landfall; every storm is different. We need to continuously remind our residents that every storm posses different risks and we need to focus on those risks for OUR county.

Because of these risks, this is why our Local Mitigation Strategy (LMS) and the work our community puts into mitigation is so important. We need to all provide our input into our LMS updates this year to ensure we are clearly identifying those risks and leveraging every opportunity to mitigate our communities. Every dollar of mitigation could save us six dollars in recovery.

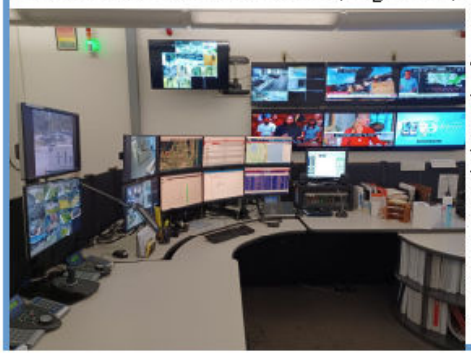
We look forward to a continued partnership with everyone serving our LMS.

Mitigation Matters!

Palm Beach County Spotlight

County Warning Point

The County Warning Point (CWP) is located at the Palm Beach County's Emergency Operations Center and is staffed with Communicators 24 hours a day, seven (7) days a week who serve as Palm Beach County's primary point of contact for a wide variety of both natural and human-caused emergencies, including technological hazards. The CWP collects, organizes, and disseminates information in reference to emergency and non-emergency events within the County.



The CWP ensures that the County's population and emergency management agencies are warned of developing emergency situations and can communicate emergency response decisions as mandated by State Law. The CWP is far from a dispatch center. It is a ***Situational Awareness*** hub that collects, analyzes, and shares information with local, state, and federal partners to aid in their response roles. Their mission is to provide agencies and stakeholders with the most accurate information available relating to ongoing or impending hazardous situations throughout the county and region.

FLORIDA RESILIENT PROGRAM

The Florida Resilient Program enhances efforts that protect inland waterways, coastlines, and shores that serve as invaluable natural defenses against sea level rise. By providing grants and education, investments in the county's communities for the impacts of sea level rise, intensified storms and flooding.

Special topics associated with the Resilient Florida Program

- Sea Level Impact Projection (SLIP) Study
- Living Shorelines
- Florida Flood Hub for Applied Research and Innovation
- Statewide Assessment

Palm Beach County Flooding and Sea Level Rise Resilience Project Funding Requests

Year Requested	Municipalities / Agencies	Total Requested	Number of Projects
2022—2023	4	$27,858,000	11
2023—2024	4	$3,807,364	4

For more information, follow:
https://floridadep.gov/Resilient-Florida

PBC LMS Revisions

Palm Beach County Division of Emergency Management is requesting public input on the current LMS which can be found at:
https://discover.pbcgov.org/publicsafety/dem/Sections/Planning-Local-Mitigation-Strategy.aspx

Email any comments to: PBC-LMS@pbcgov.org

The first draft will be posted on the LMS website in early September. A Public Forum for input has been scheduled for:

September 13, 2023 @ 6:00 pm
PBC EOC—Operations Room
20 S Military Trail, West Palm Beach, FL 33415

For more information, contact:
Jerri L. Clairday at (561) 712-6481 or
JClairday@pbcgov.org

King Tides 2023

According to the National Oceanic and Atmospheric Administration (NOAA), a King Tide is a non-scientific term people often use to describe exceptionally high tides. Tides are long-period waves that roll around the planet as the ocean is "pulled" back and forth by the gravitational pull of the moon and the sun as these bodies interact with the Earth in their monthly and yearly orbits.

Days when Palm Beach County can expect the highest tides in 2023 are:

- September 29—October 2
- October 27—31
- November 26

KNOW YOUR ZONE!!

Do you live near the coast, poor drainage areas, or sheet flow? Access Palm Beach County's ***Flood Zone Look-up Tool*** to determine if your address could be adversely affected by the King Tides.

https://discover.pbcgov.org/publicsafety/dem/pages/know-your-zone.aspx

Request for LMS Times Articles

We want to celebrate your mitigation efforts that keep Palm Beach County safe and beautiful. We are requesting community input for publication in the LMS Times quarterly newsletter. Has your community implemented or completed a mitigation project? If so, please submit a narrative of approximately 500 words along with high resolution photos to:

Jerri L. Clairday, LMS/CRS Coordinator
JClairday@pbcgov.org

LMS2024 First Draft Presentation and Public Forum the PBC EOC
September 13, 2023

Palm Beach County Division of Emergency Management

Local Mitigation Strategy 2024 Revision First Draft – Public Forum

Sign-In Sheet

Palm Beach County EOC – Broadcast Studio

Wednesday, September 13, 2023, 6:00 p.m.

NAME (PLEASE PRINT)	SIGNATURE	AGENCY/ORGANIZATION (if public, leave blank)	EMAIL	TELEPHONE
Mary Blakeney	Mary Blakeney	PBC Emergency Mgmt.	mblakeney@pbcgov.org	712-6331
Jeri L. Chinday	Jeri L. Chinday	PBC DEM	jchinday@pbcgov.org	712-6491
Ralph Wall	Ralph Wall	City of West Palm Beach	rwall@wpb.org	561-805-6661
David Roter	David Roter	Town of Jupiter	davidr@jupiter.fl.us	561-748-2705
Precious Henry	Precious Henry	PBC DEM	PGHATTER@PBCGOV.ORG	561-712-6321

1

LMS Revisions Presentation and Public Input Request at the PBC EM Team Meeting September 20, 2023


Natural Hazards
Flooding
Hurricane/Tropical Storm
Tornado
Severe Thunderstorms/Lightning
Drought
Agricultural Pests and Diseases
Wildfire/Urban Interface Zone
Muck Fire
Soil/Beach Erosion
Sea Level Rise
Seismic Hazards
Geologic Hazards
Pandemic/Communicable Diseases
Extreme Temperatures*
Technological Hazards
Dike Failure
Hazardous Materials Accident
Radiological Accident (Nuclear Pow
Accident)
Communications Failure
Transportation System Accidents
Wellfield Contamination
Power Failure (Outages)
Coastal Oil Spill*
Human-Caused Hazards
Cyber Attacks
Civil Disturbance
Domestic Security
Workplace/School Violence
Harmful Algal Blooms (HAB)*
Mass Migration Crisis*

Palm Beach County Division of Emergency Management
EM Team Meeting 10:00 a.m.
Sign-In Sheet
Wednesday September 20, 2023
Emergency Operations Center, Operations Room

NAME (PLEASE PRINT)	AGENCY/ORGANIZATION	EMAIL	TELEPHONE
Jean A. Heald	Risk Management	jheald1@pbcgov.org	561-233-5432
Jennifer Cirillo	PARKS + Rec	jcirillo@pbcgov.org	(561) 966-6613
Carson Jackson	HR	CFjackso@pbcgov.org	561-616-6885
Janet Steele	PSD/ACC	JSteele@pbcgov.org	561-233-1258
Donald White	SWA	dwhite@swa.org	561-640-4000
Ronnie Heer	PBC DEM	RHEER@PBCGOV.ORG	561-712-6484
Valerie Alleyne	HED.	valleyne@pbcgov.org	561-233-3670
Willie Puz	SWA	wpuz@swa.org	561 640 8914
K Koza	FDEM	Karen.koza@em.myflorida.com	850-754-6226
B. Qualters	P.B.C.S.D. P.D.	brian.qualters@palmbeachschools.org	561-809-1335
Reginald Duren	Admin	RDUREN@PBCGOV.ORG	561 385-3535

Palm Beach County Division of Emergency Management
EM Team Meeting 10:00 a.m.
Sign-In Sheet
Wednesday September 20, 2023
Emergency Operations Center, Operations Room

NAME (PLEASE PRINT)	AGENCY/ORGANIZATION	EMAIL	TELEPHONE
Jimmy Beno	PBC FDO	jbbeno@pbcgov.org	561-233-0285
Kevin Andrews	PBC PZB	Kandrews@pbcgov.org	561-233-5338
Donna Pulda	United Way	donnapulda@unitedwaypbc.org	561-375-6621
Lina Aragon	Palm Tran	laragon@pbcgov.org	561 8125351
Jayme Bosio	Library	bosioj@pbclibrary.org	233-2777
Angela Boyett	ISS	aboyett@pbcgov.org	233-5349
Michael Teets	DEM	mtteets@pbcgov.org	712-6325
Brad Boland	DEM	bboland@pbcgov.org	712-6378
James B. Trube	Tequesta	Jtrube@tequesta.org	561-768-0550
Keith Wall	DEM	kwall@PBCgov.org	561-712-6328
Sherry Navarro	DNFD	Snavarro@pbcgov.com	

Palm Beach County Division of Emergency Management
EM Team Meeting 10:00 a.m.
Sign-In Sheet
Wednesday September 20, 2023
Emergency Operations Center, Operations Room

NAME (PLEASE PRINT)	AGENCY/ORGANIZATION	EMAIL	TELEPHONE
Liz Plaska	Risk Mgt	eplaska@pbcgov.org	233 5422
Aurora Arthay	Library	arthaya@pbclibrary.org	233-2725
Genaya Mercado	PBC Leg. Delegation	GMercado@PBCgov.org	355-3452
Jeliset Hansen	PBC League of Cities	jhansen@pbcgov.org	355-4484
Patrick Rutter	PBC Admin	prutter@pbcgov	355-2034
Ben Norton	PBC ISS/GIS	bnorton@pbcgov.org	712-6487
SCOTT MARTING	PBC RISK MANAGEMENT	smarting@pbcgov.org	233-5441
GARY KAUFMAN	PBSchool PD	gary.Kaufman@palmBeachSchools.org	561 [illegible] 2254
Manuela Diaz	Public Safety	mdiaz@pbcgov.org	561 712-6476
Christine Mucci	Boca EM	CMucci@myboca.us	954-599-[illegible]
Danielle Cole	PBC DEM	dcole@pbcgov.org	561-712-6362
PRECIOUS GAITER	PBC DEM	PGAITER@PBCGOV.ORG	561-712-6321

Palm Beach County Division of Emergency Management
EM Team Meeting 10:00 a.m.
Sign-In Sheet
Wednesday September 20, 2023
Emergency Operations Center, Operations Room

NAME (PLEASE PRINT)	AGENCY/ORGANIZATION	EMAIL	TELEPHONE
LaDorne Brannen	PBC DEM	Lbrannen@pbcgov.org	561-712-6384
Alicia Gray	PalmTran	adgray@pbcgov.org	(561) 374-1164
Ashley Watson	Town of Manalapan	awatson@manalapan.org	561.383.2543
Richard Radcliffe	PBC League	[illegible]@pbcgov.org	561 355-4824
Patty Hindle	DHED	phindle@pbcgov.org	561-233-3641
Regina Hagger	PBC ISS/GIS	Rhagger@pbcgov.org	561-355-2246
Michael Wright	PBC CSD	MWright@pbcgov.org	5-355-9910
WAYNE CANNEY	PBC HR	wcanney@pbcgov.org	616-6562
LynteeLebensart	PBC/Library	lebensart1@pbclibrary	233-2744
Paul Mattedo	PBC HR	pmattedo2@pbcgov.org	616-6864
Gloria Taylor	PBC Public Affairs	gataylor@pbcgov.org	355-6772
Kathleen Dominguez	Lantana	kdominguez@lantana.org	561-540-5016

Palm Beach County Division of Emergency Management
EM Team Meeting 10:00 a.m.
Sign-In Sheet
Wednesday September 20, 2023
Emergency Operations Center, Operations Room

NAME (PLEASE PRINT)	AGENCY/ORGANIZATION	EMAIL	TELEPHONE
Mark Johnson	Riviera Beach Fire	Mjohnson@Riviera-Beach.org	561.657.5676
TREVOR STEEDMAN	PALM BEACH SHORES	TSTEEDMAN@PBSFire.org	5612963380
Justin Klosenberg	PBC DEM	JKlosenb@pbcgov.org	561-712-6320
Chris Davenport	PBC Logistics	cdavenpo@pbcgov.org	561-233-5331
Jerri L. Clairday	PBC DEM	jclairday@pbcgov.org	561-712-6481
ROB JESSOP	PBCFR	RJESSOP@PBCGOV.ORG	561-373-4896
JEFF BOLTON	PBC DHED	JSBOLTON@PBCGOV.ORG	561-233-3612
Mark Osinga	PBC FDO	mosinga@pbcgov.org	561-233-2044
Stessy Cocerez	PBC CSD	scocerez@pbcgov.org	561-355-4718
Dorrit Miller	PBC Admin	dmiller@pbc.org	561.355.2046
Randall Greear	PBC - DEM	rgreear@pbcgov.org	561-712-6370
DARYL BAPTISTE	ISS	dbaptist@pbcgov.org	561-355-2830

LMS Revisions Presentation and Public Input Request at the PBC EM Municipal Meeting
November 15, 2023

PALM BEACH COUNTY
EMERGENCY MANAGEMENT MUNICIPAL MEETING AGENDA

November 15, 2023
9:00 a.m. – 10:00 a.m.
Emergency Operations Center (EOC)
Broadcast Studio
20 S. Military Trail - West Palm Beach, FL 33415

Welcome and introductions	Mary Blakeney, DEM
New Business	
• Local Mitigation Strategy (LMS) Overview	Jerri Clairday, DEM Ralph Wall, West Palm Beach
• Updates on Statewide Initiatives o Everbridge (Alert Florida) o WebEOC	Mary Blakeney, DEM
Regular Business • How can we help you? • Future Meeting Topics	Mary Blakeney, DEM
Next Meeting: January 17, 2024	
Adjournment	

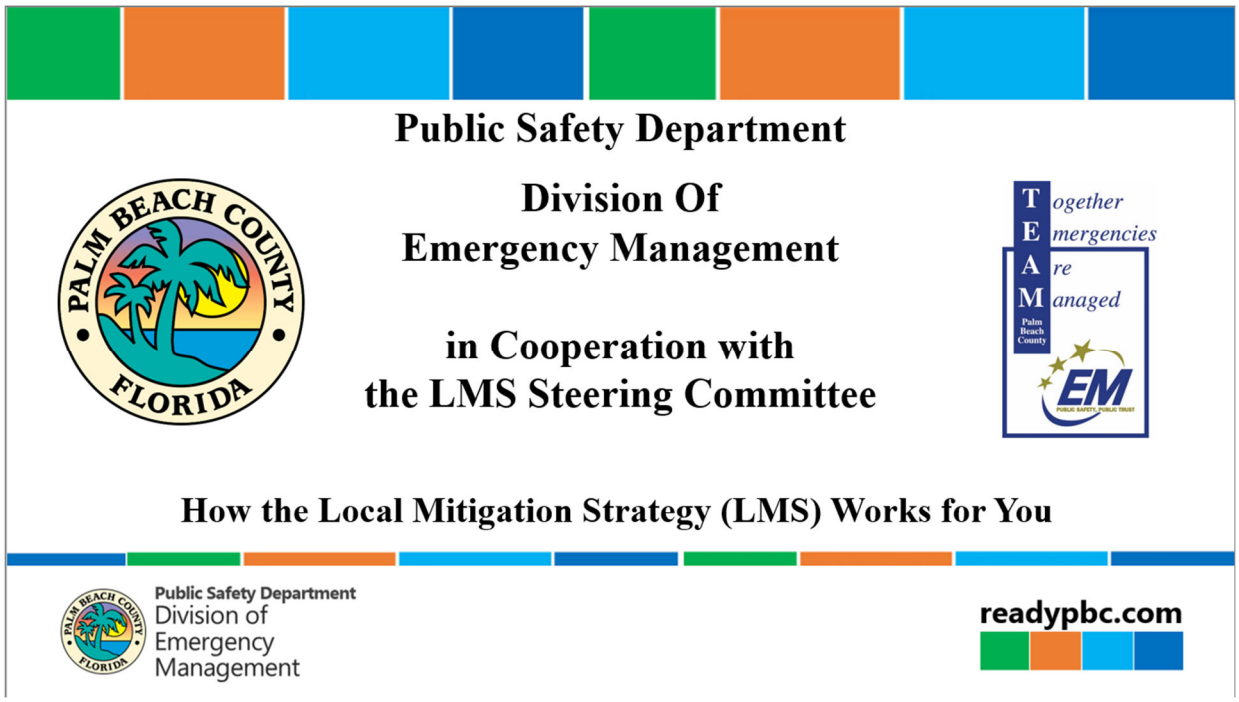
EM Municipal Meeting schedule

- January 17, 2024
- March 20, 2024
- May 22, 2024
- July 17, 2024
- September 18, 2024
- November 20, 2024

Stay connected with us:

@PBCDEM
Facebook.com/pbcdem
Instagram.com/pbcdem
www.AlertPBC.com

EM representatives: please remember that since DEM notifies only the two (2) representatives designated by your municipality or organization, it is your responsibility to communicate with, and share all emergency alerts/notifications and other relevant information received from, the DEM and EOC with all appropriate personnel within your municipality or organization in a timely manner.


Public Safety Department
Division Of
Emergency Management
in Cooperation with
the LMS Steering Committee
Together Emergencies Are Managed
Palm Beach County
EM
How the Local Mitigation Strategy (LMS) Works for You
Public Safety Department
Division of
Emergency
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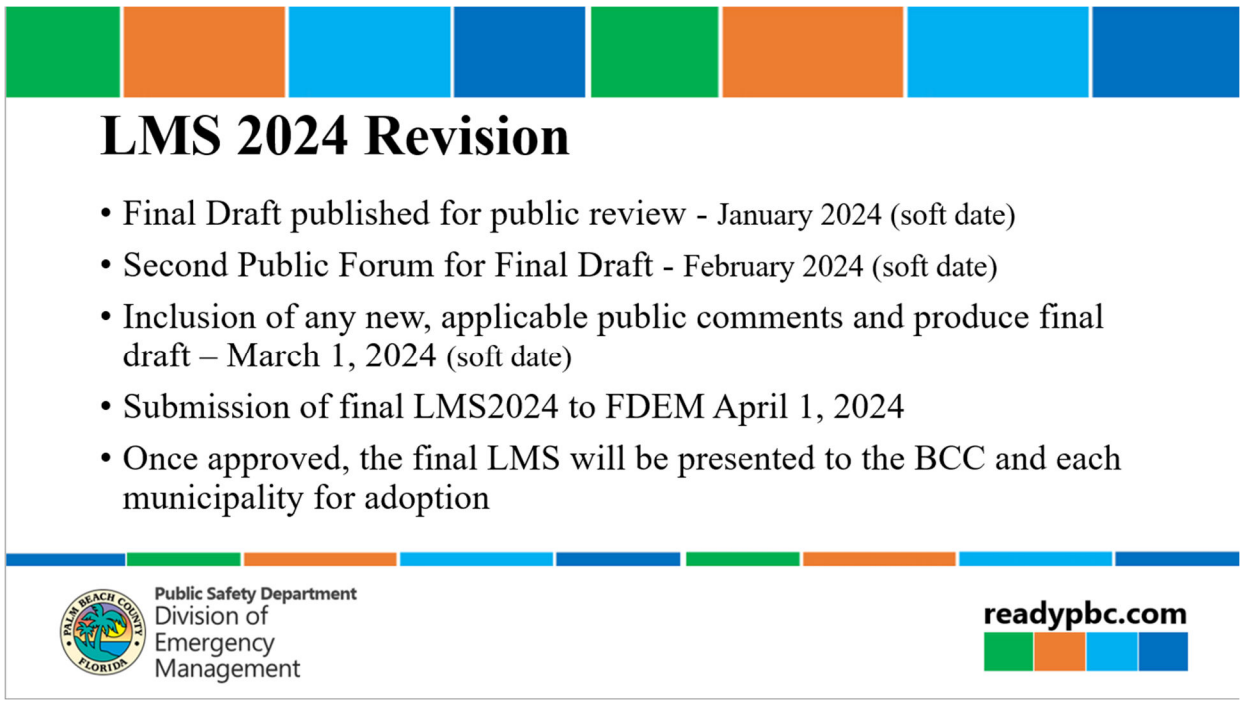
readypbc.com


LMS 2024 Revision
• Final Draft published for public review - January 2024 (soft date)
• Second Public Forum for Final Draft - February 2024 (soft date)
• Inclusion of any new, applicable public comments and produce final draft – March 1, 2024 (soft date)
• Submission of final LMS2024 to FDEM April 1, 2024
• Once approved, the final LMS will be presented to the BCC and each municipality for adoption
Public Safety Department
Division of
Emergency
Management
readypbc.com

Sign-In Sheet
Municipal EM Meeting
Wednesday November 15, 2023

Name (Please Print)	Agency/Organization	Phone	Email
Brent Bloomfield	WPB Fire/EM	561 284 3862	bbloomfield@wpb.org
Shane Miller	WPBFD EM	561 646-1804	smiller@wpb.org
Christine Mucci	Boca Raton EM	954-599-9229	cmucci@myboca.us
Joe Pettrucc	HAULHILL	561 689-0720	ON FILE
Bob Beckmann	Jupiter Inlet Colony	561-917-9505	beckmannb@JICPOLICE.ORG

Sign-In Sheet
Municipal EM Meeting
Wednesday November 15, 2023

Name (Please Print)	Agency/Organization	Phone	Email
Terri L. Clairday	PBC DEM	561-712-6481	jclairday@pbcgov.org
Mark Johnson	RBFR	561-657-5676	Mjohnson@Riviera-Beach.org
Mary Blakeney	PBC DEM	561-712-6331	mblakene@pbcgov.org
Ralph Wall	City of West Palm Beach	561-805-6661	rwall@wpb.org
TREVOR STEEDMAN	Palm Beach Shores	443 944-4911	TSTEEDMAN@PbSfire.org
Jelise Hansen	PBC League of Cities	561-355-4484	jhansen@pbcgov.org
PRECIOUS GAITER	PBC DEM	561-712-6321	PGAITER@PBCGOV.ORG


https://discover.pbc.gov/publicsafety/dem/Sections/Planning-Local-Mitigation-Strategy.aspx
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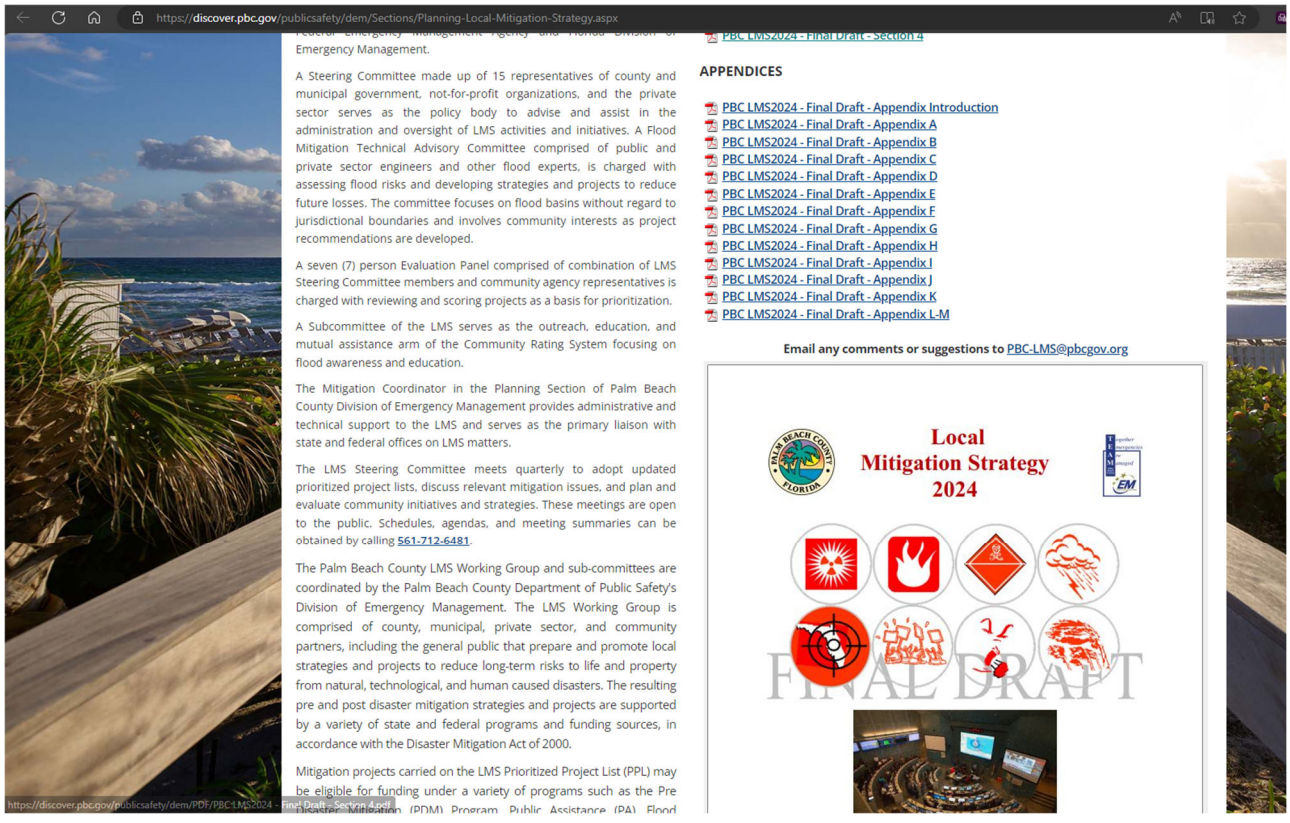
Planning
Local Mitigation Strategy (LMS)
Local Mitigation Strategy
The Local Mitigation Strategy (LMS) is a unified, coordinated effort among County and municipal governments to reduce the county's vulnerability to the impacts of identified natural and man-made hazards. Among its primary missions, the Strategy serves as a basis for comprehensive mitigation planning, project identification and prioritization, and provides assistance to project sponsors in securing and allocating available federal, state, local, and other disaster mitigation assistance funds.
LMS projects cover a range of topics including major drainage improvement projects, hardening of public structures, Emergency Operation Center purchases, etc.
At any particular time, the LMS has approximately 100 community mitigation projects on its Prioritized Project List. While some of these projects may eventually be self-funded by sponsoring communities, many will require outside financial assistance in order to be completed. By virtue of being on the LMS Prioritized Project List, each project potentially qualifies for funding assistance consideration though a variety of mitigation assistance programs. Projects typically involve a combination of outside and local funding in line with matching guidelines established by the assistance program.
The LMS closely adheres to guidelines and criteria provided by the Federal Emergency Management Agency and Florida Division of Emergency Management.
A Steering Committee made up of 15 representatives of county and municipal government, not-for-profit organizations, and the private
2024 Prioritized Project List
Spring 2024 PPL
Fall 2024 PPL
Project Submission
April 26 – May 10, 2024
Project Submission
September 6 – 20, 2024
Evaluation Period
May 17 – 24, 2024
Evaluation Period
September 23 – October 4, 2024
2024 LMS Revision
Palm Beach County 2024 LMS
Final Draft for Public Review
As part of the revision process, we are posting our FINAL DRAFT for public review.
Public forum on the final draft will on March 13, 2024 at 9:00 a.m. at the
Wellington Community Center
12150 Forest Hill Blvd
Wellington, FL 33414
Below are the links for the different sections.
PBC LMS2024 - Final Draft - Table of Contents
PBC LMS2024 - Final Draft - Section 1
PBC LMS2024 - Final Draft - Section 2
PBC LMS2024 - Final Draft - Section 2A - 2B
PBC LMS2024 - Final Draft - Section 3
PBC LMS2024 - Final Draft - Section 4
APPENDICES
PBC LMS2024 - Final Draft - Appendix Introduction


https://discover.pbc.gov/publicsafety/dem/Sections/Planning-Local-Mitigation-Strategy.aspx
Emergency Management.
A Steering Committee made up of 15 representatives of county and municipal government, not-for-profit organizations, and the private sector serves as the policy body to advise and assist in the administration and oversight of LMS activities and initiatives. A Flood Mitigation Technical Advisory Committee comprised of public and private sector engineers and other flood experts, is charged with assessing flood risks and developing strategies and projects to reduce future losses. The committee focuses on flood basins without regard to jurisdictional boundaries and involves community interests as project recommendations are developed.
A seven (7) person Evaluation Panel comprised of combination of LMS Steering Committee members and community agency representatives is charged with reviewing and scoring projects as a basis for prioritization.
A Subcommittee of the LMS serves as the outreach, education, and mutual assistance arm of the Community Rating System focusing on flood awareness and education.
The Mitigation Coordinator in the Planning Section of Palm Beach County Division of Emergency Management provides administrative and technical support to the LMS and serves as the primary liaison with state and federal offices on LMS matters.
The LMS Steering Committee meets quarterly to adopt updated prioritized project lists, discuss relevant mitigation issues, and plan and evaluate community initiatives and strategies. These meetings are open to the public. Schedules, agendas, and meeting summaries can be obtained by calling 561-712-6481.
The Palm Beach County LMS Working Group and sub-committees are coordinated by the Palm Beach County Department of Public Safety's Division of Emergency Management. The LMS Working Group is comprised of county, municipal, private sector, and community partners, including the general public that prepare and promote local strategies and projects to reduce long-term risks to life and property from natural, technological, and human caused disasters. The resulting pre and post disaster mitigation strategies and projects are supported by a variety of state and federal programs and funding sources, in accordance with the Disaster Mitigation Act of 2000.
Mitigation projects carried on the LMS Prioritized Project List (PPL) may be eligible for funding under a variety of programs such as the Pre
PBC LMS2024 - Final Draft - Section 4
APPENDICES
PBC LMS2024 - Final Draft - Appendix Introduction
PBC LMS2024 - Final Draft - Appendix A
PBC LMS2024 - Final Draft - Appendix B
PBC LMS2024 - Final Draft - Appendix C
PBC LMS2024 - Final Draft - Appendix D
PBC LMS2024 - Final Draft - Appendix E
PBC LMS2024 - Final Draft - Appendix F
PBC LMS2024 - Final Draft - Appendix G
PBC LMS2024 - Final Draft - Appendix H
PBC LMS2024 - Final Draft - Appendix I
PBC LMS2024 - Final Draft - Appendix J
PBC LMS2024 - Final Draft - Appendix K
PBC LMS2024 - Final Draft - Appendix L-M
Email any comments or suggestions to PBC-LMS@pbcgov.org
Local Mitigation Strategy 2024
FINAL DRAFT
https://discover.pbc.gov/publicsafety/dem/PDF/PBC-LMS2024 - Final Draft - Section 4.pdf

From: Press Release <PressRelease@pbcgov.org>
Sent: Tuesday, February 27, 2024 10:06 AM
To: Press Release <PressRelease@pbcgov.org>
Subject: PBC Emergency Management - Local Mitigation Strategy public input meeting, March 13, 9 a.m., Wellington Community Center

For immediate release: Feb. 27, 2024
Contact: Jerri L. Clairday (561) 712-6481

Local Mitigation Strategy (LMS) 2024
Final Draft Public Input Forum
and
LMS Working Group Meeting

The Local Mitigation Strategy (LMS) is a Palm Beach County document which identifies hazards to the community and tactics to minimize the risk associated with them. The LMS document is required to be updated/revised every five years. Its purpose is to prepare and promote local strategies and projects that will reduce long-term risks to life and property from natural, technological and human-caused hazards.

The Public Safety Department Division of Emergency Management completed the final draft and posted it for review. The department is asking for community input that will be evaluated for possible inclusion, prior to submitting to Florida Division of Emergency Management.

The county is seeking in-person public feedback on the final draft of the LMS 2024. A public forum will be held on Wednesday, March 13, 2024, at 9 a.m. at the Wellington Community Center, 12150 Forest Hill Boulevard, Wellington. The regularly scheduled LMS Working Group meeting will immediately follow the public forum.

The LMS 2024 final draft can be found at: www.ReadyPBC.com/LMS

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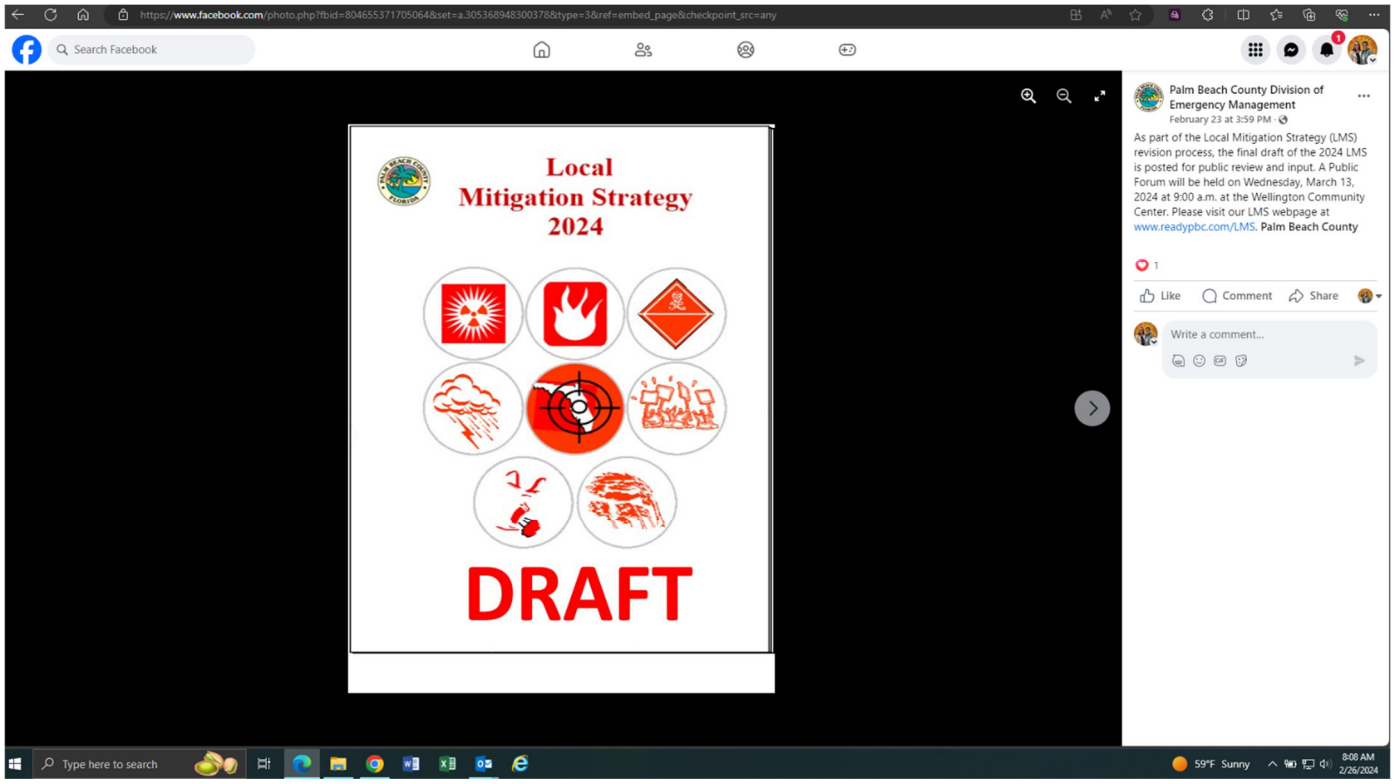
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2024
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Palm Beach County Division of Emergency Management
February 23 at 3:59 PM
As part of the Local Mitigation Strategy (LMS) revision process, the final draft of the 2024 LMS is posted for public review and input. A Public Forum will be held on Wednesday, March 13, 2024 at 9:00 a.m. at the Wellington Community Center. Please visit our LMS webpage at www.readypbc.com/LMS. Palm Beach County
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2024
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pbcdem As part of the Local Mitigation Strategy (LMS) revision process, the final draft of the 2024 LMS is posted for public review and input. A Public Forum will be held on Wednesday, March 13, 2024 at 9:00 a.m. at the Wellington Community Center. Please visit our LMS webpage at www.readypbc.com/LMS. @palmbeachcountyfl
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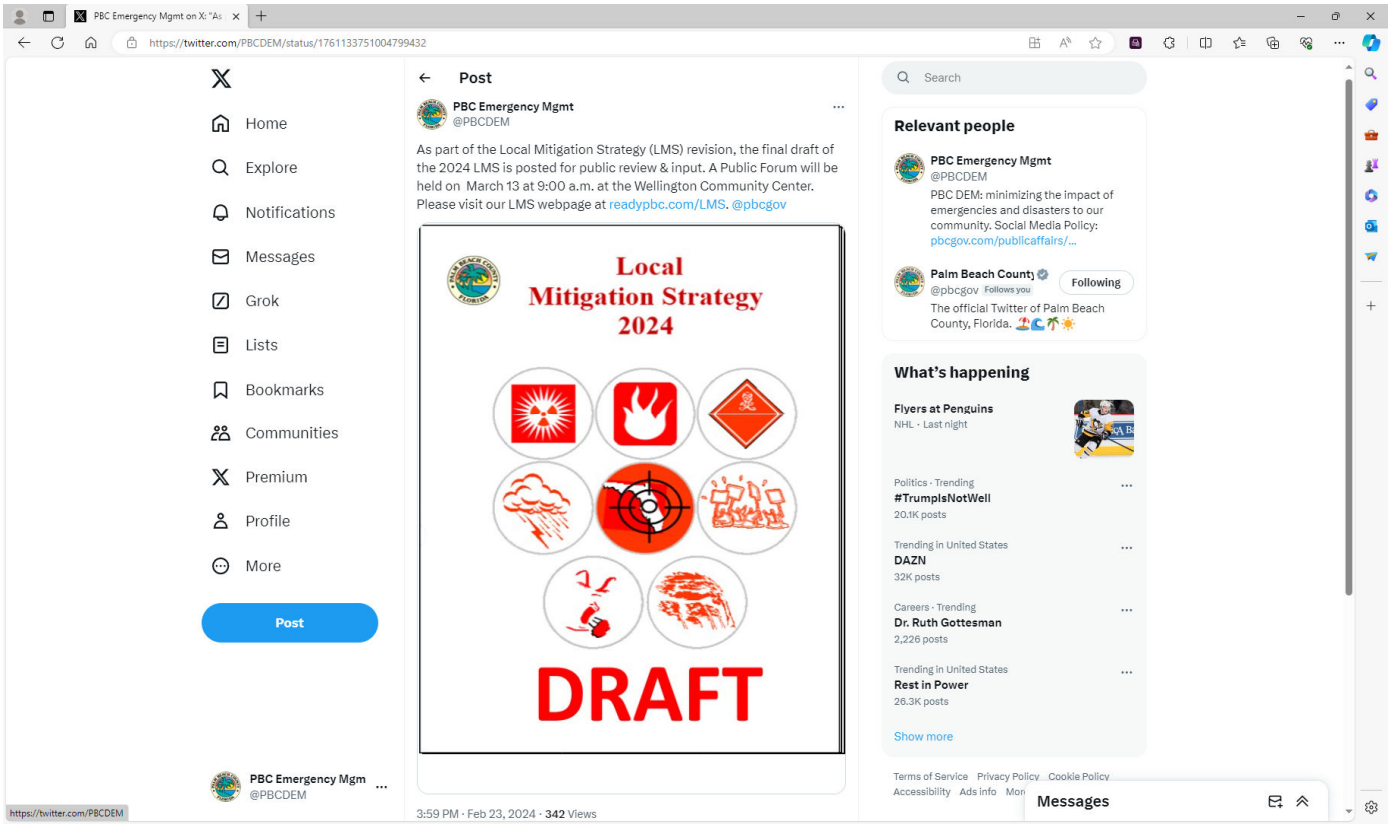
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As part of the Local Mitigation Strategy (LMS) revision, the final draft of the 2024 LMS is posted for public review & input. A Public Forum will be held on March 13 at 9:00 a.m. at the Wellington Community Center. Please visit our LMS webpage at readypbc.com/LMS. @pbcgov
Local Mitigation Strategy 2024
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Palm Beach County Local Mitigation Strategy—Division of Emergency Management

LMS TIMES

Volume 23 Winter: Jan/Feb/Mar

This Issue:

Director's Corner

By Mary Blakeney, FPEM, Director, PBCDEM

We are constantly looking over the horizon to prepare for and mitigate the pervasive threat of natural, technological and human caused hazards. It is imperative for us as leaders to continually educate and remain vigilant to ensure resilience in this dynamic environment. This year we will continue to learn off previous incident/storm responses and Emergency Operations Center Activations. We will incorporate those lessons learned into our drills, exercises and hazard response plans. Our team continues to learn and collaborate mitigating strategies by participating in Martin County and Miami Dade County LMS working groups. Additionally, we have been working alongside PBC's Office of Resilience to examine flood and sea level rise vulnerability assessments.

By the end of March, I am extremely proud that we anticipate having the updated revision to our Local Mitigation Strategy. We also are planning to educate and increase public awareness on the Prioritized Project List so that each municipality in PBC is represented and has a better understanding of the application process. We can't eliminate disasters from happening but we can plan accordingly and minimize their impact!

Palm Beach County Spotlight

LMS 2024 Revision

Local Mitigation Strategy 2024

Palm Beach County
Public Safety Department
Division of Emergency Management

20 South Military Trail
West Palm Beach, FL 33415
561-712-6400

The Final Draft of the LMS 2024 Revision was posted to readypbc.com on February 21st. The PBC DEM in conjunction with the LMS Working Group will be holding a Public Forum on the Final Draft at our LMS Working Group Meeting on:

March 13, 2024 at 9:00am

Wellington Community Center

12150 Forrest Hill Boulevard

Wellington, FL 33414

The public is encouraged to attend. Please contact Jerri Clairday, LMS Coordinator, at PBC-LMS@pbcgov.org or 561-712-6481 for more details. See you there! (More information on page 4)

Palm Beach County * Department of Public Safety * Division of Emergency Management * 20 S Military Trail * West Palm Beach, FL 33415

LMS 2024 Revision (continued from page 1)

The LMS Revisions Sub-Committee is wrapping up the final revisions of the Local Mitigation Strategy (LMS). The LMS is a living document that outlines the County's mitigation strategy for all-hazards identified as threats to Palm Beach County. Every five (5) years, the document must be revised and submitted to FDEM and FEMA for approval. The revision will be submitted to FDEM on April 1, 2024.

LMS Revisions Sub-Committee members consist of dedicated and passionate practitioners who serve as fire chiefs and firefighters, PBSO personnel, business analysts, directors of public works and safety, utility service managers, and DEM staff. Each member contributes perspective and experience that work symbiotically to protect the County's residents, guests, infrastructure, and ecosystem.

PBC DEM has published a news release, information on the web (readypbc.com), social media, and email information on the revised document and public forum for the LMS 2024 Final Draft.

KNOW YOUR ZONE!!

Do you live near the coast, poor drainage areas, or sheet flow? Access Palm Beach County's ***Flood Zone Look-up Tool*** to determine if your address could be adversely affected.

https://discover.pbcgov.org/publicsafety/dem/pages/know-your-zone.aspx

FEMA Flood Protection Toolkits

FEMA has numerous resources for property owners to protect their assets from flooding.

| Flood Protection Toolkit | FloodSmart or

https://agents.floodsmart.gov/toolkits/flood-protection-toolkit

Just one (1) inch of water cause $25,000 of damage to your home. (NFIP website)

Letter from the Editor

2023 was an exciting year. I began my journey as the LMS/CRS Coordinator for PBC DEM in April of last year. We continued to mitigate risks, focused on our priorities by working on our CRS recertification, and then plunged into the LMS2024 revision. I am in awe and inspired by the groups of dedicated PBC professionals who are committed to the preservation of life and property.

As we look ahead to 2024 and 2025, I have developed these goals:

Goals for 2024 & 2025

1. Increase LMS Working Group attendance to 100% compliance
2. Increase PPL project submission to 100% compliance (Local Mitigation Policy Guide, Section C4-a.)
3. Align the PBC DEM Mitigation Office to educate in awareness and understanding of each funding opportunity
4. Achieve CRS Classification 3

These are large undertakings. With the experience, expertise, and dedication of the members of all of the LMS and CRS Cooperating Committees, I believe that together we will not only meet but exceed these goals.

FEMA's concept of "Whole Community": We live it. We are it. Onward!

Jerri L. Clairday, LMS/CRS Coordinator

Request for LMS Times Articles

We are requesting community input for publication in the LMS Times quarterly newsletter. Has your community implemented or completed a mitigation project? If so, please submit a narrative of approximately 500 words along with high resolution photos to:

Jerri L. Clairday, LMS/CRS Coordinator

Electronic submission:
JClairday@pbcgov.org

Hardcopy submissions:
20 Military Trail
West Palm Beach, FL 33415

LMS2024 Revision Presentation and Public Forum at Wellington Community Center March 13, 2024

PALM BEACH COUNTY
LOCAL MITIGATION STRATEGY
LMS Revision Final Draft Public Forum &
LMS Working Group
Agenda

Wednesday, March 13, 2024
9:00 a.m. to 10:30 a.m.

Wellington Community Center

1. **Call to Order – Welcome and Introductions – Ralph Wall, Chairperson**

2. **LMS2024 Revision Final Draft Public Forum – Ralph Wall, Chairperson, and Jerri L. Clairday, LMS/CRS Coordinator**
   - Current LMS Expires – October 25, 2024
   - Submission to FDEM – April 1, 2024
   - Questions on LMS2024 Revision

3. **Goals for 2024 – Jerri L. Clairday, LMS/CRS Coordinator**
   - Increase Working Group attendance to 100% compliance
   - Increase PPL submission to 100% compliance

4. **LMS Working Group Attendance Compliance**
   - LMS Section 1.4 – Participation Requirements

5. **Prioritized Project List (PPL)**
   - Local Mitigation Planning Policy Guide C4-B

6. **Next Meeting**
   - June 26, 2024 – 9:00am – 10:30am (PBC EOC)

7. **Questions/Comments – Ralph Wall, Chairperson**

8. **Adjournment – Ralph Wall, Chairperson**

@PBCDEM - PBCDEM

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in Cooperation with
the LMS Steering Committee

Together Emergencies Are Managed

Local Mitigation Strategy (LMS) 2024 Revisions Public Forum

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Purpose of Mitigation

- To lessen the impact of disasters
- To substantially reduce disaster losses in lives and the social, economic, and environmental assets of Palm Beach County

Mitigation is a payment toward the future for a more resilient community.

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Why a Local Mitigation Strategy (LMS)

- Statutory Requirement
  - Stafford Act amended by Disaster Mitigation Act of 2000
    - 44 CFR Part 201
    - Fla. Stat. § 252.3655 (2022)

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What is the Local Mitigation Strategy (LMS)

- Formally adopted on September 30, 1999, the LMS is a living document that
  - Assists in development and execution of the County's ongoing strategy for
    - Reducing the vulnerability to identified hazards
  - Provides a rational, managed basis for
    - Considering and prioritizing hazard-specific mitigation options
    - Developing and executing sound, cost-effective mitigation projects
  - Provides a basis for
    - Justifying the solicitation and use of funding to support hazard mitigation projects and initiatives

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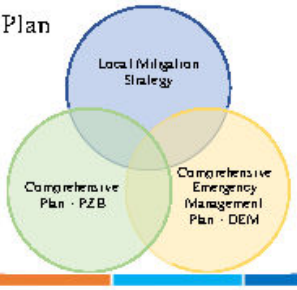
What is the Local Mitigation Strategy (LMS)

- County Continuity
  - PBC DEM Comprehensive Emergency Management Plan
  - PBC PZB Comprehensive Plan
    - Coastal Management Element Objective 2.4-e



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Local Mitigation Strategy (LMS)

- Hazard mitigation assistance and post-disaster financial aid program regulations and guidance **require** local governments to have a FEMA approved hazard mitigation plan in order to apply for and/or receive project grants under the following mitigation grant programs administered by FEMA.
  - Hazard Mitigation Grant Program (HMGP)
  - Building Resilient Infrastructure and Communities (BRIC)
  - Flood Mitigation Assistance (FMA)

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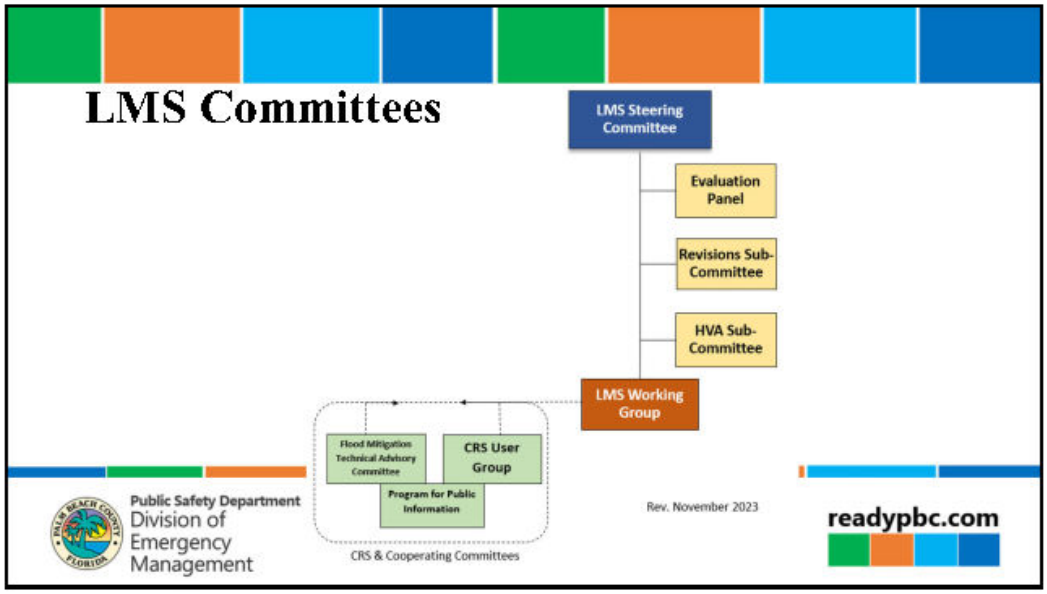
LMS Committees
LMS Steering Committee
Evaluation Panel
Revisions Sub-Committee
HVA Sub-Committee
LMS Working Group
Flood Mitigation Technical Advisory Committee
CRS User Group
Program for Public Information
CRS & Cooperating Committees
Rev. November 2023
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Local Mitigation Strategy 2024
FINAL DRAFT
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Local Mitigation Strategy (LMS) Revision

- Section 1 – Planning Process
  - Governance
  - Committees
    - LMS Standing Committees
    - Community Rating System (CRS) & Cooperating Committees
  - **Updates**
    - Table 1.1 Municipalities Participating in LMS – created and added
    - Figure 1.2 LMS2024 Timeline for PBC created, adopted, and added

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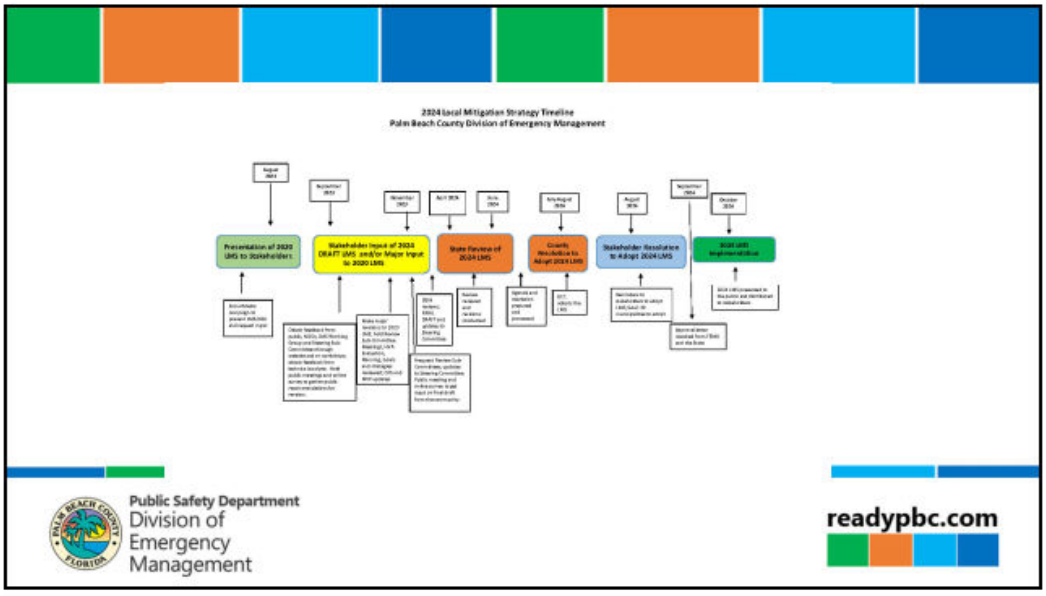

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Local Mitigation Strategy (LMS) Revision

- Section 2 – Hazard Identification & Vulnerability Assessment
  - THIRA
  - Historical Events
  - **Updates**
    - Added brief Climate Change narrative
    - Added Harmful Algal Bloom as a hazard
    - Added historical events from 2020 to present
    - Removed historical events 10 years or older unless their impact was significant
    - Hazards in subsections 2.1 (Hazard Identification) and 2.2 (Vulnerability Assessment) brought into chronological alignment (also Appendix A)

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2021 THIRA (Commissioned by PBC)

Natural Hazards
- Flooding
- Hurricane/Tropical Storm
- Tornado
- Severe Thunderstorms/Lightning
- Drought
- Agricultural Pests and Diseases
- Wildfire/Urban Interface Zone
- Muck Fire
- Soil/Beach Erosion
- Sea Level Rise
- Seismic Hazards
- Geologic Hazards
- Pandemic/Communicable Diseases
- Extreme Temperatures*

Technological Hazards
- Dike Failure
- Hazardous Materials Accident
- Radiological Accident (Nuclear Power Plant Accident)
- Communications Failure
- Transportation System Accidents
- Wellfield Contamination
- Power Failure (Outages)
- Coastal Oil Spill*

Human-Caused Hazards
- Cyber Attacks
- Civil Disturbance
- Domestic Security
- Workplace/School Violence
- Harmful Algal Blooms (HAB)*
- Mass Migration Crisis*

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Local Mitigation Strategy (LMS) Revision

- Section 2B – Vulnerability of Residential & Commercial Properties
  - **Updates**
    - Residential
      - Table 2B. 1: Summary Table of Property – Palm Beach County Property Appraiser's Office
      - Table 2B. 2: Residential Structures by Exterior Wall Type in PBC
    - Commercial
      - Table 2B. 3: Palm Beach County Property Appraiser Commercial Parcels, Buildings, and Reconstruction Costs
    - Narrative edited for continuity

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Local Mitigation Strategy (LMS) Revision

- Section 3 – Mitigation Strategy
  - **Updates**
    - 3.1.2 State
      - Goals updated to coincide with Florida State Hazard Mitigation Plan (SHMP) 2023
    - 3.1.3.2 South Florida Water Management District (SFWMD)
      - Information updated by SFWMD personnel
    - Table 3.1 PBC Population Estimates as of April 1, 2022
    - Table 3.3 Summary of Repetitive Loss Properties by Local Government and Community Rating System (CRS) (2023)
    - Added subsection 3.4 LMS Action Plan – CRS credit

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Local Mitigation Strategy (LMS) Revision

- Section 4 – Procedures
  - Project Prioritization Methodology
  - **Updates**
    - Formal Benefit/Cost Analysis (Ratio) not required for projects under $1 million, detailed narrative added
    - Fourth (4th) Tie-Break question added
      - Moved to Question #1 to break ties

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Local Mitigation Strategy (LMS) Revision

- Appendices
- Appendix A
  - **Updates**
    - Tables brought into chronological alignment with subsections 2.1 (Hazard Identification and 2.2 (Vulnerability Assessment)

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Local Mitigation Strategy (LMS) Revision

- Appendices
- Appendix D
  - **Updates**
    - Updated information regarding public input
      - Narrative
      - Exhibits

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Local Mitigation Strategy (LMS) Revision

- Appendices
- Appendix E
  - **Updates**
    - Fall 2023 Prioritized Project List
    - Juno Beach completed project
    - South Bay completed project

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Local Mitigation Strategy (LMS) Revision

- Appendices
- Appendix G
  - **Updates**
    - All maps updated by **PBC GIS**

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Local Mitigation Strategy (LMS) Revision

- Appendices
- Appendix H
  - **Updates**
    - Updated Repetitive Loss list from FEMA
    - New NFIP and Policies and Claims report from FEMA
    - New NFIP Polices in Force from FEMA
    - New Repetitive Loss Properties by Jurisdiction from FEMA

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Local Mitigation Strategy (LMS) Revision

- Appendices
- Appendix J
  - **Updates**
    - Action Items
      - Activities related to CRS Program and points accrual
    - Updated Floodplain Management Plan (Activity 510)

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Local Mitigation Strategy (LMS) Revision

- Appendices
- Appendix L
  - **Updates**
    - Updated Committee Meeting Minutes and Sign-in Sheets

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Local Mitigation Strategy (LMS) Revision

- Appendices
- Appendix M
  - **Updates**
    - Critical Facilities List updated but not released for public disclosure pursuant to Florida Statute §119.071(3)

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Next Steps

- Submit LMS2024 Final Draft to FDEM by April 1, 2024
- After obtaining Approved Pending Adoption (APA) status from FDEM
  - At least one (1) jurisdiction must adopt prior to expiration date of October 15, 2024
  - All remaining jurisdictions must adopt within 12 months after official approval

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Review Final Draft & Provide Comments

readypbc.com/LMS

OR

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Choose: Programs & Services ➔ Local Mitigation Strategy

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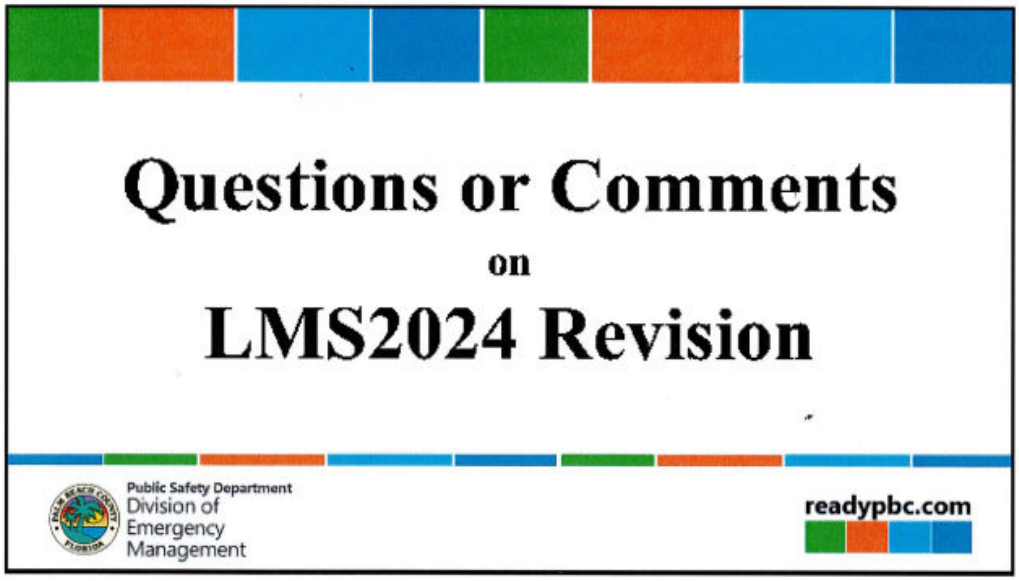
Questions or Comments
on
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in Cooperation with
the LMS Steering Committee

Palm Beach County Division of Emergency Management
LMS2024 Final Draft Public Forum & LMS Working Group Sign-In Sheet
Wellington Community Center
Wednesday, March 13, 2024, 9:00 a.m.

NAME (PLEASE PRINT)	SIGNATURE	AGENCY/ORGANIZATION (if public, leave blank)	EMAIL	TELEPHONE
Merrell Angstreich		Town of Lake Park	mangstreich@lakeparkflorida.gov	561-882-1819
Doug Chambers		Village of Tequesta	DChambers@tequesta.org	561-768-0483
Trevor Steedman		Town of Palm Beach Shores	TSTEEDMAN@PBSFIRE.ORG	561 296 3380
Rick Detar		DEM	fdetar@pbc.gov	(561)275-6713
David Rotar		Town of Jupiter	stormwater@jupiter.fl.us	561 741-2705
Alannah Irwin		City of Boynton Beach	irwina@bbfl.us	561-742-6415
Juan Cuesta		City of Delray Beach	cuestaj@mydelraybeach.com	561-243-7220
Richard Gatlett		Town of Lox Groves	rsgallant@loxahatcheegrovefl.gov	5617075573
Ashley Watson		Town of Manalapan	awatson@manalapan.org	561-383-2543
Carlos Cedeño		Greenacres	ccedeno@greenacresfl.gov	561 642-2071
Jacquelyn Anderson		PBC P2B	JBAnderson@pbc.gov	561 2335103
Precious Gaiter		PBC DEM	PGAITER@PBCGOV.ORG	5617126321
Stessy Cocerez		PBC ODR	scocerez@pbc.gov	

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Palm Beach County Division of Emergency Management

LMS2024 Final Draft Public Forum & LMS Working Group Sign-In Sheet

Wellington Community Center

Wednesday, March 13, 2024, 9:00 a.m.

NAME (PLEASE PRINT)	SIGNATURE	AGENCY/ORGANIZATION (if public, leave blank)	EMAIL	TELEPHONE
Bob Beckmann		Jupiter Inlet Colony	Beckmannb@JICPOLICE	561-917-5805
Ken Roundtree		Northern Palm Beach County Imp. Distrct	Ken@NPBCID.com	561-624-7830
Tracey Stevens		Town of Haverhill	tstevens@townofhaverhill-fl.gov	561-689-0370 x 1
ED Sperbeck		PBSO	sperbeke@pbso.org	561 371. 4455
Jaime Morales		Town of Lake Park	Jmorales@LakeParkFlorida.gov.	
Andrea Dobbins		Town of Juno Beach	adobbins@juno-beach.fl.us	
Grace Joyce		City of Riviera Beach	gjoyce@rivierabeach.org	
Christine Mucci		Boca Raton	Lmucci@myboca.us	954-599-4229
Ralph Wall		City of West Palm Beach	rwalle wpb.org	561-805-6661
Orlando Rodriguez		Town of palm Beach Shores	ORodriguez@PBSTownhall	
Adamo DiSisto		Village of Royal Palm Beach	adisisto@royalpalmbeachfl.gov	561-790-5163
Craig Lower		Town of Loxahatchee grovers	Clower@Townof Loxahatchee	561-723-5323
Jerri L. Clairday		PBC DEM	jclairday@pbcgov.org	561-712-6481

Palm Beach County Division of Emergency Management

LMS2024 Final Draft Public Forum & LMS Working Group Sign-In Sheet

Wellington Community Center

Wednesday, March 13, 2024, 9:00 a.m.

NAME (PLEASE PRINT)	SIGNATURE	AGENCY/ORGANIZATION (if public, leave blank)	EMAIL	TELEPHONE
Mary Pinkerman	Mary Pinkerman	Lake Clarke Shores	Mpinkerman@lakeclarke.org	561-964-1515
Isabella Hickey	Isabella Hickey	Town of Juno Beach	ihickey@juno-beach.fl.us	5616560318
Nicole Coates	Nicole Coates	Village of Wellington	ncoates@wellingtonfl.gov	5617914733
MICHAEL LOW	M.L. Low	RIVIERA BEACH	MLOW@RIVIERABEACH.ORG	5618454185
Jramis Cabrera	Jramis Cabrera	Village of Palm Springs	jcabrera@vpsfl.org	
IVD AKA JIMENEZ		Village of Palm Springs	JJIMENEZ@vpsfl.org	561-373-0315
Lynne Ladner	Lynne Ladner	Ocean Ridge Town of	lladner@oceanridgeflorida.com	561-732-2635

Palm Beach County Division of Emergency Management

LMS2024 Final Draft Public Forum & LMS Working Group Sign-In Sheet

Wellington Community Center

Wednesday, March 13, 2024, 9:00 a.m.

