# C I T Y O F F O R T P I E R C E

## CITY COMMISSION AGENDA

City Commission Meeting - Monday, December 8, 2025 - 9:00 a.m.
City Hall - Commission Chambers, 100 North U.S. #1, Fort Pierce, Florida

1. **Call to Order**

2. **Pledge of Allegiance**

3. **Roll Call**

4. **Approval of Minutes**

   A. Approval of the minutes from the November 10, 2025 Day Meeting.

5. **Proclamations**

6. **Additions or deletions to agenda and approval of the agenda.**

7. **COMMENTS FROM THE PUBLIC**

   Any person who wishes to comment on any subject may be heard at this time. Please limit your comments to three (3) minutes or less, as directed by the Mayor, as this section of the Agenda is limited to thirty minutes. The City Commission will not be able to take any official actions under Comments from the Public. Speakers will address the Mayor, Commissioners, and the Public with respect. Inappropriate language will not be tolerated.

8. **Miscellaneous Reports and Presentations**

   A. St. Lucie County Regional Resilience Draft Plan and companion Resilience Vulnerability Assessment-Other Hazards Resiliency Strategy Report and Feedback - Sandra Bogan, SLC Resilence Navigator

   B. Annual Update (2024–2025) from Treasure Coast Homeless Services Council on Services Provided to Fort Pierce’s Unsheltered Population.

9. **Consent Agenda**

A. Approval of U.S. Army Corps of Engineers Supplemental Agreement No. 1 Extending Jetty License Agreement No. DACW17-3-21-0001 for the Operation of Jetty Linear Park by one (1) additional year to December 13, 2026.

B. Approval of Interlocal Funding Agreement with St. Lucie County for homeless services in the amount of $125,000 for FY2026

C. Approval of the Amendment to the grant agreement between the State of Florida, the Department of State and the City of Fort Pierce extending the grant period for the Highwaymen Museum project to June 30, 2026.

10. **City Commission - Resolutions**

A. Resolution 25-R81 adopting polling places for the January 13, 2026 Special Run-Off election.

B. Resolution 25-R83 appointing members to the Civil Service Appeals Board.

11. **New Business - City Commission Discussion Items**

A. Discussion of a proposed initiative to reduce review timelines for Single-Family, Duplex and Cottage planning applications within certain Zoning Districts.

B. Comprehensive City Economic Development Overview Presentation, Discussion and Direction

C. Discussion and approval of City Manager's appointment of Fort Pierce Police Chief.

12. **City Commission Boards and Committees Updates**

13. **Adjournment**

Immediately following adjournment, please move toward the doors and exit the chambers. This allows for the safe and courteous exit of all persons, and those on the dais. Conversations after the meeting should be held outside of chambers, in the foyer or elsewhere, but not in the commission chambers where lights will be out as soon as the chambers are empty.

In accordance with the Americans with Disabilities Act and Section 286.26, Florida Statutes, persons with disabilities needing special accommodation to participate in this meeting should contact the City Clerk’s Office at (772) 467-3065 at least 48 hours prior to the meeting.

**City Commission Day Meeting - 9:00 AM** **4. A.**

**Meeting Date:** 12/08/2025

**Re:**

**SUBJECT:**

Approval of the minutes from the November 10, 2025 Day Meeting.

**SUMMARY:**

**RECOMMENDATION:**

**ALTERNATIVES:**

**RESPONSIBLE STAFF:**

**COORDINATED WITH:**

**Attachments**

Minutes

**Form Review**

Form Started By: Brittany Meredith Started On: 11/24/2025 11:41 AM

Final Approval Date: 11/24/2025

MINUTES OF A REGULAR MEETING OF THE CITY COMMISSION OF THE CITY OF FORT PIERCE, FLORIDA, HELD IN THE CITY HALL COMMISSION CHAMBERS, 100 NORTH U.S. #1, FORT PIERCE, FLORIDA, AT 9 A.M. ON MONDAY, NOVEMBER 10, 2025.

1. **Call to Order**

Mayor Hudson called the November 10, 2025, Day Meeting to order at 9:00 A.M.

2. **Pledge of Allegiance**

3. **Roll Call**

Present: Commissioner Michael Broderick; Commissioner Curtis Johnson, Jr.; Mayor Linda Hudson

Absent: Commissioner Arnold Gaines

Staff Present: City Manager Richard Chess
City Attorney Sara Hedges
City Clerk Linda Cox

Motion was made by Commissioner Michael Broderick, seconded by Commissioner Curtis Johnson, Jr. to excuse Commissioner Arnold Gaines' absence.

AYE: Commissioner Michael Broderick, Commissioner Curtis Johnson, Jr., Mayor Linda Hudson

Passed

4. **Approval of Minutes**

A. Approval of the minutes from the October 13, 2025 Day Meeting.

Motion was made by Commissioner Curtis Johnson, Jr., seconded by Commissioner Michael Broderick to approve the minutes from the October 13, 2025 Day Meeting.

AYE: Commissioner Michael Broderick, Commissioner Curtis Johnson, Jr., Mayor Linda Hudson

Passed

5. **Proclamations**

A. Law Enforcement Records Personnel Week

B. Hospice and Palliative Care Month

6. **Additions or deletions to agenda and approval of the agenda.**

Motion was made by Commissioner Curtis Johnson, Jr., seconded by Commissioner Michael Broderick to approve the agenda.

AYE: Commissioner Michael Broderick, Commissioner Curtis Johnson, Jr., Mayor Linda Hudson

Passed

## 7. COMMENTS FROM THE PUBLIC

Any person who wishes to comment on any subject may be heard at this time. Please limit your comments to three (3) minutes or less, as directed by the Mayor, as this section of the Agenda is limited to thirty minutes. The City Commission will not be able to take any official actions under Comments from the Public. Speakers will address the Mayor, Commissioners, and the Public with respect. Inappropriate language will not be tolerated.

Christina Lasera
James Vanhorn
Matt Samuel

Mayor Hudson called for a recess at 9:17 A.M. as a result of a disturbance, and recontinued the meeting at 9:22 A.M.

## 8. Miscellaneous Reports and Presentations

A. Main Street Fort Pierce, Inc. annual program update covering FY2025 (October 31, 2024 to September 30, 2025).

Donna Sizemore with Fort Pierce Main Street and Michelle Cavalcanti, Interim Director of Fort Pierce Main Street, presented the Main Street Fort Pierce annual program update for FY2025. The Commission commended their work on all the events throughout the year like the weekly Farmers Market and the annual Ghost Walk. Ms. Cavalcanti stated the upcoming Christmas parade has interest from all over the community from the Sheriff's office to Fire Rescue, and St. Lucie County.

B. Lincoln Park Main Street, Inc. annual program update covering the FY2025 (October 31, 2024 to September 30, 2025).

Pamela Carrithers with Lincoln Park Main Street presented the Lincoln Park Main Street annual program update for FY2025. Mayor Hudson asked why the 250 properties should be considered for historic designation and Ms. Carrithers stated she has a spreadsheet she will provide to the Commission that shows the research completed by multiple consultants for why these properties should be designated as historic. The Commission thanked Ms. Carrithers and the team at Lincoln Park Main Street for all their hard work.

## 9. Consent Agenda

A. Approval of Main Street Fort Pierce Inc.'s Fourth Quarter Disbursement in the amount of $12,500 subject to the acceptance of the Fourth Quarter Report, covering July 1, 2025 to September 30, 2025.

B. Approval of Lincoln Park Main Street Inc.'s Fourth Quarter Disbursement in the amount of $12,500 subject to acceptance of the Fourth Quarter Report, covering July 1, 2025 to September 30, 2025.

Motion was made by Commissioner Michael Broderick, seconded by Commissioner Curtis Johnson, Jr. to approve the Consent Agenda.

AYE: Commissioner Michael Broderick, Commissioner Curtis Johnson, Jr., Mayor Linda Hudson

Passed

## 10. City Commission - Resolutions

A. Resolution 25-R72 Entering into an Interlocal Funding Agreement between the FPRA and the City of Fort Pierce for the Avenue D Resurfacing Project where the city will accept $1,500,000.00 in funding from the FPRA.

City Clerk, Linda Cox introduced the Resolution, read by title only, into the record.

RESOLUTION 25-R72.
A RESOLUTION BY THE CITY COMMISSION OF THE CITY OF FORT PIERCE, FLORIDA, ENTERING AN INTERLOCAL FUNDING AGREEMENT BETWEEN THE FORT PIERCE REDEVELOPMENT AGENCY, A DEPENDENT SPECIAL DISTRIST OF THE CITY OF FORT PIERCE, FLORIDA, AND THE CITY OF FORT PIERCE FOR THE AVENUE D RESURFACING PROJECT; PROVIDING FINDINGS; PROVIDING AUTHORIZATION; REPEALING ALL RESOLUTIONS IN CONFLICT HEREWITH; PROVIDING FOR SEVERABILITY; AND PROVIDING AN EFFECTIVE DATE.

Motion was made by Commissioner Michael Broderick, seconded by Commissioner Curtis Johnson, Jr. to approve Resolution 25-R72.

AYE: Commissioner Michael Broderick, Commissioner Curtis Johnson, Jr., Mayor Linda Hudson

Passed

B. Resolution 25-R77 Approving an Amendment to the Interlocal Agreement between the City of Fort Pierce, Fort Pierce Redevelopment Agency, and St. Lucie County for the Development of the Avenue D Model Block Project

City Clerk, Linda Cox introduced the Resolution, read by title only, into the record.

RESOLUTION 25-R77.
A RESOLUTION BY THE CITY COMMISSION OF THE CITY OF FORT PIERCE, FLORIDA, APPROVING AN AMENDMENT TO THE INTERLOCAL AGREEMENT BETWEEN THE CITY OF FORT PIERCE, THE FORT PIERCE REDEVELOPMENT AGENCY, AND ST. LUCIE COUNTY FOR THE DEVELOPMENT OF THE AVENUE D MODEL BLOCK PROJECT; REPEALING ALL RESOLUTIONS IN CONFLICT HEREWITH; PROVIDING FOR SEVERABILITY; AND PROVIDING AN EFFECTIVE DATE.

Motion was made by Commissioner Curtis Johnson, Jr., seconded by Commissioner Michael Broderick to approve Resolution 25-R77.

AYE: Commissioner Michael Broderick, Commissioner Curtis Johnson, Jr., Mayor Linda Hudson

Passed

11. **New Business - City Commission Discussion Items**

A. Discussion of the City's Annexation Strategy in relation to:

1. The Fort Piece Utility Authority (FPUA) Service Area.
2. Existing Development Enclaves.

Planning Director Kevin Freeman, gave the Annexation Strategy presentation. The Commission discussed the benefits of annexing commercial properties over residential. The commercial properties will have a larger impact on the City's revenue because bringing more commercial properties will bring more jobs. If the City annexes more residential areas, it will create a need for more public services like police and fire. They will start out west and with the existing commercial businesses near Indrio Road, Kings Highway, North and South Industrial Park Airport area and this will help to offset the costs when the City annexes the development enclaves.

## 12. City Commission Boards and Committees Updates

Commissioner Johnson mentioned he did not have any updates for the TPO or Fire Board. He did mention the cold weather shelter will open this evening at Percy Peek Gym at 6 P.M.
Commissioner Broderick did not have any updates for his Boards or Committees but did thank the officers for their professionalism from the disturbance at the start of today's meeting.
Mayor Hudson mentioned the Boards and Committees she is a part of will be meeting soon. She was a part of the Canvassing Board for the upcoming election with Ms. Cox and Ms. Hedges, where they observed the election process. She let everyone know the next election date is January 13th, 2026.

## 13. Adjournment

Immediately following adjournment, please move toward the doors and exit the chambers. This allows for the safe and courteous exit of all persons, and those on the dais. Conversations after the meeting should be held outside of chambers, in the foyer or elsewhere, but not in the commission chambers where lights will be out as soon as the chambers are empty.

Mayor Hudson adjourned the meeting at 11:51 A.M.

ATTEST:

_____ _____

CITY CLERK MAYOR COMMISSIONER

**City Commission Day Meeting - 9:00 AM** **8. A.**

**Meeting Date:** 12/08/2025

**Re:** Resilience Plan Draft

**Submitted For:** Linda Cox, City Clerk, City Clerk

**SUBJECT:**

St. Lucie County Regional Resilience Draft Plan and companion Resilience Vulnerability Assessment-Other Hazards Resiliency Strategy Report and Feedback - Sandra Bogan, SLC Resilence Navigator

**SUMMARY:**

In 2022, St. Lucie County was awarded a CDBG-Mitigation grant in the amount of $600,000 and entered into an agreement with the Florida Department of Commerce (Commerce) to develop a community-wide St. Lucie County Regional Resilience Plan (RRP). The initiative included conducting in-depth Resilience Vulnerability Assessments (RVA) to identify risks and inform potential mitigation and adaptation strategy recommendations as part of the RRP.
Two Vulnerability Assessments were conducted:
1. RVA–Flood
o Funded through a Florida Department of Environmental Protection Resilient Florida grant.
o Analyzed present and future impacts of flooding and sea level rise on critical assets.
o Presented to and accepted by the Fort Pierce Board in June 2025.
o Included as an attachment to the RRP.

2. RVA–Other Hazards (RVA-OH)
o Funded through the CDBG-Mit grant.
o Evaluated vulnerabilities related to inland and storm-surge flooding, high winds, extreme heat, drought, wildfire, and coastal erosion.
o A draft version is included as an attachment to the RRP and is currently open for FP Board feedback.
The RVAs were developed using criteria outlined in State Statute 380.093, F.S. and Federal guidelines. This approach leads to vulnerability assessments that provide the necessary data and corresponding analyses for the County and cities to be eligible and better positioned for future grant funding.
The planning process included extensive community engagement and regular meetings of the St. Lucie Resilience Steering Committee, which played a vital role in shaping the RRP and RVAs. The Steering Committee represented various St. Lucie County, Port St. Lucie, Fort Pierce and St. Lucie Village departments, as well as local and regional agency staff.
The Regional Resilience Plan represents the first step in developing a comprehensive and collaborative approach to adapt to and mitigate the effects of extreme and disruptive natural events and is another tool that can be used in planning for a resilient community now and in the future.

**RECOMMENDATION:**

Staff is seeking input into the Draft St. Lucie County Regional Resilience Plan report (RRP) and companion Resilience Vulnerability Assessment-Other Hazards (RVA-OH). A Final SLC RRP report and RVA-OH will be brought back to the Board for formal acceptance at an upcoming Regular Public meeting.

**ALTERNATIVES:**

n/a

**RESPONSIBLE STAFF:**

Linda Cox, City Clerk

**COORDINATED WITH:**

Sandra Bogan, St. Lucie County Resilience Navigator
Paul Thomas, Director of Building, Committee Member

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**Fiscal Impact**

**OTHER INFORMATION:**

No fiscal impact.

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**Attachments**

Presentation
Draft Plan
Vuln Assmt

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**Form Review**

Form Started By: Linda Cox Started On: 09/24/2025 01:43 PM
Final Approval Date: 09/24/2025

# St. Lucie County Draft Resilience Plan

**December 8, 2025 * Fort Pierce Commission– Day Meeting**

TETRA TECH

# Agenda

- Project Overview
- Regional Resilience Plan
  - Vulnerability Assessments
  - Adaptation Strategies
- Questions & Answer

ST. LUCIE COUNTY FLORIDA

FORT PIERCE, FL THE SUNRISE CITY

PORT ST. LUCIE HEART OF THE TREASURE COAST

TOWN OF ST. LUCIE VILLAGE, FL INC. 1961

TETRA TECH

# Community Resilience Planning

Community resilience planning is a process that takes a systematic, evidence-based approach to analyze local community risks and develop actions or adaptations that reduce those risks now and in the future.

# Project Overview

## SLC Draft Regional Resilience Plan (RRP)

- Funded through a CDBG-Mitigation Grant with support from the Resilient Florida Program
- A comprehensive roadmap to enhance resilience across St. Lucie County and its municipalities
- Identifies adaptation strategies to reduce current and future risks and maintain safety, health, and economic stability
- Emphasizes collaboration, policy integration, and adaptive management for long-term resilience

# St. Lucie County's Unique Approach

- **Collaborative Approach:** St. Lucie County, Port St. Lucie, Fort Pierce, and St. Lucie Village worked together to develop community-wide vulnerability assessments and resilience plan
- **Diverse Steering Committee:** Includes key collaborators from a wide range of backgrounds and associations
- **Community Engagement:** Outreach meetings and engagement activities to gather local input and ensure community-driven solutions
- **Project Objectives:** Combines regional collaboration, science-based assessments, and inclusive engagement to create a model for integrated resilience planning

# Project Process

1. COLLECT LOCAL AND REGIONAL BACKGROUND DATA
2. IDENTIFY CRITICAL AND REGIONALLY SIGNIFICANT ASSETS
3. RESILIENCE VULNERABILITY ASSESSMENT-FLOOD
4. RESILIENCE VULNERABILITY ASSESSMENT-OTHER HAZARDS
5. IDENTIFY ADAPTATION STRATEGIES
6. REVIEW POLICIES
7. PRIORITIZATION METHODOLOGY & IMPLEMENTATION STRATEGY
8. STRATEGY FOR TRACKING RESILIENCE ACTIONS

**ST. LUCIE REGIONAL RESILIENCE PLAN**

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# Hazards Evaluated

**Flooding:**

- Sea Level Rise
- Tidal Flooding
- Storm Surge
- Rainfall
- Compound Flooding

**Flooding: Inland (Non-Coastal)**

Temporary inundation of normally dry land due to excessive precipitation rates.

**Extreme Heat:**

A period of hotter and more humid temperatures than average for a specific location at that time of year.

**Drought:**

A period of abnormally dry weather due to a rainfall deficit

**Severe Storm:**

Tornadoes, hurricanes, tropical storms, and other weather events that often intensify rapidly, bringing excessive rainfall and/or wind.

**High Wind:**

Events with sustained wind speeds that are powerful enough to down trees and powerlines, damage property, and knock debris loose.

**Wildfire:**

An uncontrolled fire that begins in an undeveloped area but may spread and threaten nearby communities, populations, and critical assets.

**Coastal Erosion:**

The permanent removal of sand from shorelines and coastal lands due to wind, waves, and longshore currents.

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# Resilience Vulnerability Assessments (RVA)

*Serve as the foundation of the Regional Resilience Plan, guiding policies, and adaptation strategies*

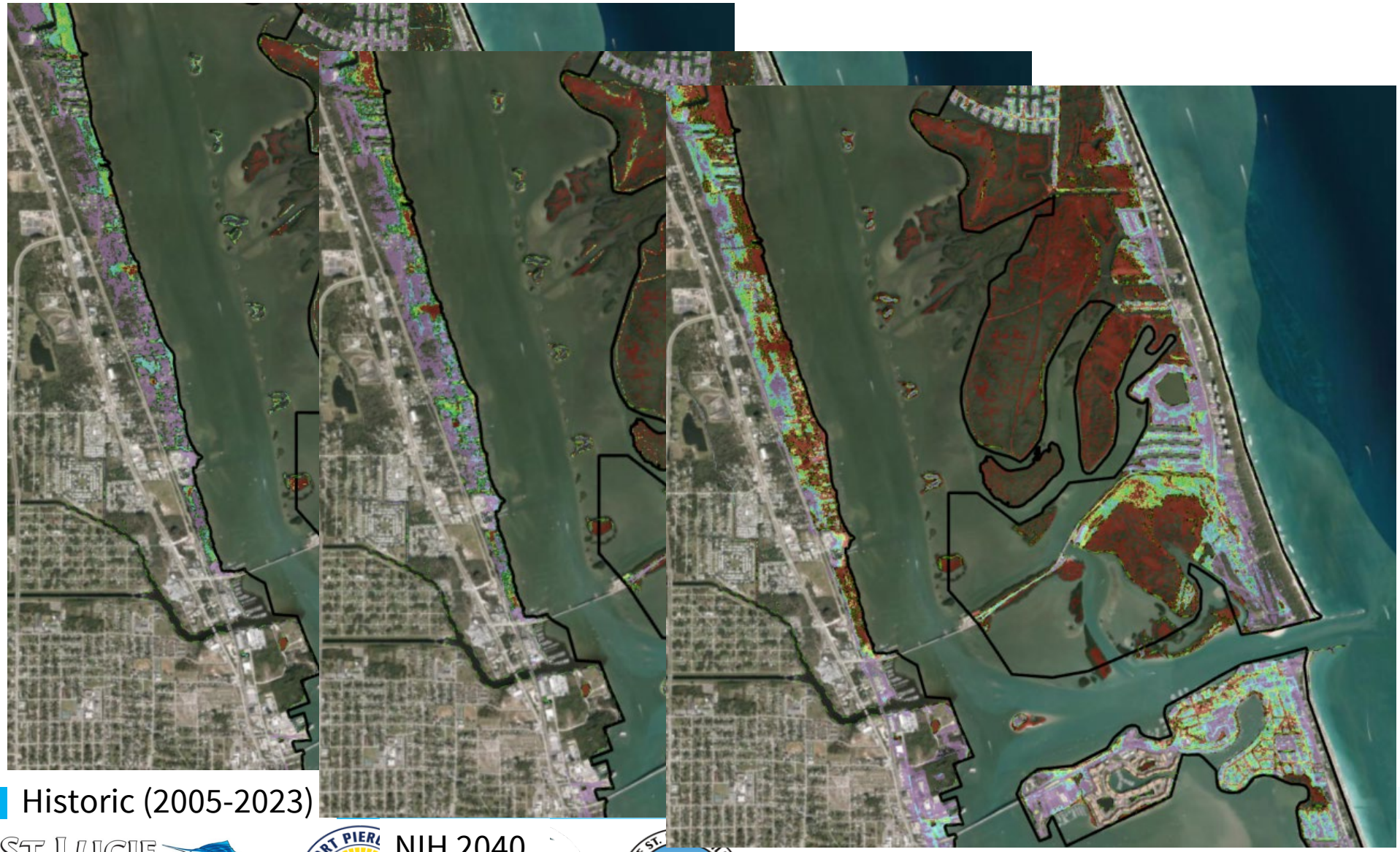
**RVA-FLOOD**

- FDEP Resilient Florida grant funded to evaluate vulnerability of critical assets from flooding hazards
- Focused on current and future flood risks (2040, 2070, 2100) from rainfall, sea level, storm surge, high tides / king tides, and combination (compound)
- Incorporated local and regional datasets, hydrologic models, and GIS-based analysis

**RVA-OTHER HAZARDS**

- CDBG-Mit grant funded to evaluate vulnerability of community assets, land and populations from a range of natural hazards
- Focused on coastal erosion, extreme heat, drought, high winds/storms, wildfires, storm surge, and inland flooding (2040 & 2070 scenarios)
- Includes SLAMM model analysis that offers a framework for utilizing conservation and restoration as an efficacious and cost-effective community resilience planning strategy.

# Days of Tidal Flooding



MHHW + 2' Contour

County Boundary

Days of Tidal Flooding

- 1 Day
- 2-5 Days
- 6-10 Days
- 11-20 Days
- 21-30 Days
- 31-40 Days
- 41-50 Days
- 51-100 Days
- 100-150 Days
- 150+ Days

Historic (2005-2023)

NIH 2040

NIH 2070

ST. LUCIE COUNTY FLORIDA

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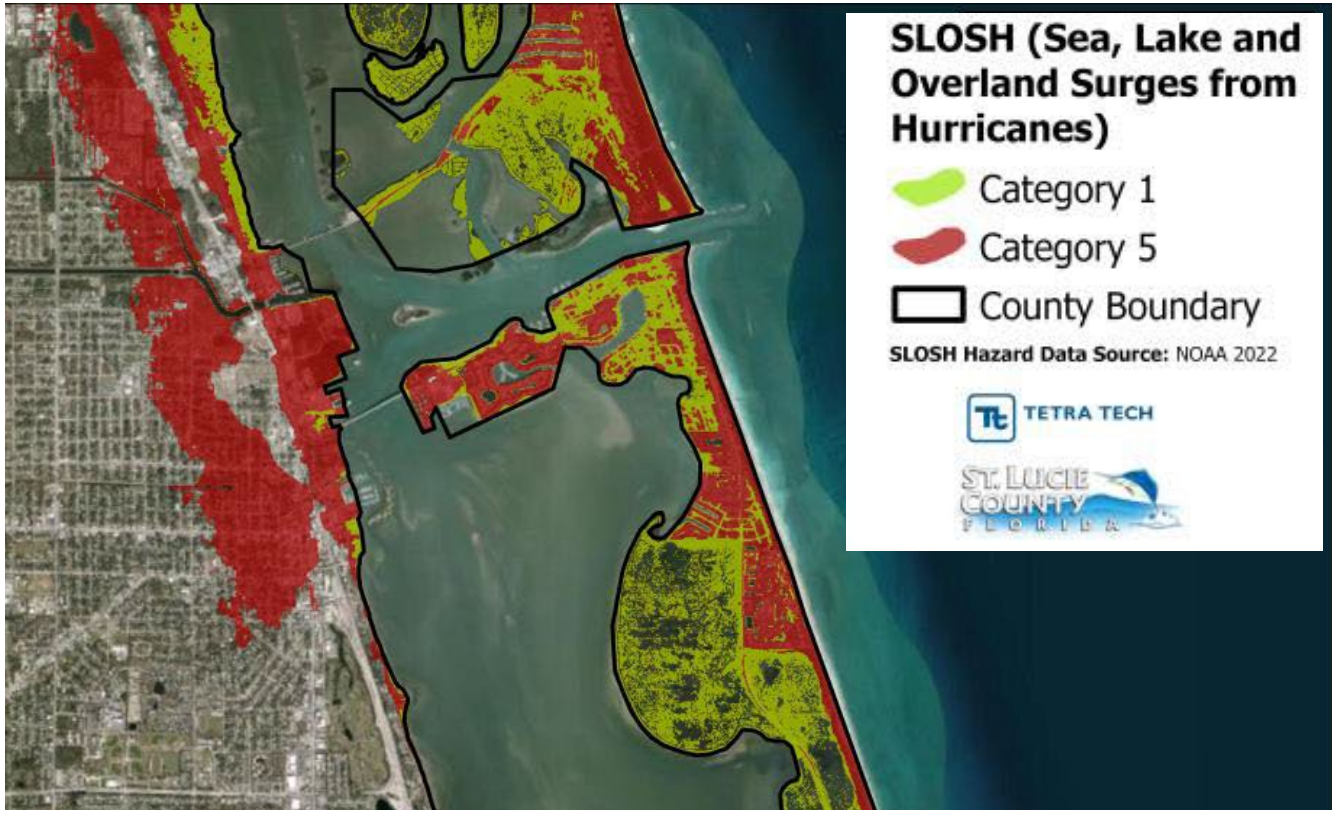
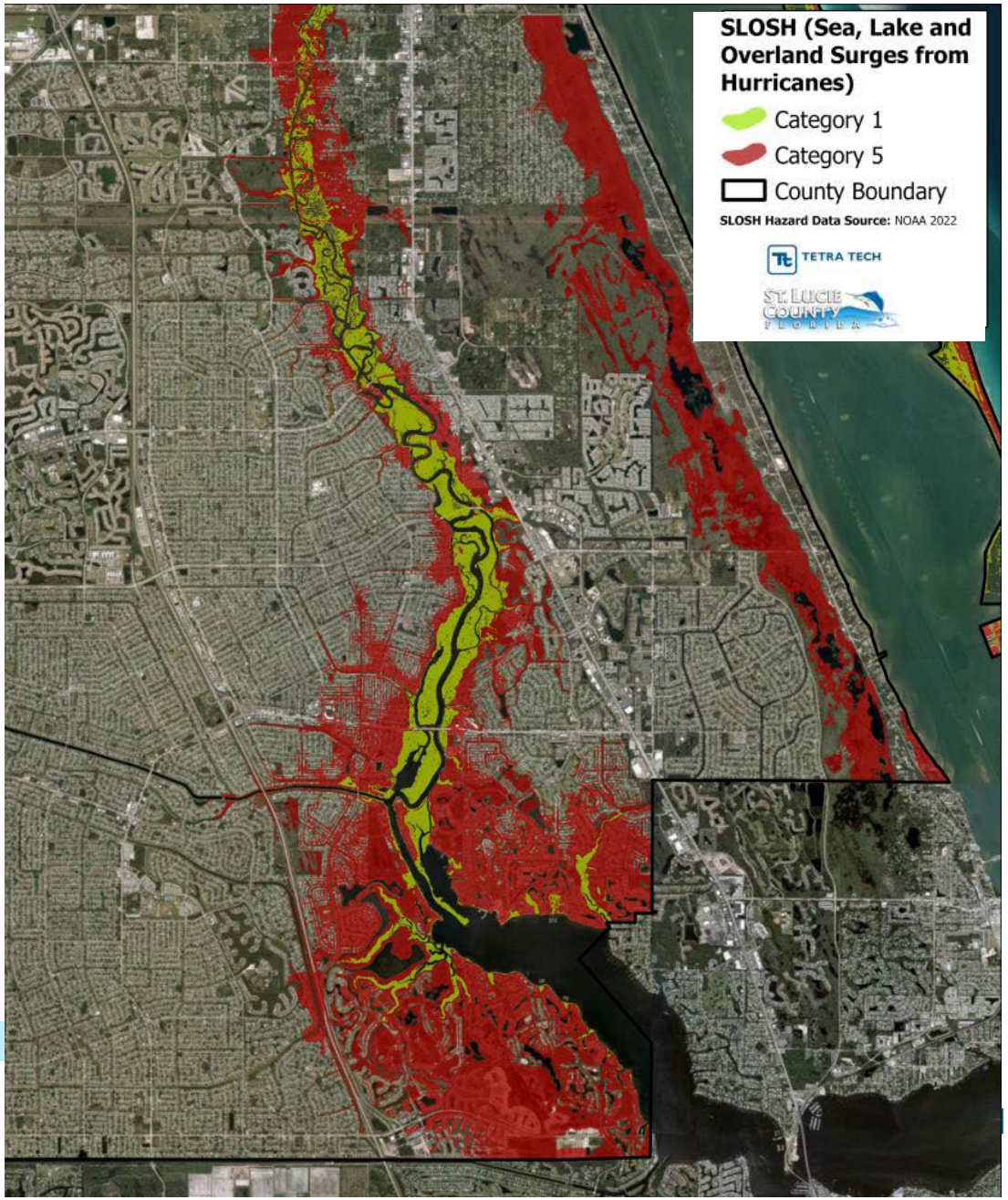
TETRA TECH

# Storm Surge

## Fort Pierce area

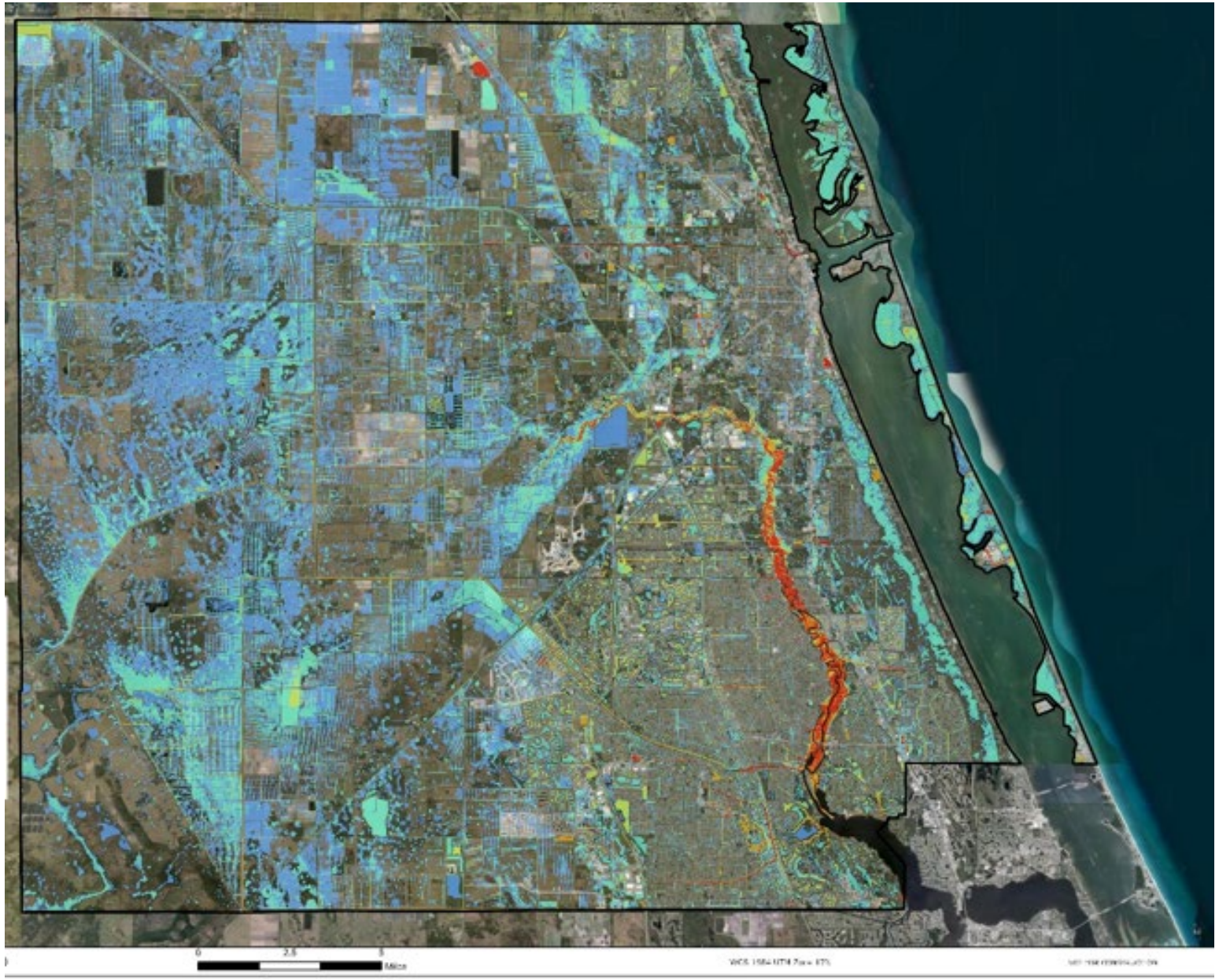



## Port St. Lucie area

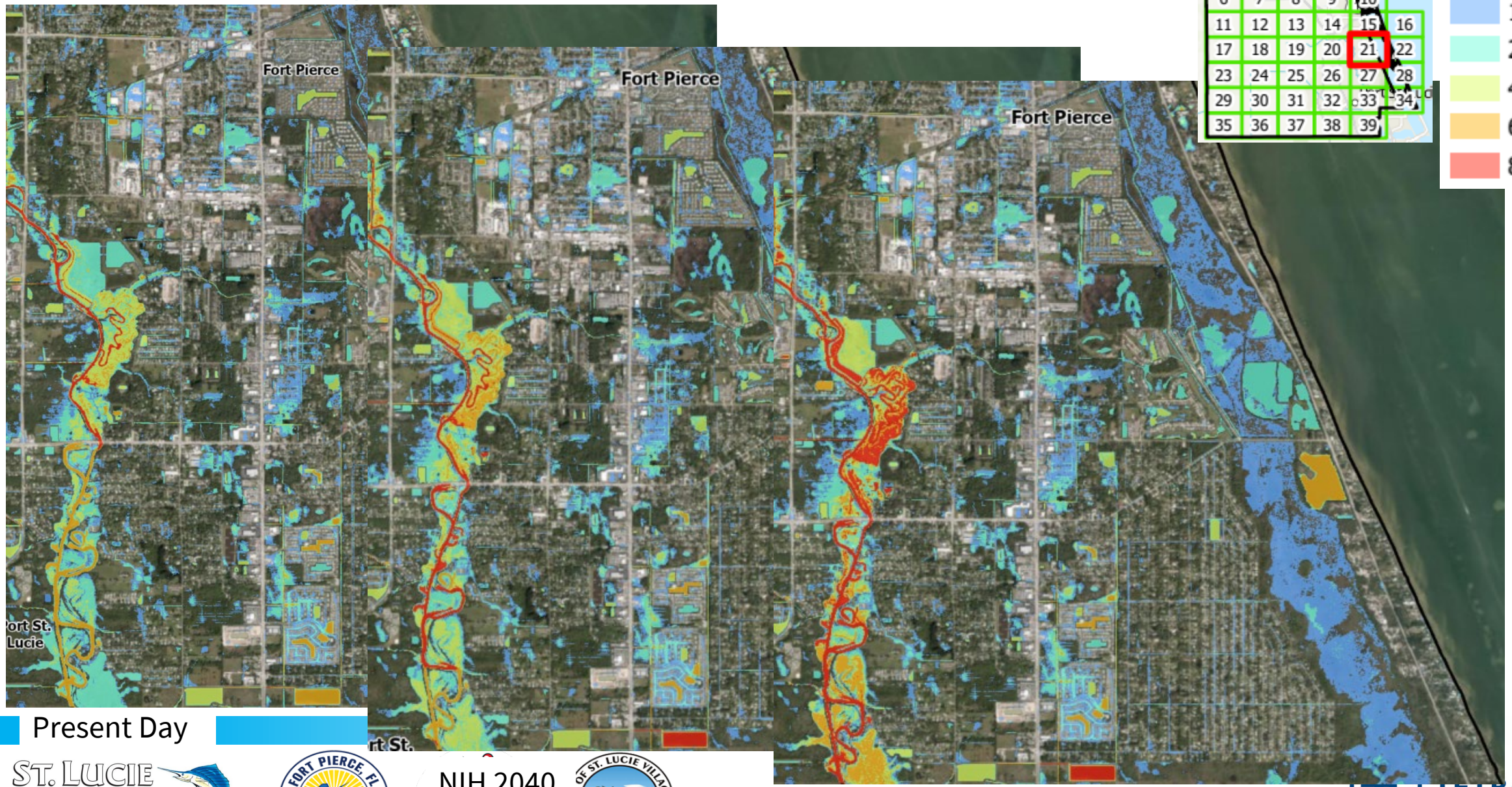


# County-wide Map

- Year 2070
- 100-Year/24-Hour Rainfall
- NOAA Intermediate High Sea Level Projections



# Rainfall: 100-year/24-hour Rain Event

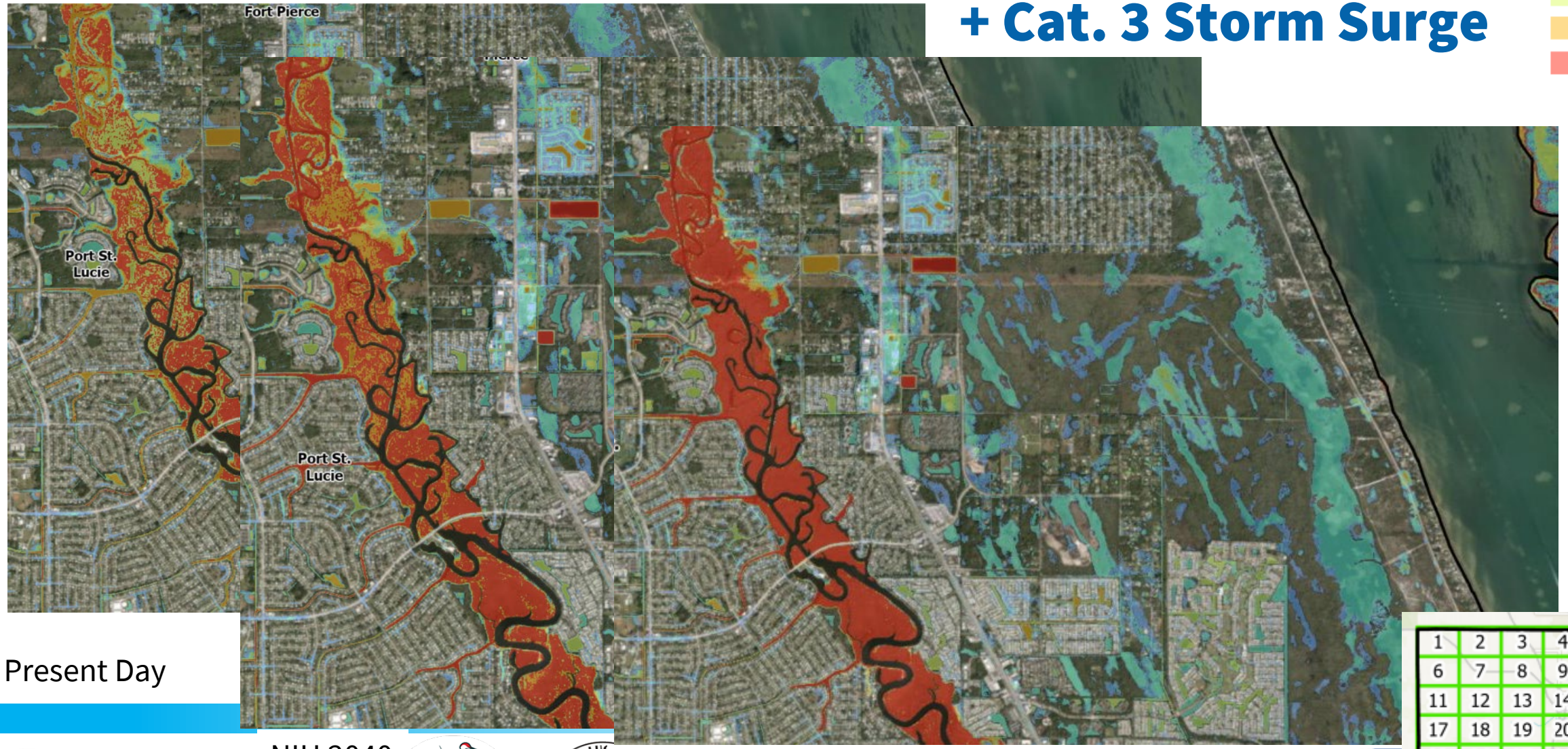



Present Day

NIH 2040

NIH 2070

# Compound Flooding : 100-year/24-hour Rain Event + Cat. 3 Storm Surge

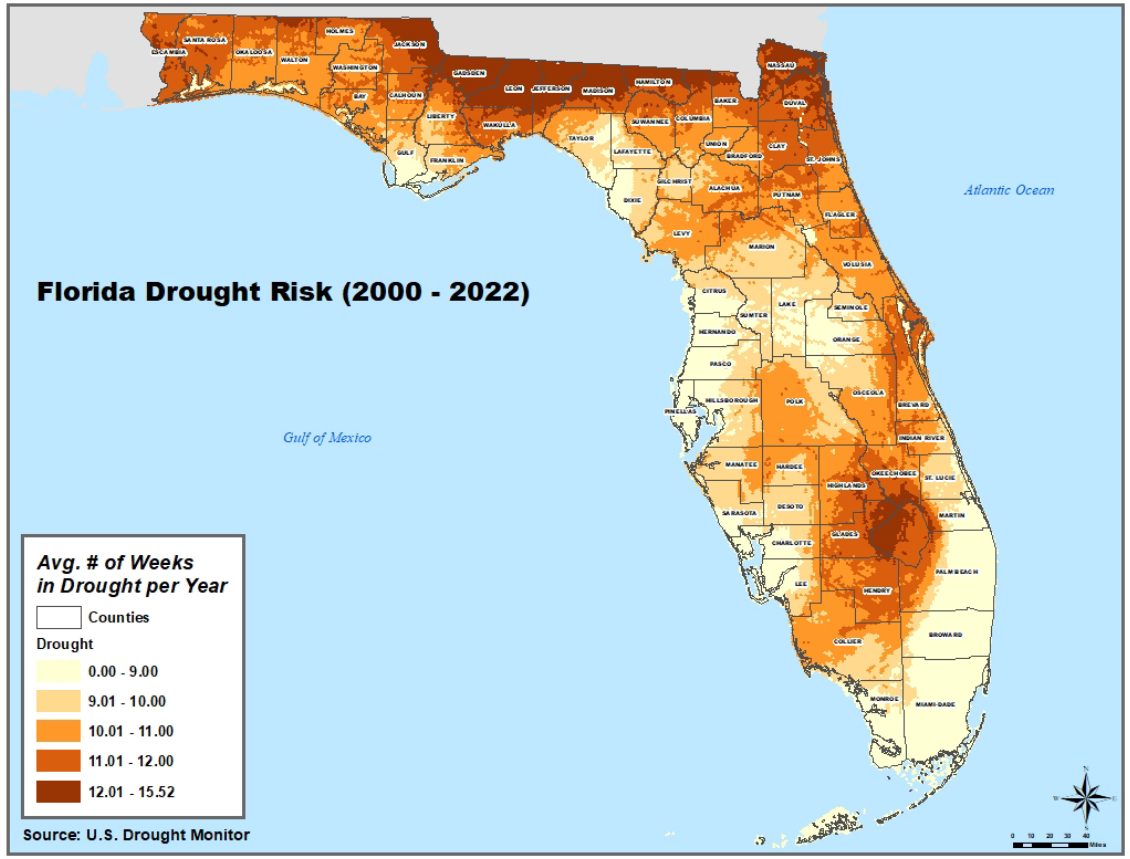



Present Day

NIH 2040

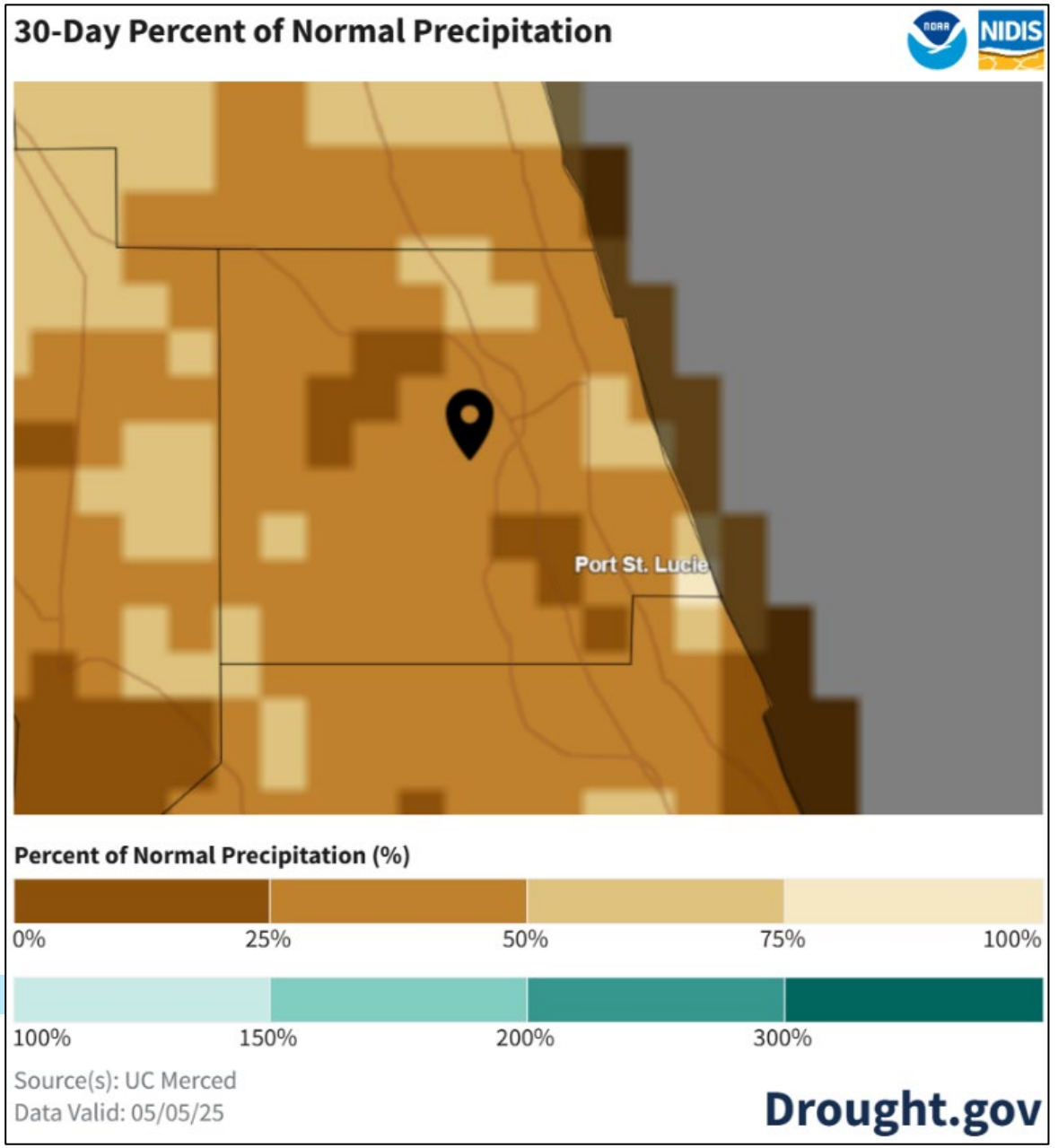
NIH 2070

# Drought

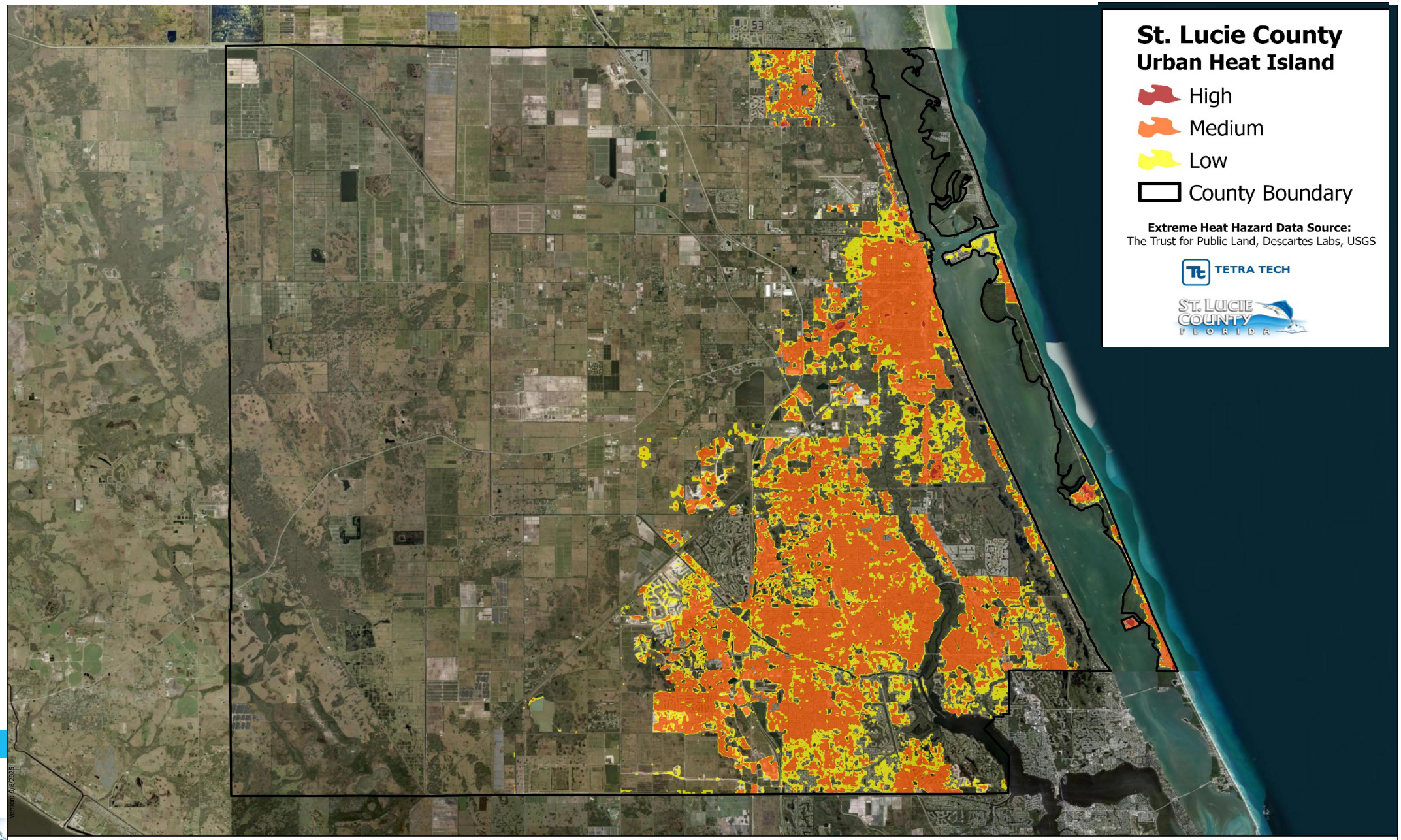



St. Lucie County has experienced an average of 9 to 10 weeks of drought annually from 2000-2022.

**Recent example: April-May 2025**

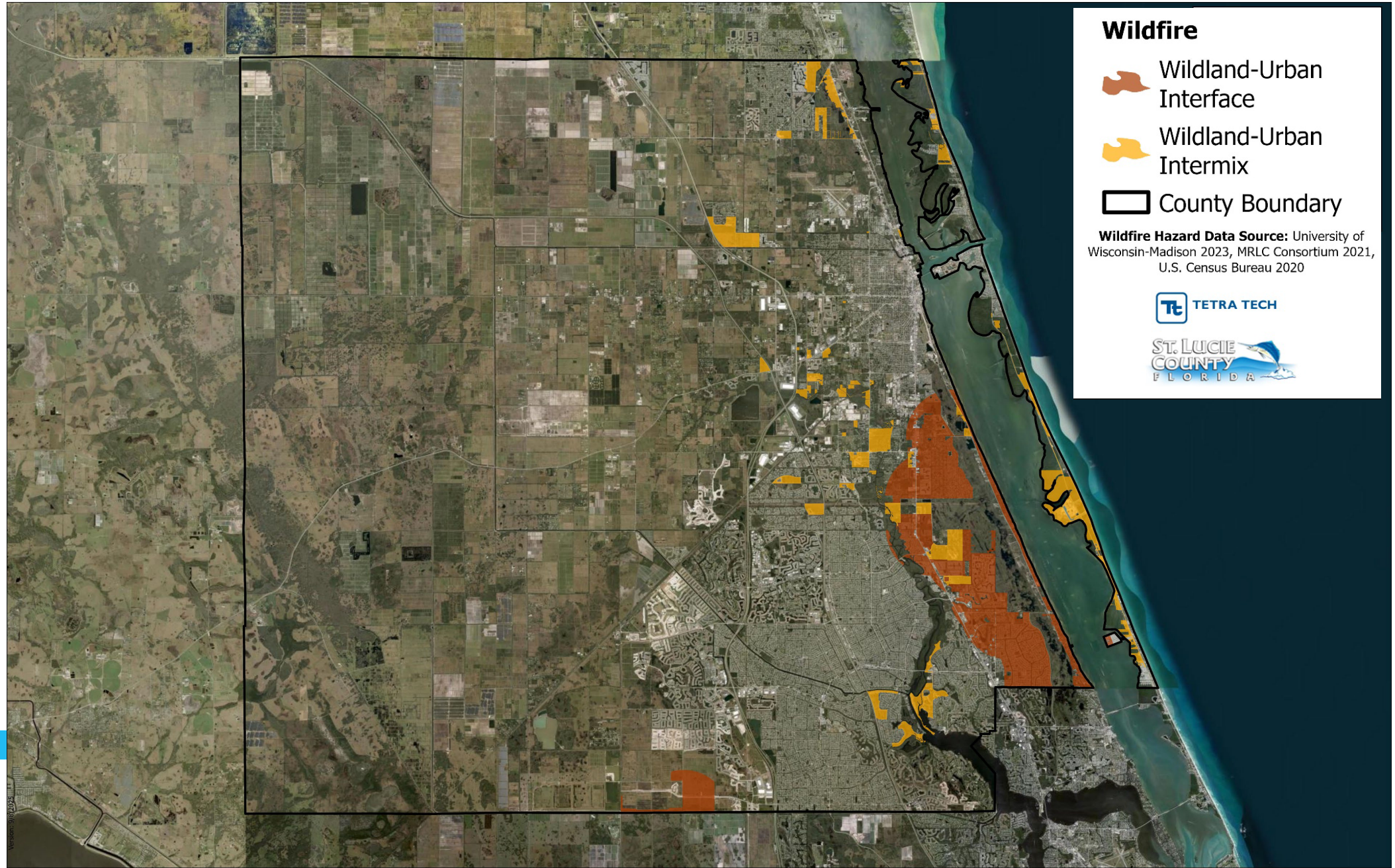


# Extreme Heat




ST. LUCIE COUNTY FLORIDA

# Wildfire




ST. LUCIE COUNTY FLORIDA

# Regional Resilience Plan

ST. LUCIE COUNTY FLORIDA

FORT PIERCE, FL THE SUNRISE CITY

PORT ST. LUCIE HEART OF THE TREASURE COAST

TOWN OF ST. LUCIE VILLAGE, FL INC. 1961

TETRA TECH

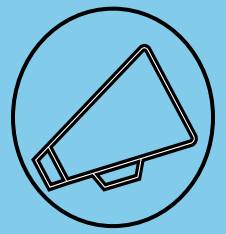
# Regional Resilience Plan

- Enhance county-wide resilience by offering adaptation and mitigation strategies based on identified risks
- Considerations include hazard mitigation, emergency preparedness, land use planning, code & policy development, infrastructure investment, and public health policies & programs
- Informed by:
  - Resilience Vulnerability Assessments, existing plans & studies, stakeholders
- Includes capacity assessment and implementation plan

# Adaptation Strategies

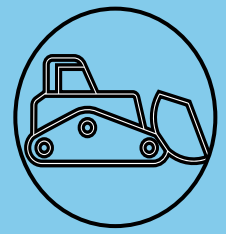
**Grey Infrastructure (fortify, elevate, relocate)**

**Green Infrastructure (protect, restore, augment)**



**Community Education, Programs, and Readiness**

**Emergency Management Planning**



**Land Use and Code Guidelines**

# Phased Adaptation Approach

1. **Immediately Actionable**:

   Actions that can begin immediately using existing resources, staff capacity, and current authority.

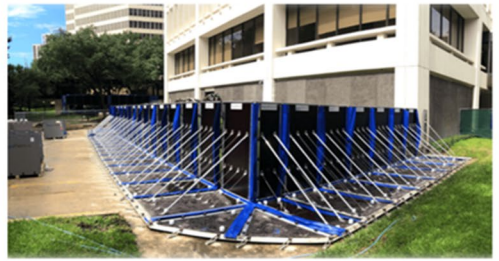
2. **Requires Planning and Coordination**:

   Actions that need more preparation before implementation, such as detailed design work, engineering studies, permitting processes, supplemental funding, and/or formal partnerships with other agencies and stakeholders.

3. **Requires Significant Research, Investment, and/or Sequencing**:

   Actions that depend on major funding commitments, technical studies, and/or enabling policies before they can move forward. These strategies may involve large-scale infrastructure projects, advanced modeling, or phased implementation to ensure feasibility and cost-effectiveness.

# Example Adaptations:
# Facilities & Infrastructure



**Retrofitting Critical Facilities**

- Retrofit and design with energy-efficient cooling systems, renewable energy sources, and passive design features like reflective & cool roofing materials to reduce utility costs, mitigate extreme heat impacts on buildings, and maintain operations during power outages.
- Retrofit and design with impact-resistant windows, reinforced roofs, and other wind-hardened features to ensure continuity of operations.

**Construction of New Facilities & Infrastructure**

- Utilize vulnerability assessments and other studies in decision-making process based on expected lifespan of specific infrastructure.
- Enhance freshwater and potable water systems by implementing salinity barriers or adaptive culverts at estuarine-freshwater interfaces.
- Establish roadway design standards that are resilient to sea level rise and extreme rain events.

# Example Adaptations:
# Ecosystems & Nature-Based Solutions

- Restore and protect inland wetlands and floodplains to enhance natural flood storage, improve water quality, and support habitat resilience.
- Maintain and expand strategic land acquisition programs and scale up use of conservation easements by prioritizing landowner outreach.
- Expand parks/preserves and tree coverage to provide shade and cooling benefits.
- Upgrade stormwater infrastructure using future rainfall projections and hybrid gray-green systems to address compound flooding risks.
- Identify and utilize public open spaces for enhanced stormwater management, including dual-purpose uses such as green space, preservation, and floodwater retention.

# Adaptation Project Types:
# Community Planning & Policy

- Conduct a comprehensive analysis for consistency and opportunities to strengthen resiliency goals and policies.
- Integrate resilience considerations, practices, and professionals into the daily functions of government agencies and infrastructure management
- Prioritize permitting incentives for resilient and low-impact development (LID); review development requirements to enhance incentives for resilient building standards.
- Ensure affordable housing requirements account for future flood risk and other hazard vulnerabilities.
- Encourage structure elevation programs for residents in low-lying areas to reduce flood risk.

# Adaptation Project Types:
# Emergency Management

- Use vulnerability assessment results in emergency management planning and to prioritize projects.
- Create a dataset on hazardous materials and analyze potent impacts by future flood risk.
- Develop a countywide extreme heat early warning system an cooling center network, with targeted siting and outreach.
- Develop a flood early warning system with gauges in strategi locations to monitor water levels and provide alerts when ro may be flooding.
- Complete property-level risk analysis using NFIP data to identify under-insured areas for targeted flood preparedness outreach.

# Adaptation Project Types:
# Community Education, Programs, and Readiness

- Maintain a database of low-interest capital resources and insurance mitigation programs to incentivize property owners to invest in storm resilience improvements and lower insurance premiums.
- Develop an online library of disaster preparedness and recovery resources that is broadly advertised and available to the public, emphasizing individual roles in community resilience.
- Encourage and incentivize residents to inspect their stormwater systems before major rain events through education and recognition programs.
- Prioritize community-based planning and development

# Capacity Assessment

*The ability of a community, infrastructure system, or organization* ***to respond to evolving hazards*** *or future risk conditions through its preparedness, operations, resources, policies, or physical assets to* ***reduce long-term risk*** *of loss of life, injury, property damage, and hardship, consistent with the objective of* ***increasing resilience*** *to natural disasters.*

The Capacity Assessment includes an evaluation of plans, policies, and response and recovery documents to determine the County and municipalities capability to adjust or withstand future hazard events

SLC as a whole scored:
**STRONG adaptive capacity for**
Inland Flooding and Storm Surge Flooding

**Moderate adaptive capacity for**
Coastal Erosion, Drought, Heat, Wildfire and Wind

# Policy Strategies

**Policy review comprised of two main components:**

1. Development of a set of uniform policies directly shaped by the Adaptation Strategies developed for the project
2. Review of individual participating local government's Comprehensive Plans and Codes for opportunities and constraints related to the Regional Resilience Plan

**Strategies to address resiliency were a priority including:**

- Stormwater design/management and/or assessment policies
- Municipal Service Benefit policies (County-level)
- Landscaping policies
- Shoreline policies
- Floodplain management policies
- Community & Neighborhood recommendations
- Others as relevant

# Key Takeaways

- ✓ The RRP provides a unified strategy for St. Lucie County and its municipalities to address risks collaboratively
- ✓ Built on comprehensive vulnerability assessments that evaluate both flooding and other natural hazards
- ✓ Identifies actionable adaptation strategies to protect critical infrastructure, natural resources, and residents
- ✓ Continued community engagement and stakeholder input is important for future updates to the RRP, ensuring local priorities and needs are reflected
- ✓ The RRP establishes a long-term roadmap that is adaptive and designed to evolve with changing conditions and new data

# Thank You!

ST. LUCIE COUNTY FLORIDA

Discussion and Questions

Website: ResilientStLucie.com

ST. LUCIE COUNTY FLORIDA

# St. Lucie County Regional Resilience Plan

Draft Report

November 2025

TETRA TECH

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*The Project Team would like to thank the following individuals for serving on the St. Lucie Community Resilience Steering Committee and providing their input and expertise in this Regional Resilience Plan:*

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# EXECUTIVE SUMMARY

Community resilience refers to the ability of governments, individuals, organizations, institutions, and businesses to anticipate, respond to, endure, and recover from both immediate and prolonged pressures stemming from natural hazards like hurricanes, flooding, and extreme heat events.

St. Lucie County (SLC, or County) and its municipalities—City of Port St. Lucie (PSL), City of Fort Pierce (FP), and St. Lucie Village (SLV)—joined together to take a collaborative approach toward short- and long-term resilience planning, beginning with the development of comprehensive Regional Resilience Vulnerability Assessments (RVA). Phase I of the RVAs, completed in June 2025, focused on flooding hazards (RVA-Flood). Phase II focused on "Other Hazards" (RVA-OH), including coastal erosion, extreme heat, drought, wind, wildfires, storm surge, inland flooding, and sea level rise. Together, the RVAs represent a foundational step in developing a community-wide resilience plan by taking a local, data-driven approach to evaluate the vulnerability of community-wide assets to various natural hazards. This document represents an initial step in a longer-term resilience planning journey. It includes the methodology, results, and recommendations developed by a committee of local practitioners and sustainability experts dedicated to advancing resilience in St. Lucie County.

This resulting Regional Resilience Plan (RRP) builds from the work completed in the RVAs and identifies adaptation strategies that can be implemented to ensure a resilient future for the region. **Adoption or acceptance of the RRP by local jurisdictions signals a shared commitment to prioritizing resilience. It does not constitute adoption of the specific policies or actions recommended in the plan, but rather, an agreement to consider these recommendations in future planning and decision-making.** Importantly, adoption of the RRP also positions the County and municipalities to be eligible for critical state and federal grant funding to support resilience initiatives.

SLC and the municipalities have a long history of collaborating to address a wide range of issues and implement initiatives that promote sustainability and resilience. From the acquisition and restoration of natural areas to the development of stormwater storage and conveyance systems, septic-to-sewer projects, water quality improvement efforts, and disaster preparedness, the St. Lucie community is well-positioned to continue to enhance its resilience to future threats.

The St. Lucie County RRP outlines a comprehensive strategy to enhance resilience, safety, economic stability, and health across St. Lucie County and the municipalities, encompassing both immediate and long-term adaptation strategies. The RRP, developed in response to hazards such as sea level rise and storm surge, wind, coastal erosion, extreme heat, and increased flooding, was informed by the RVAs that examined critical infrastructure, at-risk populations, and natural resources. The goal of this plan is to equip the County and municipalities with adaptive capacity to withstand current and projected hazard impacts while maintaining the safety, health, and economic stability of all residents.

The Phase I RVA-Flood analysis was funded in part by the Florida Department of Environmental Protection through a Resilient Florida Program grant, while the Phase II RVA-OH analysis and Regional Resilience Plan was funded by a Florida Department of Commerce Community Development Block Grant Mitigation Program, through the U.S. Department of Housing and Urban Development. Together

with the RVAs, the Regional Resilience Plan represents a critical initiative that reflects a collaborative effort among St. Lucie County and its municipalities, local agencies, and community stakeholders to build a more resilient and adaptative community.

Public stakeholders and steering committee members played a vital role in shaping the RRP by providing essential input and feedback. More than two dozen meetings or workshops were held to provide information on resilience planning and the development of the RRP, eliciting input from 11 different groups from neighborhood associations and non-profit organizations to government and agency boards and committees. SLC and the municipalities established a resilience steering committee of key collaborators, comprising representatives from diverse backgrounds. The resilience steering committee assisted in shaping the resilience project by reviewing goals, offering input on study direction, identifying geographic context, guiding modeling methodologies, pinpointing available data and resources, providing specific asset information, and reviewing project findings. The steering committee represented various St. Lucie County, Port St. Lucie, Fort Pierce, and St. Lucie Village departments including Planning & Development Services, Public Works, Utilities & Solid Waste, Public Works, Emergency Operations, Coastal Engineering, Innovation & Strategic Initiatives, and Environmental Resources. The resilience steering committee was also comprised of various member agencies including representatives from SLC Florida Department of Health, SLC School District, SLC Economic Development Council, St. Lucie Transportation Planning Organization, and the Treasure Coast Regional Planning Council.

To ensure success, the RRP emphasizes collaboration with partners, community engagement, policy integration, and adaptive management, allowing for responsive adjustments based on ongoing data collection and progress evaluations. Funding strategies include leveraging federal and state grants, local funding, and innovative financing, providing the financial foundation needed to sustain resilience efforts.

Success metrics, such as key performance indicators and regular progress assessments, will guide the County's and municipalities' efforts, ensuring transparency and accountability. Outcomes will be shared as updates with the public, fostering community support and trust in their local government's commitment to resilience.

The St. Lucie County's RRP provides a forward-looking foundation and a flexible framework to guide future resilience actions. The RRP positions the County to not only adapt to but thrive in the face of hazard-related challenges, creating a safer, healthier, and more resilient future for all residents.

# Table of Contents

**1.0 INTRODUCTION ..... 1**

1.1 Project Background ..... 1
1.2 RRP Project Goals, Metrics, and Targets ..... 1
1.3 Resilience Initiatives in St. Lucie County ..... 2
1.3.1 Vision ..... 2

**2.0 PROJECT PROCESS AND METHODOLOGIES ..... 2**

2.1 Overview of Regional Vulnerability Assessment Results ..... 3
2.2 Resilience Planning Methods ..... 4
2.3 Steering Committee ..... 4
2.4 Public Outreach ..... 4
2.4.1 Stakeholder and Public Outreach Events ..... 5

**3.0 EXISTING PLANS AND RESILIENCE INITIATIVES ..... 5**

3.1 Mobility Plan ..... 6
3.2 Stormwater Master Plan ..... 6
3.3 Environmentally Significant Lands Program ..... 9
3.4 Naturally PSL: Green Spaces & Places ..... 9
3.5 Grow Green Urban Forestry Initiative ..... 9
3.6 Torino Regional Park ..... 9
3.7 McCarty Ranch Extension & Preserve/ St. Lucie River/C-23 Water Quality ..... 9
3.8 Half Cent Sales Tax ..... 10
3.9 FEMA Community Rating System ..... 10
3.10 St. Lucie County Unified Local Mitigation Strategy ..... 10
3.11 Coastal Storm Protection Program ..... 10
3.12 St. Lucie Community Resilience Steering Committee ..... 11

**4.0 COUNTYWIDE ADAPTATION STRATEGIES ..... 11**

4.1 Adaptation Classification Types ..... 11
4.1.1 Protection ..... 11
4.1.2 Accommodation ..... 11
4.1.3 Avoidance ..... 12
4.1.4 Retreat ..... 12
4.2 Countywide Adaptation Strategies ..... 12
4.3 Proposed Adaptation Strategies ..... 12
4.3.1 Physical Modifications to Assets ..... 13

4.3.2 Natural Defenses and Nature-based Adaptations ..... 15
4.3.3 Planning, Management, and Policy ..... 17
4.3.4 Community Education, Programs, and Readiness ..... 18
**5.0 METRICS TO PRIORITIZE ADAPTATION STRATEGIES ..... 20**
5.1 Ensure Life Safety/Criticality ..... 20
5.2 Incorporate Cross-Cutting Strategies ..... 21
5.3 Maximize Cost Efficiency and Co-Benefits ..... 21
5.4 Enhance Asset Longevity and Adaptation Permanence ..... 21
5.5 Minimize Tradeoffs and Downstream Effects ..... 21
5.6 Identify Funding Source(s) ..... 21
5.7 Evaluate Short versus Long Implementation Timeline ..... 22
5.8 Facilitate Ease of Implementation ..... 22
5.9 Consider Future Adaptability ..... 22
**6.0 POLICY ..... 22**
6.1 Uniform Resilience Policies ..... 23
**7.0 ADAPTIVE CAPACITY ..... 25**
**8.0 IMPLEMENTATION ..... 25**
8.1 Level of Effort ..... 26
8.2 Cost Estimate ..... 26
8.3 Timeline ..... 26
8.4 Funding Sources ..... 26
8.5 Other Considerations ..... 28
8.5.1 Partnership and Collaborations ..... 29
8.5.2 Lead Agencies/Organizations ..... 29
8.5.3 Regulatory and Planning Capabilities ..... 29
8.5.4 Administrative and Technical Capabilities ..... 29
8.6 Fiscal Capacity ..... 30
8.7 Phased Adaptation Approach ..... 30
**9.0 MONITORING AND EVALUATION ..... 30**
9.1 Tracking Progress and Performance ..... 31
9.2 Feedback Mechanisms ..... 31
**10.0 LAND PRESERVATION COST BENEFIT ANALYSIS ..... 32**
**11.0 CONCLUSION ..... 32**

**12.0 REFERENCES ..... 33**

## List of Tables

Table 8-1. Future Resilience Adaptation Project Funding Options ..... 27

## List of Figures

Figure 1-1. RVA and RRP Project Process ..... 1
Figure 2-1. St. Lucie County Public Engagement Process ..... 5
Figure 3-1. Locations of Priority Basins with Areas of Concern Identified in the Draft Stormwater Master Plan ..... 8
Figure 4-1. Adaptation Strategy Categories ..... 13

## List of Appendices

APPENDIX A: Portfolio of Adaptation and Mitigation Strategies
APPENDIX B: Uniform Resilience Policy Recommendations
APPENDIX C: Adaptive Capacity Assessment
APPENDIX D: Watershed Mapping
APPENDIX E: Tree Canopy Analysis
APPENDIX F: Land Preservation Cost-Benefit Analysis
APPENDIX G: National Flood Insurance Program Community Rating System Review
APPENDIX H: Public Workshop Survey Results

# Acronyms and Abbreviations

| | |
|---|---|
| BCEGS | Building Code Effectiveness Grading Schedule |
| CDBG-MIT | Community Development Block Grant Mitigation |
| County | St. Lucie County |
| CRS | Community Rating System |
| FDEP | Florida Department of Environmental Protection |
| FEMA | Federal Emergency Management Agency |
| FP | Fort Pierce |
| F.S. | Florida Statute |
| GIS | geographic information system |
| HUD | U.S. Department of Housing and Urban Development |
| municipalities | City of Port St. Lucie, City of Fort Pierce, and St. Lucie Village |
| NFIP | National Flood Insurance Program |
| NIH | NOAA intermediate-high (sea level rise projection) |
| NIL | NOAA intermediate-low (sea level rise projection) |
| NOAA | National Oceanic and Atmospheric Administration |
| PSL | Port St. Lucie |
| RRP | Regional Resilience Plan |
| RVA | Resilience Vulnerability Assessment |
| RVA-OH | Resilience Vulnerability Assessment – Other Hazards |
| SLAMM | Sea Level Affecting Marshes Model |
| SLC | St. Lucie County |
| SLV | St. Lucie Village |

# Glossary

**Adaptation**: The process of adjustment to actual or expected threats and impacts, in order to moderate harm or exploit beneficial opportunities. Adaptive capacity is the ability to make these adjustments based on feedback loops.

**Adaptive Capacity:** The ability of an asset to adapt, withstand, or function effectively in the face of hazard impacts.

**Assets:** People, resources, ecosystems, infrastructure, and the services they provide. Assets are the tangible and intangible items that St. Lucie County residents and communities value.

**Bathtub Method/Model:** A methodology that calculates and/or models the addition of water on the landscape to determine existing and future risks to flooding. The bathtub model looks at water on the land based on topography without regard to current or future stormwater infrastructure nor underground hydrology dynamics.

**Critical Assets/Infrastructure:** Public assets, networks, and essential systems crucial for the well-being of St. Lucie County and the municipalities. Disruption or damage to critical infrastructure would lead to negative community, environmental, and/or economic consequences.

**Days of Tidal Flooding:** The number of days that the water level exceeds mean higher high water at (in this study) the Virginia Key Tide Gauge, when that water level is adjusted for sea level rise.

**Exposure:** The presence of people, assets, and ecosystems in places where they could be adversely affected by hazards.

**Flood Mitigation:** Structural changes to reduce the frequency and severity of flood damages.

**Hazard:** An event or condition that may cause injury, illness, or death to people or damage to assets or otherwise impede their normal function.

**Hazard Mitigation:** When used by the Federal Emergency Management Agency (FEMA), the actions taken to reduce loss of life and property by lessening the impact of near future disasters.

**Hazus:** A GIS-based software tool that applies engineering and scientific risk calculations to provide defensible damage and loss estimates.

**Impacts (negative impacts in this discussion):** Effects on natural and human systems that result from hazards. Evaluating potential impacts is a critical step in assessing vulnerability.

**Infrastructure:** Fundamental physical and organizational structures (man-man and natural) and facilities necessary for the functionality of a community.

**Likelihood:** The probability of an asset being impacted by a hazard based on its geographical position.

**Mitigation:** A human intervention to reduce impacts from current or future impacts.

**Mean Return Period**: The average amount of time expected between occurrences of a specific event, such as a hurricane or flood, based on historical data and probability.

**Nature-based Solutions:** Efforts to safeguard, sustainably manage, and restore or augment natural or altered ecosystems as an effective way to reduce the risks posed by natural hazards, such as flooding, extreme heat, and coastal erosion. Nature-based solutions can provide effective mitigation, while simultaneously enhancing human well-being and biodiversity.

**Planning Horizon:** The projected conditions at a future date, in this study the planning horizons are 2040 and 2070.

**Projections:** Potential future conditions simulated by complex computer-based models of the earth's systems. Projections are based on potential scenarios and various factors under different assumptions about natural processes and human activity and are crucial for informing adaptation and mitigation strategies, as well as community preparedness.

**Regionally Significant Assets:** Vital facilities within the County that cater to a wider geographic scope, spanning neighboring communities, and may be but are not inherently under the county or municipal ownership and maintenance.

**Resilience:** The capacity of a community, business, or natural environment to prevent, withstand, respond to, and recover from a disruption.

**Risk:** The potential total cost if something of value is damaged or lost, considered together with the likelihood of that loss occurring. Risk is often evaluated as the probability of a hazard occurring multiplied by the consequences that would result if it did happen.

**Scenarios:** A set of assumptions about the future regarding the level and effectiveness of mitigation efforts and other physical processes, each with a level of uncertainty.

**Sea Level Rise (Absolute Sea Level Rise):** An increase in the height of the ocean surface above the center of the earth, without regard to whether nearby land is rising or falling.

**Section 380.093(3), F.S.:** A Florida statute passed in 2021, 380.093(3), F.S. pertains to vulnerability assessments related to flooding and sea level rise in the state of Florida. It requires the state to compile a comprehensive statewide assessment of specific risks posed by flooding and sea level rise.

**Sensitivity:** The degree to which a system, population, or resource is or might be affected by hazards.

**Storm Surge:** An abnormal rise in seawater level generated by a storm, over and above the predicted astronomical tide. It is primarily caused by strong winds pushing water toward the shore and can result in extreme coastal flooding, especially when coinciding with high tide.

**Tidal Flooding**: Defined in Florida Statute (F.S.), Subparagraphs 380.093(3)(d)1. and 380.093(3)(d)2., F.S. as "Depth of tidal flooding, including future high tide flooding. The threshold for tidal flooding is 2 feet above mean higher high water."

**Uncertainty:** The inability to predict, with 100 percent accuracy, a particular outcome because future weather conditions and system dynamics arise from the complexity of variables.

**Urban Heat Island Effect:** A phenomenon where urban areas experience significantly higher temperatures than surrounding rural areas due to the concentration of buildings, roads, and other

infrastructure that absorb and retain heat. Limited vegetation and increased human activity further intensify this effect.

**Vulnerability:** The propensity or predisposition of assets (human, ecological, and man-made) to be adversely affected by hazards. Vulnerability encompasses the degree of exposure, sensitivity, risk, potential impacts, and adaptive capacity.

**Vulnerability Assessment:** A systematic, data-driven process for analyzing hazard exposure, hazard sensitivity, and adaptive capacity to identify who or what is vulnerable to certain conditions, the level and extent of impacts, and the potential adaptations that can be implemented to lessen risk.

**100-Year Event:** A statistical term used to describe an event (such as a flood or storm) that has a 1 percent chance of occurring in any given year. It reflects the probability based on historical data and modeling.

**24-Hour Rainfall:** A calculation of the amount of rainfall over 24-hours. This parameter is often used when calculating storm rainfall events that generally occur once every 25 or 100 years.

# 1.0 INTRODUCTION

## 1.1 Project Background

This St. Lucie County Regional Resilience Plan (RRP) represents a proactive approach to adaptation in response to escalating natural hazards impacting the South Florida region. St. Lucie County and the municipalities—City of Port St. Lucie, City of Fort Pierce, and St. Lucie Village—face increasing threats from hazards such as coastal erosion, drought, extreme heat, inland flooding, compound flooding, storm surge and sea level rise, hurricanes, and wildfires. Recognizing these mounting challenges, the County and municipalities have undertaken Phase I (Flood) and Phase II (Other Hazards) Regional Vulnerability Assessments (RVAs) and developed a comprehensive RRP to address both immediate and long-term hazards. A more detailed outline of the project process is displayed in **Figure 1-1**. This project reflects a collaborative effort among St. Lucie County and the municipalities, local agencies, and community stakeholders to build a more resilient and adaptative community.

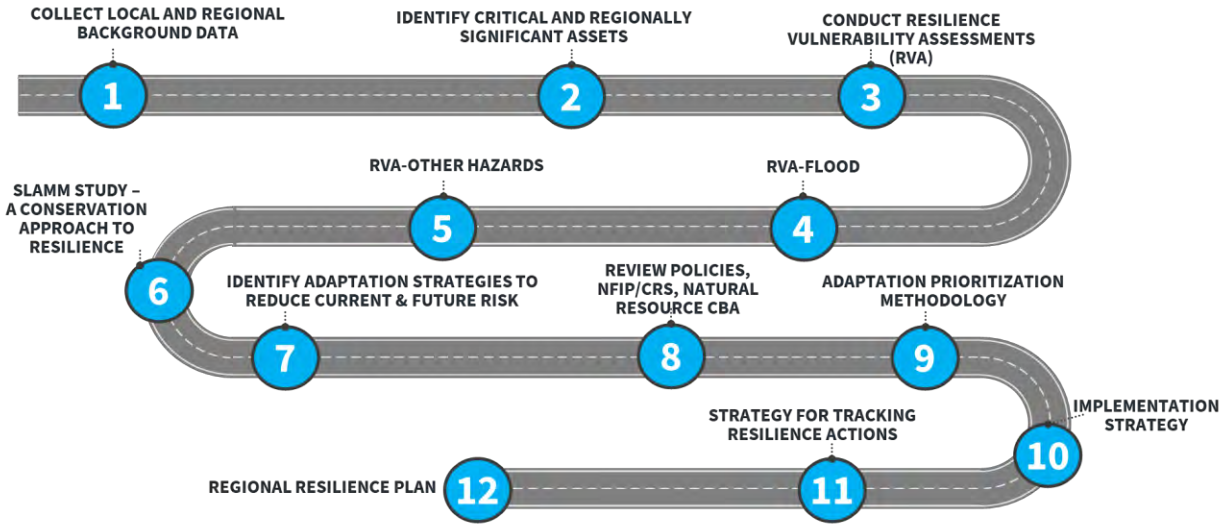


Figure 1-1. RVA and RRP Project Process

## 1.2 RRP Project Goals, Metrics, and Targets

The primary objectives of this project are to enhance County-wide resilience by offering adaptation and mitigation strategies based on current and future identified risks while maintaining safety, health, and economic stability. Key objectives include the following:

- Develop adaptation strategies that respond to prioritized hazards.
- Identify future potential funding strategies and partnerships to ensure continuity and momentum.
- Support broad access to the benefits of resilience actions, with attention to areas and populations that may be more exposed to hazards.

These objectives ensure that the RRP serves as a practical guide for decision-makers and a reference point for stakeholders as the County and municipalities moves toward a more resilient future.

## 1.3 Resilience Initiatives in St. Lucie County

### 1.3.1 Vision

The RRP envisions a St. Lucie County that is resilient, prepared, and inclusive in the face of hazard-related risks. This vision embodies the County and municipalities' commitment to safety, economic stability, and health, ensuring that every resident is protected from hazards. The vision also emphasizes a balanced approach to development and conservation, acknowledging the need to protect natural resources while fostering community well-being.

# 2.0 PROJECT PROCESS AND METHODOLOGIES

The first step in the process of developing the Regional Resilience Plan included the collection of comprehensive local data to perform mapping and GIS-based vulnerability assessments. Two Resilience Vulnerability Assessments were developed:

- Phase I: RVA Flood
- Phase II: RVA-Other Hazards (RVA-OH)

The RVAs conducted for SLC and the municipalities identified and evaluated several key hazards impacting the region, including:

- Coastal erosion
- Storm surge and sea level rise
- Inland flooding
- Compound flooding
- Drought
- Extreme heat
- Wind
- Wildfire

The RVAs included a systematic process to identify the potential vulnerabilities of the community to adverse impacts from flood hazards. It incorporated scientific data from technical sources such as the National Oceanic and Atmospheric Administration (NOAA) and the Federal Emergency Management Agency (FEMA), topographic and elevation data, hydrologic data, asset data, and sea level rise and rainfall projections. In addition, watershed mapping, a tree canopy analysis, and a cost-benefit analysis of conservation lands were performed (see **Appendices D**, **E**, and **F** respectively). Finally, supplemental information in existing local studies relative to flood risk were utilized, as well as input from residents, organizations, agencies, government entities, and businesses. Four categories of assets were evaluated: Transportation and Evacuation Routes; Critical Infrastructure; Community and Emergency Facilities; and Natural, Cultural, and Historic Resources.

The RVAs incorporated critical municipal and regionally significant assets. Critical assets are public assets, networks, and essential systems crucial for the continued delivery of essential services to the residents of St. Lucie County and its municipalities. First, data representing all critical County- and municipal-owned assets were collected to create the baseline asset inventory. Then based on community priorities, the baseline asset inventory was refined to the critical asset inventory.

The RVAs employed a sequential methods approach, first characterizing vulnerability as a function of exposure and sensitivity. Exposure refers to the presence of people, assets, and ecosystems in areas where they could be adversely affected by any of the hazards. The St. Lucie County RVAs assessed exposure levels to each hazard by identifying the projected intensity and extent caused by each scenario for each planning horizon. Intensification of flooding hazards, heat, drought, wildfire, and erosion were mapped to identify areas in need of adaptive measures. In some cases, specific area(s) were identified while others required a more regional approach.

Once the critical assets were identified, a sensitivity analysis was performed to determine the degree to which a system, population, or resource is or might be affected by the hazards and the associated risk or consequence that would result if that hazard occurred.

## 2.1 Overview of Regional Vulnerability Assessment Results

The results of the flooding analysis (RVA Phase I Flooding analysis) identified 933 critical at-risk assets across the county and its municipalities, including emergency services, healthcare facilities, schools, water infrastructure, and conservation lands. From a baseline asset inventory of over 77,000 assets, 2,178 were classified as critical. The assessment revealed that both coastal and inland areas face significant flood risks from sea level rise, storm surge, and heavy rainfall.

The results of the RVA-OH (Phase II) analysis identified threats to the delivery of essential services from heat, drought, wildfire, and erosion. These threats were analyzed and prioritized based on their threat to level of service. The asset types include emergency facilities, healthcare facilities, community support buildings, water infrastructure, schools, historic structures, and similar resources. Where possible, the Phase II RVA also leveraged quantitative data to calculate expected structural damage, measured in dollars, and the impact on low- to moderate-income populations. For hazards with future-condition scenarios available, the change in structural damage was calculated to illustrate the potential increase in sensitivity due to weather patterns. The identified assets may serve as a foundation for SLC and the municipalities to determine adaptation priorities and projects.

To enhance public understanding and engagement, the County also published a public-facing StoryMap that outlines the RVA projects. This interactive tool includes a map viewer that allows users to explore the modeled scenarios in detail. It provides a visual and accessible way for residents, stakeholders, and decision-makers to understand the geographic distribution of hazards and the assets at stake. The story map complements the technical documentation by offering a user-friendly platform for exploring the County's resilience planning efforts. The StoryMap and technical documents are available online at: www.ResilientStLucie.com.

## 2.2 Resilience Planning Methods

Resilience planning involves creating a robust, adaptive framework that addresses current vulnerabilities while building capacity for future weather-related challenges. The RRP encompasses both the immediate needs identified in the RVAs and long-term resilience strategies that strengthen community adaptability over time.

## 2.3 Steering Committee

Collaboration played a central role in this project, involving a diverse range of stakeholders to ensure both technical expertise and community insights were considered. SLC and the municipalities established a resilience steering committee of key collaborators, comprising representatives from diverse backgrounds and associations. The resilience steering committee played a vital role in shaping the project by reviewing goals, offering input on study direction, identifying geographic context, guiding modeling methodologies, pinpointing available data and resources, providing specific asset information, and reviewing project findings. The steering committee represented various County and municipal departments including Planning & Development Services, Public Works, Coastal Engineering, Utilities & Solid Waste, Emergency Operations, Innovation & Strategic Initiatives, and Environmental Resources. The resilience steering committee was also comprised of various member agencies including representatives from SLC Florida Department of Health, SLC School District, SLC Economic Development Council, St. Lucie Transportation Planning Organization, and the Treasure Coast Regional Planning Council. The resilience steering committee met throughout the process to review information, recommendations, and discuss key project milestones and decisions.

## 2.4 Public Outreach

Community resilience refers to the ability of governments, individuals, organizations, institutions, and businesses to anticipate, respond to, endure, and recover from both immediate and prolonged pressures stemming from unpredictable weather patterns and extreme weather events, rising sea levels, increased flooding frequency, and heightened storm severity. To establish community resilience, it is essential to actively engage stakeholders when shaping planning efforts and determining adaptation strategies and infrastructure priorities.

Public involvement for the RRP was comprehensive with a focus on gathering feedback from community members on adaptation strategies. Information was provided to and received from members of the community through public meetings and workshops. Public engagement and outreach efforts for this project were geared toward communicating relevant science-based information that engaged the public, community leaders, and subject matter experts, regardless of education and technical background. Utilizing various methods and multimedia tools collaboratively, the outreach initiatives aimed to enhance community understanding and involvement.

Public input and feedback were actively sought through more than two dozen public workshops and presentations. The Project Team evaluated the information gathered from the community and coordinated efforts to integrate the input into the project, while documenting the engagement outcomes to provide a transparent record of the community's contributions.

In addition to internal tracking, St. Lucie County maintains a public-facing webpage that provides access to key project information. This platform serves as a central hub for community engagement and transparency, allowing residents and stakeholders to stay informed about ongoing resilience efforts. Technical documents are available online at: www.ResilientStLucie.com.

### 2.4.1 Stakeholder and Public Outreach Events

**Figure 2-1** outlines the public engagement approach utilized by the Project Team. The public engagement encompassed multiple phases to maximize community involvement and support. The process began with strategic planning for engagement events in accessible locations throughout SLC and the municipalities. Public announcements and educational materials were widely distributed through various relevant websites, calendars, email lists, newsletters, community organizations, and social media platforms. Participants in these events were encouraged to ask questions and express their priorities and insights. Feedback was actively sought using comment cards and engagement activities such as poster board prompts and an interactive presentation tool that enabled real-time polling using a participant's smart phone to gauge comprehension and encourage participation.

Figure 2-1. St. Lucie County Public Engagement Process

St. Lucie County hosted more than two dozen stakeholder engagement meetings to introduce resilience planning, summarize the RVAs findings, and share the results of the draft Regional Resilience Plan to introduce and elicit feedback on resilience planning efforts. The purpose of these meetings was to allow the public to enter into dialogue where they were able to ask questions and provide community-specific input. During these meetings, the County conducted exercises encouraging the public to discuss vulnerabilities they have identified within the community and critical assets of concern to them if impacted by hazards (see **Appendix H**).

The most recent workshops, held in late 2025, included sessions that tied together Resilience Planning and Stormwater Master Planning efforts; highlighted a Conservation Approach to Resilience Planning; and reviewed the results of the RVAs and Regional Resilience Plan. Please see **Appendix H** for the comprehensive results of the public workshops.

## 3.0 EXISTING PLANS AND RESILIENCE INITIATIVES

The County and municipalities have demonstrated their commitment to community resilience planning through a proactive approach, implementing several adaptation and mitigation projects. Notable examples include the floodproofing and elevation of critical infrastructure, the construction of living shorelines, acquisition and conservation of natural lands, the installation of stormwater storage and management systems to reduce flooding risks, and beach and coastal dune restoration to act as the first line of defense against storms and storm damage. Additionally, the County and municipalities have a range of approved projects within its Local Mitigation Strategy, such

as retrofitting public buildings to serve as emergency shelters, enhancing seawall structures, and storm hardening of essential facilities. To lead resilience efforts, the County completed a community-wide Sea Level Rise Vulnerability Assessment in 2021, prior to the Resilient Florida Program being launched and completion of the 2025 RVAs. The County and municipalities have produced disaster and hurricane preparedness guides and worked with numerous agencies for distribution. Recognizing the importance of community involvement, SLC and the municipalities encourage residents to participate in documenting real-time flooding events. By uploading photographs and information to a local government app or the South Florida Water Management District's Flood Observation Survey tool, residents assist local and regional stormwater management planners in developing strategies to reduce flood risks. The County and municipalities also participate in the FEMA National Flood Insurance Program's (NFIP) Community Rating System program, which brings significant cost savings to residents for NFIP flood insurance policies.

This proactive approach, with a strong emphasis on community involvement, has laid the foundation for the development of this RVA and RRP initiative. By adopting a forward-thinking philosophy, the County and municipalities foster a sense of ownership and shared responsibility for addressing risks, while also enhancing preparedness and resilience. Furthermore, the recognition that identifying and addressing vulnerabilities, especially those related to critical assets before they fail, is the most fiscally responsible strategy—highlighting the County's and municipalities' long-term commitment to resilience.

## 3.1 Mobility Plan

St. Lucie County's Sustainable Mobility Infrastructure Plan is a federally funded initiative aimed at integrating transportation, land use, and resilience into long-term planning. Supported by the Community Development Block Grant Mitigation Program, the plan revises the County's Right-of-Way Protection Map to account for sea level rise, stormwater needs, and infrastructure elevation, serving as a tool to mitigate future weather impacts.

The plan is built around a "Focused Growth" scenario, which concentrates new development in compact, mixed-use corridors that are walkable and transit-accessible. This approach helps reduce single-occupancy vehicle use and supports alternative mobility options like micromobility and transit. Population and housing forecasts through 2100 are used to guide infrastructure needs, while mobility technologies and multimodal strategies are incorporated to improve access and reduce emissions.

By aligning transportation planning with flood risk projections and adaptation strategies, the plan strengthens St. Lucie County's resilience. It ensures that future infrastructure investments are not only efficient, but also capable of withstanding extreme weather, sea level rise, and other stressors.

## 3.2 Stormwater Master Plan

The County, Port St. Lucie, and Fort Pierce have developed Stormwater Master Plans to serve as comprehensive roadmaps for managing stormwater in a sustainable and cost-effective manner. The plans aim to reduce flood risks, protect water quality, and support community and economic development.

St. Lucie County is currently finalizing an update to its Stormwater Master Plan (anticipated to be completed in 2026). Key initiatives of the plan include the inventory of existing stormwater systems, identification of high-risk flood areas, and implementation of advanced stormwater management technologies (**Figure** ). The plan also emphasizes the importance of community engagement and encourages residents to participate in documenting real-time flooding events through tools like the South Florida Water Management District's Flood Observation Survey.

By integrating these Stormwater Master Planning efforts, the County and municipalities aim to enhance the resilience of their infrastructure, improve the health of local water bodies such as the Indian River Lagoon and St. Lucie River, and ensure a safer, more sustainable future for its residents. More information regarding SLC watershed information and mapping can be found within **Appendix D**.

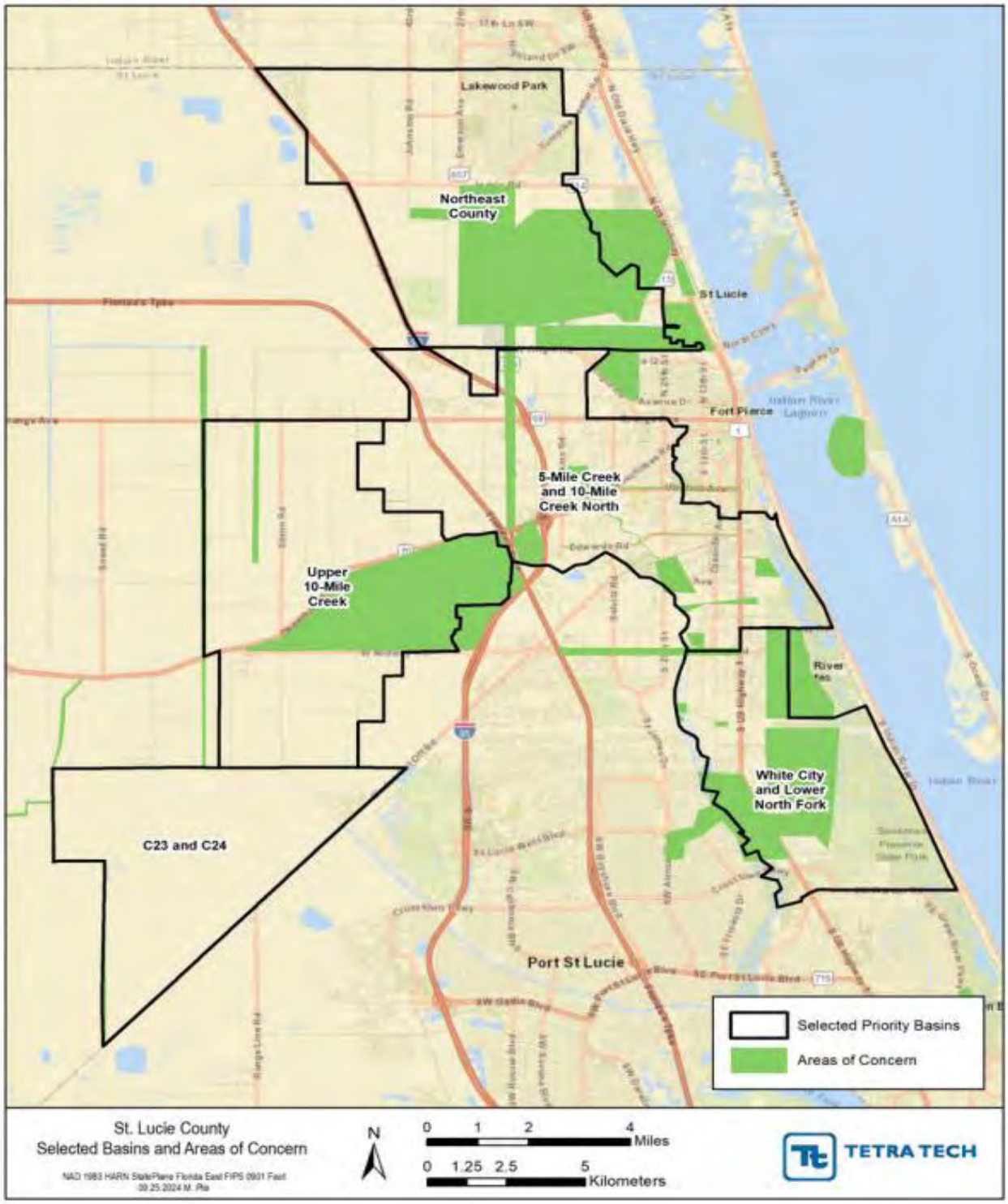


Figure 3-1. Locations of Priority Basins with Areas of Concern Identified in the Draft Stormwater Master Plan

## 3.3 Environmentally Significant Lands Program

SLC, Port St. Lucie (PSL), the City of Fort Pierce, and St. Lucie Village worked together on a 1994 ballot initiative to protect environmentally significant lands throughout the County. SLC citizens overwhelmingly passed this $20 million bond referendum, resulting in the acquisition and management of over 11,000 acres. The goal of the Environmentally Significant Lands Program is to conserve, safeguard, and rehabilitate ecosystems in their natural condition while allowing for appropriate public access. These protected ecosystems enhance the quality of life for residents, act as a natural defenses against stormwater runoff and flooding, enhance air and water quality, and attenuate wind from severe storms.

## 3.4 Naturally PSL: Green Spaces & Places

“Naturally PSL: Green Spaces & Places” is a community-driven initiative inspired by the collective vision of Port St. Lucie residents. It aims to raise awareness about the City’s green spaces, provide information on upcoming projects, and work with partners in contributing to land acquisition and green space enhancements. With residents and partners, this program seeks to protect 744 acres of conservation and recreational land within the city limit, expanding and activating 41 miles of recreational trails, recruiting new volunteers, and fostering innovative approaches to enhance community resiliency.

## 3.5 Grow Green Urban Forestry Initiative

The City of Port St. Lucie’s Grow Green initiative expands and enhances its urban forestry program by planting trees along transportation corridors, at key development sites, and on private property to increase the urban canopy cover. Trees provide multiple benefits, not only adding beauty and reducing localized heat, but also playing a significant role in reducing the impacts of stormwater and flooding.

## 3.6 Torino Regional Park

The Conceptual Master Plan for Torino Regional Park, which spans 195.17 acres, features passive and active amenities that are compatible with the site’s natural prairie, hydric pine flatwood and marshes, and over 32 acres of wetlands. Preserving and protecting these natural assets throughout the future park is critical in enhancing both city and county resilience goals through mitigating flood risk, improving water quality, and supporting regional biodiversity while providing adaptive recreational spaces for residents.

## 3.7 McCarty Ranch Extension & Preserve/ St. Lucie River/C-23 Water Quality

McCarty Ranch Preserve spans over 3,100 acres and plays a vital role in regional resilience by functioning as both a major stormwater storage facility and a water quality improvement project. Acquired in 2012 to address flooding, pollution, and water supply challenges, the preserve is engineered to capture and retain up to 21 billion gallons of stormwater annually, preventing approximately 9 billion gallons of untreated runoff from entering the North Fork of the St. Lucie River each year. Its ability to capture, store, and treat billions of gallons of stormwater annually directly reduces the risk of localized flooding, relieves pressure on downstream drainage infrastructure,

prevents nutrient-laden runoff from polluting sensitive waterways, and secures the regional water supply for generations to come.

## 3.8 Half Cent Sales Tax

In 2018, SLC, PSL, Ft. Pierce, and St. Lucie Village residents approved a ballot proposal to increase the sales tax by ½ cent to fund projects to reduce neighborhood flooding, improve water quality, improve local roads, reduce traffic congestion, and add sidewalks.

## 3.9 FEMA Community Rating System

FEMA's Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management practices that exceed the minimum requirements of the NFIP. In Community Rating System communities, NFIP flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community's efforts. SLC and the municipalities recognize the importance of floodplain management as a community-based effort to prevent or reduce the risk of flooding, resulting in a more resilient community and reducing the financial impacts of flooding. For each higher Class rating a local government obtains (higher class rating receives a 'lower class number'), the entire community receives 5 percent off their NFIP flood insurance premiums. Currently, the City of Fort Pierce maintains a Class 6 rating, and St. Lucie County and Port St. Lucie a Class 5 rating, resulting in a 20 percent and 25 percent reduction in flood insurance rates for the entire community. Additional information on the NFIP-CRS program and analysis of St. Lucie County's CRS ranking, can be found in **Appendix G**.

## 3.10 St. Lucie County Unified Local Mitigation Strategy

The St. Lucie County Unified Local Mitigation Strategy establishes a framework for implementing and coordinating mitigation goals, objectives, and projects aimed at reducing impacts on the public, property, and environment. The Unified Local Mitigation Strategy Working Group (consisting of St. Lucie County; the cities of Port St. Lucie, Ft. Pierce, and St. Lucie Village; and multiple agencies and non-profits countywide) updates the Local Mitigation Strategy document every 5 years, which outlines the various hazards faced within St. Lucie County and projects that will address them.

## 3.11 Coastal Storm Protection Program

Established in 1967, the St. Lucie County Erosion District has been tasked with evaluating and mitigating beach erosion while maintaining safe navigation in the St. Lucie Inlet. To achieve these goals, the County has implemented a long-term beach monitoring and maintenance program designed to enhance shoreline resilience by providing storm protection, recreational opportunities, and environmental benefits. Engineered beach fill templates are central to this effort, incorporating three components: equilibration fill, which quickly adjusts to a natural slope; advance fill, calculated to erode over a specified number of years; and the design fill, which represents the minimum beach width and dune height needed for adequate protection. The lifespan of the advance fill determines the renourishment cycle—the timing for additional sand placement to restore the beach and restart the process. Regular monitoring ensures that beach conditions meet protection standards and informs the schedule for future sand placement projects.

Recognizing the complexity and cost of maintaining resilient shorelines, St. Lucie County has established strong partnerships at the state and federal levels. The County works closely with the U.S. Army Corps of Engineers on two critical shoreline projects: the Fort Pierce Shore Protection Project, a 1.3-mile stretch south of the St. Lucie Inlet South Jetty, and the South County Beach Project, a 3.4-mile stretch north of the County's southern boundary. Additionally, a longstanding partnership with the Florida Department of Environmental Protection has provided substantial state funding support for beach resilience initiatives. These collaborations reduce financial burdens and bring technical expertise, ensuring that St. Lucie County beaches remain resilient and protected for the future.

## 3.12 St. Lucie Community Resilience Steering Committee

In February 2021, the County established a Resilience Steering Committee comprising representatives from all three city governments within the county as well as County staff specializing in emergency management, community health, regional planning, transportation, economic development, public works, utilities, and planning. This multi-jurisdictional and multi-agency committee collaborates on developing and implementing resilience strategies. The steering committee aims to take a systematic approach that reduces risk to people, infrastructure, the environment, and the economy from potential impacts to the local community. The committee strives to provide robust avenues for citizen and sector stakeholder engagement in the plan development process, to realize a resilience plan that protects the health, safety, and well-being of all residents in an equitable way.

# 4.0 COUNTYWIDE ADAPTATION STRATEGIES

## 4.1 Adaptation Classification Types

The RRP identifies various adaptation strategies, and while they can encompass a wide range of approaches, they can be classified under four main categories: 1) protection, 2) accommodation, 3) avoidance, and 4) retreat. When applying these adaptations to assets, the County and municipalities should consider each adaptation approach when reviewing recommended adaptation plans for each asset. Ultimately, the most applicable and effective method, based on time frame, level of effort, potential for coordination with other planned projects, cost, and scale should be selected for each asset.

### 4.1.1 Protection

Adaptation strategies can involve protection or defense mechanisms to manage the impacts of hazards. These strategies preserve the integrity of an asset through the creation of additional hard and soft measures that guard against impacts and often eliminate the need for structural modification. Protection-based adaptation strategies can include living shorelines, beach and dune nourishment, seawalls, levees, and general dry floodproofing.

### 4.1.2 Accommodation

Accommodation strategies involve modifications and retrofitting to the physical design of a structure, allowing it to remain in its current location. This type of adaptation makes the structure more resistant to flood damage and eliminates or delays the need to move or further modify the asset. Examples of these strategies include increased stormwater storage, property elevation, implementing

wet floodproofing, or creating floodable structures. It often entails review of flood hazard mapping, strategic land-use planning, and flood insurance coverage.

### 4.1.3 Avoidance

Avoidance pertains to the practice of steering new development away from vulnerable areas. Avoidance is financially significant because once infrastructure has been constructed, it must be maintained for the entirety of its lifespan. This type of policy aims to eliminate risk to future infrastructure by requiring that design practices factor in the level of current and future hazard impacts over the life of the structure. Policymaking, development and zoning regulations, and incentive programs are tools to foster avoidance in both public and private construction.

### 4.1.4 Retreat

Efforts to retreat, or participate in planned relocation, can occur when all other adaptation strategies prove to be inefficient or ineffective. Retreat often occurs when assets are in areas of consistent or increasing flood and wind loads. Retreat can occur voluntarily or result from some type of incentive and can take place promptly, usually in response to some disruptive incident or gradually as part of a long-term plan. Communities can strategize an eventual departure from vulnerable areas in the future, while making limited investments in the assets while they remain in place. It can also involve adapting the designs of future buildings to shoulder an eventual relocation. Managed retreats for non-governmental ownership can take the form of government buyout programs, development control, land-use planning, rolling easements, and land swaps.

## 4.2 Countywide Adaptation Strategies

## 4.3 Proposed Adaptation Strategies

The Regional Resilience Plan outlines four primary adaptation strategy categories aimed at bolstering the County and municipality's resilience to the impacts of hazards: Physical Modifications; Natural Defenses and Nature-Based Adaptations; Planning, Management, and Policy; and Community Education, Programs, and Readiness. Each category targets specific aspects of resilience, addressing both the structural needs of critical infrastructure and the broader social needs of the community. This comprehensive approach leverages physical, natural, policy-driven, and community-centered strategies to ensure that St. Lucie County and the municipalities are prepared for both immediate and long-term challenges. This section describes the different categories and types of strategies, while **Appendix A** builds upon this framework with a complete portfolio of associated actions for each category. It details specific adaptation and mitigation actions that the County and municipalities can apply to future programs, infrastructure upgrades, asset protection, and policy initiatives.

**Appendix A** also includes a recommended implementation category for each strategy, aligned with the adaptation approach described in Section 8.7. This approach organizes actions into three groups: Immediately Actionable strategies that can start with existing resources; strategies that Require Planning and Coordination such as design, permitting, or partnerships; and strategies that Require Significant Investment, Sequencing, or Research, which depend on funding or technical studies. Each strategy within **Appendix A** is matched with its appropriate category to guide decision-makers in sequencing projects based on feasibility, resource needs, and complexity.

Additionally, **Appendix A** aligns each adaptation strategy with the specific natural hazard(s) it may address if implemented. These hazards: coastal erosion, compound flooding, drought, extreme heat, inland flooding, storm surge and sea level rise, wind, and wildfire were analyzed in detail through the Phase I and Phase II Resilience Vulnerability Assessments. This alignment ensures that future projects are not only well-timed and feasible but also targeted to reduce risk from the most pressing threats facing St. Lucie County and its municipalities.

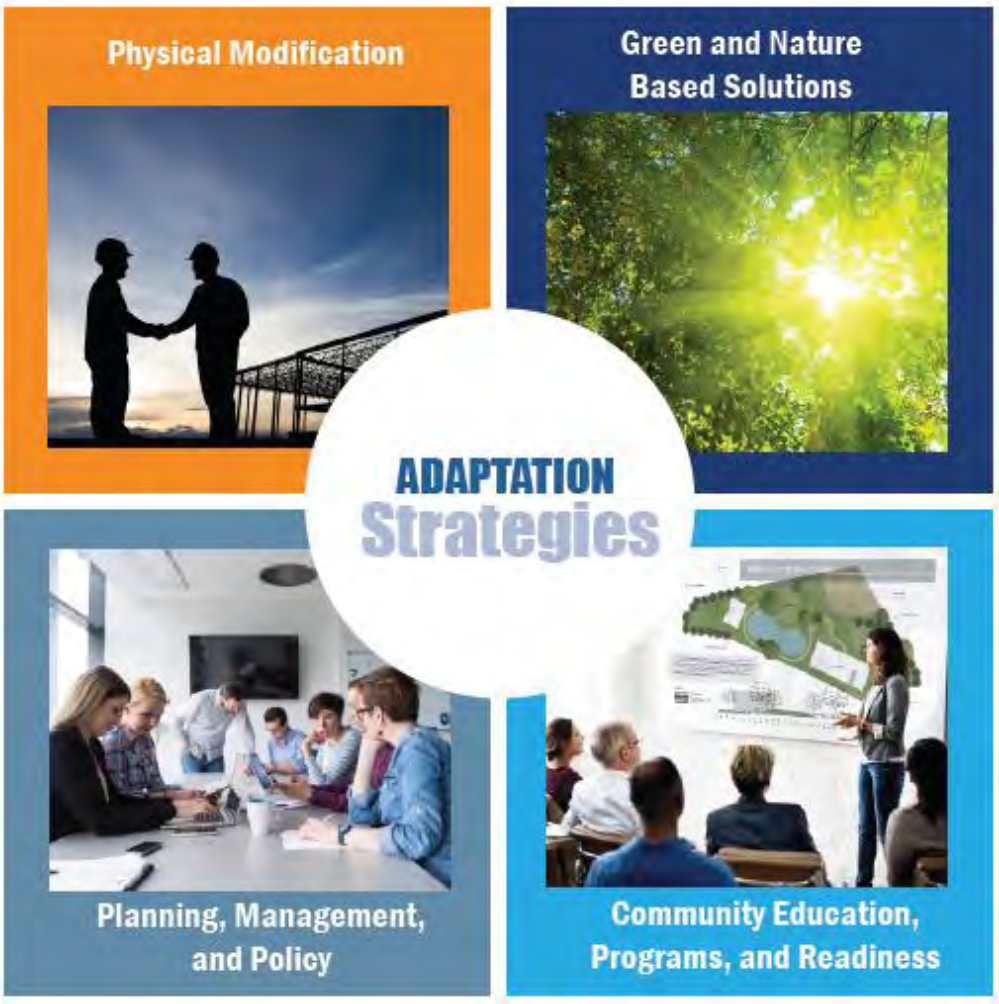


Figure 4-1. Adaptation Strategy Categories

### 4.3.1 Physical Modifications to Assets

Physical modifications focus on enhancing the resilience of existing infrastructure and developing adaptive solutions to physically fortify vulnerable assets. This category includes retrofitting, replacement, planned relocation, maintenance and operations, and demolition or abandonment. By physically modifying critical infrastructure, the County, municipalities, and community partners can reduce potential damages, maintain essential services during extreme weather events, and improve overall resilience to future conditions. These physical adjustments directly address vulnerabilities and

reinforce infrastructure to withstand the unique challenges posed by hazards such as flooding, heat, and storms.

#### 4.3.1.1 Maintenance and Operations

Maintenance and operations strategies involve the routine upkeep of infrastructure to prevent deterioration and maintain its resilience during emergencies. Examples of this strategy include regularly clearing storm drains to avoid blockages, inspecting and repairing levees and bridges to ensure structural integrity, and maintaining roads and retention ponds to manage stormwater. In addition, routine maintenance of HVAC systems in public buildings can help counteract extreme heat, and regular testing of backup generators in critical facilities ensures they are operational during emergencies. Regular inspections can identify problematic conditions and address them before they create a service disruption and reduce the need for replacement. Failed components can be replaced with parts designed to better withstand pressures from hazard-related change and result in long term system upgrades. By investing in ongoing maintenance, the County and municipalities can prevent infrastructure failures, minimize recovery costs, and ensure the effectiveness of adaptation strategies during hazard-related events. Performing routine maintenance and operations may also be a community's response to flooding disruption because full-scale adaptation of infrastructure or a facility may not achievable.

#### 4.3.1.2 Retrofitting

Retrofitting involves modifying existing infrastructure to make it more resilient to hazard conditions. This can include elevating buildings to avoid flood damage, reinforcing structures in flood-prone areas, waterproofing facilities to prevent water infiltration, and installing flood barriers to protect against storm surges. Additional retrofitting measures include upgrading drainage systems to manage increased rainfall and adding cooling systems or heat-resistant materials to buildings to mitigate extreme heat. For instance, public facilities might include increased planted trees and installation of reflective roofing to lower cooling costs and reduce the heat island effect. By enhancing existing structures, retrofitting allows the County and municipalities to maximize the longevity and performance of infrastructure while building adaptive capacity to withstand future hazard-related stresses. It can also have co-benefits such as reduced maintenance needs, lower energy consumption, and improved community aesthetics.

#### 4.3.1.3 Replacement

Replacement entails removing older, compromised infrastructure and substituting it with more resilient alternatives. This strategy reduces the likelihood of costly damages, system failures, and disruptions in essential services. Replacement projects can incorporate upgrades into the replacement design. Examples of the types of upgrades that could be considered include roadways with hazard-adapted materials, using reflective or green roofs to reduce urban heat, or designing a structure to withstand increased flooding and wind loads. For example, older bridges and transportation routes might be replaced with designs and materials engineered to handle higher temperatures or increased drainage needs. By investing in planned infrastructure replacement, the County and municipalities ensure that critical facilities and systems are built to function under more extreme hazard conditions and provide continuous support for its communities. Replacement also

provides an opportunity to coordinate with regional partners to address multi-jurisdictional issues, such as shared infrastructure vulnerabilities, interdependent systems, and regional hazard mitigation strategies. This collaborative approach can enhance the effectiveness of adaptation measures and promote consistency across neighboring jurisdictions. Replacement can be used in conjunction with, or as an alternative to planned relocation.

#### 4.3.1.4 Planned Relocation

Planned relocation focuses on moving essential infrastructure or community elements from high-risk areas to safer locations through a coordinated and strategic process. For example, in the event conditions reach a predetermined threshold such as inches of sea level rise or projected flood exposure, certain vulnerable infrastructure, such as utilities and shelters, would be relocated from their existing location in flood-prone zones to elevated areas, reducing exposure to hazards while preserving the asset's functionality. Additionally, this strategy can involve shifting agricultural operations from drought- or flood-prone areas to regions less impacted by extreme weather, or developing new sources of water supply, ensuring food security and sustainable livelihoods. Planned relocation is a proactive approach with preset triggers that will mitigate losses and maintain essential services during extreme weather events and reinforce the County's and municipalities' future resilience by strategically relocating critical infrastructure to safer locations.

#### 4.3.1.5 Demolition or Abandonment

Demolition or abandonment is employed in cases where adaptation measures or further maintenance of infrastructure are not feasible or cost-effective. This strategy involves the safe decommissioning and removal of structures in areas where continued use poses a risk. For example, vacating areas highly susceptible to flooding and converting them into green spaces can absorb excess water, reducing flood risks for surrounding communities. Similarly, old industrial zones in vulnerable locations can be transformed into community recreation areas that act as natural flood buffers while also providing new recreation opportunities. Demolition and abandonment are last-resort options, but they can be effective in reducing risks to human health and safety while also creating opportunities for ecological restoration and flood management.

### 4.3.2 Natural Defenses and Nature-based Adaptations

Nature-based adaptations leverage the power of natural systems to reduce hazard-related risks and enhance ecological resilience. These solutions include drainage improvements, natural feature construction, ecosystem restoration, beach nourishment, and tree planting and urban forestry. Nature-based adaptations offer multiple co-benefits, such as enhancing water and air quality, storing or attenuating stormwater, buffering high winds, protecting biodiversity, reducing urban heat, and providing recreational spaces for residents. By integrating natural features into urban and coastal areas, the County and municipalities can create adaptive landscapes that mitigate hazard-related impacts and enhance community resilience.

#### 4.3.2.1 Retention Structures and Drainage Improvements

Drainage improvements focus on enhancing stormwater management by using green infrastructure that slows, absorbs, and filters water runoff. Techniques such as permeable pavements, rain gardens,

bioswales, and underground storage tanks help manage stormwater effectively, reduce flood risks, and increase groundwater recharge. These solutions can be seamlessly integrated into urban areas, providing flood protection while also improving aesthetics and offering increased habitat for wildlife. By improving drainage capacity through nature-based features, the County and municipalities can better manage heavy rainfall events and minimize flood impacts on built environments.

#### 4.3.2.2 Construct Natural Features

Constructing natural features involves building natural defenses that mimic and enhance ecosystem functions. Examples include man-made marshes, wetlands, living shorelines, green roofs, dunes and beaches, oyster reefs, and artificial reefs. These natural structures act as buffers that absorb floodwaters, slow storm surges, and protect coastal areas from erosion. For instance, living shorelines stabilize the coastline and reduce erosion by using native vegetation, while artificial reefs provide habitat for marine life and dampen wave energy. Constructing natural features strengthens the County's and municipalities' resilience while supporting biodiversity and enhancing coastal aesthetics.

#### 4.3.2.3 Preserve and Restore Ecosystems

Preservation and restoration initiatives aim to rehabilitate ecosystems that provide natural protection from hazard impacts, while providing multiple co-benefits. This includes protection and restoration of forests, mangroves, reefs, wetlands, and seagrasses, which play crucial roles in attenuating impacts from high winds and flood waters, shielding coastal areas from storm surges, enhancing water quality, and promoting marine biodiversity. By prioritizing environmental land acquisition and ecosystem restoration, the County and municipalities can improve the resilience of natural habitats, benefiting both local communities and wildlife.

#### 4.3.2.4 Protect Coastal Shoreline

Coastal change is a natural process that allows beaches to accrete and erode in response to prevailing waves and currents. In a built environment, erosion must be controlled to protect roads, parks and buildings. Beach nourishment is a periodic maintenance program that involves regularly adding sand when beaches erode to a critical point, which maintains their function as a protective buffer against storm surge and sea level rise. Nourishment efforts include dune construction and stabilization, creating artificial sandbars, and periodically replenishing sand where needed to maintain a beach's storm damage protection value and maintain critical habitat for threatened and endangered nesting sea turtles, shore and wading birds, and the intertidal environment. These actions not only protect coastal infrastructure and natural environment but also support the tourism economy and recreational opportunities. Engineering studies can be conducted to determine if some combination of hard structures can prolong the life of the natural beach. Beach maintenance is a critical adaptation strategy for SLC, as it preserves valuable coastal land and manages erosion, providing a natural barrier against rising sea level, and protecting critical infrastructure including the St. Lucie power plant and hurricane evacuation routes.

#### 4.3.2.5 Increase Tree Canopy and Green Corridors

Tree planting and urban forestry are aimed at increasing the urban tree canopy to mitigate extreme heat, reduce stormwater runoff, and improve air quality. Planting shade trees along streets and in parks can cool urban areas, while green corridors connect habitats and offer recreational spaces for residents. This strategy may include initiatives to encourage tree planting in residential areas, schools, and community spaces. Expanding urban forestry enhances resilience, supports public health, and contributes to a greener, more livable community. St. Lucie County undertook a comprehensive tree canopy assessment to better understand the distribution, density, and ecological function of its urban forest. The complete analysis can be found within **Appendix E**.

### 4.3.3 Planning, Management, and Policy

Planning, management, and policy adaptations integrate resilience into jurisdictional regulatory and operational frameworks. This category includes strategies such as land use and zoning revisions, emergency planning, codes and standards, operations, capital planning, and monitoring and management. By embedding resilience into governance and planning processes, the County and municipalities can guide future development toward sustainable and adaptive outcomes, ensuring that infrastructure, services, and communities are prepared for hazard-related impacts.

While implementing adaptation projects is a critical step, it must be accompanied by thoughtful planning for the future. Incorporating effective planning, management, and policy measures is essential for building resilience and sustainability into communities. Through proactive planning, the County and municipalities can identify vulnerable areas, establish regulations for land use and development, and integrate hazard and recovery considerations into decision-making processes. Additionally, robust management practices ensure the efficient allocation of resources and the implementation of adaptation measures. By adopting forward-thinking policies, governments can create frameworks that support resilient infrastructure, encourage sustainable practices, and enhance community well-being.

#### 4.3.3.1 Land Use Policy

New and/or updated land use and zoning regulations are crucial for guiding development away from high-risk areas and encouraging resilient land use practices. This planning strategy includes updating zoning codes to discourage development in vulnerable areas, promoting land preservation, and incentivizing resilient building practices. For example, density bonuses might be offered for developments that incorporate resilient features, while vulnerable lands could be designated for nature-based infrastructure. By revising land use policies, the County and municipalities can reduce exposure to hazards and direct growth to safer areas, supporting sustainable development.

#### 4.3.3.2 Emergency Planning

Emergency planning encompasses the development and regular updating of emergency response plans for various hazards. This includes creating post-disaster code enforcement protocols, hazard mitigation plans, and emergency response and recovery plans. The County and municipalities may conduct community drills and establish temporary adaptation measures, such as deployable flood barriers and standby power generators, to enhance preparedness. Effective emergency planning

ensures that local governments and residents can respond quickly and effectively to hazard events, reducing recovery time and protecting lives.

#### 4.3.3.3 Codes and Standards

Codes and standards are essential planning considerations for establishing minimum resilience requirements for new construction and infrastructure upgrades. By strengthening building codes, refining permitting processes, and enforcing setback requirements, the County and municipalities can mandate resilient construction across sectors. For instance, energy-efficient standards may be required for public buildings, while more stringent building codes can encourage developers to adopt resilient practices. This strategy ensures that all new developments contribute to the countywide resilience goals.

#### 4.3.3.4 Operations and Staffing

Operations and staffing are management activities that involve integrating resilience considerations, practices, and professionals into the daily functions of government agencies and infrastructure management. Standardizing resilient practices across public works and utilities, developing internal protocols for departments to respond to hazard-related emergencies, and ensuring that funding includes hazard and recovery considerations are a few of the key components of operational functions. Appropriate staffing must be available to implement and maintain these functions. Establishing metadata collection protocols is also essential to ensure consistent documentation, tracking, and evaluation of resilience-related activities and infrastructure conditions. By embedding resilience into operations and budgeting, the County and municipalities can maintain functionality during extreme weather and continuously adapt to changing conditions.

#### 4.3.3.5 Capital Planning

Capital planning can include priorities that focus on investments in resilient infrastructure through long-term budgeting and planning. The development of capital improvement plans that focus on resilience, project planning, and designing infrastructure can eliminate emergency expenditures to repair damage from hazard-related impacts in the future. Through the capital improvement planning process, the County and municipalities can allocate resources strategically, ensuring that critical investments support community resilience well into the future.

#### 4.3.3.6 Data Collection, Management, and Monitoring

Monitoring and management can be structured to ensure that adaptation strategies remain effective by establishing systems to inspect, maintain, evaluate, and adapt as needed. Regular monitoring of hazard data, updating adaptation plans based on the most current monitoring information, and managing natural resources to reflect changing conditions, are vital functions for ongoing resilience. This adaptive management approach enables the County and municipalities to refine their strategies and respond to emerging trends, ensuring that all modifications are sustainable and responsive.

### 4.3.4 Community Education, Programs, and Readiness

The Community Education, Programs, and Readiness category is dedicated to fostering awareness, preparedness, and engagement within the community. Recognizing that resilience goes beyond

physical infrastructure and policy, this category emphasizes the importance of empowering residents, businesses, and organizations with the information, tools, and resources needed to understand how hazards will affect them and the actions they can take to reduce their exposure. Promoting community education, implementing outreach programs, and enhancing individual readiness are integral components of building resilience in communities. By investing in community-level adaptation efforts, the County and municipalities can ensure that all residents—especially those with increased vulnerabilities—are equipped to respond to and recover from hazard impacts. These initiatives focus on building a culture of resilience, where adaptation is a shared responsibility that strengthens community bonds and enhances overall hazard preparedness.

Easy access to information and regular updates on the progress of the County's and municipalities' resilience initiatives is vital for building trust and engagement among residents, businesses, and other stakeholders. Outreach programs disseminate information about risks, emergency procedures, and preparedness. By keeping the community informed about ongoing efforts including stormwater management projects, infrastructure improvements, and adaptation strategies, the County and municipalities foster a proactive mindset and demonstrates its own commitment to addressing hazard-related challenges. Customizing important information to specific user groups and demographics provides individuals with a tangible connection to the program that will make them more likely to contribute to and support adaptation efforts. Regular updates also provide opportunities for feedback and input, enabling further tailoring of initiatives to better meet the needs and concerns of the community. Open communication creates a sense of partnership between the local government and its residents, increasing the likelihood that the community will both support county and municipal initiatives and incorporate resilience into their daily lives, thereby reducing the strain on community services.

#### 4.3.4.1 Community Tools

Community tools aim to equip residents with practical resources for adaptation, empowering them to make informed decisions to protect their homes and neighborhoods. This could include providing access to home elevation guides, flood risk assessments, and resilience hubs where residents can gather information and supplies during hazard events. The County and municipalities might also develop interactive online tools or mobile applications offering real-time alerts, preparedness tips, and self-assessment tools. These resources encourage proactive adaptation at the household level, helping residents to take meaningful actions to safeguard their properties and improve personal resilience.

#### 4.3.4.2 Public Awareness

Public awareness initiatives focus on increasing residents' understanding of hazard risks and adaptation measures, promoting a more informed and prepared community. Programs can include workshops, informational flyers, social media campaigns, and partnerships with local schools and community centers to educate youth and adults on hazard impacts and resilience. Additionally, placing informative signage in vulnerable areas can alert residents to potential hazards and encourage them to take preventive measures. By raising public awareness, the County and

municipalities ensure that residents recognize the personal benefit from increased resilience and are more likely to engage in adaptation efforts and comply with emergency protocols.

#### 4.3.4.3 Emergency Preparedness

Emergency preparedness programs are designed to enhance the community's capacity to respond effectively to hazard-related events. These programs can include organizing regular preparedness drills and training sessions, and providing resources for families to create emergency plans and secure personal property. The County and municipalities could also aid in the establishment of neighborhood groups or volunteer networks trained in emergency response, building a grassroots network of informed individuals ready to support one another during crises. The timeliness and effectiveness of emergency response after a disaster is also crucial to creating a resilient community. Ensuring that residents are aware of and have access to the necessary resources for disaster recovery will speed the return of a functioning community. By emphasizing emergency preparedness, the County and municipalities strengthen their collective response capabilities, reducing recovery time and helping communities better withstand and recover from extreme weather events.

#### 4.3.4.4 Community-Based Planning and Development

Community-based planning and development involves engaging a diverse range of community members in resilience planning to ensure adaptation measures are accessible and responsive to the needs of all residents. By prioritizing engagement in its planning processes, the County and municipalities ensure that all residents have access to adaptation resources and are considered in resilience-building efforts.

## 5.0 METRICS TO PRIORITIZE ADAPTATION STRATEGIES

A scoring matrix has been developed by the project team to guide effective and efficient decision-making for adaptation and resilience in SLC. This tool integrates input from the project goals and objectives as well as hazard considerations to evaluate and rank any future potential adaptation projects. The tool's primary objective is to ensure any future selected adaptation project aligns with the County's and municipalities' resilience goals, delivers maximum benefit to the community, and optimizes resources. Each future adaptation project proposed by the County or municipalities can be scored across the evaluation criteria, with each metric weighted according to RRP-related priorities. The following nine evaluation criteria included in the scoring matrix allow for a comprehensive assessment of whether a future given adaptation project or strategy will meet goals and produce benefits. This comprehensive approach aligns immediate actions with long-term goals, establishing a framework for SLC and the municipalities to navigate the challenges of hazards and create a resilient future.

### 5.1 Ensure Life Safety/Criticality

Projects that prioritize safeguarding human life and ensuring the resilience of critical assets are essential for community well-being and emergency response. By focusing on life safety and the criticality of assets, these initiatives aim to enhance the community's ability to withstand and recover from adverse events. This approach ensures that essential services remain operational and that the well-being of residents is preserved during emergencies.

## 5.2 Incorporate Cross-Cutting Strategies

The County and municipalities should prioritize future projects that promote solutions addressing multiple adaptation goals and hazards, fostering collaboration across different adaptation realms for comprehensive resilience. By integrating cross-cutting strategies, this approach ensures that various aspects of adaptation are considered and addressed simultaneously. This holistic method not only enhances the overall effectiveness of the adaptation efforts but also encourages synergy and cooperation among different sectors and stakeholders, leading to more robust and resilient outcomes.

## 5.3 Maximize Cost Efficiency and Co-Benefits

The County and municipalities should prioritize future projects that reduce operational and maintenance costs while yielding both financial and nonmonetary benefits. By focusing on initiatives that maximize benefits per dollar spent, these projects aim to create sustainable, economically viable solutions. This approach ensures that financial resources are used wisely, contributing to lasting resilience and minimizing the need for additional investments down the line.

## 5.4 Enhance Asset Longevity and Adaptation Permanence

Future adaptation projects that prioritize permanent, long-term solutions for assets with extended lifespans are essential. At the same time, incorporating temporary measures for vulnerable assets as interim solutions ensures immediate protection. This balanced approach guarantees that critical infrastructure remains robust and functional over time, while also providing necessary safeguards for more susceptible assets. By combining permanent and temporary strategies, the County and municipalities aims to enhance overall asset longevity and adaptation permanence.

## 5.5 Minimize Tradeoffs and Downstream Effects

It is essential for the County and municipalities to focus on future projects that minimize trade-offs and unintended consequences. These initiatives will ensure that the implementation of the adaptation project does not introduce additional risks, environmental harm, or social challenges. By thoroughly evaluating potential downstream effects, the County and municipalities aims to develop adaptation strategies that are both effective and sustainable, preventing negative impacts on the community and the environment. This careful planning will help to create solutions that are beneficial in the long term and avoid creating new problems.

## 5.6 Identify Funding Source(s)

Securing dedicated funding is crucial for the success of adaptation strategies. Future projects with full or partial funding available and/or identified provide a stable foundation for adaptation efforts, ensuring they can be developed and maintained without solely relying on local funds. Grant funding, in particular, is essential for expanding the scope of resilience, allowing projects to move forward as planned and maximizing available resources. A consistent influx of grants empowers the County and municipalities to scale up adaptation initiatives, building lasting resilience and ensuring long-term sustainability.

## 5.7 Evaluate Short versus Long Implementation Timeline

Adaptation projects are structured with a mix of urgent and long-term measures, allowing SLC and the municipalities to address immediate vulnerabilities while building resilience for the future. Strategies requiring a short-term timeframe for implementation should be prioritized to ensure timely action on pressing needs. A balanced timeline provides flexibility to manage both short-term impacts and lasting protection against hazards. This approach ensures that immediate vulnerabilities are addressed promptly while creating a foundation for sustainable resilience over decades.

## 5.8 Facilitate Ease of Implementation

Future adaptation projects that are easy to implement, based on current funding, staffing capacity, ownership, and existing policies are critical to ensuring progress. When projects are realistic and achievable within these existing structures, they are more likely to succeed and gain community support. Simplifying the implementation process helps remove common obstacles, making it easier for stakeholders to get involved and take action. This means fewer delays, more efficient use of resources, and quicker progress toward resilience goals. Clear steps and well-defined responsibilities also help agencies coordinate more effectively, ensuring that resilience efforts are both practical and impactful.

## 5.9 Consider Future Adaptability

Ensuring that any future adaptation projects incorporate strategies that can be modified to accommodate expected future hazard conditions is crucial. Future adaptability guarantees that these strategies maintain their protective value over time. By building flexibility into these measures, future projects can adapt to new information and future risks. This adaptability provides resilience under changing circumstances, supporting SLC's ability to respond to unexpected challenges and ensuring long-term effectiveness in resilience efforts.

# 6.0 POLICY

As part of the Regional Resilience Plan (RRP), the project team completed a policy review comprised of two main components.

The first component included the development of a set of Uniform Resilience Policies directly shaped by the countywide Portfolio of Adaptation and Mitigation Strategies that was developed for the project and reviewed by the Resilience Steering Committee (**Section 4.2** and **Appendix A**). These Uniform Resilience Policy Recommendations are attached as **Appendix B**.

The second component included individual jurisdictional analyses of the participating local government's Comprehensive Plans and Codes. These lengthy analyses were provided to each local government in individualized memoranda identifying challenges and opportunities for embedding resilience-related policies into their future policy development. Every element of each jurisdiction's Comprehensive Plan was included as part of the analysis. For the Code analysis, the review focused on a couple of key sections where opportunities to address resiliency were a priority, including:

- Stormwater design/management and/or assessment regulations,

- Municipal Service Benefit Regulations (County-level),
- Landscaping regulations,
- Shoreline regulations,
- Floodplain management, and
- Others as relevant.

It should be noted that overall land development regulations were not reviewed due to their complexity and length. The project team suggests that participating jurisdictions may benefit from a more robust review of their Codes for opportunities and challenges to implement resiliency policies.

## 6.1 Uniform Resilience Policies

The project team reviewed the countywide Portfolio of Adaptation and Mitigation Strategies to identify opportunities for translating those strategies into Comprehensive Plan goals, objectives, or policies. In many instances, language from the adaptation matrix was incorporated directly into a recommended goal, objective, or policy. In other cases, adaptation strategies were too detailed to serve as recommended policies, or strategies were consolidated and broadened into more general recommendations. Overall, approximately 75 percent of the adaptation and mitigation strategies are reflected in some form within the Uniform Resilience Policies (**Appendix B**).

To acknowledge work that's already been completed, policies that have been implemented through the RVA and RRP efforts are marked with "(RRVA)". This designation indicates that the recommendation has likely been fulfilled or substantially addressed, requiring no additional effort to meet the policy.

Generally, the Uniform Resilience Policies includes:

1. Proposed Uniform Policy Goal:
    - The local government shall address infrastructure and assets, neighborhoods, and natural resources that experience coastal flooding due to extreme high tides and storm surge, and that are vulnerable to the related impacts of rising sea levels for the purpose of prioritizing funding for infrastructure needs and adaptation planning. The local government shall develop policies to improve resilience to coastal flooding in these areas resulting from high-tide events, storm surge, flash floods, stormwater runoff, and related impacts of sea level rise.
2. Four objectives:
    - **Objective 1:** The local government shall strengthen community and infrastructure resilience by implementing targeted strategies that reduce flood and climate related risks, prioritize funding, create adaptation planning initiatives, and promote sharing of data and information.
    - **Objective 2:** The local government shall address the vulnerabilities of public infrastructure and assets due to coastal flooding, storm surge, rainfall, and/or sea level

rise within the community by mapping and prioritizing locations that are at risk in the near-term, factoring in the criticality of assets and those dependent upon them.

- **Objective 3:** The local government shall address the vulnerabilities of neighborhoods or portions of neighborhoods due to coastal flooding, rainfall, storm surge, and/or sea level rise within the community.
- **Objective 4:** The local government shall assess the vulnerabilities of natural areas, open spaces and parks due to coastal flooding, storm surge, rainfall, and sea level rise by identifying locations at risk within the short, medium and long-term planning horizons.

3. Proposed policies are generally addressing:

- **Objective 1 Policy Summary**: Policies are related to the use of best available data and gathering additional future data to support resilience decision-making. Local government and agency coordination and leadership through community collaboration are also policy themes. Engagement with the relevant Chambers of Commerce is mentioned as a stakeholder engagement priority. Working across jurisdictional lines to secure collaborative funding that provides multi-jurisdictional benefits are proposed.
- **Objective 2 Policy Summary:** The identification of at-risk areas subject to flooding impact is a primary policy to support decision-making. Additional policy language proposes mechanisms to enhance data collection and include resiliency features into capital improvement projects. Collaboration and outreach to educate the community and build support for adaptation responses are outlined in proposed policies. Finally, suggestions are made for policies on how local governments can benefit from this type of capital improvement planning and be more competitive to secure grant funding.
- **Objective 3 Policy Summary:** This Objective includes policies that improve neighborhood-scale resiliency in terms of actual building strategies and policy modifications, specifically fill and shoreline guidance, and techniques for land development that can become more resilient to flood risks. The Objective also distinguishes the difference between public infrastructure adaptation and private property adaptation, which requires very different policy responses. A key priority for several policies is to aid residential and commercial property owners through permitting incentives, education, and outreach.
- **Objective 4 Policy Summary:** These policies focus on considerations related to environmental areas, natural landscapes, shorelines, and recreational facilities. Policy themes include shoreline adaptations, the value of land protection and management as a resiliency tool, and the relationship of co-benefits and outcomes related to improved water quality.

The Uniform Policies are only suggestions to coordinate the Portfolio of Adaptation and Mitigation Strategies developed within the RRP across the jurisdictions.

# 7.0 ADAPTIVE CAPACITY

St. Lucie County's Adaptive Capacity Assessment provides a comprehensive evaluation of how well the County and its municipalities are positioned to prepare for, respond to, and recover from a range of hazards. The assessment reviewed over a dozen County and municipal planning documents and ordinances, applying a scoring system to determine the strength of adaptive capacity across seven key hazards: inland flooding, storm surge, coastal erosion, drought, extreme heat, wildfire, and wind. Each hazard was evaluated based on five criteria: policies, mitigation strategies, response capability, deployable resources, and recovery time, offering a holistic view of the County's and municipalities' resilience potential.

The assessment also incorporated feedback from County and city departments and partner agencies, including emergency management and transportation planning. These insights confirmed strengths in flood and hurricane preparedness and highlighted opportunities to improve interdepartmental coordination, expand hazard coverage, and integrate future projections into long-range planning. Notably, while many plans address flooding and hurricanes, other hazards are often underrepresented, suggesting a need for broader integration of hazards into policy and infrastructure decisions.

This evaluation serves as a foundational tool for guiding future resilience efforts. By identifying areas of strength and weakness, the County and municipalities can prioritize updates to existing plans, enhance coordination across jurisdictions, and invest in adaptive strategies that address both current and emerging risks. Strengthening adaptive capacity across all hazard types will be essential to ensuring that St. Lucie County remains resilient. The full adaptive capacity assessment can be found within **Appendix C**.