NAME (PLEASE PRINT)	SIGNATURE	AGENCY/ORGANIZATION (if public, leave blank)	EMAIL	TELEPHONE
Jerry Kelly	Virtual	Lake Worth Beach		
Paul Linton	Virtual	PBC		
Daniel W	Virtual	Palm Beach Gardens		
Gerardo Martinez-Castillo	Virtual	WPB VA Med Ctr		
Glen Joseph	Virtual	Delray Beach		
Ibrahim Younis	Virtual	Green Acres		
Sherry McCoddle	Virtual	SFWMD		
Edgar Ker	Virtual	South Bay		

PBC Non-Profit Contact Information January 2024

anna.poulin@ewrunnerctr.org Edna W Runner West Jupiter Community Group, Inc.

semrichywca@yahoo.com YWCA of Palm Beach County

elisabeth.perry@211pbtc.org 2-1-1 Palm Beach/Treasure Coast

info@AchievementCentersFL.org Achievement Centers for Children and Families

info@alzpb.org Alzheimer's Care Resource Center of PB

info@aacy.org American Association of Caregiving Youth

Jgavrilos@bocahelpinghands.org Boca Helping Hands

info@cmboca.org Boca Raton Children's Museum

info@bgcpbc.org Boys and Girls Clubs of PBC

sgomez@diocesepb.org Catholic Charities

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Rich@FloridaFishingAcademy.com Florida Fishing Academy

customercare@gssef.org Girl Scouts of Southeast Florida

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Palm Beach County Private Sector (For-Profit) Contact Information

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sales@chrisallenhomes.com Chris Allen Realty

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info@efundpro.com EFundPro LLC (Business Finance)

palmbeachgardens@landmarkpb.com Landmark Insurance of the Palm Beaches

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Appendix E: Prioritized Project Lists

Appendix E contains the latest update of PBC's LMS Prioritized Project List (PPL). The list of projects is ever changing as projects completed through self - funding or with grant assistance are dropped and new proposed and planned projects are added. Jurisdictions and other potential project sponsors, particularly those not having projectson the current list, are encouraged to submit projects. The expectation is that all potential applicants be represented on the PPL with projects that address identified local hazards, vulnerabilities, and mitigation strategies. As municipalities complete projects, they will be encouraged to submit new ones. At any given time, a few communities will not have listed projects. The current project list contains 106 mitigation projects. However, not every municipality has a "brick and mortar" mitigation project. All municipalities provide outreach to their citizens. In addition, the County also provides outreach to all citizens throughout the County and within the municipalities. This outreach includes information on all hazards that are common to Palm Beach County, not just hurricanes, as well as additional information on how residents and communities can mitigate against these hazards.

Twice a year, in May and September/October, new projects for the PPL are evaluated and scored tobe added to the PPL. Additionally, once a year in November, projects that have been on the list over four (4) years will be evaluated for potential removal from the PPL. These projects can be resubmitted with current information and will be re-scored during the nextevaluation period.

Each year the evaluation committee meets in November to review the project evaluation process. This ensures that the process is current and adaptable to meet the needs of the community.

All projects on the list are maintained and monitored by the County LMS Coordinator. Once a project is funded, the project is removed from the pending list and placed on a list of active projects. Then once the project is completed, the projects will be placed on a completed list. Potential Projects funding sources include but are not limited: 406 HMP: Hazard Mitigation Program (FEMA), 404 HMGP: Hazard Mitigation Grant Program (FEMA), 426 PAAP: Public Assistance Alternative Procedures (FEMA), CDBG-DR (HUD), PDM: Pre-Disaster Mitigation (FEMA), and FMA: Flood Mitigation Assistance (FEMA).

The PPL shows the ranking of the project with the lower the number (the higher priority), the type of project, the municipality that submitted the project, the department in the municipality that will head the project, the primary funding source sought (while there may be a number of funding sources available, for the purpose of those projects, they are seeking HMGP dollars, but maintain the flexibility to other funding as it is announced and

becomes available), status of project, hazard that project will mitigate against, and duration until the project is completed once funded and started.

The appendix addresses, in part, the following FEMA requirements:

Requirement: §201.6(c)(3)(iii): The mitigation strategy section must include an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

Requirement §201.6(c)(3)(iv): For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.

Requirement §201.6(c)(3)(ii): The mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

Requirement: §201.6(c)(3)(ii): The mitigation strategy must also address the jurisdiction's participation in the National Flood Insurance Program (NFIP), and continued compliance with NFIP requirements, as appropriate.

Requirement: §201.6(d)(3): A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval within 5 years in order to continue to be eligible for mitigation grant funding.

Other sections and appendices addressing these requirements include appendices F, G, andJ and Section 3 and Section 5.

About the Prioritized Project List

Normally the PPL is updated twice a year, in the spring and in the fall. Projects are added, deleted, modified, scored, and ranked in accordance with the procedures described in Section 4.

The process and criteria used to rank projects are described in detail in Section 4. The current criteria emphasize: "community benefit" (Does the project promise tangible benefits to the community?); "project benefit" (Does the project address critical elements of the community infrastructure?); "community exposure" (Does the project mitigate an identified hazard or all-hazards to which the community is particularly vulnerable?); "costeffectiveness" (Does the project meet or exceed the thresholds of benefit to cost ratios using accepted methodologies?); "community commitment" (Is the project consistent with or incorporated in other plans, including COMP plans, CEMPs?); "public support" (Is there demonstrated public support for

the project?); and "project implementation considerations" (What further is required to accomplish implementation)?

The feasibility and benefits of ranking "like" projects rather than forcing a single list of highly dissimilar projects has been discussed by the LMS Evaluation Panel and will continue to be explored.

The current procedure for prioritizing projects will be retained until any enhancementsare fully developed and deemed acceptable under the rules of LMS by FEMA and FDEM and adopted by the LMS Steering Committee.

This section also contains completed/deferred/deleted projects as well as photos of some of our completed projects within the county that were once on the PPL list. Since the last revision, the COVID-19 pandemic was experienced world-wide. Unfortunately, mitigation efforts within the whole County (including local governments and special districts) had to reprioritize resulting in some projects expiring or removed from plans. Additionally, the cost of materials and a compromised supply chain have caused delays with implementation of projects. Conversely, the down-time during the pandemic also fostered opportunities to rethink and revise mitigation efforts resulting in longer-term plans, new and "green" projects being added, and some realigned or combined to maximize effectiveness to the communities and County.

The LMS Steering Committee, in collaboration with the Evaluation Panel, are currently in a grassroots effort to capitalize on the benefits of submitting projects to the PPL. Although each local government does not currently have a project that is scored and ranked, the LMS Working Group chair and the coordinator have begun meeting with noncompliant communities and special districts to review their CIPs and identify projects eligible for submission to the PPL. The LMS Working Group chair has stressed the importance at each Working Group meeting and hosted FDEM Mitigation Bureau members to Working Group meetings to clarify requirements and to answer any questions from the stakeholders. The LMS Working Group chair and coordinator have also been meeting with different departments and divisions within the County to identify county-wide projects that mitigate our identified threats and hazards. It has been found that each agency or jurisdiction has planned, ongoing, and completed mitigation projects that were simply not submitted to the PPL.

PALM BEACH COUNTY LMS PRIORITIZED PROJECT LIST

Fall 2023

Prioritized Project List - Palm Beach County - Fall 2023

Rank	Score	Project Number	Agency/Organization	Department / Position	Project Title	Project Type	Expected Timeframe (Years)	Potential Funding Source	Estimated Cost
1	91.83	LMS 386075	City of Boynton Beach	Operations, Deputy Director	Lake Boynton Estates Drainage Improvements	Flood Control/Reduction and Waterway Management	1	HMGP	$8,000,000
2	90.83	LMS 638815	City of Boynton Beach	Operations, Deputy Director	NW 2nd Street SFWMD C-16, Flood Risk Reduction / Heart of Downtown Boynton Drainage Improvements	Infrastructure (Water/Sewer/Drainage)	1	HMGP	$10,685,519
3	89.83	LMS 175874	City of Boynton Beach	Operations, Deputy Director	Chapell Hill Drainage Improvements	Infrastructure (Water/Sewer/Drainage)	1	HMGP	$5,000,000
4	88.57	LMS 808821	City of Delray Beach	Public Works, Stormwater Administrator	Marine Way Seawall Improvements	Flood Control/Reduction and Waterway Management	2	FMA	$2,250,000
5	88.00	LMS 763619	Village of Palm Springs	EES, Assistant Village Manager	Generators for Raw Water Wells 12, 13 & 14	Infrastructure (Water/Sewer/Drainage)	2	TBD	$450,000
6	87.57	LMS 616588	City of Delray Beach	Public Works, Stormwater Administrator	Tropic Isle Roadway and Underground Utilities Improvement	Infrastructure	3	HMGP	$16,000,000
7	87.28	LMS 206661	City of Delray Beach	Public Works, Stormwater Administrator	Thomas Street Pump Station	Flood Control/Reduction and Waterway Management	1	HMGP	$7,000,000
8	87.00	LMS 947985	City of Delray Beach	Public Works, Stormwater Administrator	Marine Way Roadway and Drainage Improvements	Infrastructure	1	HMGP	$14,000,000
9	81.17	LMS 528345	City of Boynton Beach	CRA, Assistant Director	Boynton Harbor Marina Seawall Replacement	Beach/Seawall	1	PDM	$4,500,000
10	80.00	LMS 689971	Northern Palm Beach County Improvement District	Improvement District, Director of Operations	Pump Station, Code Plus Generator / Pump Station Emergency Power	Infrastructure (Water/Sewer/Drainage)	2	HMGP or PDM	$2,450,000
11	79.17	LMS 369285	West Palm Beach	Development Services, Management Analyst	West Palm Beach Fire Station #3 / Emergency Operations Center Hurricane Hardening and Wind Retrofit	Infrastructure (Building)	2	HMGP or PDM	$3,200,000
12	78.67	LMS 348741	Northern Palm Beach County Improvement District	Improvement District, Director of Operations	Administration Building Roof, Wind Retrofit / Administration Building and Emergency Operations Center Hardening	Community of Operations/Government	1	HMGP	$200,000
13	78.33	LMS 388986	West Palm Beach	Development Services, Management Analyst	West Palm Beach Fire Station #1 Hurricane Hardening & Wind Retrofit	Infrastructure (Building)	3	HMGP	$1,000,000
14	78.00	LMS 938543	West Palm Beach	Development Services, Management Analyst	West Palm Beach Fire Station #6 Hurricane Hardening and Wind Retrofit	Infrastructure (Building)	2	HMGP or PDM	$600,000
15	77.67	LMS 519589	West Palm Beach	Development Services, Management Analyst	West Palm Beach Police Department Headquarters Building Hurricane Hardening and Wind Retrofit	Infrastructure (Building)	2	HMGP, PDM, or FMA	$5,300,000
16	77.14	LMS 975294	City of Riviera Beach	Utilities District, Assistant Executive Director	North Filter Building Hurricane Hardening	Infrastructure (Water/Sewer/Drainage)	1	HMGP	$400,000
17	76.86	LMS 220415	Town of Palm Beach	Coastal Protection, Coastal Coordinator	Stormwater and Wastewater System Resilience: D-8 Pump Station / E-3 Lift Station Elevation	Infrastructure (Water/Sewer/Drainage)	1	FCMP	$1,446,424
18	76.43	LMS 344746	City of Lake Worth Beach	Utilities, Assistant Water Utilities Director	South Palm Park Drainage Resiliency Improvements	Flood Control/Reduction and Waterway Management	1	HMGP, FMA, PDM, HFP, RFC	$600,000
19	76.25	LMS 967871	City of Riviera Beach	Utility District, Assistant Executive Director	Water Treatment Plant Generator Improvement Project	Infrastructure (Water/Sewer/Drainage)	1	HMGP	$2,450,000
20	76.00	LMS 970978	Town of Briny Breezes	Administration, Town Manager	Town-wide Stormwater Master Drainage Plan	Flood Control/Reduction and Waterway Management	2	HMGP	$2,579,000
21	75.29	LMS 631175	Town of Palm Beach	Coastal Protection, Coastal Coordinator	Wastewater System Resilience: A-5 Lift Station Elevation	Infrastructure (Water/Sewer/Drainage)	3	FCMP	$1,033,000
22	75.17	LMS 948837	City of Boynton Beach	Operations, Deputy Director	City of Boynton Beach Green/Gray Infrastructure Plan	Flood Control/Reduction and Waterway Management	1	TBD	$824,500
23	74.83	LMS 644455	Village of Palm Springs	Village Manager, Assistant Village Manager	Water Treatment Plant Generator	Infrastructure (Water/Sewer/Drainage)	2	HMGP	$300,000
24	74.83	LMS 936085	City of Delray Beach	Public Works, Stormwater Administrator	Tidal Check Valve Improvement Project - Phase 2	Flood Control/Reduction and Waterway Management	2	HMGP	$750,000
25	74.67	LMS 828881	City of Delray Beach	Public Works, Stormwater Administrator	Seawall Improvements - NE 1st Ct, NE 2nd St, NE 5th St, Bucida and Spanish Circle	Flood Control/Reduction and Waterway Management	2	HMGP or FMA	$1,200,000
26	74.5	LMS 453818	Village of Palm Springs	Village Manager, Assistant Village Manager	Ruetra Lift Station /Generator / Lift Station Emergency Power	Infrastructure (Water/Sewer/Drainage)	1	HMGP	$200,000
27	74.33	LMS 224397	City of Delray Beach	Public Works, Stormwater Administrator	Tidal Check Valve Improvement Project - Phase 4	Flood Control/Reduction and Waterway Management	2	HMGP or FMA	$750,000
28	74.33	LMS 293394	City of Delray Beach	Public Works, Stormwater Administrator	Tidal Check Valve Improvement Project - Phase 3	Flood Control/Reduction and Waterway Management	2	HMGP or FMA	$750,000
29	74.33	LMS 445644	Town of Palm Beach	Coastal Protection, Coastal Coordinator	Stormwater System Resilience: D-12 Pump Station Floodproofing	Infrastructure (Water/Sewer/Drainage)	2	FCMP	$910,000
30	74.17	LMS 601753	West Palm Beach	Development Services, Management Analyst	N. Flagler Drive Waterfront Improvements	Beach/Seawall	1	HMGP, FMA, or FCMP	$18,800,000

Adopted by LMS Steering Committee on 10/25/2023.

Prioritized Project List - Palm Beach County - Fall 2023

Rank	Score	Project Number	Agency/Organization	Department / Position	Project Title	Project Type	Expected Timeframe (Years)	Potential Funding Source	Estimated Cost
31	74.17	LMS 338148	Town of South Palm Beach	Administration, Town Manager	Town Hall Hardening and Preparedness Enhancements	Infrastructure (Building)	1	HMGP, PDM, or HP	$757,243
32	72.33	LMS 527103	West Palm Beach	Sustainability, Manager	Segment #3 - S. Flagler Waterfront Improvements - North of Bristol Condo	Beach/Seawall	1	HMGP, FMA, or RCMP	$1,500,000
33	72.33	LMS 742079	West Palm Beach	Development Services, Management Analyst	West Palm Beach Fire Station No. 9 Hurricane Hardening and Wind Retrofit	Infrastructure (Building)	2	HMGP or PDM	$2,000,000
34	72.29	LMS 3409806	Town of Jupiter	Utilities Services, Manager	Water Treatment Plant Hardened Server Rm/Training Facility and Server Room	Infrastructure (Building)	1	HMGP	$652,795
35	71.83	LMS 591558	West Palm Beach	Development Services, Management Analyst	Downtown Lakeview Ave. Waterfront Improvements	Beach/Seawall	1	HMGP, FMA, or RCMP	$2,100,000
36	71.50	LMS 894588	West Palm Beach	Development Services, Management Analyst	Palm Harbor Marina Waterfront Improvements	Beach/Seawall	1	HMGP, FMA, or RCMP	$950,000
37	70.33	LMS 3074434	South Florida Water Management District	District Resiliency, Plan Coordinator	L8 Corbett levee, Flood Risk Reduction (TB) / Corbett levee Culverts	Flood Control/Reduction and Waterway Management	1	HMGP	$17,771,277
38	69.00	LMS 6414439	City of Riviera Beach	Fire Department, Assistant Chief	Ocean Rescue Station Hardening	Mitigation	2	HMGP, EMPA, EMPG, or PDM	$1,000,000
39	68.83	LMS 4295221	Village of Wellington	Emergency Management & Public Safety, Director	Lift Stations #2 #4 Generators / Lift Station Emergency Power	Infrastructure (Water/Sewer/Drainage)	1	HMGP	$400,000
40	68.83	LMS 7190512	City of Riviera Beach	Utilities District, Assistant Executive Director	Lift Station Panel Upgrades	Infrastructure (Water/Sewer/Drainage)	3	HMGP, FMA, PDM, or Other	$900,000
41	68.71	LMS 2015991	Village of Wellington	Emergency Management & Public Safety, Director	Neighborhood Flood Control Improvements	Flood Control/Reduction and Waterway Management	1	HMGP	$3,052,848
42	68.50	LMS 1068382	Village of Wellington	Emergency Management & Public Safety, Director	Water Treatment Plant (WTP) Utility Mitigation Generator / WTP Control Facility Emergency Power	Infrastructure (Water/Sewer/Drainage)	1	HMGP	$450,000
43	68.43	LMS 0868349	Town of Palm Beach	Coastal Protection, Coastal Coordinator	Stormwater System Resilience: D-17 Pump Station Elevation	Infrastructure (Water/Sewer/Drainage)	2	RCMP	$760,000
44	67.85	LMS 0065215	City of Riviera Beach	Utilities District, Assistant Executive Director	Riviera Beach Wellfield Resiliency Upgrades	Infrastructure (Water/Sewer/Drainage)	2	HMGP or CDBG	$6,200,000
45	67.83	LMS 180784	West Palm Beach	District Resiliency, Plan Coordinator	Segment #2 - S. Flagler Waterfront Improvements - Pershing Way to Chadbourne Ct	Beach/Seawall	1	HMGP, FMA, or RCMP	$21,475,000
46	67.67	LMS 0868947	City of Riviera Beach	Utilities District, Assistant Executive Director	Raw Water Well Panel Upgrades	Infrastructure (Water/Sewer/Drainage)	3	HMGP, PDM, or FMA	$900,000
47	67.57	LMS 9983221	Baptist Health South Florida	Construction Management, Director	Baptist Health South Florida - Bethesda Hospital East Wind Retrofit	Shuttering and Wind Proofing	2	HMGP or PDM	$6,000,000
48	67.43	LMS 626499	Town of Lantana	Town Manager	N Atlantic Drive Drainage Improvements	Flood Control/Reduction and Waterway Management	2	TBD	$518,000
49	67.28	LMS 293238	Town of Lantana	Town Manager	Beach Drive/Barefoot Ln. Drainage Improvement	Flood Control/Reduction and Waterway Management	3	TBD	$400,000
50	67.17	LMS 308436	Village of Palm Springs	Village Manager, Assistant Village Manager	Raw Water Well Emergency Power	Infrastructure (Water/Sewer/Drainage)	2	HMGP	$530,000
51	67.14	LMS 6435026	City of Palm Beach Gardens	Engineering/Construction Department, COO	RGA WWTP Emergency Generator Upgrade Project	Infrastructure (Water/Sewer/Drainage)	3	HMGP, PDM, HF, or CFF/NDF	$1,890,000
52	66.67	LMS 427677	City of Lake Worth Beach	Utilities, Assistant Water Utilities Director	Lake Worth Beach Utility Standby Generators	Infrastructure (Water/Sewer/Drainage)	1	HMGP	$750,000
53	66.67	LMS 2107734	City of Riviera Beach	Fire Department, Assistant Chief	Fire Station No.89 Hurricane Hardening	Shuttering and Wind Proofing	3	TBD	$1,346,100
54	66.67	LMS 232086	Village of Royal Palm Beach	Engineering, Project Engineer	Canal Bank Tree Removal	Flood Control/Reduction and Waterway Management	1	TBD	$200,000
55	66.33	LMS 0849082	Village of Wellington	Emergency Management & Public Safety, Director	PBSO Substation, Wind Retrofit / PBSO Substation Hardening	Infrastructure (Building)	2	HMGP or PDM	$2,140,903
56	66.00	LMS 997272	City of Palm Beach Gardens	Engineering/Construction Department, COO	Lift Station 21 Hardening and Resiliency Improvements Project	Infrastructure (Water/Sewer/Drainage)	2	HMGP, PDM, HF, or CFF/NDF	$630,000
57	65.83	LMS 497864	City of Delray Beach	Public Works, Stormwater Administrator	Standby Lakeview Stormwater Pipe Improvements	Flood Control/Reduction and Waterway Management	2	HMGP, FMA, or CDBG	$500,000
58	65.14	LMS 524174	Town of Lantana	Town Manager	S. Lakeside Place Drainage Improvements	Infrastructure (Water/Sewer/Drainage)	3+	TBD	$250,000
59	64.33	LMS 316303	City of Palm Beach Gardens	Engineering/Construction Department, COO	Lift Station Telemetry Improvements Project	Mechanical Maintenance/Improvement	3	HMGP, FMA, HMGP, PDM, or [illegible]	$4,851,000
60	64.17	LMS 0316389	South Florida Water Management District	District Resiliency, Plan Coordinator	L9 Corbett Wildlife Management Area - Hydrologic Restoration and Levee Resiliency	Flood Control/Reduction and Waterway Management	1	TBD	$13,000,000

Adopted by LMS Steering Committee on 10/25/2023.

Prioritized Project List - Palm Beach County - Fall 2023

Rank	Score	Project Number	Agency/Organization	Department / Position	Project Title	Project Type	Expected Timeframe (Years)	Potential Funding Source	Estimated Cost
61	64.17	LMS 466124	Town of Lantana	Town Manager	Operations Center Roof Replacement	Continuity of Operations/Government	2	TBD	$100,000
62	64.00	LMS 968153	City of Lake Worth Beach	Utilities, Assistant Water Utilities Director	Raw Water Well F-3 Emergency Generator	Infrastructure (Water/Sewer/Drainage)	2	HMGP	$500,000
63	63.83	LMS 419883	City of Palm Beach Gardens	Engineering/Construction Department, COO	Lift Station 20 Hardening and Resiliency Improvements	Infrastructure (Water/Sewer/Drainage)	2	HMGP, PDM, HF, or CFF/NDF	$630,000
64	63.83	LMS 137646	Town of Lantana	Town Manager	N. Lake Drive Drainage Improvements	Flood Control/Reduction and Waterway Management	2	TBD	$400,000
65	63.33	LMS 478886	City of Riviera Beach	Utilities District, Assistant Executive Director	4 Dry Can Lift Station Replacements	Infrastructure (Water/Sewer/Drainage)	3	HMGP, FMA, or TBD	$2,969,408
66	63.00	LMS 977914	Village of Tequesta	Public Works, Director	Public Safety Building Emergency Generator	Continuity of Operations/Government	1	HMGP	$545,000
67	62.86	LMS 261577	Town of Juno Beach	Risk Management/ Project Coordinator	Juno Ocean Walk Drainage Project	Mitigation	1	HMGP	$70,000
68	62.33	LMS 268466	Village of Palm Springs	Village Manager, Assistant Village Manager	Lorene Dr. Flood Protection	Infrastructure (Water/Sewer/Drainage)	2	HMGP	$1,004,841
69	62.17	LMS 788074	Town of Lantana	Town Manager	Euclid Path outfall improvements	Infrastructure (Water/Sewer/Drainage)	2	TBD	$250,000
70	61.67	LMS 497259	City of Riviera Beach	Utilities District, Assistant Executive Director	Comprehensive Lift Station Rehabilitation	Infrastructure (Water/Sewer/Drainage)	2	HMGP	$6,400,000
71	61.50	LMS 122805	City of Palm Beach Gardens	Engineering/Construction Department, COO	Lift Station 1 Hardening and Resiliency Improvements Project	Infrastructure (Water/Sewer/Drainage)	2	HMGP, PDM, HF, or CFF/NDF	$756,000
72	60.57	LMS 413066	Palm Beach Gardens Regional Utility	Engineering/Construction Department, COO	Lift Station 2 Hardening and Resiliency Improvements Project	Infrastructure (Water/Sewer/Drainage)	2	HMGP, PDM, HF, or CFF/NDF	$756,000
73	60.17	LMS 853051	Town of Briny Breezes	Town Manager	Town-wide Coastal Protection & Stormwater Adaptation Project	Flood Control/Reduction and Waterway Management	3	TBD	$14,444,718
74	60.17	LMS 378014	West Palm Beach	Public Works, Director	Public Works Operations Building Hardening	Mitigation	2	HMGP	$2,363,950
75	60.17	LMS 876455	West Palm Beach	Sustainability, Manager	Segment #5 - S. Flagler Dr Waterfront Improvements - Russlyn to Greenwood Dr	Beach/Seawall	1	HMGP, FMA, or RCMP	$21,500,000
76	59.50	LMS 333532	West Palm Beach	Sustainability, Manager	Segment #1 - S. Flagler Waterfront Improvements - Monoeaux/Atala to Flushing Way	Beach/Seawall	1	HMGP, FMA, or RCMP	$7,125,000
77	59.33	LMS 703317	Town of Juno Beach	Risk Management/ Project Coordinator	Emergency Generator Replacement	Infrastructure (Building)	3	TBD	$200,000
78	59.17	LMS 445484	West Palm Beach	Sustainability, Manager	Segment #6 - S. Flagler Waterfront Improvements - Linda Lane to Russlyn Dr	Beach/Seawall	1	HMGP, FMA, or RCMP	$12,000,000
79	59.00	LMS 298956	Town of South Palm Beach	Administration, Town Manager	Master Lift Station Hardening	Infrastructure (Water/Sewer/Drainage)	2	HMGP, FMA, or PDM	$912,000
80	59.00	LMS 298292	Town of Palm Beach	Coastal Protection, Coastal Coordinator	Palm Beach Utility Undergrounding Phase 8	Infrastructure	2	HMGP	$12,000,000
81	58.83	LMS 134254	Village of Wellington	Emergency Management & Public Safety, Director	Water Treatment Plant Emergency Power	Mitigation	1	HMGP	$2,500,000
82	58.50	LMS 925187	West Palm Beach	Sustainability, Manager	Segment #4 - S. Flagler Waterfront Improvements - Summa St to Linda Lane	Beach/Seawall	1	HMGP or FMA	$25,000,000
83	55.67	LMS 229552	Village of Tequesta	Public Works, Director	Village Hall Emergency Generator	Continuity of Operations/Government	1	HMGP	$450,000
84	55.33	LMS 765557	Northern Palm Beach County Improvement District	Improvement District, Director of Operations	Unit 5 Stormwater	Infrastructure (Water/Sewer/Drainage)	1	HMGP or PDM	$2,840,000
85	55.00	LMS 881478	City of Lake Worth Beach	Utilities, Assistant Water Utilities Director	Life Station No. 5 Emergency Generator	Infrastructure (Water/Sewer/Drainage)	2	HMGP	$500,000
86	53.00	LMS 868474	City of Riviera Beach	Public Works, City Engineer	6th and 7th Street and Avenue H Stormwater	Infrastructure (Water/Sewer/Drainage)	3	HMGP, FMA, PDM, HF, or TBD	$6,427,096
87	52.14	LMS 551924	Town of Palm Beach	Coastal Protection, Coastal Coordinator	Coastal Flood Vulnerability Assessment Update and Priority Planning	Planning	1	RCMP	$270,000
88	52.00	LMS 841542	West Palm Beach	Public Works, Director	Public Works Complex Buildings Hardening	Mitigation	3	HMGP, PDM, or PW&ED	$9,136,388
89	51.86	LMS 1009825	City of Delray Beach	Public Works, Stormwater Administrator	Standby Generators for Critical Facilities	Continuity of Operations/Government	1	HMGP, FMA, or CDBG	$300,000
90	51.57	LMS 672129	Indian Trail Improvement District	Operations & Maintenance Department/Chief Construction	Corbett levee	Flood Control/Reduction and Waterway Management	1	HMGP or PDM	$5,700,000

Adopted by LMS Steering Committee on 10/25/2023.

Prioritized Project List - Palm Beach County - Fall 2023

Rank	Score	Project Number	Agency/Organization	Department / Position	Project Title	Project Type	Expected Timeframe (Years)	Potential Funding Source	Estimated Cost
01	51.33	LMS 228454	Village of Tequesta	Public Works, Director	Public Safety Building Wind Mitigation	Infrastructure (Building)	2	HMGP	$1,455,000
02	51.33	LMS 654053	Village of Tequesta	Public Works, Director	Village Hall Wind Mitigation	Infrastructure (Building)	2	HMGP	$675,000
03	51.33	LMS 397389	Northern Palm Beach County Improvement District	Improvement District, Director of Operations	Unit 20 Pond Lakes	Flood Control/Reduction and Waterway Management	1	HMGP or PDM	$1,620,000
04	50.83	LMS 809833	City of Lake Worth Beach	Utilities, Assistant Water Utilities Director	Lift Station #11 Emergency Generator	Infrastructure (Water/Sewer/Drainage)	2	HMGP	$500,000
05	50.83	LMS 646211	City of Lake Worth Beach	Utilities, Assistant Water Utilities Director	Lift Station #15 Emergency Generator	Infrastructure (Water/Sewer/Drainage)	2	HMGP	$500,000
06	50.17	LMS 000743	Village of Royal Palm Beach	Engineering, Project Engineer	La Mancha Underdrain	Infrastructure (Water/Sewer/Drainage)	1	HMGP	$1,942,001
07	48.86	LMS 067687	Town of South Palm Beach	Administration, Town Manager	Powerline Undergrounding Project	Mitigation	2	HMGP, PDM, HC, or CFF/NDF	$2,125,000
08	48.17	LMS 226051	Indian Trail Improvement District	Operations & Maintenance Department/Chief Construction Officer	40th Street Drainage	Infrastructure (Water/Sewer/Drainage)	2	HMGP	$3,000,000
09	47.50	LMS 844112	Village of Wellington	Emergency Management & Public Safety, Director	Pump Station #5	Infrastructure (Water/Sewer/Drainage)	2	HMGP	$2,400,000
10	47.00	LMS 617223	Village of Wellington	Emergency Management & Public Safety, Director	Lift Station Emergency Power - Phase II	Infrastructure (Water/Sewer/Drainage)	1	HMGP or PDM	$700,000
11	45.67	LMS 841926	City of Riviera Beach	Fire Department, Assistant Chief	Fire Station No.86 Hurricane Hardening	Shuttering and Wind Proofing	3	TBD	$500,000
12	45.14	LMS 030177	Village of Palm Springs	Village Manager, Assistant Village Manager	Police Department Hardening	Infrastructure (Building)	1	HMGP or PDM	$1,464,044
13	41.86	LMS 857722	City of Riviera Beach	Utilities District, Assistant Executive Director	South Chemical Building Hardening	Infrastructure (Building)	1	TBD	$75,000
14	41.83	LMS 223925	Village of Tequesta	Public Works, Director	Tequesta Drive Bridge Improvements Project	Infrastructure (Roadway)	2	HMGP	$520,000
15	41.14	LMS 813848	Village of Wellington	Emergency Management & Public Safety, Director	Wellington Community Center Hardening	Infrastructure (Building)	1	HMGP or PDM	$539,522
16	39.14	LMS 875296	Indian Trail Improvement District	Operations & Maintenance Department/Chief Construction Officer	Santa Rosa Groves Pump Station	Infrastructure (Water/Sewer/Drainage)	2	HMGP or PDM	$739,529
17	38.71	LMS 724894	Indian Trail Improvement District	Operations & Maintenance Department/Chief Construction Officer	M-1 Impoundment	Infrastructure (Water/Sewer/Drainage)	1	HMGP	$205,126
18	38.83	LMS 852572	Indian Trail Improvement District	Operations & Maintenance Department/Chief Construction Officer	M-1 Inverted Siphon	Infrastructure (Water/Sewer/Drainage)	1	HMGP or PDM	$1,751,400
19	31.00	LMS 148349	Village of Wellington	Emergency Management & Public Safety, Director	South Shore/Pierson Rd. Improvements	Infrastructure (Roadway)	2	HMGP or PDM	$2,530,000

Total Estimated Cost: **$385,096,665**

Projects shaded in green were added Fall 2023.

Total Estimated Cost Compared to Previous PPL: **-$1,690,618**

Adopted by LMS Steering Committee on 10/25/2023.

PROJECTS REMOVED						
Score	**Project Number**	**Agency/Organization**	**Project Title**	**Project Type**	**Estimated Cost**	
67.43	LMS-622298	Village of Royal Palm Beach	Bridge Slope Stabilization and Canal Dredging, Phase II	Flood Control/Reduction and Waterway Management	$2,600,000	EXPIRED
57.14	LMS-900137	City of Palm Beach Gardens	City Hall, Police, Fire Station Wind Retrofit	Shuttering and Wind Proofing	$600,000	EXPIRED
47.00	LMS-002675	Town of Hypoluxo	Town Hall Hardening	Shuttering and Wind Proofing	$450,000	EXPIRED
41.57	LMS-675494	Palm Beach County	PBC FDO OSC Full Building Power Generator	Continuity of Operations/Government	$1,400,000	Funded by bond issuance
36.29	LMS-928468	Indian Trail Improvement District	Outfall Canal Control Structure	Flood Control/Reduction and Waterway Management	$400,000	EXPIRED
60.00	LMS-672084	South Florida Water Management District	District Resiliency, Plan Coordinator	Corbet Levee	$8,800,000	Duplicate Project

Total Value of Projects Removed **$14,250,000**

PROJECTS COMPLETED						
Score	**Project Number**	**Agency/Organization**	**Project Title**	**Project Type**	**Estimated Cost**	
88	LMS-062731	Town of Palm Beach Shores	Palm Beach Shores Underground Utilities Project	Infrastructure	$774,920	Self-Funded

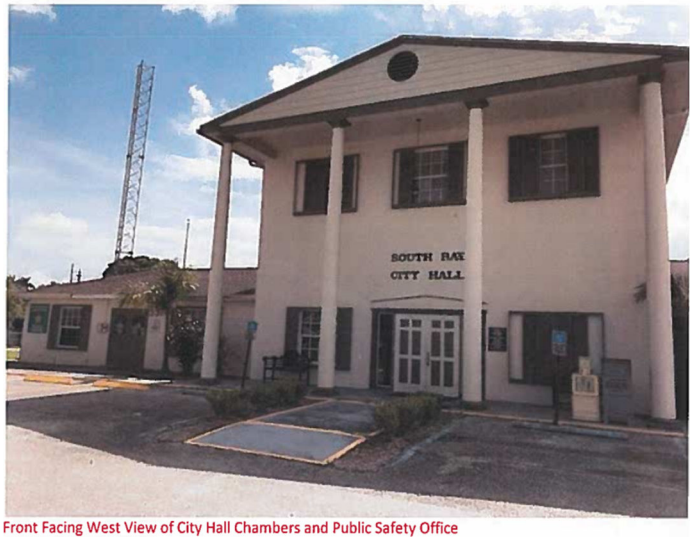
PROJECTS INITIATED						
Score	**Project Number**	**Agency/Organization**	**Project Title**	**Project Type**	**Estimated Cost**	
73.17	**LMS-389398**	**Village of North Palm Beach**	**EOC Generator / EOC Emergency Power**	**Continuity of Operations/Government**	**$800,000**	
73	**LMS-242928**	**Village of Palm Springs**	**Davis Road North Basin Stormwater Improvements**	**Infrastructure (Water/Sewer/Drainage)**	**$976,752**	Self-Funded
36.29	**LMS-928468**	**Indian Trail Improvement District**	**Outfall Canal Control Structure**	**Flood Control/Reduction and Waterway Management**	**$400,000**	HMGP / Florida Resilient Grant Match

Total Value of Projects Initiated **$2,176,752**

SUMMARY	
Project(s) Completed	1
Project(s) Initiated	3
Project(s) Removed	6
Projects Submitted for Scoring	12
New Projects on the PPL	12
Increase in Number of Projects on PPL	2
Increase in Cost of All Projects on PPL	**$4,452,546.00**

Completed South Bay Project under HMGP DR 4337- Hurricane Irma, LMS 104977

The City of South Bay's City Hall/Sheriff Office/Fire Station suffered a fire and was reconstructed in 1997 without replacing the windows and doors with impact resistant materials. Funding facilitated shuttering the facility that functions as the emergency shelter/care center for the City of South Bay.



Front Facing West View of City Hall Chambers and Public Safety Office


North East Side View of City Hall

East Side View of City Hall

South Side View of City Hall

Back Facing East View of City Hall

In-Progress Universe Boulevard Improvements in Juno Beach, LMS 181375

The project replaced and improved the Universe Boulevard drainage system. Funding facilitated the removal of the existing facilities, construction of the new infrastructure, and construction inspection activities. Project completion is targeted for January 2024.

Appendix F: Funding and Data Sources

This appendix addresses, in part, the following FEMA requirements:

Requirement §201.6(c)(3): The plan shall include a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.

Requirement §201.6(c)(3)(i): The hazard mitigation strategy must include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

Requirement §201.6(c)(3)(ii): The mitigation strategy must include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

Palm Beach County seeks to utilize every available funding source to provide comprehensive mitigation funding to mitigation projects. We do this by utilizing resources at the local, state,and federal levels and by being in continued contact with funding agencies and partners throughout the region.

The following list, though not exhaustive, includes many of the ways mitigation projects are funded or encouraged to be funded by the LMS in the county:

- **Hazard Mitigation Grant Program (HMGP)** – This program provides funding only after a Presidentially-declared disaster affects the county. It is provided by FEMA, and administered by the State of Florida's Mitigation Branch as an Enhanced Mitigation Plan state. All projects to apply for this program must be included on the County's PPL and each jurisdiction must have adopted the LMS in order to qualify for these funds. Additionally, jurisdictions are encouraged after a disaster to coordinate and use Section 406 funds in conjunction with Section 404 funds as allowable to mitigate future damages.

- **Flood Mitigation Assistance (FMA)** – Again, this is a FEMA-funded program that isreleased annually. It is not tied to disasters and is intended to mitigate recurring flooding issues within a jurisdiction. It is a nationwide, competitive grant program in which each state may only apply for one grant. Projects applying through this grant program must be included on the County's PPL and each jurisdiction must have adopted the LMS to qualify.

- **Pre-Disaster Mitigation (PDM)** – Another FEMA-funded program that is released annual ly. It is similar to the FMA program except it is not restricted to flood-related projects. It is a nationwide, competitive grant program. Projects applying through this grant program must be included on the County's PPL and each jurisdiction musthave adopted the LMS to qualify.

- **Small Business Administration Loan Program** – This program is coordinated through the DEM, but typically does not involve the LMS. It allows individuals as well as jurisdictions to take out low or no interest loans for specific issues related to mitigation.

- **Community Development Block Grants (CDBG)** – These grants, provided by the federal Housing and Urban Development department, are grants given to jurisdictions for a multitude of reasons and are somewhat flexible on how the jurisdiction may be able to use them. Although they have not been fully utilized or mitigation purposes, the LMS encourages jurisdictions to actively look at these grants as a source of potential funding for their mitigation projects. CDBG is independent of the LMS process, so funds that are used for mitigation are not required to follow the standard LMS submission and prioritization process. However, since these funds are allowable to be used as the local 25% match for HMGP funds, anytime these funds are used for that purpose they must follow the standard LMS processes.

- **Hurricane Loss Mitigation Program** – This program is 100% funded by the State of Florida annually as the only state-funded mitigation program in the nation. It provides small grants to jurisdictions of up to $194,000 dollars for mitigation projects. These funds are also independent of the LMS process, although HLMP funds have often been used to complete small mitigation projects that do not go over that funding limit. We also encourage jurisdictions to use these funds to assist in mitigating Repetitive Loss and Severe Repetitive Loss properties when the costs do not exceed the established funding limit.

- **Capital Improvement funds** – These are funds paid for locally through tax dollars toimprove the capital structure of a jurisdiction. Many prioritized LMS projects over the years have eventually been funded using Capital Improvement funds locally. These funds are independent of the standard LMS process.

- **Penny Tax** – This is a recent funding mechanism that can be used to fund projects locally. The County has a one-percent sales tax with the funding dedicated specifically to infrastructure projects, including mitigation of infrastructure. The LMS highly encourages jurisdictions to apply for and use the penny tax to complete mitigation projects.

Several years ago, Economic Development Administration and Public Entity Risk Institute grant funds, and private sector donations were used for the establishment of a state-of-the- art community wide Post Disaster Redevelopment Plan and business preparedness initiatives designed to build a more disaster resilient community and economy.

Hazard-specific HMGP projects, submitted specifically in response to county allocations, may, at the discretion of the LMS Steering Committee and Evaluation Panel, be prioritized using other criteria relevant to flood mitigation and wind retrofit projects. In response to Hurricanes Frances & Jeanne, the LMS's Flood Mitigation Technical Advisory Committee played an important role in prioritizing HMGP flood mitigation projects.

Once projects are submitted to DEM Management and FEMA those funding agencies work directly with applicant jurisdictions and organizations. The LMS monitors project status, and assists and works with applicants and funding agencies to resolve issues and problems that may arise. A list of all mitigation funding sources is maintained on the DEM SharePoint site.

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Appendix G: Hazard & Risk Assessment Maps

Appendix M contains hazard boundary and risk assessment maps. Using County and municipal GIS capabilities, facility inventory lists and property appraiser databases, and other local, regional, state, and national agency databases, the LMS is able to map any location-specific hazard risk or event and estimate associated physical and financial losses, on demand. A representative sample of hazard maps available for risk assessment, strategydevelopment, and other mitigation planning activities are presented in the following sectionsof this appendix.

The maps and data in this appendix addresses, in part, the following FEMA requirements:

Requirement §201.6(c)(2)(i): The risk assessment must include a description of the type, location, and extent of all natural hazards that can affect the jurisdiction. The plan must include information on previous occurrences of hazard events on the probability of future hazards.

Requirement §201.6(c)(2)(ii): The risk assessment must include a description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. Thisdescription must include an overall summary of each hazard and its impact on the community. All plans must address National Flood Insurance Program (NFIP) insured structures that have been repetitively damaged by floods.

Requirement §201.6(c)(2)(ii)(A): The risk assessment must include the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified areas.

Requirement §201.6(c)(2)(ii)(B): The risk assessment must include an estimate of the potential dollar losses to vulnerable structures identified in paragraph(c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate.

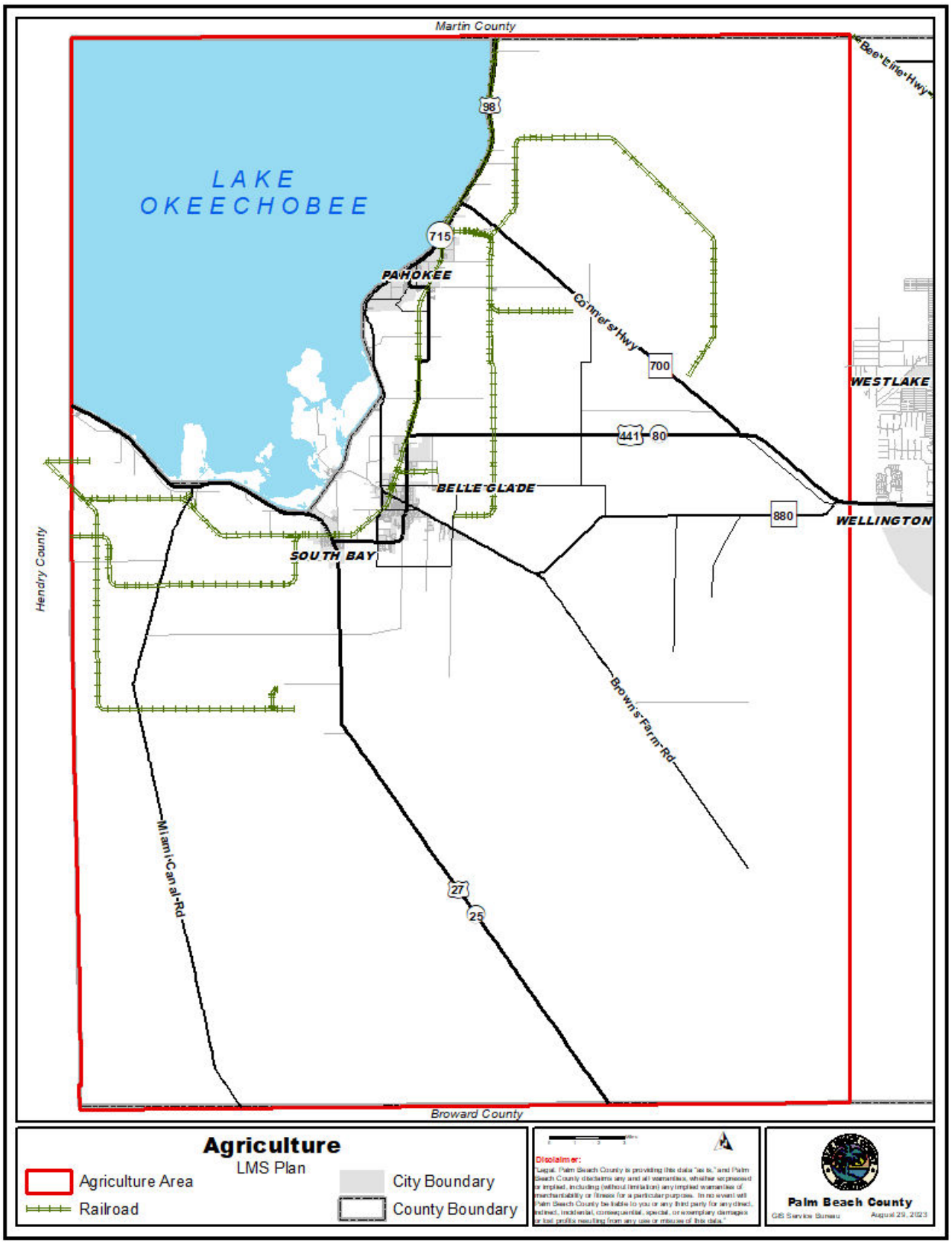
Requirement §201.6(c)(2)(ii)(C): The risk assessment must include a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decision.

Requirement §201.6(c)(2)(iii): For multi-jurisdictional plans, the risk assessment must assess each jurisdiction's risks where they vary from the risks facing the entire planning area.

Further risk assessment detail pertinent to these FEMA requirements are contained in Appendix A, in the PBC Hazard Environment section and in the hazard profiles.

The maps listed in this appendix are cited below.

Map	Source
Historical Flood Prone Areas	SFWMD & PBCGIS
Storm Surge Areas	USACE
Evacuation Zones	DEM/USACE
Coastal Erosion Boundary	PBC ERM
Hebert Hoover Dike Breach Reach	SFWMD
Wellfield Protection Zones	PBC ERM
Wildland Fire Areas	Division of Forestry/PBCFR
Radiological Ingestion Pathway Zone	FP&L
Muck Fire Areas	PBC ERM
Transportation Areas	PBC GIS
Hurricane Peak Wind Potentials	NWS/NHC
Other Countywide Hazard Threats (Tornado, Extreme Temps, etc.)	PBC GIS
Agricultural Pests	PBC ERM
Tsunami Buffer	Tsunami Society
Sea Level Rise Possible Inundation	Southeast Florida Regional Climate Change Compact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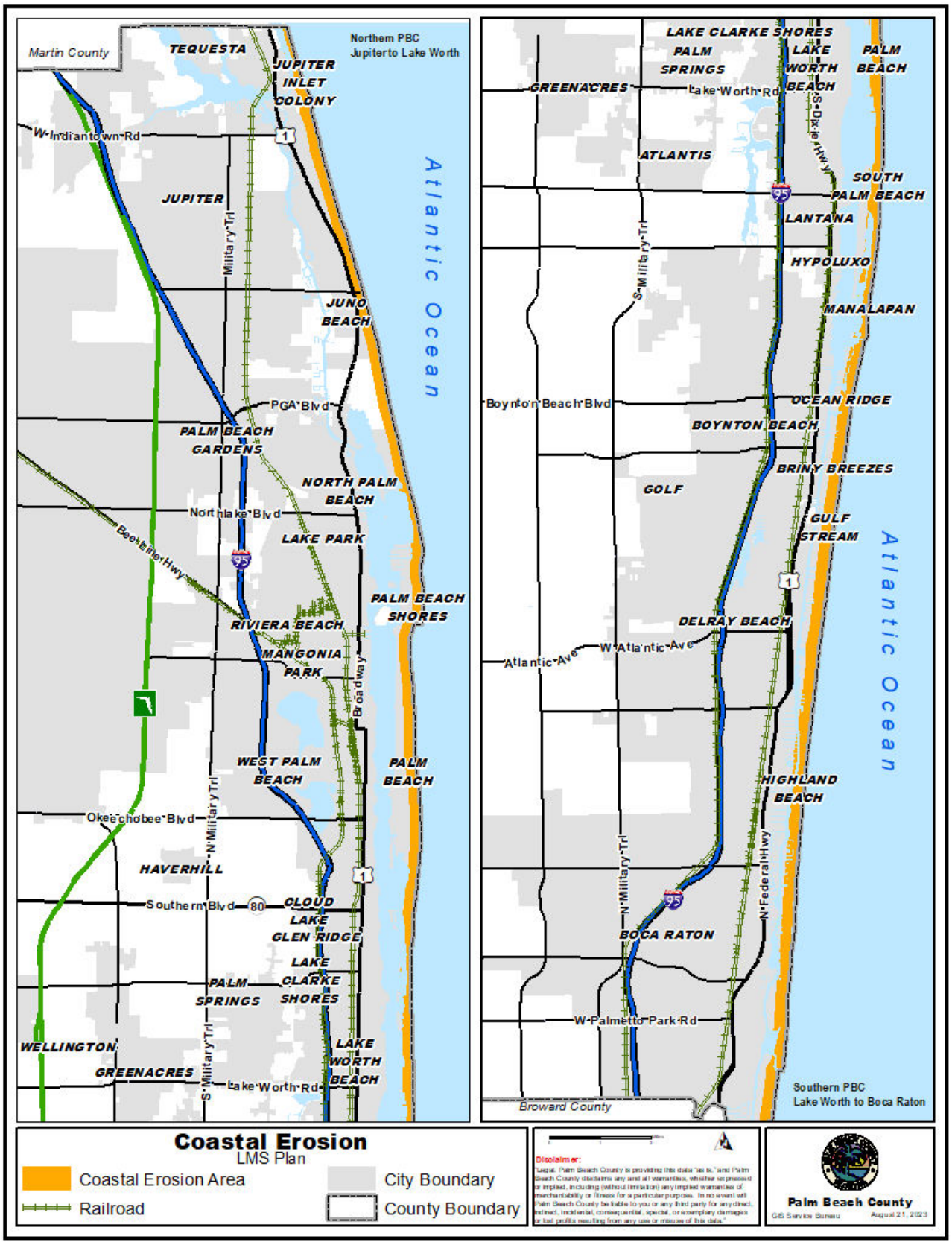
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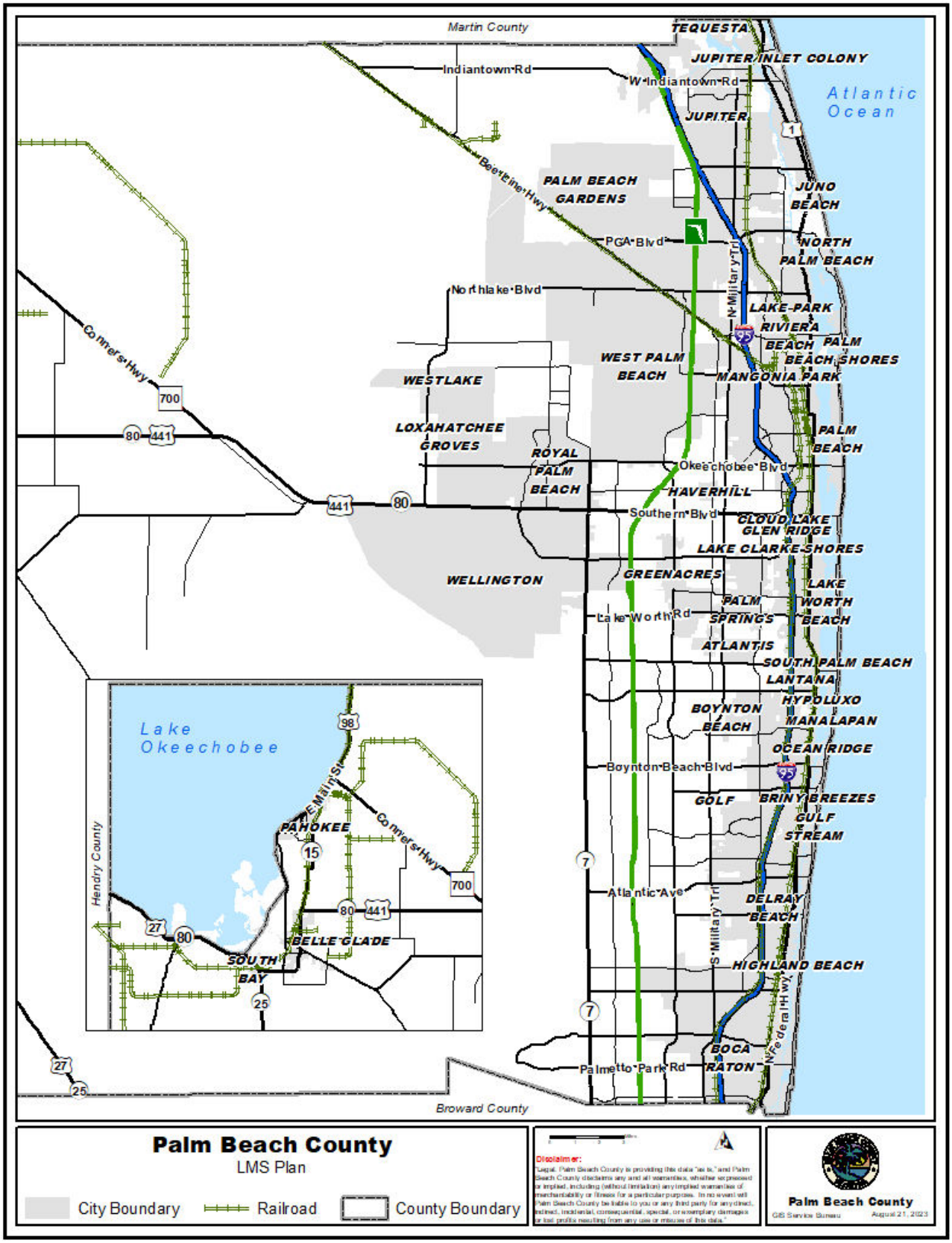
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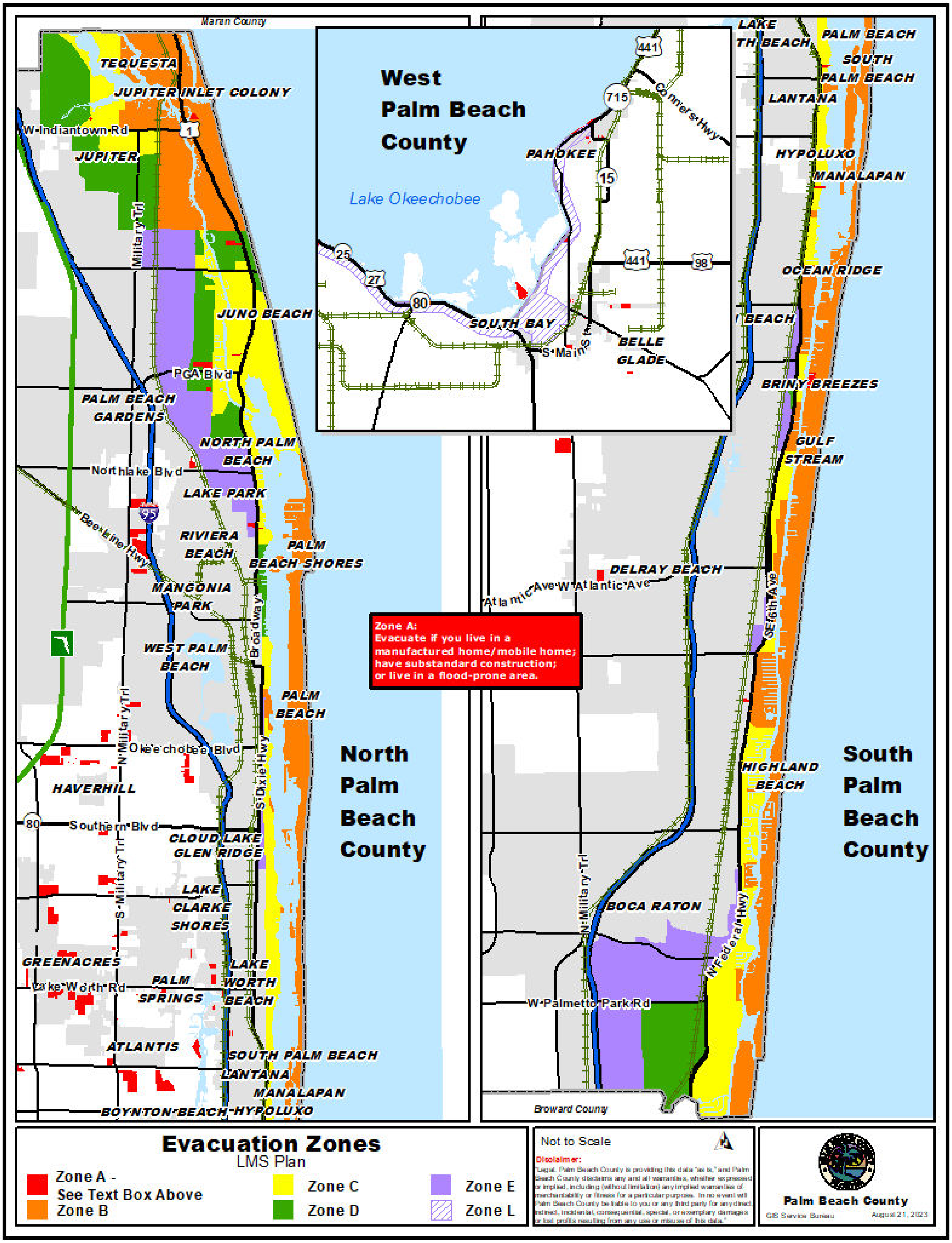
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Zone A:
Evacuate if you live in a manufactured home/mobile home; have substandard construction; or live in a flood-prone area.
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Evacuation Zones
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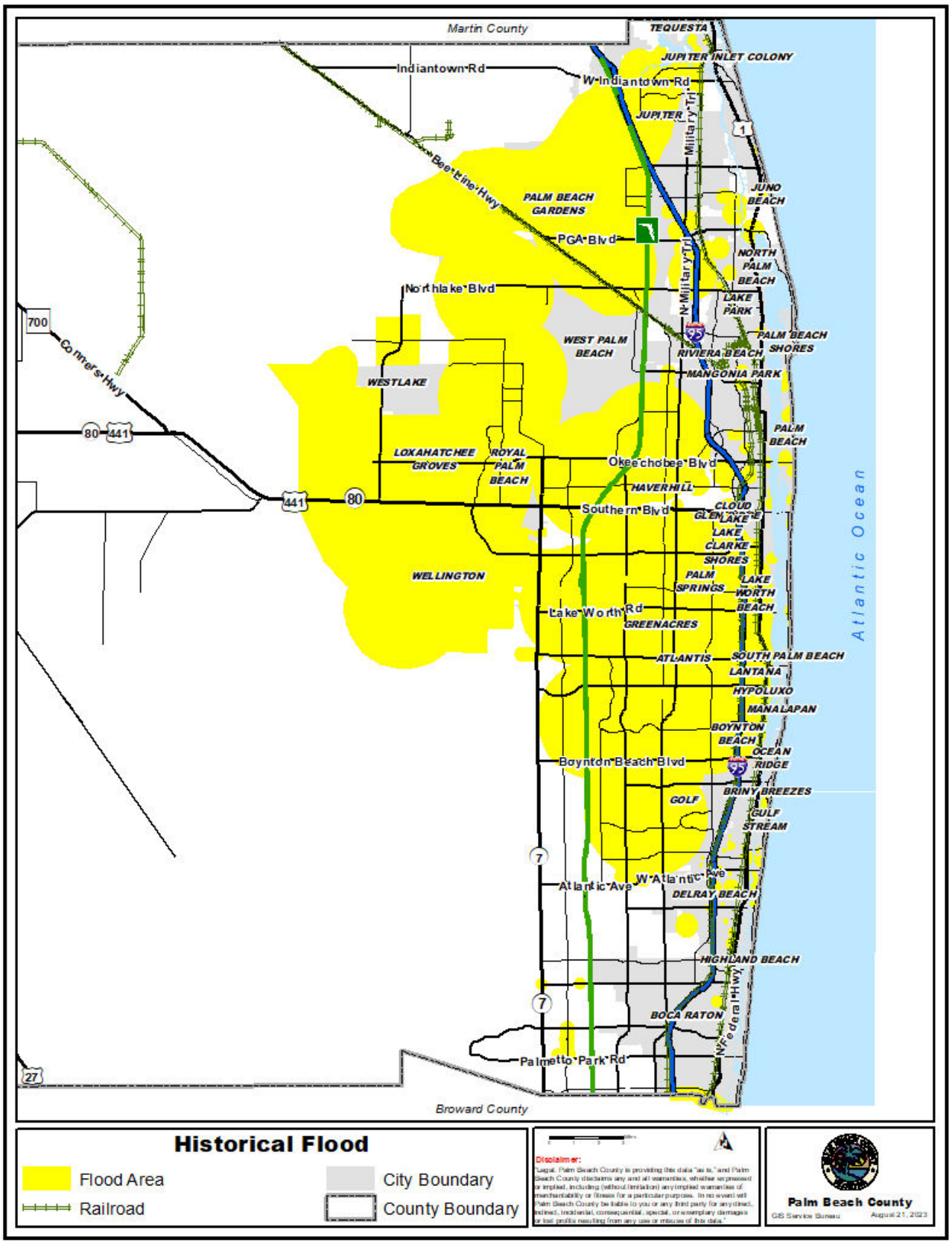
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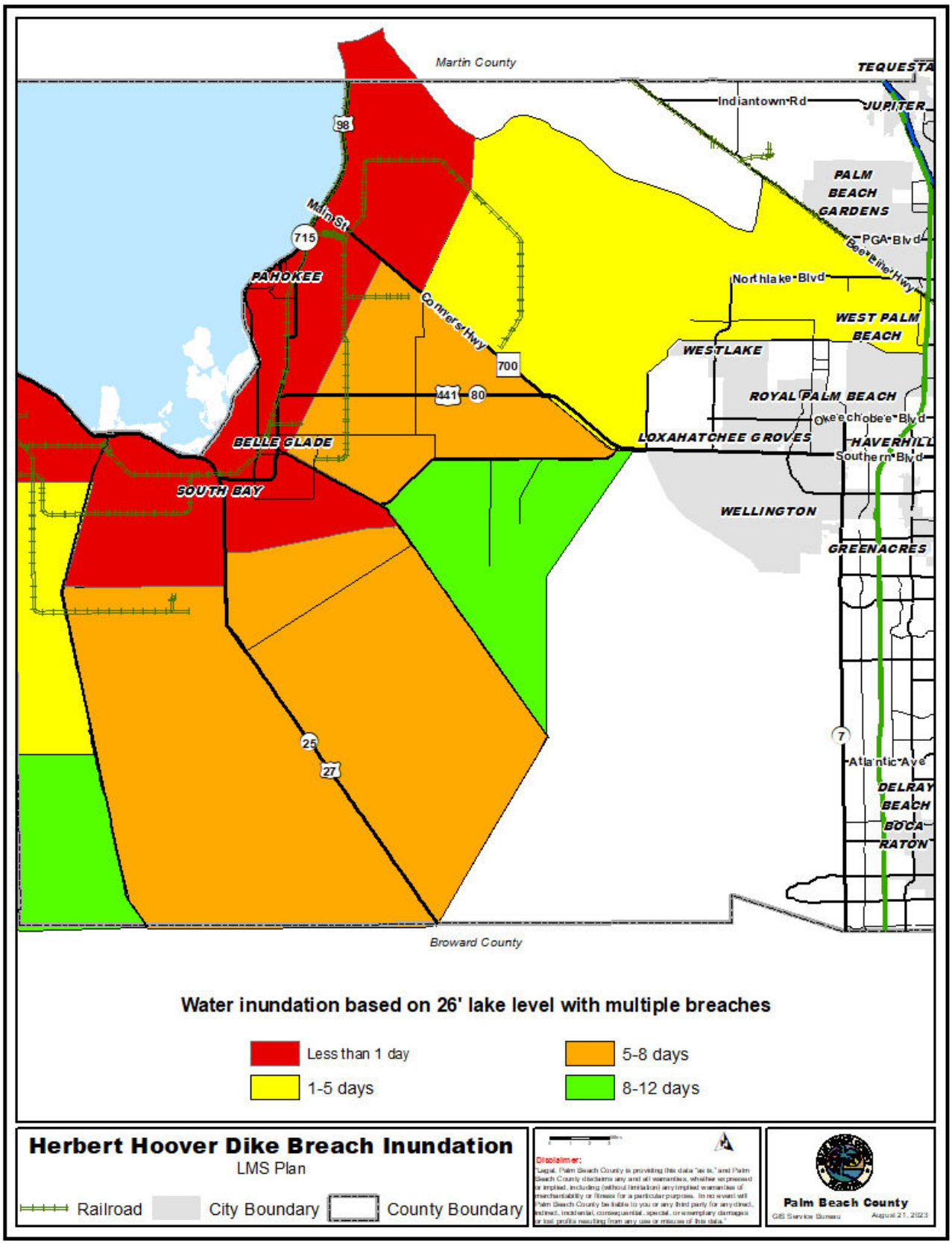
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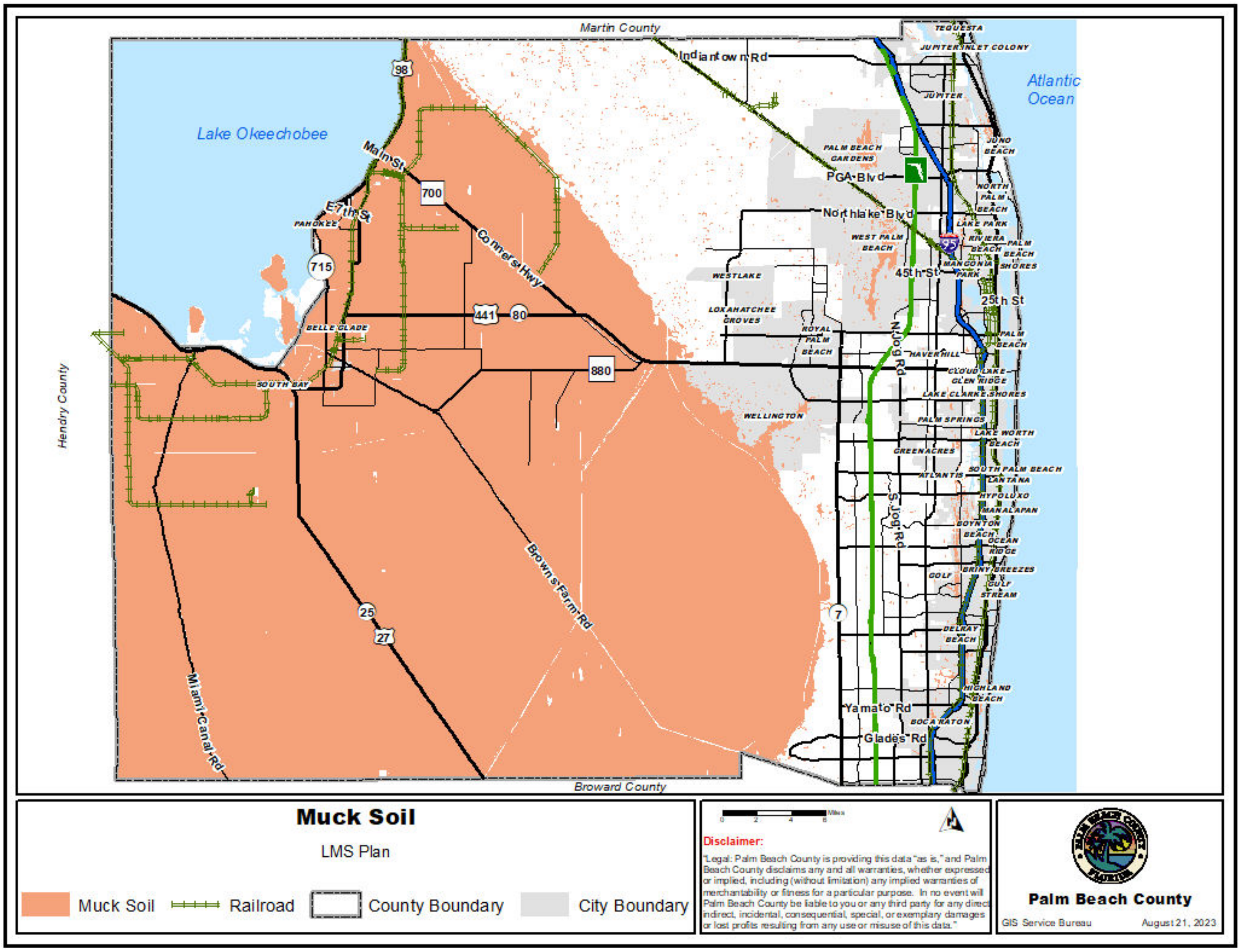
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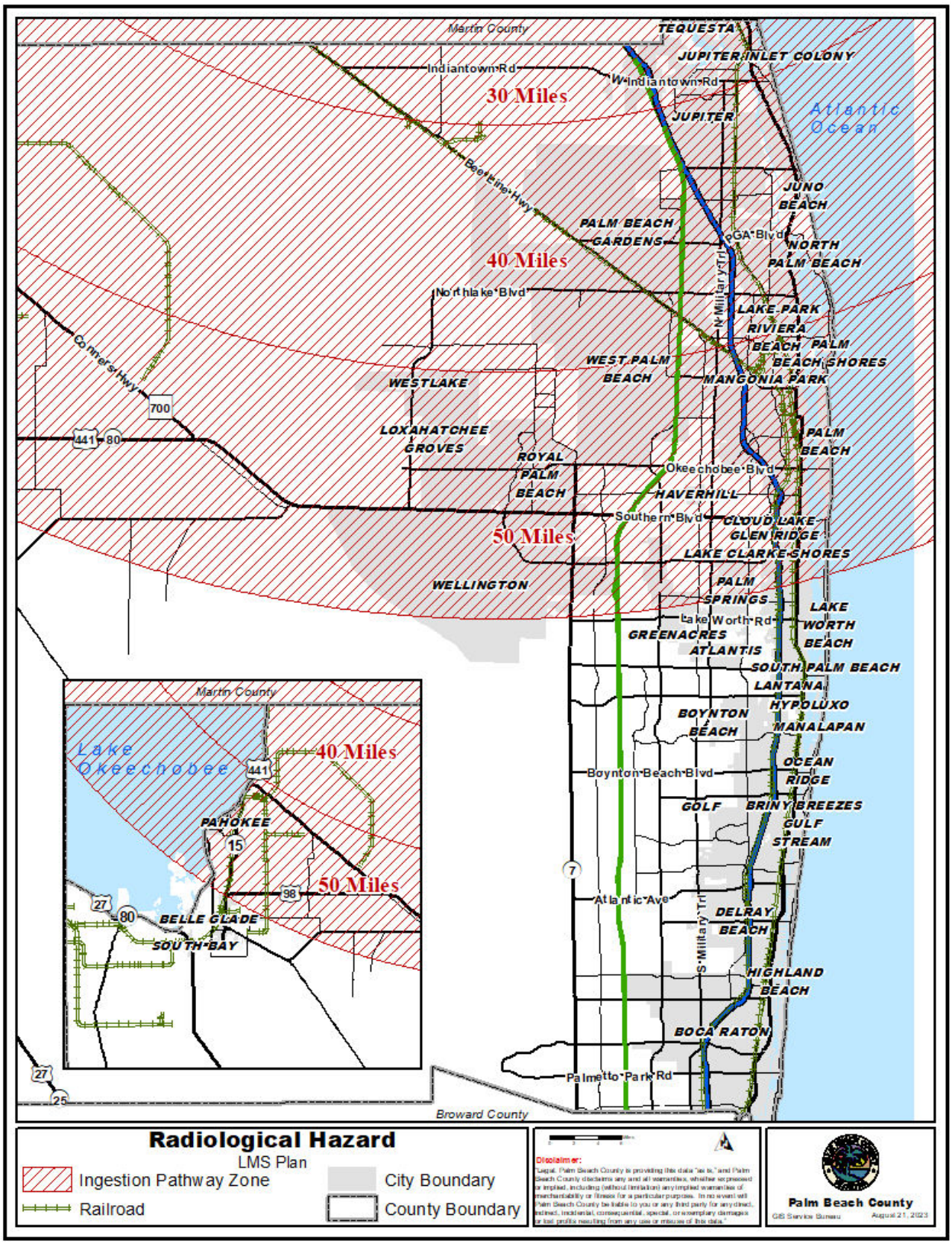
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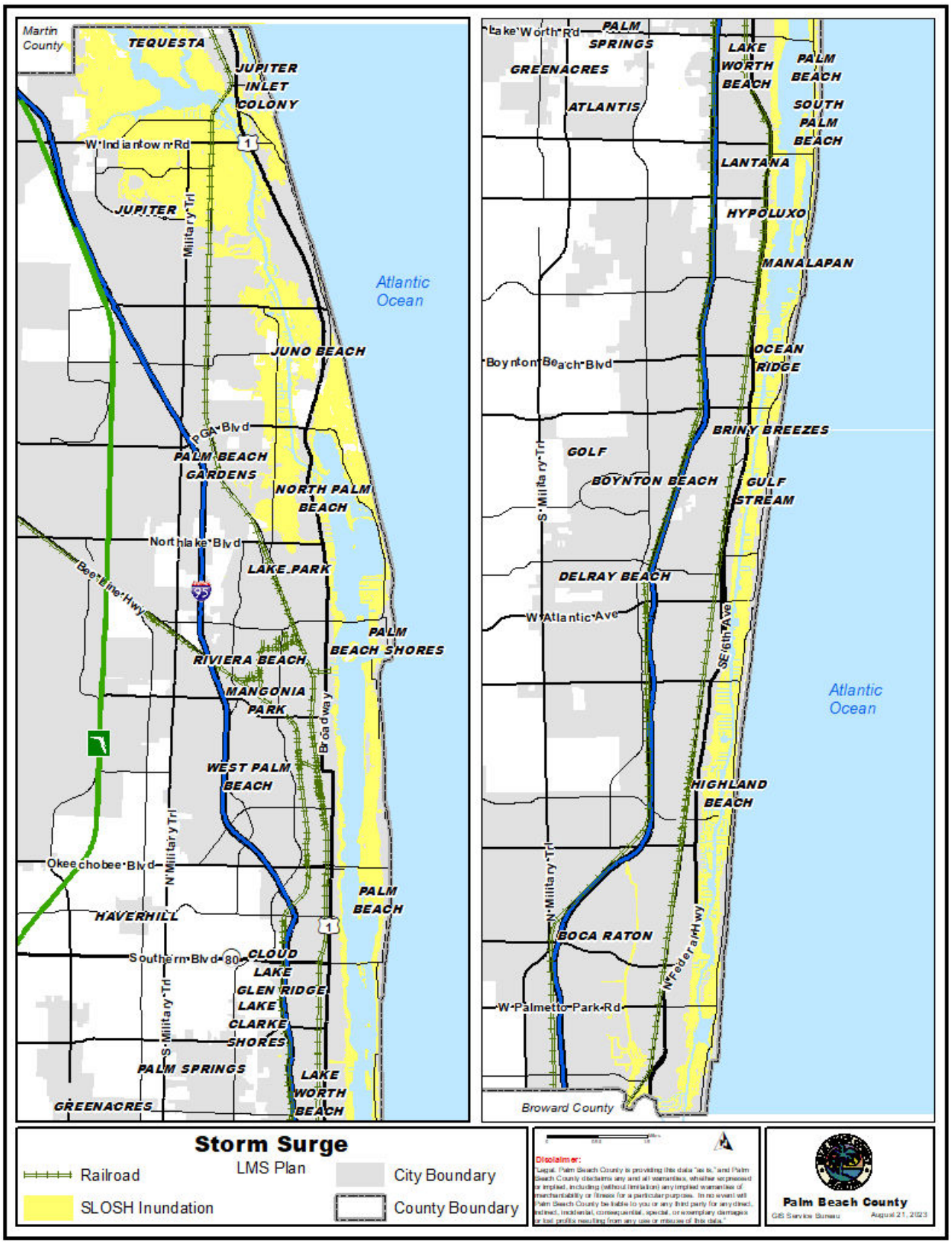
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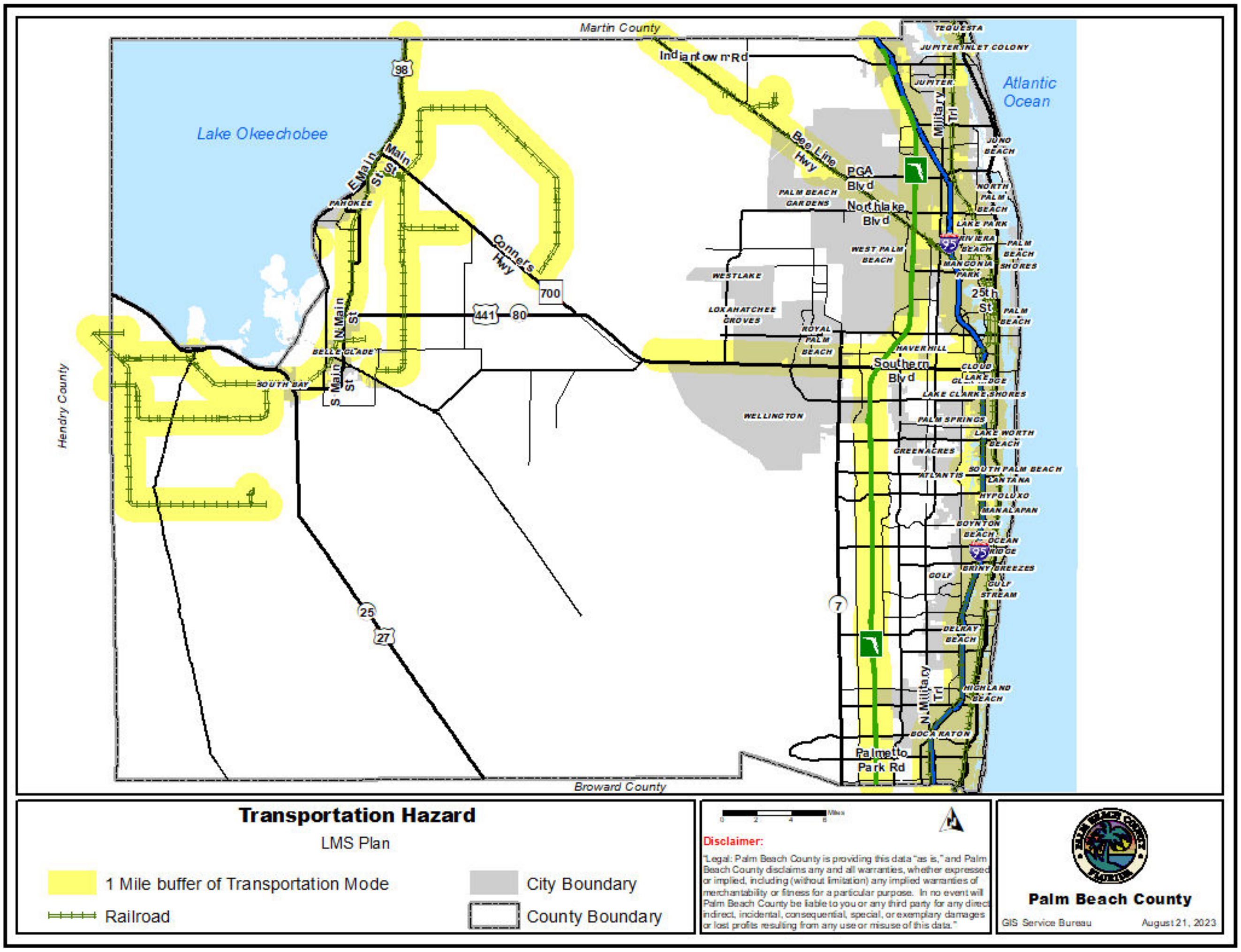
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WELLINGTON
PALM SPRINGS
LAKE WORTH BEACH
GREENACRES
SOUTH PALM BEACH
ATLANTIS
LANTANA
HYPOLUXO
MANALAPAN
BOYNTON BEACH
OCEAN RIDGE
BRINY BREEZES
GOLF
GULF STREAM
DELRAY BEACH
HIGHLAND BEACH
BOCA RATON
PAHOKEE
BELLE GLADE
SOUTH BAY
98
441
80
700
25
27
7
95
Transportation Hazard
LMS Plan
1 Mile buffer of Transportation Mode
Railroad
City Boundary
County Boundary
Miles
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Palm Beach County
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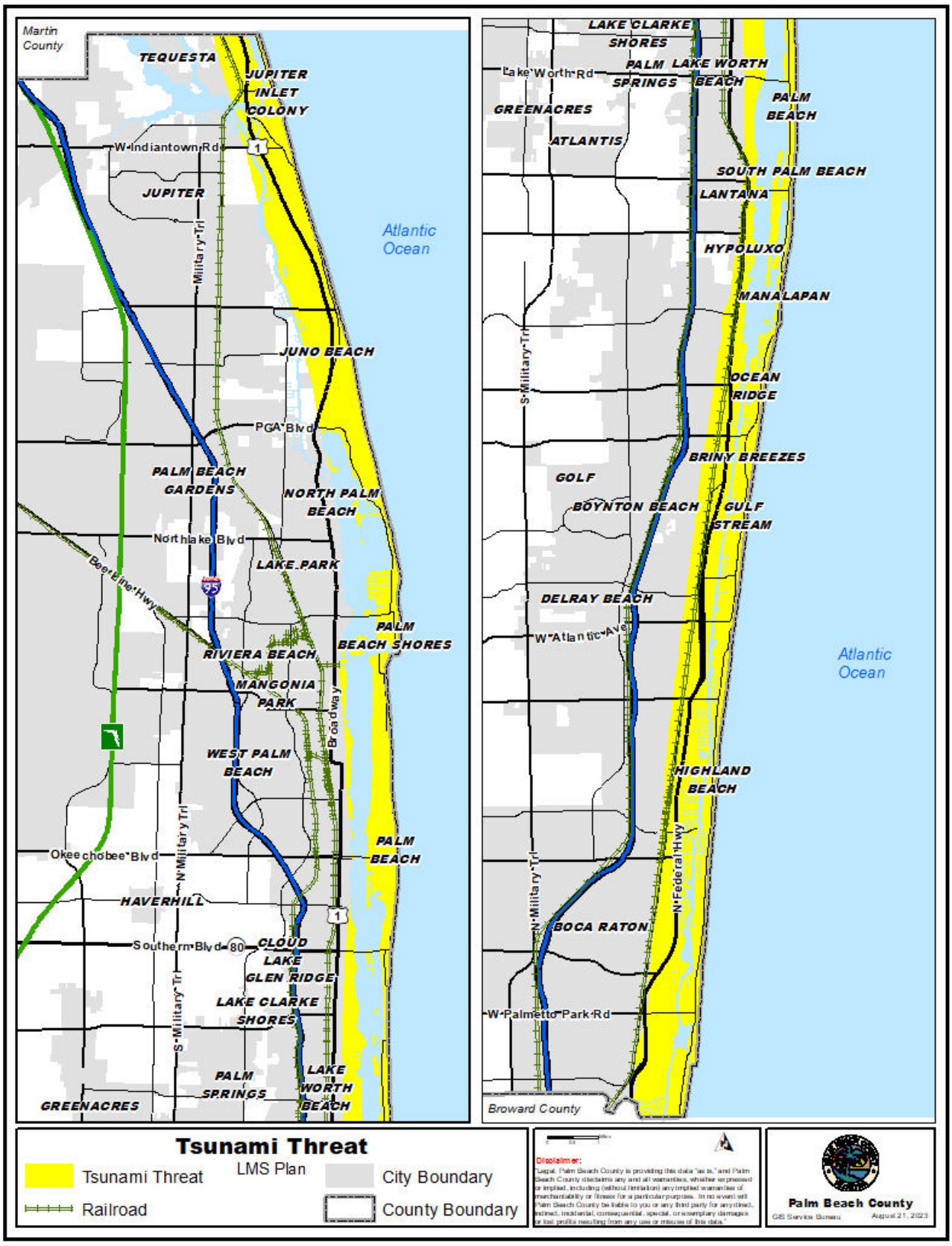
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NORTH PALM BEACH
Northlake Blvd
LAKE PARK
Beeline Hwy
PALM BEACH SHORES
RIVIERA BEACH
MANGONIA PARK
Broadway
WEST PALM BEACH
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HAVERHILL
Southern Blvd
CLOUD LAKE
GLEN RIDGE
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LAKE WORTH BEACH
GREENACRES
LAKE CLARKE SHORES
Lake Worth Rd
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PALM BEACH
SOUTH PALM BEACH
LANTANA
HYPOLUXO
MANALAPAN
S Military Trl
OCEAN RIDGE
BRINY BREEZES
GOLF
BOYNTON BEACH
GULF STREAM
DELRAY BEACH
W Atlantic Ave
Atlantic Ocean
HIGHLAND BEACH
N Federal Hwy
N Military Trl
BOCA RATON
W Palmetto Park Rd
Broward County
Tsunami Threat
Tsunami Threat
LMS Plan
City Boundary
Railroad
County Boundary
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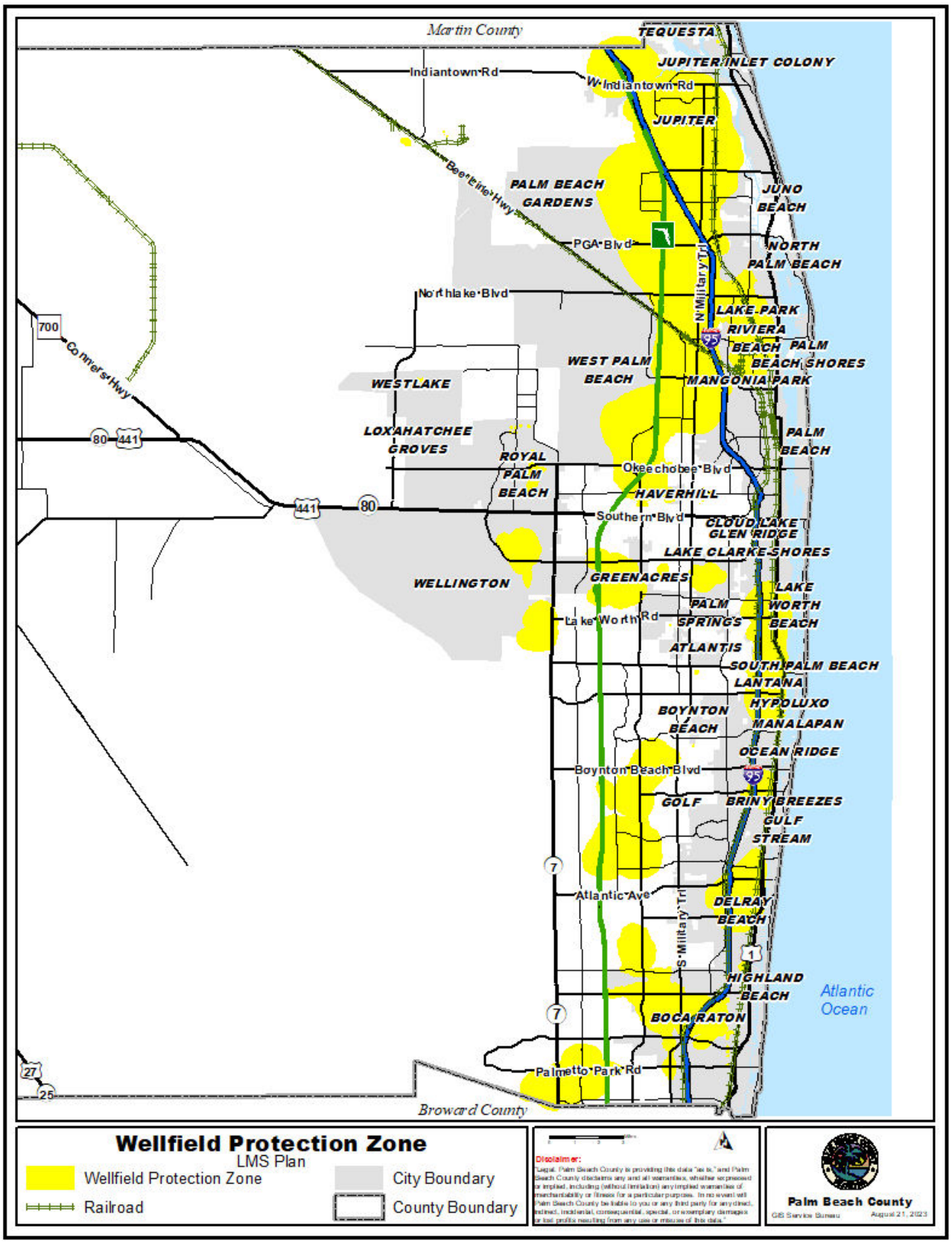
GIS Service Bureau
August 21, 2023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PGA Blvd
NORTH PALM BEACH
N Military Trl
Northlake Blvd
LAKE PARK
RIVIERA BEACH
PALM BEACH SHORES
WEST PALM BEACH
MANGONIA PARK
700
Connors Hwy
WESTLAKE
LOXAHATCHEE GROVES
80
441
ROYAL PALM BEACH
PALM BEACH
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HAVERHILL
Southern Blvd
CLOUD LAKE
GLEN RIDGE
LAKE CLARKE SHORES
WELLINGTON
GREENACRES
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PALM SPRINGS
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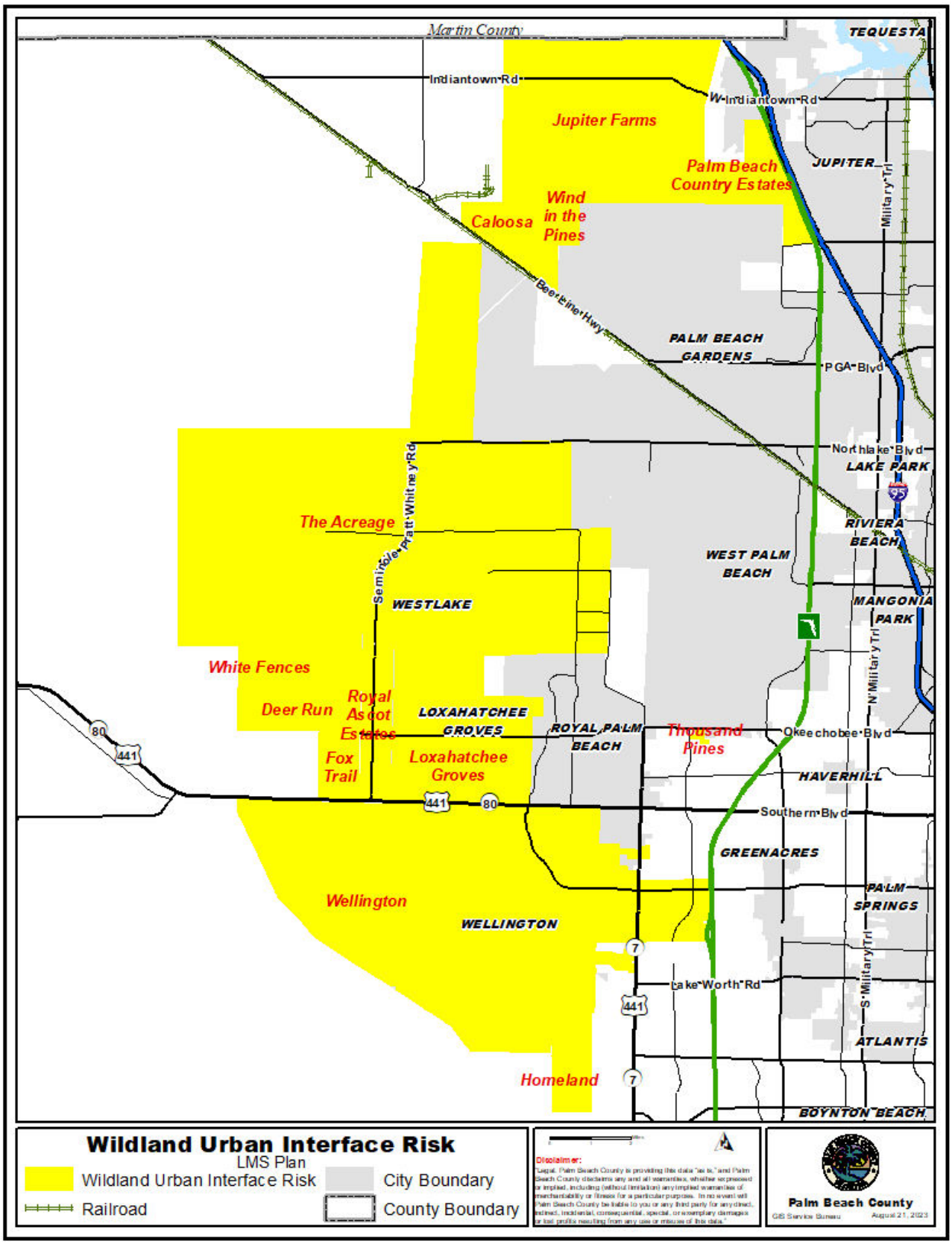
LANTANA
HYPOLUXO
BOYNTON BEACH
MANALAPAN
OCEAN RIDGE
Boynton Beach Blvd
GOLF
BRINY BREEZES
GULF STREAM
7
Atlantic Ave
DELRAY BEACH
S Military Trl
1
HIGHLAND BEACH
Atlantic Ocean
BOCA RATON
Palmetto Park Rd
27
25
Broward County
Wellfield Protection Zone
LMS Plan
Wellfield Protection Zone
Railroad
City Boundary
County Boundary
Disclaimer:
Palm Beach County
GIS Service Bureau
August 21, 2023


Martin County
TEQUESTA
Indiantown Rd
W Indiantown Rd
Jupiter Farms
Palm Beach Country Estates
JUPITER
Military Trl
Caloosa
Wind in the Pines
Bee Line Hwy
PALM BEACH GARDENS
PGA Blvd
Northlake Blvd
LAKE PARK
Seminole Pratt Whitney Rd
The Acreage
RIVIERA BEACH
WEST PALM BEACH
WESTLAKE
MANGONIA PARK
N Military Trl
White Fences
Deer Run
Royal Ascot Estates
LOXAHATCHEE GROVES
ROYAL PALM BEACH
Thousand Pines
Okeechobee Blvd
Fox Trail
Loxahatchee Groves
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HAVERHILL
Southern Blvd
GREENACRES
Wellington
WELLINGTON
PALM SPRINGS
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Lake Worth Rd
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ATLANTIS
Homeland
BOYNTON BEACH
Wildland Urban Interface Risk
LMS Plan
Wildland Urban Interface Risk
Railroad
City Boundary
County Boundary
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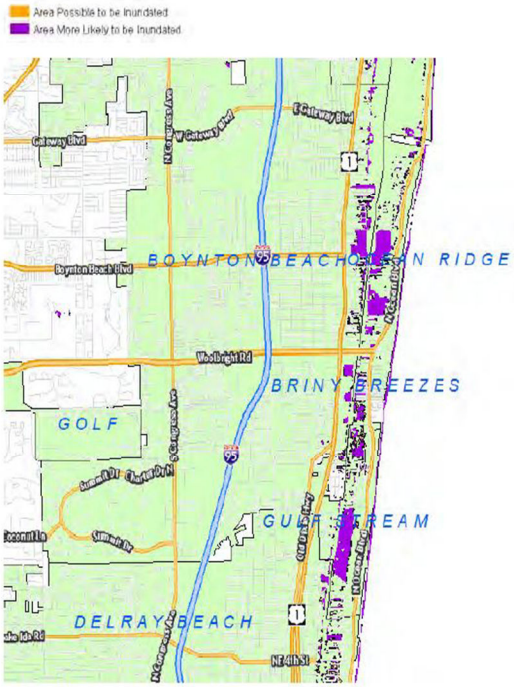
August 21, 2023

2-Foot Sea Level Rise in Palm Beach County - Jupiter Area

2-Foot Sea Level Rise in Palm Beach County - Boca Raton Area

2-Foot Sea Level Rise in Palm Beach County - Boynton Beach Area



Appendix H: Repetitive Loss Properties

In accordance with the following FEMA requirement, the PBC LMS includes repetitive flood loss structures in its risk assessments:

Requirement §201.6(c)(2)(ii): The risk assessment must also address National Flood Insurance Program (NFIP) insured structures that have been repetitively damaged by floods.

In addition, PBC's LMS and Community Rating System programs monitor the number and locations of flood prone properties countywide. Currently, there are 337 FEMA-registered repetitive flood loss buildings in the combined jurisdictions of incorporated and unincorporatedPBC.

Repetitive Loss Properties

Repetitive loss properties are defined by the National Flood Insurance Program as, "properties with two or more NFIP claims of at least $1,000 in any rolling ten year period". Repetitive-lossproperties constitute a significant drain on the resources of the NFIP, costing about $200,000,000 annually. Repetitive-loss properties comprise approximately 1 percent of currently insured properties but account for 25 to 30 percent of claims losses. They represent a key target of the NFIP for mitigation, including relocation, elevation, and buyouts.

According to FEMA Repetitive Loss data provided by FEMA Region IV insurance analysts, asof December 31, 2018 PBC has a total of **337** repetitive loss properties. A chart of repetitive loss properties is available in this appendix.

This appendix also includes aggregate data from 1978 to December, 2023 of each municipality as well as unincorporated PBC flood-related losses documented by NFIP. It also includes data from FEMA/NFIP regarding NFIP flood policy information as of February, 2024.

Repetitive Loss Buildings in Palm Beach County

Community Name	RL Buildings
Atlantis	1
Belle Glade	0
Boca Raton	24
Boynton Beach	40
Briny Breezes	0
Cloud Lake	1
Delray Beach	38
Glen Ridge	0
Golf	1
Greenacres	1
Gulf Stream	5
Haverhill	3
Highland Beach	1
Hypoluxo	0
Juno Beach	7
Jupiter	32
Jupiter Inlet Colony	0
Lake Clarke Shores	0
Lake Park	5
Lake Worth Beach	24
Lantana	12
Loxahatchee Groves	1
Manalapan	6
Mangonia Park	3
North Palm Beach	10
Ocean Ridge	40
Pahokee	1
Palm Beach	253
Palm Beach County	177
Palm Beach Gardens	14
Palm Beach Shores	8
Palm Springs	2
Riviera Beach	24
Royal Palm Beach	2
South Bay	0
South Palm Beach	16
Tequesta	7
Wellington	0
Westlake	0
West Palm Beach	54
Totals:	813

Appendix H (source: FEMA RLP data as of 12/06/2023)

Federal Emergency Management Agency
NFIP Policy and Claims Report
FLORIDA

CID	Community	Number Policies	Total Coverage	Total Premium	Total Claims Since 1978	Total Paid Since 1978
	** PALM BEACH COUNTY **					
120192	PALM BEACH COUNTY '	27.226	$8.039.062.000	$10.724.218	4.160	$18.921.580
120193	ATLANTIS. CITY OF	187	$54.765.000	$72.582	29	$316.371
120194	BELLE GLADE. CITY OF	108	$32.879.000	$65.532	10	$26.838
120195	BOCA RATON. CITY OF	12.120	$3.420.088.000	$5.503.466	691	$4.704.557
120196	BOYNTON BEACH. CITY OF	3.545	$887.830.000	$1.307.470	605	$1.829.039
120197	BRINY BREEZES. TOWN OF	35	$6.351.000	$59.182	16	$20.720
120198	CLOUD LAKE. TOWN OF	11	$3.350.000	$7.086	7	$20.318
120200	GLEN RIDGE. TOWN OF	21	$7.027.000	$13.712	6	$8.520
120201	GOLF. VILLAGE OF	19	$7.950.000	$10.849	3	$43.000
120203	GREENACRES. CITY OF	279	$81.203.000	$123.145	23	$71.036
120205	HAVERHILL. TOWN OF	21	$6.639.000	$11.847	7	$70.254
120207	HYPOLUXO. TOWN OF	861	$208.787.000	$333.343	23	$13.145
120208	JUNO BEACH. TOWN OF	1.439	$365.879.000	$507.860	45	$566.946
120211	LAKE CLARKE SHORES. TOWN OF	125	$40.757.000	$70.183	20	$27.255
120212	LAKE PARK. TOWN OF	696	$145.368.000	$160.065	44	$622.665
120213	LAKEWORTH BEACH. CITY OF	1.000	$244.857.000	$503.941	206	$932.207
120214	LANTANA. TOWN OF	961	$238.137.000	$460.260	161	$1.656.221
120215	MANALAPAN. TOWN OF	161	$52.681.000	$203.435	89	$558.611
120216	MANGONIA PARK. TOWN OF	21	$10.526.000	$27.411	13	$465.502
120217	NORTH PALM BEACH. VILLAGE OF	3.319	$811.258.000	$869.813	117	$380.817
120219	PAHOKEE. CITY OF	133	$33.668.000	$73.196	15	$45.582
120220	PALM BEACH. TOWN OF	6.467	$1.727.771.000	$4.423.944	1.271	$13.740.254
120221	PALM BEACH GARDENS. CITY OF	2.936	$985.926.000	$1.589.474	326	$1.641.366
120223	PALM SPRINGS. VILLAGE OF	249	$73.032.000	$125.527	91	$232.614
120225	ROYAL PALM BEACH. VILLAGE OF	645	$196.437.000	$222.141	40	$159.412
120226	SOUTH BAY. CITY OF	99	$29.856.000	$64.997	1	$0
120227	SOUTH PALM BEACH. TOWN OF	1.195	$276.474.000	$403.731	67	$1.400.362
120228	TEQUESTA. VILLAGE OF	1.077	$279.868.000	$408.822	78	$297.711
120229	WEST PALM BEACH. CITY OF	5.758	$1.621.014.000	$1.856.561	500	$3.850.768
120309	LOXAHATCHEE GROVES. TOWN OF	68	$21.564.000	$26.571	2	$13.333
125102	DELRAY BEACH. CITY OF	5.569	$1.522.381.000	$3.083.966	783	$2.578.156
125109	GULF STREAM. TOWN OF	378	$118.279.000	$396.566	47	$324.284
125111	HIGHLAND BEACH. TOWN OF	3.427	$874.086.000	$1.209.147	97	$443.273
125119	JUPITER. TOWN OF	6.428	$1.782.811.000	$2.830.373	497	$3.277.372
125120	JUPITER INLET COLONY. TOWN OF	103	$36.280.000	$70.835	17	$105.470
125134	OCEAN RIDGE. TOWN OF	1.112	$289.609.000	$700.497	198	$1.442.299
125137	PALM BEACH SHORES. TOWN OF	503	$129.772.000	$272.850	67	$907.928

Federal Emergency Management Agency
NFIP Policy and Claims Report
FLORIDA

CID	Community	Number Policies	Total Coverage	Total Premium	Total Claims Since 1978	Total Paid Since 1978
125142	RIVIERA BEACH, CITY OF	3,916	$1,011,214,000	$1,418,356	275	$1,461,610
125157	WELLINGTON, VILLAGE OF	2,061	$695,204,000	$1,025,409	68	$244,413
	County Total:	94,279	$26,370,638,000	$41,038,363	10,715	$63,421,809
	State Total:	94,279	$26,370,638,000	$41,038,363	10,715	$63,421,809

Appendix H: Aggregate Flood Loss Data since 1978 (source: FEMA/NFIP 2-15-24)

Community Name	Policies in Force	Total Coverage	Total Written Premium + FPF
ATLANTIS, CITY OF	227	$ 68,360,000	$ 101,421
BELLE GLADE, CITY OF	130	$ 39,131,000	$ 85,658
BOCA RATON, CITY OF	15116	$ 4,241,303,000	$ 7,918,456
BOYNTON BEACH, CITY OF	6300	$ 1,406,931,000	$ 2,213,238
BRINY BREEZES, TOWN OF	39	$ 6,501,000	$ 64,823
CLOUD LAKE, TOWN OF	20	$ 5,520,000	$ 13,107
DELRAY BEACH, CITY OF	7205	$ 1,936,740,000	$ 4,461,117
GLEN RIDGE, TOWN OF	28	$ 9,103,000	$ 19,125
GOLF, VILLAGE OF	28	$ 11,070,000	$ 16,643
GREENACRES, CITY OF	430	$ 120,104,000	$ 203,950
GULF STREAM, TOWN OF	481	$ 146,990,000	$ 541,297
HAVERHILL, TOWN OF	38	$ 12,373,000	$ 22,902
HIGHLAND BEACH, TOWN OF	4218	$ 1,063,962,000	$ 1,585,465
HYPOLUXO, TOWN OF	1492	$ 339,824,000	$ 597,807
JUNO BEACH, TOWN OF	1646	$ 419,198,000	$ 700,326
JUPITER INLET COLONY, TOWN OF	114	$ 40,002,000	$ 98,417
JUPITER, TOWN OF	7644	$ 2,142,101,000	$ 3,876,851
LAKE CLARKE SHORES, TOWN OF	167	$ 54,777,000	$ 102,349
LAKE PARK, TOWN OF	838	$ 187,086,000	$ 382,050
LAKE WORTH BEACH, CITY OF	1360	$ 340,957,000	$ 820,932
LANTANA, TOWN OF	1196	$ 285,617,000	$ 706,813
LOXAHATCHEE GROVES, TOWN OF	149	$ 48,715,000	$ 68,410
MANALAPAN, TOWN OF	233	$ 74,111,000	$ 369,904
MANGONIA PARK, TOWN OF	33	$ 15,480,000	$ 40,581
NORTH PALM BEACH, VILLAGE OF	3935	$ 935,783,000	$ 1,251,433
OCEAN RIDGE, TOWN OF	1230	$ 321,434,000	$ 967,520
PAHOKEE, CITY OF	210	$ 52,739,000	$ 129,993
PALM BEACH COUNTY, UNINCORPORATED	41944	$ 11,898,986,000	$ 17,227,126
PALM BEACH GARDENS, CITY OF	4132	$ 1,368,219,000	$ 2,376,693
PALM BEACH SHORES, TOWN OF	671	$ 165,996,000	$ 391,945
PALM BEACH, TOWN OF	7551	$ 2,020,183,000	$ 6,015,238
PALM SPRINGS, VILLAGE OF	378	$ 103,745,000	$ 201,781
RIVIERA BEACH, CITY OF	5222	$ 1,328,401,000	$ 1,965,152
ROYAL PALM BEACH, VILLAGE OF	1201	$ 364,874,000	$ 464,803
SOUTH BAY, CITY OF	225	$ 52,977,000	$ 145,040
SOUTH PALM BEACH, TOWN OF	1793	$ 411,867,000	$ 623,831
TEQUESTA, VILLAGE OF	1189	$ 310,883,000	$ 576,933
WELLINGTON, VILLAGE OF	2922	$ 981,647,000	$ 1,579,995
WESTLAKE, CITY OF	4	$ 1,400,000	$ 2,005
WEST PALM BEACH, CITY OF	7937	$ 2,227,076,000	$ 2,661,393

Appendix H: Flood Policy Information as of 10/31/23 (source: FEMA/NFIP database)

The following pages address CRS requirements of listing Repetitive Loss Properties, by jurisdiction, via occupancy type and value of structure. Also included is total building payments made by property, total contents payments, number of losses, and total amount paid per property (by jurisdiction). All property identifiers have been removed per FEMA/NFIP request.

Community Name	Occupancy	Building Value	Cumulative Building Payment	Cumulative Contents Payment	Total Losses	Total Payment
ATLANTIS	SINGLE FMLY	$115,298	$45,046	$2,882	2	$47,928
BOCA RATON	OTHR-NONRES	$0	$662	$11,251	3	$11,913
BOCA RATON	SINGLE FMLY	$0	$674	$3,827	2	$4,500
BOCA RATON	SINGLE FMLY	$109,460	$5,228	$6,467	2	$11,695
BOCA RATON	SINGLE FMLY	$301,989	$10,476	$0	2	$10,476
BOCA RATON	SINGLE FMLY	$289,438	$4,916	$0	2	$4,916
BOCA RATON	OTHR-NONRES	$7,628,690	$61,012	$0	2	$61,012
BOCA RATON	SINGLE FMLY	$250,000	$9,144	$0	2	$9,144
BOCA RATON	SINGLE FMLY	$330,200	$23,909	$0	2	$23,909
BOCA RATON	SINGLE FMLY	$773,953	$101,028	$7,475	2	$108,504
BOCA RATON	SINGLE FMLY	$255,589	$12,261	$2,685	2	$14,946
BOCA RATON	SINGLE FMLY	$1,756,879	$154,977	$35,334	3	$190,312
BOCA RATON	OTHER RESID	$31,753,220	$230,523	$0	2	$230,523
BOCA RATON	OTHER RESID	$31,080,817	$187,972	$0	3	$187,972
BOCA RATON	SINGLE FMLY	$0	$16,818	$3,425	1	$20,243
BOCA RATON	OTHER RESID	$9,140,220	$47,790	$0	2	$47,790
BOCA RATON	OTHER RESID	$0	$58,508	$3,041	2	$61,549
BOCA RATON	OTHER RESID	$0	$67,369	$0	2	$67,369
BOYNTON BEACH	SINGLE FMLY	$44,000	$5,205	$2,506	2	$7,711
BOYNTON BEACH	SINGLE FMLY	$53,000	$4,890	$2,102	2	$6,992
BOYNTON BEACH	OTHR-NONRES	$231,120	$2,117	$9,501	3	$11,618
BOYNTON BEACH	SINGLE FMLY	$40,500	$1,990	$4,017	2	$6,007
BOYNTON BEACH	SINGLE FMLY	$129,855	$4,211	$0	3	$4,211
BOYNTON BEACH	SINGLE FMLY	$76,800	$46,975	$14,255	5	$61,230
BOYNTON BEACH	SINGLE FMLY	$189,406	$61,494	$9,945	4	$71,439
BOYNTON BEACH	SINGLE FMLY	$124,705	$37,454	$10,080	2	$47,533
BOYNTON BEACH	SINGLE FMLY	$99,360	$23,887	$15,054	2	$38,940
BOYNTON BEACH	SINGLE FMLY	$114,870	$8,675	$3,000	2	$11,675
BOYNTON BEACH	SINGLE FMLY	$118,971	$21,066	$11,902	2	$32,968
BOYNTON BEACH*	SINGLE FMLY	$225,046	$149,647	$20,000	4	$169,647
BOYNTON BEACH	SINGLE FMLY	$43,750	$6,729	$664	2	$7,393
BOYNTON BEACH	SINGLE FMLY	$125,093	$7,989	$0	2	$7,989
BOYNTON BEACH	BUSI-NONRES	$0	$1,576	$42,930	2	$44,506
BOYNTON BEACH	SINGLE FMLY	$333,098	$10,087	$0	2	$10,087

BOYNTON BEACH	SINGLE FMLY	$164,788	$2,036	$1,358	2	$3,394
BOYNTON BEACH	OTHER RESID	$5,386,966	$51,961	$0	2	$51,961
BOYNTON BEACH	BUSI-NONRES	$892,743	$59,994	$5,813	2	$65,807
BOYNTON BEACH	SINGLE FMLY	$157,752	$62,940	$11,111	2	$74,051
BOYNTON BEACH	SINGLE FMLY	$178,089	$17,780	$3,346	2	$21,126
BOYNTON BEACH	SINGLE FMLY	$162,100	$22,724	$6,746	2	$29,471
BOYNTON BEACH	SINGLE FMLY	$209,228	$18,868	$0	2	$18,868
BOYNTON BEACH	SINGLE FMLY	$98,936	$4,080	$0	2	$4,080
BOYNTON BEACH	SINGLE FMLY	$152,909	$6,423	$0	2	$6,423
BOYNTON BEACH	SINGLE FMLY	$0	$8,408	$0	2	$8,408
CLOUD LAKE	SINGLE FMLY	$50,000	$3,116	$860	2	$3,976
DELRAY BEACH	SINGLE FMLY	$120,000	$7,623	$0	2	$7,623
DELRAY BEACH	SINGLE FMLY	$111,000	$2,797	$1,065	2	$3,862
DELRAY BEACH	SINGLE FMLY	$250,000	$60,327	$18,503	5	$78,830
DELRAY BEACH	OTHR-NONRES	$9,999,999,999	$53,443	$14,553	3	$67,996
DELRAY BEACH	SINGLE FMLY	$67,000	$7,374	$1,198	2	$8,572
DELRAY BEACH	SINGLE FMLY	$60,000	$1,981	$8,401	2	$10,382
DELRAY BEACH	SINGLE FMLY	$74,600	$2,328	$500	2	$2,828
DELRAY BEACH	SINGLE FMLY	$63,140	$19,687	$831	3	$20,518
DELRAY BEACH	SINGLE FMLY	$389,760	$24,909	$581	3	$25,490
DELRAY BEACH	SINGLE FMLY	$111,750	$5,909	$0	2	$5,909
DELRAY BEACH	SINGLE FMLY	$184,100	$1,236	$1,572	2	$2,808
DELRAY BEACH	SINGLE FMLY	$1,212,380	$80,591	$24,594	3	$105,184
DELRAY BEACH	SINGLE FMLY	$1,335,070,000	$5,861	$0	2	$5,861
DELRAY BEACH	OTHER RESID	$347,767	$75,074	$9,764	2	$84,837
DELRAY BEACH	SINGLE FMLY	$0	$4,199	$1,139	2	$5,338
DELRAY BEACH	SINGLE FMLY	$351,709	$19,227	$6,500	2	$25,727
DELRAY BEACH	SINGLE FMLY	$377,451	$40,871	$479	2	$41,350
DELRAY BEACH	SINGLE FMLY	$533,930	$129,947	$28,872	2	$158,819
DELRAY BEACH*	SINGLE FMLY	$9,999,999,999	$62,232	$5,329	2	$67,560
GREENACRES	SINGLE FMLY	$194,358	$19,557	$0	2	$19,557
GULF STREAM	SINGLE FMLY	$367,500	$4,954	$2,944	3	$7,898
GULF STREAM	SINGLE FMLY	$250,000	$10,178	$15,621	2	$25,799
GULF STREAM	SINGLE FMLY	$531,602	$12,591	$0	2	$12,591
HAVERHILL	SINGLE FMLY	$134,360	$10,834	$18,046	4	$28,880
HIGHLAND BEACH	SINGLE FMLY	$0	$23,074	$16,213	2	$39,287
JUNO BEACH	OTHER RESID	$4,500,000	$76,470	$0	4	$76,470
JUNO BEACH	OTHER RESID	$9,999,999,999	$47,934	$200	2	$48,134
JUNO BEACH	OTHER RESID	$0	$0	$14,422	2	$14,422
JUNO BEACH	OTHR-NONRES	$0	$0	$39,122	2	$39,122
JUPITER ISLAND	SINGLE FMLY	$443,227	$23,042	$707	3	$23,748

JUPITER	SINGLE FMLY	$96,890	$33,973	$6,130	3	$40,103
JUPITER	SINGLE FMLY	$30,000	$2,673	$5,486	3	$8,159
JUPITER*	OTHR-NONRES	$0	$43,381	$98,316	5	$141,697
JUPITER	SINGLE FMLY	$1,790	$35,272	$8,026	3	$43,298
JUPITER*	SINGLE FMLY	$235,538	$116,842	$0	6	$116,842
JUPITER*	OTHR-NONRES	$140,628	$81,768	$8,699	5	$90,467
JUPITER	SINGLE FMLY	$23,560	$13,468	$896	2	$14,363
JUPITER	SINGLE FMLY	$267,588	$107,430	$28,928	2	$136,358
JUPITER	OTHR-NONRES	$486,985	$78,525	$19,257	2	$97,782
JUPITER	SINGLE FMLY	$197,285	$6,962	$1,347	2	$8,309
JUPITER	SINGLE FMLY	$233,239	$4,147	$2,133	2	$6,280
JUPITER	BUSI-NONRES	$0	$8,244	$47,601	2	$55,845
JUPITER	SINGLE FMLY	$164,004	$19,653	$0	2	$19,653
JUPITER	SINGLE FMLY	$146,050	$50,714	$76,003	2	$126,717
LAKE PARK	OTHER RESID	$1,650,000	$5,170	$0	2	$5,170
LAKE PARK	OTHR-NONRES	$191,760	$60,891	$25,542	3	$86,433
LAKE PARK	OTHR-NONRES	$0	$0	$178,050	2	$178,050
LAKE WORTH BEACH	OTHR-NONRES	$0	$0	$4,370	2	$4,370
LAKE WORTH BEACH	OTHR-NONRES	$0	$0	$5,390	2	$5,390
LAKE WORTH BEACH	OTHR-NONRES	$95,000	$9,700	$0	3	$9,700
LAKE WORTH BEACH	SINGLE FMLY	$0	$2,216	$2,279	2	$4,496
LAKE WORTH BEACH	OTHR-NONRES	$0	$350	$7,031	3	$7,381
LAKE WORTH BEACH	SINGLE FMLY	$67,000	$6,599	$151	3	$6,750
LAKE WORTH BEACH	SINGLE FMLY	$35,420	$25,528	$4,211	3	$29,739
LAKE WORTH BEACH	SINGLE FMLY	$73,260	$9,013	$1,200	2	$10,213
LAKE WORTH BEACH	SINGLE FMLY	$50,000	$8,107	$4,310	2	$12,417
LAKE WORTH BEACH	SINGLE FMLY	$182,297	$34,905	$11,598	4	$46,503
LAKE WORTH BEACH	OTHR-NONRES	$32,700	$12,986	$7,629	2	$20,614
LAKE WORTH BEACH	SINGLE FMLY	$302,400	$86,303	$3,846	2	$90,149
LAKE WORTH BEACH	SINGLE FMLY	$230,616	$23,253	$135	2	$23,388
LAKE WORTH BEACH	SINGLE FMLY	$486,047	$105,709	$0	3	$105,709
LAKE WORTH BEACH	2-4 FAMILY	$221,237	$50,647	$0	2	$50,647
LANTANA	SINGLE FMLY	$197,600	$10,075	$9,705	2	$19,780
LANTANA*	OTHR-NONRES	$0	$0	$251,962	9	$251,962
LANTANA	SINGLE FMLY	$212,550	$17,459	$907	2	$18,366
LANTANA	SINGLE FMLY	$461,191	$249,549	$38,198	3	$287,747
LANTANA	SINGLE FMLY	$67,589	$1,343	$2,714	2	$4,057
LANTANA	SINGLE FMLY	$382,000	$21,631	$4,169	2	$25,800
LANTANA	OTHR-NONRES	$1,286,089	$113,394	$17,829	3	$131,222
LANTANA	SINGLE FMLY	$207,529	$5,374	$1,008	2	$6,382
LANTANA	SINGLE FMLY	$720,550	$73,912	$1,439	2	$75,351

LOXAHATCHEE GROVES	SINGLE FMLY	$167,257	$50,617	$5,624	4	$56,241
MANALAPAN	OTHR-NONRES	$290,000	$12,658	$0	4	$12,658
MANALAPAN	OTHR-NONRES	$0	$0	$12,121	2	$12,121
MANALAPAN	SINGLE FMLY	$344,500	$7,424	$0	2	$7,424
MANGONIA PARK	OTHR-NONRES	$0	$0	$458,808	9	$458,808
MANGONIA PARK*	OTHR-NONRES	$250	$6,694	$0	1	$6,694
NORTH PALM BEACH	SINGLE FMLY	$53,600	$25,326	$4,049	3	$29,374
NORTH PALM BEACH	OTHR-NONRES	$9,999,999,999	$53,209	$775	2	$53,984
NORTH PALM BEACH	SINGLE FMLY	$300,218	$18,086	$4,701	3	$22,786
OCEAN RIDGE*	2-4 FAMILY	$171,224	$115,924	$33,320	6	$149,244
OCEAN RIDGE	2-4 FAMILY	$175,940	$20,676	$0	2	$20,676
OCEAN RIDGE	2-4 FAMILY	$202,820	$53,807	$1,151	2	$54,958
OCEAN RIDGE	SINGLE FMLY	$83,224	$49,891	$2,745	3	$52,636
OCEAN RIDGE	SINGLE FMLY	$66,119	$18,416	$11,451	3	$29,868
OCEAN RIDGE	SINGLE FMLY	$9,999,999,999	$48,688	$19,806	2	$68,494
OCEAN RIDGE	SINGLE FMLY	$70,000	$22,512	$12,224	2	$34,736
OCEAN RIDGE	SINGLE FMLY	$297,500	$11,406	$8,201	2	$19,607
OCEAN RIDGE	SINGLE FMLY	$159,450	$85,346	$35,798	3	$121,144
OCEAN RIDGE	SINGLE FMLY	$120,600	$41,445	$34,795	3	$76,240
OCEAN RIDGE	SINGLE FMLY	$9,999,999,999	$5,509	$15,383	2	$20,892
OCEAN RIDGE	OTHER RESID	$2,416,529	$55,631	$0	4	$55,631
OCEAN RIDGE	SINGLE FMLY	$118,490	$45,559	$45,689	2	$91,248
OCEAN RIDGE	SINGLE FMLY	$9,999,999,999	$27,256	$3,510	1	$30,766
OCEAN RIDGE	SINGLE FMLY	$618,681	$28,180	$26,505	2	$54,685
OCEAN RIDGE	2-4 FAMILY	$250,000	$50,790	$5,605	2	$56,394
OCEAN RIDGE	OTHER RESID	$37,675	$52,073	$9,537	1	$61,610
OCEAN RIDGE	SINGLE FMLY	$496,705	$15,851	$2,482	3	$18,333
PAHOKEE	SINGLE FMLY	$51,600	$12,818	$5,505	2	$18,324
UNC PALM BEACH COUNTY	SINGLE FMLY	$313,141	$37,738	$5,907	3	$43,645
UNC PALM BEACH COUNTY	SINGLE FMLY	$131,583	$22,146	$17,324	6	$39,470
UNC PALM BEACH COUNTY	SINGLE FMLY	$36,600	$738	$2,634	2	$3,372
UNC PALM BEACH COUNTY	SINGLE FMLY	$27,400	$2,337	$2,084	2	$4,421
UNC PALM BEACH COUNTY	SINGLE FMLY	$48,800	$14,796	$2,153	2	$16,949
UNC PALM BEACH COUNTY	SINGLE FMLY	$111,810	$69,491	$17,965	3	$87,456
UNC PALM BEACH COUNTY	SINGLE FMLY	$160,000	$14,526	$21,658	3	$36,183
UNC PALM BEACH COUNTY	SINGLE FMLY	$145,945	$146,933	$91,716	5	$238,649

UNC PALM BEACH COUNTY	SINGLE FMLY	$180,056	$43,857	$26,445	3	$70,302
UNC PALM BEACH COUNTY	SINGLE FMLY	$127,500	$8,420	$1,823	2	$10,243
UNC PALM BEACH COUNTY	SINGLE FMLY	$100,000	$15,776	$5,205	2	$20,981
UNC PALM BEACH COUNTY	2-4 FAMILY	$191,173	$51,312	$21,568	5	$72,880
UNC PALM BEACH COUNTY	SINGLE FMLY	$106,500	$24,224	$20,564	2	$44,788
UNC PALM BEACH COUNTY	SINGLE FMLY	$1,033,420,000	$23,187	$5,000	3	$28,187
UNC PALM BEACH COUNTY	SINGLE FMLY	$65,200	$48,116	$19,335	2	$67,451
UNC PALM BEACH COUNTY	SINGLE FMLY	$120,185	$8,626	$836	2	$9,462
UNC PALM BEACH COUNTY	SINGLE FMLY	$120,960	$39,868	$14,897	2	$54,765
UNC PALM BEACH COUNTY	SINGLE FMLY	$111,150	$35,256	$0	2	$35,256
UNC PALM BEACH COUNTY	SINGLE FMLY	$57,300	$14,112	$0	3	$14,112
UNC PALM BEACH COUNTY	SINGLE FMLY	$78,700	$2,401	$1,101	2	$3,502
UNC PALM BEACH COUNTY	SINGLE FMLY	$71,995	$28,499	$4,268	2	$32,766
UNC PALM BEACH COUNTY	SINGLE FMLY	$60,960	$32,932	$8,931	2	$41,864
UNC PALM BEACH COUNTY	SINGLE FMLY	$96,568	$30,819	$17,722	3	$48,541
UNC PALM BEACH COUNTY	SINGLE FMLY	$100,602	$32,620	$0	2	$32,620
UNC PALM BEACH COUNTY	SINGLE FMLY	$122,919	$4,288	$1,508	2	$5,797
UNC PALM BEACH COUNTY	2-4 FAMILY	$129,252	$32,749	$8,616	2	$41,365
UNC PALM BEACH COUNTY	SINGLE FMLY	$57,513	$22,382	$15,754	2	$38,137
UNC PALM BEACH COUNTY	SINGLE FMLY	$66,208	$10,620	$9,584	2	$20,204
UNC PALM BEACH COUNTY	2-4 FAMILY	$51,384	$25,414	$822	3	$26,236
UNC PALM BEACH COUNTY	2-4 FAMILY	$51,798	$25,118	$0	3	$25,118
UNC PALM BEACH COUNTY	SINGLE FMLY	$93,755	$34,746	$14,412	2	$49,158
UNC PALM BEACH COUNTY	SINGLE FMLY	$375,750	$4,351	$0	2	$4,351
UNC PALM BEACH COUNTY	SINGLE FMLY	$0	$34,572	$16,606	5	$51,179
UNC PALM BEACH COUNTY	SINGLE FMLY	$174,336	$8,852	$2,528	2	$11,380
UNC PALM BEACH COUNTY	SINGLE FMLY	$219,810	$6,061	$0	2	$6,061

UNC PALM BEACH COUNTY	SINGLE FMLY	$2,235,200,000	$152,221	$103,557	3	$255,778
UNC PALM BEACH COUNTY*	SINGLE FMLY	$78,883	$34,448	$26,784	4	$61,231
UNC PALM BEACH COUNTY	2-4 FAMILY	$105,270	$13,560	$292	2	$13,853
UNC PALM BEACH COUNTY*	OTHR-NONRES	$14,000	$33,434	$0	2	$33,434
UNC PALM BEACH COUNTY	SINGLE FMLY	$136,800	$36,206	$14,140	2	$50,347
UNC PALM BEACH COUNTY	SINGLE FMLY	$1,000,000,000	$7,401	$606	2	$8,007
UNC PALM BEACH COUNTY	OTHR-NONRES	$0	$0	$7,339	2	$7,339
UNC PALM BEACH COUNTY	SINGLE FMLY	$59,339	$28,161	$13,099	2	$41,260
UNC PALM BEACH COUNTY	SINGLE FMLY	$100,137	$21,633	$18,728	3	$40,361
UNC PALM BEACH COUNTY	2-4 FAMILY	$143,860	$38,014	$0	2	$38,014
UNC PALM BEACH COUNTY	SINGLE FMLY	$244,218	$31,390	$0	3	$31,390
UNC PALM BEACH COUNTY	SINGLE FMLY	$114,715	$22,642	$26,171	2	$48,813
UNC PALM BEACH COUNTY	SINGLE FMLY	$250,000	$12,102	$25,786	3	$37,888
UNC PALM BEACH COUNTY	SINGLE FMLY	$195,932	$9,839	$1,711	2	$11,550
UNC PALM BEACH COUNTY	SINGLE FMLY	$108,000	$3,792	$3,340	3	$7,133
UNC PALM BEACH COUNTY	SINGLE FMLY	$139,616	$8,312	$2,010	2	$10,322
UNC PALM BEACH COUNTY	SINGLE FMLY	$250,000	$42,501	$5,256	2	$47,757
UNC PALM BEACH COUNTY	SINGLE FMLY	$0	$18,923	$13,854	2	$32,777
UNC PALM BEACH COUNTY*	SINGLE FMLY	$161,949	$120,173	$15,605	4	$135,778
UNC PALM BEACH COUNTY	SINGLE FMLY	$97,717	$74,340	$18,268	3	$92,608
UNC PALM BEACH COUNTY	SINGLE FMLY	$78,167	$11,562	$8,029	2	$19,591
UNC PALM BEACH COUNTY	SINGLE FMLY	$192,470	$11,484	$8,942	2	$20,426
UNC PALM BEACH COUNTY	SINGLE FMLY	$452,100	$6,634	$16,545	2	$23,178
UNC PALM BEACH COUNTY	SINGLE FMLY	$231,990	$13,137	$0	3	$13,137
UNC PALM BEACH COUNTY	SINGLE FMLY	$310,486	$14,862	$0	1	$14,862
UNC PALM BEACH COUNTY	SINGLE FMLY	$202,620	$36,326	$10,498	3	$46,823
UNC PALM BEACH COUNTY	SINGLE FMLY	$250,000	$53,572	$21,487	2	$75,059