# 8.0 IMPLEMENTATION

Adaptation strategies were developed to achieve overarching resilience goals, taking care to ensure that each strategy is actionable, measurable, and inclusive. Section 4 of this plan outlines the broad categories of adaptation strategies considered, including physical modifications, natural defenses and nature-based solutions, planning and policy measures, and community education and engagement. These categories provide a framework for addressing hazards across infrastructure, ecosystems, and communities. **Appendix A** builds upon this framework by detailing specific adaptation and mitigation actions that the County and municipalities can apply to future programs, infrastructure upgrades, asset protection, and policy initiatives.

**Appendix A** also includes a recommended implementation category for each strategy, aligned with the adaptation approach described in Section 8.7. This approach organizes actions into three groups: Immediately Actionable strategies that can start with existing resources; strategies that Require Planning and Coordination such as design, permitting, or partnerships; and strategies that Require Significant Investment, Sequencing, or Research, which depend on funding or technical studies. Each strategy within **Appendix A** is matched with its appropriate category to guide decision-makers in sequencing projects based on feasibility, resource needs, and complexity.

Additionally, **Appendix A** aligns each adaptation strategy with the specific natural hazard(s) it may address if implemented. These hazards: coastal erosion, compound flooding, drought, extreme heat, inland flooding, storm surge and sea level rise, wind, and wildfire were analyzed in detail through the Resilience Vulnerability Assessments. This alignment ensures that future projects are not only well-timed and feasible but also targeted to reduce risk from the most pressing threats facing St. Lucie County and its municipalities.

## 8.1 Level of Effort

Identifying the level of effort associated with the asset adaptation required for each future proposed project involves a detailed examination of the resources, time, scale, possible challenges, and expertise required to execute it successfully. Assessing these factors ensures that each future adaptation project is approached in a realistic manner with a clear understanding of demands. Some future-identified projects may require a significant level of effort due to high levels of intricacy, while others may be more straightforward, requiring a lower level of effort, and completion within a relatively short timeframe.

## 8.2 Cost Estimate

A future project's design should effectively address each asset's specific adaptation need while also being cost-effective over the asset's remaining useful life. Project cost has a direct correlation to other project elements such as time, scale, and funding source. Factors contributing to the determined level of cost include materials, labor, and equipment. Determining each project's level of cost allows for efficient financial planning and budgeting by the County and municipalities.

## 8.3 Timeline

A timeline for completion should be developed for each future adaptation project identified by the County or municipalities, including (at a minimum) planning, design, permitting, and construction. Project schedules highlight milestones and consider project complexity, resource availability, and community impact. The placement of future projects within a timeline would be dependent on multiple factors including County and/or municipal priorities, project urgency, availability of funds, permit hurdles, and resources. This timeline may expand or contract depending on changes in the foregoing factors. Larger-scale projects, often requiring more lead time, planning, and resources, will have longer implementation windows as compared to smaller-scale projects.

## 8.4 Funding Sources

Funding options are often specific to the type of asset. The options analyzed included federal, state, and local funding opportunities. Non-governmental organizations may also offer funding opportunities, but these are typically one-time source as opposed to recurring. Eligibility for grants in general is often based on several factors such as funding cycles, external requirements, project type, and location. A funding analysis will help the County and municipalities determine how each potential resilience project may be financed and whether additional resources are needed. The funding analysis also allows the County and municipalities to be ready to respond quickly when new and unexpected funding opportunities arise.

Local government-sponsored adaptation projects are often supported with funding from several sources. **Table 8-1** below describes potential funding mechanisms for resilience projects.

Table 8-1. Future Resilience Adaptation Project Funding Options

| Type of Funding | Funding Source |
|---|---|
| County or Municipal Generated (SLC) | 1. General Fund – Taxes collected by a local government are either dedicated to specific programs or added to the General Fund and Reserves. |
| | 2. Municipal Bonds – Issued by local governments with relatively low interest rates and a long pay-back schedule. They can be repaid through a government general fund or by the creation of a dedicated revenue source. |
| | 3. Tax Increment Funds (TIF) – These funds may be used to repay debt incurred to finance public infrastructure projects. The repayment funding stream is generated by the increased property or sales tax generated by new development or increased property values. The use of TIF districts gives local governments the ability to finance new projects without raising taxes or depleting the existing base tax revenues. |
| | 4. Sales Tax – Local Option Taxed are collected by the Florida Department of Revenue and deposited in a special account for the individual taxing authority. These taxes are generally 0.5 or 1 cent levees. The funds can be used to fund infrastructure projects among other activities. |
| | 5. State Revolving Fund (SRF) – The State of Florida provides low interest loans to local governments. Eligible expenditures include planning, design, and construction activities for drinking water, storm water, and non-point pollution projects. |
| | 6. Water Infrastructure Finance and Innovation Act (WIFIA) – The program is the federal counterpart to the SRF and provides low, fixed rate loans for larger water infrastructure projects that may have trouble obtaining other financial sources. |
| Grants - Federal | |
| Nature Based (NB) | 1. NOAA National Coastal Resilience Fund (NCRF) – The program funds conservation or construction of coastal habitats to protect, restore or expand natural features. Non-federal match (cash or in-kind) is encouraged and may improve competitiveness of the proposal but is not required. (National Coastal Resilience Fund (noaa.gov)). |
| | 2. NOAA Emergency Coastal Resilience Fund (ECRF) – The program funds the rebuilding of habitats after a natural disaster has impacted them. No match is required; however, a match may be included in the proposal. (Emergency Coastal Resilience Fund \| NFWF) |
| Grey Infrastructure (GI) | 1. Housing and Urban Development (HUD) Community Development Block Grant – Mitigation (CDBG-Mit) – The program funds are designed to increase resilience to disasters and reduce or eliminate the long-term risk of loss of life, injury, damage to and loss of property, and suffering and hardship by lessening the impact of future disasters. The goals of the program are to build or strengthen critical infrastructure and support the adoption of policies that reflect local and regional priorities with long-lasting effects on community risk reduction. (CDBG-MIT Action Plan Requirements - HUD Exchange) |
| | 2. Federal Emergency Management Agency (FEMA) Hazard Mitigation Grant Program (HMGP) – The program funds are available after disasters to support projects similar in nature to the HUD CDBG-Mit projects. The program provides 75% federal funding with 25% coming from state and local sources. (Community Development Block Grant (CDBG): Mitigation (MIT) Program \| FEMA.gov) |
| | 3. FEMA Building Resilient Infrastructure and Communities (BRIC) – The federal program funds projects that reduced a community's risk of damage from natural disasters including projects that address effects from hazards. It focuses on capability and capacity building in areas like building codes and hazard mitigation planning as well as hazard mitigation projects that are designed to increase resilience and public safety. The program provides 75% federal funding with 25% coming from state and local sources. (Building Resilient Infrastructure and Communities \| FEMA.gov) |
| | 4. FEMA Flood Mitigation Assistance (FMA) – The program funds projects that eliminate or reduce risk of repetitive flooding to buildings and communities that participate in the National Flood Insurance Program (NFIP). Adaptation, equity, and resilience projects with respect to flooding are eligible for funding under this program. The program provides 75% federal funding with 25% coming from state and local sources. (Flood Mitigation Assistance Grant Program \| FEMA.gov) |

| Type of Funding | Funding Source |
|---|---|
| | 5. Environmental Protection Agency (EPA) Environmental Finance Centers – While not a funding center, this program is comprised of university-based organizations that help communities develop programs to fund the costs of environmental protection programs, which can include impacts to the environment from the effects of hazards. (https://www.epa.gov/sites/default/files/2015-02/documents/fact_sheet_-_environmental_finance_centers_fact_sheet_february_2015.pdf) |
| | 6. Department of Transportation (DOT) Promoting Resilient Operations for Transformative, efficient and Cost-Saving Transportation (PROTECT) – The program is a discretionary grant administered through the U.S. Department of Transportation and provides federal funding to help make surface transportation more resilient to natural hazards, including extreme weather, sea level rise, flooding, extreme weather events, and other natural disasters through support of planning activities, resilience improvements, community resilience and evacuation routes, and at-risk coastal infrastructure. (Bipartisan Infrastructure Law - Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation [PROTECT] Formula Program Fact Sheet \| Federal Highway Administration [dot.gov]) |
| State of Florida (SF) | 1. Department of Transportation (DOT) Promoting Resilient Operations for Transformative, efficient and Cost-Saving Transportation (PROTECT) – The program is a formula grant administered through the Florida Department of Transportation and provides federal funding to help make surface transportation more resilient to natural hazards, including extreme weather, sea level rise, flooding, extreme weather events, and other natural disasters through support of planning activities, resilience improvements, community resilience and evacuation routes, and at-risk costal infrastructure. (Bipartisan Infrastructure Law - Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation [PROTECT] Formula Program Fact Sheet \| Federal Highway Administration [dot.gov]) |
| | 2. Local Mitigation Strategy – While this is not a funding source in and of itself, inclusion on this list provides eligibility for projects to be considered for funding under many federal programs. It is comprised of a list of mitigation projects that have been vetted and ranked by the community and includes each project's "shovel readiness". |
| | 3. Resilient Florida Program – The program is designed to provide funding to local communities to assist them in assessing their vulnerabilities to flooding caused by weather, sea level rise, and other sources of flooding, and to design and construct projects that address the exposure of critical assets to those threats. A 50% cost share is required for projects to be eligible for consideration. |
| | 4. Water Quality Improvements Grant Program - The program is available to local governments for repairing, upgrading, expanding, or constructing stormwater treatment facilities that result in improvements to surface water or groundwater quality. Match is not required, but is encouraged and may increase the competitiveness of the grant. |
| | 5. South Florida Water Management District Water Supply Grant – The program is funded annually to assist local governments in implementing cost-effective strategies to conserve water and meet water demand. To qualify for these funds, local governments projects must be construction-ready AWS projects or ready-to-implement water conservation technology programs/projects. The local governments must also have adopted an irrigation ordinance consistent with South Florida Water Management District year-round irrigation rule and have an approved Water Supply Facilities Work Plan. Maximum cost share is 50%. |
| Other sources for consideration | 1. Non-profits organizations often offer one-time grant opportunities based on funding they have acquired. Periodic Google searches and review of the Philanthropy News Digest (Philanthropy News Digest) along with major funders such as the Bill and Melinda Gates Foundation (https://www.gatesfoundation.org/) and the Kresge Foundation (https://kresge.org/) will help to identify any new funding sources. |
| | 2. Public-Private Partnerships – In some cases, the County and municipalities' objectives will line up with a private venture requiring a common outcome. The private sector partner may have funds, expertise or other types of contributions and efficiencies that would benefit a large-scale project. |

## 8.5 Other Considerations

When evaluating future projects for implementation, there are various other considerations that can support a broader array of project types and planning efforts.

### 8.5.1 Partnership and Collaborations

St. Lucie County and the municipalities have a demonstrated understanding of the importance of partnerships for successful projects. Its long working relationships with the U.S. Army Corps of Engineers, the Florida Department of Environmental Protection, the Florida Inland Navigation District, and the South Florida Water Management District, have resulted in numerous beach management, storm protection, inland waterway, and water quality projects.

The County and municipalities have also developed close working relationships as evidenced by the beach management program, which is partially within the Fort Pierce city limits; SUN Trail Project; and collaboration on land acquisition and the half-cent sales tax to address infrastructure projects. The long-term membership in the Treasure Coast Regional Planning Committee and St. Lucie Transportation Planning Organization have resulted in advancements in resilience for the region. Finally, several public-private partnerships have been forged, resulting in community art and amenities, and offsetting development impacts through the preservation of greenspaces. Funding, expertise, support, assistance, and experience are all valuable tools that have been provided by partners. These existing relationships will be equally important as the County and municipalities move into the resilience adaptation implementation stage.

### 8.5.2 Lead Agencies/Organizations

As stated earlier, critical assets support services that are fundamental to the community but are not always owned or under the control of the County or municipalities. In some cases, outside agencies or non-profit organizations may lend support to these services. One or more lead departments, agencies, or organizations should be identified for each proposed mitigation project. The agency/organization selection represents the entity or entities most appropriate to assume responsibility for the project. Agencies include those at the state and local levels, and organizations can be national or community-based.

### 8.5.3 Regulatory and Planning Capabilities

The evaluation of regulatory and planning capabilities involves assessing County and municipality management practices related to changing patterns of natural hazards. The analysis can include reviews of current development restrictions and planning, management regulations, hazard mitigation planning, sustainability programs, emergency planning, and post-disaster recovery with the aim of incorporating sustainable decision-making at every level. The County's and municipalities' level of readiness is clearly indicated by the many planning efforts that have been completed or are in process.

### 8.5.4 Administrative and Technical Capabilities

The involvement and demonstrated commitment to adaptation on the part of County / municipal administration will determine the importance of incorporating adaptive strategies into capital improvement projects that are supported by staff. Evaluating the number of subject matter experts in fields that are tied to future adaptation projects, relative to community size, indicates technical capabilities and level of support available to other staff in their efforts to identify ways to make their projects more resilient. The success that SLC and the municipalities have achieved together and

separately in obtaining grant funding, federal project participation, and community support for the types of projects that have an impact on resilience mirrors the administrative and technical capabilities of all involved staff and elected officials.

## 8.6 Fiscal Capacity

The County and municipalities can also evaluate their abilities to fund proposed adaptation strategies. The analysis included in this document explores grants, loans, taxes, insurance, bonds, and other sources. As fiscal capacity grows, more aggressive adaptation policies such as buyout programs, incentive programs, and strategic budgeting can be considered.

## 8.7 Phased Adaptation Approach

The implementation plan organizes adaptation strategies into three distinct implementation categories to guide phased action over time. Each strategy listed in **Appendix A** is assigned to one of these categories based on urgency, feasibility, and alignment with long-term resilience goals.

1. **Immediately Actionable**: Actions that can begin immediately using existing resources, staff capacity, and current authority. These strategies typically require minimal additional planning or approvals and can deliver quick benefits while building momentum for broader adaptation efforts.
2. **Requires Planning and Coordination**: Actions that need more preparation before implementation, such as detailed design work, engineering studies, permitting processes, supplemental funding, and/or formal partnerships with other agencies and stakeholders. These strategies often involve aligning multiple entities and ensuring regulatory compliance, which adds time and complexity to the process.
3. **Requires Significant Research, Investment, and/or Sequencing**: that depend on major funding commitments, technical studies, and/or enabling policies before they can move forward. These strategies may involve large-scale infrastructure projects, advanced modeling, or phased implementation to ensure feasibility and cost-effectiveness. Sequencing may be critical for these actions because they often rely on foundational steps, such as data collection, policy updates, and/or smaller enabling projects, before full deployment.

# 9.0 MONITORING AND EVALUATION

Monitoring and evaluation are crucial components of community resilience, ensuring that implemented projects achieve their intended goals and contribute to the County’s and municipality's ability to recover from a natural hazard event. A comprehensive monitoring and evaluation program should track the effectiveness of each future adaptation project, providing valuable insights and identifying necessary modifications to enhance performance. It is essential to have a knowledgeable and supportive team that understands the program's objectives and can provide real-time feedback on project implementation. While guidelines for adaptation projects are flexible to accommodate unforeseen circumstances, any deviations should be thoroughly documented to maintain the integrity of the original intent. Monitoring frequency will vary based on a future project's implementation timeline and duration, but should always have standardized reporting protocols in

place to capture progress and address key questions or issues that may indicate the need for some modification. Key management personnel should establish formal methods for adjusting projects as needed. Additionally, publicizing successful projects will increase community awareness and appreciation of efforts to build a more resilient and sustainable St. Lucie County. This approach fosters transparency, accountability, and continuous improvement in the County's and municipalities' resilience initiatives.

## 9.1 Tracking Progress and Performance

Tracking progress and performance is vital for the successful execution of resiliency efforts. Establishing a realistic timeline for the overall program and each individual future adaptation project is essential for continued success. This timeline should be adaptable to changing conditions and funding availability, with annual reviews to assess progress and make necessary adjustments. Metrics should be used to measure success, and any timeline modifications should be documented to inform future planning. For each future project, cost and timing should be monitored at the 30 percent, 50 percent, and 90 percent completion stages to identify any resource shortfalls or issues causing delays.

To support this effort, the County and municipalities may develop an internal tracking dashboard to monitor the implementation and progress of future resilience projects. This dashboard may enable staff to track project statuses across key milestones, including: Planned, Designed, Permitted, Funded, Under Construction, and Complete. The tool enhances transparency, supports data-driven decision-making, and allows for timely identification of bottlenecks or areas needing additional support.

Progress toward high-level goals should be evaluated at both the project and program levels. Recognizing achievements at the County and municipal staff and community levels can help build momentum. If progress is slower than expected, actions can be identified that can expedite the project such as increased funding, additional manpower, or improved coordination. While deadlines are consequential, it is equally important to consider whether modifying a project can resolve the timing issues while still achieving the intended goals. Deferring completion dates should occur only as a last resort due to potential cumulative impacts on the overall program.

Regular reviews, whether they highlight successes or opportunities for improvement, can provide valuable insights for future adaptation planning and help refine the progress and performance tracking process. This approach would ensure that the County and municipalities remain on course to achieve its resilience objectives.

## 9.2 Feedback Mechanisms

Feedback mechanisms are essential for assessing project performance and program success, with data gathered from various sources. Formal, quantitative feedback is generated through performance tracking while qualitative feedback can be obtained from staff, vendors, elected officials, grant managers, and the community. Processes such as suggestion boxes or innovation rewards can encourage staff to share comments and suggestions. Vendors should be invited to propose innovative solutions, while elected officials can relay constituent feedback through established channels. Grant

managers at state and federal agencies, with their broad experience in similar projects, can offer valuable insights through regular communication.

Establishing clear lines of communication with the community early in the conceptual phase ensures ongoing feedback about project implementation and goals. This structured exchange with residents and stakeholders helps clarify facts and expectations and allows County and municipal project managers to review community input promptly and make necessary modifications. Results from monitoring and feedback programs should be reviewed routinely so that existing projects can be modified and new projects can be envisioned to improve the program for the future. Additionally, the monitoring and evaluation efforts themselves should be updated as needed to better capture relevant information, ensuring the RRP remains responsive and effective.

## 10.0 LAND PRESERVATION COST BENEFIT ANALYSIS

St. Lucie County conducted a Land Preservation Cost Benefit Analysis (CBA) to evaluate the economic value of preserving natural lands compared to converting them to development. The analysis considered ecosystem service benefits such as flood protection, water quality improvements, habitat conservation, recreation, and aesthetic value against the costs of maintaining preserves. Using FEMA ecosystem service valuation methods and a 10-year planning horizon with a 7 percent discount rate, the results show that all preserves deliver benefits far exceeding costs, with Benefit-Cost Ratios (BCR) well above 1.0. In fact, BCRs ranged from 26.6 to over 90 when all benefits were considered, and even flood protection alone produced positive returns. Collectively, the nine preserve groups analyzed provide hundreds of millions of dollars in avoided costs and ecosystem benefits, reinforcing the economic and environmental rationale for long-term land conservation. These findings underscore that preservation is not only a resilience strategy, but also a sound financial investment, supporting flood mitigation, biodiversity, and community well-being while reducing future risk. The complete Land Preservation Cost Benefit Analysis can be found in **Appendix F**.

## 11.0 CONCLUSION

St. Lucie County's Regional Resilience Plan builds on the County's and municipalities' established record of commitment to resilience planning. It represents a proactive, inclusive approach to adaptation. By aligning resilience goals with community needs, economic stability, and promoting healthy practices, the RRP provides a clear path to a safer, more resilient future for all residents. Thoughtful data analysis, clear County and municipal policy priorities, and funding realities were incorporated for the development of proposed adaptation strategies. Through continued partnership, stakeholder engagement, and adaptive management, the County and municipalities are positioned to effectively navigate the challenges posed by hazards.

This report provides the County and municipalities with a robust portfolio of adaptation strategies that can be drawn from to guide future resilience projects geared toward protecting critical assets from hazards. The RRP emphasizes the importance of integrating resilience across multiple sectors, from land use and infrastructure to emergency management and public health, ensuring that adaptation efforts are both practical and forward-looking. It reflects a shared understanding that

resilience is an ongoing process that requires coordination, flexibility, and responsiveness to changing conditions.

Through continued partnerships, stakeholder engagement and education, and adaptive management, the County and municipalities are well-positioned to navigate future challenges, reduce risk, and strengthen community resilience over time. The Regional Resilience Plan serves as a framework that can evolve alongside new data, technologies, and community needs, helping St. Lucie County, Port St. Lucie, Fort Pierce, and St. Lucie Village remain prepared and adaptable.

## 12.0 REFERENCES

SLC (St. Lucie County). 2019. Comprehensive Plan EAR-Based Amendments: Coastal Management Element. Data, Inventory, and Analysis.

SLC. 2024. Comprehensive Plan EAR-Based Amendments: Conservation Element. Data, Inventory, and Analysis.

# APPENDIX A: PORTFOLIO OF ADAPTATION AND MITIGATION STRATEGIES

# St. Lucie County Regional Resilience Plan
# Portfolio of Adaptation & Mitigation Strategies

| Strategy Category | Strategy Type | Description | Applicable Hazard(s) |
|---|---|---|---|
| Physical Modifications to Assets | Maintenance and Operations | ***Ongoing*** | |
| | | Integrate building elevation and inundation data into permitting and planning of facilities by linking elevation certificates and vulnerability mapping to construction and retrofit decisions. Maintain and update elevation certificate data countywide. | Flooding (rainfall, storm surge, sea level rise, tidal flooding, combination flooding) |
| | | Develop an infrastructure asset management system with survey level data, or modify an existing one to incorporate resiliency elements, that compiles data on infrastructure age, condition, and survey-grade vulnerability metrics to guide maintenance and retrofit strategies. Digitize all relevant data into a centralized system. | All |
| | | Ensure facilities are weatherized and HVAC systems maintained to reduce vulnerability to extreme heat and storm impacts. | Extreme heat, wind |
| | Retrofitting | ***Immediately Actionable*** | |
| | | Install and prioritize tidal protection to infrastructure, including tidal gate valves, surge barriers, and valve retrofits, with annual updates to prioritization in capital planning. | Sea level rise, storm surge, tidal flooding |
| | | Retrofit critical facilities with energy-efficient cooling systems, passive design features, and renewable energy sources to reduce heat stress and maintain operations during power outages. | Extreme heat |
| | | Expand use of reflective and cool roofing materials to mitigate extreme heat impacts on buildings. | Extreme heat |
| | | ***Requires Planning and Coordination*** | |
| | | Retrofit critical facilities for wind resilience, including impact-resistant windows, reinforced roofs, and other wind-hardened features to ensure continuity of operations. | Wind |

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| **Physical Modifications to Assets** | **Retrofitting (cont'd)** | Strengthen existing infrastructure and support equipment by assessing vulnerabilities and developing a comprehensive plan to improve the integrity of public assets and systems. | All |
| | | ***Requires Significant Research, Investment, and/or Sequencing*** | |
| | | Elevate and retrofit critical infrastructure (e.g., roads, utilities, buildings) in high-risk areas using adaptive design standards such as floating infrastructure, tidal-resistant roads, and elevation strategies. | Flooding (rainfall, storm surge, sea level rise, tidal flooding, combination flooding) |
| | **Replacement** | ***Immediately Actionable*** | |
| | | Prioritize replacement of critical assets (e.g., bridges, culverts, stormwater systems) that have exceeded their design life or show signs of hazard-related stress. | All |
| | | Coordinate need for replacement with capital budgeting cycles. | All |
| | | Coordinate replacement efforts with hazard mitigation and emergency planning to ensure continuity of essential services during extreme events. | All |
| | | Incorporate nature-based design elements into replacement projects, such as permeable surfaces, bioswales, or living shorelines, where feasible. | All |
| | | ***Requires Planning and Coordination*** | |
| | | Replace aging infrastructure with hazard-adapted alternatives that meet updated resilience standards for flooding, wind, and heat | Flooding (rainfall, storm surge, sea level rise, tidal flooding, combination flooding), extreme heat, wind |
| | | ***Requires Significant Research, Investment, and/or Sequencing*** | |
| | | Use replacement projects as opportunities to integrate renewable energy systems, energy-efficient technologies, and passive cooling strategies | Extreme heat |
| | | Develop a replacement schedule based on vulnerability of assessments, maintenance records, and projected impacts to guide long-term capital planning | All |
| | **Planned Relocation** | ***Immediately Actionable*** | |
| | | Identify trigger points for relocation based on infrastructure-specific failure points using monitoring data, trends, and vulnerability assessments to inform when and where retreat or relocation should be initiated. | All |

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| **Physical Modifications to Assets** | **Planned Relocation (cont'd)** | ***Requires Planning and Coordination*** | |
| | | Develop a Managed Retreat Framework to guide the potential relocation of assets and community elements from low-lying coastal areas, considering flood exposure and ecosystem migration due to sea level rise. | Flooding (rainfall, storm surge, sea level rise, tidal flooding, combination flooding), coastal erosion |
| | **Demolition or Abandonment** | ***Immediately Actionable*** | |
| | | Identify and prioritize structures for demolition or abandonment based on vulnerability assessments, cost-benefit analyses, and long-term resilience goals. | All |
| | | Engage communities in planning for abandonment or demolition to ensure transparency and alignment with local needs and values. | All |
| | | If properly justified, coordinate demolition/abandonment efforts, and/or employ land use planning strategies to mitigate repetitive loss and reduce risks to human health. | All |
| | | ***Requires Planning and Coordination*** | |
| | | Develop protocols for safe decommissioning of compromised infrastructure, including environmental remediation and community notification. | All |
| | | Convert vacated high-risk areas into green infrastructure zones that support flood absorption, habitat restoration, and passive recreation. | Storm surge, tidal flooding, inland flooding |
| | | ***Requires Significant Research, Investment, and/or Sequencing*** | |
| | | Monitor and evaluate post-demolition land performance to assess flood mitigation, ecological benefits, and community use outcomes. | All |
| **Natural Defenses & Nature-Based Adaptations** | **Retention Structures and Drainage Improvements** | ***Immediately Actionable*** | |
| | | Identify and utilize public open spaces for enhanced stormwater management, including dual-purpose uses such as green space, preservation, and floodwater retention. | Inland flooding |
| | | Determine and model stormwater storage capacity by identifying public and private floodwater storage areas and assessing drainage potential to inform infrastructure improvements. | Inland flooding |

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| **Natural Defenses and Nature-Based Adaptations** | **Retention Structures and Drainage Improvements (cont'd)** | Complete or update stormwater master plans to ensure proper planning in the future. | Inland flooding |
| | | To support future planning and modeling, any existing metadata related to modeling efforts should be updated and maintained. | All |
| | | ***Requires Planning and Coordination*** | |
| | | Upgrade stormwater infrastructure using future rainfall projections and hybrid gray-green systems to address compound flooding risks, especially in low-gradient inland areas. Revisit level of service for stormwater management incorporating a tidal flooding consideration. | Flooding (storm surge, sea level rise, tidal flooding, inland flooding, combination flooding) |
| | | ***Requires Significant Research, Investment, and/or Sequencing*** | |
| | | Enhance freshwater system resilience by implementing hydrologic modifications to maintain freshwater inputs and installing salinity barriers or adaptive culverts at estuarine-freshwater interfaces. | Sea level rise, storm surge, tidal flooding |
| | **Construct Natural Features** | ***Immediately Actionable*** | |
| | | Prioritize nature-based solutions such as dune restoration, living shorelines, and other ecological approaches over hard infrastructure where feasible. | Coastal erosion, storm surge, wind |
| | | Increase utilization of passive green infrastructure including trails, swales, and retention areas to support stormwater management, habitat connectivity, and recreational benefits. | Inland flooding |
| | | Develop a green infrastructure master plan to guide the integration of bioswales, rain gardens, permeable surfaces, and other natural features into urban redevelopment. | Inland flooding |
| | **Preserve and Restore Ecosystems** | ***Immediately Actionable*** | |
| | | Strengthen support for wetland conservation through voluntary and incentive-based programs that emphasize flood resilience and ecosystem health. | Flooding (rain, storm surge, sea level rise, tidal flooding, inland flooding, combination flooding), drought |
| | | Restore degraded coastal wetlands and natural buffers (e.g., mangroves, dunes, beaches) to increase co-benefits for flood mitigation and biodiversity. | Sea level rise, storm surge |

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| **Natural Defenses and Nature-Based Adaptations** | **Preserve and Restore Ecosystems (cont'd)** | Restore and protect inland wetlands and floodplains to enhance natural flood storage, improve water quality, and support habitat resilience. | Inland flooding, drought |
| | | ***Requires Planning and Coordination*** | |
| | | Advance restoration of floodplain and marsh systems by reconnecting historic floodplains, removing culverts and berms, and piloting brackish zone restorations. | Inland flooding, drought, fire |
| | | Create buffer zones and implement strategic conservation goals for vulnerable habitats, including species-specific and critical wetland areas. | Inland flooding, heat, drought, fire |
| | | Harmonize natural resource restoration with resilience strategies, integrating ecological restoration into broader adaptation planning. | All |
| | | ***Requires Significant Research, Investment, and/or Sequencing*** | |
| | | Create a Coastal Habitat Transition Reserve Network by designating upland buffers for wetland migration and addressing “coastal squeeze” in highly developed areas. | Sea level rise, storm surge, tidal flooding |
| | **Protect Coastal Shorelines** | ***Immediately Actionable*** | |
| | | Implement innovative shoreline protection strategies such as groins, oyster reefs, and living shorelines to reduce erosion and enhance coastal resilience. | Coastal erosion, storm surge, sea level rise, tidal flooding |
| | | Coordinate with US Army Corps of Engineers (USACE), the Florida Department of Environmental Protection (FDEP), and local municipalities to prioritize beach nourishment projects in areas with critical infrastructure or evacuation routes at risk from future sea level rise. | Coastal erosion, storm surge, sea level rise, tidal flooding |
| | **Increase Tree Canopy and Green Corridors** | ***Immediately Actionable*** | |
| | | Conduct a tree canopy study and based on results, expand tree canopy and urban greening, prioritizing urban heat islands—especially in Fort Pierce and Port St. Lucie. | Extreme heat, inland flooding, wind |
| | | Increase tree coverage and green infrastructure in public spaces to provide shade and cooling benefits. | Extreme heat, inland flooding |
| | | Expand parks and install cooling features such as splash pads and pools to reduce heat exposure for the public. | Extreme heat, inland flooding |
| | | Ensure advanced forestry management including ecological and commercial silviculture, prescribed burns and silvopasture to minimize the potential for wildfire. | Wildfire, drought |

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| **Natural Defenses** | **Increase Tree Canopy and Green Corridors (cont'd)** | ***Requires Planning and Coordination*** | |
| | | Design recreational and open spaces with dual-purpose features, such as floodable park elements along canals and coastal areas to support stormwater management and resilience. | Extreme heat, inland flooding |
| **Planning, Management, and Policy** | **General** | ***Immediately Actionable*** | |
| | | Review the Comprehensive Plan and Code for linkages with recommendations in the Vulnerability Assessment. Conduct a comprehensive analysis for consistency and opportunities to strengthen resiliency goals, objectives, and policies. | All |
| | | Review existing shoreline policies to determine if criteria need to be developed or modified to address water quality, erosion, and sea level rise adaptation measures. Use natural resource and shoreline map series to inform policy development. | Coastal erosion, storm surge, sea level rise, tidal flooding |
| | | Monitor regional, state, and federal rulemaking related to stormwater and other resiliency-related policies. Track changes that integrate future climate conditions, including wet season groundwater elevations, sea level rise, and precipitation intensity/duration/frequency curves. | All |
| | | Coordinate with county, municipalities, agencies, and stakeholders on policy development and updates. | All |
| | | ***Requires Planning and Coordination*** | |
| | | Integrate sea level rise projections into the Comprehensive Plan and design elements of the Code. Adopt regional projections into planning and design processes. | Sea level rise, storm surge, tidal flooding |
| | | Establish roadway design standards that are resilient to sea level rise. | Sea level rise, storm surge, tidal flooding |
| | **Land Use Policy Considerations** | ***Immediately Actionable*** | |
| | | Discourage development in flood-prone and erosion-prone areas; implement coastal setback policies and align with the Coastal Construction Control Line. | Flooding (storm surge, sea level rise, tidal flooding, inland flooding, combination flooding) |

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| **Planning, Management, and Policy** | **Land Use Policy Considerations (cont'd)** | Incorporate flood risk, sea level rise, drought, and high wind projections into zoning, building codes, and comprehensive land use planning. | Flooding (storm surge, sea level rise, tidal flooding, inland flooding, combination flooding), drought, wind, wildfire |
| | | Prioritize permitting incentives for resilient and low-impact development (LID); review development requirements to enhance incentives for resilient building standards. | All |
| | | Ensure affordable housing requirements account for future flood risk and other hazard vulnerabilities. | All |
| | | Promote drought-tolerant landscaping and discourage high-water-demand development in areas with limited water supply resilience. | Drought, wildfire |
| | | Use future land development data to identify and mitigate urban heat islands. | Extreme heat |
| | | Conduct repetitive loss area analysis and integrate findings into vulnerability assessments and acquisition or flood-proofing strategies. | Flooding (storm surge, sea level rise, tidal flooding, inland flooding, combination flooding) |
| | | Encourage structure elevation programs for residents in low-lying areas to reduce flood risk. | Flooding (storm surge, sea level rise, tidal flooding, inland flooding, combination flooding) |
| | | Provide a 50% discount on permits for resilience upgrades such as impact windows, reinforced roofs, solar panels, and energy-efficient improvements—helping families prepare for hurricanes, flooding, and utility costs. The program can run certain months out of the year (spring prior to hurricane season) so as not to impact permitting program budgets. | All |

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| **Planning, Management, and Policy** | **Land Use Policy Considerations (cont'd)** | ***Requires Planning and Coordination*** | |
| | | Maintain and expand strategic land acquisition programs, including for repetitive loss properties, upland parcels in marsh/mangrove transition zones, and underutilized properties with flood storage benefits. | Flooding (storm surge, sea level rise, tidal flooding, inland flooding, combination flooding) |
| | | Limit impervious surface expansion in habitat transition zones. | Inland flooding |
| | | Ensure that dynamic shoreline management planning continues. | Coastal erosion, sea level rise, tidal flooding, storm surge |
| | | ***Requires Significant Research, Investment, and/or Sequencing*** | |
| | | Establish conservation buffers to support natural shoreline migration and reduce infrastructure exposure. | Sea level rise, storm surge, tidal flooding, wind |
| | | Implement Wildland-Urban Interface (WUI) mitigation strategies, including defensible space standards and fire-adapted landscaping. | Wildfire |
| | **Emergency Planning** | ***Immediately Actionable - Pre-Storm (Preparedness and Planning)*** | |
| | | Complete detailed adaptation assessments for earliest at-risk infrastructure. Use vulnerability assessment information in emergency management planning and to prioritize projects. | All |
| | | Incorporate vulnerability assessment data into local mitigation strategy and existing emergency management plans. | All |
| | | Update emergency management and hazard mitigation plans to include vulnerability analysis data. | All |
| | | Incorporate drought early warning into existing hazard mitigation plans by tracking updates from the US Drought Monitor and National Drought Mitigation Center. Identify clear triggers for remedial actions and communicate those actions to the public. | Drought, wildfire |
| | | Establish a pre-storm preparedness protocol for inspecting infrastructure and securing or moving equipment. | Wind, storm surge, tidal flooding, inland flooding |
| | | Ensure that a debris management plan includes pre-staging, rapid clearance, and recycling strategies to reduce post-storm recovery time and minimize impact to landfill. | Wind, storm surge, wildfire |

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| Planning, Management, and Policy | Emergency Planning (cont'd) | Enhance wildfire detection and response capacity through improved GIS mapping, remote sensing, and interagency coordination. | Wildfire |
| | | ***Immediately Actionable - During-Storm (Response and Communication)*** | |
| | | Develop a flood early warning system with gauges in strategic locations to monitor water levels and provide alerts when roads may be flooding. Incorporate streaming data sources to create real-time data portal for citizens and decision makers. | Flooding (storm surge, sea level rise, tidal flooding, inland flooding, combination flooding) |
| | | Work with other agencies and government departments to identify and ensure vulnerable populations are provided with information regarding facilities and shelters during flooding events when vehicle travel may be compromised. | Flooding (storm surge, sea level rise, tidal flooding, inland flooding, combination flooding) |
| | | Consider signage and communication plans for alternate or compromised routes during flood events. Use this as an opportunity to educate the community and property owners about access issues. | Flooding (storm surge, sea level rise, tidal flooding, inland flooding, combination flooding) |
| | | Plan for and build public facilities to have the capacity to stage resources during flood events. | Flooding (storm surge, sea level rise, tidal flooding, inland flooding, combination flooding) |
| | | ***Immediately Actionable - Post-Storm (Recovery and Adaptation)*** | |
| | | Ensure that a debris management plan includes rapid clearance and recycling strategies to reduce recovery time and minimize impact to landfill (also relevant pre-storm). | Wind |
| | | Use vulnerability assessment information to prioritize recovery projects and long-term adaptation strategies. | All |
| | | ***Requires Planning and Coordination*** | |
| | | Integrate compound flooding risk into emergency management plans. | Combination flooding |
| | | Update evacuation planning and sheltering strategies based on SLOSH Category 5 exposure, particularly for St. Lucie Village and Fort Pierce. | Storm surge |

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| **Planning, Management, and Policy** | **Codes and Standards** | ***Immediately Actionable*** | |
| | | Update design standards for public projects. | All |
| | | Use the local technical amendment process for building code enhancements that address elevation and enhanced wind resistance measures. | Wind, Flooding (storm surge, sea level rise, tidal flooding, inland flooding, combination flooding) |
| | | ***Requires Planning and Coordination*** | |
| | | Review building codes periodically to identify updates in building standards that may be required to address hazards as they change and/or intensify. | All |
| | | ***Requires Significant Research, Investment, and/or Sequencing*** | |
| | | Review, update, or develop policies to protect historic structures from future risk. Develop procedures for historic structures in highly vulnerable areas to adapt and make resilience improvements as feasible. | Flooding (storm surge, sea level rise, tidal flooding, inland flooding, combination flooding) wildfire |
| | **Operations and Staffing** | ***Immediately Actionable*** | |
| | | Update the essential employee list for emergency preparation and response activities, and conduct preparedness training for government employees to maximize workforce readiness. | All |
| | | Ensure that an employee team of appropriate size and composition is trained and up to date on disaster response expense tracking to maintain eligibility for reimbursements. | All |
| | | Coordinate with utility and service providers—including law enforcement, emergency management, schools, and critical care facilities—to evaluate infrastructure vulnerabilities and minimize service gaps. | All |
| | | Annually update elected leadership on vulnerability and resiliency planning progress, and conduct a resilience strategy review prior to the capital budgeting process to align funding and implementation. | All |
| | | Improve internal communications across departments to enhance collaboration during major events through formal or informal mechanisms. | All |

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| Planning, Management, and Policy | Operations and Staffing (cont'd) | Ensure that a properly trained employee team is in place to track disaster response expenses and maintain eligibility for reimbursements. | All |
| | | Establish a Heat Resilience Task Force to coordinate cross-sectoral responses involving public health, emergency management, and urban planning. | Extreme heat |
| | | Convene a wildfire preparedness stakeholder committee to develop a community fire-emergency response | Wildfire |
| | | ***Requires Planning and Coordination*** | |
| | | Ensure critical public services and buildings are equipped to function during power outages associated with extreme heat events, including facilities designated as cooling centers. | Extreme heat |
| | | ***Requires Significant Research, Investment, and/or Sequencing*** | |
| | | Improve the capacity of medical facilities to prepare for and recover from natural disasters and future hazard-related conditions. | All |
| | Capital Planning | ***Immediately Actionable*** | |
| | | Hold a workshop prior to the initiation of the annual budgeting process to brief elected leadership on the relationship between the capital budgeting process and resilience benefits of proposed projects. | All |
| | | ***Requires Planning and Coordination*** | |
| | | Ensure that critical public services are equipped to function during power outages that may accompany storms and extreme heat events, including public buildings that may be needed as cooling centers. | Extreme heat, wildfire, wind, flooding (storm surge, sea level rise, tidal flooding, inland flooding, combination flooding) |
| | | Integrate a resiliency tag on Capital Planning budgets where departments can identify proposed capital improvements projects as resilience improvements. | All |
| | | ***Requires Significant Research, Investment, and/or Sequencing*** | |
| | | Improve capacity of medical facility operations to prepare for and recover from natural disasters and future conditions. | All |

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| **Planning, Management, and Policy** | **Data Collection, Management, and Monitoring** | ***Immediately Actionable - Coastal and Habitat Monitoring*** | |
| | | Expand coastal monitoring programs to track erosion hotspots and sediment transport patterns. | Coastal erosion |
| | | Continue collecting localized coastal erosion data for St. Lucie County beaches and use it to model future erosion rates. | Coastal erosion |
| | | Establish baseline monitoring for key habitats such as wetlands and mangroves. | All |
| | | Install Surface Elevation Tables to monitor accretion rates in wetland areas. | Sea level rise |
| | | Develop early warning indicators for habitat transitions, such as GIS mapping, tidal gauges and elevation benchmarks. | Coastal erosion, sea level rise, tidal flooding, storm surge, extreme heat, drought |
| | | Implement storm impact monitoring to assess compound flooding effects. | Flooding (storm surge, sea level rise, tidal flooding, inland flooding, combination flooding) |
| | | Link engineered beach designs to MSL or other relative datum instead of fixed elevations like NAVD. | Sea level rise, storm surge, tidal flooding |
| | | ***Immediately Actionable - Infrastructure and Facility Risk Assessment*** | |
| | | Complete site-level investigation of public and critical facilities using survey-quality elevation data and integrate into GIS. | All |
| | | Complete property-level risk analysis using NFIP data to identify under-insured areas for targeted flood preparedness outreach. | Flooding (storm surge, sea level rise, tidal flooding, inland flooding, combination flooding) |
| | | Review flood risk for canal properties and monitor conditions to reduce erosion and improve water quality. | Flooding (storm surge, sea level rise, tidal flooding, inland flooding, combination flooding), coastal erosion |

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| **Planning, Management, and Policy** | **Data Collection, Management, and Monitoring (cont'd)** | Create a dataset on hazardous materials use or storage impacts by future flood risk. | Flooding (storm surge, sea level rise, tidal flooding, inland flooding, combination flooding) |
| | | Create an updated general building stock and critical facilities dataset using current parcels, footprints, elevations, and RSMeans Data values. | All |
| | | Include updated occupancy class attributes in general building stock and critical facilities using assessor data. | All |
| | | Maintain and update general publicly-owned building stock inventory dataset with critical facility attributes including first floor elevation and foundation type. | Flooding (storm surge, sea level rise, tidal flooding, inland flooding, combination flooding) |
| | | Maintain and update general building stock inventory with attributes for wind protection. | Wind |
| | | ***Immediately Actionable - Flood and Stormwater Management*** | |
| | | Improve stormwater vulnerability analysis by incorporating more data on structures, drainage basins, storage capacity, and rainfall. | Flooding (storm surge, sea level rise, tidal flooding, inland flooding, combination flooding) |
| | | Inventory and develop survey-grade data for control elevations of stormwater conveyance structures. | Inland flooding, Sea level rise, storm surge |
| | | Acquire detailed drainage basin delineations to understand water pooling. | Inland flooding |
| | | Identify all public and private floodwater storage areas. | Flooding (storm surge, sea level rise, tidal flooding, inland flooding, combination flooding) |
| | | As updated FEMA floodplain data becomes available, update exposure analysis and generate detailed flood depth grids. | Flooding (storm surge, sea level rise, tidal flooding, inland flooding, combination flooding) |

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| **Planning, Management, and Policy** | **Data Collection, Management, and Monitoring (cont'd)** | ***Immediately Actionable - Planning, Modeling, and Decision Support*** | |
| | | Contribute vulnerability information to regional land and water resource protection efforts. | All |
| | | Develop construction-ready plans for priority adaptation projects and incorporate them into the Local Mitigation Strategy. | All |
| | | Conduct a loss analysis to better understand economic and social impacts from flooding. | Flooding (storm surge, sea level rise, tidal flooding, inland flooding, combination flooding) |
| | | Continue expanding and updating urban flooding in areas to inform mitigation. | Flooding (storm surge, sea level rise, tidal flooding, inland flooding, combination flooding) |
| | | Perform additional modeling scenarios for higher duration events, such as the 1,000-year MRP. | All |
| | | Through the consumptive use permitting process, determine percentage of water use by sector to identify key target customers for water reduction strategies. | Drought |
| | | Track extreme temperature data for injuries, deaths, shelter needs, agricultural losses, and other impacts. | Extreme heat |
| | | ***Requires Planning and Coordination*** | |
| | | Model and update impacts to habitats and species distribution from sea level rise. | Sea level rise, tidal flooding |
| **Community Education, Programs, and Readiness** | **Community Tools** | ***Immediately Actionable*** | |
| | | Develop a program through partnerships and volunteer efforts to track changes in water quality and salinity. | Sea level rise, tidal flooding |
| | | Maintain a database of low-interest capital resources and insurance mitigation programs to incentivize property owners to invest in storm resilience improvements and lower insurance premiums. | All |
| | | Develop a central web portal dedicated to climate-related public education and outreach especially for flooding and extreme heat. | All |

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| **Community Education, Programs, and Readiness** | **Community Tools (cont'd)** | Provide or require stormwater training for landscapers and site maintenance professionals, using resources like the Florida Friendly Landscaping Program. | Inland flooding |
| | | Utilize technology for citizen scientists to document flood events by submitting photos, which can support staff in multiple ways. | Flooding (storm surge, sea level rise, tidal flooding, inland flooding, combination flooding) |
| | | Provide public access to GIS maps showing real-time flooded areas to reduce traffic congestion and support recovery efforts. | Flooding (storm surge, sea level rise, tidal flooding, inland flooding, combination flooding) |
| | | Promote hazard adaptation plans across sectors. | All |
| | | Pursue and develop programs to help property owners adapt their properties to mitigate future flood risk. Explore funding options and incentives such as fortified construction standards or similar programs. | Flooding (storm surge, sea level rise, tidal flooding, inland flooding, combination flooding) |
| | | Incentivize the use of low-flow appliances and promote water catchment devices like rain barrels and cisterns for irrigation. | Inland flooding, drought |
| | | ***Requires Planning and Coordination*** | |
| | | Establish resilience hubs. | All |
| | | Promote rainwater harvesting for floodwater retention and reuse; review land development regulations (LDRs) and provide public education. | Inland flooding |
| | **Public Awareness** | ***Immediately Actionable*** | |
| | | Develop an online library of disaster preparedness and recovery resources that is broadly advertised and available to the public, emphasizing individual roles in community resilience. | All |
| | | Continue CRS and resiliency education by linking flood insurance education with Community Rating System activities. Maximize participation in CRS and consider developing a watershed management plan as a credit activity. | Flooding (storm surge, sea level rise, tidal flooding, inland flooding, combination flooding) |
| | | Improve community discussions about projected changes and impacts and increase awareness of natural and man-made hazards and future vulnerabilities. | All |

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| **Community Education, Programs, and Readiness** | **Public Awareness (cont'd)** | Encourage and incentivize residents to inspect their stormwater systems before major rain events through education and recognition programs. | Flooding (storm surge, sea level rise, tidal flooding, inland flooding, combination flooding) |
| | | Engage and educate private sector stakeholders, elected officials, and community members about strategies to increase resilience in the built, natural, and social environments. | All |
| | | Expand public education campaigns on water conservation and drought preparedness for both residential and commercial users. | Drought, wildfire |
| | | Conduct large-scale public education on neighborhood flood risks and flood damage reduction strategies. Consider an incentive program for these activities. | Flooding (storm surge, sea level rise, tidal flooding, inland flooding, combination flooding) |
| | | Provide education opportunities on the benefits of well-designed landscaping for floodwater management. | Inland flooding |
| | | Expand public education on wind hazard preparedness, including exterior preparation, safe sheltering practices, and insurance literacy. | Wind |
| | | Target prevention-based outreach and support to vulnerable populations in high-risk zones, including manufactured housing communities and low-income residents. | All |
| | **Emergency Preparedness** | ***Immediately Actionable*** | |
| | | Develop a countywide extreme heat early warning system and cooling center network, with targeted siting and outreach. Monitor the Heat Risk tool developed by NWS and CDC for heat impact forecasting up to a week in advance. | Extreme heat |
| | | Develop and update extreme heat action plans and cooling centers. | Extreme heat |
| | | Promote fire-adapted communities and defensible space. | Wildfire |

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| **Community Education, Programs, and Readiness** | **Emergency Preparedness (cont'd)** | Ensure debris management policies reduce impacts to stormwater functions. Review landscaping debris and maintenance requirements to enhance standards on public and private property. Improve pre- and post-disaster debris management activities to increase clearing and reduce obstruction after storm events, including permit streamlining and debris mulching opportunities for residents and government facilities. | Wind, inland flooding, storm surge |
| | | ***Requires Planning and Coordination*** | |
| | | Strengthen evacuation routes and shelter capacity. | All |
| | **Community-Based Planning and Development** | ***Immediately Actionable*** | |
| | | Increase communications with the business community on resiliency issues. Enhance engagement on vulnerability and adaptation strategies to reduce risk and avoid business disruption. Organize a stakeholder group to help business leaders explore vulnerabilities related to communication, worker safety, public/private partnerships, and other preparedness issues. | All |
| | | Exchange vulnerability information with asset owners throughout the county and municipalities, including hospitals and the School District. Coordinate planning for adaptation projects at non-government-owned critical facilities. | All |
| | | Coordinate vulnerability information with the Department of Health, using generalized inundation and population vulnerability maps to assess health-related hazard risks such as vector-borne diseases. | All |
| | **Community-Based Planning and Development (cont'd)** | Identify specific populations or neighborhoods with increased vulnerability to threats and develop adaptation strategies to reduce risk. Identify suitable resources for vulnerable communities and businesses to improve preparedness for changing conditions. | All |
| | | ***Requires Planning and Coordination*** | |
| | | Develop hazard-resilient affordable housing. | All |
| | | ***Requires Significant Research, Investment, and/or Sequencing*** | |
| | | Scale up use of conservation easements by prioritizing landowner outreach in medium-priority SLAMM vulnerability areas and partnering with agricultural interests in southwestern St. Lucie County to preserve recharge zones. | All |

# APPENDIX B: UNIFORM RESILIENCE POLICY RECOMMENDATIONS

***Suggested Goals, Objectives and Policies***
***To Implement the St. Lucie County & Municipal Regional Resilience Plan***

**Uniform Policies Related to Regional Resilience Vulnerability Assessment**[1]

**Introduction**:

This document was created to suggest policies that can be incorporated into the Comprehensive Plans of local governments in St. Lucie County (and its municipalities) that implement Strategies from the Regional Resilience Vulnerability Assessment. When reviewing such policies, the following should be noted:

- The policies relate to strategies from the Regional Resilience Vulnerability Assessment to be presented to the elected leadership for acceptance, as such, neither the strategies nor policies are required to be adopted into any Comprehensive Plan;
- Adoption into a Comprehensive Plan is guided by the traditional comprehensive plan amendment process;
- The policies are not mandatory;
- The policies can be modified depending on the local government jurisdiction (for instance, Port St. Lucie is less impacted by tidal flooding, but more impacted by rainfall-driven flooding);
- Terminology can be reviewed and modified to fit local government goals (such as the aforementioned varying types of flood risk) or references to sea level rise[2] (which can also be treated as tidal flooding);
- Commitments on timeframes can be added for clarity; and,
- "Shalls" can be modified "may"

These Uniform Policies are only suggestions to coordinate the Strategies of the Regional Resilience Vulnerability Assessment across the jurisdictions. Separately, an analysis is being completed which analyzes each jurisdiction's Comprehensive Plan for opportunities to incorporate other resilience concepts for long-term planning. Each Comprehensive Plan analysis includes the existing jurisdiction's adopted Comprehensive Plan. If the local government is in the process of updating or has recently updated it Comprehensive Plan, the project team requested direction from the local community on what to review to complete the Comprehensive Plan analysis.

Additionally, certain policies contained within this document are being successfully implemented with the work conducted in the Regional Resiliency Vulnerability Assessment. Those policies where work product has been generated by these efforts, and the policy presumably already met, are marked with a notation of **(RRVA)** in green at the end of the policies. This identification is to underscore that these policies likely require no effort on the part of a local government to accomplish, because they have been met through the development of the Regional Resilience Vulnerability Assessment.

[1] These suggested policies could be incorporated into individual Comprehensive Plan Elements, a new "Resilience Element" or as needed by any local government and are based on the Strategies proposed in the St. Lucie Regional Resilience Plan.

[2] Sea level rise has been the terminology chosen for the suggested policies because that is the terminology currently used in Section 380.093, F.S. which outlines the requirements to conduct vulnerability assessments using state funds (a source of funding for the Regional Resilience Vulnerability Assessment).

***GOAL:*** ***The City/County shall address infrastructure and assets, neighborhoods and natural resources that experience coastal flooding due to extreme high tides and storm surge, and that are vulnerable to the related impacts of rising sea levels for the purpose of prioritizing funding for infrastructure needs and adaptation planning. The City/County shall develop policies to improve resilience to coastal flooding in these areas resulting from high-tide events, storm surge, flash floods, stormwater runoff, and related impacts of sea-level rise.***

**Objective 1.0 - The City/County shall strengthen community and infrastructure resilience by implementing targeted strategies that reduce flood and climate related risks, prioritize funding, create adaptation planning initiatives and promote sharing of data and information.**

Policy 1.1: The City/County shall incorporate the best available data, including results of vulnerability assessments and monitored/observed impacts, repetitive loss data and latest scientific predictions, into policy development and planning. **(RRVA)**

Policy 1.2: The City/County shall continue to coordinate with agencies, municipalities and other public and private entities to share the best available data and develop approaches to resilience to enhance the quality of life and ensure the safety of residents and visitors. **(RRVA)**

Policy 1.3: The City/County shall review projected flooding data related to transportation, other infrastructure, emergency management, natural resources and listed species, stormwater, utility and critical facilities, social vulnerability, existing and future growth, levels of service and other policy provisions for the development of projects, priorities, policies and maps. **(RRVA)**

Policy 1.4: The City/County shall conduct a vulnerability assessment within two (2) years that includes various flood hazards including rainfall, tidal, storm surge and the future impacts of sea level rise. Results from existing or future vulnerability assessments will assist in defining flood mitigation priorities. **(RRVA)**

Policy 1.5: The City/County shall continue leadership as a region through collaborative partnerships (for example, the League of Cities, Association of Counties, Chambers of Commerce, etc.) and a focus on strategic funding for the region to improve resilience throughout St. Lucie County.

Policy 1.6: The City/County shall coordinate with other governmental entities to develop and maintain an annual communications strategy that can leverage expertise across the internal departments and jurisdictions to ensure consistent, accessible messaging on resiliency data, flood risks, adaptation projects, and funding opportunities for all types of residential and business stakeholders.

Policy 1.7: The City/County shall collaborate with other governmental partners to host periodic regional resilience forums and public workshops. These meetings shall provide residents, businesses, and community organizations with information on current and projected resilience challenges, such as flooding, sea-level rise, and infrastructure adaptation—and gather stakeholder input to inform County and municipal policy updates.

Policy 1.8: The City/County shall update regional leadership on the status of regional and locally-specific resilience initiatives prior to initiation of annual budget cycle.

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**Objective 2.0 - The City/County shall address the vulnerabilities of public infrastructure and assets due to coastal flooding, storm surge, rainfall and/or sea level rise within the Community by mapping and prioritizing locations that are at risk in the near-term factoring in the criticality of assets and those dependent upon them.**

Policy 2.1: The City/County shall identify areas, to encompass infrastructure and assets including buildings, structures and other facilities that are at risk of flooding due to (1) storm surge (2) king tide (3) rainfall-induced flooding thresholds or (4) combined flooding events. The City/County shall develop maps indicating the locations of such areas. **(RRVA)**

*Data Collection and Further Analysis*

Policy 2.2: Within the next two years, the City/County shall inventory public infrastructure and assets including, locations of assets. Particular emphasis shall be placed on roads, stormwater, septic systems, utilities and areas where hazardous materials are stored or managed, but all public infrastructure and assets shall be included. This effort shall be coordinated between public works, facilities and resiliency staff for the development of a centralized database to incorporate into capital improvement decision making. **(RRVA)** The City/County should enhance these datasets with information on asset elevations and conditions to determine at risk facilities and timeframe for impacts.

Policy 2.3: The City/County shall review vulnerability assessment results and mapping outputs to ensure that all public utilities and facilities such as sewer, gas, electric, communications, and water systems that are existing or proposed, are analyzed to minimize or eliminate flood damage depending on the criticality of the assets to government functions. The City/County shall coordinate with the utility providers and share information so adequate drainage paths to guide floodwaters around and away from proposed structures to reduce exposure to flood hazards can be best accomplished. Where replacement or relocation is not practicable, the City/County may determine that maintenance of existing infrastructure is the most feasible response to flood risk.

Policy 2.4: The City/County shall consider vulnerable historical, cultural or archaeological resources within the range of infrastructure and assets that must be included within its adaptation planning initiatives. Those areas shall be mapped and collaboration shall occur with cultural, archaeological or historical experts to ensure those impacted areas can be protected, preserved and/or relocated for the use and enjoyment of future generations. **(RRVA)**

Policy 2.5: The City/County shall create a strategic Stormwater Study or update its Stormwater Master Plan in concert with its Community Rating System (CRS) activities. If no update is necessary, such efforts shall include consideration of measures that include nature-based solutions to manage stormwater. Such studies should evaluate co-benefits such as water quality improvements, flood storage enhancements, and opportunities to integrate stormwater retrofits into capital improvement projects (CIPs). Include design life expectations and assumptions for future rainfall conditions and compound flooding considerations as appropriate. Upon completion of such a study, revisit adopted stormwater levels of service to determine if more specificity is necessary to manage expectations for the functionality of the system considering future water resource conditions.

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Policy 2.6: The City/County shall collaborate with regional partners to secure funding or partnerships to develop a groundwater model that can be used to better evaluate groundwater inundation and saltwater intrusion in St. Lucie County.

Policy 2.7: For future modeling and analysis, the City/County shall coordinate with state and federal partners, such as the South Florida Water Management District (SFWMD) and United States Geological Survey (USGS), to analyze rainfall curves and integrated water resource information to provide more comprehensive data about the relationships between tidal inundation and precipitation patterns that will further exacerbate the impacts of flood risk on public infrastructure and assets. **(RRVA)**

Policy 2.8: The City/County shall evaluate the need for site-specific adaptation planning measures based on vulnerability assessments and maps identifying at-risk assets. Where assets or facilities are identified as highly vulnerable, the City/County shall determine whether retrofit or relocation strategies are appropriate.

Policy 2.9: Develop, continue and enhance collaborative efforts and regional partners to develop other useful data sources for emergency management and vulnerability planning including real time flood monitoring and early warning systems, drought warning, wildfire detection, debris management, recovery and response, pre-storm preparedness, shelter readiness and capacity, evacuation and transportation planning, recovery resource staging and other strategic local mitigation planning initiatives.

*Integrating Sea Level Rise and Flood Risk into Capital Planning Decisions*

Policy 2.10: The City/County shall incorporate sea level rise projections and flood risk data into the design and evaluation of capital planning projects for assets and facilities. The City/County shall evaluate and where appropriate, amend its Land Development Code, floodplain management provisions or Public Works design standards to incorporate such design standards which could include, but not be limited to: green infrastructure, low impact development (LID), stormwater design events and onsite retention requirements, road elevation, shorelines, pervious pavement, drought tolerant landscaping, and locations and elevations of supporting equipment such as electrical, pumps, treatment areas. The City/County shall develop supporting design manuals that convey examples of design types to communicate the goals of making infrastructure projects more resilient while achieving other co-benefits such as improving water quality treatment.

Policy 2.11: The City/County shall evaluate capital projects during its budget process to ensure that each project is designed to incorporate consideration of future flood and sea level rise risk for the useful life of the project and provide continuity of service to the extent practicable. Prior to incorporating a new project into the Capital Improvements Element, the City/County shall review it for recommendations to increase resiliency and account for the impacts from flooding. The City/County shall focus on the criticality of the project for service needs, level of service standards and practicality of managing flood risk for the project as points of analysis to ensure that infrastructure useful life and service expectations can be met considering impacts. The City/County may also conclude that adapting projects to address future risk is not practicable.

Policy 2.12: The City/County shall incorporate design considerations for renewable energy and backup power generation (as cost and service effective) to serve infrastructure making it resilient to outages.

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*Include Resiliency Elements into Public Facilities and Capital Improvements Planning*

Policy 2.13: The City/County shall evaluate the need for and implement design standards to harden and mitigate critical public infrastructure to the impacts of flooding through elevation, impact resistant openings, roof reinforcement and other wind and flood improvements to reduce service disruption and increase recovery of facilities' operations.

Policy 2.14: The City/County shall evaluate the costs and benefits of incorporating energy efficient roofing materials and cooling systems, passive design features for lighting and renewable energy sources to reduce heat stress and maintain continuity of facilities operations for government buildings.

Policy 2.15: The City/County shall maintain and periodically update a prioritized list of critical assets that are in vulnerable locations, have experienced repeated impacts or failures during hazard events or have exceeded their design life for replacement or retrofitting projects so that they can be updated and maintain continuity of operations.

Policy 2.16: The City/County shall evaluate existing public facilities to determine if relocation, retrofit, or hardening is warranted based on the 2025 SLC Resilience Vulnerability Assessments due to their location or exposure to flood risk, current or previous service failures, and the potential short, medium or long-range timeframe associated with potential relocation of the facility.

Policy 2.17: The City/County shall develop or enhance an asset management system to incorporate resiliency triggers combining age, condition, vulnerability, risk and service expectations for critical facilities. The City/County shall maintain elevation data related to facilities in conjunction with CRS-related activities that is incorporated to asset evaluation procedures.

Policy 2.18: The City/County shall identify and periodically update priorities for critical facilities' adaptation, relocation, maintenance and/or decommissioning based on service life expectations, dependencies, risk and cost benefit factors.

*Collaboration and Outreach on Adaptation Response*

Policy 2.19: The City/County shall collaborate with service providers, the Florida Department of Transportation, Florida Department of Health, School District, privately-owned medical facilities, Florida Power & Light, Florida Public Utilities and other energy providers, and other regional partners to exchange data, plans and solutions to address future vulnerability and flood risks. The City/County shall also share vulnerability data across departments and governmental entities such as schools and critical care providers.

Policy 2.20: The City/County shall coordinate the development of resilience and adaptation projects with its pre-disaster mitigation plans, the Local Mitigation Strategy and other emergency management and disaster recovery strategies and planning efforts.

Policy 2.21: The City/County shall develop and implement a public awareness program using signage and related outreach tools to inform residents and visitors of anticipated periodic tidal or other inundation impacts on infrastructure including roads, drainage systems and impacts on buildings and facilities such as parks and open spaces so that the community is aware of the impacts to transportation or access to services. Seasonal high-tide flooding events shall be used as opportunities to illustrate potential future sea level rise impacts on transportation access, community services, and infrastructure.

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Policy 2.22: The City/County shall use Capital project construction activities as an opportunity to educate the community about adaptation measures and investments that strengthen resilience to flooding, storm events, and other shocks and stressors. The City/County shall coordinate with its Public Information Office to communicate through signage, public information releases and on web applications and social media.

*Funding Adaptation Response*

Policy 2.23: The City/County shall evaluate funding structures and alternatives that include leveraging granting programs, assessments and/or user fees to increase project resilience to flooding impacts.

Policy 2.24: The City/County shall ensure adaptation project[3] design and analysis aligns with Section 161.551, F.S. (Public financing of construction projects within the coastal building zone), Rule 62S-7, F.A.C. (Sea Level Impact Projection (SLIP) Studies for State-Financed Coastal Construction), and Section 380.093, F.S. (Statewide Flooding and Sea Level Rise Resilience), so that adaptation projects are competitive for funding opportunities. This shall include review of technical criteria in these provisions so that if public funding is received for such projects, sea level rise and future flood risk are integrated into project development.

**Objective 3.0 - The City/County shall address the vulnerabilities of neighborhoods or portions of neighborhoods due to coastal flooding, rainfall, storm surge and/or sea level rise within the Community.**

Policy 3.1: The City/County shall identify neighborhoods or portions of neighborhoods that are at risk of flooding in 2040. The City/County shall develop maps indicating the locations of such areas. **(RRVA)**

*Adapting How we Build*

Policy 3.2: Considering that portions of highly vulnerable residential properties in the region may be outside of the extent of the regulatory floodplain, the City/County shall review its current floodplain management ordinance, and as needed amend its Floodplain Management Ordinance and related Land Development Code regulations to incorporate data from the vulnerability assessment. This analysis shall be used to identify neighborhoods and structures at increased flood risk and to increase opportunities for protection through enhanced drainage, freeboard, elevation standards, voluntary retrofit programs, and community outreach.

Policy 3.3: The City/County shall evaluate the need for additional freeboard requirements due to their location and proximity to the coast or low-lying areas.

Policy 3.4: The City/County shall review and where necessary revise its fill and grading policies within residential neighborhoods, to ensure that appropriate fill materials and elevations are used that protect properties, but do not compromise other adjacent properties, water quality and are coordinated with shoreline policies.

Policy 3.5: The City/County shall consider providing an incentive for private property construction or retrofits to achieve FORTIFIED Home and FORTIFIED Commercial (a program by the Insurance Institute for

[3] Note: this is not every project, just those slated as "adaptation projects" for which the local government may seek funding from the state. If state funds are sought under the Resilient Florida program, SLIP studies incorporating a factor sea level rise would have to be conducted anyway. Essentially this is about making adaptation projects more grant competitive.

Business & Home Safety or IBHS), Waterfront Edge Design Guidelines (WEDG) or other above-code resiliency standards for renovations and new construction to make homes and businesses more resilient. This should include work with other City/County partners, IBHS and organizations such as Smart Home America to build contractor capacity for evaluation of properties to achieve these standards.

Policy 3.6: The City/County shall review development standards for affordable housing projects to determine any need for revisions to increase the resiliency of these projects (whether or not they receive public funds) through incentives and other strategies.

Policy 3.7: The City/County shall identify incentives to divert future development and redevelopment away from vulnerable areas, such as transfer of development rights, clustering, density bonuses or other programs to help ensure the long-term economic resiliency of the area.

Policy 3.8: The City/County shall review data from its vulnerability assessment to identify locations where it is necessary to emphasize protecting and enhancing the built and natural environments of neighborhoods from storm surge, rainfall, erosion and sea level rise impacts, prioritizing natural green infrastructure approaches to the extent practicable. The City/County will consider developing localized flood mitigation plans at the neighborhood scale that will allow for the design of more detailed adaptation strategies such as infrastructure retrofits, enhanced storage areas, shoreline adaptation strategies and habitat restoration.

Policy 3.9: The City/County shall develop a geographically based analysis of existing housing-stock vulnerability using data on repetitive-loss areas, building age and condition, compliance with current building codes, and location within Special Flood Hazard Areas. Findings shall inform housing and mitigation programs to prioritize resilience retrofits and funding.

Policy 3.10: The City/County shall pursue programs that assist property owners in retrofitting existing housing to meet resilient design and accessibility standards. Such efforts may include partnerships to secure grant funding, establish low-interest loan programs, or offer incentives to improve structural hardening and accessibility in flood prone areas.

*Private Property Adaptation*

Policy 3.11: The City/County shall identify resources regarding a suite of financing opportunities and tools to assist individuals with personal home or business adaptation. This should include funding resources to provide assistance to property owners for weatherization, mitigation, flood-proofing, elevation and other flood-resistant improvement projects. Targeted communications about such funding sources shall be prioritized at the neighborhood scale.

Policy 3.12: The City/County shall collaborate with regional partners to identify gaps between private property adaptation and insurance mitigation credits to better link resiliency improvements, retrofits and construction with actual savings on flood and wind insurance.

Policy 3.13: The City/County shall maximize participation in FEMA's Community Rating System (CRS) program to the extent practicable to pursue greater discounts for flood insurance policy holders.

Policy 3.14: The City/County shall continue participating in federal and state grant programs and leverage disaster recovery and resiliency funding to reduce future flood losses by acquiring repetitive loss properties, elevating (lifting) structures, acquiring residential properties and returning the land to its

natural state, or demolishing residential properties and rebuilding National Flood Insurance Program (NFIP)-compliant insured structures.

Policy 3.15: The City/County shall evaluate and where feasible, implement periodic or seasonal discounts[4] on permits for resilience upgrades such as impact windows, reinforced roofs, solar panels, energy efficiency improvements and other projects that help families prepare for storm season, flood mitigation and cost savings for utilities.

*Outreach and Education to Home and Business Owners*

Policy 3.16: The City/County shall promote the collection and sharing of data through citizen science initiatives/programs and create a publicly accessible, GIS-based platform where residents and business owners can upload photographs and flood related observations to support documentation of local conditions.

Policy 3.17: The City/County shall collaborate with neighboring jurisdictions on development of a Resilience Hub to facilitate communication, distribute resources, and provide services to residents before, during, and after hazard disruptions.

Policy 3.18: Target business-oriented stakeholders for outreach and data compilation on business disruption, resilience and recovery opportunities and benefits.

**Objective 4.0 - The City/County shall assess the vulnerabilities of natural areas, open spaces and parks due to coastal flooding, storm surge, rainfall and sea level rise by identifying locations at risk within the short, medium and long-term planning horizons.**

Policy 4.1: The City/County shall identify natural areas, open spaces and parks that are at risk of flooding in the short, medium and long-term due to (1) storm surge (2) rainfall and/or (2) king tide flooding. The City/County shall develop maps indicating the locations of such areas. **(RRVA)**

*Adapting Shorelines*[5]

Policy 4.2: The City/County shall develop a baseline inventory of shoreline conditions, relationships between existing shoreline type (hardened, natural, living shoreline), their proximity to private or public development and, if new shoreline response is needed, to protect public or private assets. This may include surveying conditions, determination of seawall heights and outfalls from which to make decisions on future projects or policies. Such data should support the development of a shoreline adaptation strategy. This information should also be used to support projects that create living shorelines and protect or enhance healthy mangrove resources and wetlands.

Policy 4.3: The City/County shall identify and map publicly owned shoreline areas that are vulnerable and would benefit from coastal measures such as living shorelines, hybrid shorelines or seawalls. Projects should focus on living shoreline reinforcement for vulnerable locations whenever possible and incorporate groins, oyster reefs and other strategies to reduce erosion.

[4] Limited duration to not impact overall annual permitting budget and enforcement efforts. Akin to "sales tax holiday".
[5] For those municipalities with shorelines. Can be adapted for coastal v. river shorelines/erosion.

Policy 4.4: The City/County shall coordinate with regional partners on beach, dune and shoreline protection, restoration plans and funding strategies. This may include appropriate beach renourishment and sand bypass as well as dune fortification and restoration with native beach dune vegetation. Within three (3) years, the City/County shall review and revise its dune protection requirements if necessary, and continue to facilitate dune restoration events within the community.

Policy 4.5: The City/County shall evaluate and update its shoreline policies to acknowledge the existence of hardened shorelines that require continued fortification while promoting the creation and expansion of living shorelines and other nature-based resiliency strategies where possible. Relationships between existing shoreline type and protection benefits to other infrastructure should be analyzed as part of this process. Land Development Code updates may occur, as necessary, to modify design standards considering future sea level rise, alternative strategies that enhance water quality, the effectiveness of disclosures to property owners upon resale and the relationship between shoreline and fill policy for properties that need additional elevation protected by an existing seawall.

*Land Protection and Management*

Policy 4.6: The City/County shall evaluate and where appropriate, revise its land protection, acquisition and land management strategies or priorities to support nature-based contributions to benefit the City/County's adaptation response such as mitigation of shoreline erosion, reduction of heat islands and consideration of the need for certain areas, species of plants or animals to migrate as sea level rise and/or tidal flooding impacts increase over time.

Policy 4.7: The City/County shall identify and evaluate underutilized or vacant properties within neighborhoods that may be acquired or repurposed to enhance water quantity and quality treatment, dual purpose floodable parks and open spaces that provide recreational opportunities as well as resiliency benefits simultaneously.

Policy 4.8: The City/County shall identify and pursue opportunities for joint funding of adaptation projects, including wetland, shoreline, and habitat restoration. The City/County shall share information on these resources with other stakeholders and partner strategically and proactively on projects.

Policy 4.9: In coastal high hazard areas, alteration of sand dunes or mangrove stands shall be permitted only when supported by engineering and environmental analysis demonstrating that such alteration will not increase the potential for flood damage, storm surge impacts, or erosion.

Policy 4.10: The City/County shall develop and distribute educational materials to contractors and property owners regarding the value of sustainable landscaping practices, pervious surfaces, natural lands management, the establishment of urban tree canopy (with appropriate species), using Florida Friendly landscaping materials and the use of landscaping that retains more stormwater onsite to achieve improved water quality.

Policy 4.11: In lesser developed, rural landscapes encourage and implement Wildland-Urban Interface mitigation strategies to reduce fire threats.

*Improving Water Quality*

Policy 4.12: The City/County shall study, plan, and implement measures to reduce nutrient loads to receiving waterbodies through capital improvement projects, enhanced best management practices, land

development regulation updates, and other strategies. This shall include linking activities to any required regulatory reporting whenever possible.

Policy 4.13: The City/County shall review and where appropriate modify landscape and shoreline canal vegetative requirements (where authority exists) to increase appropriate plantings and manage tidal impacts, drainage flows, water quality and erosion. This should include engagement with the SFWMD regarding the impacts of current and future flood events on the secondary and primary canal systems in the City/County. This shall also include consideration of the potential for algal blooms and how these impacts would affect structural operations.

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# APPENDIX C: ADAPTIVE CAPACITY ASSESSMENT

# St. Lucie County Adaptive Capacity Report

## Introduction

St. Lucie County defines adaptive capacity as "the ability of a community, infrastructure system, or organization to respond to evolving hazards or future risk conditions through its preparedness, operations, resources, policies, or physical assets to reduce long-term risk of loss of life, injury, property damage, and hardship, consistent with the objective of increasing resilience to natural disasters" (adapted from IPCC 2014). St. Lucie County and each of its jurisdictions have a unique combination of capabilities to adjust to, protect from, and withstand a future hazard event, future conditions, and changing risk. The adaptive capacity for each jurisdiction's capability to address hazards and related actions was evaluated using the following classifications:

- Strong: Capacity exists and is in use.
- Moderate: Capacity exists but is not used effectively or could use some improvement.
- Low: Capacity does not exist or could use substantial improvement.

Thirteen documents provided the basis of review for this report. These were evaluated with a scoring system scale of 1 to 3 correlating to the Strong (2.1 to 3), Moderate (1.1 to 2), and Low (0 to 1) categories to reflect the strength of the document in supporting the county or municipality adaptive capacity. The scoring criteria are detailed later in this report. Seven relevant subdocuments were also taken into consideration, reviewed, and included in the score of the respective main document. See the document overviews included in the Recommendations for Plan Integration section for listed subdocuments included in this review. As a result, the County as a whole including the municipalities scored **strong adaptive capacity** related to Inland Flooding, and Storm Surge Flooding and **moderate adaptive capacity** related, coastal erosion, drought, extreme heat, wildfire, and wind hazard events. Notably, these overall results are the average of individual document scores, and therefore the documents that received strong and moderate scores are detailed in this report. The documents reviewed for this analysis include planning documents and ordinances for the County, Port St. Lucie, Fort Pierce, and St. Lucie Village. The resulting scoring provides an indicator for each document and hazard.

## Theory Review

The adaptive capacity (or capability) review includes an evaluation of the plans and policies and response and recovery, available to the County and municipalities to adjust or withstand a future hazard event. The probability of occurrence, potential impacts, adaptive capacity, and extreme weather patterns, factor into the hazard ranking and estimated hazard impacts for a community.

To build upon the previous definition, the ASTM E3429-24 Standard Guide for Property Resilience Assessments, defines adaptive capacity as the ability of a system to adjust to natural hazards (including environmental variability and weather extremes) to moderate potential damages, to take advantage of opportunities, or to cope with circumstances (ASTM International, 2024). One of the prioritization criteria indicated in the guide is the organizational capacity to implement resilience measures, or in other words, the adaptive capacity of an organization.

## Hazard Summary

This analysis is based on the review of identified hazards in the 2025 St. Lucie County Regional Resilience Vulnerability Assessments (RVAs) and Draft Plan (RRP), and the 2021 St. Lucie County Unified Local Mitigation Strategy.

The **2025 St. Lucie County Resilience Vulnerability Assessments** and Draft Plan address short and long-term resilience planning by taking a local, data-driven approach to evaluate the vulnerability of county-wide assets to the risk posed by natural hazards. The County and municipalities included the following natural hazards in the vulnerability assessments: coastal erosion, drought, extreme heat, flooding, storm surge, wildfire, and wind (St. Lucie County, 2025). These hazards were selected due to the potential risk the County and municipalities face with these specific hazards. The vulnerability assessment evaluated each hazard's frequency, severity, and extent along with anticipated environmental changes. The vulnerability assessment characterized vulnerability as a function of exposure as the presence of assets, ecosystems and populations in areas where they could be adversely affected by hazards; and a function of sensitivity, as the degree to which a system, resource or population is or might be affected by hazards.

The **2021 St. Lucie County Unified Local Mitigation Strategy** document is a pre-disaster planning process that is intended to reduce disruptions caused by natural, and human caused and technological disasters in the planning area. The LMS evaluated a range of natural and human caused hazards that can threaten life and property, while the Vulnerability Assessments focused strictly on natural hazards.

Figure 1 – Local Mitigation Strategy (LMS) Matrix -Intersection of Hazards and Potential Impacts

| | POTENTIAL IMPACT POINTS | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **WIND** Excessive wind | **WATER** Excessive water | **HAIL** Damaging hail | **EROSION** Soil/beach erosion | **ENERGY** Electric power outage | **TRANSPORTATION** Surface and air transportation disruption | **WATERWAY TRANSPORTATION** Navigable waterway impairment | **POTABLE WATER** Potable water system loss or disruption, saltwater intrusion | **WASTEWATER** Sewer system outage | **COMMUNICATIONS** Telecommunications system outage | **HUMAN HEALTH** Disease/Physical & Mental health | **HUMAN SAFETY** Design/Planning, risk reduction | **ECONOMY & AGRICULTURE** Economic disruption; Agricultural/fisheries damages; | **SERVICES & SOCIAL NETWORKS** Disruption of community services & social networks | **BUILDINGS & INFRASTRUCTURE** Damage or loss of buildings or infrastructure | **ENVIRONMENT** Damage to critical environmental resources | **HISTORICAL RESOURCES** Damage | **FIRE** Fire and Wildfire | **TOXINS /HAZARDOUS** Toxic / Hazardous material releases | **STORMWATER** Stormwater drainage impairment |
| **NATURAL HAZARDS** | | | | | | | | | | | | | | | | | | | | |
| Flooding* | | X | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| Hurricanes/Tropical Storms* | X | X | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| Tornadoes* | X | | | | X | X | | | | X | X | X | X | | | | | | | |
| Severe Thunderstorms & Lightning* | X | X | X | | X | X | | | | X | X | X | X | | | | | X | | X |
| Wildfire* | | | | | X | X | | | | X | X | X | X | X | X | X | | X | X | |
| Erosion* | | X | | X | | | X | | | | | | X | | | X | | | | X |
| Extreme Temperatures* | | | | | X | | | | | | X | X | | | X | X | | | | |
| Drought | | | | | | | | | | | | | X | | X | X | | X | | |
| Seismic Hazards eg: earthquakes, sinkholes | | | | | | X | | | | | | | | | | | | | X | |
| Tsunami | | X | | X | | X | X | | | | X | | X | | | X | | | | X |
| Sea Level Rise | | | X | X | | X | X | X | X | | X | X | X | X | X | X | X | X | X | X |
| Dam/Levee Failure | | X | | | | X | X | | | | X | | X | | X | | | | | X |
| Agricultural Pests & Diseases | X | | | | | | | | | | X | X | X | | X | X | | | | |
| **TECHNOLOGICAL HAZARDS** | | | | | | | | | | | | | | | | | | | | |
| Power Systems Failures | | | | | X | X | | X | X | X | X | X | X | X | | | | | | |
| Wellfield Contaminations | | | | | | | | X | X | | X | X | X | X | | | | | | |
| Epidemics/Pandemics | | | | | | | | | | | X | X | X | X | | | | | | |
| Radiological Accidents | | | | | X | X | | | | X | X | X | X | X | | | | | X | |
| Hazardous Materials Accidents | | | | | | X | | | | | X | X | X | X | | | | X | X | |
| Transportation Systems Accidents | | | | | | X | X | | | | X | | X | X | X | | | X | | |
| Communication Systems Failures | | | | | | | | | | X | X | | X | X | | | | | | |
| **HUMAN CAUSED HAZARDS** | | | | | | | | | | | | | | | | | | | | |
| Terrorism and Sabotage | | | | | X | X | | X | | X | X | X | X | | | X | X | X | X | |
| Civil Disturbances | | | | | | X | | | | | X | X | X | X | | | X | | | |
| Mass Migration | | | | | | | | | | | X | X | X | X | | | | | | |

## Criteria & Ranking System

For the purposes of this capability assessment, the following criteria were evaluated to provide an overall adaptive capacity ranking per natural hazard identified in the Resilience Vulnerability Assessments:

- Policies
- Mitigation Strategies
- Response Capability & Resources
- Recovery

County and local documents[1] were reviewed to indicate how the documents address these criteria per identified hazard type. This approach provides a method to evaluate how local plans support adaptive capacity to natural hazards across jurisdictions. The content of plans relative to the identified criteria helps to highlight strengths and gaps in planning coverage at the county and municipal levels. This method allows for consistent comparison and supports strategic planning for resilience improvements.

It should be noted that the scores should be interpreted within the context of each document's intended scope and function. Not all planning documents are designed to meet every criterion evaluated. Adaptive capacity is supported by County and municipal plans and tools that work together across agencies and jurisdictions. Reviewing plans provides a useful diagnostic tool to evaluate coverage, identify priorities for updates or integration, and support a more coordinated approach to resilience. However, document review is not intended to serve as a ranking of plan quality in isolation, but rather as a step toward building a more comprehensive and cohesive planning framework for resilience.

### Policies

Policies provide legal and institutional frameworks that guide hazard preparedness, response, and recovery activities. Clear policies help ensure coordinated and consistent adaptation actions. Policies determine the allocation of financial resources and investments toward hazard mitigation, infrastructure resilience, emergency services, and community support, directly influencing adaptive capacity. Building codes, land development and environmental regulations, and zoning regulations set by policies can reduce vulnerability by preventing development in high-risk areas and promoting hazard-resistant construction.

Additionally, policies can mandate inter-agency cooperation, stakeholder engagement, and public-private partnerships, enhancing the pooling and efficient use of resources for adaptation efforts. Adaptive policies allow for flexibility in implementation and encourage innovation in adaptation strategies to respond to evolving hazard risks and uncertainties. Lastly, policies that consider the needs of vulnerable populations ensure inclusive adaptation measures, enhancing overall community resilience.

[1] Plans reviewed are noted in the Sources section of this report.

### Policy Ranking Criteria

Policies are considered strong, moderate, or low as follows:

- Strong and current adaptation methods are comprehensive, forward-looking, and designed to maximize resilience and adaptive capacity. They embody best practices and promote sustainable and effective hazard mitigation. This includes regular review and update of policies based on new and updated data, addressing interconnected hazards and compound risk, and mandated participation and coordination across sectors and municipalities.
- Moderate scoring for policies allows some partial flexibility to adapt to new information or conditions, policies address individual hazards but lack integrated, multi-hazard planning, or gaps exist in integration between different planning components.
- Low with outdated adaptation methods apply when policies are not available, policies are inflexible and do not allow for adjustments to new or updated data, or when policies lack clear enforcement or monitoring.

## Mitigation Strategies

Mitigation strategies significantly influence a community's or system's ability to adapt to natural hazards based on the strategies that are put in place. Effective mitigation strategies reduce exposure and vulnerability to hazards by addressing potential causes and impacts, thereby lessening the severity of future events. By strengthening infrastructure, enforcing building codes, preserving natural buffers such as wetlands, and improving land-use planning, mitigation practices increase resilience to withstand hazards. Additionally, investing in mitigation measures can lower the financial burden of disaster response and recovery which in turn frees up resources that can be directed toward other initiatives. Furthermore, integrating mitigation into development planning ensures that growth does not increase hazard risks which creates a balanced approach to economic and environmental health.

### Mitigation Strategies Ranking Criteria

The mitigation strategies are considered strong, moderate or low as follows:

- Strong (Implemented) - Strong mitigation refers to concrete actions, projects, or policies that have been put into practice to reduce hazard risks and enhance resilience. These strategies have moved beyond planning or proposal stages and are actively contributing to hazard risk reduction. Examples include structural measures, enforceable land use planning and zoning, ecosystem-based approaches such as wetlands, early warning systems, public education and outreach, infrastructure upgrades, and emergency preparedness infrastructure.
- Moderate (Identified but not implemented) – Moderate mitigation strategies are those that have been recognized, proposed, or planned but have not yet been put into practice. These strategies may be documented in hazard mitigation plans, assessments, or policy recommendations but remain pending due to various constraints.
- Low (Not identified) - Low mitigation actions are potential actions, approaches, or policies that have not yet been recognized, considered, or documented within existing hazard mitigation or adaptation plans. These actions represent gaps or missed opportunities in the planning process.

## Response Capability & Resources

A strong response capability enables rapid mobilization and deployment of personnel, equipment, and interventions immediately after a hazard, reducing damage and speeding recovery. Well-trained responders, coordinated emergency teams, and adequate equipment allow timely actions such as evacuation, medical care, and infrastructure repairs, directly improving community resilience. Effective communication systems ensure warnings, situational updates, and interagency coordination reach the public and responders quickly, while post-event evaluations and incorporation of lessons learned strengthen future responses.

Additionally, the quantity, readiness, and diversity of deployable resources such as mobile units, shelters, generators, supplies, and financial reserves determine how quickly and effectively a community can adapt to changing hazard conditions. Skilled personnel and technical capacity improve hazard assessment and execution of adaptation strategies, and multiple backup sources for critical systems reduce vulnerability and sustain essential services. Coordinated, integrated resource management across agencies enhances efficiency, reduces duplication, and supports sustained adaptation during prolonged or repeated events.

### Response Capability & Resources Ranking Criteria

The ability to respond and available resources was evaluated to be a strong, moderate, or limited response capability and resources availability.

- Strong response capability and resources - Strong response capability and resources refer to a community's robust and effective ability to take timely, coordinated, and appropriate actions before, during, and after hazard events while having resources and capabilities in place to quickly mobilize and reduce hazard impacts. Key characteristics of strong response capability and resources include well-trained personnel, effective communication systems, comprehensive emergency plans, interagency coordination, resource availability, immediate resource deployment, systems for continuous improvement, and effective use of technology.
- Moderate response capability and resources - Moderate response capability and resources represent a community that has foundational elements for effective but not immediate response but may face some limitations in speed, coordination, resources, or flexibility. Key characteristics of moderate response capability include basic training of personnel, functional communication systems, existence of emergency plans, some interagency coordination, adequate resource availability, moderate flexibility of response strategies, and partial use of technology.
- Limited response capability and resources - Limited response capability and resources describe a community with significant constraints that hinder effective and timely actions before, during, and after natural hazard events. Key characteristics of limited response capability include insufficiently trained personnel, poor communication systems, outdated or non-existent emergency plans, weak interagency coordination, scare and/or delayed resources, inflexibility, and minimal use of technology.

## Recovery

Recovery times or the duration it takes for a community to return to normal or improved functioning after a natural hazard are a critical factor influencing the ability to adapt. Shorter recovery times indicate a more resilient system capable of quickly restoring essential services, infrastructure, and social functions, which enhances overall adaptive capacity. Faster recovery limits the period during which communities are vulnerable to secondary hazards, economic losses, and social disruptions, strengthening long-term adaptation while reducing stress and displacement for communities. Alternatively, prolonged recovery can strain resources, depleting financial, human, and material assets needed for future adaptation efforts, whereas quicker recovery preserves these resources.

Additionally, efficient recovery processes allow for timely incorporation of lessons learned into policies and practices, improving future adaptive responses. Rapid recovery supports economic continuity and reduces long-term financial burdens on individuals, businesses, and governments, facilitating investment in adaptive measures.

### Recovery Ranking Criteria

The recovery time was considered Strong (short recovery time), Moderate (a moderate recovery time), or low (a long recovery time).

- Short recovery time - Short recovery time refers to the ability of a community to restore normal or improved functioning quickly after a natural hazard event. Characteristics of short recovery time include rapid restoration of essential services, quick reopening of critical infrastructure, efficient damage assessment and repair, effective mobilization, streamline administration processes, and minimal economic disruption. This timeframe is up to 2 months.
- Moderate recovery time - Moderate recovery time refers to a recovery period that is neither short nor long, typically spanning a few weeks or months. Characteristics of short recovery time include gradual restoration of essential services, phased reopening of critical infrastructure, systematic damage assessment and repair, mobilization with some delays, administration and regulatory processes have standard timelines, and some economic disruption. This timeframe is up to 4 months.
- Long recovery time - Long recovery time refers to an extended duration required for a community to return to normal or improved functioning after a natural hazard event. It often spans several months to years. Characteristics of long recovery time include prolonged disruption of essential services, delayed reopening of critical infrastructure, lengthy damage assessment and repair, slow mobilization of resources, cumbersome administration processes, and sustained economic impact. This timeframe is over to 4 months.

## Hazard Results Summary

Following the evaluation of the planning documents and ordinances an overall adaptive capacity score was calculated per document to evaluate its strength to support the County's and municipalities' adaptive capacity. A score was also developed to determine the adaptive capacity per natural hazard by averaging the score for each reviewed document. This process shows which natural hazards the County and/or cities have a low, moderate, or strong overall adaptive capacity to address and mitigate.

TABLE 1 – ADAPTIVE CAPACITY SCORE PER HAZARD

| Hazard | Adaptive Capacity – Strong/Moderate/Low |
|---|---|
| Coastal Erosion | Moderate |
| Drought | Moderate |
| Extreme Heat | Moderate |
| Inland Flooding | Strong |
| Storm Surge Flooding | Strong |
| Wildfire | Moderate |
| Wind | Moderate |

No hazard-specific capabilities were scored as "**low**" in the assessment.

Based on the assessment, the county-wide capacity to address the Coastal Erosion, Drought, Extreme Heat, Wildfire, and Wind hazards reviewed in this assessment is "**moderate**". The following capabilities were noted as justification:

- Moderate capability scores were generally given for hazards that discussed specific hazards but did not have detailed policies to address hazard impacts or lacked strong reference to resources as indicated through document review and agency feedback.
- The moderate capability scores show that capacity exists for each of these hazard types, but that improvements could be made to further strengthen county-wide adaptive capacity. The recommendations are detailed in the Recommendations for Plan Integration section of this report.

Based on the assessment, the capacity to address the Inland Flooding and Storm Surge Flooding hazards reviewed in this assessment is "**strong**". The following capabilities were noted as justification:

- Strong capability scores were generally given for hazards that have a strong foundation of policies or resources as indicated through document review and agency feedback. For example, documents that address all or most of the hazards included in the evaluation.

TABLE 2 – HAZARDS ADDRESSED PER POLICY OR DOCUMENT

| Policy/Document | Hazards | | | | | | |
|---|---|---|---|---|---|---|---|
| | Coastal Erosion | Drought | Extreme Heat | Inland Flooding | Storm Surge Flooding | Wildfire | Wind |
| **St. Lucie County Unified Local Mitigation Strategy** | X | X | X | X | X | X | X |
| **Draft St. Lucie Regional Resilience Plan** | X | X | X | X | X | X | X |
| **St. Lucie County Comprehensive Plan** | X | X | X | X | X | X | X |
| **St. Lucie County Code of Ordinances** | X | X | | X | X | | |
| **St. Lucie County Comprehensive Emergency Management Plan** | X | X | X | X | X | X | X |
| **Port St. Lucie Comprehensive Plan** | | | | X | X | | |
| **Port St. Lucie Code of Ordinances** | | | X | X | X | | |
| **Port St. Lucie Comprehensive Emergency Management Plan** | X | X | X | X | X | X | X |
| **Fort Pierce Comprehensive Plan** | X | X | X | X | X | X | X |
| **Fort Pierce Code of Ordinances** | X | X | | X | X | X | X |
| **St. Lucie Village Comprehensive Plan** | | | | X | | | |
| **St. Lucie Village Code of Ordinances** | | X | | X | X | | |
| **Port of Fort Pierce Consolidated Master Plan** | X | X | X | X | X | | X |

## Document Summaries

The following section details the scoring evaluation and results for each of the plan and ordinance documents based on considerations of all natural hazards and policies, mitigation strategies, response capability and resources, and post-event recovery. The adaptive capacity for each identified hazard and the jurisdiction's capability to address related actions was evaluated using the following classifications:

- Strong: Capacity exists and is in use.
- Moderate: Capacity exists but is not used effectively or could use some improvement.
- Low: Capacity does not exist or could use substantial improvement.

Thirteen documents provided the basis of review for this report. These were evaluated with a scoring system scale of 1 to 3 correlating to the Strong (2.1 to 3), Moderate (1.1 to 2), and Low (0 to 1) categories to reflect the strength of the document in supporting the county or municipality adaptive capacity.

Documents that are notable for supporting strong adaptive capacity for the County and municipalities, especially in areas of policy, response capability and resources, and mitigation strategy criteria include:

- **St. Lucie County Comprehensive Emergency Management Plan**
  - This document received a strong score as it has strong 'response and capability resources' information and moderately fulfilled criteria for the other review categories.
- **Port St. Lucie Comprehensive Emergency Management**
  - The plan received a strong score as it has strong information and planning across the policy, response and capability resources, and recovery categories.

The development of the St. Lucie County Regional Resilience Plan can be considered a step towards building additional regional capacity. This document, along with its supporting subdocuments can facilitate a stronger score building overall adaptive capacity for its policy recommendations and mitigation strategies, along with Moderate scores for the other categories.

### Capability Assessment Surveys

As part of the St. Lucie Regional Resilience Planning effort, capability assessment surveys were submitted to the County, municipalities and St. Lucie Transportation Planning Organization to better incorporate their lived experience and overall thoughts on adaptive capacity. The responses provide helpful insight into how each agency approaches natural hazard policy, resources, response, recovery, and mitigation. The responses generally align with and reinforce findings identified through the review of multiple existing plans.

The assessments demonstrate a regional commitment to addressing natural hazards, particularly flood and hurricane risks, through integrated planning, resource management, and interagency collaboration. For example, St. Lucie County has incorporated hazard mitigation into its budgeting (as budget allows) and land use processes. Coordination among departments ensures that resilience is embedded across programs and projects, though continued improvement in interdepartmental communication and long-term resource capacity was noted as a priority. The St. Lucie TPO supports resilience through transportation planning that integrates considerations for sea-level rise, stormwater management, and environmentally sensitive areas. While the TPO does not construct or fund mitigation projects directly, its long-range planning and vulnerability assessments help guide infrastructure away from hazard-prone locations, supporting broader community resilience goals. There is an opportunity to include future weather-related risk and vulnerability projections into the planning. The City of Port St. Lucie Emergency Management Department demonstrates strong preparedness and response capabilities for all hazards identified in this review. The department conducts regular multi-hazard exercises, maintains policies for resource deployment, and applies lessons learned from after-action reviews to strengthen future operations. It also leads a robust public outreach program.

Collectively, these responses highlight a foundation for resilience across St. Lucie County and its partner agencies, with opportunities to expand hazard considerations, enhance coordination, and sustain adaptive capacity to meet evolving future conditions.

## Document Overview

Table 3 provides a summary overview of each of the documents reviewed as part of the adaptive capacity assessment. Each cell summarizes the level of detail and focus applied to key risks.

TABLE 3 - PLAN COMPARISON MATRIX

| Plan or Policy Document | Coastal Erosion | Drought | Extreme Heat | Inland Flooding | Storm Surge Flooding | Wildfire | Wind |
|---|---|---|---|---|---|---|---|
| **St. Lucie County Unified Local Mitigation Strategy** | Identifies beach and dune erosion as a major concern. Identifies 18 miles of "critically eroded" shoreline. Includes a County Beach Preservation Plan to guide re-nourishment and coastal management along with mitigation projects. | Recognizes drought as a hazard that impacts the County. Includes water-conservation goals, agricultural vulnerability, and the South Florida Water Management District's drought contingency plans. | Recognizes extreme temperatures as a hazard that impacts the County. Promotes outreach and sheltering for vulnerable populations, energy efficiency, and adaptation integration. | Flood hazard has the most detail and focus in this plan. Distinguishes riverine, flash, and inland flooding; includes FEMA Flood Insurance Rate Maps, repetitive-loss data, and vulnerability mapping. Identifies major mitigation actions. | Recognizes hurricanes and tropical storms as having the most potential impact within the County. Storm surge mapped with modeled tide heights up to 27.7 ft in Category 5 hurricanes. Identified mitigation projects. | Discusses burn probability in the County, Wildland-Urban Interface (WUI) risk maps, Firewise Communities, and fire-hazard classifications. | Describes potential high-wind impacts, debris, building performance, and code-based mitigation. Mainly addressed with storms. |
| **St. Lucie County Resilience Vulnerability Assessments 2025** | Identified as a major coastal risk affecting beaches, dunes, and built infrastructure. The RVA links erosion directly to sea-level rise and storm surge and notes chronic shoreline retreat as a threat to roads, utilities, | The hazard analysis defines drought as both meteorological and hydrological. Notes increasing frequency of seasonal water deficits and agricultural losses. | Identified as an emerging hazard affecting public health, labor productivity, and infrastructure. The assessment includes projected increases in heat index | Modeled extensively using NOAA Atlas 14 rainfall and HEC-RAS modeling for 25-, 100-, 500-year storms. Reinforces stormwater master-plan improvements, low-impact development standards, natural-land acquisition and restoration programs, and wetland restoration | Major focus throughout the assessment. Uses NOAA Intermediate-Low and Intermediate-High projections for 2040, 2070, 2100. Supported by maps and tables to identify impacted areas and potential inundation depths. Integrates with | Highlights wildfire risk in the western and southern county due to wildland-urban interface (WUI). Includes wildfire susceptibility maps and identifies moderate-to-high ignition zones. Suggests fuel-reduction programs, | Defines high-wind hazard, including hurricane and tornado events. Includes modeling Identifies structural vulnerability for older housing stock and critical infrastructure. Promotes building-code |

| Plan or Policy Document | Coastal Erosion | Drought | Extreme Heat | Inland Flooding | Storm Surge Flooding | Wildfire | Wind |
|---|---|---|---|---|---|---|---|
| | and cultural assets. Emphasizes living-shoreline stabilization and encourages restoration and management projects. Identifies adaptation strategies aligned with policies, response, resources, and recovery. Includes a vulnerability assessment of historical attributes to coastal storm-based hazards. | Includes vulnerability mapping and recommend-ations for recharge, conservation, and reuse. Identifies adaptation strategies aligned with policies, response, resources, and recovery. | days > 95 °F through 2070. Encourages programs, infrastructure updates, and considers vulnerable populations. Identifies adaptation strategies aligned with policies, response, resources, and recovery. | for storage. Includes a vulnerability assessment of historical attributes to coastal storm-based hazards. Identifies adaptation strategies aligned with policies, response, resources, and recovery. | FEMA NFIP CRS and Resilient Florida plans. Advocates for dune restoration, elevation of critical facilities, and protection of coastal roads and utilities. Includes recommended policies to increase resilience. Includes a vulnerability assessment of historical attributes to coastal storm-based hazards. Identifies adaptation strategies aligned with policies, response, resources, and recovery. | Firewise community outreach, prescribed-burn coordination, and maintaining defensible space. Identifies adaptation strategies aligned with policies, response, resources, and recovery. | compliance, retrofit, microgrid hardening, and wind-resistant design. Identifies adaptation strategies aligned with policies, response, resources, and recovery. |
| **St. Lucie County Comprehensive Plan** | Offers codes to require shoreline erosion considerations and mitigation strategies during development | Requirements for drought tolerant vegetation are included in the policy to decrease water | Not addressed. | Policies mandate flood-resistant construction for development. The County maintains consistency with policies of | Policies mandate flood-resistant construction and flood-zones for development. Development restrictions include | Policy directs the County to provide hazard-mitigation information, including wildfire safety, to the public and County | Although wind is not explicitly addressed, building-code compliance, coastal-construction |

| Plan or Policy Document | Coastal Erosion | Drought | Extreme Heat | Inland Flooding | Storm Surge Flooding | Wildfire | Wind |
|---|---|---|---|---|---|---|---|
| | within coastal areas. | consumption. Policy also enforces emergency drought and water management plans to conserve water resources and minimize long-term impacts. | | participate in the National Flood Insurance Program and Community Rating System. Suggests monitoring of new cost-effective programs to minimize flood damage. Flooding must be considered in infrastructure and Capital Improvement decisions. | potential relocation away from storm-surge zones. Policy includes considerations for shelter space. Additionally, indicates that planning should include storm surge, and flooding must be considered in infrastructure and Capital Improvement decisions. | personnel. Integration with the County's Emergency Management and Local Mitigation Strategy ensures wildfire preparedness and outreach. | controls, and public-awareness programs mitigate high-wind and storm impacts. |
| **St. Lucie County Code of Ordinances** | Addresses St. Lucie River Erosion Control. Also includes coastal preservation policies and supports shoreline management programs. | Offers chapters supporting water shortages, water shortage plans, and landscaping for conservation. | Not addressed. | Addresses flood protection restrictions, flood resistant development, site plan review related to stormwater, floodplain management, wetlands protection, and coastal construction. | Floodplain management chapters address coastal high hazard zones and special flood hazard areas. | Not addressed. | Addresses wind resistant improvements, building code related information, debris removal post windstorm, coastal area protections, and coastal construction code requirements. |
| **St. Lucie County Comprehensive Emergency** | Addressed under flood- and storm-surge | Managed through coordination | Identified as a risk to St. Lucie County. | Flooding is extensively covered. Report details 100- | Storm surge and storm-related hazards are the | Reports on the County's responsibility to | Addressed through storms, tornados, and |

| Plan or Policy Document | Coastal Erosion | Drought | Extreme Heat | Inland Flooding | Storm Surge Flooding | Wildfire | Wind |
|---|---|---|---|---|---|---|---|
| **Management Plan** | management, coastal evacuation planning, and debris-management operations. Ties erosion to floodplain management and FEMA's National Flood Insurance Program. | with the Local Mitigation Strategy (LMS) and Emergency Support Function #11 (Food & Water), which handles commodity distribution and water supply during shortages | Public-health protection and sheltering provide indirect support through cooling shelters and medical monitoring during heat events. | and 500-year floodplains, rainfall-related drainage, and canal systems. Multiple Emergency Support Functions manage drainage, water-control, and emergency infrastructure. Mitigation Annex ties directly to FEMA's Floodplain Management program. | primary focus. Response framework coordinates with the National Hurricane Center (Hurrevac) model for storm-surge-based evacuation. Coastal flood protection and building elevation standards are included. Evacuation routes and shelter locations are mapped. Includes thorough public guidance for hurricane preparedness. | reduce wildland and structural fires. Mitigation and coordination through an Emergency Support Function and the Florida Forest Service. Includes prescribed-burn programs and Firewise community education. | severe thunderstorms. Includes detailed sections on protective actions. Building-code enforcement, coordination with National Hurricane Center data, and storm-tracking via Hurrevac support hurricane and wind mitigation. |
| **Port St. Lucie Comprehensive Plan** | Shoreline protection, setbacks and coastal system conservation are included in Comp Plan | Not addressed. | Not addressed. However, open space, vegetation, and conservation policies may indirectly mitigate heat risk | Focuses on drainage, flood mitigation, and conservation to address inland flooding indirectly. | The plan supports elevation standards, development controls in hazard zones, and protection of coastal infrastructure. | Not addressed. | Addresses briefly through hurricanes and storms. |

| Plan or Policy Document | Coastal Erosion | Drought | Extreme Heat | Inland Flooding | Storm Surge Flooding | Wildfire | Wind |
|---|---|---|---|---|---|---|---|
| **Port St. Lucie Code of Ordinances** | Addresses through soil, erosion, and sediment control and through floodplain and shoreline development limits. | Not addressed. | Not addressed. | Regulates development in flood hazard areas. | Establishes flood-hazard area standards, elevation and anchoring of structures, permits, and flood-resistant materials. | Not addressed. | Encourages storm shutters and hurricane protection devices regulated for wind protection. |
| **Port St. Lucie Comprehensive Emergency Management Plan** | Although the city itself is mainly inland, erosion is considered in coordination with St. Lucie County's LMS and coastal partners. Also managed indirectly through coordination with the County's Coastal Management programs, dune restoration, and the County's evacuation and storm-surge planning efforts. | Recognizes drought as a hazard that could affect the planning area. Addressed through water supply and conservation coordination under St. Lucie County's mitigation framework; supported by public-health and water utility contingency planning. | Recognizes extreme heat as a hazard that could affect the planning area. Managed via public-health coordination, cooling shelters, and emergency medical operations under Emergency Support Function #8 (Health and Medical) and ESF #6 (Mass Care). | Flood hazard is one of the primary focuses. Mitigation coordinated with the County LMS and stormwater master plans; evacuation and re-entry directed by the County Emergency Operations Center. Floodplain management and debris-removal guidance support recovery. | Addresses storm surge flooding through sea level rise. The city uses the *St. Lucie County Evacuation Zones and Routes Interactive Map* for surge planning. The city coordinates evacuation and sheltering with the County Department of Public Safety. Long-term risk reduction through grant and funding programs. | Notes wildfire as a hazard that could affect the planning area. Managed through Unified Command between City Manager's Office, St. Lucie County Fire District, and the Department of Forestry. | Addresses through tornadoes, hurricanes, and tropical storms. The plan includes detailed EOC activation and command procedures and public warning and evacuation processes. Federal funding and rebuilding programs are listed. |
| **Fort Pierce Comprehensive Plan** | Land use is regulated in | Some policies are in place in the land use | Not explicitly addressed; building code, | Infrastructure and Conservation elements implicitly | The Coastal Management element mentions | Wildfire is only briefly mentioned in a policy to | Not explicitly addressed, however, is |

| Plan or Policy Document | Coastal Erosion | Drought | Extreme Heat | Inland Flooding | Storm Surge Flooding | Wildfire | Wind |
|---|---|---|---|---|---|---|---|
| | coastal hazard areas. | and conservation sections that protect the shallow aquifer and potable water supply. | tree protection, and land use provisions may contribute indirectly. | address stormwater, drainage and floodplain development controls. | hazard mitigation via the Local Mitigation Strategy and managing development in coastal hazard areas. | increase public awareness and hazard mitigation. | implicitly addressed in the context of storms under Coastal Management. |
| **Fort Pierce Code of Ordinances** | Addresses coastal erosion through site impacts and shoreline development regulations for the protection of beaches and shorelines from erosion. | The code specifies policies to be followed when using water under drought conditions. | Not explicitly addressed. Building code, tree protection, and land use provisions may contribute indirectly. | The code sets regulations for development in special flood hazard areas. Stormwater run-off from new construction is managed, and stormwater management facilities must be maintained and avoid hazards. | Storm surge is not specified, however, floodplain management addresses development in coastal high hazard zones. | Wildfire is only briefly mentioned in a policy to increase public awareness and hazard mitigation. | Not explicitly addressed, However, structural standards imply mitigation of wind hazard. |
| **St. Lucie Village Comprehensive Plan** | The Coastal Management Element recognizes erosion as a threat to beaches and dunes. Policies call for protection and restoration of coastal systems, coordination with state and federal | Policies call for coordination with the South Florida Water Management District to update the town's Water Supply Facility Work Plan. Water supply evaluation and needs is mentioned, although there | Not addressed. However, vegetation, open-space, and air-quality policies provide incidental urban heat mitigation. | The Infrastructure Element and Future Land Use Element require stormwater management consistent with floodplain ordinances. Emphasis on limiting development in flood-prone areas. | The Coastal Management Element establishes the Coastal High Hazard Area (CHHA) and restricts development there. The County must consider sea-level rise, storm surge, and hurricane hazards when planning | Not addressed. | Addresses wind through hurricane considerations. Includes implementation considerations of evacuation plans, hazard-resistant building standards, and post-disaster redevelopment criteria. |

| Plan or Policy Document | Coastal Erosion | Drought | Extreme Heat | Inland Flooding | Storm Surge Flooding | Wildfire | Wind |
|---|---|---|---|---|---|---|---|
| | agencies, and limits on development that could accelerate erosion. | is conflicting comments about supply needs. | | | infrastructure and land use. Coordination with local planning and FEMA NFIP; elevation and evacuation policies is ensured. Consideration of the storm-surge model. | | |
| **St. Lucie Village Code of Ordinances** | Coastal erosion specifically is not addressed, but multiple policies are in place to prevent soil erosion in development and land clearing. Additionally, vegetation protection, mangrove preservation, and coordination with for shoreline and dock permitting reduce erosion risks. | The code regulates year-round irrigation practices and establishes water-shortage emergency procedures. Promotes efficient irrigation, rain sensors, and drought-response variances; reduces long-term strain on potable-water supplies. | While not explicitly addressed, landscaping requires canopy trees, vegetative cover, and irrigation efficiency—all of which mitigate heat-island effects. | Mandates compliance with the Floodplain Management Ordinance, required consistency with the Comprehensive Plan and established drainage rules. Ensures first-floor elevations above flood levels; mandates drainage plan review and compliance with stormwater level-of-service standards. | Establishes elevation standards and dock construction limits. Designates the environmental protection areas and restricts development. Includes integration with FEMA NFIP standards; setbacks from bulkheads; coastal-high-hazard-area management via elevation and permitting requirements. | Not addressed. | Enforces building standards and the Florida Building Code. Requires durable exteriors and regulates Class "A" mobile homes to ensure hurricane-resistant construction. Reviews include storm-impact considerations, evacuation access, and requires hurricane-resilient design. |
| **Fort Pierce Consolidated Master Plan** | Acknowledges the port's exposure to | Water supply is minimally discussed, | Not addressed. | Identifies stormwater management and | Acknowledges that hurricanes, storm surge, and sea- | Not addressed. | Addresses wind through hurricanes and |

| Plan or Policy Document | Coastal Erosion | Drought | Extreme Heat | Inland Flooding | Storm Surge Flooding | Wildfire | Wind |
|---|---|---|---|---|---|---|---|
| | coastal erosion. It highlights shoreline stabilization, dredging management, and sediment control as key components of long-term port maintenance and infrastructure protection. | mainly through the discussion of potable water facility infrastructure. The only mention of water supply in a resource conservation aspect is through one mention of the negative effects from invasive species. | | drainage improvements as critical to port operation and expansion. It notes that the port area's low elevation and proximity to tidal waters make it vulnerable to heavy rainfall and flooding, requiring enhanced drainage and infrastructure resilience. Incorporates stormwater master planning, green infrastructure, and compliance with stormwater standards to reduce flood risk. | level rise pose substantial threats to port operation. Integrates with FEMA floodplain standards and U.S. Army Corps of Engineers coastal risk assessments. Recommends hurricane hardening, shoreline restoration, and surge-adaptive infrastructure design. | | tropical storm considerations. Includes provisions for emergency response coordination, building code compliance, and post-storm debris and dredging operations. |

Notes:
EM = Emergency Management
CDBG = Community Development Block Grant
CHHA = Coastal High Hazard Area
FEMA = Federal Emergency Management Agency
NFIP = National Flood Insurance Program
WUI = Wildland Urban Interfaces

## Recommendations for Plan Integration

The following section will discuss how each planning document can be integrated and updated to provide improved adaptive capacity for the County and municipalities through comprehensive evaluations and improvements.

### St. Lucie County Unified Local Mitigation Strategy - 2021

**Overview.** The County Unified Local Mitigation Strategy plan identifies local natural and human caused hazards, assesses vulnerabilities to people and property, and establishes short- and long-term mitigation actions to reduce risk and increase community resilience. It includes natural hazard profiles for flooding, hurricanes/tropical storms, tornados, severe thunderstorms/lightning, wildfires, erosion and landslide and drought. The LMS also evaluates risk, assesses capability, prioritizes mitigation strategies, and includes a cost benefit review, plan monitoring, and public involvement methodology. The LMS also aligns local actions with state and federal mitigation goals to improve eligibility for mitigation grant funding.

**Integration Opportunities.** The plan can be improved by identifying specific hazard related policies to reduce impacts from hazard events. This would apply to all relevant hazards. The plan noted a general goal to evaluate policies related to natural hazards, but as specific hazards were not identified, this would be a beneficial next step for the County and municipalities. Adaptive capacity can be strengthened through further evaluation of deployment times for resources after disaster event and additional evaluations of recovery timeline goals.

### Draft St. Lucie County Regional Resilience Plan - 2025

Subdocuments included in this review:

- St. Lucie County Cultural and Historical Vulnerability Assessment
- St. Lucie County Resilience Vulnerability Assessment – Phase I Flooding and Phase II Other Hazards
- St. Lucie County Data Gap Analysis Report
- CRS Class 4 Analysis
- Uniform Recommended Policies Document
- Draft St. Lucie County Regional Response Plan Adaptation Strategies

**Overview.** The 2025 Resilience Vulnerability Assessments (Phase I & II) and associated subdocuments evaluate the vulnerability of community-wide assets, land and populations to the risks posed by natural hazards, including sea level rise, flooding, storm surge, extreme heat, drought, wildfire, wind and coastal erosion. In addition, the assessment included a study that modeled ecosystem changes over time and provided a conservation approach to resilience in St. Lucie County through detailed planning, preservation, nature-based solution guidance, buffer recommendations and community partnerships.

The RVAs identify vulnerabilities using localized data, GIS-based modeling, exposure mapping, and sensitivity analyses. They are designed to support adaptive infrastructure investments and align current and future development with risk reduction. As part of the RVAs, a Data Gap Analysis was performed, highlighting data that was not available at the time of these assessments, with recommendations on data acquisition and management for future updates.

This draft plan outlines physical, nature-based, and policy-level recommended adaptation strategies through 2100. It includes actions such as building retrofits, floodproofing, managed retreat, shoreline stabilization, cooling infrastructure, and policy updates (e.g., zoning, design standards). The Draft RRP includes Uniform Policy recommendations that outline policies based on the findings of the vulnerability assessment and identified adaptation strategies. The goals address infrastructure, resilience, adaptation planning, data collection, capital planning, collaboration and outreach, funding adaptation, shoreline adaptation, water quality initiatives and community education and engagement. Through adoption of recommended policies and implementation of mitigation strategies, these work products will increase the participating jurisdiction's adaptive capacity.

**Integration Opportunities.** This adaptation strategies approach can be strengthened in the following ways. For response capability and resources, while some short-term post disaster actions were defined, specific hazard recovery approaches were not detailed, and deployment timelines were not discussed. Similarly, goal recovery timelines are not detailed, and the County would benefit from evaluating recovery timeline capabilities and goals. Implemented mitigation strategies can also be documented so that County agencies can determine which mitigation approaches have been effective to then aid in determining future mitigation needs. Overall, this document takes a strong approach to disaster mitigation and other County plans and policies would benefit from aligning with this plan.

The regional resilience vulnerability assessment contains both in-depth and broad information related to mitigation strategies by documenting implemented projects and a range of mitigation strategies for all the hazard types. The floodproofing, shoreline conservation, and improved stormwater approaches are means to reduce flood risk that should be implemented countywide where applicable. The RVAs do not address response capability and resources and minimally address recovery policy recommendations. It is essential that other County and Municipal documents and policies address these criteria and confirm that these mitigation approaches are included in the Comprehensive Plans and the Local Mitigation Strategy document. Enhanced data collection and management systems should be provided across various sectors to add value to comprehensive planning, hazard mitigation planning, and emergency planning initiatives.

## St. Lucie County Comprehensive Plan - 2022

**Overview.** The St. Lucie County Comprehensive Plan integrates hazard mitigation with environmental protection and land use planning, particularly for vulnerable coastal and inland flood zones. It emphasizes development restrictions in Coastal High Hazard Area conservation of coastal and floodplain ecosystems, and implementation of the LMS to reduce vulnerability to hurricanes, storm surge, and flooding. The plan requires post-disaster redevelopment guidelines, coordinated evacuation planning, and infrastructure improvements to support resilience. Future development is steered away from high-risk zones, and sea level rise is acknowledged as a future planning concern, with policies encouraging shoreline stabilization and managed retreat where necessary. The County's Coastal Management and Conservation elements also prioritize maintaining natural buffers such as wetlands and dunes to reduce the impact of storms and erosion. It should be noted that the County is currently processing a Comprehensive Plan update and the pending update was not reviewed in the context of this analysis.

**Integration Opportunities.** The County Comprehensive Plan contains general discussions of policies within the plan related to most of the known hazards and includes considerations to use best available hazard data and update planning documents with new data. This plan addresses many policy components that the County can implement to address hazard mitigation and emergency management needs. The plan details and prioritizes hazard mitigation initiatives and plan collaboration in the County and region. Deployment timeframes are unknown, but a beneficial next step would be to determine goals for these timeframes post hazard event which factors into the low deployable resource's adaptive capacity score. The Post-Disaster Redevelopment plan is useful in addressing post-disaster policies and can be strengthened to ensure that it addresses all hazards of concern. While the comprehensive plan details post disaster recovery, development of a recovery task force, and post disaster assessments and repairs in the plan, the plan does not include timeframes, specific services, or other streamlining measures related to recovery. The plan can be strengthened by evaluating goal recovery times and measures. The mitigation strategies detail coordination for disaster preparedness, community education, and building code improvements and address natural hazards comprehensively with the exception of drought, which would benefit from further mitigation strategies. In addition, strategies for coordination could be included in the LMS to promote resilience.

## St. Lucie County Code of Ordinances

**Overview.** The County's Code of Ordinances includes key regulatory frameworks aimed at reducing risk from natural hazards. For example, the Floodplain Management Ordinance (Appendix 6.05.00) applies to development wholly or partially within flood hazard areas and sets standards for subdivisions, filling, grading and other site improvements. In addition, the "Environment and Natural Resources" chapter (Article IV) declares as its purpose the control of activities that may cause contamination or pollution, as a means to protect public health, safety and welfare. These ordinances support resilience by regulating construction in flood zones, protecting natural buffer functions (e.g., floodplain forests, wetlands) and participating in the National Flood Insurance Program via community-rating efforts. Hazards such as extreme heat, and wildfire are not directly addressed through hazard-specific ordinance provisions.

**Integration Opportunities.** While the County ordinances include policies that address coastal erosion, drought, inland flooding, storm surge, and wind, there are no ordinances related to extreme heat and wildfire. To address extreme heat related ordinances, the County could consider heat-resilient building standards, urban heat island mitigation measures, landscape related ordinances, and cooling features for large new developments or public facilities. To address wildfire related impacts, the County could consider defensible space standards, vegetation management, fire-resistant building materials, and open-burning restrictions. These strategies could also be included in the LMS.

## St. Lucie County Comprehensive Emergency Management Plan – 2023

Subdocuments included in this review:

- St. Lucie County Hurricane Preparedness Guide

**Overview.** The St. Lucie County Comprehensive Emergency Management Plan (CEMP) establishes a coordinated, all-hazards framework to reduce risks from natural and human-caused disasters

such as flooding, hurricanes, storm surge, erosion, drought, wildfires, and extreme temperatures. Its overarching goal is to protect lives, property, and the environment through prevention, preparedness, response, recovery, and mitigation. The plan integrates with the National Incident Management System (NIMS) and the Local Mitigation Strategy (LMS) to guide floodplain management, stormwater control, and evacuation planning. It emphasizes coastal and inland flooding reduction through canal drainage systems, flood-prone mapping, and resilient land-use patterns, while addressing coastal erosion via dune protection and shoreline restoration. Heat and drought are acknowledged under "extreme temperatures" and "drought" hazards but receive limited targeted actions beyond public health coordination and water-supply management. This plan is the primary County plan detailing response capability and resources, and recovery strategies and policies for the County and municipalities and is a critical plan for ensuring that the County is prepared for emergency response.

As part of St. Lucie County's Emergency Management strategies, the St. Lucie County Hurricane Preparedness Guide was developed to provide practical guidance for residents to reduce risk and protect life and property from natural hazards, including hurricanes, storm surge, coastal and inland flooding, and high winds. The guide's goal is to strengthen community preparedness through early planning, home fortification, evacuation readiness, and post-storm safety measures. It outlines steps for developing a hurricane plan, preparing emergency supply kits, reinforcing homes (e.g., roofs, doors, windows, trees), and safeguarding boats and pools. It also includes evacuation zones, shelter information, and transportation assistance, emphasizing protection of vulnerable groups and pets.

**Integration Opportunities.** The comprehensive emergency management plan addresses all natural hazards of concern included in this assessment and addresses all the adaptive capacity review criteria while achieving high scores in the response capability and resources category. The main integration opportunity is for the County, with the municipalities, to evaluate and determine goal timeframes for both response capability and resources, and recovery. Goal timeframes would aid the County in building upon the strong communication, emergency planning, preparedness activities, and response capabilities outlined in this plan. In addition, strategies for coordination could be included in the LMS to promote resilience.

The St. Lucie County Hurricane Preparedness Guide efficiently guides residents through some first steps to be taken before, during, and after a hurricane, building individual and community resilience. Opportunities exist that can lead to streamlining and centralizing this information. This includes providing links to additional information to support: current policies centered around hurricane resilience, availability of deployable resources, emergency management response actions, short and long-term recovery programs, potential strategies and incentives for homeowners or landlords to mitigate against hurricanes and related hazards, and preparedness guides for other hazards. The links could lead to a more permanent, centralized webpage that directs users to additional resources, such as the page for the St. Lucie County Comprehensive Emergency Management Plan. This way, resources can be updated, or information can be changed without the issue of broken links on the Hurricane Preparedness Guide.

## Port St. Lucie Comprehensive Plan - 2020

**Overview.** The Port St. Lucie Comprehensive Plan provides a long-range policy framework for land use, infrastructure, conservation and coastal management, guiding how the city grows while protecting natural resources and addressing hazard exposure. Specifically, through its Conservation & Coastal Management element it directs development in higher-risk zones (such as low-lying or coastal hazard areas), incorporates open space and stormwater infrastructure standards, and preserves natural buffers (wetlands, shoreline, dunes) to reduce vulnerability to inland flooding, coastal flooding, storm surge and sea-level rise. It should be noted that Port St. Lucie is currently processing an update to its Comprehensive Plan and the new draft was not reviewed as part of this analysis.

**Integration Opportunities.** The Port St. Lucie Comprehensive plan addresses flooding storm surge and erosion. Drought, extreme heat, wildfire, and wind are mentioned but not addressed further in the plan. The city would benefit from including evaluations and policy approaches to all natural hazards and other hazards of concern. Additionally, the City could consider developing goal timeframes for deployment of resources, response, and recovery.

## Port St. Lucie Code of Ordinances

**Overview.** The City of Port St. Lucie Code of Ordinances establishes several regulatory mechanisms that reduce risk to natural hazards, focusing mainly on flooding, storms, and drainage management. Chapter 152, Floodplain Management, is the core framework, setting standards for construction and land use within flood hazard areas, requiring elevation, anchoring, and flood-resistant materials for new and substantially improved structures. It aligns with FEMA's National Flood Insurance Program (NFIP) to protect life and property in high-risk zones. Other relevant provisions include Stormwater Utility regulations (Chapter 41, Article III) that ensure proper stormwater management and drainage to mitigate inland flooding, and Emergency Management provisions (Chapter 35) that define local authority for emergency response to hurricanes and related events.

**Integration Opportunities.** While the City ordinances include policies that address erosion, extreme heat, flooding, and storm surge, there are no ordinances related to drought, wildfire, and wind. To address drought, the City should consider water conservation standards, landscape and irrigation ordinances, commercial water use efficiency plans, and drought response triggers. To address wildfire-related impacts, the City should consider defensible space standards, vegetation management, fire-resistant building materials, and open-burning restrictions. To address wind-related impacts, the City could consider wind-resistant building standards, shelter standards, critical infrastructure hardening, tree and vegetation management, and utility pole and overhead line requirements.

## Port St. Lucie Comprehensive Emergency Management Plan

**Overview.** The City of Port St. Lucie Comprehensive Emergency Management Plan (CEMP, 2021) provides an all-hazards framework for preventing, preparing for, responding to, and recovering from emergencies and disasters that threaten life and property. The plan's goal is to enhance community resilience through coordinated local, county, state, and federal efforts using the National Incident Management System (NIMS) and Incident Command System (ICS). It identifies natural hazards, including flooding, hurricanes, coastal erosion, drought, wildfires, and extreme

temperatures, and assigns lead agencies and command structures for each. Key mitigation efforts include flood control via canal systems, protection of sensitive ecosystems like the St. Lucie River and Indian River Lagoon, and participation in FEMA's Hazard Mitigation Grant Program. The plan emphasizes flooding and hurricane preparedness, while extreme heat and drought are acknowledged but less extensively addressed, primarily through general emergency response coordination rather than long-term adaptation policies

**Integration Opportunities.** The Port St. Lucie comprehensive emergency management plan addresses all natural hazards of concern included in the assessments and addresses all the adaptive capacity review criteria while achieving high scores in the policy, response capability and resources, and recovery categories. The main integration opportunity for the City is to strengthen the mitigation strategies by identifying needed mitigation projects to address hazard impacts. This recommendation is applicable across all of the identified hazards.

## Fort Pierce Comprehensive Plan - 2019

**Overview.** The Fort Pierce Comprehensive Plan integrates hazard mitigation throughout multiple elements, with a clear emphasis on flood protection, stormwater management, and resilience in coastal areas. It incorporates the St. Lucie County Local Mitigation Strategy (LMS) and requires that new development in coastal high hazard areas (CHHAs) evaluate evacuation impacts and include mitigation to maintain evacuation times. Policies prohibit density bonuses in environmentally sensitive or CHHA zones and mandate elevation and floodproofing for development in the 100-year floodplain. The plan encourages green infrastructure, low-impact development, and adaptive strategies, including reduced greenhouse gas emissions, water-efficient buildings, and enhanced public access in coastal areas—all framed to increase the city's resilience to flooding, storm surge, high temperatures, and sea level rise. It should be noted that Fort Pierce is currently processing an update to its Comprehensive Plan and the new draft was not reviewed as part of this analysis.

**Integration Opportunities.** The Fort Pierce Comprehensive Plan can be improved across the response capability and resources and recovery criteria. A strength of the plan is the Capital Improvement project schedule which includes a prioritization approach for hazard mitigation initiatives. To build upon preparedness, outreach, interagency coordination, and building code improvement strengths, the City could consider developing goal timeframes for deployment of resources, response, and recovery. Additionally, if City planning documents included information on successful implemented mitigation strategies, that would aid the City in determining approaches to build upon previous successes and strengths.

## Fort Pierce Code of Ordinances

**Overview.** The Fort Pierce Code of Ordinances addresses resilience and mitigation by establishing land-use and development standards, permitting and building requirements, and stormwater and floodplain management measures designed to reduce vulnerability to coastal storms, flooding, and other hazards. The ordinances incorporate floodplain regulations (elevation and construction standards in Special Flood Hazard Areas), stormwater drainage and erosion-control rules, coastal setback or buffer provisions, and requirements for infrastructure design and maintenance that support hazard resistance. The code also assigns responsibilities for enforcement, ties development review to hazard considerations (through zoning and permitting), and supports emergency preparedness and post-disaster recovery processes.

**Integration Opportunities.** While the city ordinances include policies that address coastal erosion, drought, inland flooding, storm surge, wildfire, and wind, there are no ordinances related to extreme heat. To address extreme heat related ordinances, the City could consider heat-resilient building standards, urban heat island mitigation measures, more targeted landscape related ordinances, and cooling features for large new developments or public facilities to build upon the current tree protection ordinances. Additionally, the hazards that were scored as low would benefit from stronger policies and regulations to both reduce potential impacts and strengthen the community's ability to respond to hazard events.

## St. Lucie Village Comprehensive Plan – 2011 Update

**Overview.** St. Lucie Village's plan is highly focused on preserving its coastal, low-density residential character while mitigating risks from natural hazards, especially coastal flooding, storm surge, and sea-level rise. Nearly all of the eastern portion of the Village lies within the CHHA, and policies strongly discourage increased development density in this area. The plan promotes minimal development in flood-prone areas, maintains a development suitability analysis to avoid high-risk zones, and enforces a 0.5-acre minimum lot size to align with septic system safety requirements in areas with poor drainage. It includes detailed vulnerability mapping, emphasizes the conservation of coastal ecosystems, and outlines strict controls on marina and shoreline development to prevent erosion and flood damage. The Village's coordination with County and regional hazard planning (including the LMS) supports its efforts to manage risks from hurricanes, flooding, and hazard impacts.

**Integration Opportunities.** The mapping and data supporting the policies of the Comprehensive Plan are outdated. The team recommends updating mapping and data, including land use mapping, population projections, utility and infrastructure records. Mapping of vulnerable areas would be beneficial. Updates to objectives, priorities, and capital improvement projects should be made based on updated information.

## St. Lucie Village Code of Ordinances

**Overview.** The St. Lucie Village Code of Ordinances addresses resilience and mitigation by establishing local regulations that guide land use, building standards, and stormwater/floodplain management to reduce vulnerability to coastal storms, flooding, and erosion. The code provisions include floodplain development controls (elevation and construction standards in special flood hazard areas), stormwater drainage and erosion-control requirements, coastal setbacks or buffers, and requirements for infrastructure maintenance and safe permitting. The code assigns enforcement responsibility to local officials, integrates hazard considerations into zoning and permitting processes, and supports emergency preparedness and recovery actions.

**Integration Opportunities.** The city ordinances include policies that directly address drought, inland flooding, and storm surge. Erosion, extreme heat, and wind are indirectly addressed through land and vegetation protections, tree canopy and landscaping policies, and building codes. There are no ordinances addressing wildfire. There is an opportunity to adopt more targeted policies with the intent of directly mitigate coastal erosion, extreme heat, wind, and wildfire. To address coastal erosion, the Town could consider coastal setback requirements, targeted vegetation and habitat conservation, and erosion monitoring approaches. To address extreme heat related ordinances, the Town could consider heat-resilient building standards, landscape related ordinances, and

other cooling features. To address wildfire-related impacts, the Town could consider defensible space standards, vegetation management, fire-resistant building materials, and open-burning restrictions. To address wind-related impacts, the Town could consider wind-resistant building standards, shelter standards, and targeted tree and vegetation management. Additionally, the scores for the hazards that were addressed were generally low and would benefit from stronger policies and regulations to both reduce potential impacts and strengthen the community's ability to respond to hazard events.

### Port of Fort Pierce Consolidated Master Plan

**Overview.** The Fort Pierce plan prioritizes sustainable land use and infrastructure planning to mitigate risk in the Coastal High Hazard Area (CHHA) and flood-prone zones. Policies prohibit development that increases density in CHHAs and environmentally sensitive areas, and support building elevation, floodproofing, and low-impact development techniques. The plan incorporates the Local Mitigation Strategy (LMS), advances stormwater master planning, and promotes energy-efficient and heat-resilient structures, green space, and tree cover to reduce risks from flooding, storm surge, and extreme temperatures.

**Integration Opportunities.** The Port of Fort Pierce consolidated master plan primarily addresses coastal erosion, flooding, and storm surge, as these hazards align with the planning area. However, wind and extreme heat could be impactful to the Port, and therefore the plan would benefit from additional considerations for these hazards. The Fort Pierce Comprehensive Plan includes more detail on all natural hazards, so the Port Master Plan could consider evaluating and including mitigation approaches that are included in the City's comprehensive plan. Additionally, while this plan primarily addresses policy, the plan would benefit from identifying additional mitigation strategies to reduce risk to the Port.

## General Recommendations for Integration of Policies and Plans to Increase Resilience

- Recommend determining specific timeframes for deploying resources, response, and recovery to include goals to potentially increase response and deployment time and reduce recovery timelines.
- Many plans reference hazards in general terms. It is recommended that plans clearly identify and specify the hazards considered during planning, preparedness, and mitigation activities.
- For the hazards that scored in the "moderate" range, including coastal erosion, drought, extreme heat, wildfire, and wind, the review criteria suggest that improvements to policy, response capability and resources, recovery, and mitigation strategies should be considered and reviewed. While some hazards, including flooding and hurricanes risk, are commonly addressed, other potential hazards are often overlooked or not as explicitly integrated into the planning process. It is recommended that the jurisdictions also emphasize and incorporate coastal erosion, drought, extreme heat, wildfire, and high wind events into future planning and mitigation efforts to ensure a more comprehensive approach to adaptation and resilience.

- Recommend interdepartmental reviews and coordination where possible in the planning process to ensure a shared vision and promote efficiency, resource sharing, and aligned implementation.
- The budgeting section for the Transportation Planning only supports mitigation in roadway improvements that are included in the Long-Range Transportation Plan. The plan is based on population projections and driver behavior/patterns and does not consider limiting extensions into areas that are vulnerable to natural hazards.
- Update plans to reflect actual operations as needed.

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# APPENDIX D: WATERSHED MAPPING

# Watershed Mapping

St. Lucie County faces significant stormwater management challenges due to its flat topography, high groundwater table, limited soil storage, and high tidal surges, which hinder natural drainage and infiltration and lead to frequent ponding and reduced conveyance performance. **Figure 1** represents the watershed basins located within St. Lucie County (SLC).

Two Resilience Vulnerability Assessments (RVA) were conducted, in which flooding and other natural hazards were modeled and mapped using GIS-based data. These RVAs show potential increases in impacts from sea level rise, and tidal, storm surge, and rainfall-induced flooding in all SLC watersheds and especially along the coast, inland along the St. Lucie River, as well as other low-lying areas. **Figure 2 through Figure 5** show the impacted areas and depth of flooding in present day and future scenarios.

Compounded by population growth and urban development these factors heighten flood risk and contribute nutrient-laden runoff that impairs St. Lucie County water bodies. The updated SLC Stormwater Master Plan aims to guide infrastructure investments and management strategies to improve flood protection, meet regulatory requirements, and reduce pollutant and nutrient loads to protect water quality and community resilience.

Effective stormwater programs analyze basin topography, soils, land cover, hydrology, and tidal/groundwater interactions; then deploy a mix of gray and green infrastructure, regulatory measures, maintenance plans, and monitoring at the basin scale to reduce flooding, improve water quality, and protect ecosystems.

Watershed basins are fundamental units for effective stormwater management because they define how and where water flows, accumulates, and interacts with the landscape and built environment.

Key reasons they matter:

- Hydrologic control: Basins determine runoff generation, peak flow timing, and flow pathways; understanding basin boundaries and characteristics is essential to predict flood risk and design conveyance systems.
- Storage and attenuation: Natural and engineered basins (ponds, wetlands, detention areas) provide temporary storage that reduces peak flows, delays runoff, and lowers downstream flood risk.
- Water quality treatment: Basin-scale features capture sediments, nutrients, and pollutants—allowing settling, biological uptake, and filtration—so basins are primary locations for implementing best management practices (BMPs).
- Scale for planning and regulation: Watersheds provide a logical geographic scale for planning, permitting, monitoring, and compliance with regulatory requirements (e.g., total maximum daily loads, MS4 permits).

- Ecosystem services and habitat: Basins with wetlands, riparian zones, and vegetated buffers support biodiversity, recharge groundwater, moderate temperatures, and improve water chemistry.
- Integrated infrastructure siting: Basin analysis guides where to place stormwater infrastructure (pumps, culverts, retention/detention, green infrastructure) for greatest effectiveness and cost-efficiency.
- Prioritization and targeting: Assessing basins helps identify high-risk or high-impact areas (e.g., chronic flooding, pollutant hotspots) so investments can be prioritized.
- Resilience to climate variability: Basin-based designs can be adjusted for changing rainfall intensity, sea-level rise, and tidal influences to maintain protection over time.
- Community and land-use coordination: Watershed basins cross jurisdictional and land-use boundaries; managing at the basin scale fosters coordination among municipalities, developers, and resource agencies.