UNC PALM BEACH COUNTY	SINGLE FMLY	$75,000	$21,078	$23,952	2	$45,030
UNC PALM BEACH COUNTY	SINGLE FMLY	$99,487	$3,702	$734	2	$4,436
UNC PALM BEACH COUNTY	SINGLE FMLY	$186,150	$40,293	$13,777	2	$54,070
UNC PALM BEACH COUNTY	OTHR-NONRES	$1,850,396	$81,270	$0	2	$81,270
UNC PALM BEACH COUNTY	SINGLE FMLY	$303,680	$70,787	$0	2	$70,787
UNC PALM BEACH COUNTY	SINGLE FMLY	$170,500	$27,411	$1,199	2	$28,610
UNC PALM BEACH COUNTY	SINGLE FMLY	$358,172	$15,548	$0	2	$15,548
UNC PALM BEACH COUNTY	2-4 FAMILY	$115,045	$22,594	$9,504	2	$32,098
UNC PALM BEACH COUNTY	SINGLE FMLY	$184,790	$8,217	$2,303	2	$10,520
UNC PALM BEACH COUNTY	SINGLE FMLY	$4,291,500	$13,948	$10,543	2	$24,490
UNC PALM BEACH COUNTY	SINGLE FMLY	$450,670	$19,612	$13,522	2	$33,134
UNC PALM BEACH COUNTY	SINGLE FMLY	$139,376	$44,343	$13,149	3	$57,492
UNC PALM BEACH COUNTY	SINGLE FMLY	$272,076	$2,390	$0	2	$2,390
UNC PALM BEACH COUNTY	SINGLE FMLY	$135,971	$27,547	$3,714	2	$31,261
UNC PALM BEACH COUNTY	SINGLE FMLY	$251,519	$2,845	$0	2	$2,845
UNC PALM BEACH COUNTY	SINGLE FMLY	$94,333	$29,411	$10,135	2	$39,546
UNC PALM BEACH COUNTY	2-4 FAMILY	$108,097	$9,903	$0	2	$9,903
UNC PALM BEACH COUNTY	SINGLE FMLY	$227,300	$14,515	$0	2	$14,515
UNC PALM BEACH COUNTY	SINGLE FMLY	$263,135	$95,093	$8,346	3	$103,439
UNC PALM BEACH COUNTY	2-4 FAMILY	$124,234	$28,098	$1,329	2	$29,427
UNC PALM BEACH COUNTY	SINGLE FMLY	$225,682	$40,834	$5,756	2	$46,591
UNC PALM BEACH COUNTY	SINGLE FMLY	$240,460	$70,873	$18,603	2	$89,476
UNC PALM BEACH COUNTY	SINGLE FMLY	$149,928	$28,670	$15,714	2	$44,384
UNC PALM BEACH COUNTY	SINGLE FMLY	$158,300	$26,185	$4,430	2	$30,615
UNC PALM BEACH COUNTY	SINGLE FMLY	$406,620	$21,089	$0	2	$21,089
UNC PALM BEACH COUNTY	SINGLE FMLY	$273,376	$12,241	$2,393	2	$14,635
UNC PALM BEACH COUNTY	SINGLE FMLY	$798,879	$53,672	$37,391	2	$91,063

UNC PALM BEACH COUNTY	SINGLE FMLY	$15,120	$3,102	$0	2	$3,102
UNC PALM BEACH COUNTY	SINGLE FMLY	$121,790	$8,973	$0	2	$8,973
UNC PALM BEACH COUNTY	SINGLE FMLY	$267,035	$6,230	$0	2	$6,230
UNC PALM BEACH COUNTY	SINGLE FMLY	$211,685	$35,406	$3,161	2	$38,567
UNC PALM BEACH COUNTY	SINGLE FMLY	$491,219	$6,553	$0	2	$6,553
UNC PALM BEACH COUNTY	SINGLE FMLY	$183,872	$71,142	$0	1	$71,142
UNC PALM BEACH COUNTY	SINGLE FMLY	$416,958	$21,081	$0	2	$21,081
UNC PALM BEACH COUNTY	SINGLE FMLY	$243,621	$6,794	$1,120	2	$7,913
UNC PALM BEACH COUNTY	SINGLE FMLY	$248,838	$13,413	$0	2	$13,413
UNC PALM BEACH COUNTY	SINGLE FMLY	$316,978	$18,881	$5,000	2	$23,881
UNC PALM BEACH COUNTY	SINGLE FMLY	$395,722	$39,425	$0	2	$39,425
UNC PALM BEACH COUNTY	2-4 FAMILY	$113,322	$8,159	$0	2	$8,159
UNC PALM BEACH COUNTY	SINGLE FMLY	$306,000	$146,461	$48,024	3	$194,485
UNC PALM BEACH COUNTY	OTHR-NONRES	$600,000	$55,373	$0	2	$55,373
UNC PALM BEACH COUNTY	SINGLE FMLY	$0	$1,051	$67,198	2	$68,249
UNC PALM BEACH COUNTY	SINGLE FMLY	$1,436,175	$16,569	$371	2	$16,940
UNC PALM BEACH COUNTY	OTHER RESID	$0	$651	$2,835	1	$3,486
UNC PALM BEACH COUNTY	SINGLE FMLY	$0	$18,747	$367	1	$19,114
UNC PALM BEACH COUNTY	SINGLE FMLY	$108,900	$500	$25,500	2	$26,000
UNC PALM BEACH COUNTY	SINGLE FMLY	$95,436	$6,944	$2,113	2	$9,056
UNC PALM BEACH COUNTY	SINGLE FMLY	$797,950	$18,154	$0	2	$18,154
UNC PALM BEACH COUNTY	SINGLE FMLY	$569,739	$16,935	$0	2	$16,935
PALM BEACH GARDENS	SINGLE FMLY	$69,000	$4,004	$818	2	$4,822
PALM BEACH GARDENS	SINGLE FMLY	$1,000	$2,174	$347	2	$2,522
PALM BEACH GARDENS	SINGLE FMLY	$101,200	$12,291	$16,037	2	$28,328
PALM BEACH GARDENS	SINGLE FMLY	$177,435	$4,579	$0	2	$4,579
PALM BEACH GARDENS	SINGLE FMLY	$239,360	$4,028	$0	2	$4,028

PALM BEACH GARDENS	SINGLE FMLY	$100,531	$4,885	$812	2	$5,696
PALM BEACH GARDENS	SINGLE FMLY	$250,000	$16,667	$2,208	2	$18,876
PALM BEACH GARDENS	SINGLE FMLY	$592,381	$34,002	$884	2	$34,886
PALM BEACH GARDENS	SINGLE FMLY	$251,865	$19,467	$2,512	2	$21,979
PALM BEACH GARDENS	SINGLE FMLY	$89,700	$7,073	$5,839	2	$12,912
PALM BEACH GARDENS*	OTHR-NONRES	$9,999,999,999	$243,576	$24,810	3	$268,386
PALM BEACH GARDENS	OTHER RESID	$1,874,010	$28,037	$0	2	$28,037
PALM BEACH GARDENS	OTHER RESID	$1,874,010	$29,866	$0	2	$29,866
PALM BEACH	OTHER RESID	$250,000	$7,692	$0	2	$7,692
PALM BEACH	2-4 FAMILY	$1,020,330	$24,490	$0	4	$24,490
PALM BEACH	SINGLE FMLY	$509,000	$35,758	$25,956	4	$61,714
PALM BEACH	SINGLE FMLY	$151,574	$96,390	$40,966	2	$137,356
PALM BEACH*	OTHER RESID	$23,561,211	$120,412	$10,025	6	$130,437
PALM BEACH	SINGLE FMLY	$10,000	$205	$4,455	2	$4,660
PALM BEACH	SINGLE FMLY	$400,000	$54,361	$376	2	$54,737
PALM BEACH	SINGLE FMLY	$404,663	$152,508	$76,436	9	$228,944
PALM BEACH*	OTHER RESID	$41,508,077	$267,576	$5,215	7	$272,791
PALM BEACH	OTHER RESID	$50,000	$11,160	$0	2	$11,160
PALM BEACH*	OTHER RESID	$19,000,000	$405,706	$117,762	8	$523,468
PALM BEACH*	SINGLE FMLY	$267,385	$43,347	$27,175	6	$70,522
PALM BEACH	SINGLE FMLY	$151,410	$4,708	$4,048	3	$8,756
PALM BEACH	OTHR-NONRES	$70,000	$29,488	$0	2	$29,488
PALM BEACH	OTHER RESID	$42,000	$8,592	$0	2	$8,592
PALM BEACH	SINGLE FMLY	$160,000	$9,016	$1,023	3	$10,039
PALM BEACH	SINGLE FMLY	$200,000	$2,339	$425	2	$2,764
PALM BEACH	SINGLE FMLY	$233,941	$117,415	$74,224	6	$191,639
PALM BEACH	SINGLE FMLY	$136,719	$16,708	$0	5	$16,708
PALM BEACH	OTHR-NONRES	$462,880	$75,214	$4,170	5	$79,384
PALM BEACH	SINGLE FMLY	$195,500	$4,464	$1,409	2	$5,873
PALM BEACH	SINGLE FMLY	$198,940	$21,691	$4,856	3	$26,547
PALM BEACH*	SINGLE FMLY	$152,935	$59,681	$24,116	6	$83,797
PALM BEACH	OTHR-NONRES	$492,030	$168,732	$91,613	3	$260,345
PALM BEACH	OTHER RESID	$855,000	$12,272	$0	5	$12,272
PALM BEACH	SINGLE FMLY	$7,700,000	$31,721	$10,242	3	$41,963
PALM BEACH	OTHER RESID	$9,000,000	$37,059	$10,285	2	$47,344
PALM BEACH	SINGLE FMLY	$666,619	$86,974	$8,514	4	$95,489
PALM BEACH	SINGLE FMLY	$173,972	$8,053	$0	2	$8,053

PALM BEACH	OTHER RESID	$9,999,999,999	$56,385	$0	4	$56,385
PALM BEACH	SINGLE FMLY	$169,780	$26,243	$6,653	2	$32,897
PALM BEACH	SINGLE FMLY	$1,599,935	$34,620	$0	3	$34,620
PALM BEACH	SINGLE FMLY	$300,000	$192,858	$22,047	4	$214,905
PALM BEACH*	SINGLE FMLY	$255,085	$164,159	$56,248	5	$220,407
PALM BEACH	OTHER RESID	$5,266,648	$188,274	$17,997	3	$206,271
PALM BEACH	SINGLE FMLY	$364,238	$21,299	$50	4	$21,349
PALM BEACH	2-4 FAMILY	$76,525	$16,332	$6,104	3	$22,437
PALM BEACH	SINGLE FMLY	$160,000	$55,427	$4,833	3	$60,260
PALM BEACH*	SINGLE FMLY	$368,283	$188,673	$132,993	5	$321,666
PALM BEACH	SINGLE FMLY	$154,986	$26,923	$3,540	4	$30,463
PALM BEACH	SINGLE FMLY	$183,107	$55,822	$22,995	3	$78,816
PALM BEACH	SINGLE FMLY	$330,000	$74,875	$34,160	4	$109,035
PALM BEACH	SINGLE FMLY	$305,320	$37,140	$54,394	3	$91,534
PALM BEACH*	SINGLE FMLY	$257,750	$88,301	$47,526	4	$135,827
PALM BEACH	SINGLE FMLY	$285,000	$23,411	$15,287	2	$38,698
PALM BEACH	SINGLE FMLY	$208,947	$135,785	$50,510	2	$186,296
PALM BEACH*	SINGLE FMLY	$9,999,999,999	$78,905	$43,106	4	$122,012
PALM BEACH	SINGLE FMLY	$160,347	$11,784	$0	2	$11,784
PALM BEACH	SINGLE FMLY	$300,000	$7,032	$0	2	$7,032
PALM BEACH	SINGLE FMLY	$198,516	$6,409	$0	2	$6,409
PALM BEACH*	SINGLE FMLY	$1,653,003	$43,583	$2,204	4	$45,787
PALM BEACH	SINGLE FMLY	$246,240	$84,214	$50,000	2	$134,214
PALM BEACH	2-4 FAMILY	$2,499,668	$40,266	$0	3	$40,266
PALM BEACH	SINGLE FMLY	$515,550	$269,113	$112,028	3	$381,140
PALM BEACH	OTHER RESID	$2,403,120	$3,550	$5,360	2	$8,909
PALM BEACH	SINGLE FMLY	$276,100	$19,582	$35,814	2	$55,396
PALM BEACH	OTHR-NONRES	$320,453	$9,437	$0	2	$9,437
PALM BEACH	SINGLE FMLY	$312,484	$27,795	$10,042	4	$37,837
PALM BEACH	SINGLE FMLY	$140,752	$22,861	$0	2	$22,861
PALM BEACH	SINGLE FMLY	$540,000	$13,220	$3,700	2	$16,920
PALM BEACH	SINGLE FMLY	$470,898	$28,870	$0	2	$28,870
PALM BEACH	SINGLE FMLY	$408,000	$177,204	$72,035	3	$249,238
PALM BEACH	OTHR-NONRES	$361,760	$111,682	$0	2	$111,682
PALM BEACH	OTHER RESID	$5,782,060	$44,926	$877	3	$45,803
PALM BEACH	OTHER RESID	$19,045,280	$19,383	$0	2	$19,383
PALM BEACH	OTHER RESID	$3,624,000	$432,157	$15,215	3	$447,371
PALM BEACH	OTHER RESID	$1,228,258	$56,687	$0	2	$56,687
PALM BEACH	SINGLE FMLY	$2,081,419	$306,893	$100,000	3	$406,893
PALM BEACH	SINGLE FMLY	$310,531	$16,215	$0	3	$16,215
PALM BEACH	SINGLE FMLY	$717,440	$45,059	$4,414	2	$49,473

PALM BEACH	OTHER RESID	$4,264,535	$314,171	$20,451	4	$334,622
PALM BEACH	SINGLE FMLY	$161,229	$21,898	$9,902	3	$31,800
PALM BEACH	SINGLE FMLY	$269,735	$8,815	$0	2	$8,815
PALM BEACH	SINGLE FMLY	$277,129	$59,500	$76,687	4	$136,187
PALM BEACH	SINGLE FMLY	$9,999,999,999	$103,549	$35,112	3	$138,661
PALM BEACH	SINGLE FMLY	$254,940	$21,131	$9,661	2	$30,792
PALM BEACH	SINGLE FMLY	$186,600	$23,418	$25,988	3	$49,406
PALM BEACH	SINGLE FMLY	$597,934	$15,418	$7,477	2	$22,895
PALM BEACH	SINGLE FMLY	$366,600	$82,242	$15,240	2	$97,482
PALM BEACH	2-4 FAMILY	$1,020,700	$16,737	$0	2	$16,737
PALM BEACH	2-4 FAMILY	$1,020,700	$23,805	$0	2	$23,805
PALM BEACH	SINGLE FMLY	$245,000	$42,517	$29,733	2	$72,250
PALM BEACH	OTHER RESID	$179,125	$18,610	$9,640	2	$28,250
PALM BEACH	OTHER RESID	$25,853,180	$18,185	$0	2	$18,185
PALM BEACH	OTHER RESID	$10,416,743	$50,964	$530	3	$51,494
PALM BEACH	OTHER RESID	$1,275,875	$29,663	$0	2	$29,663
PALM BEACH*	OTHER RESID	$4,102,578	$235,027	$2,806	5	$237,833
PALM BEACH	OTHER RESID	$0	$0	$23,565	3	$23,565
PALM BEACH	OTHR-NONRES	$4,446,204	$13,262	$0	3	$13,262
PALM BEACH	OTHR-NONRES	$182,431	$26,965	$0	2	$26,965
PALM BEACH	SINGLE FMLY	$241,916	$20,080	$0	2	$20,080
PALM BEACH	SINGLE FMLY	$94,026	$20,593	$0	2	$20,593
PALM BEACH	SINGLE FMLY	$776,055	$28,933	$184	2	$29,117
PALM BEACH	SINGLE FMLY	$2,500,055	$270,419	$86,668	2	$357,087
PALM BEACH	SINGLE FMLY	$0	$21,221	$703	4	$21,924
PALM BEACH	OTHER RESID	$0	$4,776	$0	2	$4,776
PALM BEACH	SINGLE FMLY	$475,850	$12,061	$0	2	$12,061
PALM BEACH	SINGLE FMLY	$0	$7,671	$0	2	$7,671
PALM BEACH	OTHER RESID	$1,860,480	$26,472	$0	2	$26,472
PALM BEACH	SINGLE FMLY	$0	$7,676	$0	3	$7,676
PALM BEACH	SINGLE FMLY	$0	$9,516	$0	2	$9,516
PALM BEACH	SINGLE FMLY	$256,154	$8,751	$0	2	$8,751
PALM BEACH	OTHER RESID	$3,624,000	$136,901	$8,513	2	$145,415
PALM BEACH	OTHR-NONRES	$9,999,999,999	$94,127	$7,196	2	$101,323
PALM BEACH	OTHR-NONRES	$127,008	$50,115	$20,457	2	$70,572
PALM BEACH	SINGLE FMLY	$10,000	$9,130	$0	2	$9,130
PALM BEACH	OTHR-NONRES	$9,999,999,999	$161,205	$6,214	2	$167,419
PALM BEACH	SINGLE FMLY	$459,613	$8,649	$0	2	$8,649
PALM SPRINGS	SINGLE FMLY	$112,200	$12,960	$5,491	2	$18,452
PALM SPRINGS	SINGLE FMLY	$122,268	$30,690	$1,103	2	$31,793
PALM SPRINGS	SINGLE FMLY	$0	$33,435	$0	2	$33,435

RIVIERA BEACH	SINGLE FMLY	$117,550	$6,696	$0	2	$6,696
RIVIERA BEACH	SINGLE FMLY	$244,500	$17,779	$7,280	3	$25,058
RIVIERA BEACH	OTHR-NONRES	$800,000	$231,256	$69,270	2	$300,526
RIVIERA BEACH	SINGLE FMLY	$85,573	$14,637	$7,605	2	$22,242
RIVIERA BEACH	SINGLE FMLY	$117,125	$21,528	$11,117	2	$32,646
RIVIERA BEACH	SINGLE FMLY	$74,126	$6,949	$0	3	$6,949
RIVIERA BEACH	SINGLE FMLY	$72,671	$21,880	$6,814	3	$28,694
RIVIERA BEACH	OTHER RESID	$235,225	$14,353	$0	2	$14,353
RIVIERA BEACH	OTHER RESID	$56,792,275	$422,873	$0	2	$422,873
RIVIERA BEACH	SINGLE FMLY	$167,471	$21,631	$10,857	2	$32,488
RIVIERA BEACH	OTHER RESID	$14,221,700	$14,760	$0	2	$14,760
RIVIERA BEACH	SINGLE FMLY	$165,735	$23,300	$3,245	2	$26,544
SOUTH PALM BEACH	OTHER RESID	$250,000	$23,814	$0	2	$23,814
SOUTH PALM BEACH	OTHER RESID	$250,000	$16,165	$0	2	$16,165
SOUTH PALM BEACH	OTHER RESID	$9,999,999,999	$1,052,987	$169,551	5	$1,222,537
SOUTH PALM BEACH	OTHER RESID	$0	$0	$62,447	3	$62,447
TEQUESTA	SINGLE FMLY	$60,000	$3,756	$2,684	3	$6,440
TEQUESTA	SINGLE FMLY	$80,400	$7,003	$4,286	2	$11,289
TEQUESTA	SINGLE FMLY	$90,000	$37,489	$14,934	2	$52,424
TEQUESTA	SINGLE FMLY	$289,000	$35,197	$720	3	$35,918
WEST PALM BEACH	OTHR-NONRES	$0	$0	$5,806	2	$5,806
WEST PALM BEACH	OTHR-NONRES	$11,100	$7,975	$808	2	$8,783
WEST PALM BEACH	SINGLE FMLY	$131,160	$17,764	$8,567	4	$26,330
WEST PALM BEACH	OTHR-NONRES	$0	$0	$3,468	2	$3,468
WEST PALM BEACH	SINGLE FMLY	$210,000	$4,648	$576	2	$5,224
WEST PALM BEACH	SINGLE FMLY	$433,128	$47,622	$35,905	4	$83,527
WEST PALM BEACH	OTHR-NONRES	$200,000	$27,095	$0	2	$27,095
WEST PALM BEACH	OTHR-NONRES	$1,608,000	$124,405	$0	2	$124,405
WEST PALM BEACH	SINGLE FMLY	$79,294	$7,017	$0	2	$7,017
WEST PALM BEACH	2-4 FAMILY	$95,040	$9,215	$496	2	$9,711
WEST PALM BEACH	SINGLE FMLY	$160,650	$41,301	$3,172	6	$44,473
WEST PALM BEACH	SINGLE FMLY	$55,965	$55,063	$0	4	$55,063
WEST PALM BEACH*	SINGLE FMLY	$57,200	$40,726	$0	4	$40,726
WEST PALM BEACH	SINGLE FMLY	$59,550	$38,975	$7,047	2	$46,022
WEST PALM BEACH	OTHR-NONRES	$641,313	$23,203	$0	4	$23,203
WEST PALM BEACH	SINGLE FMLY	$107,235	$26,777	$450	4	$27,227
WEST PALM BEACH	2-4 FAMILY	$83,250	$7,700	$0	2	$7,700
WEST PALM BEACH	2-4 FAMILY	$118,680	$42,358	$0	2	$42,358
WEST PALM BEACH	SINGLE FMLY	$0	$1,013	$14,264	2	$15,276
WEST PALM BEACH	OTHR-NONRES	$3,789,807	$20,881	$0	2	$20,881
WEST PALM BEACH	2-4 FAMILY	$244,613	$65,285	$0	2	$65,285

WEST PALM BEACH	SINGLE FMLY	$182,600	$46,596	$699	2	$47,295
WEST PALM BEACH	2-4 FAMILY	$115,380	$57,636	$22,899	3	$80,534
WEST PALM BEACH	2-4 FAMILY	$140,420	$83,111	$5,175	2	$88,286
WEST PALM BEACH	SINGLE FMLY	$250,000	$17,124	$0	2	$17,124
WEST PALM BEACH	SINGLE FMLY	$528,279	$30,653	$13,400	5	$44,053
WEST PALM BEACH	2-4 FAMILY	$245,485	$71,320	$0	2	$71,320
WEST PALM BEACH	OTHR-NONRES	$363,000	$17,729	$10,690	2	$28,419
WEST PALM BEACH	OTHR-NONRES	$105,900	$14,771	$0	2	$14,771
WEST PALM BEACH	SINGLE FMLY	$129,492	$23,981	$6,408	2	$30,389
WEST PALM BEACH	SINGLE FMLY	$220,106	$8,499	$1,909	2	$10,408
WEST PALM BEACH	SINGLE FMLY	$125,941	$54,165	$13,154	2	$67,319
WEST PALM BEACH	2-4 FAMILY	$88,776	$56,641	$8,425	2	$65,066

Appendix H: FEMA RLP Data by jurisdiction as of 1/12/2024.
*Severe Repetitive Loss Property

Appendix I: Project Scoring Examples

This appendix addresses the following FEMA requirement:

Requirement: §201.6(c)(3)(iii): The mitigation strategy section shall include an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

This appendix supports the above FEMA requirement by providing a few examples of PBC's current project scoring process using the criteria established at the program's inception. This process is used as the basis for ranking (prioritizing) proposed projects. In order for a mitigation project to be eligible for federal monies there must be a Benefit Cost Analysis completed with results of a ratio greater than one (1). This appendix illustrates the current scoring process through four examples:

- EXAMPLE 1: Community A - Library Wind Retrofit
- EXAMPLE 2: Community B - RV Park Flooding Prevention
- EXAMPLE 3: Community C - Hardening of an EOC; and
- EXAMPLE 4: Community D - Initiation of a Burn Program to Prevent Wildfire losses in the Urban Interface

EXAMPLE 1: COMMUNITY A - LIBRARY RETROFIT

Community A is a well-to-do community centered along the beach and on the Intracoastal Waterway. They have recently completed a large and very nice public library located on the Intracoastal Waterway. The library has many windows and a picturesque view of the waterway.The building itself is engineered to withstand category 5 hurricane force winds, but it is locatedin an area that can expect a five (5) foot above mean high tide storm surge during storms rated at category 3 or higher. A storm surge of this magnitude will flood the bottom floor of this library to a depth of two (2) feet. Equipment and books threatened by such an event are valued at an estimated $200,000. It will cost approximately $60,000 to raise the books and equipment in this library three (3) feet above their current level. This would eliminate the $60,000 of exposure in all but the most catastrophic hurricanes of category 5 strength, achieving and an estimated 80% reduction in potential losses.

Applying the Benefit/Cost formula:

($200,000 - $40,000) / $ 60,000 = 2.67 Benefit/Cost Ratio therefore, this is a viable project.

Applying the Scoring Criteria (See Attached Score Sheet) this project would be scored as follows:

COMMUNITY BENEFIT

This is a Damage Reduction activity and is awarded 10 points here.

Libraries are considered secondary critical facilities and six (6) points are awarded here.

In terms of Community Exposure, $200,000 is considered moderate and the frequency of the hazard this project mitigates for, Category 3 or higher storm surge, is low. Therefore Moderate (M) Exposure (E) + Low (L) Frequency (F) = four (4) points under category; and

Cost Effectiveness in terms of the Benefit/Cost Ration is 2.67; therefore, 12 points are awarded here.

This project's score under Community Benefit is 32.

COMMUNITY COMMITMENT

This project is not contained within a specific policy of Community A's Comprehensive Growth Management Plan, but this type of mitigation is addressed as a broad goal in the Coastal Management Element of that plan. Five (5) points are awarded under this category.

Although libraries are considered secondary critical facilities this project is not part of any emergency management plan. It is, however, part of the Library Department's long -term strategic plan, which has been officially adopted by the City Council. Ten points are awarded here.

While there is considerable public support for the library in general, and there is every reason to believe there would be widespread public support for this mitigation project if it was presented to the public, this has not yet been done. Most of the citizens of Community A are not aware of the potential problem this mitigation project addresses. No points can be awarded here at this time. (Community A could change this score by holding public workshops on the problem and soliciting voter response questionnaires or other methods.).

This projects score under Community Commitment is 15 points.

PROJECT IMPLEMENTATION

There are no regulatory problems with this project and five (5) points are awarded here.

Although the exposure is clearly visible, there has not been a severe hurricane since this library was constructed and therefore there is no history of loss or repetitive loss for this structure. Floodhazard mitigation money available now is directed toward structures suffering repetitive losses, and consequently no funds are immediately available. FEMA and other funding sources are being reviewed and it is believed that funds for this type of mitigation project will be available within the next one (1) to two (2) years. This project is awarded six (6) points in this category.

Community A is an affluent community and despite the fact that the public is currently unaware of this problem, the City Council feels confident enough of public support to commit a 50% match,or $30,000 toward this mitigation effort. The project is awarded five (5) points here; if funding were to become available, this project could accomplish its objective of raising library books and equipment above the category 3 storm surge level in less than one year. The project is awarded five (5) points here.

This project's score under Project Implementation is 21 points.

The Final Score for this proposed mitigation project is 68 points.

EXAMPLE 2: COMMUNITY B - RV PARK FLOODING PREVENTION

Community B has a large RV park with very poor drainage. Every time there is a minimal rain event the area floods, causing significant danger and health hazards to the residents in terms of flooded power outlets and sewage-contaminated standing water. These events also cause the town and county considerable expense and inconvenience such as traffic problems, emergency services disruption, and clean-up. This type of flooding happens approximately eight times per year withan estimated expense to the town and county of $3,000 per event. Correcting this problem will require a substantial reworking of the local drainage system. The estimated cost for this mitigationeffort is $400,000.

If the flooding this project is designed to correct occurs eight times a year at a cost of $3,000 per event to the town and county in terms of police, fire/rescue, and utility worker time involvement, then Community B has a documented exposure of $24,000 per year to this hazard. If we assumethe life expectancy of a drainage project to be 30 years, the potential savings to the town and county could be as high as $720,000. A reduction in the frequency of these flooding events by 90% would make the Benefit/Cost ratio on this project:

($720,000 - $72,000) / $400,000 = 1.62 Benefit/Cost Ratio therefore, this is a viable project.

Applying the Scoring Criteria (See Attached Score Sheet) this project would be scored as follows:

COMMUNITY BENEFIT

This project is a Damage Reduction project and is awarded 10 points here.

This project addresses a problem within an RV park where there are no permanent residents. It does not address critical elements of the community infrastructure and must be considered as addressing only public convenience considerations. Award four (4) points here.

Based on individual flooding events the community's exposure is low, but when considered over time this exposure becomes much higher. Points are awarded under this criterion based on a Medium Exposure and a High Frequency of occurrence. Nine (9) points are awarded here.

The cost effectiveness based on the Benefit/Cost ratio for this project is 1.62; therefore, eight (8) points are awarded here.

Total project score under Community Benefit is 31 points.

COMMUNITY COMMITMENT

This proposed project is contained within a broad mitigation goal under the Coastal Element of Community B's CGMP, but Community B has developed a proposed specific Policy amendment directed toward this type of drainage system retrofit. The project is awarded eight (8) points here.

This project is also contained within the Flood Plain Management Plan for Community B, which has been officially adopted. Award 10 points in this category.

This problem has been the subject of numerous letters and editorials in the local paper. It has also been the subject of one (1) advertised public meeting. Award five (5) points here.

Total project score under Community Commitment = 23 points

PROJECT IMPLEMENTATION

This project requires a considerable amount of construction work. While it is consistent within the local regulatory framework, there are regional and possibly national issues that will have to be addressed. Since the project will be discharging storm water runoff into some body of water, there will be water quality issues that must be dealt with. If Federal money is used, an NPDES review will be required. While all these issues can be addressed, they will delay implementationof the project and increase its cost. Award only one (1) point under this criterion.

Currently, there are no identified sources for funding for this project. Once the LMS is adopted it is believed the Federal Government will make available, through the State DEM some funds to implement priority mitigation projects. These funds may be available within one (1) to two (2) years. Award six (6) points under this criterion.

While Community B is relatively affluent, they are not in a position to match more than 10% or $40,000 on a project of this magnitude. Award one (1) point under this criterion.

If funding were immediately available for this project it would take approximately three (3) years before this project could be permitted, bid, constructed, and operational. Award three (3) points under this criterion.

Total project points under Project Implementation = 11

The Final Score for this proposed mitigation project is 65 points.

EXAMPLE 3: COMMUNITY C - DEVELOP A HARDENED EOC

Community C has no hardened Emergency Operations Center. They presently base their emergency management personnel in city office buildings that are highly vulnerable to both flooding and wind damage. They have an estimated $300,000 worth of computer, communications, and emergency response equipment housed within these vulnerable facilities. The county provides Community C with its Fire/Rescue services and is presently building a new,hardened fire station to serve this section of the county. County Fire/Rescue Services have offeredto provide Community C space within their new building, but Community C will have to have this space fitted for Emergency Management Operations. Fitting this space and moving Community C's existing equipment into it will cost Community C an estimated $60,000. By undertaking this move, Community C should reduce the exposure to its physical assets by 95%, as well as position its Emergency Management personnel in a much safer environment.

Applying the Benefit/Cost formula shows:

($300,000 - $15,000) / $ 60,000 = 4.75 Benefit/Cost Ratio therefore, this is a viable project.

Applying the Scoring Criteria (See Attached Score Sheet) to this project would be scored as follows:

COMMUNITY BENEFIT

Although not its specific aim, this project may be classified as a Damage Reduction activity. Award 10 points under this criterion.

This project addresses hardening of a Primary Critical Facility. Award 10 points here.

The currently utilized location of emergency management operations is highly vulnerable to severe tropical storms, hurricanes, or tornadoes and all these types of storms occur with mediumfrequency. Thus, we have a High Exposure = Medium Frequency = eight (8) points for this criterion.

The cost effectiveness for this proposed project expressed as the Benefit/Cost Ration is 4.75, thus 20 points are awarded in this criterion. Total Community Benefit Points = 48

COMMUNITY COMMITMENT

The concept of developing a hardened EOC for Community C is expressed in both a goal and a specific Policy of their CGMP. Award 10 points under this criterion.

Development of a permanent, protected EOC is also contained with Community C's Emergency Management Plan. Award 10 points under this criterion.

There is no real public support for, or opposition to, this project. Although it is believed the public would be highly supportive of this project if it were presented to them, they are at this time unaware of the problem. No points can be awarded in this criterion.

Total Community Commitment points = 20

PROJECT IMPLEMENTATION

There are no regulatory problems with this proposed project. Award five (5) points here.

There is an identified funding source through the State Division of Emergency Management forthe project at this time. Award 10 points here.

Community C will match with funds and in-kind services 20% of the cost of this project. Awardtwo (2) points for this criterion.

This project can be accomplished as soon as the new fire station is ready for occupancy in approximately six months. Award five (5) points here.

Total Project Implementation Points = 22 points

The Final Score for this proposed mitigation project is 90 points.

EXAMPLE 4: COMMUNITY D - INITIATION OF A CONTROLLED BURNING PROGRAM TO PREVENT WILDFIRE LOSSES IN THE URBAN INTERFACE ZONE.

Community D has a large agricultural, ranching, and undeveloped land component within its jurisdiction. The community wishes to undertake a controlled burning program along the urban interface zone, but to do this it will have to upgrade its fire control equipment, pass a new controlled burning ordinance, and get the required permission from the forestry and environmentalservices. The cost of initiating this new program is estimated to be $200,000 including the necessary upgrading of fire control equipment. Community C has an exposure, based on tax roledata, of $3 million within the area where wildfire is considered a threat. Controlled burning wouldreduce the potential risk of wildfire by 60%.

Applying the Benefit/Cost formula shows:

($3,000,000 - $1,200,000) / $200,000 = 9.0 Benefit/Cost Ratio therefore, this is a viable project.

Applying the Scoring Criteria (See Attached Score Sheet) to this project would be scored as follows:

COMMUNITY BENEFIT

This is a Preparedness Against Hazard project, so three (3) points are awarded here.

There are primary critical facilities located in the area threatened by wildfire so this project does mitigate for threats to critical elements of the community's infrastructure. Award 10 points here.

The community has a high exposure to wildfire ($3 million) and wildfires have occurred withmoderate frequency recently in south Florida. Award eight (8) points for this criterion.

The project has a Benefit/Cost Ratio of 9.0. Award 20 points under this criterion.Total

Community Benefit Points = 41 points

COMMUNITY COMMITMENT

Controlled burning is currently expressed as a broad Goal under Community D's CGMP, but it is the subject of a specific Policy amendment that has been proposed. Award eight (8) points here.

Controlled burning is not addressed in any existing emergency management plans, but following last summer's wildfire outbreaks, controlled burning plans have been developed and proposed. Award six (6) points under this criterion.

The danger of wildfire and the desirability of a controlled burn program have been the subjects of two publicly advertised meetings and a considerable number of letters and written comments from the public at-large. Award five (5) points for this criterion.

Total Community Commitment points = 19

PROJECT IMPLEMENTATION

The proposed controlled burn ordinance will have to be adopted by the City Council. Various permits will have to be obtained from the county and Division of Forestry when controlled burningis actually to take place, but these are not considered regulatory obstacles to the program itself. The only area of non-regulatory compliance is an issue in passing the ordinance creating the program itself. Award four (4) points for this criterion.

The county and the City have agreed to put up the funding for this program so funds will be available as soon as the program has been legally adopted by Community D. Award 10 points here.

Community D will match 50% of the funds required for this program. Award five (5) points here.

Once the program is in place, it will begin to accomplish its stated goals immediately. Award five

(5) points here.

Total Project Implementation Points = 24 points

The final score for this proposed mitigation project is 84 points.

PALM BEACH COUNTY
LMS PROJECT/INITIATIVE SCORING SHEET

Project Title:

Sponsor:

OFFICIAL USE ONLY
PROJECT #
Reviewer:

MEASURED CRITERIA	POINTS AVAILABLE	POINTS AWARDED
Community Benefit	50	
Project Implementation	25	
Community Commitment	25	
PROJECT / INITIATIVE FINAL SCORE		

COMMUNITY BENEFIT	AVAILABLE POINTS	SCORING INSTRUCTION	AWARDED POINTS
Community Benefit–What benefit does the community derive from this effort? How and to what extent does this mitigation project benefit the citizens of a community?	5	Damage Reduction =5 Mapping and Regulatory = 4 Preparedness Against Hazard = 3 Public Information = 2 Other = 1 No Benefit = 0	
Project Benefit - Does the project address critical elements of the community infrastructure?	10	Primary Critical Facilities = 10 Storm Water/Flooding = 8 Secondary Critical Facilities = 6 Public Convenience Facilities = 4 Residential Structures = 2 No Benefit = 0	
Community Exposure - Does the project mitigate a frequently occurring problem or a problem to which a community is particularly vulnerable? H = High M = Medium L = Low E = Exposure F = Frequency of occurrence	10	HE + HF = 10 HE + MF = 8 HE + LF = 6 ME + HF = 9 ME + MF = 7 ME + LF = 4 LE + HF = 5 LE + MF = 2 LE + LF = 1 No Exposure + No Frequency = 0	
Cost Effectiveness - What is the benefit/cost ratio of the project applying the following Benefit/Cost ratio formula: (Loss Exposure ($) Before Project−Loss Exposure ($) After Project)÷ Cost of the Project	20	Benefit/Cost ratio = 4.0 or greater =20 points Benefit/Cost Ratio = 3.0 to 3.9 = 16 points Benefit/Cost ratio = 2.0 to 2.9 = 12 points Benefit/Cost ratio = 1.0 to 1.9 = 8 points Benefit/Cost ratio = < 1.0 = 0 points	
Area Benefit – How many people stand to benefit from the project implementation?	5	Multiple Jurisdictions = 5 Community = 3 Neighborhood = 1 No Benefit = 0	
TOTAL COMMUNITY BENEFIT POINTS	50	POINTS AWARDED	

PALM BEACH COUNTY
LMS PROJECT/INITIATIVE SCORING SHEET

PROJECT IMPLEMENTATION	AVAILABLE POINTS	SCORING INSTRUCTION	AWARDED POINTS
Containment within the Existing Comprehensive Growth Management Plan or Equivalent Plan – Is the project or initiative consistent with or incorporated within the existing Comprehensive Growth Management Plan or equivalent document?	10	Contained within a specific Policy/Plan = 10 Contained in "Goal" with proposed Policy/Plan amendment = 8 Contained within a broad "Goal" = 5 Contained in a proposed Amendment = 3 Not in conflict with any Policy/Plan = 1 No Plan =0	
Containment within an Existing Emergency Management Plan / Other Functional Plan Developed by an Official Local Governmental Entity/Organization - Has this project or initiative already been proposed as a management initiative or structural improvement in any emergency plan or proposed or adopted by County\local jurisdictions or entity?	10	Officially adopted = 10 Proposed/Not officially adopted = 6 Not in conflict with any plan = 2 No Plan = 0	
Consistency with Existing Regulatory Framework - Is the project consistent with existing legal and regulatory and environmental/cultural framework?	5	No regulatory issues = 5 Local issues = 4 Regional issues = 3 State issues = 2 Federal issues = 1 No Consistency = 0	
TOTAL PROJECT IMPLEMENTATION POINTS	25	TOTAL POINTS AWARDED	

PALM BEACH COUNTY
LMS PROJECT/INITIATIVE SCORING SHEET

COMMUNITY COMMITMENT	AVAILABLE POINTS	SCORING INSTRUCTION	AWARDED POINTS
Public Support - Is there demonstrated public support for this project or recognition of this problem?	5	Has this project or problem been the subject of: A) An Advertised Public Meeting = 3 B) Written evidence of public support = 2 Both A and B = 5 No evidence of public support = 0	
Funding Availability – Is there a funding source readily available?	10	Funds available Now = 10 1 year = 8 2 years = 6 3 years = 4 4 years = 2 5 years = 1 5+ years = 0	
Matching Funds - Are matching funds or in-kind services available for this project?	5	50 % or more = 5 40 to 49 % = 4 30 to 39 % = 3 20 to 29 % = 2 1 to 20 % = 1 0% = 0	
Timeframe for Accomplishing Objectives - How long will it take for the proposed mitigation project to accomplish its stated goals?	5	1 year = 5 2 years = 4 3 years = 3 4 years = 2 5 years = 1 5+ years = 0	
TOTAL COMMUNITY COMMITMENT POINTS	25	POINTS AWARDED	

NOTES:

Appendix J: NFIP and CRS Status and Activities

This appendix is intended to provide current data and information on NFIP and CRS status and activities countywide in fulfillment of the following FEMA requirement:

Requirement: §201.6(c)(3)(ii): The mitigation strategy must also address the jurisdiction's participation in the National Flood Insurance Program (NFIP), and continued compliance with NFIP requirements, as appropriate.

The tables on the following pages provide summaries of NFIP and CRS status by jurisdiction. Sources for summary tables were compiled from the following locations on FEMA's NFIP website:

- https://www.fema.gov/sites/default/files/documents/fema_crs_eligible-communities_oct-2023.pdf
  (Includes CRS Class Information for PBC)
- https://www.fema.gov/media-library-data/1493922774199-5d4a9a625dd3b1b90c31577c33a24f61/10-5-2017.Consolidated.pdf (FIRM Map latest updates for PBC)
- https://bsa.nfipstat.fema.gov/reports/1040.htm (Flood Losses since 1978 in PBC)
- https://bsa.nfipstat.fema.gov/reports/1011.htm (Policies in-force in PBC)

The number and value of NFIP insurance policies in effect, total losses, and claims activity from CRS participation are included on a jurisdiction-by-jurisdiction basis. As of this writing, 28 out of 39 jurisdictions are participating in CRS. Currently the CRS program is generating close to $5 million in insurance premium savings countywide on an annual basis.

As of this writing, the County's CRS program was evaluated in April 2021 and retained a Class 5 CRS rating. The County will be recertified in August 2024.

Community ID	Name	Policies in Force	Class Rating	Map Date	CRS_Entry_Date
120193	Atlantis, City of	225	10	10/5/2017	10/1/1992
120195	Boca Raton, City of	15,073	7	10/5/2017	10/1/1992
120196	Boynton Beach, City of	6,264	5	10/5/2017	10/1/1991
120198	Cloud Lake, Town of	19	7	10/5/2017	10/1/1994
125102	Delray Beach, City of	7,194	6	10/5/2017	10/1/1994
120200	Glen Ridge, Town of	28	10	10/5/2017	10/1/1994
120203	Greenacres, City of	423	9	10/5/2017	10/1/2017
125109	Gulf Stream, Town of	477	10	10/5/2017	10/1/1999
125111	Highland Beach, Town of	4,215	10	10/5/2017	10/1/1993
120207	Hypoluxo, Town of	1,486	7	10/5/2017	10/1/1994
120208	Juno Beach, Town of	1,639	5	10/5/2017	10/1/1993
125119	Jupiter, Town of	7,646	5	10/5/2017	10/1/1994
120211	Lake Clarke Shores, Town of	163	8	10/5/2017	10/1/1994
120212	Lake Park, Town of	837	6	10/5/2017	10/1/1992
120213	Lake Worth Beach, City of	1,357	6	10/5/2017	10/1/1996
120214	Lantana, Town of	1,198	8	10/5/2017	10/1/1994
120215	Manalapan, Town of	229	8	10/5/2017	10/1/1992
120216	Mangonia Park, Town of	32	10	10/5/2017	10/1/1994
120217	North Palm Beach, Village of	3,696	5	10/5/2017	10/1/1994
125134	Ocean Ridge, Town of	1,226	6	10/5/2017	10/1/1992
120192	Palm Beach County	41,485	5	10/5/2017	10/1/1991
120221	Palm Beach Gardens, City of	4,101	10	10/5/2017	10/1/2003
125137	Palm Beach Shores, Town of	667	7	10/5/2017	10/1/1994
120220	Palm Beach, Town of	7,209	6	10/5/2017	10/1/1992
120223	Palm Springs, Village of	392	6	10/5/2017	10/1/1992
125142	Riviera Beach, City of	5,021	8	10/5/2017	5/1/2016
120225	Royal Palm Beach, Village of	1,185	6	10/5/2017	10/1/2018
120227	South Palm Beach, Town of	1,794	8	10/5/2017	10/1/1993
120228	Tequesta, Village of	1,193	6	10/5/2017	10/1/1992
125157	Wellington, Village of	2,933	5	10/5/2017	1/3/2001
120229	West Palm Beach, City of	7,634	5	10/5/2017	10/1/1992

*Unincorporated areas of the county only
Note: All PBC FIRM Maps were officially updated as of 10/5/2017. Entry date is the date the municipality entered the NFIP program.
Source: as of 10/1/2023 from NFIP Website nfip-policy-information-by-state-20230930.xlsx (live.com)

Name	Policies in Force	Total Losses	Total Losses Paid
PALM BEACH COUNTY *	50,725	3,982	$18,312,549.68
ATLANTIS, CITY OF	295	29	$316,370.90
BELLE GLADE, CITY OF	169	9	$26,837.91
BOCA RATON, CITY OF	15,972	637	$3,520,222.52
BOYNTON BEACH, CITY OF	7,849	586	$1,808,039.14
BRINY BREEZES, TOWN OF	61	6	$14,227.77
CLOUD LAKE, TOWN OF	19	7	$20,317.57
DELRAY BEACH, CITY OF	7,681	755	$2,605,335.07
GLEN RIDGE, TOWN OF	26	6	$8,520.02
GOLF, VILLAGE OF	24	3	$42,999.54
GREENACRES, CITY OF	503	20	$42,206.73
GULF STREAM, TOWN OF	355	43	$215,581.04
HAVERHILL, TOWN OF	30	7	$70,254.16
HIGHLAND BEACH, TOWN OF	4,120	90	$443,273.13
HYPOLUXO, TOWN OF	1,341	22	$13,145.43
JUNO BEACH, TOWN OF	1,722	43	$566,945.73
JUPITER INLET COLONY, TOWN OF	127	17	$105,470.23
JUPITER, TOWN OF	8,872	480	$3,251,400.08
LAKE CLARKE SHORES, TOWN OF	211	19	$27,254.62
LAKE PARK, TOWN OF	861	44	$622,665.46
LAKE WORTH BEACH, CITY OF	1,442	200	$747,811.11
LANTANA, TOWN OF	1,167	153	$1,442,016.22
MANALAPAN, TOWN OF	239	83	$552,485.98
MANGONIA PARK, TOWN OF	48	13	$465,502.44
NORTH PALM BEACH, VILLAGE OF	3,963	110	$367,768.76
OCEAN RIDGE, TOWN OF	1,237	193	$1,403,890.71
PAHOKEE, CITY OF	169	15	$45, 582.20
PALM BEACH, TOWN OF	7,521	1,201	$13,635,675.85
PALM BEACH GARDENS, CITY OF	4,711	307	$1,500,704.43
PALM BEACH SHORES, TOWN OF	736	58	$889,658.54
PALM SPRINGS, VILLAGE OF	1,291	83	$182,235.26
RIVIERA BEACH, CITY OF	5,311	267	$1,447,709.46
ROYAL PALM BEACH, VILLAGE OF	1,093	36	$233,542.42
SOUTH PALM BEACH, TOWN OF	1,735	65	$1,400,361.95

TEQUESTA, VILLAGE OF	1,342	75	$261,270.90
WELLINGTON, VILLAGE OF	676	0	$0.00
WEST PALM BEACH, CITY OF	8,021	477	$3,715,504.48

*Unincorporated areas of the county only
Source: As of 10/1/23 from NFIP

ACTION ITEMS

1. **LMS Capital Improvement Projects** selected and implemented as scheduled [updated list of projects (PPL) to be released twice each year]

The PPL contains projects in the following categories:

- Preventive (drainage improvements)
- Structural Flood Control Projects
- Property Protection (Critical Facility mitigation and retrofitting)
- Emergency Services (EOC hardening)

Responsible Party: LMS Evaluation Panel and LMS Steering Committee
Participating/ Benefitting Municipalities: County and all municipalities with PPL projects or project submissions and/or that have representatives participating in LMS Working Group
Possible Funding: Staff Time
Timeframe: Ongoing
Categories: Preventive, Structural Flood Control Projects, Property Protection, Emergency Services

Palm Beach County and its municipalities will continue their commitment to NFIP by continuing to:

2. **Enforce the Floodplain Management Ordinance** that regulates new development and substantial improvements in the special flood hazard areas.

- Inform the community by news releases and open public meeting
- Community Outreach
- County Public TV

Responsible Party: County and Municipal Floodplain Managers and Building Officials
Participating/ Benefitting Municipalities: County and all NFIP participating municipalities
Possible Funding: Staff Time
Timeframe: Ongoing
Categories: Floodplain Management, Public Information

3. **Maintain elevation certificates** on file for all new construction in the SFHAs or for substantial improvements to properties in the SFHA.

- Hold county seminars geared toward construction industry and builders

Responsible Party: County and Municipal CRS Coordinators and/or Floodplain Managers
Participating/ Benefitting Municipalities: County and all NFIP participating municipalities
Possible Funding: Staff Time
Timeframe: Ongoing
Categories: Floodplain Management, Public Information

4. **Use best available (flood map) data** for issuing construction permits.

- Public Education Seminars
- Updated mapping provided to each municipality
- Mapping placed in all county libraries

Responsible Party: County and Municipal Building Departments and Floodplain Managers

Participating/ Benefitting Municipalities: County and all NFIP participating municipalities
Possible Funding: Staff Time
Timeframe: Ongoing
Categories: Floodplain Management, Public Information

5. **Maintain public records** and make them available for review.

- Community outreach
- News releases and county public TV

Responsible Party: County and Municipal CRS Coordinators and/or Floodplain Managers
Participating/ Benefitting Municipalities: County and all NFIP participating municipalities
Possible Funding: Staff Time
Timeframe: Ongoing
Category: Floodplain Management, Public Information

6. **Maintain records** pertaining to LOMAS, and LOMRS, etc.

Responsible Party: County and Municipal Floodplain Managers
Participating/ Benefitting Municipalities: County and all NFIP participating municipalities
Possible Funding: Staff Time
Timeframe: Ongoing
Category: Floodplain Management

7. **Provide information** related to flood hazards, flood maps, etc., to the public upon request.

Responsible Party: County and Municipal Floodplain Managers
Participating/ Benefitting Municipalities: County and all NFIP participating municipalities
Possible Funding: Staff Time
Timeframe: Ongoing
Category: Floodplain Management, Public Information

8. **Continue community outreach** efforts for compliance with the community rating system program.

- Integrate new NFIP information and mapping into already existing strong community presentations
- Incorporate Flooding information into every Emergency Management presentation to the public.

Responsible Party: County and Municipal CRS Coordinators
Participating/ Benefitting Municipalities: County and all CRS participating municipalities
Possible Funding: Staff Time
Timeframe: Ongoing
Category: Public Information

9. **Continue to promote flood insurance** to property owners.

- Increase and continue outreach presentations to community and homeowners associations
- Incorporate flood insurance outreach into every emergency management

presentation, increasing the reach of the message throughout the county and municipalities.

Responsible Party: County and Municipal CRS Coordinators
Participating/ Benefitting Municipalities: County and all CRS participating municipalities
Possible Funding: Staff Time
Timeframe: Ongoing
Categories: Public Information, Property Protection

10. **Maintain flood hazard publications** at the main branch of the library.

Responsible Party: County and Municipal CRS Coordinators
Participating/ Benefitting Municipalities: County and all CRS participating municipalities
Possible Funding: Staff Time
Timeframe: Ongoing
Category: Public Information

11. **Where feasible, continue to identify/acquire land in the SFHA for open space/preservation**, seek out opportunities to expand the publicly owned properties that are designated natural and beneficial areas, and encourage the expansion of privately owned open space through PUD open space and land swap regulations.

Responsible Party: County and Municipal Floodplain Managers and/or CRS Coordinators
Participating/ Benefitting Municipalities: County and all CRS participating municipalities
Possible Funding: Staff Time
Timeframe: Ongoing
Category: Natural Resource Protection

12. **Promote flood hazard mitigation** to the public.

- LMS posted on the County website
- Grant information posted on County website
- Integrate into outreach presentation

Responsible Party: County and Municipal CRS Coordinator, LMS Working Group
Participating/ Benefitting Municipalities: County and all CRS participating municipalities
Possible Funding: Staff Time
Timeframe: Ongoing
Categories: Floodplain Management, Preventive, Public Information, Property Protection

13. **Continue drainage maintenance and drainage system improvement projects**. Encourage more drainage projects throughout the county in all LMS meetings

Responsible Party: County and Municipal Engineering and Utilities Department Leads, LMS Working Group, LMS Steering Committee
Participating/ Benefitting Municipalities: County and all NFIP participating municipalities
Possible Funding: Staff Time
Timeframe: Ongoing
Categories: Preventive, Structural

14. Continue floodplain management activities to maintain and/or improve current CRS Class Rating.

Responsible Party: County and Municipal Floodplain Managers and/or CRS Coordinators
Participating/ Benefitting Municipalities: County and all CRS participating municipalities
Possible Funding: Staff Time
Timeframe: Ongoing
Category: Floodplain Management

15. Adopt and enforce the floodplain management plan (LMS)

- Schedule quarterly meetings with CRS User Group and invite all 39 municipalities
- Provide continued education and best practices to all municipalities

Responsible Party: County and Municipal Floodplain Managers and/or CRS Coordinators, LMS Working Group
Participating/ Benefitting Municipalities: County and all CRS participating municipalities
Possible Funding: Staff Time
Timeframe: Ongoing
Category: Floodplain Management

16. Provide a robust community assistance program that includes:

- Community outreach presentations
- Town hall meetings in different municipalities
- Press releases and TV programs
- Telephone information Hotline Floodplain and Mapping questions
- New map pick up information

Responsible Party: County and Municipal Floodplain Managers and/or CRS Coordinators, Public Information Officer
Participating/ Benefitting Municipalities: County and all CRS participating municipalities
Possible Funding: Staff Time
Timeframe: Ongoing
Categories: Public Information, Property Protection

17. Continue outreach to municipalities not yet participating in the CRS/NFIP and encourage program participation. Continue to provide program support to those that do participate.

- Provide continued outreach, best practices to municipalities that are not yet part of the CRS/NFIP
- Document each municipality not a participant in the CRS/NFIP and continue providing them with best practices incentives to participate
- Ensure that municipalities not participating in the CRS/NFIP are members of the LMS working group, allowing them still to receive mitigation information

Responsible Party: County CRS Coordinator
Participating/ Benefitting Municipalities: County and all CRS/NFIP non-participating municipalities
Possible Funding: Staff Time
Timeframe: Ongoing with identification of non-participating communities done by Fall 2025 and outreach to each completed by Fall 2026
Category: Floodplain Management

Palm Beach County and its municipalities will continue their commitment to NFIP by continuing to:

18. **Continue to participate in federal, state, and local mitigation programs and initiatives:** Palm Beach County and its 39 municipalities participate in a full range of federal, state, and local mitigation programs and initiatives. Representative of these programs and initiatives are the

- LMS,
- Community Rating System (CRS),
- National Flood Insurance Program (NFIP),
- Flood Mitigation Assistance Program (FMA),
- Pre-Disaster Mitigation Program (PDM),
- Hazard Mitigation Grant Program (HMGP),
- Emergency Management Preparedness & Assistance Program (EMPA),
- CERT,
- Continuity of Operations,
- Post Disaster Redevelopment Plan (PDRP),
- ESF18, Private-Public Partnerships, counterterrorism, radiological emergency preparedness initiatives, hazardous materials, etc.

Responsible Party: County and Municipal Floodplain Managers and/or CRS Coordinators
Participating/ Benefitting Municipalities: County and all NFIP participating municipalities
Possible Funding: Staff Time
Timeframe: Ongoing
Category: Floodplain Management

19. **Continue to prioritize the reduction of repetitive flood losses and the mitigation of repetitive loss properties/ areas:** The County and its CRS participating municipalities track repetitive loss properties countywide on an ongoing basis using data gathered annually from FEMA and the State's Focus reports.

For mitigation planning and strategy development purposes, LMS maintains updated GIS maps and informational databases of repetitive loss property locations relative to historical flood areas and designated Special Flood Hazard Areas. Repetitive loss properties are an ongoing discussion and planning priority for the LMS, CRS, and Flood Mitigation Technical Advisory committees. These committees, comprised of public and private sector representatives, are encouraged to develop and promote mitigation project ideas and strategies. As a result, a majority of the projects on the Prioritized Project List (PPL) are flood mitigation projects.

In accordance with CRS guidelines, letters are mailed annually to repetitive loss property owners by PBC and municipalities, explaining NFIP program benefits, the availability of mitigation assistance funding through the FMA and other mitigation assistance programs. Non-CRS members of the LMS are encouraged to stay in compliance with NFIP standards. Information and support is provided in a variety of forms to potential FMA applicants to assist them in developing projects and preparing application packages. Through PBC's LMS committee structure, members of the Technical Advisory Committee are available to offer technical guidance and assistance to applicants, including assistance in preparing benefit-cost analyses.

Mitigation projects are prioritized and implemented according to their direct potential for loss reduction or for their potential in contributing to longer-term, comprehensive plans and strategies for loss reduction. Once projects are underway, it is the responsibility of each jurisdiction to support and monitor performance in accordance with FEMA, state and local guidelines and codes, and to oversee and coordinate documentation and funding processes.

Responsible Party: County and Municipal Floodplain Managers and/or CRS Coordinators
Participating/ Benefitting Municipalities: County and all NFIP participating municipalities
Possible Funding: Staff Time
Timeframe: Ongoing
Category: Floodplain Management

20. **Continue involving the Planning, Zoning, and Building, Fire-Rescue, and other departments in LMS activities:** This participation includes committee participation, which bolsters communication among key agencies and the LMS. This also helps ensure that mitigation interests are appropriately represented in local building codes, fire codes, land-use ordinances, flood loss prevention ordinances, and other governing documentation.

Responsible Party: County and Municipal Floodplain Managers and/or CRS Coordinators, LMS Working Group, LMS Steering Committee
Participating/ Benefitting Municipalities: County and all NFIP participating municipalities
Possible Funding: Staff Time
Timeframe: Ongoing
Category: Floodplain Management

21. **Continue implementing a variety of community awareness, outreach and education activities:** This includes presentations, workshops, expos, panel discussions, plan reviews, publications, websites, etc. prepared and presented utilizing networks of public-private sector partners. As opportunities present themselves, lending institutions and insurers are urged to provide financial incentives for mitigation. Jurisdictions are urged to accelerate permitting and inspections and, if allowable, to waive or reduce fees for mitigation projects. In addition to mitigation incentives, millions of dollars of annual insurance premium savings are realized by a significant segment of PBC residents residing within the County s CRS participating jurisdictions.

Responsible Party: County and Municipal Floodplain Managers and/or CRS Coordinators, Public Information Officer
Participating/ Benefitting Municipalities: County and all NFIP participating municipalities
Possible Funding: Staff Time
Timeframe: Ongoing
Category: Public Information

22. **Identify, prioritize, and implement projects aimed at avoiding and/or reducing long-term vulnerability to the hazards identified by the hazard identification and risk assessment processes.** A more detailed description of the hazards, as well as recommended strategies, programs, and actions, are contained in the body of the plan and reflected in the list of prioritized projects in Appendix E. Under the committee structure of the LMS program, increased attention is given to expanding and refining hazard-specific mitigation strategies exclusive of jurisdictional boundaries, capabilities, and interests, and to giving appropriate attention to mitigation in planning future land uses (see Appendix C).

The process and criteria employed for ranking mitigation projects and initiatives are described in detail in Section 4.0 of the LMS plan. In response to federal guidelines applying to grant awards through the Pre-Disaster Mitigation, Flood Mitigation Assistance, and HMGPs, particular emphasis is given to technically feasible and environmentally responsible projects having attractive ratios of loss reduction benefits to cost. Projects involving worthy benefits that are difficult to quantify are given serious consideration, in light of different sets of criteria and are referred to appropriate alternative funding sources not requiring stringent benefit-cost justifications.

Responsible Party: County and Municipal Floodplain Managers and/or CRS Coordinators, LMS Working Group, LMS Steering Committee and LMS Evaluation Panel
Participating/ Benefitting Municipalities: County and all NFIP participating municipalities
Possible Funding: Staff Time
Timeframe: Ongoing
Category: Floodplain Management

23. **Continue to maintain and implement Post Disaster strategies and policies.** Short-term and long-term post disaster recovery strategies are addressed by the County and municipal Continuity of Operations Plans, the CEMPs, the Post-Disaster Redevelopment Plans, and specialized plans and procedures covering key recovery issues such as debris removal, public services resumption, temporary housing, unmet needs, etc. These plans, procedures, and projects address and provide guidance on priorities, processes, schedules, resource requirements, restoration, and redevelopment of critical facilities, infrastructure, services, and economic redevelopment.

Post-disaster mitigation initiatives are developed in response to needs and opportunities identified through collective federal, state, and local inputs following the guidance offered by the Post Disaster Redevelopment Plan. The County and LMS members are also available to work with state and federal Mitigation Assessments Teams. It is the goal following disasters to rebuild to a higher standard (meeting or exceeding codes) and, whenever practicable, to apply sound mitigation practices to reduce future risk.

Responsible Party: County and Municipal Floodplain Managers and/or CRS Coordinators and Emergency Managers
Participating/ Benefitting Municipalities: County and all NFIP participating municipalities
Possible Funding: Staff Time
Timeframe: Ongoing
Categories: Post Disaster, Emergency Response, Floodplain Management

24. **Maintain and implement the Comprehensive Plans (COMP) of PBC and the Municipalities.** These plans include some or all of the following elements: Land Use, Transportation, Housing, Utility, Recreation and Open Space, Conservation, Coastal Management, Intergovernmental Coordination, Capital Improvement, Economic, Fire-Rescue, Public School Facilities, Health and Human Services, Library Services and Historic Preservation. These elements define the components of the community and the inter-relationship among them, integrating the complex relationships of each of these elements in reference to the people who live, work, and visit PBC. When the Comp Plan is updated, critical components of the LMS will be reviewed and included in the comprehensive planning process. Agreement and overlap between the COMP plan and LMS will be incorporated into the COMP plan.

Responsible Party: County and Municipal Floodplain Managers and/or CRS Coordinators and Planning Department

Participating/ Benefitting Municipalities: County and all NFIP participating municipalities
Possible Funding: Staff Time
Timeframe: Ongoing
Category: Floodplain Management

25. **Encourage municipalities to draft a Floodplain Species Assessment and Plan** which will help identify any listed species having ranges and/or habitat within the floodplain as well as identify possible floodplain management actions that can be implemented to benefit the species of concern.

Responsible Party: County and Municipal Floodplain Managers and/or CRS Coordinators and Offices of Sustainability & Resiliency
Participating/ Benefitting Municipalities: County and all CRS participating municipalities
Possible Funding: Staff Time
Timeframe: Ongoing
Category: Natural Resource Protection

26. **Continue to ensure that all flood control structures are properly maintained and operated**.

Responsible Party: County and Municipal Floodplain Managers and/or CRS Coordinators and Engineering Department, in collaboration with South Florida Water Management District and local Drainage Districts
Participating/ Benefitting Municipalities: County and all CRS participating municipalities
Possible Funding: Staff Time
Timeframe: Ongoing
Categories: Structural, Preventive

27. **Draft a County Watershed Master Plan to include Climate Change/Sea Level Rise Planning** (currently underway) and encourage municipalities to either draft their own or adopt the County Plan.

Responsible Party: County and Municipal Floodplain Managers and Offices of Sustainability & Resiliency in collaboration with participating universities and engineering firms
Participating/ Benefitting Municipalities: County and all participating municipalities
Possible Funding: Staff Time and State Grant Funding
Timeframe: Ongoing county-wide with completion expected by next plan update in 2029
Categories: Floodplain Management, Regulatory/Current & Future Conditions, Structural, Preventive

28. **Encourage municipalities to review and update County or municipality ordinances** that relate to Floodplain Management as needed. Consolidation, updates, and revisions will be considered.

Responsible Party: County and Municipal Floodplain Managers and Planning Departments
Participating/ Benefitting Municipalities: County and all municipalities
Possible Funding: Staff Time
Timeframe: Ongoing with an ordinance review conducted annually
Categories: Floodplain Management, Regulatory/Current & Future Conditions

29. **Continue to conduct /leverage existing and ongoing hydrogeological studies to inform County/ municipality efforts and policies**, to include collaboration with the Southeast Florida Regional Climate Change Compact.

Responsible Party: County and Municipal Floodplain Managers, engaging Offices of Sustainability & Resiliency and Planning Departments as needed, in collaboration with the Southeast Florida Regional Climate Change Compact
Participating/ Benefitting Municipalities: County and all municipalities
Possible Funding: Staff Time
Timeframe: Ongoing
Categories: Floodplain Management, Regulatory/Current & Future Conditions

30. **Focus on water quality, restoring natural hydrologic regimes, and maintaining the baseline of ecology** to avoid natural system degradation.