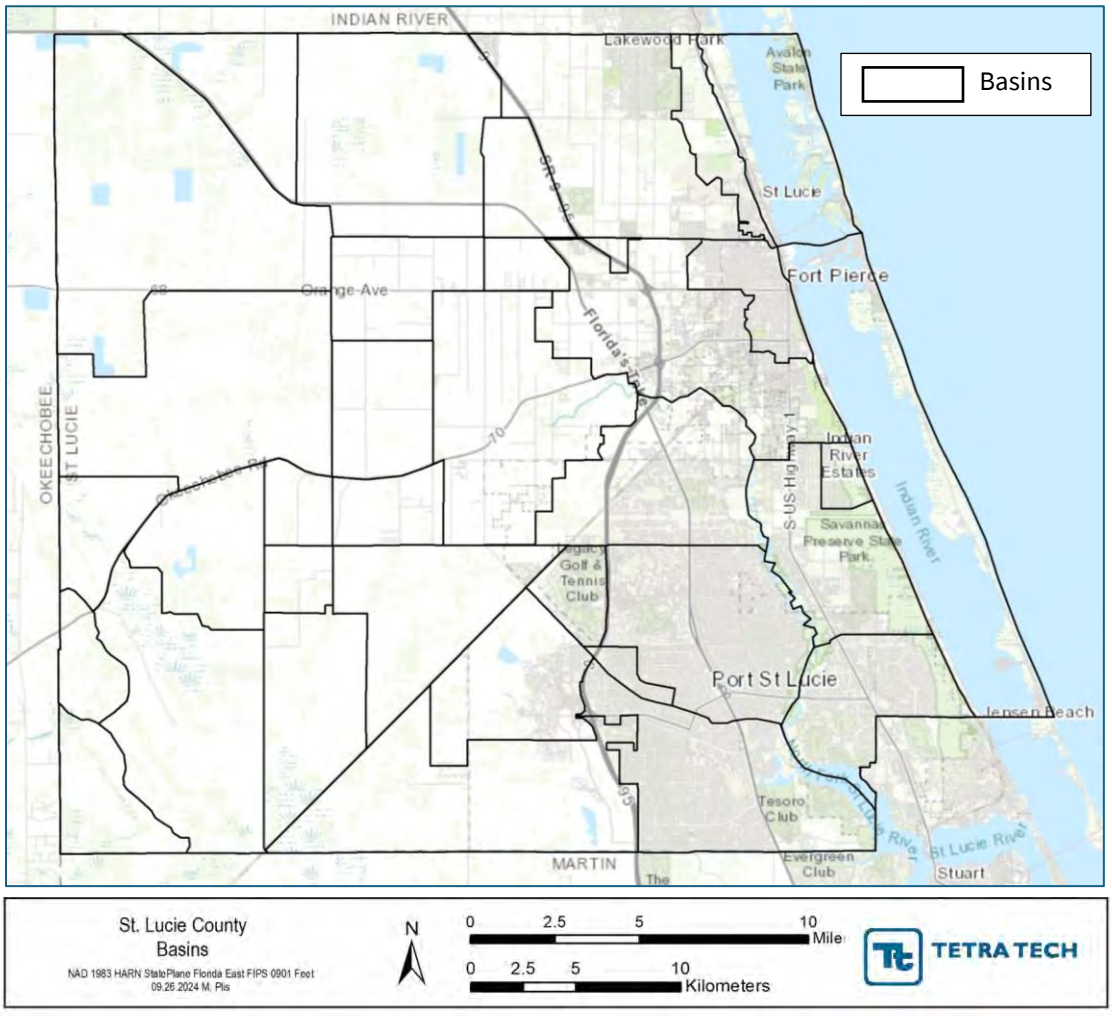

Figure 1. St. Lucie County Basins

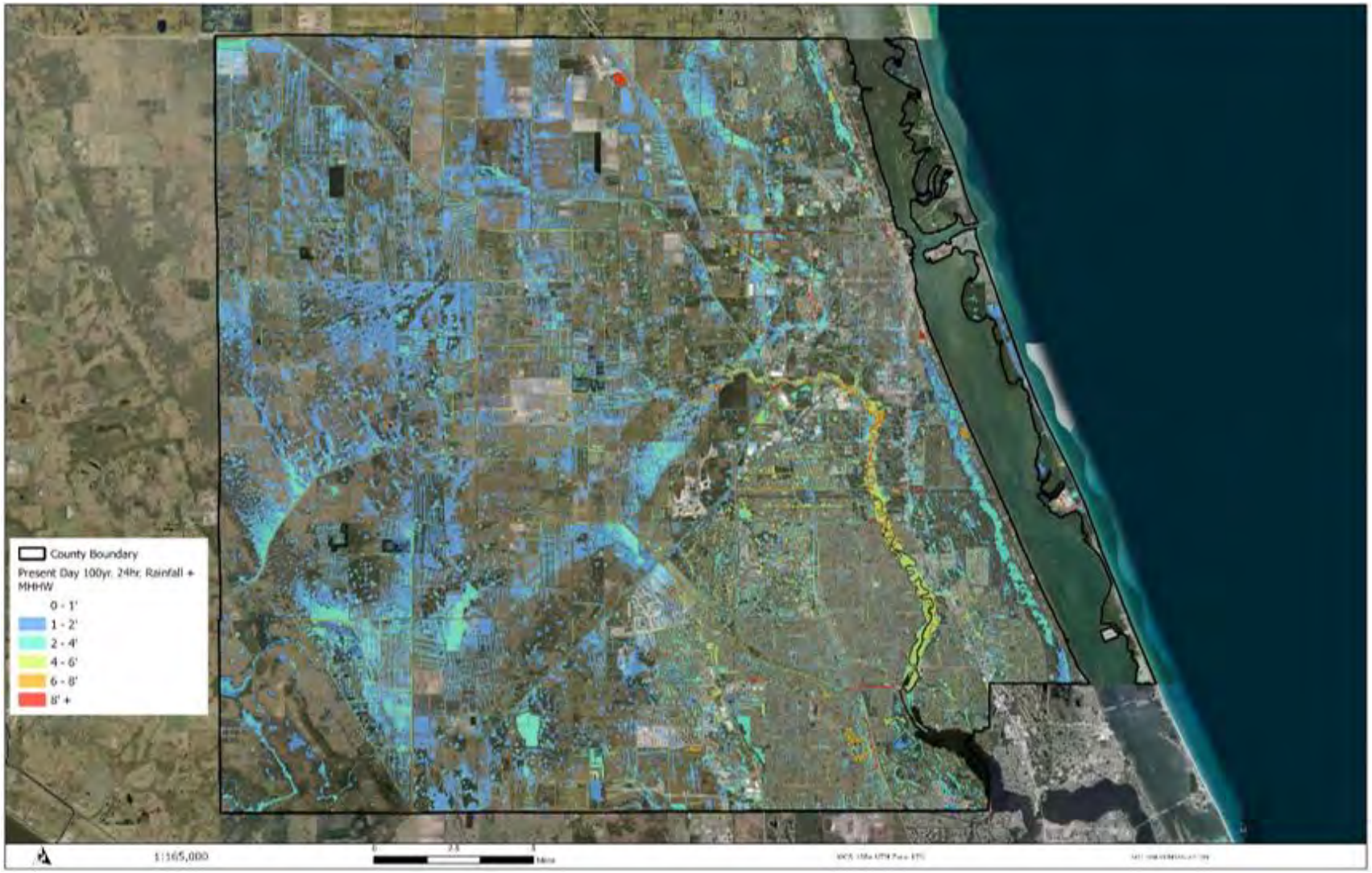


Figure 2. Present Day – 100-Year/24-Hour Rainfall-Induced Flooding Depths

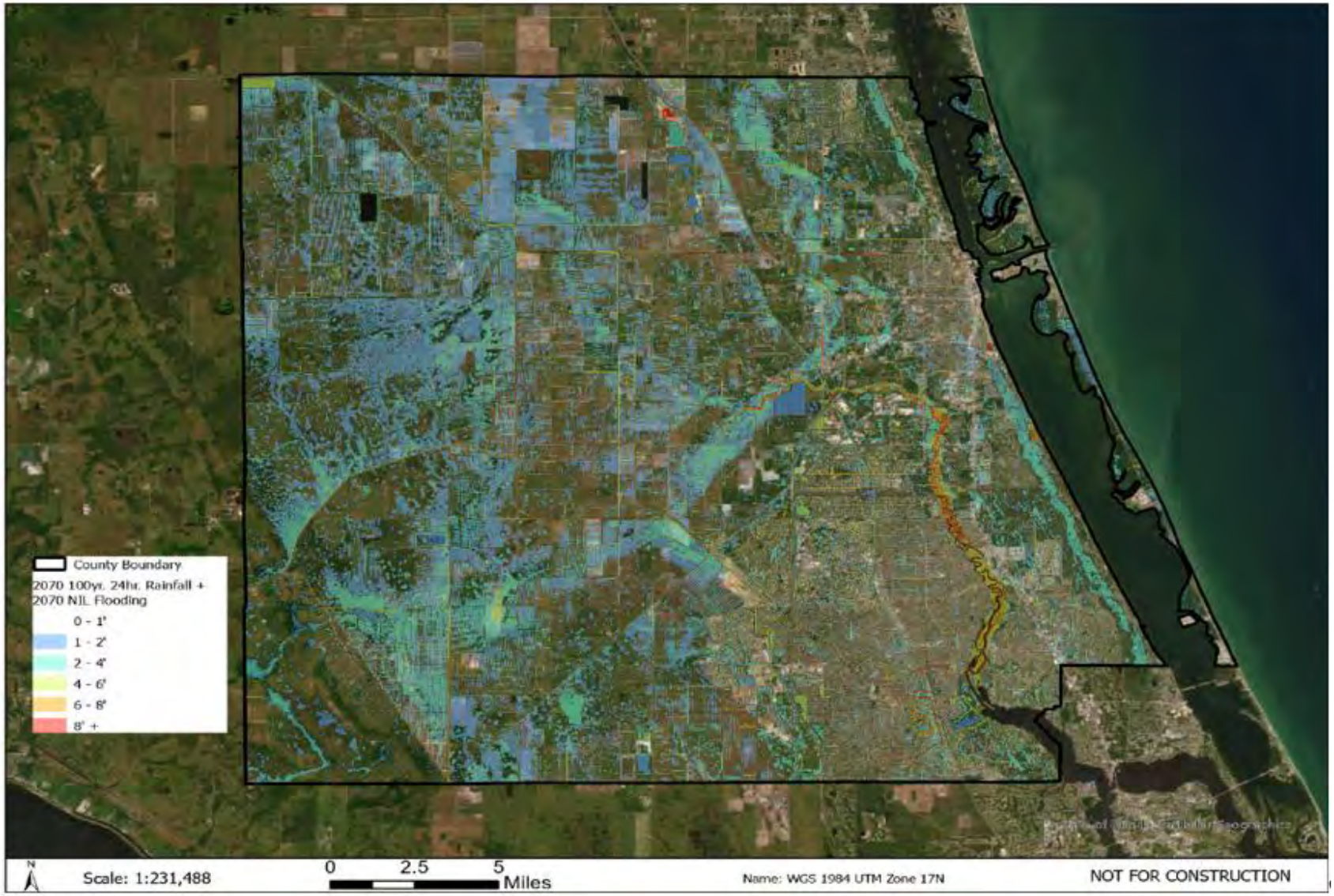


Figure 3. Year 2070 – 100-Year/24-Hour Rainfall + NOAA Intermediate Low Sea Level Projections

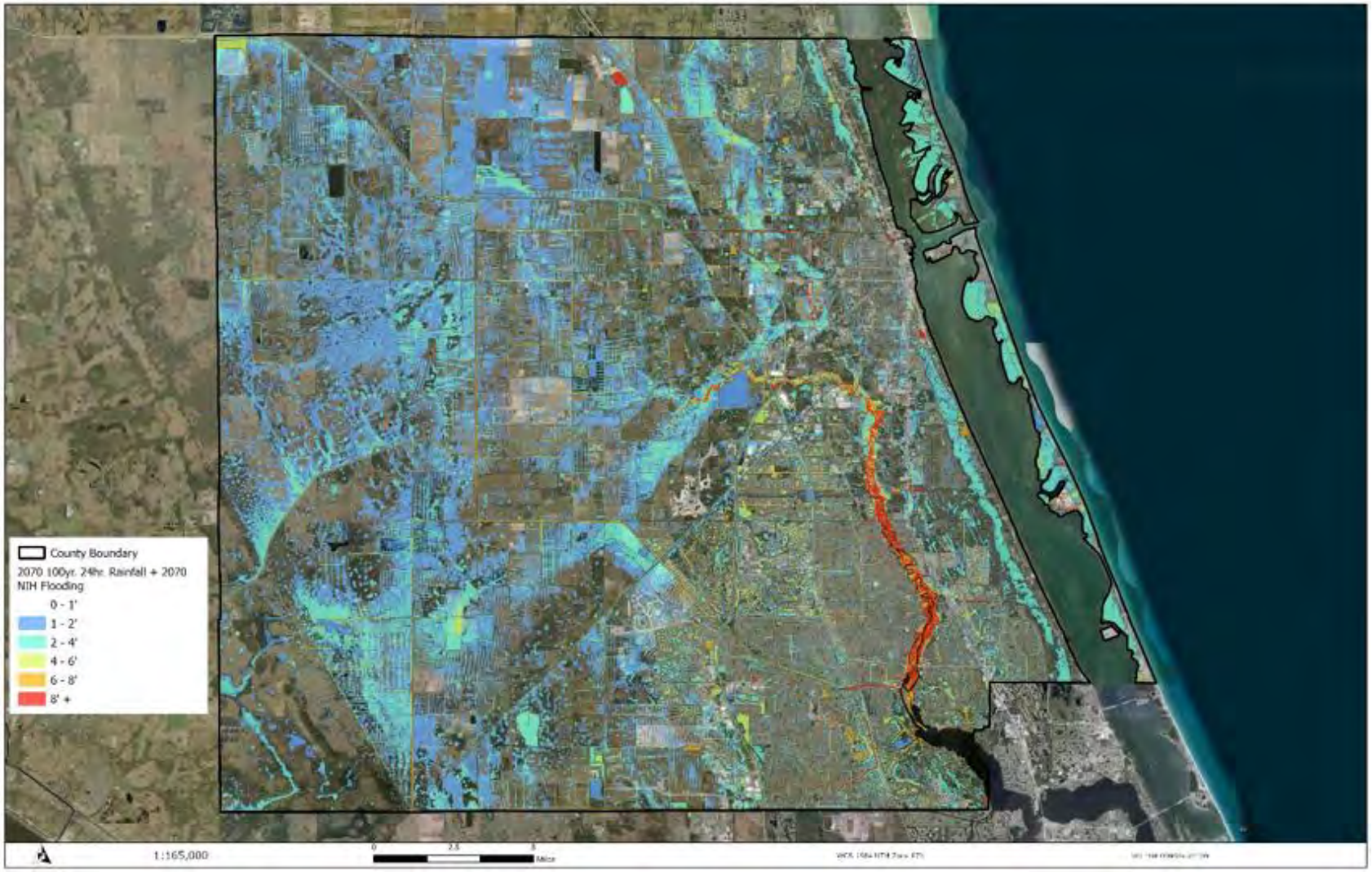


Figure 4. Year 2070 – 100-Year/24-Hour Rainfall + NOAA Intermediate High Sea Level Projections

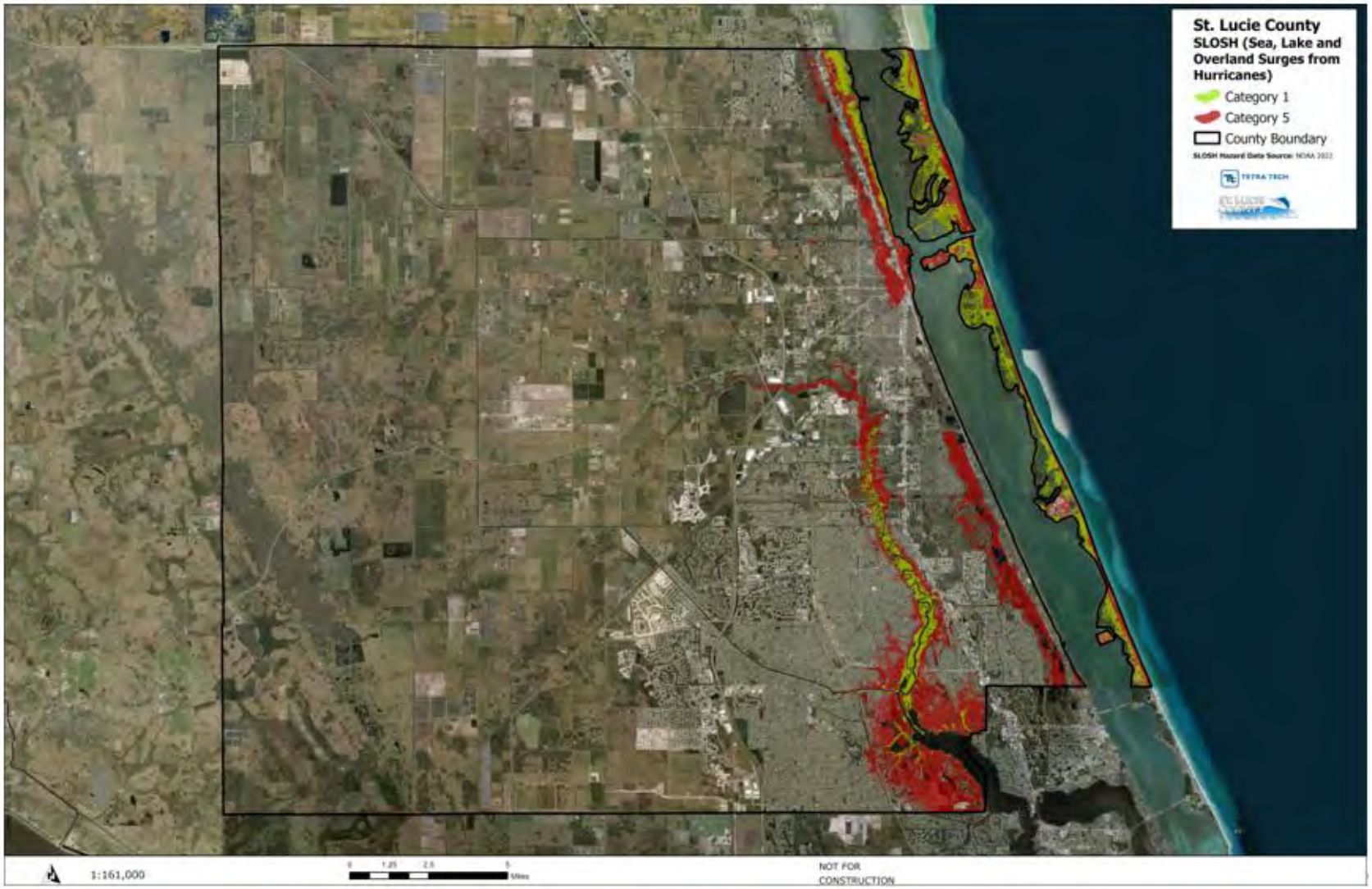


Figure 5. Present Day – Category 1 and 5 Hurricane Impact Areas

# APPENDIX E: TREE CANOPY ANALYSIS

# Tree Canopy Analysis

St. Lucie County undertook a comprehensive tree canopy assessment to better understand the distribution, density, and ecological function of its urban forest. This initiative supports the County's broader resilience and sustainability goals by identifying areas with limited canopy coverage and informing future greening strategies that can help mitigate extreme heat, improve air quality, and enhance stormwater absorption.

The assessment utilized publicly available aerial 2018 LiDAR data sourced from the U.S. Geological Survey. Vegetative structures with a minimum vertical extent of 6 feet were analyzed to delineate tree canopy coverage across both public and private lands. Utilizing an automated processing pipeline, integrated with advanced LiDAR classification software, canopy features were extracted. The process involved isolating vegetation returns from the LiDAR point cloud, classifying points that met the height threshold, and generating a Canopy Height Model to represent the spatial distribution and elevation of canopy features. The Canopy Height Model was then converted into vector format for geospatial analysis within a GIS environment. Quality assurance and quality control procedures were applied to ensure spatial accuracy and classification integrity.

The validated dataset was used to calculate canopy coverage metrics across the County. St. Lucie County has a total land area of 369,795 acres, of which 62,989 acres are covered by tree canopy, equating to an overall canopy coverage of 17 percent (Error! Reference source not found. and Error! Reference source not found.). Within the municipalities, St. Lucie Village stands out with 55 percent canopy coverage across its 531 acres. Port St. Lucie, with a land area of 76,963 acres, has 13,099 acres of canopy, equating to 17 percent coverage. Fort Pierce, covering 16,241 acres, has 5,572 acres of canopy, representing 34 percent coverage. Unincorporated St. Lucie County contains 276,060 acres of land and has 44,027 acres of canopy, equating to 16 percent coverage. Maps displaying the tree canopy coverage for SLC as well as the municipalities are displayed in **Figure 3** through **Figure 6**.

Tree canopy is recognized as a vital component of the County's and the municipalities' resilience efforts. It plays a key role in reducing urban heat island effects, sequestering carbon emissions, and managing stormwater runoff. The resulting maps and data products from this assessment will support decision-making around land use planning, environmental protection, and adaptation, while also guiding future tree planting and preservation efforts on County- and municipal-owned properties.

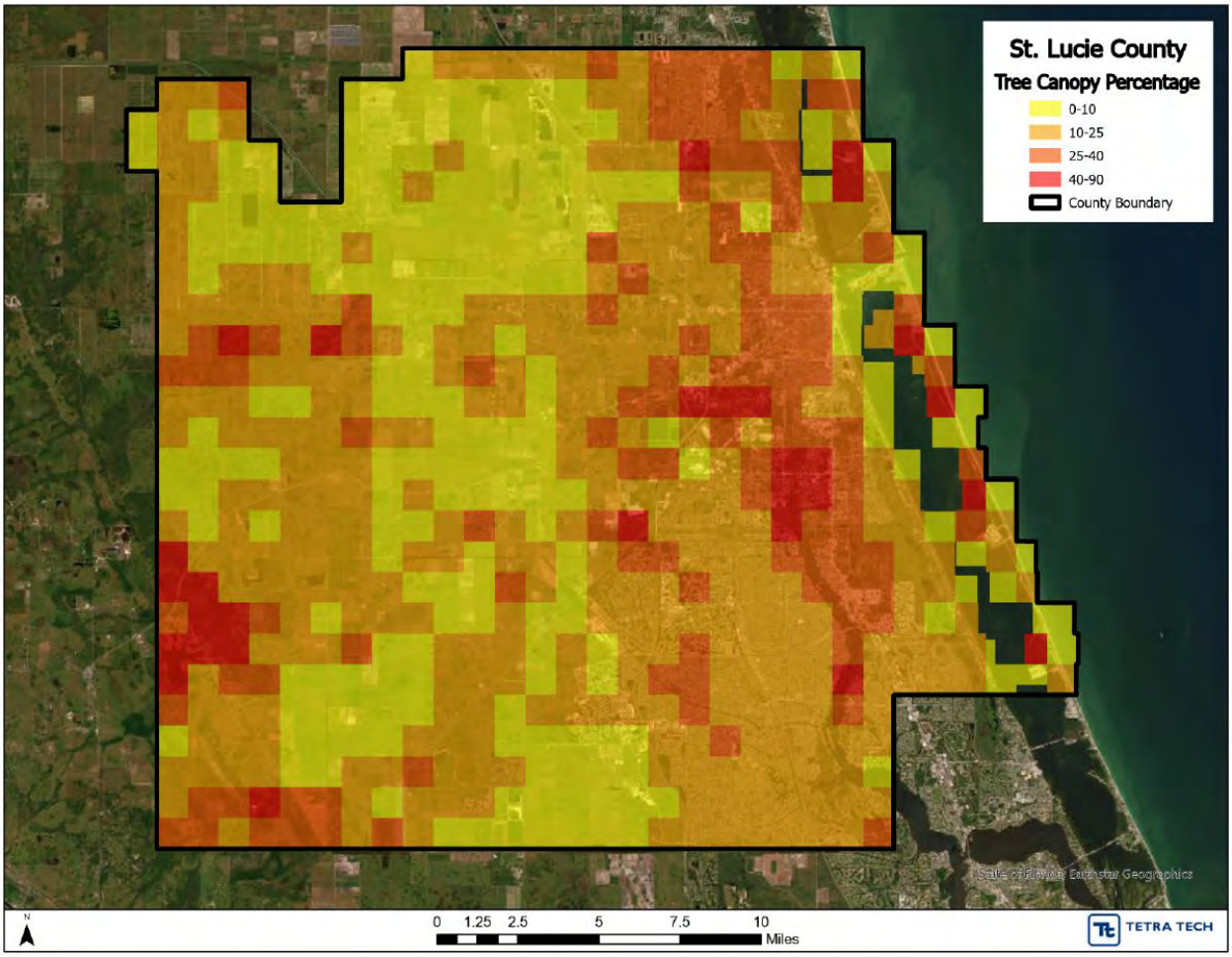


Figure 1. St. Lucie County Tree Canopy Percentage Map

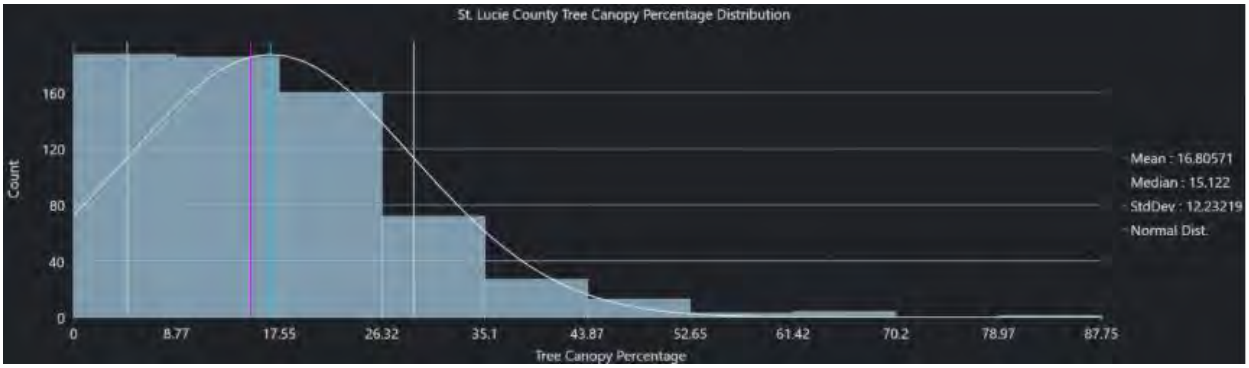


Figure 2. St. Lucie County Tree Canopy Percentage Distribution

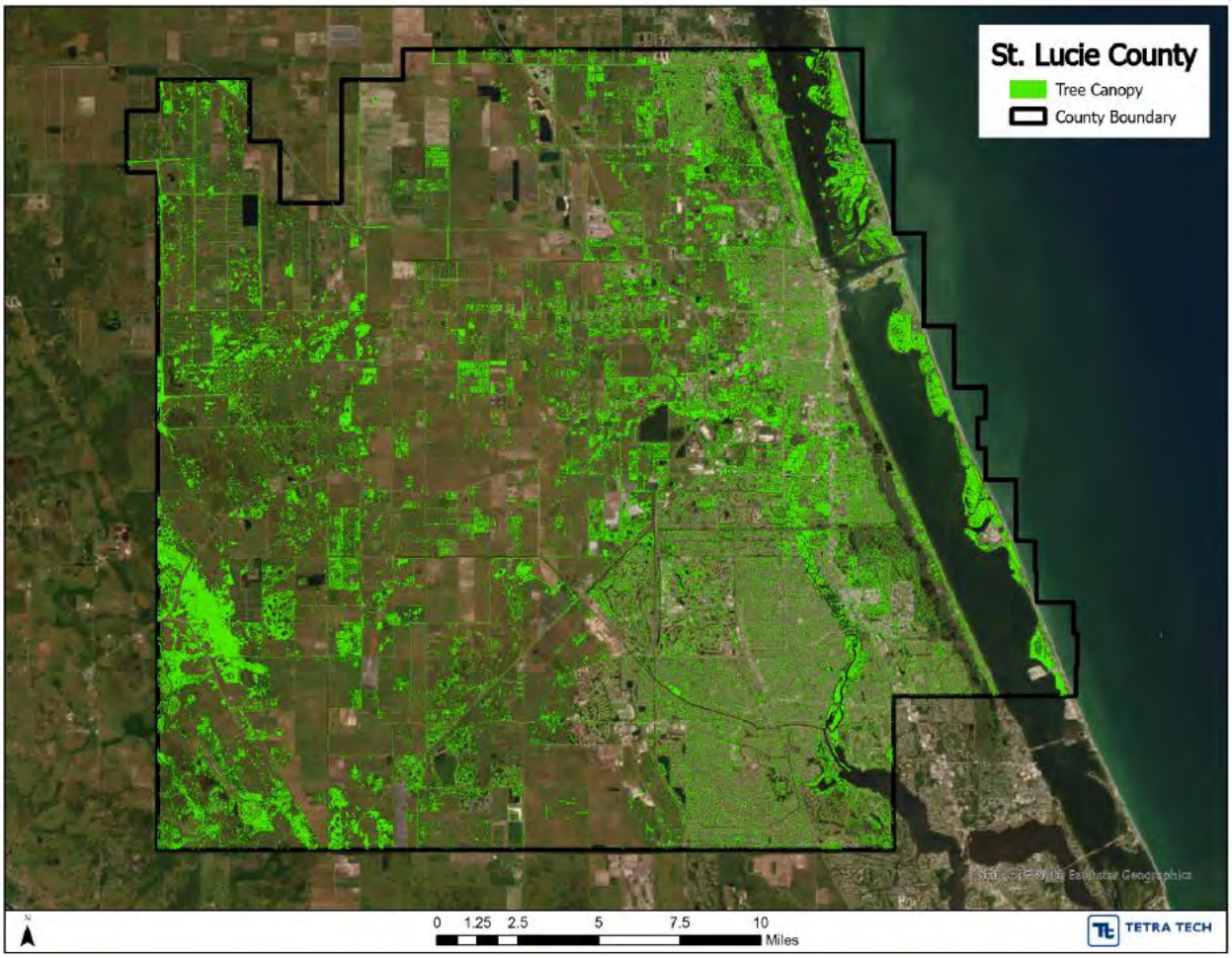


Figure 3. St. Lucie County Tree Canopy Coverage

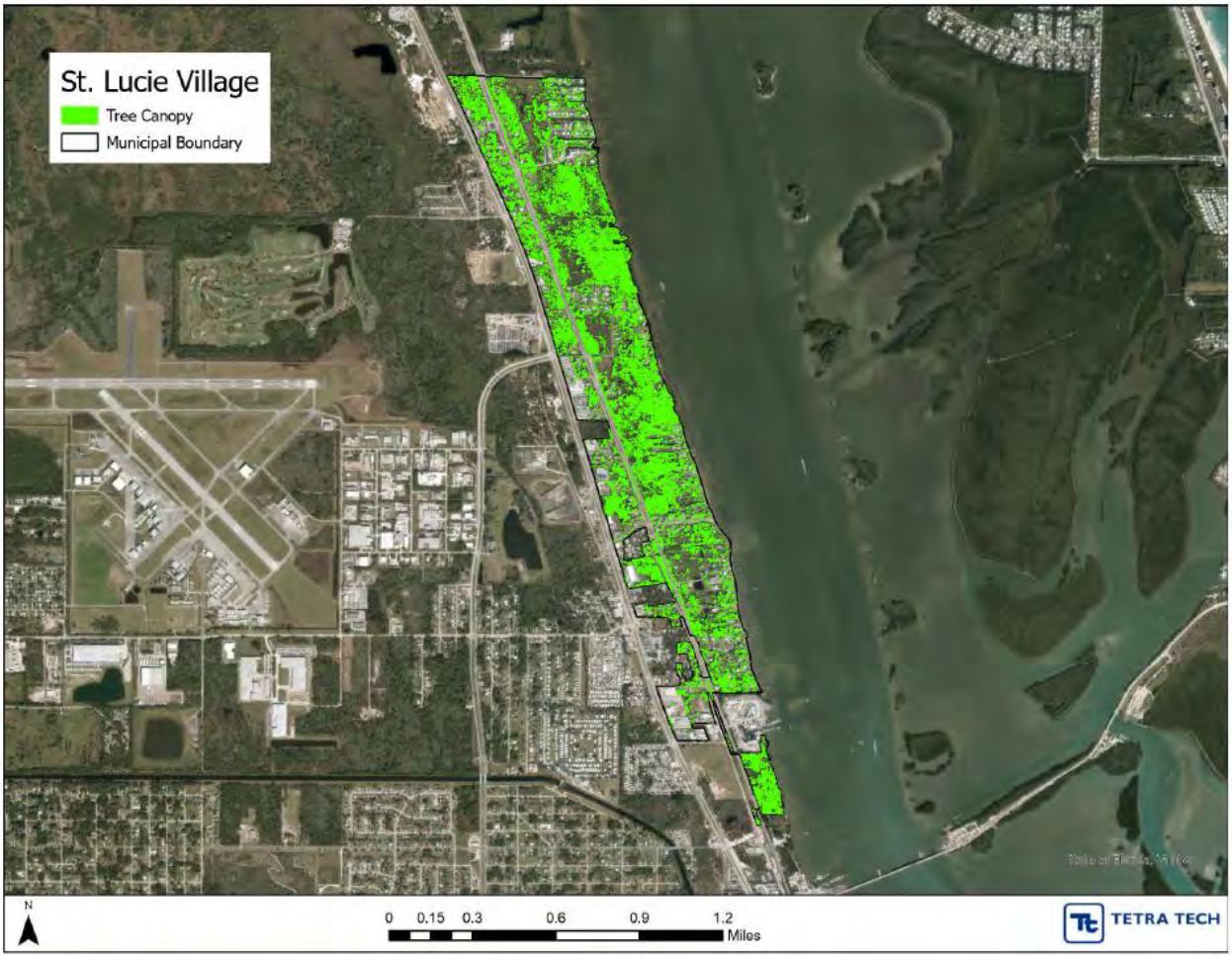


Figure 4. St. Lucie Village Tree Canopy Coverage

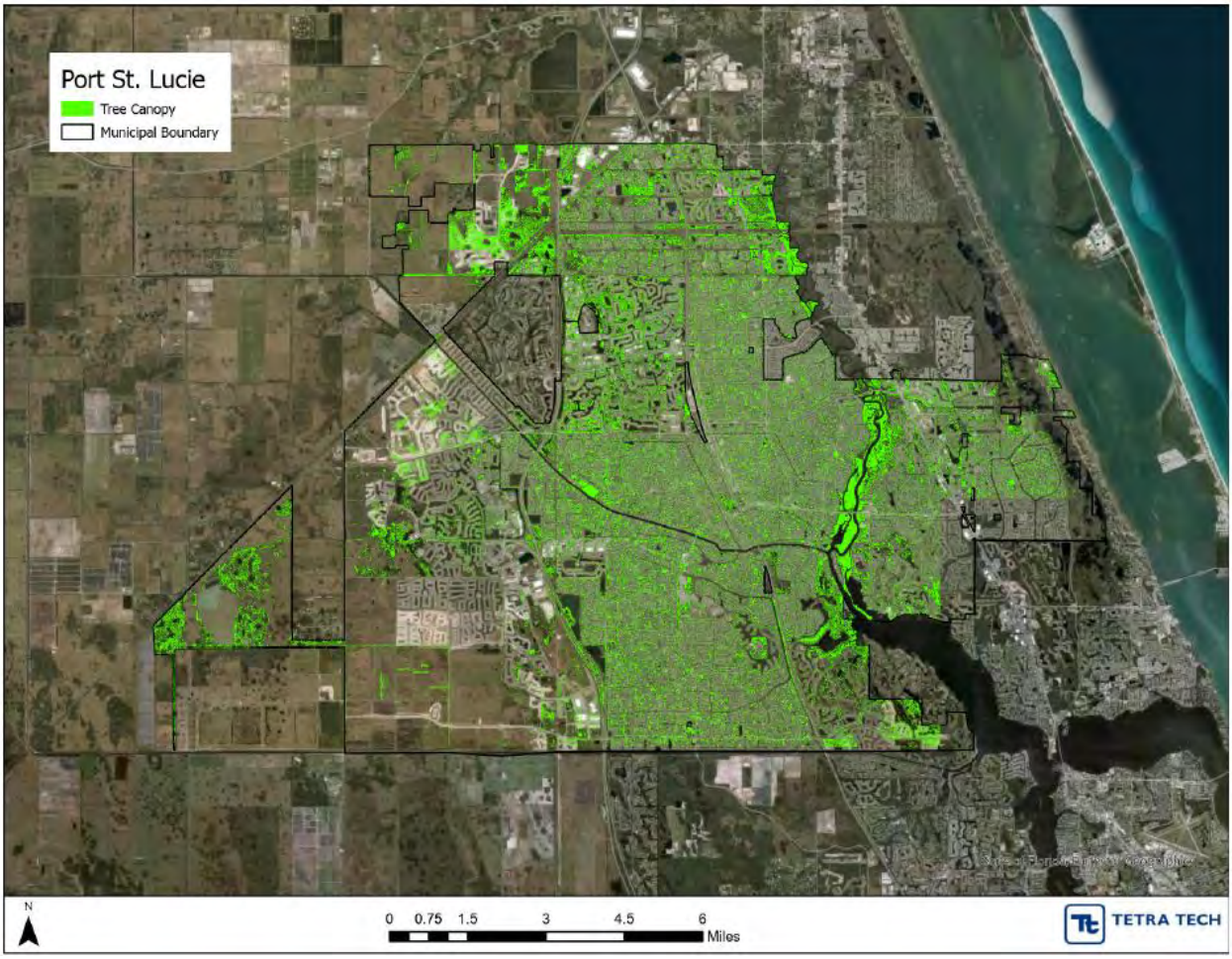


Figure 5. Port St. Lucie Tree Canopy Coverage

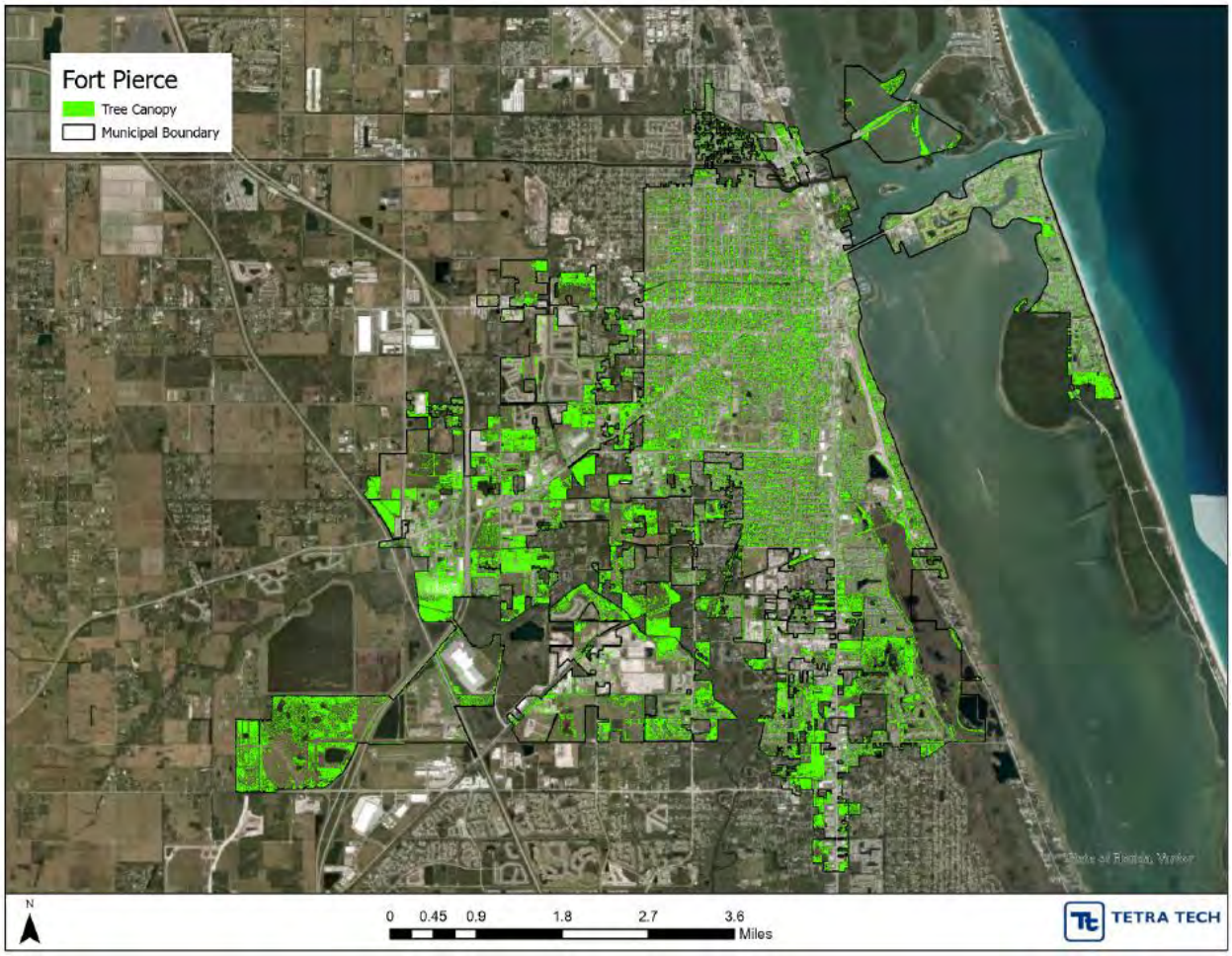


Figure 6. Fort Pierce Tree Canopy Coverage

# APPENDIX F: LAND PRESERVATION COST-BENEFIT ANALYSIS

In Process

# APPENDIX G: NATIONAL FLOOD INSURANCE PROGRAM COMMUNITY RATING SYSTEM REVIEW

September 11, 2025

# Achieving Flood Insurance Rate Reduction through FEMA's National Flood Insurance Program

FEMA's Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management practices that exceed the minimum requirements of the National Flood Insurance Program (NFIP). In Community Rating System communities, NFIP flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community's efforts. SLC and the municipalities recognize the importance of floodplain management as a community-based effort to prevent or reduce the risk of flooding, resulting in a more resilient community and reducing the financial impacts of flooding. For each higher Class rating a local government obtains (higher class rating receives a 'lower class number'), the entire community receives 5 percent off their NFIP flood insurance premiums. Currently, the City of Fort Pierce maintains a Class 6 rating, and St. Lucie County and Port St. Lucie a Class 5 rating, resulting in a 20 percent and 25 percent reduction in flood insurance rates for the entire community.

To advance to a CRS Class 4 rating, a community must not only earn over 3,000 CRS points but also meet a series of rigorous prerequisites outlined in the 2025 CRS Coordinator's Manual. These include maintaining a Building Code Effectiveness Grading Schedule (BCEGS) classification of 4/4 or better, enforcing higher regulatory standards such as a 1-foot freeboard requirement for all new construction throughout the Special Flood Hazard Area, and adopting a floodplain management plan that earns at least 50 percent of the maximum credit under Activity 510. Additional requirements include earning substantial credit for protecting natural floodplain functions and implementing life safety measures such as flood warning systems and dam failure threat mapping.

**CRS Class 4 Prerequisites and Recommendations for St. Lucie County**

St. Lucie County currently meets many of these prerequisites, including a BCEGS rating of 3/3, maintaining flood insurance on community-owned properties, and earning 794 points under Activity 430 for higher regulatory standards. The County also exceeds the required credit thresholds in floodplain planning steps 2, 5, and 8, and has earned 128 points for protecting natural floodplain functions through open space preservation, water quality improvements, and erosion control.

Despite these accomplishments, various gaps remain that must be addressed to achieve Class 4 status. The County must prepare and adopt a qualifying Watershed Master Plan that meets CRS criteria, including managing runoff from 100-year storm events and covering at least 50 percent of projected growth areas. Additionally, the County must provide dam failure threat mapping per Activity 630, which includes identifying areas that would be flooded by the failure of high-hazard-potential dams and the critical facilities that would be affected. Improvements are also needed in elevation certificate management, specifically achieving ≥90 percent accuracy and increasing credit for certificate procedures.

To reach the 3,000-point threshold and strengthen its CRS standing, SLC can pursue several strategic enhancements. These include updating the Program for Public Information to incorporate stakeholder-endorsed outreach projects under Activity 330, enhancing GIS datasets under Activity 440 by adding natural hazard layers, floodplain data in tax assessments, and building elevation data. Under Activity 540, the County can develop standard operating procedures for inspection and

maintenance of natural drainage systems, problem sites, and County-owned storage basins. Additional credit opportunities exist through stream dumping regulations and capital improvement programs. Continued pursuit of TsunamiReady status under Activity 610 and coordination with state dam safety programs and critical facility operators under Activity 630 will further support life safety measures and resilience goals. Together, these actions will not only position St. Lucie County to achieve a CRS Class 4 rating but also enhance its overall flood resilience, reduce financial impacts on residents, and align with broader regional sustainability and hazard mitigation objectives. The full CRS analysis can be found within Appendix B.

## CRS Prerequisites for CRS Class 4

### *2025 CRS Coordinators Manual*

The *2025 Community Rating System (CRS) Coordinators Manual* establishes enhanced expectations and prerequisites for communities seeking to achieve or maintain a CRS Class 4 or better designation. This classification recognizes jurisdictions that demonstrate exceptional commitment to floodplain management through comprehensive programs that minimize flood losses, protect life and property, preserve natural floodplain functions, and prevent future flood damage.

Achieving a Class 4 rating requires not only the accumulation of sufficient CRS points but also verification that the community's regulatory, planning, and operational frameworks meet the highest standards of FEMA's National Flood Insurance Program (NFIP). Advancing from a Class 5 to a Class 4 provides a significant benefit to property owners, increasing the NFIP flood insurance premium discount from 25% to 30%, resulting in substantial annual savings across the community.

This report summarizes the prerequisites and performance measures for achieving a Class 4 CRS rating and evaluates the County's current progress toward those benchmarks. It identifies existing accomplishments, outlines areas where additional documentation or program enhancements are needed, and recommends targeted strategies to both meet the Class 4 prerequisites and achieve the 3,000-point threshold for advancement. By strengthening watershed management, enhancing life safety planning, and expanding natural floodplain protection, the County can continue to position itself as a regional leader in resilience and proactive flood risk reduction.

In order to achieve and maintain a **Class 4 or better** CRS classification, a community must both (1) earn enough points for the class and (2) meet the following prerequisites:

- **Meet all Class 6 prerequisites.**
- **Maintain a BCEGS classification of 4/4 or better.**
- **Demonstrate actions to eliminate or minimize future flood losses.**
  To do this, a Class 4 or better community must receive credit for the following CRS activities:

**Activity 430 – Higher Regulatory Standards**

- The community must enforce higher standards for managing new development in the floodplain.
- Requirements include:

    1. Adoption and enforcement of at least a **1-foot freeboard requirement** (including equipment and mechanical items) for all new construction, substantial improvements, and reconstruction due to substantial damage. This also applies to buildings allowed to be floodproofed, throughout the SFHA (except in areas receiving OSP credit under Activity 420).
    2. In unnumbered A, AO, and V Zones, the community must first determine a base flood elevation (BFE) using techniques credited under Activity 410 (Flood Hazard Mapping).

The community must earn **at least 700 points (after impact adjustment)** under other elements of Activity 430 and under Sections 422.a, f, and g of Activity 420 (Open Space Preservation).**Activity 450 – Stormwater Management**

- The community must receive credit under Section 452.b for its watershed management plan(s) (WMP):

    1. **WMP1:** 90 points (before impact adjustment) for meeting all credit criteria for WMP.
    2. **WMP2:** 30 points (before impact adjustment) for managing runoff from all storms up to and including the 100-year event, ensuring no increase in downstream flood flows.
    3. **Impact Adjustment:** rWMP = 0.5 or greater. Alternatively, at least 50% of the watershed area expected to see future growth must be covered by one or more credited watershed management plans.

**Activity 510 – Floodplain Management Planning**

- The community must adopt and implement a floodplain management plan that earns **at least 50% of the maximum credit** under Activity 510 (after impact adjustment).
- This 50% threshold must also include at least **50% of the available points** in **planning steps 2, 5, and 8.**

**Natural Floodplain Functions**

- Obtain a minimum of **100 credit points (after impact adjustment)** from one or a combination of the following elements:

    - **420 – Natural Functions Open Space (NFOS)**
    - **420 – Natural Shoreline Protection (NSP)**
    - **430 – Prohibition of Fill (DL1)**
    - **440 – Additional Map Data (AMD12) – Natural Functions Layer**
    - **450 – Stormwater Management** credits for:

- Managing the volume of stormwater runoff (SMR, DS bonus credit)
- Low Impact Development (LID)
- Watershed Management Plan (WMP), credit items 3, 5, 6, and 7
- Erosion and Sediment Control (ESC)
- Water Quality (WQ)

- **510 – Natural Floodplain Functions Plan (NFP)**

**Life Safety Measures**

Communities must:

- Obtain some credit under **Activity 610 – Flood Warning and Response.**
- Provide a **description of dam failure threats**, including a map of all areas that would be flooded by the failure of each high-hazard-potential dam, plus the types of buildings and critical facilities that would be affected (per Activity 630, Section 631.b).

**St. Lucie County Comparison to CRS Class 4 Prerequisites Table**

To simplify the CRS Class 4 Prerequisites, the chart below lists prerequisites and compares the requirement to St. Lucie County's current accomplishments under the CRS program.

| Class 4 Prerequisite | Credit | Met |
|---|---|---|
| Community agreed to show any draft LiMWAs on the final FIRM, if applic. | | X |
| Enough points to warrant the Class (3,000+) | 2,519 | |
| If one or more rep loss properties, actions set in Sections 501-504 are met | | X |
| All flood insurance policies on community owned properties are maintained | | X |
| BCEGS of 4/4 or better | 3/3 | X |
| **Activity 310 Elevation Certificates** | | |
| Maintain all required floodplain-related construction certificates | | X |
| ≥ 90% accuracy on construction certificates during annual review | | X |
| Credit for construction certificate management procedures (CCMP) | 38 | |
| **Activity 430 Higher Regulatory Standards** | | |
| 1ft Freeboard throughout the SFHA | | X |
| ≥ 700 pts. in all other 430 elements, including 422.a., e., and f. in 420 Open Space Preservation (after to imp. adj.) | 794 | |
| 430—Development limitations (DL), | | |
| 430—Freeboard (FRB), | 65 | |
| 430—Cumulative substantial improvements (CSI), | | |
| 430—Lower substantial improvements (LSI), | | |
| 430—Protection of critical facilities (PCF), | | |
| 430—Enclosure limits (ENL), | | |
| 430—Building codes (BC), | 78 | |

| Class 4 Prerequisite | Credit | Met |
|---|---|---|
| 430—Local drainage protection (LDP), | 60 | |
| 430—Manufactured home parks (MHP), | | |
| 430—Coastal A Zones (CAZ), | | |
| 430—Special flood-related hazards regulations (SHR), | | |
| 430—Other higher standards (OHS), | | |
| 430—Regulations administration (RA), | 20 | |
| 420—Open space preservation (OSP), | 507.5 | |
| 420—Open space incentives (OSI), | 15 | |
| 420—Low-density zoning (LZ). | 48 | |
| **Activity 450 Watershed Master Plan (WMP)** | | |
| Adopt a Watershed Management Plan | | |
| 90 pts. for meeting all WMP prerequisites | | |
| 30 pts. for 452.b.2 (managing all storms up to and including 100-yr. event) | | |
| rWMP = 0.5 or greater (or show that WMP covers watersheds that comprise at least 50% of its growth) | | |
| **Activity 510 Floodplain Management Plan (FMP)** | | |
| Adopt a Floodplain Management Plan | | X |
| ≥ 50% of the maximum credit under Activity 510 after imp. adj. (≥ 191 pts.) | 251 | X |
| ≥ 50% of available pts. in Planning Step 2 (≥ 60 pts.) | 81 | X |
| ≥ 50% of available pts. in Planning Step 5 (≥ 26 pts.) | 27 | X |
| ≥ 50% of available pts. in Planning Step 8 (≥ 30 pts.) | 45 | X |
| **Natural Floodplain Functions** | | |
| At least 100 pts. (after impact adjustment) from one or a combination of the following elements: | 128 | X |
| 420 – Natural functions open space (NFOS) | 84 | |
| 420 – Natural shoreline protection (NSP) | | |
| 430 – Prohibition of fill (DL1) | | |
| 440 – Additional map data (AMD) natural functions layer | 14 | |
| 450 – Managing the volume of stormwater runoff (SMR – DS) | | |
| 450 – Low impact development (LID) | | |
| **450 – Watershed management plan (WMP), Credit point items 3, 5, 6 and 7** | | |
| 450 – Erosion and Sediment Control (ESC) | 10 | |
| 450 – Water Quality (WQ) | 20 | |
| 510 – Natural floodplain functions plan (NFP) | | |
| **Life Safety Measures** | | |
| 610 – obtain some credit under this Activity | 255 | X |
| 620 – meet prerequisite 621.b(2) [map of all areas protected by levees] | | N/A |
| 630 – meet prerequisite 631.b(1) [map of all areas flooded by the failure of a high hazard dam and critical facilities that would be flooded.] | | |

** The community may propose alternative approaches to these prerequisites that are more appropriate for local conditions.

## Recommendations for Achieving a CRS Class 4 Prerequisites

**Activity 450 Watershed Master Planning**

Prepare and adopt a qualifying Watershed Master Plan that meets the CRS qualifications for credit. The plan would need to have an area ratio of .05 or greater and show that the plan covers watersheds that comprise at the 50% of its growth.

**Life Safety**

High Hazard Dam - Have a description of the dam failure threat, including a map of all areas that would be flooded by the failure of each high-hazard-potential dam that affects the community, and the types of buildings (residential, commercial, etc.) and critical facilities that would be flooded. This is the same as activity credit criteria (2) under Activity 630 (Dams), Section 631.b.

## Recommendations for Increasing CRS Score to Achieve 3,000 CRS Points

**Activity 330 – Outreach**

**Stakeholder Delivery (Max 50 points)**

- **Opportunity:** Update the Program for Public Information (PPI) to include **stakeholder-endorsed outreach projects**.
- **Benefit:** Strengthens PPI and Outreach Projects scoring while also increasing stakeholder engagement.

---

**Activity 440 – Flood Data Maintenance**

**Additional Map Data (Max 30 points)**
Add the following datasets to the GIS:

- Other natural hazards (**AMD7**)
- Floodplain data in the tax assessment database (**AMD9**)
- Old FIRMs (**AMD10**)
- Building elevation data (**AMD13**)

---

**Activity 450 – Stormwater Management**

**Watershed Master Plan (Max 120 points)**

- **Opportunity:** Develop a **Watershed Master Plan** in coordination with the **Vulnerability Assessment** and **Regional Resilience Plan**.
- **Benefit:** Integrates resilience planning and maximizes watershed-based credit.

---

**Activity 540 – Drainage System Maintenance**

- **Channel Debris Removal (Max 200 points):** Develop **SOPs for inspection and maintenance** of natural drainage system components.
- **Problem Site Maintenance (Max 50 points):** Develop SOPs for inspection and **more frequent maintenance** of drainage problem sites.
- **Storage Basin Maintenance (Max 120 points):** Develop SOPs for inspection of **County-owned storage basins**.
- **Capital Improvement Program (Max 70 points):** Credit possible if the County funds drainage projects **and** receives credit for problem site maintenance.
- **Stream Dumping Regulation (Max 30 points):** Local and state regulations may be credited **if channel debris removal is credited**.

**Resources:**

- *CRS Credit for Drainage System Maintenance Quick Guide*
- *CRS Credit for Drainage System Maintenance*

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**Activity 610 – Flood Warning and Response**

**TsunamiReady (Max 30 points)**

- Continue to pursue **TsunamiReady status** from the National Weather Service.

---

**Activity 630 – Dams**

- **State Dam Safety Program (Max 45 points):** Credit based on state's program.
- **Dam Failure Threat Recognition System (Max 30 points):** Program to notify EM when threat arises.
- **Dam Failure Warning (Max 35 points):** Program to disseminate public warning.
- **Dam Failure Critical Facilities Planning (Max 20 points):** Coordination with **critical facility operators** for dam failure warning/response.

# APPENDIX H: PUBLIC WORKSHOP SURVEY RESULTS

# May 2025 Public Workshop

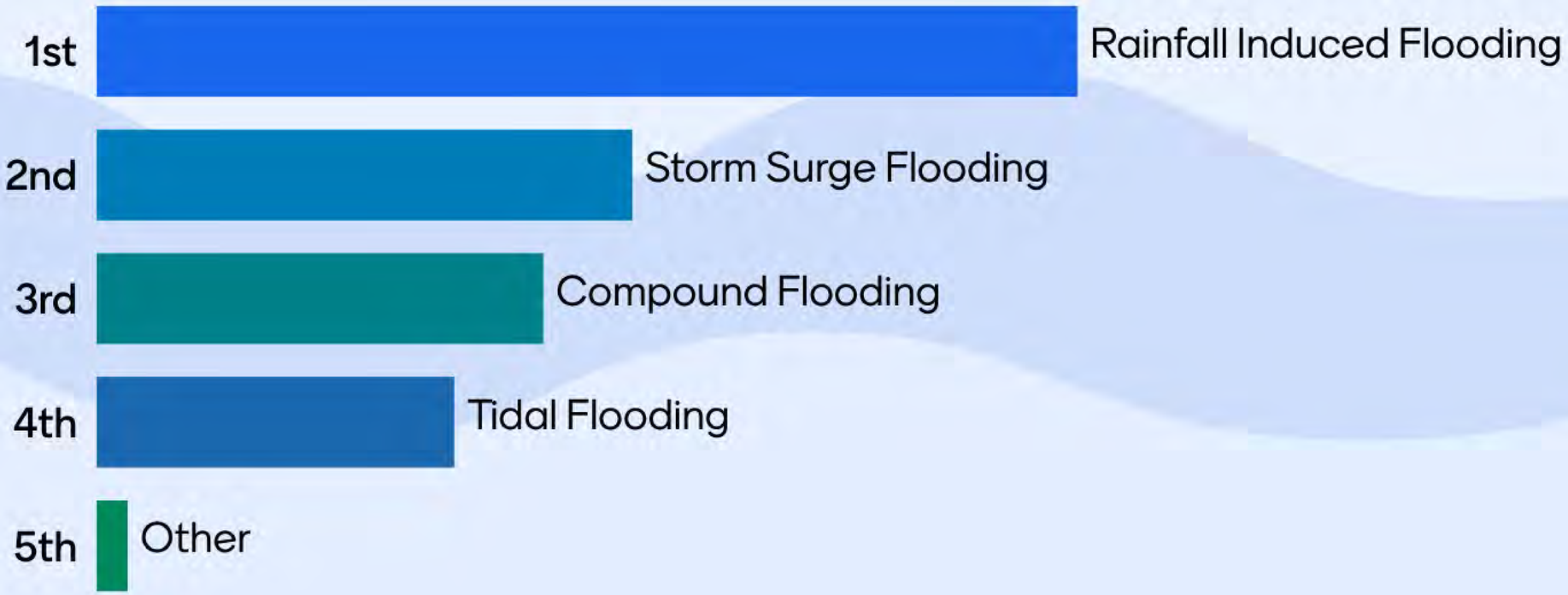
Mentimeter

# Have you observed flooding in your neighborhood?

1

Mentimeter

# What type of flooding have you observed throughout St, Lucie County?

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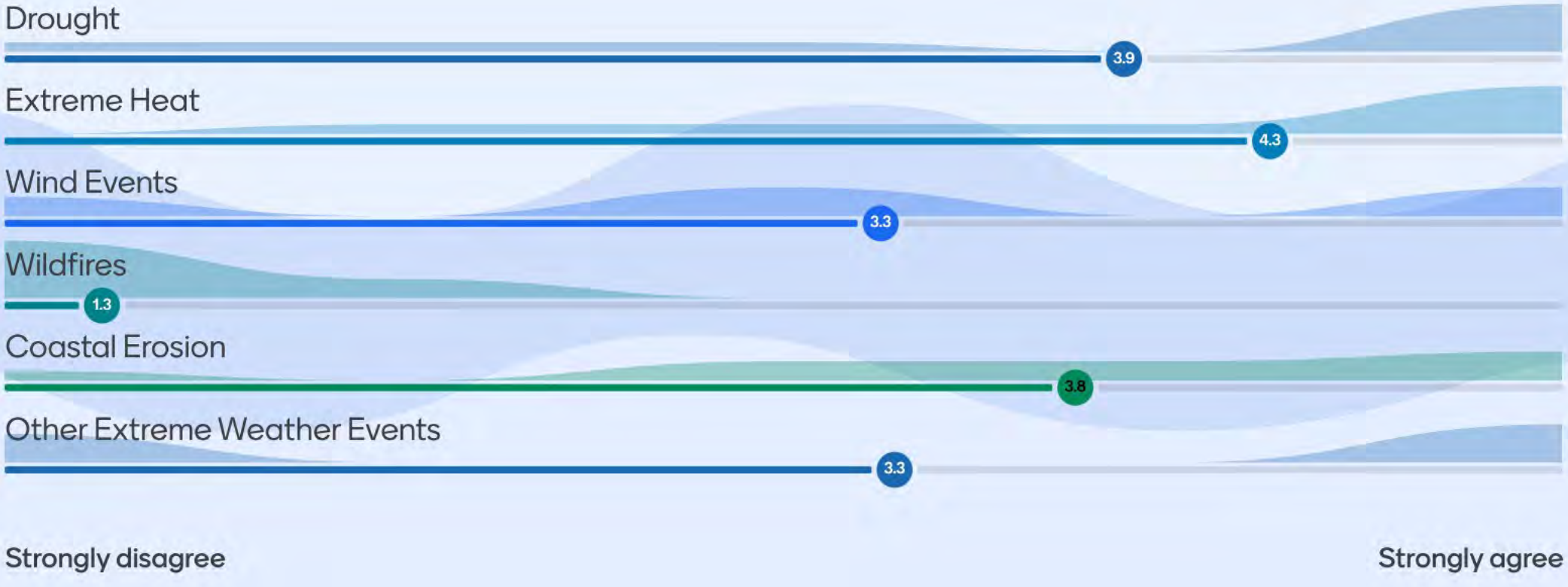
# Have you observed other extreme weather events?



# What type of community assets are important to you and your family during or after an emergency event?

Hospital

Hospitals

Hospital, grocery store

Home, hospital, roads, gas stations, grocery stores and hardware stores.

gas station, FPL

Roads, communication platforms, EOC updates, hospitals, gas stations.

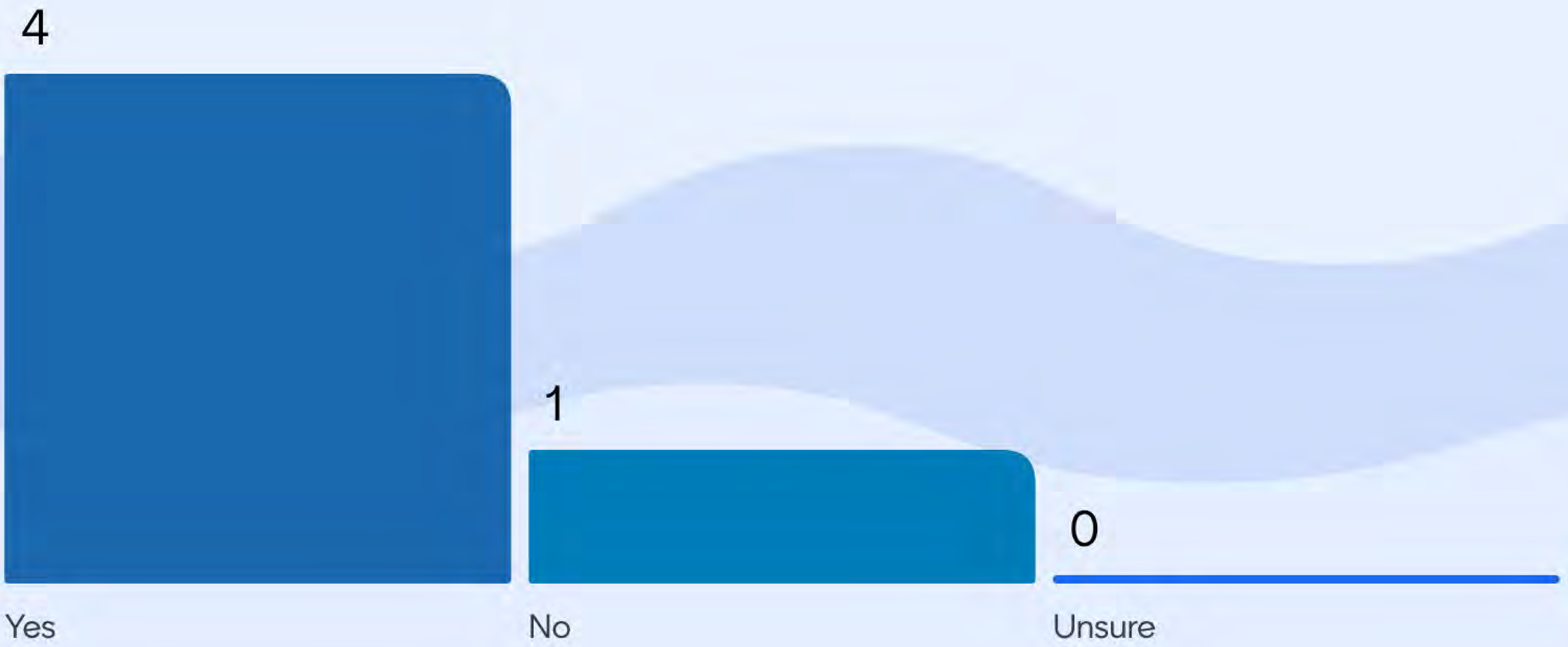
Roads, Hospitals, Emergency Responders, Fuel Stations, Grocery stores

Hospital, Gas station, grocery stores.

# May 2025 Public Workshop

Mentimeter

# Have you observed flooding in your neighborhood?

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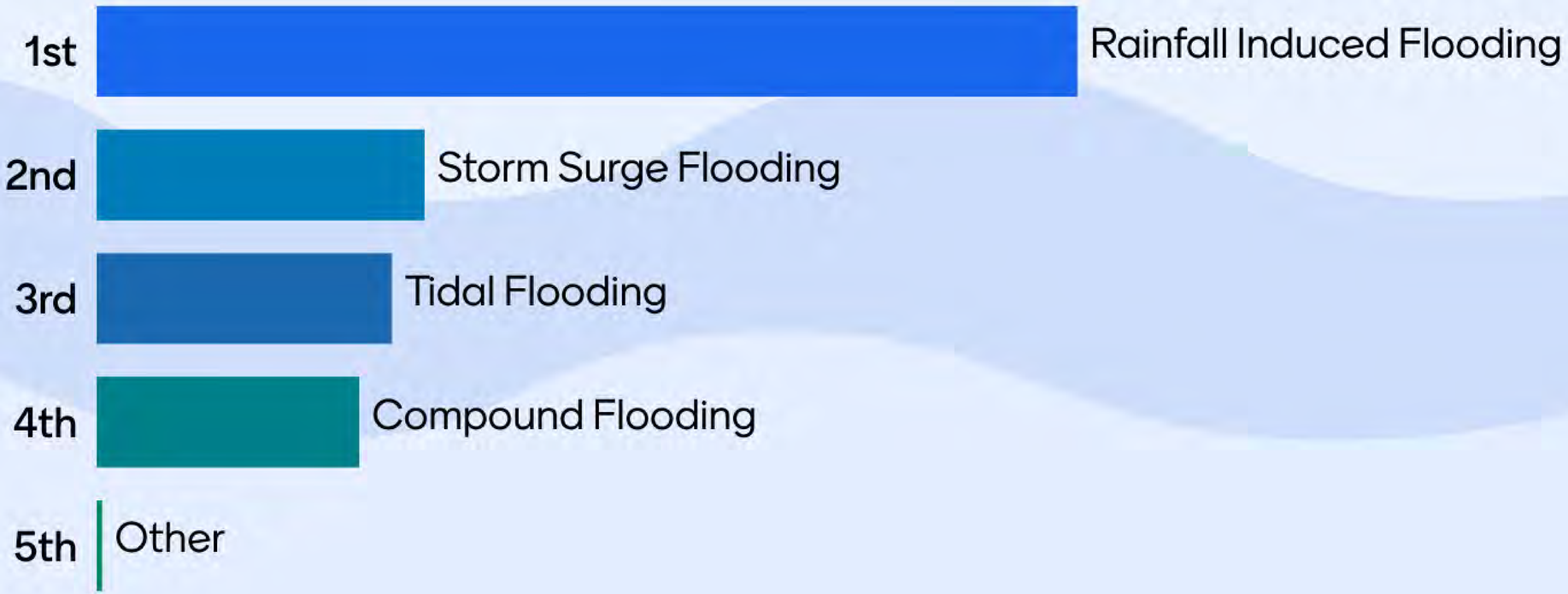
Mentimeter

# What type of flooding have you observed throughout St, Lucie County?




6

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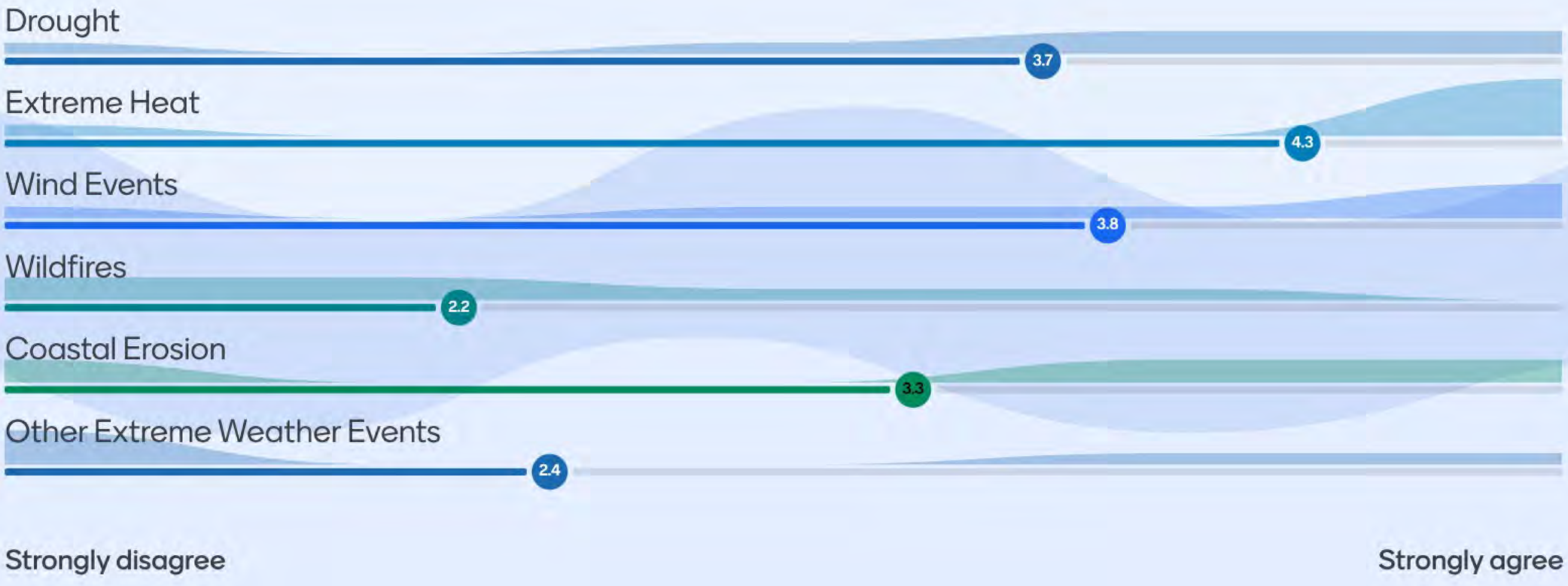
# Have you observed other extreme weather events?




1
6

# What type of community assets are important to you and your family during or after an emergency event?

Communication, hospitals, water

Electricity & clean water.

Publix and gas stations

Gas stations

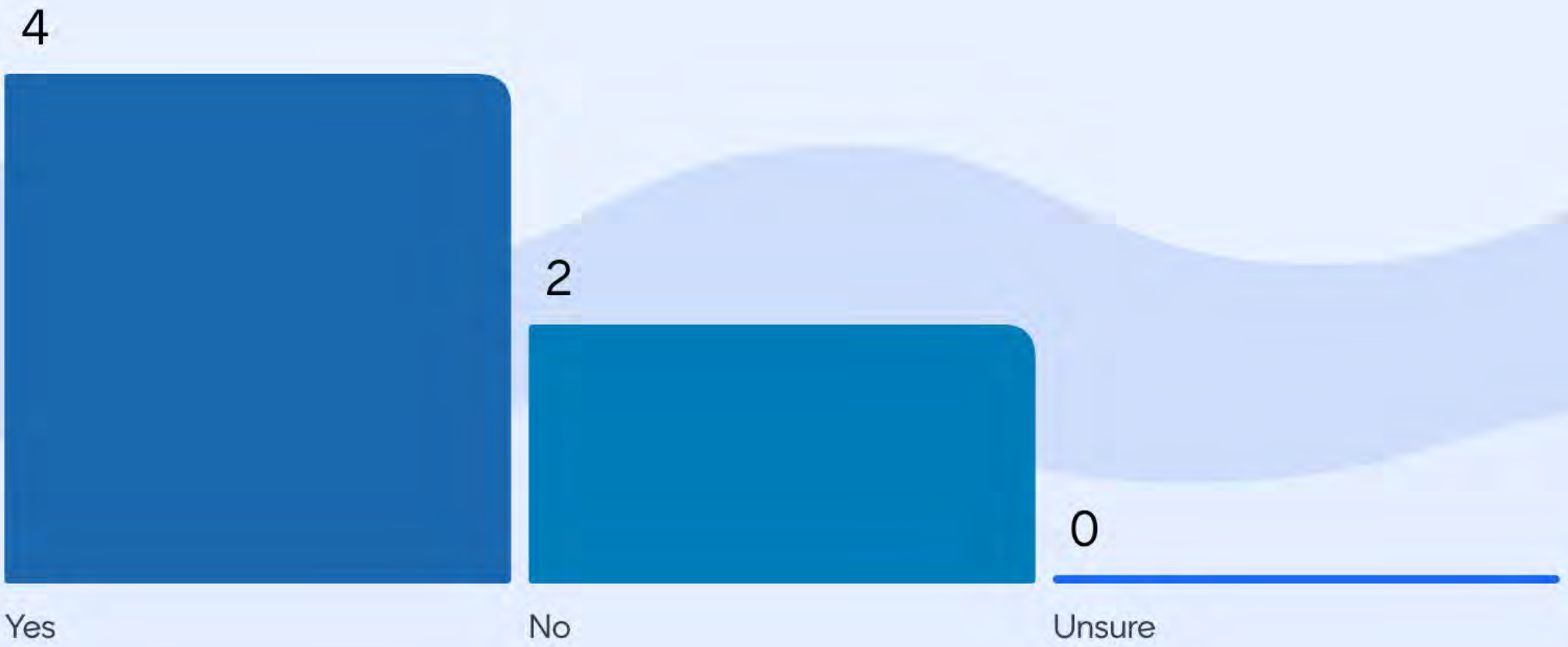
Cell phone towers

Electricity, roadways, shelters, distribution centers, communications, hospitals, gas stations

# May 2025 Public Workshop

Mentimeter

# Have you observed flooding in your neighborhood?



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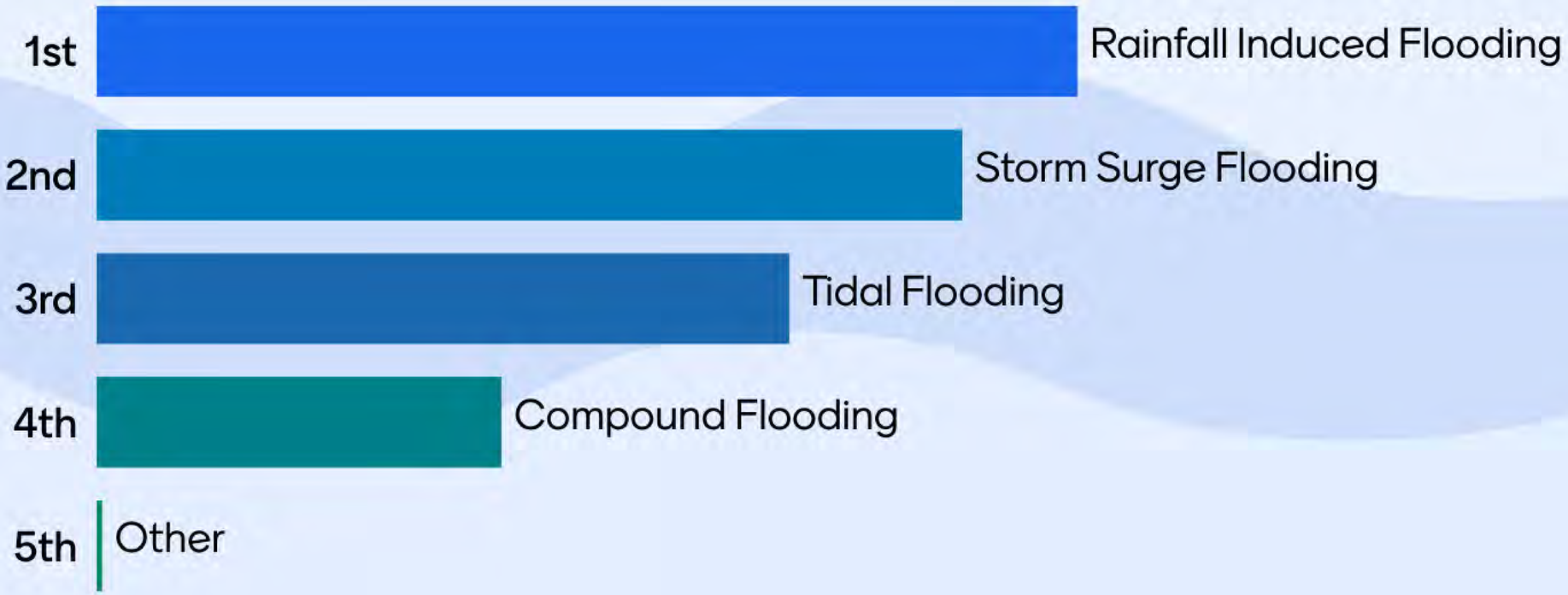
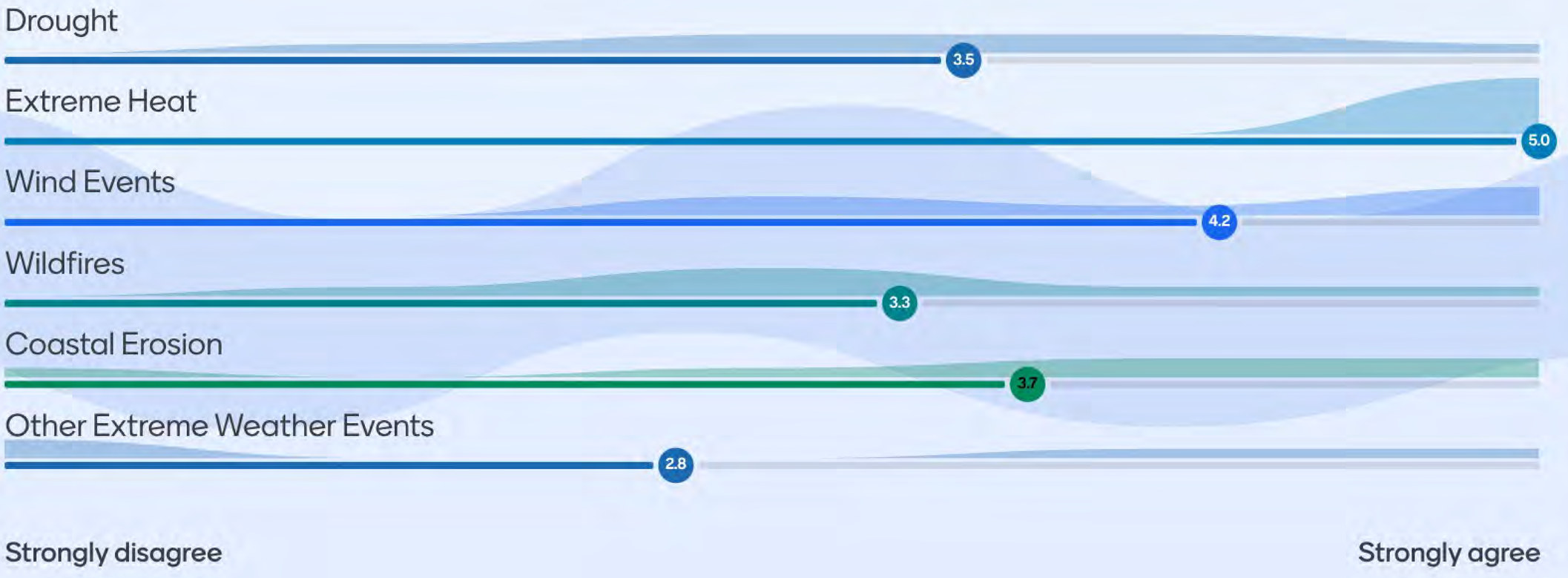
# What type of flooding have you observed throughout St, Lucie County?




1
4

Mentimeter

# Have you observed other extreme weather events?




2
6

Mentimeter

# What type of community assets are important to you and your family during or after an emergency event?

- Costco
- Gas stations
- Parks and library.
- Grocery
- Bank
- Electricity, water, medical, roads,
- Urgent care
- Schools

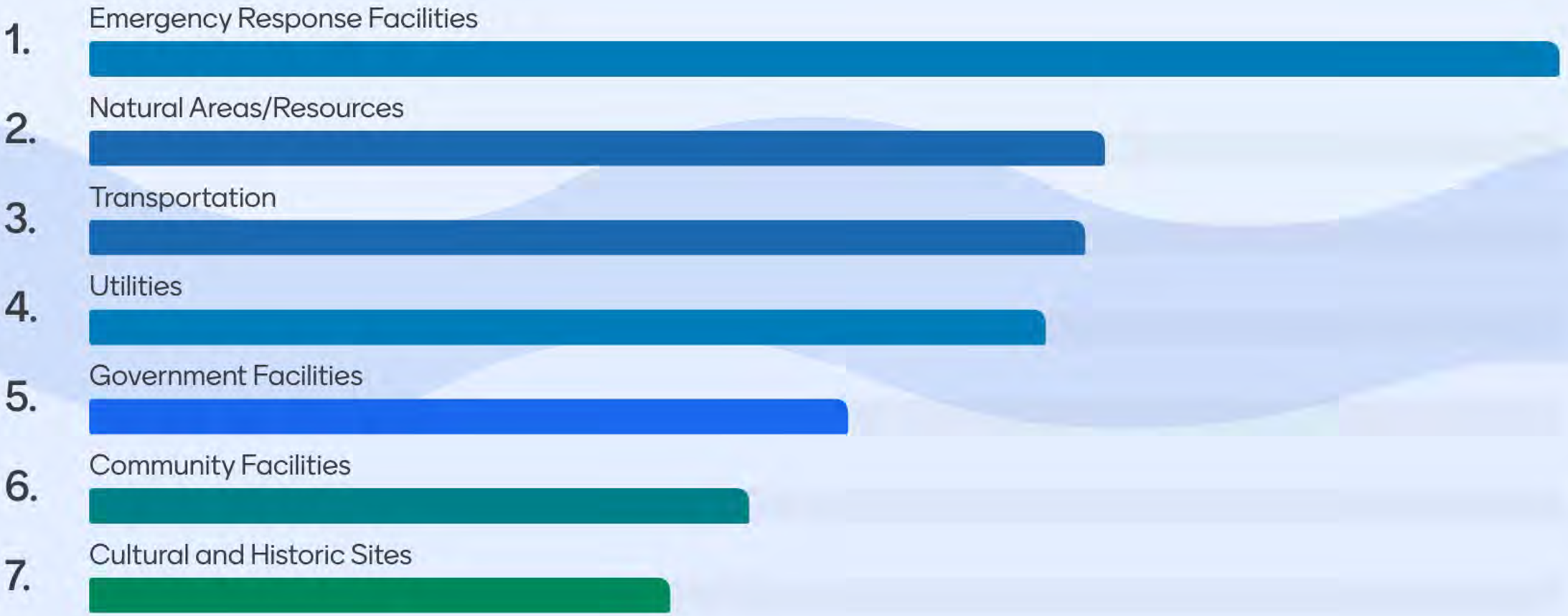
Mentimeter

# What type of community assets are important to you and your family during or after an emergency event?

Communications, electricity, utilities, highways and roads, access to food, schools,

Mentimeter

# Which types of assets should be prioritized for climate adaptation efforts?



# October 2026 Public Workshop

Mentimeter

# How is your community impacted when critical assets are inaccessible as a result of a climate event?

Life safety

Lack of resources and access to required facilities

Life safety

Parents cannot work due to businesses being closed, but even when they are back Oppenheimer, they cannot work until schools are opened

Life safety

Major health issue

Hospitals

Emergency services are threatened.

1

8

Mentimeter

# How is your community impacted when critical assets are inaccessible as a result of a climate event?

Depressed economy

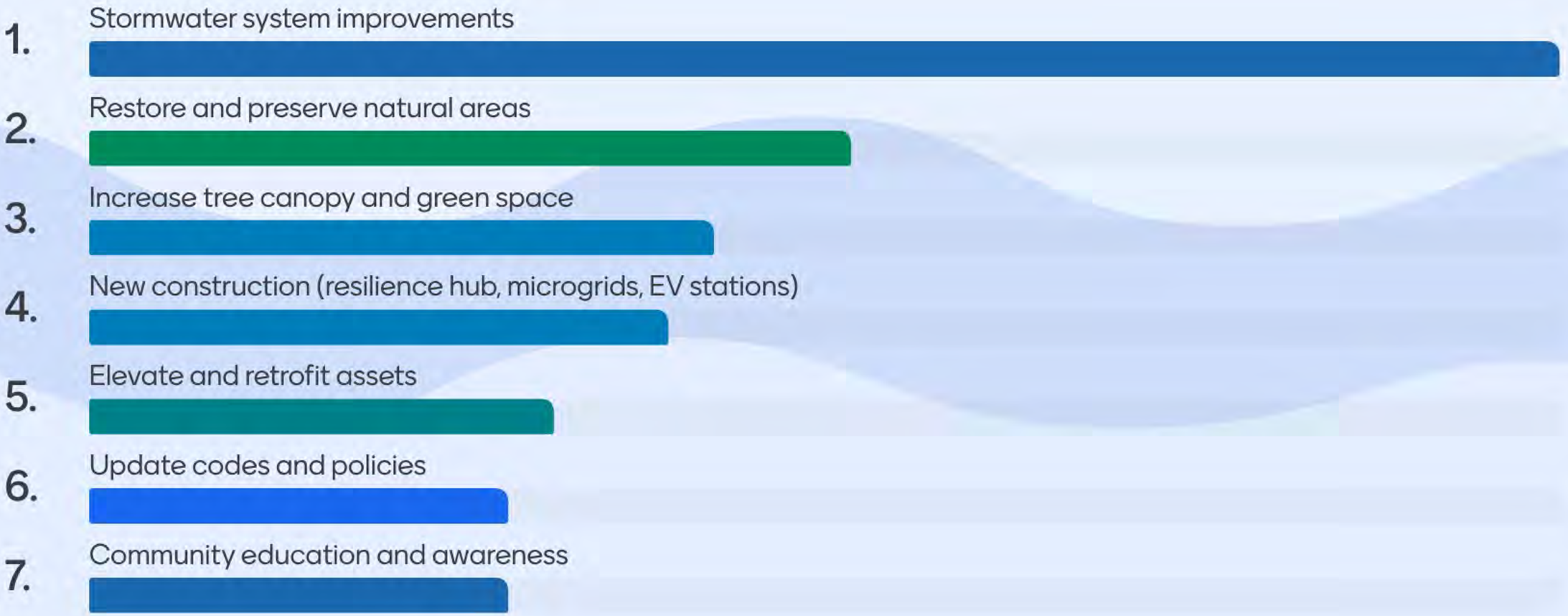
Lack of resources

Concerns for the elderly and special needs populations are at a severe disadvantage. Heat, food etc are major concerns.

Electricity is necessary for medically vulnerable

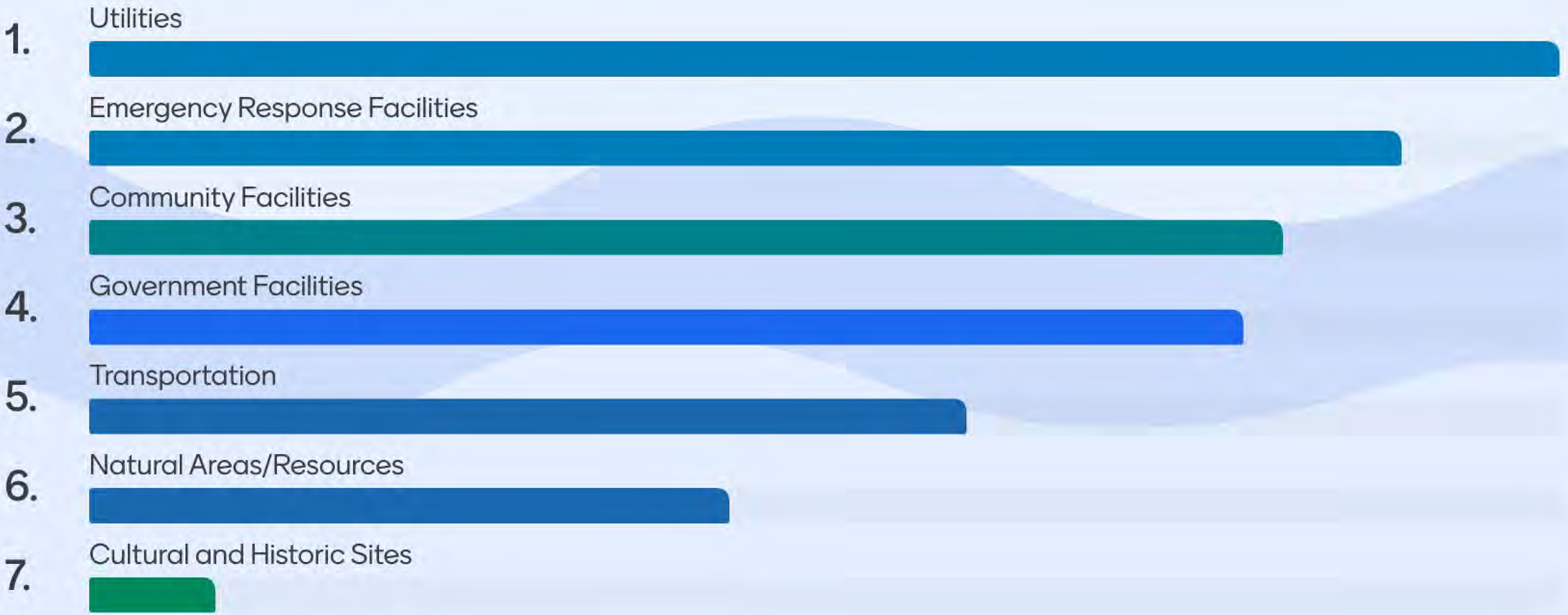
1 8

# Which adaptation efforts would you like to prioritize for your community?



# November 2025 Public Workshop

# Which types of assets should be prioritized for climate adaptation efforts?



Mentimeter

# How is your community impacted when critical assets are inaccessible as a result of a climate event?

People suffer

Housing damage “loss of utilities Financial hardship

It makes for tougher recovery when the community isn't able to access critical services.

Debris management

Emotionally, Health and well being plus Financially

People move away

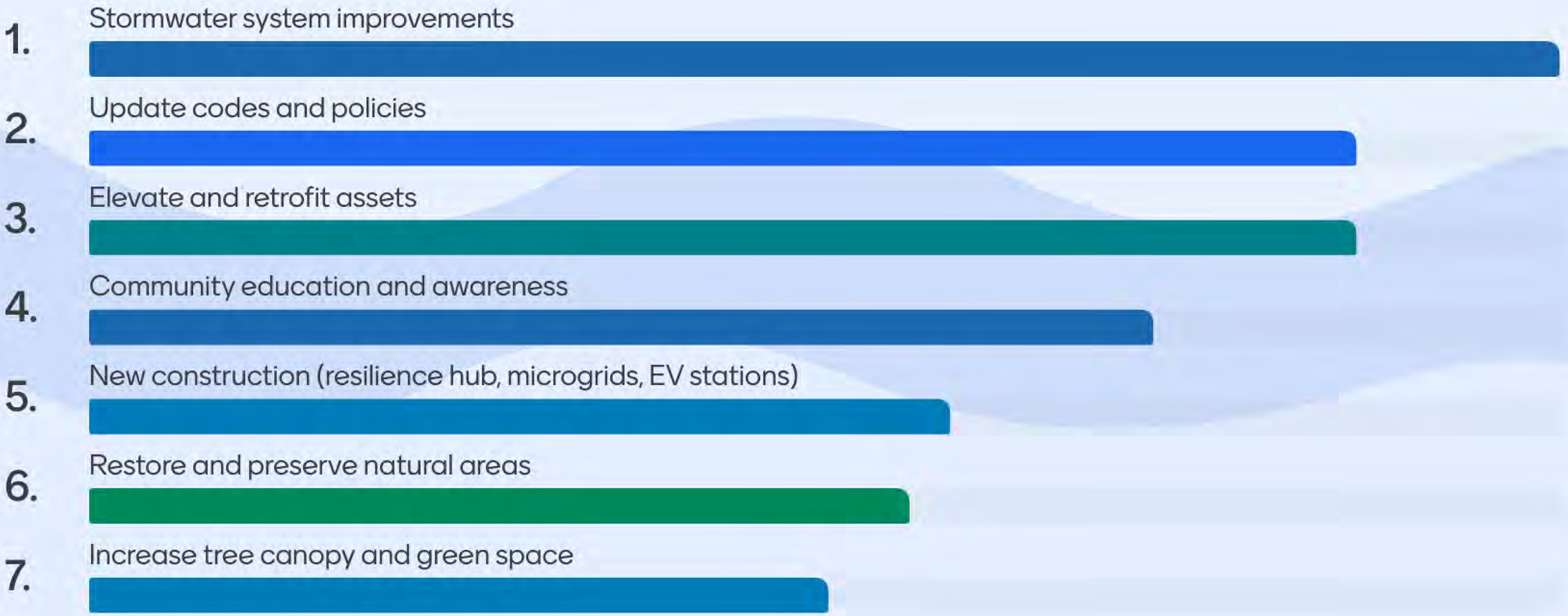
Deeper sense of loss and emotional toll

2

6

Mentimeter

# Which adaptation efforts would you like to prioritize for your community?

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# St. Lucie County
## Resilience Vulnerability Assessment
## Phase II – Other Hazards (RVA-OH)
Draft Report

resilient ST. LUCIE

ST. LUCIE COUNTY • PORT ST. LUCIE • FORT PIERCE • ST. LUCIE VILLAGE

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Community Development Block Grant -Mitigation

TETRA TECH

September 2025

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**Stephanie Torres**, St. Lucie Transportation Planning Organization

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To the residents, businesses, organizations and leaders of
St. Lucie County, Port St. Lucie, Fort Pierce, and St. Lucie Village

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# EXECUTIVE SUMMARY

Community resilience refers to the ability of governments, individuals, organizations, institutions, and businesses to anticipate, respond to, endure, and recover from both immediate and prolonged pressures stemming from natural hazards, like hurricanes, flooding and extreme heat events.

St. Lucie County (SLC), the City of Port St. Lucie (PSL), the City of Fort Pierce (FP) and St. Lucie Village (SLV) joined together to take a collaborative approach toward short- and long-term resilience planning, beginning with the development of comprehensive Resilience Vulnerability Assessments (RVA). Phase I of the RVAs, completed in June 2025, focused on flooding hazards (RVA-Flood). This assessment, Phase II, focuses on 'Other Hazards' (RVA-OH), including coastal erosion, extreme heat, drought, wind, wildfires, storm surge, inland flooding, and sea level rise (SLR).

Together, the RVAs represent a foundational step in developing a community-wide resilience plan, by taking a local, data-driven approach to evaluate the vulnerability of community-wide assets to various natural hazards. The forthcoming Regional Resilience Plan (RRP) will build from the work completed in the RVAs and will identify strategies that can be implemented to ensure a resilient future for the region.

SLC and the municipalities have a long history of collaborating to address a wide range of issues and implement initiatives that promote sustainability and resilience. From the acquisition and restoration of natural areas to the development of stormwater storage and conveyance systems, septic-to-sewer projects, water quality improvement efforts, and disaster preparedness, the St. Lucie community is well-positioned to continue to enhance its resilience to future threats.

Like many communities in Florida, SLC faces significant challenges from a rapidly growing population, loss of green space, and increasing impacts from natural hazards, including coastal erosion and flooding from SLR, extreme rainfall events and storms. For example, recent record rainfall events from Hurricanes Ian (2022) and Milton (2024) have highlighted vulnerabilities to flooding throughout much of SLC. In addition, marsh systems create a dynamic buffer attenuating impacts of SLR, while mangrove forests excel at stabilizing shorelines against erosion. This has led to a focus on more integrated stormwater management, wetlands and ecosystem protection, and low-impact development practices, all of which provide opportunities to build greater resilience.

The modeling results and analyses developed in this report are intended to help SLC better understand some of the challenges it faces, while at the same time helping the community and decision-makers identify key opportunities for moving forward toward a more resilient future.

This RVA and RRP together represent a critical initiative funded by the Florida Department of Commerce Community Development Block Grant Mitigation Program, through the U.S. Department of Housing and Urban Development. The project aims to address hazards and disaster risks throughout the County, aligning with Federal Emergency Management Agency (FEMA) community lifelines. The RVA scope represents a comprehensive approach to identifying hazards, evaluating vulnerabilities, and identifying potential mitigation opportunities.

The RVA includes a systematic process to identify the potential vulnerabilities of the community to adverse impacts from hazards. It incorporates scientific data from multiple federal, state, and local sources, as well as input from residents and organizations. Data collection for the project was extensive, incorporating public assets, networks, and essential systems crucial for the well-being of the community. Critical county, municipal and regionally significant assets were evaluated in four categories: Transportation and Evacuation Routes; Critical Infrastructure; Community and Emergency Facilities; and Natural, Cultural, and Historic Resources.

To identify the most impacted geographic areas and vulnerable assets throughout the County and municipalities, the RVA analyzed present day and future scenarios for the years 2040 and 2070, based on best-available science and data, including geographic information system (GIS) database details, modeling and mapping, and critical asset evaluation. Findings from this RVA will form the foundation for a SLC RRP addressing actions to increase the County's and the municipalities' adaptive capacity to chronic and acute stressors; prioritize needs of the community; identify funding sources; and provide guidance on proactive responses to potential risks and impacts. The RVA and subsequent RRP will ultimately provide the data, vulnerability analysis, strategic planning, adaptation evaluation, and community engagement, to create a more resilient and sustainable future for the County and municipalities.

SLC's diverse natural and coastal ecosystems, including forests, wetlands, mangroves, and beaches, play a critical role in environmental resilience, offering storm protection, water filtration, and habitat for wildlife. However, these systems face growing threats from sea level rise, extreme weather, and rapid development. Using the Sea Level Affecting Marshes Model (SLAMM), this analysis (Part II) evaluates how coastal habitats may shift over time, identifies vulnerable areas, and explores conservation and adaptation strategies to enhance long-term resilience. It emphasizes the importance of open space preservation, green infrastructure, and integrated planning to mitigate flood risks and safeguard ecosystem services. The analysis provides actionable insights for decision-makers, planners, and environmental managers, highlighting the urgent need for proactive measures and flexible strategies to protect communities and natural resources.

Public stakeholders and steering committee members played a vital role in shaping the RVA by providing essential input and feedback. More than two dozen meetings or workshops were held to provide information on resilience planning and the development of the RVA, eliciting input from 11 different groups from neighborhood associations and non-profit organizations to government and agency boards and committees. SLC and the municipalities established a resilience steering committee of key collaborators, comprising representatives from diverse backgrounds. The resilience steering committee assisted in shaping the resilience project by reviewing goals, offering input on study direction, identifying geographic context, guiding modeling methodologies, pinpointing available data and resources, providing specific asset information, and reviewing project findings. The steering committee represented various St. Lucie County, Port St. Lucie, Fort Pierce and St. Lucie Village departments including Planning & Development Services, Public Works, Utilities & Solid Waste, Engineering, Emergency Operations, and Environmental Resources. The resilience steering committee was also comprised of various member agencies, including representatives from SLC Florida

Department of Health, SLC School District, SLC Economic Development Council, St. Lucie Transportation Planning Organization, and the Treasure Coast Regional Planning Council.

The modeling results and analyses developed in this report are intended to help SLC and its municipalities better understand some of the challenges it faces, while at the same time helping the community and decision-makers identify key opportunities for moving forward toward a more resilient future. It's an important step in developing a comprehensive approach to adapt to and mitigate the effects of chronic and acute natural hazards, recognizing that identifying and addressing vulnerabilities, especially those related to critical assets, before they fail is the most fiscally responsible strategy approach to long-term resilience. By adopting a forward-thinking philosophy, the County and municipalities foster a sense of ownership and shared responsibility for addressing risks, while enhancing preparedness and responsiveness.

# Table of Contents

**EXECUTIVE SUMMARY ..... ES-1**

**PART 1: MULTIPLE HAZARD ASSESSMENT**

**1.0 INTRODUCTION ..... 1-1**

1.1 Project Background ..... 1-1
1.2 St. Lucie County, Port St. Lucie, Fort Pierce, St. Lucie Village Background ..... 1-2
1.2.1 Geographical Setting and Characteristics ..... 1-2
1.2.2 Economic & Demographic Overview ..... 1-3
1.2.3 St. Lucie County Vulnerabilities ..... 1-5

**2.0 RESILIENCE VULNERABILITY ASSESSMENT OVERVIEW ..... 2-1**

2.1 Project Goals and Objectives ..... 2-1
2.2 Steering Committee ..... 2-1
2.3 Public Engagement ..... 2-2
2.3.1 Stakeholder and Public Outreach Events ..... 2-2

**3.0 HAZARDS ..... 3-1**

3.1 Hazard Inventory ..... 3-1
3.2 Hazard Evaluation ..... 3-1
3.3 Summary of Hazards ..... 3-2
3.3.1 Coastal Erosion ..... 3-2
3.3.2 Drought ..... 3-2
3.3.3 Extreme Heat ..... 3-3
3.3.4 Inland Flooding ..... 3-5
3.3.5 Storm Surge Flooding ..... 3-5
3.3.6 Wind ..... 3-6
3.3.7 Wildfire ..... 3-7

**4.0 EXPOSURE ANALYSIS OVERVIEW ..... 4-1**

4.1 Data Types and Methods ..... 4-1
4.2 Exposure Levels ..... 4-1

**5.0 SENSITIVITY ANALYSIS ..... 5-1**

5.1 Data Types and Methods ..... 5-1
5.2 Determining Sensitivity ..... 5-1

**6.0 ASSESSMENT MODELING AND METHODOLOGIES ..... 6-1**

6.1 Overview of Modeling Approach ..... 6-1

6.2 Hazard Modeling and Results ..... 6-2
6.2.1 Coastal Erosion ..... 6-2
6.2.2 Drought ..... 6-6
6.2.3 Extreme Heat ..... 6-12
6.2.4 Inland Flooding ..... 6-25
6.2.5 Storm Surge ..... 6-32
6.2.6 Wind ..... 6-43
6.2.7 Wildfire ..... 6-57
**7.0 NATURAL, CULTURAL, AND HISTORIC RESOURCES ..... 7-1**
7.1 Natural Resources ..... 7-1
7.2 Cultural and Historic Resources ..... 7-3

**PART 2: A CONSERVATION APPROACH TO LONG-TERM RESILIENCE (SLAMM STUDY)**

**8.0 PART 2 INTRODUCTION ..... 8-7**
8.1 Project Overview ..... 8-9
8.1.1 Study Area ..... 8-10
8.1.2 Current Climate Trends & Recent Storm Context ..... 8-17
8.2 Methodology ..... 8-21
8.2.1 SLAMM Model Overview ..... 8-21
8.2.2 Input Data Sources ..... 8-22
8.3 Model Parameters ..... 8-49
8.4 Scenarios and Runs ..... 8-50
8.4.1 Sea Level Rise Scenarios ..... 8-50
8.4.2 Protection Scenarios ..... 8-51
8.4.3 Planning Horizons ..... 8-51
8.5 Analysis Methods ..... 8-52
**9.0 MODEL STRUCTURE AND CONTENT ..... 9-1**
9.1 Primary Results ..... 9-1
9.1.1 Dry Land Habitats ..... 9-2
9.1.2 Wetland Habitats ..... 9-2
9.1.3 Water Habitats ..... 9-3
9.1.4 Beach and Flat Habitats ..... 9-3
9.1.5 Other Categories ..... 9-3
**10.0 SEA LEVEL RISE PROJECTIONS ..... 10-1**

10.1 NOAA Intermediate Low (NIL) ..... 10-1
10.1.1 Description ..... 10-1
10.1.2 SLR Values ..... 10-1
10.1.3 Key Characteristics ..... 10-1
10.2 NOAA Intermediate High (NIH) ..... 10-2
10.2.1 Description ..... 10-2
10.2.2 SLR Values ..... 10-2
10.2.3 Key Characteristics ..... 10-2
**11.0 PROTECTION SCENARIOS ..... 11-1**
11.1 No Protection ..... 11-1
11.1.1 Description ..... 11-1
11.1.2 Key Characteristics ..... 11-1
11.1.3 NOAA Intermediate Low (NIL) - No Protection ..... 11-2
11.1.4 NOAA Intermediate High (NIH) - No Protection ..... 11-2
11.2 Protect All Dry Land ..... 11-4
11.2.1 Description ..... 11-4
11.2.2 Key Characteristics ..... 11-4
11.2.3 NOAA Intermediate Low (NIL) - Protect All Dry Land ..... 11-5
11.2.4 NOAA Intermediate High (NIH) - Protect All Dry Land ..... 11-5
11.3 Protect Developed Dry Land ..... 11-7
11.3.1 Description ..... 11-7
11.3.2 Key Characteristics ..... 11-7
11.3.3 NOAA Intermediate Low (NIL) - Protect Developed Dry Land ..... 11-7
11.3.4 NOAA Intermediate High (NIH) - Protect Developed Dry Land ..... 11-8
11.4 Protection Strategy Parameter Comparison ..... 11-9
**12.0 PLANNING HORIZONS ..... 12-1**
12.1 Initial Conditions (2020) ..... 12-1
12.1.1 Description ..... 12-1
12.1.2 Spatial Distribution ..... 12-1
12.1.3 Habitat Distribution ..... 12-4
12.2 Near-term (2040) ..... 12-4
12.2.1 Description ..... 12-4
12.2.2 SLR Values ..... 12-4
12.2.3 Projected Changes ..... 12-5
12.2.4 Key Characteristics ..... 12-8

12.2.5 Protection Strategy Effectiveness ..... 12-8
12.3 Mid-term (2070) ..... 12-9
12.3.1 Description ..... 12-9
12.3.2 SLR Values ..... 12-12
12.3.3 Projected Changes ..... 12-12
12.3.4 Key Characteristics ..... 12-13
12.3.5 Protection Strategy Effectiveness ..... 12-13
12.4 Long-term (2100) ..... 12-14
12.4.1 Description ..... 12-14
12.4.2 SLR Values ..... 12-14
12.4.3 Projected Changes ..... 12-17
12.4.4 Key Characteristics ..... 12-17
12.4.5 Protection Strategy Effectiveness ..... 12-18
**13.0 CROSS-SCENARIO COMPARISONS ..... 13-1**
13.1 Impact of Sea Level Rise Scenario ..... 13-1
13.1.1 Habitat Loss Comparison ..... 13-1
13.1.2 Timing of Impacts ..... 13-1
13.2 Impact of Protection Strategy ..... 13-2
13.2.1 Developed Dry Land Preservation ..... 13-2
13.2.2 Undeveloped Dry Land Preservation ..... 13-2
13.2.3 Wetland Preservation ..... 13-3
**14.0 SLAMM STUDY CONCLUSION AND RECOMMENDATIONS ..... 14-1**
14.1 Sea Level Rise and Land Cover Change ..... 14-1
14.2 Florida Natural Areas Inventory ..... 14-1
14.3 Short-term (2040) Priorities ..... 14-3
14.3.1 Monitoring ..... 14-3
14.3.2 Planning ..... 14-3
14.3.3 Conservation ..... 14-3
14.3.4 Research ..... 14-4
14.4 Medium-term (2070) Priorities ..... 14-4
14.4.1 Key Findings and Supporting Actions ..... 14-4
14.4.2 Strategic Land Acquisition for Migration ..... 14-4
14.4.3 Advance Restoration of Floodplain and Marsh Systems ..... 14-4
14.4.4 Scale Up Use of Conservation Easements ..... 14-4
14.4.5 Upgrade Stormwater Infrastructure for Dual Threats ..... 14-5

14.4.6 Reform Comprehensive Planning Policy ..... 14-5
14.5 Long-term (2100) Priorities ..... 14-5
14.5.1 Key Findings and Supporting Actions ..... 14-5
14.5.2 Develop Managed Retreat Framework ..... 14-5
14.5.3 Strengthen Support for Wetland Conservation with Resilience Co-Benefits ..... 14-5
14.5.4 Create Coastal Habitat Transition Reserve Network ..... 14-6
14.5.5 Enhance Freshwater System Resilience ..... 14-6
14.5.6 Invest in Adaptive Infrastructure for End-of-Century Conditions ..... 14-6
14.6 Framework for Taking Action ..... 14-7
14.6.1 A Three Phase Approach to Tackling Priorities ..... 14-8
14.7 Recommendations for Future Assessments ..... 14-10
14.7.1 Modeling Submerged Aquatic Vegetation Analysis ..... 14-11
14.7.2 Future Land Use Review ..... 14-13
**15.0 TECHNICAL APPENDIX ..... 15-1**
15.1 Project Workflow ..... 15-1
15.2 Data Limitations ..... 15-2
15.3 Modeling & Analysis Limitations ..... 15-2
**16.0 RVA-OH RECOMMENDATIONS ..... 16-1**
**17.0 REFERENCES ..... 17-1**

## List of Tables

Table 6-1. Land Area Exposure to Extreme Heat ..... 6-16
Table 6-2. Number of Critical Assets Exposed to Extreme Heat ..... 6-22
Table 6-3. Total Miles of Critical Linear Assets Exposed to Extreme Heat ..... 6-23
Table 6-4. Population Exposure to Extreme Heat ..... 6-24
Table 6-5. LMI Population Exposure to Extreme Heat ..... 6-24
Table 6-6. Atlas 14 AMS-based Precipitation Estimates ..... 6-26
Table 6-7. Inland Flooding Mean Inundation Depth ..... 6-26
Table 6-8. Land Area Exposure to SLOSH Category 1 Hazard Area in Acres ..... 6-38

Table 6-9. Land Area Exposure to SLOSH Category 5 Hazard Area in Acres ..... 6-38
Table 6-10. Number of Critical Assets Exposed to the SLOSH Category 1 and 5 Hazard Area ..... 6-39
Table 6-11. Population Exposure to the SLOSH Category 1 Hazard Area ..... 6-41
Table 6-12. Population Exposure to the SLOSH Category 5 Hazard Area ..... 6-41
Table 6-13. LMI Population Exposure to the SLOSH Category 1 Hazard Area ..... 6-42
Table 6-14. LMI Population Exposure to the SLOSH Category 5 Hazard Area ..... 6-42
Table 6-15. Critical Asset Sensitivity to Hurricane Wind ..... 6-50
Table 6-16. Population Sensitivity to 100-Year Mean Return Period Hurricane ..... 6-55
Table 6-17. Population Sensitivity to 500-Year Mean Return Period Hurricane ..... 6-57
Table 6-18. Land Area in Wildfire Hazard Areas ..... 6-61
Table 6-19. Summary of Assets Exposed to Wildfire ..... 6-61
Table 6-20. Assets Exposed to Wildfire by Jurisdiction and Asset Category ..... 6-62
Table 6-21. Total Miles Exposed to the Wildfire Hazard Area ..... 6-63
Table 6-22. Population Exposure in Wildfire Areas ..... 6-63
Table 6-23. LMI Population in Wildfire Area ..... **Error! Bookmark not defined.**
Table 8-1. Historic Sea Level Trends ..... 8-19
Table 8-2. NIL and NIH Sea Level Rise Scenarios (in feet) ..... 8-20
Table 8-3. Input Data for the SLAMM model ..... 8-22
Table 8-4. Description of the physiographic subdistricts ..... 8-28
Table 8-5. Land cover types by area ..... 8-47
Table 8-6. St Lucie Conservation Lands by Size and Manager ..... 8-47
Table 8-7. Table of SLAMM Input Parameters ..... 8-49
Table 9-1. Description of modeling results output provided by the SLAMM model ..... 9-2
Table 10-1. NOAA 2017 Intermediate Low Sea Level Rise values for the St Lucie County SLAMM model ..... 10-1
Table 10-2. NOAA 2017 Intermediate High Sea Level Rise values for the St Lucie County SLAMM model ..... 10-2
Table 11-1. NOAA Intermediate Low Habitat Change by Year with Percentage change from Baseline – No Protection ..... 11-2
Table 11-2. NOAA Intermediate High Habitat Change by Year with Percentage change from Baseline – No Protection ..... 11-2
Table 11-3. NOAA Intermediate Low Habitat Change by Year with Percentage change from Baseline – Protect All Dry Lands ..... 11-5
Table 11-4. NOAA Intermediate Habitat Change by Year with Percentage change from Baseline – Protect All Dry Lands ..... **Error! Bookmark not defined.**

Table 11-5. NOAA Intermediate Low Habitat Change by Year with Percentage change from Baseline – Protect Developed Dry Lands ..... 11-7
Table 11-6. NOAA Intermediate Habitat Change by Year with Percentage change from Baseline – Protect Developed Dry Lands ..... 11-8
Table 12-1. Distribution of initial condition habitat types ..... 12-4
Table 12-2. Relative differences between projected NIL and NIH conditions in 2040 - No Protection ..... 12-5
Table 12-3. Relative differences between projected NIL and NIH conditions in 2040 - Protection Strategy Comparisons ..... 12-9
Table 12-4. Relative differences between projected NIL and NIH conditions in 2070 - No Protection ..... 12-12
Table 12-5. Relative differences between projected NIL and NIH conditions in 2070 - Protection Strategy Comparison ..... 12-13
Table 12-6. Relative differences between projected NIL and NIH conditions in 2100 – No Protection ..... 12-17
Table 12-7. Relative differences between projected NIL and NIH conditions 2100 - Protection Strategy Comparison ..... 12-18
Table 13-1. Generalized rate of habitat loss without protection within modeling ..... 13-1
Table 13-2. Rate and time line of significant mangrove losses ..... 13-1
Table 13-3. Preservation rates of developed dry lands across protection strategies ..... 13-2
Table 13-4. Preservation rates of undeveloped dry lands across protection strategies ..... 13-2
Table 13-5. Preservation rates of mangrove habitats across protection strategies ..... 13-3

## List of Figures

Figure 1-1. Project Milestones ..... 1-1
Figure 1-2. St. Lucie County Boundary ..... 1-4
Figure 2-1. Overview of Resilience Planning Initiative ..... 2-1
Figure 2-2. Month 2025 Public Workshop Interactive Survey Question #1 ..... 2-3
Figure 2-3. Month 2025 Public Workshop Interactive Survey Question #2 ..... 2-3
Figure 3-1. Hazards Evaluated within the CDBG-MIT RVA-OH ..... 3-1
Figure 3-2. Change in U.S. Annual Temperature 1901-2020 ..... 3-3
Figure 3-3. National Weather Service Heat Index Chart ..... 3-4
Figure 5-1. Sensitivity Analysis Framework ..... 5-1
Figure 6-1. Regional Vulnerability Assessment Approach Framework ..... 6-1
Figure 6-2. South St. Lucie County Coastal Erosion Hazard Area ..... 6-3
Figure 6-3. Central St. Lucie County Coastal Erosion Hazard Area ..... 6-4

Figure 6-4. Average Number of Drought Weeks per Year 2000-2022 ..... 6-8
Figure 6-5. U.S. Drought Monitor Drought Categories ..... 6-8
Figure 6-6. Historical Conditions for St. Lucie County 2000-2025 ..... 6-8
Figure 6-7. U.S. Drought Conditions May 2025 ..... 6-10
Figure 6-8. St. Lucie County 30-Day Precipitation April 2025 ..... 6-11
Figure 6-9. St. Lucie County Extreme Heat Days Through 2099 ..... 6-13
Figure 6-10. Florida Extreme Heat Risk Map ..... 6-15
Figure 6-11. St. Lucie County Extreme Heat Hazard Area ..... 6-17
Figure 6-12. Fort Pierce Extreme Heat Hazard Area ..... 6-18
Figure 6-13. Port St. Lucie Extreme Heat Hazard Area ..... 6-19
Figure 6-14. St. Lucie Village Extreme Heat Hazard Area ..... 6-20
Figure 6-15. 25-Year 24-Hour Rainfall-Induced Flooding Depths – Present Day ..... 6-28
Figure 6-16. 100-Year 24-Hour Rainfall-Induced Flooding Depths – Present Day ..... 6-29
Figure 6-17. 100-Year 24-Hour Rainfall-Induced Flooding Depths – 2070 NOAA Intermediate Low Sea Level ..... 6-30
Figure 6-18. 100-Year 24-Hour Rainfall-Induced Flooding Depths – 2070 NOAA Intermediate High Sea Level ..... 6-31
Figure 6-19. Countywide Land Area Exposure to SLOSH Category 1 and Category 5 ..... 6-34
Figure 6-20. St. Lucie Village Land Area Exposure to SLOSH Category 1 and Category 5 ..... 6-35
Figure 6-21. Port St. Lucie Land Area Exposure to SLOSH Category 1 and Category 5 ..... 6-36
Figure 6-22. Fort Pierce Land Area Exposure to SLOSH Category 1 and Category 5 ..... 6-37
Figure 6-23. Historical Tropical Storm Tracks Near St. Lucie County (since late 1800s) ..... 6-44
Figure 6-24. 10-Year Probable Hurricane Wind Scenario ..... 6-45
Figure 6-25. 20-Year Probable Hurricane Wind Scenario ..... 6-45
Figure 6-26. 50-Year Probable Hurricane Wind Scenario ..... 6-46
Figure 6-27. St. Lucie County 100-Year Peak Wind Gusts ..... 6-47
Figure 6-28. St. Lucie County 500-Year Peak Wind Gusts ..... 6-48
Figure 6-29. St. Lucie County Estimated Building Loss from 100-Year Hurricane Event ..... 6-51
Figure 6-30. St. Lucie County Estimated Building Loss from 500-Year Hurricane Event ..... 6-52
Figure 6-31. St. Lucie County Population Sensitivity to 100-Year Mean Return Period Hurricane ..... 6-54
Figure 6-32. St. Lucie County Population Sensitivity to 500-Year Mean Return Period Hurricane ..... 6-56
Figure 6-33. Florida Wildfire Risk Map ..... 6-59
Figure 6-34. St. Lucie County Wildfire Hazard Area ..... 6-60
Figure 7-1. Potential Conservation Land Parcels in St. Lucie County ..... 7-3

Figure 7-2. Overview of Historic Buildings, Structures, and Archeological Sites within St. Lucie County ..... 7-4
Figure 8-1. Warren Pinnacle Consulting, Inc's Website, more details are available for SLAMM at: https://www.warrenpinnacle.com/ ..... 8-9
Figure 8-2. Overview of St. Lucie County ..... 8-10
Figure 8-3. Regional overview, locating St Lucie County for context within the peninsula of Florida ..... 8-11
Figure 8-4. St Lucie Flood 100-yr and 500-yr flood hazard areas ..... 8-12
Figure 8-5. Increases in freshwater rates via rainfall in southeast Florida, one component of increasing hydrologic flood risk ..... 8-14
Figure 8-6. Open space within St Lucie County, considering areas with less than 25 percent impervious surface coverage ..... 8-16
Figure 8-7. Hurricane Ian Storm Track ..... 8-17
Figure 8-8. Hurricane Milton Storm Track ..... 8-18
Figure 8-9. Relative sea level trend at Gauge 8723214 Virginia Key, Florida ..... 8-19
Figure 8-10. Coastal Defenses Systems of St. Lucie ..... 8-23
Figure 8-11. Map detailing a complex system of coastal wetlands (blue areas within the map above) vulnerable to “coastal squeeze” and other stressors ..... 8-24
Figure 8-12. Visualization of Coastal Squeeze Freshwater Resources ..... 8-24
Figure 8-13. Map of some Northeastern Portions of the Freshwater Wetland Resources in the Interior of the County ..... 8-25
Figure 8-14. Map depicting freshwater wetland systems, within highlighted urbanized areas ..... 8-26
Figure 8-15. Map depicting portions of coastal St Lucie County with wetland and impervious surface overlays to highlight areas with high migration potential ..... 8-27
Figure 8-16. Physiographic Subdistricts of St. Lucie County ..... 8-28
Figure 8-17. FNAI Natural Floodplain Function ..... 8-32
Figure 8-18. FNAI Functional Wetlands ..... 8-33
Figure 8-19. FNAI Surface Water Protection ..... 8-34
Figure 8-20. FNAI Groundwater Recharge ..... 8-35
Figure 8-21. FNAI Forest Lands to Maintain Recharge Function ..... 8-36
Figure 8-22. FNAI Fragile Coastal Resources ..... 8-37
Figure 8-23. FNAI Strategic Habitat Conservation Area ..... 8-38
Figure 8-24. FNAI Rare Species Habitat Conservation Priorities ..... 8-39
Figure 8-25. FNAI Florida Ecological Greenway Network ..... 8-40
Figure 8-26. FNAI Under-Represented Natural Communities ..... 8-41
Figure 8-27. FNAI Sustainable Forestry ..... 8-42
Figure 8-28. FNAI Critical Lands and Waters Identification Project (CLIP) ..... 8-43

Figure 8-29. Color Coded Legend of baseline SLAMM Habitats ..... 8-44
Figure 8-30. SFWMD Land Use Classifications color coded to match SLAMM legend ..... 8-46
Figure 8-31. Map of Existing Conservation Lands within the St. Lucie County..... 8-48
Figure 8-32. Sea level rise relative to NOAA Intermediate High and Intermediate Low ..... 8-50
Figure 12-1. Map of SLAMM's initial input condition adjusted to fit SLR curve for baseline NOAA Intermediate Low ..... 12-2
Figure 12-2. Map of SLAMM's initial input condition adjusted to fit SLR curve for baseline NOAA Intermediate High ..... 12-3
Figure 12-3. St Lucie County 2040 SLAMM habitat change results – NOAA Intermediate Low ..... 12-6
Figure 12-4. St. Lucie County 2040 SLAMM habitat change results - NOAA Intermediate High ..... 12-7
Figure 12-5. St. Lucie County 2070 SLAMM habitat change results – NOAA Intermediate Low ..... 12-10
Figure 12-6. St. Lucie County 2070 SLAMM habitat change results – NOAA Intermediate High..... 12-11
Figure 12-7. St. Lucie County 2100 SLAMM habitat change results - NOAA Intermediate Low ..... 12-15
Figure 12-8. St. Lucie County 2100 SLAMM habitat changes results -NOAA Intermediate High ..... 12-16
Figure 14-1. Potential Conservation Lands Based on FNAI CLIP Data ..... 14-2
Figure 14-2. Future Land Use of St Lucie County..... 14-14

# Acronyms and Abbreviations

| | |
|---|---|
| °F | degrees Fahrenheit |
| AMS | Annual Maximum Series |
| ATSDR | Agency for Toxic Substances and Disease Registry |
| CDBG-MIT | Community Development Block Grant Mitigation |
| CDC | Center for Disease Control |
| CLIP | Critical Lands and Waters Identification Project |
| County | St. Lucie County |
| FDEP | Florida Department of Environmental Protection |
| FEMA | Federal Emergency Management Agency |
| FP | Fort Pierce |
| F.S. | Florida Statute |
| GIS | geographic information system |
| gSSURGO | Gridded Soil Survey Geographic Database |
| HEC-RAS | Hydrologic Engineering Center's River Analysis System |
| HUD | U.S. Department of Housing and Urban Development |
| LAI | Location Affordability Index |
| Municipalities | Port Saint Lucie, Fort Pierce, and Saint Lucie Village |
| MRP | mean return period |
| NCEI | National Centers for Environmental Information |
| NIH | NOAA intermediate-high (sea level rise projection) |
| NIL | NOAA intermediate-low (sea level rise projection) |
| NOAA | National Oceanic and Atmospheric Administration |
| PDS | partial duration series |
| PSL | Port St Lucie |
| RRP | Regional Resilience Plan |
| RVA | Resilience Vulnerability Assessment |
| RVA-OH | Resilience Vulnerability Assessment – Other Hazards |
| SFWMD | South Florida Water Management District |
| SLAMM | Sea Level Affecting Marshes Model |
| SLC | St. Lucie County |
| SLOSH | Sea, Lake, and Overland Surges from Hurricanes |
| SLR | Sea Level Rise |
| SLV | St. Lucie Village |
| T&E | threatened and endangered species |
| WUI | Wildland Urban Interface |

# Glossary

**Adaptation**: The process of adjustment to actual or expected threats and impacts, in order to moderate harm or exploit beneficial opportunities. Adaptive capacity is the ability to make these adjustments based on feedback loops.

**Assets:** People, resources, ecosystems, infrastructure, and the services they provide. Assets are the tangible and intangible items that St. Lucie County residents and communities value.

**Bathtub Method/Model:** A methodology that calculates and/or models the addition of water on the landscape to determine existing and future risks to flooding. The bathtub model looks at water on the land based on topography without regard to current or future stormwater infrastructure nor underground hydrology dynamics.

**Critical Assets/Infrastructure:** Public assets, networks, and essential systems crucial for the well-being of St Lucie County and the municipalities. Disruption or damage to critical infrastructure would lead to negative community, environmental, and/or economic consequences.

**Days of Tidal Flooding:** The number of days that the water level exceeds mean higher high water at (in this study) the Virginia Key Tide Gauge, when that water level is adjusted for sea level rise.

**Exposure:** The presence of people, assets, and ecosystems in places where they could be adversely affected by hazards.

**Flood Mitigation:** Structural changes to reduce the frequency and severity of flood damages.

**Hazard:** An event or condition that may cause injury, illness, or death to people or damage to assets or otherwise impede their normal function.

**Hazard Mitigation:** When used by the Federal Emergency Management Agency (FEMA), the actions taken to reduce loss of life and property by lessening the impact of near future disasters.

**Hazus:** A GIS-based software tool that applies engineering and scientific risk calculations to provide defensible damage and loss estimates.

**Impacts (negative impacts in this discussion):** Effects on natural and human systems that result from hazards. Evaluating potential impacts is a critical step in assessing vulnerability.

**Infrastructure:** Fundamental physical and organizational structures (man-man and natural) and facilities necessary for the functionality of a community.

**Likelihood:** The probability of an asset being impacted by a hazard based on its geographical position.

**Mitigation:** A human intervention to reduce impacts from current or future impacts.

**Mean Return Period**: The average amount of time expected between occurrences of a specific event, such as a hurricane or flood, based on historical data and probability.

**Nature-based Solutions:** Efforts to safeguard, sustainably manage, and restore or augment natural or altered ecosystems as an effective way to reduce the risks posed by natural hazards, such as

flooding, extreme heat, and coastal erosion. Nature-based solutions can provide effective mitigation, while simultaneously enhancing human well-being and biodiversity.

**Planning Horizon:** The projected conditions at a future date, in this study the planning horizons are 2040 and 2070.

**Projections:** Potential future conditions simulated by complex computer-based models of the earth's systems. Projections are based on potential scenarios and various factors under different assumptions about natural processes and human activity and are crucial for informing adaptation and mitigation strategies, as well as community preparedness.

**Regionally Significant Assets:** Vital facilities within the County that cater to a wider geographic scope, spanning neighboring communities, and may be but are not inherently under the county or municipal ownership and maintenance.

**Resilience:** The capacity of a community, business, or natural environment to prevent, withstand, respond to, and recover from a disruption.

**Risk:** The potential total cost if something of value is damaged or lost, considered together with the likelihood of that loss occurring. Risk is often evaluated as the probability of a hazard occurring multiplied by the consequences that would result if it did happen.

**Scenarios:** A set of assumptions about the future regarding the level and effectiveness of mitigation efforts and other physical processes, each with a level of uncertainty.

**Sea Level Rise (Absolute Sea Level Rise):** An increase in the height of the ocean surface above the center of the earth, without regard to whether nearby land is rising or falling.

**Section 380.093(3), F.S.:** A Florida statute passed in 2021, 380.093(3), F.S. pertains to vulnerability assessments related to flooding and sea level rise in the state of Florida. It requires the state to compile a comprehensive statewide assessment of specific risks posed by flooding and sea level rise.

**Sensitivity:** The degree to which a system, population, or resource is or might be affected by hazards.

**Storm Surge:** An abnormal rise in seawater level generated by a storm, over and above the predicted astronomical tide. It is primarily caused by strong winds pushing water toward the shore and can result in extreme coastal flooding, especially when coinciding with high tide.

**Tidal Flooding**: Defined in Florida Statute (F.S.), Subparagraphs 380.093(3)(d)1. and 380.093(3)(d)2., F.S. as "Depth of tidal flooding, including future high tide flooding. The threshold for tidal flooding is 2 feet above mean higher high water."

**Uncertainty:** The inability to predict, with 100 percent accuracy, a particular outcome because future weather conditions and system dynamics arise from the complexity of variables.

**Urban Heat Island Effect:** A phenomenon where urban areas experience significantly higher temperatures than surrounding rural areas due to the concentration of buildings, roads, and other infrastructure that absorb and retain heat. Limited vegetation and increased human activity further intensify this effect.

**Vulnerability:** The propensity or predisposition of assets (human, ecological, and man-made) to be adversely affected by hazards. Vulnerability encompasses the degree of exposure, sensitivity, risk, potential impacts, and adaptive capacity.

**Vulnerability Assessment:** A systematic, data-driven process for analyzing hazard exposure, hazard sensitivity, and adaptive capacity to identify who or what is vulnerable to certain conditions, the level and extent of impacts, and the potential adaptations that can be implemented to lessen risk.

**100-Year Event:** A statistical term used to describe an event (such as a flood or storm) that has a 1 percent chance of occurring in any given year. It reflects the probability based on historical data and modeling.

**24-Hour Rainfall:** A calculation of the amount of rainfall over 24-hours. This parameter is often used when calculating storm rainfall events that generally occur once every 25 or 100 years.

# PART I: MULTI-HAZARD VULNERABILITY ANALYSIS

## 1.0 INTRODUCTION

### 1.1 Project Background

St. Lucie County (SLC), the City of Port St. Lucie (PSL), the City of Fort Pierce (FP) and St. Lucie Village (SLV) joined together to take a collaborative approach toward short- and long-term resilience planning, beginning with the development of comprehensive Resilience Vulnerability Assessments (RVA). Phase I of the RVAs, completed in June 2025, focused on flooding hazards (RVA-Flood). This assessment, Phase II, focuses on 'Other Hazards' (RVA-OH), including coastal erosion, extreme heat, drought, wind, wildfires, storm surge and inland flooding. The St. Lucie Regional RVAs increase our understanding of our community's vulnerabilities. They serve as the foundation for evaluating natural hazard risks and identifying strategies for improved preparedness and responsiveness to crises, while informing future decision-making.

The RVAs are the first step to develop a SLC Regional Resilience Plan (RRP), using a systematic data-driven approach to evaluating the vulnerability of community-wide critical assets and populations to various natural hazards. Critical assets are public assets, networks, and essential systems crucial for the well-being of SLC and its municipalities. The core project milestones are delineated in **Figure 1-1**. The RVA utilized scientific data from technical sources, topographic and elevation data, and asset data to analyze current and future risks. In addition, supplemental information in existing local studies was utilized. The RVA incorporated critical county, municipal, and regionally significant assets organized into four categories: Transportation and Evacuation Routes; Critical Infrastructure; Community and Emergency Facilities; and Natural, Cultural, and Historic Resources.

The forthcoming Regional Resilience Plan (RRP) will be designed to provide an informed roadmap for SLC to enhance community resilience. The RRP will include an evaluation of the County's and municipalities' capability to adapt, delineate strategies, and identify potential investments to eliminate or reduce risk and minimize response timeframes. In essence, the RRP creates a conceptual plan for addressing, mitigating, and alleviating the impacts highlighted in the RVAs. Hazard mitigation efforts, emergency preparedness, land use planning, code and policy development, infrastructure fortification, and public health policies and programs will be considered as part of the RRP.

Figure 1-1. Project Milestones

The modeling results and analyses developed in this report are intended to help SLC and its municipalities better understand some of the challenges it faces, while at the same time helping the community and decision-makers identify key opportunities for moving forward toward a more resilient future. It's an important step in developing a comprehensive approach to adapt to and mitigate the effects of chronic and acute natural hazards, recognizing that identifying and addressing vulnerabilities, especially those related to critical assets, before they fail is the most fiscally responsible strategy approach to long-term resilience. By adopting a forward-thinking philosophy, the County and the municipalities foster a sense of ownership and shared responsibility for addressing risks, while also enhancing preparedness and responsiveness.

## 1.2 St. Lucie County, Port St. Lucie, Fort Pierce, St. Lucie Village Background

### 1.2.1 Geographical Setting and Characteristics

St. Lucie County, located along Florida's Treasure Coast, is known for its beautiful beaches, vibrant communities, and rich agricultural history. St. Lucie County is home to a mix of urban and suburban communities, economic hubs, agricultural lands, and protected natural areas. The largest city, Port St. Lucie, is one of the fastest growing cities in Florida, while Fort Pierce and St. Lucie Village are smaller and have a more historic and maritime character.

Spanning approximately 688 square miles, natural resources have defined the culture of the community throughout its history. There are more than two dozen natural areas within St. Lucie County encompassing more than 25,000 acres of parks and preserves, from pristine beaches to cypress hammocks and freshwater marshes. With 21 miles of Atlantic coastline, as well as the North Fork St. Lucie River and the Indian River Lagoon within its boundaries, water is a way of life in St. Lucie County.

The Indian River Lagoon is a shallow-water estuary that spans 156 miles from Brevard County to just south of St. Lucie County. It is one of North America's most diverse estuaries with more than 4,400 species of plants and animals, including 35 that are listed as threatened or endangered. For more than a century, people have been drawn to the Lagoon for its biodiversity, temperate climate, and proximity to the Atlantic Ocean. The Indian River Lagoon supports commercial and recreational fisheries and acts as an economic engine for the region. The annual economic value of the Lagoon was estimated to be $7.6 billion in 2016, which included nearly 72,000 jobs, and recreational opportunities for more than 7.4 million visitors per year (Indian River Lagoon Economic Valuation Report 2016).

The North Fork St. Lucie River was designated as a state aquatic preserve in 1972 and is a freshwater system upstream and a brackish system near the St. Lucie Estuary. The North Fork St. Lucie River supports a variety of federally and state protected species such as American alligators, manatees, wood storks, and tricolored herons. The North Fork is home to more species of fish than any other river in the state and provides important habitat for the juvenile phases of commercially important species such as blue crabs, snook, snapper, drum, and shrimp. The North Fork St. Lucie River drains an area of approximately 108,165 acres (169 square miles) in eastern St. Lucie County and northeastern Martin County. Historically, it was a slow-moving and meandering river in a largely forested catchment until dredge-and-fill operations to "straighten" the river were completed in the early 1900s. These activities combined with accelerated growth in SLC have resulted in long-standing

impacts, including loss of natural stormwater storage and filtration, severe erosion of channel banks, and increased sedimentation, all of which increase the risk of flooding in surrounding areas. Working collaboratively, the County and municipalities launched the Environmentally Significant Lands Program in 1994, following overwhelming citizen approval of a $20 million local bond referendum. The goal of the Program is to conserve and safeguard ecosystems in their natural condition while allowing for appropriate public access. Through additional partnerships and leveraging bond funding, more than two dozen preserves have been established totaling over 11,000 acres.

### 1.2.2 Economic & Demographic Overview

Together, St. Lucie County and the municipalities have a population of approximately 385,746 residents (Florida Bureau of Economic and Business Research, 2024 current population estimate). The County has a relatively diverse economy, with tourism, healthcare, retail, and agriculture representing its major sectors. Proximity to the coast makes tourism and recreational industries important contributors to the local economy, with visitors drawn to the county's beaches, parks, and fishing spots. Additionally, the county benefits from a strong retail and service sector, which caters to both residents and tourists.

The County's demographic landscape features a balanced age distribution, with around 19.6 percent of the population under the age of 18 and approximately 24.8 percent aged 65 and older. Ethnically, the County's population is comprised of about 54 percent White, 23 percent Black or African American, 22 percent Hispanic or Latino, and a smaller percentage of other racial groups (U.S. Census Bureau 2023).

Educational attainment shows that roughly 88.6 percent of the population holds a high school diploma or higher, while about 25.4 percent have a bachelor's degree or advanced degree. Economically, St. Lucie County's median household income stands at $69,027, with a poverty rate of about 10 percent (U.S. Census Bureau 2023). Countywide housing is characterized by 77.7 percent of residents owning their homes and 22.3 percent renting. The housing market in SLC reflects the rising demand for coastal living, with rental and home ownership costs steadily increasing, contributing to a dynamic but increasingly competitive housing landscape.

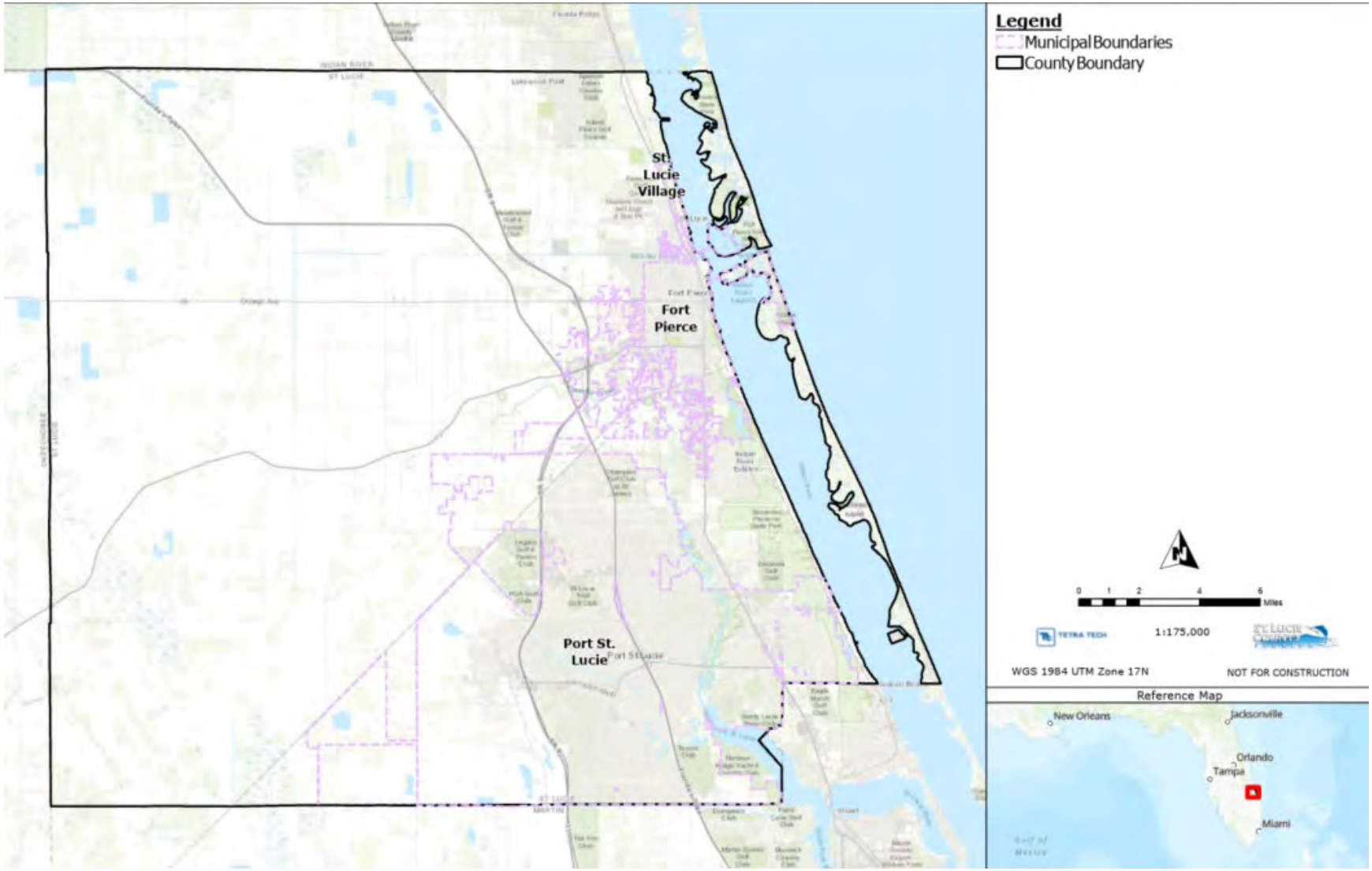



Figure 1-2. St. Lucie County Boundary

### 1.2.3 St. Lucie County Vulnerabilities

As a low-lying coastal community, SLC and the municipalities are at the forefront of potential impacts from chronic and acute natural hazards, highlighting the need for proactive planning to safeguard its residents, assets, and resources.

In the context of SLC and the municipalities, the RVA's primary goal is to understand these unique conditions, the interaction of various systems and the complex array of challenges to assess and develop appropriate and proactive responses. With rising atmospheric and oceanic temperatures, shifting weather patterns, and increased frequency of extreme events, these changes create direct and indirect impacts across different areas in SLC and the municipalities, affecting various facets of the region's environment, economy, and society.

Moreover, the heightened occurrence and severity of storms including nor'easters, hurricanes and tropical cyclones represent a significant threat to SLC's coastal regions. Higher ocean temperatures fuel hurricane intensity as they approach the coast, while elevated sea level amplifies the impact of storm surge, heightening the likelihood of severe inundation, and coastal erosion during storm events.

# 2.0 RESILIENCE VULNERABILITY ASSESSMENT OVERVIEW

## 2.1 Project Goals and Objectives

The County received a grant from the Department of Commerce through the Community Development Block Grant Mitigation (CDBG-MIT) program to prepare a countywide Resilience Vulnerability Assessment (RVA) and Regional Resilience Plan (RRP). The objective of the CDBG-MIT Program is to protect Florida from future disasters by developing and improving state, regional, and local plans and improving state and local mitigation planning mechanisms.

The following are the key primary goals and objectives of the RVA and RRP:

- Identify vulnerability of various County and municipal assets
- Understand the exposure level of assets to the threats identified
- Gather and incorporate public and stakeholder input
- Develop a range of adaptation strategies to protect and adapt vulnerable assets
- Incorporate results into County and municipal planning initiatives

Figure 2-1. Overview of Resilience Planning Initiative

## 2.2 Steering Committee

Collaboration played a central role in this project, involving a diverse range of stakeholders to ensure both technical expertise and community insights were considered. SLC and the municipalities established a resilience steering committee of key collaborators, comprising representatives from diverse backgrounds and associations. The resilience steering committee played a vital role in

shaping the project by reviewing goals, offering input on study direction, identifying geographic context, guiding modeling methodologies, pinpointing available data and resources, providing specific asset information, and reviewing project findings. The steering committee represented various County and municipal departments including Planning & Development Services, Public Works, Utilities & Solid Waste, Engineering, Emergency Operations, and Environmental Resources. The resilience steering committee was also comprised of various member agencies, including representatives from SLC Florida Department of Health, SLC School District, SLC Economic Development Council, St. Lucie Transportation Planning Organization, and the Treasure Coast Regional Planning Council. The resilience steering committee met throughout the process to review information, recommendations, and discuss key project milestones and decisions.

## 2.3 Public Engagement

Community resilience refers to the ability of governments, individuals, organizations, institutions, and businesses to anticipate, respond to, endure, and recover from both immediate and prolonged pressures stemming from unpredictable weather patterns and extreme events, rising sea levels, increased flooding frequency, and heightened storm severity. To establish community resilience, it is essential to actively engage stakeholders when shaping planning efforts and determining adaptation strategies and infrastructure priorities.