Responsible Party: County and Municipal Floodplain Managers, engaging Offices of Sustainability & Resiliency and Engineering Departments as needed, in collaboration with other agencies such as PBC ERM, SFWMD, DEP, ACoE and FWC
Participating/ Benefitting Municipalities: County and all municipalities
Possible Funding: Staff Time
Timeframe: Ongoing
Category: Natural Resource Protection

31. **Develop early warning systems and social media applications** to both inform residents and visitors of extreme high-tide events and to raise overall awareness on sea level rise and climate change issues.

Responsible Party: County and Municipal Emergency Managers and Public Information Officers
Participating/ Benefitting Municipalities: County and all municipalities
Possible Funding: Staff Time
Timeframe: Ongoing
Category: Emergency Services

32. **Annually update the list of Critical Facilities in the County**. Currently the County maintains a county-wide list against which each municipality can compare their Critical Facility lists.

Responsible Party: County and Municipal Emergency Managers
Participating/ Benefitting Municipalities: County and all municipalities
Possible Funding: Staff Time
Timeframe: Ongoing
Category: Emergency Services

33. **Post the Palm Beach County Hurricane Survival Guide on the County website** in a location that is easily accessed by the community. Encourage individual municipalities to post and distribute it as well.

Responsible Party: County and Municipal Emergency Managers and Public Information Officers
Participating/ Benefitting Municipalities: County and all municipalities
Possible Funding: Staff Time
Timeframe: Ongoing
Category: Public Information

34. **Collaborate with the Southeast Florida Regional Climate Change Compact** as they make recommendations for land development standards with respect to low-lying coastal areas, the designation of adaptation action areas and sea level rise adaptations. The input will be incorporated into all updates of the LMS, Storm water Master Plan and the Comprehensive Plan.

Responsible Party: County and Municipal Floodplain Managers, engaging Offices of Sustainability & Resiliency and Planning Departments as needed, in collaboration with the Southeast Florida Regional Climate Change Compact
Participating/ Benefitting Municipalities: County and all municipalities
Possible Funding: Staff Time
Timeframe: Ongoing
Categories: Floodplain Management, Regulatory/Current & Future Conditions

35. **Draft and implement a County-wide Vulnerability Study and Risk Assessment** which will generate a separate adaptation specific action plan. This plan will benefit all jurisdictions within the County.

Responsible Party: County and Municipal Floodplain Managers and Offices of Sustainability & Resiliency in collaboration with participating universities and engineering firms
Participating/ Benefitting Municipalities: County and all participating municipalities
Possible Funding: Staff Time and State Grant Funding
Timeframe: Ongoing county-wide with completion expected by next plan update in 2029
Categories: Floodplain Management, Regulatory/Current & Future Conditions

36. **Review and update floodplain regulations** in order to accommodate re-mapping of the County, addition of V Zones and consideration of future conditions.

Responsible Party: County and Municipal Floodplain Managers and Planning Departments
Participating/ Benefitting Municipalities: County and all municipalities, especially re-mapped municipalities expected to gain V-Zones
Possible Funding: Staff Time
Timeframe: Ongoing county-wide, with each affected municipality to complete an ordinance review and update before adoption of new maps and annually thereafter
Categories: Floodplain Management, Regulatory/Current & Future Conditions

37. **Support County and municipal Resiliency Departments** which will be focused on helping communities adapt to future conditions.

Responsible Party: County and Municipal Floodplain Managers and Offices of Sustainability & Resiliency
Participating/ Benefitting Municipalities: County and all municipalities
Possible Funding: Staff Time
Timeframe: Ongoing
Categories: Floodplain Management, Regulatory/Current & Future Conditions

Action Items related to Post Disaster Planning

38. **Maintain and adhere to the Post-Disaster Redevelopment Plan (PDRP) policies as defined in the County and municipality Post Disaster Plans.** Review and update the plan in accordance with County SOG PL-009 *Review and Maintenance of DEM Plans*. Encourage communities to adopt County Plan in absence of their own.

Responsible Party: County and Municipal Emergency Managers and Floodplain Managers
Participating/ Benefitting Municipalities: County and all municipalities
Possible Funding: Staff Time
Timeframe: Ongoing in accordance with County SOG PL-009 *Review and Maintenance of DEM Plans*
Categories: Post Disaster, Emergency Services, Floodplain Management

39. **Maintain and adhere to County and municipality Comprehensive Emergency Management Plan (CEMP).** Review and update the plan in accordance County SOG PL-009 *Review and Maintenance of DEM Plans*. Encourage communities to adopt County Plan in absence of their own.

Responsible Party: County and Municipal Emergency Managers
Participating/ Benefitting Municipalities: County and all municipalities
Possible Funding: Staff Time
Timeframe: Ongoing in accordance with County SOG PL-009 *Review and Maintenance of DEM Plans* **Categories:** Post Disaster, Emergency Services

40. **Review the County and municipality Flood Hazard Specific Plan (HSP)** Review and update the plan in accordance with County SOG PL-009 *Review and Maintenance of DEM Plans* and implement the procedure when flooding is eminent, to provide residents with vital information before, during and after the flood. Information includes:

- life safety,
- property protection,
- property recovery and
- availability of disaster assistance.

Responsible Party: County and Municipal Emergency Managers, CRS Coordinators and Public Information Officers
Participating/ Benefitting Municipalities: County and all CRS participating municipalities
Possible Funding: Staff Time
Timeframe: Ongoing in accordance with County SOG PL-009 *Review and Maintenance of DEM Plans*
Categories: Post Disaster, Emergency Services, Public Information

41. **Maintain and adhere to County and municipality Continuity of Operations Plan (COOP)** Review and update the plan in accordance with County SOG PL-009 *Review and Maintenance of DEM Plans*. Encourage communities to adopt County Plan in absence of their own.

Responsible Party: County and Municipal Emergency Managers
Participating/ Benefitting Municipalities: County and all municipalities
Possible Funding: Staff Time
Timeframe: Ongoing in accordance with County SOG PL-009 *Review and Maintenance of DEM Plans* **Categories:** Post Disaster, Emergency Services

42. **Assess the need for, and if needed, request assistance from other communities** by way of FDEM, utilizing the Statewide Mutual Aid Agreement (SMAA).

Responsible Party: County and Municipal Emergency Managers
Participating/ Benefitting Municipalities: County and all municipalities
Possible Funding: Staff Time
Timeframe: Ongoing
Category: Post Disaster, Emergency Services, Floodplain Management

43. **Continue emergency building permit regulations and procedures.** After a major storm event the Building Department can issue emergency permits in the field. The resident is required to formally apply for the permit later.

Responsible Party: County and Municipal Building Officials and Floodplain Managers
Participating/ Benefitting Municipalities: County and all municipalities
Possible Funding: Staff Time
Timeframe: Ongoing
Category: Post Disaster, Floodplain Management

44. **Based on availability and prioritized needs, provide knowledgeable staff to assist citizens before, during, and after a flood event** to help them understand their options for repairing/ rebuilding/ flooding/ mitigation. Integrate response to flooded homes with appropriate response organizations (Red Cross, faith-based organizations, other non-profit entities, Community Emergency Response Team (CERT), etc.)

Responsible Party: County and Municipal Floodplain Managers or CRS Coordinators and Emergency Managers
Participating/ Benefitting Municipalities: County and all municipalities
Possible Funding: Staff Time
Timeframe: Ongoing
Category: Post Disaster, Emergency Services, Public Information, Floodplain Management

45. **Immediately prior to, during and after a hurricane or flood event, post pertinent information** concerning major points of interest, such as bridge and road closures, evacuation orders, emergency shelter locations and electrical outages, utilizing various media.

Responsible Party: County and Municipal Floodplain Managers or CRS Coordinators and Emergency Managers in collaboration with Public Information Officers
Participating/ Benefitting Municipalities: County and all municipalities
Possible Funding: Staff Time
Timeframe: Ongoing
Category: Post Disaster, Emergency Services, Public Information

46. **Encourage municipalities to begin formally documenting High Water marks** after flooding occurs. The County will work with staff to evaluate the feasibility of establishing procedures for identifying and recording High Water marks using guidance provided in the Florida Post Disaster Toolkit for Floodplain Administrators. Some municipalities in the County are already doing this. Communities can be encouraged to develop or continue utilizing compatible procedures for formally documenting High Water marks after floods, so that information can be collected in a standardized format throughout the County.

Responsible Party: County and Municipal Floodplain Managers or CRS Coordinators
Participating/ Benefitting Municipalities: County and all municipalities
Possible Funding: Staff Time
Timeframe: Ongoing
Category: Post Disaster, Floodplain Management

47. **Encourage municipalities to develop a Substantial Damage/ Substantial Improvement Plan** to help facilitate post-disaster operations and train licensed Building Inspectors and Plan Reviewers in SD/SI procedures.

Responsible Party: County and Municipal Floodplain Managers or CRS Coordinators and Building Officials
Participating/ Benefitting Municipalities: County and all municipalities
Possible Funding: Staff Time
Timeframe: Ongoing
Category: Post Disaster, Floodplain Management

Palm Beach County
2023 Review of Possible Activities

Action Items Reviewed (from 2020 LMS)

Possible Action Plan Items	Category/ Categories	Determination/ Rank	Reason for Determination	Possible Funding	Responsible Party	Participating/ Benefitting Municipalities	Timeframe
Reference to the PPL Process							
LMS Capital Improvement Projects selected and implemented as scheduled (updated list of projects (PPL) to be released twice each year)	The PPL contains projects in the following categories (?): ▪ Preventive (drainage improvements) ▪ Structural Flood Control Projects ▪ Property Protection (Critical Facility mitigation and retrofitting) ▪ Emergency Services (EOC hardening)	Yes 1	Vital Component	Various Sources, HMGP, BRIC, FMA	LMS Steering Subcommittee	County and all municipalities with PPL projects or project submissions and/or that have representatives participating in LMS Woking Group	Reviewed twice annually and updated twice annually
Review Appendix J (from 2020 LMS): NFIP and CRS Status and Activities Palm Beach County and its municipalities will continue their commitment to NFIP by continuing to:							
Enforce the Floodplain Management Ordinance that regulates new development and substantial improvements in the special flood hazard areas. o Inform the community by news releases and open public meeting o Community Outreach o County Public TV Notes: Previous to the 2020 LMS there were regulation changes that were being advertised and jurisdictions were being encouraged to adopt. When new coastal FIRMs become effective, jurisdictions will need to modify and re-address regulations and then advertise.	▪ Floodplain management ▪ Public Information	Yes 2	NFIP Required	Staff time	County and Municipal Floodplain Managers and Building Officials	County and all NFIP participating municipalities	Ongoing

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Bold Blue Text - Notes from discussion, not included in final Action Plan
Bold Text with light gray fill - Items related to review the of policies and ordinances

Palm Beach County LMS
2023 Review of Possible Activities

Possible Action Plan Items	Category/ Categories	Determination/ Rank	Reason for Determination	Possible Funding	Responsible Party	Participating/ Benefitting Municipalities	Timeframe
Maintain elevation certificates on file for all new construction in the SFHAs or for substantial improvements to properties in the SFHA. o county seminars geared toward construction industry and builders	▪ Floodplain management ▪ Public Information	Yes 3	NFIP Required	Staff time	County and Municipal CRS Coordinators and/or Floodplain Managers	County and all NFIP participating municipalities	Ongoing
Use best available (flood map) data for issuing construction permits. o Public Education Seminars o Updated mapping provided to each municipality o Mapping placed in all county libraries	▪ Floodplain Management ▪ Public Information	Yes 4	NFIP Required	Staff time	County and Municipal CRS Coordinators and/or Floodplain Managers	County and all NFIP participating municipalities	Ongoing
Maintain public records and make them available for review. o Community outreach o News releases and county public TV	▪ Public Information	Yes 5	NFIP Required	Staff time	County and Municipal CRS Coordinators and/or Floodplain Managers	County and all NFIP participating municipalities	Ongoing
Maintain records pertaining to LOMAS, and LOMRS, etc.	▪ Floodplain management	Yes 6	NFIP Required	Staff time	County and Municipal Floodplain Managers	County and all NFIP participating municipalities	Ongoing
Provide information related to flood hazards, flood maps, etc., to the public upon request.	▪ Public Information	Yes 7	NFIP Required	Staff time	County and Municipal Floodplain Managers	County and all NFIP participating municipalities	Ongoing
Continue community outreach efforts for compliance with the community rating system program. o Integrate new NFIP information and mapping into already existing strong community presentations o Incorporate Flooding information into every Emergency Management presentation to the public. **Notes: Included in Program for Public Information (PPI)**	▪ Public Information	Yes 8	Effective CRS Program Component	Staff time	County and Municipal CRS Coordinators	County and all CRS participating municipalities	Ongoing

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Palm Beach County LMS
2023 Review of Possible Activities

Possible Action Plan Items	Category/ Categories	Determination/ Rank	Reason for Determination	Possible Funding	Responsible Party	Participating / Benefiting Municipalities	Timeframe
Continue to promote flood insurance to property owners. o Increase and continue outreach presentations to community and homeowners' associations o Incorporate flood insurance outreach into every emergency management presentation, increasing the reach of the message throughout the county and municipalities. **Notes: Included in Program for Public Information (PPI)**	▪ Public Information ▪ Property Protection	Yes 9	Effective CRS Program Component	Staff time	County and Municipal CRS Coordinators	County and all CRS participating municipalities	Ongoing
Maintain flood hazard publications at the main branch of the library.	▪ Public Information	Yes 10	Effective CRS Program Component	Staff time	County and Municipal CRS Coordinators	County and all CRS participating municipalities	Ongoing
Where feasible, continue to identify/acquire land in the SFHA for open space/preservation, seek out opportunities to expand the publicly owned properties that are designated natural and beneficial areas, and encourage the expansion of privately owned open space through PUD open space and land swap regulations.	▪ Natural Resource Protection	Yes 11	Effective CRS Program Component Open Space designations reduce loss exposure and protect natural resources	Staff time	County and Municipal CRS Coordinators and/or Floodplain Managers, Department of Environmental Resource Management	County and all CRS participating municipalities	Ongoing
Promote hazard flood mitigation to the public. o LMS posted on the County website o Grant information posted on County website o Integrate into outreach presentation	▪ Floodplain Management ▪ Preventive ▪ Public Information ▪ Property Protection	Yes 12	Effective CRS Program Component	Staff time	County and Municipal CRS Coordinator, LMS Working Group	County and all CRS participating municipalities	Ongoing
Continue drainage maintenance and drainage system improvement projects. o Encourage more drainage projects throughout the county in all LMS meetings	▪ Preventive ▪ Structural	Yes 13	Drainage improvement is critical to flood prevention and loss reduction	Staff time	County and Municipal Engineering and Utilities Department Leads, LMS Working Group, LMS Steering Committee	County and all NFIP participating municipalities	Ongoing

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Palm Beach County LMS
2023 Review of Possible Activities

Possible Action Plan Items	Category/ Categories	Determination/ Rank	Reason for Determination	Possible Funding	Responsible Party	Participating/ Benefitting Municipalities	Timeframe
Continue floodplain management activities to maintain ~~a Class 5~~ and/or improve CRS Class Rating. Notes: Wording changed to broaden application to all CRS participating municipalities	▪ Floodplain Management	Yes 14	Improves floodplain management and earns insurance discounts	Staff time	County and Municipal CRS Coordinators and/or Floodplain Managers	County and all CRS participating municipalities	Ongoing
Adopt and enforce the floodplain management plan (LMS) o Schedule quarterly meetings with CRS User Group and invite all 39 municipalities o Provide continued education and best practices to all municipalities	▪ Floodplain Management	Yes 15	Effective CRS Program Component	Staff time	County and Municipal Floodplain Managers and/or CRS Coordinators, LMS Working Group	County and all CRS participating municipalities	Ongoing
Provide a robust community assistance program o Community outreach presentations o Town hall meetings in different municipalities o Press releases and TV programs o Telephone information Hotline Floodplain and Mapping questions o New map pick up information	▪ Public Information ▪ Property Protection	Yes 16	Benefits residents and improves community resiliency/ recovery	Staff time	County and Municipal Floodplain Managers and/or CRS Coordinators, Public Information Officer	County and all CRS participating municipalities	Ongoing
Outreach to municipalities not participating in the CRS/NFIP o Provide continued outreach, best practices to municipalities that are not part of the CRS/NFIP o Document each municipality not a participant in the CRS/NFIP and continue providing them with best practices incentives to participate o Ensure that municipalities not participating in the CRS/NFIP are members of the LMS working group, allowing them still to receive mitigation information	▪ Floodplain management	Yes 17	CRS/ NFIP participation strengthens floodplain management and earns insurance discounts	Staff time	County CRS Coordinator	County and all CRS/NFIP non-participating municipalities	Ongoing with identification of non-participating communities done by Fall 2025 and outreach to each completed by Fall 2026

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Palm Beach County LMS
2023 Review of Possible Activities

Possible Action Plan Items	Category/ Categories	Determination/ Rank	Reason for Determination	Possible Funding	Responsible Party	Participating / Benefitting Municipalities	Timeframe
Review Appendix B (from 2020 LMS): Countywide Mitigation Initiatives, ~~addressing in part, the following~~ satisfying FEMA's LMS and Mitigation Planning requirements: ▪ Requirement §201.6(c)(3)(i): The hazard mitigation strategy shall include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards. ▪ Requirement §201.6(c)(3)(ii): The mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure. The mitigation strategy must also address the jurisdiction's participation in the National Flood Insurance Program (NFIP), and continued compliance with NFIP requirements, as appropriate. ▪ Requirement §201.6(c)(3)(iii): The mitigation strategy section shall include an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.							
Continue: Palm Beach County and its 39 municipalities participate in a full range of federal, state, and local mitigation programs and initiatives. Representative of these programs and initiatives are the • Local Mitigation Strategy (LMS), • Community Rating System (CRS), • National Flood Insurance Program (NFIP), • Flood Mitigation Assistance Program (FMA), • Pre-Disaster Mitigation Program (PDM), • Hazard Mitigation Grant Program (HMGP), • Emergency Management Preparedness & Assistance Program (EMPA), • CERT, • Continuity of Operations, • Post Disaster Redevelopment Plan (PDRP), ▪ ESF18, Private-Public Partnerships, counter-terrorism, radiological emergency preparedness initiatives, hazardous materials, etc.	▪ Floodplain management	Yes 18	Benefits residents and improves community resiliency/ recovery	Staff time	County and Municipal Floodplain Managers and/or CRS Coordinators	County and all NFIP participating municipalities	Ongoing
Continue to prioritize the reduction of repetitive flood losses to properties: The County and its CRS participating municipalities track repetitive loss properties countywide on an ongoing basis using data gathered annually from FEMA and the State's Focus reports. For mitigation planning and strategy development purposes, LMS maintains updated GIS maps and informational databases of repetitive loss property locations relative to historical flood areas and designated Special Flood Hazard Areas. Repetitive loss properties are an ongoing discussion and planning priority for the LMS, CRS, and Flood Mitigation Technical Advisory committees. These committees, comprised of public and private sector representatives, are encouraged to develop and promote mitigation	▪ Floodplain Management ▪ Property Protection	Yes 19	Effective CRS Program Component RLPs account for significant losses that can be reduced through targeted mitigation efforts & outreach	Staff time	County and Municipal Floodplain Managers and/or CRS Coordinators	County and all NFIP participating municipalities	Ongoing

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Palm Beach County LMS
2023 Review of Possible Activities

Possible Action Plan Items	Category/ Categories	Determination/ Rank	Reason for Determination	Possible Funding	Responsible Party	Participating / Benefitting Municipalities	Timeframe
project ideas and strategies. As a result, a majority of the projects on the Prioritized Project List (PPL) are flood mitigation projects. In accordance with CRS guidelines, letters are mailed annually to repetitive loss property owners by PBC and municipalities, explaining NFIP program benefits, the availability of mitigation assistance funding through the FMA and other mitigation assistance programs. Non-CRS members of the LMS are encouraged to stay in compliance with NFIP standards. Information and support is provided in a variety of forms to potential FMA applicants to assist them in developing projects and preparing application packages. Through PBC's LMS committee structure, members of the Technical Advisory Committee are ~~is~~ available to offer technical guidance and assistance to applicants, including assistance in preparing benefit-cost analyses. Mitigation projects are prioritized and implemented according to their direct potential for loss reduction or for their potential in contributing to longer-term, comprehensive plans and strategies for loss reduction. Once projects are underway, it is the responsibility of each jurisdiction to support and monitor performance in accordance with FEMA, state and local guidelines and codes, and to oversee and coordinate documentation and funding processes.							
Continue involving the ~~Involvement of~~ Planning, Zoning, and Building, Fire-Rescue, and other departments in LMS activities, including committee participation, bolsters communication among key agencies and the LMS. This ensures that mitigation interests are appropriately represented in local building codes, fire codes, land-use ordinances, flood loss prevention ordinances, and other governing documentation.	▪ Floodplain management	Yes 20	Effective CRS Program Component	Staff time	County and Municipal Floodplain Managers and/or CRS Coordinators, LMS Working Group, LMS Steering Committee	County and all NFIP participating municipalities	Ongoing

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Palm Beach County LMS
2023 Review of Possible Activities

Possible Action Plan Items	Category/ Categories	Determination/ Rank	Reason for Determination	Possible Funding	Responsible Party	Participating / Benefitting Municipalities	Timeframe
Continue implementing a variety of community awareness and education activities including presentations, workshops, expos, panel discussions, plan reviews, publications, websites, etc. prepared and presented utilizing networks of public-private sector partners. As opportunities present themselves, lending institutions and insurers are urged to provide financial incentives for mitigation. Jurisdictions are urged to accelerate permitting and inspections and, if allowable, to waive or reduce fees for mitigation projects. In addition to mitigation incentives, millions of dollars of annual insurance premium savings are realized by a significant segment of PBC residents residing within the County s CRS participating jurisdictions.	▪ Public information	Yes 21	Effective CRS Program Component	Staff time	County and Municipal Floodplain Managers and/or CRS Coordinators, Public Information Officer	County and all NFIP participating municipalities	Ongoing
Identify, prioritize, and implement projects aimed at avoiding and/or reducing ~~Avoid and/or reduce~~ long-term vulnerability to hazards identified by the hazard identification and risk assessment processes. More detailed descriptions of the strategies, programs, and actions are contained in the body of the plan and reflected in the list of prioritized projects in Appendix E. Under the committee structure of the LMS program, increased attention is given to expanding and refining hazard-specific mitigation strategies exclusive of jurisdictional boundaries, capabilities, and interests, and to giving appropriate attention to mitigation in planning future land uses (see Appendix C). The process and criteria employed for ranking mitigation projects and initiatives are described in detail in Section 4.0 of the LMS plan. In response to federal guidelines applying to grant awards through the Pre-Disaster Mitigation, Flood Mitigation Assistance, and HMGPs, particular emphasis is given to technically feasible and environmentally responsible projects having attractive ratios of loss reduction benefits to cost. Projects involving worthy benefits that are difficult to quantify are given serious consideration, in light of different sets of criteria and are referred to appropriate alternative funding sources not requiring stringent benefit-cost justifications.	▪ Floodplain Management	Yes 22	Effective CRS Program Component	Staff time	County and Municipal Floodplain Managers and/or CRS Coordinators, LMS Working Group, LMS Steering Committee and LMS Evaluation Panel	County and all NFIP participating municipalities	Ongoing

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Palm Beach County LMS
2023 Review of Possible Activities

Possible Action Plan Items	Category/ Categories	Determination/ Rank	Reason for Determination	Possible Funding	Responsible Party	Participating / Benefitting Municipalities	Timeframe
Continue to maintain and implement Post Disaster strategies and policies: Short-term and long-term recovery strategies are addressed by the County and municipal Continuity of Operations Plans, the CEMP, the Post-Disaster Redevelopment Plan, and specialized plans and procedures covering key recovery issues such as debris removal, public services resumption, temporary housing, unmet needs, etc. These plans, procedures, and projects address and provide guidance on priorities, processes, schedules, resource requirements, restoration, and redevelopment of critical facilities, infrastructure, services, and economic redevelopment. Post-disaster mitigation initiatives are developed in response to needs and opportunities identified through collective federal, state, and local inputs following the guidance offered by the Post Disaster Redevelopment Plan. The County and LMS members are also available to work state and federal Mitigation Assessments Teams. It is goal following disasters to rebuild to a higher standard (meeting or exceeding codes) and, whenever practicable, to apply sound mitigation practices to reduce future risk.	▪ Post Disaster ▪ Emergency Management ▪ Floodplain Management	Yes 23	Effective CRS Program Component Benefits residents and improves community resiliency/ recovery	Staff time	County and Municipal Floodplain Managers and/or CRS Coordinators and Emergency Managers	County and all NFIP participating municipalities	Ongoing
Maintain and implement the ~~PBC~~ Comprehensive Plans (COMP) of PBC and the Municipalities which includes the following elements: Land Use, Transportation, Housing, Utility, Recreation and Open Space, Conservation, Coastal Management, Intergovernmental Coordination, Capital Improvement, Economic, Fire-Rescue, Public School Facilities, Health and Human Services, Library Services and Historic Preservation. These elements define the components of the community and the inter-relationship among them, integrating the complex relationships of each of these elements in reference to the people who live, work, and visit PBC. Linkages of the COMP plan and LMS have been incorporated into the COMP plan.	▪ Floodplain management	Yes 24	Effective CRS Program Component Benefits residents and improves community resiliency/ recovery	Staff time	County and Municipal Floodplain Managers and/or CRS Coordinators and Planning Department	County and all NFIP participating municipalities	Ongoing

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Palm Beach County LMS
2023 Review of Possible Activities

Possible NEW Action Items Reviewed for inclusion

Possible Action Plan Items	Category	Determination	Reason for Determination	Possible Funding	Responsible Party	Participating / Benefitting Municipalities	Timeframe
Other Possible Action Items							
Continue to ensure that all flood control structures are properly maintained and operated	▪ Preventive ▪ Structural Flood Control Projects	Yes 26	Maintain standards of service and reduce losses	Staff time	County and Municipal Floodplain Managers and/or CRS Coordinators and Engineering Department, in collaboration with South Florida Water Management District and local Drainage Districts	County and all CRS participating municipalities	Ongoing
Draft a County Watershed Master Plan to include Climate Change/Sea Level Rise Planning (currently underway) and encourage municipalities to either draft their own or adopt the County Plan.	▪ Preventive ▪ Structural Flood Control Projects ▪ Regulatory/Current & Future Conditions	Yes 27	Watershed Master Plan is a valuable tool for floodplain management and an effective component of CRS Program	Staff time and State grant funding	County and Municipal Floodplain Managers, Offices of Sustainability & Resiliency in collaboration with participating universities and engineering firms	County and all participating municipalities	Ongoing county-wide with completion expected by next LMS plan update in 2029

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Palm Beach County LMS
2023 Review of Possible Activities

Possible Action Plan Items	Category	Determination	Reason for Determination	Possible Funding	Responsible Party	Participating / Benefitting Municipalities	Timeframe
Encourage municipalities to review and update any County ordinances that relate to Floodplain Management as needed. Consolidation, updates, and revisions will be considered.	▪ Regulatory/Current & Future Conditions ▪ Floodplain management	Yes 28	Regulation is critical to effective floodplain management	Staff time	County and Municipal Floodplain Managers and Planning Departments	County and all municipalities	Ongoing with an ordinance review conducted annually
Encourage developing provisions for low-impact stormwater design management practices and include drainage solutions such as the use of pervious concrete and pavement.	▪ Preventive ▪ Floodplain Management Regulatory ▪ Natural Resource Protection	No	Too vague, already covered by other action items				
Continue to conduct /leverage existing and ongoing hydrogeological studies to inform County efforts and policies, to include collaboration with the Southeast Florida Regional Climate Change Compact as they make recommendations for land development standards with respect to low-lying coastal areas, the designation of adaption action areas and sea level rise adaptations. The input will be incorporated into all updates of the Watershed Master Plan and the Comprehensive Plan.	▪ Preventive ▪ Floodplain Management ▪ Regulatory/Current & Future Conditions	Yes 29		Staff time	County and Municipal Floodplain Managers, engaging Offices of Sustainability & Resiliency and Planning Departments as needed, in collaboration with the Southeast Florida Regional Climate Change Compact	County and all municipalities	Ongoing
Encourage individual property owners to pursue percolation-oriented drainage improvements using best management practices through outreach and education. Drainage that seeps into the soil, rather than being directed out to the ocean, provides multiple benefits. Not only does it mitigate flooding, but it also recharges the aquifer, enhances water quality, and reduces erosion.	▪ Preventative ▪ Natural Resource Protection	No	Already part of robust floodplain management program				

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Palm Beach County LMS
2023 Review of Possible Activities

Possible Action Plan Items	Category	Determination	Reason for Determination	Possible Funding	Responsible Party	Participating / Benefitting Municipalities	Timeframe
Implement strict enforcement of best management practices for reducing erosion during development activity.	▪ Natural Resource Protection	No	Already required and enforced				
Focus on water quality, restoring natural hydrologic regimes, and maintaining the baseline of ecology to avoid natural system degradation.	▪ Natural Resource Protection	Yes 30	Currently a high priority	Staff time	County and Municipal Floodplain Managers, engaging Offices of Sustainability & Resiliency and Engineering Departments as needed, in collaboration with other agencies such as SFWMD, DEP, ACoE and FWC	County and all municipalities	Ongoing
Develop early warning systems and social media applications to both inform residents and visitors of extreme high-tide events and to raise overall awareness on sea level rise and climate change issues.	▪ Emergency Services ▪ Public Information	Yes 31	Utilization of modern media channels is critical to public safety	Staff time	County and Municipal Emergency Managers and Public Information Officers	County and all municipalities	Ongoing
Consider roadway signage prior to the events for tidal flooding zones.	▪ Emergency Services ▪ Public Information	No	Too community specific				
Place / maintain flood sensors in water bodies.	▪ Emergency Services	No	Community specific, for PPL				
Maintain a reverse 911 system to deliver warning messages.	▪ Emergency Services ▪ Public Information	No	Already in place				

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Palm Beach County LMS
2023 Review of Possible Activities

Possible Action Plan Items	Category	Determination	Reason for Determination	Possible Funding	Responsible Party	Participating / Benefitting Municipalities	Timeframe
Annually update the list of Critical Facilities in the County. Currently the County maintains a county-wide list against which each municipality can compare their Critical Facility lists.	▪ Emergency Services	Yes 32	Critical for public safety, opportunity to strengthen County & municipal coordination	Staff time	County and Municipal Emergency Managers	County and all municipalities	Ongoing
Ensure adherence to the County's Comprehensive Emergency Management Plan (CEMP), particularly in the event of evacuation orders. Key components of the procedures should be reviewed before June 1st of each year.	▪ Emergency Services	Yes, but not here	Moved to "Post Disaster"				
Post the Palm Beach County Hurricane Survival Guide on the County website in a location that is easily accessed by the community.	▪ Emergency Services ▪ Public Information	Yes 33	Reliable source of information trusted by the public	Staff time	County and Municipal Emergency Managers and Public Information Officers	County and all municipalities	Ongoing
Evaluate the LMS, particularly the PPL, annually and update every 5 years.	▪ Floodplain Management Regulatory ▪ Preventive	No	Duplication of first action item				
Immediately prior to, during and after a hurricane or flood event, post pertinent information concerning major points of interest, such as bridge and road closures, evacuation orders, emergency shelter locations and electrical outages, utilizing various media.	▪ Emergency Services ▪ Public Information	Yes, but not here	Moved to "Post Disaster"				
Integrate response to flooded homes with appropriate response organizations (Red Cross, faith-based organizations, other non-profit entities, Community Emergency Response Team (CERT), etc.).	▪ Emergency Services ▪ Public Information	Yes, but not here	Moved to "Post Disaster"				

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Palm Beach County LMS
2023 Review of Possible Activities

Possible Action Plan Items	Category	Determination	Reason for Determination	Possible Funding	Responsible Party	Participating / Benefitting Municipalities	Timeframe
Advertise the availability of evacuation assistance prior to an emergency	▪ Emergency Services ▪ Public Information	Yes, but not here	Moved to "Post Disaster"				
Based on availability and prioritized needs, provide knowledgeable staff to assist citizens before, during, and after a flood event to help them understand their options for repairing/ rebuilding/ mitigating.	▪ Emergency Services ▪ Public Information	Yes, but not here	Moved to "Post Disaster"				
Continue to support the County's efforts to improve its classification in the Community Rating System, thus enhancing the County's flood mitigation efforts while securing insurance premium rewards for its residents and businesses.	▪ Floodplain Management Regulatory ▪ Preventive	No	Duplication of previous action item				
Continue emergency building permit regulations and procedures. After a major storm event the Building Department can issue emergency permits in the field. The resident is required to formally apply for the permit later.	▪ Emergency Services ▪ Property Protection	Yes, but not here	Moved to "Post Disaster"				
Continue to require designation of open space property for all major development and incentives	▪ Natural Resource Protection ▪ Preventive ▪ Regulatory	No	Already included in regulation review and update				
The County will continue to require that installation of stormwater management facilities made necessary by new development is the responsibility of the developer.	▪ Floodplain Management Regulatory ▪ Preventive	No	Already included in regulation review and update				

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Palm Beach County LMS
2023 Review of Possible Activities

Possible Action Plan Items	Category	Determination	Reason for Determination	Possible Funding	Responsible Party	Participating / Benefitting Municipalities	Timeframe
When responding to resident inquiries staff will encourage the elevation of existing property, property acquisitions, and/or appropriate flood-proofing techniques, such as: • Elevating appliances and utilities • Utilizing flood walls, gates and barriers • Utilizing flood openings and vents • Installing flood resistant landscaping • Using flood resistant building materials • Installing drains and pumps • Sealing against seepage • Elevating points of entry such as doors and windows	• Property Protection • Preventative	No	Community specific, will need more information before including this activity County-wide				
Collaborate with the Southeast Florida Regional Climate Change Compact as they make recommendations for land development standards with respect to low-lying coastal areas, the designation of adaptation action areas and sea level rise adaptations. The input will be incorporated into all updates of the Stormwater Master Plan and the Comprehensive Plan.	• Floodplain Management • Regulatory/Current & Future Conditions • Preventive • Natural Resource Protection	Yes 34	Regulating for future conditions is a high priority	Staff time	County and Municipal Floodplain Managers, engaging Offices of Sustainability & Resiliency and Planning Departments as needed, in collaboration with the Southeast Florida Regional Climate Change Compact	County and all municipalities	Ongoing

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Palm Beach County LMS
2023 Review of Possible Activities

Reviewed Action Items related to Post Disaster Planning (10 points)

Possible Action Plan Items - Post Disaster	Category	Determination	Reason for Determination	Possible Funding	Responsible Party	Participating / Benefitting Municipalities	Timeframe
Maintain and adhere to the Post-disaster policies as defined in the County Post Disaster Plan. Review the plan annually and update every 5 years or as needed.	▪ Floodplain Management ▪ Emergency Services ▪ Post Disaster	Yes 38	Benefits residents and improves community resiliency/ post disaster recovery	Staff Time	County and Municipal Emergency Managers and Floodplain Managers	County and all municipalities	Ongoing, with annual plan review and update every 5 years or as needed
Maintain and adhere to County Comprehensive Emergency Response Plan (CEMP). Review plan annually by June 1st of each year and update every 5 years or as needed. Encourage communities to adopt County Plan in absence of their own.	▪ Emergency Services ▪ Post Disaster	Yes 39	Critical to Public Safety, Improves community resiliency/ post disaster recovery	Staff time	County and Municipal Emergency Managers	County and all municipalities	Ongoing, with annual plan review by June 1st of each year and update every 5 years or as needed
Maintain and adhere to County and municipality ~~Create a~~ **Continuity of Operations Plans.** Review the plans annually by June 1st of each year and update every 5 years or as needed. Encourage communities to adopt County Plan in absence of their own.	▪ Emergency Services ▪ Post Disaster	Yes 41	Critical to Public Safety	Staff time	County and Municipal Emergency Managers	County and all municipalities	Ongoing, with annual plan review by June 1st of each year and update every 5 years or as needed

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Palm Beach County LMS
2023 Review of Possible Activities

Possible Action Plan Items - Post Disaster	Category	Determination	Reason for Determination	Possible Funding	Responsible Party	Participating/ Benefitting Municipalities	Timeframe
Review the County and municipality Flood Response Preparations (FRP) annually by June 1st, and implement the procedure when flooding is eminent, to provide residents with vital information before, during and after the flood. Information includes: • life safety, • property protection, • property recovery and • availability of disaster assistance.	▪ Emergency Services ▪ Public Information ▪ Post Disaster	Yes 40	Critical to Public Safety	Staff time	County and Municipal Emergency Managers, CRS Coordinators and Public Information Officers	County and all CRS participating municipalities	Ongoing, with annual plan review by June 1st of each year and updates as needed
Assess the need for, and if needed, request assistance from other communities by way of FDEM, utilizing the Statewide Mutual Aid Agreement (SMAA)	▪ Emergency Services ▪ Post Disaster	Yes 42	Improves community resiliency/ post disaster recovery	Staff time	County and Municipal Emergency Managers	County and all municipalities	Ongoing
Continue emergency building permit regulations and procedures. After a major storm event the Building Department can issue emergency permits in the field. The resident is required to formally apply for the permit later.	▪ Emergency Services ▪ Property Protection	Yes 43	Improves community resiliency/ post disaster recovery	Staff time	County and Municipal Building Officials and Floodplain Managers	County and all municipalities	Ongoing
Based on availability and prioritized needs, provide knowledgeable staff to assist citizens before, during, and after a flood event to help them understand their options for repairing/ rebuilding/ flooding/ mitigation. Integrate response to flooded homes with appropriate response organizations (Red Cross, faith-based organizations, other non-profit entities, Community Emergency Response Team (CERT), etc.)	▪ Emergency Services ▪ Public Information	Yes 44	Improves community resiliency/ post disaster recovery	Staff time	County and Municipal Floodplain Managers or CRS Coordinators and Emergency Managers	County and all municipalities	Ongoing

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Palm Beach County LMS
2023 Review of Possible Activities

Possible Action Plan Items - Post Disaster	Category	Determination	Reason for Determination	Possible Funding	Responsible Party	Participating / Benefitting Municipalities	Timeframe
Immediately prior to, during and after a hurricane or flood event, post pertinent information concerning major points of interest, such as bridge and road closures, evacuation orders, emergency shelter locations and electrical outages, utilizing various media	▪ Emergency Services ▪ Public Information	Yes 45	Critical to public safety	Staff time	County and Municipal Floodplain Managers or CRS Coordinators and Emergency Managers in collaboration with Public Information Officers	County and all municipalities	Ongoing
NEW Post Disaster Action Items Resulting from Meeting Discussion							
Encourage municipalities to begin formally documenting High Water marks after flooding occurs. The County will work with staff to evaluate the feasibility of establishing procedures for identifying and recording High Water marks using guidance provided in the *Florida Post Disaster Toolkit for Floodplain Administrators*. Some municipalities in the County are already doing this. Communities can be encouraged to develop or continue utilizing compatible procedures for formally documenting High Water marks after floods, so that information can be collected in a standardized format throughout the County.	▪ Floodplain Management ▪ Post Disaster	Yes 46	Better data will help future planning and decision making	Staff time	County and Municipal Floodplain Managers or CRS Coordinators	County and all municipalities	Ongoing
Encourage municipalities to develop a Substantial Damage / Substantial Improvement Plan to help facilitate post-disaster operations and train licensed Building Inspectors and Plan Reviewers in SD/SI procedures.	▪ Floodplain Management ▪ Post Disaster ▪ Property Protection	Yes 47	Effective NEW CRS Program component	Staff time	County and Municipal Floodplain Managers or CRS Coordinators and Building Officials	County and all municipalities	Ongoing

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Palm Beach County LMS
2023 Review of Possible Activities

NEW Action Items Resulting from Meeting Discussion

Proposed Action Items	Category	Determination	Reason for Determination	Possible Funding	Responsible Party	Participating / Benefitting Municipalities	Timeframe
Encourage municipalities to draft a Floodplain Species Assessment and Plan which will help identify any listed species having ranges and/or habitat within the floodplain as well as identify possible floodplain management actions that can be implemented to benefit the species of concern.	▪ Natural Resource Protection	Yes 25	Effective NEW CRS Program Component	Staff time	County and Municipal Floodplain Managers and/or CRS Coordinators and Offices of Sustainability & Resiliency	County and all CRS participating municipalities	Ongoing
Draft and implement a County-wide Vulnerability Study and Risk Assessment which will generate a separate adaptation specific action plan. This plan will benefit all jurisdictions within the County.	▪ Floodplain Management ▪ Regulatory/Current & Future Conditions	Yes 35	Understanding and preparing for future conditions is a high priority	Staff time and State grant funding	County and Municipal Floodplain Managers and Offices of Sustainability & Resiliency in collaboration with participating universities and engineering firms	County and all municipalities	Ongoing county-wide with completion expected by next LMS plan update in 2029
Develop and maintain County and municipal Resiliency Departments which will be focused on helping communities adapt to future conditions.	▪ Floodplain Management, ▪ Regulatory/Current & Future Conditions	Yes 37	Resiliency is a high priority	Staff time	County and Municipal Floodplain Managers and Offices of Sustainability & Resiliency	County and all municipalities	Currently underway and ongoing
Review and update floodplain regulations in order to accommodate re-mapping of the County, addition of V Zones and consideration of future conditions.	▪ Floodplain Management, ▪ Regulatory/Current & Future Conditions	Yes 36	Necessitated by re-mapping	Staff time	County and Municipal Floodplain Managers and Planning Departments	County and all municipalities, especially re-mapped municipalities expected to gain V-Zones	Ongoing county-wide, with each affected municipality to complete ordinance review and update before adoption of new maps and annually thereafter

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The following is the latest annual progress report for the County CRS Floodplain Management Plan (CY2022):

PALM BEACH COUNTY COMMUNITY RATING SYSTEM
FLOODPLAIN MANAGEMENT PLAN

Palm Beach County, Florida
NFIP Number - 120192

CRS Activity 510
Annual Progress Report on Implementation of Credited Plan

Department of Public Safety
Division of Emergency Management
20 South Military Trail
West Palm Beach, FL 33415
(561) 712-6400
FAX: (561) 712-6464
www.pbcgov.com

Which Plan is this for:

- ☑ **Floodplain Management Plan (Hazard Mitigation Plan)**
- ☐ **Repetitive Loss Area Analysis**
- ☐ **Floodplain Species Plan**
- ☐ **Substantial Damage Plan**

Name of Community: Palm Beach County, Florida, NFIP # 120192

Date this Annual Progress Report was prepared: April 17, 2023

Name of the CRS Floodplain Management Plan:

Palm Beach County Unified Local Mitigation Strategy

The purpose of the Palm Beach County Unified Local Mitigation Strategy (LMS) is to develop and execute an ongoing unified strategy for reducing the community's vulnerability to identified natural, technological, and societal hazards. The strategy provides a rational, managed basis for considering and prioritizing hazard-specific mitigation options and for developing and executing sound, cost effective mitigation projects. The LMS also provides a basis for justifying the solicitation and use of local, state, federal, and other monies to support hazard mitigation projects and initiatives. The Palm Beach County Unified LMS believes broad community support, including ongoing public and private sector involvement, is very important to the success of the program.

Palm Beach County (PBC) has had an increasing number of stakeholders preparing to incorporate the LMS as part of their Floodplain Management Plans in accordance with the CRS Coordinator's Manual Activity 500 – Flood Damage Reduction Activities, specifically, Activity 510 – Floodplain Management Planning. Several communities have worked with PBC Division of Emergency Management, the Building Division of the Planning, Zoning, and Building Department, and private contractors in efforts to identify the resources necessary to accomplish planning initiatives. Currently nearly all of our municipalities use the LMS for their floodplain management plan in addition to unincorporated Palm Beach County.

Date(s) of Adoption of Plan:

- Original adoption: September 30, 1999
- Revised Plan approved by FEMA: November 2004
- Revised Plan approved by FEMA: January 2010
- Revised Plan approved by FEMA: February 2015
- Revised Plan approved by FEMA: October 16, 2019

5-Year CRS Expiration Date of Plan: October 1, 2024

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1. **How can a copy of the credited Plan be obtained:**

Palm Beach County Division of Emergency Management
Emergency Operations Center
20 South Military Trail
West Palm Beach, FL 33415

Contact: Ronnie Heen, CRS-LMS Coordinator, Planning Section

The plan is also posted on the internet at the following address:
http://discover.pbcgov.org/publicsafety/dem/Publications/PBC%20Local%20Mitigation%20Strategy%202020.pdf

2. **Describe how *this annual progress report* (not the credited Plan) was prepared and how it was submitted to the governing body, released to the media, and made available to the public:**

The status of all mitigation projects and success stories were reported and discussed at the quarterly LMS Working Group and Steering Committee meetings (open to the public).

LMS Steering Committee Meetings
- February 9, 2022
- May 25, 2022
- August 31, 2022
- October 26, 2022

LMS Revisions Sub-Committee Meetings
- January 19, 2022
- August 24, 2022

LMS Working Group Meetings were held on:
- March 9, 2022
- June 8, 2022
- September 14, 2022
- December 15, 2022

At two of the four Steering Committee meetings, after discussion of the status of each project, the Prioritized Projects List (PPL) was updated. The PPL is then posted on the DEM website once approved by the Steering Committee, and is publicly available for review at https://discover.pbcgov.org/publicsafety/dem/PDF/2022%20Fall%20Prioritized%20Project%20List%20(PPL).pdf. An update to the website includes the number of new and existing projects.

All general meetings are publicized through media releases, social media platforms, and posted announcements. See Annex 3 for media release example. The minutes for each LMS Working Group and Steering Committee meetings are posted on our LMS webpage for public consumption https://discover.pbcgov.org/publicsafety/dem/Sections/Planning-Local-Mitigation-Strategy.aspx.

We have provided copies of this report to our governing board and local media. The governing board for the CRS is the LMS Steering Committee. A copy of this progress report has been posted to the homepage of the Palm Beach County Division of Emergency Management website for public review. A media release announcing the report and its posting has been executed.

3. **Provide a description of the implementation of each recommendation or action item in the action plan or area analysis report, including a statement on how the project was implemented or not implemented during the previous year:**

Each of the 91 action items from the 2021 Prioritized Project List (PPL) in the LMS were reviewed by the LMS Steering Committee during the 2022 LMS PPL Update. The status updates are included in the tables in Annex 1 and Annex 2.

Major progress in the LMS program during this reporting period includes:

- The LMS Program is working with PBC Planning, Zoning, and Building (PZB) Department to produce a Watershed Master Plan (WMP) for credit under the Community Rating System (CRS). PZB applied for and was awarded grant funding thru the Watershed Planning Initiative under the Hazard Mitigation Grant Program (HMGP), as approved by Florida Division of Emergency Management.
- Quarterly Meetings were held for the LMS Working Group (4), LMS Steering Committee (4), and the CRS Users Group (4). There were two meetings of the LMS Evaluation Panel to evaluate, score, and rank new projects for the Prioritized Project List (PPL).
- PBC continues to use the LMS WebEOC portal in capturing community submission packages for the Prioritized Project List (PPL). A total of 95 projects are active on the PPL.
- The LMS Newsletter was published three (3) times in 2022. These documents are sent out to the LMS Working Groups, available to all municipalities to be displayed in their public spaces, and posted online at https://discover.pbcgov.org/publicsafety/dem/Sections/Planning-Local-Mitigation-Strategy.aspx .
- PPL Mitigation projects continued to be funded from previous disasters, including those of flood mitigation projects. See Annex 1 for updated projects in progress for Hazard Mitigation Grant Program funding.

4. Discuss why any objectives were not reached or why implementation is behind schedule:

As a result of the return to normal operations after, and other changes due to COVID-19, some outreach activities were not implemented as planned in 2022. Specifically, the Program for Public Information (PPI), CRS Activity 330, was not completed. However, staff and stakeholders are working to resume these projects whenever feasible and PBC Division of Emergency Management is working with a consultant to finalize the PPI before the next CRS Verification Visit.

There was discussion at the LMS Steering Committee meetings of why any Action Item objectives were not reached, or why implementation of any specific action item is behind schedule or had to be postponed. Status updates are provided in the tables found in Annex 1 and Annex 2.

5. What are the recommendations for new projects or revised recommendations?

The LMS PPL continues to operate on its normal schedule. New projects were scored/ranked, after a vote of the LMS Working Group, in two periods. These two review periods took place in March/April 2022, and the second in September/October 2022. Eight out of the 12 projects added in the March/April 2022 period and 14 out of the 19 projects added in the September/October 2022 period were dedicated to mitigating flooding issues within the respective communities. Projects on the list for more than five (5) years at the time of bi-annual reviews were reviewed, and if necessary, either updated or purged. New PPL projects are listed in the table found in Annex 2.

6. Summarize any flooding that occurred during calendar year 2022:

The LMS ranks floods at the top of the list of identified hazards because of their projected impact potential across the entire spectrum of community exposure and services. Florida, and especially PBC, is highly susceptible to localized flooding. Inland and coastal flooding in particular are the likely types of floods frequently affecting communities across the County. The tropical rainfall pattern in the County coupled with the hurricane season (June 1 through November 30) makes PBC particularly vulnerable to flooding, especially later in the hurricane season when the water table is high and the ground is saturated from impacts of cyclones and rain events. PBC received just under 53.48 inches of rain last year, and more than 121 rain days, with most of that occurring between the months of March and November.

The following flooding advisory statistics were noted for CY 2022 (from NOAA Storm Events Database at https://www.ncdc.noaa.gov/stormevents/ and https://nwschat.weather.gov/):

Areal Flood Advisories:	92	
Areal Flood Watches:	4	(6/3, 6/6, 9/26, 11/09)
Flash Flood Warnings:	7	(1/12, 4/6, 4/15, 4/29, 5/20, 6/4, 9/18)
Flash Flood Watches:	0	
Coastal Flood Watches:	1	(11/8)
Costal Flood Advisories:	3	(5/15, 11/8)
Coastal Flood Statements:	25	
Tropical Storm Warnings:	3	(6/3, 9/26, 11/7)
Flood Watches:	7	

Data from NOAA Storm Events Database

Event Types: Coastal Flood, Flash Flood, Flood, Heavy Rain, Hurricane (Typhoon), Lakeshore Flood, Sneakerwave, Storm Surge/Tide, Tropical Depression, Tropical Storm, Tsunami

Palm Beach county contains the following zones:
Inland Palm Beach County, Metro Palm Beach County, Coastal Palm Beach County

12 events were reported between 01/01/2022 and 12/31/2022 (365 days)

Summary Info:

Number of County/Zone areas affected:	4
Number of Days with Event:	7
Number of Days with Event and Death:	0
Number of Days with Event and Death or Injury:	0
Number of Days with Event and Property Damage:	1
Number of Days with Event and Crop Damage:	0
Number of Event Types reported:	5

Location	Date	Time	Type	Deaths	Injuries	Property Damage
MANGONIA PARK	04/15/2022	09:00	Flash Flood	0	0	0
BOCA RATON	05/20/2022	13:35	Flash Flood	0	0	5 K
BOCA RATON	05/20/2022	15:45	Flood	0	0	0
JUPITER	06/10/2022	15:20	Flood	0	0	0
COASTAL PALM BEACH COUNT...	09/28/2022	01:00	Tropical Storm	0	0	0
INLAND PALM BEACH COUNTY...	09/28/2022	07:00	Tropical Storm	0	0	0
METRO PALM BEACH COUNTY ...	09/28/2022	08:00	Tropical Storm	0	0	0
JUPITER	10/13/2022	13:15	Flash Flood	0	0	0
COASTAL PALM BEACH COUNT...	11/08/2022	21:00	Tropical Storm	0	0	0
COASTAL PALM BEACH COUNT...	11/09/2022	08:00	Storm Surge/tide	0	0	0
METRO PALM BEACH COUNTY ...	11/09/2022	08:00	Tropical Depression	0	0	0
INLAND PALM BEACH COUNTY...	11/09/2022	21:00	Tropical Depression	0	0	0

Total Precipitation for CY 2021 (NWS – Miami taken from PBC PBI)

Monthly Total Precipitation for West Palm Beach Area, FL (ThreadEx)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2022	2.27	1.97	2.69	6.40	1.88	9.02	2.00	3.12	11.86	2.66	6.10	3.51	53.48

2022	Total Observed (Inches)	Normal	Deviation From Normal	Days >0.01"	Days >0.10"	Days >0.50"	Days >1.00"	Greatest Rain Day	Date
Jan	2.27	3.47	-1.20	6	5	1	1	1.2	10-Jan
Feb	1.97	2.63	-0.66	7	4	2	0	0.79	5-Feb
Mar	2.69	3.31	-0.62	7	3	1	1	1.75	15-Mar
Apr	6.4	3.68	+2.72	9	6	4	3	2.15	15-Apr
May	1.88	4.91	-3.03	5	3	1	1	1.13	20-May
Jun	9.02	8.48	+0.54	16	10	4	2	4.52	4-Jun
Jul	2	5.63	-3.63	12	5	1	0	0.57	26-Jul
Aug	3.12	8.68	-5.56	16	4	3	0	0.71	14 & 17-Aug
Sep	11.86	7.96	+3.90	15	13	6	4	3.18	27-Sep
Oct	2.66	5.9	-3.24	9	3	2	1	1.6	15-Oct
Nov	6.1	3.62	+2.48	11	8	4	2	2.25	3-Nov
Dec	3.51	3.48	+0.03	9	5	2	2	1.32	14-Dec
Annual	53.48	61.75	-8.27	121					

Source NWS: https://w2.weather.gov/climate/index.php?wfo=mfl

7. What impact did the flooding have on repetitive loss areas?

This office did not receive any reports of flooding from repetitive loss property area owners. The rainfall average total was approximately 8 inches below the normal rainfall average in 2022 throughout unincorporated PBC, and the county was limited to minor street flooding. No structures were reported flooded during any of 2022 rain events.

Annex 1: PPL Project Progress

As part of this annual progress report preparation process, the LMS Coordinator prepares an update on the status of all active county flood mitigation projects from the state. The most current update to projects submitted for Hazard Mitigation Grant Program (HMGP) funds for Hurricane Matthew (4283), Hurricane Dorian (4468), and Hurricane Sally (4564) that were awarded funds are listed below. A total of $7,673,818.63 in total project costs.

HMGP FY22 Quarter 4 Overview

Disaster Number	Project Number	Suffix	Subgrantee	Project Title	Type	Project Status	Date Initially Approved	Project Date Closed	Federal Share Obligated	Fed Share Grantee Admin Amt	Fed Share Subgrantee Admin Amt	Subrecipient Management Costs	Total Obligated Amount	Non Federal Share
4283	0096	R	Lantana	Town of Lantana, Police	205.8: Retrofitting Public	Approved	06/26/2018		$1,125,000.00	$0.00		$0.00	$1,125,000.00	$375,000.00
4468	0016	R	Riviera Beach	City of Riviera	601.2: Generator	Approved	09/08/2021		$282,492.00	$0.00		$15,245.60	$297,737.60	$94,164.00
4468	0023	R	Palm Springs	Village of Palm	103.1: Feasibility,	Approved	09/20/2021		$96,244.01	$0.00		$6,416.27	$102,660.28	$268,938.00
4468	0030	R	Riviera Beach	City of Riviera	601.2: Generator	Approved	09/20/2021		$278,077.50	$0.00		$17,643.75	$295,721.25	$92,692.50
4468	0036	R	Jupiter	Town of Jupiter, WTP	103.2: Feasibility, Engineeri	Approved	12/06/2021		$144,895.47	$0.00		$0.00	$144,895.47	$611,905.00
4564	0030		West Palm Beach	City of West Palm	205.8: Retrofitting Public	Pending								$4,410,000.00

This report will be released to the media via the County's Public Affairs Department, and posted on the Division of Emergency Management's website.