Public involvement for the RVA was focused on sharing resilience information and the findings of the RVA and gathering feedback from community members. Information was provided to and received from members of the community through public meetings and workshops. Public engagement and outreach efforts for this project were geared toward communicating relevant science-based information that engaged the public, community leaders, and subject matter experts, regardless of education and technical background. Utilizing various methods and multimedia tools collaboratively, the outreach initiatives aimed to enhance community understanding and involvement.

Public input and feedback were actively sought in public workshops and various relevant websites, calendars, and social media platforms. The Project Team evaluated the information gathered from the community and coordinated efforts to integrate the input into the project, while documenting the engagement outcomes to provide a transparent record of the community's contributions.

### 2.3.1 Stakeholder and Public Outreach Events

St. Lucie County hosted more than a dozen engagement sessions within the community beginning in March 2023 to introduce the upcoming vulnerability assessment and resilience planning efforts. NUMBER (placeholder) community workshops were conducted between DATE to present the results of the St. Lucie RVA.

The purpose of these meetings was to allow the public to enter a dialogue where they were able to ask questions and provide community-specific input on the results of the analyses. **Figure 2-2** and **Figure 2-3** exhibit examples of the outputs derived from the input provided by participants during these public workshops. Please see Appendix B for the comprehensive results of the public workshops.

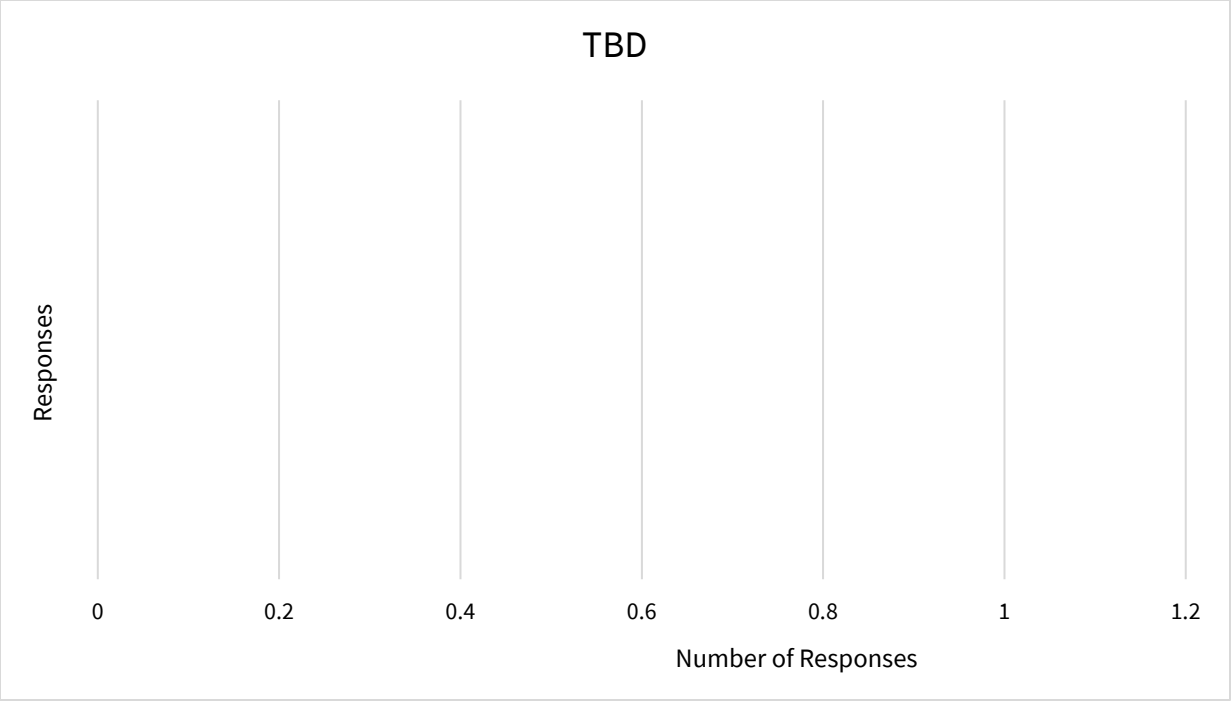



Figure 2-2. Month 2025 Public Workshop Interactive Survey Question #1

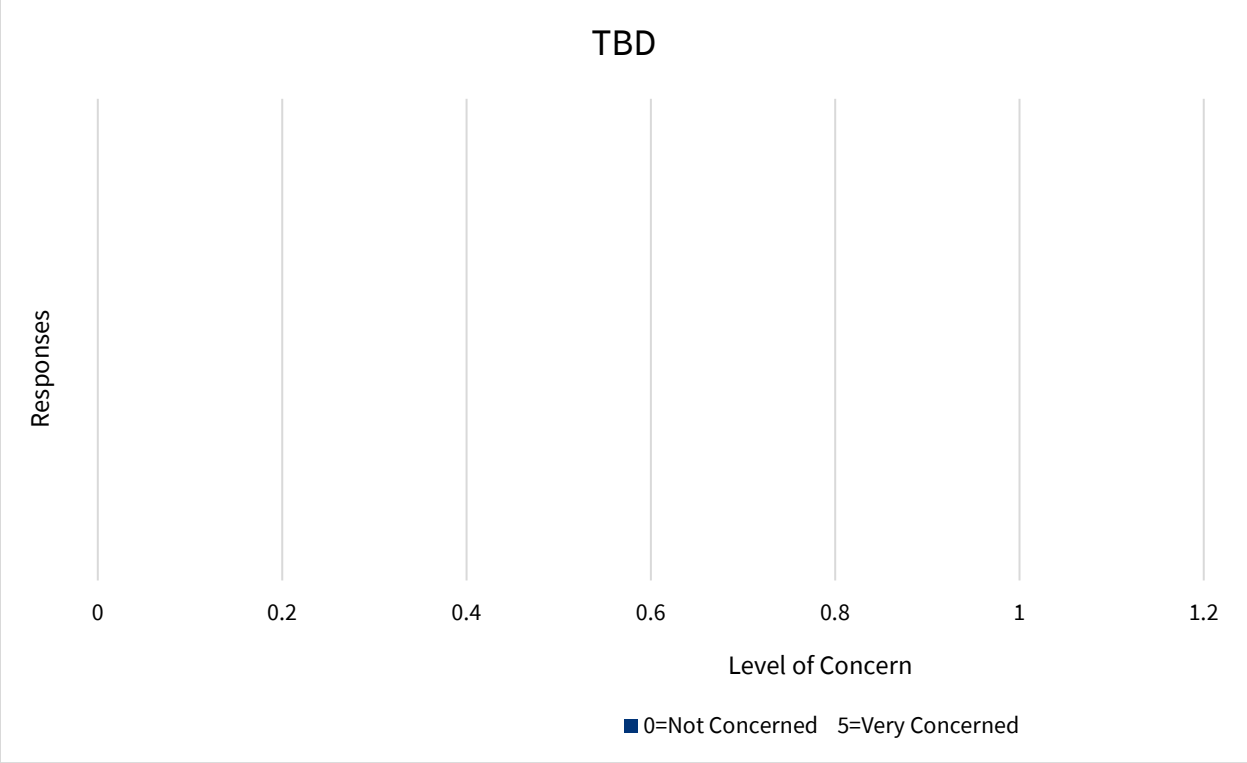



Figure 2-3. Month 2025 Public Workshop Interactive Survey Question #2

# 3.0 HAZARDS

## 3.1 Hazard Inventory

The County and municipalities are committed to protecting their future against various hazards such as coastal erosion, drought, extreme heat, inland flooding, storm surge, wildfire, and wind. Impacts resulting from any of these events pose a significant threat to SLC and the municipalities (**Figure 3-1**). To assist communities experiencing these increasing threats, the CDBG-MIT program has been strategically designed to guide the County and municipalities as they adapt to risks and ensure a resilient future.

Figure 3-1. Hazards Evaluated within the CDBG-MIT RVA-OH

## 3.2 Hazard Evaluation

The factors that influence each hazard's frequency, severity, and extent varies, and these factors are affected by anticipated environmental changes. In recognition of these differences, the exposure and sensitivity methods are tailored to each natural hazard in the community (see Sections 4.0 and 5.0 for further details).

This RVA employs a sequential methods approach, first characterizing vulnerability as a function of exposure and then asset sensitivity:

- **Exposure** – exposure refers to the presence of assets, ecosystems and populations in areas where they could be adversely affected by hazards. This RVA assessed exposure levels to each hazard for two planning horizons: 2040 and 2070.
- **Sensitivity** – the degree to which a system, resource or population is or might be affected by hazards.

Within the analysis, 27,211 assets primarily owned or maintained by the County and the municipalities were classified as critical assets. The asset types include emergency facilities, healthcare facilities, community support buildings, water infrastructure, schools, historic structures, and similar resources.

The following sections outline the framework and general process for exposure and sensitivity methods, and hazard-specific methods are detailed in corresponding results sections.

SLC and the municipalities conducted an evaluation of each hazard to better understand and communicate the potential magnitude, frequency, impact severity, and extent of the impact of each hazard. The hazards include consideration of the potential effects of chronic stressors and extreme weather events on the site-specific operational viability of assets, infrastructure, and programs. These

hazards can lead to impacts affecting SLC and the municipalities' critical facilities, infrastructure, public health, housing, economies, emergency response capabilities, transportation systems, and community resources. Both near-term impacts and long-term ramifications have been considered within this RVA.

## 3.3 Summary of Hazards

### 3.3.1 Coastal Erosion

Coastal erosion is caused by wind, waves, and longshore currents and can negatively affect buildings, shoreline, and infrastructure along the coast. Coastal erosion adversely affects the economy, particularly the tourism industry, a significant economic driver that supports multiple ancillary businesses. Coastal "hardening" measures such as seawalls or revetments may be installed to protect buildings and infrastructure. However, these measures are likely to increase erosion rates and interrupt the natural retreat of beaches. Coastal property losses have totaled about $500 million annually in the United States due to coastal erosion (U.S. Climate Resilience Toolkit 2021). SLC currently has five areas of eroded shoreline, three that are considered critically eroded by the Florida Department of Environmental Protection data sources (FDEP 2023). Eroded shorelines can also leave adjacent upland areas vulnerable to other hazards including storm surge and over-wash events.

### 3.3.2 Drought

A drought is an extended period of abnormally low precipitation that increases water demand and can result in water supply shortages that affect everyday life. While droughts are naturally occurring phenomena, they are increasing in both frequency and severity. They can contribute to various secondary impacts such as public health and safety issues. Both weather and human factors influence the severity and geographic extent of a drought. For example, unusually low precipitation over several months or longer can create or worsen a water deficit in affected regions, but so too can a large influx of development to an area with limited water infrastructure or availability. The RVA focused on weather-driven droughts, excluding current or future human-driven factors.

Rising atmospheric temperatures contribute to an increase in the rate of soil moisture loss, resulting in a likely increase in drought intensity (Runkle et al. 2022). This can be further magnified by population growth and land-use changes that increase competition for water (Runkle et al. 2022).

Since 1990, there has been about one severe and widespread drought in Florida each decade (Florida State University n.d.a). Reduced availability of water, caused by drought, has several implications for the County and municipalities. Prolonged periods of drought can increase wildfire hazards that not only destroy property but also reduce air quality. Heightened public health hazards are linked to reduced air quality, food scarcity and drinking water shortage.

Drought also contributes to environmental and agricultural disruptions. In SLC, rainfall, local watersheds and underground freshwater aquifers are the main sources of water. When the normal water cycle is disrupted by drought, one of the most economically damaging effects can be substantial crop loss. Drought in SLC is also linked to increased insect infestations, plant disease and wind erosion. The frequency of wildfires also increases during extended droughts, which then leads to human and wildlife populations being at risk.

### 3.3.3 Extreme Heat

Annual average temperatures across the United States have been rising consistently at an accelerated rate since the 1970s (**Figure 3-2**). In fact, historical records since 1850, show the 10 warmest years have occurred since 2013.

According to the National Weather Service, heat stress is the leading cause of weather-related deaths in the United States each year. Due to the subtropical humid climate of Florida, the entire state has historically been vulnerable to extreme events and leads the nation in heat-related illnesses.

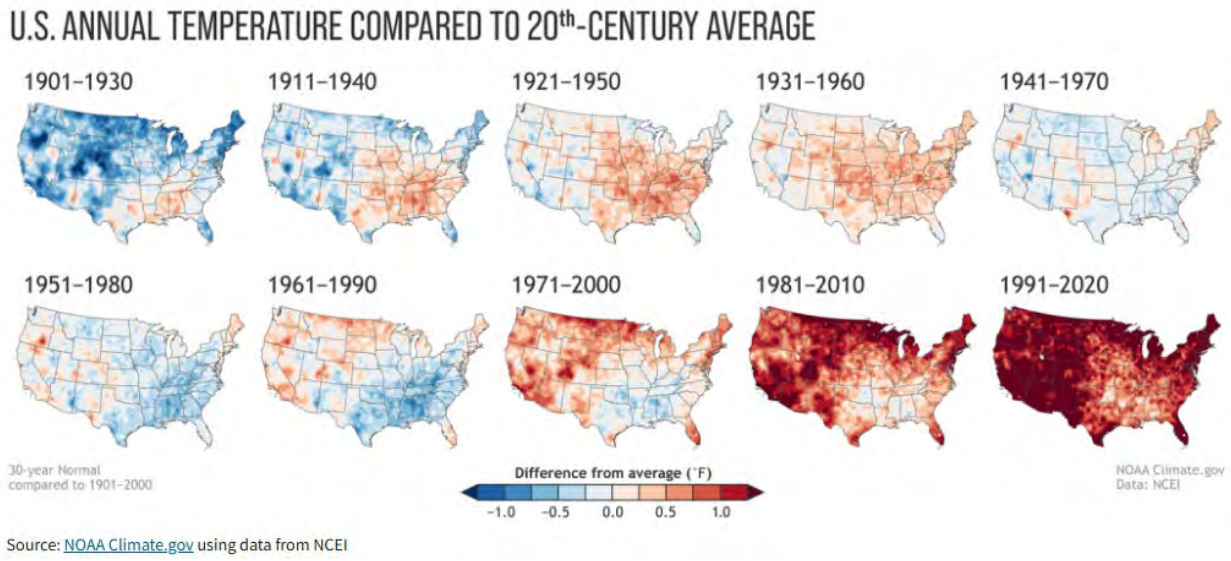



Figure 3-2. Change in U.S. Annual Temperature 1901-2020

Extreme heat events can affect anyone, but a broad range of the population can have a higher susceptibility to heat-related illness, including adults over age 65, children and infants, people with chronic illnesses or disabilities, low-income households, and people who are unhoused. In addition, jobs that require outdoor work or are in high-heat conditions pose more risk to heat related complications.

Florida leads the nation in heat-related illnesses. In addition to heat-related health risks, extreme heat can impact tourism and recreational activities, lead to other environmental impacts such as harmful algal blooms, reduction in agricultural production, and an increase in demand for energy and other utilities which strain household costs and the systems that support cooling operations.

Additional impacts from increased heat relate to storm-related or extreme rainfall events that may cover large areas or be very localized. Florida typically experiences fewer days than other states where the temperature reaches 95˚F or greater due to its proximity to large water bodies and wetlands. However, that proximity also increases the humidity. As the air temperature warms, water is evaporated into the atmosphere, causing a rise in humidity, average rainfall, and the frequency of heavy rainstorms in many places (Florida Enhanced State Hazard Mitigation Plan 2023). A detailed meteorological attribution study of Hurricane Ian suggests that the modern rise in average

temperatures increased the storm's overall rainfall total in Florida by about 18 percent (Reed and Wehner 2023).

Extreme heat events are defined in a number of ways, including:

- days where the temperature equals or exceeds 95°F;
- as a summertime temperature that is much hotter and/or humid than average; or
- as defined by the Department of Homeland Security, a period of high heat and humidity with temperatures above 90°F for at least 2 to 3 days.

Different tools are used to measure heat and the potential for heat-related illnesses. For example, the heat index, also known as the apparent temperature, is what the temperature feels like to the human body when relative humidity is combined with the air temperature. When faced with hot weather conditions, the body regulates its internal temperature by sweating. Sweat absorbs heat from the body and sheds it through evaporation, cooling the skin. However, this process becomes significantly less effective in humid environments, where the air is already saturated with moisture and sweat cannot evaporate efficiently. This leads to increased physiological stress, dehydration, and a higher risk of heat-related illnesses such as heat exhaustion and heat stroke.

In the heat index chart shown below (**Figure 3-3**), the red area indicates extreme danger. Health alerts are issued when the heat index is expected to exceed 105 to 110°F for at least two consecutive days.

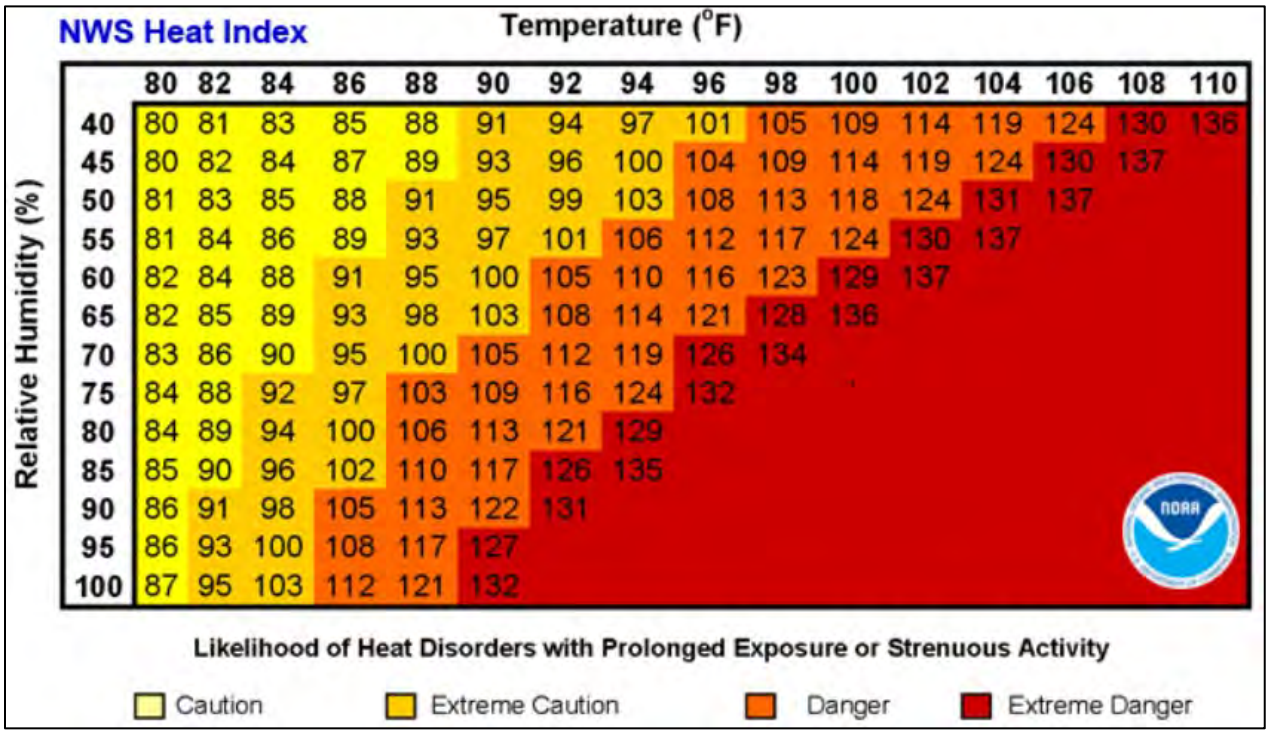



Figure 3-3. National Weather Service Heat Index Chart

The wet-bulb temperature is a more recent approach to understanding how the apparent temperature (heat index) acts on the body, by determining the lowest temperature at which air can be cooled by evaporation. For years, it was believed that the upper survivable limit, the point at which

the human body can no longer effectively shed heat through sweating, was around 95°F at 100 percent humidity or 115°F at 50 percent humidity. However, recent research from Penn State University has shown that this threshold may be lower than previously thought. In controlled laboratory conditions, young, healthy adults began to experience dangerous levels of heat stress at temperatures of 87°F at 100 percent humidity (Penn State 2022). For older adults and individuals with pre-existing health conditions, the threshold is likely lower. This means that extreme heat events may become life-threatening at lower temperatures than once assumed, especially in regions with high humidity.

### 3.3.4 Inland Flooding

Flooding results from three major sources in SLC and the municipalities: coastal areas subject to inundation from tidal flooding; ocean storm surges during hurricanes and tropical storms; and inland areas that become flooded during rainfall events when water accumulates in low, flat areas and the storage and capacity of the existing drainage system is exceeded.

Three factors play into the increasing risk from flooding. First, historical and ongoing population growth is associated with substantial land use change, increasing amounts of impervious land cover and the loss of natural functioning wetlands and floodplain areas (Volk et al. 2017). Such land use change factors are known to increase the risks in magnitude and extent of rainfall-induced flooding within urban, suburban, and peri-urban areas (Blum et al. 2020; Liao et al. 2022). Second, sea level rise is an exacerbating factor directly corresponding to higher storm surge potential, reducing ability of existing stormwater conveyance systems to remove rainfall-driven water from inland communities and tidally-connected waterways, including the St. Lucie River and ancillary creeks and canals. Third, data suggests that eastern Florida may already be undergoing a trend toward more frequent occurrences of extreme precipitation events, defined as rainfall episodes that significantly exceed historical averages in intensity or duration, often overwhelming drainage systems and increasing the likelihood of flash flooding (Obeysekera et al. 2021). Taken together, these factors bring the likelihood of higher flood damage risks for built areas that are already designated as flood-prone, while also potentially creating novel flood exposure hazards within areas historically thought to have minimal flood risk (Sohn et al. 2020; Panos et al. 2021; Clearview Geographic LLC 2025).

Wet season rainfall patterns coupled with the hurricane season make SLC more susceptible 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. Flooding can have numerous and wide-ranging impacts, including impacts on public safety, infrastructure, the economy, agriculture, and housing. Within SLC, non-coastal flooding can result from a buildup of ground and surface water levels over time, or from intense localized precipitation that exceeds storage and drainage capacities.

### 3.3.5 Storm Surge Flooding

Storm surge is the abnormal rise of seawater levels during a storm, caused by intense sustained onshore winds that push ocean water toward the coast and low atmospheric pressure that allows the sea surface elevation to increase during extreme weather events. It can occur during major storms such as hurricanes and often results in severe flooding extending to inland areas of the County. This impact from surging seas is especially pronounced for assets along coastlines on the open ocean and

along other tidally influenced canals, rivers, and waterways where it quickly overwhelms stormwater drainage systems. Storm surge can lead to widespread and rapid inundation of the County's shoreline, causing extensive damage to infrastructure, homes, and critical facilities. It further threatens the shoreline as it accelerates coastal erosion, reducing the protection afforded by a healthy beach and dune system where they exist, and can compromise the stability of other coastal protection structures such as rock revetments and seawalls. Additionally, surges can introduce saltwater into freshwater systems, posing risks to natural ecosystems and water supplies, further accelerating the deterioration of infrastructure components.

The height and extent of the storm surges associated with hurricanes Irma, Nicole, and Milton were enhanced by approximately nine inches of sea level rise since 1971, based on long-term tide gauge data from NOAA (NOAA Tides and Currents 2025). Legacy coastal stormwater drainage systems that discharge into tidal water bodies also have inherently less capacity to convey water due to increased infiltration from the rising sea. During Irma and Milton, the combination of storm surge, SLR, and extreme rainfall resulted in the complete failure of some legacy stormwater systems in St. Lucie County and associated municipalities. As SLR continues to accelerate, associated flood risks from storm surge, failure of current coastal stormwater drainage systems can be expected to increase (Clearview Geographic LLC 2025).

### 3.3.6 Wind

Florida is the most susceptible state in the country to the impacts caused by hurricanes and tropical storms due to the frequency of storms, the length of the coastline, and the relatively low and flat ground elevations. Hurricanes and tropical storms are of particular significance during the 6-month Atlantic hurricane season, June 1 through November 30, with the peak occurring between mid-August and late October (Florida State University n.d.b). The 2021 Florida Atlantic Hurricane Season ranked third among the state's most active seasons with a reported 21 tropical storms, 7 hurricanes, and 4 major hurricanes (Powell 2022).

Impacts from hurricanes can include wind, storm surge and flooding. Roofs, vegetation, and power lines are often damaged by winds occurring in the hurricane eyewall. Hurricane winds can reach speeds of more than 155 mph and often remain at strong levels due to Florida's generally flat terrain. Large hurricanes can produce winds extending more than 150 miles from the eyewall (Florida Gulf Coast University n.d.). As a hurricane moves onshore, water is pushed toward the shoreline, which is known as storm surge. Storm surges can reach heights of 15 feet and create deadly waves and water levels. Worldwide, 90 percent of hurricane-related casualties are a result of drowning incidents within the storm surge or the associated flooding areas (Florida State University n.d.b). In addition, slow-moving tropical storms have a direct correlation to higher flooding levels, as they produce larger amounts of rain. Slow-moving Hurricane Frances in 2004 caused extensive flooding and wind damage, with sustained winds reaching up to 105 mph and storm surge flooding affecting coastal areas significantly.

A study at Florida State University outlines potential changes in hurricanes in a report titled: "Understanding Past, Present, and Future Tropical Cyclone Activity", (Carstens, Uejio and Wing 2022):

- Coastal flooding from storm surge is expected to increase regardless of changes in storm intensity due to future SLR.
- There is agreement between theory and model projections that flooding rain associated with hurricanes will become more hazardous. It is more difficult to evaluate historical trends in hurricane rainfall, but a notable trend of slower-moving storms has recently emerged.
- While the mean intensity of hurricanes has not changed significantly, warmer oceans raise the ceiling for intensity. A larger proportion of storms have reached major hurricane (Category 3 to 5) strength in recent years, along with an increase in rapid intensification events.

Stronger hurricanes and tropical storms can result in increased damage to buildings and homes, threats to infrastructure, undermining of energy, water, and sewer systems, erosion of beaches, and damage to flood management structures. Stronger hurricanes also pose a risk to public health and human lives. Problems with water supplies and power systems can cause waterborne illness, environmental contaminants, mosquito-borne illnesses, and can result in hospital closures. In addition to direct damage to infrastructure, the potential for crop damage and economic disruption from hurricanes and tropical storms are also significant.

### 3.3.7 Wildfire

Most of Florida's natural systems are adapted to periodic wildfires and even depend on them to maintain a balanced and sustainable ecosystem. However, in urbanized areas, naturally occurring wildfires are suppressed to protect life and property. Without management strategies, this results in the build-up of dead or decaying vegetation that provides fuel when a fire occurs and can lead to rapid acceleration and increased danger to surrounding areas.

Wildfires can be classified by how they move through the environment. Ground fires or subsurface fires occur when dead vegetation, peat or tree roots burn underground. This type of fire moves very slowly and tends to smolder rather than produce flames. Given these conditions, a ground fire can continuously spread for months.

Surface fires are common but are usually low intensity. They partially consume the "fuel layer" while presenting little danger to mature trees and root systems. The buildup of fuel and vegetation on the forest floor can create surface fires of higher intensity. In drought conditions, surface fires can transition into damaging ground fires.

Crown fires are fast-moving fire in the upper canopy of vegetation and involve the burning of vegetation both at the surface and crown (treetop) layer. Because crown fires affect multiple levels of vegetation, they are often fast moving and extreme intensity fires. Wind conditions have a larger impact on the spread of canopy level fires.

Florida experiences its peak number of wildfires from January to mid-June annually. In 2020, there were 2,381 wildfires in Florida with a total of 99,413 acres burned, attributing to Florida ranking as

fifth in the nation for the number of wildfires. As droughts continue to intensify, it will likely trigger more wildfires in the future (Runkle et al. 2022).

Wildfires can cause significant property and infrastructure damage, and potential health risks can arise from diminished air quality. Soil erosion and altered water quality and supply levels can also result from wildfires.

# 4.0 EXPOSURE ANALYSIS OVERVIEW

The exposure analysis estimated how a hazard intersects with County and municipal land, assets, and residents in terms of event likelihood and severity. Exposure depends on the type of hazard relate to the item (i.e., land, assets, or residents) being studied.

In total, 27,211 assets were evaluated in this analysis including emergency facilities, healthcare facilities, community support buildings, water infrastructure, schools, historic structures, and similar resources.

## 4.1 Data Types and Methods

The quality and amount of data on physical exposure and relevant asset characteristics vary by hazard and critical asset type (**Appendix A**). Where possible, the RVA integrated spatial and quantitative data, supported by qualitative information on historical events and the County's and municipalities' natural environment. Analytical reviews were conducted for all hazards to develop a broad understanding of how each hazard has historically affected the County and to what extent environmental changes may influence future event frequency and severity. For hazards lacking spatial extent data, the review evaluated the types of land, and assets that are most likely to be exposed to the hazard. For hazards with spatial data, the level of analysis depended on the quality and quantity of available resources.

## 4.2 Exposure Levels

The loss estimations derived from the RVA methodology are grounded in a robust analysis of vulnerability and exposure levels across key community elements, including populations, buildings, and critical infrastructure systems. By integrating these factors, the RVA provides a nuanced and data-driven framework for evaluating the potential impacts of a wide range of natural hazards. This approach enables local governments, including both County and municipal entities, to identify and prioritize at-risk assets, assess the scale and scope of potential damages, and develop informed strategies for risk reduction and resilience planning. Ultimately, the RVA supports a more comprehensive understanding of community vulnerability, facilitating proactive decision-making to safeguard residents, essential services, and infrastructure.

# 5.0 SENSITIVITY ANALYSIS

Sensitivity refers to the degree to which a system, population or resource is or might be affected by hazards. This RVA includes a sensitivity analysis on assets for all hazard scenarios that evaluated the degree to which an area, asset, or population will experience adverse impacts, such as habitat loss, structural damage, or business closures. Adverse impacts vary based on the type of hazard and the item being studied.

## 5.1 Data Types and Methods

The quality and amount of data on physical sensitivity and asset characteristics vary by hazard and asset type. Where possible, the sensitivity analysis leveraged quantitative data to calculate expected structural damage, measured in dollars. For hazards with future-condition scenarios available, the change in structural damage was calculated to illustrate the increase in sensitivity due to changing conditions. **Figure 5-1** illustrates the sensitivity analysis' overall approach and integration of qualitative and quantitative information.

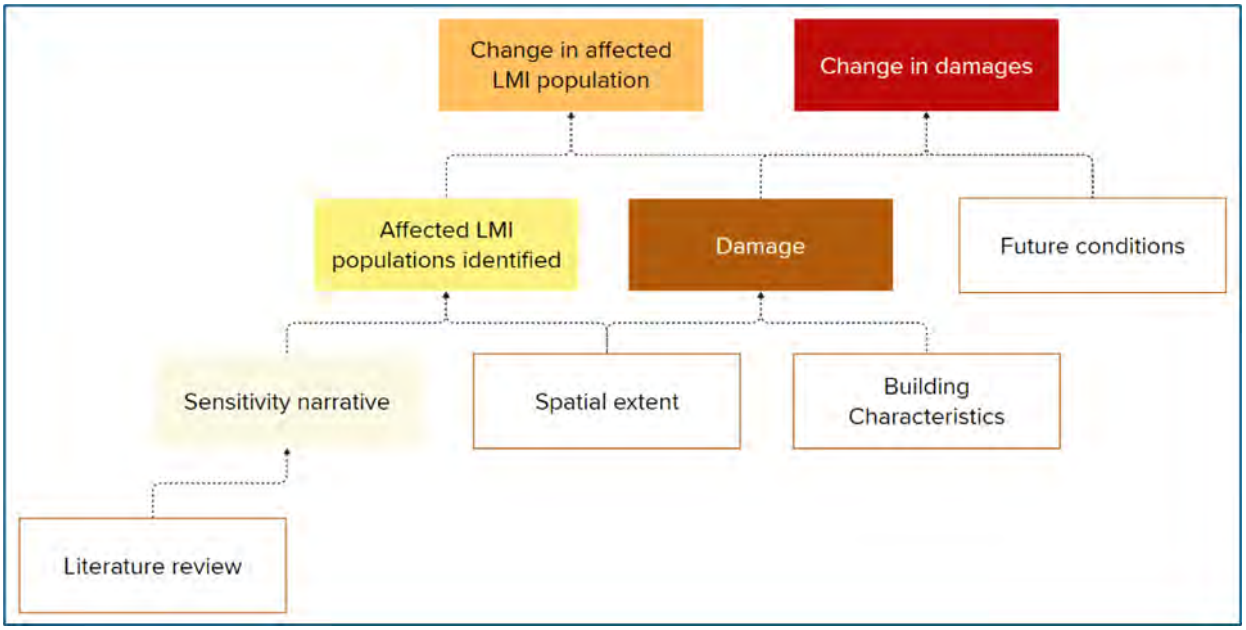



Figure 5-1. Sensitivity Analysis Framework

## 5.2 Determining Sensitivity

A population's sensitivity to adverse impacts depends on demographic characteristics such as income, age, or preexisting health conditions. For some populations, these adverse impacts may be disproportionate compared to the larger population or more likely to trigger cascading events, such as economic hardship or temporary displacement that can have increased impacts on vulnerable populations. If affected by a hazard, these populations may struggle to recover due to limited income to pay for home repairs or alternative shelter, inability to commute or work, or limited access to healthcare and medical services.

To identify sensitive populations, the HUD Low-to-Moderate Income (LMI) data was leveraged, which is available at the Census Tract level. Block Groups with higher shares of LMI populations may experience more severe impacts than those with lower shares. Individuals or households are considered LMI if their household income is no more than 80 percent of the median income for the area. For hazards with spatial data, sensitivity was evaluated by determining what share of a Block Group's LMI households are exposed.

Tracts with a Ranking Percentile Variable greater than 0.8 were extracted to identify the general highly vulnerable population areas. An area analysis was conducted on the remaining tracts by calculating the total square mileage of the tract, identifying the municipalities that are tied to the specific tracts, and performing an additional square mileage calculation of the smaller subset of tracts by jurisdiction. From there, a percentage was calculated that identified the percent of the LMI population for each segment of the tracts, delineated by jurisdiction. This provides an estimate of total vulnerable population within each jurisdiction. For hazards with spatial data, sensitivity was evaluated by performing an exposure assessment by area analysis. LMI populations were clipped down to the specific hazard of concern spatial extent, and total square mileage was leveraged to calculate a percentage to apply to the overall vulnerable population statistics. This process identifies the estimated LMI populations within each jurisdiction, by hazard of concern.

The HUD LMI database and mapping tools can assist with emergency preparedness in several ways. They can be used to estimate the amount of necessary supplies, such as food, water, medicine, and bedding, as well as the number of emergency personnel needed to assist at specific sites. The tool can also identify areas in need of emergency shelters and aid in the preparation of evacuation plans, accounting for those with special needs, and highlighting communities that may need continued support to recover from a natural disaster.

Economic vulnerability is a significant factor in resilience. Individuals earning a low percentage of the median household income may have less financial flexibility to recover from hazard-related damage or to invest in preventative measures such as insurance or home improvements that reduce hazard risk. In addition, households with limited incomes may also face challenges evacuating and accessing medical care or health resources following an event.

An individual's susceptibility to various hazards, like flooding, extreme heat, high winds and wildfire, is highly influenced by their housing conditions.

Mobile homes are an affordable form of housing in St. Lucie County, and they are distributed throughout the County, in rural as well as urban areas. There are 8,921 mobile home spaces and 1,184 recreational vehicle spaces throughout the County (SLC Planning & Development Services 2021). Manufactured housing is typically built on land that has been stabilized to ensure a sufficient anchoring system to serve as the unit's foundation (FEMA 2009). However, if the area is affected by storm surge or flooding, these anchoring systems could be weakened or damaged, increasing the risk for potential damage or other harm. In addition, people who reside in manufactured housing may lack air conditioning or struggle to keep their units cool, depending on the building's materials and insulation efficiencies (Bernard and Proano 2022), making them more susceptible to the impacts of extreme heat events and health risks.

Public housing units tend to be older, meaning they were built before more resilient design standards were implemented, making them more susceptible to flooding, storms and extreme heat. Moreover, the types of individuals who rely on public housing may also experience additional demographic factors, such as age or access to healthcare, that compound these risks (Gabbe and Pierce 2020). If their unit is damaged due to flooding, this could lead to compounding impacts, such as increased likelihood of mold and reduced indoor air quality, or difficulty finding temporary shelter elsewhere due to the unit's conditions.

In the context of hazard risk, the correlation between higher rates of renters in a community and increased vulnerability is critical. Renters often reside in areas more susceptible to hazards such as flooding, either due to the lower cost of housing in such locations or limited availability of affordable options in safer areas. This situation places them at a disproportionate risk during hazard-related events, not only in terms of immediate physical danger but also regarding the longer-term repercussions on their stability and well-being. The transient nature of rental housing means that renters may have less knowledge about local hazard risks and less incentive to invest in long-term hazard preparedness measures.

# 6.0 ASSESSMENT MODELING AND METHODOLOGIES

## 6.1 Overview of Modeling Approach

The Project Team conducted the RVA by exploring various future scenarios across the County and municipalities. The geospatial exploration conducted is intended to aid the County and municipalities in making decisions that bolster resilience against hazard impacts. The analyzed hazard scenarios provide projections for both general predictions and characterizations of current conditions.

The RVA uses an adaptive mixed-methods approach leveraging the best available data for SLC and the municipalities. The RVA modeling approach characterizes vulnerability, the extent to which an area, asset, or population could be harmed by a hazard, as a function of two components:

- **Exposure,** which refers to the spatial presence of populations, assets, or systems in locations that are susceptible to specific hazards. It quantifies the potential for these elements to be physically affected based on their geographic proximity to the hazard source and the nature of the asset or area under consideration. Exposure is fundamentally determined by location and the distribution of elements at risk.
- **Sensitivity,** which denotes the degree to which an exposed population, asset, or system is likely to experience negative consequences when subjected to a hazard. It reflects the intrinsic characteristics or conditions—such as structural robustness, ecological fragility, or number of residents—that influence the severity of impact. Sensitivity is hazard-specific and varies according to the vulnerability profile of the element being assessed.

The RVA uses quantitative and qualitative data to comprehensively characterize SLC and the municipalities' vulnerability to hazards. **Figure 6-1** illustrates the RVA's overall framework.

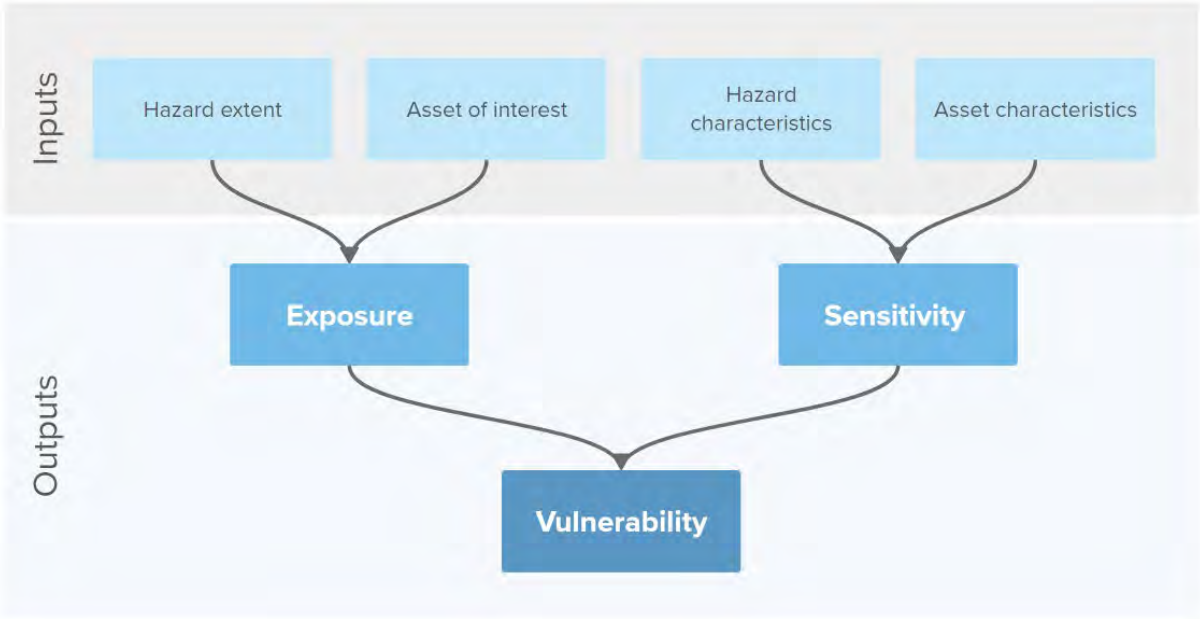



Figure 6-1. Regional Vulnerability Assessment Approach Framework

## 6.2 Hazard Modeling and Results

The following sections describe the modeling approach for each hazard and the exposure and sensitivity results. Recommendations are discussed in Section 8.0.

### 6.2.1 Coastal Erosion

This assessment evaluates the geographic distribution of coastal erosion risk in St. Lucie County using data from two primary sources: the Florida Department of Environmental Protection's Coastal Critical Erosion Area data (2024) and the U.S. Geological Survey (USGS) National Shoreline Change short-term linear regression rates (2021). These rates reflect changes in shoreline position from the 1970s to 2018 and include both erosion (land loss) and accretion (land gain).

#### 6.2.1.1 Coastal Erosion Exposure Analysis

The County's oceanfront habitats form its first line of defense against storms and rising seas. Beach systems naturally buffer inland areas from wave energy, while providing critical nesting habitat for sea turtles. Rocky intertidal zones create stable shoreline anchors and support diverse marine life. These systems show high vulnerability to erosion and storms but demonstrate a moderate capacity to adapt through natural processes when given sufficient space and sediment supply.

To assess risk, County and municipal assets—such as infrastructure and population centers—were overlaid with the areas identified as vulnerable to erosion. The analysis estimated the following:

- Length (in miles) of shoreline projected to be affected by erosion
- Acreage of erosion zones
- Number of critical assets exposed
- Population count in erosion zones
- Overall land area impacted under two future time horizons: 2040 and 2070

This modeling approach assumes erosion continues at a constant rate, based on historical trends, without considering the influence of future coastal storms, sea level rise, or the construction of protective infrastructure such as breakwater structures, beach renourishment, or revetments. The resulting data defines a projected impact zone and illustrates expected erosion boundaries: pink for 2040 and green for 2070. However, because the model excludes real-world variables such as mitigation efforts and extreme weather events, its outputs should be used strictly as planning references. The actual process of erosion is expected to be continuous, uneven, and variable across locations.

Figure 6-2. South St. Lucie County Coastal Erosion Hazard Area

Figure 6-3. Central St. Lucie County Coastal Erosion Hazard Area

### Land, Assets, and Population Exposure to Coastal Erosion

#### *Land Exposure*

Across the County, areas expected to face additional exposure to erosion are limited. By 2040, the number of acres exposed to erosion will grow by 24.7 acres, and by 2070 will increase to 92.8 acres.

#### *Asset Exposure*

Of the 27,211 critical assets evaluated across the county, 52 miles of transportation and evacuation routes by 2040 and 193 miles by 2070 could be impacted by coastal erosion. This represents 0.1 percent and 0.2 percent respectively of County-wide transportation and evacuation route miles. Two Natural, Cultural, and Historic assets face exposure to 2070 landward coastal erosion.

#### *Population Exposure*

Due to the limited geographic extent of the Critical Coastal Erosion Areas and shoreline data, less than 0.1 percent of the total population will be directly exposed to coastal erosion in 2040 and 2070, representing 61 people and 230 people respectively.

#### *Coastal Erosion Sensitivity Analysis*

Coastal erosion and accretion are continual and cyclical with net sand losses due to the interruption of sand by manmade inlets as well as natural processes. FDEP has identified St. Lucie County at a medium-high risk to erosion. The beaches of Florida will continue to shift and change over time, especially when faced with current levels of development and future changes in frequency and severity of storm events. The probability of future beach erosion in St. Lucie County is high. Erosion is exacerbated by tropical storms, winter storms, and hurricanes and is anticipated that there will be at least one storm event on an annual basis that will contribute to erosion (SLC Department of Public Safety Division of Emergency Management 2021). Erosion can have the following potential impacts within a community:

- Degradation of sandy beaches, dunes, mangroves and other critical environmental resources, impacting beach access, habitats for many species of plants and animals, and losses in tourism, shipping, trade, fishing, and other industries;
- Navigable waterway impairment;
- Damage to infrastructure;
- Higher rates of runoff, shedding of water, and pollutants;
- Limitation to new development in some coastal areas;
- Creation of new water channels from spoil deposits, and flooding of areas previously not impacted; and
- Stormwater drainage impairment.

Florida's Atlantic coastline will face a consistent threat of erosion from nuisance flooding and more extreme events as sea levels rise. Without offsetting changes in natural sediment supply, SLC's sandy beaches will rapidly erode and migrate toward the mainland. Additionally, increased frequency and intensity of extreme precipitation and/or drought events can elevate the risk of erosion by

destabilizing soils on the coast and inland. While projections regarding the frequency of hurricanes remain uncertain, there is strong scientific consensus that hurricane-associated rainfall will increase as the atmosphere continues to warm. Warmer air holds more moisture, leading to heavier rainfall during tropical storms and hurricanes (Papacek, et al. 2024). This means that even lower-category storms could produce torrential rainfall, resulting in significant erosion and flooding impacts, including vulnerable coastal zones.

A recent example is Hurricane Nicole in November 2022. Although it was a Category 1 storm, Nicole caused widespread coastal erosion along Florida's east coast, including areas in and around St. Lucie County. The storm's slow movement and prolonged rainfall, lasting over 48 hours, was exacerbated by Hurricane Ian's extreme rainfall that in the region just weeks earlier. Nicole's impact highlighted how cumulative storm effects and slower-moving systems can dramatically increase erosion and infrastructure vulnerability, even when storm intensity is relatively low (Massachusetts Institute of Technology 2020).

These events usually cause damage to structures located along the beaches and Lagoon, especially if there is no dune or marsh system to slow down the wave action. Where structures are not present, the over wash process that happens when surge or waves overtop dune systems allows those systems to migrate inland. While this migration of barrier islands is a natural process, the installation of structures like homes, roads, and other infrastructure requires that this movement be managed. Without the implementation of mitigation strategies, rising sea level will further threaten the stability of the coastline and increase the potential for more damage during a future event. Beyond damage to the beach, dune systems and coastlines, the survival of coastal wetlands is also threatened when they cannot adapt fast enough to offset the rising sea (see Part II: SLAMM Analysis). This could have disastrous consequences to fishery ecosystems, biodiversity, and tourism that St. Lucie's economy relies upon (Florida Division of Emergency Management 2023).

### 6.2.2 Drought

The drought hazard assessment consisted of a qualitative analysis, drawing upon a range of data sources such as water supply and use, projected population growth estimates, historical monetary losses due to drought, historical drought events and future climate projections, and precipitation estimates. Historical data included regional plans and studies, as well as national sources. The analysis identified areas of high susceptibility to drought based on historical information and the potential effects of drought.

#### 6.2.2.1 Drought Exposure Analysis

Droughts generally affect broad regions with drier than normal conditions. For the drought assessment, it is assumed the entire County is equally exposed to drought. According to the U.S Drought Monitor, St. Lucie County and its municipalities are expected to experience 9 to 10 weeks of drought per year based on the average weeks of annualized drought in the County from 2000 to 2022.

The map uses five categories to depict the location and intensity of drought: Abnormally Dry (D0), showing areas that may be going into or are coming out of drought, and four levels of drought (D1-D4).

Since 2000, the U.S. Drought Monitor has documented more than 560 drought events in St. Lucie County. The worst drought (D4 extreme) occurred from May 1, 2011 until October 2011. When compared with the rest of the nation, FEMA's National Risk Index rates the County's expected annual loss due to drought as "relatively moderate" with $1.3 million in projected annual losses (FEMA 2025). The National Risk Index forecasts an annualized frequency of 18 events per year based on historical data from 2000 to 2021. St. Lucie County's 2021 Unified Local Mitigation Strategy assesses future probability of drought as "high" based on past occurrences and the cyclical nature of drought in the County.

The impacts of drought can be difficult to measure because it affects many sectors of the local economy. Industries that rely on ecological health—such as agriculture, landscaping, recreation, and tourism—can experience impacts ranging from minor to severe. Impacts on agriculture in St. Lucie County includes hay, haylage, and livestock such as cattle and sheep. Droughts may result in reduced surface and groundwater availability. Water demand (particularly in industry sectors such as agriculture or hydropower), precipitation and runoff, groundwater withdrawals, and aquifer recharge may all be affected. Buildings and facilities are typically not considered vulnerable to drought conditions. However, drought conditions increase the risk of wildfires that can threaten buildings, homes and property (see Section 6.2.7).

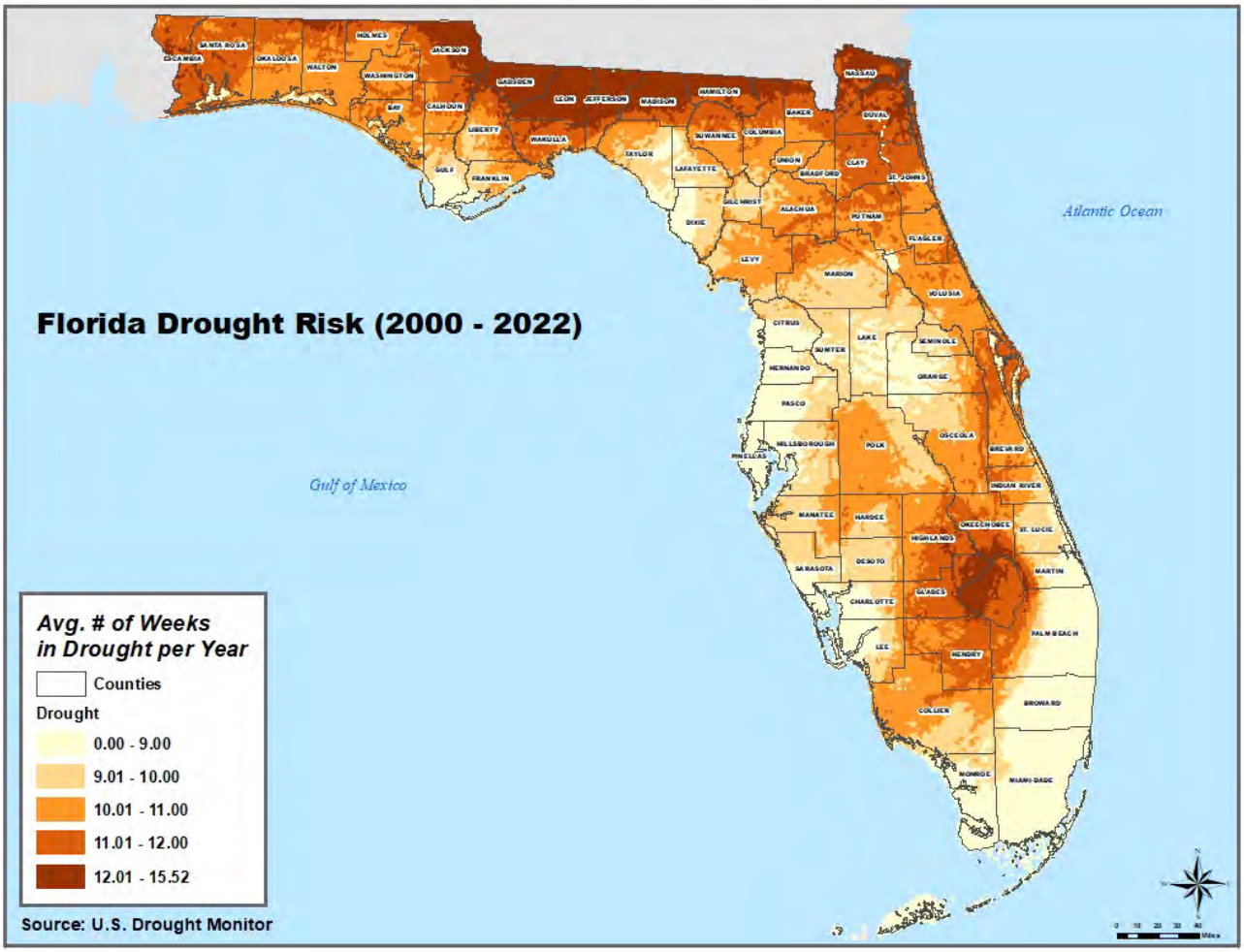


Figure 6-4. Average Number of Drought Weeks per Year 2000-2022

| Category | Description | Possible Impacts |
|---|---|---|
| D0 | Abnormally Dry | **Going into drought:** Short-term dryness slowing planting and growths of crops/pastures<br>**Coming out of drought:** Some lingering water deficits; pastures/crops not fully recovered |
| D1 | Moderate Drought | Some damage to crops/pastures<br>Streams, reservoirs, or wells low, water shortages developing<br>Voluntary water-use restrictions requested |
| D2 | Severe Drought | Crop/pasture losses likely<br>Water shortages common<br>Water restrictions imposed |
| D3 | Extreme Drough | Major crop-pasture losses<br>Widespread water shortages or restrictions |
| D4 | Exceptional Drought | Exceptional and widespread crop/pasture losses<br>Shortages of water in reservoirs, streams, and wells creating emergencies |

Figure 6-5. U.S. Drought Monitor Drought Categories

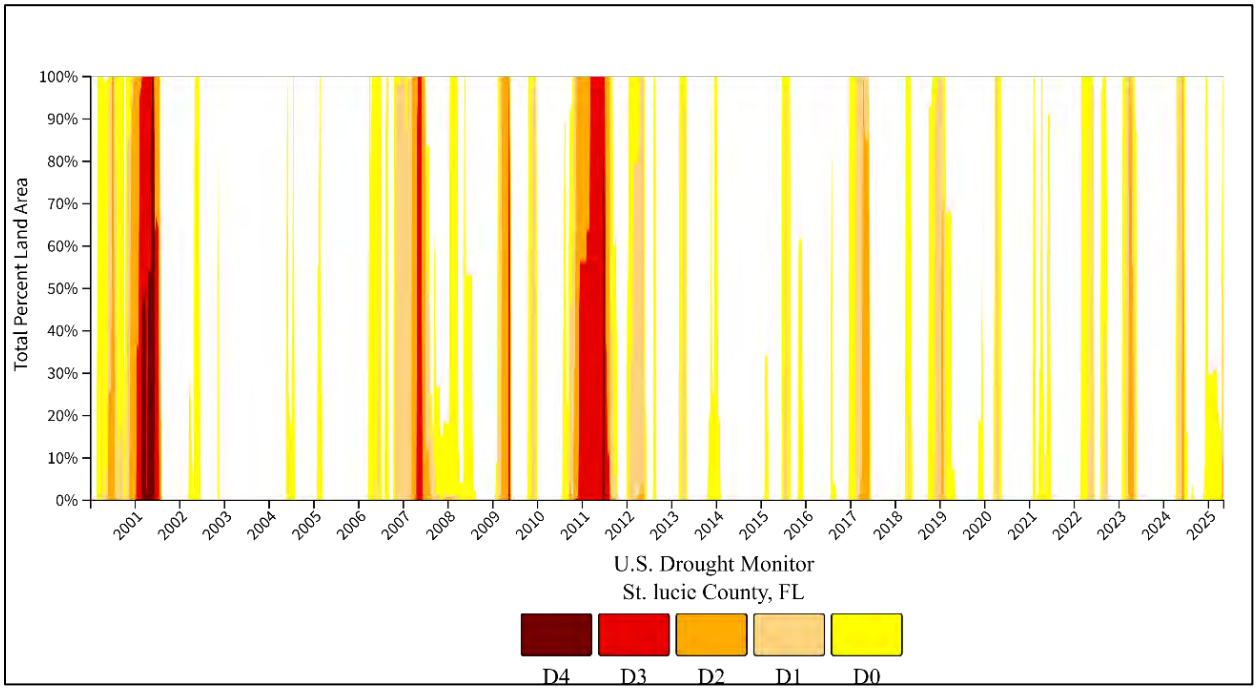



Figure 6-6. Historical Conditions for St. Lucie County 2000-2025

In addition to these economic and ecological impacts, drought conditions can also increase the risk of sinkhole formation. Although buildings and facilities are typically not considered vulnerable to drought conditions directly, the increased potential for sinkholes poses a secondary hazard to infrastructure. This risk is particularly relevant in areas with known karst geology, where even minor shifts in groundwater levels can lead to ground subsidence or collapse (Thompson Earth Systems Institute 2022). The geologic subdistrict known as the Green Ridge Loxahatchee Karst area, located in central and south St. Lucie County, is more prone to dissolution, forming sinkholes, springs, and underground conduits. This karst system typically allows rapid infiltration, with stormwater draining into the subsurface. However, if sinkholes clog or conduits become overloaded, drainage is impeded, and surface flooding can result. The complex, uneven underground drainage creates unpredictable flood patterns, sometimes causing flash flooding far from the rainfall source. In this subdistrict, the geology creates both rapid drainage routes and hidden flood risks when those pathways fail (see Part II: SLAMM Analysis) (Clearview Geographics LLC.).

#### 6.2.2.2 Drought Sensitivity Analysis

St. Lucie County will continue to be exposed to droughts in the future, with drought events potentially becoming more severe and prolonged than in the past. By mid- to late-century, the County is expected to receive a minimal net increase in annual precipitation as it does today in both low- and high-emission scenarios (NOAA 2025b). Overall, the County and its municipalities are expected to experience higher temperatures year-round. As temperatures rise, the rate of soil moisture loss will accelerate, meaning the minimal increase in annual rainfall and shift in the dry season is unlikely to lessen the impacts of increased temperatures (NOAA 2022).

In early 2025, parts of Florida experienced the most severe drought in nearly a quarter-century. By May 2025,more than 84 percent of the state including SLC, was under dry conditions ranging from abnormally dry to extreme drought (Skinner 2025) (**Figure 6-7**).

During this event, the U.S Drought Monitor classified 49 percent of the county as “abnormally dry” (D0), 41 percent as “moderate drought” (D1), and 11 percent as “severe drought” (D2), totaling approximately 52 percent of the county in an active drought area (National Drought Mitigation Center 2025).

Over the previous 30 days of this drought event, precipitation across most of the County was 25 to 50 percent of the historical average, and zero to 25 percent in some areas, as compared to the same date range from 1991 to 2020 (**Figure 6-8**).

These conditions led to increased wildfire risks, with multiple brush fires reported across SLC and the broader Treasure Coast region. In tandem with the dry weather, more than 1,600 wildfires burned nearly 75,000 acres of land across South and Central Florida since the start of the year, according to Florida Forest Service wildfire data. The combination of below-average rainfall and higher-than-average temperatures strained local agriculture in St. Lucie County, particularly citrus groves that were already facing increased risk of citrus greening disease due to drought conditions.

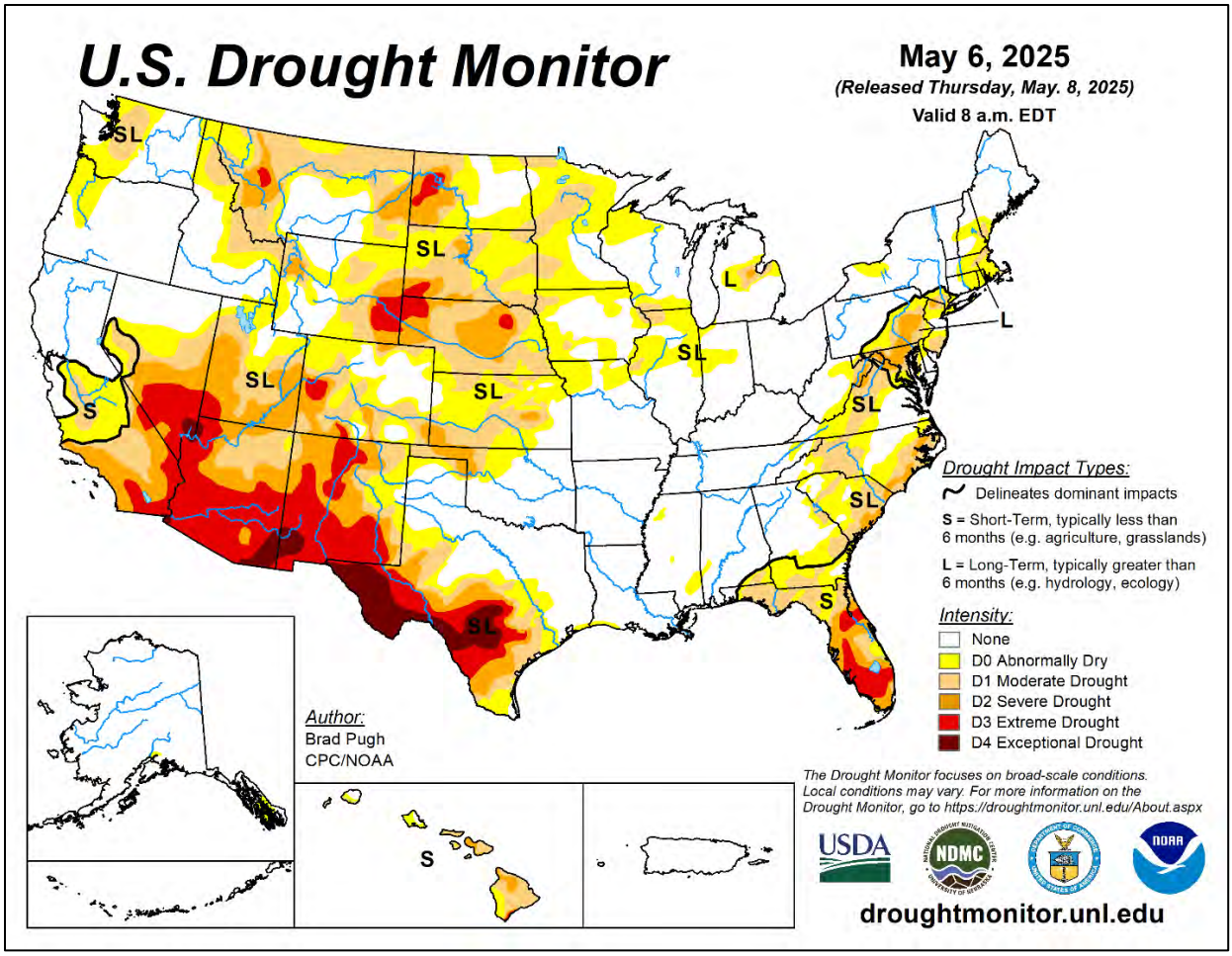



Figure 6-7. U.S. Drought Conditions May 2025

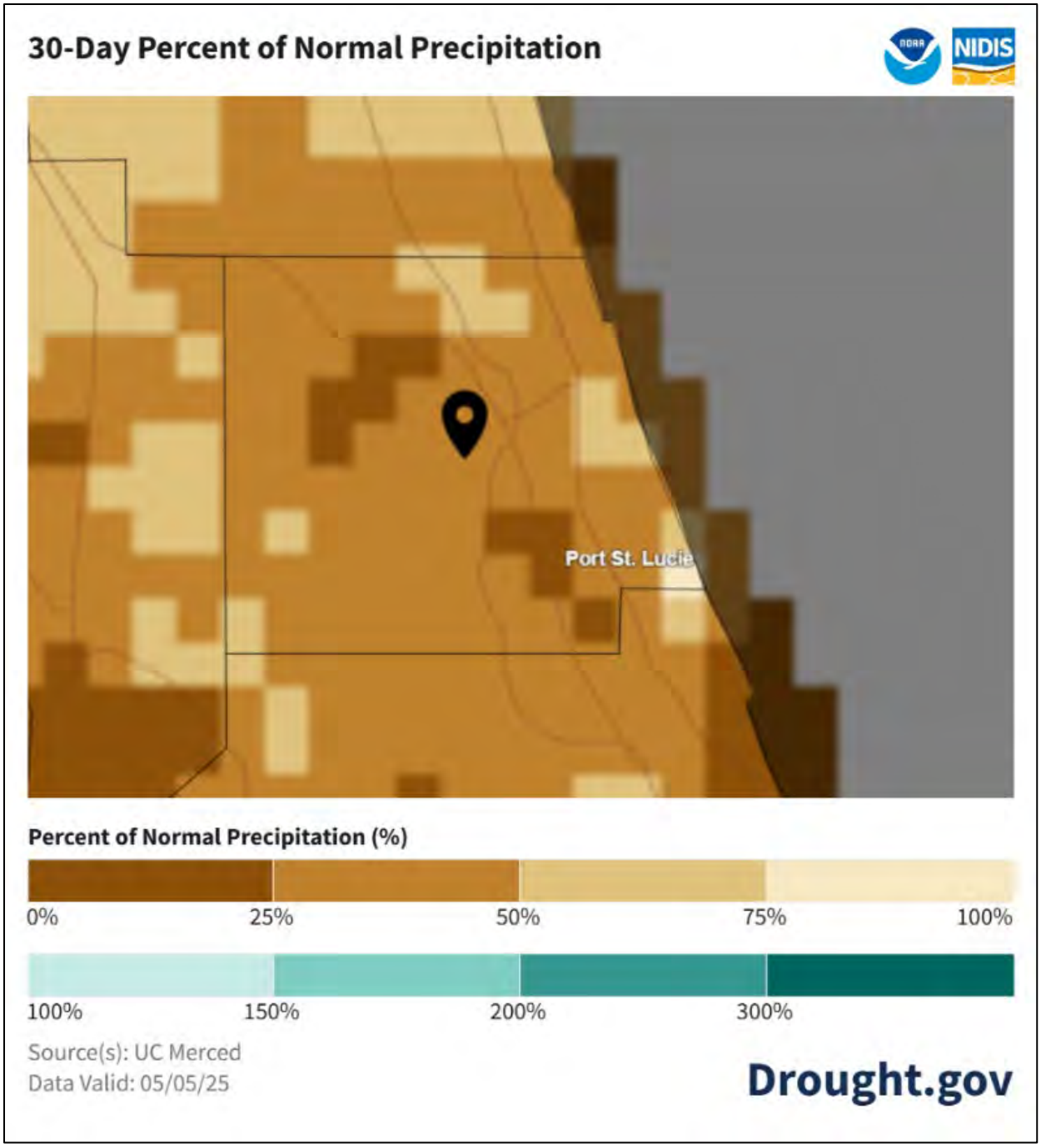



Figure 6-8. St. Lucie County 30-Day Precipitation April 2025

### 6.2.3 Extreme Heat

To evaluate exposure to extreme heat, the heat assessment used the average number of days per year that exceed 95°F in St Lucie County, in conjunction with areas that have historically experienced the urban heat island effect. Using the Trust for Public Land's Urban Heat Island Severity Index, assets were overlaid with the extreme heat hazard data (low, medium, and high). An area analysis was performed that identified the total acreage exposed to the extreme heat hazard.

#### 6.2.3.1 Extreme Heat Exposure Analysis

Florida is known for its high humidity and heat, which combine to affect its population. Due to its proximity to large water bodies and wetlands, Florida typically experiences fewer days than other states where the temperature reaches 95 ° F or greater. However, that proximity also increases the humidity. As the air temperature warms, water is evaporated into the atmosphere, causing a rise in humidity, average rainfall, and the frequency of heavy rainstorms in many places (Florida Enhanced State Hazard Mitigation Plan 2023). The heat index, also known as the 'apparent temperature' is a measure of the actual temperature as felt by the human body. A high heat index decreases the body's ability to dissipate heat, which can lead to heat exhaustion, heat stroke, dehydration and cardiovascular and nervous systems impacts.

In Florida, the average air temperature has increased over 2°F since the beginning of the twentieth century (Runkle et al. 2022). Seventy years from now, most of the state is likely to experience 45 to 90 days per year with temperatures above 95°F, compared to less than 15 days per year today. In addition, Florida's summer heat index is expected to experience the largest increase in the United States with an increase of 8°F to 15°F (Runkle et al. 2022).

The urban heat island effect further compounds this issue in many densely populated areas of the County with high amounts of impervious surface as compared to outlying areas. These surfaces absorb and re-emit the sun's heat into the atmosphere, increasing localized temperatures. In contrast, vegetated and natural areas re-emit less heat and provide more shade (EPA 2023) reducing the heat island effect.

The National Centers for Environmental Information (NCEI) reports that the average annual temperature across the contiguous U.S. in 2024 was 55.5 degrees Fahrenheit, 3.5 degrees above the 20th-century average, ranking as the nation's warmest year in NOAA's 130-year climate record (NOAA 2025).

## Future Climate Indicators

| Indicator | Modeled History (1976 - 2005) | Early Century (2015 - 2044) | | Mid Century (2035 - 2064) | | Late Century (2070 - 2099) | |
|---|---|---|---|---|---|---|---|
| | | Lower Emissions | Higher Emissions | Lower Emissions | Higher Emissions | Lower Emissions | Higher Emissions |
| | Min - Max | Min - Max | Min - Max | Min - Max | Min - Max | Min - Max | Min - Max |
| **Temperature thresholds:** | | | | | | | |
| Annual days with maximum temperature > 90°F | 60 days<br>60 - 72 | 119 days<br>77 - 150 | 124 days<br>89 - 143 | 138 days<br>92 - 169 | 154 days<br>116 - 182 | 157 days<br>113 - 186 | 201 days<br>155 - 235 |
| Annual days with maximum temperature > 95°F | 2 days<br>1 - 3 | 17 days<br>2 - 42 | 21 days<br>5 - 39 | 33 days<br>7 - 72 | 53 days<br>15 - 98 | 56 days<br>10 - 97 | 121 days<br>51 - 163 |
| Annual days with maximum temperature > 100°F | 0 days<br>0 - 0 | 0 days<br>0 - 1 | 0 days<br>0 - 1 | 1 days<br>0 - 5 | 2 days<br>0 - 10 | 3 days<br>0 - 5 | 26 days<br>3 - 85 |
| Annual days with maximum temperature > 105°F | 0 days<br>0 - 0 | 0 days<br>0 - 0 | 0 days<br>0 - 0 | 0 days<br>0 - 0 | 0 days<br>0 - 0 | 0 days<br>0 - 0 | 1 days<br>0 - 7 |
| **Annual temperature:** | | | | | | | |
| Annual single highest maximum temperature °F | 96 °F<br>95 - 96 | 98 °F<br>96 - 100 | 98 °F<br>96 - 100 | 99 °F<br>97 - 101 | 100 °F<br>98 - 102 | 100 °F<br>97 - 102 | 104 °F<br>101 - 107 |
| Annual highest maximum temperature averaged over a 5-day period °F | 93 °F<br>93 - 94 | 96 °F<br>94 - 97 | 96 °F<br>94 - 97 | 97 °F<br>95 - 99 | 98 °F<br>96 - 100 | 98 °F<br>95 - 100 | 101 °F<br>98 - 104 |
| Cooling degree days (CDD) | 3405 degree-days<br>3294 - 3542 | 4,086 degree-days<br>3,622 - 4,708 | 4,147 degree-days<br>3,735 - 4,518 | 4,402 degree-days<br>3,781 - 5,072 | 4,701 degree-days<br>4,058 - 5,183 | 4,746 degree-days<br>4,053 - 5,364 | 5,710 degree-days<br>4,777 - 6,499 |

N/A = Data Not Available for the selected area

Source: (NOAA n.d.)

Figure 6-9. St. Lucie County Extreme Heat Days Through 2099

This 'extreme heat' assessment evaluates the change in the average annual number of days that reached or exceeded 95°F from the present day up to 2099 in St. Lucie County, based on relatively low carbon emissions (RCP 4.5) and relatively high (RCP 8.5) carbon emission scenarios. The Lower Emissions Scenario, RCP 4.5, is a possible future in which heat-trapping emissions are drastically reduced by 2040. The Higher Emissions Scenario, RCP 8.5, is a possible future in which emissions continue to trend higher throughout this century.

As maximum and minimum temperatures rise, so does the possibility of extreme heat events and urban heat islands. Over the next 65 years, these patterns in SLC are expected to intensify due to projected future conditions.

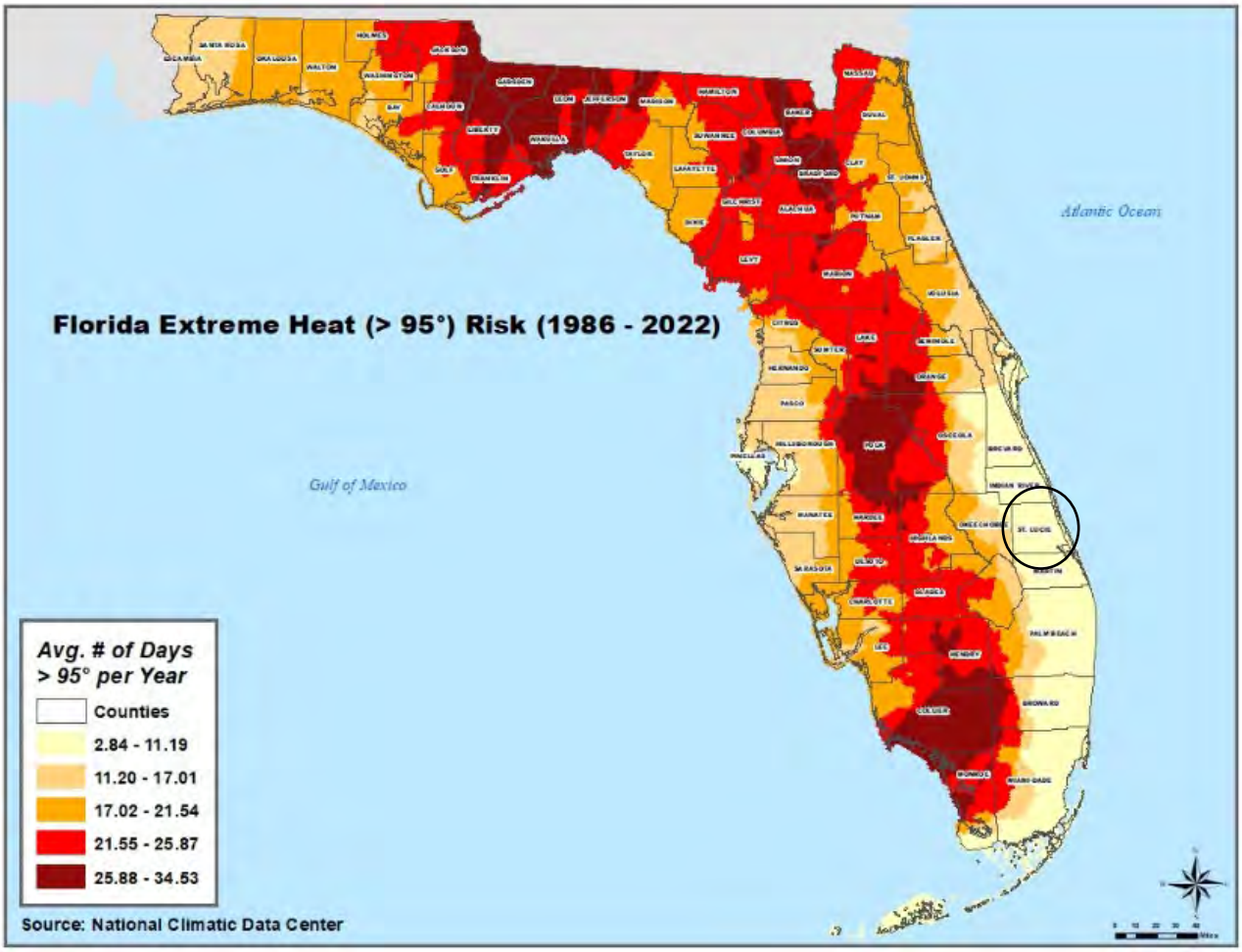
As shown in **Figure 6-9**, the County experienced less than 3 days each year in which maximum temperatures reached or exceeded 95°F. Projections for the early 21st century, through 2044, jump from an average of 2 days in the modeled history (1976-2005) to 17 days in the lower emissions scenario and 21 days in the higher emissions scenario. By the late century, 2070-2099, the average number of annual days with maximum temperatures above 95°F is projected to increase to 56 days and 121 days in the respective scenarios.

**Land, Assets and Population Exposure**

***Land Exposure***

All of St. Lucie County and its municipalities are exposed to extreme heat, but certain topographies and development patterns increase the likelihood of urban heat islands. An urban heat island is an area with a high ratio of impervious surfaces (such as buildings and roadways) relative to green spaces. These locations usually experience higher maximum daytime temperatures and less nighttime cooling, effectively becoming isolated areas (e.g., "islands") of temperatures that are several degrees hotter than other areas.

According to the Florida Department of Transportation's 2018 Florida Population Growth report, roughly 88 percent of Florida's population resides in urban areas (FDOT 2019). The Florida Extreme Heat Risk Map, as displayed in **Figure 6-10**, shows the average number of days with temperatures above 95 degrees each year. Even though there are large concentrations of urban areas along the coast, proximity to the ocean generally keeps these areas cooler than the more interior regions of Florida (Florida Division of Emergency Management 2023).




*Please note: St. Lucie County indicated by black circle.*

Figure 6-10. Florida Extreme Heat Risk Map

To evaluate exposure to extreme heat, the heat assessment identified areas in the County that have historically experienced urban heat island effects. Using the Trust for Public Land's Urban Heat Island Severity Index, assets were overlaid with the extreme heat hazard data. The purpose of this layer is to show where certain areas of cities are hotter than the average temperature for that same city as a whole. This 30-meter raster was derived from Landsat 8 imagery band 10 (ground-level thermal sensor) from the summer of 2023 (The Trust for Public Land 2024). An area analysis was performed that identified the total acreage of the County exposed to the extreme heat hazard (Figure 6-11). For the purposes of these analyses the Urban Heat Island Severity Index rankings, 1 (mild) to 5 (severe), we categorized as low (1 or mild), medium (2 or mild to moderate, 3 or moderate) and high (5 or severe).

As shown in **Table 6-1**, approximately 63,200 acres of the entire County are considered exposed to extreme heat, representing 17 percent of the total land area. The data and maps associated with the extreme heat hazard should be used as a reference and for planning purposes only.

Table 6-1. Land Area Exposure to Extreme Heat

| Jurisdiction | Total Land Area (Acres) | Land Area (Acres) Exposed to Extreme Heat | | | | | |
|---|---|---|---|---|---|---|---|
| | | Low | Percent of Total | Medium | Percent of Total | High | Percent of Total |
| Fort Pierce (C) | 15,663.3 | 2,659.9 | 17.0% | 7,897.5 | 50.4% | 81.8 | 0.5% |
| Port St. Lucie (C) | 75,850.8 | 14,301.1 | 18.9% | 28,868.9 | 38.1% | 8.2 | <0.1% |
| St. Lucie Village (T) | 524.0 | 51.6 | 9.8% | 105.5 | 20.1% | 15.8 | 3.0% |
| Unincorporated St. Lucie County | 274,265.0 | 4,379.3 | 1.6% | 4,861.0 | 1.8% | 169.5 | 0.1% |
| St. Lucie County (Total) | 366,303.2 | 21,391.9 | 5.8% | 41,732.9 | 11.4% | 275.3 | 0.1% |

Unincorporated St. Lucie County primarily consists of relatively undeveloped rural land, natural vegetation, wetlands and surface waters, leading to minimal exposure from extreme heat, with just 3.4 percent exposure across all scenarios, with about 2 percent under medium-level extreme heat **Figure 6-11**.

Nearly 70 percent of Fort Pierce's total land mass is exposed to extreme heat across all scenarios, with about 50 percent ranked as medium-level extreme heat as visualized in orange in **Figure 6-12**.

Approximately 56 percent of Port St. Lucie's total land cover (43,178 of 75,850 acres) is exposed to extreme heat across all scenarios, with 38 percent ranked as medium-level extreme heat. (**Figure 6-13**).

About 32 percent of St. Lucie Village's total land mass is exposed to extreme heat across all scenarios, with 20 percent ranked as medium-level extreme heat (**Figure 6-14**).

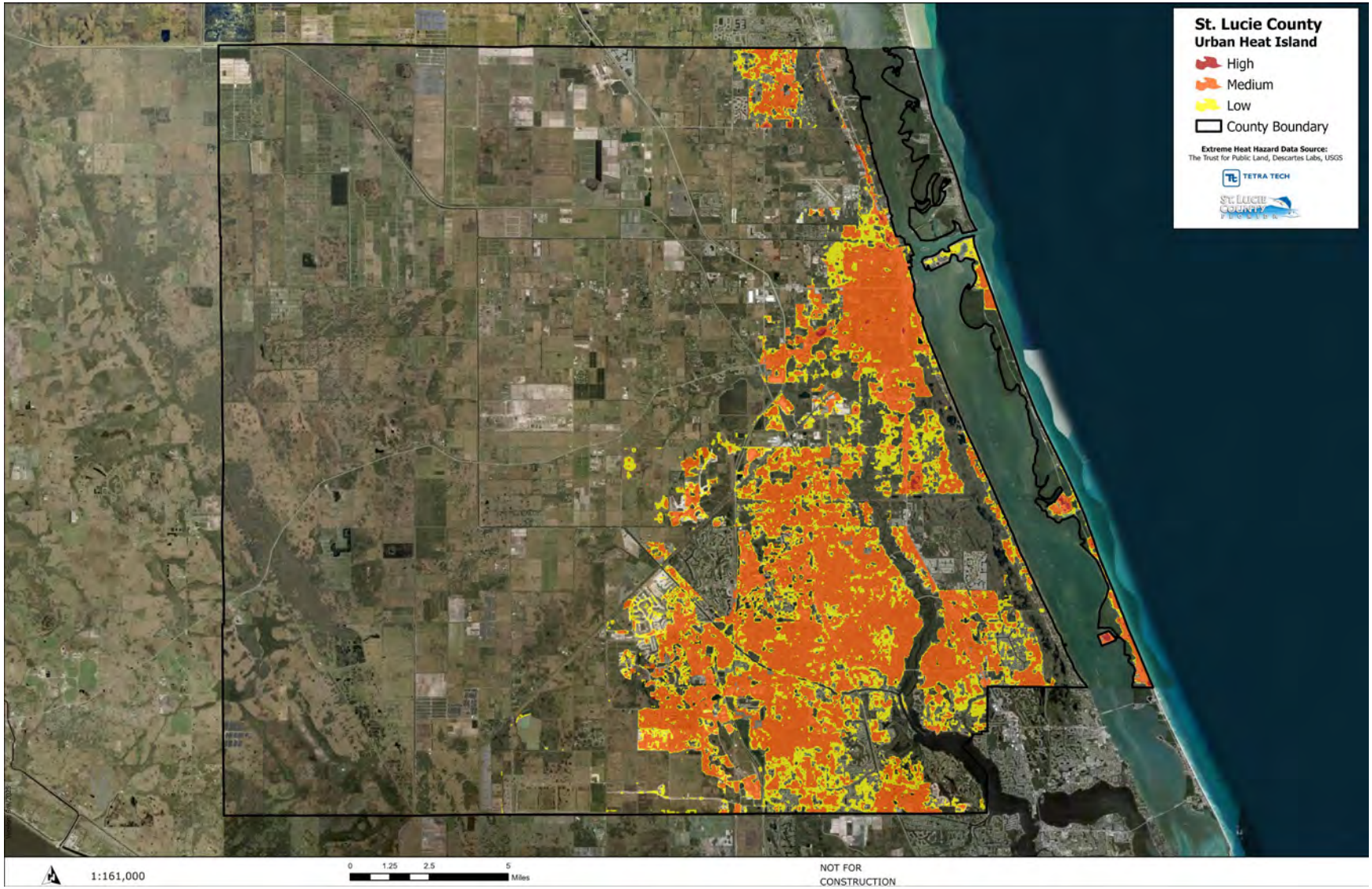



Figure 6-11. St. Lucie County Extreme Heat Hazard Area

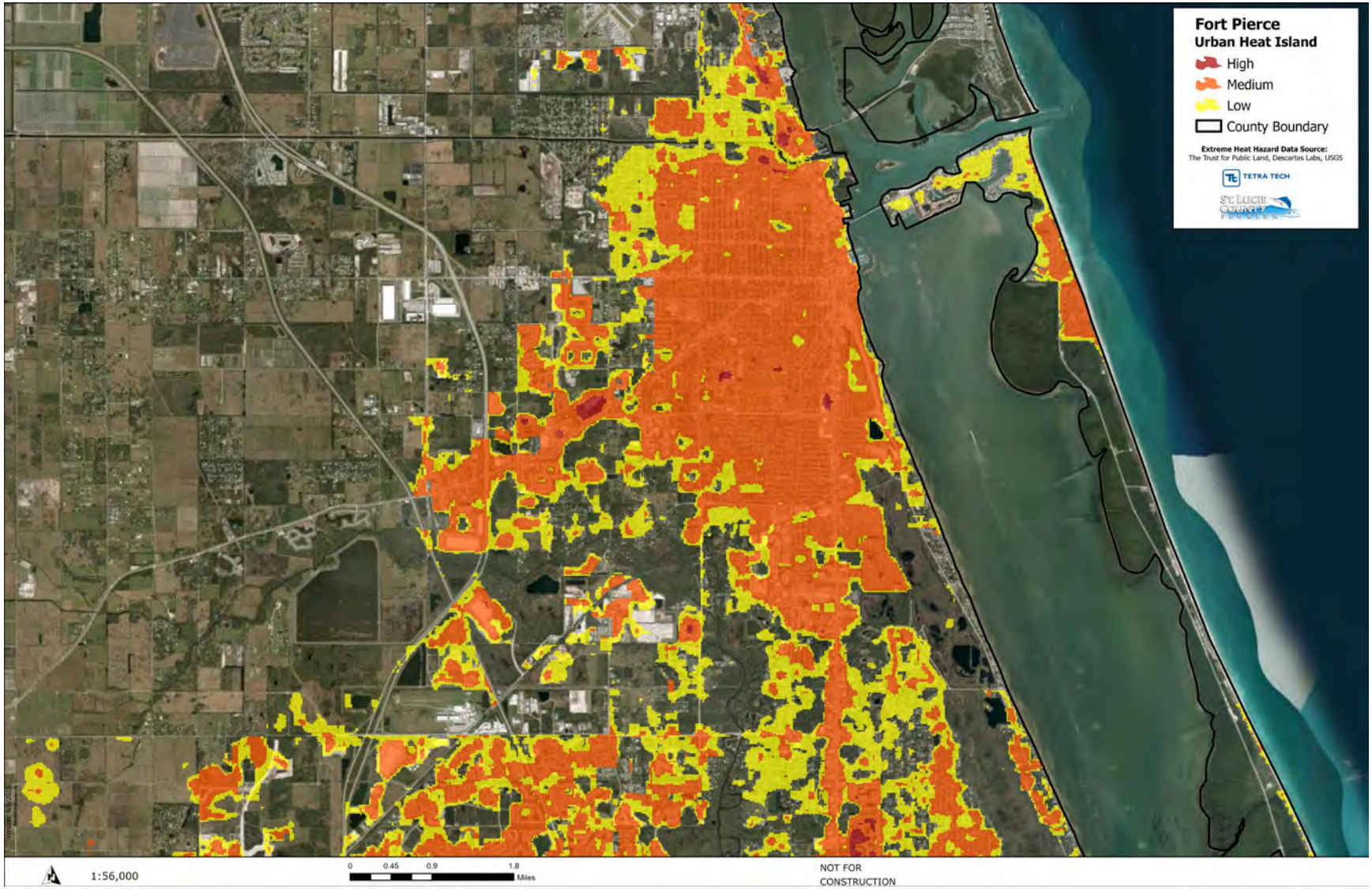



Figure 6-12. Fort Pierce Extreme Heat Hazard Area

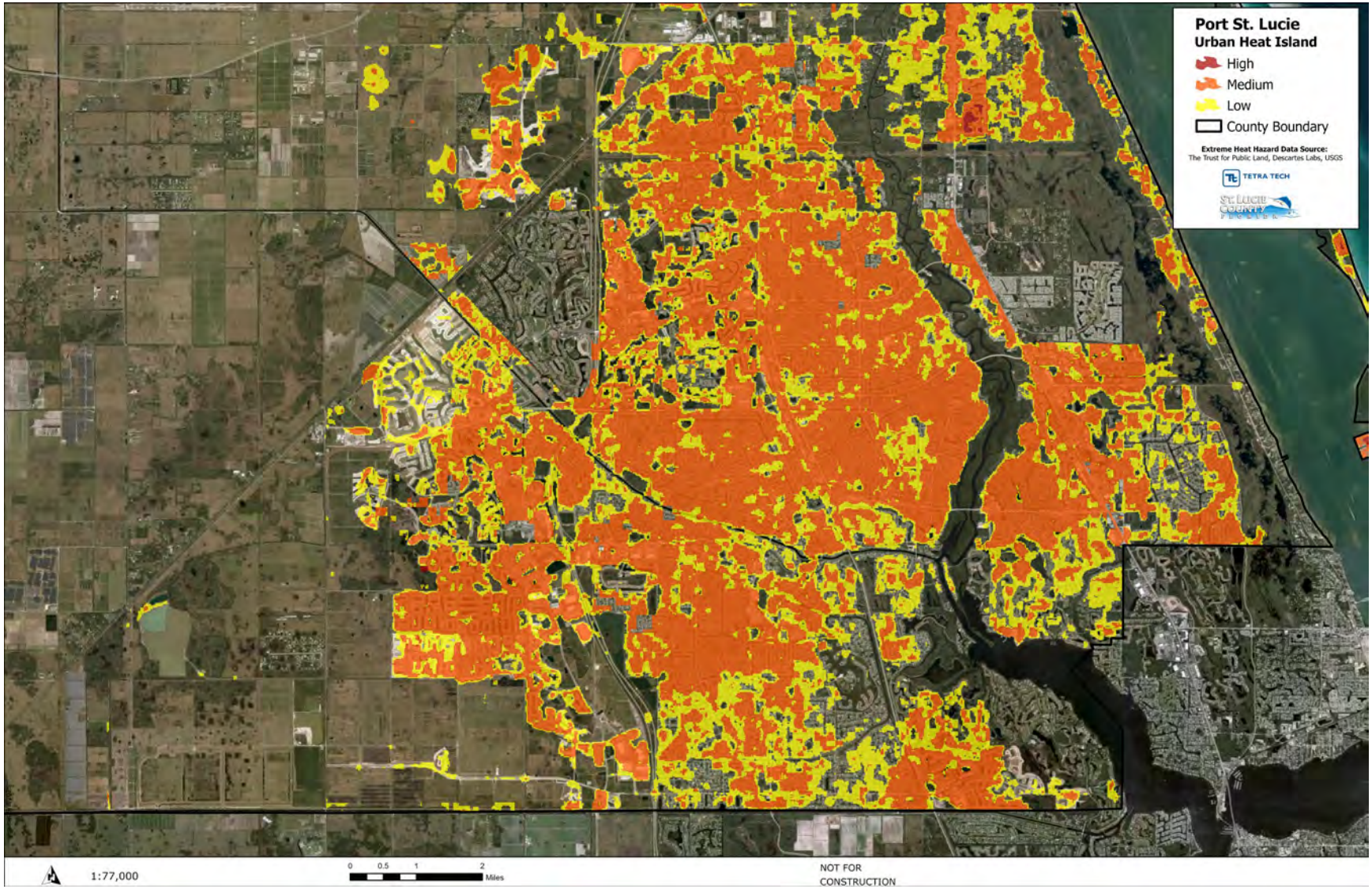



Figure 6-13. Port St. Lucie Extreme Heat Hazard Area

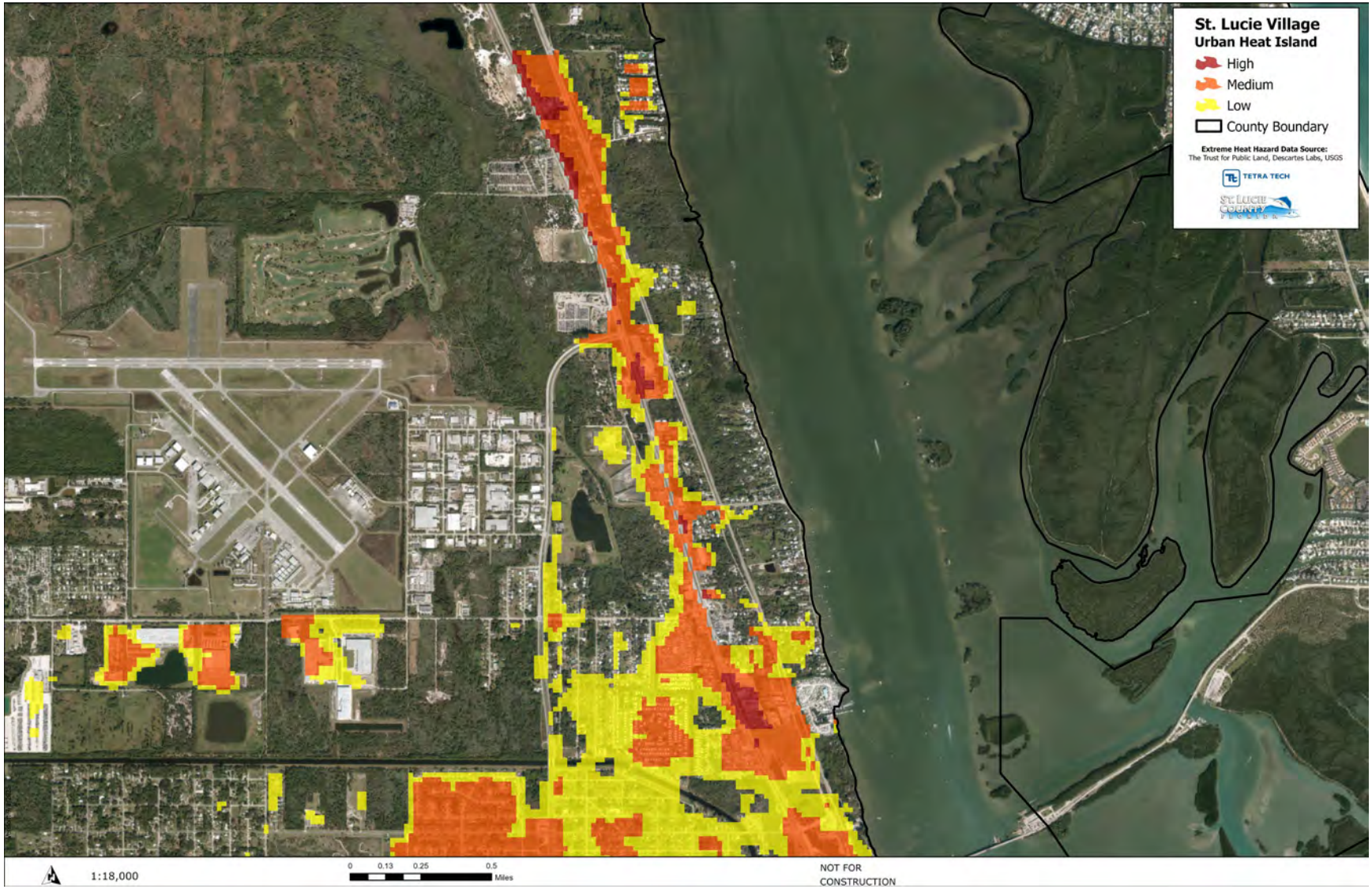



Figure 6-14. St. Lucie Village Extreme Heat Hazard Area

### *Asset Exposure*

Although facilities themselves are not typically vulnerable to extreme heat, the areas or regions that the facilities are in may be susceptible to extreme heat. Additionally, the efficiency at which a building operates may be affected if the building is in an area vulnerable to extreme heat. For example, extreme heat conditions can result in less efficient cooling systems or systems that must run constantly to effectively cool a building. This can lead to utility failure and energy infrastructure disruption.

Extreme heat can also have serious implications for transportation infrastructure, particularly roadways. High temperatures cause asphalt to soften and deform, leading to rutting, cracking, and pothole formation, especially under the weight of heavy vehicles. When temperatures reach around 100°F, road surface temperatures can exceed 140°F, causing the bitumen in asphalt to become pliable and sticky. This not only increases maintenance costs but also creates safety hazards such as reduced tire grip and vehicle instability. In some cases, roads can become buckled or melted, requiring emergency repairs and temporary closures.

Assets that intersected the extreme heat hazard area are considered exposed. The analysis determined the extent (in miles) of shoreline, the extent (in acreage) of critical asset areas, count of critical assets and population, and land area affected by the extreme heat hazard.

As shown in **Table 6-3**, 27,211 critical assets countywide were assessed. Roughly 14 percent are classified as low exposure, 47 percent as medium exposure, and 0.9 percent as high exposure to extreme heat. A total of 945 Critical Community and Emergency Facilities assets, or 70.3 percent, and 15,837 Critical Infrastructure assets, or 67.5 percent, are classified as medium extreme heat exposure.

A total of 18,654 critical assets in the City of Fort Pierce were assessed for exposure to extreme heat. Of these approximately 11 percent are classified as low exposure, 76 percent as medium exposure, and 0.88 percent as high exposure to extreme heat across all asset categories. The largest total number of assets exposed are Critical Infrastructure; nearly 14,000 of these assets are exposed in the medium extreme heat scenario.

A total of 805 critical assets in the City of Port St. Lucie were assessed. Of these, approximately 26 percent are classified as low exposure, 47 percent as medium exposure, and zero percent as high exposure to extreme heat across all asset categories. The largest total number (250) of assets assessed in Port St. Lucie are Critical Community and Emergency Facilities facing medium extreme heat exposure.

The Town of St. Lucie Village includes 445 critical assets analyzed for extreme heat exposure. Approximately 44 percent are classified as low exposure, 25 percent as medium exposure and 1.28 percent as high exposure to extreme heat across all asset categories. A total of 138 Critical Infrastructure assets are exposed to medium extreme heat.

In the unincorporated areas of the County 7,307 critical assets are included in this analysis. Approximately 9 percent are classified as low exposure, 52 percent as medium exposure and 0.78 percent as high exposure to extreme heat. A total of 1,558 Critical Infrastructure assets face medium extreme heat exposure.

Table 6-2. Number of Critical Assets Exposed to Extreme Heat

| Jurisdiction | Critical Asset Category | Total Critical Assets Evaluated | Number of Critical Assets Exposed to Extreme Heat | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Low | % of Total | Medium | % of Total | High | % of Total |
| Fort Pierce (C) | Critical Community and Emergency Facilities | 714 | 26 | 3.6% | 641 | 89.8% | 23 | 3.2% |
| | Critical Infrastructure | 17,152 | 2,069 | 12.1% | 13,989 | 81.6% | 37 | 0.2% |
| | Natural, Cultural, and Historic Resources | 761 | 64 | 8.4% | 589 | 77.4% | 1 | 0.1% |
| | Transportation and Evacuation Routes | 27 | 5 | 18.5% | 15 | 55.6% | 0 | 0.0% |
| Port St. Lucie (C) | Critical Community and Emergency Facilities | 343 | 61 | 17.8% | 250 | 72.9% | 0 | 0.0% |
| | Critical Infrastructure | 275 | 55 | 20.0% | 152 | 55.3% | 0 | 0.0% |
| | Natural, Cultural, and Historic Resources | 124 | 24 | 19.4% | 54 | 43.5% | 0 | 0.0% |
| | Transportation and Evacuation Routes | 63 | 29 | 46.0% | 10 | 15.9% | 0 | 0.0% |
| St. Lucie Village (T) | Critical Community and Emergency Facilities | 5 | 3 | 60.0% | 1 | 20.0% | 0 | 0.0% |
| | Critical Infrastructure | 435 | 75 | 17.2% | 138 | 31.7% | 22 | 5.1% |
| | Natural, Cultural, and Historic Resources | 4 | 0 | 0.0% | 2 | 50.0% | 0 | 0.0% |
| | Transportation and Evacuation Routes | 1 | 1 | 100.0% | 0 | 0.0% | 0 | 0.0% |
| Unincorporated St. Lucie County | Critical Community and Emergency Facilities | 283 | 26 | 9.2% | 53 | 18.7% | 6 | 2.1% |
| | Critical Infrastructure | 5,595 | 1,192 | 21.3% | 1,558 | 27.8% | 57 | 1.0% |
| | Natural, Cultural, and Historic Resources | 1,373 | 45 | 3.3% | 31 | 2.3% | 0 | 0.0% |
| | Transportation and Evacuation Routes | 56 | 2 | 3.6% | 2 | 3.6% | 0 | 0.0% |
| St. Lucie County (Total) | Critical Community and Emergency Facilities | 1,345 | 116 | 8.6% | 945 | 70.3% | 29 | 2.2% |
| | Critical Infrastructure | 23,457 | 3,391 | 14.5% | 15,837 | 67.5% | 116 | 0.5% |
| | Natural, Cultural, and Historic Resources | 2,262 | 133 | 5.9% | 676 | 29.9% | 1 | <0.1% |
| | Transportation and Evacuation Routes | 147 | 37 | 25.2% | 27 | 18.4% | 0 | 0.0% |

As shown in **Table 6-3**, 42.5 percent of the countywide transportation route miles are exposed, and 29 percent of countywide critical infrastructure asset miles—referring to other linear systems—are exposed to extreme heat.

Table 6-3. Total Miles of Critical Linear Assets Exposed to Extreme Heat

| Jurisdiction | Critical Infrastructure Miles | | | | Transportation Route Miles | | | |
|---|---|---|---|---|---|---|---|---|
| | Total | Low – % of Total | Medium - % of Total | High - % of Total | Total | Low - % of Total | Medium - % of Total | High - % of Total |
| Fort Pierce (C) | 53.9 | 14.4% | 56.6% | 0.0% | 52.6 | 15.5% | 74.0% | 0.2% |
| Port St. Lucie (C) | 99.4 | 15.2% | 23.2% | 0.0% | 133.7 | 23.1% | 51.2% | 0.0% |
| St. Lucie Village (T) | 2.2 | 1.6% | 67.0% | 29.0% | 2.1 | 22.2% | 36.1% | 0.55 |
| Unincorporated St. Lucie Co. | 169.3 | 2.8% | 5.7% | .8% | 271.1 | 6.0% | 10.8% | 0.7% |
| St. Lucie County (Total) | 324.8 | 8.5% | 19.9% | 0.6% | 459.4 | 12.2% | 29.9% | 0.4% |

***Population Exposure***

Florida has the highest rate of heat-related illness (ranging from heat rash to exhaustion to heat stroke) and the 6th highest rate of heat-related deaths in the United States; an estimated 150 Florida residents died due to heat-related illness between 2017 and 2021. Between 2018 and 2022, Florida recorded over 26,000 emergency room visits and nearly 5,000 hospitalizations due to heat-related illnesses (Tsoukalas and Sela 2024). The prevalence of HRI is likely underestimated, especially among working people who fear retaliation or lack of meaningful follow-through if they report to their supervisors (e.g., immigrants and temporary workers). This is concerning because once someone experiences a heat-related incident, their body's ability to tolerate heat is often significantly reduced, making repeat heat-related illness even more likely (Tsoukalas and Sela 2024).

HRI also hurts businesses and the economy by reducing labor productivity. For example, at 77degrees Fahrenheit with 30 percent humidity, the average person can work at 95 percent capacity; at 95 degrees Fahrenheit with 50 percent humidity, work capacity drops to 68 percent. In Florida, two of the top three outdoor jobs are key drivers of its economy — construction along with amusement and recreation. Due to heat-related illness, Florida loses an estimated $11 billion annually in productivity (Tsoukalas and Sela 2024).

Extreme heat events can also result in local or regional health and medical systems becoming overloaded. Energy systems and power grids may also exceed capacity, making electricity availability unreliable for air conditioning and refrigeration of food and medications. Finally, heatwaves can cause more instances of unrest and conflict which increases the need for law enforcement resources and emergency services (Florida Division of Emergency Management 2023).

As shown in **Table 6-4**, about 215,000 total residents, or 63 percent of people living in St. Lucie County, its jurisdictions, and unincorporated areas, are exposed to extreme heat.

Table 6-4. Population Exposure to Extreme Heat

| Jurisdiction | Total Population | # Low | % of Total | # Medium | % of Total | # High | % of Total |
|---|---|---|---|---|---|---|---|
| Fort Pierce (C) | 48,094 | 4,992 | 10.4% | 29,245 | 60.8% | 260 | 0.5% |
| Port St. Lucie (C) | 220,453 | 46,012 | 20.9% | 112,051 | 50.8% | 7 | <0.1% |
| St. Lucie Village (T) | 818 | 45 | 5.5% | 71 | 8.7% | 18 | 2.2% |
| Unincorporated St. Lucie County | 76,872 | 9,823 | 12.8% | 12,613 | 16.4% | 345 | 0.4% |
| St. Lucie County (Total) | 346,237 | 60,872 | 17.6% | 153,980 | 44.5% | 630 | 0.2% |

As shown in **Table 6-5**, the largest portion (54.1 percent ) of low to moderate income residents throughout SLC are exposed to medium level extreme heat.

The City of Fort Pierce has the largest share of LMI residents across all exposure levels in both the total number and percentage; with nearly 39,000 people, or 81 percent of the total population of the City. A total of 74 percent of LMI residents, or nearly 29,000 people, are exposed to medium level extreme heat.

The City of Port St. Lucie has around 4,000 LMI residents, of which about 62 percent, or 2,382 people are exposed to medium level extreme heat.

St. Lucie Village has 132 LMI residents, of which about 30 percent or 39 people are exposed to medium-level extreme heat.

Unincorporated St. Lucie County has about 22,000 low to moderate income residents, of which 17.6 percent or 3,883 are exposed to medium level extreme heat.

Table 6-5. LMI Population Exposure to Extreme Heat

| Jurisdiction | # of Low to Moderate Income (LMI) Population | # Low | % of LMI | # Medium | % of LMI | # High | % of LMI |
|---|---|---|---|---|---|---|---|
| Fort Pierce (C) | 38,933 | 4,517 | 11.6% | 28,824 | 74.0% | 255 | 0.7% |
| Port St. Lucie (C) | 3,853 | 650 | 16.9% | 2,382 | 61.8% | 0 | 0.0% |
| St. Lucie Village (T) | 132 | 30 | 22.7% | 39 | 29.5% | 14 | 10.6% |
| Unincorporated St. Lucie County | 22,063 | 3,509 | 15.9% | 3,883 | 17.6% | 68 | 0.3% |
| St. Lucie County (Total) | 64,981 | 8,706 | 13.4% | 35,128 | 54.1% | 337 | 0.5% |

### 6.2.3.2 Extreme Heat Sensitivity Analysis

Extreme heat events can affect anyone, but a broad range of the population has increased susceptibility to heat-related illness, including the elderly, children and infants, people with chronic illnesses or disabilities, low-income households, and people who are unhoused. In addition, jobs that require outdoor work or are in high-heat conditions pose more risk to heat related complications. For example, according to the U.S. Bureau of Labor Statistics, 490,710 Floridians work in outdoor-dominant professions. Among these, construction, landscaping, and amusement / recreation are the

top outdoor industries in the state. Men are three times more likely to suffer from heat-related incidents at work than women; and people under 30 are twice as likely to experience HRI than older working people (Tsoukalas and Sela 2024). In addition, compelling data suggests that people with minimum- and other low-wage jobs are particularly prone to HRI. The Institute of Labor Economics finds that working people in the bottom 20 percent of wages suffer five times as many heat-related injuries as those in the highest 20 percent. This is partly because those working in lower-wage jobs may lack other opportunities and job prospects, giving them less negotiating power for additional safety measures to be implemented (Tsoukalas and Sela 2024).

### 6.2.4 Inland Flooding

The heart of St. Lucie County's natural infrastructure lies in its extensive wetland networks. Mangrove forests excel at stabilizing shorelines along inland waterways while providing essential nursery habitat for fisheries. The marsh system, comprising transitional, regular, and irregular flooding zones, creates a dynamic buffer that naturally adapts to changing water levels. These wetlands show promising adaptation potential through vertical accretion and inland migration given sufficient time to transform naturally or using some form of artificial augmentation. Freshwater-dependent ecosystems face increasing stress from saltwater intrusion and changing rainfall patterns. Preservation of these inland natural ecosystems is crucial for natural flood protection and maintaining water quality and availability for inland communities.

Inland flood used scenarios for 100- and 25-year events under 2040 and 2070 timelines, based on rainfall and other change factors. Rainfall-induced flooding was examined using the SFWMD standard rainfall distribution for four 24-hour events, and NOAA Atlas 14 precipitation. Future rainfall precipitation change factors were derived from the SFWMD and U.S. Geological Survey and applied appropriately. A HEC-RAS (Hydrologic Engineering Center – River Analysis System) rain-on-grid modeling approach was integrated with SLC Light Detection and Ranging (LiDAR) elevation data. The HEC-RAS model was developed to estimate depth of ponding due to heavy rainfall events. It did not evaluate riverine flooding or account for culverts and other stormwater infrastructure.

The HEC-HMS (Hydrologic Engineering Center – Hydrologic Modeling System) model was used to develop the precipitation file for the HEC-RAS model. The HEC-HMS model was prepared to simulate nine design storms representing 2040 rainfall patterns and 2070 rainfall depths both evaluated for 100- and 25-year return interval, 24-hour design storms.

Rainfall depths representing each 24-hour hypothetical storm event were taken from NOAA Atlas 14 annual maximum series to represent rainfall patterns (NOAA 2023a). Zonal statistics were calculated for the two-dimensional flow area from the Atlas 14 rasters and the mean rainfall depth was used. Future 2070 rainfall depths were computed using the current depths and the multiplier published in Technical Memorandum: Adoption of Future Extreme Rainfall Change Factors for Flood Resiliency Planning in South Florida (SFWMD 2022).

#### 6.2.4.1 Inland Flooding Exposure Analysis

NOAA Atlas 14 utilizes two primary methods for analyzing precipitation frequency: the Annual Maximum Series (AMS) and the Partial Duration Series (PDS). The AMS method involves selecting the

single largest precipitation event for each year and is a simplified analysis based on one event per year. **Table 6-6** includes precipitation estimates, in inches, for varying recurrence intervals utilizing the AMS approach. For infrastructure projects where the focus is on the most extreme events (e.g., dam spillways) AMS-based estimates are typically sufficient.

Table 6-6. Atlas 14 AMS-based Precipitation Estimates

| Hypothetical Storm Event | Current Atlas 14 Mean Rainfall Depth (inches) – 24-hour duration | Current Atlas 14 Mean Rainfall Depth (inches) – 72-hour duration |
|---|---|---|
| 100-year | 13.3 | 15.1 |
| 25-year | 9.86 | 11.3 |

The PDS method includes all precipitation events that exceed a specific threshold, regardless of how many events occurred in a single year. Since it includes multiple events per year, this method offers a more comprehensive view of precipitation extremes. In scenarios where understanding the frequency of multiple significant events within a year is critical (e.g., urban drainage systems) PDS-based analyses may offer more detailed insights. Estimates using the PDS approach resulted in nearly identical outputs (NOAA 2025d)

**Land Exposure**

Inland flooding refers to flooding driven by rainfall that cannot be absorbed by the soil or transported by existing drainage systems or natural features. Extreme rainfall occurs when precipitation amounts experienced by a region are more intense and prolonged than average. In low-lying areas, this phenomenon often results in flash flooding, overwhelming stormwater management systems and leading to widespread damage to many types of infrastructure. The asset types that may be impacted can include roads, bridges and buildings, as well as homes and businesses. Extreme rainfall can interrupt essential services and transportation networks. While SLC can experience rainfall anywhere, not all areas are equally vulnerable to inland flooding, due to variations in elevation, drainage capacities of physical and natural systems, and existing waterbodies and streamflow patterns.

Sea level rise, as well as storm surge, impact inland areas where rivers, creeks and canals are connected to the coast and whose capacity is thereby tidally influenced. Two NOAA sea level projections were used for future inland flood analysis: NOAA Intermediate Low (NIL) and NOAA Intermediate High (NIH). **Table 6-7** provides an overview of flooding that results from extreme precipitation with volumes equal to 25- and 100-year rainfall events in the present day and under future conditions in 2040, 2070, and 2100. **Figure 6-15**, **Figure 6-16**, **Figure 6-17**, and **Figure 6-18** show two present day scenarios and two 2070 scenarios – precipitation volumes equal to a 100-year rainfall event at NOAA Intermediate Low and Intermediate High projections.

Table 6-7. Inland Flooding Mean Inundation Depth

| Timescale | Scenario | | Mean Inundation (inches) | Maximum Inundation (inches) |
|---|---|---|---|---|
| Present Day | -- | 25-Year 24-Hour | 11.52 | 164.28 |
| Present Day | -- | 100-Year 24-Hour | 14.4 | 278.76 |
| 2040 | NIL | 25-Year 24-Hour | 12.48 | 271.32 |
| 2040 | NIL | 100-Year 24-Hour | 15.72 | 280.8 |

| Timescale | Scenario | | Mean Inundation (inches) | Maximum Inundation (inches) |
|---|---|---|---|---|
| 2040 | NIH | 25-Year 24-Hour | 12.72 | 279.96 |
| 2040 | NIH | 100-Year 24-Hour | 15.96 | 289.44 |
| 2070 | NIL | 25-Year 24-Hour | 12.96 | 279.36 |
| 2070 | NIL | 100-Year 24-Hour | 16.68 | 289.32 |
| 2070 | NIH | 25-Year 24-Hour | 13.92 | 303.72 |
| 2070 | NIH | 100-Year 24-Hour | 17.52 | 313.68 |
| 2100 | NIL | 25-Year 24-Hour | 13.32 | 286.44 |
| 2100 | NIL | 100-Year 24-Hour | 18 | 297.72 |
| 2100 | NIH | 25-Year 24-Hour | 15.72 | 337.2 |
| 2100 | NIH | 100-Year 24-Hour | 20.04 | 348.48 |

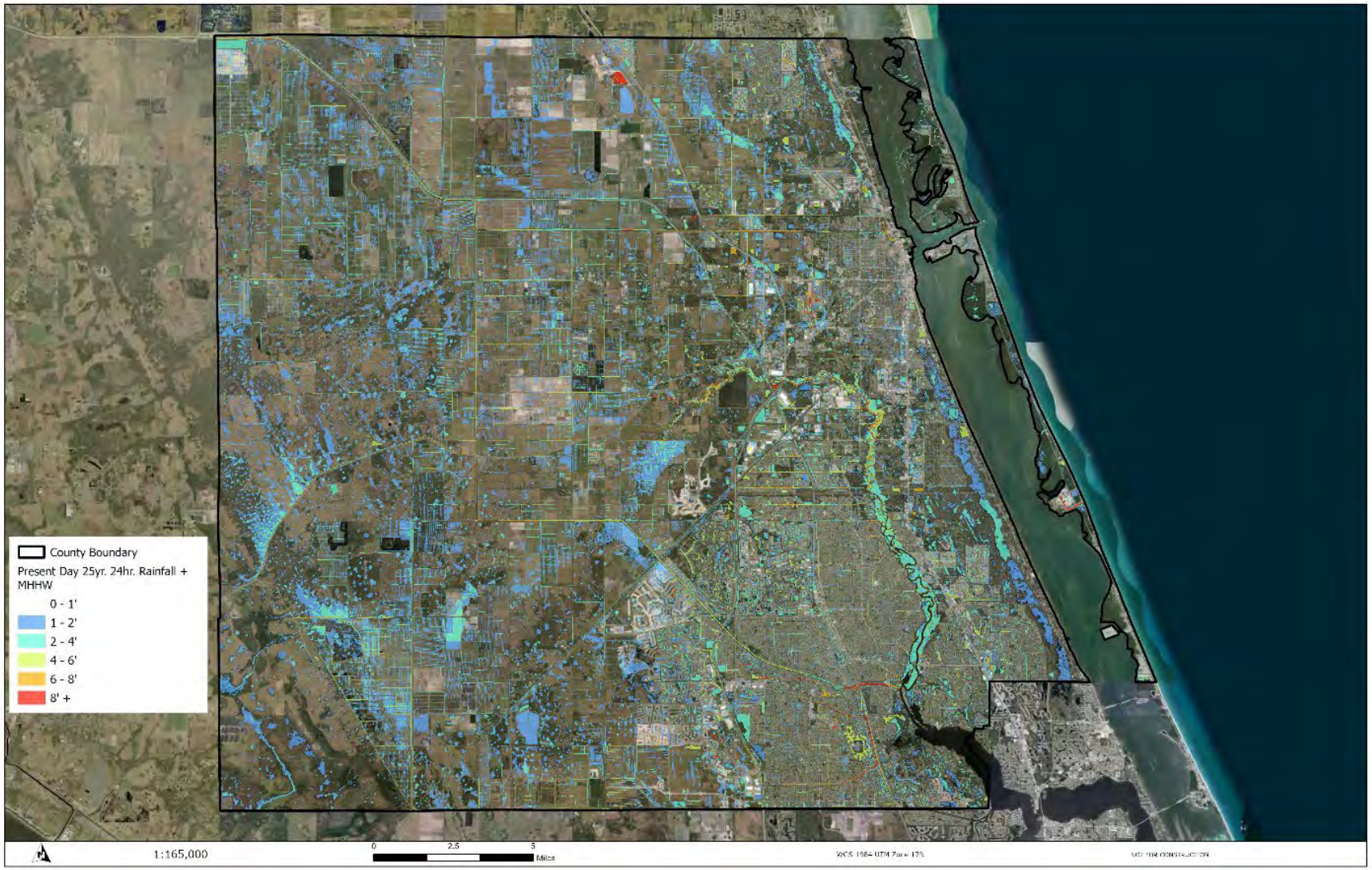



Figure 6-15. 25-Year 24-Hour Rainfall-Induced Flooding Depths – Present Day

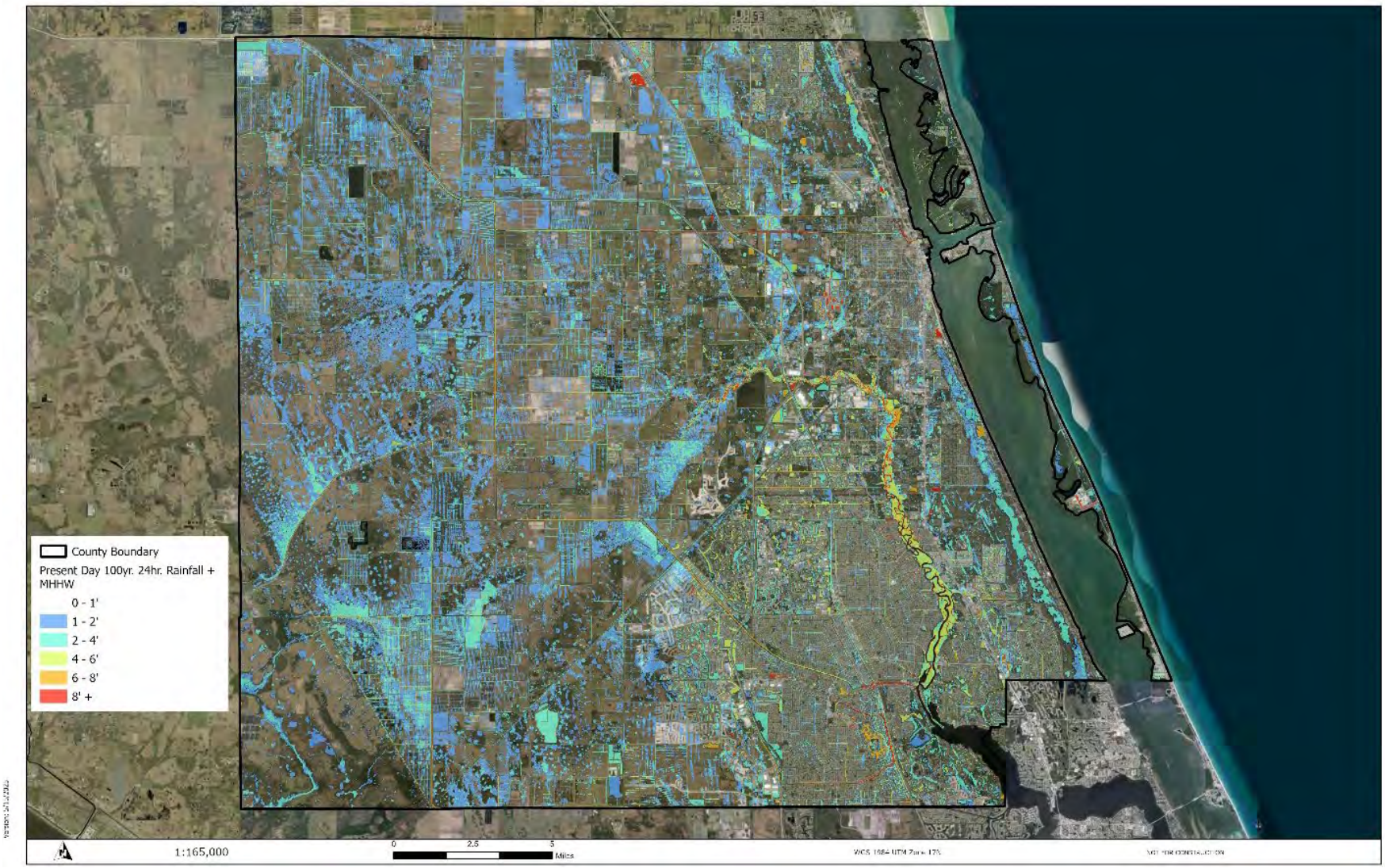



Figure 6-16. 100-Year 24-Hour Rainfall-Induced Flooding Depths – Present Day

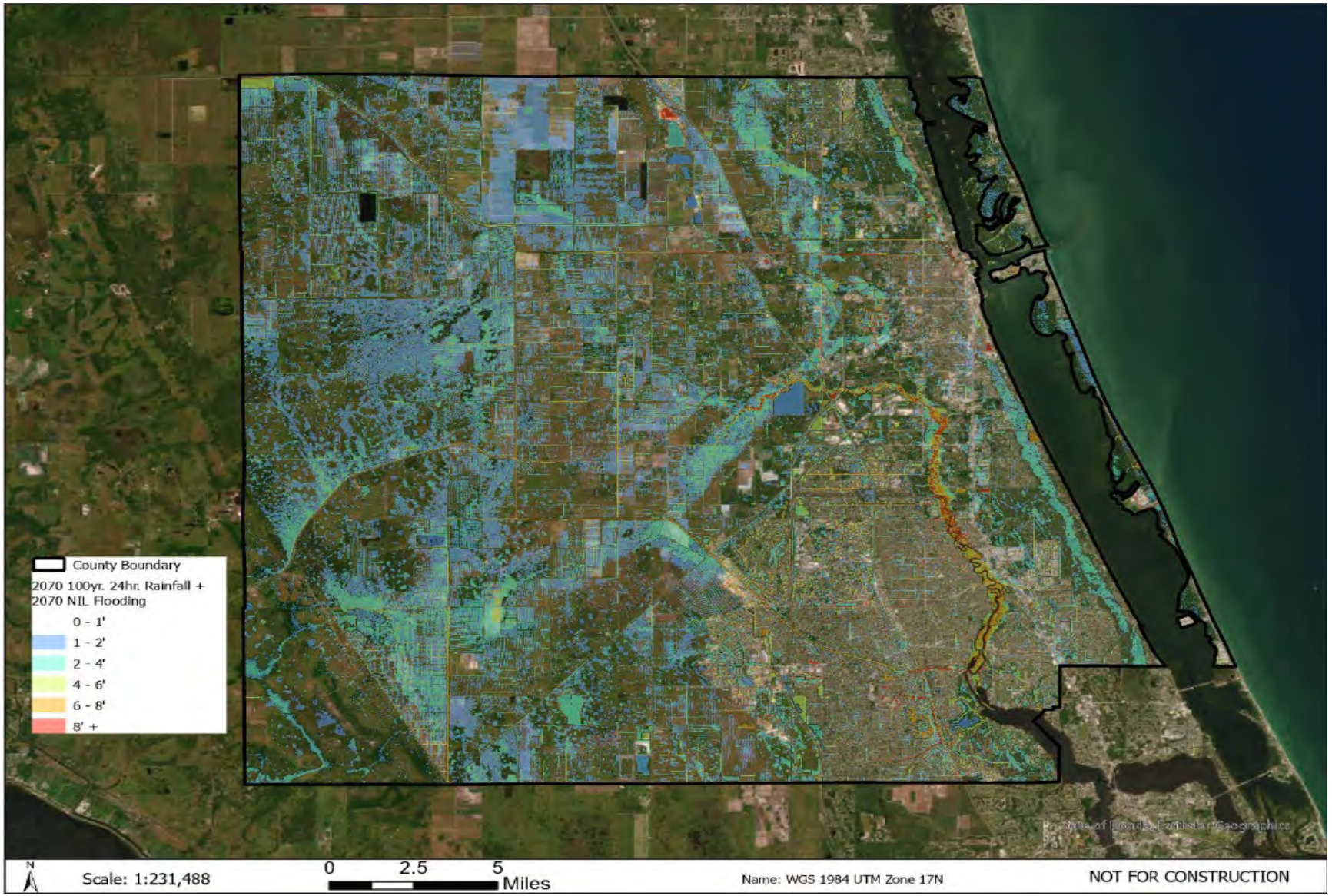



Figure 6-17. 100-Year 24-Hour Rainfall-Induced Flooding Depths – 2070 NOAA Intermediate Low Sea Level

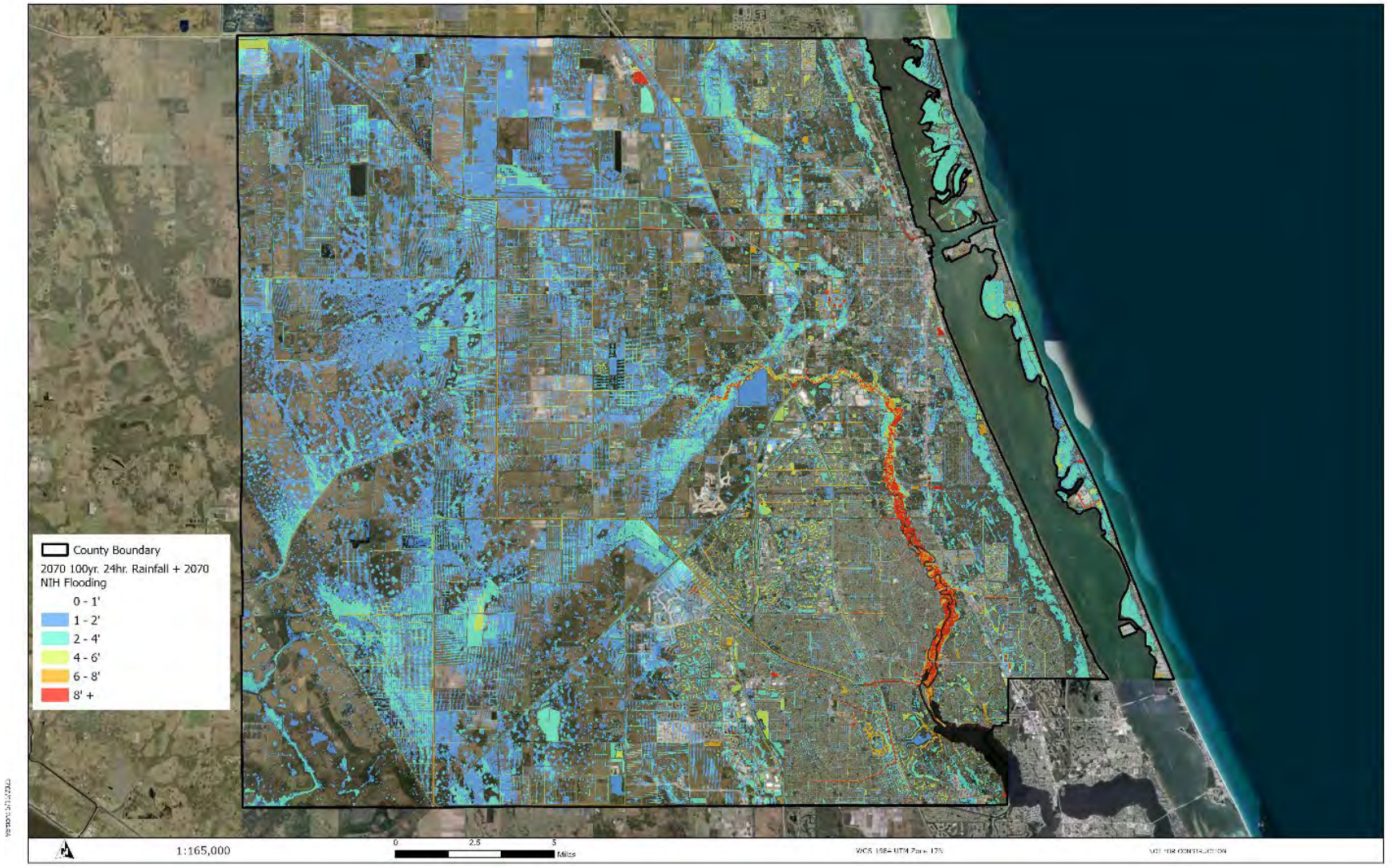



Figure 6-18. 100-Year 24-Hour Rainfall-Induced Flooding Depths – 2070 NOAA Intermediate High Sea Level

#### 6.2.4.2 Inland Flooding Sensitivity Analysis

Tropical cyclones can produce widespread and heavy rains, which can result in life-threatening and damaging floods. Tropical cyclones pose significant flooding threats for people who live inland. Flooding impacts can occur hundreds of miles away from the center of a storm and can last much longer than storm surge-related flooding. Rainfall can cause flash flooding and flooding on rivers and streams that can persist for several days after the storm. Rainfall amounts are related to the speed and size of tropical cyclones, not the intensity. This is because a slower moving and larger tropical cyclone has a longer and larger capacity to produce more rainfall (Florida Division of Emergency Management 2023).

In addition, flood damage can be very costly. Just 1 inch of flooding can cause $26,000 in damage and lead to mold or other health concerns (NLIHC & PAHRC 2021). Despite this risk, flood insurance coverage remains low across Florida. Only 13 percent of Florida's 11 million households carry flood insurance, meaning roughly 8 out of 10 homes are uninsured against flood damage. This gap is especially concerning given that 25 percent of all flood claims come from moderate- to low-risk areas, where residents may not perceive the need for coverage.

### 6.2.5 Storm Surge

The threat of severe storms can encompass a range of weather events, including tornadoes, extreme precipitation, hurricanes, and tropical storms. The assessment of these events focused on storm surge. The Sea, Lake, and Overland Surges from Hurricanes (SLOSH) model was used to assess impacts under two hurricane scenarios: Category 1 and Category 5.

#### 6.2.5.1 Storm Surge Exposure Analysis

Strong storms, including hurricanes and tropical cyclones, can result in greater tidal and wave action that pushes water further inland and above typical tide levels. For the purposes of this assessment, areas are exposed to storm surge if they intersect with the spatial extents of SLOSH Categories 1 and 5 storm surges. For reference, Hurricane Nicole in 2022 was a Category 1 storm, whereas Hurricanes Irma (2017), Dorian (2019), and Ian (2022) were Category 5.

The SLOSH Category scenarios represent bracketing storm surge events, from least (Category 1) to most severe (Category 5). Category 1 exposure is categorized into two levels based on storm surge heights: zero to 3 feet (Low), and 3 to 5 feet (Moderate). Category 5 includes an additional category, greater than 5 feet (High). However, the SLOSH system's primary purpose is to identify areas that may require evacuation during certain events, rather than measure flood risks. FEMA products such as the Flood Insurance Rate Maps are the primary source of information to evaluate flood risks as well as flood insurance rates. SLOSH was selected to represent storm surge due to its inclusion of parameters that consider atmospheric pressure, wind speed, and storm size that influence the degree of flooding during severe storm events (National Hurricane Center n.d.).

The two sub-levels under Category 1 (Low and Moderate) and three sub-levels under Category 5 (Low, Moderate and High) do not overlap. Therefore, total land, asset and population impacts are not reflected as cumulative. Instead, Moderate and High quantities are in addition to the lower level surge impacts.

### Land, Assets and Population Exposure

#### *Land*

As shown in **Table 6-8** and **Figure 6-19**, under both scenarios in a Category 1 hurricane, slightly more than 1.5 percent of countywide land area is expected to be impacted by storm surge. However, some areas along the County's coastline, where storm surge occurs, face significant exposure. Nearly 35 percent of St. Lucie Village is exposed to Category 1 Low (zero to 3 feet storm surge), with an additional 2 percent exposed to Moderate inundation (3 to 5 feet) (**Figure 6-20**).

Other areas of the County with less land area directly exposed to the coast are projected to experience limited storm surge impacts during Category 1 events. Under the combined Low and Moderate scenarios, the City of Port St. Lucie has the least exposure to storm surge, approximately 1.3 percent of the total land area (**Figure 6-21**), followed by unincorporated SLC at 1.6 percent, and the City of Fort Pierce at 2.5 percent storm surge exposure (**Figure 6-22**).

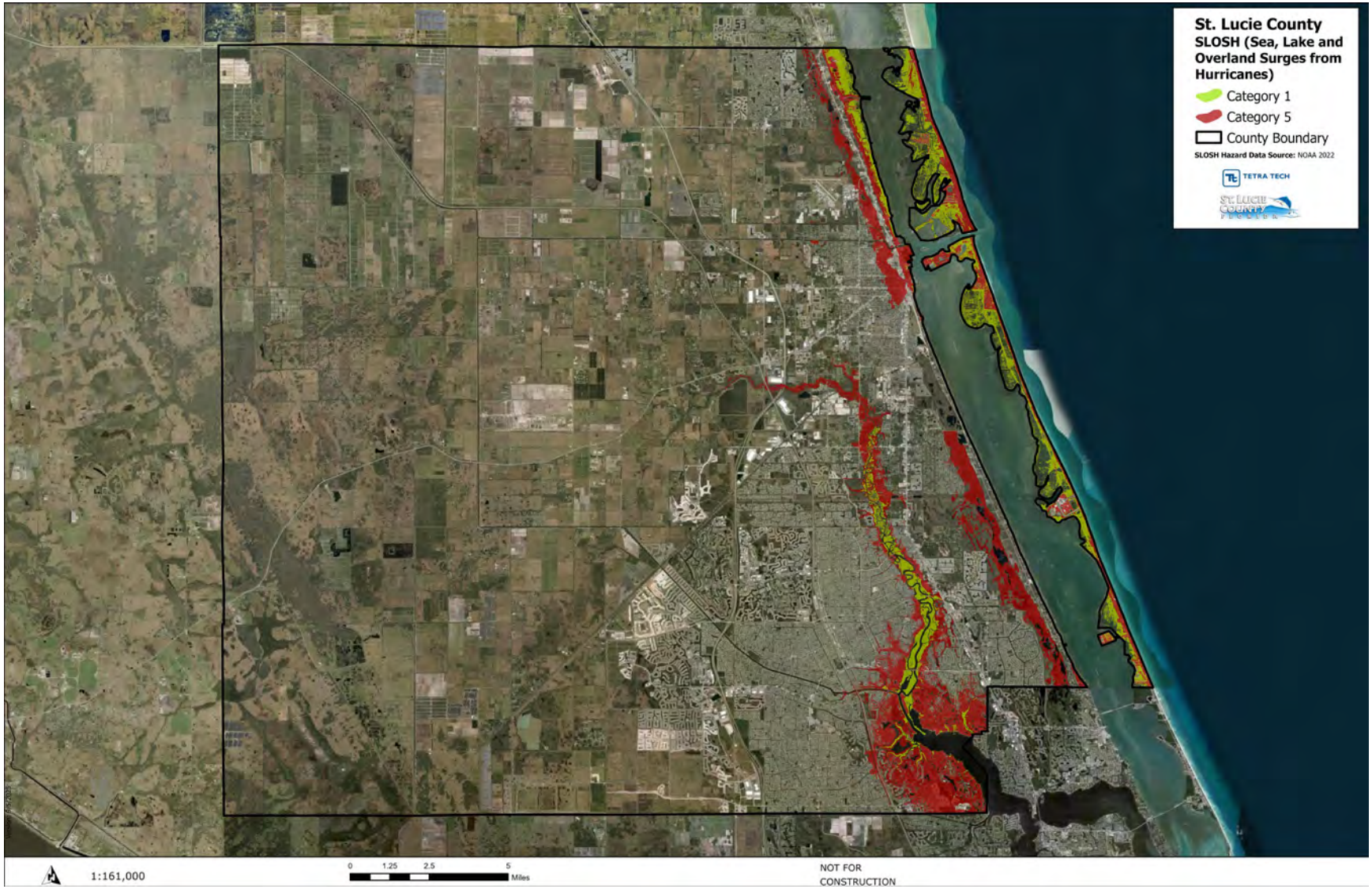



Figure 6-19. Countywide Land Area Exposure to SLOSH Category 1 and Category 5

Figure 6-20. St. Lucie Village Land Area Exposure to SLOSH Category 1 and Category 5

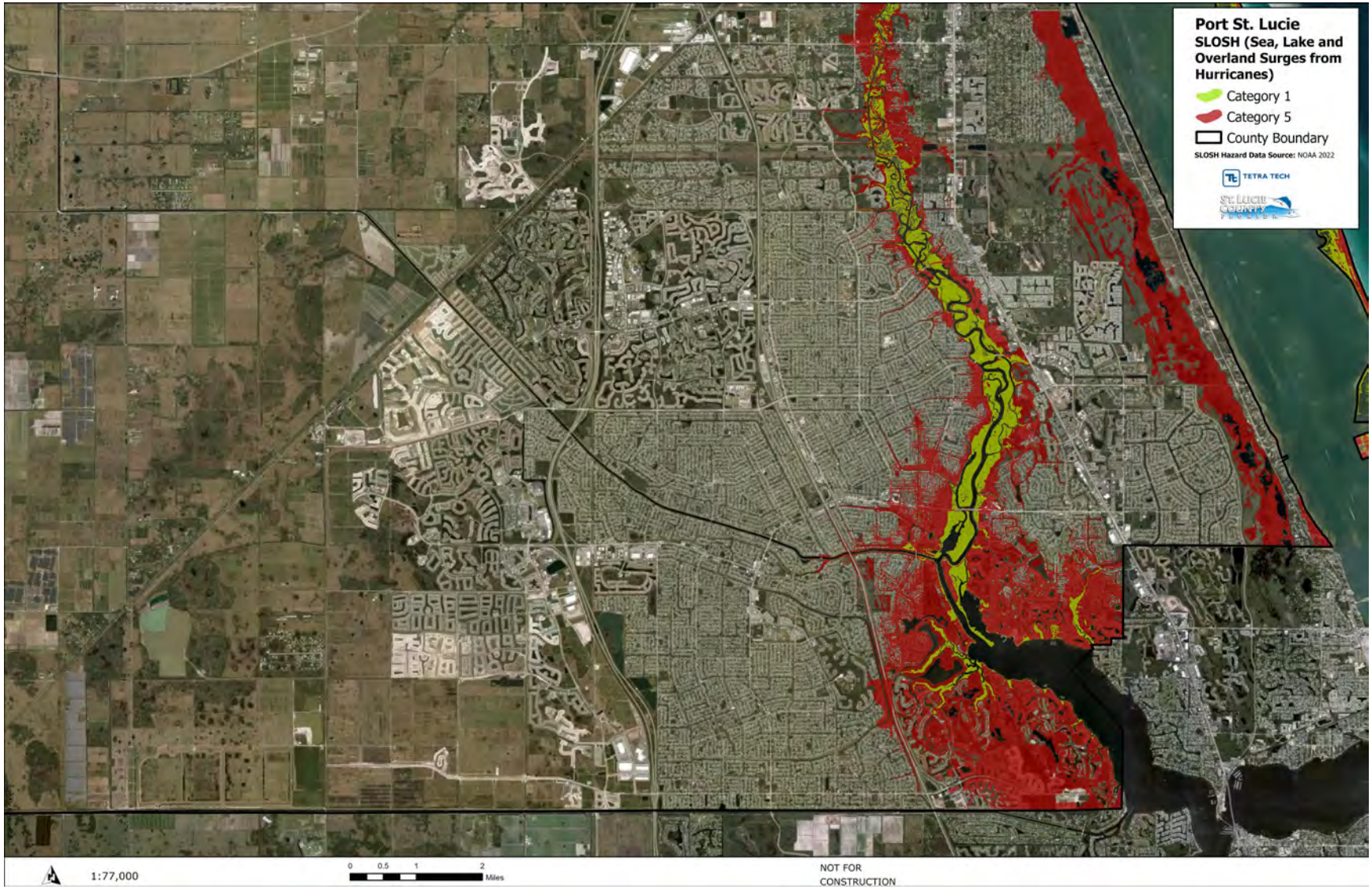



Figure 6-21. Port St. Lucie Land Area Exposure to SLOSH Category 1 and Category 5

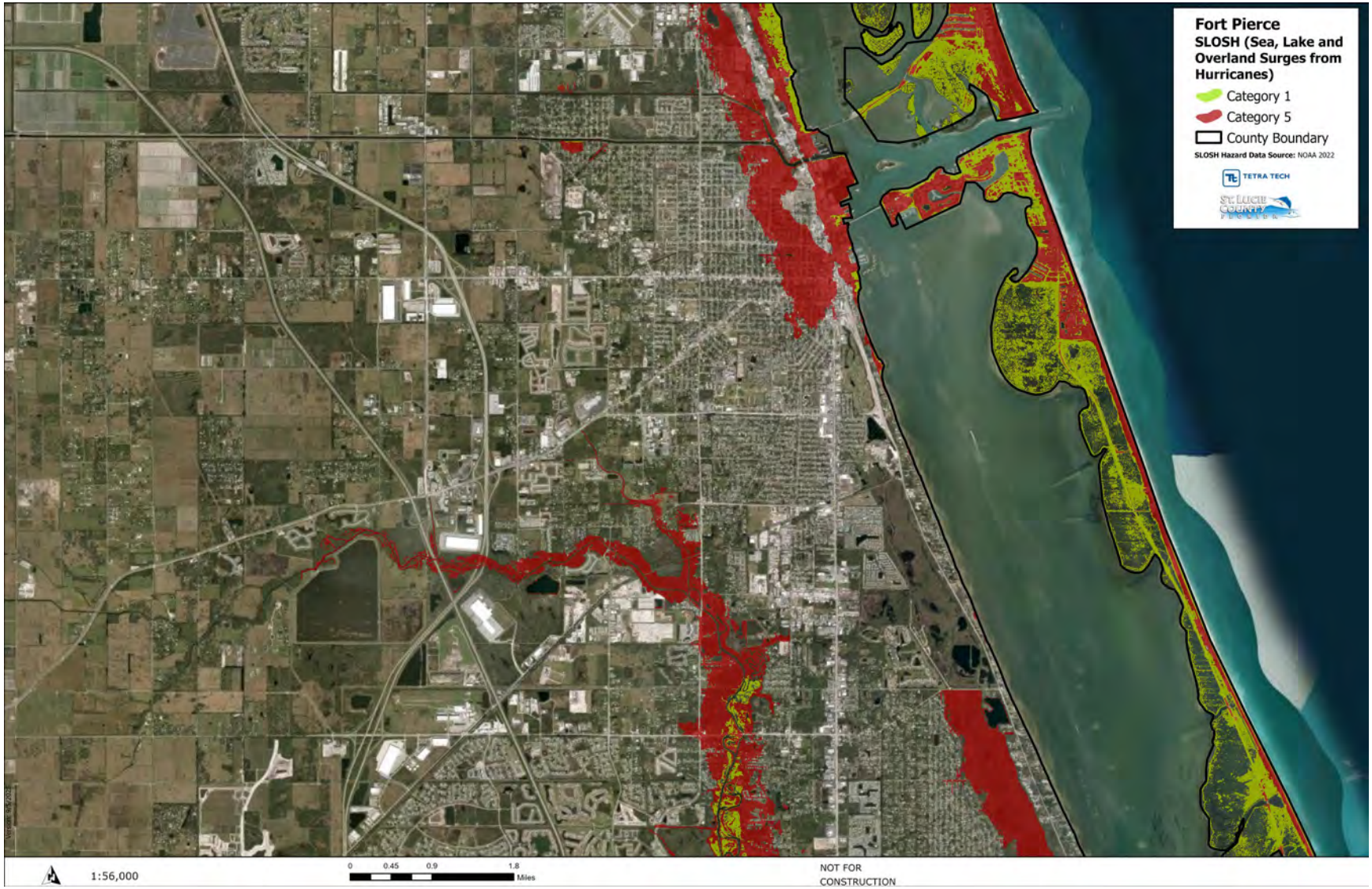



Figure 6-22. Fort Pierce Land Area Exposure to SLOSH Category 1 and Category 5

Table 6-8. Land Area Exposure to SLOSH Category 1 Hazard Area in Acres

| Jurisdiction | Total Land Area (Acres) | Acres Exposed to SLOSH Category 1 Storm Surge (Acres) | | | |
|---|---|---|---|---|---|
| | | 0-3 feet *Low* | Percent of Total | 3-5 feet *Moderate* | Percent of Total |
| Fort Pierce (C) | 15,663.3 | 316.1 | 2.0% | 75.9 | 0.5% |
| Port St. Lucie (C) | 75,850.8 | 1,023.4 | 1.3% | 34.1 | <0.1% |
| St. Lucie Village (T) | 524.0 | 182.3 | 34.8% | 10.4 | 2.0% |
| Unincorporated St. Lucie County | 274,265.0 | 2,616.3 | 1.0% | 1,557.5 | 0.6% |
| St. Lucie County (Total) | 366,303.2 | 4,138.1 | 1.1% | 1,677.8 | 0.5% |

As shown in **Table 6-9** and **Table 6-10**, the number of county-wide acres exposed to storm surge increases to 5.9 percent across Category 5 combined scenarios; a 4.4 percent increase across Category 1 storm surge combined scenarios.