Annex 2: 2022 PPL Project Progress (and PPL changes since 2021)

Fall 2022 Rank	Score	Project #	Agency/ Org.	Project Title	Project Type	Estimated Cost	Fall 2021 Rank	Increase (+) / Decrease (-) in rank priority since 2021	2021 Score	Score change since 2021
1	93.15	LMS-362712	Lake Worth	17th Ave South Drainage Resiliency Enhancements	Infrastructure (Water/Sewer/Drainage)	$700,000	1	0	93.15	N/A
2	91.83	LMS-386075	Boynton Beach	Lake Boynton Estates Drainage Improvements	Flood Control/Reduction and Waterway Management	$8,000,000	N/A	NEW	N/A	NEW
3	90.83	LMS-638815	Boynton Beach	Heart of Downtown Boynton Drainage Improvements	Infrastructure (Water/Sewer/Drainage)	$10,000,000	N/A	NEW	N/A	NEW
4	89.83	LMS-175874	Boynton Beach	Chapell Hill Drainage Improvements	Infrastructure (Water/Sewer/Drainage)	$5,000,000	N/A	NEW	N/A	NEW
5	88.57	LMS-808821	Delray Beach	Marine Way Seawall Improvements	Flood Control/Reduction and Waterway Management	$2,250,000	2	-3	88.57	N/A
6	88.00	LMS-763619	Palm Springs	Generators for Raw Water Wells 12, 13 & 14	Infrastructure (Water/Sewer/Drainage)	$450,000	4	-2	88.00	N/A
7	88.00	LMS-62731	Palm Beach Shores	Palm Beach Shores Underground Utilities Project	Infrastructure	$774,920	3	-4	88.00	N/A
8	87.57	LMS-616588	Delray Beach	Tropic Isle Roadway and Underground Utilities Improvement	Infrastructure	$36,300,000	5	-3	87.57	N/A
9	87.28	LMS-206661	Delray Beach	Thomas Street Pump Station	Flood Control/Reduction and Waterway Management	$7,000,000	N/A	NEW	N/A	NEW
10	87.00	LMS-947985	Delray Beach	Marine Way Roadway and Drainage Improvements	Infrastructure	$14,000,000	N/A	NEW	N/A	NEW
11	80.00	LMS-689971	Northern Palm Beach County Improvement District	Pump Station Emergency Power	Infrastructure (Water/Sewer/Drainage)	$2,450,000	N/A	NEW	N/A	NEW

Fall 2022 Rank	Score	Project #	Agency/ Org.	Project Title	Project Type	Estimated Cost	Fall 2021 Rank	Increase (+) / Decrease (-) in rank priority since 2021	2021 Score	Score change since 2021
12	78.67	LMS-369285	West Palm Beach	West Palm Beach Fire Station # 5 / Emergency Operations Center Hurricane Hardening and Wind Retrofit	Infrastructure (Building)	$3,200,000	9	-3	78.67	N/A
13	78.33	LMS-388986	West Palm Beach	West Palm Beach Fire Station #1 Hurricane Hardening & Wind Retrofit	Infrastructure (Building)	$1,000,000	10	-3	78.33	N/A
14	78.00	LMS-938543	West Palm Beach	West Palm Beach Fire Station #6 Hurricane Hardening and Wind Retrofit	Infrastructure (Building)	$600,000	11	-3	78.00	N/A
15	77.67	LMS-519589	West Palm Beach	West Palm Beach Police Department Headquarters Building Hurricane Hardening and Wind Retrofit	Infrastructure (Building)	$5,500,000	12	-3	77.67	N/A
16	77.14	LMS-75294	Riviera Beach	North Filter Building Hurricane Hardening	Infrastructure (Water/Sewer/Drainage)	$400,000	13	-3	77.14	N/A
17	76.86	LMS-220415	Palm Beach	Stormwater and Wastewater System Resilience: D-8 Pump Station / E-5 Lift Station Elevation	Infrastructure (Water/Sewer/Drainage)	$1,336,423	14	-3	76.86	N/A
18	76.43	LMS-344736	Lake Worth	South Palm Park Drainage Resiliency Improvements	Flood Control/Reduction and Waterway Management	$600,000	15	-3	76.43	N/A
19	76.25	LMS-67871	Riviera Beach	Water Treatment Plant Generator Improvement Project	Infrastructure (Water/Sewer/Drainage)	$2,350,000	16	-3	76.25	N/A
20	75.29	LMS-651175	Palm Beach	Wastewater System Resilience: A-5 Lift Station Elevation	Infrastructure (Water/Sewer/Drainage)	$1,033,000	18	-2	75.29	N/A
21	74.83	LMS-36085	Delray Beach	Tidal Check Valve Improvement Project - Phase 2	Flood Control/Reduction and Waterway Management	$750,000	19	-2	74.83	N/A
22	74.67	LMS-828881	Delray Beach	Seawall Improvements - NE 1st Ct, NE 2nd St., NE 5th St., Bucida and Spanish Circle	Flood Control/Reduction and Waterway Management	$1,200,000	20	-2	74.67	N/A

Fall 2022 Rank	Score	Project #	Agency/ Org.	Project Title	Project Type	Estimated Cost	Fall 2021 Rank	Increase (+) / Decrease (-) in rank priority since 2021	2021 Score	Score change since 2021
23	74.57	LMS-443634	Palm Beach	Stormwater System Resilience: D-12 Pump Station Floodproofing	Infrastructure (Water/Sewer/Drainage)	$910,000	21	-2	74.57	N/A
24	74.57	LMS-358148	South Palm Beach	Town Hall Hardening and Preparedness Enhancements	Infrastructure (Building)	$757,245	N/A	NEW	N/A	NEW
25	74.33	LMS-293394	Delray Beach	Tidal Check Valve Improvement Project - Phase 3	Flood Control/Reduction and Waterway Management	$750,000	23	-2	74.33	N/A
26	74.33	LMS-224397	Delray Beach	Tidal Check Valve Improvement Project - Phase 4	Flood Control/Reduction and Waterway Management	$750,000	24	-2	74.33	N/A
27	73.00	LMS-242928	Palm Springs	Davis Road North Basin Stormwater Improvements	Infrastructure (Water/Sewer/Drainage)	$976,752	25	-2	73.00	N/A
28	72.33	LMS-742079	West Palm Beach	West Palm Beach Fire Station No. 9 Hurricane Hardening and Wind Retrofit	Infrastructure (Building)	$2,000,000	26	-2	72.33	N/A
29	72.33	LMS-527103	West Palm Beach	Segment #3 - S. Flagler Waterfront Improvements – North of Bristol Condo	Beach/Seawall	$1,500,000	27	-2	72.33	N/A
30	72.29	LMS-340906	Jupiter	Water Treatment Plant Hardened Server Rm/Training Facility and Server Room	Infrastructure (Building)	$652,795	28	-2	72.29	N/A
31	69.14	LMS-713904	West Palm Beach	Stormwater System Rehab Phase 2	Infrastructure (Water/Sewer/Drainage)	$3,000,000	31	0	69.14	N/A
32	69.00	LMS-641439	Riviera Beach	Ocean Rescue Station Hardening	Mitigation	$1,000,000	N/A	NEW	N/A	NEW
33	68.83	LMS-719052	Riviera Beach	Lift Station Panel Upgrades	Infrastructure (Water/Sewer/Drainage)	$900,000	N/A	NEW	N/A	NEW
34	68.71	LMS-201391	Wellington	Neighborhood Flood Control Improvements	Flood Control/Reduction and Waterway Management	$3,052,838	32	-2	68.71	N/A
35	68.43	LMS-86839	Palm Beach	Stormwater System Resilience: D-17 Pump Station Elevation	Infrastructure (Water/Sewer/Drainage)	$760,000	33	-2	68.43	N/A

Fall 2022 Rank	Score	Project #	Agency/ Org.	Project Title	Project Type	Estimated Cost	Fall 2021 Rank	Increase (+) / Decrease (-) in rank priority since 2021	2021 Score	Score change since 2021
36	67.85	LMS-6525	Riviera Beach	Riviera Beach Wellfield Resiliency Upgrades	Infrastructure (Water/Sewer/Drainage)	$4,200,000	34	-2	67.85	N/A
37	67.83	LMS-180784	West Palm Beach	Segment #2 - S. Flagler Waterfront Improvements – Pershing Way to Clusbourne Ct	Beach/Seawall	$21,475,000	35	-2	67.83	N/A
38	67.67	LMS-86947	Riviera Beach	Raw Water Well Panel Upgrades	Infrastructure (Water/Sewer/Drainage)	$900,000	N/A	NEW	N/A	NEW
39	67.57	LMS-998321	Baptist Health	Baptist Health South Florida - Bethesda Hospital East Wind Retrofit	Shuttering and Wind Proofing	$6,000,000	36	-3	67.57	N/A
40	67.43	LMS-622298	Royal Palm Beach	Bridge Slope Stabilization and Canal Dredging, Phase II	Flood Control/Reduction and Waterway Management	$2,600,000	37	-3	67.43	N/A
41	67.43	LMS-626499	Lantana	N. Atlantic Drive Drainage Improvements	Flood Control/Reduction and Waterway Management	$518,000	38	-3	67.43	N/A
42	67.28	LMS-293258	Lantana	Beach curve/Barefoot Ln. Drainage Improvement	Flood Control/Reduction and Waterway Management	$400,000	39	-3	79.86	+12.58
43	67.14	LMS-645026	Palm Beach Gardens Regional Utility	PGA WWTP Emergency Generator Upgrade Project	Infrastructure (Water/Sewer/Drainage)	$1,890,000	40	-3	67.14	N/A
44	66.43	LMS-252086	Royal Palm Beach	Canal Bank Tree Removal	Flood Control/Reduction and Waterway Management	$200,000	41	-3	78.86	+12.43
45	66.43	LMS-497863	Delray Beach	Standby Lakeview Stormwater Pipe Improvements	Flood Control/Reduction and Waterway Management	$500,000	42	-3	66.43	N/A
46	66.33	LMS-49082	Wellington	PBSO Substation Hardening	Infrastructure (Building)	$2,140,905	N/A	NEW	N/A	NEW
47	66.00	LMS-997272	Palm Beach Gardens Regional Utility	Lift Station 21 Hardening and Resiliency Improvements Project	Infrastructure (Water/Sewer/Drainage)	$630,000	43	-4	66.00	N/A

Fall 2022 Rank	Score	Project #	Agency/ Org.	Project Title	Project Type	Estimated Cost	Fall 2021 Rank	Increase (+) / Decrease (-) in rank priority since 2021	2021 Score	Score change since 2021
48	65.14	LMS-524174	Lantana	S. Lakeside Place Drainage Improvements	Infrastructure (Water/Sewer/Drainage)	$250,000	44	-4	65.14	N/A
49	65.00	LMS-223563	Delray Beach	Basin Street Pumping Station	Equipment	$1,000,000	45	-4	77.86	+12.86
50	64.00	LMS-366124	Lantana	Operations Center Roof Replacement	Continuity of Operations/Government	$100,000	47	-3	64.00	N/A
51	64.00	LMS-316303	Palm Beach Gardens Regional Utility	Lift Station Telemetry Improvements Project	Mechanical Maintenance/Improvement	$4,851,000	48	-3	64.00	N/A
52	63.85	LMS-419883	Palm Beach Gardens Regional Utility	Lift Station 20 Hardening and Resiliency Improvements	Infrastructure (Water/Sewer/Drainage)	$630,000	49	-3	63.85	N/A
53	63.33	LMS-478886	Riviera Beach	3 Dry Can Lift Station Replacements	Infrastructure (Water/Sewer/Drainage)	$2,969,408	N/A	NEW	N/A	NEW
54	63.00	LMS-137646	Lantana	N. Lake Drive Drainage Improvements	Flood Control/Reduction and Waterway Management	$400,000	51	-3	63.00	N/A
55	62.86	LMS-261577	Juno Beach	Juno Ocean Walk Drainage Project	Mitigation	$70,000	N/A	NEW	N/A	NEW
56	61.71	LMS-397259	Riviera Beach	Comprehensive Lift Station Rehabilitation	Infrastructure (Water/Sewer/Drainage)	$4,400,000	53	-3	61.71	N/A
57	61.71	LMS-122805	Palm Beach Gardens Regional Utility	Lift Station 1 Hardening and Resiliency Improvements Project	Infrastructure (Water/Sewer/Drainage)	$756,000	54	-3	61.71	N/A
58	61.56	LMS-399345	Wellington	Pump Station #2 Hardening	Flood Control/Reduction and Waterway Management	$2,085,000	55	-3	61.56	N/A
59	60.71	LMS-788074	Lantana	Euclid Path outfall improvements	Infrastructure (Water/Sewer/Drainage)	$250,000	56	-3	60.71	N/A
60	60.57	LMS-413066	Palm Beach Gardens Regional Utility	Lift Station 2 Hardening and Resiliency Improvements Project	Infrastructure (Water/Sewer/Drainage)	$756,000	57	-3	60.57	N/A

Fall 2022 Rank	Score	Project #	Agency/ Org.	Project Title	Project Type	Estimated Cost	Fall 2021 Rank	Increase (+) / Decrease (-) in rank priority since 2021	2021 Score	Score change since 2021
61	60.17	LMS-76355	West Palm Beach	Segment #5 - S. Flagler Dr Waterfront Improvements - Russlyn to Greenwood Dr	Beach/Seawall	$21,500,000	58	-3	60.17	N/A
62	60.00	LMS-672084	South Florida Water Management District	Corbet Levee	Flood Control/Reduction and Waterway Management	$8,800,000	N/A	NEW	N/A	NEW
63	59.85	LMS-636161	Wellington	Public Works Facility Retrofit	Infrastructure (Building)	$955,000	60	-3	59.85	N/A
64	59.57	LMS-345236	Indian Trail Improvement District	Culvert Improvements - Phase I	Infrastructure (Water/Sewer/Drainage)	$2,106,500	61	-3	59.57	N/A
65	59.50	LMS-331532	West Palm Beach	Segment #1 - S. Flagler Waterfront Improvements - Monsesaur/Avila to Pershing Way	Beach/Seawall	$7,125,000	62	-3	81.86	+22.36
66	59.17	LMS-445434	West Palm Beach	Segment #6 - S. Flagler Waterfront Improvements - Linda Lane to Russlyn Dr	Beach/Seawall	$12,000,000	64	-2	59.17	N/A
67	59.00	LMS-298956	South Palm Beach	Master Lift Station Hardening	Infrastructure (Water/Sewer/Drainage)	$912,000	N/A	NEW	N/A	NEW
68	58.83	LMS-134254	Wellington	Water Treatment Plant Emergency Power	Mitigation	$2,500,000	N/A	NEW	N/A	N/A
69	58.50	LMS-398292	Palm Beach	Palm Beach Utility Undergrounding Phase 8	Infrastructure	$12,000,000	N/A	NEW	N/A	NEW
70	58.50	LMS-925187	West Palm Beach	Segment #4 - S. Flagler Waterfront Improvements - Summa St to Linda Lane	Beach/Seawall	$25,000,000	65	-5	58.50	N/A
71	58.43	LMS-728688	West Palm Beach	Lift Station Sea Level Rise/Tidal Flooding Impact Study and Improvements	Infrastructure (Water/Sewer/Drainage)	$5,850,000	66	-5	58.43	N/A

Fall 2022 Rank	Score	Project #	Agency/ Org.	Project Title	Project Type	Estimated Cost	Fall 2021 Rank	Increase (+) / Decrease (-) in rank priority since 2021	2021 Score	Score change since 2021
72	57.14	LMS-900137	Palm Beach Gardens	City Hall, Police, Fire Station Wind Retrofit	Shuttering and Wind Proofing	$600,000	67	-5	57.14	N/A
73	55.33	LMS-765557	Northern Palm Beach County Improvement District	Unit 5 Stormwater	Infrastructure (Water/Sewer/Drainage)	$2,840,000	68	-5	55.33	N/A
74	54.85	LMS-174335	Delray Beach	Fire Station 1 Hurricane Hardening	Shuttering and Wind Proofing	$1,070,000	69	-5	54.85	N/A
75	52.14	LMS-551924	Palm Beach	Coastal Flood Vulnerability Assessment Update and Priority Planning	Planning	$210,000	70	-5	52.14	N/A
76	52.00	LMS-841542	West Palm Beach	Public Works Complex Buildings Hardening	Mitigation	$9,136,388	N/A	NEW	N/A	NEW
77	51.86	LMS-9925	Delray Beach	Standby Generators for Critical Facilities	Continuity of Operations/Government	$300,000	71	-6	51.86	N/A
78	51.57	LMS-672129	Indian Trail Improvement District	Corbett Levee	Flood Control/Reduction and Waterway Management	$3,700,000	73	-5	51.57	N/A
79	51.33	LMS-397389	Northern Palm Beach County Improvement District	Unit 20 Juno Isles	Flood Control/Reduction and Waterway Management	$1,620,000	74	-5	51.33	N/A
80	51.00	LMS-853573	Indian Trail Improvement District	I Canal Drainage Improvements	Flood Control/Reduction and Waterway Management	$225,000	75	-5	51.00	N/A
81	50.57	LMS-743	Royal Palm Beach	La Mancha Underdrain	Infrastructure (Water/Sewer/Drainage)	$1,932,000.60	76	-5	50.57	N/A
82	48.86	LMS-67687	South Palm Beach	Powerline Undergrounding Project	Mitigation	$2,125,000	77	-5	48.86	N/A
83	47.50	LMS-834112	Wellington	Pump Station #5	Infrastructure (Water/Sewer/Drainage)	$2,400,000	N/A	NEW	N/A	NEW
84	47.00	LMS-617223	Wellington	Lift Station Emergency Power- Phase II	Infrastructure (Water/Sewer/Drainage)	$790,000	80	-4	47.00	N/A

Fall 2022 Rank	Score	Project #	Agency/ Org.	Project Title	Project Type	Estimated Cost	Fall 2021 Rank	Increase (+) / Decrease (-) in rank priority since 2021	2021 Score	Score change since 2021
85	47.00	LMS-2675	Hypoluxo	Town Hall Hardening	Shuttering and Wind Proofing	$450,000	79	-6	47.00	N/A
86	45.14	LMS-30177	Palm Springs	Police Department Hardening	Infrastructure (Building)	$1,363,044	81	-5	80.86	+35.72
87	41.86	LMS-857722	Riviera Beach	South Chemical Building Hardening	Infrastructure (Building)	$75,000	83	-4	41.86	N/A
88	41.57	LMS-673494	Facilities Development & Operations Department	PBC FDO OSC Full Building Power Generator	Continuity of Operations/Government	$1,400,000	N/A	NEW	N/A	NEW
89	40.14	LMS-813848	Wellington	Wellington Community Center Hardening	Infrastructure (Building)	$539,522	84	-5	40.14	N/A
90	39.86	LMS-568322	Lantana	Lantana Cove Drainage Improvements (2017)	Flood Control/Reduction and Waterway Management	$380,000	85	-5	39.86	N/A
91	39.14	LMS-873296	Indian Trail Improvement District	Santa Rosa Groves Pump Station	Infrastructure (Water/Sewer/Drainage)	$739,529	86	-5	39.14	N/A
92	36.29	LMS-928468	Indian Trail Improvement District	Outfall Canal Control Structure	Flood Control/Reduction and Waterway Management	$400,000	87	-5	36.29	N/A
93	33.71	LMS-724894	Indian Trail Improvement District	M-2 Impoundment	Infrastructure (Water/Sewer/Drainage)	$205,126	88	-5	33.71	N/A
94	32.83	LMS-852572	Indian Trail Improvement District	M-1 Inverted Siphon	Infrastructure (Water/Sewer/Drainage)	$1,751,400	90	-4	32.83	N/A
95	31.00	LMS-148549	Wellington	South Shore/Pierson Rd. Improvements	Infrastructure (Roadway)	$3,530,000	91	-4	31.00	N/A
Removed since 2021		LMS-702263	Greenacres	Greenacres Original Section Drainage Improvements Phases 6 & 7	Infrastructure (Water/Sewer/Drainage)	$702,000	6	N/A	84.86	N/A
Removed since 2021		LMS-292308	Riviera Beach	Lift Station #47 Generator Improvement Project	Infrastructure (Water/Sewer/Drainage)	$400,000	7	N/A	80.71	N/A
Removed since 2021		LMS-837788	Lake Park	Southern Outfall Priority Rehabilitation Project	Infrastructure (Water/Sewer/Drainage)	$3,053,200	8	N/A	80.28	N/A

Fall 2022 Rank	Score	Project #	Agency/ Org.	Project Title	Project Type	Estimated Cost	Fall 2021 Rank	Increase (+) / Decrease (-) in rank priority since 2021	2021 Score	Score change since 2021
Removed since 2021		LMS-101666	Juno Beach	Juno Ocean Walk Drainage Project	Other	$35,000	17	N/A	76.00	N/A
Removed since 2021		LMS-580495	Delray Beach	Tidal Check Valve Improvement Project Phase 1	Flood Control/Reduction and Waterway Management	$750,000	22	N/A	74.50	N/A
Removed since 2021		LMS-715858	Briny Breezes	Town-wide Vulnerability Assessment & Coastal Protection Plan	Planning	$475,000	29	N/A	70.57	N/A
Removed since 2021		LMS-880318	Delray Beach	Thomas Street Pump Station	Flood Control/Reduction and Waterway Management	$2,300,000	30	N/A	69.57	N/A
Removed since 2021		LMS-839233	Delray Beach	Atlantic Dunes Park Seawall Improvements	Flood Control/Reduction and Waterway Management	$1,700,000	46	N/A	64.66	N/A
Removed since 2021		LMS-486424	South Palm Beach	Town Hall and Police Department Hardening	Infrastructure (Building)	$1,325,000	50	N/A	63.71	N/A
Removed since 2021		LMS-371219	Riviera Beach	Standby Generators for Five (5) Lift Station Improvements	Infrastructure (Water/Sewer/Drainage)	$375,000	52	N/A	62.50	N/A
Removed since 2021		LMS-82521	South Palm Beach	Master Lift Station Hardening	Infrastructure (Water/Sewer/Drainage)	$813,100	59	N/A	60.00	N/A
Removed since 2021		LMS-865563	Briny Breezes	Sub-Pump Emergency Response	Flood Control/Reduction and Waterway Management	$50,000	63	N/A	59.42	N/A
Removed since 2021		LMS-181375	Juno Beach	Universe Blvd Improvements	Infrastructure (Water/Sewer/Drainage)	$2,600,000	72	N/A	51.86	N/A
Removed since 2021		LMS-787214	Delray Beach	Marine Way Pump Station	Flood Control/Reduction and Waterway Management	$4,000,000	78	N/A	47.57	N/A
Removed since 2021		LMS-394308	Pahokee	East Lake Village Project	Flood Control/Reduction and Waterway Management	$300,375	82	N/A	43.00	N/A
Removed since 2021		LMS-510787	Indian Trail Improvement District	M-2 Impoundment Bypass	Infrastructure (Water/Sewer/Drainage)	$389,324	89	N/A	33.71	N/A

Annex 3: Media Release examples for LMS Meetings

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Local Mitigation Strategy (LMS) Steering Committee to Hold General Meeting

Posted On Monday, May 16, 2022

On Wednesday, May 25, 2022, at 2 p.m., the Palm Beach County Local Mitigation Strategy (LMS) Steering Committee will hold a virtual general meeting of its public and private sector membership. This meeting is open to the public.

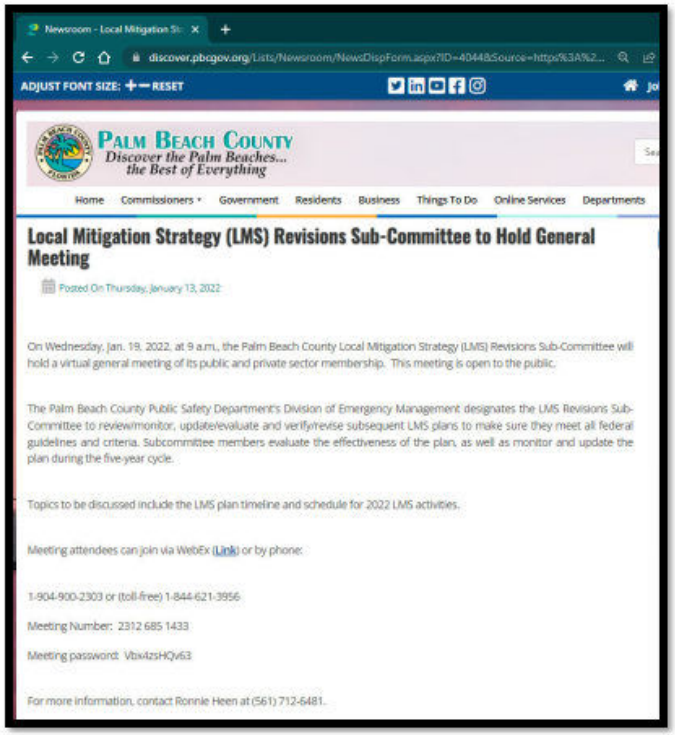
The Palm Beach County Public Safety Department's Division of Emergency Management designates the LMS Steering Committee to advise and assist in the administration and oversight of LMS activities and initiatives. It is the primary decision and policy body for LMS-sponsored mitigation activity. The LMS Steering Committee also monitors the implementation of the LMS annually and makes recommendations to jurisdictions and other LMS members regarding how to implement LMS strategies within their jurisdictions.

Topics to be discussed include the LMS project list and mitigation activities.

This meeting will be located at:

Palm Beach County Emergency Operations Center
Broadcast Studio
20 South Military Trail
West Palm Beach, FL 33415

For more information: Ronnie Heen, (561) 712-6481.



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Local Mitigation Strategy (LMS) Revisions Sub-Committee to Hold General Meeting

Posted On Thursday, January 13, 2022

On Wednesday, Jan. 19, 2022, at 9 a.m., the Palm Beach County Local Mitigation Strategy (LMS) Revisions Sub-Committee will hold a virtual general meeting of its public and private sector membership. This meeting is open to the public.

The Palm Beach County Public Safety Department's Division of Emergency Management designates the LMS Revisions Sub-Committee to review/monitor, update/evaluate and verify/revise subsequent LMS plans to make sure they meet all federal guidelines and criteria. Subcommittee members evaluate the effectiveness of the plan, as well as monitor and update the plan during the five-year cycle.

Topics to be discussed include the LMS plan timeline and schedule for 2022 LMS activities.

Meeting attendees can join via WebEx (Link) or by phone:

1-904-900-2303 or (toll-free) 1-844-621-3956

Meeting Number: 2312 685 1433

Meeting password: Vbx4zsHQv63

For more information, contact Ronnie Heen at (561) 712-6481.

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Local Mitigation Strategy Working Group to Hold General Meeting

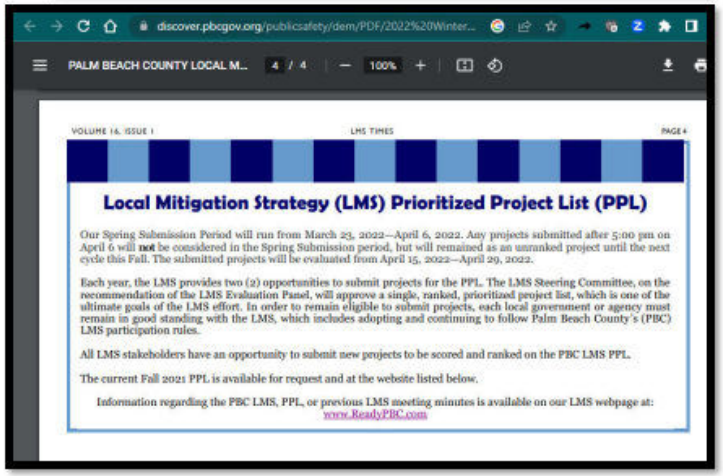
Posted On Thursday, June 2, 2022

On Wednesday, June 8, 2022, from 10 to 11 a.m., the Palm Beach County Local Mitigation Strategy (LMS) Working Group will hold a general meeting of its public and private sector membership. This meeting is open to the public. Among the topics to be discussed is the 2022 Spring Prioritized Project List (PPL).

The Palm Beach County Public Safety Department's Division of Emergency Management coordinates the LMS Working Group and it is comprised of county, municipal and community partners. The purpose is to prepare and promote local strategies and projects that will reduce long-term risks to life and property from natural, technological, and human-caused hazards. The resulting pre- and post-disaster mitigation strategies and projects are supported by a variety of state and federal programs and funding sources, in accordance with the Disaster Mitigation Act of 2000.

This meeting will be located at:
Juno Beach Town Center
340 Ocean Drive
Juno Beach, FL 33408

For more information, contact Ronnie Heen at (561) 712-6481.



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VOLUME 16, ISSUE 1 — LMS TIMES — PAGE 4

Local Mitigation Strategy (LMS) Prioritized Project List (PPL)

Our Spring Submission Period will run from March 23, 2022—April 6, 2022. Any projects submitted after 5:00 pm on April 6 will **not** be considered in the Spring Submission period, but will remained as an unranked project until the next cycle this Fall. The submitted projects will be evaluated from April 15, 2022—April 29, 2022.

Each year, the LMS provides two (2) opportunities to submit projects for the PPL. The LMS Steering Committee, on the recommendation of the LMS Evaluation Panel, will approve a single, ranked, prioritized project list, which is one of the ultimate goals of the LMS effort. In order to remain eligible to submit projects, each local government or agency must remain in good standing with the LMS, which includes adopting and continuing to follow Palm Beach County's (PBC) LMS participation rules.

All LMS stakeholders have an opportunity to submit new projects to be scored and ranked on the PBC LMS PPL.

The current Fall 2021 PPL is available for request and at the website listed below.

Information regarding the PBC LMS, PPL, or previous LMS meeting minutes is available on our LMS webpage at: www.ReadyPBC.com

The following is the annual progress report for the County CRS Floodplain Management Plan (CY2021):

PALM BEACH COUNTY COMMUNITY RATING SYSTEM
FLOODPLAIN MANAGEMENT PLAN
ACTIVITY 510 PROGRESS REPORT CY2021

Palm Beach County, Florida
NFIP Number - 120192

Department of Public Safety
Division of Emergency Management
20 South Military Trail
West Palm Beach, FL 33415
(561) 712-6400
FAX: (561) 712-6464
www.pbcgov.com

1. Name of the CRS Floodplain Management Plan:

Unified Local Mitigation Strategy
The purpose of the Palm Beach County Unified Local Mitigation Strategy (LMS) is to develop and execute an ongoing unified strategy for reducing the community's vulnerability to identified natural, technological, and societal hazards. The strategy provides a rational, managed basis for considering and prioritizing hazard-specific mitigation options and for developing and executing sound, cost effective mitigation projects. The LMS also provides a basis for justifying the solicitation and use of local, state, federal, and other monies to support hazard mitigation projects and initiatives. The Palm Beach County Unified LMS believes broad community support, including ongoing public and private sector involvement, is very important to the success of the program.

Palm Beach County (PBC) has had an increasing number of stakeholders preparing to incorporate the LMS as part of their Floodplain Management Plans in accordance with the CRS Coordinator's Manual Activity 500 – Flood Damage Reduction Activities, specifically, Activity 510 – Floodplain Management Planning. Several communities have worked with PBC Division of Emergency Management, the Building Division of the Planning, Zoning, and Building Department, and private contractors in efforts to identify the resources necessary to accomplish planning initiatives. Currently nearly all of our municipalities use the LMS for their floodplain management plan in addition to unincorporated Palm Beach County.

2. Date Adopted
   - Original adoption: September 30, 1999
   - Revised Plan approved by FEMA: November 2004
   - Revised Plan approved by FEMA: January 2010
   - Revised Plan approved by FEMA: February 2015
   - Revised Plan approved by FEMA: October 16, 2019

3. Location where copies are available for review:

Palm Beach County Division of Emergency Management
Emergency Operations Center
20 South Military Trail
West Palm Beach, FL 33415

Contact: Ronnie Heen, CRS-LMS Coordinator, Planning Section

Also posted on the internet at the following address:
http://discover.pbcgov.org/publicsafety/dem/Publications/PBC%20Local%20Mitigation%20Strategy%202020.pdf

4. Summarize any flooding that occurred during calendar year 2021:

The LMS ranks floods at the top of the list of identified hazards because of their projected impact potential across the entire spectrum of community exposure and services. Florida, and especially PBC, is highly susceptible to localized flooding. Inland and coastal flooding in particular are the likely types of floods frequently affecting communities across the County. The tropical rainfall pattern in the county coupled with the hurricane season (June 1 through November 30) makes PBC particularly vulnerable to flooding, especially later in the hurricane season when the water table is high and the ground is saturated from impacts of cyclones and rain events. PBC averaged just over 54 inches of rain per year last year, and more than 120 rain days, with most of that occurring between the months of June and November. The following flooding advisory statistics were noted for CY 2021:

Flood Advisories:	40
Flash Flood Warnings:	2
Flash Flood Watches:	3
Coastal Flood Statements	5

Total Precipitation for CY 2021 (NWS – Miami taken from PBC PBI)

2021	Total Rain	Days >0.01"	Days >0.10"	Days >0.50"	Days 1.00">	Greatest Rain Day	Date
Jan	0.3	3	1	0	0	0.21	13-Jan
Feb	2.62	9	5	2	1	1.02	16-Feb
Mar	0.96	2	2	1	0	0.55	6-Mar
Apr	2.88	6	5	3	0	0.97	11-Apr
May	0.61	5	1	0	0	0.4	6-May
Jun	6.85	22	15	4	1	1.46	16-Jun
Jul	5.66	17	10	6	0	0.85	5-Jul
Aug	9.9	17	12	5	3	2.31	3-Aug
Sep	6.64	15	13	5	2	1.43	4-Sep
Oct	9.02	15	10	6	3	2.26	8-Oct
Nov	6.54	8	7	2	2	2.99	19-Nov
Dec	2.16	7	6	1	0	0.63	19-Dec

Source NWS: https://w2.weather.gov/climate/index.php?wfo=mfl

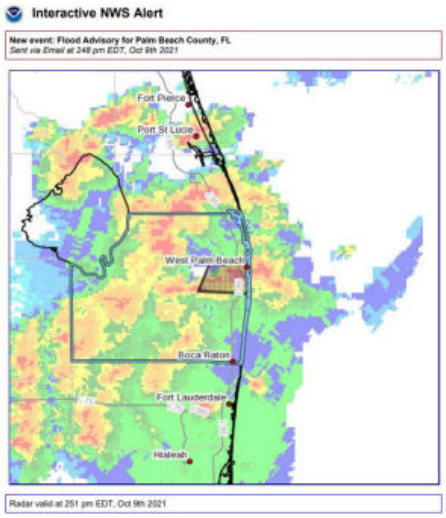
Significant weather activities during this past year:

June 16, 2021

Doppler radar indicated heavy rain due to developing thunderstorms. Approximately 1.46 inches of rain have fallen causing minor flooding over portions of southeastern Palm Beach County.

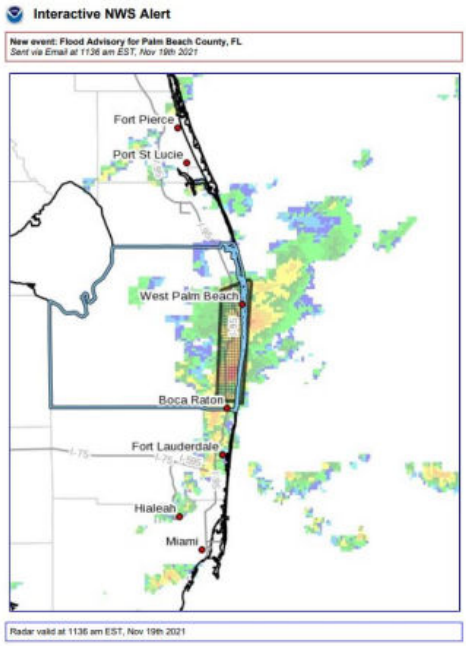
October 9, 2021

Doppler radar indicated heavy rain due to thunderstorms causing minor flooding within the areas of West Palm Beach, Wellington, Lake Worth, Palm Beach and Greenacres. Approximately 2.22 inches of rainfall was recorded.



November 19, 2021

Doppler radar and automated rain gauges indicated heavy rain due to thunderstorms causing minor flooding affecting West Palm Beach, Boca Raton, Boynton Beach, Delray Beach, Palm Beach Gardens, Lake Worth, Riviera Beach, Palm Beach, Highland Beach, Ocean Ridge, Greenacres, Palm Springs, North Palm Beach, Lantana, Lake Park, Atlantis, Haverhill, Cloud Lake, Gun Club Estates and Village Of Golf. Approximately 2.99 inches of rainfall was recorded.



5. What impact did the flooding have on repetitive loss areas?

   This office did not receive any reports of flooding from repetitive loss property area owners. The rainfall average total was approximately 10 inches below the normal rainfall average in 2021 throughout unincorporated PBC, and the county was limited to minor street flooding. No structures were reported flooded during any of 2021 rain events.

6. List each element of the plan and note how much was accomplished during the previous year.

   Major progress in the LMS program during this reporting period includes:

- The LMS Program continued its mitigation efforts as the spread of COVID-19 slowed and we transitioned back to a normal schedule for most government and private sector agencies within Palm Beach County in 2021. In-person meetings that were all but impossible due to social distancing requirements resumed, along with travel for work and training. Our LMS team continued to adapt by using virtual means of communication in order to keep moving the program forward, and almost all of our normal meetings were held as scheduled.

- Quarterly Meetings were held for the LMS Working Group (4), LMS Steering Committee (4), and the CRS Users Group (4). There were two (2) meetings of the LMS Evaluation Panel to evaluate, score, and rank new projects for the Prioritized Project List (PPL).
- We continue to use the LMS WebEOC portal in capturing community submission packages for the Prioritized Project List (PPL). A total of 91 projects are active on our PPL.
- The LMS Newsletter was published four (4) times in 2021. These documents are sent out to the LMS Working Groups, available to all municipalities to be displayed in their public spaces, and posted online at https://discover.pbcgov.org/publicsafety/dem/Sections/Planning-Local-Mitigation-Strategy.aspx .
- Completed the Dike Failure Hazard Specific Plan, addressing response to a breach or failure of the Herbert Hoover Dike and the Corbett Berm, and subsequent flooding to the identified vulnerable areas, in Palm Beach County.
- Palm Beach County along with Broward, Monroe, and Miami-Dade continued to enhance the Southeast Florida Regional Climate Change Compact to coordinate mitigation and adaptation activities across county lines. Palm Beach County hosted the 13th Annual Climate Leadership Summit virtually on December 9 and 10, 2021. This summit emphasizes how climate resiliency is cross-sector and intersects with all of PBC's Departments.
- PPL Mitigation projects continued to be funded from previous disasters, including those of flood mitigation projects. See *Annex 1* for updated projects in progress or completed from FEMA disaster number 4468.

7. Were any objectives not reached or are implementation behind schedule? If so, state why.

   As a result of the response to COVID-19, the Program for Public Information (CRS Activity 330) was not completed as scheduled in 2021. However, it is now in final review with our stakeholders and should be finalized by May of 2022.

8. Should new projects be started or should any of the recommendations or objectives be revised?

   The LMS PPL returned to its normal schedule. New projects were scored/ranked, after a vote of the LMS Working Group, in two (2) periods. These two (2) review periods took place in March/April 2021, and the second in October/November 2021. Seven (7) out of the 18 projects added in the March/April period and 14 out of the 19 projects added in the October/November 2021 period were dedicated to mitigate flooding issues within the respective communities. Projects on the list for then more than five (5) years at the time of bi-annual reviews were reviewed, and if necessary, either updated or purged.

9. Progress Reports discussed and/or made available at a public meeting.

   The status of all mitigation projects and success stories were reported and discussed at the quarterly LMS Working Group and Steering Committee meetings (open to the public). An update to the website includes the number of new and existing projects. The PPL is posted on the DEM website once approved by the Steering Committee, and is publicly available for review at https://discover.pbcgov.org/publicsafety/dem/PDF/Fall%202021%20Prioritized%20Project%20List%20(PPL).pdf.

   All general meetings are publicized through media releases, social media platforms, and posted announcements. See *Annex 2* for media release example. The minutes for each LMS Working Group and Steering Committee meeting are posted on our LMS webpage for public consumption at https://discover.pbcgov.org/publicsafety/dem/Sections/Planning-Local-Mitigation-Strategy.aspx.

10. We have provided copies of this report to our governing board and local media.

The governing board for the CRS is the LMS Steering Committee. Copies of this progress report have been provided to members of the Steering Committee and have been posted to the homepage of the Palm Beach County Division of Emergency Management website for public review. A media release announcing the report and its posting has been executed.

Annex 1: PPL Project Progress

As part of this annual progress report preparation process, the LMS Coordinator prepares an update on the status of all active county flood mitigation projects from the state. The most current update to projects submitted for Hazard Mitigation Grant Program (HMGP) funds for Hurricane Dorian that were awarded funds are listed below. A total of $898,144.43 were funded in total project costs.

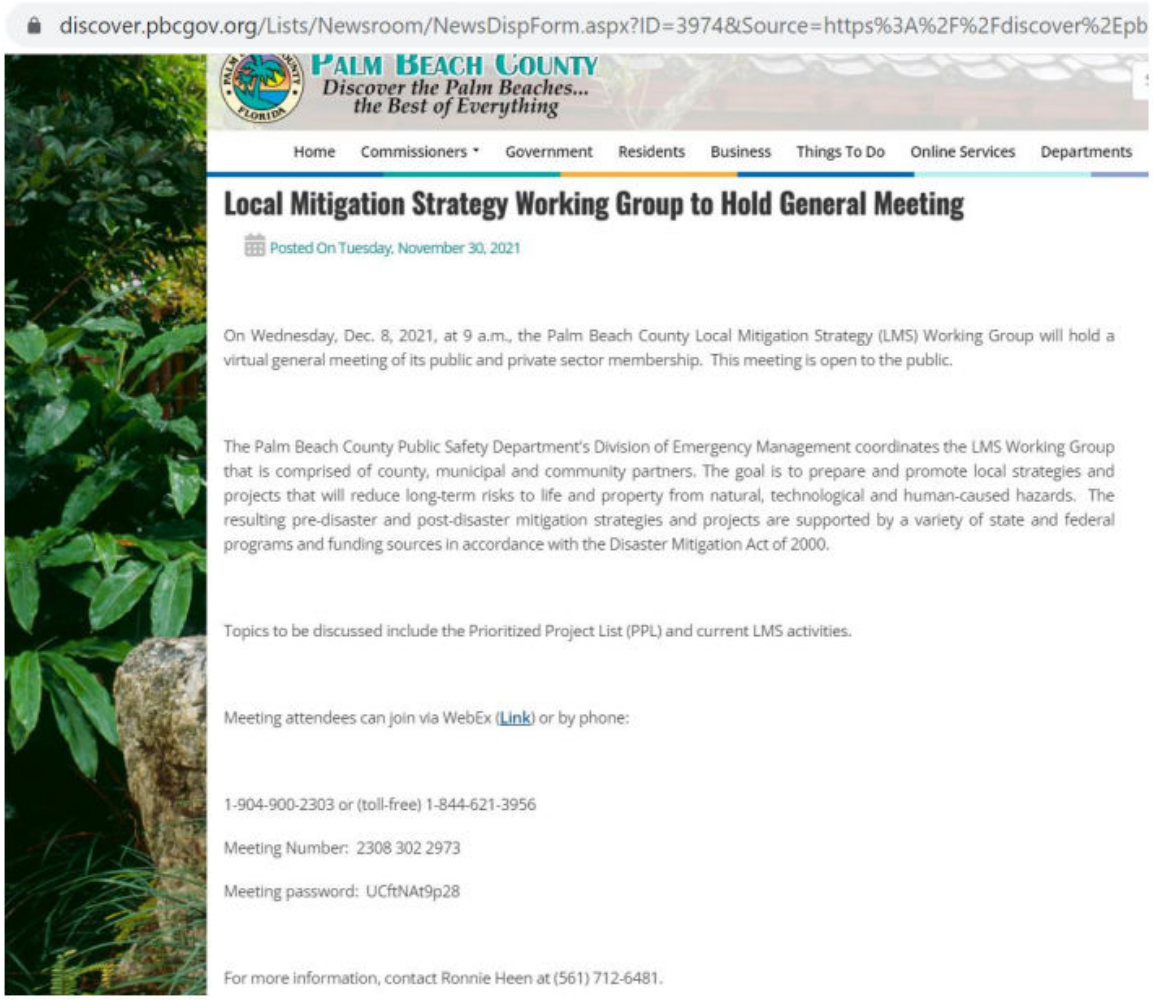
Hurricane Dorian DR-4468

Disaster Number	Project Number	Subgrantee	Project Title	Type	Project Status	Date Initially Approved	Project Date Closed	Federal Share Obligated	Fed Share Grantee Admin Amount	Fed Share Subgrantee Admin Amount	Subrecipient Management Costs Obligated Amount	Total Obligated Amount
4468	0018	Riviera Beach	City of Riviera Beach Lift Station #47 Generator	5012 Generators - Regular	Approved	9/3/2021		$232,492.00	$0.00	$8,624.50	$27,737.50	[illegible]
4468	0023	Palm Springs	Village of Palm Springs Davis Road North Basin Drainage	603.1 Feasibility Engineering and Design Studies	Approved	9/20/2021		$38,244.01	$0.00	$4,182.7	$30,288.23	[illegible]
4468	0025	JUPITER TOWN HALL	Town of Jupiter WTP Server Room Code Plus Safe Room & Generator	603.2 Feasibility Engineering and Design Studies - Safe Rooms	Approved	3/25/2021		$44,395.47	$0.00	$0.00	$44,395.47	[illegible]
4468	0027	Lake Park	Town of Lake Park Lake Park Harbor Marina Drainage	603.1 Feasibility Engineering and Design Studies	Approved	3/25/2021		$38,435.45	$0.00	$0.00	$38,435.45	[illegible]
4468	0030	Riviera Beach	City of Riviera Beach Lift Stations Generators	5012 Generators - Regular	Approved	9/20/2021		$273,077.50	$0.00	$10,843.75	$35,721.25	[illegible]

This report will be released to the media via the county's Public Affairs Department, and posted on the Division of Emergency Management's website.

Annex 2: Media Release example for LMS Meetings

LMS Working Group Meeting: Media Release Distributed on November 30, 2021.



Action Plan and Recommendations Municipal

Integration of Mitigation Measures

The following section identifies how the participating municipalities have incorporated mitigation into their planning processes, policies and/or ordinances. The municipalities continuously strive to expand and improve upon their mitigation measures as illustrated below and with the extensive listing of mitigation projects identified in Appendix E. The list below also represents the municipalities and agencies that are expected to adopt the LMS2024.

Municipality	*Resolution*	*Date LMS Adopted*
Palm Beach County (unincorporated)	R2014-1968	December 16, 2014
City of Atlantis	14-29	November 19, 2014
City of Belle Glade	2014-3130	December 1, 2014
City of Boca Raton	133-2014	November 25, 2014
City of Boynton Beach	R14-110	November 5, 2014
Town of Briny Breezes	2014-30	November 20, 2014
Town of Cloud Lake	2014-07	November 13, 2014
City of Delray Beach	67-14	December 9, 2014
Town of Glen Ridge	2014-3	November 5, 2014
City of Green Acres	2014-31	November 17, 2014
Village of Golf	2014-12	November 19, 2014
Town of Gulf Stream	14-17	December 12, 2014
Town of Haverhill	2014-11	November 13, 2014
Town of Highland Beach	14-009R	December 2, 2014
Town of Hypoluxo	14-439	November 19, 2014
Town of Juno beach	2014-05	December 10, 2014
Town of Jupiter	2-15	January 20, 2015
Jupiter Inlet Colony	2014-10	December 8, 2014
Town of Lake Clarke Shores	14-28	November 6, 2014
Town of Lake Park	01-01-15	January 7, 2015
City of Lake Worth Beach	05-2015	January 6, 2015
Town of Lantana	R-14-2014	November 24, 2014
Town of Loxahatchee Groves	2015-07	January 26, 2015
Town of Manalapan	4-2014	September 23, 2014
Town of Mangonia Park	2014-13	December 2, 2014
Village of North Palm Beach	2014-85	November 13, 2014
Town of Ocean Ridge	2014-16	December 1, 2014
City of Pahokee	2014-53	November 25, 2014
Town of Palm Beach	2-2015	January 13, 2015
City of Palm Beach Gardens	70-2014	December 4, 2014
Town of Palm Beach Shores	R-17-14	December 15, 2014
Village of Palm Springs	2014-66	December 11, 2014

Village of Royal Palm Beach	14-43	November 20, 2014
City of Riviera Beach	10-15	January 21, 2015
City of South Bay	44-2014	November 18, 2015
Town of South Palm Beach	02-2014	January 13, 2015
Village of Tequesta	7-15	January 26, 2015
Village of Wellington	R2014-67	January 13, 2015
City of West Palm Beach	2-15	January 5, 2015
South Florida Water Management District	Board Approval	December 14, 2014
Indian Trail Management District	Board Approval	January 12, 2015
Northern Palm Beach Improvement District	Board Approval	December 15, 2014

Incorporation of Existing Policies, Ordinances, and Programs

Since the implementation of the LMS, the PBC LMS Coordinator and Chairman of the LMS Working Group along with Working Group members were invited to participate and assist by reviewing municipality and water district local policies, ordinances, and programs to better identify areas where areas of mitigation principals may be aligned. Numerous planning agencies and documents were reviewed and addressed the needs of mitigation actions and recommended how often the local plans may be reviewed or updated into planning factors to assess countywidehazards and risks. They remain successful to discuss, review, and identify areas were PBC as a whole community can be more effective approach to mitigation and resiliency.

The incorporation of municipality and district plans includes reviews of the following:

- Southeast Florida Regional Climate Action Plan
- Palm Beach County Comprehensive Plan (PBC Planning, Zoning, and Building)
- Palm Beach County Comprehensive Emergency Management Plan
- Florida Administrative Code 9J-2.0256

Periodic reviews and revisions of the local government ordinances, policies, and programs must occur no less than once every other year. Each municipality that has not yet done so should adopt a floodplain management ordinance and participate in the Community Rating System (CRS) program. At the present time, the PBC LMS serves as a Floodplain Management Plan when adopted by a municipality or water management district.

After review of the activities in CRS Step 7, located in Sections 3.1.4 and appendices E, J, and L, the committee recommends the following actions and assigns the following priorities for those actions:

Activity	Recommended Action	How to Fund	Responsible Party	Priority	Timeline
Prevention	Each jurisdiction re-evaluate their	None needed	Jurisdictional building officials	1	Before the next LMS

	building code with the goal of ensuring a minimum 18-inch freeboard in place, with the goal of raising this requirement to 24 inches in the near future to prevent floods		and CRS program managers		update cycle
Prevention	Each jurisdiction re-evaluate their storm water management regulations and adjust (as necessary) the overall volume of future development/ redevelopment of storm water drains to handle increasing amounts of water as seen through frequent storms during the wet season and the potential for sea-level rise through the year 2040 to prevent floods	HMGP and FMA grants, Capital Improve funds	Jurisdictional storm water managers and engineering departments	2	Before the next LMS update cycle
Prevention	Each jurisdiction should review their comprehensive or land-use plan and consider the effects of more frequent storms and sea-level rise in future editions in order to avoid flooding conditions	None needed	Jurisdictional administrators and land-use experts	3	By the next update of these documents
Property Protection	Each jurisdiction should put procedures in place to sponsor private	HMGP, FMA, and PDM federal grant funding, as	Grants management in cooperation with jurisdictional	2	12/2028

	homeowners in their communities with repetitive loss or severe repetitive loss in obtaining grant funds for acquisition projects using available funding streams	well as HLMP state mitigation funds	legal and engineering departments		
Property Protection	Each jurisdiction should put procedures in place to sponsor private homeowners in their communities with repetitive loss and severe repetitive loss properties in obtaining grants for home elevation projects using available funding streams	HMGP, FMA, and PDM federal grant funding, as well as HLMP state mitigation funds	Grants management in cooperation with jurisdictional legal and engineering departments	1	12/2028
Natural Resource Protection	Each jurisdiction should inventory current natural areas and strive to acquire more areas to provide more natural beneficial flooding protection	Environment grants, FMA grants	Environmental department in conjunction with land-development /zoning boards	2	1/2028
Natural Resource Protection	Each jurisdiction should plan to strategically acquire natural lands around newly-identified neighborhoods during growth periods to allow for some natural protection against flooding	Environment grants, FMA grants	Environmental department in conjunction with land-development /zoning boards	1	12/2028

Emergency Services Activities	Each jurisdiction should acquire the capabilities offered by County DEM to allow for them to operate and function on the mass notification system within their jurisdictional boundaries to alert residents to all-hazards including flash flooding and hurricanes	No cost/free to municipalities within PBC	Municipal administrators, police chiefs, fire chiefs, emergency managers	2	12/2026
Emergency Services Activities	Each jurisdiction should participate in a minimum of one (1) annual exercise of emergency communications systems, with the most readily identifiable exercise being the annual statewide hurricane exercise (HURREX) to ensure communications capabilities during a flooding or any other hazard situation	None needed	Emergency Managers from each jurisdiction	1	Annually during the first week of May
Public Information Activities	Each jurisdiction should participate in a stakeholders (STK) event annually to maximize exposure of CRS and the NFIP to the citizens of their respective jurisdictions.	Minimal funding for handouts, information, and potential overtime/comp time for the event	CRS Coordinators from each jurisdiction, led by the PBC CRS who sets up the event annually	2	May/June Annually

Public Information Activities	Each jurisdiction should develop a Program for Public Information (PPI) to maximize public information coordination and activities related to CRS/flooding in their respective jurisdiction	No funding needed other than the members time to attend meetings and develop a PPI	CRS Coordinators from each jurisdiction	3	6/2027
Public Information Activities	Each jurisdiction should maintain a supply of CRS materials/handouts for use in all public outreach events, including information on hurricane/flood preparedness, NFIP, evacuation zones, and mass notification systems.	General funds or a small grant for printing costs of any localized handouts. FEMA handouts are available for free	CRS Coordinator from each jurisdiction in cooperation with their public information or public affairs department	1	12/2026

**Priorities are listed 1 – 3 depending on availability of funds and staffing*

Appendix K: Mitigation Assessment Teams (MATs)

Should PBC be impacted by a natural disaster deemed by FEMA to be of national significance, teams of technical specialists, referred to as Mitigation Assessment Teams (MATs), might be mobilized by FEMA, in conjunction with State and local officials, to conduct on-site qualitative engineering analyses to assess damage to government offices, homes, hospitals, schools businesses, critical facilities and other structures and infrastructure. The purpose of the assessment would be to determine the causes of structural failures (or successes) and to evaluate the adequacy of local building codes, practices, and construction materials for the purpose of improving future performance. They also might use the opportunity to review the effectiveness of previous mitigation projects.

Most frequently, MATs would be mobilized by FEMA's Directorate in response to joint federal,state, and local requests for technical support.

The technical make-up of MATs will depend largely on the nature and extent of damage incurred.Disciplines most commonly represented are likely to include: civil and coastal engineering, hydraulics, architecture, construction, and building code development and enforcement. If the damage is severe, representatives from FEMA Headquarters, Regional Office engineers, representatives from other Federal agencies and academia, and experts from the design and construction industry may also participate. State representatives would be dispatched by the FDEM Mitigation Bureau. The County would be expected to provide local team members and support services as defined below.

At the county level, during activations, the Operations Section Chief will be responsible for coordinating with the Logistics Section to arrange for local personnel, equipment, vehicles, data,and other resources necessary to support MAT assessments. Once staffed and equipped, MAT activities will be closely supported by the Damage Assessment and Impact Assessment Units of the Operations Section under the direction of the Operations Section Chief. Most likely FEMA and State representatives will bring personal resources such as laptop computers, cell phones, GPS, etc. with them in their Go Bags, however, backup inventories and sources for local resourceswill be maintained.

According to NIMS/ICS task force guidelines, federal and state MATs may choose to coordinatetheir activities with local law enforcement homeland security units who commonly perform critical infrastructure and key resource (CI/KR) field assessments within the County. This temporary disaster response task force may also include special operations personal from the fireservice as necessary. Non-sensitive information from local law enforcement's established database will be shared to the fullest extent possible with the MATs. Any exchange of informationassociated with this initiative will limited so as not to compromise local law enforcement's tacticalor strategic capabilities or the region's efforts in CI/KR programs in support of the National Infrastructure Protection Plan (NIPP).

Lists of needed resources will be prepared by the Operations Manager and given to the LogisticsManager who will be responsible for maintaining the inventories at the EOC or other PBC facilities and ensuring equipment is secured, available, and ready for deployment. Access to special or emergency resources beyond the working inventory, may be available through the Purchasing Unit, through the ESF18 (Business & Industry) functions at the regional and state levels, through WebEOC source lists, or through private sector partners party to the Business Continuity Information Network (BCIN). The BCIN is a web-based service available to local businesses, county emergency management, and organizations that assist

businesses to gather andshare critical information that support continuity efforts before, during and after a disaster. Available year round as a public service, this trusted, business-to-business, community network provides participating companies a tool to track their key employees and supply chain status, andlocate needed recovery goods and services.

The County will provide appropriate public sector and private sector technical, operational, logistical, administrative, and planning expertise necessary to support the mitigation assessment mission. The Logistics Section will maintain lists of emergency contacts.

Depending on the geographic distribution and severity of damage throughout the PBC, the MATmight establish its base(s) of operation at the EOC or at sites near any or all of the six EmergencyOperating Areas (EOAs).

The MATs may work in conjunction with Damage Assessment Teams or independently, based on need, time priorities and the availability of State and FEMA MAT personnel.

The mission of the MATs is to learn exactly what happened and why, and how to reduce disasterdamage in the future. Key questions include:

- How did buildings perform?
- Did winds exceed building codes?
- Did flood damages go beyond special flood hazard areas?
- Were building codes followed and enforced?
- Were construction materials sufficient to withstand wind and water damages?
- Were protective measures such as shutters used?
- Were local, State, and Federal building standards and ordinances sufficient?

PBC is the largest county by area in the U.S. east of the Mississippi River. Most of its populationand development are heavily concentrated in the eastern corridor within 12 miles of the coastline.The County's emergency management planning is based on the assumption that the County maynot be serviced effectively by a single EOC location. Consequently, the County has been dividedinto six Emergency Operations Areas, each of which is equipped to function on its own before, during and after a disaster. Pre-equipped field response trailers are available for deployment yearround. Where lead times are sufficient, resources will be pre-staged. Mitigation assessment resources may not be available for all EOAs concurrently, in which case the Operations Section Chief will work with the MAT to identify priorities and will request additional resources through Logistics.

If available local personnel resources are insufficient, the County may be able to draw mutual aidsupport from neighboring counties on an as needed basis. The Logistics and Operations Sections may also coordinate with FDEM, as necessary and appropriate, to arrange for field support fromorganizations such as the International Code Council.

Based on a comprehensive analysis of assessment data compiled in the field, the teams will prepare recommendations regarding construction codes and standards, building design, and best practices that PBC, its municipalities and the construction industry can use to reduce future disaster damage. Throughout the process, the MAT will consult with partnering government agencies and supporting private sector

organizations to ensure consensus on each phase of the investigation, including methodology, data collection, and analysis. This will help to ensure the MAT's final recommendations represent the most current and best available data and technical expertise. Once consensus is reached, FEMA will issue a series of "Recovery Advisories" that will provide initial guidance on building issues and best practices that can be used in the reconstruction process. FEMA will also publish a comprehensive report that provides local decision makers with information and detailed technical recommendations for improving building construction and design, building code policy and enforcement, and mitigation activities that canlimit or eliminate damages in future disasters.

MAT observations and recommendations submitted to the LMS will provide a basis for future mitigation strategies, initiatives, and projects and the optimum uses of mitigation assistance funds.

The DEM recovery branch will provide oversight. The recovery and post-disaster coordinator from the recovery branch along with the LMS Coordinator will facilitate and coordinate the application process and serve as a primary communication link with funding agencies.

Public information will be coordinated through the Joint Information Center (managed by ESF- 14), based on cleared information provided by the MATs and Disaster Recovery Centers. Longer-term, information will be integrated into media releases, LMS and CRS outreach activities, publicpresentations, presentations at professional conferences, training curricula, etc.

Mitigation assessment activities are integral to assessing the mitigation program. DEM coordinates with the Inspections Section of the County's Building Department regarding these. Many of the 39 municipalities of the County have their own building departments, officials, and procedures and will be an important part of future procedure development processes. Several of these departments can draw from their damage assessment experiences following Hurricane Andrew in 1992, and their experiences following Hurricane Irma in 2017, which affected PBC. Organizations such as the PBC Builder's Association and the Building Code Advisory Board of PBC may also be consulted regarding these activities.

Appendix L: LMS Coordination and Documentation (Separate Appendix due to large volume of meeting minutes and sign-in sheets)

This appendix may be accessed by contacting The Palm Beach County Division of Emergency Management during business hours. This information is open to public inspection.

Appendix M: Critical Facilities (Separate Appendix due to exemption from disclosure pursuant to Florida Statute §119.071(3).

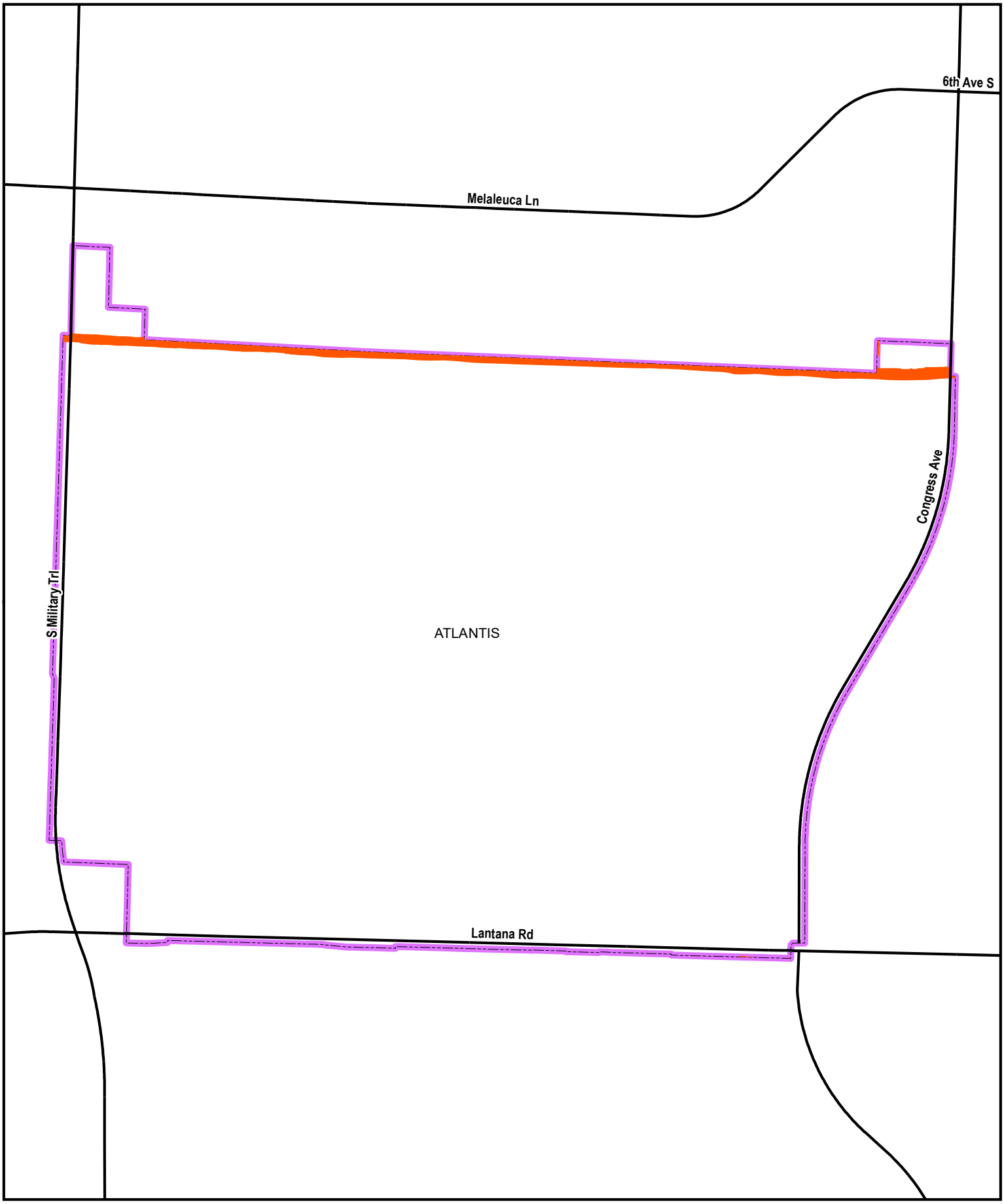
Appendix N: Flood Maps (FIRMS available at FEMA's website)

https://www.fema.gov/flood-maps/products-tools

Appendix O: Program for Public Information

Appendix N

Palm Beach County Local Mitigation Strategy 2024



Atlantis

Special Flood Hazard Area

City Boundary

0 0.055 0.11 0.165 Miles

Disclaimer:

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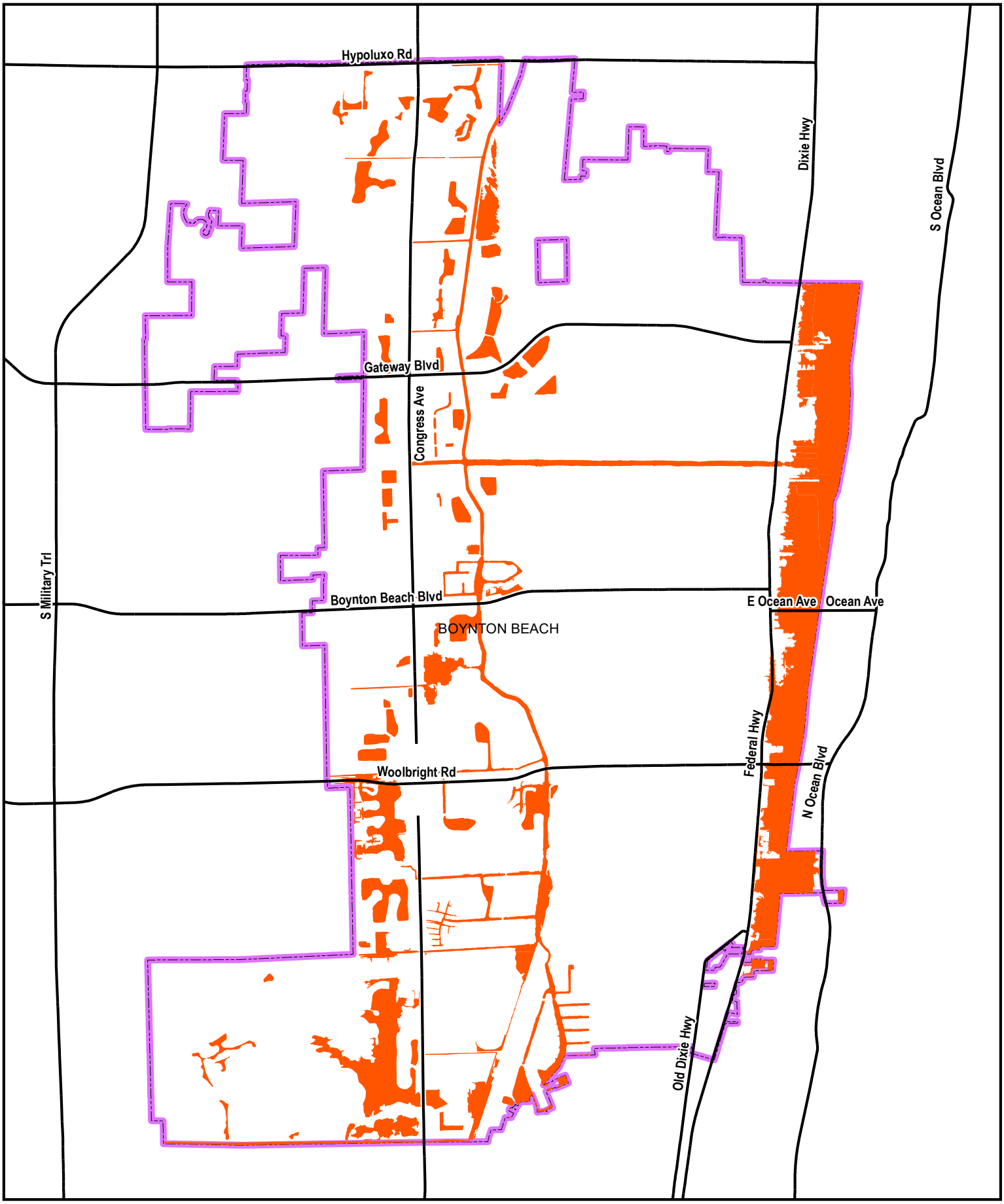
Palm Beach County

GIS Service Bureau

May 28, 2024



Boynton Beach

Special Flood Hazard Area

City Boundary

0 0.15 0.3 0.45 Miles

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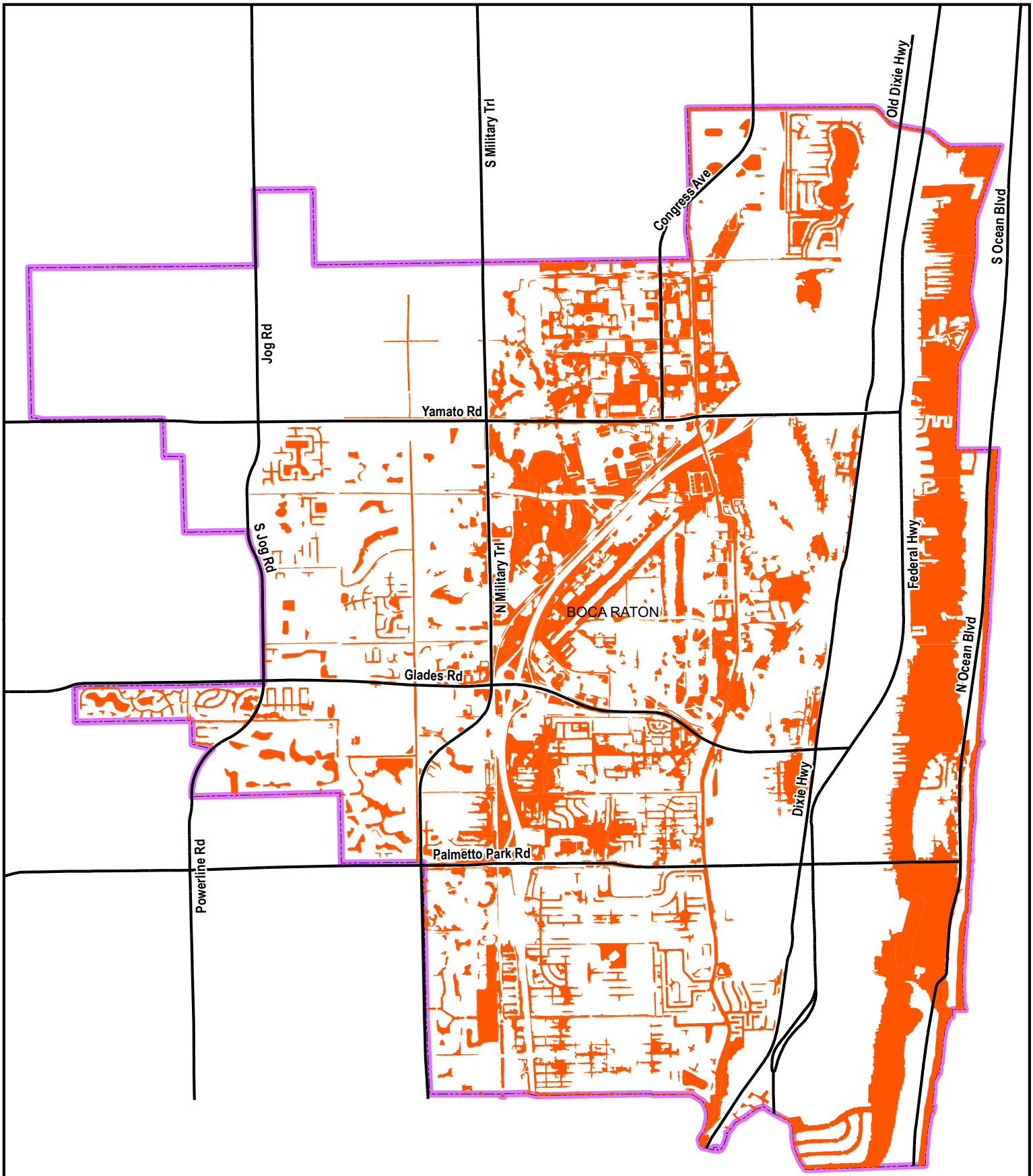
Palm Beach County