Table 6-9. Land Area Exposure to SLOSH Category 5 Hazard Area in Acres

| Jurisdiction | Total Land Area (Acres) | Acres Exposed to Category 5 Storm Surge | | | | | |
|---|---|---|---|---|---|---|---|
| | | 0-3 feet *Low* | Percent of Total | 3-5 feet *Moderate* | Percent of Total | >5 feet *High* | Percent of Total |
| Fort Pierce (C) | 15,663.3 | 616.0 | 3.9% | 255.5 | 1.6% | 1,299.6 | 8.3% |
| Port St. Lucie (C) | 75,850.8 | 3,730.1 | 4.9% | 1,626.2 | 2.1% | 2,539.5 | 3.3% |
| St. Lucie Village (T) | 524.0 | 26.5 | 5.1% | 15.3 | 2.9% | 396.6 | 75.7% |
| Unincorporated St. Lucie County | 274,265.0 | 3,032.4 | 1.1% | 1,418.2 | 0.5% | 6,712.8 | 2.4% |
| St. Lucie County (Total) | 366,303.2 | 7,405.0 | 2.0% | 3,315.1 | 0.9% | 10,948.5 | 3.0% |

***Asset Exposure***

This section provides an assessment of countywide critical assets that are exposed to storm surge hazards, specifically focusing on Category 1 and Category 5 hurricane levels. The assets are categorized into four main groups: Critical Community and Emergency Facilities, Critical Infrastructure, Natural, Cultural, and Historic Resources, and Transportation and Evacuation Routes.

The SLOSH model analysis of storm surge vulnerability reveals significant variability in critical asset exposure across SLC (**Table 6-10**). Out of 27,211 critical assets analyzed, 10.1 percent of community and emergency facilities, 23.7 percent of critical infrastructure, 28.8 percent of natural, cultural, and historic resources, and 25.2 percent of transportation routes (by quantity, not mileage) are exposed to Category 5 storm surge. While exposure under Category 1 scenarios is notably lower, critical infrastructure and cultural resources still show vulnerability even under low-surge conditions.

Fort Pierce exhibits the highest number of exposed assets, particularly in critical infrastructure, where 24.2 percent are vulnerable under a Category 5 surge. Notably, 59.3 percent of transportation routes in the city could be inundated, with a significant portion exposed to high surge levels. Port St. Lucie shows relatively limited exposure overall, with only 1.8 percent of community facilities and 6.1 percent of infrastructure exposed under Category 5 conditions. The smallest jurisdiction, St. Lucie Village demonstrates the highest proportional exposure, with 73.5 percent of critical infrastructure at risk under Category 5 storm surge conditions.

Table 6-10. Number of Critical Assets Exposed to the SLOSH Category 1 and 5 Hazard Area

| | | | Critical Assets Exposed to Category 1 Storm Surge | | | | | Critical Assets Exposed to Category 5 Storm Surge | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jurisdiction | Critical Asset Class | Total Critical Assets Evaluated | 0-3 feet *Low* | % of Total | 3-5 feet *Mod.* | % of Total | Total | 0-3 feet *Low* | % of Total | 3-5 feet *Mod* | % of Total | >5 feet *High* | % of Total | Total |
| Fort Pierce (C) | Critical Community and Emergency Facilities | 714 | 0 | 0.00% | 0 | 0.00% | 0.00% | 30 | 4.20% | 16 | 2.20% | 52 | 7.30% | 13.70% |
| | Critical Infrastructure | 17,152 | 641 | 3.70% | 0 | 0.00% | 3.70% | 1,212 | 7.10% | 620 | 3.60% | 2,320 | 13.50% | 24.20% |
| | Natural, Cultural, and Historic Resources | 761 | 23 | 3.00% | 2 | 0.30% | 3.30% | 35 | 4.60% | 17 | 2.20% | 101 | 13.30% | 20.10% |
| | Transportation and Evacuation Routes | 27 | 4 | 14.80% | 0 | 0.00% | 14.80% | 0 | 0.00% | 2 | 7.40% | 14 | 51.90% | 59.30% |
| Port St. Lucie (C) | Critical Community and Emergency Facilities | 343 | 0 | 0.00% | 0 | 0.00% | 0.00% | 4 | 1.20% | 2 | 0.60% | 0 | 0.00% | 1.80% |
| | Critical Infrastructure | 275 | 0 | 0.00% | 0 | 0.00% | 0.00% | 10 | 3.60% | 5 | 1.80% | 2 | 0.70% | 6.10% |
| | Natural, Cultural, and Historic Resources | 124 | 4 | 3.20% | 1 | 0.80% | 4.00% | 9 | 7.30% | 2 | 1.60% | 8 | 6.50% | 15.40% |
| | Transportation and Evacuation Routes | 63 | 0 | 0.00% | 0 | 0.00% | 0.00% | 3 | 4.80% | 1 | 1.60% | 1 | 1.60% | 8.00% |
| St. Lucie Village (T) | Critical Community and Emergency Facilities | 5 | 0 | 0.00% | 3 | 60.00% | 60.00% | 0 | 0.00% | 0 | 0.00% | 2 | 40.00% | 40.00% |
| | Critical Infrastructure | 435 | 149 | 34.30% | 0 | 0.00% | 34.30% | 17 | 3.90% | 14 | 3.20% | 289 | 66.40% | 73.50% |
| | Natural, Cultural, and Historic Resources | 4 | 2 | 50.00% | 0 | 0.00% | 50.00% | 0 | 0.00% | 0 | 0.00% | 4 | 100.00 % | 100.00 % |
| | Transportation and Evacuation Routes | 1 | 1 | 100.00 % | 0 | 0.00% | 100.00% | 0 | 0.00% | 0 | 0.00% | 1 | 100.00 % | 100.00 % |
| Unincorporated St. Lucie County | Critical Community and Emergency Facilities | 283 | 4 | 1.40% | 22 | 7.80% | 9.20% | 7 | 2.50% | 4 | 1.40% | 20 | 7.10% | 11.00% |
| | Critical Infrastructure | 5,595 | 168 | 3.00% | 15 | 0.30% | 3.30% | 405 | 7.20% | 206 | 3.70% | 462 | 8.30% | 19.20% |
| | Natural, Cultural, and Historic Resources | 1,373 | 119 | 8.70% | 0 | 0.00% | 8.70% | 15 | 1.10% | 41 | 3.00% | 419 | 30.50% | 34.60% |

| | | | Critical Assets Exposed to Category 1 Storm Surge | | | | | Critical Assets Exposed to Category 5 Storm Surge | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jurisdiction | Critical Asset Class | Total Critical Assets Evaluated | 0-3 feet *Low* | % of Total | 3-5 feet *Mod.* | % of Total | Total | 0-3 feet *Low* | % of Total | 3-5 feet *Mod* | % of Total | >5 feet *High* | % of Total | Total |
| | Transportation and Evacuation Routes | 56 | 4 | 7.10% | 1 | 1.80% | 8.90% | 2 | 3.60% | 4 | 7.10% | 9 | 16.10% | 26.80% |
| St. Lucie County (Total) | Critical Community and Emergency Facilities | 1,345 | 4 | 0.30% | 25 | 1.90% | 2.20% | 41 | 3.00% | 22 | 1.60% | 74 | 5.50% | 10.10% |
| | Critical Infrastructure | 23,457 | 958 | 4.10% | 15 | 0.10% | 4.20% | 1,644 | 7.00% | 845 | 3.60% | 3,073 | 13.10% | 23.70% |
| | Natural, Cultural, and Historic Resources | 2,262 | 148 | 6.50% | 3 | 0.10% | 6.60% | 59 | 2.60% | 60 | 2.70% | 532 | 23.50% | 28.80% |
| | Transportation and Evacuation Routes | 147 | 9 | 6.10% | 1 | 0.70% | 6.80% | 5 | 3.40% | 7 | 4.80% | 25 | 17.00% | 25.20% |

### *Population Exposure*

As shown in **Table 6-11**, population exposure is limited countywide, with only 0.5 percent of residents directly exposed to Category 1 storm surge.

Exposure for each jurisdiction under both Category 1 scenarios combined show:

- 111 people in St. Lucie Village are exposed (13.6 percent of 818 residents),
- 5,150 people in unincorporated areas are exposed (6.7 percent of nearly 77,000),
- 2,816 people in Port St. Lucie are exposed (1.3 percent of more than 220,000), and
- 409 people in Fort Pierce are exposed (0.8 percent of nearly 48,100).

Table 6-11. Population Exposure to the SLOSH Category 1 Hazard Area

| Jurisdiction | Total Population | Population Exposed to Category 1 Storm Surge | | |
|---|---|---|---|---|
| | | 0-3 feet *Low* | 3-5 feet *Moderate* | Percent of Total |
| Fort Pierce (C) | 48,094 | 359 | 50 | 0.8% |
| Port St. Lucie (C) | 220,453 | 2,766 | 50 | 1.3% |
| St. Lucie Village (T) | 818 | 106 | 5 | 13.6% |
| Unincorporated St. Lucie County | 76,872 | 3,381 | 1,769 | 6.7% |
| St. Lucie County (Total) | 346,237 | 6,612 | 1,874 | 0.5% |

Population exposure to Category 5 storm surge countywide is 4.3 percent of the total population under low storm surge, 1.8 percent under moderate storm surge, and 4.6 percent under high storm surge (**Table 6-12**).

A small number of LMI residents across all jurisdictions are exposed to Category 1 storm surge, less than 0.3 percent (194 of nearly 65,000 LMI residents), which represents 0.05 percent of the total population of St. Lucie County. Proportionally, LMI residents within St. Lucie Village are the most exposed at 38.6 percent (51 people). Even with much larger populations of LMI residents, Fort Pierce and the unincorporated areas have very low exposure rates overall, 0.02 percent (72 people) and 0.03 percent (71 people), respectively (**Table 6-13**).

Table 6-12. Population Exposure to the SLOSH Category 5 Hazard Area

| Jurisdiction | Total Population | Population Exposed to Category 5 Storm Surge | | | | | |
|---|---|---|---|---|---|---|---|
| | | 0-3 feet *Low* | Percent of Total | 3-5 feet *Moderate* | Percent of Total | >5 feet *High* | Percent of Total |
| Fort Pierce (C) | 48,094 | 2,224 | 4.6% | 915 | 1.9% | 1,808 | 3.8% |
| Port St. Lucie (C) | 220,453 | 8,660 | 3.9% | 3,133 | 1.4% | 5,586 | 2.5% |
| St. Lucie Village (T) | 818 | 11 | 1.3% | 8 | 1.0% | 218 | 26.7% |
| Unincorporated St. Lucie County | 76,872 | 4,087 | 5.3% | 2,016 | 2.6% | 8,254 | 10.7% |
| St. Lucie County (Total) | 346,237 | 14,982 | 4.3% | 6,072 | 1.8% | 15,866 | 4.6% |

Table 6-13. LMI Population Exposure to the SLOSH Category 1 Hazard Area

| Jurisdiction | # of LMI Residents | # and % of Low to Moderate Income Residents Exposed to Category 1 Storm Surge | | |
|---|---|---|---|---|
| | | 0-3 feet *Low* | 3-5 feet *Moderate* | Percent of Total |
| Fort Pierce (C) | 38,933 | 65 | 7 | 0.2% |
| Port St. Lucie (C) | 3,853 | 0 | 0 | 0.0% |
| St. Lucie Village (T) | 132 | 49 | 2 | 38.6% |
| Unincorporated St. Lucie County | 22,063 | 66 | 5 | 0.3% |
| St. Lucie County (Total) | 64,981 | 180 | 14 | <0.3% |

There are varying degrees of exposure to Category 5 storm surge among LMI populations across different jurisdictions within St. Lucie County. Across St. Lucie County, 4.5 percent of the LMI population is exposed to low storm surge, 1.9 percent to moderate storm surge, and 2.2 percent to high storm surge.

Fort Pierce has the largest number and percentage of LMI residents, with nearly 39,000 or 80 percent of the total population of the City). Of these residents, slightly more than 4,000 are exposed to Category 5 storm surge. St. Lucie Village has the highest percentage of LMI residents that are exposed to high storm surge (greater than 5 feet) at 69.7 percent. Port St. Lucie has no highly vulnerable population exposed to any level of storm surge (**Table 6-14**).

Table 6-14. LMI Population Exposure to the SLOSH Category 5 Hazard Area

| Jurisdiction | # of LMI Residents | # and % of Low to Moderate Income Population Exposed to Category 5 Storm Surge | | | | | |
|---|---|---|---|---|---|---|---|
| | | 0-3 feet *Low* | Percent of Total | 3-5 feet *Moderate* | Percent of Total | >5 feet *High* | Percent of Total |
| Fort Pierce (C) | 38,933 | 2,224 | 5.7% | 906 | 2.3% | 903 | 2.3% |
| Port St. Lucie (C) | 3,853 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| St. Lucie Village (T) | 132 | 2 | 1.5% | 3 | 2.3% | 92 | 69.7% |
| Unincorporated St. Lucie County | 22,063 | 693 | 3.1% | 308 | 1.4% | 404 | 1.8% |
| St. Lucie County (Total) | 64,981 | 2,919 | 4.5% | 1,217 | 1.9% | 1,399 | 2.2% |

### 6.2.5.2 Storm Surge Sensitivity Analysis

Storm surge is an extremely dangerous hazard associated with hurricanes and tropical storms and is defined as an abnormal rise of water generated by a storm, over and above the predicted astronomical tides. It is a phenomenon that can raise the water level several feet or more, causing flooding in normally dry areas many miles from the shore, especially in low-lying areas. Just one foot of moving water can carry a small car, but during storm surge, many feet of water can move onshore. The force of this water can sweep houses and buildings from their foundations. As a result, damage from storm surge can be catastrophic. Historically, about half of the direct deaths in landfalling tropical cyclones in the United States are from storm surge.

Storm surge due to tropical cyclone events can impact the stability of community services and critical infrastructure, especially near or at the coastline. Fuel, electricity and communications services may be interrupted. Transportation networks, especially evacuation routes and bridges are extremely vulnerable to damage from storm surge, disrupting access to health and medical lifelines including emergency services.

In addition, the impact to hazardous materials, such as nuclear power plants, wastewater treatment infrastructure, and HAZMAT facilities, could cause major damage or contamination based on the level of storm surge. A more common occurrence is the failure of wastewater pumps and lift stations, causing the surrounding areas and potentially the groundwater to be contaminated (Florida Division of Emergency Management 2023).

It is likely that storm surges from tropical cyclone events will be higher in the coming decades, mainly due to rising sea levels. Mean sea level in St. Lucie County has already risen about 11 inches since 1950, and 7.65 inches since 1990 according to NOAA tidal gauge data. Researchers expect SLR to accelerate as hotter temperatures cause polar ice sheets to melt faster. Over the next century, South Florida could see more than 6 feet of SLR (NOAA) with a correlating increase in storm surge, making the total water elevation higher as it approaches the coast and allowing storm surge to reach further inland.

### 6.2.6 Wind

The Hazus software was utilized to depict and analyze St. Lucie County's vulnerability to hurricane winds. Two recurrent interval events were assessed—the 100-year wind event and the 500-year wind event—using data from the NOAA Saffir Simpson Hurricane Wind scale. To create a comprehensive profile, the wind hazard analysis involved historical information from other sources.

#### 6.2.6.1 Wind Exposure Analysis

For the purposes of this wind assessment, it is assumed that the entire County is exposed to high wind events. As a coastal community, St. Lucie County is exposed to strong winds associated with tropical depressions (maximum sustained surface winds of less than 39 miles per hour), tropical cyclones (maximum sustained winds of at least 39 mph), hurricanes (maximum sustained winds above 74 mph), and tornadoes.

According to data from the NCEI Storm Event Database, and data from 2012 to 2022, the state of Florida experienced an average of 5.80 tropical storm events and 0.90 hurricane events each year. **Figure 6-23** depicts historical hurricane tracks for 67 storms that have occurred within a buffer distance of 25 miles of St. Lucie County since the late 1800s (NOAA 2025c) Ten of these events occurred between 2004 and 2022. The City of Fort Pierce, St. Lucie Village, and areas along the intracoastal waterway or St. Lucie River are highly vulnerable to wind damage related to these storms (SLC Department of Public Safety Division of Emergency Management 2021).

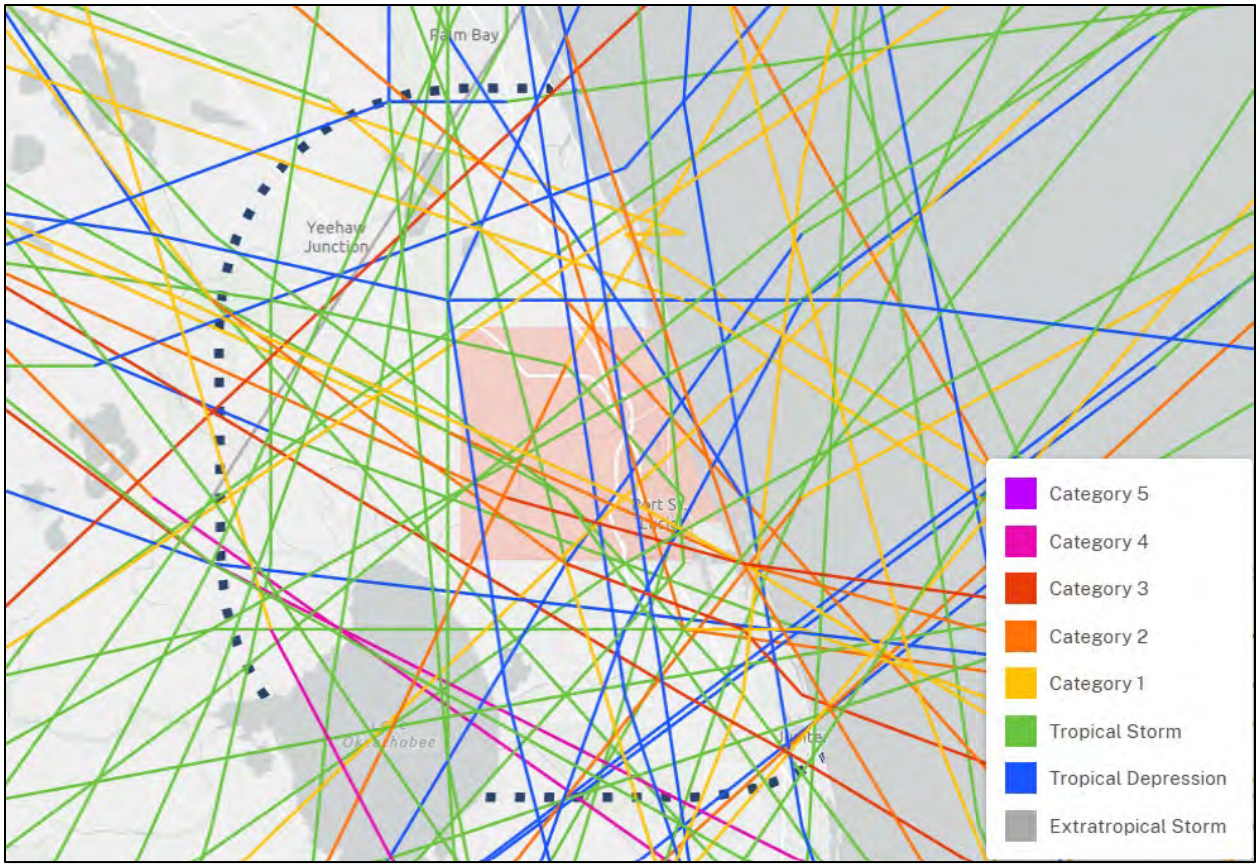



Figure 6-23. Historical Tropical Storm Tracks Near St. Lucie County (since late 1800s)

The 2023 Florida State Hazard Mitigation Plan includes probabilistic hurricane wind scenarios for the 10-, 20-, and 50- year return periods. The return period—also known as the recurrence interval—is a statistical estimate of the average time between events of a certain intensity or magnitude. For example, a 10-year return period indicates a 1-in-10 (or 10 percent) chance of that event occurring in any given year. The mean return period is the average interval between occurrences of a specific event, based on historical data and probabilistic modeling. It does not guarantee that the event will occur precisely every 10, 20, or 50 years, but rather reflects the long-term likelihood.

The return period scenario maps (**Figure 6-24**, **Figure 6-25**, and **Figure 6-26**) show that St. Lucie County will experience Category 1 force winds at least once within 10 years, Category 2 force winds in the 20-year scenario, and Category 3 force winds in the 50-year scenario. St. Lucie County's location bordering the Atlantic Ocean coupled with generally low coastal elevations and moderate-to-high coastal urban development, makes the County vulnerable to high wind events.

Studies show that the rapid intensification of hurricanes has increased over the last 40 years. It is very likely that changing conditions associated with warmer temperatures will cause an increase in the proportion of major hurricanes (Category 3 through 5) in the future. The frequency of hurricanes worldwide, however, is not expected to increase and will remain unchanged or even decrease. This is due to weakening ocean currents that help hurricanes form. When looking regionally, exposure to fewer but more intense storms in the future can be expected.

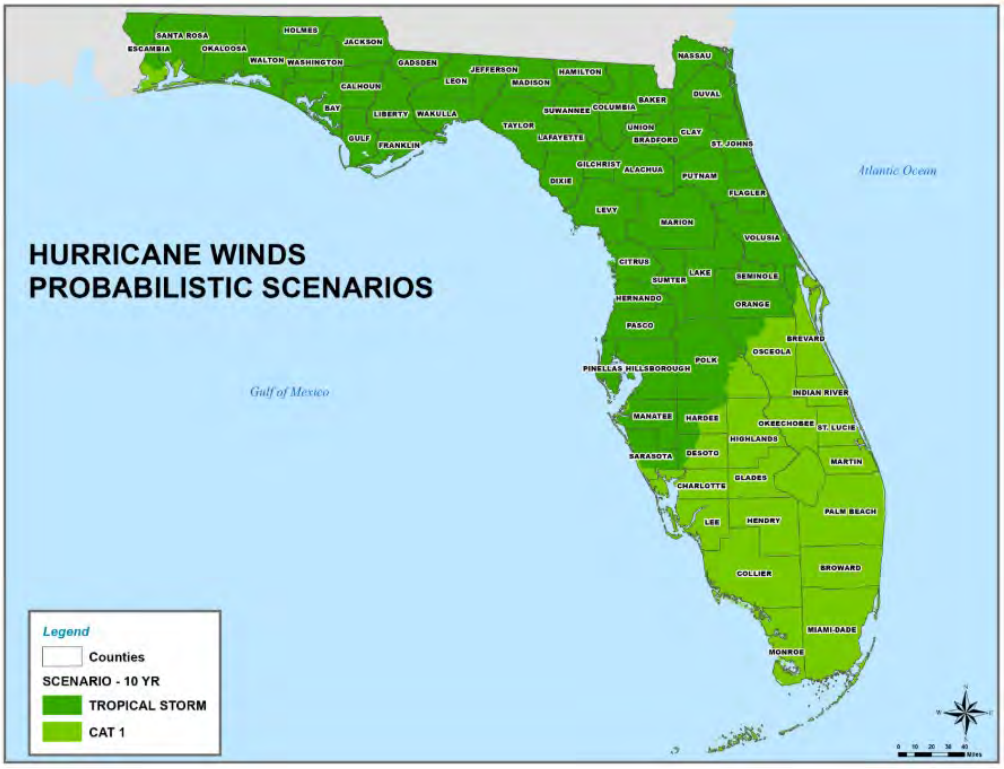



Figure 6-24. 10-Year Probable Hurricane Wind Scenario

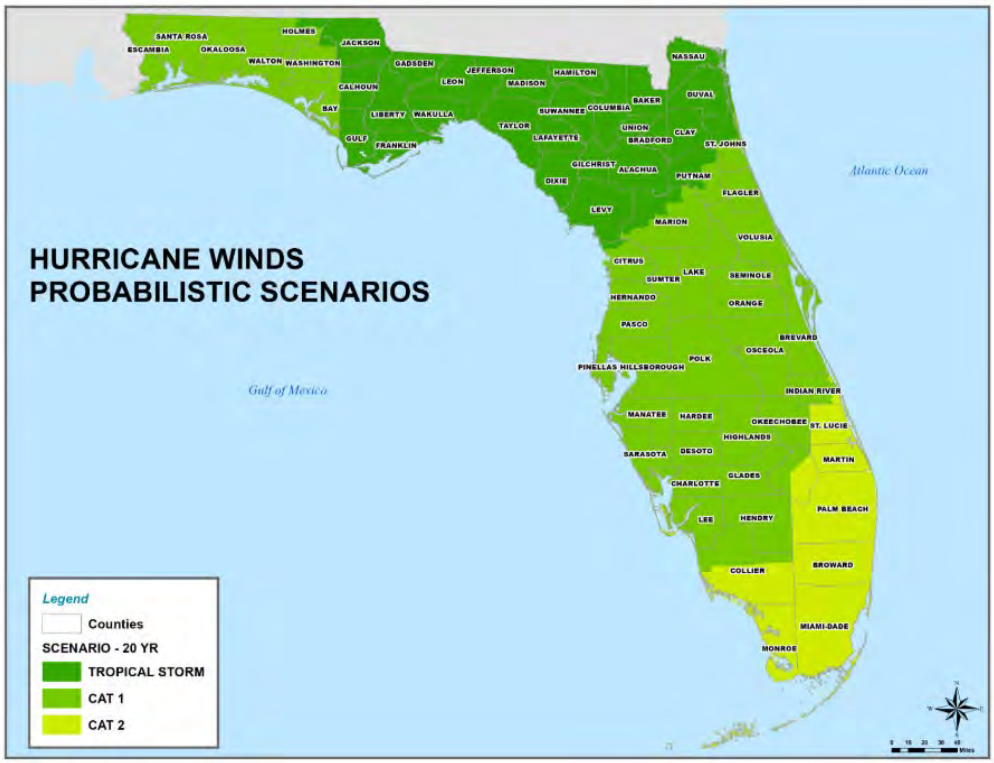



Figure 6-25. 20-Year Probable Hurricane Wind Scenario

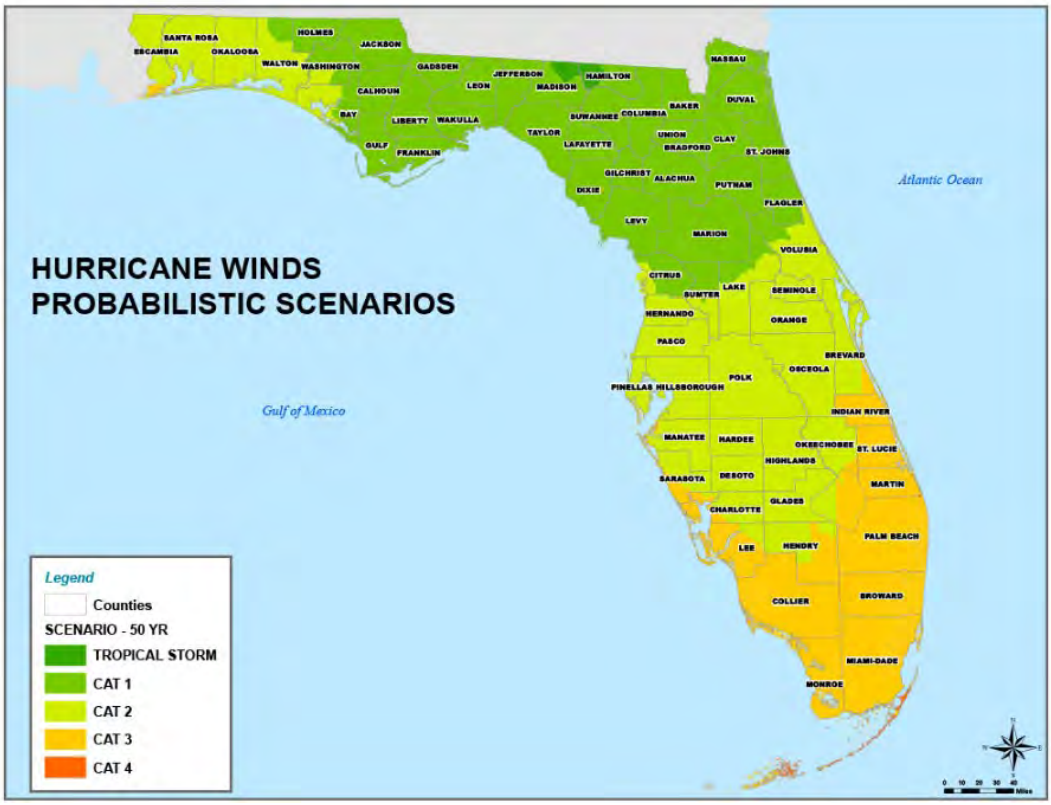


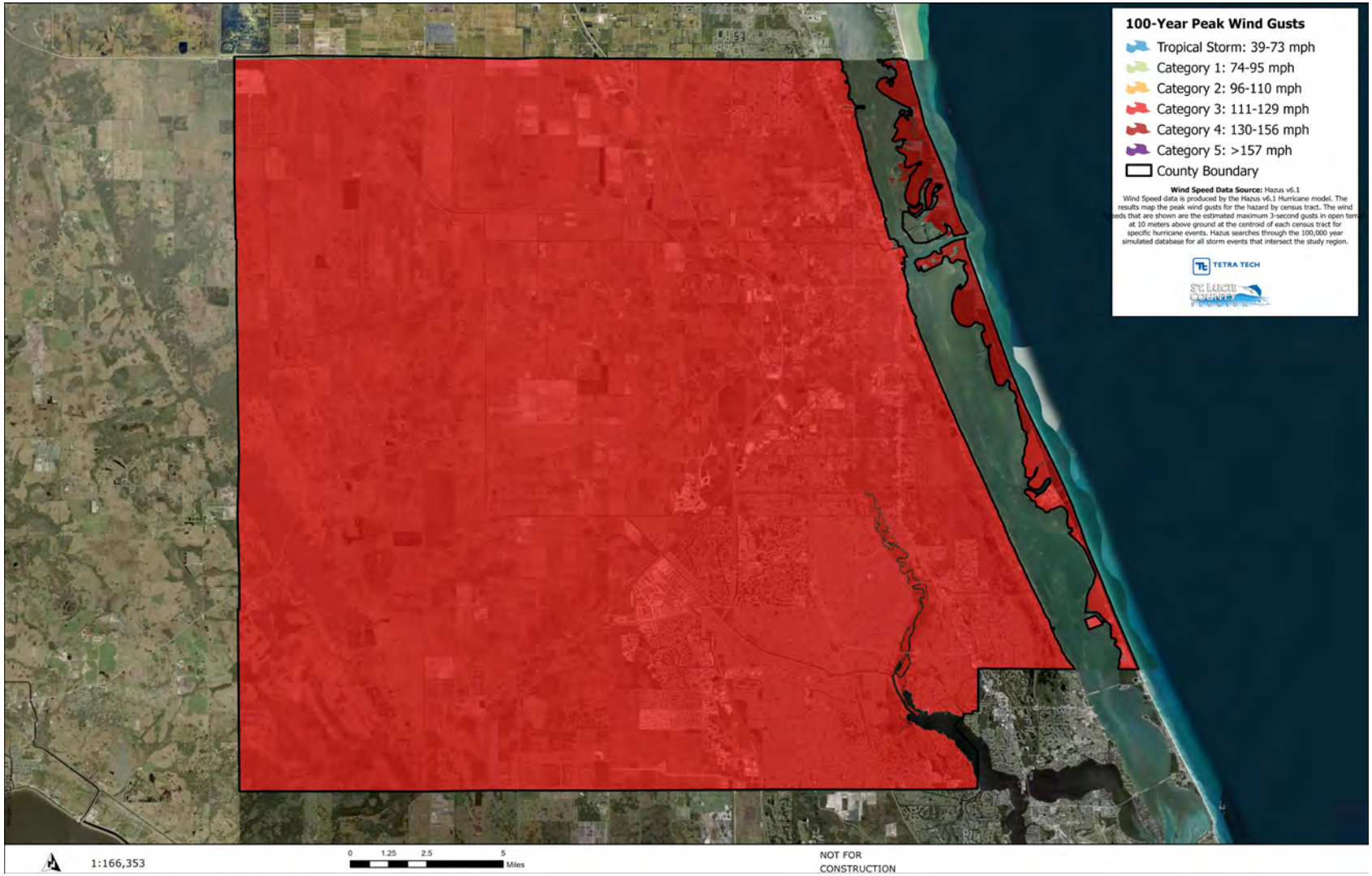

Figure 6-26. 50-Year Probable Hurricane Wind Scenario

The 100-year peak wind gust event scenario model performed for this RVA projects Category 3, with 111 to 129 mph sustained winds, for almost the entire County except for a small area along the coast in the northeastern portion of the County, which would be impacted by Category 4, with sustained winds of 130 to 156 mph (**Figure 6-27**). According to the Saffir-Simson Hurricane Wind Scale, both Categories 3 and 4 are considered "major" hurricane events.

During a Category 3 event, devastating damage is projected to occur, including the possibility of major damage to well-built framed homes and removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.

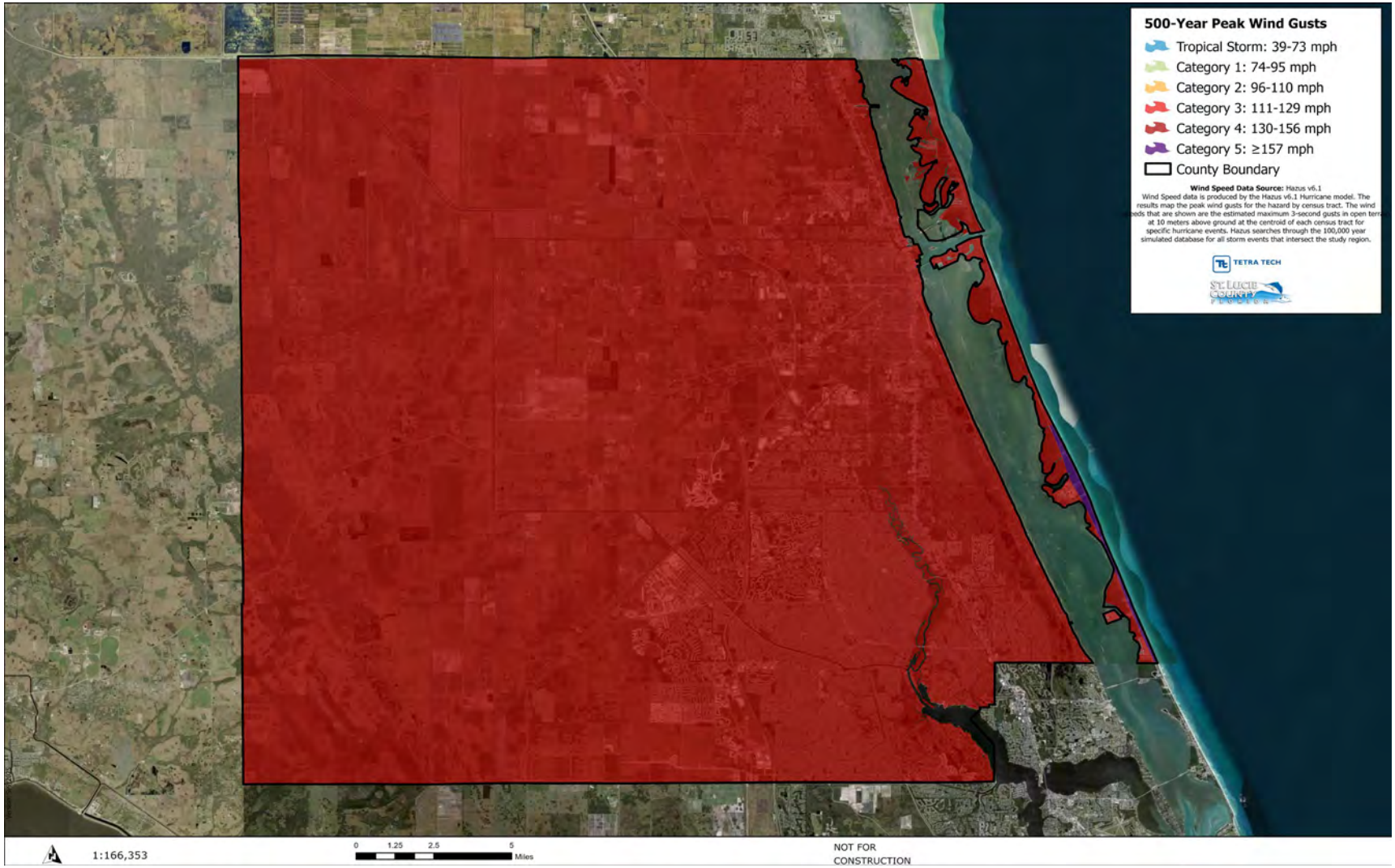
During a Category 4 event, catastrophic damage is projected to occur: well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted, with power outages potentially lasting several weeks. Many areas will be uninhabitable.

In hurricanes, gusts of wind can be expected to exceed the sustained wind velocity by 25 to 50 percent. This means a hurricane with sustained winds of 130 miles per hour (mph) can have wind gusts between 162 and 195 mph. **Figure 6-28** shows that the entire county is vulnerable to Category 4 wind gusts in the 500-year event.




Note: Wind speed data is produced by Hazus v6.1 Hurricane model. The results map the peak wind gusts for the hazard by census tract. The wind speeds displayed are the estimated maximum 3-second gusts in open terrain at 10 meters above ground at the centroid of each census tract for specific hurricane events. Hazus searches through the 100,000 year simulated database for all storm events that intersect the study region.

Figure 6-27. St. Lucie County 100-Year Peak Wind Gusts




Note: Wind speed data is produced by Hazus v6.1 Hurricane model. The results map the peak wind gusts for the hazard by census tract. The wind speeds displayed are the estimated maximum 3-second gusts in open terrain at 10 meters above ground at the centroid of each census tract for specific hurricane events. Hazus searches through the 100,000 year simulated database for all storm events that intersect the study region.

Figure 6-28. St. Lucie County 500-Year Peak Wind Gusts

Tornadoes are a significant threat during tropical cyclones and have been present in most events that have affected Florida. Florida ranks third in the United States in the number of tornado strikes, and first in the number of tornadoes per square mile (SLC Department of Public Safety Division of Emergency Management 2021). The NOAA NCEI Storm Database reports 48 tornado events between 1960 and 2024 in St. Lucie County, 29 of which resulted in property damage. Total property damage for this period is estimated at $501 million, though it is likely higher (NOAA, Storm Events Database 2025a).

Until the 2024 tornadoes spawned by Hurricane Milton, tornadoes in St. Lucie County had mainly been of lower magnitude (EF-0 or EF-1), resulting in light to moderate damage. Light damage can range from peeled surface off roofs, damage to gutters or siding, branches broken off trees, and shallow-rooted trees pushed over. Moderate damage can include severely stripped roof, overturned or badly damaged mobile homes, loss of exterior doors, and broken windows and other glass.

Most recently, Hurricane Milton in 2024 triggered an historic tornado outbreak across South Florida, with multiple confirmed tornadoes touching down in St. Lucie County and surrounding areas, prompting numerous emergency warnings throughout the region, and causing significant damage and multiple deaths.

#### 6.2.6.2 Wind Sensitivity Analysis

**Asset Sensitivity**

Generally, it is the wind that produces most of the property damage in dollar terms associated with tropical storms, hurricanes, and tornadoes. Although high winds can exert tremendous pressure against a structure, a large percentage of high wind damage is caused not from the wind itself, but from flying debris. Tree limbs, signs and signposts, roof tiles, metal siding, and other loose objects can become airborne missiles that penetrate 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 (SLC Department of Public Safety Division of Emergency Management 2021).

The external and internal pressures generated against a structure vary greatly with increases in elevation, shapes of buildings, 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. Recent studies estimate that wind speed increases by approximately 37 percent just 15 feet above ground level. High-rise buildings, particularly those located along the beachfront, will receive the full strength of a hurricane's winds on their upper stories.

Excessive wind events generate massive quantities of debris that can easily exceed a community's entire solid waste capacity by three times or more and are cost- and time-intensive for municipalities to remove before beginning to repair and recover after a hazard event. 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 (Florida Division of Emergency Management 2023).

As seen in **Table 6-15**and **Figure 6-29**, a 100-year wind event is expected to impact 3.7 percent of assets countywide, with the total estimated total replacement cost valued at $15 trillion.

The 500-year wind event projections are substantially higher for all jurisdictions and the unincorporated areas of the County, with 13.2 percent of assets being impacted countywide at a total replacement cost valued at $53 trillion (**Table 6-15** and **Figure 6-30**).

Table 6-15. Critical Asset Sensitivity to Hurricane Wind

| Jurisdiction | Total Replacement Cost Value of Critical Assets Evaluated | 100-year Mean Return Period | | 500-year Mean Return Period | |
|---|---|---|---|---|---|
| | | Building Damages | Percent of Total | Building Damages | Percent of Total |
| Fort Pierce (C) | $134,571,612,529 | $5,487,615,448 | 4.1% | $19,558,698,438 | 14.5% |
| Port St. Lucie (C) | $45,592,032,539 | $1,328,121,291 | 2.9% | $5,569,795,194 | 12.2% |
| St. Lucie Village (T) | $3,042,642,605 | $192,708,758 | 6.3% | $776,817,797 | 25.5% |
| Unincorporated St. Lucie County | $220,504,524,380 | $8,068,842,639 | 3.7% | $27,311,357,730 | 12.4% |
| St. Lucie County (Total) | $403,710,812,054 | $15,077,288,136 | 3.7% | $53,216,669,159 | 13.2% |

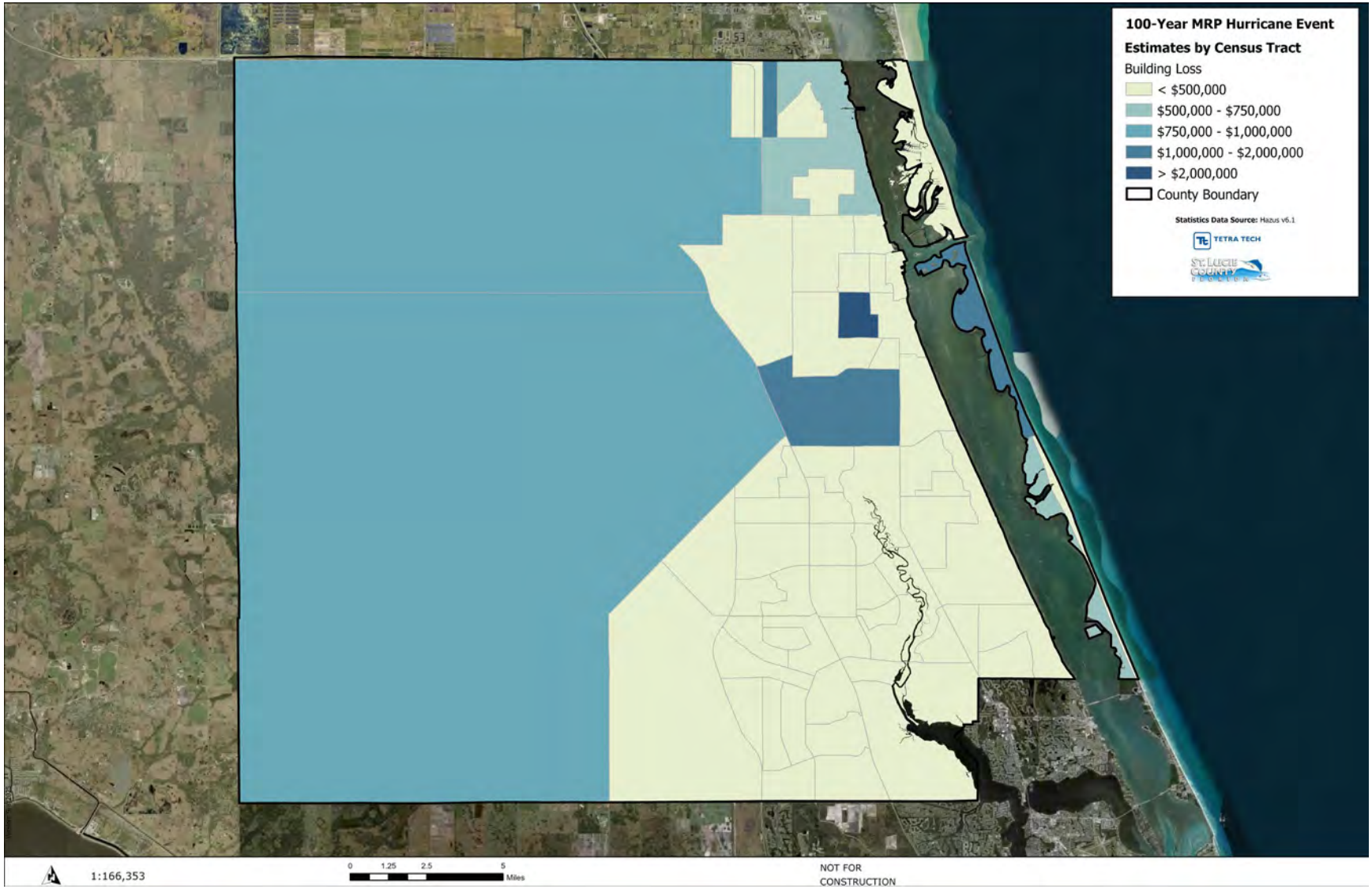



Figure 6-29. St. Lucie County Estimated Building Loss from 100-Year Hurricane Event

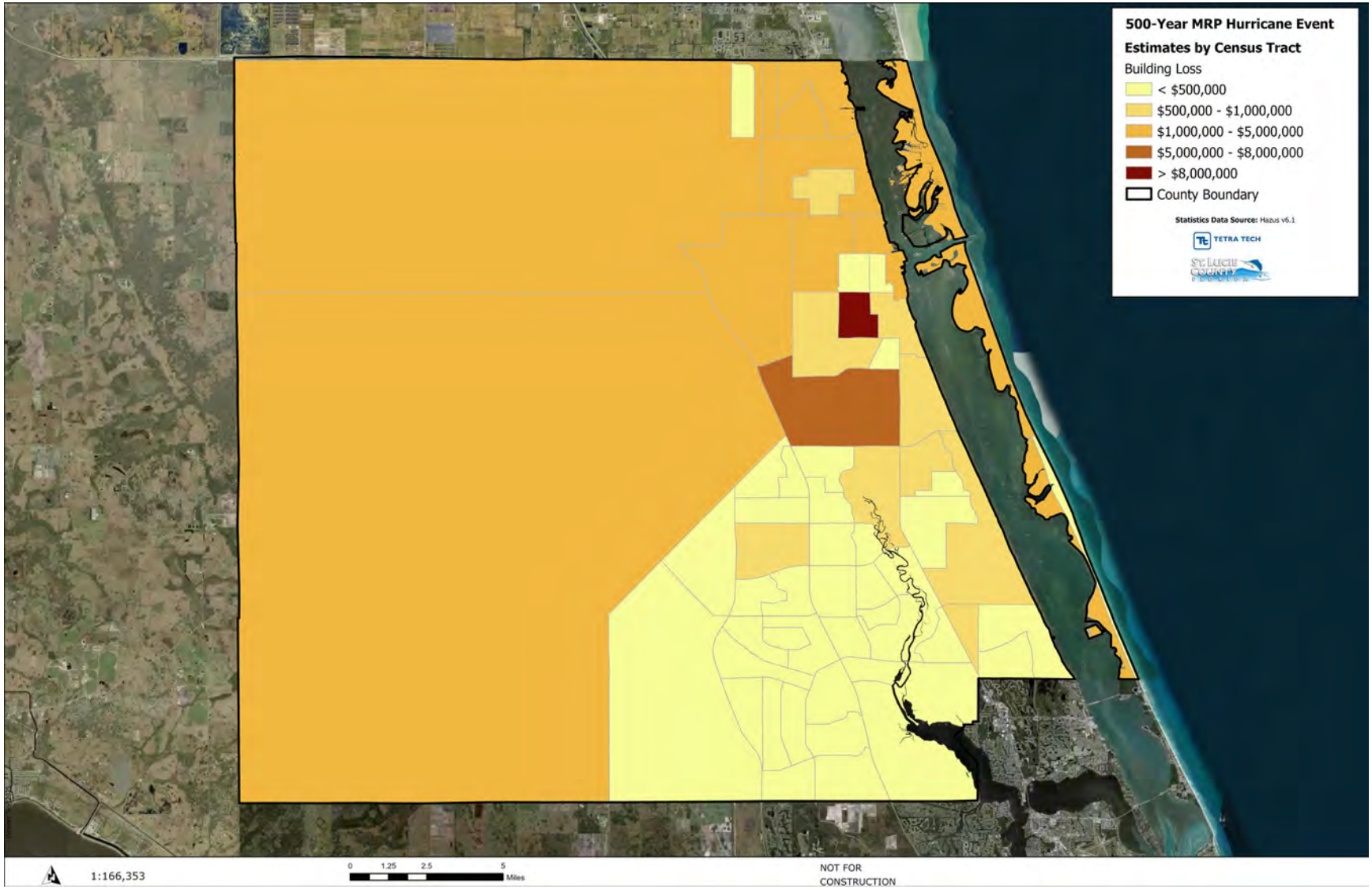



Figure 6-30. St. Lucie County Estimated Building Loss from 500-Year Hurricane Event

**Population Sensitivity**

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.

St. Lucie County's vulnerability to high winds is compounded by the high concentration of mobile home residents in large mobile home communities in both incorporated and unincorporated areas. There are 8,921 mobile home spaces and 1,184 recreational vehicle spaces throughout the County (SLC Planning & Development Services 2021). Mobile homes are an affordable form of housing in St. Lucie County, and they are distributed in both rural and urban areas. Although the number of mobile homes within the County has been reduced over the last 5 years, they remain the most vulnerable to tornadic activity.

During a 100-year event (i.e., 1 percent annual probability), an estimated 3,192 people (0.9 percent of the total population) would need to evacuate countywide, with nearly 2,759 (0.8 percent) of those requiring short term shelter to house them during the time they are displaced (**Figure 6-13** and **Table 6-16**). These numbers increase significantly during a 500-year event (i.e., 0.2 percent annual probability) to 19,763 (5.7 percent of the total population) displaced residents and 17,622 (5.1 percent) requiring short term shelter countywide (**Figure 6-32** and **Table 6-17**).

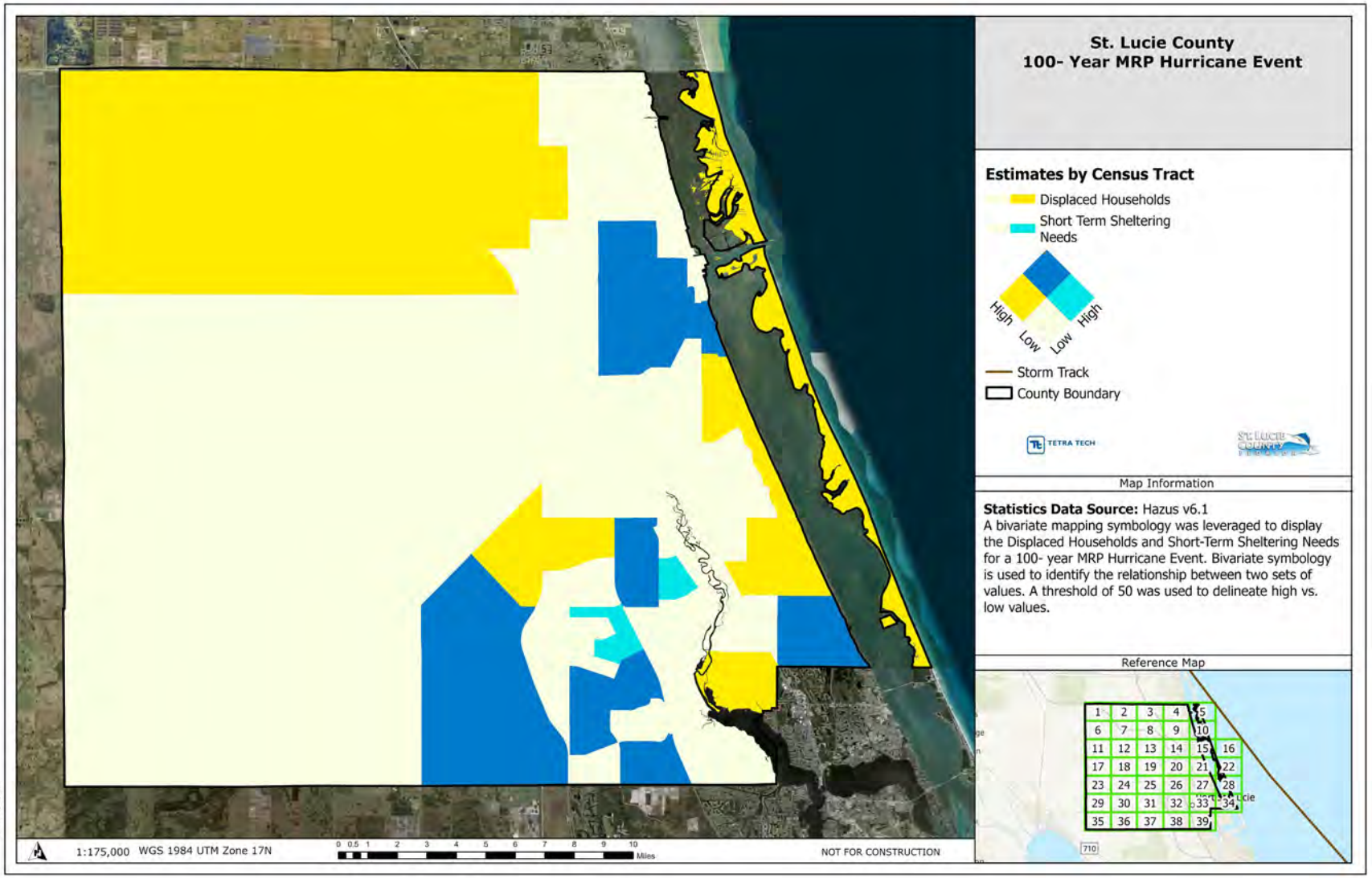



Figure 6-31. St. Lucie County Population Sensitivity to 100-Year Mean Return Period Hurricane

Table 6-16. Population Sensitivity to 100-Year Mean Return Period Hurricane

| Jurisdiction | Total Population | Displaced Population | % of Total | Population Requiring Short Term Shelter | Percent of Total |
|---|---|---|---|---|---|
| Fort Pierce (C) | 48,094 | 600 | 1.2% | 612 | 1.3% |
| Port St. Lucie (C) | 220,453 | 1,432 | 0.6% | 1,433 | 0.7% |
| St. Lucie Village (T) | 818 | 2 | 0.2% | 2 | 0.2% |
| Unincorporated St. Lucie County | 76,872 | 1,158 | 1.5% | 712 | 0.9% |
| St. Lucie County (Total) | 346,237 | 3,192 | 0.9% | 2,759 | 0.8% |

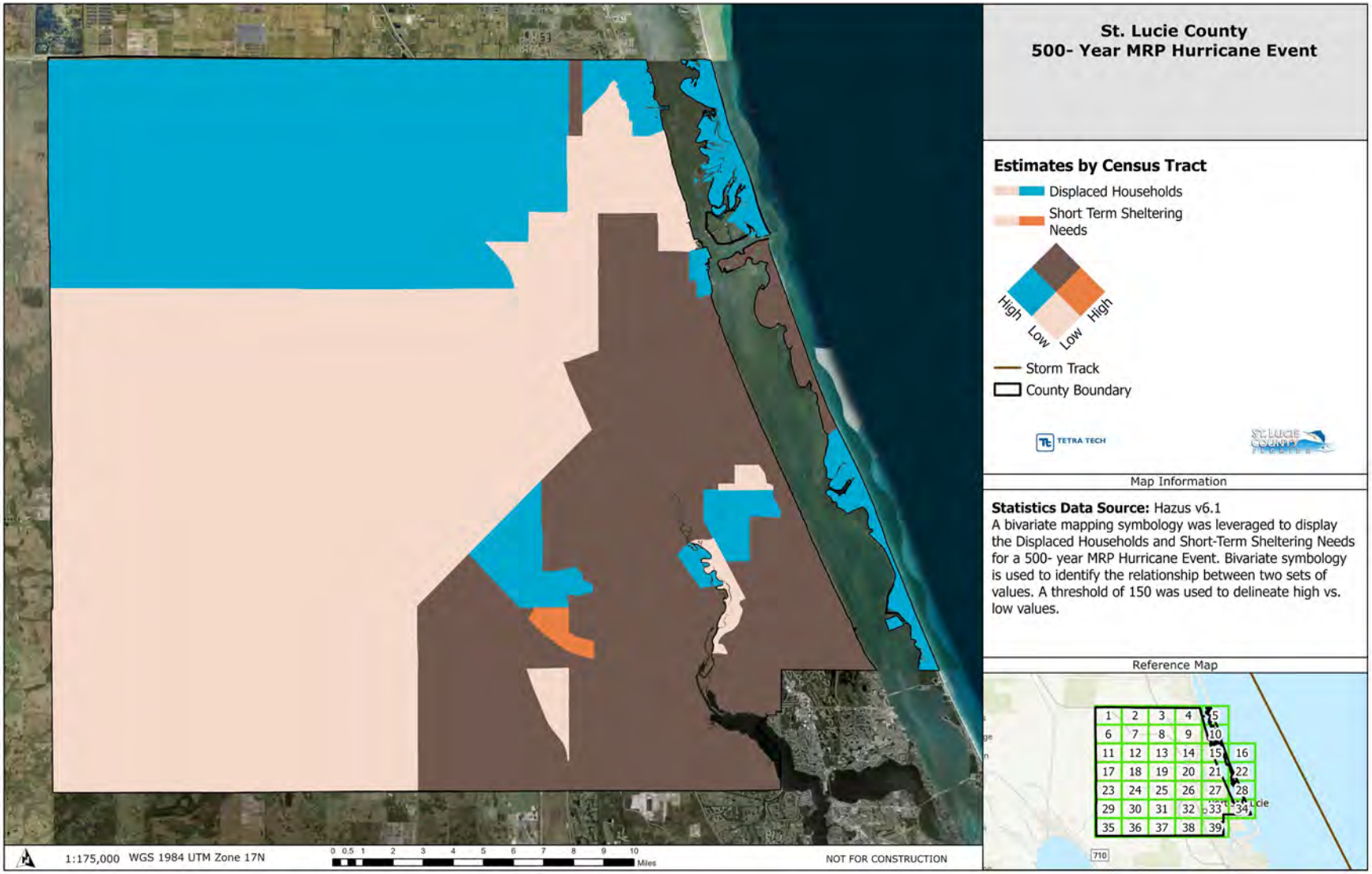



Figure 6-32. St. Lucie County Population Sensitivity to 500-Year Mean Return Period Hurricane

Table 6-17. Population Sensitivity to 500-Year Mean Return Period Hurricane

| Jurisdiction | Total Population | Displaced Population | Percent of Total | Population Requiring Short Term Shelter | Percent of Total |
|---|---|---|---|---|---|
| Fort Pierce (C) | 48,094 | 3,879 | 8.1% | 4,046 | 8.4% |
| Port St. Lucie (C) | 220,453 | 9,244 | 4.2% | 9,206 | 4.2% |
| St. Lucie Village (T) | 818 | 15 | 1.8% | 12 | 1.5% |
| Unincorporated St. Lucie County | 76,872 | 6,625 | 8.6% | 4,358 | 5.7% |
| St. Lucie County (Total) | 346,237 | 19,763 | 5.7% | 17,622 | 5.1% |

### 6.2.7 Wildfire

Most of Florida's natural systems are adapted to periodic wildfires and even dependent on them to maintain a balanced and sustainable ecosystem. However, in urbanized areas, naturally occurring wildfires are suppressed to protect life and property. Without management strategies, this results in the build-up of dead or decaying vegetation that provides fuel when a fire occurs and can lead to rapid acceleration and increased danger to surrounding areas.

Wildfire Hazard data from the University of Wisconsin-Madison's SILVIS Lab categorizes wildfire risk into two types: intermix and interface. Interface areas are where housing exists near large, contiguous wildlands, while intermix areas are where housing and smaller natural areas are intermingled. The most recent dataset from 2020 was used in this analysis. These wildfire hazard boundaries were overlaid on updated asset layers, including population data and critical facilities. Any asset points, lines or blocks that intersected the wildfire boundaries were totaled to estimate building replacement cost values and populations vulnerable to wildfire risk.

Wildfires can be caused by humans or occur naturally. Often, weather conditions determine how much a wildfire grows; dry conditions, high temperatures, and wind can cause a wildfire to grow quickly. Additionally, topography is important because it affects the movement of air over the ground surface, and the slope and shape of terrain can change the rate of speed at which fire travels. The Florida Forest Service records fire events by cause through a reporting system. In Florida, a total of 7,184 occurred between 2018 and 2022 burning 304,493 acres. About half of the acres were burned due to wildfires started by lightning. The 2023 Florida State Hazard Mitigation Plan states that the Wildland Urban Interface (WUI) areas of the state have increased and evaluates wildfire risk in the state as high. WUI areas are vulnerable to wildfires and can cause significant property damage (Florida Enhanced State Hazard Mitigation Plan 2023).

Wildfires have the potential for the following impacts within communities (SLC Department of Public Safety Division of Emergency Management 2021):

- Lives and property loss
- Electric power outage
- Surface and air transportation disruption
- Telecommunications system outage

- Disruption of community services
- Human health and safety
- Economic disruption
- Agricultural/fisheries damage
- Loss of livestock
- Damage to critical environmental resources
- Damage to identified historical resources

#### 6.2.7.1 Wildfire Exposure Analysis

To evaluate exposure to wildfire, the assessment uses the WUI data from the University of Madison-Wisconsin to identify vulnerable areas with certain topographies and vegetation, as well as historical incidents of wildfires.

Wildfires are of particular concern in the WUI because they bring humans—the primary cause for wildfire ignition in the United States—into greater contact with flammable wildlands. The WUI grows nationwide by approximately 2 million acres each year as communities continue to expand, often due to the pressures of high housing costs in more densely populated areas.

The wildfire assessment categorized exposure into two categories: intermix and interface. As indicated previously, a wildfire interface is an area where human development meets or mixes with relatively large undeveloped natural environments such as forests, grasslands, or shrublands. This zone is a transition between unoccupied land and developed land. Interface areas are defined as having more than one house per 40 acres, less than 50 percent vegetation, and are within 1.5 miles of an area over 1,235 acres that is more than 75 percent vegetated (Stewart, et al. 2006).

The wildfire intermix is a geographical area where structures and wildlands intermingle, with no clear boundary between the two. In an intermix area, homes and other structures are scattered throughout a wildland area. These structures are often surrounded by trees and vegetation and are only accessible by narrow roads. This makes it difficult to reach these areas if a fire occurs. Intermix areas have more than one house per 40 acres and have more than 50 percent vegetation (Stewart, et al. 2006).

Using the WUI data, assets were overlaid with the wildfire hazard data. Assets that intersected the interface and intermix hazard area are considered exposed. The analysis determined the extent (in miles) of shoreline, the extent (in acreage) of critical asset areas, count of critical assets, count of populations, and land area affected by the wildfire hazard.

The Florida Wildfire Risk Map shown in **Figure 6-33** shows burn probability data. Burn probability is the annual probability of wildfire burning in a specific location. The map was generated using a geospatial Fire Simulation (FSim) system developed by the U.S. Forest Service, Missoula Fire Sciences Laboratory. The FSim includes modules for weather, wildfire occurrence, fire growth, and fire suppression. The map shows wildfires are likely to occur across most of the state, with a 5 to 10 probability ranking, except for portions of the Panhandle and other intermittent areas across the state (Florida Division of Emergency Management 2023).

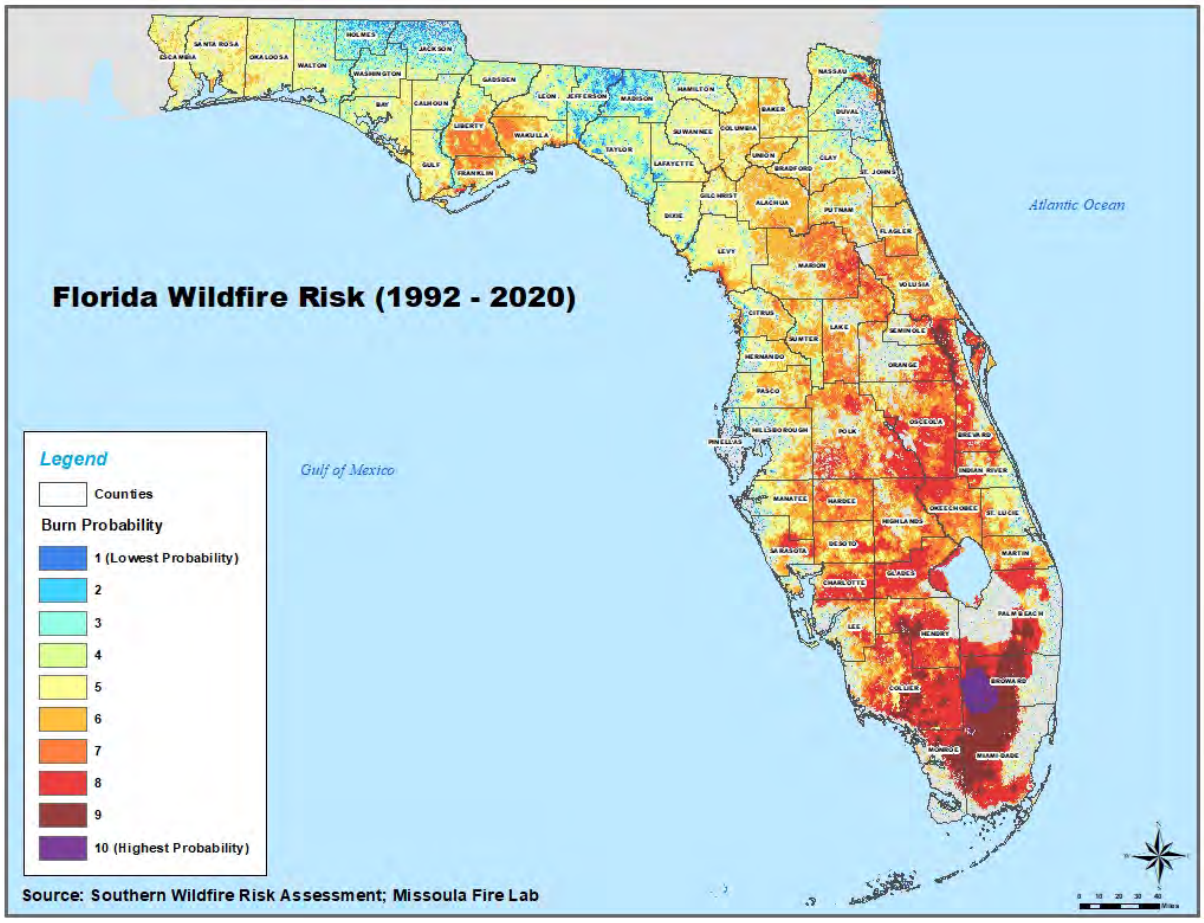



Figure 6-33. Florida Wildfire Risk Map

## Land, Assets and Population Exposure

### *Land Exposure*

Wildfire exposure is assessed using both WUI interface and intermix areas. **Figure 6-34** shows the WUI interface and intermix areas in St. Lucie County.

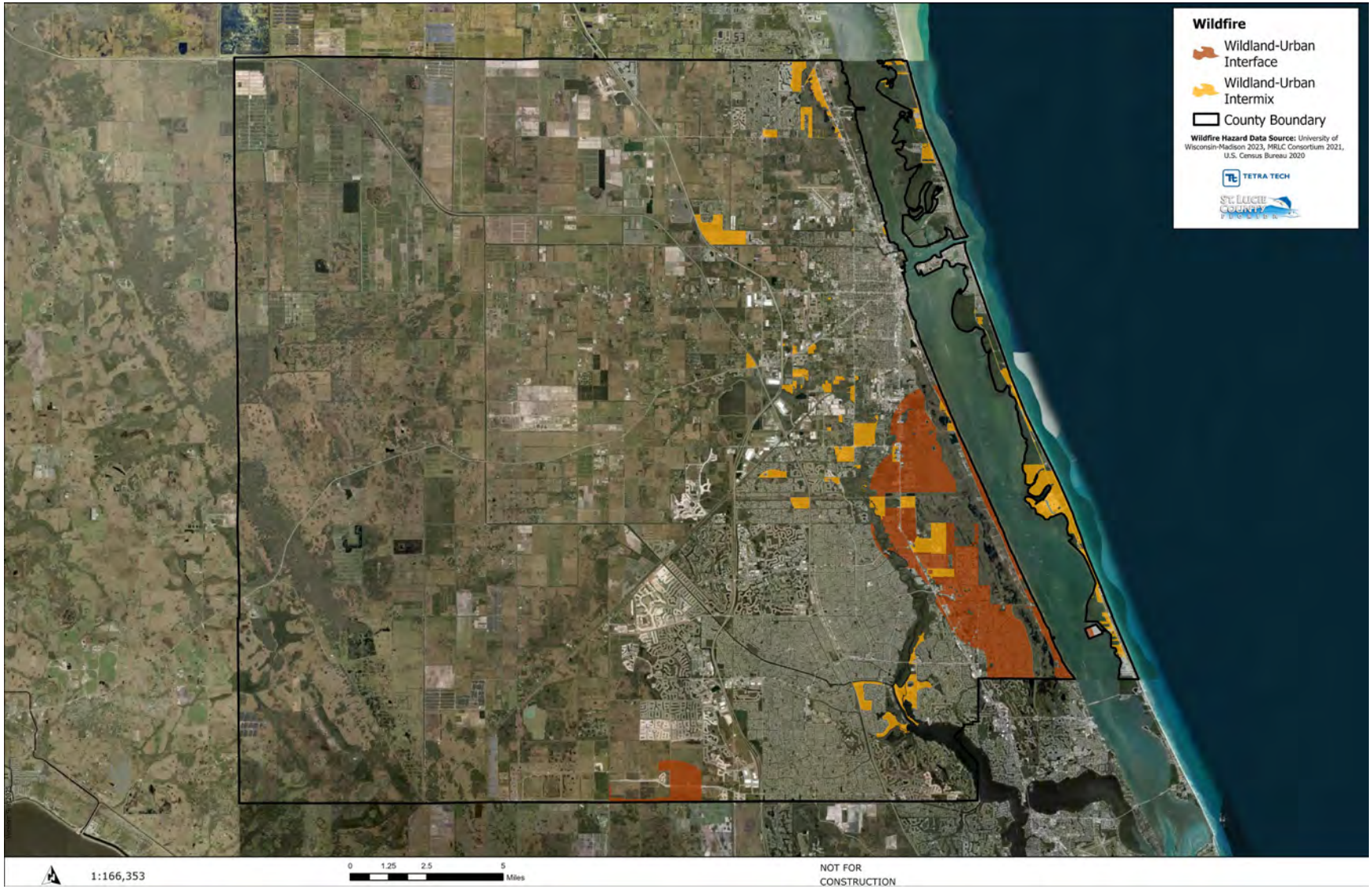



Figure 6-34. St. Lucie County Wildfire Hazard Area

As shown in **Table 6-18**, approximately 17,700 acres countywide are considered exposed to wildfire, representing almost 5 percent of the total land area. Of those total acres, 11,270 or 3.1 percent are categorized as wildfire interface, while 6,563 or 1.8 percent are categorized as wildfire intermix.

Table 6-18. Land Area in Wildfire Hazard Areas

| Jurisdiction | Total Land Area (Acres) | Land Area Exposure in Acres | | | |
|---|---|---|---|---|---|
| | | Interface | % of Total | Intermix | % of Total |
| Fort Pierce (C) | 15,663.3 | 802.4 | 5.1% | 230.1 | 1.5% |
| Port St. Lucie (C) | 75,850.8 | 4,589.7 | 6.1% | 1,132.0 | 1.5% |
| St. Lucie Village (T) | 524.0 | 0.0 | 0.0% | 13.9 | 2.7% |
| Unincorporated St. Lucie County | 274,265.0 | 5,878.9 | 2.1% | 5,186.9 | 1.9% |
| St. Lucie County (Total) | 366,303.2 | 11,270.9 | 3.1% | 6,563.0 | 1.8% |

### *Asset Exposure*

As shown in **Table 6-19**, nearly 23 percent of critical assets are exposed to wildfires countywide, with Critical Infrastructure assets making up the largest group facing wildfire exposure.

Table 6-19. Summary of Assets Exposed to Wildfire

| Jurisdiction | Number of Assets | | | | | Percent of Total Exposed |
|---|---|---|---|---|---|---|
| | Total Critical Assets Evaluated | Critical Community and Emergency Facilities | Critical Infrastructure | Natural, Cultural, and Historic Resources | Transportation Assets | |
| Fort Pierce (C) | 18,654 | 12 | 451 | 1 | 1 | 8.1% |
| Port St. Lucie (C) | 805 | 46 | 36 | 17 | 2 | 43.40% |
| St. Lucie Village (T) | 445 | 0 | 6 | 0 | 0 | 1.4% |
| Unincorporated St. Lucie County | 7,307 | 35 | 484 | 83 | 8 | 41.30% |
| St. Lucie County (Total) | 27,211 | 93 | 977 | 101 | 11 | 23% |

Table 6-20. Assets Exposed to Wildfire by Jurisdiction and Asset Category

| Jurisdiction | Critical Asset Category | Total Critical Assets Evaluated | Number of Critical Assets Exposed to the Wildland-Urban Interface (WUI) Hazard Area | | | |
|---|---|---|---|---|---|---|
| | | | Interface | % of Total | Inter-mix | % of Total |
| Fort Pierce (C) | Critical Community and Emergency Facilities | 714 | 11 | 1.5% | 1 | 0.1% |
| | Critical Infrastructure | 17,152 | 335 | 2.0% | 116 | 0.7% |
| | Natural, Cultural, and Historic Resources | 761 | 0 | 0.0% | 1 | 0.1% |
| | Transportation and Evacuation Routes | 27 | 0 | 0.0% | 1 | 3.7% |
| Port St. Lucie (C) | Critical Community and Emergency Facilities | 343 | 45 | 13.1% | 1 | 0.3% |
| | Critical Infrastructure | 275 | 32 | 11.6% | 4 | 1.5% |
| | Natural, Cultural, and Historic Resources | 124 | 10 | 8.1% | 7 | 5.6% |
| | Transportation and Evacuation Routes | 63 | 1 | 1.6% | 1 | 1.6% |
| St. Lucie Village (T) | Critical Community and Emergency Facilities | 5 | 0 | 0.0% | 0 | 0.0% |
| | Critical Infrastructure | 435 | 0 | 0.0% | 6 | 1.4% |
| | Natural, Cultural, and Historic Resources | 4 | 0 | 0.0% | 0 | 0.0% |
| | Transportation and Evacuation Routes | 1 | 0 | 0.0% | 0 | 0.0% |
| Unincorporated St. Lucie County | Critical Community and Emergency Facilities | 283 | 21 | 7.4% | 14 | 4.9% |
| | Critical Infrastructure | 5,595 | 170 | 3.0% | 314 | 5.6% |
| | Natural, Cultural, and Historic Resources | 1,373 | 9 | 0.7% | 74 | 5.4% |
| | Transportation and Evacuation Routes | 56 | 1 | 1.8% | 7 | 12.5% |
| St. Lucie County (Total) | Critical Community and Emergency Facilities | 1,345 | 77 | 5.7% | 16 | 1.2% |
| | Critical Infrastructure | 23,457 | 537 | 2.3% | 440 | 1.9% |
| | Natural, Cultural, and Historic Resources | 2,262 | 19 | 0.8% | 82 | 3.6% |
| | Transportation and Evacuation Routes | 147 | 2 | 1.4% | 9 | 6.1% |

As shown in **Table 6-21**, a small portion of countywide evaluated road miles, for transportation systems and critical asset systems (systems like transmission lines, that cannot be identified as a single site), are exposed to the wildfire hazard areas; 4.8 percent of critical infrastructure asset miles (334 miles) and 6.3 percent transportation asset miles (479 miles).

Table 6-21. Total Miles Exposed to the Wildfire Hazard Area

| Jurisdiction | Critical Asset Category | Total Miles Evaluated | Total Miles of Critical Assets (Linear) Exposed to the Wildland-Urban Interface (WUI) Hazard Area | | | |
|---|---|---|---|---|---|---|
| | | | Interface | % of Total | Inter-mix | % of Total |
| Fort Pierce (C) | Critical Infrastructure | 53.9 | 0.97 | 1.8% | 0.65 | 1.2% |
| | Transportation and Evacuation Routes | 52.6 | 0.94 | 1.8% | 0.70 | 1.3% |
| Port St. Lucie (C) | Critical Infrastructure | 99.4 | 1.80 | 1.8% | 2.90 | 2.9% |
| | Transportation and Evacuation Routes | 133.7 | 1.56 | 1.2% | 1.03 | 0.8% |
| St. Lucie Village (T) | Critical Infrastructure | 2.2 | 0.00 | 0.0% | 0.00 | 0.0% |
| | Transportation and Evacuation Routes | 2.1 | 0.00 | 0.0% | 0.00 | 0.0% |
| Unincorporated St. Lucie County | Critical Infrastructure | 169.3 | 4.02 | 2.4% | 5.38 | 3.2% |
| | Transportation and Evacuation Routes | 271.1 | 6.72 | 2.5% | 18.05 | 6.7% |
| St. Lucie County (Total) | Critical Infrastructure | 324.8 | 6.79 | 2.1% | 8.93 | 2.7% |
| | Transportation and Evacuation Routes | 459.4 | 9.22 | 2.0% | 19.78 | 4.3% |

***Population Exposure***

The population in the wildfire interface and intermix areas described above are presented in **Table 6-22**. Ten percent of countywide residents are exposed to wildfire, equating to about 34,700 people.

Table 6-22. Population Exposure in Wildfire Areas

| Jurisdiction | Total Population | Population Exposure to the Hazard Area | | | |
|---|---|---|---|---|---|
| | | Interface | % of Total | Intermix | % of Total |
| Fort Pierce (C) | 48,094 | 1,183 | 2.5% | 505 | 1.1% |
| Port St. Lucie (C) | 220,453 | 12,858 | 5.8% | 2,073 | 0.9% |
| St. Lucie Village (T) | 818 | 0 | 0.0% | 32 | 3.9% |
| Unincorporated St. Lucie County | 76,872 | 11,193 | 14.6% | 6,872 | 8.9% |
| St. Lucie County (Total) | 346,237 | 25,234 | 7.3% | 9,482 | 2.7% |

Wildfires can cause significant property damage, as well as result in lingering environmental health issues. As discussed previously, asset exposure and sensitivity to wildfire is as much a function of location as it is structure type. The materials and structural integrity of older homes that pre-date enhanced building codes can be significantly more vulnerable to wildfires, as well as mobile homes no matter their age.

The impacts from smoke entering and lingering in the air can become an increased threat to certain populations. Elderly people, children, disabled individuals, and those living with respiratory and chronic illnesses are particularly vulnerable to wildfire hazards. Children breathe more air than adults in proportion to their body size, making them more susceptible to smoke inhalation.

#### 6.2.7.2 Wildfire Sensitivity Analysis

Wildfire risk has been increasing in recent years across the United States. NOAA's Billion-Dollar Weather and Climate Disasters report shows that there was $79.8 billion in costs associated with wildfires between 2018 and 2021, as compared to $8.5 million between 2012 and 2016.

The 2023 Florida State Hazard Mitigation Plan estimates nearly $4.4 million in expected annual loss for St. Lucie County due to wildfires. Total expected annual loss is a combination of exposure, frequency, and historical loss ratio, and depicts the average economic loss in dollars from each natural hazard by census tract and county. Expected annual loss is computed for each hazard type and only quantifies loss for relevant consequence types (i.e., buildings, population or agriculture).

The 'fuel' that drives wildfires is primary dry or decaying vegetation that builds up over time. Local land managers use various strategies to consistently reduce fuel build-up in our rural and urban environments, thereby reducing the risk of catastrophic fires to occur. This includes clearing wide corridors to act as fire breaks, mechanically chopping flammable materials, and using prescribed fires, which are controlled burns under optimal conditions that eliminate the fuel load.

Reduced moisture of living vegetation, soils, and decomposing organic matter during drought or extreme heat events is associated with increased incidence of wildfires. Changes over time in vegetation types could change the mixture and flammability – either favorably or unfavorably – for fuel build-up. 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. Florida has weather patterns that lead to both dry and wet periods each year. Future conditions may cause one or the other, or both types of conditions to increase in occurrence and magnitude.

The First Street Foundation's 5th National Risk Assessment: Fueling the Flames Report models risk to fire and threat to properties (First Street Foundation 2022). The Wildfire Model integrates information on fuels, wildfire weather, and ignition. The wildfire weather data looks at factors like surface wind, air temperature, relative humidity, and precipitation. This report shows Florida's current 6 percent of properties at risk from wildfires could jump to 12 percent by 2052 (First Street Foundation 2022). This is partially because Florida is expected to have an increased number of hot days, but also because development is increasingly encroaching into undeveloped land.

# 7.0 NATURAL, CULTURAL, AND HISTORIC RESOURCES

## 7.1 Natural Resources

The Sea Level Affecting Marshes Model (SLAMM) is a freely available, spatially explicit land cover change model that simulates coastal habitat transformation due to sea level rise (SLAMM 2022). The model integrates multiple datasets and processes, including elevation and slope, tidal datum shifts, erosion and accretion, storm tide over wash, and existing land cover. SLAMM produces spatially explicit projections of land cover changes over user-defined time steps and SLR scenarios. It is widely used for long-term conservation planning, including imperiled species conservation (Evans & Bergh, 2016; Benedict et al., 2018), flood risk assessments (Hauer et al., 2015), coastal resilience, and planning (Clough et al., 2016; Mazor et al., 2021).

The full St. Lucie County 2025 SLAMM analysis, entitled "Long-Term Resilience in St. Lucie County, FL: A Conservation Planning Approach," is presented in Part II of this report. It provides a comprehensive evaluation of the countywide vulnerability to sea level rise and outlines strategic pathways for long-term resilience.

SLAMM version 6.7 was implemented with locally calibrated parameters to accurately represent local conditions. The model uses a 10-meter-by-10-meter cell-based approach, where each cell represents elevation, habitat type, and key attributes. The fate of each cell is determined by SLR-driven processes that includes inundation of low-lying areas, shoreline erosion, habitat conversion, soil saturation from rising water tables, and sediment and organic matter accretion.

As a rapidly growing coastal region, SLC is particularly vulnerable to the impacts of SLR, extreme weather, and increased flooding, especially on its ecosystems. St. Lucie County's coastal ecosystems provide critical services, including storm protection, carbon storage, wildlife habitat, and recreational opportunities. Emerging concerns in resilience are focused on development in flood-prone areas that increase regional flood exposure, reduce the footprint of natural lands, and lead to a condition known as coastal squeeze, where developed waterfront land prevents the migration of wetlands in response to SLR (Clearview Geographic LLC 2025).

Recent record rainfall from Hurricanes Irma (2017) and Milton (2024) has further highlighted these concerns, emphasizing the need for integrated stormwater management, wetland conservation, and sustainable land-use planning (Clearview Geographic LLC 2025).

SLAMM is a computer-based model that simulates how coastal wetlands and shorelines respond to rising sea levels. It predicts how habitats such as mangroves, marshes, and beaches may migrate, transform, or disappear as sea levels rise. SLAMM considers key processes like inundation, erosion, accretion, and habitat conversion, making it a valuable tool for climate adaptation planning and coastal resilience strategies. The SLAMM analysis for the SLC region explored opportunities to enhance resilience through open space conservation and green stormwater infrastructure. Science-based planning and proactive management will be increasingly important for the region as it seeks to protect its environment, economy, and quality of life. The findings from this SLAMM analysis will help local decision-makers develop strategies that will minimize ecosystem loss and maximize natural flood protection (Clearview Geographic LLC 2025).

Using high-resolution elevation data, wetland inventories, and NOAA's SLR projections, the study modeled ecological changes for years 2040, 2070 and 2100 under two scenarios: Intermediate Low (NIL) and Intermediate High (NIH). The results show that under the NIH scenario, St. Lucie County could lose up to 94 percent of its mangrove habitat (over 64,000 acres) and nearly 49 percent of regularly-flooded marshes, while estuarine open water could expand by nearly 400 percent. In contrast, the NIL scenario projects far less dramatic changes, including a slight increase in mangrove area and more moderate wetland losses (Clearview Geographic LLC 2025).

While protection strategies (such as safeguarding all dry land or only developed dry areas) are effective at preserving infrastructure, they offer limited benefits for natural systems. In fact, the "Protect All Dry Land" strategy may exacerbate habitat loss due to 'coastal squeeze', where wetlands are trapped between rising seas and hardened infrastructure, unable to migrate inland. A "Protect Developed Dry Land" strategy, offers a more balanced approach, preserving infrastructure while supporting some ecological adaptation (Clearview Geographic LLC 2025).

To guide future action, a phased adaptation strategy is recommended in the report. In the short term, priorities should include monitoring habitat changes, protecting critical wetland areas, and updating land use codes, with longer term strategies considering increased land acquisition, floodplain restoration, and infrastructure retrofits.

**Figure 7-1** presents a spatial analysis of high-priority parcels in SLC identified for potential conservation action. The map integrates outputs from the SLAMM model with the Florida Natural Areas Inventory's Critical Lands and Waters Identification Project (CLIP) data to highlight parcels that are ecologically valuable, and have the potential to support flood mitigation, biodiversity long-term resilience. Specifically, it displays 581 parcels, each 10 acres or larger, that meet multiple criteria: they contain natural land cover types (e.g., wetlands, upland forests), overlap with Priority 1 or 2 CLIP conservation areas, and are adjacent to or near existing protected lands. These parcels are primarily located in the western portion of the County, where SLAMM projections indicate less direct inundation risk, but nonetheless critical for preserving freshwater ecosystems, groundwater recharge zones, and habitat connectivity. The figure underscores the importance of proactive land acquisition and conservation easements in areas that can serve as refugia or migration corridors for ecosystems threatened by SLR and development pressure.

Ultimately, the SLAMM report provides a robust foundation for recognizing increased hazard risk potential and integrating adaptation and mitigation strategies into land use planning, conservation initiatives, and infrastructure investment. It underscores that local actions—particularly those that preserve and restore natural systems—can significantly enhance St. Lucie County's ability to adapt to a changing conditions.

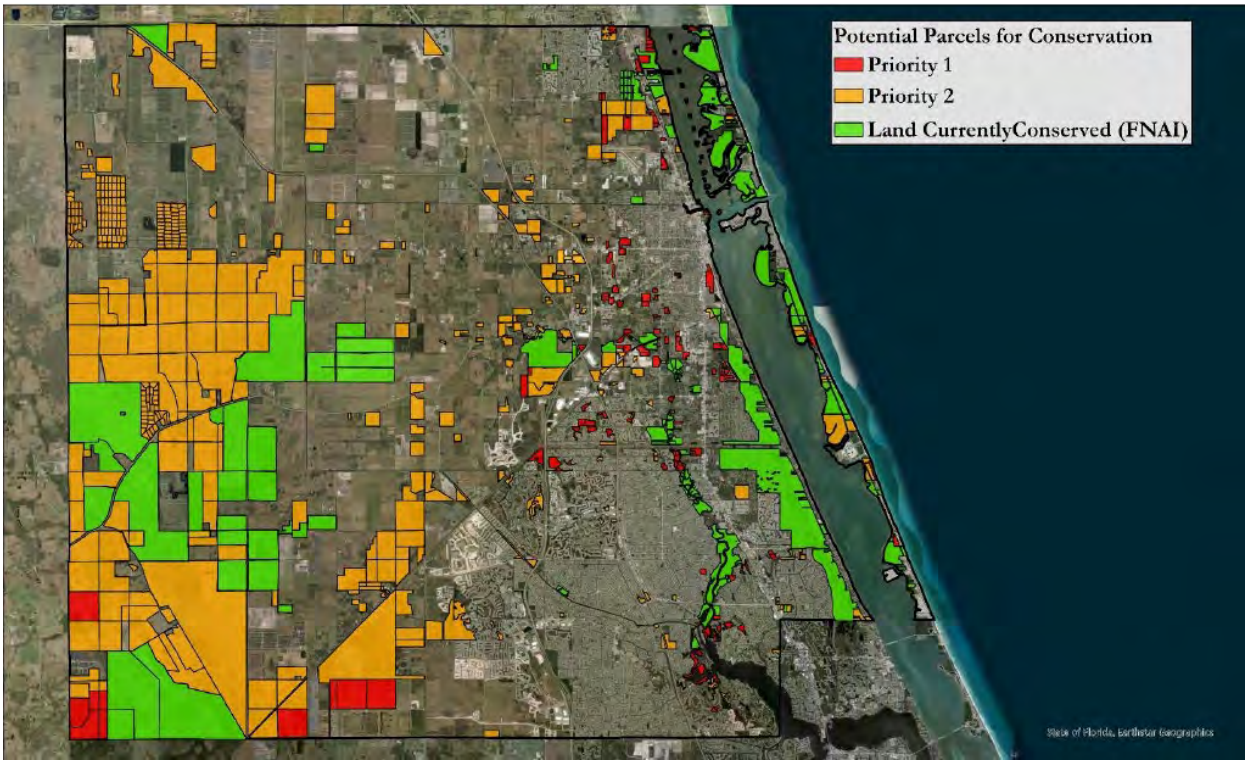



Figure 7-1. Potential Conservation Land Parcels in St. Lucie County

## 7.2 Cultural and Historic Resources

St. Lucie County is rich in cultural and historical assets that reflect its diverse heritage and community. These cultural and historical assets play a vital role in preserving the community's heritage, fostering a sense of identity, and promoting tourism. These assets include museums, historical landmarks, cultural centers, and heritage sites.

A number of historical resources are at risk due to flood hazards and pose substantial challenges for continued protection and preservation. As reflected in **Figure 7-2**, within SLC, there are 66 previously recorded historic buildings or structures (April 2024), and 59 previously recorded archaeological sites on city-, county-, or state-owned or managed parcels (Parsons et al. 2025).

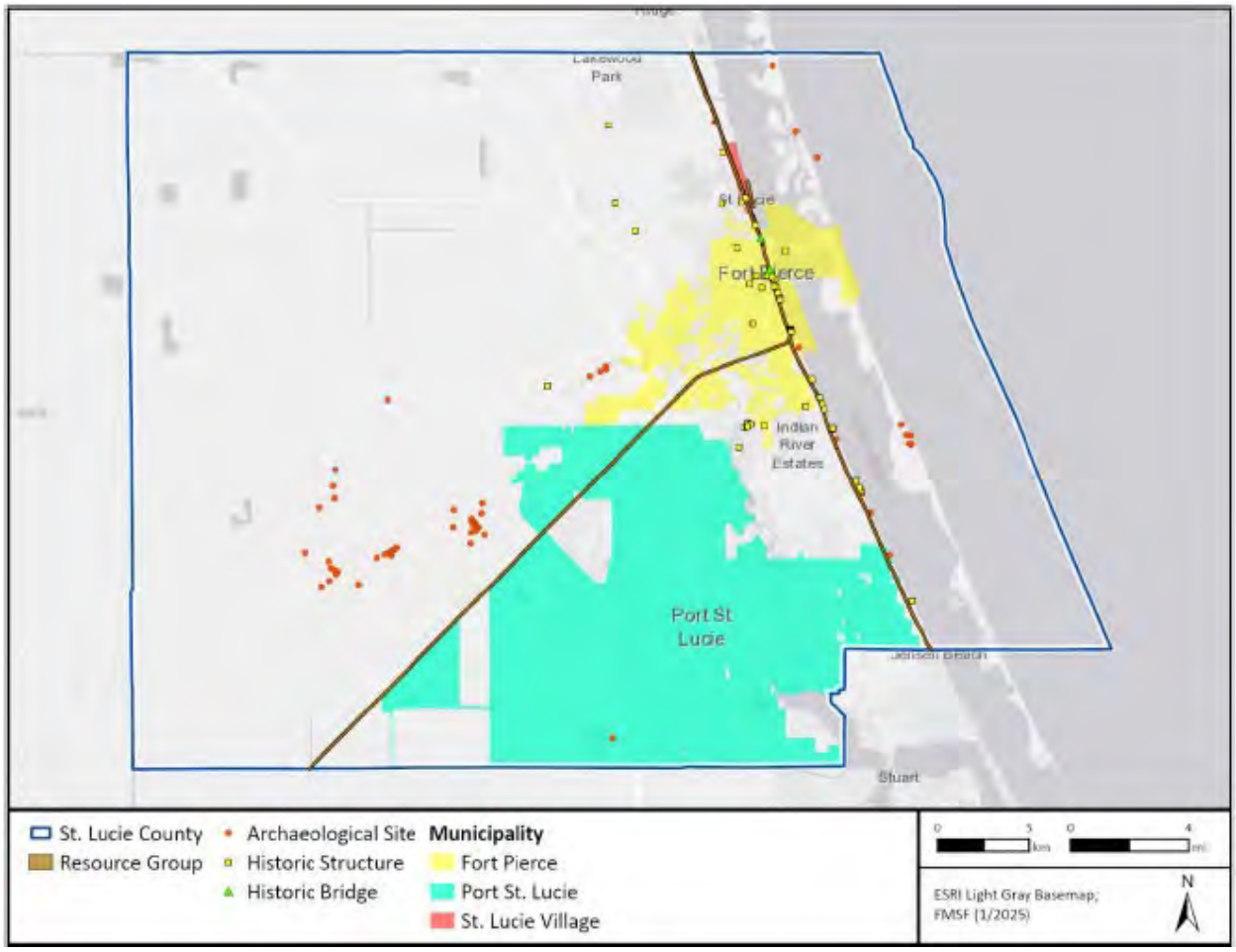



Figure 7-2. Overview of Historic Buildings, Structures, and Archeological Sites within St. Lucie County

Of the 66 historic resources analyzed, 62 are currently vulnerable to 24-hour 100-year rainfall events, while all face risks from heavy rainfall events. The Florida East Coast Railroad – Lake Harbor Branch is projected to have the most severe potential flood value (11.24 inches) along with Moore's Creek Bridge (9.91 inches). Of the 59 archeological sites analyzed, 42 are currently vulnerable to 24-hour 100-year rainfall events (ranging from 0.38 to 9.5 inches). Field Site #3 (a prehistoric habitation site) is projected with the most severe potential flood value (9.5 inches) along with Williams Midden (8.28 inches) (Parsons et al. 2025).

By 2040, the number of historic resources impacted by the 100-year rainfall event is projected to remain at 62, with the number of archeological sites impacted increases from 42 to 48. The projected impacts to historic resources under 2040 conditions range from less than 1.0 inch to 12.81 inches. Sites with significant potential flooding impacts include Indian Garden, Indian River Drive Site #9, Williams Midden, Blind Creek II, and Indian River Drive Site #8 (Parsons et al. 2025).

By 2070, projected impacts to historic resources range from less than 1.0 inch to 12.84 inches. Historic resources with significant potential flooding impacts include the Captain Hammond House, N U.S. Highway 1, Dixie Highway, and Red Barn Produce. Similarly, by 2070, the number of archeological sites impacted by the 100-year rainfall event is projected to increase to 52 sites (Parsons et al. 2025).

Historic buildings in SLC and the municipalities have diverse foundation types, including poured concrete footers, concrete block foundations, brick piers, raised concrete slabs, and at-grade concrete slabs. This variety results in different first-floor elevations, affecting each building's vulnerability and adaptation strategies. Architectural surveys and research can identify prominent building types and development patterns to estimate impacts and inform adaptive strategies. Public input is crucial for determining which historic resources the community prioritizes for protection.

Identifying general building types can aid in developing adaptation strategies, as well as design regulations for future construction, following guidelines from the National Park Service.

Flooding and inundation risks reduce opportunities to document and interpret archaeological information. SLC and the municipalities have various archaeological site types, including Native American precontact sites, Spanish and early American historic sites, multicomponent sites, and submerged sites like historic shipwrecks listed in the National Register of Historic Places. While not all sites can undergo intensive investigations, prioritizing at-risk sites for documentation involves professional judgment and systematic criteria, considering factors like rarity, integrity, threat severity, archaeological potential, and access. Unlike historic buildings, archaeological sites cannot be moved without destruction, limiting mitigation options.

This analysis highlights the growing vulnerability of SLC and the municipalities' historic and cultural resources. Proactively protecting these cultural and historic assets is essential for preserving SLC's cultural and historical fabric. Prioritizing adaptive measures, such as flood mitigation infrastructure, elevation, and other preservation techniques, will help ensure that these irreplaceable sites remain intact for future generations.

# PART 2

# St. Lucie County

# Resilience Vulnerability Assessment

# Phase II – Other Hazards (RVA-OH)

**August 2025**

This Report was developed through research by Clearview Geographic LLC, and supported by the CBDG-MIT Program

# PART 2: A CONSERVATION APPROACH TO LONG-TERM RESILIENCE

## 8.0 INTRODUCTION

St. Lucie County's natural and semi-natural interior landscape is characterized by a mosaic of forests, grasslands and wetlands. Located at the intersection of the subtropical and tropical zones, the county contains a unique mix of flora and fauna, contributing to its relatively high local biodiversity. The county contains large areas of protected conservation areas and privately held undeveloped lands that provide important ecosystem services, including provisioning of water quality protection, groundwater recharge and floodwater storage. Each of these natural communities plays a vital role in the region's environmental resilience.

In addition, St. Lucie County's coastal landscape is a rich tapestry of 18 interconnected habitats, ranging from beaches and mangroves to freshwater wetlands and upland systems. Oceanfront habitats form the county's first line of defense against storms and rising seas. Beach systems and coastal scrub naturally buffer inland areas from wave and wind energy while mangroves, salt marshes and tidal flats create stable shoreline anchors.

Coastal areas of eastern St. Lucie County are known to be susceptible to major flood hazards associated with coastal erosion, storm surge, long-term sea level rise, and extreme precipitation. Due to the very low gradient of the St. Lucie River and its connection to tidal influence, some areas of central St. Lucie County are vulnerable to impacts from long-term sea level rise and rainfall. Many populated areas throughout St. Lucie County, not located near a water body, are also known to be susceptible to flooding associated with localized extreme rainfall and stormwater runoff.

Conservation, preservation, and restoration of undeveloped open space is widely regarded as one of the most efficacious and cost-effective flood risk mitigation strategies, especially when considering the uncertainties of future flood-related hazards. Open space conservation is known to reduce flood risk at multiple scales that range from stormwater catch basins draining less than an acre of land, up to regional watershed drainages covering hundreds of square miles or more. The many other co-benefits of open space – including biodiversity preservation, water quality protection, food and fiber production, carbon capture and storage, recreational enjoyment, and quality of life – provide further impetus for increased utilization of land conservation as a primary tool in comprehensive flood management, resilience, and mitigation programs.

The Sea Level Rise Affecting Marshes Model (SLAMM) is a data-driven initiative designed to assess how coastal ecosystems will respond to rising sea levels. By utilizing county-wide high-resolution elevation data, wetland inventories, and advanced habitat modeling, this study provides key insights into the migration of coastal habitats, potential ecosystem shifts, and long-term resilience strategies.

This study explores opportunities to enhance resilience through open space conservation and green stormwater infrastructure. The analysis examines:

**Ecosystem Vulnerabilities** – Identifying which coastal habitats face the greatest risk from sea level rise.

**Projected Changes Over Time** – Understanding when and how ecological transitions may occur.

**Protection and Adaptation Strategies** – Evaluating conservation and mitigation efforts to enhance resilience.

This SLAMM Analysis of St. Lucie County's coastal ecosystems reveals a complex interplay of vulnerability and resilience. While rising seas and changing local weather patterns pose significant risks, many of the county's natural systems retain the potential to adapt—if given adequate space and support.

As a rapidly growing coastal county, St. Lucie is particularly vulnerable to the impacts of sea level rise, extreme weather, and increased flooding. Recent record rainfall from Hurricanes Irma (2017) and Milton (2024) has further highlighted these risks, emphasizing the need for integrated stormwater management, wetland conservation, and sustainable land-use planning (e.g. Low Impact Development strategies).

Results from this analysis, under moderate to high sea level rise projection scenarios, show the potential for extensive wetland change within the coastal areas of St. Lucie County and conversion of freshwater ecosystems into estuarine conditions within the St. Lucie River, by the year 2070. However, projected trend-based land cover change patterns associated with expected population growth, show much more extensive impacts than even the highest modeled rate of sea level rise on freshwater wetlands and other natural ecosystems across St. Lucie County.

Without proactive measures, the county faces significant risks, including:

- Increased infrastructure damage due to flooding and extreme weather events.
- Loss of critical natural resources that provide storm protection, water filtration, and habitat preservation.
- Economic disruptions affecting property values, tourism, agriculture, and local businesses.
- Greater financial strain on county budgets due to disaster response and recovery expenses.

As St. Lucie County continues to grow and develop, strategic protection and maintenance of priority green space areas will be required in order to maintain these ecosystem services. This will take a complex, multi-layered strategy involving conservation policy, fee simple land acquisition, conservation easements, forestry and agricultural land use incentives, and low impact development approaches.

The key to enhancing long-term resilience lies in:

- Decisive action in the present
- Flexibility to adapt strategies as conditions evolve
- A resilient future requires sustained commitment and collaboration from all sectors. The investment in protecting and enhancing natural infrastructure today will help ensure St. Lucie County remains a vibrant, resilient community for generations to come.

## 8.1 Project Overview

This document presents a comprehensive analysis of the Sea Level Affecting Marshes Model (SLAMM) outputs for St. Lucie County, Florida. The study evaluates projected changes in coastal habitats under various sea level rise (SLR) scenarios, protection strategies, and planning horizons. The findings indicate significant habitat transitions over time, with the extent and timing of changes varying based on the SLR scenario and chosen protection strategy.

**What is SLAMM?** The Sea Level Affecting Marshes Model (SLAMM) is a computer-based model that simulates how coastal wetlands and shorelines respond to rising sea levels. It predicts how habitats such as mangroves, marshes, and beaches may migrate, transform, or disappear as sea levels rise. SLAMM considers key processes like inundation, erosion, accretion, and habitat conversion, making it a valuable tool for adaptation planning and coastal resilience strategies (**Figure 8-1**).

Figure 8-1. Warren Pinnacle Consulting, Inc's Website, more details are available for SLAMM at: https://www.warrenpinnacle.com/

### 8.1.1 Study Area

St. Lucie County (**Figure 8-2**), located on Florida's east coast, contains diverse coastal ecosystems including mangroves, swamps, marshes, and developed areas. The county has approximately 21 miles of Atlantic Ocean coastline and significant estuarine shoreline along the Indian River Lagoon. These ecosystems provide important ecological services, including:

- Habitat for wildlife, including threatened and endangered species
- Storm protection and flood mitigation
- Carbon sequestration and storage
- Water quality improvement
- Recreational opportunities and tourism

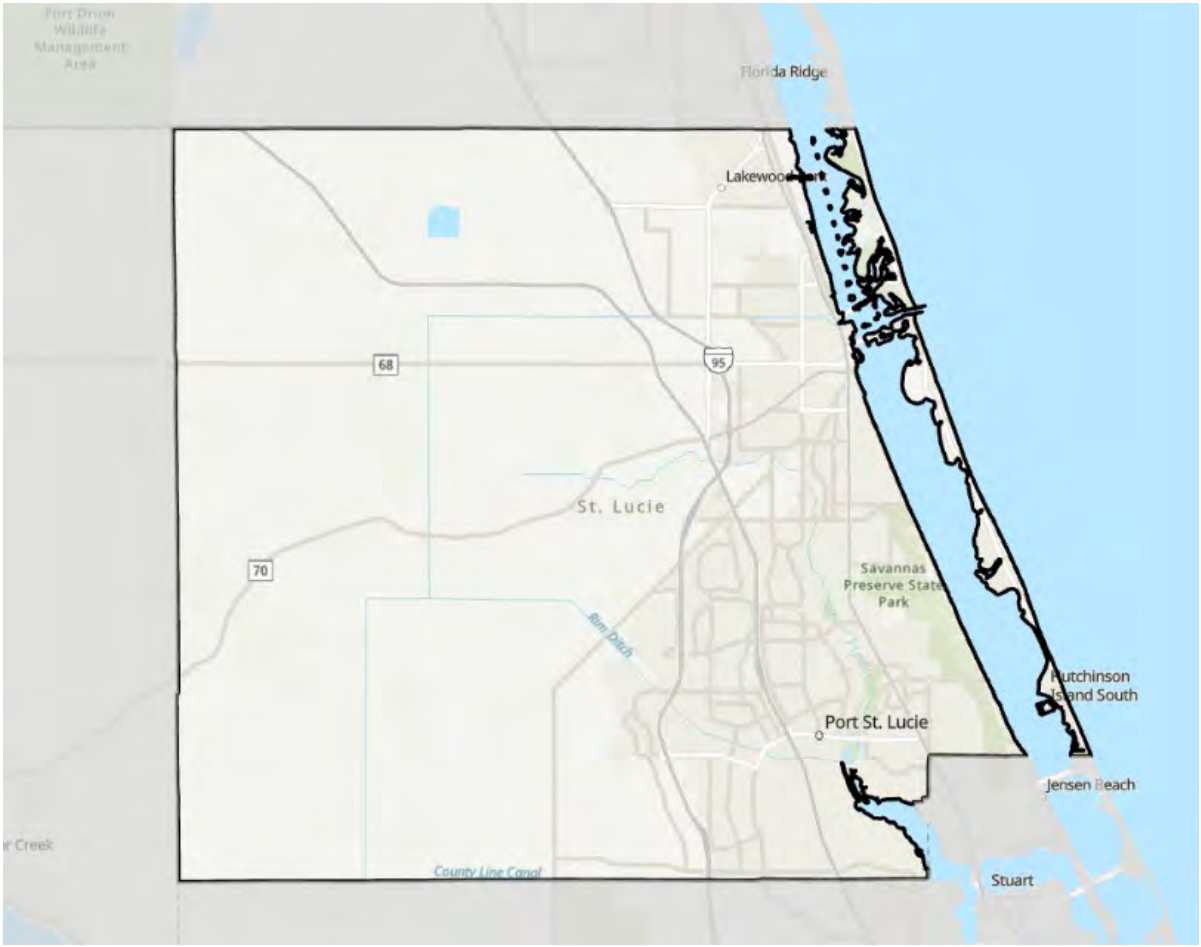



Figure 8-2. Overview of St. Lucie County

Sea level rise poses a significant threat to these coastal ecosystems and developed areas, potentially causing habitat transitions, loss of ecosystem services, and impacts to infrastructure. While it is not clear if sea-level rise is already contributing to increasing flood risk along the St. Lucie River in St. Lucie County, high rates of sea-level rise would be expected to increase water levels within the St.

Lucie River – and cause increased flood risk in low-lying riverine areas – across western and southern St. Lucie County over the next several decades.

St. Lucie County is a geographically moderate-sized and populous coastal county in southeastern Florida (**Figure 8-3**). With a total area of approximately 688 square miles, including 572 square miles of land area and 116 square miles of open water, St. Lucie County is not among the largest by area out of Florida's 67 counties. The 2020 U.S. Census Bureau's population count for St. Lucie County is approximately 373,586, making it the 20th largest by population within Florida.

St. Lucie County currently contains a total of three incorporated cities and towns: Port St. Lucie, Fort Pierce, and St. Lucie Village. The county seat is Fort Pierce.

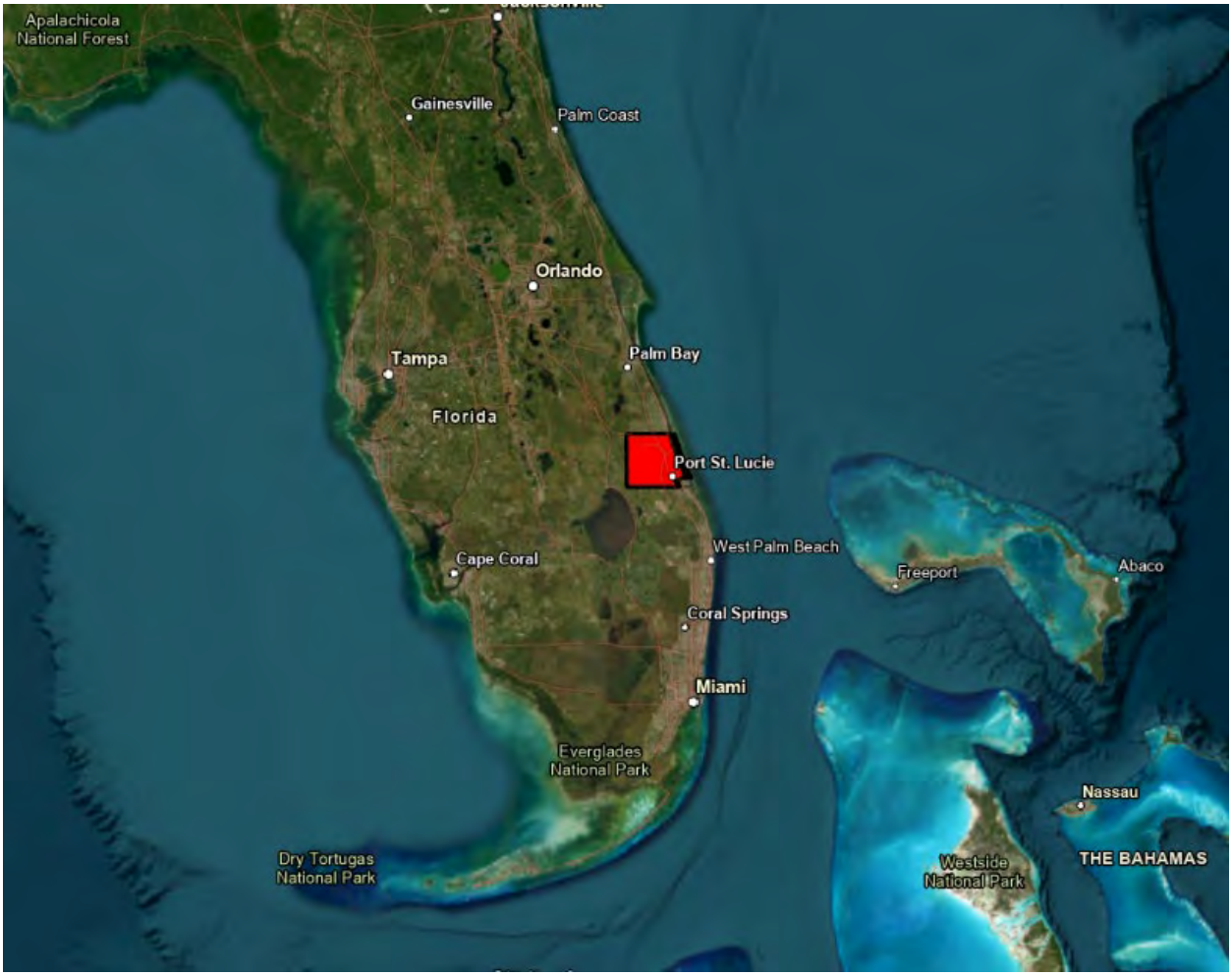



Figure 8-3. Regional overview, locating St Lucie County for context within the peninsula of Florida

Eastern St. Lucie County is bordered by the Atlantic Ocean and includes significant inland estuarine waters within the Indian River Lagoon and North Fork St. Lucie River. Indian River County borders St. Lucie County to the north, Martin County to the south, and Okeechobee County to the west.

The National Weather Service reports the average annual precipitation for Port St. Lucie as approximately 53.5 inches per year. Summer months of June-September tend to bring the highest

precipitation totals due to the regular occurrence of convective thunderstorms and periodic impacts from tropical cyclones. The driest months usually occur in December-February. Frontal storms generally provide the most significant precipitation to St. Lucie County during non-summer months.

#### 8.1.1.1 Flood Risk Hazards

Coastal areas of eastern St. Lucie County are known to be susceptible to major flood hazards associated with coastal erosion, storm surge, long-term sea level rise, and extreme precipitation. Central and western St. Lucie County contains large expanses of low-lying areas, particularly near the St. Lucie River and ancillary water bodies, that experience riverine flooding – also known as "fluvial" flooding – in the aftermath of large regional precipitation events. Due to the very low gradient of the St. Lucie River, some areas of central and western St. Lucie County may additionally be vulnerable to impacts from long-term sea level rise. Many populated areas throughout St. Lucie County not located near a water body are also known to be susceptible to flooding associated with localized extreme rainfall and stormwater runoff, or what is often referred to as "pluvial" flooding (**Figure 8-4**).

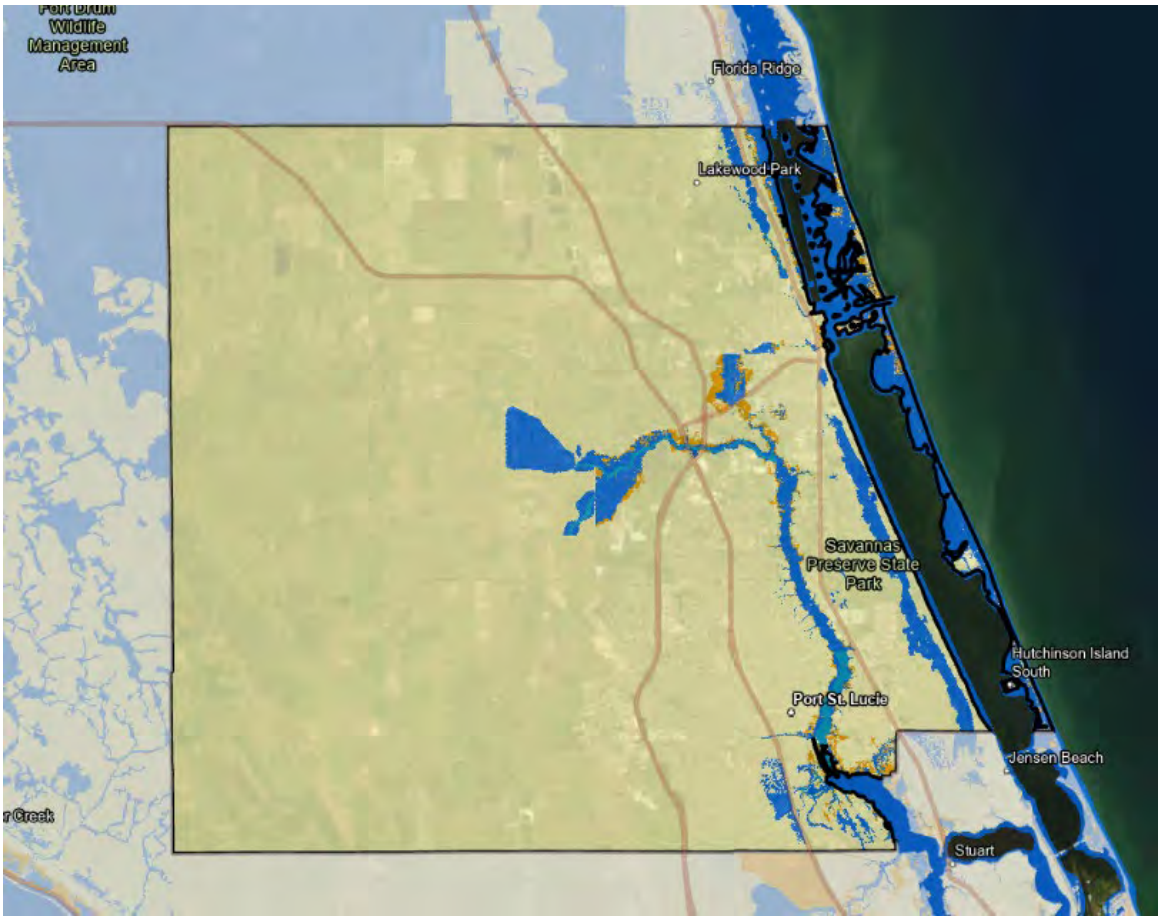



Figure 8-4. St Lucie Flood 100-yr and 500-yr flood hazard areas

Although large rainfall events that bring the potential for flooding can occur anytime of the year in St. Lucie County, the area's most severe flooding events have generally been associated with storm surge as a result of landfalling tropical cyclones (i.e., hurricanes, tropical storms, or tropical depressions) in

late summer to early fall. Some of the named tropical cyclones that have produced major flooding in portions of St. Lucie County over the past three decades include Tropical Storm Gordon (November 1994), Hurricane Frances (September 2004), Hurricane Jeanne (September 2004), Tropical Storm Fay (August 2008), Tropical Storm Debby (2012), Hurricane Dorian (2019), Tropical Storm Eta (2020), Hurricane Ian (2022), Hurricane Nicole (2022), and Hurricane Milton (2024). Unfortunately, research indicates a trend toward larger, wetter tropical cyclones, within the North Atlantic Ocean basin that impacts Florida and, more generally, across the world (Marsooli et al. 2019; Guzman and Jiang 2021; Reed et al. 2022).

In 2022, St. Lucie County was significantly impacted by both Hurricane Ian and Hurricane Nicole over an approximately six-week period. On September 28, Hurricane Ian made landfall as a large and powerful Category 4 storm on Florida's Gulf coast near Ft. Myers, where its winds and storm surge caused catastrophic levels of damage. Although Ian's winds weakened substantially as it crossed the state before impacting St. Lucie County, many coastal and inland properties – including properties not contained within an officially designated FEMA flood zone – sustained some degree of flood damage. Wind speeds in St. Lucie County reached up to 59 mph in Fort Pierce, and rainfall totals varied, with some areas receiving up to 12 inches of rain.

Most of Ian's flooding in St. Lucie County was caused by torrential rainfall, which in some locations along its path totaled up to 20 inches over the duration of the storm (~24 hours). The sheer volume of precipitation overwhelmed natural and human-engineered drainage systems, resulting in large amounts of pluvial flooding that severely impacted many streets, homes, businesses, and other structures as the storm moved through the area. Numerous lakes, ponds, streams, and wetlands also reached record levels in the days and weeks after Ian passed, as floodwaters slowly made their way through natural drainages. For example, several gauges along the St. Lucie River, the primary drainage basin for most of St. Lucie County, crested at the highest stages ever recorded approximately 1-2 weeks following Ian.

Several weeks later, numerous beachfront properties in St. Lucie County were further impacted by additional storm surge and shoreline erosion associated with Hurricane Nicole, a large Category 1 storm that made landfall on the Atlantic Coast near Vero Beach on November 10, 2022. Despite being less intense than Ian, Nicole still had a notable impact on St. Lucie County, causing coastal flooding and beach erosion due to the storm surge, localized flooding from heavy rains, and moderate wind damage to structures and vegetation. Wind speeds in St. Lucie County during Nicole reached up to 44 MPH near Treasure Coast International Airport, and rainfall totals in the county were around 2.61 inches.

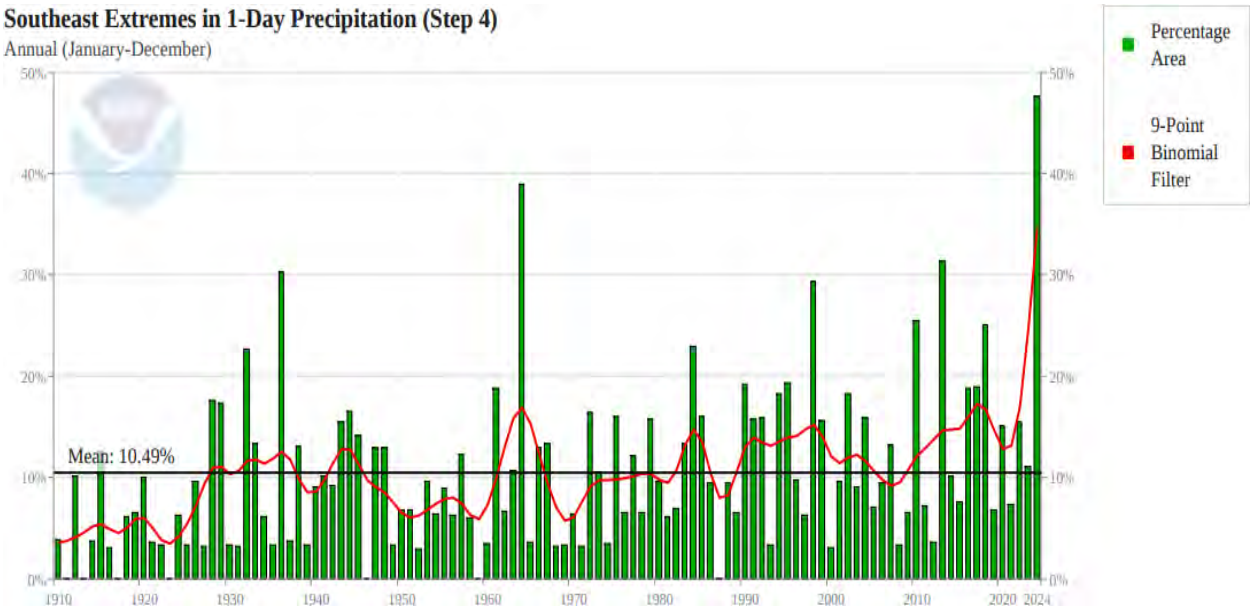
By contrast, damages from Nicole were mostly associated with severe waterfront erosion, which occurred as the large, slow-moving storm brought multiple days of large waves and storm surge to shoreline areas that had already been damaged by Ian several weeks earlier. Large areas of the urbanized shoreline in St. Lucie County, particularly the area's Atlantic beaches that had recently been impacted by Ian, suffered devastating damages from the additional coastal flooding and erosion brought by Nicole.

Together, the impacts from both hurricanes combined to increase damages in SLC, and individually highlighted the vulnerability of coastal communities like St. Lucie County to severe weather events.

### 8.1.1.2 Increasing Flood Risks

Concern about the potential for increased flooding risk in St. Lucie County comes from at least three major factors. First, historical and ongoing population growth is associated with substantial land use change, increasing amounts of impervious cover, and the loss of natural functioning in wetland and floodplain areas (Volk et al. 2017). Such land use change factors are known to increase the risks of pluvial flood magnitude and extent within urban, suburban, and peri-urban areas (Blum et al. 2020; Li et al. 2022). Second, ongoing sea level rise is a source of compounding flood risks within the coastal zone, as increasingly higher sea levels directly correspond to higher storm surge potential and reduced ability of existing stormwater conveyance systems to remove rainfall-driven water from the built environment. Third, data suggest that eastern Florida may already be undergoing a trend toward a more frequent occurrence of more extreme precipitation events as compared to historical baselines (Obeysekera et al. 2021) (**Figure 8-5**). Taken together, these factors bring the likelihood of higher flood damage risks for built areas that are already designated as flood-prone, while also potentially creating novel flood exposure hazards within areas historically thought to have minimal flood risk (Sohn et al. 2020; Panos et al. 2021).

St Lucie Flood 100-yr and 500-yr flood hazard areas; majority of St Lucie County mapped in X or minimal flood hazard area.




Data source: NOAA (National Oceanic and Atmospheric Administration). (2024). Southeast Climate Extremes Index. Retrieved May 6, 2025, from www.ncei.noaa.gov/access/monitoring/cei

Figure 8-5. Increases in freshwater rates via rainfall in southeast Florida, one component of increasing hydrologic flood risk.

Even with the advent and enforcement of modern stormwater management standards since the 1980s, the much higher footprint of developed lands in eastern Florida has likely increased the region's overall exposure to flooding (Feng et al. 2021). The large-scale flooding associated with recent hurricanes has raised substantial public discussion and concern about the potential role of development in exacerbating flood risks. In addition, the large rainfall totals associated with recent storms appear to be a direct function of increasingly warmer ocean and atmospheric temperatures. For example, a detailed meteorological attribution study of Hurricane Ian suggests that the modern increase in average global temperatures and associated climatic alterations increased the storm's overall rainfall total in Florida by about 18 percent (Reed and Wehner 2023). Given the increased developed area throughout the St. Lucie River watershed and the record rain events associated with Hurricane Irma and Hurricane Milton, it is perhaps unsurprising that record water levels were observed in some areas of St. Lucie County during the aftermath of these storms.

Sea level along the U.S. coastline is expected to rise, on average, 10 - 12 inches in the next 30 years, which will be as much as the rise measured over the last 100 years (1920 - 2020). Sea level rise will vary regionally along U.S. coasts because of changes in both land and ocean height. On average, rise in the next three decades is anticipated to be: 10-14 inches along the U.S. east coast---https://sealevel.globalchange.gov/.

It is also quite clear that rising sea levels have already increased flood risks in coastal St. Lucie County. For example, the height and extent of the storm surges associated with Irma, Nicole, and Milton were enhanced by the 0.12 inches (+/- 0.009 inches) per year of sea level rise that has occurred over the past 93 years (NOAA Tides and Currents, 2025). Legacy coastal stormwater drainage systems that discharge into tidal water bodies also have inherently less capacity to convey water due to increased infiltration from the rising sea. During Irma and Milton, the combination of storm surge, sea level rise, and extreme rainfall resulted in the complete failure of some legacy stormwater systems in St. Lucie County and associated municipalities. As sea level rise continues to accelerate, associated flood risks from storm surge and failure of coastal stormwater drainage systems can be expected to increase. Legacy coastal stormwater drainage systems that discharge into tidal water bodies also have inherently less capacity to convey water due to increased infiltration from the rising sea. During Irma and Milton, the combination of storm surge, sea level rise, and extreme rainfall resulted in the complete failure of some legacy stormwater systems in St. Lucie County and associated municipalities. As sea level rise continues to accelerate, associated flood risks from storm surge and failure of coastal stormwater drainage systems can be expected to increase.

#### 8.1.1.3 Open Space Conservation and Flood Resilience

Planning for flood risk mitigation and resilience in the context of an uncertain future is an incredibly challenging task. Upgrades of existing infrastructure systems are highly expensive and often face significant funding and permitting barriers. In addition, the complexity of forecasting future precipitation patterns and the diverse range of potential impacts from sea level rise makes it difficult to know if engineered systems are likely to be inadequate (thus prone to catastrophic failure) or, conversely, substantially overbuilt (thus costing much more than needed) in support of long-term flood resilience. Despite these uncertainties, there is a compelling need for society to locate and

implement thoughtful interventions that can be reasonably expected to provide resilience against even the most unpredictable current and future flood risks (Axelsson et al. 2021).

Conservation, preservation, and restoration of undeveloped open space is widely regarded as one of the most efficacious and cost-effective flood risk mitigation strategies, especially when considering the uncertainties of future flood-related hazards (Farrugia et al. 2013; Kousky et al. 2013; Mukherjee and Takara 2018). Open space conservation is known to reduce flood risk at multiple scales that range from stormwater catch basins draining less than an acre of land (Liao et al. 2017), up to regional watershed drainages covering hundreds of square miles or more (Lourenco et al. 2020). The many other co-benefits of open space – including biodiversity preservation, water quality protection, food and fiber production, carbon sequestration, and recreational enjoyment – provide further impetus for increased utilization of land conservation as a primary tool in comprehensive flood management, resilience, and mitigation programs (Rosenzweig et al. 2018; Axelsson et al. 2021). **Figure 8-6** provides a general idea of where St. Lucie possesses the most open space.

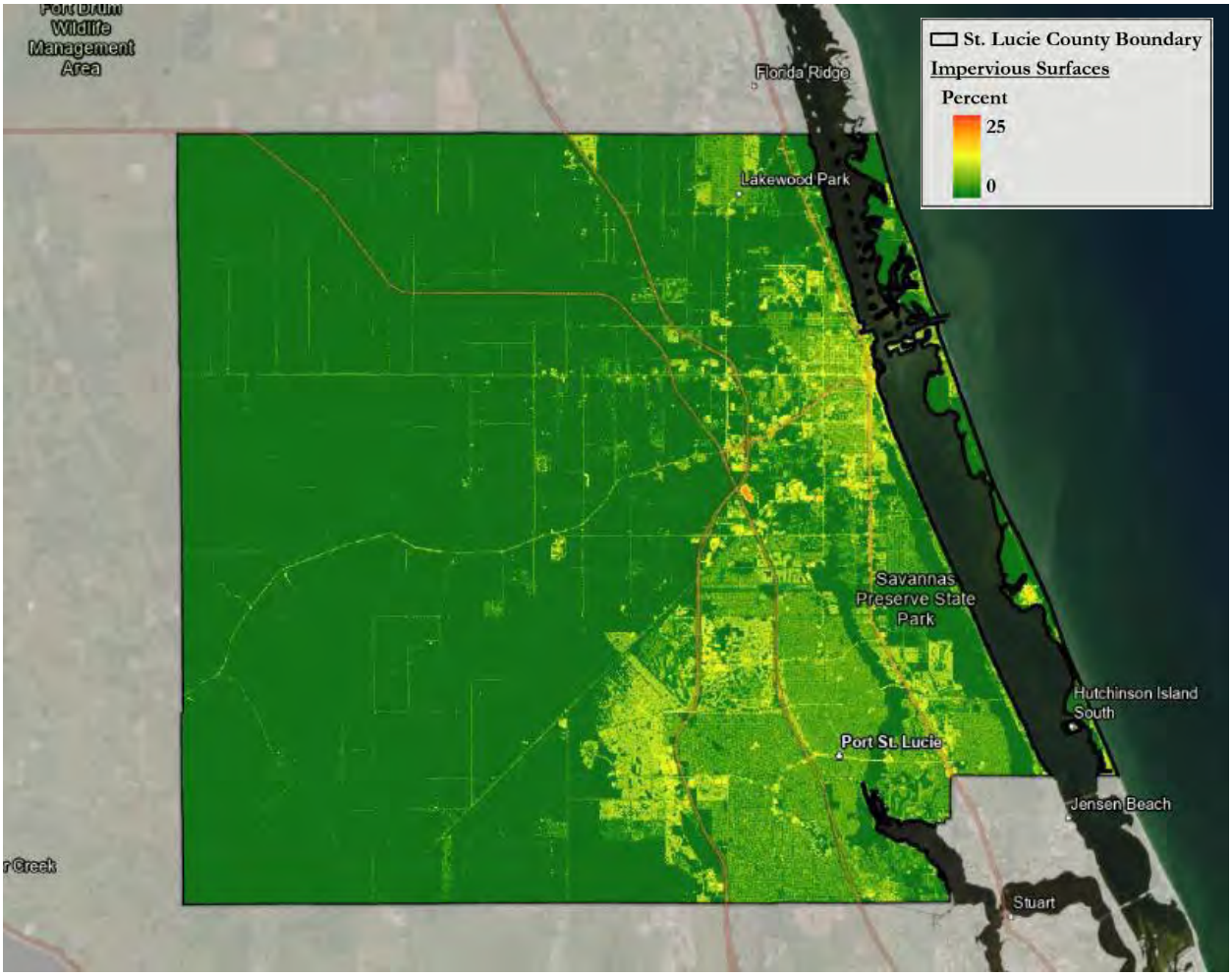



Figure 8-6. Open space within St Lucie County, considering areas with less than 25 percent impervious surface coverage

### 8.1.2 Current Climate Trends & Recent Storm Context

Analysis of localized climate data reveals significant changes affecting coastal habitats:

- Average annual temperature increase: 1.2°C over past 30 years
- Precipitation pattern shifts: 15 percent increase in extreme rainfall events
- Storm intensity: 23 percent increase in Category 3+ hurricane frequency

#### 8.1.2.1 Recent Storm Impacts

Recent major storms have demonstrated the vulnerability of the circled region (an 80-mile radius around St. Lucie County) to sea level rise and extreme weather events: to sea level rise and extreme weather events:

Hurricane Ian (2022) (**Figure 8-7**):

- Peak storm surge: 8.5 feet above MHHW - Rainfall: 20+ inches in 24 hours
- Erosion: 45-foot dune recession in vulnerable areas
- Environmental impacts: 35 percent loss of sea turtle nesting habitat; significant mangrove defoliation; extensive marsh sediment redistribution

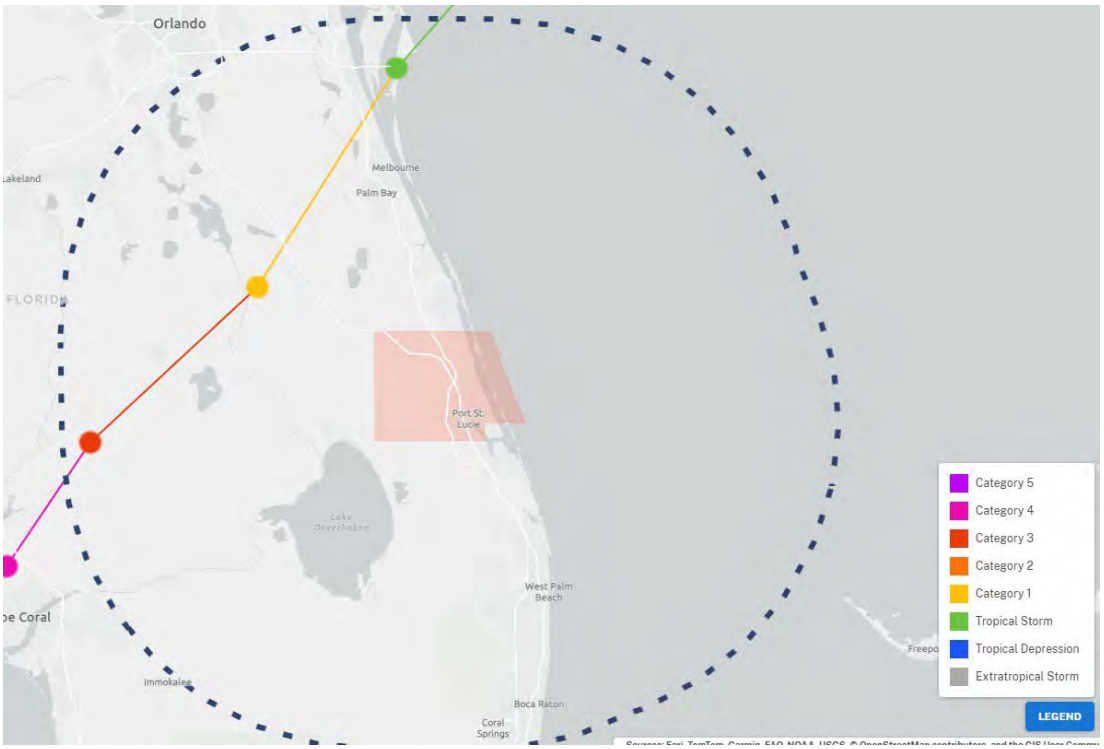



Figure 8-7. Hurricane Ian Storm Track

Hurricane Milton (2024) (**Figure 8-8**):

- Peak storm surge: 6.2 feet above MHHW
- Rainfall: 15 inches in 36 hours
- Combined surge and rainfall created compound flooding effects
- Environmental impacts: - 28 percent temporary loss of wading bird foraging habitat; significant freshwater wetland salinity intrusion; accelerated barrier island over wash

Figure 8-8. Hurricane Milton Storm Track

### 8.1.2.2 Notes on Compound Flooding

Historical data reveals an increase in compound flooding events since 1990. Primary mechanisms typically include:

- Storm surge + extreme rainfall
- King tides + moderate rainfall
- Groundwater emergence + tidal flooding

It is likely that surge event duration and frequency will continue to increase now and into the future, indicating a growing threat to coastal ecosystems and infrastructure

### 8.1.2.3 Risk Adverse Tidal Assessment

Analysis of sea level trends for St. Lucie County utilized data from the Virginia Key NOAA tide gauge (Station 8723214), which provides a relevant reference point for coastal water level projections in the region. Historical measurements from Virginia Key show a relative sea level trend of 0.125 inches/year with a 95 percent confidence interval of +/- 0.009 inches/yr, based on monthly mean sea level data from 1931 to 2024 (**Figure 8-9**). This rate is equivalent to approximately 1.05 feet of sea level rise over a 100-year period. To isolate the long-term trend, the observed data excludes regular seasonal fluctuations from coastal ocean temperatures, salinity, wind, atmospheric pressure, and ocean currents.