GIS Service Bureau

May 28, 2024



Boca Raton

Special Flood Hazard Area

City Boundary

0 0.2 0.4 0.6 Miles

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Palm Beach County

GIS Service Bureau

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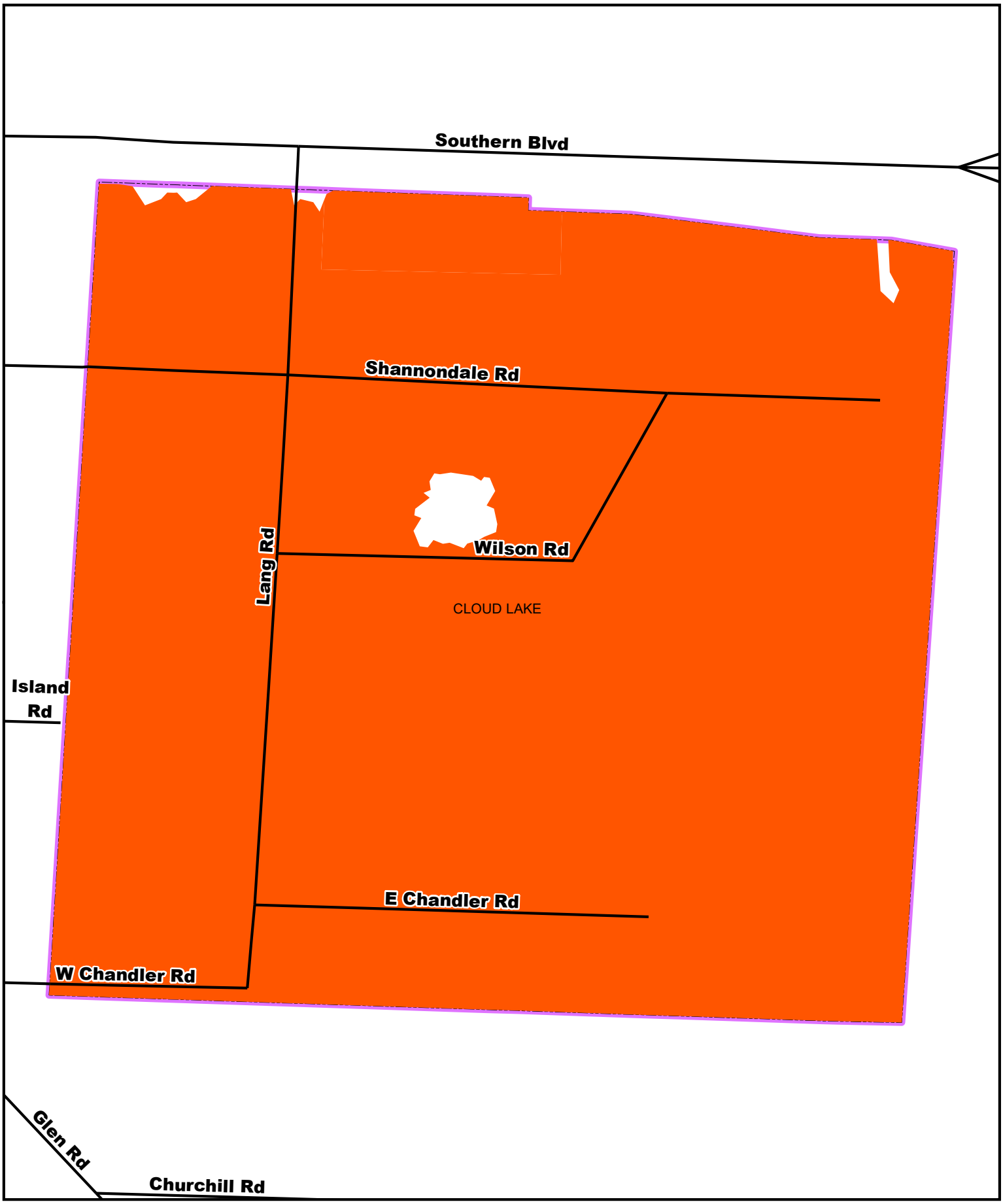

Cloud Lake

Special Flood Hazard Area

City Boundary

0 0.01 0.02 0.03 Miles

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Palm Beach County

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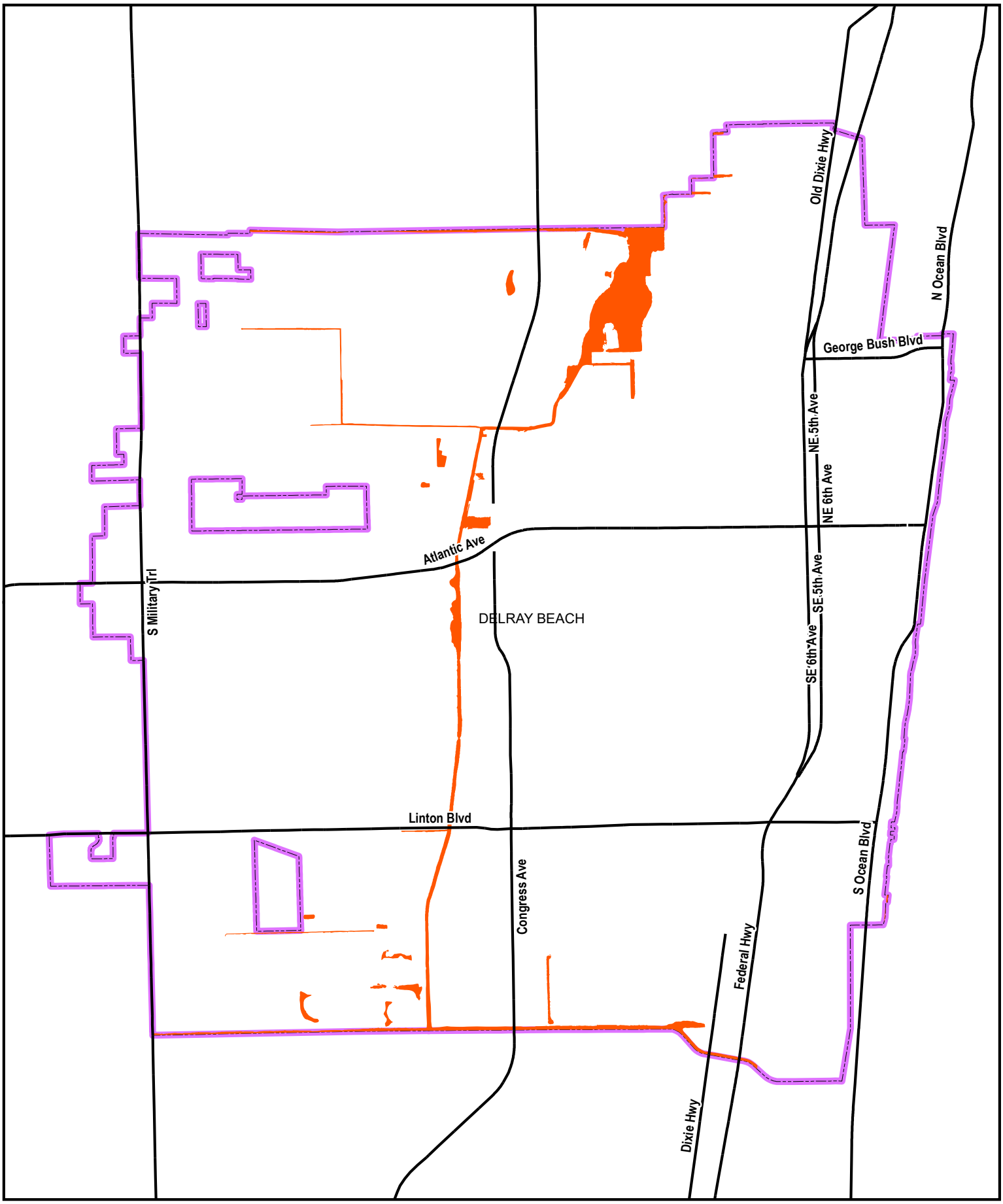

Delray Beach

Special Flood Hazard Area

City Boundary

0 0.15 0.3 0.45 Miles

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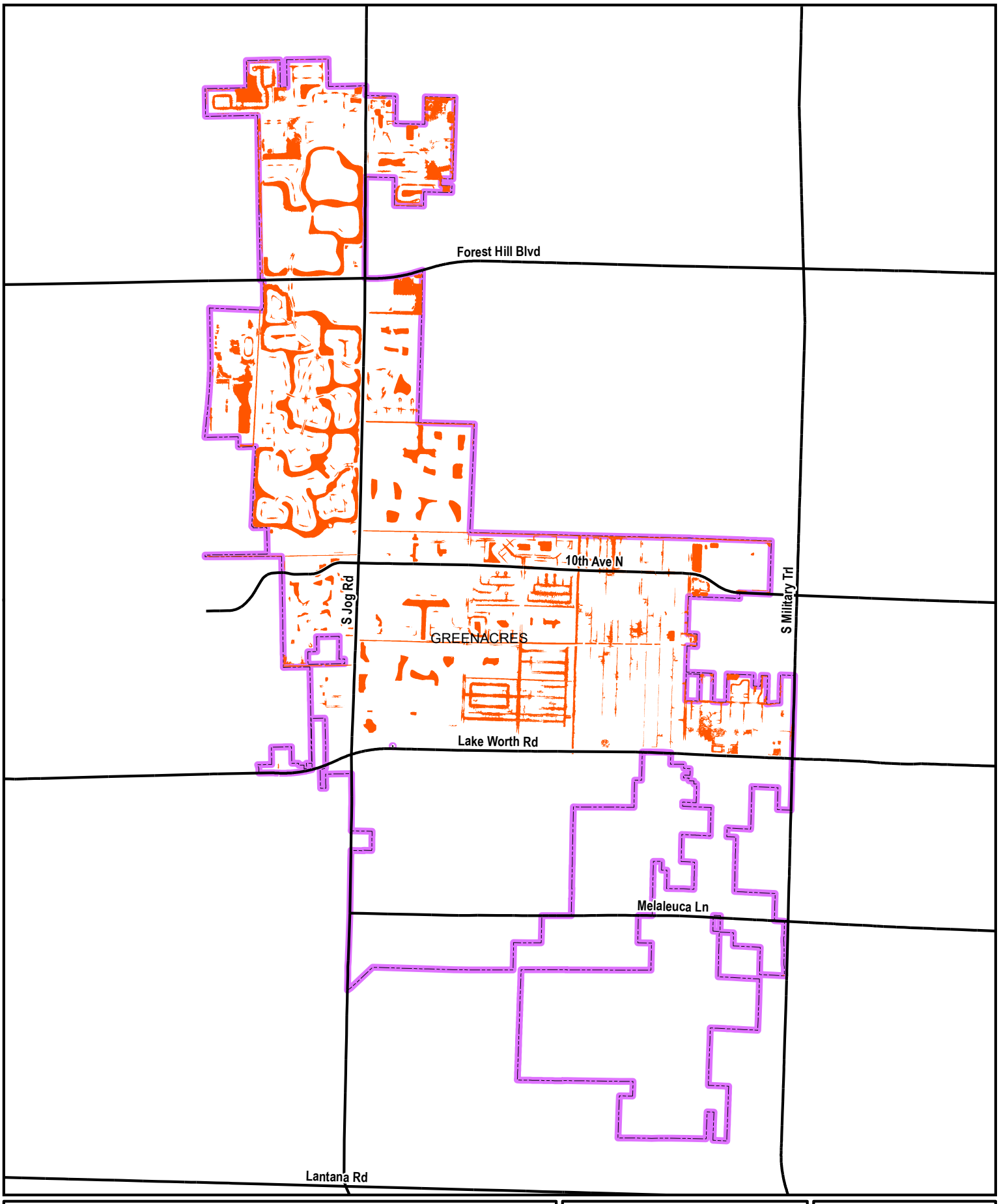

Greenacres

Special Flood Hazard Area

City Boundary

0 0.15 0.3 0.45 Miles

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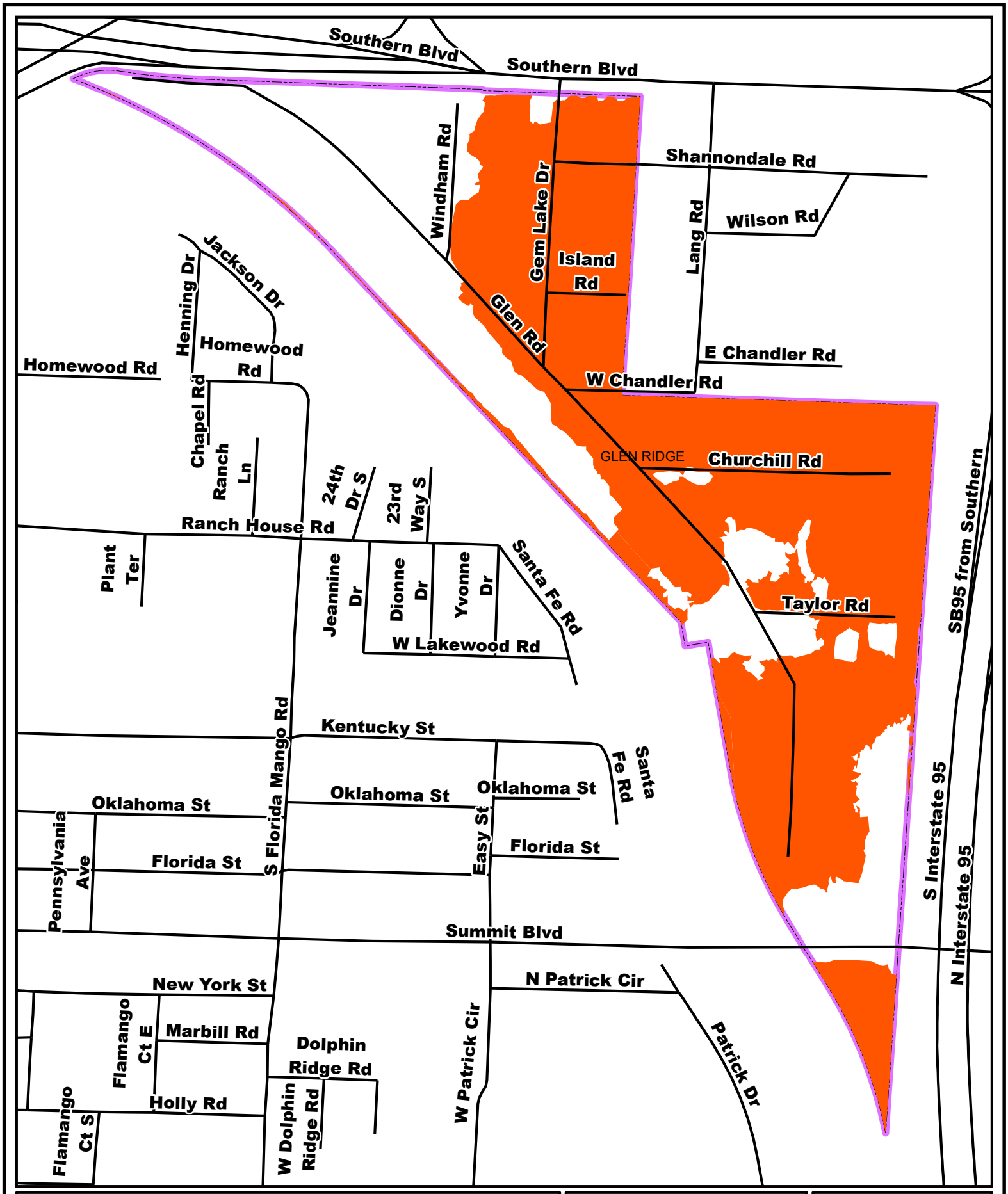

Glen Ridge

Special Flood Hazard Area

City Boundary

0 0.025 0.05 0.075 Miles

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Palm Beach County

GIS Service Bureau

May 28, 2024

Gulf Stream

Special Flood Hazard Area

City Boundary

0 0.06 0.12 0.18 Miles

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Palm Beach County

GIS Service Bureau

May 28, 2024

Highland Beach

Special Flood Hazard Area

City Boundary

0 0.09 0.18 0.27 Miles

N

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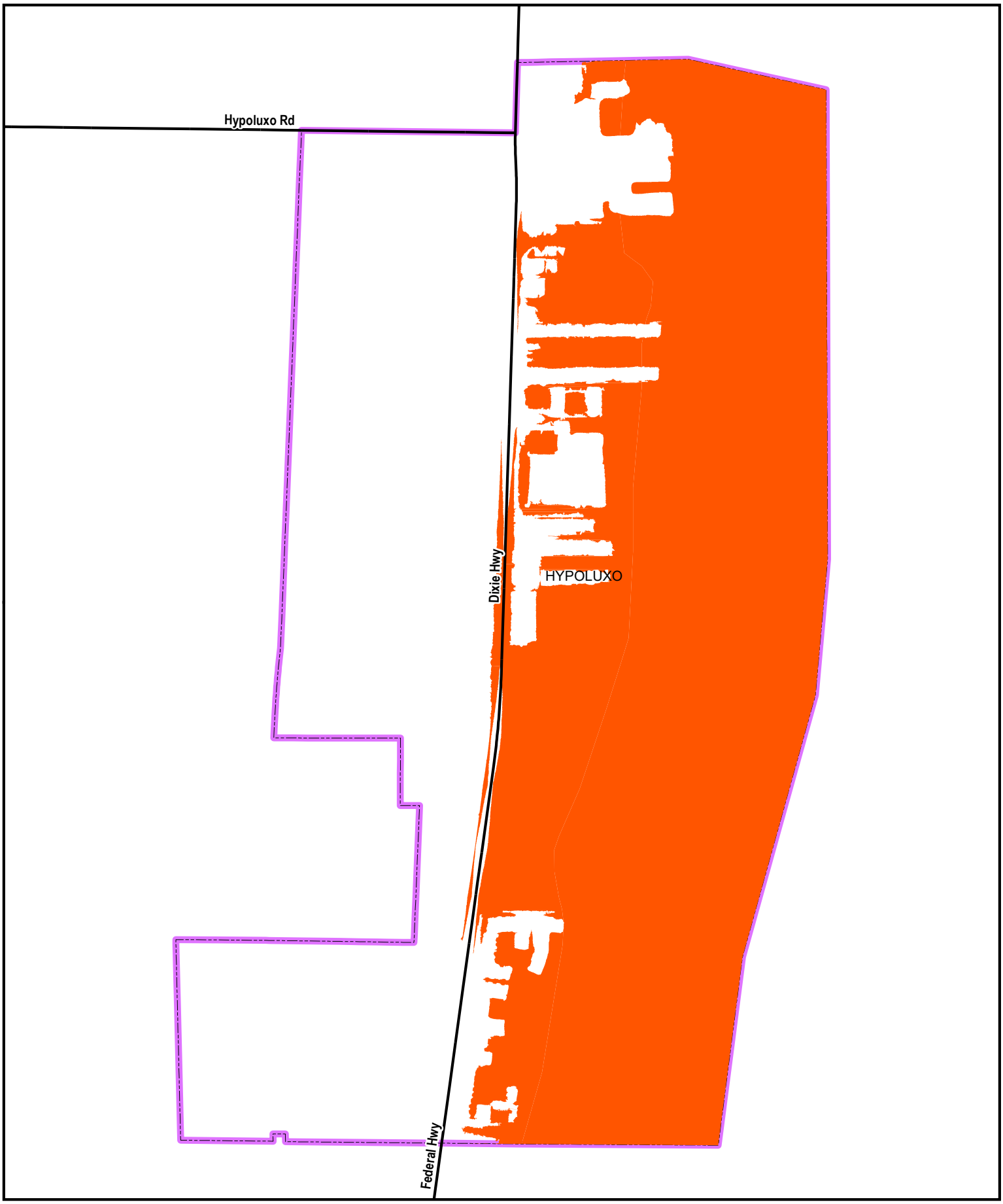

Hypoluxo

Special Flood Hazard Area

City Boundary

0 0.04 0.08 0.12 Miles

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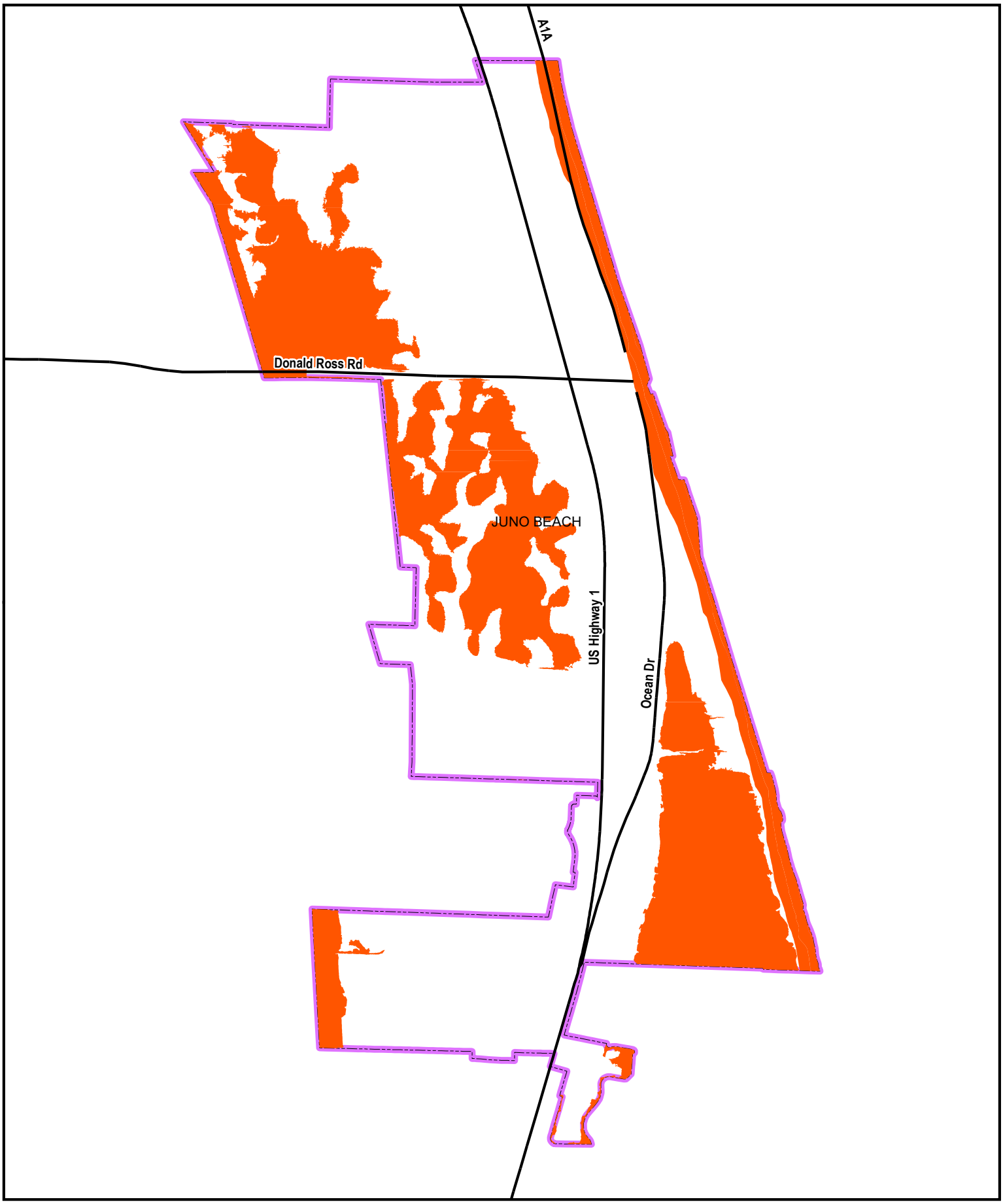

Juno Beach

Special Flood Hazard Area

City Boundary

0 0.085 0.17 0.255 Miles

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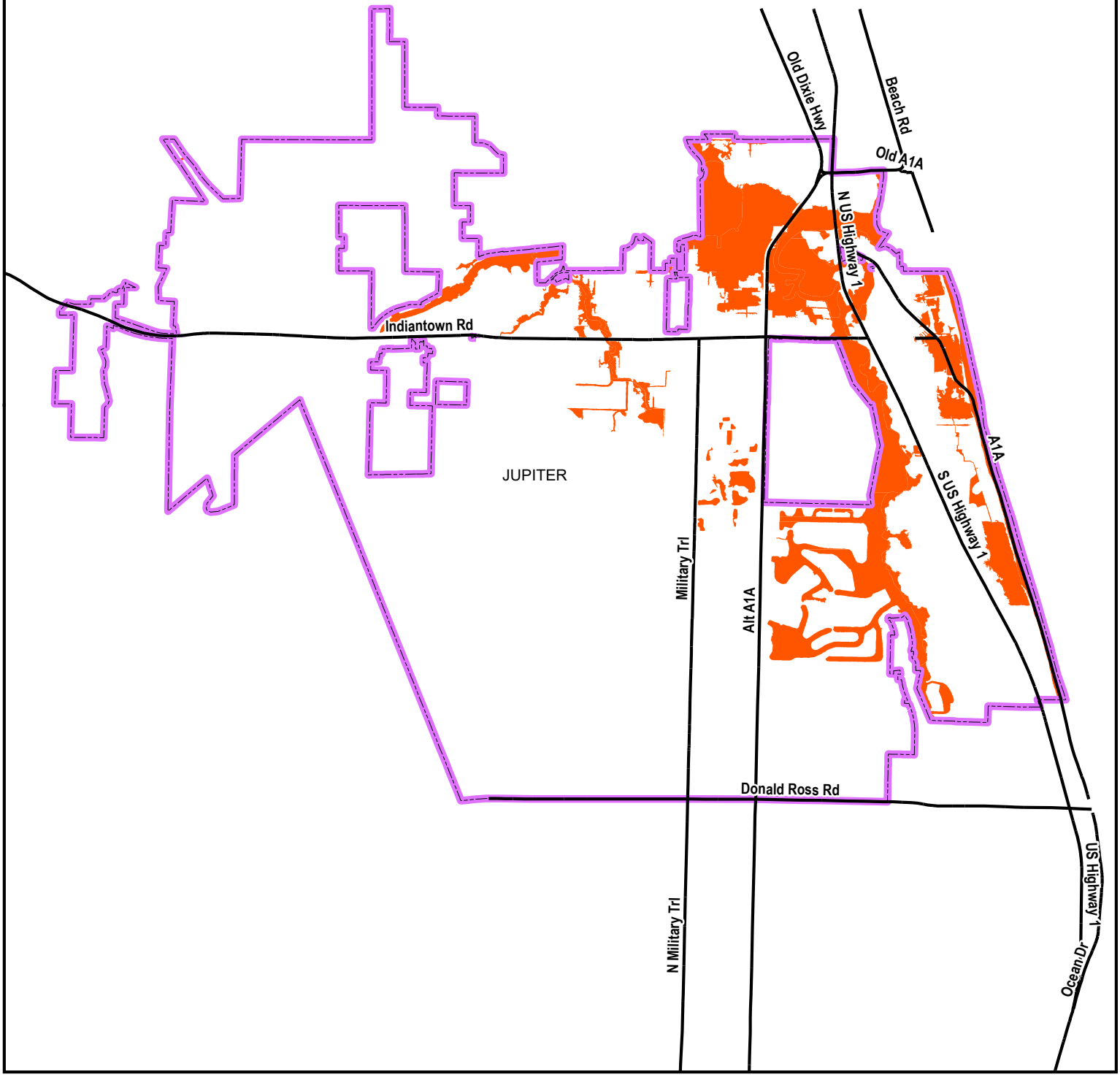

Jupiter

Special Flood Hazard Area

City Boundary

0 0.25 0.5 0.75 Miles

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Palm Beach County

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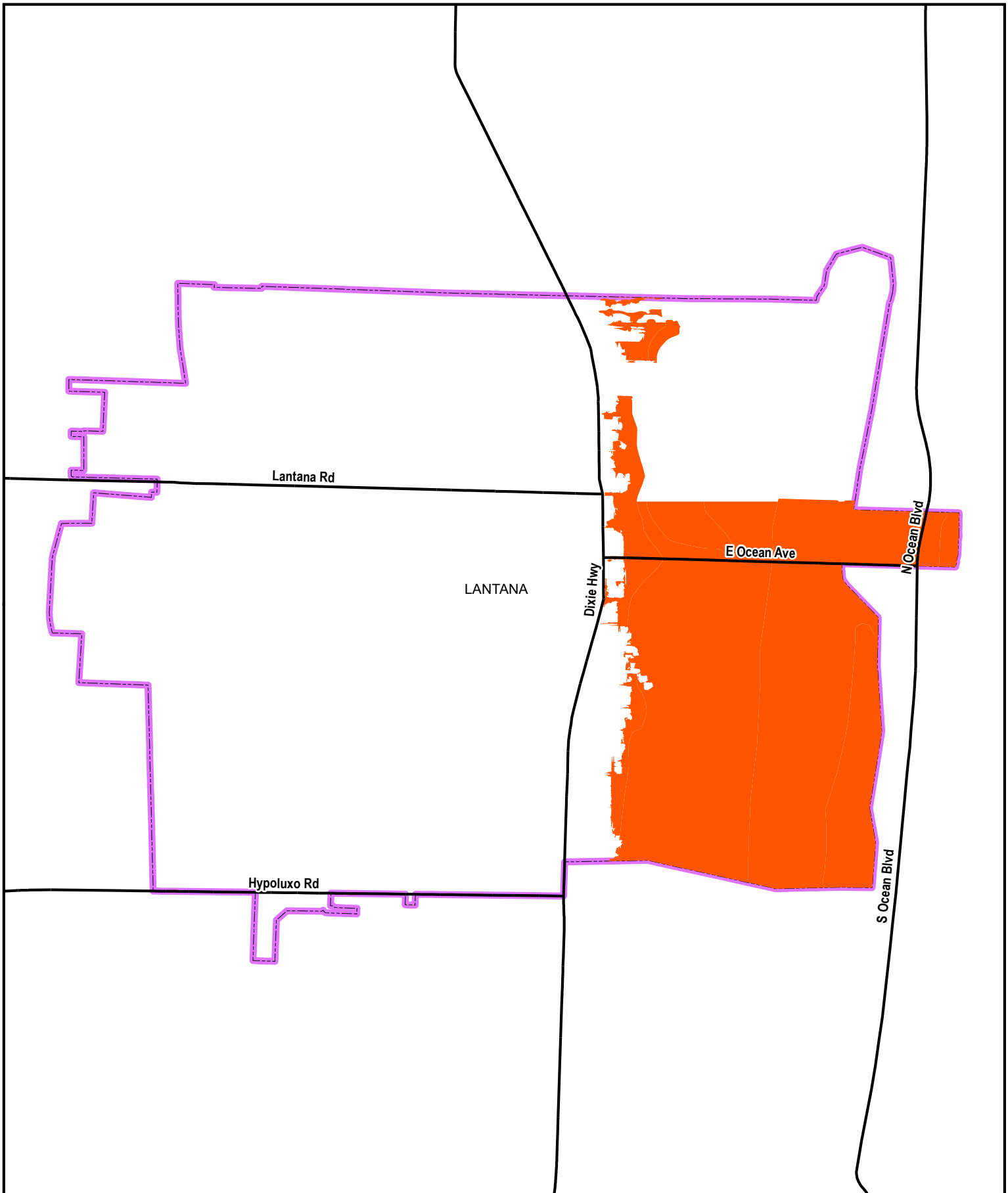

Lantana

Special Flood Hazard Area

City Boundary

0 0.085 0.17 0.255 Miles

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Palm Beach County

GIS Service Bureau

May 28, 2024

Lake Clarke Shores

Special Flood Hazard Area

City Boundary

0 0.055 0.11 0.165 Miles

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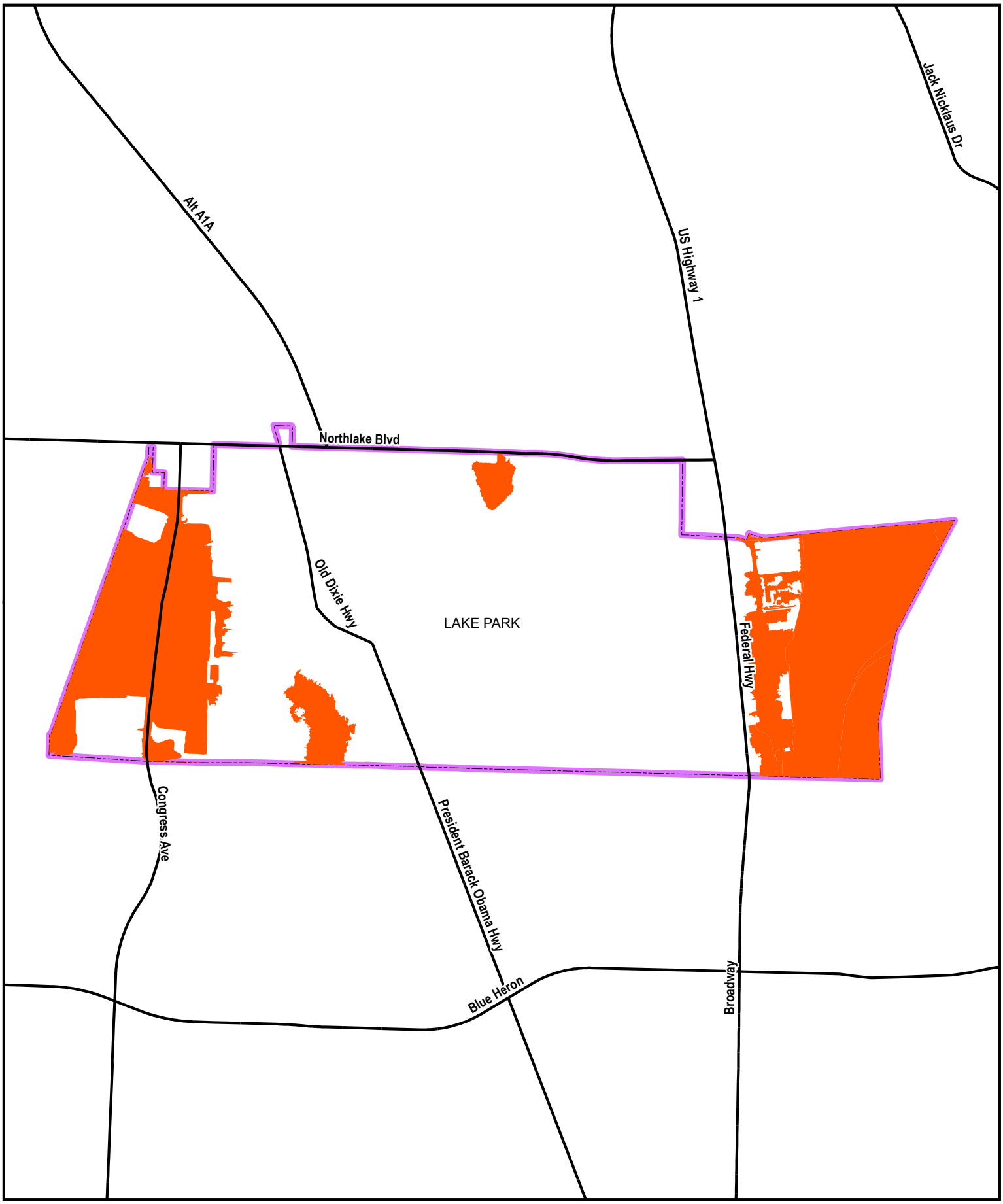
Palm Beach County

GIS Service Bureau

May 28, 2024



Lake Park

Special Flood Hazard Area

City Boundary

0 0.1 0.2 0.3 Miles

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Palm Beach County

GIS Service Bureau

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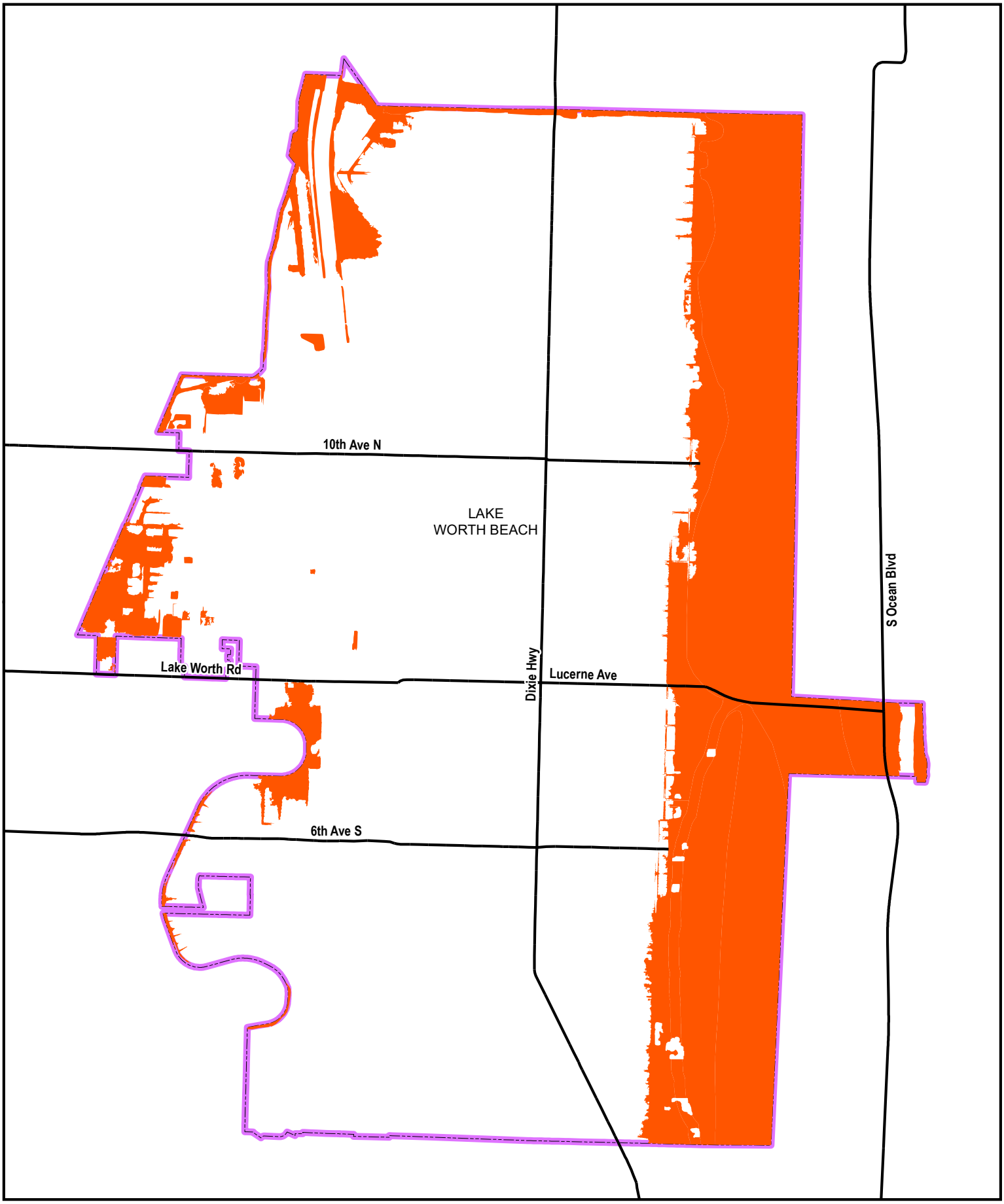

Lake Worth Beach

Special Flood Hazard Area

City Boundary

0 0.1 0.2 0.3 Miles

N

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Palm Beach County

GIS Service Bureau

May 28, 2024

Manalapan

Special Flood Hazard Area

City Boundary

0 0.08 0.16 0.24 Miles

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Palm Beach County

GIS Service Bureau

May 28, 2024

Mangonia Park

Special Flood Hazard Area

City Boundary

0 0.04 0.08 0.12 Miles

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Palm Beach County

GIS Service Bureau

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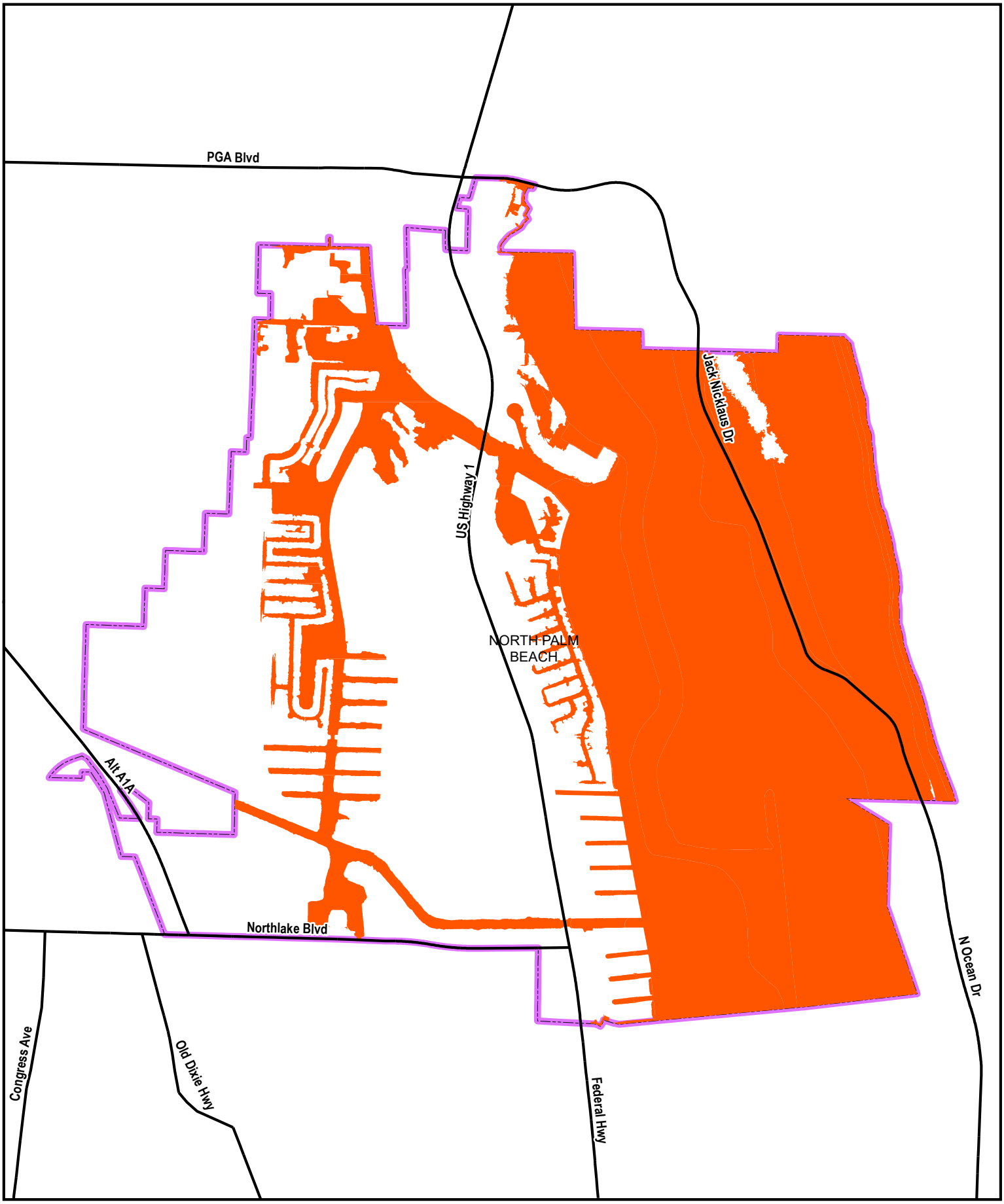

North Palm Beach

Special Flood Hazard Area

City Boundary

0 0.1 0.2 0.3 Miles

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Palm Beach County

GIS Service Bureau

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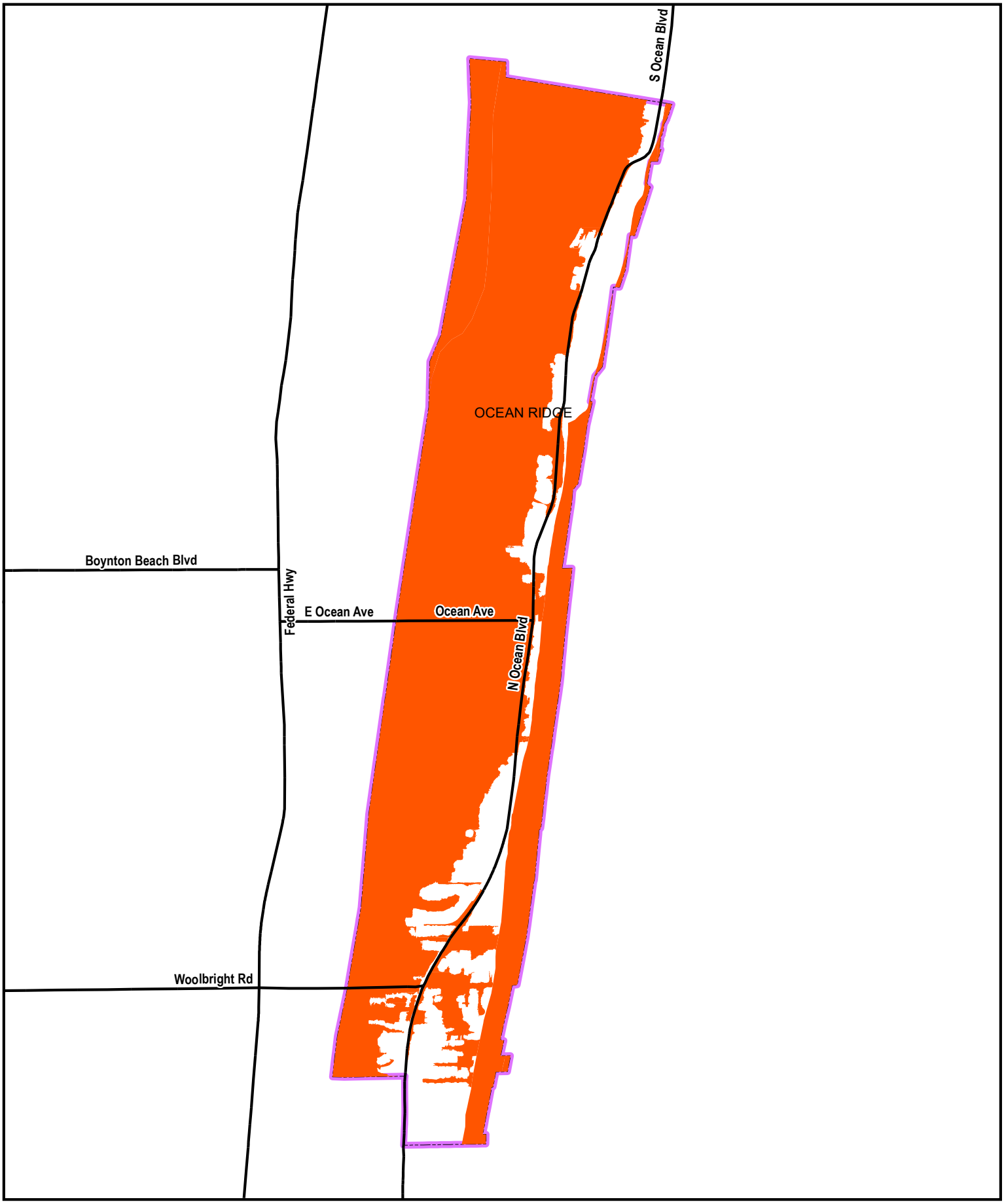

Ocean Ridge

Special Flood Hazard Area

City Boundary

0 0.08 0.16 0.24 Miles

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Palm Beach County

GIS Service Bureau

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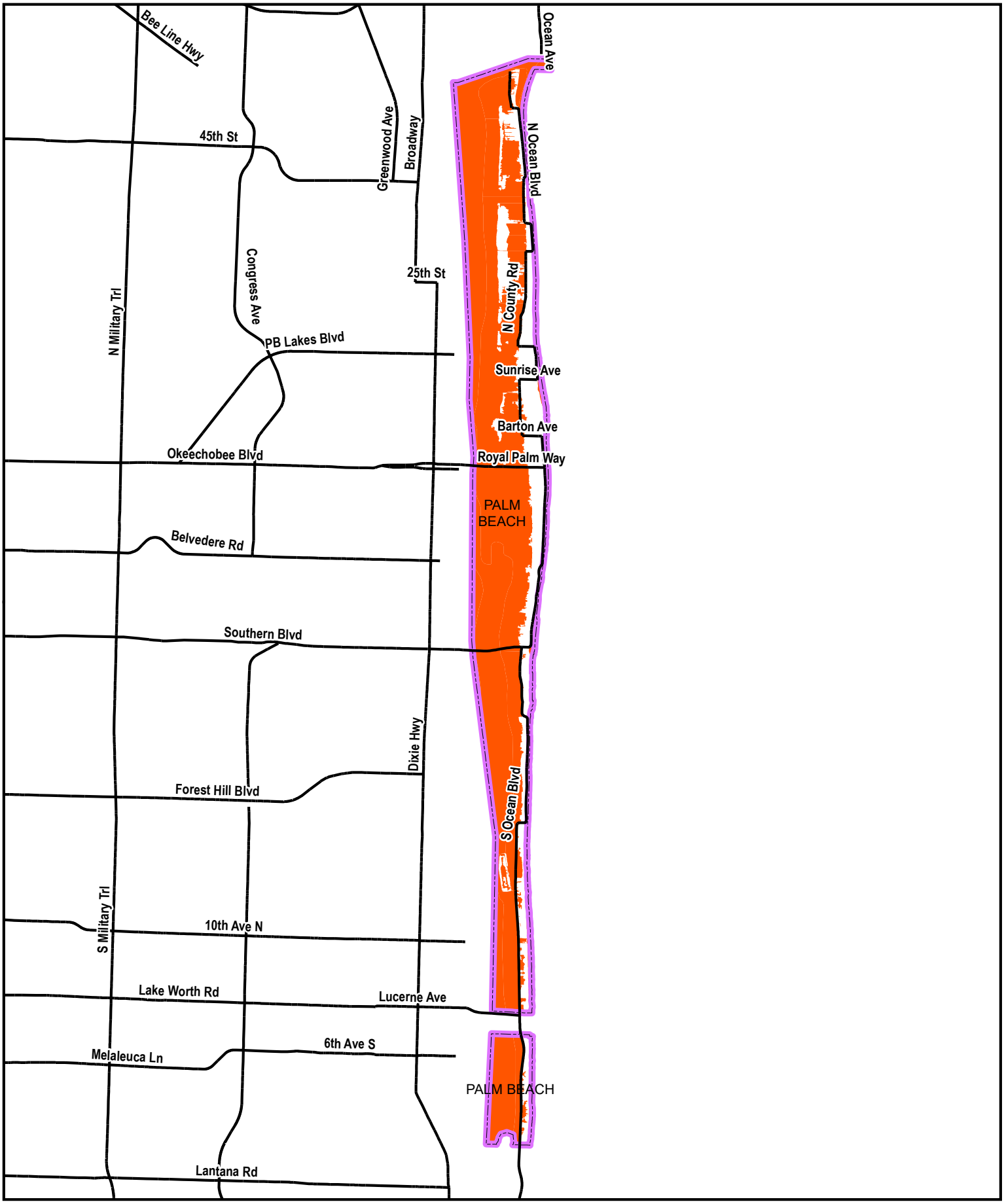

Palm Beach

Special Flood Hazard Area

City Boundary

0 0.35 0.7 1.05 Miles

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Palm Beach County

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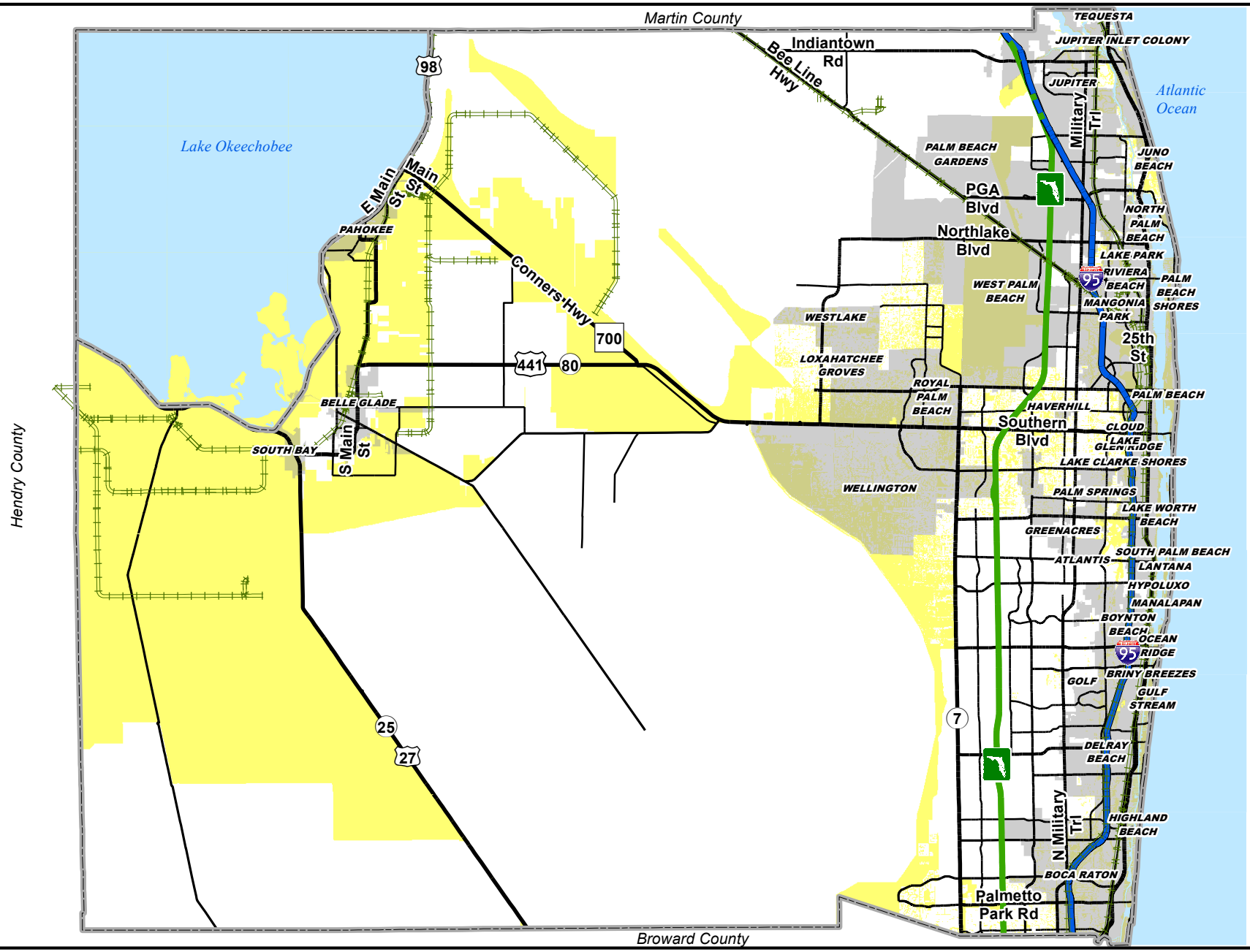

Special Flood Hazard

LMS Plan

- Special Flood Hazard Area
- Railroad
- City Boundary
- County Boundary

Miles
0 2 4 6

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Palm Beach County

GIS Service Bureau

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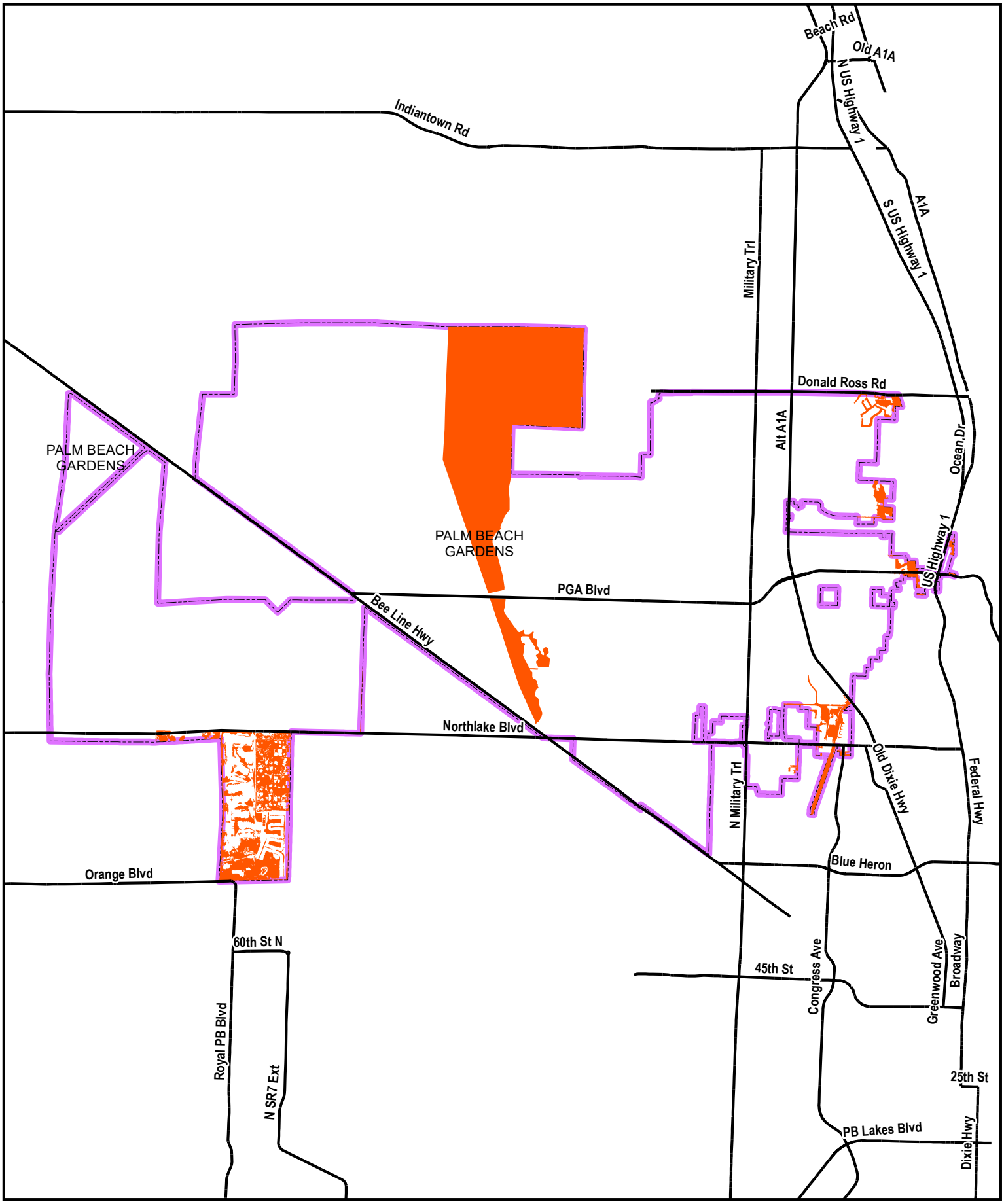

Palm Beach Gardens

Special Flood Hazard Area

City Boundary

0 0.45 0.9 1.35 Miles

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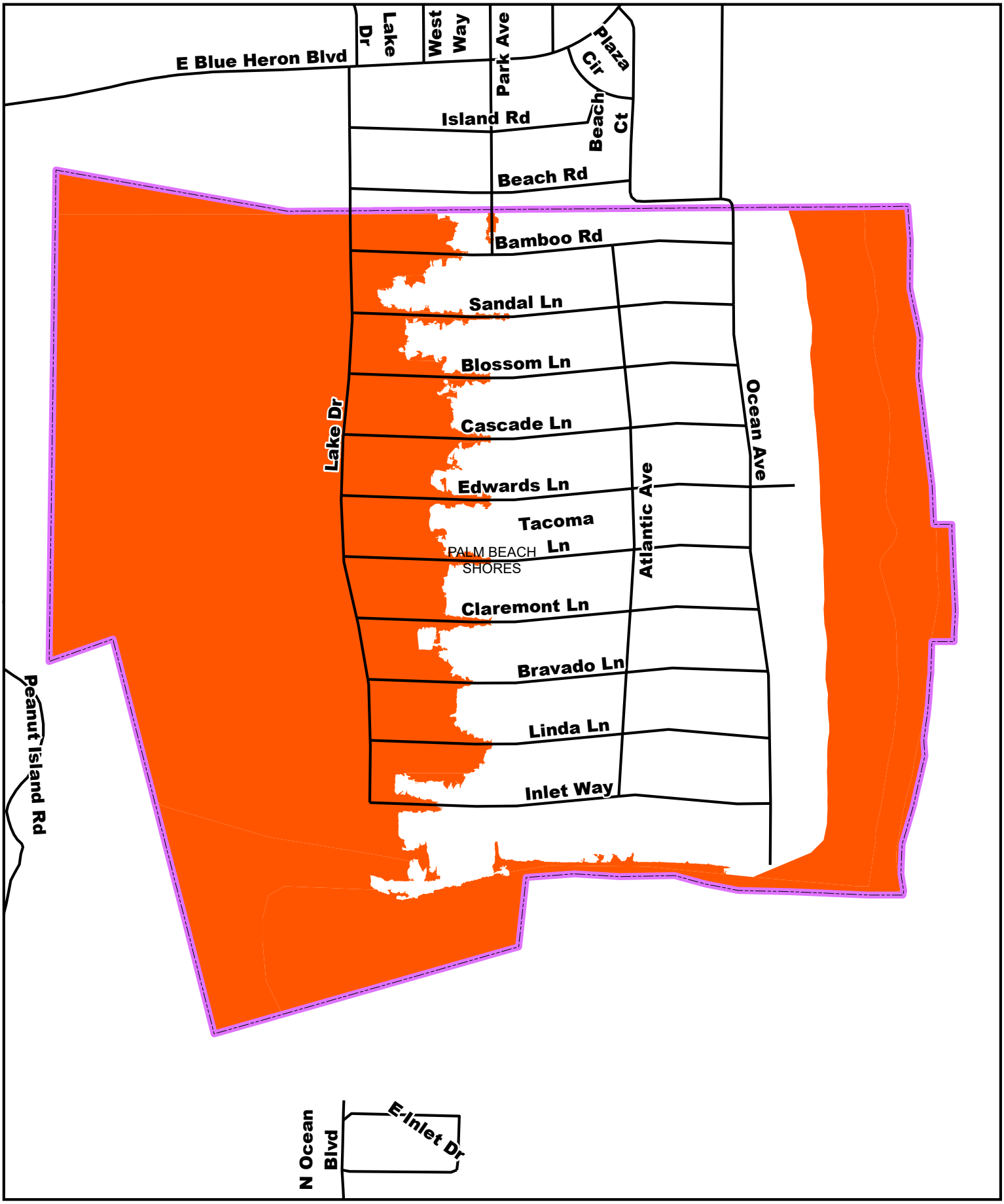