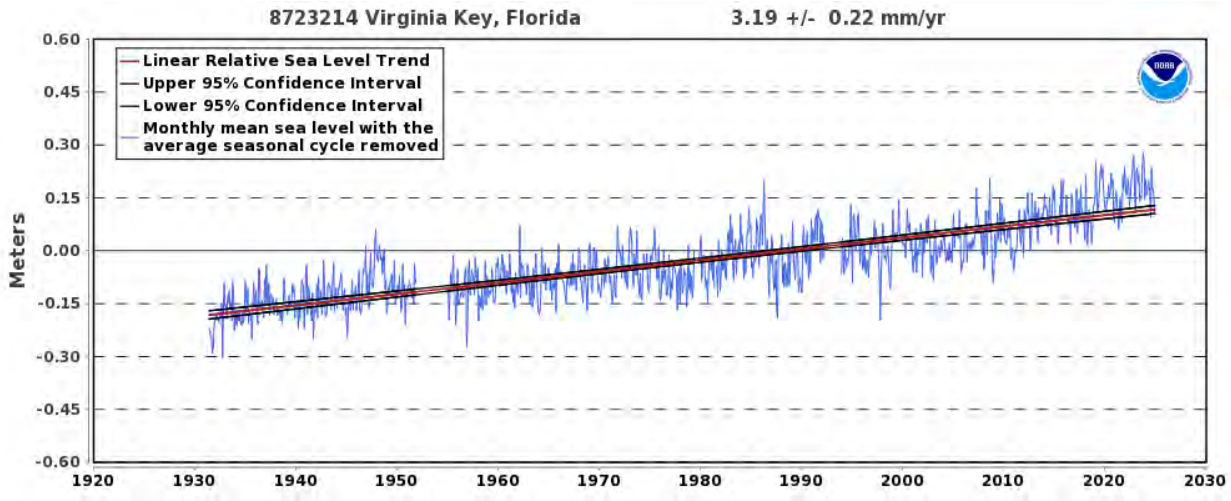



Figure 8-9. Relative sea level trend at Gauge 8723214 Virginia Key, Florida

To provide a perspective of how sea level rise trends have been increasing in more recent years an analysis of the observed high and low tides was conducted for the timeframes 1950 to 2024, 1970 to 2024, and 1990 to 2024. Because the Virginia Key tide gauge only possesses observed high and low tide records from 1994 to 2024 the analysis was conducted on the Key West NOAA tide gauge, which possesses observed tide record from 1913 to 2024. In order to account for any variation between the sea level trends at the Virginia Key tide gauge and Key West tide gauge a comparison of observed high and low tide levels from 1994 to 2024 was conducted, this showed that the Virginia Key tide gauge sea level trend is approximately 0.023 inches higher then the Key West tide gauge sea level trend, therefore the value of 0.023 was added to the sea level rise trends taken from the Key West tide gauge to make the trends relative to the Virginia Key tide gauge sea level trend. Based on this analysis indicates that sea level rise is on an upward trend see **Table 8-1**.

Table 8-1. Historic Sea Level Trends

| Year | Sea Level Rise Trend (inches per year) |
|---|---|
| 1950 - 2024 | 0.146 |
| 1970 - 2024 | 0.169 |
| 1990 - 2024 | 0.225 |

The St. Lucie SLAMM assessment incorporated projections from the Virginia Key tide gauge, which serves as an established reference point for sea level rise planning in the region. This gauge provides sea level projections under multiple NOAA scenarios, allowing for risk-based planning approaches that consider both lower and higher potential sea level rise trajectories. Based on the Virginia Key tide gauge data used in the St. Lucie Vulnerability Assessment, the projected tidal elevations for key planning horizons and the difference between NOAA Intermediate Low (NIL) and NOAA Intermediate High (NIH) scenarios are (**Table 8-2**).

Table 8-2. NIL and NIH Sea Level Rise Scenarios (in feet)

| Year | NIL | NIH | Difference |
|---|---|---|---|
| Present Day | 0.42 | 0.72 | 0.3 |
| 2040 | 0.78 | 1.5 | 0.72 |
| 2070 | 1.34 | 3.37 | 2.03 |
| 2100 | 1.87 | 6.1 | 4.23 |

These projections demonstrate a pattern of increasing divergence between time. In the near term, the difference between scenarios is relatively modest (a 0.72 ft difference by 2040), but this gap widens substantially for longer planning horizons. By 2070, the difference increases to 2.03 ft (3.37 ft - 1.34 ft), and by 2100, the scenarios diverge by 4.23 ft (6.10 ft – 1.87 ft).

The significant difference between the Intermediate-Low and Intermediate-High scenarios by 2100 highlights the increased uncertainty inherent in longer-term sea level rise projections. This pattern of scenario divergence suggests that while near-term planning horizons through 2040 face relatively constrained uncertainty, longer-term planning should account for a much wider range of potential outcomes.

The Intermediate-High projection of 6.10 ft by 2100 represents a risk-adverse planning scenario that may be appropriate for critical infrastructure and long-term coastal resilience initiatives where the consequences of underestimating sea level rise could be significant. The Intermediate-Low projection of 1.87 ft by 2100 may be more suitable for shorter-term planning or less vulnerable assets.

These Virginia Key tide gauge projections provide St. Lucie County with scientifically grounded reference points for sea level rise planning across various time horizons and risk tolerances, supporting adaptive management approaches that can be adjusted as new data and projections become available over time.

However, because the observed tide levels at the Virginia Key tide gauge only go back as late as 1994 and later tidal records from the Miami and Haulover gauges are no longer available, in order to calculate tidal trends later than 1994 the Key West tide gauge was utilized as it possesses observed tidal records between 1913 and present day. Therefore, to strengthen this record with a longer historical perspective, observations from the Key West tide gauge—spanning 1913 to the present—were incorporated. This enabled the calculation of sea level rise trends over multiple eras (1950–2024, 1970–2024, and 1990–2024), highlighting how the pace of sea level rise has accelerated in more recent decades compared to earlier periods. A direct comparison of overlapping records from Virginia Key (1994–2024) and Key West confirmed that the Virginia Key trend is approximately 0.023 inches higher.

This adjustment was applied to align the historic Key West trends with the Virginia Key record, ensuring consistency and producing a continuous, historically informed dataset for local planning.

## 8.2 Methodology

This project had two primary objectives:

- Model potential future land cover and ecosystem changes in St. Lucie County due to sea level rise using the Sea Level Affecting Marshes Model (SLAMM).
- Overlay SLAMM results with future land use maps to protect and conserve valuable ecosystems.

### 8.2.1 SLAMM Model Overview

The Sea Level Affecting Marshes Model (SLAMM) is a freely available, spatially explicit land cover change model that simulates coastal habitat transformation due to sea level rise (SLR) (Warren Pinnacle Inc., 2016). The model integrates multiple datasets and processes, including:

- Elevation & slope
- Tidal datum shifts
- Erosion & accretion
- Storm tide over wash (in version 6.6)
- Existing land cover

SLAMM produces spatially explicit projections of land cover changes over user-defined time steps and SLR scenarios. It is widely used for long-term conservation planning, including:

- Imperiled species conservation (Evans & Bergh, 2016; Benedict et al., 2018)
- Flood risk assessments (Hauer et al., 2015)
- Coastal resilience planning (Clough et al., 2016; Mazor et al., 2021)

For St. Lucie County, SLAMM version 6.7 was implemented with locally calibrated parameters to accurately represent local conditions. The model uses a 10m x 10m cell-based approach, where each cell represents elevation, habitat type, and key attributes. The fate of each cell is determined by SLR-driven processes, including:

- Inundation of low-lying areas
- Shoreline erosion
- Habitat conversion
- Soil saturation from rising water tables
- Sediment & organic matter accretion.

### 8.2.2 Input Data Sources

The St. Lucie County SLAMM implementation utilized the input data shown in **Table 8-3**.

Table 8-3. Input Data for the SLAMM model

| Input Data Type | Source | Resolution | Format | Description |
|---|---|---|---|---|
| Digital Elevation Model (DEM) | 2022 & 2018 USGS LiDAR survey | 32.8ft | ASCII grid (.asc) | High-resolution elevation data critical for determining inundation patterns |
| Land Cover Classification | USFWS National Wetlands Inventory (NWI) & SFWMD Land Use Land Cover | 32.8ft | ASCII grid (.asc) | Baseline habitat distribution derived from NWI data |
| Dikes / Levees | NWI Attribute Table | 32.8ft | ASCII grid (.asc) | Locations of existing flood protection infrastructure |
| Impervious Surfaces | National Land Cover Database | 32.8ft | ASCII grid (.asc) | Areas with impervious cover (buildings, roads, etc.) |
| Slope | Derived from DEM | 32.8ft | ASCII grid (.asc) | Calculated slope values used in erosion calculations |

### 8.2.2.1 Natural Systems Analysis

**Coastal Defense Systems:** The county's oceanfront habitats form its first line of defense against storms and rising seas. Beach systems and coastal scrub provide critical nesting habitat for a multitude of wildlife species while naturally buffering inland areas from wave energy. Mangroves, scrub habitat, salt marshes, and tidal flats create stable shoreline anchors and support diverse marine life (**Figure 8-10**). These systems are highly vulnerability to erosion and storms but demonstrate moderate capacity to adapt through natural processes when given sufficient space and sediment supply.

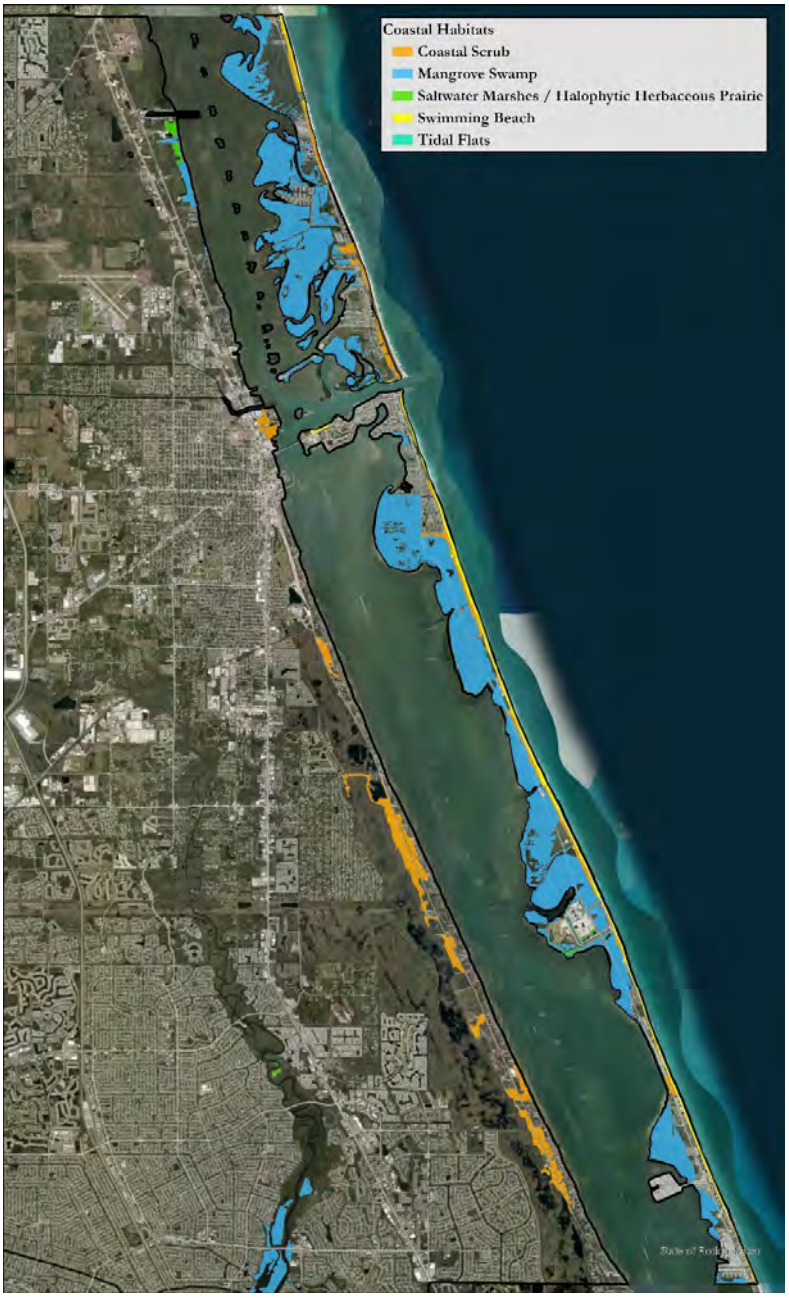



Figure 8-10. Coastal Defenses Systems of St. Lucie

**Wetland Complexes:** The heart of St. Lucie County's natural infrastructure lies in its extensive wetland networks. Mangrove forests excel at stabilizing shorelines while providing essential nursery habitat for fisheries. The marsh system, comprising transitional, regular, and irregular flooding zones creates a dynamic buffer that naturally adapts to changing water levels (**Figure 8-11**). These wetlands show promising adaptation potential through vertical accretion and inland migration, though they face challenges from coastal squeeze against developed areas (**Figure 8-12**).

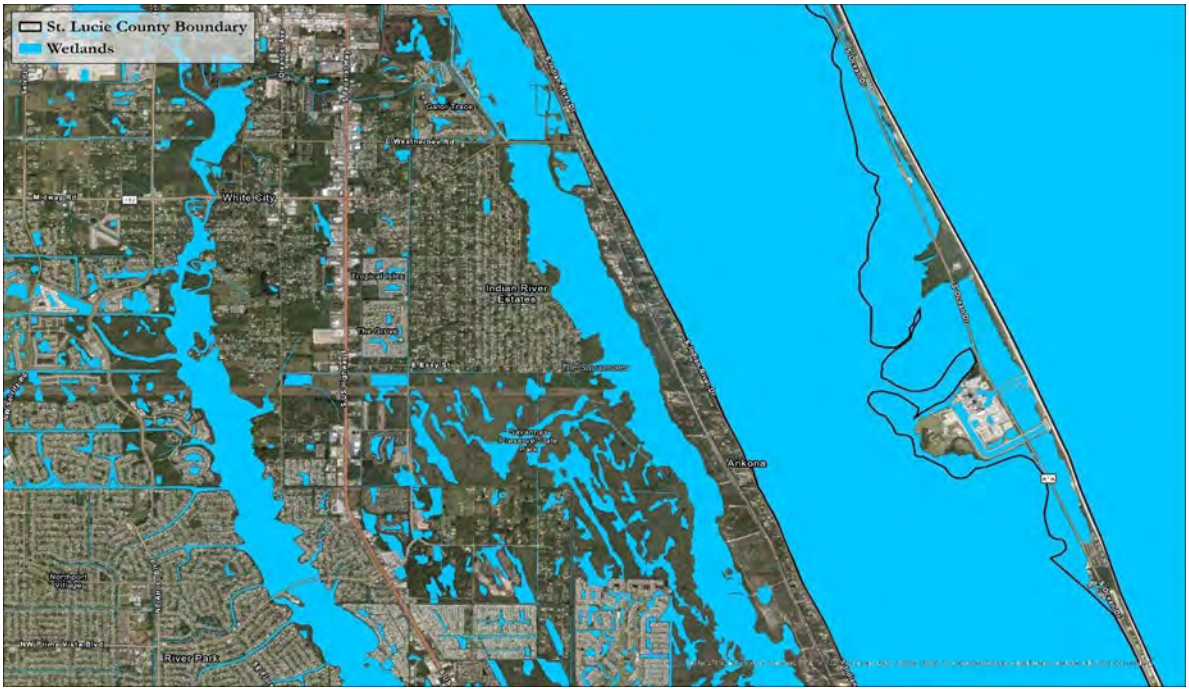



Figure 8-11. Map detailing a complex system of coastal wetlands (blue areas within the map above) vulnerable to “coastal squeeze” and other stressors.

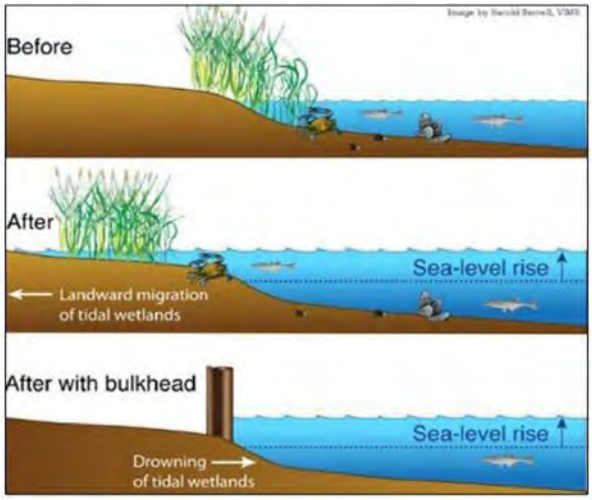



Figure 8-12. Visualization of Coastal Squeeze Freshwater Resources

Interior wetland systems, including swamps and cypress stands (Categories 3 and 4), represent some of the county's most vulnerable yet valuable habitats (**Figure 8-13**). These freshwater-dependent ecosystems face increasing stress from saltwater intrusion and changing rainfall patterns. Their preservation is crucial for maintaining water quality and natural flood protection for inland communities.

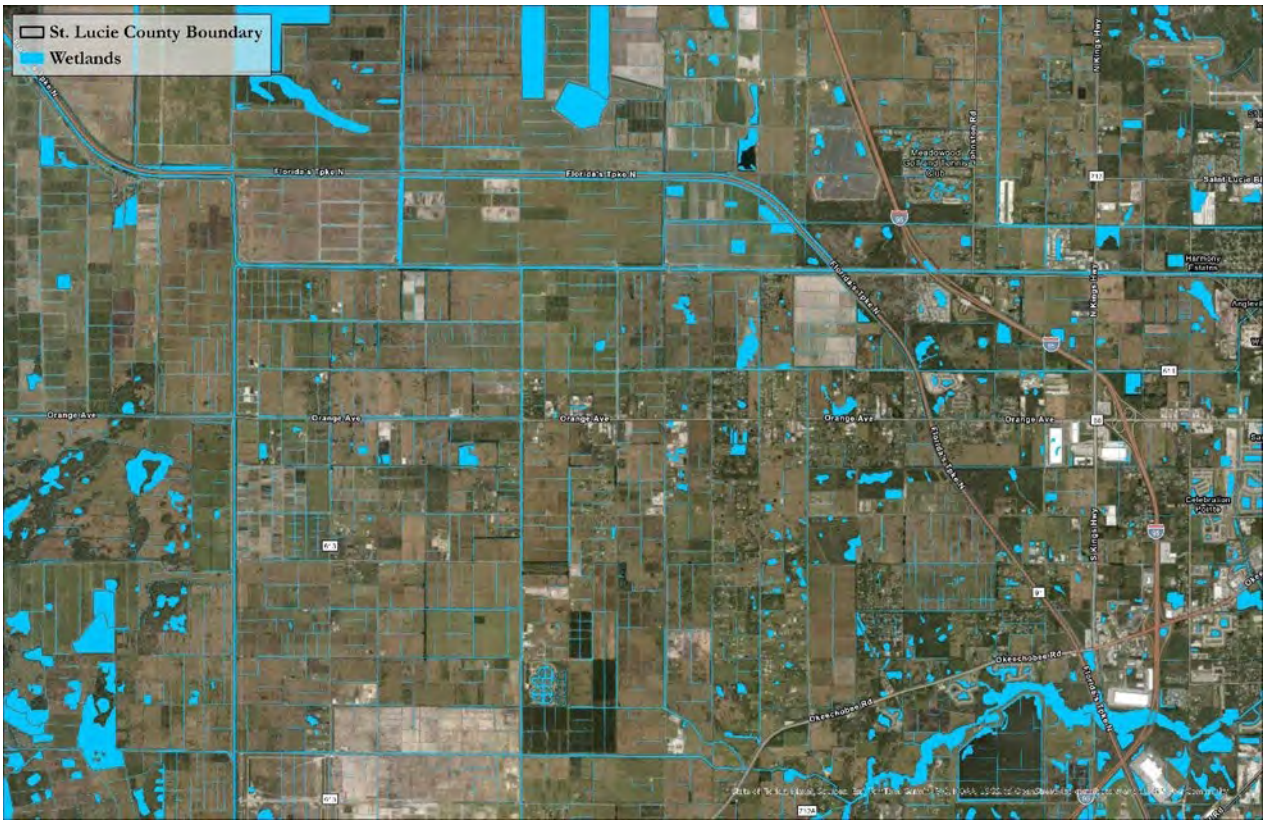



Figure 8-13. Map of some Northeastern Portions of the Freshwater Wetland Resources in the Interior of the County

**Development Interface:** The transition between natural and built environments presents both challenges and opportunities. Currently developed areas must be protected while allowing space for habitat migration through remaining undeveloped lands and inland shores. **Figure 8-14** and **Figure 8-15** highlight some of the areas in St. Lucie County where urbanization has encroached upon freshwater wetlands. This interface zone offers prime opportunities for implementing nature-based solutions that benefit both human and natural communities.

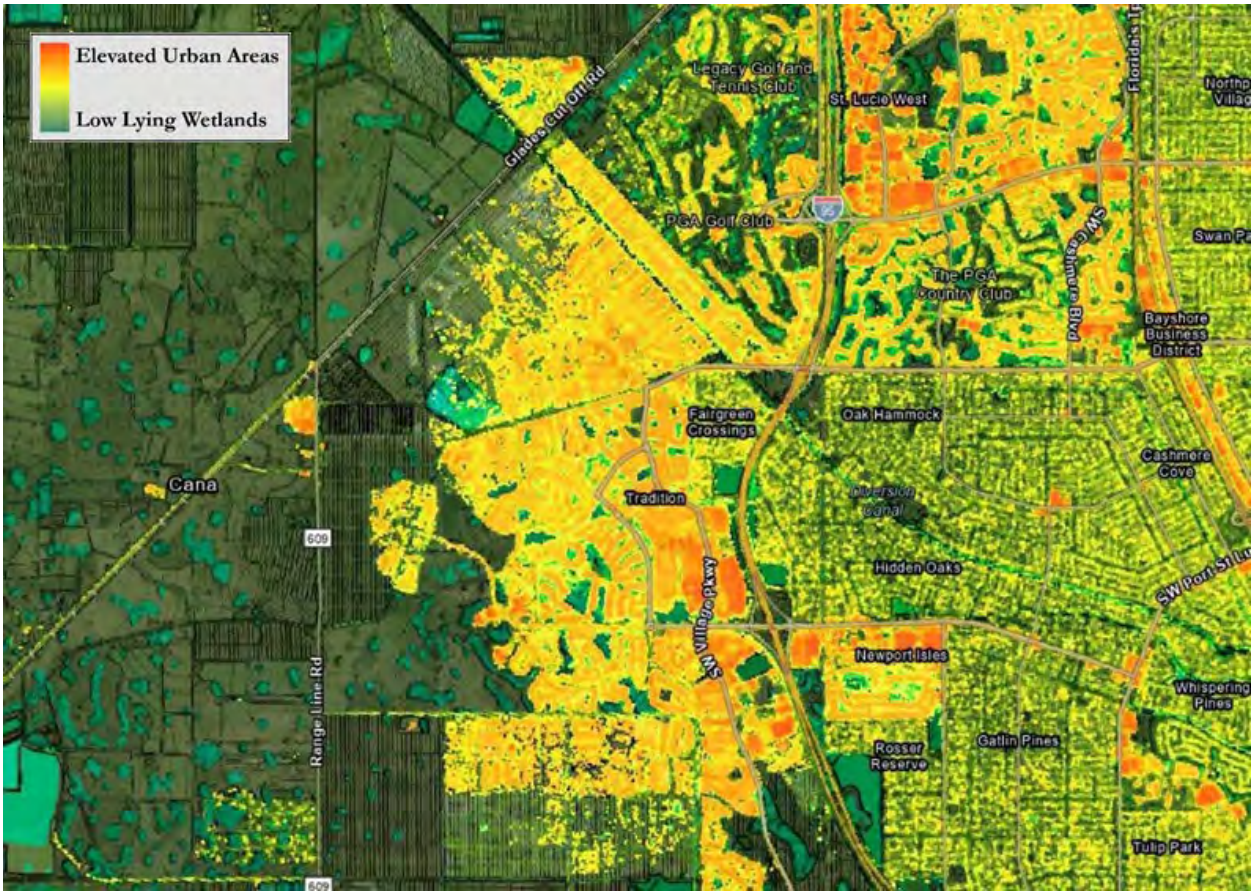



Figure 8-14. Map depicting freshwater wetland systems, within highlighted urbanized areas

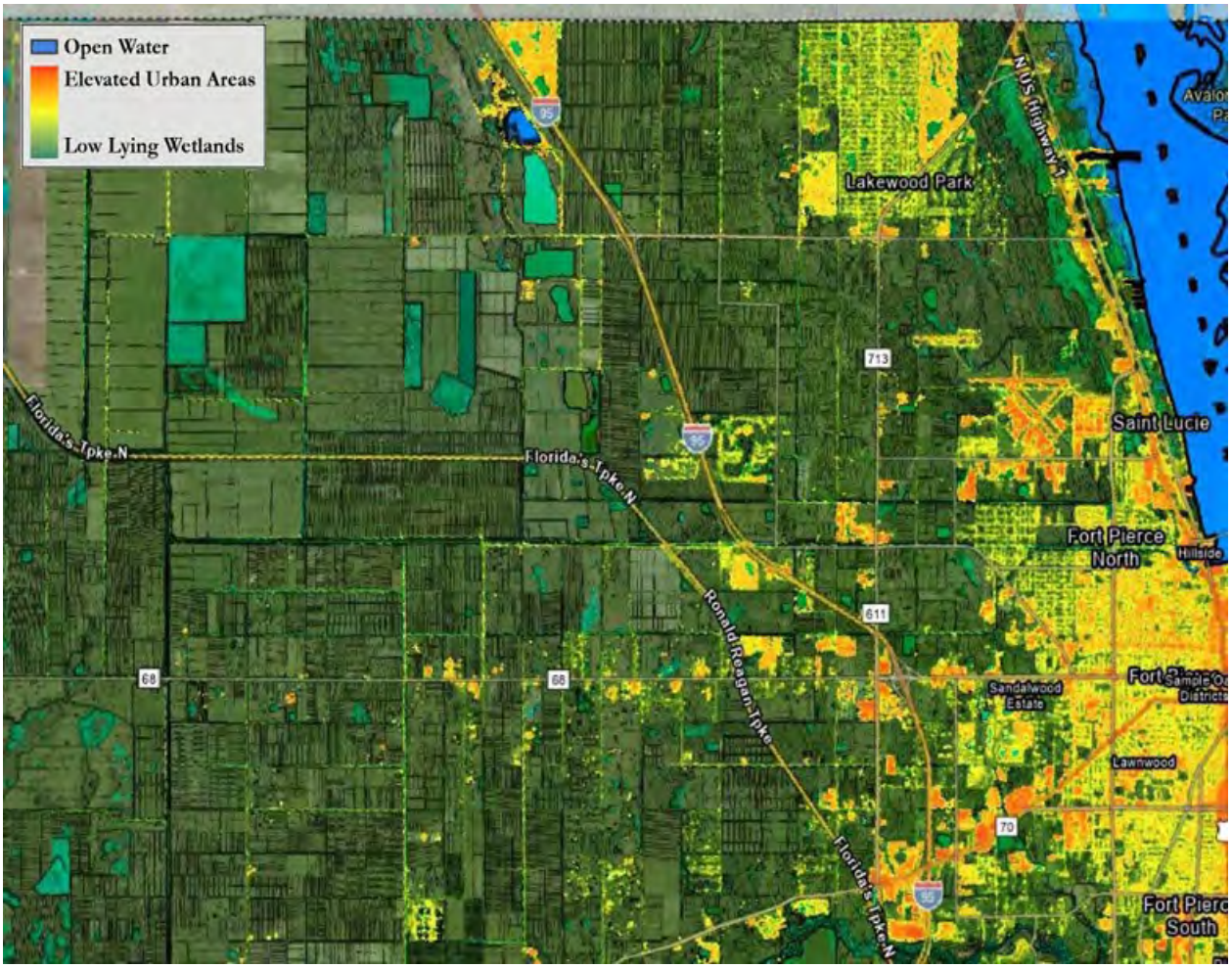



Figure 8-15. Map depicting portions of coastal St Lucie County with wetland and impervious surface overlays to highlight areas with high migration potential

### 8.2.2.2 Physiographic Subdistricts

Becoming a more flood resilient community is a complex and ongoing endeavor. A first step involves better understanding of current and future risk factors within the natural and human environments. The underlying geology of the natural environment is critically important for understanding how the natural environment functions, helping to explain patterns of human development, and clarifying key risks, challenges, and opportunities from a geophysical perspective (**Figure 8-16**).

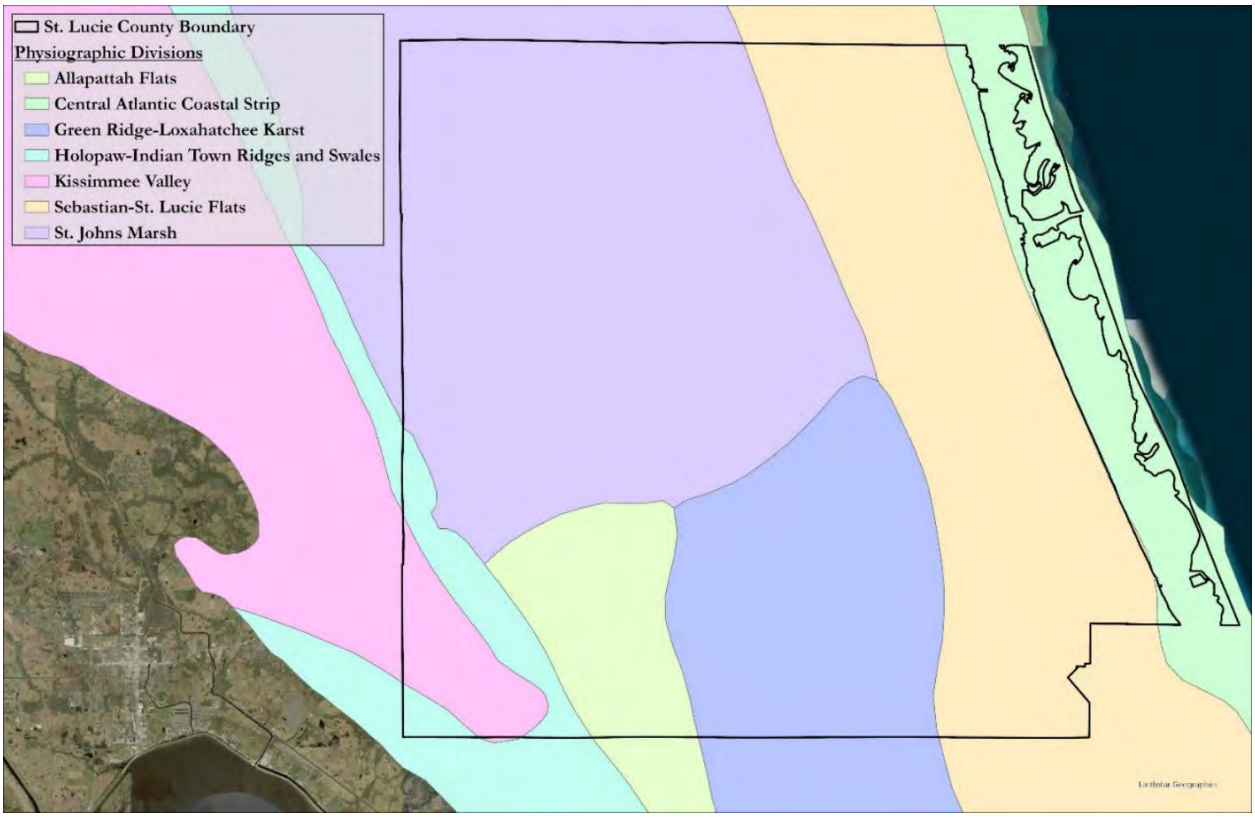



Figure 8-16. Physiographic Subdistricts of St. Lucie County

Understanding flood risk requires knowledge of natural geology and hydrological conditions, as outlined in **Table 8-4**.

Table 8-4. Description of the physiographic subdistricts

| Subdistrict | Key Features | Primary Flood Risks |
|---|---|---|
| Central Atlantic Coastal Strip | Atlantic beaches & estuaries | Storm surge, coastal erosion, SLR, pluvial flooding |
| St. Johns Marsh | Inland marshes with peat deposits | Slow drainage, prolonged flood retention |
| Green Ridge Loxahatchee Karst | Limestone bedrock with sinkholes | Sinkhole-induced flooding, underground drainage failures |
| Allapattah Flats & Kissimmee Valley | Wetlands & floodplains | Hurricane-driven overflows, high urbanization pressure |

The easternmost parts of St. Lucie County fall within the Central Atlantic Coastal Strip physiographic subdistrict (**Figure 8-16**), encompassing barrier islands and coastal lowlands adjacent to the Atlantic Ocean. The geology is dominated by sandy soils mixed with shell materials overlying limestone

bedrock. These sandy soils are typically well-drained, allowing rainwater to percolate rapidly. However, because the water table is shallow near the coast and the soils rest on porous limestone, rising sea levels and storm surge events can elevate the water table or cause coastal upwelling. This reduces the soil's capacity to absorb rainfall, leading to prolonged pluvial flooding even where soils would otherwise drain well. The loose sandy soils also increase vulnerability to erosion from wave energy and wind. Dune and mangrove restoration helps stabilize these soils, buffer wave energy, and maintain natural drainage capacity.

The Sebastian-St. Lucie Flats physiographic subdistrict lies just inland, adjacent to the Intracoastal Waterway. This area features flat terrain and poorly drained, fine-textured soils that naturally retain water. Urbanization has further altered drainage patterns by replacing natural ground cover with impervious surfaces (asphalt, concrete) and fill material. These modifications reduce infiltration, diminish soil water storage, and increase surface runoff during storms. The geology and modified soils contribute to flood risks from intense rainfall (pluvial flooding), storm surge, and long-term inundation due to sea level rise. The interaction of poorly drained soils, low relief, and human alterations means this area is especially prone to compound flooding events.

The central portion of St. Lucie County includes the St. Johns Marsh and Green Ridge Loxahatchee Karst subdistricts. The St. Johns Marsh is underlain by fibrous peat deposits that have high water-holding capacity but become quickly saturated, limiting infiltration during heavy rainfall. The underlying flat limestone plain and minimal river gradient cause slow water movement, prolonging flood conditions. Here, geology shapes a landscape where water lingers, and drainage is inherently sluggish.

The Green Ridge Loxahatchee Karst area is defined by limestone bedrock prone to dissolution, forming sinkholes, springs, and underground conduits. This karst system typically allows rapid infiltration, with stormwater draining into the subsurface. However, if sinkholes clog or conduits become overloaded, drainage is impeded, and surface flooding can result. The complex, uneven underground drainage creates unpredictable flood patterns, sometimes causing flash flooding far from the rainfall source. In this subdistrict, the geology creates both rapid drainage routes and hidden flood risks when those pathways fail.

The southwestern parts of the county, including the Allapattah Flats, Kissimmee Valley, and Holopaw-Indian Town Ridges and Swales, consist of low-lying floodplains, wetlands, and sandy to loamy soils. In the Allapattah Flats, extensive fibrous peats and flat topography limit drainage, causing water to pool during heavy rains. In the Kissimmee Valley, the broad floodplain and low slope of the Kissimmee River mean water spreads out during floods, and past channelization has altered how floodwaters disperse, often reducing natural drainage capacity and increasing flood intensity downstream. The Holopaw-Indian Town Ridges and Swales feature sandy, poorly drained soils where water rapidly saturates the soil profile, accumulating in low areas. Here, geology interacts with drainage by limiting infiltration rates and slowing runoff, making these areas highly flood-prone without extensive natural or engineered drainage solutions.

### 8.2.2.3 Florida Natural Areas Inventory Data

FNAI data is often used to inform development of implementation strategies that strive to meet a diverse array of conservation objectives. Six layers have direct relevance to conservation planning as it relates to flood hazard mitigation:

- Natural Floodplain Function,
- Functional Wetlands,
- Surface Water Protection,
- Groundwater Recharge,
- Forests Lands to Maintain Recharge, and
- Fragile Coastal Resources.

The other five layers focus more directly on protection of imperiled species and plant communities; open space and natural lands connectivity; and maintenance of rural economies and livelihoods:

- Strategic Habitat Conservation Areas,
- Rare Habitat Conservation Priorities,
- Florida Ecological Greenway Network,
- Underrepresented Ecosystems, and
- Sustainable Forestry.

Future studies should build upon the Florida Natural Areas Inventory (FNAI) data by integrating it with outputs from the Sea Level Affecting Marshes Model (SLAMM) assessment to develop a parcel-level ranking system. This will provide a data-driven approach to identifying, prioritizing, and evaluating specific areas for conservation, flood hazard mitigation, and long-term resilience planning.

**Overview of FNAI Layers in the Following Pages**

1. Natural Floodplain Function – Examines the ecological condition of 100-year floodplains, identifying areas with minimal human disturbance that provide critical flood storage and water quality benefits.
2. Functional Wetlands – Maps existing wetland ecosystems, emphasizing their role in stormwater retention, aquifer recharge, and biodiversity conservation.
3. Surface Water Protection – Highlights areas essential for maintaining clean and reliable water supplies, including riparian buffers, reservoirs, and key watersheds.
4. Groundwater Recharge – Identifies zones that contribute significantly to aquifer replenishment, which is vital for drinking water supplies and ecosystem health.
5. Forested Lands to Maintain Recharge – Focuses on forested areas that enhance infiltration and groundwater recharge, mitigating runoff and erosion.
6. Fragile Coastal Resources – Includes barrier islands, dunes, and estuarine habitats that buffer storm surges, sea level rise, and coastal erosion.

In addition to the flood and water-related layers, the following pages also provide preliminary overviews of datasets that focus on habitat conservation, ecosystem connectivity, and sustainable land management:

1. Strategic Habitat Conservation Areas – Prioritizes lands critical for the long-term viability of native species, based on habitat quality and fragmentation risks.
2. Rare Habitat Conservation Priorities – Identifies imperiled and underrepresented ecosystems, ensuring targeted conservation efforts.
3. Florida Ecological Greenway Network – Maps corridors that connect protected lands, maintaining wildlife movement and ecological resilience.
4. Underrepresented Ecosystems – Highlights natural communities lacking sufficient protection, guiding efforts to expand preservation initiatives.
5. Sustainable Forestry – Focuses on working forests that balance ecological health and economic viability, promoting carbon sequestration, water quality protection, and biodiversity.

These preliminary assessments help establish a baseline understanding of each dataset within the context of the SLAMM assessment. They are intended to:

- Facilitate stakeholder engagement by providing accessible explanations of why these layers matter in the context of county planning.
- Guide future research efforts by identifying gaps or opportunities for further data refinement.
- Lay some groundwork for the parcel-level ranking system, ensuring that land-use and conservation decisions are based on robust environmental data.

By reviewing these layers in detail, decision-makers can begin aligning conservation priorities with broader county goals, ensuring that natural resources, flood resilience, and land-use planning efforts are effectively integrated into future policy and investment strategies.

The conservation priorities for natural floodplain function involve ranking the ecological condition of identified 100-year floodplains (**Figure 8-17**). This ranking is based on the "naturalness" of the plant community and the intensity of existing land use. Higher prioritization is given to floodplain areas that are more natural, meaning they have less human disturbance and more intact plant communities. As depicted above, nearly all of the barrier island within St. Lucie County is highly prioritized.

By focusing on these more natural floodplain areas, conservation efforts can better preserve the ecological functions that floodplains provide, such as water filtration, flood mitigation, and habitat for wildlife. Protecting these areas helps maintain the health and resilience of ecosystems, ensuring that they continue to provide essential services and support biodiversity. This approach is crucial for effective floodplain management and long-term environmental sustainability.

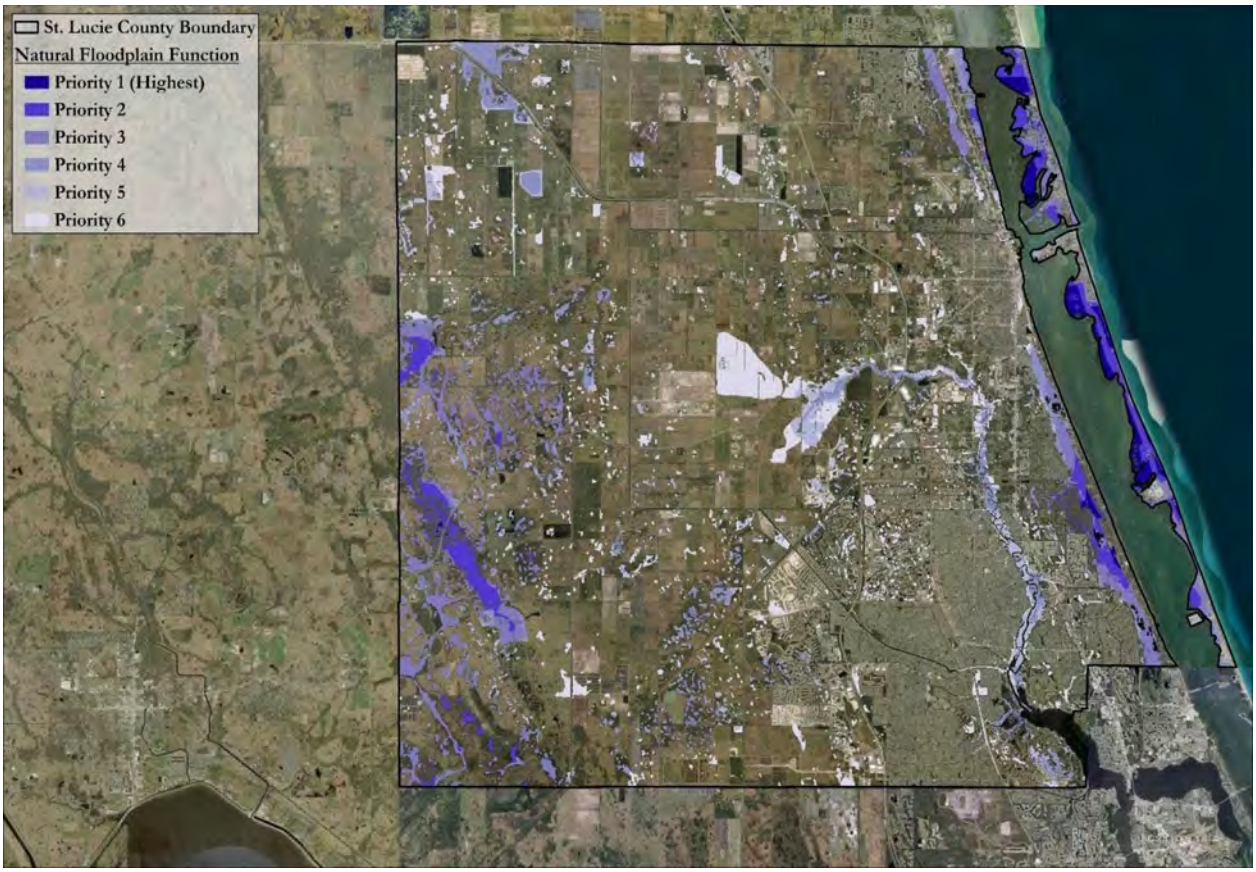



Figure 8-17. FNAI Natural Floodplain Function

The conservation priorities for priorities for functional wetlands involve identifying and ranking wetlands based on an assessment of their vegetative and hydrologic integrity. Wetlands that are in a more natural state, with intact plant communities and minimal human disturbance and intact plant communities, are given higher prioritization. This approach ensures that conservation efforts focus on preserving wetlands that maintain their ecological functions, such as water filtration, flood control, and habitat provision for diverse species. By prioritizing these more natural wetlands, conservation planners can enhance the resilience and health of wetland ecosystems, ensuring they continue to provide essential services and support biodiversity. Protecting functional wetlands is crucial for maintaining the overall ecological balance and sustainability of the environment and reducing flood risk in both urban and rural areas of the county. Within St. Lucie County, the highest priority functional wetlands are mainly located along the coastal areas, followed by large swaths of intact wetlands in the west, as shown in **Figure 8-18**.

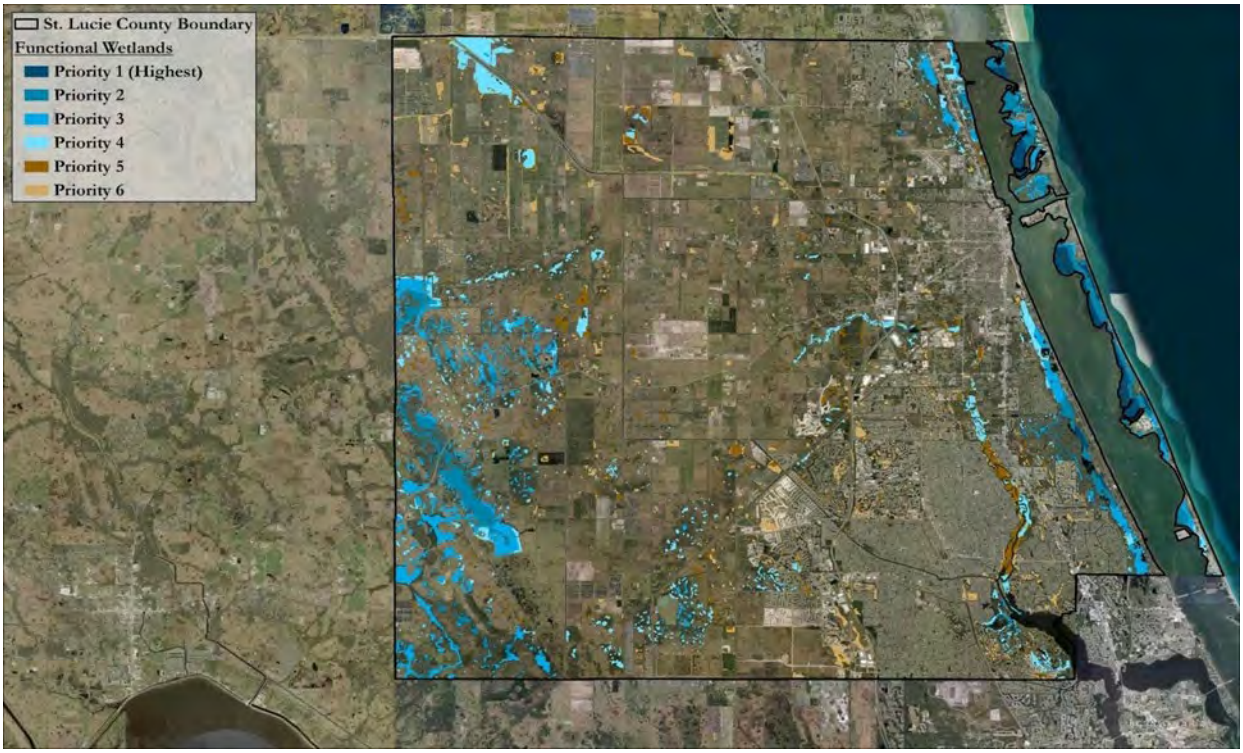



Figure 8-18. FNAI Functional Wetlands

The conservation priorities for surface water protection involve ranking the landscape based on proximity and other factors that impact water quality in critical areas. The surface waters through this land conservation strategy in SLC include: Outstanding Florida Waters, National Scenic Waters, National Estuaries, shellfish harvesting areas, seagrass beds, water supply areas, and waters important for imperiled fish. By prioritizing landscapes that have a significant influence on these water bodies, conservation efforts can be more effectively directed to maintain and improve water quality. Protecting these vital water resources ensures the health of aquatic ecosystems, supports biodiversity, and provides clean water for human use. This approach is essential for safeguarding the ecological integrity of Florida's water bodies and ensuring their sustainability for future generations. The image above indicates that the areas of St. Lucie County with the highest priority of surface water protection are located along the Indian River Lagoon, with most of the western areas listed as medium priority (**Figure 8-19**).

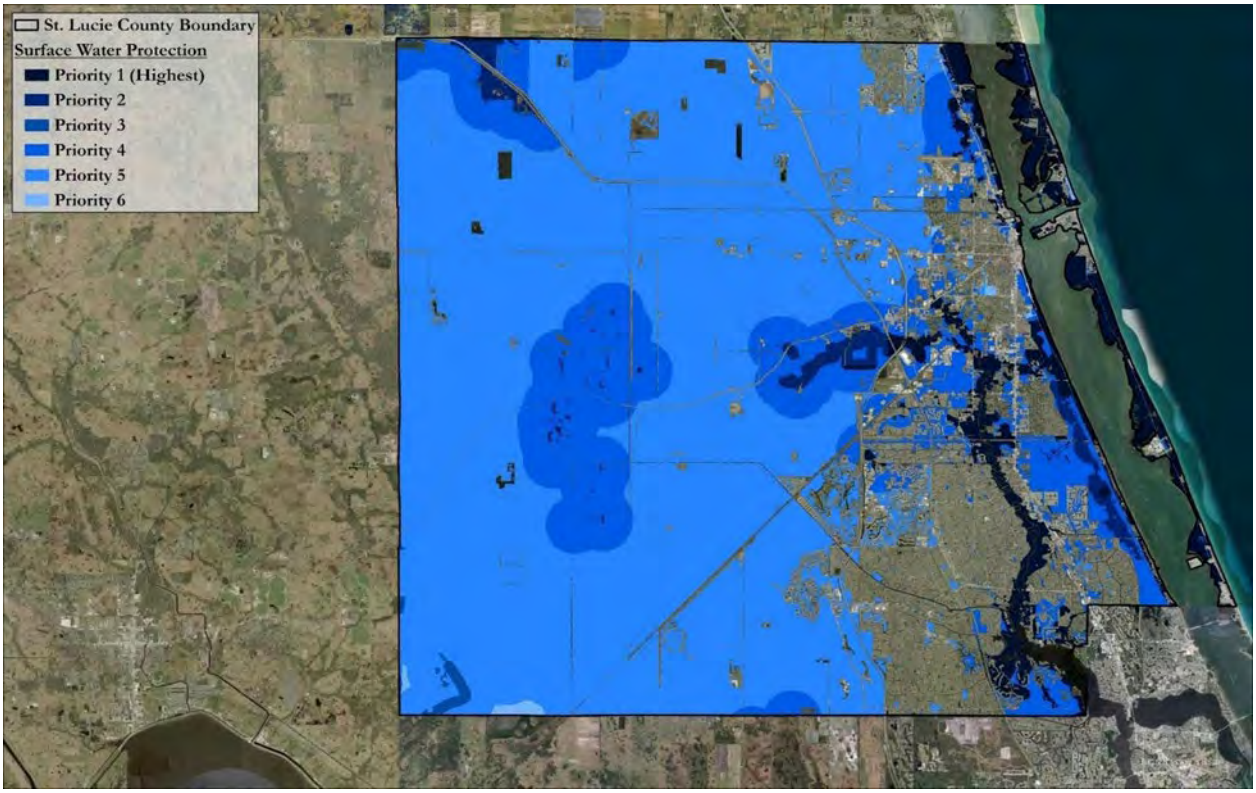



Figure 8-19. FNAI Surface Water Protection

The conservation priorities for groundwater recharge involve ranking the importance of areas based on their impact on the quality and quantity of groundwater recharge. This ranking considers several factors, including proximity to public water supply wells, the thickness of the aquifer confining unit, and the presence of swallets or topographical sinks. By prioritizing areas that significantly influence groundwater recharge, conservation efforts can ensure the protection and sustainability of vital water resources. This approach helps maintain the availability of clean groundwater for public use, supports the health aquifers, and preserves the overall integrity of the hydrologic cycle. Protecting key groundwater recharge areas is essential for long-term water security and environmental sustainability. Areas with the highest priorities are scattered throughout the inland portion of the county (**Figure 8-20**).

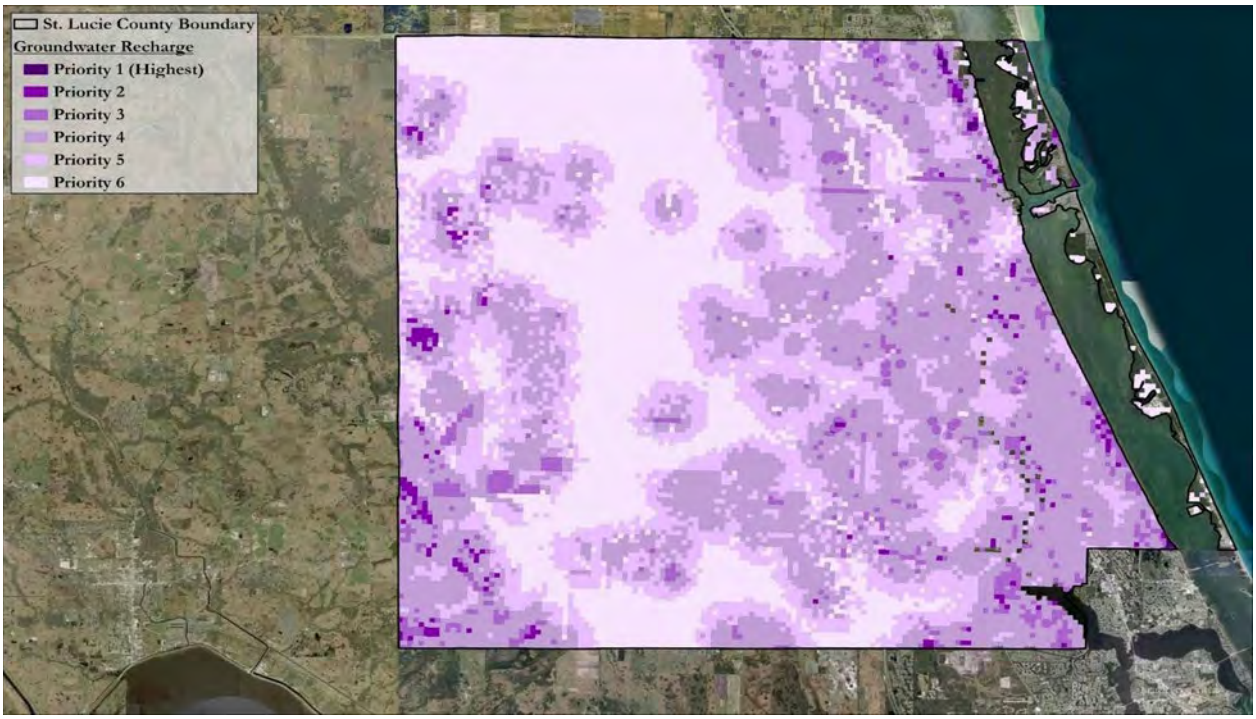



Figure 8-20. FNAI Groundwater Recharge

The conservation priorities for forest lands to maintain recharge function involve identifying areas of existing forestland that also serve as high groundwater recharge zones. By focusing on these dual-function areas, conservation efforts can ensure that forest lands continue to support both ecological health and water resource sustainability. Protecting these forested recharge areas helps maintain the natural processes that allow groundwater to be replenished, ensuring a reliable supply of clean water. This approach is crucial for preserving the integrity of both forest ecosystems and groundwater resources, providing long-term environmental and community benefits. Prioritizing forest lands that contribute significantly to groundwater recharge is essential for maintaining the balance between land use and water conservation. These areas are few and scattered within St. Lucie County, as shown in **Figure 8-21**.

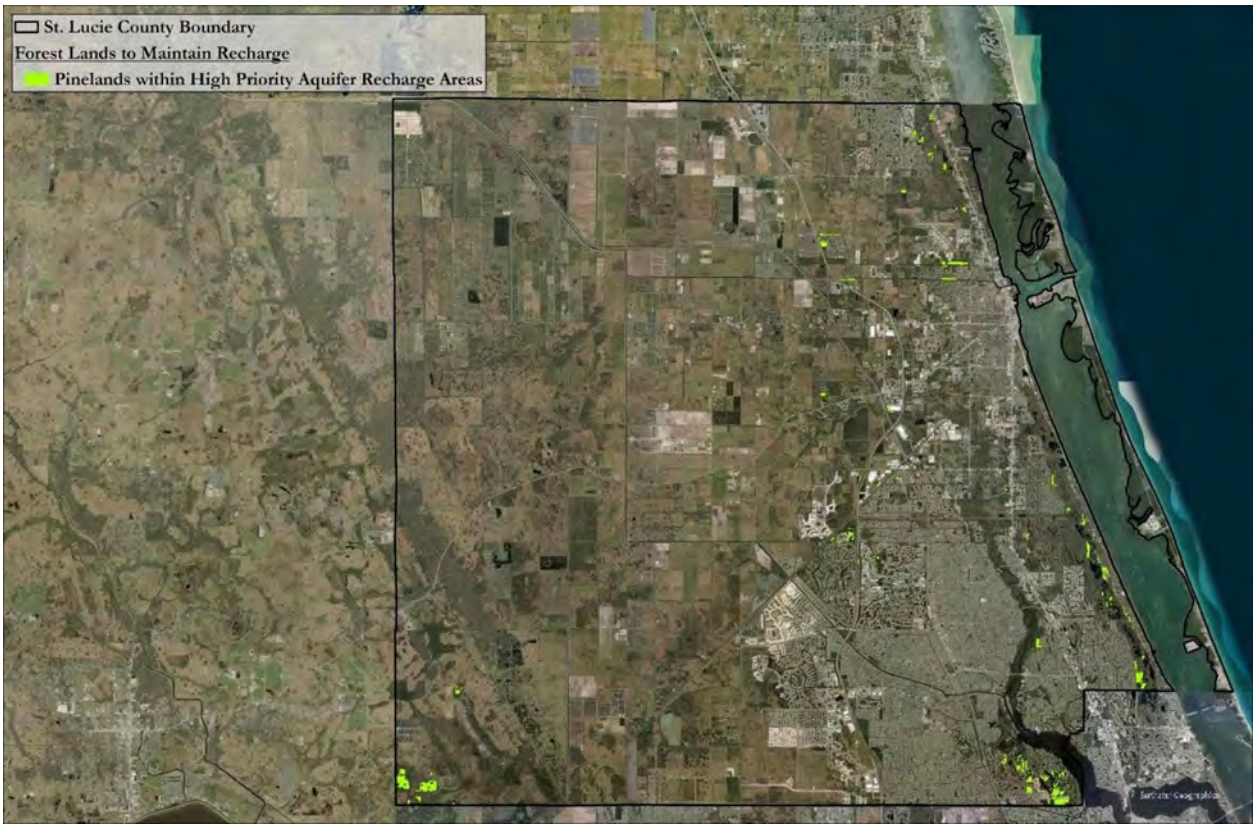



Figure 8-21. FNAI Forest Lands to Maintain Recharge Function

The conservation priorities for fragile coastal resources focus on natural communities located within one mile of the coast that are most vulnerable to development or disturbance. By identifying and prioritizing these areas, conservation efforts can be directed towards protecting coastal ecosystems that are at the highest risk. These fragile coastal resources are essential for maintaining biodiversity, providing habitat for various species, and supporting the overall health of coastal environments. Protecting these areas helps to mitigate the impacts of development and human activities, ensuring that coastal ecosystems remain resilient and continue to provide vital ecological services. This approach is crucial for preserving the natural beauty and ecological integrity of coastal regions, safeguarding them for future generations. While there are some fragile coastal uplands in the northernmost region, the majority of the barrier island within St. Lucie is classified as a fragile coastal wetland (**Figure 8-22**).

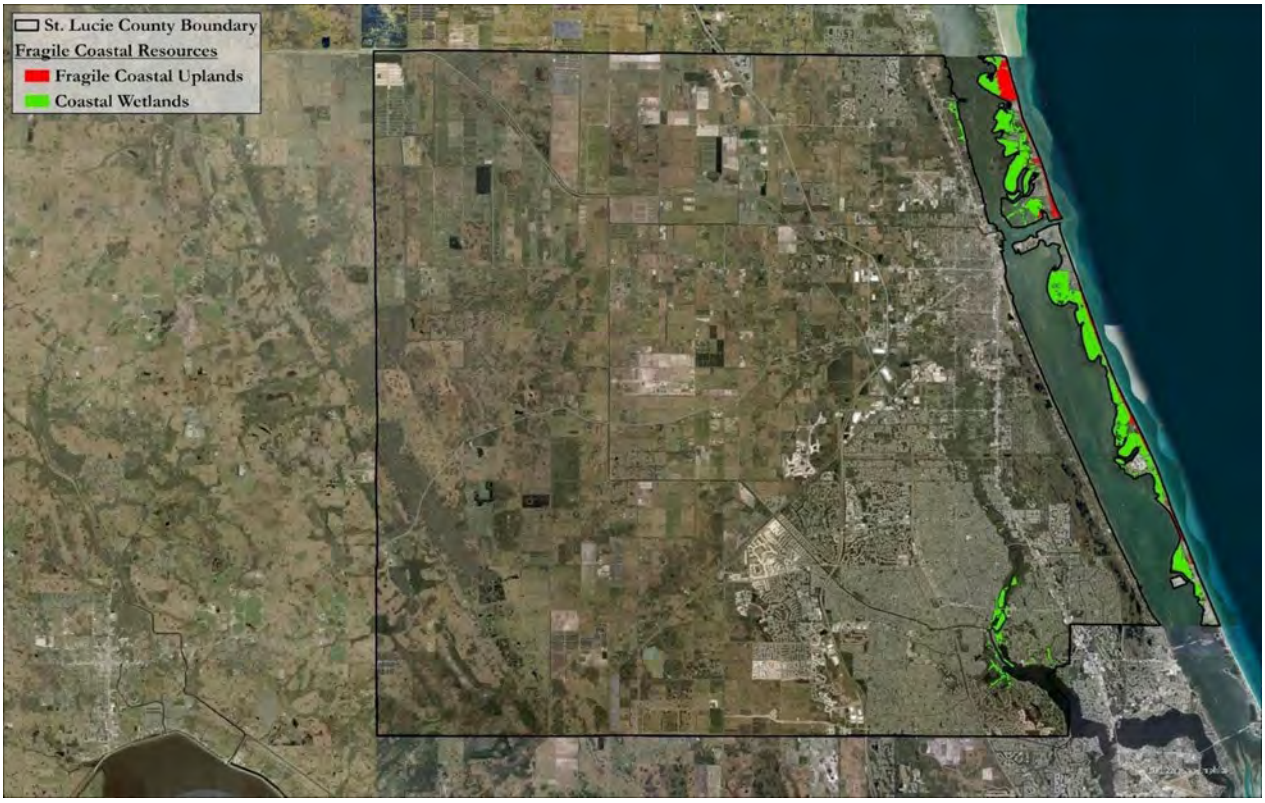



Figure 8-22. FNAI Fragile Coastal Resources

The Florida Fish and Wildlife Conservation Commission (FWC) has identified areas across Florida that serve as potential habitats for the long-term maintenance of 62 focal vertebrate species. These species are not adequately protected by existing conservation lands. The prioritization of these areas is based on the quality of the habitat and the rarity of the focal species. Higher quality habitats and those supporting rarer species are given higher priority for conservation efforts. Identifying high-priority habitats allows conservation planners to target their efforts more effectively. Resources can be allocated to areas that will have the most significant impact on preserving biodiversity. This is useful in developing adaptive management strategies that can respond to changing environmental conditions, which is particularly important in the face of sea level rise. High priority habitat conservation areas within St. Lucie County, depicted in **Figure 8-23**, are concentrated along the Indian River Lagoon, St. Lucie River, and within the expansive agricultural areas of the county's southwestern corner region.

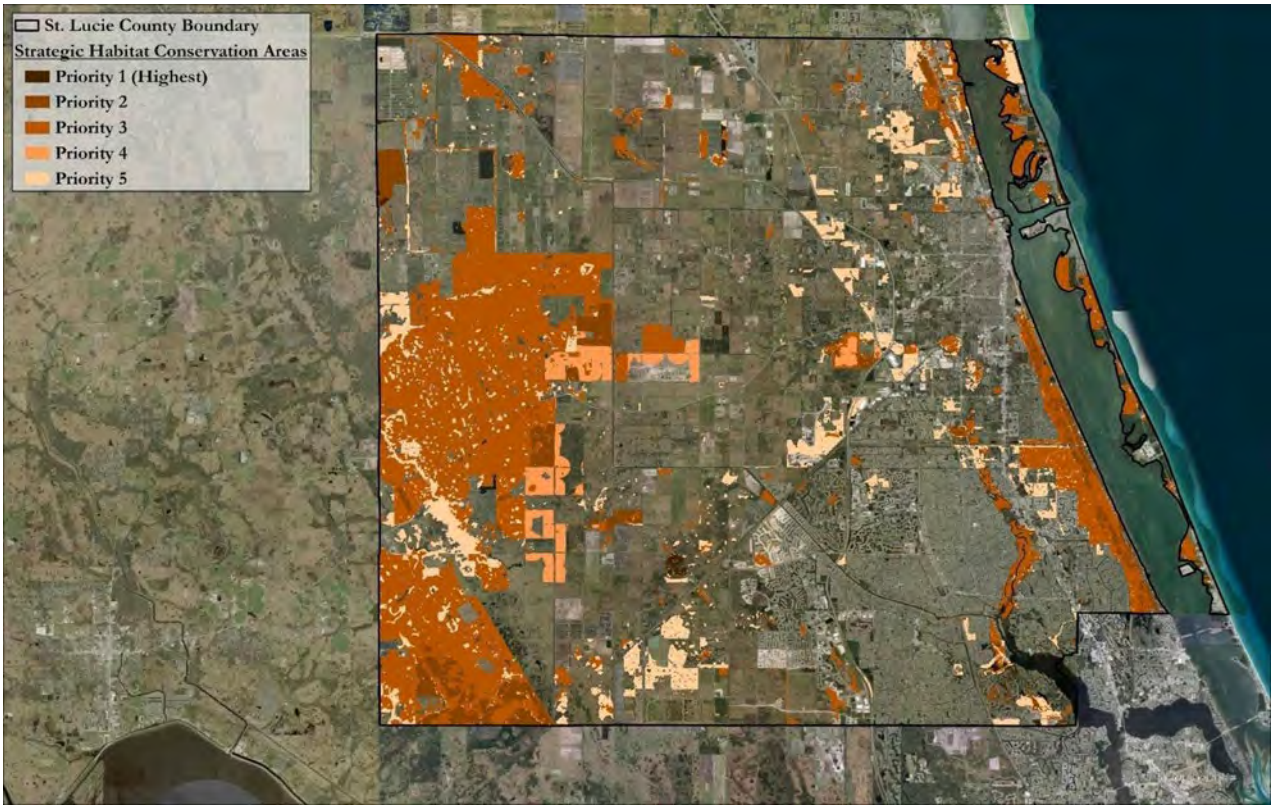



Figure 8-23. FNAI Strategic Habitat Conservation Area

The conservation priorities for rare species habitats focus on occurrence-based habitats for 281 species that require conservation efforts. These species include a diverse array of plants, invertebrates, and vertebrates. The prioritization of these habitats is determined by the rarity and diversity of the species they support. This approach ensures that conservation efforts are directed towards the most critical areas, where the preservation of unique and diverse species can have the most significant impact. By focusing on habitats that support a high diversity of rare species, conservation planners can maximize the effectiveness of their efforts, ensuring that these vulnerable species have the best chance of survival in the long term. This strategy is essential for maintaining biodiversity and ecological balance, as it targets the protection of species that are most at risk of extirpation or extinction. **Figure 8-24** highlights high priority habitats, most of which are concentrated along the coast.

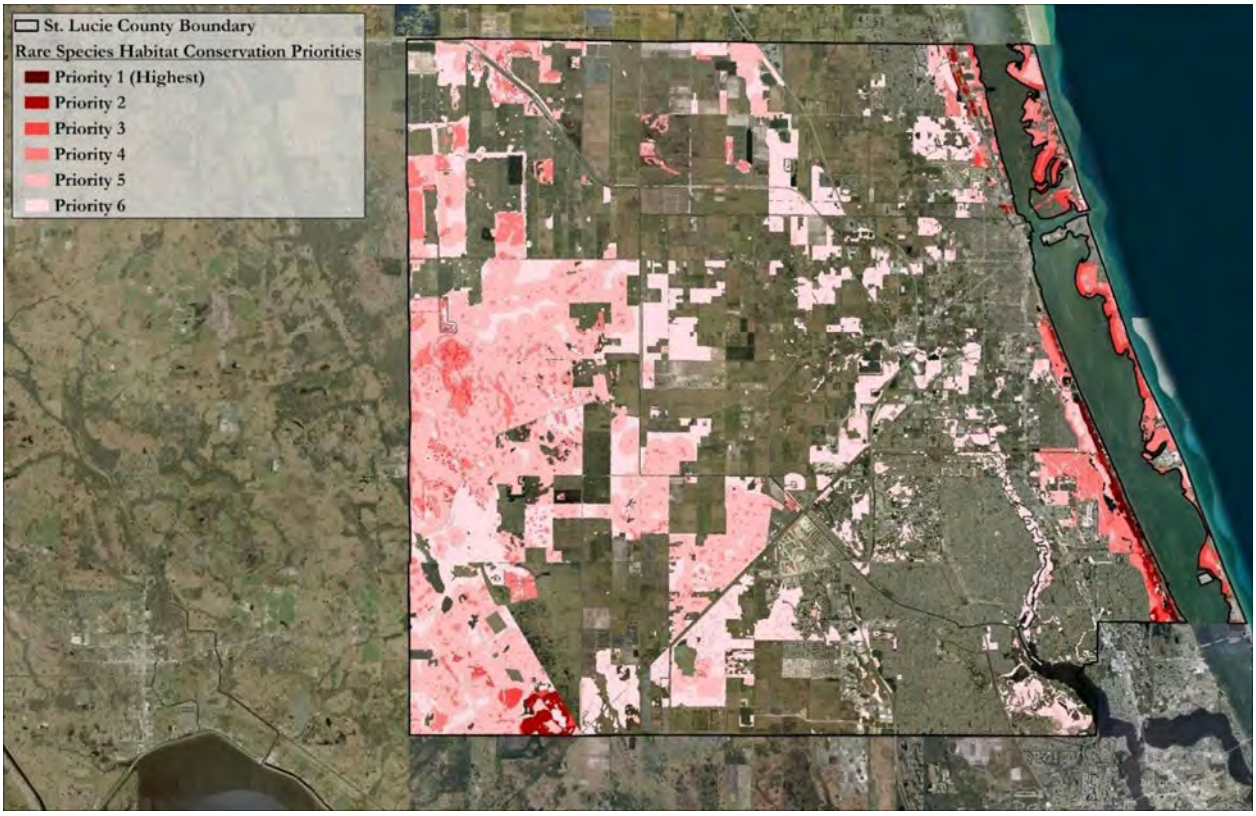



Figure 8-24. FNAI Rare Species Habitat Conservation Priorities

The Florida Ecological Greenway Network prioritizes the representation of landscape hubs, linkages, and corridors to enhance ecological connectivity. This network focuses on creating and maintaining connections that facilitate the movement of wide-ranging species, ensuring they can traverse between existing reserves and riparian areas. By prioritizing links that promote connectivity, the network supports the ecological health and genetic diversity of species populations. This strategic approach helps to mitigate habitat fragmentation, allowing species to access essential resources, migrate in response to environmental changes, and maintain viable populations. The emphasis on connectivity within the Florida Ecological Greenway Network is crucial for the long-term conservation of biodiversity and the resilience of ecosystem services, such as water storage and resource protection, flood attenuation and water quality enhancement across the state. As depicted in **Figure 8-25**, most of the western portion of the county is encompassed by the Florida Ecological Greenway Network and listed as the second highest priority.

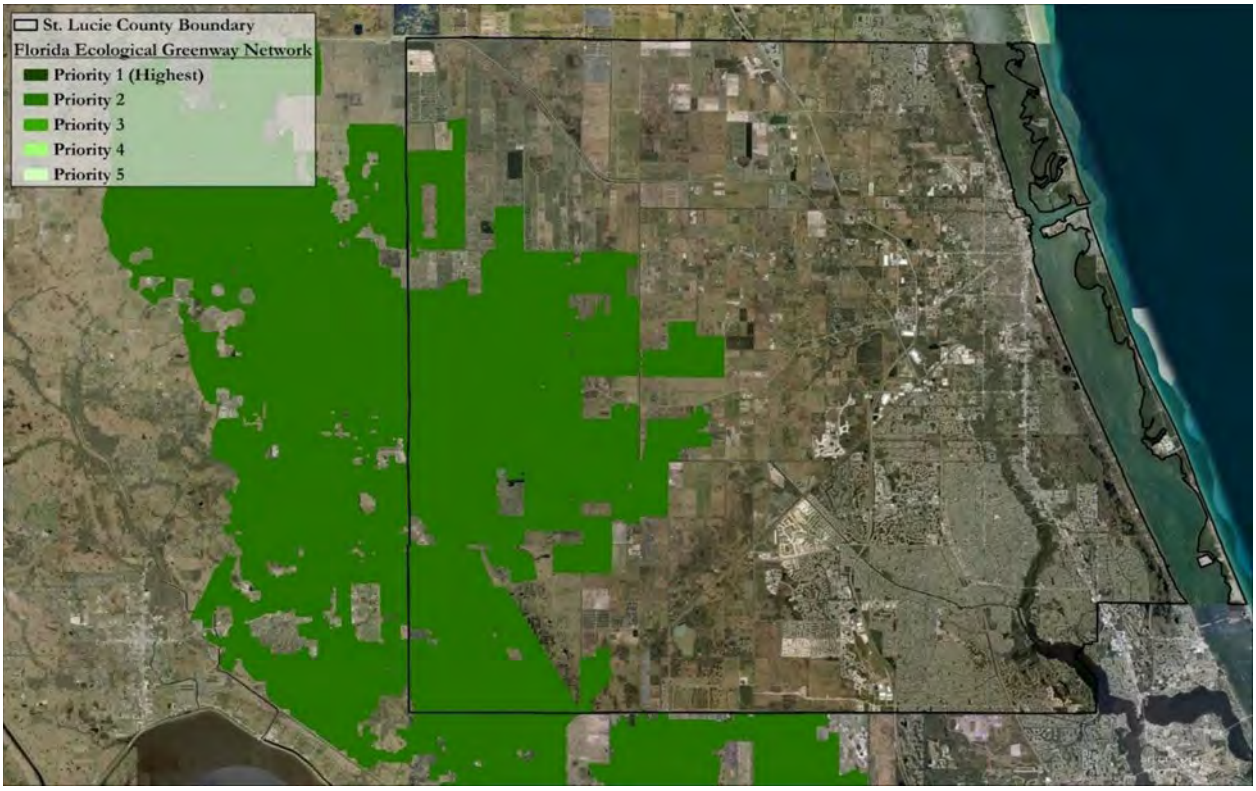



Figure 8-25. FNAI Florida Ecological Greenway Network

The conservation priorities for underrepresented natural communities focus on identifying and protecting those that lack adequate representation within existing conservation lands. These natural communities are prioritized based on their global rarity, ensuring that the most unique and vulnerable ecosystems receive the attention they need. By targeting these underrepresented areas, conservation efforts can address gaps in the current network of protected lands, safeguarding a broader range of biodiversity. This approach helps to preserve the ecological integrity and resilience of these rare natural communities, ensuring their survival for future generations. Prioritizing rare natural communities is essential for maintaining the overall health and diversity of the environment, as it ensures that even the most uncommon ecosystems are given the protection they deserve. The majority of under- represented natural communities in St. Lucie County are pine flatwoods, followed by scrub and scrubby flatwoods (**Figure 8-26**).

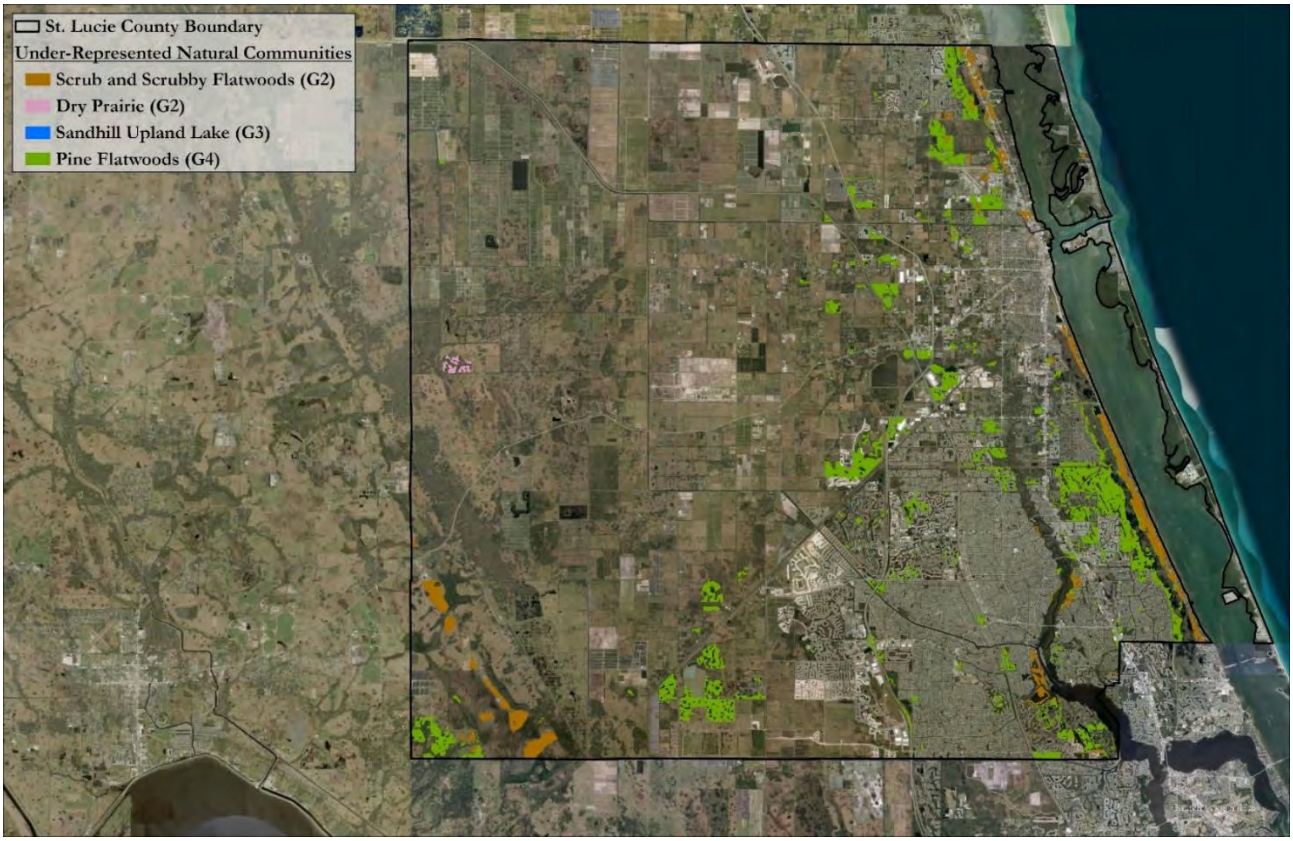



Figure 8-26. FNAI Under-Represented Natural Communities

The conservation priorities for sustainable forestry involve identifying areas that are potentially suitable for pine-based forestry. Higher prioritization is given to larger tracts of land, more mesic (moderately moist) sites, and locations within 50 miles of a mill. By focusing on these criteria, conservation efforts can support the development of sustainable forestry practices that maximize productivity while minimizing environmental impact. Prioritizing larger tracts ensures that forestry operations can be more efficient and economically viable. Mesic sites are preferred because they provide optimal growing conditions for pine species. Proximity to a mill promotes sustainable forestry operations. This approach helps balance the economic benefits of forestry with the need to protect and manage natural resources responsibly. Suitable areas within the county, most of which have a low priority, are concentrated to the east (**Figure 8-27**).

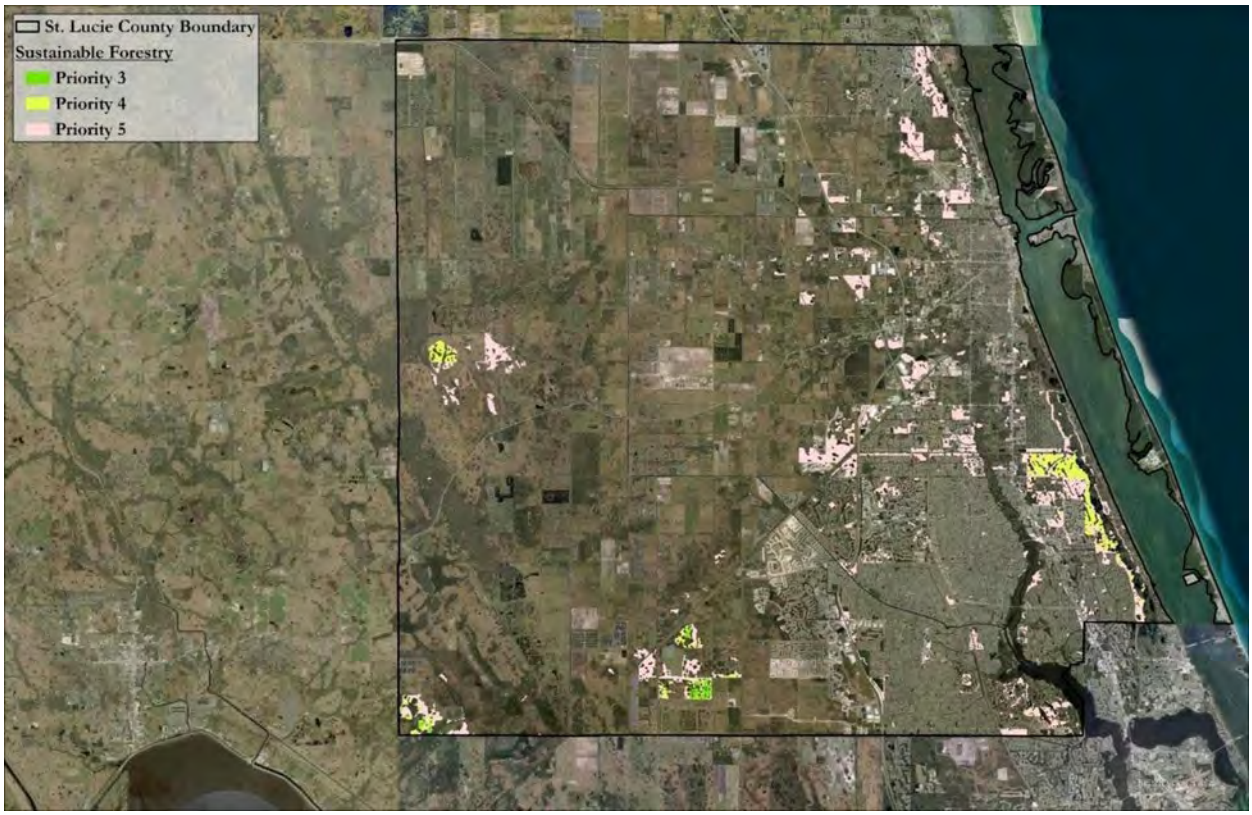



Figure 8-27. FNAI Sustainable Forestry

The FNAI CLIP layer utilizes the natural data resources described above to identify critical lands and waters that support flood storage, groundwater recharge, and biodiversity; and protect surface waters; and supply essential landscapes and waterways to different wildlife species. The utilization of this data can support local government initiatives to identify high quality natural ecosystems for conservation (**Figure 8-28**).

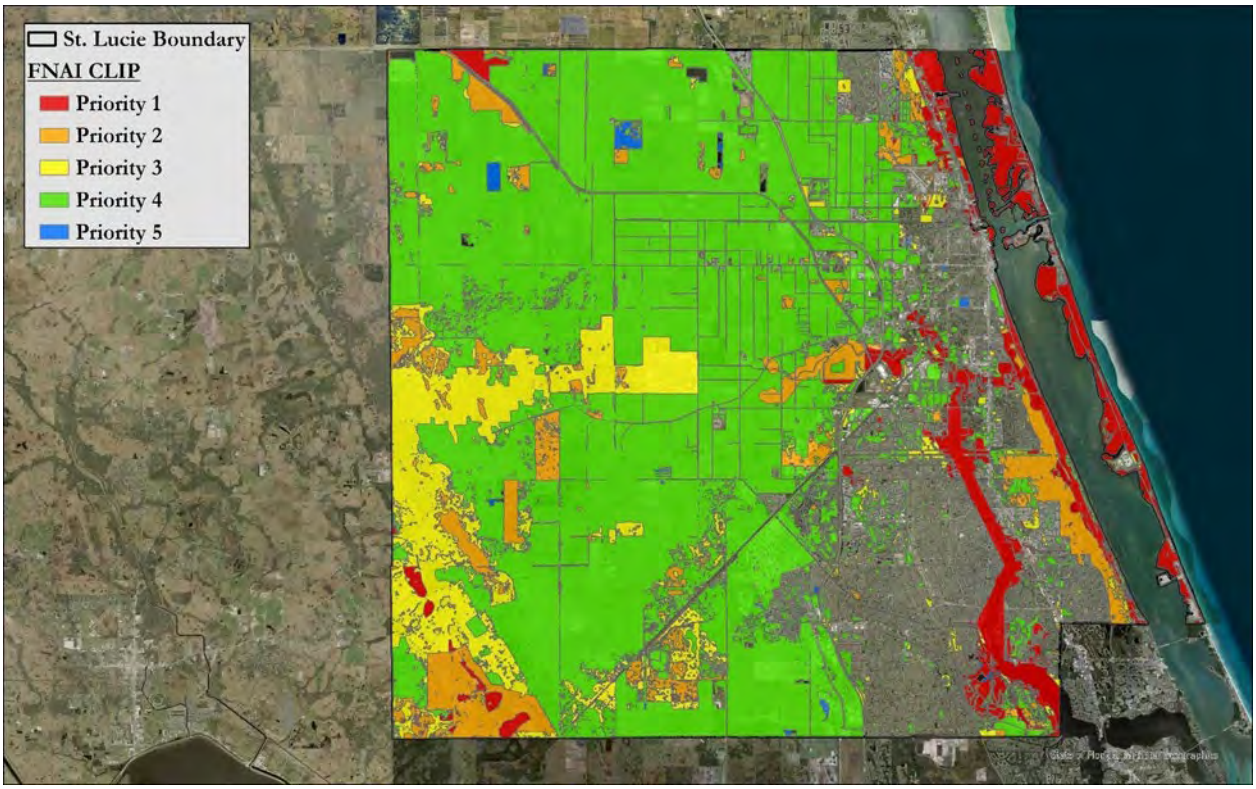



Figure 8-28. FNAI Critical Lands and Waters Identification Project (CLIP)

### 8.2.2.4 Habitat Profiles

The SLAMM model uses a detailed 26-category land classification system to represent coastal and wetland ecosystems, each responding differently to sea level rise. **Figure 8-29** highlights some key categories occurring within St Lucie County.

Figure 8-29. Color Coded Legend of baseline SLAMM Habitats

Upland Categories:

- Developed Dry Land: Urban/developed areas above Mean Tide Level (MTL), including infrastructure and built environment.
- Undeveloped Dry Land: Natural areas above MTL, potential for wetland migration

Freshwater Wetlands:

- Swamp: Non-tidal forested wetlands.
- Cypress Swamp: Specialized freshwater forested wetlands dominated by cypress trees.
- Inland-Fresh Marsh: Non-tidal herbaceous wetlands.
- Tidal-Fresh Marsh: Fresh marshes influenced by tidal action but minimal salinity

Transitional and Salt Marshes:

- Transitional Salt Marsh: Intermediate zone between fresh and salt marshes.
- Regularly-Flooded Marsh: Salt marsh flooded daily by tides.
- Irregularly-Flooded Marsh: Salt marsh flooded only during spring tides or storms

Coastal Wetlands and Shores:

- Mangrove: Saltwater-tolerant forest ecosystems.
- Estuarine Beach and Ocean Beach: Different types of shoreline environments.
- Tidal Flat and Ocean Flat: Low-lying areas regularly exposed at low tide.
- Rocky Intertidal: Rocky shores influenced by tides

Water Bodies :

- Inland Open Water: Freshwater bodies.
- Riverine Tidal: Rivers influenced by tides.
- Estuarine Open Water: Brackish water bodies.
- Tidal Creek: Small tidal channels.
- Open Ocean: Marine environment

Additional Categories:

- Inland Shore: Non-tidal shorelines.
- Tidal Swamp: Forested wetlands with tidal influence.
- Flooded Developed Dry Land: Developed areas inundated by sea level rise.
- Flooded Forest: Forested areas inundated by sea level rise.

This classification system enables computational modeling of how different habitats respond to sea level rise, considering factors such as elevation, tidal range, salinity, and accretion rates. Each category has unique threshold elevations and transition rules that determine how it changes under different sea level rise scenarios.

St. Lucie County's coastal landscape is characterized by a rich tapestry of 18 interconnected habitats, ranging from beaches and mangroves to freshwater wetlands and upland systems. Each of these natural communities plays a vital role in the region's environmental resilience, while facing unique challenges from sea level rise and prolonged flooding implications.

### 8.2.2.5 Land Cover and Native Ecological Communities

St. Lucie County's natural and semi-natural landscape is characterized by a highly diverse mosaic of forests, grasslands, and wetlands. One of the drivers of the diversity of landscapes and associated species is the location of the county at a transition point between the humid subtropical climate zone of the southeastern United States and a more tropical climate zone characteristic of southern Florida. Accordingly, the flora and fauna of St. Lucie County contain a mix of species between the two zones, contributing to relatively high local biodiversity.

Land cover and land use data from the South Florida Water Management District provides an in-depth snapshot of current land cover in St. Lucie County (**Figure 8-30**; **Table 8-5**). As a coastal county, St. Lucie County contains extensive areas of marine water, wetlands, lakes, and other water features, which together account for 13 percent of total area in the county. Over

15 percent of these water features are comprised of marine and estuarine waters – including the nearshore Atlantic Ocean – that are highly valued for their support of outdoor recreation, tourism, and productive fishery economies. The county's estuarine wetlands, including salt marshes and mangrove swamps, play an especially important role in regulating nearshore water quality, supporting fisheries, and helping to protect inland areas from storm surges.

Similarly, the county's extensive freshwater wetland communities are critical for regulating water quality in lakes and streams, serving as storage for floodwaters, and providing important nursery habitat for many native birds, amphibians, fish, and other wildlife.

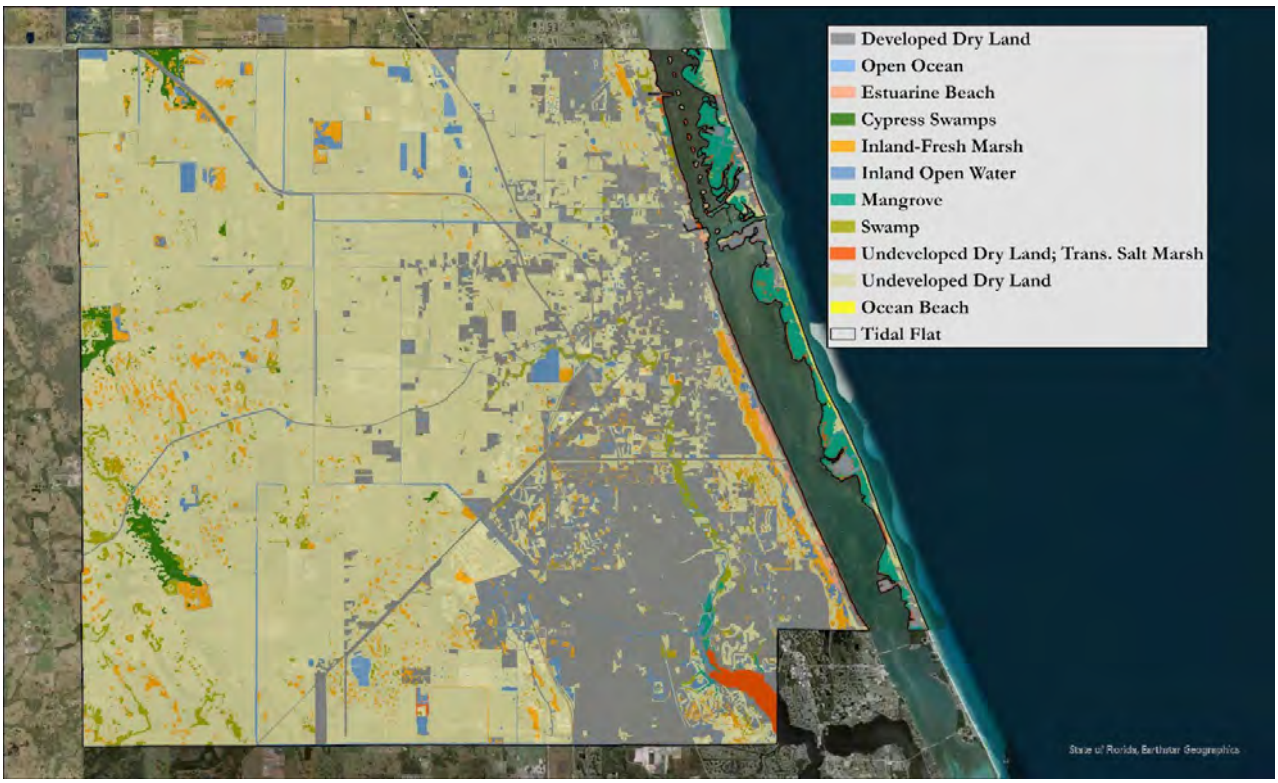



Figure 8-30. SFWMD Land Use Classifications color coded to match SLAMM legend

Table 8-5. Land cover types by area

| Land Cover Type | Area (Acres) |
|---|---|
| Low Density Urban | 12,030.71 |
| Medium Density Urban | 39,757.33 |
| High Density Urban | 6,925.97 |
| Transportation | 5,787.15 |
| Industrial/Commercial | 15,168.88 |
| Barren/Open Land | 6,353.53 |
| Agriculture | 206,408.51 |
| Recreational | 4,516.36 |
| Upland Non-Forested | 8,283.88 |
| Upland Forest | 17,133.29 |
| Mangroves | 5,098.29 |
| Wetlands/Sloughs (Excluding Mangroves) | 30,184.05 |
| Reservoirs | 6,756.92 |
| Lakes | 689.05 |
| Streams/Waterways | 3,468.7 |
| Bays/Estuaries | 2,186.52 |
| Ocean | 21.02 |
| Total | 370,770.16 |

### 8.2.2.6 Existing Conservation Lands

To facilitate stakeholder engagement in future projects, the names, management entity, and land areas of the fifteen largest protected land units in St. Lucie County are shown in **Table 8-6** below. Conservation lands within St. Lucie are highlighted in green in **Figure 8-31**.

Table 8-6. St Lucie Conservation Lands by Size and Manager

| Property | Manager | Area (Acres) |
|---|---|---|
| Savannas Preserve State Park | FL Dept. of Environmental Protection, Div. of Recreation and Parks | 6,408.00 |
| C-23/C-24 South Reservoir | South Florida Water Management District | 4,853.37 |
| Cow Creek Ranch Agricultural and Conservation Easement #2 | FL Dept. of Agriculture and Consumer Services | 3,488.23 |
| Bluefield Ranch | St. Lucie County | 3,278.77 |
| Ru-Mar Conservation Easement | FL Dept. of Environmental Protection, Div. of State Lands | 3,153.45 |
| McCarty Ranch Preserve | City of Port St. Lucie | 3,107.00 |
| C-23/C-24 Stormwater Treatment Area | South Florida Water Management District | 2,757.12 |
| C-23/C-24 North Reservoir | South Florida Water Management District | 2,609.21 |
| Bluefield Ranch Mitigation Bank | Bluefield Ranch Mitigation Bank | 2,494.65 |
| Cypress Creek Complex | South Florida Water Management District | 1,233.17 |

| Property | Manager | Area (Acres) |
|---|---|---|
| Ten Mile Creek | South Florida Water Management District | 959.89 |
| Cypress Creek | St. Lucie County | 783.75 |
| St. Lucie Pinelands | St. Lucie County | 750.84 |
| Fort Pierce Inlet State Park | FL Dept. of Environmental Protection, Div. of Recreation and Parks | 701.20 |
| Avalon State Park | FL Dept. of Environmental Protection, Div. of Recreation and Parks | 657.24 |
| Walpole Ranch Agricultural and Conservation Easement | FL Dept. of Agriculture and Consumer Services | 599.16 |

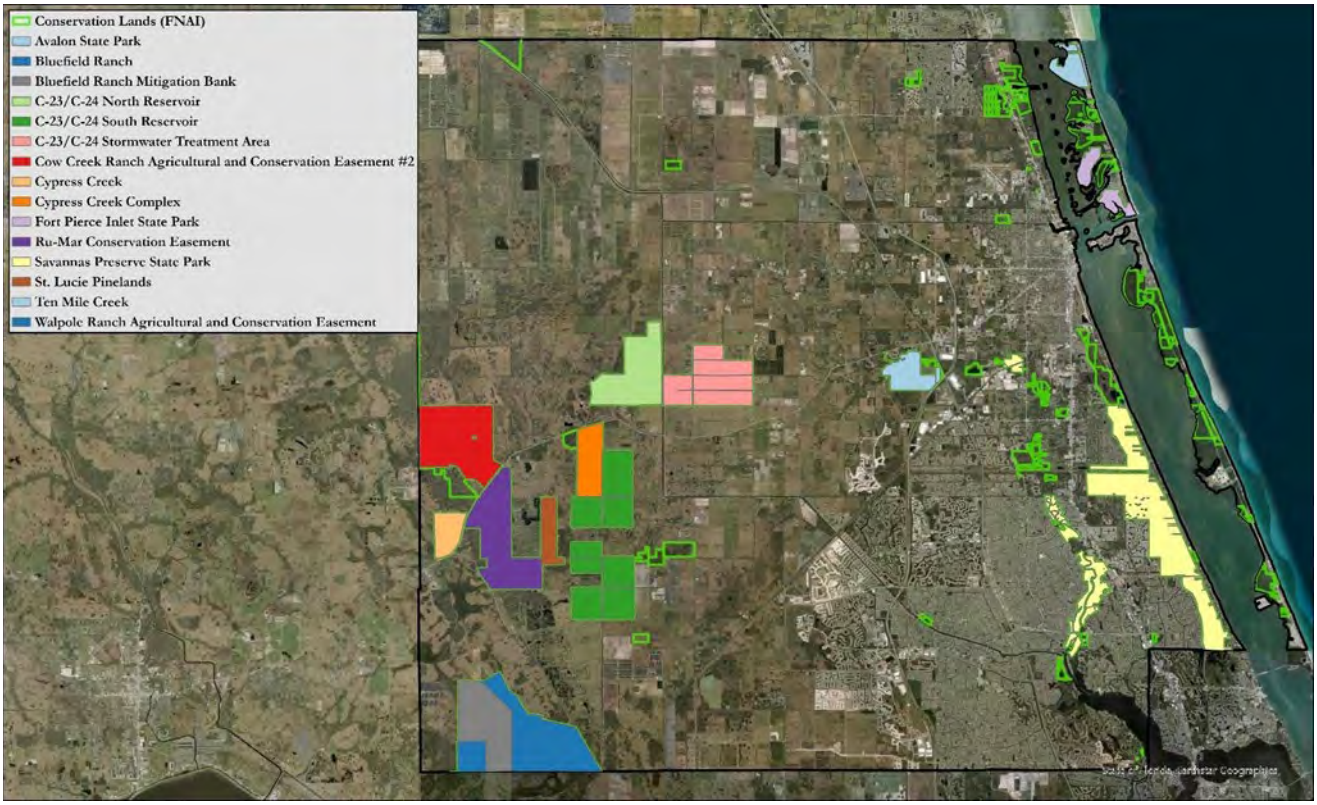



Figure 8-31. Map of Existing Conservation Lands within the St. Lucie County

## 8.3 Model Parameters

The model was configured using locally calibrated parameters, ensuring accuracy in simulating SLR effects (**Table 8-7**). Future assessments should work on verifying or validating these values:

Table 8-7. Table of SLAMM Input Parameters

| Parameter | Value | Description | Importance |
|---|---|---|---|
| NWI Photo Date | 2022 | Date of NWI data used for initial conditions | Establishes baseline year |
| DEM Date | 2018 | Date of majority elevation data | Ensures consistency with NWI data |
| Direction Offshore | East | Primary direction toward open ocean | Used in fetch calculations |
| Historic Trend | 0.13 inches/year | Historic rate of sea level rise | Used to adjust initial conditions |
| MTL-NAVD88 | -0.34 m | Correction between Mean Tide Level and NAVD88 datum | Critical for accurate elevation referencing |
| GT Great Diurnal Tide Range | 2.20 ft | Tide range for the study area | Determines habitat elevation ranges |
| Salt Elevation | 1.12 ft | Elevation above MTL for salt boundary | Defines boundary between fresh and salt influence |
| Marsh Erosion | 3.28 ft/year | Horizontal erosion rate for marshes | Affects shoreline retreat rates |
| Swamp Erosion | 1.64 ft/year | Horizontal erosion rate for swamps | Lower than marsh due to greater root stabilization |
| Tidal Flat Erosion | 4.92 ft/year | Horizontal erosion rate for tidal flats | Higher due to lack of vegetation |
| Mangrove Erosion | 3.28 ft/year | Horizontal erosion rate for mangroves | Based on field measurements |
| Regularly Flooded Marsh Accretion | 0.16 inches/year | Vertical accretion rate | Critical for determining marsh response to SLR |
| Irregularly Flooded Marsh Accretion | 0.12 inches/year | Vertical accretion rate | Lower than regularly flooded due to less sediment input |
| Tidal Fresh Marsh Accretion | 0.14 inches/year | Vertical accretion rate | Intermediate value based on local conditions |
| Beach Sedimentation Rate | 0.02 inches/year | Vertical accretion rate for beaches | Conservative estimate for natural beaches |
| Mangrove Accretion | 0.18 inches/year | Vertical accretion rate for mangroves | Higher than marshes due to root structures |

These parameters were carefully selected based on scientific literature, local measurements, and expert knowledge to ensure the model accurately represents the processes affecting coastal habitats in St. Lucie County.

Accretion rates represent how quickly wetlands can build up vertically by trapping sediment and organic matter. If a wetland can build up faster than sea level is rising, it may survive. If sea level rises faster than the wetland can build up, it may convert to open water. The values above show that mangroves (0.18 inches/year) can build up faster than marshes (0.12-0.16 inches/year), which may affect their relative vulnerability to sea level rise.

## 8.4 Scenarios and Runs

### 8.4.1 Sea Level Rise Scenarios

Two sea level rise scenarios from NOAA were selected to represent a range of possible futures:

- **NOAA Intermediate Low (NIL)**: A lower sea level rise trajectory
  - 2040 = 0.78 ft
  - 2070 = 1.34 ft
  - 2100 = 1.87 ft
- **NOAA Intermediate High (NIH)**: A higher sea level rise trajectory
  - 2040 = 1.5 ft
  - 2070 = 3.37 ft
  - 2100 = 6.1 ft

These scenarios were selected to represent a plausible range of sea level rise based on current scientific understanding, without exploring the most extreme scenarios. The historic rate of sea level rise in this region has been about 0.09 inches/year. If this rate continued unchanged, sea level would rise only about 0.61 ft (7.3 inches) by 2100. Both scenarios used in this analysis project significantly faster rates of sea level rise, which is evident in **Figure 8-32**.

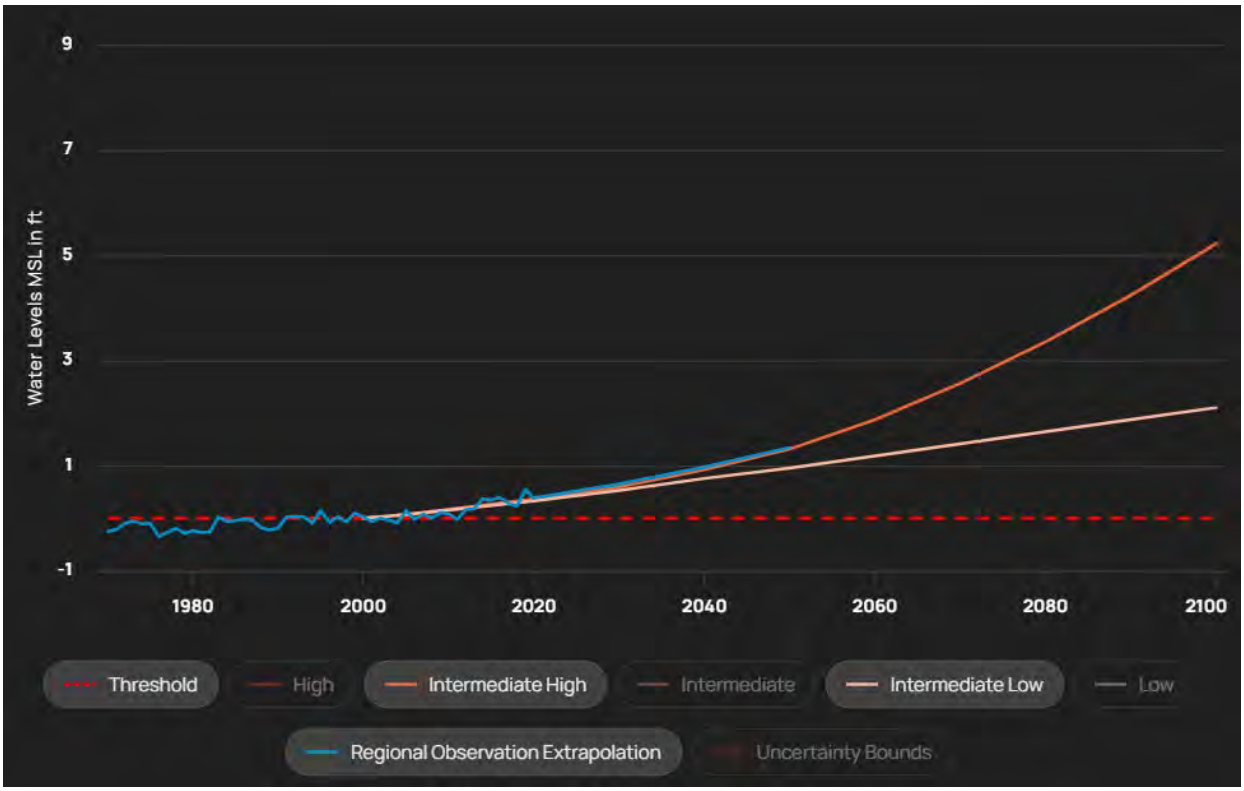



Figure 8-32. Sea level rise relative to NOAA Intermediate High and Intermediate Low

### 8.4.2 Protection Scenarios

Three protection scenarios were modeled to evaluate different management approaches:

- **No Protection**: Natural migration of all habitats with no human intervention
  - Serves as a baseline for comparison; wetlands move inland where possible
  - Represents a "do nothing" approach, natural habitat migration
- **Protect All Dry Land**: Protection of all developed and undeveloped dry land
  - Represents a comprehensive protection approach; Limits habitat migration, increases coastal squeeze
  - Would require significant infrastructure investment; Hard barriers around all land
- **Protect Developed Dry Land**: Protection of only developed dry land areas
  - Represents a more targeted protection approach; reduces infrastructure risk, but allows wetland transition
  - Focuses on protecting infrastructure and developed areas; barriers for urban areas only

When sea levels rise, coastal habitats naturally try to migrate inland. However, if there are barriers like seawalls or elevated roads (as in the protection scenarios), these habitats can become "squeezed" between the rising water and fixed barrier. This can lead to habitat loss if there's nowhere for these ecosystems to go.

### 8.4.3 Planning Horizons

Results were analyzed for four time periods to support planning at different time scales:

- **Initial conditions (2020):** Baseline conditions – Midway point DEM and NWI dates
- **Near-term (2040)**: 20-year planning horizon
- **Mid-term (2070)**: 50-year planning horizon
- **Long-term (2100)**: 80-year planning horizon

Different planning horizons are relevant for different types of decisions. Near-term projections (2040) are most relevant for current planning cycles and immediate adaptation decisions. Mid-term projections (2070) align with the lifespan of major infrastructure and buildings. Long-term projections (2100) are important for understanding the legacy of current decisions and long-range planning.

## 8.5 Analysis Methods

The St. Lucie County SLAMM (Sea Level Rise Affecting Marshes Model) Analysis Project employed a structured approach to quantify habitat changes, assess carbon sequestration potential, and compare the effectiveness of various adaptation strategies. The following analytical methods were used:

1. Habitat Area Calculation
   - The total area (hectares) of each habitat type was summed by year and scenario to track changes over time.
   - This method enabled a direct comparison of habitat areas across different sea level rise scenarios and time periods.

2. Percentage Change Calculation
   - Changes in habitat extent were assessed relative to baseline conditions using the following formula:

$$\text{Percentage Change} = \left(\frac{\text{Current} - \text{Baseline}}{\text{Baseline}}\right) \times 100$$

   For example, to calculate the change in mangrove habitats:

$$\left(\frac{5{,}000\ acres\ -\ 10{,}000\ acres}{10{,}000\ acres}\right) \times 100\ =\ -50\%$$

   - This metric provides a standardized way to measure the rate and magnitude of habitat transitions.

3. Cross-Scenario Comparison
   - A comprehensive comparison was conducted across all modeled scenarios and protection strategies to assess the relative effectiveness of these three different adaptation approaches.

These methods provide a quantifiable and comparative framework to support data-driven decision-making for coastal resilience planning in St. Lucie County.

# 9.0 MODEL STRUCTURE AND CONTENT

Results from the SLAMM runs show progressive and increasing inundation of low-lying developed lands and undeveloped uplands, particularly within coastal areas of St. Lucie County, from 2040 through 2100. Inspection of the full SLAMM land cover categories and projected changes by scenario reveals the need for some important interpretive caveats.

The SLAMM algorithm appears to be systematically – and could certainly mistakenly – be selecting for marshes, rather than mangroves within habitat transition modules, as the dominant saltwater wetland for areas newly inundated by sea level rise in St. Lucie County. This suggests that the interpretation of SLAMM land cover change results should likely focus on broader, aggregated categories (e.g., saltwater wetlands, which includes mangroves, marshes, and other intertidal areas), rather than place high levels of confidence in the accuracy of specific wetland types provided by the raw model outputs.

Another key caveat is that the extension of SLAMM into the non-tidal portions of the St. Lucie River should be viewed as both exploratory and experimental. While it is intuitive that significant upstream transgression of saltwater can be expected with large increments of sea level rise, the current model does not incorporate more complex dynamics between non-stationary groundwater (e.g., rising regional water table) and surface head pressure from fresh headwater areas that could, for example, be expected to favor creation of new freshwater wetlands in areas that are currently uplands. Moreover, the extent of saltwater transgression into the upper St. Lucie River seems conservative under the sea level rise scenarios.

A final caveat is that the SLAMM results are obviously dependent on the accuracy of data input files, model parameters, and sea level rise projection scenarios, while also being subject to the technical limitations of the model itself. The results can be informative about general trends and planning at the landscape scale but should not in any way be used as a standalone tool for site-level design, engineering, or ecosystem management decisions.

## 9.1 Primary Results

Six scenario-specific model runs were conducted, each representing different sea level rise projections and protection strategies (**Table 9-1**). These results offered a quantitative foundation for assessing habitat changes, ecosystem resilience, and adaptation measures.

**Total Study Area:**
3,263,184 hectares (approximately 8,063,503 acres)

**Years Simulated:**
2020, 2040, 2070, 2100

**Sea Level Rise Scenarios:**
NOAA Intermediate Low ("NIL") and NOAA Intermediate High ("NIH")

**Protection Strategies:**
None, Protect All Dry Land, Protect Developed Dry Land

Each scenario provides insight into how different protection strategies influence habitat transformation over time, guiding coastal planning, resilience efforts, and conservation priorities.

Table 9-1. Description of modeling results output provided by the SLAMM model

| Parameter | Description | Values | Purpose |
|---|---|---|---|
| Scenario | Sea level rise scenario | "NIL", "NIH"<br>(See SLR – eustatic below) | Specifies which SLR curve was used |
| Year | Simulation year | 2020, 2040, 2070, 2100 | Indicates the time period |
| Protection | Protection strategy | "Protect None", "Protect All Dry", "Protect Developed Dry" | Specifies the protection approach |
| GIS Num | Numeric identifier for habitat type | 1-25 (see SLAMM technical documentation) | Internal SLAMM code for habitat types |
| Acres | Area in acres | 276153.9146,<br>-9999.0 (for null/void) | The primary data value being tracked |
| SLAMMText | Habitat type name | "Developed Dry Land", "Mangrove", etc. | Habitat description |
| SLR (eustatic) | Sea level rise value in meters | "NOAA et al 2017" | The amount of sea level rise for that year |

The model provides over 30 outputs, which are grouped into six categories below. Understanding these habitat types is essential for interpreting the model results.

### 9.1.1 Dry Land Habitats

- **Developed Dry Land**: Urban and built-up areas above the reach of tides
- **Undeveloped Dry Land**: Natural upland areas above the reach of tides
- **Flooded Developed Dry Land**: Developed areas that have been inundated

### 9.1.2 Wetland Habitats

- **Swamp**: Freshwater forested wetland
- **Cypress Swamp**: Wetland dominated by cypress trees
- **Tidal Swamp**: Forested wetland influenced by tides
- **Mangrove**: Salt-tolerant tropical trees growing in intertidal zones
- **Inland-Fresh Marsh**: Non-tidal freshwater herbaceous wetland
- **Tidal-Fresh Marsh**: Tidally influenced freshwater herbaceous wetland
- **Trans. Salt Marsh**: Transitional zone between salt marsh and upland
- **Regularly-Flooded Marsh**: Salt marsh flooded by most high tides
- **Irreg.-Flooded Marsh**: Salt marsh flooded only by spring or storm tides
- **Saltmarsh**: General category for salt marshes

### 9.1.3 Water Habitats

- **Estuarine Open Water**: Open water in estuaries
- **Open Water**: General category for open water
- **Inland Open Water**: Freshwater lakes and ponds
- **Open Ocean**: Marine waters beyond the shoreline
- **Tidal Creek**: Small tidal channels within marshes
- **Riverine Tidal**: Rivers influenced by tides

### 9.1.4 Beach and Flat Habitats

- **Estuarine Beach**: Beaches along estuarine shorelines
- **Ocean Beach**: Beaches along ocean shorelines
- **Tidal Flat**: Unvegetated intertidal areas
- **Ocean Flat**: Unvegetated areas in shallow ocean waters
- **Rocky Intertidal**: Rocky areas in the intertidal zone

### 9.1.5 Other Categories

- **Transitional**: Areas transitioning between habitat types
- **Inland Shore**: Shorelines of inland water bodies
- **Freshwater Tidal**: Areas with freshwater that are tidally influenced
- **Freshwater Non-Tidal**: Areas with freshwater not influenced by tides
- **Aggregated Non Tidal**: Combined category for non-tidal areas
- **Low Tidal**: Areas in the lower intertidal zone

*Note: Submerged Aquatic Vegetation SAV (sq.km) underwater plants are not included in this analysis*

These habitat types represent the full range of coastal ecosystems found in St. Lucie County and are the basis for tracking changes due to sea level rise. As sea level rises, habitats typically transition in a predictable sequence. For example, upland areas may become freshwater wetlands, freshwater wetlands may become brackish or salt marshes, salt marshes may become mangroves (in tropical areas like Florida), and mangroves may eventually become open water if they cannot keep pace with sea level rise. The SLAMM model results offer a framework for understanding habitat vulnerability and potential adaptation pathways in St. Lucie County. By comparing scenarios, stakeholders can assess the trade-offs between land protection strategies, ecosystem resilience, and long-term sustainability. These insights will directly inform coastal management, wetland conservation, and adaptation efforts for the region.

# 10.0 SEA LEVEL RISE PROJECTIONS

This section examines the projected sea level rise (SLR) trajectories for St. Lucie County based on two NOAA-defined scenarios: NOAA Intermediate Low (NIL) and NOAA Intermediate High (NIH). These projections help guide long-term resilience planning, habitat conservation, and climate adaptation strategies.

## 10.1 NOAA Intermediate Low (NIL)

The NOAA Intermediate Low (NIL) scenario, assumes:

- Decreased rate of sea level rise.
- Slower ocean thermal expansion.
- Moderate ice sheet loss from Antarctica and Greenland.

### 10.1.1 Description

This scenario represents a more optimistic future with substantial mitigation efforts.

### 10.1.2 SLR Values

The rate of sea level rise is more consistent over time than in the Intermediate High scenario, with the rate increasing from 0.20 inches/year in the 2020-2040 period to 0.22 inches/year in the 2040-2070 period, then maintaining a similar rate of 0.22 inches /year in the 2070-2100 period (**Table 10-1**).

Table 10-1. NOAA 2017 Intermediate Low Sea Level Rise values for the St Lucie County SLAMM model

| Year | SLR (eustatic) (m) | Inches | Feet | Cumulative Change |
|---|---|---|---|---|
| 2020 | 0.00 | 0.0 | 0.0 | Baseline |
| 2040 | 0.10 | 3.9 | 0.3 | +0.33ft in 20 years |
| 2070 | 0.27 | 10.6 | 0.9 | +0.56ft in next 30 years |
| 2100 | 0.44 | 17.3 | 1.4 | +0.56ft in final 30 years |

### 10.1.3 Key Characteristics

The Intermediate Low scenario leads to several distinctive outcomes:

- More gradual habitat transitions
  - Slower conversion of wetlands to open water
  - Less extensive loss of beaches and tidal flats
  - More limited inland migration of salt-influenced habitats
- Less expansion of estuarine open water
  - Moderate increase in water area in the Indian River Lagoon
  - Less conversion of mangroves and marshes to open water
  - Fewer changes in water quality and fisheries
- More preservation of mangroves and marshes

  - Slight increase 0.2 percent or approximately 153 acres of mangroves by 2100
  - 32.0 percent loss or approximately 133 acres of regularly-flooded marsh by 2100
  - Greater retention of habitat for wildlife
- Lower atmospheric carbon emissions
  - Less release of stored carbon as wetlands are preserved
  - Greater future carbon sequestration capacity
  - Reduced feedback from temperature increases

## 10.2 NOAA Intermediate High (NIH)

The NOAA Intermediate (NIH) scenario represents a higher sea level rise trajectory, assuming:

- Continued thermal expansion of ocean waters.
- Accelerated ice sheet loss from Antarctica and Greenland.
- Moderate net atmospheric greenhouse gases due to limited emissions reduction (aligned with RCP 4.5).

### 10.2.1 Description

This scenario represents a plausible future if current trends continue with some mitigation efforts.

### 10.2.2 SLR Values

The rate of sea level rise accelerates over time, with the rate increasing from 0.45 inches/year in the 2020-2040 period to 0.75 inches/year in the 2040-2070 period, then slightly increasing to 1.09 inches/year in the 2070-2100 period (**Table 10-2**).

Table 10-2. NOAA 2017 Intermediate High Sea Level Rise values for the St Lucie County SLAMM model

| Year | SLR (eustatic) (m) | Inches | Feet | Cumulative Change |
|---|---|---|---|---|
| 2020 | 0.00 | 0.0 | 0.0 | Baseline |
| 2040 | 0.23 | 9.1 | 0.8 | +0.75ft in 20 years |
| 2070 | 0.80 | 31.5 | 2.6 | +1.88ft in next 30 years |
| 2100 | 1.63 | 64.2 | 5.3 | +2.72ft in final 30 years |

### 10.2.3 Key Characteristics

The Intermediate High scenario leads to several distinctive outcomes:

- More rapid and severe habitat transitions
  - Faster conversion of wetlands to open water
  - More extensive loss of beaches and tidal flats
  - Greater inland migration of salt-influenced habitats
- Greater expansion of estuarine open water
  - Significant increase in water area in the Indian River Lagoon

  - Conversion of mangroves and marshes to open water
  - Potential changes in water quality and fisheries
- More significant loss of mangroves and marshes
  - Up to 94.3 percent loss or approximately 65,061.4 acres of mangroves by 2100
  - Up to 48.8 percent loss or approximately 197.44 acres of regularly-flooded marsh by 2100
  - Substantial reduction in habitat for wildlife
- Atmospheric carbon emissions
  - Coastal wetlands that are allowed to migrate have been found to sequester 5 to 9 times more carbon than coastal wetlands unaffected by sea level rise (Rogers et al, March 7, 2019)
  - Wetlands that are unable to migrate and become drowned rapidly release stored carbon
  - Lost wetlands result in reduced future carbon sequestration capacity
  - Potential feedback from increased temperatures

# 11.0 PROTECTION SCENARIOS

While many strategies exist for protecting natural and built environments, this assessment compares three protection scenarios: No Protection (no protective/management action taken), Protect All Dry Land, and Protect Developed Dry Land.

## 11.1 No Protection

### 11.1.1 Description

The No Protection scenario assumes no human intervention to mitigate the impacts of sea level rise, allowing natural processes such as inundation, erosion, and habitat migration to occur unimpeded. This serves as a baseline scenario for assessing the extent of environmental changes in the absence of adaptive measures.

Key assumptions under this scenario:

- No new coastal defenses such as dikes, levees, or seawalls are constructed.
- Existing infrastructure remains unchanged and is not elevated or modified.
- Coastal and inland habitats transition naturally based on sea level rise projections.
- Both developed and undeveloped areas are affected by rising water levels and coastal changes.

This scenario is useful for identifying the most vulnerable regions and serves as a benchmark against which other protection strategies can be compared. In certain areas with low development density and high ecological value, a No Protection approach may be considered a viable option.

### 11.1.2 Key Characteristics

The No Protection scenario results in several significant environmental outcomes:

- **Maximum dry land loss:** Both developed and undeveloped lands are susceptible to inundation.
- **Greatest transition to open water:** Coastal wetlands experience extensive conversion to estuarine waters.
- **Rapid habitat changes:** The highest rates of habitat transformation and migration occur.
- **Provides a comparative baseline:** Highlights the full extent of sea level rise impacts and helps assess the effectiveness of intervention strategies.

While this scenario represents a "do-nothing" approach, it reflects an intentional decision to allow natural landscape shifts in response to environmental changes.

### 11.1.3 NOAA Intermediate Low (NIL) - No Protection

#### 11.1.3.1 Habitat Changes by Year

Table 11-1. NOAA Intermediate Low Habitat Change by Year with Percentage change from Baseline – No Protection

| Habitat Type | 2020 (acres) | 2040 (acres) | 2070 (acres) | 2100 (acres) | Change 2020-2100 (acres) | Change 2020-2100 (%) |
|---|---|---|---|---|---|---|
| Developed Dry Land | 682, 390.09 | 682,383.18 | 682,316.95 | 682,236.64 | -153.42 | -0.02% |
| Undeveloped Dry Land | 2,397,649.68 | 2,397,631.89 | 2,397,529.10 | 2,397,377.62 | -272.16 | -0.01% |
| Swamp | 189,752.13 | 189,735.92 | 189,630.72 | 189,493.31 | -258.81 | -0.14% |
| Cypress Swamp | 152,206.85 | 152,206.38 | 152,203.09 | 152,194.05 | -12.80 | -0.01% |
| Mangrove | 68,999.62 | 69,165.83 | 68,951.04 | 69,109.98 | 110.36 | 0.16% |
| Inland-Fresh Marsh | 164,953.95 | 164,953.68 | 164,950.07 | 164,948.32 | -5.63 | 0.00% |
| Regularly-Flooded Marsh | 404.56 | 367.49 | 314.64 | 271.77 | -132.79 | -32.82 |
| Estuarine Open Water | 19,749.05 | 24,474.81 | 25,673.74 | 26,325.63 | 6,576.67 | 33.30% |

#### 11.1.3.2 Spatial Distribution of Changes

**Table 11-1** reveals several important patterns under the NIL 'No Protection' scenario:

1. **Coastal Areas**: Moderate changes in low-lying coastal areas
2. **Inland Areas**: Minimal changes in inland areas
3. **Wetland Areas**: Gradual transition of wetlands to open water

### 11.1.4 NOAA Intermediate High (NIH) - No Protection

This scenario combines the higher sea level rise trajectory with no protection measures, representing a "do nothing" approach under more severe sea level rise conditions.

#### 11.1.4.1 Habitat Changes by Year

Table 11-2. NOAA Intermediate High Habitat Change by Year with Percentage change from Baseline – No Protection

| Habitat Type | 2020 (acres) | 2040 (acres) | 2070 (acres) | 2100 (acres) | Change 2020-2100 (acres) | Change 2020-2100 (%) |
|---|---|---|---|---|---|---|
| Developed Dry Land | 682,390.09 | 682,350.56 | 681,525.96 | 677,792.46 | -4,597.73 | -0.67% |
| Undeveloped Dry Land | 2,397,649.68 | 2,397,575.80 | 2,395,907.59 | 2,391,294.39 | -6,355.37 | -0.27% |
| Swamp | 189,752.13 | 189,552.17 | 187,083.86 | 178,941.98 | -10,810.15 | -5.70% |
| Cypress Swamp | 152,206.85 | 152,197.68 | 151,936.12 | 151,028.70 | -1,178.15 | -0.77% |
| Mangrove | 68,999.62 | 59,098.32 | 26,295.93 | 3,938.26 | -65,061.26 | -94.29% |
| Inland-Fresh Marsh | 164,953.95 | 164,948.25 | 164,875.99 | 164,724.86 | -229.09 | -0.14% |

| Habitat Type | 2020 (acres) | 2040 (acres) | 2070 (acres) | 2100 (acres) | Change 2020-2100 (acres) | Change 2020-2100 (%) |
|---|---|---|---|---|---|---|
| Regularly-Flooded Marsh | 404.56 | 290.79 | 65.95 | 207.17 | -197.39 | -48.79% |
| Estuarine Open Water | 19,749.05 | 35,460.93 | 74,283.72 | 98,406.33 | 78,657.28 | 398.28% |

#### 11.1.4.2 Spatial Distribution of Changes

**Table 11-2** reveals several important patterns:

1. **Minimal dry land impacts**: Despite the higher sea level rise scenario, dry land losses remain below 1 percent, approximately 10,900 acres, indicating that most developed and undeveloped areas are above the projected inundation levels.

2. **Severe mangrove loss**: Mangroves show a dramatic decline of over 94 percent, approximately 64,250 acres, with losses accelerating over time. This represents a significant loss of critical coastal habitat.

3. **Loss of regularly-flooded marsh**: With a decline of nearly 48 percent, approximately 195 acres, regularly-flooded marshes are significantly reduced by 2100.

4. **Dramatic expansion of estuarine open water**: A 398 percent increase, approximately 77,000 acres, in estuarine open water represents a fundamental transformation of coastal areas, with significant implications for ecosystems and human use.

5. **Significant increase in atmospheric carbon emissions**: The GHG values become increasingly negative over time, indicating substantial carbon emissions as wetlands are lost.

Based on the percentage loss by 2100 under the NOAA Intermediate High (NIH) sea level rise scenarios with no protection measures, the most vulnerable habitats are: (1) Mangroves (-94.29 percent or –65,061.26 acres), (2) Regularly-Flooded Marsh (-48.79 percent or -197.39 acres), (3) Swamp (-5.70 percent or –10,810.15 acres), and (4) Dry Land (-0.94 percent or -10,953.10 acres). This vulnerability ranking highlights the disproportionate impact of sea level rise on coastal wetland ecosystems and sandy shorelines, which face extensive habitat conversion and loss under the higher sea level rise trajectory. The extreme vulnerability of mangroves and beach habitats underscores the urgent need for targeted conservation and adaptation strategies to preserve these critical coastal ecosystems.

## 11.2 Protect All Dry Land

### 11.2.1 Description

The Protect All Dry Land scenario assumes full protection of all developed and undeveloped dry land areas against sea level rise. This approach prioritizes land preservation through engineered infrastructure such as levees, seawalls, and drainage systems. While it prevents the loss of land, it does not include measures to protect wetlands, marshes, or intertidal zones, leading to significant ecological consequences.

Under this scenario:

- Urban, residential, commercial, and industrial areas are fully protected.
- Undeveloped upland areas are also safeguarded against inundation.
- Protection is assumed to be 100 percent effective, with no infrastructure failures.
- Wetlands, marshes, and coastal ecosystems remain unprotected and are subject to sea level rise.

This scenario represents an aggressive protection strategy that maintains human infrastructure but alters natural coastal processes.

### 11.2.2 Key Characteristics

The Protect All Dry Land scenario leads to several distinctive outcomes:

- Preservation of all dry land: Ensures no loss of developed or undeveloped dry land.
- Significant wetland losses: Coastal squeeze prevents wetland migration, leading to habitat loss.
- Altered hydrology: Infrastructure changes drainage and sediment flow patterns.
- Accelerated wetland conversion: Wetlands convert to open water more quickly due to restricted inland migration.
- Potential for increased erosion: Protection structures may exacerbate erosion at their edges.

### 11.2.3 NOAA Intermediate Low (NIL) - Protect All Dry Land

#### 11.2.3.1 Habitat Changes by Year

Table 11-3. NOAA Intermediate Low Habitat Change by Year with Percentage change from Baseline – Protect All Dry Lands

| Habitat Type | 2020 (acres) | 2040 (acres) | 2070 (acres) | 2100 (acres) | Change 2020-2100 (acres) | Change 2020-2100 (%) |
|---|---|---|---|---|---|---|
| Developed Dry Land | 682,391.14 | 682,391.14 | 682,391.14 | 682,391.14 | 0.00 | 0.00 |
| Undeveloped Dry Land | 2,397,653.38 | 2.397,579.42 | 2,395,911.31 | 2,391,298.27 | -6,355.2 | -0.27 |
| Swamp | 189,752.42 | 189,552.46 | 187,083.8 | 178,941.75 | -10,810.66 | -5.70 |
| Cypress Swamp | 152,207.08 | 152,197.91 | 151,936.35 | 151,028.93 | -1,178.14 | -0.77 |
| Mangrove | 68,999.72 | 59,098.41 | 26,296.23 | 3,938.39 | -65,061.33 | -94.29 |
| Inland-Fresh Marsh | 164,954.2 | 164,948.5 | 164,876.19 | 164,725.01 | -229.19 | -0.14 |
| Regularly-Flooded Marsh | 404.56 | 290.79 | 65.95 | 207.17 | -197.38 | -48.79 |
| Estuarine Open Water | 19,749.08 | 35,460.98 | 74,283.83 | 98,406.6 | 78,657.52 | 398.28 |

#### 11.2.3.2 Spatial Distribution of Changes

**Table 11-3** reveals several important patterns:

1. **Protected Areas**: No change in developed and undeveloped dry land
2. **Wetland Areas**: Gradual transition of wetlands to open water
3. **Transition Zones**: Sharp boundaries between protected and unprotected areas

### 11.2.4 NOAA Intermediate High (NIH) - Protect All Dry Land

This scenario combines the higher sea level rise trajectory with comprehensive protection of all dry land, representing an aggressive protection approach under more severe sea level rise conditions.

#### 11.2.4.1 Habitat Changes by Year

Table 11-4. NOAA Intermediate Habitat Change by Year with Percentage change from Baseline – Protect All Dry Lands

| Habitat Type | 2020 (acres) | 2040 (acres) | 2070 (acres) | 2100 (acres) | Change 2020-2100 (acres) | Change 2020-2100 (%) |
|---|---|---|---|---|---|---|
| Developed Dry Land | 682,391.14 | 682,391.17 | 682,396.17 | 682,391.17 | 0.00 | 0.00 |
| Undeveloped Dry Land | 2,397,653.38 | 2,397,647.5 | 2,397,504.0 | 2,397,132.95 | -520.52 | -0.02 |
| Swamp | 189,752.42 | 189,555.27 | 187,112.46 | 178,999.28 | -10,753.13 | -5.67 |
| Cypress Swamp | 152,207.08 | 152,198.40 | 151,955.69 | 151,051.24 | -1,155.83 | -0.76 |
| Mangrove | 68,999.72 | 59,030.83 | 24,749.39 | 2,727.96 | -66,271.76 | -96.05 |
| Inland-Fresh Marsh | 164,954.20 | 164,948.50 | 164,876.66 | 164,727.34 | -226.86 | -0.14 |
| Regularly-Flooded Marsh | 404.56 | 290.79 | 65.95 | 198.40 | -206.16 | -50.96 |
| Estuarine Open Water | 19,749.08 | 35,460.98 | 74,283.68 | 97,972.02 | 78,222.93 | 396.08 |

### 11.2.4.2 Spatial Distribution of Changes

**Table 11-4** reveals several important patterns:

1. **Complete protection of developed dry land**: As expected, there is no loss of developed dry land under this scenario.
2. **Near-complete protection of undeveloped dry land**: Undeveloped dry land shows only a minimal loss of 0.01%, 26.31 acres, representing a significant improvement over the No Protection scenario.
3. **Similar wetland losses**: Despite the protection of dry land, wetland losses are similar to or slightly worse than the No Protection scenario, indicating that protection does not benefit wetlands.
4. **Slightly worse mangrove loss**: Mangroves show a slightly higher loss rate (56.77 percent) compared to the No Protection scenario (54.57 percent), suggesting that protecting dry land may actually increase pressure on mangroves.
5. **Similar water expansion**: The expansion of estuarine open water is nearly identical to the No Protection scenario, indicating that protection of dry land does not significantly affect this process.

The slightly worse outcomes for mangroves under the Protect All Dry Land scenario demonstrate the "coastal squeeze" effect. When sea levels rise, wetlands would naturally migrate inland. Protection of structures prevents this migration, resulting in greater wetland loss than would occur under natural conditions.

## 11.3 Protect Developed Dry Land

### 11.3.1 Description

The Protect Developed Dry Land scenario prioritizes human infrastructure by safeguarding only developed areas (urban, residential, commercial, and industrial). Unlike the Protect All Dry Land scenario, this strategy allows undeveloped areas to undergo natural processes, permitting some wetland migration.

Under this scenario:

- All developed areas are protected.
- Undeveloped uplands remain unprotected.
- Wetlands and other coastal habitats continue to evolve naturally.
- Infrastructure investments are more targeted, reducing overall protection costs.

This approach represents a compromise between full protection and unmanaged retreat.

### 11.3.2 Key Characteristics

The Protect Developed Dry Land scenario leads to several distinctive outcomes:

- Full protection of human infrastructure: Ensures no loss of developed areas.
- Allows natural adaptation of undeveloped areas: Supports some wetland migration.
- Less extreme coastal squeeze: Wetlands adjacent to undeveloped land have room to migrate.
- Moderate habitat loss: Coastal habitats still face sea level rise impacts.

The Protect Developed Dry Land scenario represents a compromise between full protection and no protection. It prioritizes protection of human infrastructure while allowing natural processes to occur in undeveloped areas. This approach may be more feasible from both economic and ecological perspectives.

### 11.3.3 NOAA Intermediate Low (NIL) - Protect Developed Dry Land

#### 11.3.3.1 Habitat Changes by Year

Table 11-5. NOAA Intermediate Low Habitat Change by Year with Percentage change from Baseline – Protect Developed Dry Lands

| Habitat Type | 2020 (acres) | 2040 (acres) | 2070 (acres) | 2100 (acres) | Change 2020-2100 (acres) | Change 2020-2100 (%) |
|---|---|---|---|---|---|---|
| Developed Dry Land | 682,390.09 | 682,390.09 | 682,390.09 | 682,390.09 | 0.00 | 0.00 |
| Undeveloped Dry Land | 2,397,649.68 | 2,397,631.89 | 2,397,529.10 | 970,185.80 | -110.14 | -0.01 |
| Swamp | 76,790.08 | 76,783.52 | 76,740.95 | 76,685.34 | -104.74 | -0.14 |
| Cypress Swamp | 61,596.02 | 61,595.83 | 61,594.50 | 61,590.84 | -5.18 | -0.01 |
| Mangrove | 27923.20 | 27,990.46 | 27,903.54 | 27,967.86 | 44.66 | 0.16 |
| Inland-Fresh Marsh | 66,754.60 | 66,754.49 | 66,753.03 | 66,752.32 | -2.28 | 0.00 |

| Habitat Type | 2020 (acres) | 2040 (acres) | 2070 (acres) | 2100 (acres) | Change 2020-2100 (acres) | Change 2020-2100 (%) |
|---|---|---|---|---|---|---|
| Regularly-Flooded Marsh | 163.72 | 148.72 | 127.33 | 109.98 | -53.74 | -32.82 |
| Estuarine Open Water | 7,992.17 | 9,904.62 | 10,389.81 | 10,653.66 | 2,661.49 | 33.30 |

#### 11.3.3.2 Spatial Distribution of Changes

The spatial distribution of changes under the NIL Protect Developed Dry Land scenario shows (**Table 11-5**):

1. **Protected Areas**: No change in developed dry land
2. **Unprotected Areas**: Gradual transition of wetlands to open water
3. **Transition Zones**: Sharp boundaries between protected and unprotected areas

### 11.3.4 NOAA Intermediate High (NIH) - Protect Developed Dry Land

This scenario combines the higher sea level rise trajectory with targeted protection of only developed dry land, representing a more balanced protection approach under more severe sea level rise conditions.

#### 11.3.4.1 Habitat Changes by Year

**Table 11-6** shows the projected habitat areas and changes over time under this scenario:

Table 11-6. NOAA Intermediate Habitat Change by Year with Percentage change from Baseline – Protect Developed Dry Lands

| Habitat Type | 2020 (acres) | 2040 (acres) | 2070 (acres) | 2100 (acres) | Change 2020-2100 (acres) | Change 2020-2100 (%) |
|---|---|---|---|---|---|---|
| Developed Dry Land | 682,391 | 682,391.14 | 682,391.14 | 682,391.14 | 0.00 | 0.00 |
| Undeveloped Dry Land | 2,397,653 | 2.397,579 | 2,395,9111 | 2,391,298.27 | -6,355.2 | -0.27 |
| Swamp | 189,752 | 189,552.46 | 187,083.8 | 178,941.75 | -10,810.66 | -5.70 |
| Cypress Swamp | 152,207 | 152,197.91 | 151,936.35 | 151,028.93 | -1,178.14 | -0.77 |
| Mangrove | 68,999 | 59,098.41 | 26,296.23 | 3,938.39 | -65,061.33 | -94.29 |
| Inland-Fresh Marsh | 164,954.2 | 164,948.5 | 164,876.19 | 164,725.01 | -229.19 | -0.14 |
| Regularly-Flooded Marsh | 404.56 | 290.79 | 65.95 | 207.17 | -197.38 | -48.79 |
| Estuarine Open Water | 19,749.08 | 35,460.98 | 74,283.83 | 98,406.6 | 78,657.52 | 398.28 |

#### 11.3.4.2 Spatial Distribution of Change

**Table 11-6** reveals several important patterns:

1. **Complete protection of developed dry land**: As expected, there is no loss of developed dry land under this scenario.

2. **Same undeveloped dry land loss as No Protection**: Undeveloped dry land shows the same loss as under No Protection, indicating that this strategy does not protect undeveloped areas.
3. **Same wetland losses as No Protection**: Wetland losses are identical to the No Protection scenario, suggesting that protecting only developed dry land does not affect wetland dynamics.
4. **Same water expansion as No Protection**: The expansion of estuarine open water is identical to the No Protection scenario.
5. **Slightly better carbon emissions than Protect All Dry Land**: Carbon emissions are slightly lower than under Protect All Dry Land, suggesting that allowing natural processes in undeveloped areas may have slight carbon benefits.

The data shows that protection strategies are highly effective for preserving developed dry land but have minimal or even slightly negative effects on wetland preservation. This suggests that protection strategies should be carefully targeted and combined with wetland conservation measures to achieve comprehensive resilience.