Palm Beach Shores

Special Flood Hazard Area

City Boundary

0 0.025 0.05 0.075 Miles

N

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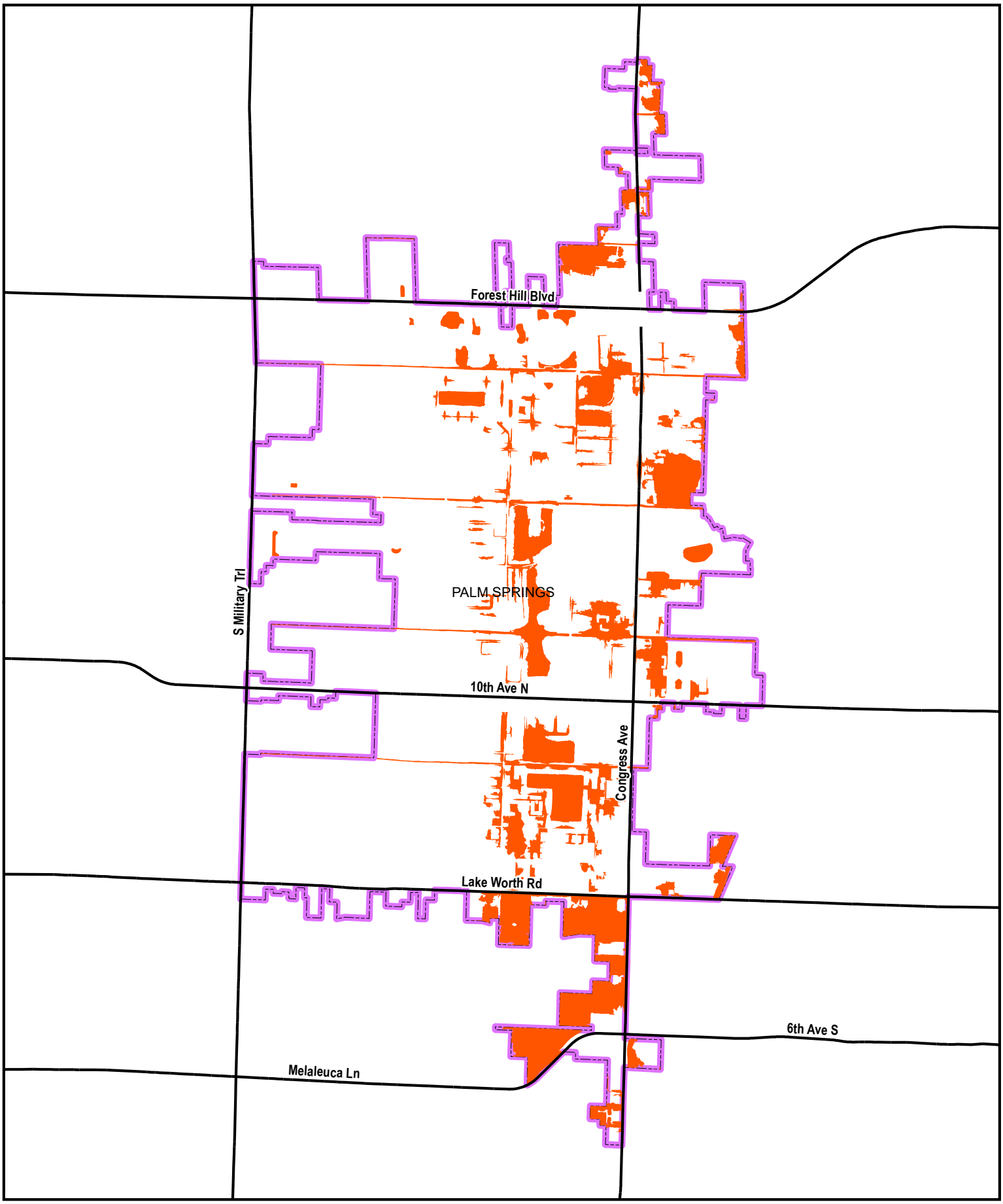

Palm Springs

Special Flood Hazard Area

City Boundary

0 0.1 0.2 0.3 Miles

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Palm Beach County

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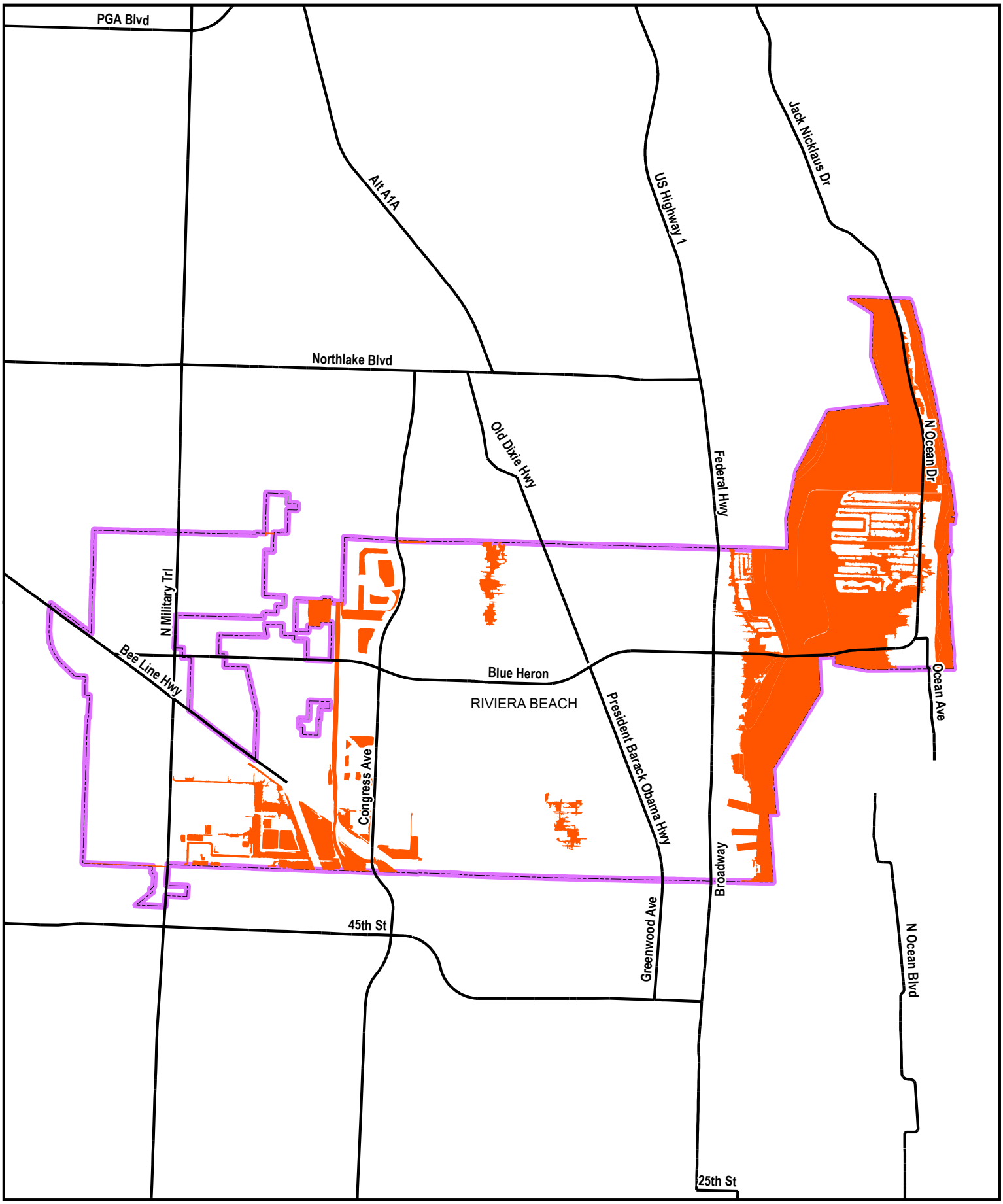

Riviera Beach

Special Flood Hazard Area

City Boundary

0 0.2 0.4 0.6 Miles

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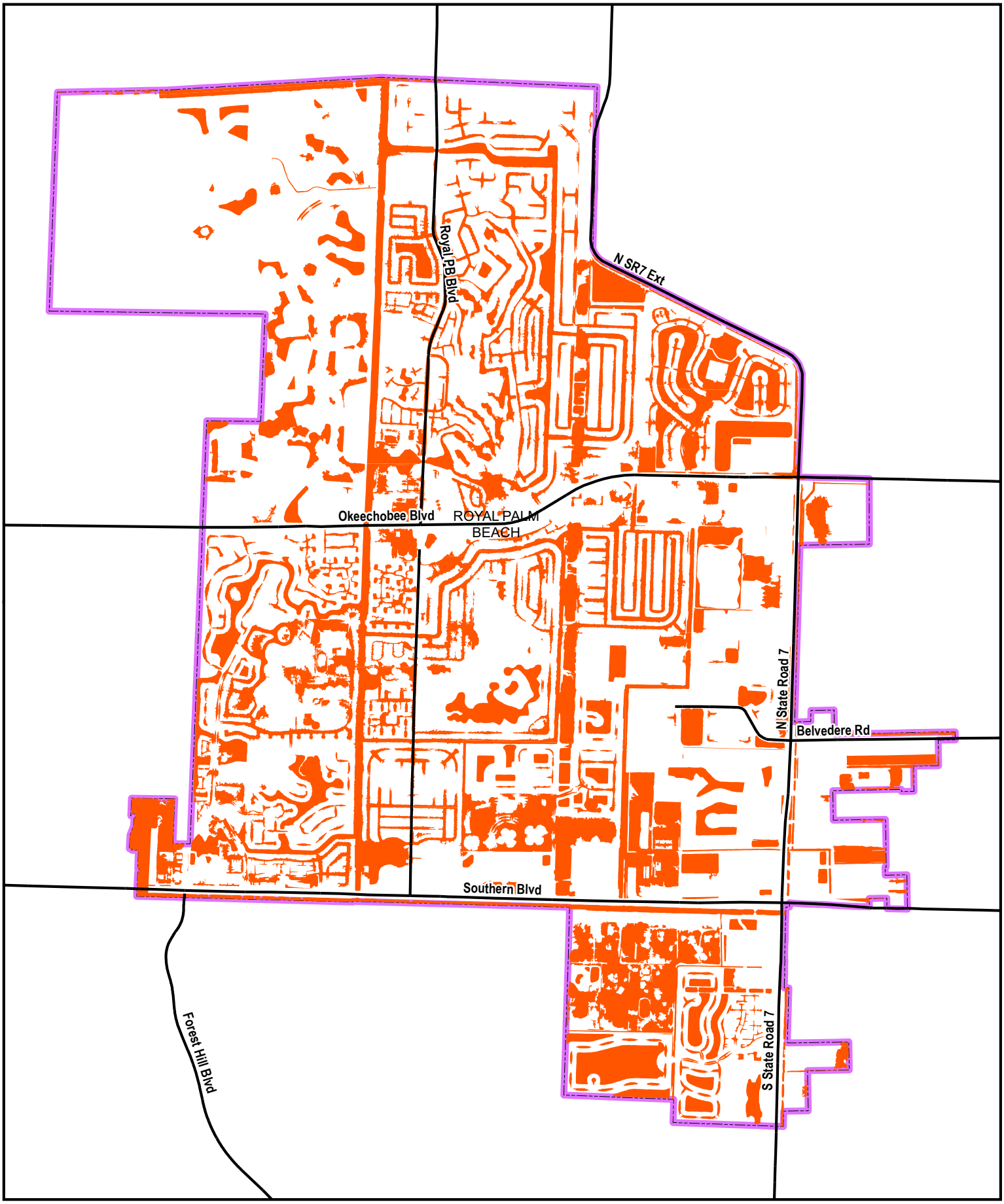

Royal Palm Beach

Special Flood Hazard Area

City Boundary

0 0.15 0.3 0.45 Miles

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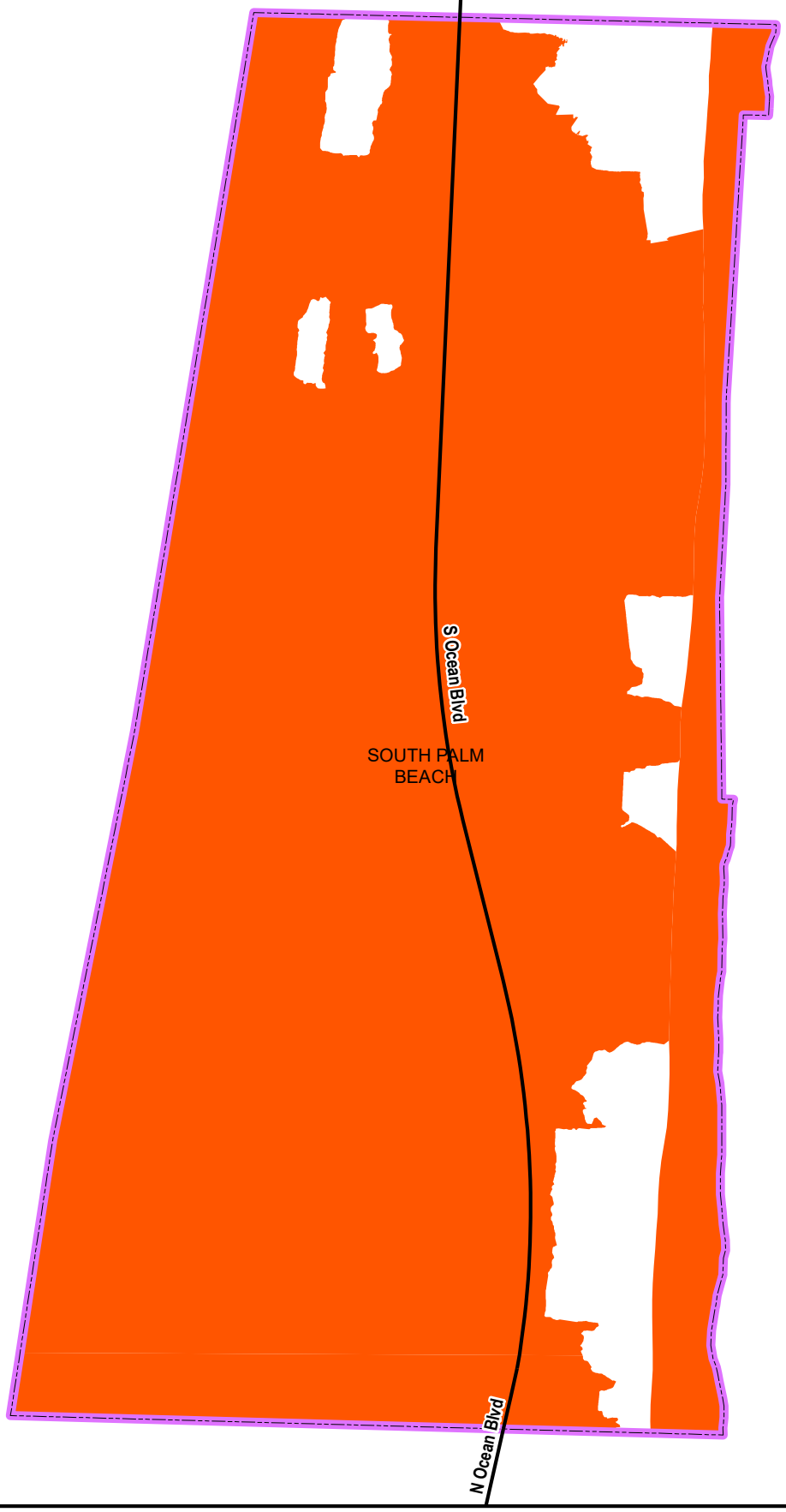

South Palm Beach

Special Flood Hazard Area

City Boundary

0 0.015 0.03 0.045 Miles

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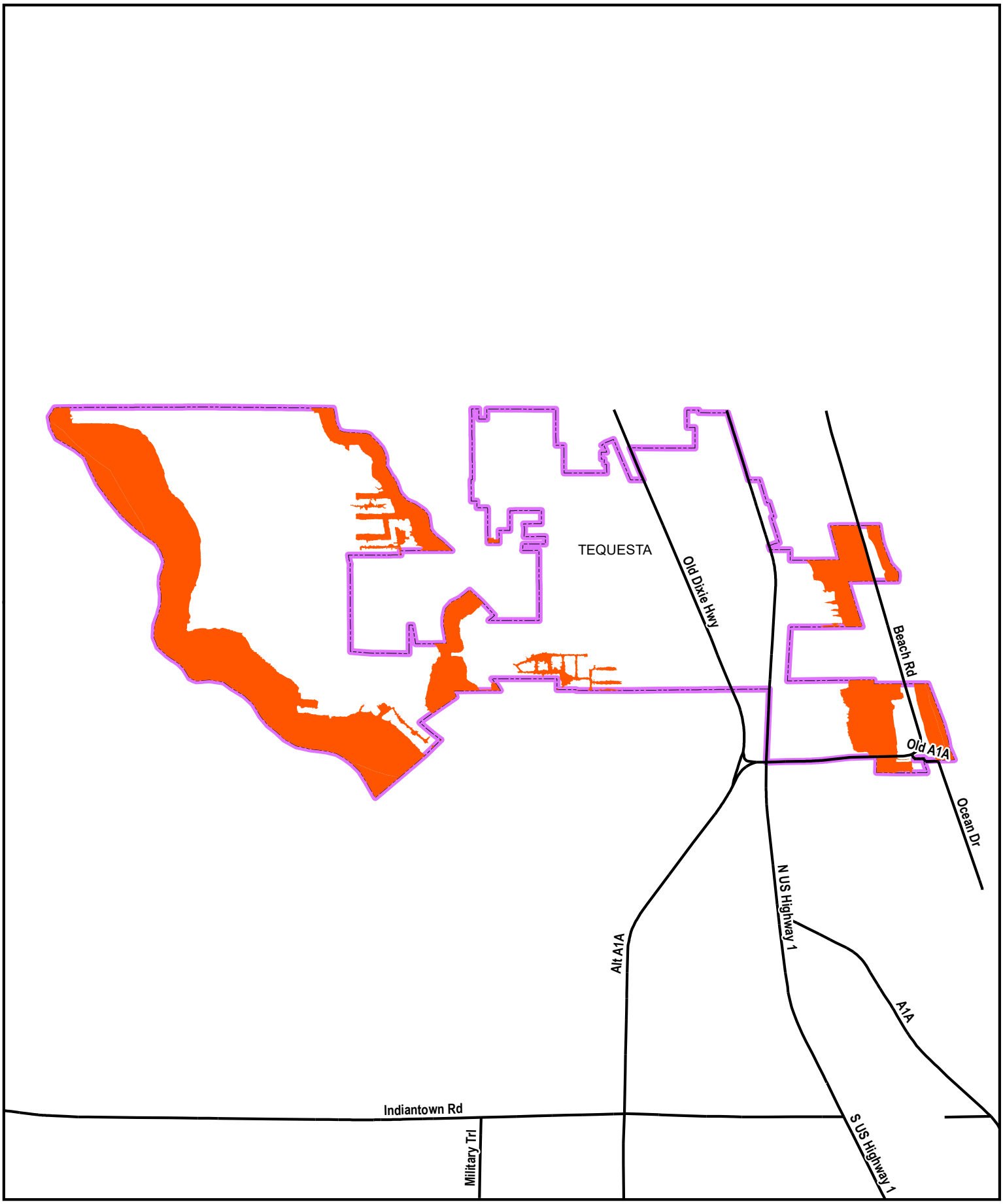

Tequesta

Special Flood Hazard Area

City Boundary

Miles
0 0.1 0.2 0.3

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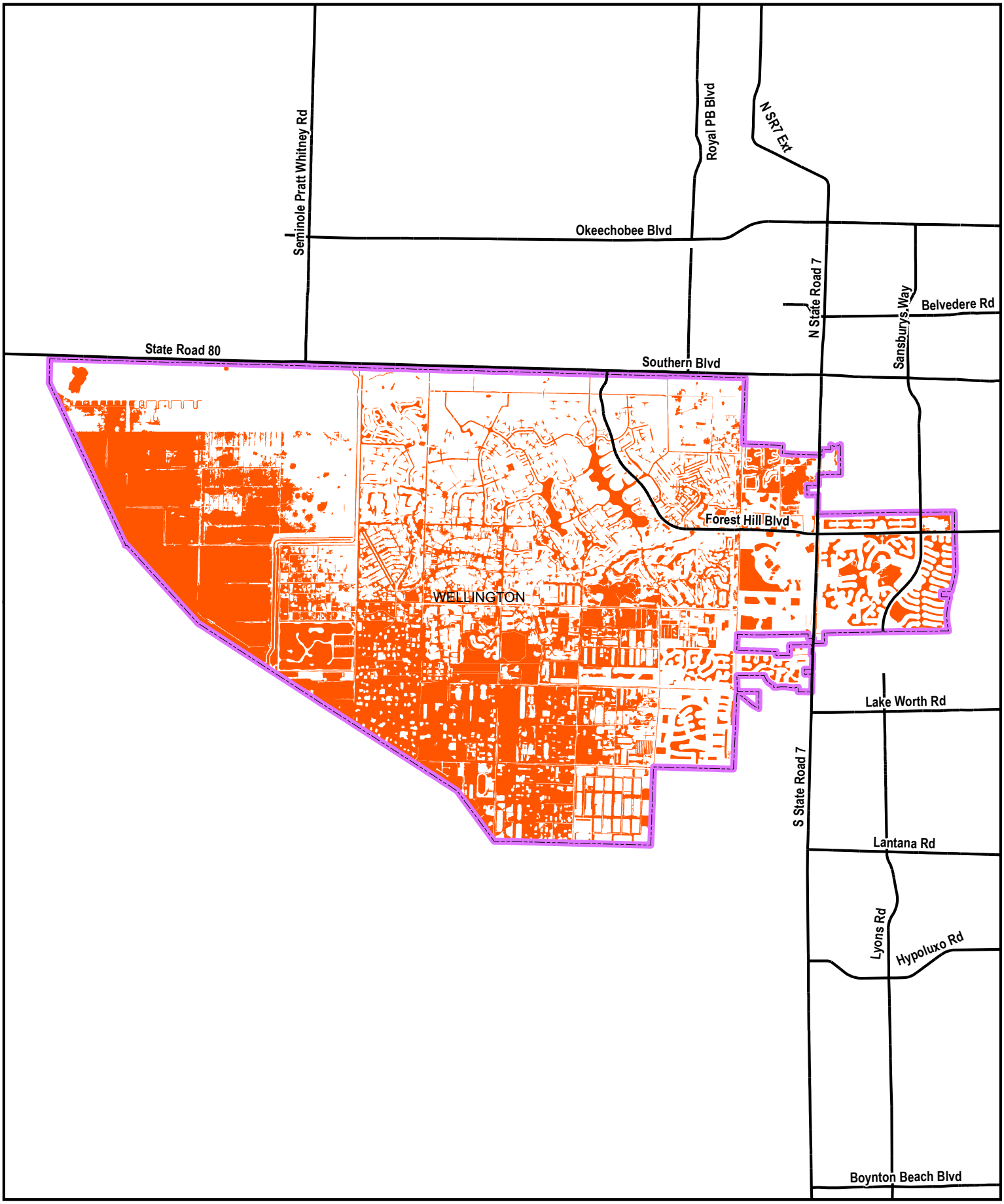

Wellington

Special Flood Hazard Area

City Boundary

0 0.4 0.8 1.2 Miles

N

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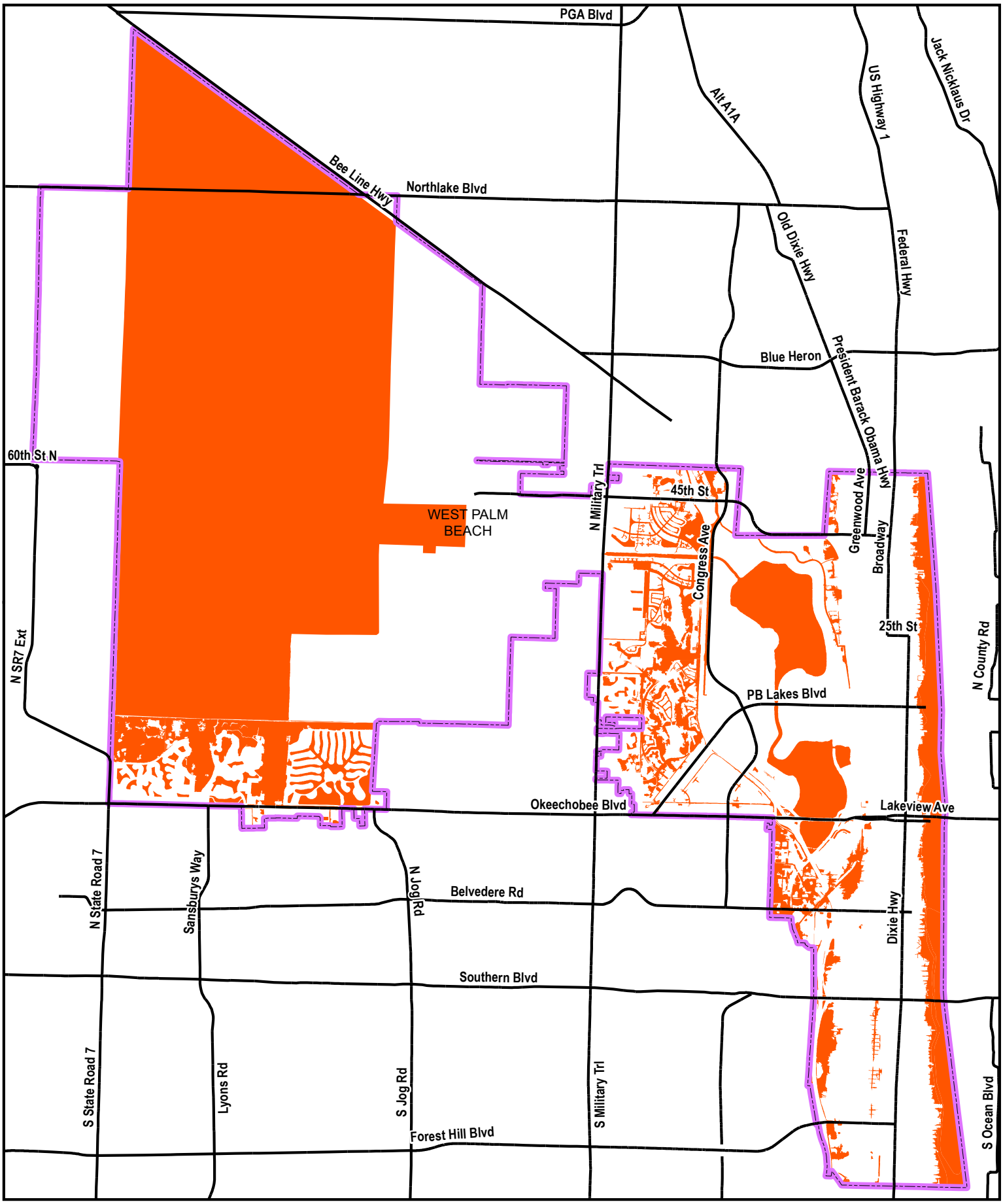

West Palm Beach

Special Flood Hazard Area

City Boundary

0 0.35 0.7 1.05 Miles

N

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Palm Beach County

GIS Service Bureau

May 24, 2024

Appendix O

Palm Beach County Local Mitigation Strategy 2024

Palm Beach County, Florida
Program for Public Information (PPI) 2024

Background

In order to provide the public with information needed to increase flood hazard awareness and to motivate actions to reduce flood damage, encourage flood insurance coverage, and protect the natural functions of floodplains, Palm Beach County has developed an extensive outreach program to educate the community concerning matters pertaining to floodplain management and to highlight its importance to the community.

In October 1991, Palm Beach County qualified for the Community Rating System (CRS) Program. CRS is a part of the National Flood Insurance Program (NFIP). It provides reductions to flood insurance premiums in participating communities. The reductions are based on community floodplain management programs, including public information activities. To keep those discounts, communities must continue to implement their programs and provide status reports to the NFIP each year. Since its entrance into the CRS Program, the County has included the dissemination of flood-related information to its residents and businesses.

Palm Beach County also values matters of environmental concern. To this end, it has emphasized not only the life and property protection components of floodplain management but also the natural and beneficial functions of floodplains and the maintenance of open space. Furthermore, it continues active compliance with the MS4 program (Municipal Separate Storm Sewer Systems). The MS4 program is part of the US Environmental Protection Agency's efforts to reduce pollution caused by untreated stormwater runoff.

Palm Beach County was among the first communities in the country to develop a Program for Public Information when it initially did so in 2014. Since that time, a strong outreach program has characterized the County's flood mitigation efforts. Though the plan did not undergo formal five-year updates, the Plan has consistently been maintained, adapted and implemented since its inception. In 2023, County staff decided to formally develop an updated Program for Public Information in accordance with the PPI standard outlined in the *2017 CRS Coordinator's Manual*. The County is pleased that its efforts will not only prove beneficial to the Palm Beach County community through mitigation of the hazardous effects of flooding, but they can also prove beneficial in maximizing credit in the CRS program.

PPI Committee

The County's Program for Public Information Committee is composed of key individuals representing applicable departments in the County as well as key community stakeholders representing a range of the County's citizens and businesses. The PPI Committee met three times to develop a Program for Public Information. Meetings were held in-person with a virtual component by WebEx:

- August 24, 2023
- September 14, 2023
- October 12, 2023
- March 21,2024

This document, which embodies the results of the PPI Committee's work, will serve as the community's guide to implement, and expand the effectiveness of dissemination of floodplain management information to its public.

The PPI Committee members include six stakeholders and six County staff members, one of whom is a Certified Floodplain Manager.

Palm Beach County Stakeholders:

- Chris Ryder, P.E. – Owner of R & R Realty
- Ralph Wall – CRS Coordinator, City of West Palm Beach
- Juan Moises Cuesta, P.E., PMP – Stormwater Engineer, City of Delray Beach Public Works Department
- Alannah Irwin – Sustainability and Resiliency Administrator, City of Boynton Beach
- Kelley Rea-Murphy – Real Estate Agent at Murphy Homes
- John Gelrud – Insurance Agent & Regional Sales Manager at Wright National Flood Insurance Services
- Alyssa Dalloo – City of Delray Beach (participated in planning, replaced by Juan Moises Cuesta in 2024)
- Tammy Bosio – Palm Beach County Library (participated in planning until 2024, no longer a committee member)

Palm Beach County Staff:

- Jerri Clairday – CRS Coordinator, Emergency Management
- Precious Gaiter – Office Manager, Emergency Management
- John Jamason – Deputy Director of Palm Beach County Public Affairs
- Danette Cole – Administrative, Emergency Management
- Rick DeTar – Planning Coordinator, Emergency Management
- Lucia Bonavita – Planning, Zoning, and Building Department, Manager Public Information Services

CRS Max Consultants, Inc. served as facilitator in the development of the PPI.

<u>Assessment of Public Information Needs</u>

After a brief introduction to the National Flood Insurance Program and the Community Rating System, the Committee began by assessing the community's public information needs pertaining to the local flood hazard.

In Palm Beach County, intense or prolonged, concentrated rain is the primary cause of localized flooding. Coastal flooding has also been reported, mainly from king tides and tropical systems. Major rainfall events occur in association with hurricanes, tropical storms, and thunderstorms associated with frontal systems. This overabundance of rainfall creates saturated soil conditions, after which additional rain causes surface ponding or an overflow of catchment canals and ponds. This can result in street and yard flooding, which is regarded as nuisance flooding. Flood damage to buildings has historically been significant, as confirmed by the fact that there are 177 Repetitive Loss Properties within unincorporated Palm Beach County, The County as a whole has 177 repetitive Loss Properties and 4,159 paid flood insurance claims since 1979.

Target Areas:

The Committee agreed that, while it is important that the whole community receive public information pertaining to flooding, there are some areas and groups that particularly need to be targeted.

1. Target Area #1: Coastal Evacuation Zones. Properties located in coastal evacuation zones should be especially targeted with outreach that contains messages relevant to coastal flooding, king tides, preparing for storm surge and the importance of heeding evacuation orders. These areas can be targeted with both electronic and mailed outreach.
2. Target Area #2: Potential Levee Inundation Areas. Properties located in levee inundation areas should be especially targeted with outreach that contains messages relevant to levee hazards, possible preventive actions and the importance of heeding evacuation orders. These areas can be targeted with both electronic and mailed outreach.
3. Target Area #3: Potential Dam Inundation Areas. Properties located in dam inundation areas should be especially targeted with outreach that contains messages relevant to dam hazards, possible preventive actions and the importance of heeding evacuation orders. These areas can be targeted with both electronic and mailed outreach.
4. Target Area #4: Properties within the Repetitive Loss Areas. Any area that has been subject to repetitive losses from flooding, as defined by the NFIP, needs to be especially targeted for public information. A special outreach project entailing an advisement to the properties in these areas in the County will be undertaken annually. The four advisements specified in the 2017 CRS Coordinator's Manual will be included.
5. Target Area #5: Pre-FIRM buildings in the Special Flood Hazard Areas. Properties located within special flood hazard areas are deemed to be especially vulnerable because they are at increased risk of flooding events. Compliance with modern building codes and other floodplain specific regulations can often provide some risk reduction for these properties by requiring the buildings be elevated above the base flood elevation. The Committee agreed that the older buildings in the Special Flood Hazard Areas that were constructed prior to the implementation of NFIP regulations based on FIRM floodplain maps, and therefore do not benefit from these risk reductions, are particularly vulnerable and outreach should be targeted to these areas.

Target Audiences:

The Committee recognized several additional target audiences, other than those characterized by target areas, which need flood-related information.

1. Target Audience #1: Homeowner and Condominium Associations: Because condominium and homeowner associations typically concern themselves with matters vital to their respective communities, this was determined to be an appropriate target audience.
2. Target audience #2: Apartment Owners: Because apartment owners are in a strong position to implement preventative actions and encourage their renters to obtain flood insurance coverage on their contents, the Committee identified this as a target group.
3. Target audience #3: Real Estate Agents: Because real estate agencies are key players in the purchase of properties and can encourage flood insurance coverage, the Committee identified this audience as a target group.
4. Target audience #4: Insurance Agents: Because insurance agencies are central to the National Flood Insurance Program and because they are in a strong position to encourage flood insurance coverage, the Committee identified this as a target group.
5. Target audience #5: Lenders: Lenders and mortgage companies can be especially impacted by flooding because of the fiscal exposure they face. These professionals are also a trusted source of information for new homebuyers. New homeowners may not be aware of unique flood risks associated with each property and area, flood insurance options, or preventive actions they can take to protect the newly purchased property. Lenders are also in a strong position to encourage flood insurance coverage and provide flood protection information. Accordingly, this target audience was determined to be important.
6. Target audience #6: Surveyors: Surveyors conducting property surveys and completing elevation certificates were determined to be an appropriate audience for outreach aimed at emphasizing the importance of submitting accurate elevation certificates which are required for County staff to review building permits within the Special Flood Hazard Area.

7. Target Audience #7: Palm Tran Riders: With an estimated annual ridership of 7,000,000, advertisements on Palm Tran buses are a cost effective way to reach a substantial local audience. Palm Tran riders can be targeted with messaging about local hazards, preventative actions and emergency preparations.
8. Target Audience #8: Citizen's Policy Holders: Because Citizen's property insurance does not cover flood damage but is now requiring certain policyholders to obtain flood insurance coverage, it was determined that messaging aimed at providing information to Citizen's policyholders about how to obtain flood insurance would be appropriate. Additional messages about preventive measures can also be provided along with the flood insurance information.

Included in the assessment of public information was an assessment of the projects which are already being undertaken both by the various departments within the County and by stakeholders and agencies outside the County. A listing of some of the projects conducted by the County or by others is included in Table 1 below.

Table 1. Public Information Efforts

Organization	Project	Subject Matter	Frequency
Palm Beach County	Flood hazard brochure	Various hurricane and flood related topics	Annually in May
Palm Beach County	County eNewsletter	Various topics	Twice Monthly
Palm Beach County	Handouts and brochures available at various locations	Various topics	Year-round
Palm Beach County	Social media postings	Various flood-related topics	Year-round
	Press releases	Various flood-related topics	As needed
	Website	Various flood-related topics	Year-round
	Map inquiry service	Flood hazard areas, Flood Insurance 101, flood protection	Year-round
	Parks Department Presentations	Various flood-related topics	Year-round
	MS4 Projects, Swale and Canal Maintenance, Illegal Dumping Signage, etc.	Take care of your storm drain; protect water quality, no illegal dumping	Year-round
Palm Beach County	Government YouTube Channel	Various topics	Year-round
South Florida Water Management District and Lake Worth Drainage District	Handouts on water flow and stormwater management	Stormwater management	Available year-round
Local TV Stations	Hurricane preparedness publications	Hurricane preparedness	Annually at beginning of hurricane season
Regional network TV and radio stations	Coverage during hurricane season	Preparation for and response to hurricanes and floods	May - November
Palm Beach Post	Newspaper	Various topics	Daily
CodeRed	Pertinent messages by phone	Various topics	As deemed appropriate
Publix	Hurricane preparedness guide available at stores	Preparation for hurricanes	May

An assessment of flood insurance coverage was also conducted and is discussed later in this report.

Messages and Outcomes

After assessing the Community's flooding information needs, the PPI Committee identified the following as the priority messages. Each message has a desired, measurable, outcome, as shown in the third column of Table 2.

Table 2. Topics, Messages and Desired Outcomes

Topic	Message	Outcome
1. Know your flood hazard	1A. Know the difference between EVACUATION ZONE and FLOOD ZONE. Go to discover.pbcgov.org/publicsafety/dem/Pages/Know-Your-Zone.aspx 1B. Learn about the flood risks in Palm Beach County. Go to readypbc.com 1C. Do you know your flood zone? For properties within unincorporated Palm Beach County only, call 561-233-5374 or email floodzone@pbcgov.org. 1D. To learn if your property is in a Special Flood Hazard Area, call the PBC Flood Zone Request Line at 561-233-5374	More official zone determinations
2. Insure your property for flood hazard	2A. Do I need flood insurance? Go to floodsmart.gov to learn how much flood damage could cost you, and to find a flood insurance agent. 2B. Do not wait for the next imminent flooding event to buy flood insurance protection. In most cases, there is a 30-day waiting period before the coverage takes effect. 2C. Flood insurance is available for your building and for the contents (Renters take note!). Contact your insurance agent for more information on rates and coverage. 2D. Consider purchasing flood insurance whether your property is in a high-risk Special Flood Hazard Area (SFHA) or not. 2E. Residents living in unincorporated areas of Palm Beach County can call 561-233-5374 for flood insurance technical assistance.	Increase in the number of flood insurance policies
3. Protect people from the hazard	3A. Build a Kit. Having the right items during a disaster will make a difference. Go to readypbc.com and click on "Emergency Supply Shopping list". 3B. Sign up for AlertPBC, Palm Beach County's Emergency Notification System, at alertpbc.com. 3C. Make a Plan and practice it often. Go to FloridaDisaster.org/ Plan Prepare/ and click on "Make a Family Plan". 3D. Pre-register for Special Needs Shelter or the Pet Friendly Shelter well before a disaster is imminent. Go to readypbc.com or call 561-712-6400.	Increase in number of residents prepared to safely shelter/ evacuate during a storm. Fewer safety issues resulting from flooding.
4. Protect your property from the hazard	4A. Find Flood Protection Documents at the Palm Beach County Library in the Government Research Catalog at pbcLibrary.org/research-and-homework/government and click on "FEMA Flood Control Library". 4B. Safeguard your building by taking some basic precautions such as shuttering windows, bracing and sandbagging garage and entry doors and bringing in yard items. It may mean the difference between destruction and minor damage. 4C. Install a floor drain plug or backup valve to prevent sewer backup flooding. 4D. Elevate electric panel boxes, A/C condensing units, and other appliances. Mark your electric panel box to show circuits to floodable areas. Turning off power to these areas before a flood can save lives and reduce property damage. 4E. For properties within unincorporated Palm Beach County only, if you have drainage problems on your property, or are considering improvements, County staff can offer property protection advice and/or provide a site visit. Call the PBC Flood Zone Request Line at 561-233-5374. For issues only related to storm drains: If you live in an HOA community, please contact your HOA. If you live on a County maintained road, please call the Palm Beach County Road and Bridge Division at 561-684-4000. Or, if you live in a neighborhood that is part of an Improvement District (ITID, SIRWCD, NPBCPD, etc.), please contact your respective Improvement District.	Reduced property loss due to flooding
5. Build responsibly	5A. Keep in mind that some flood protection measures may require a building permit and others may not be safe for your type of building, so be sure to speak with the Palm Beach County Building Division at 561-233-5374 before making any improvements. 5B. No construction, including moving the earth, is legal in a floodplain without a permit. Obtain a permit from Palm Beach County. Call 561-233-5100.	Reduced number of Building Division citations

Table 2. Topics, Messages and Desired Outcomes		
Topic	**Message**	**Outcome**
6. Protect natural floodplain functions	6A. When rainfall drains into the ground, it helps reduce flooding and recharges our drinking water supply. Unpaved land filters stormwater runoff as it seeps through the ground and into our aquifer. 6B. It is important to appreciate natural floodplains – keep these open and clean! 6C. It is illegal to throw anything into the lakes, canals, or other waterways in the county. 6D. Dumping materials into our waters or drains pollutes the waters, clogs the storm drains, and increases flooding in neighborhoods. Please call the Engineering Department at 561-684-4000 for more information about stormwater management, or Code Enforcement at 561-233-5500 to report illegal dumping	Increase protection of natural floodplain functions Reduce dumping and stormwater contamination
7. Be informed & prepared for hurricanes	7. Like us on Facebook @PBCDEM. Follow us on X and Instagram @PBCDEM.	Increase resident preparation & evacuation in storm events
8. Obey Evacuation Orders	8. All residents living in a manufactured/mobile home or sub-standard housing must evacuate in a hurricane warning.	Increased evacuation in storm events
9. Stay Safe during and after storm	9. Obey curfews. They are mandatory and will be re-evaluated daily. Anyone out during curfew could be subject to arrest.	Decrease in number of road rescues and curfew arrests.
10. Report Flood and Storm Damage	10. Report damage using our official App, PBC DART (Disaster Awareness & Recovery Tool) from the Apple App Store or the Android App on Google Play.	Increase number of accurate damage reports to aid in effective response & recovery

Outreach Projects to Convey Messages

After determining the messages and their desired outcomes, the Committee proceeded to identify outreach projects to convey the messages. The PPI Committee identified 43 projects and initiatives that are recommended to be implemented. Many of the projects have already been established and their continued implementation is recommended. Other projects are specific recommendations of the Committee that can be implemented to enhance the current outreach program. Table 6 included at the end of this report, represents a compilation of the recommended projects, complete with the assignment as to who is responsible for implementation and when implementation is anticipated.

Some discussion ensued concerning the benefit of utilizing stakeholders to disseminate information. The Committee members who are also stakeholders expressed a willingness to assist with dissemination of flood-related information. Additionally, the following partners and stakeholders were identified:

- South Florida Water Management District
- Lake Worth Drainage District
- Chamber of Commerce
- Homeowner's Associations
- Realtor associations
- Other professional associations
- Other municipalities within the County

Other Public Information Initiatives

In addition to the outreach projects recommended in Table 6 there are other important public information initiatives that are an integral part of the community's CRS program. The PPI Committee acknowledges the importance of advertising through public information venues the various services that the County offers, some of which are credited in the CRS program under other activities. In particular, the County will advertise the following assistance that it offers:

- **Activity 310 (Elevation Certificates):** The availability of elevation certificates will continue to be advertised in the County's email newsletter, on the County website and advertised in the County flood hazard brochure at least annually.

- **Activity 320 (Map Information Service):** This service continues to be offered. CRS map information elements are being identified to maximize points in relation to CRS. This service can be advertised in the County flood hazard brochure at least annually and on the County website.

- **Activity 340 (Hazard Disclosure):** The PPI Committee recommends advising real estate agents about the benefits of providing suggested hazard disclosure for coastal communities in its annual targeted outreach.

- **Activity 350 (Flood Protection Information):** The PPI Committee recommends the County ensures its website covers all the messages chosen by the Committee. FEMA publications and locally pertinent documents are also cataloged at the Palm Beach County Public Library and are available online in the electronic collection.

- **Activity 360 (Flood Protection Assistance):** County staff members provide one-on-one advice to anyone interested in protecting their building from flood damage. Some instances involve a site visit to allow staff to examine a local drainage condition onsite. The PPI Committee recommends the County should advertise the services, including site visits, in the County Flood Hazard Brochure at least annually, on the County website and through additional electronic-based advisements

- **Activity 370 (Flood Insurance Promotion):** The Committee recommends the County implement the Coverage Improvement Plan included in this report.

- **Activity 540 (Drainage System Maintenance):** The "No dumping" regulations should be advertised on social media at least annually. It should also be advertised on the County website, and in the County's Flood Hazard Brochure.

- **Activity 610 (Flood Warning and Response):** Flood warning and safety information will be advertised to the entire community in the County flood hazard brochure at least annually, and included on the County website and social media

- **Activity 630 (Dam Safety):** Dam breach warning and safety information will be advertised to the dam breach inundation area at least annually, and included on the County website and social media

Publicity Recommendations

The PPI Committee discussed the benefits and decided to recommend that, whenever feasible, the County move from printed media to electronic media when disseminating publicity. The following describes the recommendation and justification:

It is noted that effective communications are increasingly conveyed through electronic, rather than through printed, media. This trend is clear and growing. In light of this movement from print to electronic media, the Committee recommends the primary media used by the County for publicity of all required elements be electronic. Not only does this recommendation result from considerations of effectiveness and efficiency, but there is also an economic component. The printing and postal costs for mailing hard copies of flood-related materials to the buildings in the community is expensive. The Committee recommends electronic formats, such as emails, social media, website, television, radio and news feeds be the primary means used to publicize the required elements in the CRS program.

At a minimum, the following electronic-based media should be utilized for each one of the publicity requirements:

- Website
- Email blasts
- Social media
- Government Access TV Channel

In essence, the PPI Committee proposes the replacement of one annual printed publicity with numerous messages disseminated through numerous electronic media platforms. With the continuing movement in the 21st Century from the printed to the electronic media, the PPI Committee has determined that this new approach makes sense from the perspective of effectiveness, efficiency, and economy.

The PPI Committee recommends this publicity strategy be utilized for all required publicity elements in the CRS program, including:

- Activity 310 – Elevation Certificates
- Activity 320 – Map Information Services
- Activity 360 – Flood Protection Assistance
    - Property protection advice (PPA)
    - Protection advice provided after a site visit (PPV)
- Activity 370 – Flood Insurance Promotion
- Activity 540 – Drainage System Maintenance
- Activity 610 – Flood Warning and Response
- Activity 630 – Dam Safety

Flood Response Preparations

In addition to projects that are implemented every year, the PPI Committee recommends projects that will be implemented immediately before, during, and after a flood. These projects are ready for reproduction and dissemination after a flood warning. A copy of the Flood Response Preparations (FRP) document will be reviewed by County staff annually and updated as needed. The document is recommended as a toolkit for the County to utilize as deemed most appropriate in the event of a major flood or hurricane event. The projects are briefly described at the end of this PPI in Table 7.

Implementation, Monitoring and Evaluation

Upon adoption of the PPI Report, the various entities listed in Table 6 will begin implementation of the projects included in the PPI. The CRS Coordinator will monitor the projects as they are developed, as well as their results. He/she will record input from PPI Committee members and suggestions from other County employees and stakeholders participating in the activities.

The PPI Committee will meet at least once each year to review the implementation of these projects and initiatives. At that time, the status of the projects will be explained and progress toward the outcomes will be discussed. The Committee will review the outcomes of the activities to change, add, or approve them. An evaluation report will then be written and sent by email for approval by the Committee. Upon approval, it will be sent to the Commission and submitted as part of the County's annual recertification package to the Community Rating System. A review and evaluation of the Flood Insurance Promotion component of the PPI, and the Flood Response Preparations document will be included with this document.

FLOOD INSURANCE PROMOTION

In addition to serving as the County's Program for Public Information Committee, the members chose to function also as its Flood Insurance Promotion Committee. The Committee was structured with this purpose in mind; all CRS Committee membership requirements are met.

Flood Insurance Coverage Assessment:

Tables 3 and 4 provided helpful information to assess the county's flood insurance coverage.

Table 3: Flood Insurance Coverage by Flood Zone:

Insurance Zone

As of 10/02/2023

Community:	PALM BEACH COUNTY *	State:	FLORIDA
County:	PALM BEACH COUNTY	CID:	120192

Overview | Occupancy | Zone | Pre/Post FIRM

	Policies in Force	Premium	Insurance in Force	Number of Closed Paid Losses	$ of Closed Paid Losses	Adjustment Expense
A01-30 & AE Zones	2,185	$1,092,304	$624,582,000	647	$3,729,901.58	$246,473.68
A Zones	0	$0	$0	16	$68,576.12	$4,614.82
AO Zones	761	$180,081	$174,128,000	120	$247,594.97	$48,635.54
AH Zones	28	$11,017	$8,675,000	8	$99,933.83	$3,145.00
AR Zones	0	$0	$0	0	$0.00	$0.00
A99 Zones	0	$0	$0	0	$0.00	$0.00
V01-30 & VE Zones	9	$27,015	$2,863,000	3	$1,634.32	$1,495.00
V Zones	0	$0	$0	0	$0.00	$0.00
D Zones	0	$0	$0	0	$0.00	$0.00
B, C & X Zone						
Standard	20,879	$8,506,930	$6,461,634,000	739	$3,791,610.06	$227,673.56
Preferred	0	$0	$0	1,529	$8,176,138.23	$853,002.32
Total	23,862	$9,817,347	$7,271,882,000	3,062	$16,115,389.11	$1,385,039.92

Table 4: Flood Insurance Coverage by Occupancy:

Insurance Occupancy

As of 10/02/2023

Community:	PALM BEACH COUNTY *	State:	FLORIDA
County:	PALM BEACH COUNTY	CID:	120192

Overview | Occupancy | Zone | Pre/Post FIRM

	Policies in Force	Premium	Insurance in Force	Number of Closed Paid Losses	$ of Closed Paid Losses	Adjustment Expense
Single Family	20,891	$9,117,507	$6,618,344,000	3,384	$15,268,255.29	$1,456,115.80
2-4 Family	1,357	$358,467	$257,347,000	254	$1,142,622.21	$105,621.19
All Other Residential	5,191	$816,660	$1,074,233,000	370	$855,436.45	$102,968.89
Non Residential	659	$592,774	$322,425,000	149	$1,649,448.83	$102,417.17
Total	28,098	$10,885,408	$8,272,349,000	4,157	$18,915,762.78	$1,767,123.05

	Policies in Force	Premium	Insurance in Force	Number of Closed Paid Losses	$ of Closed Paid Losses	Adjustment Expense
Condo	6,843	$1,182,967	$1,360,614,000	326	$1,586,143.06	$168,112.98
Non Condo	21,255	$9,702,441	$6,911,735,000	3,833	$17,335,437.40	$1,599,430.07
Total	28,098	$10,885,408	$8,272,349,000	4,159	$18,921,580.46	$1,767,543.05

The information from the tables above was combined with County GIS data to create Table 5 below. Table 5 provides a summary of the number of buildings in the respective flood zones in Palm Beach County, as well as the estimated number of policies in each flood zone. These numbers were then used to calculate the estimated percentage of the buildings in each flood zone that are insured.

Table 5: Buildings and Policies in each Flood Zone

Flood Zone	# of Buildings	# of Policies	% of Buildings Insured
A & AE	8,046	2,185	27.1%
AH & AO	1,981	789	39.8%
VE	108	9	8.3%
Total buildings in SFHA	10,135	**2,983**	**29.4%**
B, C, & X Zone	**186,676**	**20,879**	**11.2%**

The PPI Committee used these tables and additional insurance data provided by the CRS Program to make some helpful assessments of the flood insurance coverage. Discussion ensued as the Committee examined the data included in the tables and compared the concentrations of flood insurance claims with the concentrations of flood insurance policies.

Following are some of the assessments made:

- There are 28,098 active policies in the community and a total of 4,159 closed, paid claims.
- There are far more claims as a percentage of policies within special flood hazard areas than there are outside these areas.
- There are far more claims as a percentage of policies among non-condo policies than there are for condo policies.
- Considering the size of the County, and compared to the total number of households, there are relatively few flood insurance claims that have been made over the years.
- In light of expected changes to local FIRM maps, residents in proposed areas (that are expected to be mapped into the floodplain) could benefit from signing up for flood insurance before the change.

The Committee noted that the intensity of flood insurance claims does not tell the complete story of damage resulting from flooding. Because not all properties carry flood insurance, no doubt there is damage that is sustained by properties that are not quantified in the NFIP record.

Identification of Target Areas

The Committee identified the same target areas as were previously identified in this PPI report.

- Target Area #1: Coastal Evacuation Zones
- Target Area #2: Potential Levee Inundation Areas
- Target Area #3: Potential Dam Inundation Areas
- Target Area #4: Properties within the Repetitive Loss Areas
- Target Area #5: Pre-FIRM buildings in the Special Flood Hazard Areas

The Committee also identified one additional target area:

- Target Area #6: Areas of potential map changes such as potential annexation or proposed SFHAs

Identification of Target Audiences

The Committee identified the same target audiences for flood insurance promotion as were previously identified in this PPI report.

- Target Audience #1: Homeowner and Condominium Associations
- Target audience #2: Apartment Owners
- Target audience #3: Real Estate Agents
- Target audience #4: Insurance Agents
- Target audience #5: Lenders
- Target audience #6: Surveyors
- Target Audience #7: Palm Tran Riders
- Target Audience #8: Citizen's Policy Holders

The Committee also identified one additional target audience:

- Target Audience #9: Seniors and other residents with limited access to electronic information (through Library and Community Services Department)

Narrative Summary

The Committee was in agreement that the promotion of flood insurance is a very important message for the Palm Beach County community and that it needs to be prioritized. Furthermore, it needs to be addressed to all residents and businesses in the community with special effort made to reach target areas and audiences.

- Repetitive loss areas are typically particularly vulnerable to flooding; targeted outreach to these areas is recommended.
- The target areas and audiences that were already identified in the PPI are recommended as target areas and audiences under flood insurance promotion efforts.
- Two additional target areas/audiences were identified for outreach related specifically to insurance promotion: Areas of potential map changes and seniors/ residents with limited access to electronic communications
- An increase in both building coverage and property content coverage is recommended.

Outcomes of flood insurance promotion efforts should include the following:

- Increasing the number of buildings insured throughout the community, and especially within the target areas
- Increasing the number of properties and renters with contents coverage
- Increase in the number of buildings insured outside the SFHA

COVERAGE IMPROVEMENT PLAN:

Projects Designed to Increase Flood Insurance Participation

Numerous projects have already been identified in the previous sections of this PPI document, including Table 1. Other projects are listed in Table 6; among the topics covered and messages proposed, the promotion of flood insurance is paramount. There are informative brochures in local insurance agency offices, and there are incentives at these offices designed to promote flood insurance. Additionally, this community receives FloodSmart commercials on television. Following are a few of the projects that should be prioritized:

1. Letter from Mayor: One key component of the coverage improvement plan is the letter from the Mayor, or other elected official(s), to all properties in the County encouraging residents and businesses to consider purchasing flood insurance.

2. Outreach to property owners and renters in Target Areas: The Committee determined that perhaps the ones who need the message of flood insurance promotion most are the ones most vulnerable to flooding. These will be recipients of several outreach projects.

3. Social media postings: Because Palm Beach County has developed effective social media capabilities, this will be implemented to get the flood insurance promotion message out.

Technical Assistance

The County is committed to providing technical assistance pertaining to advising people who have questions about flood insurance. This service is advertised to the entire community.

Adoption

This document will become effective when it is adopted by the Palm Beach County Commission. The adoption is anticipated on September 17, 2024.

Table 6. PPI/Flood Insurance Promotion Projects and Initiatives							
Outreach Projects (OP)							
OP #	**Target Audience**	**Message(s) (See Table 2)**	**Outcome (See Table 2)**	**Project**	**Assignment**	**Schedule**	**Stakeholder**
OP #1	Residents in unincorporated areas of County	1-10	1-10	County Flood Hazard Brochure	CRS Coordinator	Annually in May	
OP #2		1-10	1-10	County Flood Hazard Postcard	CRS Coordinator	May	
OP #3		1-10	1-10	Handouts and brochures available at various locations	CRS Coordinator	Year-round	FEMA
OP #4		1 - 10	1 - 10	Twitter, Facebook and You Tube postings of flood information	Communications and Marketing Manager	Year-round	
OP #5		2	2	Flood insurance promotion letter from mayor or other elected official with flood flyer attached; electronic media (370)	CRS Coordinator	May	
OP #6		1 - 10	1 - 10	PSAs on County Government Access Channel & Various TV shows on Palm Beach County Emergency Management TV channel	Communications and Marketing Manager	Year-round	
OP #7		1 - 10	1 - 10	Hurricane Expo	CRS Coordinator	Annually in June	
OP #8		1 - 10	1 - 6	County eNewsletter	Communications and Marketing Manager	Year-round	
OP #9		6	6, 8	Advisements against clogging storm drains and polluting drainage system (MS4 activities)	Communications and Marketing Manager	Year-round	
OP #10		1 - 10	1 - 10	Inserts in water customer bills	CRS Coordinator	Monthly	
OP #11		3-4, 7-10	3, 4, 8 & 9	AlertPBC Messages to subscribers	Communications and Emergency Manager	As needed in emergency events	
OP #12		1 - 10	1 - 10	Public Library (Activity 350)	CRS Coordinator	Year-round	FEMA
OP #13		1,6	1,6	Map inquiry service (Activity 320)	CRS Coordinator	Year-round	

OP #14	Residents in unincorporated areas of County	1 - 10	1 - 10	County website flood and preparedness info (Activity 350)	Communications and Marketing Manager	Year-round	
OP #15		1-10	1-10	Presentations at Town Halls, Community & Committee Meetings	CRS Coordinator	various	
OP #16		1-4, 7	1-4	Proclamations & Présentations at County Commission meetings	Communications and Marketing Manager, CRS Coordinator	As needed	
OP #17		1, 6	1, 6	Environmental Times	Department of Environmental Resources Management	Quarterly	
OP #18		1-10	1-10	Presentations to professional associations (property management, real estate & banking)	Committee stakeholders	Varies	PPI Committee members & Professional associations
OP #19		1-10	1-10	Articles in local weekly magazines	magazine staff	Weekly magazine	*Palm Beach Florida Weekly, Palm Beach illustrated*
OP #20		3-4,7-10	3-4,8-9	Hurricane Preparedness Guides Published by Local TV Channels	Local TV Channels	Annually in May	Local TV Channels
OP #21		3-4, 7-10	3-4, 8-9	Hurricane Preparedness Guide published by *Sun Sentinel* and *Palm Beach Post* Newspapers	*Sun Sentinel* staff	Annually in May	*Sun Sentinel* and *Palm Beach Post*
OP #22		1-10	1-10	Hurricane preparedness guide available at stores	Publix	May	Publix
OP #23		1 - 10	1 - 10	Hurricane preparedness pamphlet included with monthly bill	Florida Power and Light	May	Florida Power and Light
OP #24		1-10	1-10	Presentations at HOAs & Flood information in HOA eNewsletters / emails	CRS Coordinator & Stakeholders	Fall	Federation of HOAs, Beach Property Owners Association, individual HOAs
OP #25		1-10	1-10	Chamber of Commerce eNewsletter	Chamber of Commerce	Monthly	Chamber of Commerce
OP #26		1 - 10	1 - 10	Coverage before, during and after hurricanes	Regional network TV and radio stations	May-November	Regional network TV and radio stations, and The Weather Channel
OP #27		1, 6	1, 6	Information in “Compact Currents” Newsletter	SE Florida Climate Compact	Quarterly/ Seasonal	SE Florida Climate Compact
OP #28		1 - 10	1 - 10	Handouts on water flow and stormwater	South Florida Water Management District	Available year-round	South Florida Water Management District

	Residents in unincorporated areas of County			management; emails			
OP #29		1 - 10	1 - 10	Information in Lake Worth Drainage District Newsletter	LWDD	Quarterly/ Seasonal	LWDD
OP #30		6	6	Hidden Wild Movie	The Palm Beaches	Available year-round	The Palm Beaches
OP #31		6	6	Articles submitted to or published by local environmental organizations in blogs and newsletters	CRS Coordinator and stakeholders	varies	Sustainable Palm Beach County, Audubon Society, 1000 Friends of Florida, etc.
OP #32	Buildings in Repetitive Loss Areas	1 - 10	1 - 10	RL Letter with Flood awareness information (including flood brochure and insurance promotion)	CRS Coordinator	May – general outreach; followed by flood insurance promotion outreach	FEMA
OP #33	Buildings within coastal evacuation zones	1 - 10	1 - 10	Distribution of flood awareness/ mitigation materials by mail or email	CRS Coordinator	July	FEMA
OP #34	Buildings within potential levee inundation areas	1 - 10	1 - 10	Distribution of flood awareness/ mitigation materials by mail or email	CRS Coordinator	July	FEMA
OP #35	Buildings within potential dam inundation areas	1-10	1-10	Distribution of flood awareness/ mitigation materials by mail or email	CRS Coordinator	Summer	FEMA
OP #36	Homeowner and Condo Associations	1-10	1-10	Distribution of flood awareness/ mitigation materials by mail or email	Communications and Marketing Manager	At least annually	FEMA
OP #37	Apartment Owners	1-10	1-10	Distribution of flood awareness/ mitigation materials by mail or email	CRS Coordinator	At least annually	FEMA
OP #38	Real Estate Agents	1 - 10	1 - 10	Letter with Flood awareness information (including flood brochure)	CRS Coordinator	At least annually	FEMA
OP #39	Real Estate Agents	1-7	1-7	Presentation to local Real Estate Agents	CRS Coordinator	At least annually	Local Real Estate Agencies

OP #40	Insurance Agents	1-10	1-10	Letter with Flood awareness information (including flood brochure)	CRS Coordinator	At least annually	FEMA
OP #41	Lenders	1-10	1-10	Letter with Flood awareness information (including flood brochure)	CRS Coordinator	At least annually	FEMA
OP #42	Surveyors	1-10	1-10	Letter with Flood awareness information (including flood brochure)	CRS Coordinator	At least annually	FEMA
OP #43	Palm Tran Riders	1	1	Ads on Palm Tran Buses (in 3 languages)	CRS Coordinator	May - August	Palm Tran

Table 7. Flood Response Preparation (FRP) Projects

Outreach Projects (OP)

FRP Number	Target Audience	Message(s) (See Table 2)	Outcome (See Table 2)	Project	Assignment	Schedule	Stakeholder
FRP #1	N/A	1-4; 7-9	1-4; 7-9	Facebook PSAs	Communications Director	Before the storm	N/A
FRP #2	N/A	1-4; 7-9	1-4; 7-9	Other Social Media PSAs	Communications Director	Before the storm	N/A
FRP #3	N/A	1-4; 7-9	1-4; 7-9	Email PSAs	Communications Director	Before the storm	N/A
FRP #4	N/A	1-4; 7-9	1-4; 7-9	Brochure handouts	Communications Director	Before the storm	N/A
FRP #5	N/A	1-4; 7-9	1-4; 7-9	TV/ Radio PSAs	Communications Director	Before the storm	N/A
FRP #6	N/A	1-4; 7-9	1-4; 7-9	Reverse 911 messages	Communications Director	Before the storm	N/A
FRP #7	N/A	1-4; 7-9	1-4; 7-9	Newspaper PSAs	Communications Director	Before the storm	N/A
FRP #8	N/A	1-4; 7-9	1-4; 7-9	EOC communications	Communications Director	Before the storm	N/A
FRP #9	N/A	1-4; 7-9	1-4; 7-9	Facebook PSAs	Communications Director	During the storm	N/A

Table 7. Flood Response Preparation (FRP) Projects							
Outreach Projects (OP)							
FRP Number	**Target Audience**	**Message(s) (See Table 2)**	**Outcome (See Table 2)**	**Project**	**Assignment**	**Schedule**	**Stakeholder**
FRP #10	N/A	1-4; 7-9	1-4; 7-9	Other Social Media PSAs	Communications Director	During the storm	N/A
FRP #11	N/A	1-4; 7-9	1-4; 7-9	Email PSAs	Communications Director	During the storm	N/A
FRP #12	N/A	1-4; 7-9	1-4; 7-9	Brochure handouts	Communications Director	During the storm	N/A
FRP #13	N/A	1-4; 7-9	1-4; 7-9	TV/ Radio PSAs	Communications Director	During the storm	N/A
FRP #14	N/A	1-4; 7-9	1-4; 7-9	Reverse 911 messages	Communications Director	During the storm	N/A
FRP #15	N/A	1-4; 7-9	1-4; 7-9	Newspaper PSAs	Communications Director	During the storm	N/A
FRP #16	N/A	1-4; 7-9	1-4; 7-9	EOC communications	Communications Director	During the storm	N/A
FRP #17	N/A	1-4; 7-9	1-4; 7-9	Facebook PSAs	Communications Director	After the storm	N/A
FRP #18	N/A	1-4; 7-9	1-4; 7-9	Other Social Media PSAs	Communications Director	After the storm	N/A
FRP #19	N/A	1-4; 7-9	1-4; 7-9	Email PSAs	Communications Director	After the storm	N/A
FRP #20	N/A	1-4; 7-9	1-4; 7-9	Brochure handouts	Communications Director	After the storm	N/A
FRP #21	N/A	1-4; 7-9	1-4; 7-9	TV/ Radio PSAs	Communications Director	After the storm	N/A
FRP #22	N/A	1-4; 7-9	1-4; 7-9	Reverse 911 messages	Communications Director	After the storm	N/A
FRP #23	N/A	1-4; 7-9	1-4; 7-9	Newspaper PSAs	Communications Director	After the storm	N/A
FRP #24	N/A	1-4; 7-9	1-4; 7-9	EOC communications	Communications Director	After the storm	N/A
FRP #25	N/A	1-4; 7-9	1-4; 7-9	Public Address System	Communications Director	After the storm	N/A