## 11.4 Protection Strategy Parameter Comparison

The results of the SLAMM analysis indicate that the 3 different protection strategies are highly effective for preserving developed dry land but have minimal or even slightly negative effects on wetland preservation. This suggests that protection strategies should be carefully targeted and combined with wetland conservation measures to achieve comprehensive resilience.

The spatial distribution of changes suggests that adaptation and conservation efforts should prioritize the Indian River Lagoon and North Fork St. Lucie River areas, where the most significant changes are projected to occur. These areas may require more immediate and intensive management interventions such as:

- Replacing seawalls and ripraps where possible with natural shorelines to allow mangroves and salt marshes to migrate inland as sea levels rise.
- Increase land acquisition and restoration efforts for undeveloped parcels along the Indian River Lagoon and North Fork St. Lucie to maintain and expand existing mangrove and salt marsh habitats.
- Consider large-scale restoration projects such as the creation of barrier islands and tidal flats to increase area of mangroves and salt marshes in the Indian River Lagoon, while also facilitating habitat migration.

# 12.0 PLANNING HORIZONS

## 12.1 Initial Conditions (2020)

### 12.1.1 Description

The initial conditions represent the baseline land cover at the start of the simulation. For St. Lucie County, the baseline year is 2020, which corresponds to the most recent comprehensive land cover data available (**Figure 12-1** and **Figure 12-2**).

The initial conditions serve several important purposes:

- Provide a starting point for all model simulations
- Establish a baseline for measuring changes
- Document the current distribution of habitats
- Serve as a reference for validation

Understanding the initial distribution of habitats is essential for interpreting the projected changes and identifying the most vulnerable areas.

### 12.1.2 Spatial Distribution

The spatial distribution of habitats in the initial conditions shows several important patterns:

1. Coastal Zone:
    - Narrow band of beaches along the Atlantic coast
    - Mangroves concentrated in protected coastal areas
    - Regularly-flooded marsh in limited areas adjacent to mangroves
2. Estuarine Zone:
    - Estuarine open water in the Indian River Lagoon
    - Mangroves along the estuarine shoreline
    - Transitional areas between estuarine and freshwater systems
3. Inland Zone:
    - Swamps and cypress swamps in low-lying inland areas
    - Inland-fresh marsh in scattered wetland complexes
    - Developed and undeveloped dry land in higher elevation areas

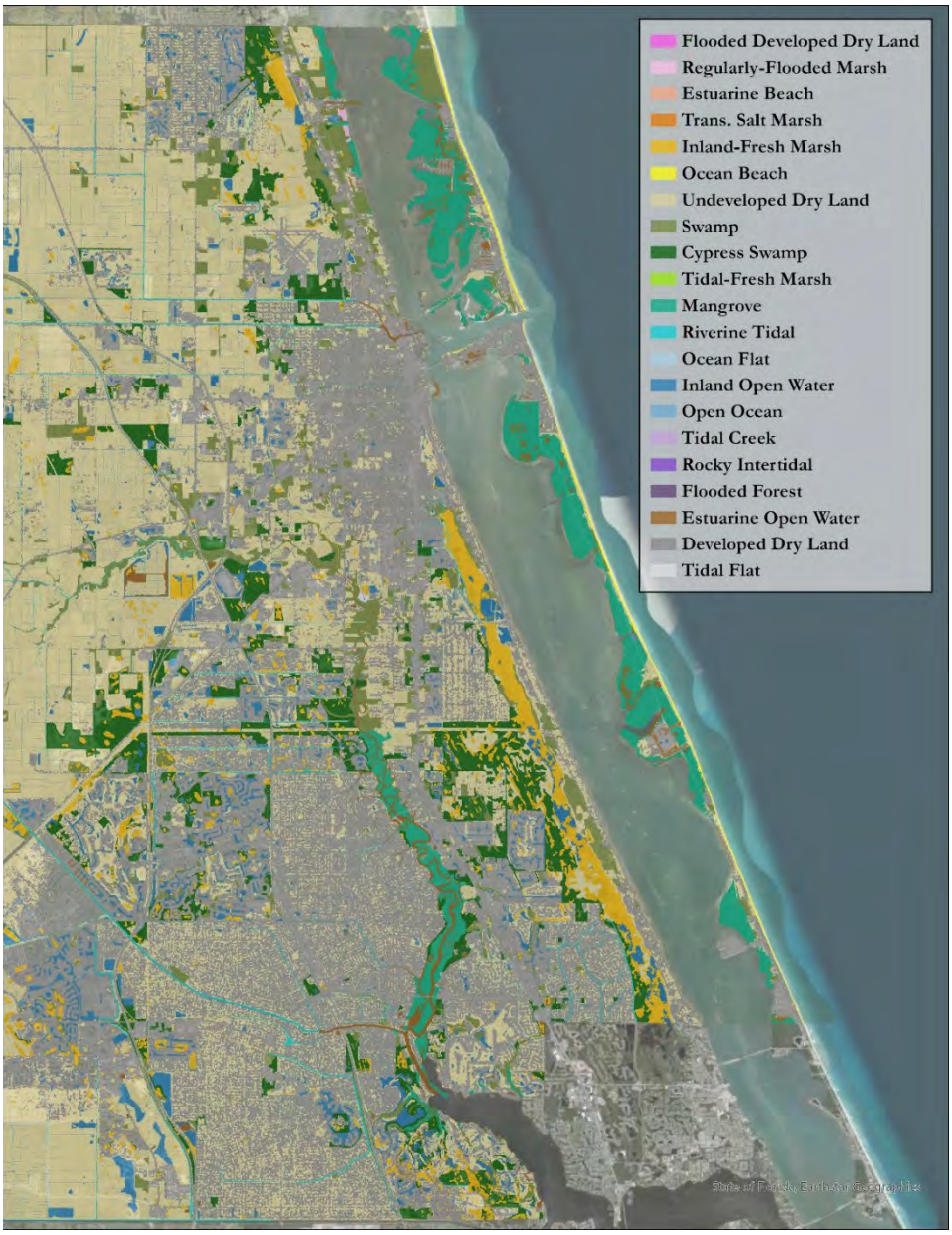



Figure 12-1. Map of SLAMM's initial input condition adjusted to fit SLR curve for baseline NOAA Intermediate Low

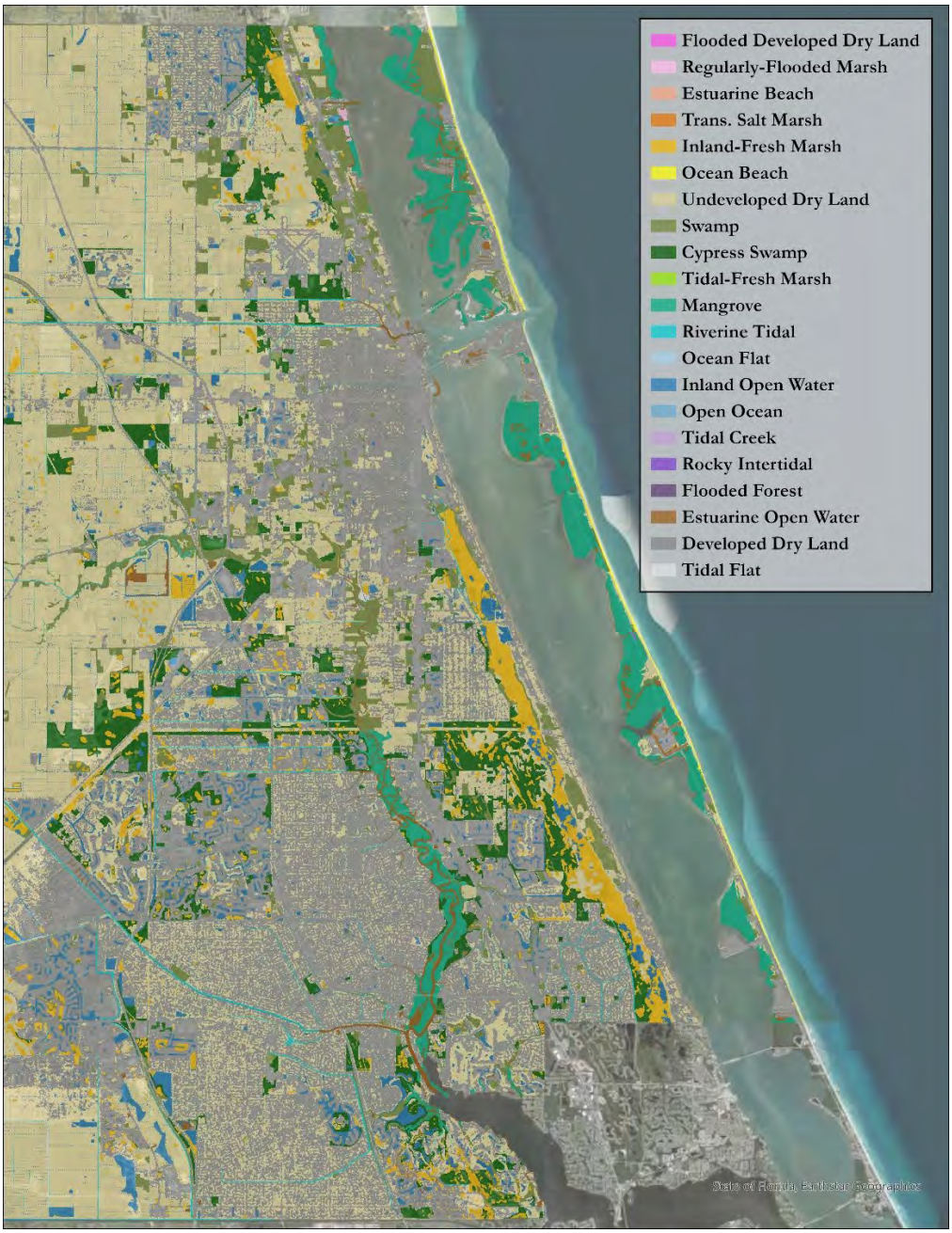



Figure 12-2. Map of SLAMM's initial input condition adjusted to fit SLR curve for baseline NOAA Intermediate High

### 12.1.3 Habitat Distribution

**Table 12-1** shows the distribution of key habitat types in the 2020 conditions:

Table 12-1. Distribution of initial condition habitat types

| Habitat Type | Area (acres) | Percentage of Total |
|---|---|---|
| Developed Dry Land | 682,391.17 | 10.3% |
| Undeveloped Dry Land | 2,397,653.48 | 36.2% |
| Swamp | 189,752.42 | 2.9% |
| Cypress Swamp | 152207.08 | 2.3% |
| Mangrove | 68,999.72 | 1.0% |
| Inland-Fresh Marsh | 164954.20 | 2.5% |
| Regularly-Flooded Marsh | 404.56 | 0.01% |
| Estuarine Open Water | 19,749.08 | 0.3% |
| Open Ocean | 158,092.80 | 5.9% |
| Other | 1,038,421.56 | 38.7% |
| Total | 2,684,184.00 | 100.0% |

This distribution shows that St. Lucie County is dominated by dry land (46.5 percent or 3,080,045.18 acres combined developed and undeveloped), with significant areas of swamp, cypress swamp, and inland-fresh marsh. Mangroves and regularly-flooded marsh occupy relatively small areas but provide important ecosystem services.

## 12.2 Near-term (2040)

The near-term planning horizon (2040) represents conditions approximately 20 years from the baseline.

### 12.2.1 Description

This timeframe is relevant for immediate planning and adaptation strategies, including:

- Current comprehensive planning cycles
- Infrastructure planning and investment
- Near-term conservation priorities
- Adaptation planning for existing development

This planning horizon is most relevant for current decision-makers and represents changes that may occur within their tenure or professional careers.

### 12.2.2 SLR Values

The sea level rise values for 2040 vary by scenario:

- NOAA Intermediate Low (NIL): 3.9 inches
  - This represents a rate of 0.20 inches/year from 2020
  - Approximately 2.2 times the historic rate of 0.09 inches/year

- NOAA Intermediate High (NIH): 9.1 inches
  - This represents a rate of 0.45 inches/year from 2020
  - Approximately 5.0 times the historic rate of 0.09 inches/year

These values represent a significant acceleration from historic rates but are within the range of current observations in some locations.

The 2040 timeframe aligns with typical comprehensive planning cycles (15-20 years) and infrastructure planning horizons. Decisions made today about infrastructure investments, land use planning, and conservation priorities will be directly affected by the sea level rise projected for this period.

### 12.2.3 Projected Changes

By 2040, the model projects relatively minor changes in habitat distribution under both sea level rise scenarios (**Table 12-2**, **Figure 12-3**, and **Figure 12-4**):

Table 12-2. Relative differences between projected NIL and NIH conditions in 2040 - No Protection

| Habitat Type | NIL No Protection Change (%) | NIH No Protection Change (%) | Difference |
|---|---|---|---|
| Developed Dry Land | -0.01% | -0.02% | 0.01% |
| Undeveloped Dry Land | -0.01% | -0.01% | 0.00% |
| Swamp | -0.05% | -0.03% | -0.02% |
| Cypress Swamp | 0.00% | 0.00% | 0.00% |
| Mangrove | +0.24% | -14.35% | 14.59% |
| Inland-Fresh Marsh | 0.00% | 0.00% | 0.00% |
| Regularly- Flooded Marsh | -9.16% | -28.12% | 18.96% |
| Estuarine Open Water | +23.93% | +79.55% | 56.62% |

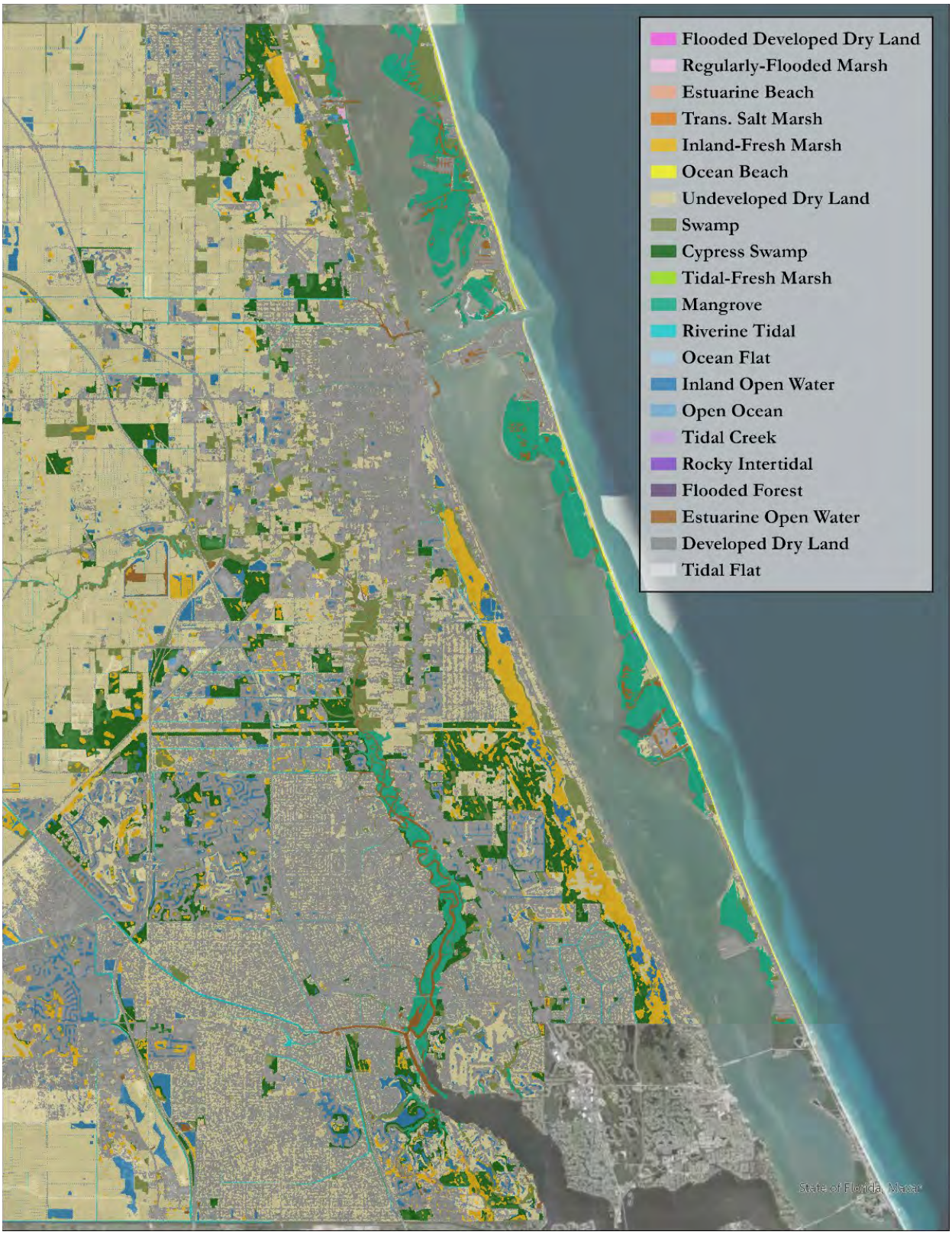



Figure 12-3. St Lucie County 2040 SLAMM habitat change results – NOAA Intermediate Low

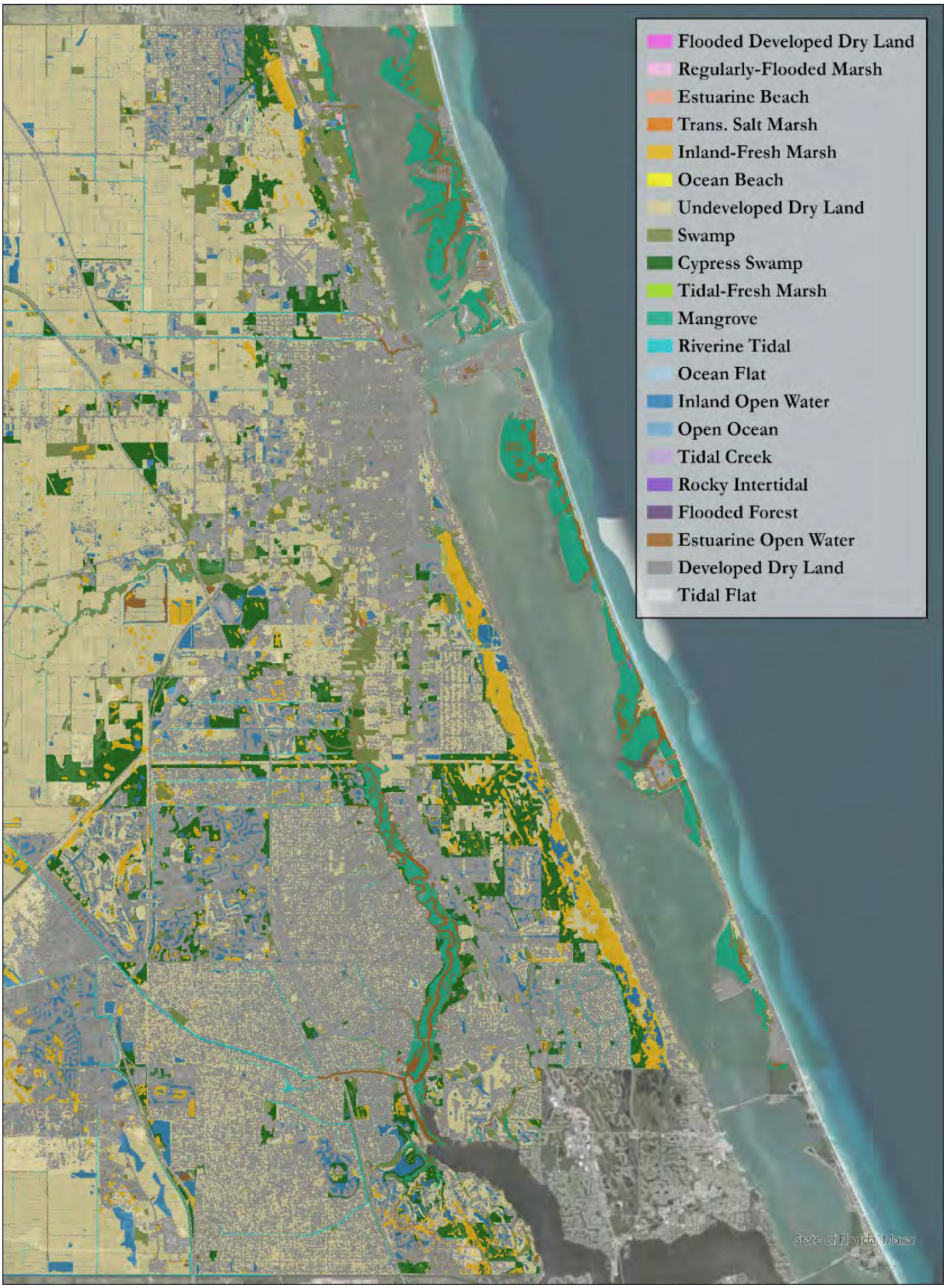



Figure 12-4. St. Lucie County 2040 SLAMM habitat change results - NOAA Intermediate High

These changes show that by 2040:

- Dry land shows minimal impacts under both scenarios
- Mangroves show slight increase under NIL (24%) but moderate loss (14.4%) under NIH
- Regularly- flooded marsh shows moderate loss under NIL (9.16%) and significant loss (28.1%) under NIH
- Estuarine open water shows significant increase under both scenarios, with a much larger increase under NIH.

The relatively minor changes by 2040 suggest that there is time to implement monitoring, planning, and conservation measures before more significant impacts occur. However, the differences between scenarios highlight the importance of monitoring actual sea level rise trends to determine which trajectory is unfolding.

### 12.2.4 Key Characteristics

The near-term (2040) planning horizon under both scenarios (NIL and NIH) shows several distinctive patterns:

- Minor to moderate habitat changes
  - Initial signs of habitat transitions
  - Beginning of wetland losses
  - Early expansion of estuarine open water
- Beginning of wetland transitions
  - Slight mangrove increase under NIL scenario
  - 14.4% mangrove loss under NIH Scenario
  - 28.1% regularly-flooded marsh loss under NIH Scenario
- Limited dry land impacts
  - Minimal loss of developed and undeveloped dry land
  - Impacts primarily limited to lowest-lying areas
  - Protection strategies highly effective
- Initial carbon emission increases
  - Beginning of release of carbon into atmosphere from wetland loss
  - Similar level of emissions across scenarios and protection strategies

### 12.2.5 Protection Strategy Effectiveness

By 2040, protection strategies show minimal differences in outcomes compared to the No Protection scenario, as shown in **Table 12-3**.

Table 12-3. Relative differences between projected NIL and NIH conditions in 2040 - Protection Strategy Comparisons

| Habitat Type | NIL Protect All Dry Land | NIL Protect Developed Dry Land | NIH Protect All Dry Land | NIH Protect Developed Dry Land |
|---|---|---|---|---|
| Developed Dry Land | 0.00% | 0.00% | 0.00% | 0.00% |
| Undeveloped Dry Land | 0.00% | -0.01% | 0.00% | -0.01% |
| Mangrove | +0.22% | +0.24% | -14.45% | -14.35% |
| Regularly-Flooded Marsh | -9.16% | -9.16% | -28.12% | -28.12% |
| Estuarine Open Water | +23.93% | +23.93% | +79.55% | +79.55% |

These results show that by 2040:

- Protection strategies effectively preserve dry land, though impacts are minimal even under No Protection
- Protection strategies have negligible effect on wetland habitats
- The differences between protection strategies are minimal at this timeframe

The minimal differences between protection strategies by 2040 suggest that near-term management decisions should focus on monitoring, planning, and conservation rather than major protection infrastructure. This provides time to develop and implement more targeted adaptation strategies based on observed trends.

## 12.3 Mid-term (2070)

### 12.3.1 Description

The mid-term planning horizon represents conditions approximately 50 years from the baseline. This timeframe is relevant for infrastructure planning and long-term adaptation strategies, including:

- Long-term infrastructure planning
- Building and facility lifespans
- Mortgage and financing timeframes
- Generational planning

This planning horizon is relevant for long-term investments and represents changes that may occur within the lifetime of current young adults (**Figure 12-5** and **Figure 12-6**).

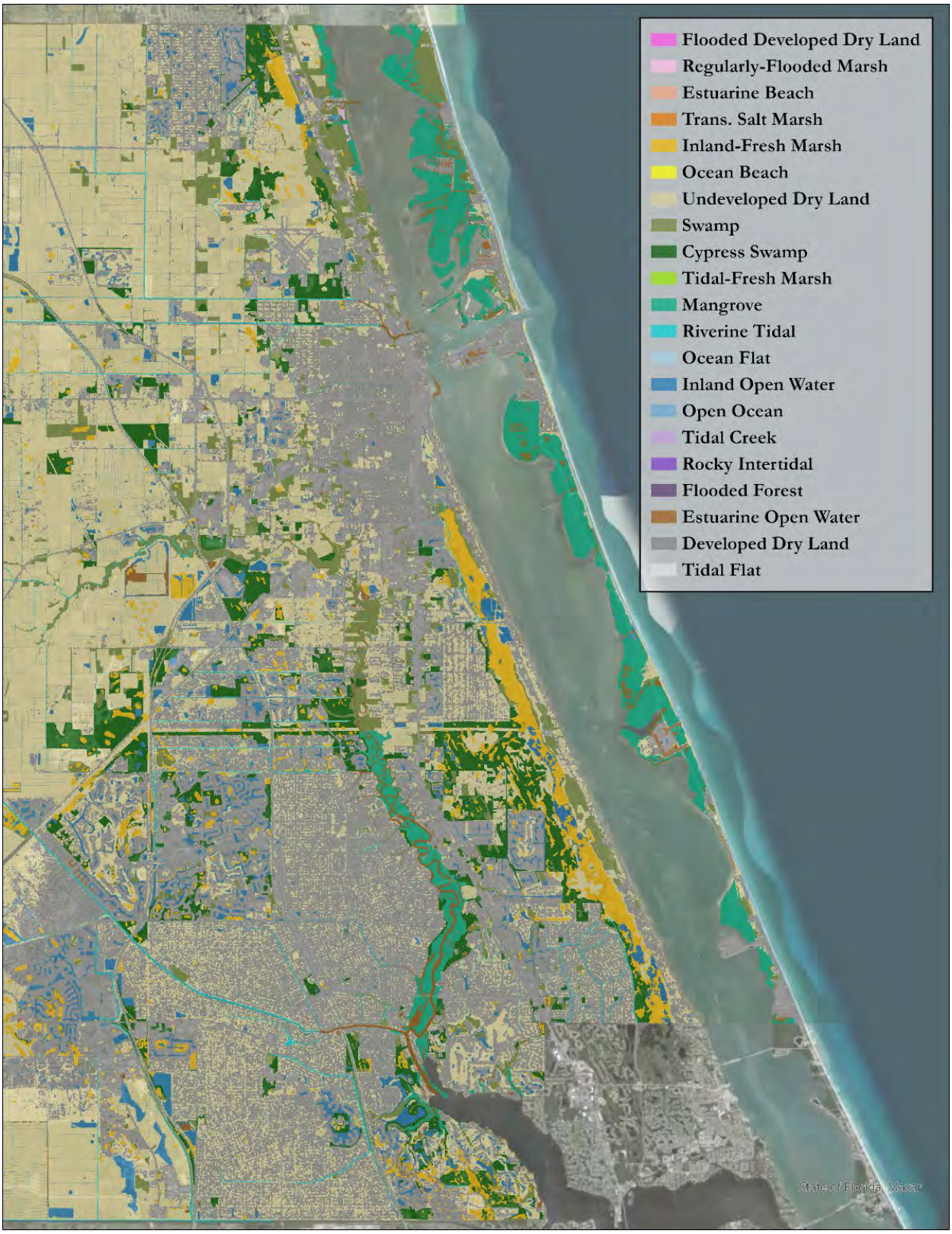



Figure 12-5. St. Lucie County 2070 SLAMM habitat change results – NOAA Intermediate Low

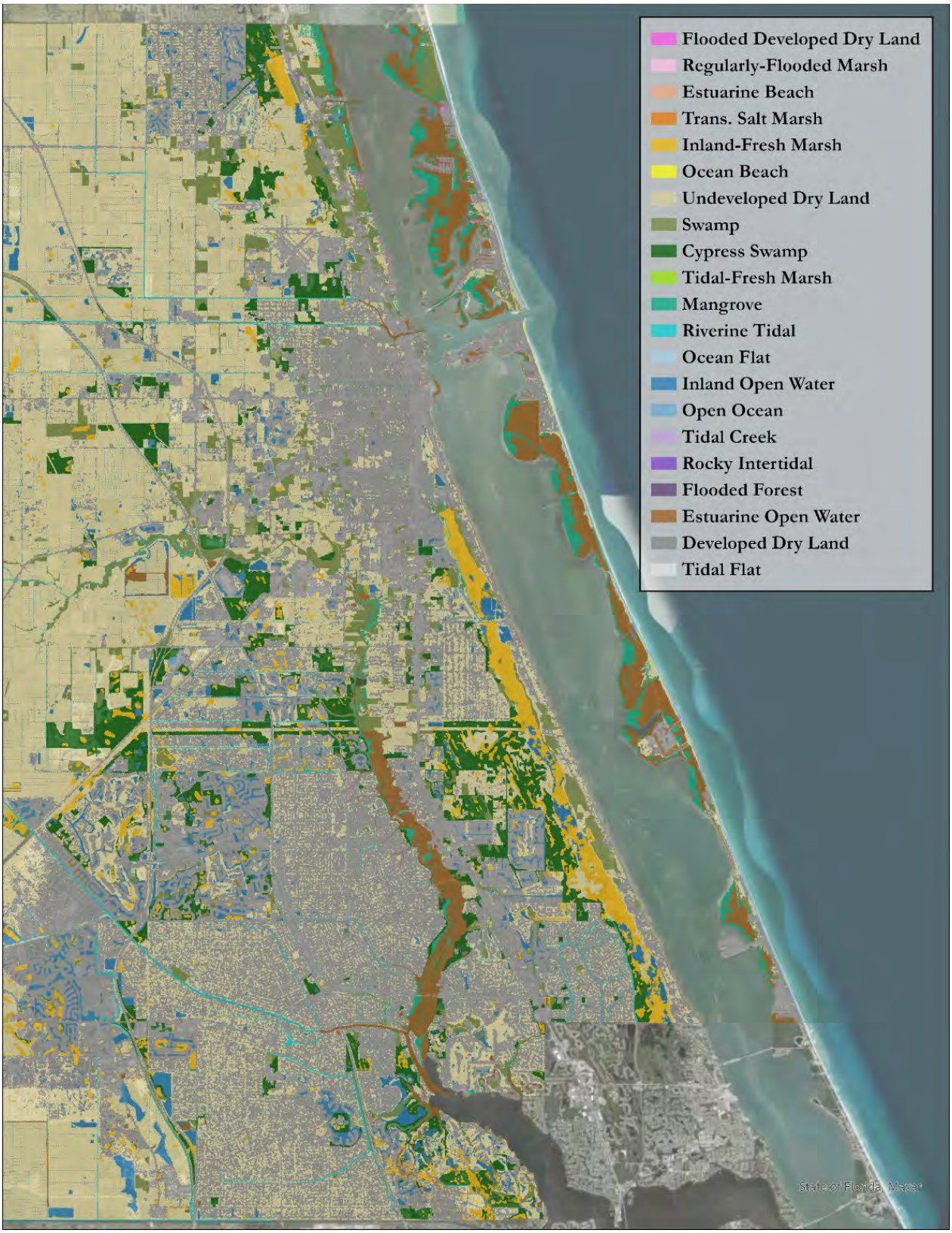



Figure 12-6. St. Lucie County 2070 SLAMM habitat change results – NOAA Intermediate High

### 12.3.2 SLR Values

The sea level rise values for 2070 vary significantly by scenario:

- NOAA Intermediate Low (NIL): 10.6 inches
  - This represents a rate of 0.09 inches/year from 2040
  - Approximately 2.5 times the historic rate of 0.09 inches/year
- NOAA Intermediate High (NIH): 31.5 inches
  - This represents a rate of 0.75 inches/year from 2040
  - Approximately 8.2 times the historic rate of 2.32 mm/year

These values represent a substantial difference between scenarios, with the NIH Scenario showing nearly twice the sea level rise of the NIL scenario.

Many infrastructure investments made today (roads, bridges, water/sewer systems, buildings) have design lifespans of 50+ years, meaning they will still be in service in 2070. The sea level rise projected for this period should be considered in current infrastructure design and investment decisions.

### 12.3.3 Projected Changes

By 2070, the model projects more significant changes in habitat distribution, with substantial differences between sea level rise scenarios (**Table 12-4**).

Table 12-4. Relative differences between projected NIL and NIH conditions in 2070 - No Protection

| Habitat Type | NIL No Protection Change (%) | NIH No Protection Change (%) | Difference |
|---|---|---|---|
| Developed Dry Land | -0.02% | -0.13% | 0.11% |
| Undeveloped Dry Land | -0.01% | -0.07% | 0.06% |
| Swamp | -0.06% | -1.40% | 1.34% |
| Cypress Swamp | 0.00% | -0.18% | 0.18% |
| Mangrove | -0.07% | -61.89% | 61.82% |
| Inland-Fresh Marsh | 0.00% | -0.05% | 0.05% |
| Regularly-Flooded Marsh | -22.23% | -83.70% | 61.47% |
| Estuarine Open Water | +30.00% | +276.14% | 246.14% |

These changes show that by 2070:

- Mangroves show minimal loss under NIL (0.07%) but severe loss (61.89%) under NIH
- Regularly-flooded marsh shows moderate loss under NIL (22.23%) and severe loss (83.7%) under NIH
- Estuarine open water shows moderate increase under NIL (30%) and dramatic increase (276.1%) under NIH.

The dramatic differences between scenarios by 2070 highlight the importance of the sea level rise trajectory in determining mid-term outcomes. Under the NIH Scenario, significant adaptation measures would be needed by this time, while under the NIL scenario, impacts remain relatively moderate and are almost identical to NIH 2040 projections.

### 12.3.4 Key Characteristics

The mid-term (2070) planning horizon shows several distinctive patterns:

- Moderate to significant habitat changes
  - Accelerating habitat transitions
  - Moderate wetland losses under NIL scenario
  - Significant wetland losses under NIH Scenario
- Accelerating wetland transitions
  - 22.23% regularly-flooded marsh loss under NIL scenario
  - 0.07% mangrove loss under NIL scenario
  - 61.82% mangrove loss under NIH Scenario
  - 83.70% regularly-flooded marsh loss under NIH Scenario
- Beginning of dry land impacts
  - Minor loss of developed and undeveloped dry land
  - Impacts expanding beyond lowest-lying areas
  - Protection strategies still highly effective
- Significant carbon emission increases
  - Substantial carbon emissions from wetland loss

By 2070, the two sea level rise scenarios show dramatically different outcomes, particularly for vulnerable habitats like mangroves and regularly-flooded marshes. The NIH Scenario shows losses by 2070 that are similar to or greater than what the NIL scenario shows by 2100, highlighting the importance of both the magnitude and timing of sea level rise.

### 12.3.5 Protection Strategy Effectiveness

By 2070, protection strategies show more noticeable differences in outcomes compared to the No Protection scenario (**Table 12-5**):

Table 12-5. Relative differences between projected NIL and NIH conditions in 2070 - Protection Strategy Comparison

| Habitat Type | NIL Protect All Dry Land | NIL Protect Developed Dry Land | NIH Protect All Dry Land | NIH Protect Developed Dry Land |
|---|---|---|---|---|
| Developed Dry Land | 0.00% | 0.00% | 0.00% | 0.00% |
| Undeveloped Dry Land | 0.00% | -0.01% | -0.01% | -0.07% |
| Mangrove | -0.14% | -0.07% | -64.12% | -61.89% |
| Regularly-Flooded Marsh | -22.23% | -22.22% | -83.70% | -83.70% |
| Estuarine Open Water | +30.00% | +30.00% | +276.14% | +276.14% |

These results show that by 2070:

- Protection strategies effectively preserve dry land, though impacts remain relatively minor even under No Protection
- Protection strategies have minimal effect on wetland habitats, with Protect All Dry Land showing slightly worse outcomes for mangroves due to coastal squeeze
- The differences between protection strategies remain relatively minor at this timeframe

By 2070, the sea level rise scenario becomes the dominant factor determining outcomes, with protection strategies having relatively minor effects.

## 12.4 Long-term (2100)

### 12.4.1 Description

The long-term planning horizon (2100) represents conditions approximately 80 years from the baseline. This timeframe is relevant for long-range planning and understanding the full potential impacts of sea level rise, including:

- Long-term community visioning
- Major infrastructure investments
- Intergenerational equity considerations
- Understanding potential end-of-century conditions

This planning horizon is relevant for understanding the legacy of current decisions and represents changes that may occur within the lifetime of children born today.

### 12.4.2 SLR Values

The sea level rise values for 2100 vary dramatically by scenario (**Figure 12-7** and **Figure 12-8**):

- NOAA Intermediate Low (NIL): 17.3 inches
  - This represents a rate of 0.22 inches/year from 2070
  - Approximately 2.5 times the historic rate of 0.09 inches/year
- NOAA Intermediate High (NIH): 64.2 inches
  - This represents a rate of 1.09 inches/year from 2070
  - Approximately 11.9 times the historic rate of 0.09 inches/year

These values represent a substantial difference between scenarios, with the NIH Scenario showing 73% more sea level rise than the NIL scenario.

The 2100 timeframe represents conditions that will be experienced by future generations. Decisions made today about protection strategies and land use will determine the coastal conditions inherited by these future generations, raising important questions about intergenerational equity and responsibility.

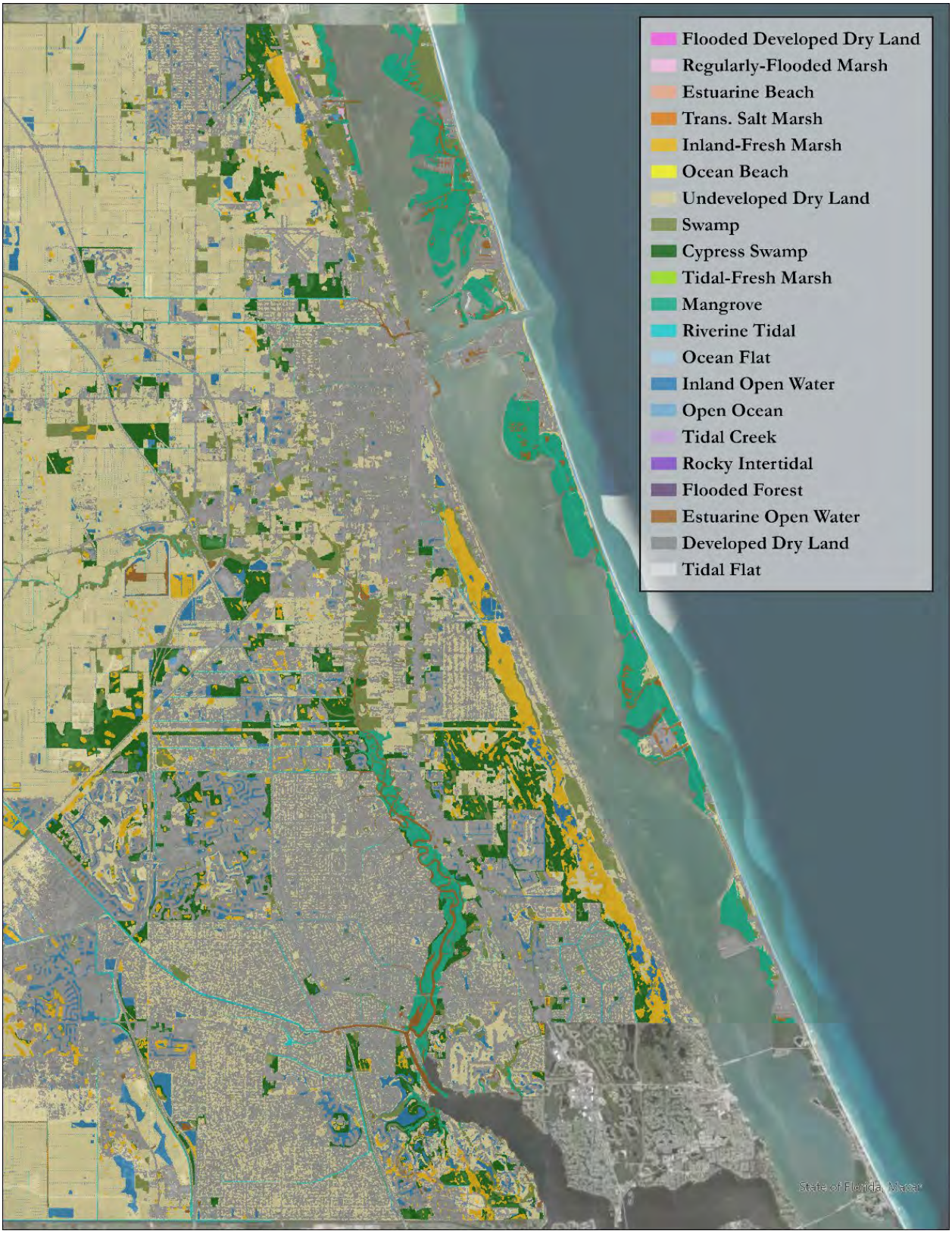



Figure 12-7. St. Lucie County 2100 SLAMM habitat change results - NOAA Intermediate Low

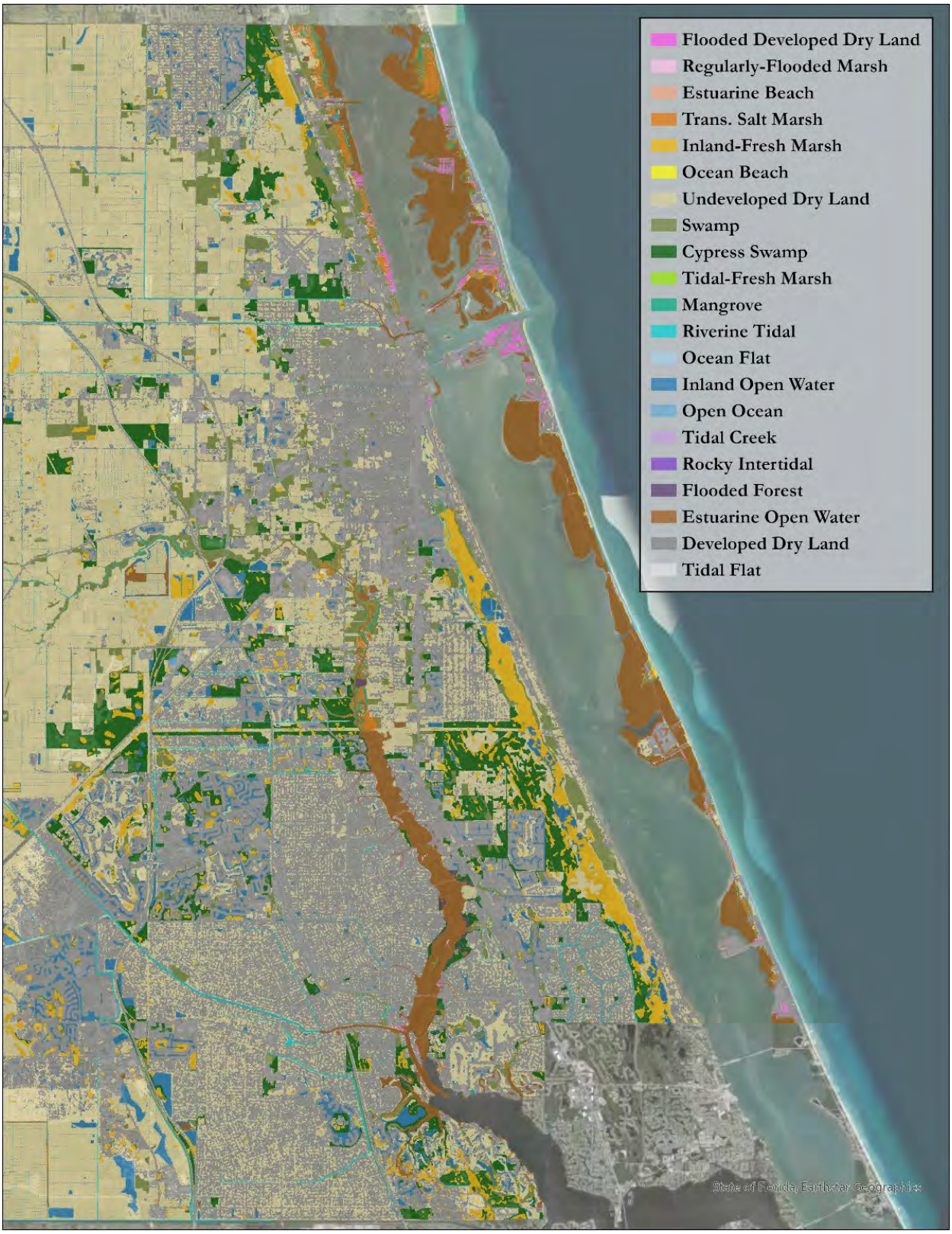



Figure 12-8. St. Lucie County 2100 SLAMM habitat changes results -NOAA Intermediate High

### 12.4.3 Projected Changes

By 2100, the model projects major changes in habitat distribution, with dramatic differences between sea level rise scenarios (**Table 12-6**).

Table 12-6. Relative differences between projected NIL and NIH conditions in 2100 – No Protection

| Habitat Type | NIL No Protection Change (%) | NIH No Protection Change (%) | Difference |
|---|---|---|---|
| Developed Dry Land | -0.04% | -0.67% | 0.63% |
| Undeveloped Dry Land | -0.02% | -0.27% | 0.25% |
| Swamp | -0.27% | -5.70% | 5.43% |
| Cypress Swamp | -0.01% | -0.77% | 0.76% |
| Mangrove | 0.20% | -94.29% | 94.49% |
| Inland-Fresh Marsh | 0.00% | -0.14% | 0.14% |
| Regularly-Flooded Marsh | -32.80% | -48.79% | 15.99% |
| Estuarine Open Water | +33.30% | +398.28% | 364.98% |

These changes show that by 2100:

- Dry land shows minimal impacts under NIL (0.02% to 0.04%) and more significant losses under NIH (0.27% to 0.67%).
- Mangroves show slight increase under NIL (0.20%) but catastrophic loss (94.3%) under NIH.
- Regularly-flooded marsh shows significant loss under both scenarios (NIL: 32.8% / NIH: 48.8%).
- Estuarine open water shows moderate increase under NIL (33.3%) and dramatic increase (398.3%) under NIH.

The extreme differences between scenarios by 2100 highlight the critical importance of the sea level rise trajectory in determining long-term outcomes. The NIH Scenario would require transformative adaptation approaches, while the NIL scenario would still require significant adaptation but may be manageable with more conventional approaches.

### 12.4.4 Key Characteristics

The long-term (2100) planning horizon shows several distinctive patterns:

- Major habitat changes
  - Extensive habitat transitions
  - Moderate wetland losses under NIL scenario
  - Severe wetland losses under NIH Scenario
- Significant wetland losses
  - 32.8% regularly-flooded marsh loss under NIL scenario
  - Slight mangrove gain under NIL
  - 94.3% mangrove loss under NIH Scenario
  - 48.8% regularly-flooded marsh loss under NIH scenario

- Moderate dry land impacts (depending on protection)
  - Noticeable loss of developed and undeveloped dry land under No Protection
  - Minimal impacts under protection scenarios
  - Protection strategies remain effective but with increasing challenges
- Maximum net carbon emission increases
  - Maximum atmospheric carbon released due to wetland loss
  - Greater under NIH Scenario

The progression from near-term (2040) to long-term (2100) shows an acceleration of impacts, with relatively minor changes by 2040, moderate to significant changes by 2070, and major changes by 2100. This progression highlights the importance of both immediate adaptation actions and long-term planning to address the full range of potential impacts.

### 12.4.5 Protection Strategy Effectiveness

By 2100, protection strategies show more noticeable differences in outcomes compared to the No Protection scenario (**Table 12-7**).

Table 12-7. Relative differences between projected NIL and NIH conditions 2100 - Protection Strategy Comparison

| Habitat Type | NIL No Protection | NIL Protect All Dry Land | NIL Protect Developed Dry Land | NIH No Protection | NIH Protect All Dry Land | NIH Protect Developed Dry Land |
|---|---|---|---|---|---|---|
| Developed Dry Land | -0.04% | 0.00% | 0.00% | -0.67% | 0.00% | 0.00% |
| Undeveloped Dry Land | -0.02% | 0.00% | -0.02% | -0.27% | -0.01% | -0.27% |
| Mangrove | +0.20% | -0.20% | +0.20% | -94.29% | -96.05% | -94.29% |
| Regularly-Flooded Marsh | -32.80% | -32.80% | -32.80% | -48.79% | -50.96% | -48.79% |
| Estuarine Open Water | +33.30% | +33.30% | +33.30% | +398.28% | +396.08% | +398.28% |

These results show that by 2100:

- Protection strategies effectively preserve dry land, though impacts remain relatively minor even under No Protection
- Protection strategies have minimal effect on wetland habitats, with Protect All Dry Land showing worse outcomes for mangroves due to coastal squeeze
- The differences between protection strategies remain relatively minor compared to the differences between sea level rise scenarios

By 2100, the sea level rise scenario is clearly the dominant factor determining outcomes, with protection strategies having relatively minor effects. Local adaptation strategies should focus on accommodating habitat migration and managing the transition to new ecosystem configurations.

# 13.0 CROSS-SCENARIO COMPARISONS

## 13.1 Impact of Sea Level Rise Scenario

### 13.1.1 Habitat Loss Comparison

**Table 13-1** compares habitat losses between the NIL and NIH scenarios under No Protection scenario.

Table 13-1. Generalized rate of habitat loss without protection within modeling

| Habitat Type | NIH No Protection (%) | NIL No Protection (%) | Difference (%) |
|---|---|---|---|
| Developed Dry Land | -0.67% | -0.04% | 0.63% |
| Undeveloped Dry Land | -0.27% | -0.02% | 0.25% |
| Swamp | -5.70% | -0.27% | 5.43% |
| Cypress Swamp | -0.77% | -0.01% | 0.76% |
| Mangrove | -94.29% | +0.20% | 94.49% |
| Regularly-Flooded Marsh | -48.79% | -32.80% | 15.99% |
| Estuarine Open Water | 398.28% | 33.30% | 364.98% |

The NIH Scenario causes significantly more habitat conversion than the NIL scenario, with the most dramatic differences in mangroves (94.49% more loss) and estuarine open water (364.98% more increase). On average, the NIH Scenario causes approximately 5-6 times more habitat conversion than the NIL scenario. The dramatic differences between scenarios highlight the importance of sea level rise trajectory in determining habitat outcomes. The 1.19m difference in sea level rise by 2100 (1.63m vs. 0.44m) results in approximately 10-12 times more habitat conversion. This suggests that global emissions reductions that result in lower sea level rise could significantly reduce habitat impacts.

### 13.1.2 Timing of Impacts

**Table 13-2** shows the timing of mangrove loss under both scenarios.

Table 13-2. Rate and time line of significant mangrove losses

| Year | NIL Scenario Mangrove Loss (%) | NIH Scenario Mangrove Loss (%) |
|---|---|---|
| 2040 | +0.24% | -14.35% |
| 2070 | -0.07% | -61.89% |
| 2100 | +0.20% | -94.29% |

Under the NIL scenario, major impacts are delayed until 2100, while under the NIH Scenario, significant impacts occur by 2070. This difference in timing has important implications for adaptation planning, as it affects the urgency of adaptation measures. The timing differences between scenarios have important implications for adaptation planning. Under the NIL scenario, there would be more time to implement adaptation measures than under the NIH Scenario, where significant adaptation measures would be needed by 2070. This highlights the importance of monitoring sea level rise trends and adjusting adaptation timelines accordingly.

## 13.2 Impact of Protection Strategy

### 13.2.1 Developed Dry Land Preservation

**Table 13-3** compares the preservation of developed dry land across the three protection strategies.

Table 13-3. Preservation rates of developed dry lands across protection strategies

| Protection Strategy | NIL Scenario (acres) | NIH Scenario (acres) | Preservation (%) |
|---|---|---|---|
| No Protection | 682,237.74 | 677,793.43 | 99.33% / 99.96% |
| Protect All Dry Land | 682,391.17 | 682,391.17 | 100.00% / 100.00% |
| Protect Developed Dry Land | 682,391.17 | 682,391.17 | 100.00% / 100.00% |

All protection strategies effectively preserve developed dry land, with 100% preservation under both protection strategies and minimal loss (less than 0.7%) under No Protection. This suggests that protection strategies may not be necessary for preserving developed dry land in St. Lucie County, as most developed areas are already above projected inundation levels.

The high preservation rates for developed dry land even under the No Protection scenario (99.96% under NIL scenario; 99.33% under NIH Scenario) suggest that most developed areas in St. Lucie County are already above projected inundation levels. This raises questions about the necessity and cost-effectiveness of extensive protection measures, especially given their minimal or slightly negative effects on wetland preservation.

### 13.2.2 Undeveloped Dry Land Preservation

**Table 13-4** compares the preservation of undeveloped dry land across all three protection strategies.

Table 13-4. Preservation rates of undeveloped dry lands across protection strategies

| Protection Strategy | NIL Scenario (acres) | NIH Scenario (acres) | Preservation (%) |
|---|---|---|---|
| No Protection | 2,397,381.32 | 2,391,298.1 | 99.73% / 99.98% |
| Protect All Dry Land | 2,397,627.93 | 2,397,132.95 | 99.98% / 100.00% |
| Protect Developed Dry Land | 2,397,381.32 | 2,391,299.78 | 99.73% / 99.98% |

Protection strategies have minimal effect on undeveloped dry land preservation, with all strategies preserving at least 99.73% (2,397,381.32 acres) of the initial area. This suggests that protection strategies may not be necessary for preserving undeveloped dry land in St. Lucie County, as most undeveloped areas are already above projected inundation levels.

The high preservation rates for both developed and undeveloped dry land across all protection strategies suggest that St. Lucie County has relatively high topography compared to other coastal areas. This topographic context is important for interpreting the results and considering their applicability to other regions, which may have different topographic profiles and therefore different vulnerability patterns.

### 13.2.3 Wetland Preservation

**Table 13-5** compares the preservation of mangroves across all three protection strategies.

Table 13-5. Preservation rates of mangrove habitats across protection strategies

| Protection Strategy | NIL Scenario Mangrove (acres) | NIH Scenario Mangrove (acres) | Preservation (%) |
|---|---|---|---|
| No Protection | 69,110.08 | 3,938.26 | 5.41% / 100.20% |
| Protect All Dry Land | 68,875.8 | 2,727.96 | 3.95% / 99.82% |
| Protect Developed Dry Land | 69,110.08 | 3,938.39 | 5.71% / 100.20% |

Protection strategies have minimal effect on wetland preservation, with similar loss rates across all strategies. In fact, the Protect All Dry Land strategy shows slightly worse outcomes for mangroves than the No Protection strategy, suggesting that comprehensive protection may have unintended negative consequences for wetlands.

The slightly worse outcomes for mangroves under the Protect All Dry Land strategy compared to the No Protection strategy provide evidence for the “coastal squeeze” effect. When sea levels rise and protection structures prevent wetlands from migrating inland, they can become trapped between rising water and fixed barriers, resulting in greater wetland loss than would occur under natural conditions.

# 14.0 SLAMM STUDY CONCLUSION AND RECOMMENDATIONS

Like many communities in Florida, St. Lucie County faces significant challenges from a rapidly growing population, loss of green space, and increasing flood risks. Recent record rainfall events from Hurricanes Ian (2022) and Milton (2024) have highlighted vulnerabilities to flooding throughout much of St. Lucie County. This has prompted calls for more integrated stormwater management, wetlands protection, and low-impact development practices, all of which provide opportunities to build greater resilience.

The modeling results and analyses developed in this report are intended to help St. Lucie County better understand some of the challenges it faces, while at the same time helping the community and decision-makers identify key opportunities for moving forward toward a more resilient future.

## 14.1 Sea Level Rise and Land Cover Change

Results from the Sea Level Affecting Marshes Model (SLAMM) under moderate to high sea-level rise projection scenarios show the potential for extensive wetland change within the coastal areas of St. Lucie County and conversion of freshwater ecosystems within the St. Lucie River into estuarine conditions through the year 2070. However, projected trend-based land cover change patterns associated with expected population growth, as previously modeled by University of Florida researchers (Carr and Zwick 2016), show much more extensive impacts than even the highest modeled rate of sea level rise on freshwater wetlands and other natural ecosystems across St. Lucie County through 2070.

Sea-level rise is already a clear factor in increasing the compound flood risks from storm surges and extreme rainfall events in coastal St. Lucie County. While it is not clear if sea-level rise is already contributing to increasing flood risk along the St. Lucie River in St. Lucie County, high rates of sea-level rise would be expected to increase water levels within the St. Lucie River, causing increased flood risk in low-lying riverine areas across western and southern St. Lucie County over the next several decades.

## 14.2 Florida Natural Areas Inventory

St. Lucie County contains large areas of protected conservation areas and privately held undeveloped lands that provide important ecosystem services, including provisioning of critical wildlife habitat, water quality protection, groundwater recharge, and floodwater storage. As St. Lucie County continues to grow and develop, strategic protection and maintenance of priority green space areas will be required in order to maintain these ecosystem services. A complex, multi-layered approach involving fee simple land acquisitions, conservation easements, regulatory conservation, forestry and agricultural land use incentives, and low impact development approaches would almost certainly be required to meet aggressive land conversation targets.

Utilizing the results of the SLAMM projections along with the FNAI CLIP, SFWMD landcover, and Florida conservation lands data, the project team developed a preliminary assessment of parcels within St. Lucie County that may have the potential to maintain ecological biodiversity, preserve essential wetland and terrestrial ecosystems, and support in flood storage, groundwater recharge, and surface water protection. This assessment specifically reviewed parcels that contained priority 1 and 2 critical

lands and waters identified by FNAI; had a natural ecosystem land cover classification such as wetland, upland forests; and non- forested uplands, and were connected to or in relative proximity to already conserved land areas. The result of this method identified 581 potential conservation parcels that were 10 acres or greater in size. The coastal portion of St. Lucie County already possesses a significant area of conserved land, however, based on SLAMM projections coastal ecosystems such as mangroves and tidal marshes, which are essential habitats and provide natural protection from storm surge, are at significant risk of being lost as a result coastal squeeze. The western portion St. Lucie County possesses the greater area of land that is unaffected by future habitat change based on the SLAMM projections, therefore conservation in these areas may be essential in order to maintain freshwater ecosystems within St. Lucie County (**Figure 14-1**).

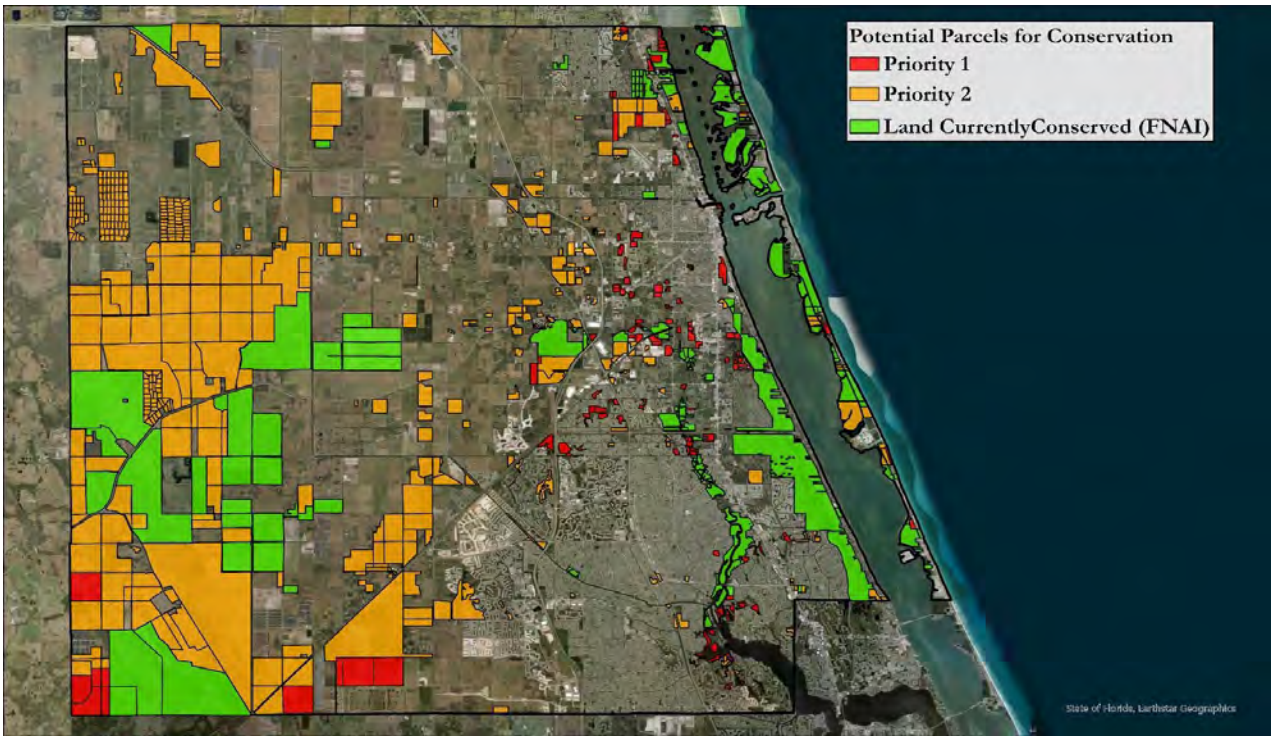



Figure 14-1. Potential Conservation Lands Based on FNAI CLIP Data

The analysis of St. Lucie County's coastal ecosystems reveals a complex interplay of vulnerability and resilience. While rising seas and changing climate patterns pose significant risks, many of the county's natural systems retain the potential to adapt, if given adequate space and support.

The key to enhancing long-term resilience lies in:

1. Decisive action in the present
2. Flexibility to adapt strategies as conditions evolve

*A Note about Recommendations:*

The following pages provide recommendations for short-term, medium-term and long-term planning strategies. Recommendations should be considered 'as practicable' and independently evaluated to ensure compliance with state and federal law, as applicable, at the time of implementation.

## 14.3 Short-term (2040) Priorities

The next 20 years represent a critical window for monitoring, planning, and conservation to establish a strong foundation for long-term adaptation. The short-term priorities lay the foundation for long-term adaptation. In this timeframe, monitoring and research are critical for understanding local environmental processes and establishing baseline conditions. Planning and conservation efforts should prioritize no-regrets actions - strategies that provide benefits under all scenarios, regardless of future conditions.

### 14.3.1 Monitoring

- Establish baseline monitoring for key habitats for continued observation, i.e. wetlands and mangroves:
  - Mangrove loss starts under NIL (+0.24), while NIH (-14.35%) sees a slight increase.
  - Regularly-flooded marsh declines more significantly under NIH (-9.16%) compared to NIL (-8.1%)
- Develop early warning indicators for habitat transitions, such as tidal gauges and elevation benchmarks in estuarine transition zones:
  - Estuarine open water begins to expand (+23.9% under NIL, +79.5% under NIH).
- Monitor accretion rates in wetland areas by installing surface elevation tables.
- Track changes in water quality and salinity.
- Implement storm impact monitoring to assess compound flooding effects.
- Implement policy overlays and integrate SLAMM data in permitting where practicable:
  - Establish "SLAMM-informed" setback zones for new development in flood- prone areas.
  - Limit impervious surface expansions in habitat transition zones.
  - Prioritize permitting incentives for low-impact development (LID).
  - Require site-scale SLAMM overlays in environmental impact assessments.

### 14.3.2 Planning

- Develop long-term adaptation strategies.
- Identify critical areas for protection.
- Incorporate sea level rise projections into land use planning.
- Update building codes and infrastructure standards.
- Integrate compound flooding risk into emergency management plans.

### 14.3.3 Conservation

- Protect critical mangrove and marsh habitats.
- Enhance sediment delivery to wetlands.
- Restore degraded wetlands.
- Create buffer zones around vulnerable habitats.

- Implement species-specific conservation strategies for vulnerable mangroves and threatened or endangered species.

### 14.3.4 Research

- Improve understanding of habitat migration patterns.
- Study accretion rates and sediment dynamics.
- Develop better carbon sequestration estimates.
- Evaluate effectiveness of adaptation strategies.
- Research compound flooding mechanisms and mitigation approaches.

## 14.4 Medium-term (2070) Priorities

The next 50 years will require active adaptation, restoration, and infrastructure improvements to manage the accelerating impacts of sea level rise and land use change. The timing of medium-term priorities will depend on the sea level rise scenario that unfolds. Under the NIH Scenario, these actions should be implemented sooner (by 2050-2060) to address accelerating impacts. In contrast, the NIL scenario allows for a more gradual approach. Continuous monitoring of actual sea level rise trends will be essential to determine the optimal implementation timeline.

### 14.4.1 Key Findings and Supporting Actions

- Under the NIL Scenario 0.07% of mangroves were lost while in the NIH Scenario 61.89% of mangroves were lost.
- Under the NIL Scenario 22.23% of regularly-flooded marsh was lost while in the NIH Scenario 83.70% of regularly-flooded marsh was lost.
- Estuarine open water increases significantly under the NIH Scenario (+276.14%) compared to the NIL Scenario (+30.00%).
- Notable conversion of freshwater systems and saltwater intrusion into swamp begins.

### 14.4.2 Strategic Land Acquisition for Migration

- Acquire key undeveloped upland parcels in marsh and mangrove transition zones.
- Focus acquisitions on the North Fork St. Lucie River and Indian River Lagoon Corridors.

### 14.4.3 Advance Restoration of Floodplain and Marsh Systems

- Reconnect historic floodplains through culvert and berm removal.
- Begin trial restorations of brackish transition zones to improve resilience.

### 14.4.4 Scale Up Use of Conservation Easements

- Prioritize landowner outreach in medium-priority SLAMM vulnerability areas.
- Partner with agricultural interests in southwestern St. Lucie to preserve recharge zones.

### 14.4.5 Upgrade Stormwater Infrastructure for Dual Threats

- Begin design of hybrid gray-green systems considering compound flooding risks.
- Retrofit systems in low-gradient inland areas where flooding and saltwater intrusion may overlap.

### 14.4.6 Reform Comprehensive Planning Policy

- Amend comprehensive plans to include long term SLAMM and FNAI data layers.
- Require 2070 scenario overlays in all infrastructure funding requests.

## 14.5 Long-term (2100) Priorities

The long-term priorities emphasize transformative approaches to address the significant changes projected by 2100, under both scenarios. These strategies require a fundamental shift from preserving current conditions to actively managing change and emerging ecosystems. To ensure a smooth transition, early planning should begin in the short- and medium-terms.

### 14.5.1 Key Findings and Supporting Actions

- Under NIL scenario an increase in mangroves 0.02% while under the NIH scenario 94.3% mangrove loss, NIL 32.80% marsh loss and NIH 48.8% marsh loss.
- Under NIL scenario a 33.00% increase in estuarine open water and under NIH scenario a significant increase in estuarine open water, 398.28%.
- Major carbon released into atmospheric due to wetland loss (33.1 million kg $CO_2e$).
- Undeveloped lands face minimal inundation, but ecological transformation is substantial.

### 14.5.2 Develop Managed Retreat Framework

- Plan for the potential relocation or retreat from low-lying coastal developments, recognizing both flood exposure and the shifting boundaries of sensitive ecosystems as sea level rise progresses.
- Identify trigger points for asset relocation based on SLAMM projections, incorporating not just flood risk thresholds (e.g., frequency of inundation) but also ecological indicators such as the migration of critical habitats (e.g., wetlands, mangroves) and movement wildlife species into new areas.
- Consider that as areas become increasingly inundated or "swampy", certain sensitive built assets (e.g., infrastructure, cultural sites) may face greater risk and merit proactive relocation - while at the same time, these emerging wetland areas may provide important habitat for species adapting to new conditions.

### 14.5.3 Strengthen Support for Wetland Conservation with Resilience Co-Benefits

- Prioritize the protection and restoration of wetlands that provide multiple benefits, including flood attenuation, habitat for wildlife, and long-term carbon storage potential.

- Explore voluntary and incentive-based programs that recognize the hazard mitigation value of wetland preservation, while keeping the focus on flood resilience and ecosystem health as primary drivers for action.

### 14.5.4 Create Coastal Habitat Transition Reserve Network

- Designate and maintain upland buffers for wetland migration via acquisition and zoning.
- Focus on the "coastal squeeze" particularly adjacent to areas that are highly developed and migration space is limited.

### 14.5.5 Enhance Freshwater System Resilience

- Implement major hydrologic modifications to maintain freshwater inputs in high- priority systems.
- Introduce salinity barriers or adaptive culverts in estuarine-freshwater interfaces.

### 14.5.6 Invest in Adaptive Infrastructure for End-of-Century Conditions

- Support floating infrastructure, elevated development design standards, and tidal- resistant roads in high-risk areas.

## 14.6 Framework for Taking Action

This report offers both analysis and a practical framework for action. Through continuous monitoring and adaptive management, St. Lucie County can ensure that both its natural and human communities thrive in the face of future projected hazards.

In creating a conservation approach for resilience, three areas of focus are important throughout the process:

Policy and Planning:

- Conduct a Future Land Use Review to identify areas at highest risk and assess opportunities for conservation, redevelopment, and infrastructure adaptation.
- Strengthen policy and land development codes as practicable to incorporate adaptation and resilience measures that benefit the community as a whole.
- Update and align local, state, and federal policies to streamline funding and regulatory approvals.

Strategic Collaboration and Resource Allocation:

- Foster cross-sector partnerships among government agencies, private landowners, conservation groups, and local businesses to align resources and initiatives.
- Expand participation in state and federal grant programs that support conservation and adaptation efforts.
- Develop public-private funding models for resilient infrastructure and green spaces that benefit both environmental sustainability and economic growth.

Implementation of Nature-Based and Infrastructure Solutions:

- Invest in nature-based solutions, such as wetland restoration / augmentation, enhanced green stormwater infrastructure, and living shorelines, to enhance flood protection and ecosystem health.
- Enhance resilient infrastructure, including elevated roadways, enhanced stormwater management systems, and flood-resistant public buildings.
- Develop long-term monitoring and adaptation strategies to track environmental changes and adjust policies accordingly.

### 14.6.1 A Three Phase Approach to Tackling Priorities

**Phase 1 - First Five Years: Building a Strong Foundation**

The first phase focuses on immediate actions that establish a solid base for long-term resilience:

1. Prioritize Green Infrastructure – Use nature-based approaches as the first line of defense against flooding and climate impacts.
2. Enhance Habitat Connectivity – Protect and link natural lands to support wildlife migration and ecosystem adaptation.

Key Actions:

- Strengthen what works – Protect the county's healthiest mangrove and marsh systems.
- Test new approaches – Launch pilot living shoreline projects in vulnerable areas.
- Secure future options – Identify and protect key habitat migration corridors.
- Learn and adapt – Implement robust monitoring programs to track ecosystem responses.

**Phase 2 – The Next Decade: Scaling Solutions**

With a strong foundation in place, the next phase expands and enhances resilience measures:

- Heal and restore – Revitalize degraded wetlands to improve flood protection.
- Work with nature – Integrate natural solutions into existing infrastructure.
- Plan ahead – Develop flexible easement programs for at-risk areas.
- Think regionally – Coordinate with neighboring communities on sediment and shoreline management.

**Phase 3 - Long-Term Vision: Transformative Resilience**

To ensure lasting resilience, long-term planning must prioritize adaptability and innovation:

- Support natural adaptation – Help ecosystems migrate as environmental conditions shift.
- Reimagine infrastructure – Design built environments to work with, rather than against, natural processes.
- Preserve vital ecosystem services – Maintain clean water, storm protection, and biodiversity benefits.
- Build partnerships – Strengthen cross-jurisdictional collaboration to enhance regional resilience.

The data and technology available today provide unprecedented insights into how coastal systems respond to change. However, information alone is not enough; we must act on it.

This report offers both analysis and a practical framework for action. Through continuous monitoring and adaptive management, St. Lucie County can ensure that both its natural and human communities thrive in the face of future projected hazards.

**Immediate Policy and Planning Adjustments**

- Conduct a Future Land Use Review to identify areas at highest risk and assess opportunities for conservation, redevelopment, and infrastructure adaptation.
- Strengthen zoning and development regulations to incorporate climate adaptation and resilience measures.
- Update and align local, state, and federal policies to streamline funding and regulatory approvals.

**Strategic Collaboration and Resource Allocation**

- Foster cross-sector partnerships among government agencies, private landowners, conservation groups, and local businesses to align resources and initiatives.
- Expand participation in state and federal grant programs that support conservation and climate adaptation efforts.
- Develop public-private funding models for resilient infrastructure and green spaces that benefit both environmental sustainability and economic growth.

**Implementation of Nature-Based and Infrastructure Solutions**

- Invest in nature-based solutions, such as wetland restoration, green stormwater infrastructure, and living shorelines, to enhance flood protection and ecosystem health.
- Enhance climate-resilient infrastructure, including elevated roadways, stormwater management systems, and flood-resistant public buildings.
- Develop long-term monitoring and adaptation strategies to track environmental changes and adjust policies accordingly.

The cost of inaction far exceeds the investment needed for resilience. Without proactive measures, the county faces significant risks, including:

- Increased infrastructure damage due to flooding and extreme weather events.
- Loss of critical natural resources that provide storm protection, water filtration, and habitat preservation.
- Economic disruptions affecting property values, tourism, agriculture, and local businesses.
- Greater financial strain on county budgets due to disaster response and recovery expenses.

By taking thoughtful steps now, St. Lucie County can safeguard its communities, ecosystems, and economy for future generations. A resilient future requires sustained commitment and collaboration from all sectors. The investment in protecting and enhancing natural infrastructure today will help ensure St. Lucie County remains a vibrant, climate-resilient community for generations to come.

## 14.7 Recommendations for Future Assessments

Further studies could strengthen decision-making and resilience planning in St. Lucie County, including:

1. **Submerged Aquatic Vegetation Analysis (SAV) –** St. Lucie County's estuarine and coastal systems contain extensive SAV resources that provide essential ecosystem services. A dedicated SAV assessment would be implemented into the SLAMM analysis to provide valuable insights for restoration planning and coastal resource management.

2. **Future Land Use Review –** To build a comprehensive and data-driven approach to land conservation and resilience in St. Lucie County, a Future Land Use Review will provide St Lucie County with a powerful tool for prioritizing conservation efforts, optimizing land use planning, and achieving balanced environmental and economic goals.

3. **Storm Impact Analysis** – Evaluate the effects of Hurricane Ian (2022), Hurricane Milton (2024) and similar storms specifically on coastal habitats.

4. **Compound Flooding Analysis** – Assess risks where storm surge combines with heavy rainfall with both hydraulic and hydrologic considerations.

5. **Mangrove Migration Modeling** - Incorporate existing knowledge of species-specific mangrove responses to water levels (red mangroves preferring inundation, black mangroves requiring less water for pneumatophore exposure, and white mangroves favoring salt-tolerant upland positions) to create more detailed spatial projections of mangrove community composition changes under sea level rise scenarios which is conceptually captured within the results of this assessment. This would enhance habitat management planning by identifying areas where specific species interventions might be most effective.

6. **Enhanced Tide Gauge Analysis** – Utilize detailed tide gauge data from Virigina Key and other nearby tide and water level gauges.

7. **Expanded Management Recommendations** – Provide refined adaptation strategies based on risk and timeframe.

8. **Improved Visualizations** – Enhance graphical representations of key findings.

9. **Technical Appendix Expansion** – Include more details on data processing, methodology, and model limitations.

10. **Additional References** – Expand the literature base supporting analysis and recommendations.

### 14.7.1 Modeling Submerged Aquatic Vegetation Analysis

The SAV module of the SLAMM model was not included in this assessment due to scope constraints and data limitations. However, given the importance of submerged aquatic vegetation to water quality, habitat stability, and coastal resilience, we strongly recommend incorporating this module in future analyses. This will provide critical insights into the impact of sea level rise on SAV and support conservation and restoration efforts across St. Lucie County's estuarine ecosystems.

To model SAV distribution, the module requires spatial datasets that define current SAV locations and surrounding water conditions. These include data such as:

- Existing SAV Distribution – High-resolution GIS layers (e.g., NOAA Coastal Change Analysis Program (C-CAP), Florida Fish and Wildlife Conservation Commission (FWC), or Florida Natural Areas Inventory (FNAI)).
- Bathymetric Data – Elevation of the seafloor and nearshore bathymetry (e.g., NOAA Coastal Bathymetry, USGS Digital Elevation Models (DEMs)).
- Light Availability (PAR – Photosynthetically Active Radiation) – Determines SAV growth potential (NASA MODIS, NOAA Coastal Monitoring).
- Turbidity & Water Quality – Suspended sediment and nutrient levels affecting light penetration (USGS, Florida DEP, local water quality monitoring programs).
- Salinity Gradients – Changes in freshwater inputs and estuarine conditions (USGS streamflow data, NOAA estuarine salinity datasets).
- Wave Energy & Erosion – Determines SAV stability and potential loss areas (NOAA WaveWatch III, local hydrodynamic models).

By integrating these additional analyses, St. Lucie County can better prepare for long-term environmental changes, improve resilience, and prioritize conservation efforts that protect both natural ecosystems and human communities.

SAV persistence depends on the ability of different species to tolerate changing conditions, including variations in sediment type, water quality (e.g., turbidity, nutrient levels, dissolved oxygen), salinity, light availability, and depth. Some of the data that can enhance SAV assessments include:

- Sediment Type & Stability – Sandy vs. muddy substrates influence SAV rooting and resilience (USGS Coastal Sediment Surveys, NOAA Seafloor Mapping).
- Species-Specific Growth Tolerances – Each SAV species has different tolerance thresholds for depth, salinity, and light availability (local seagrass monitoring studies, NOAA Seagrass Watch).
- Coastal Land Use & Human Impact Data – Urbanization, shoreline hardening, and boat traffic impact SAV survival (Florida DEP Coastal Land Cover Data, USGS National Land Cover Database).

The SAV module in SLAMM requires an integrated approach, combining spatial, environmental, hydrodynamic, and datasets where available to simulate how submerged aquatic vegetation responds to sea level rise. By incorporating high-resolution GIS layers, water quality data, and ecosystem monitoring records, this module provides a detailed projection of SAV vulnerability and

guides conservation and restoration planning for coastal resilience. The SAV module of the SLAMM model was not included in this assessment due to scope constraints and data limitations. However, given the importance of submerged aquatic vegetation to water quality, habitat stability, and coastal resilience, we strongly recommend incorporating this module in future analyses. This will provide critical insights into the impact of sea level rise on SAV and support conservation and restoration efforts across St. Lucie County's estuarine ecosystems.

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ecosystem monitoring records, this module provides a detailed projection of SAV vulnerability and guides conservation and restoration planning for coastal resilience.

### 14.7.2 Future Land Use Review

Key goals of a Future Land Use Review include:

- Identify vulnerable areas most at risk to hazard projections such as sea level rise, flooding, and habitat loss, in conjunction with asset vulnerability assessments to maximize capital improvement program investments.
- Prioritize conservation and protection efforts for lands that provide critical ecosystem services, natural flood mitigation, and serve nearby critical and regionally significant assets
- Determine areas suitable for resilient development and infrastructure upgrades utilizing SLAMM modeling, asset vulnerability assessment results, future land use analyses and other types of data with conservation prioritization tools like the Marxan Model (https://marxansolutions.org/what-is-marxan).
- Align land use planning with state and federal funding opportunities to maximize financial and environmental benefits.

Through proactive planning, strategic investment, and community engagement, St. Lucie County can transform challenges into opportunities, ensuring a sustainable and resilient future for all residents. The following information provides an overview of the Future Land Use (**Figure 14-2**) within St Lucie County for preliminary targeting of areas that may benefit from strategic conservation focused land acquisition programs.

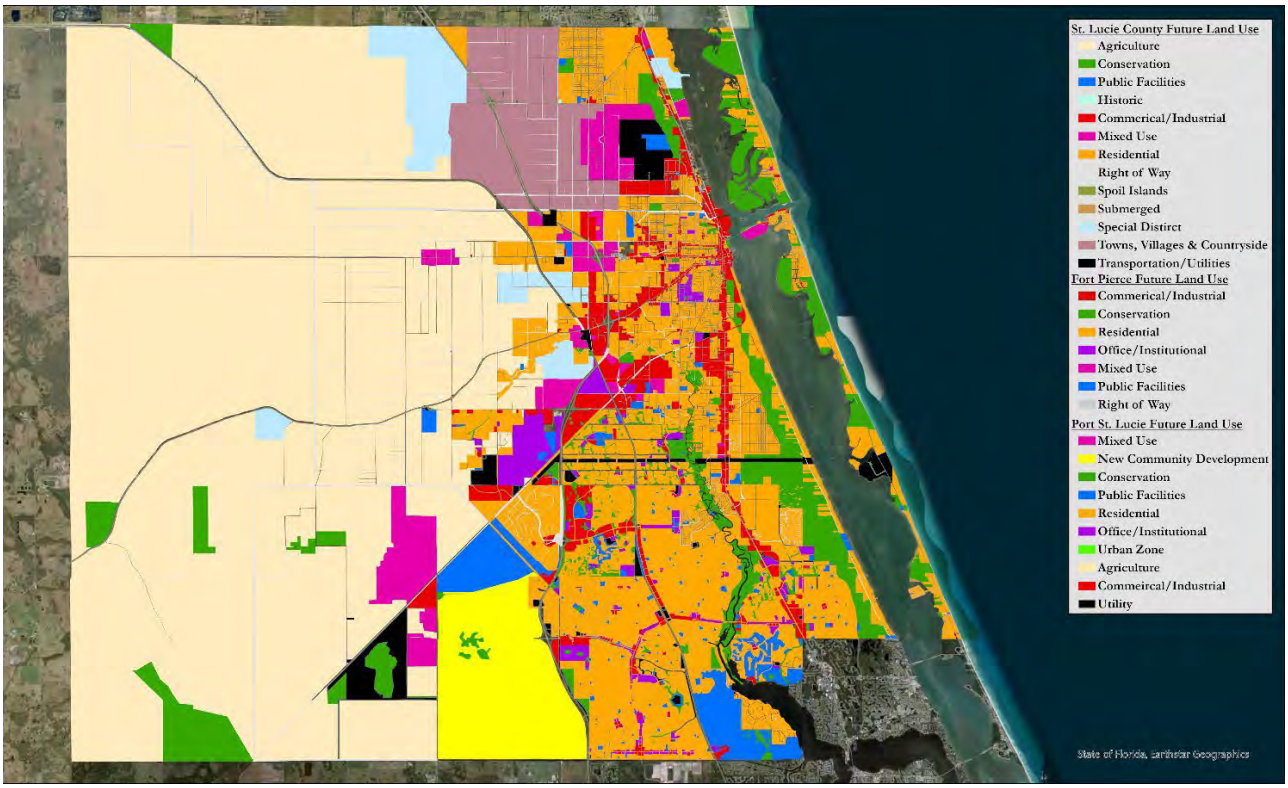

Figure 14-2. Future Land Use of St Lucie County

To build a comprehensive and data-driven approach to land conservation and resilience in St. Lucie County, incorporating Marxan into a Future Land Use Review can provide St Lucie County with a powerful tool for prioritizing conservation efforts, optimizing land use planning, and achieving balanced environmental and economic goals.

Originally designed for marine spatial planning, Marxan has evolved into one of the most widely used systematic conservation planning tools across the globe. It enables decision- makers to:

- Identify optimal conservation areas while balancing cost-effectiveness and land-use priorities.
- Consider multiple land use scenarios and trade-offs between development, conservation, and infrastructure planning.
- Address ecological connectivity, ensuring that protected areas support biodiversity and ecosystem services over time.
- Incorporate uncertainty and risk factors, helping planners adapt to flood-related hazards and other environmental stressors.

Marxan's flexibility makes it a powerful tool for guiding St. Lucie County's conservation planning efforts, ensuring resilient landscapes that can withstand natural hazard events while supporting economic sustainability. Marxan can be used to support St. Lucie County's Future Land Use Review by:

1. Identifying High-Priority Conservation Lands:
    - Using Marxan's spatial optimization algorithms, planners can identify critical areas for land conservation based on biodiversity, flood mitigation, and ecosystem services.
    - The model helps target undeveloped lands that provide natural flood protection, ensuring coastal resilience.
    - Conservation priorities can be aligned with funding opportunities, including state and federal land acquisition programs.
2. Optimizing Development and Infrastructure Planning:
    - Marxan can analyze how urban expansion, transportation corridors, and utility infrastructure interact with natural systems.
    - It helps balance land use demands, ensuring that development does not compromise ecosystem functions.
    - The tool can assess alternative land-use scenarios to support smart growth strategies.
3. Enhancing Connectivity Between Natural Areas:
    - Maintaining ecological corridors is crucial for wildlife movement, water flow, and landscape resilience.
    - Marxan can identify key linkages between protected areas, helping avoid fragmentation of natural habitats.
4. Incorporating Community and Stakeholder Input:

- The model enables scenario planning, allowing stakeholders to visualize trade-offs between conservation and development.
- By integrating local knowledge with scientific modeling, planners can ensure that conservation decisions reflect community priorities.

By incorporating Marxan into St. Lucie County's Future Land Use Review, decision-makers can take a science-based approach to conservation and growth management.

- Resilience can be strengthened by prioritizing high-value conservation lands and coastal adaptation measures.
- Sustainable growth can be achieved through balanced land-use planning.
- Cost-effective solutions can be identified, ensuring that investments in conservation yield long-term economic and environmental benefits.

# 15.0 TECHNICAL APPENDIX

## 15.1 Project Workflow

The Sea Level Affecting Marshes Model (SLAMM) analysis for St. Lucie County followed a structured workflow to ensure transparency, reproducibility, and accuracy. The key steps are outlined below:

**1. Data Preparation**

- Convert input datasets to ASCII grid format for compatibility with SLAMM.
- Ensure all spatial data maintains consistent projection and resolution to prevent misalignment.
- Conduct quality control checks on input datasets to validate completeness and accuracy.

**2. Model Configuration**

- Define model parameters, including tidal ranges, sedimentation rates, and other parameterized factors.
- Configure sea level rise (SLR) scenarios, incorporating projections from NOAA and other sources.
- Establish protection scenarios, differentiating between natural adaptation, managed retreat, and engineered interventions.

**3. Model Execution**

- Run SLAMM for each SLR scenario and protection strategy to simulate long-term marsh and wetland changes.
- Generate output CSV files containing habitat transition results and projected landscape shifts.
- Perform output validation, comparing results against historical trends and ground-truthing data where available.

**4. Data Analysis**

- Extract key metrics from SLAMM output CSV files for further processing.
- Calculate habitat changes, including net loss/gain percentages for each wetland type.
- Generate summary tables and visualizations to illustrate projected ecosystem transitions.

**5. Reporting**

- Compile results into comprehensive reports detailing findings and implications.
- Develop scenario-specific summaries to highlight the expected outcomes under different SLR trajectories.
- Provide management recommendations based on modeled results, emphasizing adaptation strategies for local decision-makers.

## 15.2 Data Limitations

While rigorous quality control measures were applied, certain limitations inherent to the input data and modeling approach should be acknowledged:

1. Land Cover Classification: Potential classification errors in the input datasets may affect habitat change projections.
2. Temporal Resolution: The analysis is limited to discrete time steps (2020, 2040, 2070, and 2100), which may not capture dynamic, year-to-year variations.
3. Protection Scenarios: The representation of protection strategies is simplified and does not account for future policy changes or evolving adaptation measures.

To ensure data reliability, multiple quality control and assurance validation methods were applied, including:

- In-depth staff review to identify and correct potential issues.
- Comparisons with historical data to validate classification accuracy.
- Model calibration to refine assumptions where possible.

Any issues identified during the modeling process were addressed before finalizing the results in this report.

## 15.3 Modeling & Analysis Limitations

In addition to data constraints, several modeling limitations should be considered when interpreting results:

1. Land Cover Classification: Errors in land cover classification can impact habitat transition projections.
2. Temporal Resolution: The model operates on specific years (2020, 2040, 2070, 2100), limiting its ability to capture continuous change.
3. Protection Scenarios: The model assumes simplified protection strategies that do not fully account for future engineering innovations or policy changes.
4. Species-Specific Data: The analysis lacks species-specific responses to sea level rise, limiting biodiversity impact assessments.
5. Elevation Data Accuracy: The model relies on 10-meter cell size elevation data, which is appropriate for large-scale planning but may require higher-resolution data for site-specific applications.
6. Accretion Assumptions: The model applies constant accretion rates, which may not fully reflect local field conditions or recent sedimentation trends.
7. Habitat Grouping: Certain habitat types are simplified into broader categories, potentially masking localized ecological responses.
8. Spatial Analysis: The analysis focuses on large-scale trends, with limited fine-scale spatial analysis in this report.

9. Uncertainty Analysis: The report does not include a full uncertainty analysis, meaning that error margins around projections are not explicitly quantified.
10. Submerged Aquatic Vegetation (SAV): The SAV module was not run, so potential impacts on submerged habitats are not assessed.
11. Simplified Processes: Some complex ecological and hydrodynamic interactions are simplified to align with model constraints.
12. Spatial Resolution: The 10m resolution may omit small-scale features and microhabitats, limiting the detection of finer ecological changes.

These limitations should be carefully considered when applying the results of this analysis. While the findings provide valuable insights into potential sea level rise impacts, they should be viewed as projections based on current data and assumptions, rather than precise predictions. To address these limitations, an adaptive management approach is recommended—allowing policies and decisions to evolve as new data and improved methodologies become available. Future studies incorporating higher-resolution data, improved uncertainty analyses, and site-specific validations will enhance the accuracy and applicability of SLAMM-based projections.

# 16.0 RVA-OH RECOMMENDATIONS

The overarching objectives of this RVA revolve around the comprehensive acquisition of data and the evaluation of threats posed by hazards. The results of this analysis will inform the formulation of the St. Lucie Regional Resilience Plan (RRP). The RVA is based on an analysis that revealed potential County and municipal susceptibilities to the adverse impacts of hazards. The hazards considered include coastal erosion, drought, extreme heat, inland flooding, storm surge, wind, wildfire and sea level rise (see Part II: SLAMM Analysis). Present day and future hazard scenarios were layered on maps containing County and municipal assets to determine each asset's relative risk. This was followed by identifying specific characteristics of the assets and the predicted impacts to determine vulnerability levels to the hazards.

The following items, organized by hazard, are offered for consideration to enhance the overall understanding of hazard-related risks and inform future planning efforts for the County and municipalities. In each case it should be noted that steps taken to facilitate private and commercial resilience activities will benefit the local government socially and economically.

## Part I: Multi-Hazard Vulnerability Assessment Recommendations

### All Hazards

- Create an updated user-defined general building stock and critical facilities dataset using up-to-date parcels, footprints, elevations, and values from the RSMeans Data (cost data software) inventory.
- Use updated and current demographic data.
- Using assessor data, include updated occupancy class attributes in general building stock and critical facilities.
- Develop construction ready plans for priority adaptation projects and ensure they are incorporated into the Local Mitigation Strategy to maximize access to mitigation funding.
- Update the essential employee list for emergency preparation and response activities and conduct preparedness training for government employees to maximize the workforce available to respond to and prepare for both pre- and post-disaster.
- Ensure that an employee team of the appropriate size and composition is trained and up to date on disaster response expense tracking to maintain eligibility for reimbursements.
- Develop an on-line library of disaster preparedness and recovery resources that is broadly advertised and available to the public, underscoring that each one of us plays a part in community resilience.

### Coastal Erosion

- Ensure that dynamic shoreline management planning continues.
- Prioritize nature-based solutions (e.g., dune restoration, living shorelines) over hard infrastructure where feasible.

- Link engineered beach designs to MSL or other relative datum and not a fixed elevation such as NAVD to incorporate sea level changes into beach construction templates.
- Investigate the use of structures (groins) to reduce and/or control erosion rates.
- Expand coastal monitoring programs to track erosion hotspots and sediment transport patterns, especially in areas identified as medium-high risk by FDEP.
- Establish rolling easements or conservation buffers in erosion-prone areas to allow for natural shoreline migration and reduce long-term infrastructure exposure.
- Continue coordination with FDEP and local municipalities to prioritize beach nourishment projects in areas with critical infrastructure or evacuation routes that may be at risk by 2070.
- Continue to collect localized coastal erosion data for St. Lucie County beaches and use it to model future erosion rates. Data for the northern mile of the County's Fort Pierce project was not available within the USGS datasets used in this RVA, and local data is essential to fill this gap and support targeted planning and mitigation.

**Drought**

- Incorporate drought early warning into existing hazard mitigation plans by tracking the weekly updates on the US Drought Monitor website and longer term forecasts on the National Drought Mitigation Center website. Identify clear triggers for remedial actions and communicate those actions to the public.
- Determine percentage of water use by sector to identify key target customers for water reduction strategies and to prioritize water use categories, e.g. essential, socially and economically important, non-essential.
- Develop a countywide adaptive water management strategy that includes drought contingency planning, water reuse, and aquifer recharge initiatives.
- Promote drought-tolerant landscaping and agricultural practices through incentives and technical assistance, especially in high-risk agricultural zones.
- Expand public education campaigns on water conservation and drought preparedness, targeting both residential and commercial users
- Incentivize the use of low-flow appliances such as showers, faucets, toilets, washing machines, and promote water catchment devices like rain barrels and cisterns for irrigation.
- Integrate drought risk into land use planning by discouraging high-water-demand development in areas with limited water supply resilience.

**Extreme Heat**

- Track extreme temperature data for injuries, deaths, shelter needs, agricultural losses, and other impacts to determine distributions of most at-risk areas.
- Use and explore future land development data from the County and municipalities through a qualitative analysis.
- Use best available hazard data as it becomes available.

- Establish a Heat Resilience Task Force to coordinate cross-sectoral responses, including public health, emergency management, and urban planning.
- Prioritize tree canopy expansion and green infrastructure in urban heat islands, especially in Fort Pierce and Port St. Lucie where exposure is highest.
- Ensure that critical public services are equipped to function during power outages that may accompany extreme heat events – including public buildings that may be needed as cooling centers.
- Retrofit public housing and critical facilities with energy-efficient cooling systems and passive design features to reduce heat stress, possibly using renewable energy sources that would be available during power outages.
- Expand parks, increase tree coverage, install splash pads and pools to provide cooling options for the public.
- Develop a countywide extreme heat early warning system and cooling center network, with targeted siting and outreach. Monitor the Heat Risk tool developed by NWS and CDC for heat impact forecasting up to a week in advance.
- Ensure facilities are well weatherized to avoid leaky building envelopes and keep HVAC systems maintained.
- Investigate energy efficiency improvements and renewable energy sources as strategies to reduce stress on the power grid during peak energy demand driven by extreme heat events.

**Inland Flooding**

- Maintain and update a general building stock inventory dataset with critical facility attributes regarding first floor elevation and foundation type (pier, slab on grade, etc.) to enhance loss estimates via a Hazus loss analysis.
- As more current FEMA floodplain data becomes available (i.e., Digital Flood Insurance Rate Maps), update the exposure analysis and generate a detailed flood depth grid that can be integrated into the current Hazus version.
- Conduct a Hazus loss analysis to better understand economic and social impacts from flooding in specific areas.
- Conduct a repetitive loss area analysis and layer those results with the vulnerability analysis. Consider a property acquisition program or flood-proofing subsidies for the highest repetitive losses areas.
- Review building codes periodically to identify updates in building standards that may be required to address hazards as they change and/or intensify.
- Conduct large scale public education to better inform residents of the flood risk to their neighborhood and on flood damage reduction strategies they can implement such as installing flood vents, waterproofing exterior walls, sealing foundations, flood barriers, elevating electric panels and HVAC systems. Consider an incentive program for these activities.
- Continue to expand and update urban flood areas to further inform mitigation.

- Upgrade stormwater infrastructure using future rainfall projections (e.g., 100-year, 24-hour events under 2070 conditions) to reduce system overload or system failure.
- Restore and protect inland wetlands and floodplains to enhance natural flood storage and reduce downstream impacts.
- Incorporate flood risk into zoning and building codes, especially in areas with high socio-economic vulnerability and aging infrastructure exists.
- Develop a green infrastructure master plan to integrate bioswales, rain gardens, and permeable surfaces into urban redevelopment projects.
- Encourage residents in low-lying areas to participate in structure elevation programs as they become available.
- Provide education opportunities on the benefits of well-designed landscaping as it relates to floodwater management.
- Provide public access to GIS maps that identify flooded areas in real time to reduce traffic congestion in these areas and allow recovery actions to progress unimpeded.

**Storm Surge**

- Maintain and update a general building stock inventory dataset with critical facility attributes regarding protection against strong winds, such as hurricane straps, to enhance loss estimates via a Hazus loss analysis.
- Update evacuation planning and sheltering strategies based on SLOSH Category 5 exposure, particularly for St. Lucie Village and Fort Pierce.
- Elevate or floodproof critical infrastructure in high-exposure zones, including emergency services, utilities, and transportation corridors.
- Implement coastal setback policies and discourage new development in areas projected to be inundated under Category 5 scenarios.
- Coordinate with FEMA and FDEM to develop and align local mitigation projects with NFIP and CRS program incentives.

**Wind**

- Perform additional Hazus modeling scenarios, such as the 1,000 MRP.
- A custom general building stock inventory could be developed and include attributes regarding protection against strong winds, such as hurricane straps, to enhance loss estimates.
- Establish a pre-storm preparedness protocol for inspecting infrastructure and securing or moving equipment.
- Strengthen building codes and enforcement for wind-resistant construction, especially for mobile homes and coastal high-rises.
- Ensure that a debris management plan includes pre-staging, rapid clearance, and recycling strategies to reduce post-storm recovery time and minimize impact to landfill.

- Retrofit critical facilities with wind-hardened features (e.g., impact-resistant windows, reinforced roofs) to maintain continuity of operations.
- Expand public education on wind hazard preparedness, including exterior preparation/securing loose objects, safe sheltering practices and insurance literacy.

**Wildfire**

- Maintain and update a general building stock inventory dataset with critical facility attributes regarding first floor elevation and foundation type (pier, slab on grade, etc.) to enhance loss estimates via a Hazus loss analysis.
- Implement a Wildland-Urban Interface (WUI) mitigation strategy that includes defensible space standards, fuel reduction, and fire-adapted landscaping.
- Enhance wildfire detection and response capacity through improved GIS mapping, remote sensing, and interagency coordination.
- Convene a wildfire preparedness stakeholder committee to create a community fire-emergency response plan and to assist with communicating the plan, along with types and timing of wildfire warnings.
- Target prevention-based outreach and support to vulnerable populations in high-risk zones, including manufactured housing communities and low-income residents.
- Integrate wildfire risk into comprehensive planning and development review processes, especially in expanding suburban areas.

## Part II: SLAMM Analysis Recommendations

**Short Term (2040)**

- Establish baseline monitoring for wetlands and mangroves.
- Develop early warning indicators for habitat transitions.
- Integrate SLAMM data into permitting and land use decisions.
- Protect and restore critical habitats (mangroves, marshes).
- Promote low-impact development and conservation incentives.
- Conduct research on habitat migration, sediment dynamics, and compound flooding.

**Medium Term (2070)**

- Acquire upland parcels in marsh/mangrove transition zones.
- Restore floodplain and brackish transition zones.
- Expand use of conservation easements, especially in vulnerable areas.
- Upgrade stormwater infrastructure to address compound flooding.
- Amend comprehensive plans to include SLAMM and FNAI data layers.

**Long Term (2100)**

- Develop a managed retreat framework for vulnerable assets.
- Strengthen wetland conservation for flood and carbon benefits.
- Create a coastal habitat transition reserve network.
- Enhance freshwater system resilience through hydrologic modifications.
- Invest in adaptive infrastructure (e.g., floating roads, elevated buildings).

**Recommendations for Future Assessments**

- Conduct submerged aquatic vegetation (SAV) analysis.
- Perform compound flooding and storm impact assessments.
- Model mangrove migration and enhance tide gauge analysis.
- Expand technical documentation and visualizations.
- Use Marxan modeling for strategic land conservation planning.

# 17.0 REFERENCES

These references provide additional context and information on sea level rise projections, coastal adaptation planning, and the SLAMM analysis. They are recommended for readers interested in exploring these topics in more depth.

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**City Commission Day Meeting - 9:00 AM** **8. B.**

**Meeting Date:** 12/08/2025

**Re:** Annual Update from Treasure Coast Homeless Services Council on Services Provided to Fort Pierce's Unsheltered Population

**Submitted For:** Audria Moore, Special Projects Coordinator, City Manager

**SUBJECT:**

Annual Update (2024–2025) from Treasure Coast Homeless Services Council on Services Provided to Fort Pierce's Unsheltered Population.

## Attachments

Presentation

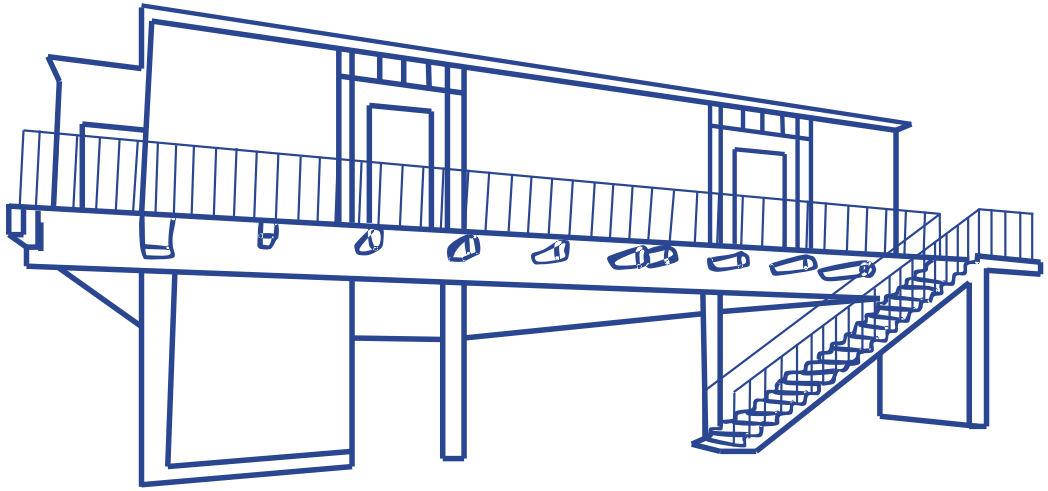
## Form Review

| Inbox | Reviewed By | Date |
|---|---|---|
| City Manager | Audria Moore | 11/26/2025 12:37 PM |
| City Manager | Richard Chess | 12/02/2025 04:04 PM |
| Form Started By: Audria Moore | | Started On: 11/26/2025 12:31 PM |
| Final Approval Date: 12/02/2025 | | |

Homeless Services Council

Connect Collaborate Cultivate

# Housing Hub Services Overview



Building a better future in the City of Ft. Pierce

Presenter: Rayme L. Nuckles, MHS
Visionary Leader

# About Us

**Our Mission** is to prevent and end homelessness on the Treasure Coast and to assure that if homelessness happens, it is brief and non-recurring.

**We are** the designated Lead Agency for the local FL-509 Continuum of Care for Indian River, St. Lucie, and Martin Counties. Collaborating with and guiding 60+ agencies to address homelessness on Florida's Treasure Coast.

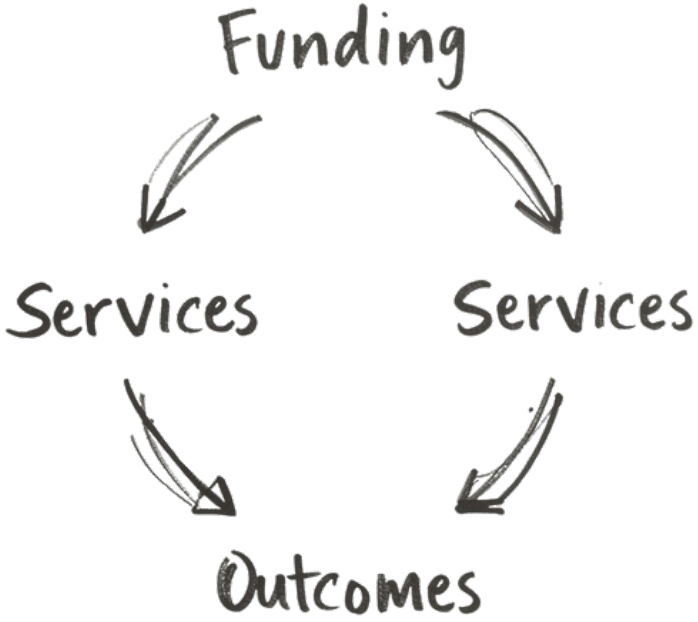
**The Housing Hub / Adam's Place** provides access to shelter, coordinated entry, outreach, and housing navigation for residents experiencing homelessness in Fort Pierce and across St. Lucie County.

# Purpose of the Interlocal Agreement

- Funding supports operations of the Housing Hub
- Ensures coordinated, efficient access to homeless services
- Strengthens countywide homelessness prevention and response

# Support Breakdown

921 total clients served
166 clients at Hub
135 Successfully Housed



# Core Services Provided at the Housing Hub

- Immediate and safe emergency shelter for unaccompanied women and men
- Coordinated Entry intake & assessment
- Case management & housing navigation
- Diversion & Rapid Resolution services
- Benefit navigation : SNAP, Medicaid, disability applications
- Career navigation / connection to support
- Housing navigation
- Physical and mental healthcare navigation

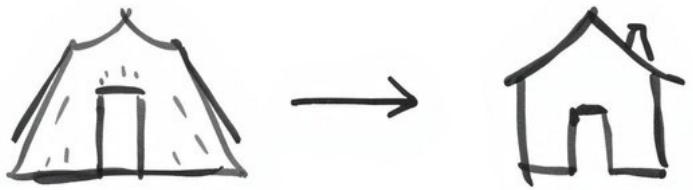
# Street Outreach & Engagement in the City of Ft. Pierce

- Daily engagement with unsheltered individuals in Fort Pierce / St. Lucie County
- Connection to medical and behavioral health partners
- Crisis response and safety planning
- **Linking individuals directly to Hub services**

# Housing Placement & Stabilization Support

Housing Hub staff help households transition from crisis to stability via targeted outreach, emergency shelter, supportive services, crisis mediation, and rapid resolution tactics . Other services include :

- Shared housing
- Landlord partnerships
- Rapid rehousing
- Diversion tactics
- Strong collaboration with local service providers, including those providing :
    - Career guidance / job placement
    - Mental health support
    - Physical health support
    - Recovery Support



# City of Ft. Pierce

## What We See Locally

- City of Ft. Pierce experiences high housing costs and limited rental inventory .
- Seniors are increasing as a percentage of those with housing insecurities .
- Unsheltered homelessness is rising due to a lack of available low-income housing and housing assistance. In addition to shelter space.
- Veterans and medically fragile individuals remain priority populations .

**49,384**

**services provided to**

**4,404**

**households so far in 2025**

# 2025 PIT COUNT

These numbers represent the number of sheltered or unsheltered literally homeless individuals in St. Lucie County seeking or receiving services or interviewed in camp sites, feeding sites, and other locations on one single day. **An additional 1757 individuals residing in the housing of others and were not counted in these totals .**

## TOTAL HOMELESS INDIVIDUALS

| | JANUARY 25, 2024 | FEBRUARY 20, 2025 | DIFFERENCE | % |
|---|---|---|---|---|
| ADULTS | 218 | 132 | (86) | -39.4% |
| CHILDREN | 63 | 43 | (20) | -31.7% |
| TOTAL | **281** | **175** | **(106)** | **-37.7%** |

## VETERAN STATUS

| | | | | |
|---|---|---|---|---|
| VETERANS | 16 | 10 | (6) | -37.5% |

## 2025 SHELTERED AND UNSHELTERED

| | SHELTERED | UNSHELTERED | TOTAL |
|---|---|---|---|
| ADULTS | 16 | 116 | 132 |
| CHILDREN | 9 | 34 | 43 |
| TOTAL | **25** | **150** | **175** |

# Looking Ahead

**We are** comm itted to continuing strong collaboration with St. Lucie County

**We plan** to strengthen diversion, outreach, and housing pathways

**We will** continue prioritizing transparency and shared data with community partners and funders

## Thank You

**for your continued partnership and dedication to our mission**

**City Commission Day Meeting - 9:00 AM** **9. A.**

**Meeting Date:** 12/08/2025

**Re:** U.S. Army Corps of Engineers Supplemental Agreement No. 1 Extending Jetty License Agreement No. DACW17-3-21-0001 by one (1) additional year

**Submitted For:** Leroy Lewis, Solid Waste Division Manager, Public Works

**SUBJECT:**

Approval of U.S. Army Corps of Engineers Supplemental Agreement No. 1 Extending Jetty License Agreement No. DACW17-3-21-0001 for the Operation of Jetty Linear Park by one (1) additional year to December 13, 2026.

**SUMMARY:**

The City is currently working on extending its existing License Agreement No. DACW17-3-21-0001 for an additional five years to continue operating Jetty Linear Park. In staff discussions with the Army Corps of Engineers, a new agreement will be necessary for an extended term. However, due to the time it is taking for them to provide a new agreement, they have provided a supplemental agreement as an extension of the license. This extension will prolong the existing license for an additional year, preventing any expiration and allowing sufficient time to establish a new agreement. The license expires on December 13, 2025.

**RECOMMENDATION:**

Approve Supplemental Agreement No. 1

**ALTERNATIVES:**

City Staff will proceed as directed by the City Commission

**RESPONSIBLE STAFF:**

Marsha Commond, Special Projects Coordinator

**COORDINATED WITH:**

Richard Chess, City Manager
Felicia Holloman, Assistant City Attorney

**Fiscal Impact**

| | |
|---|---|
| **Budgeted Y/N:** | N/A |
| **Fiscal Year:** | N/A |
| **Account:** | N/A |
| **Amount:** | N/A |

**FISCAL IMPACT:**

N/A

**Attachments**

Supplemental Agreement
License Agreement No. DACW17-3-21-0001
City Attorney's Office Memo

# Form Review

| Inbox | Reviewed By | Date |
| --- | --- | --- |
| City Manager | Linda Cox | 12/02/2025 04:12 PM |

Form Started By: Marsha Commond
Started On: 11/25/2025 04:00 PM
Final Approval Date: 12/02/2025

Supplemental Agreement No. 1
Department of the Army
License No. DACW17-3-21-0001
Fort Pierce Harbor Project
St. Lucie County, Florida

**THIS SUPPLEMENTAL AGREEMENT**, made and entered into between the Secretary of the Army, hereinafter referred to as the Secretary, and **CITY OF FORT PIERCE, FLORIDA,** hereinafter referred to as the Grantee,

**WITNESSETH:**

**WHEREAS**, on the 14th day of December 2020, the Secretary, granted to the Grantee, a license to install, use, repair and maintain a concrete walkway/ maintenance track, low level solar lights, benches and trash receptacles on the South Jetty of the Fort Pierce Harbor Project, St Lucie County, Florida; and

**WHEREAS**, the Grantee has requested that this license's term be extended by one (1) year to facilitate the license's renewal prior to its expiration; and

**WHEREAS**, it has been administratively determined to be in the public interest to amend the license and extend its term by one (1) year.

**NOW THEREFORE**, in consideration of the premises and the mutual benefits to be derived, the parties hereto do mutually agree that License No. DACW17-3-21-0001 is hereby amended effective on the date of execution by the Secretary as follows:

1. Condition 1. Term is amended by replacing the existing provision with "This license is granted for a term of six (6) years beginning 14 December 2020 and ending 13 December 2026, but revocable at will by the Secretary, and provided further that this License may be renewed at five (5) year intervals upon review and approval by the U.S. Army Corps of Engineers. This license shall terminate and supersede Department of Army License No. DACW17-3-16-0001."

Except as provided herein, all other terms and conditions of the license shall be and remain the same.

This Supplemental Agreement no. 1 is not subject to Title 10, United States Code,Section 2662.

**IN WITNESS WHEREOF** I have hereunto set my hand by authority/direction of the Secretary of the Army this _____ day of _____, 2025.

_____
EMMANUEL J. FREEMAN
Real Estate Contracting Officer
Deputy Chief, Real Estate Division

**THIS LICENSE** is also executed by the Grantee this_____ day of _____, 2025.

**CITY OF FORT PIERCE, FLORIDA**

BY:_____

TITLE: Mayor

ATTEST:

_____
Linda Cox, City Clerk, Fort Pierce

APPROVED AS TO FORM AND CORRECTNESS:

_____
Sara Hedges, City Attorney, Fort Pierce

# CERTIFICATE OF AUTHORITY

I,_____, certify that I am the _____
**(Name)** **(Secretary or Attesting Officer)**

of the_____**,** named as grantee/lessee/licensee herein;
**(Agency Name)**

that_____, who signed this Agreement on behalf
**(Officer Name)**

of said_____, was then _____
**(Agency Name)** **(Officer Title)**

of the Agency; and that said Agreement was duly signed for and on behalf ofthe

_____by authority of its governing body and is
**(Agency Name)**

within the scope of its statutory powers.

**Signed,**_____
**Secretary or Attesting Officer**

**(The person that signed the attached instrument cannot sign Certificate)**

**This form certifies that the person signing the attached instrument has the authority to do so. The signature of the Secretary/Attesting Officer and the Individual signing the attached instrument cannot be the same.**

# DEPARTMENT OF THE ARMY LICENSE

Fort Pierce Harbor
**PROJECT/INSTALLATION**

St. Lucie County, Florida
**COUNTY, STATE**

**THE SECRETARY OF THE ARMY**, hereinafter referred to as the Secretary, under authority of General Administrative Powers, hereby grants to **CITY OF FORT PIERCE, FLORIDA,** hereinafter referred to as the Grantee, a license to install, use, repair and maintain a concrete walkway/maintenance track, low level solar lights, benches and trash receptacles on the South Jetty of the Fort Pierce Harbor Project, hereinafter referred to as the premises, containing to 0.33 acres, more or less, as shown in red on Exhibits "A" attached here and made part hereof, herein referred to as the premises.

**THIS LICENSE** is granted subject to the following conditions.

## 1. TERM

This license is granted for a term of five (5) years beginning 14 December 2020 and ending 13 December 2025, but revocable at will by the Secretary and provided further that this license may be renewed at five (5) year intervals upon review and approval by the U. S. Army Corps of Engineers. This license shall terminate and supersede Department of the Army License No. DACW17-3-16-0001.

## 2. CONSIDERATION

The consideration for this license shall be the construction, operation and maintenance of the premises for the benefit of the general public and the Army in accordance with the terms and conditions herein set forth.

## 3. NOTICES

All notices and correspondence to be given pursuant to this license shall be addressed, if to the Grantee, City Manager, City of Fort Pierce, City Hall, 100 North U.S. Highway 1, Ft. Pierce, Florida 34954; and if to the United States, to the District Engineer, Attention: Chief, Real Estate Division, Post Office Box 4970, Jacksonville, Florida 32232-0019; or as may from time to time otherwise be directed by the parties. Notice shall be deemed to have been duly given if and when enclosed in a properly sealed envelope addressed as aforesaid, and deposited, postage prepaid, in a post office regularly maintained by the United States Postal Service.

## 4. AUTHORIZED REPRESENTATIVES

Except as otherwise specifically provided, any reference herein to "District Engineer" or "said officer" shall include their duly authorized representatives. Any reference to "Grantee" shall include any duly authorized representatives.

## 5. SUPERVISION BY THE DISTRICT ENGINEER

The use and occupation of the premises shall be subject to the general supervision and approval of the District Engineer hereinafter referred to as said officer, and to such rules and regulations as may be prescribed from time to time by said officer.

## 6. APPLICABLE LAWS AND REGULATIONS

The Grantee shall comply with all applicable Federal, state, county and municipal laws, ordinances and regulations wherein the premises are located.

## 7. CONDITIONAL USE BY GRANTEES

The exercise of the privileges herein granted shall be:

a. without cost or expense to the United States;

b. subject to the right of the United States to improve, use or maintain the premises;

c. subject to other outgrants of the United States on the premises;

d. personal to the Grantee, and this license, or any interest therein, may not be transferred or assigned.

## 8. CONDITION OF PREMISES

The Grantee acknowledges that they have inspected the premises, know its condition, and understand that the same is licensed without any representations or warranties whatsoever and without any obligation on the part of the United States to make any alterations, repairs, or additions thereto.

## 9. COST OF UTILITIES

The Grantee shall pay the cost, as determined by the officer having immediate supervision over the premises, of producing and/or supplying any utilities and other services furnished by the Government or through Government-owned facilities for the use of the grantee, including the grantee's proportionate share of the cost of operation and maintenance of the Government-owned facilities by which such utilities or services are produced or supplied. The Government shall be under no obligation to furnish utilities or services. Payment shall be made in the manner prescribed by the officer having such jurisdiction.

## 10. PROTECTION OF PROPERTY

The Grantee shall keep the premises in good order and in a clean, safe condition by and at the expense of the Grantee. The Grantee shall be responsible for any damage that may be caused to property of the United States by the activities of the Grantee under this license, and shall exercise due diligence in the protection of all property located on the premises against fire or damage from any and all other causes. Any property of the United States damaged or destroyed by the Grantee incident to the exercise of the privileges herein

granted shall be promptly repaired or replaced by the Grantee to a condition satisfactory to said officer, or at the election of said officer, reimbursement made therefor by the Grantee in an amount necessary to restore or replace the property to a condition satisfactory to said officer.

## 11. INDEMNITY

The United States shall not be responsible for damages to property or injuries to persons which may arise from or be incident to the exercise of the privileges herein granted, or for damages to the property of the Grantee, or for damages to the property or injuries to the person of the Grantee's officers, agents, or employees or others who may be on the premises at their invitation or the invitation of any one of them, and the Grantee shall hold the United States harmless, to the extent allowed by law, from any and all such claims not including damages due to the fault or negligence of the United States or its contractors.

## 12. RESTORATION

On or before the expiration of this license or its termination by the Grantee, the Grantee shall vacate the premises, remove the property of the Grantee, and restore the premises to a condition satisfactory to said officer. If, however, this license is revoked, the Grantee shall vacate the premises, within such time as the District Engineer may designate. In either event, if the Grantee shall fail or neglect to remove said property and restore the premises, then, at the option of said officer, the property shall either become the property of the United States without compensation therefor, or said officer may cause the property to be removed and no claim for damages against the United States or its officers or agents shall be created by or made on account of such removal and restoration work. The Grantee shall also pay the United States on demand any sum, which may be expended by the United States after the expiration, revocation, or termination of this license in restoring the premises.

## 13. NON-DISCRIMINATION

The Grantee shall not discriminate against any person or persons or exclude them from participation in the Grantee's operations, programs or activities because of race, color, religion, sex, age, handicap or national origin in the conduct of operations on the premises. The Grantee will comply with the Americans with Disabilities Act and attendant Americans with Disabilities Act Accessibility Guidelines (ADAAG) published by the Architectural and Transportation Barriers Compliance Board.

## 14. SUBJECT TO EASEMENTS

This license is subject to all existing easements, or those subsequently granted as well as established access routes for roadways and utilities located, on the premises.

## 15. TERMINATION BY THE GRANTEES

This license may be terminated by the Grantee at any time by giving the District Engineer at least thirty (30) days notice in writing provided that no refund by the United States of any consideration previously paid shall be made.

## 16. TERMINATION BY THE GOVERNMENT

The Government may terminate this license as follows:

a. NON COMPLIANCE. The Government may terminate this license if the Grantee fails to comply with any of the terms and conditions specified herein by the issuance of 30-days written notice provided that the Grantee has not made reasonable and diligent attempts to cure. The Grantee shall have no claim for damages.

b. FEDERAL REQUIREMENT: In the event the property is required for Federal use or if Grantee's use of the property is not consistent with Federal program purposes, the Government may terminate the license upon issuance thirty (30) days written notice to Grantee.

c. SALE OR TRANSFER OF THE PROPERTY: If the property is to be sold or transferred by the Government during the term of this license, the Government may terminate this license by providing thirty (30) days written notice in advance of the actual sale and transfer date.

## 17. ENVIRONMENTAL PROTECTION

a. Within the limits of their respective legal powers, the parties to this license shall protect the premises against pollution of its air, ground and water. The Grantee shall comply with any laws, regulations, conditions, or instructions affecting the activity hereby authorized if and when issued by the Environmental Protection Agency, or any Federal, state, interstate or local governmental agency having jurisdiction to abate or prevent pollution. The disposal of any toxic or hazardous materials within the premises is specifically prohibited. Such regulations, conditions, or instructions in effect or prescribed by said Environmental Protection Agency, or any Federal, state, interstate or local governmental agency are hereby made a condition of this license. The Grantee shall not discharge waste or effluent from the premises in such a manner that the discharge will contaminate streams or other bodies of water or otherwise become a public nuisance.

b. The Grantee will use all reasonable means available to protect the environment and natural resources, and where damage nonetheless occurs from the Grantee's activities, the Grantee shall be liable to restore the damaged resources.

C. The Grantee must obtain approval in writing from said officer before any pesticides or herbicides are applied to the premises.

## 18. HISTORIC PRESERVATION

The Grantee shall not remove or disturb, or cause or permit to be removed or disturbed, any historical, archeological, architectural or other cultural artifacts, relics, remains or objects of antiquity. In the event such items are discovered on the premises, the Grantee shall immediately notify said officer and protect the site and the material from further disturbance until said officer gives clearance to proceed.

**19. MODIFICATIONS**

This license contains the entire agreement between the parties hereto, and no modification of this agreement, or waiver, or consent hereunder shall be valid unless the same be in writing, signed by the parties to be bound or by a duly authorized representative and this provision shall apply to this condition as well as all other conditions of this license.

**20. DISCLAIMER**

This license is effective only insofar as the rights of the United States in the premises are concerned; and the Grantee shall obtain any permit or license which may be required by Federal, state, or local statute in connection with the use of the premises. It is understood that the granting of this license does not preclude the necessity of obtaining a Department of the Army permit for activities which involve the discharge of dredge or fill material or the placement of fixed structures in the waters of the United States, pursuant to the provisions of Section 10 of the Rivers and Harbors Act of 3 March 1899 (33 U.S.C. 403), and Section 404 of the Clean Waters Act (33 U.S.C. 1344).

**THIS LICENSE** is not subject to Title 10, United States Code, Section 2662, as amended.

**IN WITNESS WHEREOF**, I have hereunto set my hand by authority of the Secretary of the Army, this _____ day of _____, 2021.

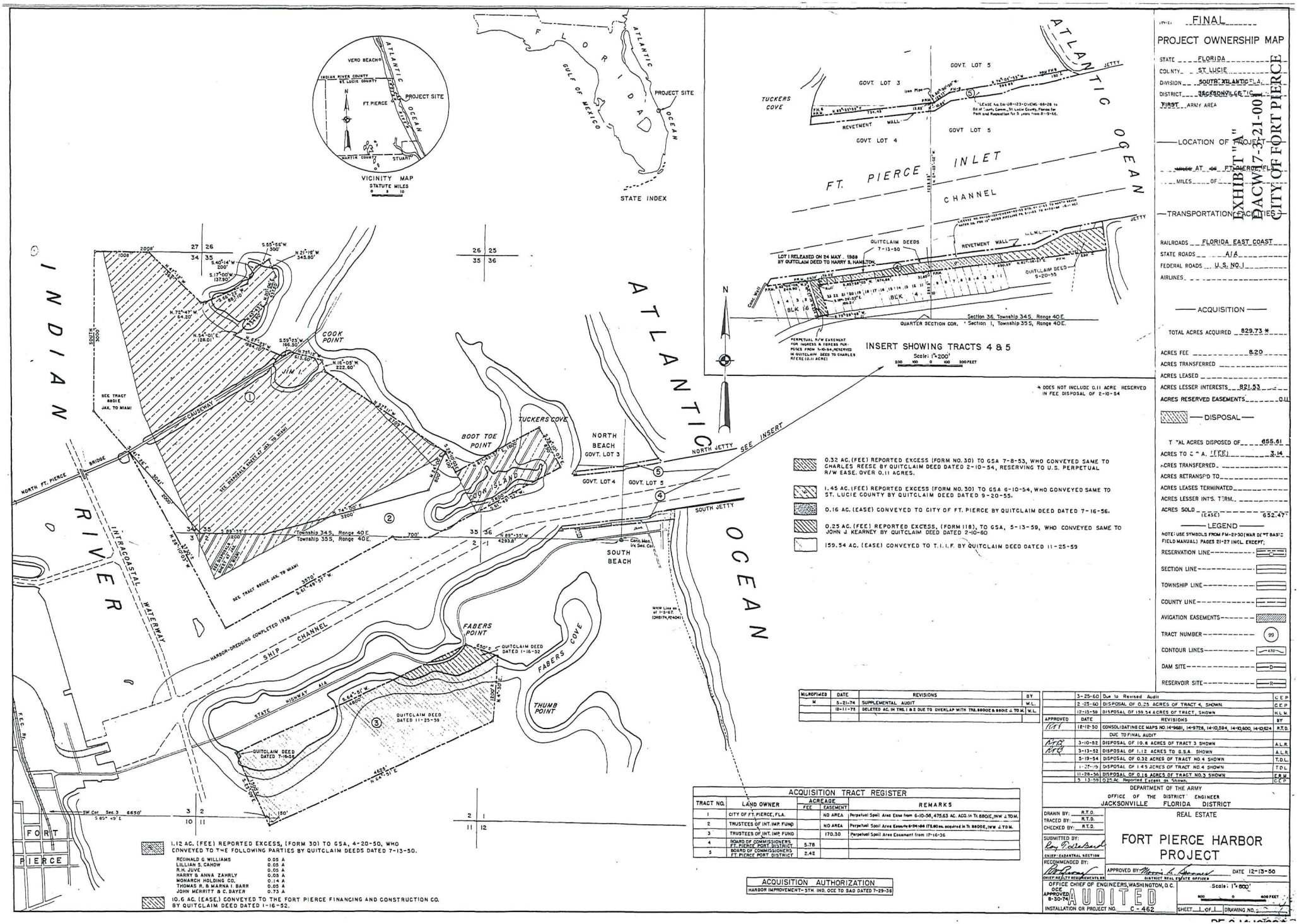
_____
TIMOTHY H. MCQUILLEN
Chief, Real Estate Division
Real Estate Contracting Officer
U.S. Army Engineer District
Jacksonville, Florida

**THIS LICENSE** is also executed by the Grantee this 16th day of February, 2021.

**CITY OF FORT PIERCE, FLORIDA**

By: Linda Hudson
Linda Hudson, Mayor

ATTEST:
Linda W. Cox
City Clerk




* DOES NOT INCLUDE 0.11 ACRE RESERVED IN FEE DISPOSAL OF 2-10-54

0.32 AC.(FEE) REPORTED EXCESS (FORM NO. 30) TO GSA 7-8-53, WHO CONVEYED SAME TO CHARLES REESE BY QUITCLAIM DEED DATED 2-10-54, RESERVING TO U.S. PERPETUAL R/W EASE. OVER 0.11 ACRES.

1.45 AC.(FEE) REPORTED EXCESS (FORM NO. 30) TO GSA 6-10-54, WHO CONVEYED SAME TO ST. LUCIE COUNTY BY QUITCLAIM DEED DATED 9-20-55.

0.16 AC.(EASE) CONVEYED TO CITY OF FT. PIERCE BY QUITCLAIM DEED DATED 7-16-56.

0.23 AC.(FEE) REPORTED EXCESS, (FORM 118), TO GSA, 5-13-59, WHO CONVEYED SAME TO JOHN J. KEARNEY BY QUITCLAIM DEED DATED 2-10-60

159.54 AC. (EASE) CONVEYED TO T.I.I.F. BY QUITCLAIM DEED DATED 11-25-59

1.12 AC. (FEE) REPORTED EXCESS, (FORM 30) TO GSA, 4-20-50, WHO CONVEYED TO THE FOLLOWING PARTIES BY QUITCLAIM DEEDS DATED 7-13-50.

| | |
|---|---|
| REGINALD G. WILLIAMS | 0.05 A |
| LILLIAN S. CAHOW | 0.05 A |
| R.H. JUVE | 0.05 A |
| HARRY & ANNA ZAHRLY | 0.05 A |
| MONARCH HOLDING CO. | 0.14 A |
| THOMAS R. & MARNA I. BARR | 0.05 A |
| JOHN MERRITT & C. BAYER | 0.73 A |

10.6 AC. (EASE.) CONVEYED TO THE FORT PIERCE FINANCING AND CONSTRUCTION CO. BY QUITCLAIM DEED DATED 1-16-52.

## ACQUISITION TRACT REGISTER

| TRACT NO. | LAND OWNER | ACREAGE FEE | ACREAGE EASEMENT | REMARKS |
|---|---|---|---|---|
| 1 | CITY OF FT. PIERCE, FLA. | | NO AREA | Perpetual Spoil Area Ease from 6-10-54, 475.63 AC. ACQ. in Tr. 880QE, NW ¼ TOM. |
| 2 | TRUSTEES OF INT. IMP. FUND | | NO AREA | Perpetual Spoil Area Easefrom 6-24-54 17.80 ac. acquired in Tr. 880QE, NW ¼ TOM. |
| 3 | TRUSTEES OF INT. IMP. FUND | | 170.30 | Perpetual Spoil Area Easement from 17-16-36 |
| 4 | BOARD OF COMMISSIONERS FT. PIERCE PORT DISTRICT | 5.78 | | |
| 5 | BOARD OF COMMISSIONERS FT. PIERCE PORT DISTRICT | 2.42 | | |

## ACQUISITION AUTHORIZATION

HARBOR IMPROVEMENT - 57th IND. OCE TO SAD DATED 7-29-36

| MICROFILMED | DATE | REVISIONS | BY |
|---|---|---|---|
| M | 5-21-74 | SUPPLEMENTAL AUDIT | W.L. |
| | 12-11-78 | DELETED AC. IN TRS. 1 & 2 DUE TO OVERLAP WITH TRS. 880QE & 880QE J TO M. | W.L. |

| | DATE | REVISIONS | BY |
|---|---|---|---|
| | 3-25-60 | Due to Revised Audit | C.E.P. |
| | 2-25-60 | DISPOSAL OF 0.23 ACRES OF TRACT 4, SHOWN | C.E.P. |
| | 12-13-50 | DISPOSAL OF 159.54 ACRES OF TRACT, SHOWN | H.L.M. |
| APPROVED | DATE | REVISIONS | BY |
| [illegible] | 10-12-50 | CONSOLIDATING CE MAPS NO. 14-9681, 14-9726, 14-10,594, 14-10,600, 14-10,624 | R.T.D. |
| | | DUE TO FINAL AUDIT | |
| [illegible] | 3-10-52 | DISPOSAL OF 10.6 ACRES OF TRACT 3 SHOWN | A.L.R. |
| [illegible] | 3-13-52 | DISPOSAL OF 1.12 ACRES TO G.S.A. SHOWN | A.L.R. |
| | 5-19-54 | DISPOSAL OF 0.32 ACRES OF TRACT NO. 4 SHOWN | T.D.L. |
| | 1-27-55 | DISPOSAL OF 1.45 ACRES OF TRACT NO. 4 SHOWN | T.D.L. |
| | 11-28-56 | DISPOSAL OF 0.16 ACRES OF TRACT NO. 3 SHOWN | F.B.M. |
| | 5-13-59 | 0.23 AC. Reported Excess in Shown. | C.E.P. |

DEPARTMENT OF THE ARMY
OFFICE OF THE DISTRICT ENGINEER
JACKSONVILLE FLORIDA DISTRICT

REAL ESTATE

# FORT PIERCE HARBOR PROJECT

DRAWN BY: R.T.D.
TRACED BY: R.T.D.
CHECKED BY: R.T.D.
SUBMITTED BY: [signature] CHIEF, CADASTRAL SECTION
RECOMMENDED BY: [signature] CHIEF, REAL ESTATE DIVISION
APPROVED BY: [signature] DISTRICT REAL ESTATE OFFICER
DATE 12-13-50

OFFICE CHIEF OF ENGINEERS, WASHINGTON, D.C.
OCE APPROVED 8-30-74 AUDITED
INSTALLATION OR PROJECT NO. C-462

Scale: 1"=800'
800 0 800 FEET
SHEET 1 OF 1 DRAWING NO. 2

STATUS: FINAL

PROJECT OWNERSHIP MAP

STATE FLORIDA
COUNTY ST. LUCIE
DIVISION SOUTH ATLANTIC DIV.
DISTRICT JACKSONVILLE DIST.
FIRST ARMY AREA

LOCATION OF PROJECT
[redacted] AT FT. PIERCE, FLA.
MILES OF

TRANSPORTATION FACILITIES
RAILROADS FLORIDA EAST COAST
STATE ROADS A1A
FEDERAL ROADS U.S. NO. 1
AIRLINES

ACQUISITION

| | |
|---|---|
| TOTAL ACRES ACQUIRED | 829.73 * |
| ACRES FEE | 8.20 |
| ACRES TRANSFERRED | |
| ACRES LEASED | |
| ACRES LESSER INTERESTS | 821.53 |
| ACRES RESERVED EASEMENTS | 0.11 |

DISPOSAL

| | |
|---|---|
| TOTAL ACRES DISPOSED OF | 655.61 |
| ACRES TO C.A.A. (FEE) | 3.14 |
| ACRES TRANSFERRED | |
| ACRES RETRANSFD TO | |
| ACRES LEASES TERMINATED | |
| ACRES LESSER INT'S. TERM. | |
| ACRES SOLD (EASE) | 652.47 |

LEGEND

NOTE: USE SYMBOLS FROM FM-21-30 (WAR DEPT BASIC FIELD MANUAL) PAGES 21-27 INCL. EXCEPT;

RESERVATION LINE
SECTION LINE
TOWNSHIP LINE
COUNTY LINE
AVIGATION EASEMENTS
TRACT NUMBER (99)
CONTOUR LINES (470)
DAM SITE (D)
RESERVOIR SITE (R)

EXHIBIT "A" ACW7-321-00
CITY OF FORT PIERCE

THE SUNRISE CITY
FORT PIERCE
CITY ATTORNEY'S OFFICE Florida

TO: Marsha Commond, Special Projects Coordinator - Public Works, Public Works, Directors Office

FROM: Felicia Holloman, Assistant City Attorney **FH**

THROUGH: Sara Hedges, City Attorney *SH*

RE: Army Corp. of Engineers Supplemental Agreement No. 1 for Jetty License Agreement No. DACW17-3-21-0001

CAO RLS FILE: 25-386

DATE: November 25, 2025

---

I have reviewed the request for legal services related to the supplemental agreement with the Department of the Army to extend the Jetty license agreement for one year. Edits were made to the PDF form provided by the Army to include signature lines for the City Clerk and City Attorney. This edited form is attached, and is approved as to form and correctness.

If you have any questions, please do not hesitate to contact this Office via phone or e-mail.

Thank you.

**City Commission Day Meeting - 9:00 AM** **9. B.**

**Meeting Date:** 12/08/2025

**Re:** Approval of Interlocal Funding Agreement

**Submitted For:** Audria Moore, Special Projects Coordinator, City Manager

**SUBJECT:**

Approval of Interlocal Funding Agreement with St. Lucie County for homeless services in the amount of $125,000 for FY2026

**SUMMARY:**

In support of St. Lucie County's effort to address unsheltered homelessness, the City of Fort Pierce committed $125,000 in FY2024 to fund operations at the Housing HUB, a 24-bed men's shelter, managed by the Treasure Coast Homeless Services Council and to help develop a Women's Facility. Additional funding was included in FY2025. This Interlocal Funding Agreement outlines the distribution of requested FY2026 funds to continue sustaining and expanding these efforts.

**RECOMMENDATION:**

Staff recommends approval of the Interlocal Funding Agreement with St. Lucie County for homeless services.

**ALTERNATIVES:**

Revise or deny the Interlocal Funding Agreement.

**RESPONSIBLE STAFF:**

Audria V. Moore, Special Projects Coordinator

**COORDINATED WITH:**

City Attorney's Office
St. Lucie County Attorney's Office
St. Lucie County Community Services

**Fiscal Impact**

| | |
|---|---|
| **Budgeted Y/N:** | Y |
| **Fiscal Year:** | 2026 |
| **Account:** | 0016000-581100 |
| **Amount:** | $125,000 |

**FISCAL IMPACT:**

The City will provide the County with the sum of $125,000 to be remitted to the Treasure Coast Homeless Services Council to fund staffing as well as operational costs at the Housing HUB and to expand services by developing a Women's Facility. The City shall remit payment to the County within thirty (30) days of the effective date of the agreement.

**Attachments**

Interlocal Funding Agreement
CAO Memo

## Form Review

| Inbox | Reviewed By | Date |
|---|---|---|
| City Manager | Audria Moore | 11/26/2025 09:46 AM |
| City Manager | Richard Chess | 11/26/2025 02:04 PM |
| Finance Department | Johnna Morris | 12/02/2025 09:44 AM |
| City Manager | Richard Chess | 12/02/2025 04:07 PM |
| Form Started By: Audria Moore | | Started On: 11/25/2025 04:00 PM |
| Final Approval Date: 12/02/2025 | | |

**INTERLOCAL FISCAL YEAR 2026 FUNDING AGREEMENT**
**BY AND BETWEEN ST. LUCIE COUNTY, FLORIDA AND THE CITY OF FORT PIERCE FOR HOMELESS SERVICES**

This Interlocal Agreement ("Agreement") is entered into this ___ day of _____, 2025, by and between the CITY OF FORT PIERCE, a Florida municipal corporation ("City") and ST. LUCIE COUNTY, a political subdivision of the State of Florida ("County").

**RECITALS**

**WHEREAS,** the County and City desire to enter into this Agreement pursuant to Section 163.01, Florida Statutes, known as the "Florida Interlocal Cooperation Act of 1969," which authorizes local governmental units to make the most efficient use of their powers by enabling them to cooperate with each other on a basis of mutual advantage; and

**WHEREAS,** the County is seeking financial contributions in support of the Treasure Coast Homeless Services Council, Inc. (TCHSC), a non-profit organization, to fund staffing and operational costs at the Housing Hub (a 24-bed shelter for adult men and women) and associated services; and

**WHEREAS,** the City desires to contribute funds to support TCHSC's Housing Hub; and

**WHEREAS,** the County acknowledges the importance of these services and agrees to accept the City's funds for the purposes outlined herein.

**NOW, THEREFORE,** in consideration of the foregoing and mutual benefits to be derived from the cooperation of the parties regarding homeless services, the parties agree as follows:

1. **Recitations.** The foregoing recitals are true and incorporated herein by reference.

2. **City Responsibilities.** The City agrees to provide the County with the sum of One Hundred Twenty-Five Thousand Dollars ($125,000) to be remitted to TCHSC to fund homeless initiatives. Payment shall be remitted by the City to the County within thirty (30) days of the effective date of this Agreement.

3. **County Responsibilities:** The County shall remit the funds received from the City to TCHSC on a cost-reimbursement basis and provide the City with the quarterly reporting submitted by TCHSC. The County will reimburse the City for any portion of funds not used in accordance with this Agreement within thirty (30) days of a written request from the City following audit findings or other determination. Funds are to be used exclusively for the eligible activities herein incorporated as Exhibit A.

4. **Term; Termination**. This Agreement shall commence on the effective date set forth in paragraph 11 below and shall remain in effect until September 30, 2026 or until the City's funding has been fully expended, whichever occurs later. Funds provided under this Agreement may be used to reimburse eligible costs incurred by TCHSC on or after October 1,

2025. This Agreement may be terminated upon mutual agreement of the parties, except in the event of a breach of any provision herein, in which case the non-breaching party may terminate this Agreement upon thirty (30) days' written notice to the other party.

5. **Notices.** All written notices required under this Agreement, shall be in writing and shall be (as elected by the party giving such notice) hand delivered by messenger or courier service or mailed by certified mail, postage prepaid, return receipt requested, and shall be directed to the following persons and places designated by the parties:

| FOR THE CITY | FOR THE COUNTY |
|---|---|
| CITY OF FORT PIERCE<br>100 N. U.S. Highway 1<br>Fort Pierce, FL 34950<br><br>WITH A COPY TO:<br>City Manager<br>City of Fort Pierce<br>100 N. U.S. Highway 1<br>Fort Pierce, FL 34950<br><br>AND<br><br>SARA HEDGES, CITY ATTORNEY | ATTN: COMMUNITY SERVICE DIRECTOR<br>714 Avenue C, 2nd Floor<br>Fort Pierce, FL 34950<br><br>With a copy to:<br>ST. LUCIE COUNTY ADMINISTRATOR<br>County Administration Annex<br>2300 Virginia Avenue<br>Fort Pierce, FL 34982<br><br>AND<br><br>St. LUCIE COUNTY ATTORNEY |

6. **Invalid Provisions.** In the event any term or provision of this Agreement is held illegal, unenforceable, or inoperative as a matter of law, the remaining terms and provisions will not be affected thereby but will be valid and remain in full force and effect so far as possible. If any provision of this Agreement may be construed in two or more ways, one of which would render the provision invalid or otherwise voidable or unenforceable and another of which would render the provision valid and enforceable, such provision shall have the meaning which renders it valid and enforceable.

7. **Liability.** The parties to this Agreement shall not be deemed to have assumed any liability for the negligent or wrongful acts or omissions of the other party, or their respective officers, employees, servants, or agents. Nothing contained herein shall be construed as a waiver, by either party, of the liability limits established in Section 768.28, Florida Statutes, or any other source of applicable governing law.

8. **Counterparts.** This Agreement may be executed in one or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

9. **Entire Agreement.** This Agreement contains the entire agreement between the parties hereto as it pertains to the subject matter contained herein and shall supersede and take precedence

over any and all prior and contemporaneous verbal or written agreements and understandings between the parties hereto.

10. **Amendments.** This Agreement may not be amended, modified, altered, or changed in any respect whatsoever, except by a further agreement in writing duly executed by each and all of the parties hereto.

11. **Recording; Effective Date.** This Agreement shall be recorded by the County in the Official Public Records of the Clerk of the Court of St. Lucie County, Florida. A copy of the recorded Agreement shall be forwarded to the City. The Effective Date of this Agreement shall be the date the Agreement is recorded in the public records of St. Lucie County, Florida

**(Remainder of this page left blank)**

**IN WITNESS WHEREOF,** the County and City have caused this Agreement to be executed on behalf of their respective entities, their successors, and assigns, on the day first above written

**ATTEST:**

**_____**
**DEPUTY CLERK**

**ST. LUCIE COUNTY, FLORIDA**
**BOARD OF COUNTY COMMISSIONERS**

**BY: _____**
**JAIME LEE FOWLER, CHAIR**

**APPROVED AS TO FORM AND CORRECTNESS:**

**BY: _____**
**COUNTY ATTORNEY**

**ATTEST:**

**_____**
**CITY CLERK**

**CITY OF FORT PIERCE, FLORIDA**

**BY: _____**
**LINDA HUDSON, MAYOR**

**APPROVED AS TO FORM AND CORRECTNESS:**

**BY: _____**
**SARA HEDGES, CITY ATTORNEY**

THE SUNRISE CITY
FORT PIERCE
CITY ATTORNEY'S OFFICE Florida

TO: AUDRIA MOORE, SPECIAL PROJECTS COORDINATOR, CITY MANAGER

FROM: CAMILLE WALLACE, ESQ., SENIOR ASSISTANT CITY ATTORNEY CAW

THROUGH: SARA HEDGES, CITY ATTORNEY SH

RE: INTERLOCAL FUNDING AGREEMENT WITH ST. LUCIE COUNTY FOR HOMELESS SERVICES FOR FISCAL YEAR 2026

CAO RLS#: 25-383

DATE: NOVEMBER 24, 2025

---

I have reviewed the above Request for Legal Services (RLS) related to the Interlocal Funding Agreement for Homeless Services for FY 2026 and removed the Draft watermark. **The Agreement is approved as to form and correctness**.

If you have any questions, please do not hesitate to contact this Office via phone or e-mail. Thank you.

ST. LUCIE COUNTY FLORIDA

# Annual Report 2024-2025

## Homeless Advisory Committee

# Table of Contents


| | |
|---|---|
| Letter from Chair | 3 |
| Meet the Committee & Our Focus | 4-5 |
| Homelessness in St. Lucie County | 6-7 |
| Community Heroes | 8-12 |
| New Initiatives | 13-14 |
| Testimonials | 15 |
| Challenges | 16-18 |
| Moving Forward & Next Steps | 19-20 |

# Letter from Chair

*Dear Friends, Partners, and Community Members,*

*This past year has been marked by both significant achievements and persistent challenges as we work towards meeting the needs of some of our most vulnerable community members. Through the tireless efforts of our service providers, community advocates, and dedicated volunteers, we have expanded access to emergency shelter via a coordinated entry process, increased permanent housing placements, and strengthened our network of support for individuals and families experiencing homelessness. Our collaboration with local government, nonprofit organizations, and faith-based partners has allowed us to not only serve more people but to do so with compassion, dignity, and respect.*

*We also recognize that the road ahead remains challenging. Rising housing costs, economic instability, and limited resources continue to place pressure on our system. Yet, these realities only strengthen our resolve to work together toward sustainable solutions. Our committee remains committed to advocating for equitable housing policies, expanding prevention programs, and fostering innovative partnerships that address both the immediate and root causes of homelessness.*

*To everyone who has contributed time, resources, or expertise — thank you. Your support is not just appreciated; it is essential. The progress we celebrate today is a direct reflection of your dedication.*

*Together, we can continue building a community where every person has a safe place to call home. I look forward to another year of collaboration, compassion, and meaningful change.*

*With gratitude and hope,*

Jennifer Harris

Jennifer Harris

# Meet the Committee

Cathy Townsend.....St. Lucie County Commissioner, District 5

Anthony Bonna.....City of PSL Councilmember, District 3

Arnold Gaines.....City of Fort Pierce Commissioner, District 1

Jennifer Harris (Chair).....Mental Health Professional

Kylee Fuhr (Vice Chair).....Social Worker/Case Manager

Rayme Nuckles.....Treasure Coast Homeless Services Council

Debbie Hawley.....SLC School Board

Martin Gawlak.....Business Owner

Ana Maria Soares.....Legal

Parris Brady.....Finance

Channel Bonner.....FL Department of Health

Vacant.....Lived Experience

# Our Focus

## Target Groups

- Chronically Homeless
- Veterans
- Seniors
- Families with minor Children

## Outreach Efforts

- Street Outreach
- Community Education

## Ongoing Efforts

- Increase affordable housing
- Create solutions for Unsheltered Homeless
- Help clients secure successful employment
- Learn from persons with Lived Experience

## Coordinated Entry

- Established three distinct, county-based Coordinated Entry systems to operate under a single, unified protocol
- Established and prioritized key criteria for housing prioritization and scoring
- Currently refining the assessment tool to develop a new, more equitable version

# Homelessness in St. Lucie County

## 2024
## Point In Time Count

## HOMELESSNESS FACT SHEET
### ST. LUCIE COUNTY

These numbers represent the number of sheltered or unsheltered literally homeless individuals in St. Lucie County. These numbers are based on those individuals seeking or receiving services or interviewed in camp sites, feeding sites, and other locations on one single day. **An additional 1757 individuals residing in the housing of others were not counted in these totals.**

**TOTAL HOMELESS INDIVIDUALS**

| | JANUARY 25, 2024 | FEBRUARY 20, 2025 | DIFFERENCE | % |
|---|---|---|---|---|
| **ADULTS** | 218 | 132 | (86) | -39.4% |
| **CHILDREN** | 63 | 43 | (20) | -31.7% |
| **TOTAL** | **281** | **175** | **(106)** | **-37.7%** |

**VETERAN STATUS**

*(self-reported and not verified during the PIT count)*

| | | | | |
|---|---|---|---|---|
| **VETERANS** | 16 | 10 | (6) | -37.5% |

**2025 SHELTERED AND UNSHELTERED**

| | SHELTERED | UNSHELTERED | TOTAL |
|---|---|---|---|
| **ADULTS** | 16 | 116 | 132 |
| **CHILDREN** | 9 | 34 | 43 |
| **TOTAL** | **25** | **150** | **175** |

**AGENCIES PROVIDING DATA**

**UNSHELTERED:** NEW HORIZONS, ST. LUCIE COUNTY SCHOOL DISTRICT, TREASURE COAST HOMELESS SERVICES COUNCIL, UP CENTER, MUSTARD SEED, SLC SALVATION ARMY, CAREER SOURCE, RITELIFE INC., REACH CHURCH, WEST PALM BEACH VA, FLORIDA DEPARTMENT OF HEALTH

**SHELTERED:** ST. LUCIE HOUSING HUB, CHILDREN'S HOME SOCIETY

# Homelessness in St. Lucie County

## Law Enforcement Data Calendar Year 2024 & 2025 January-August

ST. LUCIE COUNTY SHERIFF

| 2024 | 2025 |
|---|---|
| **29** Field Interview Reports with homeless persons | **49** Field Interview Reports with homeless individuals through August |
| **75** individuals in jail self report as homeless | **49** individuals in jail self report as homeless through July |

POLICE DEPARTMENT PORT ST. LUCIE

| 2024 | 2025 through August |
|---|---|
| **98** contacts with homeless persons | **72** contacts with homeless individuals |

FORT PIERCE POLICE DEPARTMENT

| August 11, 2024 through August 11, 2025 |
|---|
| officers have had one or more contacts with **368** homeless persons |

# Community Heroes

Thrift Store, Sarah's Kitchen, Food Pantry, Utility Assistance, Rent/Mortgage Assistance

***Served over 40 households***

Thanksgiving Meals, Baby Clothing, Backpack Program, Basic Needs, Breakfast Club, Case Management, Childcare, Diapers, Electric Bill Assistance

***Served almost 4,000 households***

Case Management, Training Certification Programs, Financial Literacy, Food, Utility Assistance, ID's & Birth Certificates, Mental Health Counseling, Work Readiness

*Served over 2,700 households*

Case Management, Mental Health Services, Housing Assistance, Peer Support, Outreach, Substance Use Treatment

***Served over 120 households***

Permanent Supportive Housing, Case Management, Utility Assistance, Medication Review, Wrap Around Services

***Served 39 households***

# Housing Hub Data
# St. Lucie County

FY23 through FY25 2nd Quarter

## 281
### Total Served
The Housing Hub provided services for 181 men and 50 women for a total of 281

## 79%
### Positive Exits
183 individuals housed at the Housing Hub had positive exits.

## 83%
### Street to Housed
191 individuals were placed in shelter directly from the street.

## 19%
### Increased Income
44 individuals were able to increase their income within a 90 day period or less.

## 1
### Recidivism
Since the inception of the program only 1 individual has returned to the Housing Hub for shelter.

## 30%
### Veterans Served
69 Veterans received shelter assistance since the inception of the program.

# Homeless Services Council

- 495 Rental Assistance/ Homeless Prevention Services
- 141 SOAR Screenings, 15 Eligible Enrollments
- 51 Benefits Enrollment (SNAPS)
- 97 Medical Services Referrals

## Housing Hub

St. Lucie County Shelter for Men & Women

**07/2024 - 07/2025**

| 77 | 48 | 49 | 36 |
|---|---|---|---|
| Men Enrolled | Men Successful Exits So Far | Women Enrolled | Women Successful Exits So Far |

**13%**

Increase in all services across St. Lucie County

**95**

Street Outreach Services with 60 outreach encounters resulting in shelter intake



Treasure Coast Homeless Services Council, Inc. is a 501(c)3 registered nonprofit and the lead agency for the FL-509 Continuum of Care for Fort Pierce/St. Lucie, Indian River, Martin Counties.

# Continuum of Care 2024 Impact

## Top Five Services Provided By Value

| St. Lucie County | Total Value | Individuals Served |
|---|---|---|
| **Housing Related** | $1,494,254.69 | 609 |
| **Utilities** | $199,953.13 | 1,161 |
| **Case Management** | $97,206.05 | 9,205 |
| **Health** | $43,364.69 | 4,101 |
| **Food** | $56,808.1 | 7,332 |

## Permanent Supportive Housing

**$445,740**
Awarded

**47**
Households

**St. Lucie County**

51,149 services provided to 5,110 households.

St. Lucie PUBLIC SCHOOLS
AN "A" RATED DESTINATION DISTRICT

ST. LUCIE COUNTY FLORIDA

*Removing Barriers, Providing Equal Access to Education for Students Experiencing Homelessness*

**2,600**

Approximately 2,600 students were identified as homeless in school year 24 25

**642**

Students who received backpacks, clothing & shoes

**1,377**

Holiday bags distributed

**119**

Families that received Case Management Services

## McKinney Vento Training

**232**
School District Employees

**252**
Community Partners

## National Conference Presentations

**3**

## Summer Slide Packets

**125**

## Graduates

**27** McKinney Vento High School Graduates Utilized Tuition Waiver Program to Attend Post Secondary School



Kylee.Fuhr@stlucieschools.org 772-429-3930 https://www.stlucie.k12.fl.us

# New Initiatives

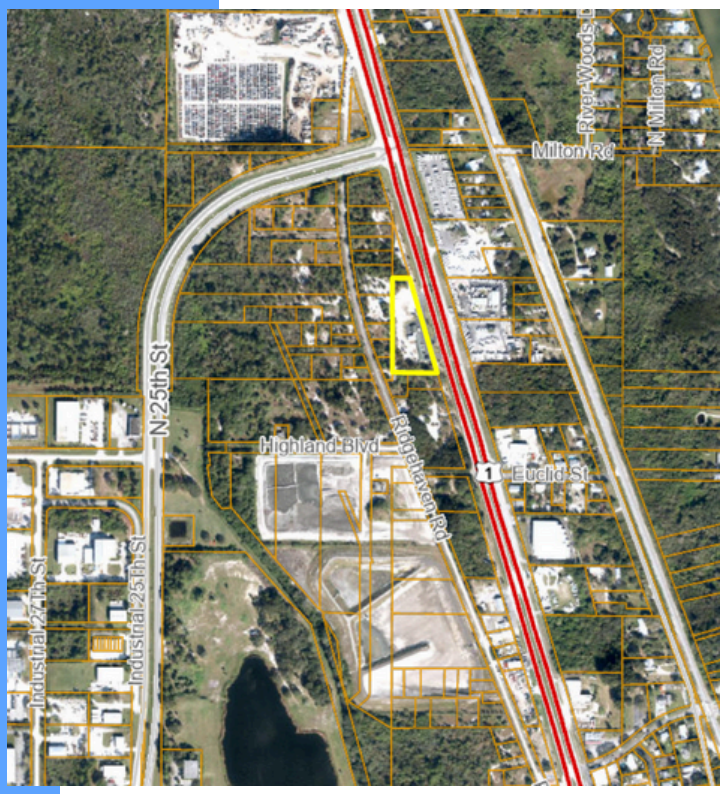
## Graceway Village

GraceWay Village will construct the Family Restorative Shelter to provide temporary shelter for families with minor dependent children. The first phase of the project will include: 10 private family units, each with a private bathroom; classrooms, communal areas, laundry and administrative offices. In addition, 24/7 staffing and Case Management will be provided.

# New Initiatives

## Veterans Shelter

This initiative reflects a holistic approach to supporting those who have served their country by providing them with not only a roof over their heads but also the necessary resources and services to facilitate their transition towards stability and independence. The conversion of the motel into a shelter represents a strategic utilization of existing infrastructure to meet the specific needs of homeless veterans. By repurposing the facility, the county demonstrates a cost-effective and efficient solution to the challenge of providing adequate housing for this vulnerable population.




### Services Offered

- 13 units with Private Bathroom
- Meals
- Wrap Around Services
- Case Management
- Transportation
- Veteran Service Officer available
- Housing
- Financial Support

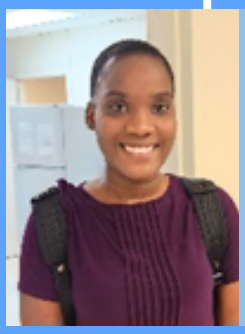
ST. LUCIE COUNTY FLORIDA

# Homeless Services Council

## Barbara and Michael

**Shelter to Move-in:** 120 Days

Barbara, a Veteran, and her son, Micheal were both enrolled into the Housing Hub, mother and son. Barbara was hospitalized due to a back injury and spinal fracture and they were evicted while she was in Rehab. We were able to keep the family intact and locate permanent housing for both. Michael is being followed by the Hands clinic and his mom is now engaging with the VA and receiving Food bank assistance.



## Asline

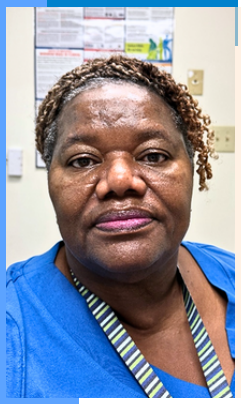
**Shelter to Move-in:** 71 Days

Asline became homeless and ended up sleeping in her storage unit until she was no longer able to live there. She was already working at Walmart and doing her best to save money for stable housing. During her time in the program, Asline gained more hours at work and began her training to obtain her Medical Assistant Certification. She was able to find a stable living arrangement for herself and TCHSC assisted her with her transition from the shelter into her new home.

## Steven

**Shelter to Move-in:** 90 Days

Steven found himself homeless due to no fault of his own and was the second youngest resident at the time he was in the program. While enrolled, he utilized services by HANDS clinic and the Treasure Coast food bank to secure food stamps, and found gainful, permanent employment through Hire Quest and now works as a longshoreman. This allowed him the means to purchase a car and begin living independently in his own apartment.



## Juanita

**Shelter to Move-in:** 68 Days

At 58, Juanita found herself on the brink of homelessness after her hours at work were drastically reduced. With no family nearby and her savings depleted, she was forced to sleep in her car. Shortly after, she was contacted by Treasure Coast Homeless Services Council's Outreach Team and was directed to the Housing Hub.

Within weeks, she secured a transitional apartment while TCHSC continues to provide wrap-around services and job support. Today, Jaunita is back on her feet, working full-time and mentoring others facing similar challenges. **"I never thought I'd need help,"** she says, **"but asking for it changed everything."**

# Homelessness in St. Lucie County

## 2025 Out of Reach Report

## FLORIDA #10*

In **Florida**, the Fair Market Rent (FMR) for a two-bedroom apartment is **$1,833**. In order to afford this level of rent and utilities — without paying more than 30% of income on housing — a household must earn **$6,109** monthly or **$73,308** annually. Assuming a 40-hour work week, 52 weeks per year, this level of income translates into an hourly Housing Wage of:

**$35.24 PER HOUR STATE HOUSING WAGE**

### FACTS ABOUT **FLORIDA:**

| STATE FACTS | |
|---|---|
| Minimum Wage | $12.00 |
| Average Renter Wage | $22.63 |
| 2-Bedroom Housing Wage | $35.24 |
| Number of Renter Households | 2,767,517 |
| Percent Renters | 33% |

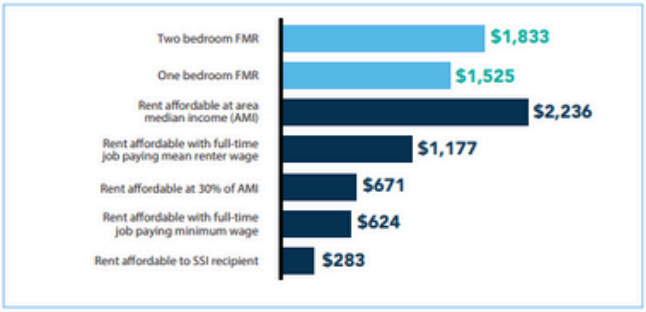
**117** Work Hours Per Week At **Minimum Wage** To Afford a **2-Bedroom Rental Home** (at FMR)

**98** Work Hours Per Week At **Minimum Wage** To Afford a **1-Bedroom Rental Home** (at FMR)

**2.9** Number of Full-Time Jobs At **Minimum Wage** To Afford a **2-Bedroom Rental Home** (at FMR)

**2.4** Number of Full-Time Jobs At **Minimum Wage** To Afford a **1-Bedroom Rental Home** (at FMR)

| MOST EXPENSIVE AREAS | HOUSING WAGE |
|---|---|
| Miami-Miami Beach-Kendall HMFA | $44.69 |
| West Palm Beach-Boca Raton HMFA | $42.81 |
| Monroe County | $41.13 |
| Fort Lauderdale HMFA | $40.42 |
| Orlando-Kissimmee-Sanford MSA | $35.71 |




MSA = Metropolitan Statistical Area; HMFA = HUD Metro FMR Area.
* Ranked from Highest to Lowest 2-Bedroom Housing Wage. Includes District of Columbia and Puerto Rico.

WWW.NLIHC.ORG/OOR | © 2024 NATIONAL LOW INCOME HOUSING COALITION

| FY24 HOUSING WAGE | HOUSING COSTS | | | AREA MEDIAN INCOME (AMI) | | | | RENTERS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hourly wage necessary to afford 2 BR[1] FMR[2] | 2 BR FMR | Annual income needed to afford 2 BR FMR | Full-time jobs at minimum wage to afford 2BR FMR[3] | Annual AMI[4] | Monthly rent affordable at AMI[5] | 30% of AMI | Montly rent affordable at 30% of AMI | Renter households (2018-2021) | % of total households (2018-2021) | Estimated hourly mean renter wage (2024) | Monthly rent affordable at mean renter wage | Full-time jobs at mean renter wage needed to afford 2 BR FMR |
| SLC $30.25 | $1,573 | $62,920 | 2.5 | $87,800 | $2,195 | $26,340 | $659 | 28,968 | 23% | $17.55 | $912 | 1.7 |

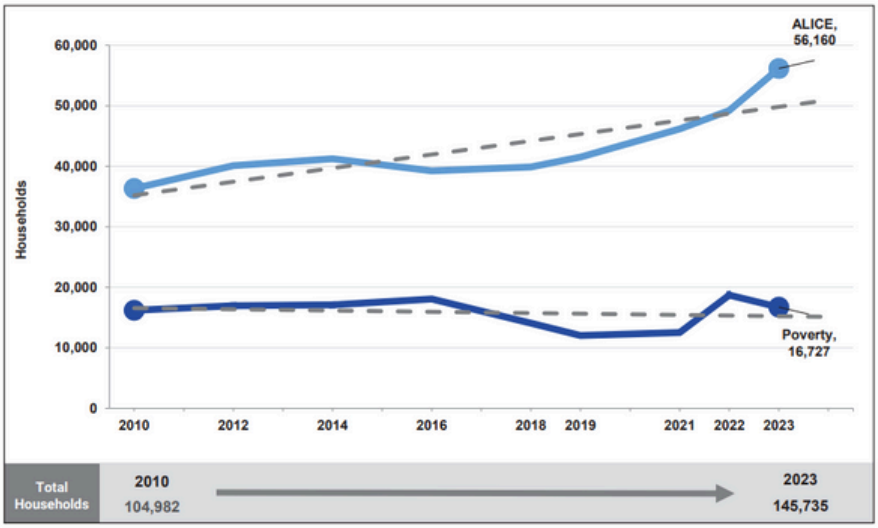
# ALICE IN ST. LUCIE COUNTY

2023 Point-in-Time Data

**Population:** 373,586 • **Number of Households:** 145,735
**Median Household Income:** $66,530 (state: $73,311)
**Labor Force Participation Rate:** 56.1% (state: 60%)
**ALICE Households:** 39% (state: 34%) • **Households in Poverty:** 11% (state: 13%)

| St. Lucie County, 2023 | | |
|---|---|---|
| Town | Total Households | % ALICE & Poverty |
| Fort Pierce CCD | 34,872 | 63% |
| Hutchinson Island CCD | 4,965 | 47% |
| Port St. Lucie CCD | 88,622 | 44% |
| West St. Lucie CCD | 3,181 | 44% |

## ALICE and Poverty-Level Households, St. Lucie County, 2010-2023




*Note: See an interactive version of this data at UnitedForALICE.org/Florida*
*Sources: ALICE Threshold, 2010-2023; American Community Survey, 2010-2023*

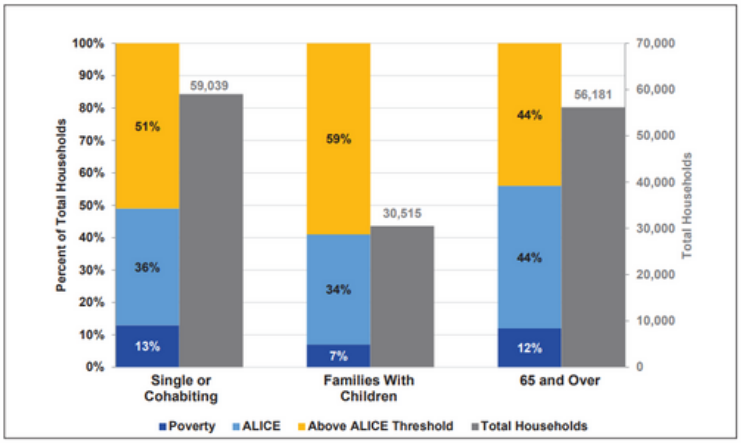
ALICE is an acronym for Asset Limited, Income Constrained, Employed — households that earn more than the Federal Poverty Level, but less than the basic cost of living for the county (the ALICE Threshold). Households below the ALICE Threshold — ALICE households plus those in poverty — can't afford the essentials.

Households move below or above the ALICE Threshold as economic factors and circumstances change. The line graph to the right shows the number of ALICE and poverty-level households (solid blue lines), as well as the trend over time (dotted gray lines). By 2023, 72,887 households (50%) were below the ALICE Threshold in St. Lucie County.

| Household Survival Budget, St. Lucie County, 2023 | | |
|---|---|---|
| | Single Adult | 2 Adults, 1 Infant, 1 Preschooler |
| **Monthly Costs** | | |
| Housing | $1,268 | $1,604 |
| Child Care | – | $1,502 |
| Food | $491 | $1,333 |
| Transportation | $469 | $996 |
| Health Care | $162 | $759 |
| Technology | $86 | $116 |
| Miscellaneous | $248 | $631 |
| Taxes | $378 | $617 |
| **Monthly Total** | $3,102 | $7,558 |
| **ANNUAL TOTAL** | $37,224 | $90,696 |
| ***Hourly Wage**** | ***$18.61*** | ***$45.35*** |

**Full-time wage required to support this budget*
*For ALICE Household Survival Budget sources, visit UnitedForALICE.org/Methodology*

## Household Financial Status by Household Type, St. Lucie County, 2023




*Note: Families with children include married-parent, single-female-headed, and single-male-headed households.*
*Sources: ALICE Threshold, 2023; American Community Survey, 2023*

# Challenges

## Lack of Affordable Housing

- High rental costs
- Limited employment opportunities with sufficient pay
- Long waitlists for public housing or housing vouchers

## Insufficient Funding

- Limited or inconsistent government funding for shelters and support services
- Heavy reliance on grant cycles, fundraising, or donor support
- Funding restrictions that limit flexibility in service delivery

## Mental Health and Substance Use Disorders

- Limited access to mental health and addiction treatment services
- Co-occurring disorders that complicate care and housing stability
- Stigma around behavioral health

## Coordination Between Systems

- Fragmented service delivery and siloed agencies
- Lack of data sharing between healthcare, housing, and criminal justice systems
- Duplication of services or clients falling through the cracks

## Employment Barriers

- Lack of job training, education, or employment support
- Legal issues (Ex. criminal records) or lack of documentation
- Insufficient number of jobs available that pay a living wage

## Long-Term Housing Stability

- Support services may end after housing placement (Ex. Rapid Re-Housing)
- Tenants may struggle with lease compliance due to high rent costs
- Risk of returning to homelessness due to economic barriers

# MOVING FORWARD

## PARTNERSHIPS & COLLABORATION

Work closely with CoC, City of Ft Pierce, City of PSL, Faith Based partners, non-profit organizations, law enforcement agencies and business community to address the issues of homelessness in St. Lucie County.

## FUNDING

Continue to identify and secure funding sources, allocate resources effectively, and ensure financial transparency in the use of funds dedicated to addressing homelessness.

## HOUSING

Continue to promote the development of affordable housing and support programs that provide temporary, transitional, or permanent housing solutions.

## EDUCATION

The Homeless Advisory Committee is committed to fostering a deeper understanding of homelessness and its root causes within our community. To this end, the committee will actively promote and coordinate educational efforts aimed at increasing awareness, reducing stigma, and supporting informed decision-making among stakeholders, service providers, and the general public.

## DATA COLLECTION

The Homeless Advisory Committee recognizes that effective solutions to homelessness must be grounded in accurate, timely, and comprehensive data. To better understand the scope, characteristics, and needs of the local homeless population, the committee will prioritize the collection, analysis, and sharing of data as a foundational strategy in its efforts.

# Next Steps:

**01** 2 New Seats to Committee

Faith Based and Law Enforcement

**02** Law Enforcement will help with data collection & innovative strategies for homeless engagement

**03** Places of Worship and Law Enforcement will coordinate to provide Safe Parking

**04** County libraries will begin collecting homeless data & more organizations will begin using HMIS

**05** HAC will work with School District to offer waterproof bags for persons living in streets to secure impiortant documents

## ST. LUCIE COUNTY BOARD OF COUNTY COMMISSIONERS

772-462-1100

stlucieco.gov

2300 Virginia Avenue - Fort Pierce, FL 34982

**City Commission Day Meeting - 9:00 AM** **9. C.**

**Meeting Date:** 12/08/2025

**Re:** Approval of Grant Agreement Amendment

**Submitted For:** Audria Moore, Special Projects Coordinator, City Manager

**SUBJECT:**

Approval of the Amendment to the grant agreement between the State of Florida, the Department of State and the City of Fort Pierce extending the grant period for the Highwaymen Museum project to June 30, 2026.

**SUMMARY:**

This extension moves the grant deadline to **June 30, 2026**, allowing adequate time to complete the grant-funded portion of the project by the projected completion date of December 30, 2025. Remaining work includes exterior site improvements—such as the overflow preventer plumbing tie-in, dumpster enclosure, parking lot grading, asphalt paving, fence installation, and paver brick installation—as well as interior tasks like completing the punch list and final walkthrough. Additionally, the installation of four cement mosaic benches and final landscaping will be completed during this period.

In addition, the mural installation is expected to begin December 8, 2025 and be completed by February 13, 2026.

**RECOMMENDATION:**

Staff recommends approval of the Amendment to the extension of the grant period for the Highwaymen Museum project.

**ALTERNATIVES:**

Staff will proceed as directed by the Commission.

**RESPONSIBLE STAFF:**

Audria V. Moore, Special Projects Coordinator

**COORDINATED WITH:**

City Manager's Office
City Attorney's Office
Teri Abstein, FL Department of State

**Fiscal Impact**

| | |
|---|---|
| **Budgeted Y/N:** | N/A |
| **Fiscal Year:** | 2026 |
| **Account:** | N/A |
| **Amount:** | 0 |

**FISCAL IMPACT:**

There is no fiscal impact.

**Attachments**

Grant Extension Amendment

CAO Memo

Original Grant Agreement and Amendments

## Form Review

| Inbox | Reviewed By | Date |
|---|---|---|
| City Manager | Richard Chess | 11/26/2025 02:04 PM |
| Finance Department | Johnna Morris | 12/02/2025 09:44 AM |
| City Manager | Richard Chess | 12/02/2025 04:05 PM |
| Form Started By: Audria Moore | | Started On: 11/25/2025 04:44 PM |
| Final Approval Date: 12/02/2025 | | |

**City of Fort Pierce**

**23.s.aa.900.084**

This Amendment is between the State of Florida, Department of State, Division of Central Office hereinafter referred to as the "Division" and City of Fort Pierce, hereinafter referred to as the "Grantee".

The parties entered into a grant agreement for the implementation of a African-American Cultural and Historical Grant grant, grant number 23.s.aa.900.084 for "FL Highwaymen & African-American Culture Project". The parties now mutually desire to amend certain terms and conditions of the grant agreement.

In consideration of the covenants contained herein, it is agreed:

All section of the original grant agreement not specifically amended by this or a prior written amendment and all prior written amendments are hereby reaffirmed.

The following sections are hereby revised as follows:

## Original Length of Agreement

7/1/2021 -12/31/2025

## Amended Length of Agreement

7/1/2021 - 6/30/2026

## Additional Conditions

12. Grant Reporting Requirements:

n) Fourteenth Report is due by January 15, 2026, for the period ending December 31, 2025.

o) Fifteenth Report is due by April 15, 2026, for the period ending March 31, 2026.

p) Final Report. The Grantee must submit a Final Report to the Division within one month of the Grant Period End Date set forth in Section 2 above. All final reports must document the completion of all deliverables/tasks, expenses and activities that occurred by the Grant Period End Date. The Grantee may expend funds only for allowable costs resulting from obligations incurred during the specified agreement period. Expenditures of state or federal financial assistance must be in compliance with the laws, rules, and regulations applicable to expenditures of state and federal funds, including, but not limited to, this Agreement, the Reference Guide for State Expenditures, 2 CFR Part 200 and the HPF Grants Manual.

AUTHORIZATION

| | |
|---|---|
| _____ | _____ |
| Authorized official for the Grantee | Authorized official for the Division |

| | | | |
|---|---|---|---|
| _____ | _____ | _____ | _____ |
| Authorized official Signature | Date | Division Authorized official Signature | Date |

THE SUNRISE CITY
FORT PIERCE
CITY ATTORNEY'S OFFICE Florida

TO: AUDRIA MOORE, SPECIAL PROJECTS COORDINATOR, CITY MANAGER
FROM: FELICIA HOLLOMAN, ASSISTANT CITY ATTORNEY FH

THROUGH: SARA HEDGES, CITY ATTORNEY *SH*

RE: APPROVAL OF HIGHWAYMEN MUSEUM GRANT EXTENSION AMENDMENT EXTENDING THE GRANT PERIOD TO 06/30/2026

CAO RLS FILE: 25-382

DATE: NOVEMBER 24, 2025

---

I have reviewed the request for legal services pertaining to an amendment to the African-American Cultural and Historical Grant between the State of Florida and the City. This grant amendment is in the same format as the previous amendments which have been reviewed by this Office. This amendment is thus approved as to form and correctness.

If you have any questions, please do not hesitate to contact this Office via phone or e-mail.

Thank you.

**GRANT AWARD AGREEMENT BETWEEN**
**THE STATE OF FLORIDA, DEPARTMENT OF STATE**
AND
City of Fort Pierce
HD7SD9PNKNA5
23.s.aa.900.084

This Agreement is by and between the State of Florida, Department of State, hereinafter referred to as the "Department," and the City of Fort Pierce hereinafter referred to as the "Grantee."

The Grantee has been awarded an African-American Historical and Cultural Grant by the Department, grant number23.s.aa.900.084 for the Project 'FL Highwaymen & African-American Culture Project," in the amount of $$483,662 ("Grant Award Amount"). The Department enters into this Agreement and has the authority to administer this grant in accordance with Section 152 of the 2021-2022 General Appropriations Act and Section 197 of the 2022-23 General Appropriations Act.

Funding for this grant is provided by the federal Coronavirus State and Local Fiscal Recovery Funds (SLFRF) program established by the American Rescue Plan, Pub. L. No. 117-2 (ARPA), as authorized by the Department of the Treasury. Federal funds disbursed under this program may only be used in compliance with ARPA, Treasury's regulations implementing the Act, applicable provisions of 2 CFR 200, Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards, and all other applicable federal statutes, regulations, and executive orders. For additional information about the SLFRF program, see the Assistance Listing in SAM.gov under assistance listing number (formerly known as CFDA number) 21.027.

In consideration of the mutual covenants and promises contained herein, the parties agree as follows:

1. **Grant Purpose**. This grant shall be used exclusively for the "**FL Highwaymen & African-American Culture Project** ," the public purpose for which these funds were appropriated.

a. The Grantee shall perform the following **Scope of Work**:

Funds are to be used to transform an existing two-story, 3,200 square feet building located in the historical African American community of Lincoln Park to house The Florida Highwaymen Museum. Work items include: HVAC; fire suppression; security system; decorative security fencing; upgrade (5) exterior doors; renovate kitchen and install wood shutters; install brick pavers; install LED track lighting; remove and replace flooring on both floors; repair, patch, prime, paint interior walls; install custom window coverings in the main gallery; and install new generator with transfer switch.

All tasks associated with the Project shall meet the requirements set forth in this agreement.

b. The Grantee agrees to provide the following **Deliverables** and **Performance Measures** related to the Scope of Work for payments to be awarded.

| # | Payment Type | Deliverable Description | Documentation | Payment Amount |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| 1 | Fixed Price | Provide one (1) copy of the draft contract with a professional architectural/engineering consultant; one (1) copy of the project timeline to the Department for review and approval; one (1) copy of the Certificate of Completion for participation in the Grants Management Webinar demonstrating a 100/100 score on the AACH Grants Management Quiz; one (1) copy of the SAM.gov entity information form. | One (1) copy of the draft contract with a professional architectural/engineering consultant; one (1) copy of the project timeline to the Department for review and approval; one (1) Certificate of Completion demonstrating a 100/100 score on the AACH Grants Management Quiz; one (1) copy of the SAM.gov entity information form. | $120,915 |
| 2 | Fixed Price | Complete and submit a completed Application and Certificate for Payment (AIA Document G702) and Schedule of Contract Values (AIA Document G703), or their equivalents, showing at least thirty percent (30%) of the project completed for review and approval; Photographic documentation of installed project identification sign with Grant Funding Acknowledgement; documentation to support all paid expenditures including detailed paid invoices, bank records, and canceled checks. | One (1) copy of a completed Application and Certificate for Payment (AIA Document G702) and Schedule of Contract Values (AIA Document G703), or their equivalents, showing at least thirty percent (30%) of the project completed; Photographic documentation of installed project identification sign with Grant Funding Acknowledgement; documentation to support all paid expenditures including detailed paid invoices, bank records, and canceled checks. | $120,915 |
| 3 | Fixed Price | Complete and Submit one (1) copy of a completed Application and Certificate for Payment (AIA Document G702) and Schedule of Contract Values (AIA Document G703), or their equivalents, showing at least sixty percent (60%) of the project completed; documentation to support all paid expenditures including detailed paid invoices, bank records, and canceled checks. | One (1) copy of a completed Application and Certificate for Payment (AIA Document G702) and Schedule of Contract Values (AIA Document G703), or their equivalents, showing at least sixty percent (60%) of the project completed; documentation to support all paid expenditures including detailed paid invoices, bank records, and canceled checks. | $120,916 |

| | | | | |
|---|---|---|---|---|
| 4 | Fixed Price | Complete and submit an Application and Certificate for Payment (AIA Document G702) and Schedule of Contract Values (AIA Document G703), or their equivalents, showing at least one hundred percent (100%) of the project completed, including all retainage amounts paid, for review and approval. In addition, a new/updated FMSF form (for previously extant structures over 50 years old) for the property and executed Restrictive Covenant filed with the County Clerk shall be submitted prior to final payment; a Single Audit Form shall be completed by the Grantee and submitted along with the Final Progress Report prior to final payment; documentation to support all paid expenditures including detailed paid invoices, bank records, and canceled checks. | One (1) copy of the completed Application and Certificate for Payment (AIA Document G702) and Schedule of Contract Values (AIA Document G703), or their equivalents, showing at least one hundred percent (100%) of the project completed, including all retainage amounts paid; One (1) copy of the new/updated FMSF form (for previously extant structures over 50 years old); One (1) copy of the executed Restrictive Covenant filed with the County Clerk; One (1) Single Audit Form; documentation to support all paid expenditures including detailed paid invoices, bank records, and canceled checks. | $120,916 |
| **Totals** | | | | **$483,662** |

c. The Grantee has provided an Estimated Project Budget based upon reasonable expenditures projected to accomplish the Grantee's Scope of Work and Deliverables outlined in the Agreement. The Budget provides details of how grant and match funds will be spent. All expenditures shall be in accordance with this budget (which is incorporated as part of this Agreement and entitled Attachment A) and must be incurred during the term of this Agreement, as stated in Section 2 of this Agreement.

d. Should grant expenditures vary from the budgeted grant amount for any line item in Attachment A (Estimated Project Budget) by more than 20%, the Grantee shall be required to submit a proposal for revision of the Estimated Project Budget with a written explanation for the reason(s) for deviation(s) from the original Estimated Project Budget to the Division for review and written approval.

2. **Length of Agreement.** This Agreement shall begin on July 1, 2021, and shall end June 30, 2023, unless terminated in accordance with the provisions of Section 33 of this Agreement. Contract extensions will not be granted unless Grantee is able to provide substantial written justification and the Department approves such extension. The Grantee's written request for such extension must be submitted to the Department no later than thirty (30) days prior to the termination date of this Agreement and no amendment will be valid until a written amendment is signed by both parties as required in Section 7 and Section 15 of this Agreement.

3. **Contract Administration.** The parties are legally bound by the requirements of this Agreement. Each party's contract manager, named below, will be responsible for monitoring its performance under this Agreement, and will be the official contact for each party. Any notice(s) or other communications in regard to this agreement shall be directed to or delivered to the other party's contract manager by utilizing the information below. Any change in the contact information below shall be submitted in writing to the contract manager within 10 days of the change.

**For the Department :**
Teri Abstein
Florida Department of State
R.A. Gray Building
500 South Bronough Street
Tallahassee, FL 32399

Phone: 850.245.6299
Email: teri.abstein@dos.myflorida.com

**For the Grantee:**
Contact: Audria Moore-Wells
Address: 100 N US Highway 1 Fort Pierce Florida 34950
Phone: 772.467.3184
Email: amoorewells@cityoffortpierce.com

4. **Grant Payments.** All grant payments are requested online via https://dosgrants.com/ by submitting a payment request with documentation that the deliverable has been completed. The total grant award shall not exceed the Grant Award Amount, which shall be paid by the Department in consideration for the Grantee's minimum performance as set forth by the terms and conditions of this Agreement. Grant payment requests are not considered complete for purposes of payment until review of the deliverables for compliance with the terms and conditions of this Agreement by the appropriate Department staff is complete and approval of the deliverable given. The grant payment schedule is outlined below:

   a. All payments will be made in the amounts identified with the Deliverables in Section 1 of this agreement.
   b. All payments will be made in accordance with the completion of those Deliverables.

5. **Electronic Payments**. The Grantee can choose to use electronic funds transfer (EFT) to receive grant payments. All grantees wishing to receive their award through electronic funds transfer must submit a Direct Deposit Authorization form to the Florida Department of Financial Services (DFS). If EFT has already been set up for the organization, the Grantee does not need to submit another authorization form unless the organization has changed bank accounts. The authorization form is accessible at http://www.myfloridacfo.com/Division/AA/Forms/DFS-A1-26E.pdf where information pertaining to payment status is also available.

6. **Florida Substitute Form W-9.** A completed Substitute Form W-9 issued by DFS is required from any entity that receives a payment from the State of Florida that may be subject to 1099 reporting. DFS must have the correct Taxpayer Identification Number (TIN) and other related information in order to report accurate tax information to the Internal Revenue Service (IRS). To register or access a Florida Substitute Form W-9 visit http://www.flvendor.myfloridacfo.com/. **A copy of the Grantee's Florida Substitute Form W-9 must be submitted to the Department, as required, in advance of or with the executed Agreement.**

7. **Amendment to Agreement.** Either party may request modification of the provisions of this Agreement by contacting the Department to request an Amendment to the Contract. **Changes which are agreed upon shall be valid only when in writing, signed by each of the parties, and attached to the original of this Agreement**. If changes are implemented without the Department's written approval, the organization is subject to noncompliance, and the grant award is subject to reduction, partial, or complete refund to the State of Florida and termination of this agreement.

8. **Financial Consequences**. The Department shall apply the following financial consequences for failure to perform the minimum level of services required by this Agreement in accordance with Sections 215.971 and 287.058, *Florida Statutes*.

   a. Payments will be withheld for failure to complete services as identified in the Scope of Work and Deliverables, provide documentation that the deliverable has been completed, or demonstrate the appropriate use of state or federal funds.
   b. If the Grantee has spent less than the Grant Award Amount in state or federal funds to complete the Scope of Work, the final payment will be reduced by an amount equal to the difference between spent state or federal dollars and the Grant Award Amount.
   c. The Division may reduce individual payments by 10% if the completed deliverable is not consistent with any applicable historic preservation standards as outlined in the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation available online at https://www.nps.gov/subjects/historicpreservation/standards.htm or applicable industry standards.

   The Department shall reduce total grant funding for the Project in direct proportion to any required match contributions not met by the end of the grant period. This reduction shall be calculated by dividing the actual match amount by the required match amount indicated in the Agreement and multiplying the product by the Grant Award Amount indicated in the Agreement. Pursuant to Section 17, Grantee shall refund to the Department any excess funds paid out prior to a reduction of total grant funding.

**9. Additional Special Conditions.**

a) For all projects involving **development activities**, the following special conditions apply:

i. All project work shall be completed under the supervision of a licensed architect or licensed contractor.

ii. All project work affecting a Historic Property must be in compliance with the **Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation** available online at: https://www.nps.gov/subjects/historicpreservation/standards.htm.

iii. The Grantee shall provide photographic documentation of the Project activity. Guidelines regarding the photographic documentation are available online at https://dos.myflorida.com/historical/grants/special-category-grants/.

iv. Architectural Services

A. All projects shall require contracting for architectural/engineering services.
B. The Grantee may request a waiver of this requirement from the Department if they believe that the architectural/engineering services are not needed for the Project. The Department shall make a recommendation to the Grantee after review of the proposed work.

v. Architectural Documents and Construction Contracts

The Grantee shall submit the architectural services contract to the Department for review and approval prior to final execution. In addition, pursuant to *Section 267.031(5)(i), Florida Statutes*, the Grantee shall submit architectural planning documents to the Department for review and approval at the following stages of development:

A. Upon completion of **schematic design**;
B. Upon completion of **design development and outline specifications**; and
C. Upon completion of **100% construction documents and project manual**, prior to execution of the construction contract.

vi. For the construction phase of the Project, in addition to the review submissions indicated above, a copy of the construction contract must be submitted to the Department for review and approval prior to final execution. Department review and approval of said contracts shall not be construed as acceptance by or imposition upon the Department of any financial liability in connection with said contracts.

vii. For projects involving ground disturbance (examples include: historic building or structure relocation, grading and site work, installation of sewer and water lines, subgrade foundation repairs or damp proofing, construction of new foundations and installation of landscape materials), the Grantee shall ensure that the following requirements are included in all contracts for architectural and engineering services:

A. Ground disturbance around historic buildings or elsewhere on the site shall be minimized, thus reducing the possibility of damage to or destruction of significant archaeological resources.

B. If an archaeological investigation of the Project site has not been completed, the architect or engineer shall contact the Department for assistance in determining the actions necessary to evaluate the potential for adverse effects of the ground disturbing activities on significant archaeological resources.

C. Significant archaeological resources shall be protected and preserved in place whenever possible. Heavy machinery shall not be allowed in areas where significant archaeological resources may be disturbed or damaged.

D. When preservation of significant archaeological resources in place is not feasible, a mitigation plan shall be developed in consultation with and approved by the Division of Historical Resources, Bureau of Historic Preservation's Compliance Review Section (contact information available online at www.flheritage.com). The mitigation plan shall be implemented under the direction of an archaeologist meeting the *Secretary of the Interiors' Professional Qualification Standards for Archaeology*.

E. Documentation of archaeological investigation and required mitigation actions shall be submitted to the Compliance Review Section for review and approval. This documentation shall conform to the *Secretary of the Interior's Standards for Archaeological Documentation*, and the reporting standards of the Compliance Review Section set forth in *Chapter 1A-46, Florida Administrative Code.*

b) For all projects involving **survey activities**, the following special conditions apply:

i. The Grantee shall submit survey contracts to the Department for review and approval prior to execution.

ii. A 1A-32 permit must be obtained from the Division of Historical Resources, Bureau of Archaeological Research prior to the beginning of fieldwork conducted in state lands and a copy submitted to the Department, if applicable.

iii. For historical structure and archaeological surveys, the Grantee shall follow the historic structure and archaeological survey guidelines as outlined in the documents found online at https://dos.myflorida.com/historical/grants/small-matching-grants/. The survey report shall conform to *Chapter 1A-46, Florida Administrative Code.*

c) Federal Coronavirus State and Local Fiscal Recovery Funds (SLFRF) program Grant Subrecipients must comply with the Federa Special Conditions contained in Attachment C.

**10. Credit Line(s) to Acknowledge Grant Funding.** Pursuant to Section 286.25, *Florida Statutes*, in publicizing, advertising, or describing the sponsorship of the program the Grantee shall include the following statement:

a. "This project is sponsored in part by the Department of State and the State of Florida." Any variation in this language must receive prior approval in writing by the Department.
b. All site-specific projects must include a Project identification sign, with the aforementioned language, that must be placed on site. The cost of preparation and erection of the Project identification sign are allowable project costs. Routine maintenance costs of Project signs are not allowable project costs. A photograph of the aforementioned sign must be submitted to the Department as soon as it is erected.

**11. Encumbrance of Funds.** The Grantee shall execute a binding contract for at least a part of the Scope of Work within six (6) months from the date of execution of this Agreement, except as allowed below.

a. Extension of Encumbrance Deadline: The encumbrance deadline indicated above may be extended by written approval of the Department. To be eligible for this extension, the Grantee must demonstrate to the Department that encumbrance of grant funding and the required match by binding contract(s) is achievable by the end of the requested extended encumbrance period. The Grantee's written request for extension of the encumbrance deadline must be submitted to the Department no later than fifteen (15) days prior to the encumbrance deadline indicated above.

b. Encumbrance Deadline Exception: For projects not involving contract services the Grantee and the Department shall consult on a case-by-case basis to develop an acceptable encumbrance schedule.

**12. Grant Reporting Requirements.** The Grantee must submit the following reports to the Department. All reports shall document the completion of any deliverables/tasks, expenses and activities that occurred during that reporting period. All reports on grant progress will be submitted online via https://dosgrants.com/. If the Grant Period end date set forth in Section 2 is extended in accordance with the requirements of Section 7 and Section 15 of this Agreement, additional quarterly progress reports shall be submitted until the expiration of the Grant Period.

a. **First Project Progress Report** is due by July 15, 2022, for the period April 1 - June 30, 2022.

b. **Second Project Progress Report** is due by October 15, 2022, for the period July 1 September 30, 2022.

c. **Third Project Progress Report** is due by January 15, 2023, for the period October 1 - December 31, 2022.

d. **Fourth Project Progress Report** is due by April 15, 2023 for the period ending January 1 - March 31, 2023.

e. **Fifth Project Progress Report** is due by July 15, 2023, for the period ending April 1 - June 30, 2023.

f. **Final Report.** The Grantee must submit a Final Report to the Division within one month of the Grant Period End Datset forth in Section 2 above. All final reports must document the completion of all deliverables/tasks, expenses and activities that occurred by the Grant Period End Date. The Grantee may expend funds only for allowable costs resulting from obligations incurred during the specified agreement period. Expenditures of state or federal financial assistance must be in compliance with the laws, rules, and regulations applicable to expenditures of state and federal funds, including, but not limited to, this Agreement, the *Reference Guide for State Expenditures*, and 2 CFR Part 200.

**13. Matching Funds.** Grantee is not required to provide matching funds if the Grant Award Amount is equal to or less than $500,000. *However*, if the Grant Award Amount is greater than $500,000, Grantee is required to provide a 50% match of the amount above $500,000. The Grantee is responsible for any matching funds included in the budget in Attachment A, whether required or voluntary. The Grantee must submit documentation that the match requirements of this Agreement have been met and provide to the Department documentation evidencing expenses incurred to comply with this requirement.

**14. Grant Completion Deadline.** The grant completion deadline is the end date of this Agreement set forth in Section 2 above. The Grant Completion Deadline is the date when all grant and any required matching funds have been paid out or incurred in accordance with the work described in the Scope of Work, detailed in the Estimated Project Budget. If the Grantee finds it necessary to request an extension of the Grant Completion Deadline, an Amendment to the Agreement must be executed as per Section 7, and the stipulations in Section 15 must be met.

**15. Extension of the Grant Completion Deadline.** An extension of the completion date must be requested at least thirty (30) days prior to the end of the Grant Period and may not exceed six (6) months, unless the Grantee can clearly demonstrate extenuating circumstances: *provided, however,* that under no circumstances may this Agreement be extended beyond the period of performance for use of SLFRF funds, as set forth by the Department of the Treasury. An extenuating circumstance is one that is beyond the control of the Grantee, and one that prevents timely completion of the Project such as a natural disaster, death or serious illness of the individual responsible for the completion of the Project, litigation related to the Project, or failure of the contractor or architect to provide the services for which they were contracted to provide. An extenuating circumstance does not include failure to read or understand the administrative requirements of a grant or failure to raise sufficient matching funds. Changes to the original completion deadline shall be valid only when requested in writing, approved by the Department, and an Amendment to the Agreement has been executed by both parties and attached to the original of this Agreement. The Grantee must provide documentation that a portion of the grant funds and match contributions are encumbered and demonstrate to the satisfaction of the Department that project work is progressing at a rate such that completion is achievable within the extended Grant Period.

**16. Non-allowable Grant Expenditures.** The Grantee agrees to expend all grant funds received under this agreement solely for the purposes for which they were authorized and appropriated. Expenditures (grant and match) shall be in compliance with applicable federal and state statutes, regulations, the program guidelines, and this agreement. The following categories of expenditures are non-allowable for expenditure of grant funds and as contributions to required match:

a) Expenditures for work not included in the Scope of Work of the executed Grant Award Agreement;
b) Costs of goods and services not procured in accordance with procurement procedures set forth in the Grant Award Agreement and 2 CFR Part 200;
c) Expenses incurred or obligated prior to or after the Grant Period, as indicated in the Grant Award Agreement;
d) Expenditures of state or federal financial assistance not in compliance with the laws, rules, and regulations applicable to expenditures of state and federal funds as outlined in the Department of Financial Services' Reference Guide for State Expenditures (revised 11/1/2019) and 2 CFR Part 200.
e) Expenses associated with lobbying or attempting to influence Federal, State or local legislation, the judicial branch or any state agency;
f) For project activities directed at a Historic Property, expenditures for work not consistent with the applicable historic Preservation Standards as outlined in the Secretary of the Interior's Guidelines available at www.nps.gov/tps/standards/treatment-guidelines-2017.pdf, standards available at http://www.nps.gov/tps/standards.htm and nps.gov/history/local-law/arch_stnds_0.htm or applicable industry standards;
g) Costs for projects having as their primary purpose the fulfillment of Federal or State regulatory requirements, including costs of

consultation and mitigation measures required under Section 106 of the National Historic Preservation Act of 1966, as amended, or under Section 267.031, F.S.;

h) Projects directed at activities or Real Properties that are restricted to private or exclusive participation or access, which shall include restricting access on the basis of sex, race, color, religion, national origin, disability, age, pregnancy, handicap or marital status;
i) Entertainment, food, beverages, plaques, awards or gifts;
j) Costs not documented in accordance with the provisions of the Grant Award Agreement;
k) Indirect costs including Grantee overhead, management expenses, general operating costs and other costs that are not readily identifiable as expenditures for the materials and services required to complete the work identified in the Scope of Work in the Grant Award Agreement. Examples of indirect costs include: rent/mortgage, utilities, janitorial services, insurance, accounting, internet service, monthly expenses associated to security systems, non-grant related administrative and clerical staffing, marketing and fundraising activities;
l) Administrative and project management expenditures such as expenditures that are directly attributable to management of the grant-assisted Project and meeting the reporting and associated requirements of the Grant Award Agreement;
m) Grantee operational support (i.e., organization salaries not directly related to grant activities; travel expenditures; per diem; or supplies);
n) Insurance costs (Exception: costs for builder's risk, workers' compensation and contractor's liability insurance);
o) Capital improvements to the interior of Religious Properties (Exception: repairs to elements of the structural system. Examples include: foundation repairs, repairs to columns, load bearing wall framing, roof framing, masonry repairs, window and exterior door repairs and restoration practices associated with the building envelope);
p) Accessibility improvements for Religious Properties;
q) Parking facilities, sidewalks, walkways, and trails that are the entire scope of work; landscaping; fabrication or design of exhibits; or commercial projects (coffee shops, cafés, and gifts shops as part of the facility are allowable);
r) Furniture and equipment unnecessary to furnish and operate a new or improved facility as part of a Fixed Capital Outlay project. Specific prior approval must be granted by the Department for all expenditures for furniture and equipment;
s) Costs associated with attending or hosting conferences, summits, workshops or presentations (Exception: municipal or county required public meetings necessary for completion of the grant assisted project);
t) Travel expenditures, including those of personnel responsible for items of work approved by the Department, administrative personnel, contracted or subcontracted employees, either for purposes of work on-site or research off-site; and
u) Tuition waivers, fees, and other non-grant related costs associated with employing students for grant projects.

17. **Unobligated and Unearned Funds and Allowable Costs.** In accordance with Section 215.971, *Florida Statutes*, the Grantee shall refund to the State of Florida any balance of unobligated funds which has been advanced or paid to the Grantee. In addition, funds paid in excess of the amount to which the recipient is entitled under the terms and conditions of the agreement must be refunded to the state agency. Further, the recipient may expend funds only for allowable costs resulting from obligations incurred during the specified agreement period. Expenditures of state or federal financial assistance must be in compliance with the laws, rules, and regulations applicable to expenditures of state and federal funds, including, but not limited to, the *Reference Guide for State Expenditures* and 2 CFR Part 200.

18. **Repayment**. All refunds or repayments to be made to the Department under this Agreement are to be made payable to the order of the "Department of State" and mailed directly to the following address: Florida Department of State, Attention: African-American Cultural and Historical Grant Program, Department of State, 500 South Bronough Street Tallahassee, FL 32399. In accordance with Section 215.34(2), *Florida Statutes*, if a check or other draft is returned to the Department for collection, Grantee shall pay to the Department a service fee of $15.00 or five percent (5%) of the face amount of the returned check or draft, whichever is greater.

19. **Single Audit Act.** The Grantee is required to complete a Single Audit Act certification form through the Department of State grants management system at https://dosgrants.com/. Each grantee, other than a grantee that is a State agency, shall submit to an audit pursuant to 2 CFR 200, Subpart F - Audit Requirements, and Section 215.97, *Florida Statutes*. See Attachment B for additional information regarding this requirement.

20. **Retention of Accounting Records**. Financial records, supporting documents, statistical records, and all other records including electronic storage media pertinent to the Project shall be retained for a period of five (5) years after the close out of the grant. If any litigation or audit is initiated, or claim made, before the expiration of the five-year period, the records shall be retained until the litigation, audit, or claim has been resolved.

21. **Obligation to Provide State Access to Grant Records.** The Grantee must make all grant records of expenditures, copies of reports, books, and related documentation available to the Department or a duly authorized representative of the State of Florida for inspection at reasonable times for the purpose of making audits, examinations, excerpts, and transcripts.

22. **Obligation to Provide Public Access to Grant Records.** The Department reserves the right to unilaterally cancel this Agreement in the event that the Grantee refuses public access to all documents or other materials made or received by the Grantee that are subject to the provisions of Chapter 119, *Florida Statutes*, known as the *Florida Public Records Act*. The Grantee must immediately contact the Department 's Contract Manager for assistance if it receives a public records request related to this Agreement.

23. **Restrictive Covenants**. The Grantee and the Property Owner(s), if different, shall execute and file Restrictive Covenants with the Clerk of the Circuit Court in the county where the property is located, prior to initial release of grant funds. The Restrictive Covenants shall include at a minimum the following provisions:

    a. The Restrictive Covenants shall run with the title of the property, shall encumber the property and shall be binding upon the Grantee and the Property Owner(s), if different, and their successors in interest for ten (10) years from the date of the recordation of the Restrictive Covenants for projects involving improvements to Real Property.

    b. The Grantee and Property Owner(s) shall permit the Department to inspect the property at all reasonable times to determine whether the Grantee and Property Owner(s) are in compliance with the terms of the Restrictive Covenants.

    c. In the case of Historic Properties, the Grantee and Property Owner(s) shall maintain the property in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties.

    d. In the case of Cultural Facilities, the Grantee and Property Owner(s) shall maintain the property as a building which is be used primarily for the programming, production, presentation, exhibition or any combination of the above functions of any of the cultural disciplines defined in Section 265.283(7), Florida Statute. These disciplines include, but are not limited to music, dance, theatre, creative writing, literature, architecture, painting, sculpture, folk arts, photography, crafts, media arts, visual arts, programs of museums, and other such allied, major art forms.

    e. The Grantee and Property Owner(s) agree that no modifications will be made to the property, other than routine repairs and maintenance, without advance review and approval of the plans and specifications by the Department.

    f. The Restrictive Covenants shall contain the following amortization schedule of the repayment of grant funds, should the Grantee or Property Owner(s) or their successors in interest violate the Restrictive Covenants.

        i. Amortization Schedule for projects involving improvements to Real Property:
        If the violation occurs within the first five (5) years of the effective date of these covenants, the Department shall be entitled to return of the entire grant amount. If the violation occurs after the first five (5) years, the Department shall be entitled to return of the entire grant amount, less 10% for each year past the first five (5).

    g. Other provisions as agreed upon by the Department and the Grantee.

24. **Noncompliance with Grant Requirements.** Any Grantee that has not submitted required reports or satisfied other administrative requirements for this grant or other grants from any other Florida Department of State (DOS) Division will be in noncompliance status and subject to the DOS Grants Compliance Procedure. Grant compliance issues must be resolved before a grant award agreement may be executed, and before grant payments for any DOS grant may be released.

25. **Accounting Requirements.** The Grantee must maintain an accounting system that provides a complete record of the use of all grant funds as follows:

    a. The accounting system must be able to specifically identify and provide audit trails that trace the receipt, maintenance, and expenditure of state funds;

b. Accounting records must adequately identify the sources and application of funds for all grant activities and must classify and identify grant funds by using the same budget categories that were approved in the grant application. If Grantee's accounting system accumulates data in a different format than the one in the grant application, subsidiary records must document and reconcile the amounts shown in the Grantee's accounting records to those amounts reported to the Department.

c. An interest-bearing checking account or accounts in a state or federally chartered institution may be used for revenues and expenses described in the Scope of Work and detailed in the Estimated Project Budget.

d. The name of the account(s) must include the grant award number;

e. The Grantee's accounting records must have effective control over and accountability for all funds, property, and other assets; and

f. Accounting records must be supported by source documentation and be in sufficient detail to allow for a proper pre-audit and post-audit (such as invoices, bills, and canceled checks).

**26. Availability of Funds.** The State of Florida's performance and obligation to pay under this Agreement are contingent upon an annual appropriation by the Florida Legislature, or the United States Congress in the case of a federally funded grant. In the event that the state or federal funds upon which this Agreement is dependent are withdrawn, this Agreement will be automatically terminated and the Department shall have no further liability to the Grantee, beyond those amounts already released prior to the termination date. Such termination will not affect the responsibility of the Grantee under this Agreement as to those funds previously distributed. In the event of a state revenue shortfall, the total grant may be reduced accordingly.

**27. Independent Contractor Status of Grantee.** The Grantee, if not a state agency, agrees that its officers, agents and employees, in performance of this Agreement, shall act in the capacity of independent contractors and not as officers, agents, or employees of the state. The Grantee is not entitled to accrue any benefits of state employment, including retirement benefits and any other rights or privileges connected with employment by the State of Florida.

**28. Grantee's Subcontractors.** The Grantee shall be responsible for all work performed and all expenses incurred in connection with this Agreement. The Grantee may subcontract, as necessary, to perform the services and to provide commodities required by this Agreement. The Department shall not be liable to any subcontractor(s) for any expenses or liabilities incurred under the Grantee's subcontract(s), and the Grantee shall be solely liable to its subcontractor(s) for all expenses and liabilities incurred under its subcontract(s). The Grantee must take the necessary steps to ensure that each of its subcontractors will be deemed to be "independent contractors" and will not be considered or permitted to be agents, servants, joint ventures, or partners of the Department.

**29. Liability.** The Department will not assume any liability for the acts, omissions to act, or negligence of, the Grantee, its agents, servants, or employees; nor may the Grantee exclude liability for its own acts, omissions to act, or negligence, to the Department.

a. The Grantee shall be responsible for claims of any nature, including but not limited to injury, death, and property damage arising out of activities related to this Agreement by the Grantee, its agents, servants, employees, and subcontractors. The Grantee, other than a Grantee which is the State or the State's agencies or subdivisions, as defined in Section 768.28, *Florida Statutes*, shall indemnify and hold the Department harmless from any and all claims of any nature and shall investigate all such claims at its own expense. If the Grantee is governed by Section 768.28, *Florida Statutes*, it shall only be obligated in accordance with that Section.
b. Neither the state nor any agency or subdivision of the state waives any defense of sovereign immunity, or increases the limits of its liability, by entering into this Agreement.
c. The Department shall not be liable for attorney fees, interest, late charges or service fees, or cost of collection related to this Agreement.
d. The Grantee shall be responsible for all work performed and all expenses incurred in connection with the Project. The Grantee may subcontract as necessary to perform the services set forth in this Agreement, including entering into subcontracts with vendors for services and commodities; and provided that it is understood by the Grantee that the Department shall not be liable to the subcontractor for any expenses or liabilities incurred under the subcontract and that the Grantee shall be solely liable to the subcontractor for all expenses and liabilities incurred under the subcontract.

**30. Strict Compliance with Laws.** The Grantee shall perform all acts required by this Agreement in strict conformity with all applicable laws

and regulations of the local, state and federal law.

31. **No Discrimination.** The Grantee may not discriminate against any employee employed under this Agreement, or against any applicant for employment because of race, color, religion, gender, national origin, age, pregnancy, disability or marital status. The Grantee shall insert a similar provision in all of its subcontracts for services under this Agreement.

32. **Breach of Agreement.** The Department will demand the return of grant funds already received, will withhold subsequent payments, and/or will terminate this agreement if the Grantee improperly expends and manages grant funds, fails to prepare, preserve or surrender records required by this Agreement, or otherwise violates this Agreement.

33. **Termination of Agreement.**

    a. Termination by the Department. The Department will terminate or end this Agreement if the Grantee fails to fulfill its obligations herein. In such event, the Department will provide the Grantee a notice of its violation by letter, and shall give the Grantee fifteen (15) calendar days from the date of receipt to cure its violation. If the violation is not cured within the stated period, the Department will terminate this Agreement. The notice of violation letter shall be delivered to the Grantee's Contract Manager, personally, or mailed to his/her specified address by a method that provides proof of receipt. In the event that the Department terminates this Agreement, the Grantee will be compensated for any work completed in accordance with this Agreement, prior to the notification of termination, if the Department deems this reasonable under the circumstances. Grant funds previously advanced and not expended on work completed in accordance with this Agreement shall be returned to the Department, with interest, within thirty (30) days after termination of this Agreement. The Department does not waive any of its rights to additional damages, if grant funds are returned under this Section.

    b. Termination for convenience. The Department or the Grantee may terminate the grant in whole or in part when both parties agree that the continuation of the Project would not produce beneficial results commensurate with the further expenditure of funds. The two parties will agree upon the termination conditions, including the effective date, and in the case of partial terminations, the portion to be terminated.

    c. Termination by Grantee. The Grantee may unilaterally cancel the grant at any time prior to the first payment on the grant although the Department must be notified in writing prior to cancellation. After the initial payment, the Project may be terminated, modified, or amended by the Grantee only by mutual agreement of the Grantee and the Department. Request for termination prior to completion must fully detail the reasons for the action and the proposed disposition of the uncompleted work.

34. **Preservation of Remedies.** No delay or omission to exercise any right, power, or remedy accruing to either party upon breach or violation by either party under this Agreement, shall impair any such right, power or remedy of either party; nor shall such delay or omission be construed as a waiver of any such breach or default, or any similar breach or default.

35. **Non-Assignment of Agreement.** The Grantee may not assign, sublicense nor otherwise transfer its rights, duties or obligations under this Agreement without the prior written consent of the Department, which consent shall not unreasonably be withheld. The agreement transferee must demonstrate compliance with the requirements of the Project. If the Department approves a transfer of the Grantee's obligations, the Grantee shall remain liable for all work performed and all expenses incurred in connection with this Agreement. In the event the Legislature transfers the rights, duties, and obligations of the Department to another governmental entity pursuant to Section 20.06, *Florida Statutes*, or otherwise, the rights, duties, and obligations under this Agreement shall be transferred to the successor governmental agency as if it was the original party to this Agreement.

36. **Required Procurement Procedures for Obtaining Goods and Services.**

    a. The Grantee shall provide maximum open competition when procuring goods and services related to the grant-assisted project. Procurement documentation supporting maximum open competition must be submitted to the Department for review and approval prior to execution of project contracts.

    b. Grantee's procurement standards must be consistent with 2 C.F.R. §§ 200.317 – 200.327, as applicable. All procurement

transactions for goods or services must be conducted in a manner providing full and open competition, consistent with the standards outlined in 2 C.F.R. §200.320, which allows for non-competitive procurements only in circumstances where at least one of the four applicable conditions provided are met; *provided, however*, that 2 C.F.R. §200.320(c)(4) is not applicable to SLFRF program awards.

37. **Conflicts of Interest.** The Grantee hereby certifies that it is cognizant of the prohibition of conflicts of interest described in Sections 112.311 through 112.326, *Florida Statutes*, and affirms that it will not enter into or maintain a business or other relationship with any employee of the Department of State that would violate those provisions. The Grantee further agrees to seek authorization from the General Counsel for the Department of State prior to entering into any business or other relationship with a Department of State Employee to avoid a potential violation of those statutes.

38. **Binding of Successors.** This Agreement shall bind the successors, assigns and legal representatives of the Grantee and of any legal entity that succeeds to the obligations of the Department of State.

39. **No Employment of Unauthorized Aliens.** The employment of unauthorized aliens by the Grantee is considered a violation of Section 274A (a) of the Immigration and Nationality Act. If the Grantee knowingly employs unauthorized aliens, such violation shall be cause for unilateral cancellation of this Agreement.

40. **Severability.** If any term or provision of the Agreement is found to be illegal and unenforceable, the remainder will remain in full force and effect, and such term or provision shall be deemed stricken.

41. **Americans with Disabilities Act.** All programs and facilities related to this Agreement must meet the standards of Sections 553.501-553.513, *Florida Statutes*, and the Americans with Disabilities Act of 1990 as amended (42 U.S.C. 12101,*et seq.*), which is incorporated herein by reference.

42. **Governing Law.** This Agreement shall be construed, performed, and enforced in all respects in accordance with the laws and rules of Florida. Venue or location for any legal action arising under this Agreement will be in Leon County, Florida.

**43. Entire Agreement.** The entire Agreement of the parties consists of the following documents:

a. This Agreement
b. Estimated Project Budget (Attachment A)
c. Single Audit Act Requirements and Exhibit I (Attachment B)
d. Federal Special Conditions (Attachment C)
e. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion Lower Tier Covered Transactions (Attachment D)

**In acknowledgment of this grant, provided from funds appropriated in the Florida FY2021-22 General Appropriation Act, the Florida FY2022-23 General Appropriation Act and the federal Coronavirus State Fiscal Recovery Fund (Public Law 117-2), I hereby certify that I have read this entire Agreement, and will comply with all of its requirements.**

| Department of State: | Grantee: |
|---|---|
| By: Sandy Shaughnessy | By: Linda Hudson |
| Division Director Sandy Shaughnessy | Authorizing Official for the Grantee |
| Division of Arts and Culture | Linda Hudson, Mayor |
| | Typed name and title |
| August 23, 2022 | 8/1/2022 |
| Date | Date |

**ATTACHMENT A**

**Estimated Project Budget**

| Description | Grant Funds | Cash Match | In Kind Match |
|---|---|---|---|
| **Other** | | | |
| HVAC Systems | $21,450 | $0 | $0 |
| Alarm System | $81,596 | $0 | $0 |
| Fencing | $78,480 | $0 | $0 |
| Building Pressure Wash | $1,200 | $0 | $0 |
| Exterior Building Painting | $16,500 | $0 | $0 |
| Brick Garden Pavers | $32,500 | $0 | $0 |
| LED Track Lights 1st Fl | $12,000 | $0 | $0 |
| Exterior Doors PGT Impact 1st Fl | $10,000 | $0 | $0 |
| Kitchen Wood Shutters | $1,350 | $0 | $0 |
| Removal & Replace Flooring 1st Fl | $11,600 | $0 | $0 |
| Windowsills 1st Fl | $1,800 | $0 | $0 |
| Repair Prime Patch Paint Walls 1st Fl | $10,200 | $0 | $0 |
| LED Track Lighting 2nd FL | $18,750 | $0 | $0 |
| Window Coverings 2nd Fl | $7,200 | $0 | $0 |
| 2 Exterior Doors PGT Impact 2nd Fl | $5,000 | $0 | $0 |
| Removal & Replace Flooring 2nd Fl | $11,600 | $0 | $0 |
| Repair Patch Paint 2nd Fl | $10,200 | $0 | $0 |
| Generators | $75,500 | $0 | $0 |
| Install Fire Wet Water Suppression System | $25,000 | $0 | $0 |
| Install 6 Custom Window Coverings throughout 1st Floor | $3,600 | $0 | $0 |
| Remove Cabinet and Sink Repair , Patch, Paint area 2nd Floor | $1,250 | $0 | $0 |

| Description | Grant Funds | Cash Match | In Kind Match |
|---|---|---|---|
| Supply and Install 5 Windowsills 2nd Fl | $750 | $0 | $0 |
| Elevator Repair | $6,136 | $0 | $0 |
| Kitchen Renovation | $40,000 | $0 | $0 |
| *Subtotals* | *$483,662* | *$0* | *$0* |
| **Totals** | **$483,662** | **$0** | **$0** |

## ATTACHMENT B

## FEDERAL AND STATE OF FLORIDA SINGLE AUDIT ACT REQUIREMENTS

### AUDIT REQUIREMENTS

The administration of resources awarded by the Department of State to the Grantee may be subject to audits and/or monitoring by the Department of State as described in this Addendum to the Grant Award Agreement.

### MONITORING

In addition to reviews of audits conducted in accordance with 2 CFR 200, Subpart F - Audit Requirements, and section 215.97, Florida Statutes (F.S.), as revised (see AUDITS below), monitoring procedures may include, but not be limited to, on-site visits by Department of State staff, limited scope audits as defined by 2 CFR §200.425, or other procedures. By entering into this agreement, the recipient agrees to comply and cooperate with any monitoring procedures or processes deemed appropriate by the Department of State. In the event the Department of State determines that a limited scope audit of the recipient is appropriate, the recipient agrees to comply with any additional instructions provided by Department of State staff to the recipient regarding such audit. The recipient further agrees to comply and cooperate with any inspections, reviews, investigations, or audits deemed necessary by the Chief Financial Officer (CFO) or Auditor General.

### AUDITS

**Part I: Federally Funded**

This part is applicable if the recipient is a state or local government or a nonprofit organization as defined in 2 CFR §200.90, §200.64, and §200.70.

1. A recipient that expends $750,000 or more in federal awards in its fiscal year must have a single or program-specific audit conducted in accordance with the provisions of 2 CFR 200, Subpart F - Audit Requirements. EXHIBIT 1 to this agreement lists the federal resources awarded through the Department of State by this agreement. In determining the federal awards expended in its fiscal year, the recipient shall consider all sources of federal awards, including federal resources received from the Department of State. The determination of amounts of federal awards expended should be in accordance with the guidelines established in 2 CFR §§200.502-503. An audit of the recipient conducted by the Auditor General in accordance with the provisions of 2 CFR §200.514 will meet the requirements of this Part.

2. For the audit requirements addressed in Part I, paragraph 1, the recipient shall fulfill the requirements relative to auditee responsibilities as provided in 2 CFR §§200.508-512.

3. A recipient that expends less than $750,000 in federal awards in its fiscal year is not required to have an audit conducted in accordance with the provisions of 2 CFR 200, Subpart F - Audit Requirements. If the recipient expends less than $750,000 in federal awards in its fiscal year and elects to have an audit conducted in accordance with the provisions of 2 CFR 200, Subpart F - Audit Requirements, the cost of the audit must be paid from non-federal resources (i.e., the cost of such an audit must be paid from recipient resources obtained from other than federal entities).

The Internet web addresses listed below will assist recipients in locating documents referenced in the text of this agreement and the interpretation of compliance issues.

U.S. Government Printing Office *www.ecfr.gov*

**Part II: State Funded**

This part is applicable if the recipient is a nonstate entity as defined by section 215.97(2), F.S.

1. In the event that the recipient expends a total amount of state financial assistance equal to or in excess of $750,000 in any fiscal year of such recipient (for fiscal years ending June 30, 2017, and thereafter), the recipient must have a state single or project-specific audit for such fiscal year in accordance with section 215.97, F.S.; Rule Chapter 69I-5, F.A.C., State Financial Assistance; and Chapters 10.550 (local governmental entities) and 10.650 (nonprofit and for-profit organizations), Rules of the Auditor General. EXHIBIT 1 to this agreement lists the state financial assistance awarded through the Department of State by this agreement. In determining the state financial assistance expended in its fiscal year, the recipient shall consider all sources of state financial assistance, including state financial assistance received from the Department of State, other state agencies, and other nonstate entities. State financial assistance does not include federal direct or pass-through awards and resources received by a nonstate entity for federal program matching requirements.

2. For the audit requirements addressed in Part II, paragraph 1, the recipient shall ensure that the audit complies with the requirements of section 215.97(8), F.S. This includes submission of a financial reporting package as defined by section 215.97(2), F.S., and Chapters 10.550 (local governmental entities) and 10.650 (nonprofit and for-profit organizations), Rules of the Auditor General.

3. If the recipient expends less than $750,000 in state financial assistance in its fiscal year (for fiscal years ending June 30, 2017, and thereafter), an audit conducted in accordance with the provisions of section 215.97, F.S., is not required. If the recipient expends less than $750,000 in state financial assistance in its fiscal year and elects to have an audit conducted in accordance with the provisions of section 215.97, F.S., the cost of the audit must be paid from the nonstate entity's resources (i.e., the cost of such an audit must be paid from the recipient's resources obtained from other than state entities).

The Internet web addresses listed below will assist recipients in locating documents referenced in the text of this agreement and the interpretation of compliance issues.

State of Florida Department of Financial Services (Chief Financial Officer)
http://www.myfloridacfo.com/

State of Florida Legislature (Statutes, Legislation relating to the Florida Single Audit Act) http://www.leg.state.fl.us/

**Part III: Report Submission**

1. Copies of reporting packages for audits conducted in accordance with 2 CFR 200, Subpart F - Audit Requirements, and required by Part I of this agreement shall be submitted, when required by 2 CFR §200.512, by or on behalf of the recipient directly to each of the following:

   A. The Department of State through the https://dosgrants.com/ grants management system.

   B. The Federal Audit Clearinghouse (FAC) as provided in 2 CFR §200.36 and §200.512.

      The FAC's website provides a data entry system and required forms for submitting the single audit reporting package. Updates to the location of the FAC and data entry system may be found at the OMB website.

2. Copies of financial reporting packages required by Part II of this agreement shall be submitted by or on behalf of the recipient directly to each of the following:

   A. The Department of State through the https://dosgrants.com/ grants management system.

   B. The Auditor General's Office at the following address:

      Auditor General
      Local Government Audits/342
      Claude Pepper Building, Room 401

111 West Madison Street
Tallahassee, Florida 32399-1450

The Auditor General's website (https://flauditor.gov/) provides instructions for filing an electronic copy of a financial reporting package.

3. Any reports, management letters, or other information required to be submitted to the Department of State pursuant to this agreement shall be submitted timely in accordance with 2 CFR §200.512, section 215.97, F.S., and Chapters 10.550 (local governmental entities) and 10.650 (nonprofit and for-profit organizations), Rules of the Auditor General, as applicable.

4. Recipients, when submitting financial reporting packages to the Department of State for audits done in accordance with 2 CFR 200, Subpart F - Audit Requirements, or Chapters 10.550 (local governmental entities) and 10.650 (nonprofit and for-profit organizations), Rules of the Auditor General, should indicate the date that the reporting package was delivered to the recipient in correspondence accompanying the reporting package.

**Part IV: Record Retention**

The recipient shall retain sufficient records demonstrating its compliance with the terms of the award(s) and this agreement for a period of five years from the date the audit report is issued, and shall allow the Department of State, or its designee, the CFO, or Auditor General access to such records upon request. The recipient shall ensure that audit working papers are made available to the Department of State, or its designee, the CFO, or Auditor General upon request for a period of at least three years from the date the audit report is issued, unless extended in writing by the Department of State.

**EXHIBIT 1**

**FEDERAL RESOURCES AWARDED TO THE RECIPIENT PURSUANT TO THIS AGREEMENT CONSIST OF THE FOLLOWING:**

Department of the Treasury, Coronavirus State and Local Fiscal Recovery Funds, Assistance Listing number (formerly known as CFDA number) 21.027. $483,662

**COMPLIANCE REQUIREMENTS APPLICABLE TO THE FEDERAL RESOURCES AWARDED PURSUANT TO THIS AGREEMENT ARE AS FOLLOWS:**

As contained in 2 CFR Part 200 – Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards and 31 CFR Part 35, Subpart A – Coronavirus State and Local Fiscal Recovery Funds.

**STATE RESOURCES AWARDED TO THE RECIPIENT PURSUANT TO THIS AGREEMENT CONSIST OF THE FOLLOWING:**

Not applicable

**MATCHING RESOURCES FOR FEDERAL PROGRAMS:**

Not applicable.

**SUBJECT TO SECTION 215.97, FLORIDA STATUTES:**

Not applicable.

**COMPLIANCE REQUIREMENTS APPLICABLE TO STATE RESOURCES AWARDED PURSUANT TO THIS AGREEMENT ARE AS FOLLOWS:**

Not applicable.

## ATTACHMENT C

## FEDERAL SPECIAL CONDITIONS

In addition to the terms and conditions contained in this agreement and the program guidelines generally applicable to grants awarded by the Department, African-American Cultural and Historical Grants, as federal pass-through grants, are also subject to additional federal requirements for use of SLFRF funds. The SLFRF awards are generally subject to the requirements set forth in the Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards, 2 CFR Part 200 (the "Uniform Guidance"). In all instances, Applicant Organizations should review the Uniform Guidance requirements applicable to your organization's use of SLFRF funds, and SLFRF-funded projects.

The following sections provide a general summary of compliance responsibilities under applicable federal statutes and regulations, including the Uniform Guidance, as described in the 2020 OMB Compliance Supplement Part 3. Compliance Requirements (issued August 18, 2020). Note that the descriptions below are only general summaries and all recipients and subrecipients of SLFRF funds are advised to carefully review the Uniform Guidance requirements and any additional regulatory and statutory requirements applicable to the program.

Grantee, as a subrecipient of federal funds, should ensure they remain in compliance with all SLFRF Award Terms and Conditions.

1. **Allowable Costs/Cost Principles.** As outlined in the Uniform Guidance at 2 CFR Part 200, Subpart E regarding Cost Principles, allowable costs are based on the premise that a recipient is responsible for the effective administration of Federal awards, application of sound management practices, and administration of Federal funds in a manner consistent with the program objectives and terms and conditions of the award. As such, the Department will implement robust internal controls and effective monitoring of subrecipients to ensure compliance with the Cost Principles, which are important for building trust and accountability. SLFRF Funds may be, but are not required to be, used along with other funding sources for a given project. Note that SLFRF Funds may not be used for a non-Federal cost share or match where prohibited by other Federal programs, e.g., funds may not be used for the State share for Medicaid.

2. **Cash Management.** SLFRF payments made to recipients are not subject to the requirements of the Cash Management Improvement Act and Treasury's implementing regulations at 31 CFR part 205 or 2 CFR 200.305(b)(8)-(9). As such, recipients can place funds in interest-bearing accounts, do not need to remit interest to Treasury, and are not limited to using that interest for eligible uses under the SLFRF award.

3. **Equipment and Real Property Management.** Any purchase of equipment or real property with SLFRF funds (as approved by the Department) must be consistent with the Uniform Guidance at 2 CFR Part 200, Subpart D. Equipment and real property acquired under this program must be used for the originally authorized purpose. Consistent with 2 CFR 200.311 and 2 CFR 200.313, any equipment or real property acquired using SLFRF funds shall vest in the non-Federal entity. Any acquisition and maintenance of equipment or real property must also be in compliance with relevant laws and regulations.

4. **Period of Performance.** All SLFRF funds remain subject to statutory requirements that they must be used for costs incurred by the recipient during the period that begins on March 3, 2021, and ends on December 31, 2024, and that award funds for the financial obligations incurred by December 31, 2024 must be expended by December 31, 2026. Any funds not used must be returned to Treasury.

5. **Procurement, Suspension & Debarment.** Recipients are responsible for ensuring that any procurement using SLFRF funds, or payments under procurement contracts using such funds are consistent with the procurement standards set forth in the Uniform Guidance at 2 CFR 200.317 through 2 CFR 200.327, as applicable. The Uniform Guidance establishes in 2 CFR 200.319 that all procurement transactions for property or services must be conducted in a manner providing full and open competition, consistent with standards outlined in 2 CFR 200.320, which allows for non-competitive procurements only in circumstances where at least one of the conditions below is true: the item is below the micro-purchase threshold; the item is only available from a single source; the public exigency or emergency will not permit a delay from publicizing a competitive solicitation; or after solicitation of a number of sources, competition is determined inadequate. Recipients must have and use documented procurement procedures that are consistent with the standards outlined in 2 CFR 200.317 through 2 CFR 200.320. The Uniform Guidance requires an infrastructure for competitive

bidding and contractor oversight, including maintaining written standards of conduct and prohibitions on dealing with suspended or debarred parties. Your organization must ensure adherence to all applicable local, State, and federal procurement laws and regulations.

6. **Program Income.** Generally, program income includes, but is not limited to, income from fees for services performed, the use or rental or real or personal property acquired under Federal awards and principal and interest on loans made with Federal award funds. Program income does not include interest earned on advances of Federal funds, rebates, credits, discounts, or interest on rebates, credits, or discounts. Recipients of SLFRF funds should calculate, document, and record the organization's program income. Additional controls that your organization should implement include written policies that explicitly identify appropriate allocation methods, accounting standards and principles, compliance monitoring checks for program income calculations, and records. The Uniform Guidance outlines the requirements that pertain to program income at 2 CFR 200.307. Treasury intends to provide additional guidance regarding program income and the application of 2 CFR 200.307(e)(1), including with respect to lending programs.

7. **Reporting.** All recipients of federal funds must complete financial, performance, and compliance reporting. Expenditures may be reported on a cash or accrual basis, as long as the methodology is disclosed and consistently applied. Reporting must be consistent with the definition of expenditures pursuant to 2 CFR 200.1. Your organization should appropriately maintain accounting records for compiling and reporting accurate, compliant financial data, in accordance with appropriate accounting standards and principles. In addition, where appropriate, your organization needs to establish controls to ensure completion and timely submission of all mandatory performance and/or compliance reporting to the Department, for use in its required reporting to Treasury.

8. **SAM.gov Requirements.** All eligible recipients are also required to have an active registration with the System for Award Management (SAM) (https://www.sam.gov). To ensure timely receipt of funding, Treasury has stated that Non-entitlement Units of Government (NEUs) who have not previously registered with SAM.gov may do so after receipt of the award, but before the submission of mandatory reporting.

9. **Recordkeeping Requirements.** Generally, your organization must maintain records and financial documents for five years after all funds have been expended or returned to Treasury. Treasury may request transfer of records of long-term value at the end of such period. Wherever practicable, such records should be collected, transmitted, and stored in open and machine-readable formats. Your organization must agree to provide or make available such records to Treasury upon request, and to any authorized oversight body, including but not limited to the Government Accountability Office ("GAO"), Treasury's Office of Inspector General ("OIG"), and the Pandemic Relief Accountability Committee ("PRAC").

10. **Single Audit Requirements.** Recipients and subrecipients that expend more than $750,000 in Federal awards during their fiscal year will be subject to an audit under the Single Audit Act and its implementing regulation at 2 CFR Part 200, Subpart F regarding audit requirements. Recipients and subrecipients may also refer to the Office of Management and Budget (OMB) Compliance Supplements for audits of federal funds and related guidance and the Federal Audit Clearinghouse to see examples and single audit submissions.

11. **Civil Rights Compliance**. Recipients of Federal financial assistance from the Treasury are required to meet legal requirements relating to nondiscrimination and nondiscriminatory use of Federal funds. Those requirements include ensuring that entities receiving Federal financial assistance from the Treasury do not deny benefits or services, or otherwise discriminate on the basis of race, color, national origin (including limited English proficiency), disability, age, or sex (including sexual orientation and gender identity), in accordance with the following authorities: Title VI of the Civil Rights Act of 1964 (Title VI) Public Law 88-352, 42 U.S.C. 2000d-1 et seq., and the Department's implementing regulations, 31 CFR part 22; Section 504 of the Rehabilitation Act of 1973 (Section 504), Public Law 93-112, as amended by Public Law 93-516, 29 U.S.C. 794; Title IX of the Education Amendments of 1972 (Title IX), 20 U.S.C. 1681 et seq., and the Department's implementing regulations, 31 CFR part 28; Age Discrimination Act of 1975, Public Law 94-135, 42 U.S.C. 6101 et seq., and the Department implementing regulations at 31 CFR part 23. In order to carry out its enforcement responsibilities under Title VI of the Civil Rights Act, Treasury will collect and review information from recipients to ascertain their compliance with the applicable requirements before and after providing financial assistance. Treasury's implementing regulations, 31 CFR part 22, and the Department of Justice (DOJ) regulations, Coordination of Non-discrimination in Federally Assisted Programs, 28 CFR part 42, provide for the collection of data and information from recipients (see 28 CFR 42.406). Treasury may request that recipients submit data for post-award compliance reviews, including information such as a narrative describing their Title VI compliance status.

12. **General Federal Regulations.** Recipients shall comply with the regulations listed in 2 CFR 200, 48 CFR 31, and 40 U.S.C. 110 *et sequence.*

13. **Rights to Patents and Inventions Made Under a Contract or Agreement.** Rights to inventions made under this assistance agreement are subject to federal patent and licensing regulations, which are codified at Title 37 CFR Part 401 and Title 35 U.S.C. 200 through 212.

14. **Compliance with the Trafficking Victims Protection Act of 2000 (2 CFR Part 175).** Recipients, their employees, subrecipients under this award, and subrecipients' employees may not:

    i. Engage in severe forms of trafficking in persons during the period of time that the award is in effect;
    ii. Procure a commercial sex act during the period of time that the award is in effect; or
    iii. Use forced labor in the performance of the award or subawards under the award.

15. **Whistleblower Protection.** Recipients shall comply with U.S.C. §4712, Enhancement of Recipient and Subrecipient Employee Whistleblower Protection. This requirement applies to all awards issued after July 1, 2013 and effective December 14, 2016 has been permanently extended (Public Law (P.L.) 114-261).

    i. This award, related subawards, and related contracts over the simplified acquisition threshold and all employees working on this award, related subawards, and related contracts over the simplified acquisition threshold are subject to the whistleblower rights and remedies in the pilot program on award recipient employee whistleblower protections established at 41 U.S.C. 4712 by section 828 of the National Defense Authorization Act for Fiscal Year 2013 (P.L. 112-239).

    ii. Recipients, their subrecipients, and their contractors awarded contracts over the simplified acquisition threshold related to this award, shall inform their employees in writing, in the predominant language of the workforce, of the employee whistleblower rights and protections under 41 U.S.C. 4712.

    iii. The Recipient shall insert this clause, including this paragraph C, in all subawards and in contracts over the simplified acquisition threshold related to this award; best efforts should be made to include this clause, including this paragraph C in any subawards and contracts awarded prior to the effective date of this provision.

16. **Notification of Termination (2 CFR § 200.340).** In accordance with 2 CFR § 200.340, in the event that the Agreement is terminated prior to the end of the period of performance due to the Recipient's or subcontractor's material failure to comply with Federal statutes, regulations or the terms and conditions of this Agreement or the Federal award, the termination shall be reported to the Office of Management and Budget (OMB)-designated integrity and performance system, accessible through System for Award Management (SAM) currently the Federal Awardee Performance and Integrity Information System (FAPIIS). The Non-Federal Entity will notify the Recipient of the termination and the Federal requirement to report the termination in FAPIIS. See 2 CFR § 200.340 for the requirements of the notice and the Recipient's rights upon termination and following termination.

17. **Additional Lobbying Requirements.**

    i. The Recipient certifies that no funds provided under this Agreement have been used or will be used to engage in the lobbying of the Federal Government or in litigation against the United States unless authorized under existing law.

    ii. The Lobbying Disclosure Act of 1995, as amended (2 U.S.C. §1601 *et seq.*), prohibits any organization described in Section 501(c)(4) of the Internal Revenue Code, from receiving federal funds through an award, grant (and/or subgrant) or loan unless such organization warrants that it does not, and will not engage in lobbying activities prohibited by the Act as a special condition of such an award, grant (and/or subgrant), or loan. This restriction does not apply to loans made pursuant to approved revolving loan programs or to contracts awarded using proper procurement procedures.

    iii. Pursuant to 2 CFR §200.450 and 2 CFR §200.454(e), the Recipient is hereby prohibited from using funds provided by this

Agreement for membership dues to any entity or organization engaged in lobbying activities.

18. **Compliance with Assurances.** Recipients shall comply with any and all applicable assurances made by the Department or the Recipient to the Federal Government during the Grant application process.

19. **Federal Reporting Requirements (FFATA).** Grant Recipients awarded a new Federal grant greater than or equal to $30,000 awarded on or after October 1, 2015, are subject to the FFATA the Federal Funding Accountability and Transparency Act ("FFATA") of 2006. The FFATA legislation requires that information on federal awards (federal financial assistance and expenditures) be made available to the public via a single, searchable website, which is www.USASpending.gov. The Grantee agrees to provide the information necessary, within one (1) month of execution, for the Department to comply with this requirement.

20. **2 CFR Part 200 Appendix 2 – Contract Provisions for Non-Federal Entity Contracts Under Federal Awards**In addition to other provisions required by the Federal agency or non-Federal entity, all contracts made by the non-Federal entity under the Federal award must contain provisions covering the following, as applicable.

    i. Contracts for more than the simplified acquisition threshold, which is the inflation adjusted amount determined by the Civilian Agency Acquisition Council and the Defense Acquisition Regulations Council (Councils) as authorized by 41 U.S.C. 1908, must address administrative, contractual, or legal remedies in instances where contractors violate or breach contract terms, and provide for such sanctions and penalties as appropriate.

    ii. All contracts in excess of $10,000 must address termination for cause and for convenience by the non-Federal entity including the manner by which it will be effected and the basis for settlement.

    iii. Equal Employment Opportunity. Except as otherwise provided under 41 CFR Part 60, all contracts that meet the definition of "federally assisted construction contract" in 41 CFR Part 60-1.3 must include the equal opportunity clause provided under 41 CFR 60-1.4(b), in accordance with Executive Order 11246, "Equal Employment Opportunity" (30 FR 12319, 12935, 3 CFR Part, 1964-1965 Comp., p. 339), as amended by Executive Order 11375, "Amending Executive Order 11246 Relating to Equal Employment Opportunity," and implementing regulations at 41 CFR part 60, "Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor."

    iv. Davis-Bacon Act, as amended (40 U.S.C. 3141-3148). When required by Federal program legislation, all prime construction contracts in excess of $2,000 awarded by non-Federal entities must include a provision for compliance with the Davis-Bacon Act (40 U.S.C. 3141-3144, and 3146-3148) as supplemented by Department of Labor regulations (29 CFR Part 5, "Labor Standards Provisions Applicable to Contracts Covering Federally Financed and Assisted Construction"). In accordance with the statute, contractors must be required to pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in a wage determination made by the Secretary of Labor. In addition, contractors must be required to pay wages not less than once a week. The non-Federal entity must place a copy of the current prevailing wage determination issued by the Department of Labor in each solicitation. The decision to award a contract or subcontract must be conditioned upon the acceptance of the wage determination. The non-Federal entity must report all suspected or reported violations to the Federal awarding agency. The contracts must also include a provision for compliance with the Copeland "Anti-Kickback" Act (40 U.S.C. 3145), as supplemented by Department of Labor regulations (29 CFR Part 3, "Contractors and Subcontractors on Public Building or Public Work Financed in Whole or in Part by Loans or Grants from the United States"). The Act provides that each contractor or subrecipient must be prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public work, to give up any part of the compensation to which he or she is otherwise entitled. The non-Federal entity must report all suspected or reported violations to the Federal awarding agency.

    **The Davis-Bacon Act requirements do not apply to projects funded solely with award funds from the SLFRF. Recipients may be otherwise subject to the requirements of the Davis-Bacon Act, when SLFRF award funds are used on a construction project in conjunction with funds from another federal program that requires enforcement of the Davis-Bacon Act.**

    v. Contract Work Hours and Safety Standards Act (40 U.S.C. 3701-3708). Where applicable, all contracts awarded by the non-Federal entity in excess of $100,000 that involve the employment of mechanics or laborers must include a provision for compliance with 40 U.S.C. 3702 and 3704, as supplemented by Department of Labor regulations (29 CFR Part 5). Under 40 U.S.C. 3702 of the Act, each contractor must be required to compute the wages of every mechanic and laborer on the basis of

a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is compensated at a rate of not less than one and a half times the basic rate of pay for all hours worked in excess of 40 hours in the work week. The requirements of 40 U.S.C. 3704 are applicable to construction work and provide that no laborer or mechanic must be required to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous. These requirements do not apply to the purchases of supplies or materials or articles ordinarily available on the open market, or contracts for transportation or transmission of intelligence.

vi. Rights to Inventions Made Under a Contract or Agreement. If the Federal award meets the definition of "funding agreement" under 37 CFR § 401.2 (a) and the recipient or subrecipient wishes to enter into a contract with a small business firm or nonprofit organization regarding the substitution of parties, assignment or performance of experimental, developmental, or research work under that "funding agreement," the recipient or subrecipient must comply with the requirements of 37 CFR Part 401, "Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements," and any implementing regulations issued by the awarding agency.

vii. Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act (33 U.S.C. 1251-1387), as amended - Contracts and subgrants of amounts in excess of $150,000 must contain a provision that requires the non-Federal award to agree to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. 1251-1387). Violations must be reported to the Federal awarding agency and the Regional Office of the Environmental Protection Agency (EPA).

viii. Debarment and Suspension (Executive Orders 12549 and 12689) - A contract award (see 2 CFR 180.220) must not be made to parties listed on the governmentwide exclusions in the System for Award Management (SAM), in accordance with the OMB guidelines at 2 CFR 180 that implement Executive Orders 12549 (3 CFR part 1986 Comp., p. 189) and 12689 (3 CFR part 1989 Comp., p. 235), "Debarment and Suspension." SAM Exclusions contains the names of parties debarred, suspended, or otherwise excluded by agencies, as well as parties declared ineligible under statutory or regulatory authority other than Executive Order 12549.

ix. Byrd Anti-Lobbying Amendment (31 U.S.C. 1352) - Contractors that apply or bid for an award exceeding $100,000 must file the required certification. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant or any other award covered by 31 U.S.C. 1352. Each tier must also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the non-Federal award.

x. Procurement of Recovered Materials. A non-Federal entity that is a state agency or agency of a political subdivision of a state and its contractors must comply with section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act. The requirements of Section 6002 include procuring only items designated in guidelines of the Environmental Protection Agency (EPA) at 40 CFR part 247 that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition, where the purchase price of the item exceeds $10,000 or the value of the quantity acquired during the preceding fiscal year exceeded $10,000; procuring solid waste management services in a manner that maximizes energy and resource recovery; and establishing an affirmative procurement program for procurement of recovered materials identified in the EPA guidelines.

xi. Prohibition on Certain Telecommunications and video surveillance services or equipment. Recipients and subrecipients are prohibited from obligating or expending loan or grant funds to:

A. Procure or obtain;

B. Extend or renew a contract to procure or obtain; or

C. Enter into a contract (or extend or renew a contract) to procure or obtain equipment, services, or systems that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system. As described in Public Law 115-232, section 889, covered telecommunications equipment is telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities).

1. For the purpose of public safety, security of government facilities, physical security surveillance of critical infrastructure, and other national security purposes, video surveillance and telecommunications equipment produced by Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliate of such entities).

2. Telecommunications or video surveillance services provided by such entities or using such equipment.
3. Telecommunications or video surveillance equipment or services produced or provided by an entity that the Secretary of Defense, in consultation with the Director of the National Intelligence or the Director of the Federal Bureau of Investigation, reasonably believes to be an entity owned or controlled by, or otherwise connected to, the government of a covered foreign country.

D. In implementing the prohibition under Public Law 115-232, section 889, subsection (f), paragraph (1), heads of executive agencies administering loan, grant, or subsidy programs shall prioritize available funding and technical support to assist affected businesses, institutions and organizations as is reasonably necessary for those affected entities to transition from covered communications equipment and services, to procure replacement equipment and services, and to ensure that communications service to users and customers is sustained.

E. See Public Law 115-232, section 889 for additional information.

F. See also 2 CFR § 200.471.

xii. Domestic Preferences for Procurements.

A. As appropriate and to the extent consistent with law, the non-Federal entity should, to the greatest extent practicable under a Federal award, provide a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States (including but not limited to iron, aluminum, steel, cement, and other manufactured products). The requirements of this section must be included in all subawards including all contracts and purchase orders for work or products under this award.

B. For purposes of this section:

1. "Produced in the United States" means, for iron and steel products, that all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States.
2. "Manufactured products" means items and construction materials composed in whole or in part of non-ferrous metals such as aluminum; plastics and polymer-based products such as polyvinyl chloride pipe; aggregates such as concrete; glass, including optical fiber; and lumber.

**ATTACHMENT D**

**CERTIFICATION REGARDING**
**DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION**
**LOWER TIER COVERED TRANSACTIONS**

This certification is required by the regulations implementing Executive Order 12549, Debarment and Suspension, 45 CFR 1183.35, Participants' responsibilities. The regulations were published as Part VII of the May 26, 1988 Federal Register (pages 19160-19211). Copies of the regulations may be obtained by contacting the person to which this proposal is submitted.

**(BEFORE COMPLETING CERTIFICATION, READ ATTACHED INSTRUCTIONS)**

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals are presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any federal department or agency.
2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

Linda Hudson

Name and Title of Authorized Representative

Linda Hudson, Mayor 8/1/2022

Signature Date

**INSTRUCTIONS FOR CERTIFICATION**

1. By signing and submitting this proposal, the prospective lower tier participant is providing the certification set out below.
2. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the federal government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.
3. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.
4. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations.
5. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.
6. The prospective lower tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility, and Voluntary Exclusion-Lower Tier Covered Transactions," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.
7. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that it is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Non-procurement List.
8. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
9. Except for transactions authorized under paragraph 5 of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntary excluded from participation in this transaction, in addition to other remedies available to the federal government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

**City of Fort Pierce**

**23.s.aa.900.084**

This Amendment is between the State of Florida, Department of State, Division of Central Office hereinafter referred to as the "Division" and City of Fort Pierce, hereinafter referred to as the "Grantee".

The parties entered into a grant agreement for the implementation of a Florida Department of State African-American Cultural and Historical Grant, grant number 23.s.aa.900.084, for the "FL Highwaymen & African-American Culture Project." The parties now mutually desire to amend certain terms and conditions of the grant agreement.

In consideration of the covenants contained herein, it is agreed:

All sections of the original grant agreement not specifically amended by this or a prior written amendment and all prior written amendments are hereby reaffirmed.

The following sections are hereby revised as follows:

**Original Scope Of Work**

Funds are to be used to transform an existing two-story, 3,200 square feet building located in the historical African American community of Lincoln Park to house The Florida Highwaymen Museum. Work items include: HVAC; fire suppression; security system; decorative security fencing; upgrade (5) exterior doors; renovate kitchen and install wood shutters; install brick pavers; install LED track lighting; remove and replace flooring on both floors; repair, patch, prime, paint interior walls; install custom window coverings in the main gallery; and install new generator with transfer switch.

**Amended Scope Of Work**

Funds are to be used to renovate an existing building to create the City of Fort Pierce Florida Highwaymen Museum in the historical African American community of Lincoln Park. The work includes HVAC replacement; decorative security fencing; upgrade (5) exterior doors; complete demolition of kitchen, installation of new flooring, cabinets, countertops, new appliances, and install wood shutters; install brick pavers; install LED track lighting; removal of and replace the flooring on both floors; repair, patch, prime, paint interior walls; install custom window coverings in the main gallery; and install new generator with a transfer switch.

**Original Budgets**

| Description | Grant Funds | Cash Match | In Kind Match |
|---|---|---|---|
| HVAC Systems | $21,450 | $0 | $0 |
| Alarm System | $81,596 | $0 | $0 |
| Fencing | $78,480 | $0 | $0 |
| Building Pressure Wash | $1,200 | $0 | $0 |
| Exterior Building Painting | $16,500 | $0 | $0 |
| Brick Garden Pavers | $32,500 | $0 | $0 |
| LED Track Lights 1st Fl | $12,000 | $0 | $0 |

| Description | Grant Funds | Cash Match | In Kind Match |
|---|---|---|---|
| Exterior Doors PGT Impact 1st Fl | $10,000 | $0 | $0 |
| Kitchen Wood Shutters | $1,350 | $0 | $0 |
| Removal & Replace Flooring 1st Fl | $11,600 | $0 | $0 |
| Windowsills 1st Fl | $1,800 | $0 | $0 |
| Repair Prime Patch Paint Walls 1st Fl | $10,200 | $0 | $0 |
| LED Track Lighting 2nd FL | $18,750 | $0 | $0 |
| Window Coverings 2nd Fl | $7,200 | $0 | $0 |
| 2 Exterior Doors PGT Impact 2nd Fl | $5,000 | $0 | $0 |
| Removal & Replace Flooring 2nd Fl | $11,600 | $0 | $0 |
| Repair Patch Paint 2nd Fl | $10,200 | $0 | $0 |
| Generators | $75,500 | $0 | $0 |
| Install Fire Wet Water Suppression System | $25,000 | $0 | $0 |
| Install 6 Custom Window Coverings throughout 1st Floor | $3,600 | $0 | $0 |
| Remove Cabinet and Sink Repair , Patch, Paint area 2nd Floor | $1,250 | $0 | $0 |
| Supply and Install 5 Windowsills 2nd Fl | $750 | $0 | $0 |
| Elevator Repair | $6,136 | $0 | $0 |
| Kitchen Renovation | $40,000 | $0 | $0 |
| **Totals** | **$483,662** | **$0** | **$0** |

**Amended Budgets**

| Description | Grant Funds | Cash Match | In Kind Match |
|---|---|---|---|
| HVAC Systems | $22,800 | $0 | $0 |
| Fencing | $77,508 | $0 | $0 |
| Pressure wash and paint the exterior building | $19,790 | $0 | $0 |
| Brick Garden Pavers | $31,500 | $0 | $0 |
| LED Track Lights 1st and 2nd floors | $32,250 | $0 | $0 |
| Exterior Doors PGT Impact 1st and 2nd floors | $10,325 | $0 | $0 |

| Description | Grant Funds | Cash Match | In Kind Match |
|---|---|---|---|
| Kitchen Wood Shutters | $1,400 | $0 | $0 |
| Removal of existing Flooring 1st and 2nd floors | $3,200 | $0 | $0 |
| Windowsills 1st and 2nd floors | $8,200 | $0 | $0 |
| Repair Prime Patch Paint Walls 1st and 2nd floors | $12,895 | $0 | $0 |
| Window Coverings 1st and 2nd floors | $9,600 | $0 | $0 |
| Replace Flooring 1st and 2nd floors | $23,200 | $0 | $0 |
| Generator | $67,480 | $0 | $0 |
| Architectural and Engineering | $28,000 | $0 | $0 |
| Remove Cabinet and Sink Repair , Patch, Paint area 2nd Floor | $7,675 | $0 | $0 |
| cleaning and Waste Management | $6,100 | $0 | $0 |
| General Conditions | $3,500 | $0 | $0 |
| Kitchen Renovation | $44,200 | $0 | $0 |
| Project Fee (includes management and coordination) | $74,039 | | |
| **Totals** | **$483,662** | **$0** | **$0** |

AUTHORIZATION

Linda Hudson

Authorized official for the Grantee

Sandy Shaughnessy, Director

Authorized official for the Division

Linda Hudson

Authorized official Signature

Date

Division Authorized official Signature

March 23, 2023

Date

**City of Fort Pierce**

**23.s.aa.900.084**

This Amendment is between the State of Florida, Department of State, Division of CentralOffice hereinafter referred to as the "Division" and City of Fort Pierce, hereinafter referred to as the "Grantee".

The parties entered into a grant agreement for the implementation of a African-American Cultural and Historical Grant grant, for FL Highwaymen & African-American Culture Project . The parties now mutually desire to amend certain terms and conditions of the grant agreement.

In consideration of the covenants contained herein, it is agreed:

All section of the original grant agreement not specifically amended by this or a prior written amendment and all prior written amendments are hereby reaffirmed.

The following sections are hereby revised as follows:

**Original Length of Agreement**

7/1/2021 - 06/30/2023

**Amended Length of Agreement**

7/1/2021 -12/31/2023

**Additional Conditions**

12. Grant Reporting Requirements:

f) Sixth Report is due by October 15, 2023 for the period ending September 30, 2023 (third year of the grant period).

g) Final Report. The Grantee must submit a Final Report to the Division within one month of the Grant Period End Date set forth in Section 2 above. All final reports must document the completion of all deliverables/tasks, expenses and activities that occurred by the Grant Period End Date. The Grantee may expend funds only for allowable costs resulting from obligations incurred during the specified agreement period. Expenditures of state or federal financial assistance must be in compliance with the laws, rules, and regulations applicable to expenditures of state and federal funds, including, but not limited to, this Agreement, the Reference Guide for State Expenditures, 2 CFR Part 200 and the HPF Grants Manual.

AUTHORIZATION

Linda Hudson, Mayor

Authorized official for the Grantee

Sandy Shaughnessy, Director

Authorized official for the Division

Linda Hudson 6/5/23

Authorized official Signature Date

June 6, 2023

Division Authorized official Signature Date

**City of Fort Pierce**

**23.s.aa.900.084**

This Amendment is between the State of Florida, Department of State, Division of CentralOffice hereinafter referred to as the "Division" and City of Fort Pierce, hereinafter referred to as the "Grantee".

The parties entered into a grant agreement for the implementation of a African-American Cultural and Historical Grant grant, for FL Highwaymen & African-American Culture Project . The parties now mutually desire to amend certain terms and conditions of the grant agreement.

In consideration of the covenants contained herein, it is agreed:

All section of the original grant agreement not specifically amended by this or a prior written amendment and all prior written amendments are hereby reaffirmed.

The following sections are hereby revised as follows:

## Original Length of Agreement

7/1/2021 -12/31/2023

## Amended Length of Agreement

7/1/2021 -6/30/2024

## Additional Conditions

12. Grant Reporting Requirements:

g) Seventh Report is due by January 15, 2024, for the period ending December 31, 2023.

h) Eighth Report is due by April 15, 2024, for the period ending March 31, 2024.

i) Final Report. The Grantee must submit a Final Report to the Division within one month of the Grant Period End Date set forth in Section 2 above. All final reports must document the completion of all deliverables/tasks, expenses and activities that occurred by the Grant Period End Date. The Grantee may expend funds only for allowable costs resulting from obligations incurred during the specified agreement period. Expenditures of state or federal financial assistance must be in compliance with the laws, rules, and regulations applicable to expenditures of state and federal funds, including, but not limited to, this Agreement, the Reference Guide for State Expenditures, 2 CFR Part 200 and the HPF Grants Manual.

AUTHORIZATION

Linda Hudson, Chair

Authorized official for the Grantee

Sandy Shaughnessy, Director

Authorized official for the Division

Linda Hudson

Authorized official Signature Date

November 27, 2023

Division Authorized official Signature Date

**City of Fort Pierce**

**23.s.aa.900.084**

This Amendment is between the State of Florida, Department of State, Division of Central Office hereinafter referred to as the "Division" and the City of Fort Pierce, hereinafter referred to as the "Grantee".

The parties entered into a grant agreement for the implementation of an African-American Cultural and Historical Grant, grant number 23.s.aa.900.084, for "FL Highwaymen & African-American Culture Project." The parties now mutually desire to amend certain terms and conditions of the grant agreement.

In consideration of the covenants contained herein, it is agreed:

All sections of the original grant agreement not specifically amended by this or a prior written amendment and all prior written amendments are hereby reaffirmed.

The following sections are hereby revised as follows:

**2. Length of Agreement.**

**Original Length of Agreement:** 7/1/2021 - 6/30/2023

**Amended Length of Agreement:** 7/1/2021 - 12/31/2024

**3. Contract Administration.**

**For the Grantee:**
Contact: Audria Moore
Address: 100 N US Highway 1, Fort Pierce Florida 34950
Phone: 772-467-3184
Email: Amoore@cityoffortpierce.com

**12. Grant Reporting Requirements.**

i) Ninth Report is due by July 15, 2024, for the period ending June 30, 2024.

j) Tenth Report is due by October 15, 2024, for the period ending September 30, 2024.

k)Final Report. The Grantee must submit a Final Report to the Division within one month of the Grant Period End Date set forth in Section 2 above. All final reports must document the completion of all deliverables/tasks, expenses and activities that occurred by the Grant Period End Date. The Grantee may expend funds only for allowable costs resulting from obligations incurred during the specified agreement period. Expenditures of state or federal financial assistance must be in compliance with the laws, rules, and regulations applicable to expenditures of state and federal funds, including, but not limited to, this Agreement, the *Reference Guide for State Expenditures*, 2 CFR Part 200 and the HPF Grants Manual.

AUTHORIZATION

Linda Hudson, Mayor

Authorized official for the Grantee

Sandy Shaughnessy, Director

Authorized official for the Division

Linda Hudson

Authorized official Signature

6/3/24

Date

Division Authorized official Signature

June 4, 2024

Date

**City of Fort Pierce**

**23.s.aa.900.084**

This Amendment is between the State of Florida, Department of State, Division of Central Office hereinafter referred to as the "Division" and the City of Fort Pierce, hereinafter referred to as the "Grantee".

The parties entered into a grant agreement for the implementation of an African-American Cultural and Historical Grant, grant number 23.s.aa.900.084, for "FL Highwaymen & African-American Culture Project." The parties now mutually desire to amend certain terms and conditions of the grant agreement.

In consideration of the covenants contained herein, it is agreed:

All sections of the original grant agreement not specifically amended by this or a prior written amendment and all prior written amendments are hereby reaffirmed.

The following sections are hereby revised as follows:

## Original Length of Agreement

7/1/2021 - 12/31/2024

## Amended Length of Agreement

7/1/2021 - 6/30/2025

## Additional Conditions

### 12. Grant Reporting Requirements:

k) Eleventh Report is due by January 15, 2025, for the period ending December 31, 2024.

l) Twelfth Report is due by April 15, 2025, for the period ending March 30, 2025.

m) Final Report. The Grantee must submit a Final Report to the Division within one month of the Grant Period End Date set forth in Section 2 above. All final reports must document the completion of all deliverables/tasks, expenses and activities that occurred by the Grant Period End Date. The Grantee may expend funds only for allowable costs resulting from obligations incurred during the specified agreement period. Expenditures of state or federal financial assistance must be in compliance with the laws, rules, and regulations applicable to expenditures of state and federal funds, including, but not limited to, this Agreement, the Reference Guide for State Expenditures, 2 CFR Part 200 and the HPF Grants Manual.

AUTHORIZATION

Linda Hudson

Authorized official for the Grantee

Sandy Shaughnessy, Director

Authorized official for the Division

Linda Hudson

Authorized official Signature

11/4/2024

Date

Division Authorized official Signature

December 9, 2024

Date

**City of Fort Pierce**

**23.s.aa.900.084**

This Amendment is between the State of Florida, Department of State, Division of Central Office hereinafter referred to as the "Division" and City of Fort Pierce, hereinafter referred to as the "Grantee".

The parties entered into a grant agreement for the implementation of an African-American Cultural and Historical Grant grant, grant number 23.s.aa.900.084, for "FL Highwaymen & African-American Culture Project." The parties now mutually desire to amend certain terms and conditions of the grant agreement.

In consideration of the covenants contained herein, it is agreed:

All sections of the original grant agreement not specifically amended by this or a prior written amendment and all prior written amendments are hereby reaffirmed.

The following sections are hereby revised as follows:

**Original Length of Agreement**

7/1/2021 - 6/30/2025

**Amended Length of Agreement**

7/1/2021 -12/31/2025

**Additional Conditions**

12. Grant Reporting Requirements:

l) Twelfth Report is due by April 15, 2025, for the period ending March 31, 2025.

m) Thirteenth Report is due by October 15, 2025, for the period ending September 30, 2025.

n) Final Report. The Grantee must submit a Final Report to the Division within one month of the Grant Period End Date set forth in Section 2 above. All final reports must document the completion of all deliverables/tasks, expenses and activities that occurred by the Grant Period End Date. The Grantee may expend funds only for allowable costs resulting from obligations incurred during the specified agreement period. Expenditures of state or federal financial assistance must be in compliance with the laws, rules, and regulations applicable to expenditures of state and federal funds, including, but not limited to, this Agreement, the Reference Guide for State Expenditures, 2 CFR Part 200 and the HPF Grants Manual.

AUTHORIZATION

| Linda Hudson | Sandy Shaughnessy, Director |
|---|---|
| Authorized official for the Grantee | Authorized official for the Division |
| Linda Hudson | Sandy Shaughnessy |
| 6/2/25 | June 3, 2025 |
| Authorized official Signature | Date |
| Division Authorized official Signature | Date |

**City Commission Day Meeting - 9:00 AM** **10. A.**

**Meeting Date:** 12/08/2025

**Re:** Polling Places

**Submitted For:** Linda Cox, City Clerk, City Clerk

**SUBJECT:**

Resolution 25-R81 adopting polling places for the January 13, 2026 Special Run-Off election.

**SUMMARY:**

Section 12-1 of the Code of Ordinances requires that the City Commission, through the City Clerk, give notice of the location of each precinct polling place, after having received such notice from the supervisor of elections in due time, by one publication in a newspaper of general circulation in the city not less than ten (10) days, nor more than thirty (30) days, prior to any regular or special election held by the city.

**RECOMMENDATION:**

Adopt the Resolution.

**ALTERNATIVES:**

n/a

**RESPONSIBLE STAFF:**

Linda W. Cox, City Clerk

**COORDINATED WITH:**

Supervisor of Elections

**Fiscal Impact**

**OTHER INFORMATION:**

The consolidation of two precincts is estimated to the save the city approximately $5,000.00 from the total election costs.

**Attachments**

25-R81

**Form Review**

| Inbox | Reviewed By | Date |
|---|---|---|
| City Manager | Richard Chess | 11/24/2025 01:44 PM |
| Form Started By: Linda Cox | | Started On: 11/24/2025 12:36 PM |
| Final Approval Date: 11/24/2025 | | |

**RESOLUTION NO. 25-R81**

A RESOLUTION OF THE CITY COMMISSION OF THE CITY OF FORT PIERCE, FLORIDA, PROVIDING FOR PUBLICATION OF THE DESIGNATED **PRECINCT POLLING PLACES** IN THE CITY OF FORT PIERCE FOR THE **SPECIAL RUN-OFF ELECTION TO BE HELD ON JANUARY 13, 2026**; PROVIDING FOR AN EFFECTIVE DATE.

**WHEREAS**, Section 12-1 of the Code of Ordinances requires that the City Commission, through the City Clerk, give notice of the location of each precinct polling place, after having received such notice from the supervisor of elections in due time, by one publication in a newspaper of general circulation in the city not less than ten (10) days, nor more than thirty (30) days, prior to any regular or special election held by the city.

**NOW, THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF FORT PIERCE, FLORIDA AS FOLLOWS**:

**SECTION 1**. The Polling Places for the Election Precincts in the City of Fort Pierce, a list of which is attached hereto and thereby made a part hereof, be and they are hereby designated as the Official Polling Places for the Special Run-Off Election to be held on January 13, 2026.

**SECTION 2**. The City Clerk shall publish the designated Polling Places in a newspaper of general circulation in the City, one time, not less than ten days, nor more than thirty days, prior to the Special Election.

**SECTION 3**. This Resolution shall become effective upon its adoption.

**IN WITNESS WHEREOF**, this Resolution has been duly adopted on this 8th day of December, 2025.

_____
Linda Hudson, Mayor

ATTEST:

_____
Linda W. Cox, City Clerk

(SEAL)

Approved as to Form
And Correctness:

_____
Sara K. Hedges, Esq.
City Attorney

**LIST OF VOTING PRECINCTS**
**CITY OF FORT PIERCE**

| | |
|---|---|
| **PRECINCT 8.1** | Midway Road Church of Christ<br>3040 W. Midway Road |
| **PRECINCTS 10.0 & 13.1** | Havert L. Fenn Center<br>2000 Virginia Avenue |
| **PRECINCT 16.1 & 60.2** | Westside Church (formerly known as Chapel By The Sea)<br>1717 Gulfstream Avenue |
| **PRECINCT 25.1** | Days Inn<br>3224 S. U.S. #1 |
| **PRECINCT 40.1 & 12.1** | All Generations Church (formerly known as Church of God)<br>3212 Oleander Avenue |

**City Commission Day Meeting - 9:00 AM** **10. B.**

**Meeting Date:** 12/08/2025

**Re:** Resolution 25-R83 Civil Service Appeals Board Appointments

**Submitted For:** Linda Cox, City Clerk, City Clerk

**SUBJECT:**

Resolution 25-R83 appointing members to the Civil Service Appeals Board.

**SUMMARY:**

David Hewitt was appointed to the Civil Service Appeals Board as a commissioner regular appointee. He no longer lives in the City, making him ineligible to serve. Applications were solicited and Steven Dipalma was the only applicant. Thora Moore's commission appointed term expired on October 22, 2025. She wishes to remain on the board.

**RECOMMENDATION:**

Appoint applicants.

**ALTERNATIVES:**

Seek applications.

**RESPONSIBLE STAFF:**

Linda W. Cox, City Clerk

**COORDINATED WITH:**

Communications Department

**Attachments**

Resolution

Application

**Form Review**

Form Started By: Tina Rel Started On: 12/01/2025 09:45 AM

Final Approval Date: 12/01/2025

**RESOLUTION NO. 25-R83**

A RESOLUTION OF THE CITY COMMISSION OF THE CITY OF FORT PIERCE, FLORIDA, **CERTIFYING THE APPOINTMENT OR REAPPOINTMENT OF MEMBERS TO THE CIVIL SERVICE APPEALS BOARD**; PROVIDING FOR AN EFFECTIVE DATE.

**BE IT RESOLVED** by the City Commission of the City of Fort Pierce, Florida, in accordance the Fort Pierce City Charter, Article VII, Sec. 82, that the following be and are hereby appointed and/or reappointed as members of the Civil Service Appeals Board; said terms to commence upon adoption of this resolution, and to expire as shown below, or when a successor has been duly appointed:

| Name | Seat | Term Expires |
|---|---|---|
| Steven DiPalma | Commission Regular | December 8, 2027 |
| Thora Moore | Commission Regular | December 8, 2027 |

**BE IT FURTHER RESOLVED** that this Resolution shall become effective on December 8, 2025.

**IN WITNESS WHEREOF**, this Resolution has been duly adopted this 8th day of December, 2025.

_____
LINDA HUDSON, MAYOR COMMISSIONER

ATTEST:

_____
LINDA W. COX, CITY CLERK

(CITY SEAL)

APPROVED AS TO FORM
AND CORRECTNESS:

_____
SARA HEDGES, CITY ATTORNEY

# Print

# Application For Appointment/Reappointment - Submission #24471

**Date Submitted: 11/26/2025**

**Name of Board or Boards for which you are applying:***

Civil Service Appeal Board

**Name:***

Steven DiPalma

**Home Address:***

3514 Carriage Pointe Circle

**City:***

Fort Pierce

**State:***

FL

**Zip:***

34981

**How long at this address?***

5 years

**Telephone Number***

7723707440

**If less than two years, provide prior address:**

3514 Carriage Pointe Circle

**Are you a citizen of the United States? ***

☑ Yes

☐ No

**Occupation: ***

President / Office Manager

**Employer:***

High Point of Fort Pierce Condominium Association Section One

**Do you own a business that operates within the City of Fort Pierce?***

☐ Yes

☑ No

**If yes, list the address and nature of said business:**

**Do you now or in the future plan to do business with the City of Fort Pierce or the Fort Pierce Utilities Authority(FPUA)?***

☐ Y

Yes

☑

No

**If yes, in which organization and in what capacity?**

Fort Pierce

**Are you employed by a business that is located within the City of Fort Pierce?***

☑

Yes

☐

No

**If yes, state the business and location:**

High Point of Fort Pierce Condominium Association Section One 204 Manatee Lane Fort Pierce, Fl 34982

**Do you have special training or knowledge in the area of:**

**Engineering:***

☐

Yes

☑

No

**Architecture:***

☐

Yes

☑

No

**Real Estate Brokering:***

☑

Yes

☐

No

**Finanace/Accounting:**

☑

Yes

☐

No

No

**Contracting:***

- [x] Yes
- [ ] No

**Land Development:***

- [ ] Yes
- [x] No

**Utilities:**

- [x] Yes
- [ ] No

**Management:***

- [x] Yes
- [ ] No

**Describe your professional background and what expertise you will bring to this Board. (Attach your resume or other applicable information below if desired) ***

Resume Attached

**Are you currently a member of a Commission-appointed board/committee?***

- [x] Yes
- [ ] No

**If yes, please specify:**

FPUA Advisory Committee

**Have you ever been convicted of a felony?***

- [ ]

Yes

☑

No

**If yes, what was the nature of the crime(s) you were convicted of:**

**If appointed, are you willing to attend a training session which could last several hours?***

☑

Yes

☐

No

**Referred by:***

Linda Cox

**Applicant Email Address:***

steven.dipalma@yahoo.com

**Date:***

11/26/2024

**Applicant's Signature:***

Steven DiPalma

APPLICATIONS EXPIRE 6 MONTHS FROM THE DATE OF SUBMISSION. PLEASE REAPPLY AS OFTEN AS DESIRED.

For additional information, please contact the City Clerk's Office at 772.467.3065 or email lcox@cityoffortpierce.com.

**Steven DiPalma**
Ft. Pierce, FL
Phone: 772-370-7440 | Email: steven.dipalma@yahoo.com

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**PROFESSIONAL SUMMARY**

Experienced leader and community advocate with over 50 years of service to the Ft. Pierce area. Proven expertise in property management, budget oversight, contract negotiation, and team supervision. Demonstrated success in leading nonprofit organizations, working with local government agencies, and facilitating community growth. A semi-retired president and office manager with a strong record of volunteer leadership and civic involvement.

---

**EXPERIENCE**

**President / Office Manager**
*High Point of Ft. Pierce Condominium Section One*
*Ft. Pierce, FL | 2009 – Present (15 Years)*

- Oversee the day-to-day operations and management of the High Point Condominium Association, a 264-unit community with a $1.5 million budget.
- Approve all bills and payments, ensuring the proper financial health of the community.
- Negotiate contracts with vendors, service providers, and contractors, ensuring the best value for the association.
- Supervise a team of three employees and collaborate with real estate agents, mortgage companies, and title companies to facilitate property transactions.
- Manage a 7-member Board of Directors, guiding decision-making processes and implementing community policies.

**Community Activist**
*Ft. Pierce, FL | 1982 – Present*

- Dedicated to the betterment of Ft. Pierce through active leadership in numerous civic organizations.
- Serve as a key figure in local events, charity initiatives, and community development efforts.
- Past leadership roles in various organizations and boards, including Ft. Pierce Athletic League, St. Lucie Sheriff's PAL, and Kiwanis Club.

**President**
*Ft. Pierce Athletic League*
*Ft. Pierce, FL | 2005 – Present*

- Lead a nonprofit organization focused on youth sports and community recreation.

- Coordinate athletic programs and events, fostering a positive environment for young athletes in the community.

**Past President**
*St. Lucie Sheriff's PAL (Police Athletic League)*
*Ft. Pierce, FL*

- Provided leadership for the St. Lucie Sheriff's PAL, promoting positive interactions between law enforcement and youth through sports and community engagement.

**Special Deputy**
*St. Lucie Sheriff's Department*
*Ft. Pierce, FL | 2009]*

- Support local law enforcement efforts as a Special Deputy, helping to ensure public safety and community well-being.

**Vice Chair**
*Fort Pierce Utilities Advisory Board*
*Ft. Pierce, FL | 2023 – Present*

- Assist in providing advice to the Fort Pierce Utilities Authority on matters related to the city's utilities and infrastructure.

---

**COMMUNITY LEADERSHIP & AFFILIATIONS**

- **Past President**, *Ft. Pierce Downtown Kiwanis Club*
- **Past Chairperson**, *Civil Service Appeals Board*
- **Past Vice Chairman**, *Communitywide Council*
- **Committee Member**, *City of Ft. Pierce Advisory Board for FPUA*
- **Member**, *Ft. Pierce Elks Lodge 1520*
- **Member**, *Downtown Landlords Association*
- **Member**, *Fraternal Order of Police (FOP) #41*
- **Committee Member**, *Saint Lucie County Toy Run*
- **Special Deputy**, *St. Lucie County Sheriff's Department*
- **Honorary Deputy**, *St. Lucie County Sheriff's Department*
- **Vice Chairman,** *FPUA Advisory Committee*

---

**EDUCATION & CERTIFICATIONS**

- CAD (Computer Aided Design) Certificate
- Condominium Seminar Certificate
- CAM (Community Association Mangers) License

---

**PERSONAL INFORMATION**

- **Family**:
    - Sons: Steven DiPalma (St. Lucie County Fireman/Paramedic), Brian DiPalma (Chief Technology Officer at Nexus IT Services)
    - Grandchildren: Vincenzo (9 years old), Amelia Mae (4 years old)
- **Residence**: Ft. Pierce, FL (Resident for almost 50 years)

---

**SKILLS & QUALIFICATIONS**

- **Property Management**: Budget oversight, contract negotiation, team leadership
- **Community Engagement**: Leadership in local organizations, event coordination, volunteer management
- **Leadership & Team Management**: Board governance, employee supervision, cross-functional collaboration
- **Public Service**: Experience in law enforcement, youth advocacy, and public safety initiatives

---

*References available upon request.*

**City Commission Day Meeting - 9:00 AM** **11. A.**

**Meeting Date:** 12/08/2025

**Re:** Discussion of Pre-Approved Residential Infill lots

**Submitted For:** Kev Freeman, Planning Director, Planning Department

**SUBJECT:**

Discussion of a proposed initiative to reduce review timelines for Single-Family, Duplex and Cottage planning applications within certain Zoning Districts.

**SUMMARY:**

The City has a preponderance of vacant lots in neighborhoods close to downtown and on the west side of US-1.
Staff are requesting feedback to bring forward a proposal to develop a fast-track, single-family/duplex/cottage residential planning approval for lots within the R-3 and R-4 Zoning Districts.

**RECOMMENDATION:**

Provide feedback to Staff.

**ALTERNATIVES:**

N/A

**RESPONSIBLE STAFF:**

Kev Freeman, Planning Director.

**COORDINATED WITH:**

To be undertaken.

## Fiscal Impact

**Budgeted Y/N:** n

**OTHER INFORMATION:**

No fiscal impact apart from Staff time. If implemented will result in process time saving for sfatt and applicants.

## Attachments

Staff Presentation

## Form Review

| Inbox | Reviewed By | Date |
|---|---|---|
| City Manager | Richard Chess | 11/26/2025 02:05 PM |

Form Started By: Kev Freeman Started On: 11/24/2025 03:06 PM

Final Approval Date: 11/26/2025

# CITY OF FORT PIERCE

## CITY COMMISSION

DECEMBER 1, 2025

## Discussion

## Single-Family/Duplex Residential Infill Pre-approval

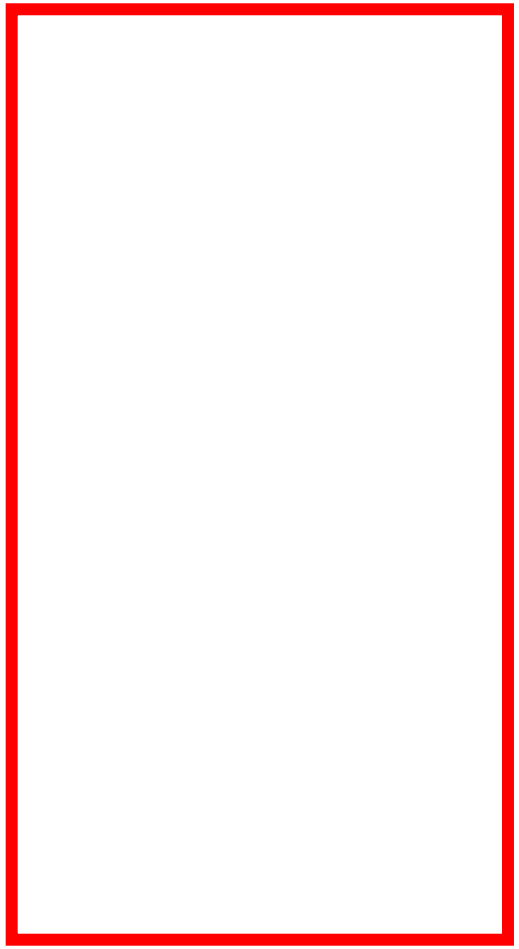
## SITUATION

The City has a preponderance of vacant lots in neighborhoods close to downtown and on the west side of US-1

Staff are requesting feedback to bring forward a proposal to develop a fast-track, single-family/duplex/cottage residential planning approval for lots within the R-3 and R-4 Zoning Districts.

**PROPOSAL**

# Undeveloped R-3 and R-4 Lots: Typical Dimensions



Staff will seek input from architects by requesting submittals for design proposals for typical lots within the R-3 and R-4 Zoning districts.

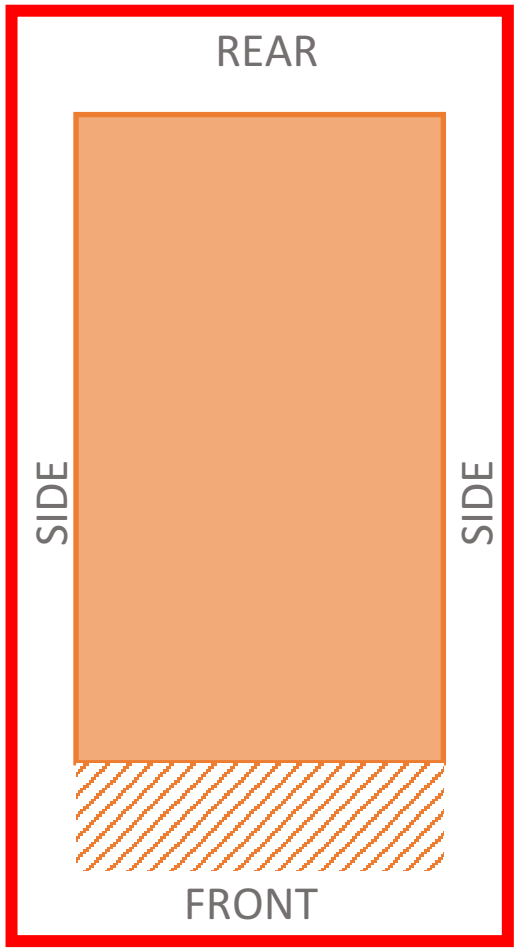
R-3 Width 50ft-100ft x 120-150ft

R-4 Width 50ft-65ft x 130ft-150ft

Design Criteria will be set and incorporate work being undertaken by the TCRPC within the FPRA as appropriate.

# PROPOSAL

## Design Criteria to be rationalized



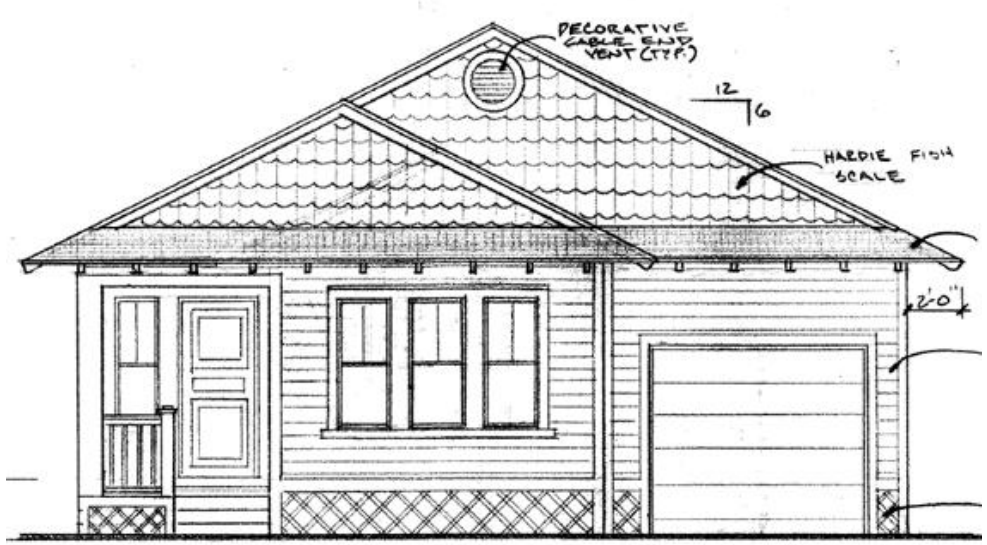

| Single-Family | R-3 | R-4 |
|---|---|---|
| Front Yard | 6ft to 25ft | 10ft to 25ft |
| Side Yard (min) | 6ft | 6ft |
| Rear Yard (min) | 15ft | 15ft |
| Building Coverage (max) | 40% | 40% |
| Lot Width (min) | No minimum | No Minimum |
| Lot Area | No minimum | No minimum |
| Building Height (max) | 28ft | 45ft |

| Duplex | R-3 | R-4 |
|---|---|---|
| Front Yard | 6ft to 25ft | 10ft to 25ft |
| Side Yard (min) | 6ft | 6ft |
| Rear Yard (min) | 15ft | 15ft |
| Building Coverage (max) | 40% | 45% |
| Lot Width | No minimum | No Minimum |
| Lot Area | No minimum | No minimum |
| Building Height (max) | 28ft | 45ft |

# RESULT

The proposed output will be a ‘catalogue’ of acceptable designs/floorplan sets, submitted voluntarily by architects and pre-approved by the City Commission and Boards (Planning Board & Historic Preservation Board). Applicants will select a design and negotiate directly with the Architect to utilize the plan set.

Planning pre-approval will speed the process and eliminate several review steps.



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**City Commission Day Meeting - 9:00 AM** **11. B.**

**Meeting Date:** 12/08/2025

**Re:** Economic Development Overview

**Submitted For:** Shyanne Harnage, Director, Community and Economic Dev

**SUBJECT:**

Comprehensive City Economic Development Overview Presentation, Discussion and Direction

**SUMMARY:**

This item provides the Comprehensive Economic Development Overview presentation requested during the City's Strategic Plan process. This presentation will provide an overview of the City's ongoing economic development initiatives, redevelopment efforts, and strategic priorities, including coordination with the Planning Department to create an Economic Development Element in the Comprehensive Plan.

**RECOMMENDATION:**

Provide feedback to staff.

**ALTERNATIVES:**

N/A

**RESPONSIBLE STAFF:**

Shyanne Harnage, Community and Economic Development Director
Kev Freeman, Planning Director

**COORDINATED WITH:**

Economic Development Council of St. Lucie County

**Fiscal Impact**

**OTHER INFORMATION:**

N/A

**Form Review**

| Inbox | Reviewed By | Date |
|---|---|---|
| City Manager | | |
| City Manager | | |
| Form Started By: Shyanne Harnage | | Started On: 12/02/2025 04:31 PM |

**City Commission Day Meeting - 9:00 AM** **11. C.**

**Meeting Date:** 12/08/2025

**Re:** Police Chief Appointment

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**SUBJECT:**

Discussion and approval of City Manager's appointment of Fort Pierce Police Chief.

**SUMMARY:**

**RECOMMENDATION:**

**ALTERNATIVES:**

**RESPONSIBLE STAFF:**

**COORDINATED WITH:**

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## Form Review

| Inbox | Reviewed By | Date |
|---|---|---|
| City Manager | Linda Cox | 12/02/2025 04:12 PM |
| Form Started By: Linda Cox | | Started On: 12/01/2025 11:24 AM |
| Final Approval Date: 12/02/2025 | | |