



ST. LUCIE
COUNTY
FLORIDA



April 21, 2025
City of Port St. Lucie Council Workshop

St. Lucie County
Regional Resilience
Vulnerability Assessment



Agenda

- Team Introductions
- Project Overview
- Purpose
- Project Timeline
- Questions & Answers

Project Team



TETRA TECH

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Project Overview

SLC Regional Resilience Vulnerability Assessment (RVA)

- Funded by FDEP through a Resilient Florida Planning Grant
 - This RVA will maintain our eligibility for future Resilient Florida / State infrastructure grant funding
- Collaborative approach with St. Lucie County, Port St. Lucie, Fort Pierce and St. Lucie Village to develop a county-wide assessment
- Community stakeholder engagement to ensure technical expertise is balanced with on-the-ground insights and perspectives
 - Resilience Steering Committee, made up of county, city and agency staff, established in 2021
- Evaluates present day and future flood risks based on State criteria



Value of Community-wide Approach

- The process can enhance:
 - synergy between groups
 - expertise and resources
 - continuity and timing of projects
- Identify common threads where collaboration & coordination is beneficial to all
- Allow diverse groups to coordinate more fluidly at regional level



Resilient Florida Program Overview

(Florida Statute 380.093 F.S.)

- Requires Florida Flood Hub (USF) to develop statewide Sea Level Rise and Flooding Vulnerability Assessment (update every 5 years)
- Requires FDEP to develop annual Sea Level Rise and Flooding Resilience Plan, including a priority projects list to be considered for funding



Resilient Florida Grant Program

- **Planning Grants**

- Goal to ensure all Florida Counties develop a compliant Vulnerability Assessment
- Funds local / regional resilience plans and data collection; project, strategy, policy and adaptation planning; feasibility studies and cost of permitting for nature-based solutions, etc.
- No match required

- **Infrastructure Grants**

- Funds projects that mitigate current and future risks of flooding on critical assets
- Encourages nature-based projects where practicable
- 50% match requirement



Resilient Florida Grant Program

2021 – 2024 Resilient Florida Grant Program

Total Projects	Total Awarded
733	\$1,516,464,129



Project Objectives

1

Develop a comprehensive strategy to identify flood risks

2

Evaluate types and levels of flood hazards

3

Evaluate Assets at risk to hazards now and in the future

4

Begin developing guiding strategies for adaptation and infrastructure design

Next Step...

Resilient Florida Requirements

Section 380.93(3) F.S.

- Assessment to encompass entire County boundary
- Most recent elevation data
- 2017 NOAA Intermediate Low and Intermediate High sea level rise projections for 2040 and 2070 (This project also assesses 2100)
- High Tide-, Storm Surge-, Rainfall-induced Flooding
- Compound flooding (to the extent practicable) – depth of potential future flooding from combination scenarios, for example:
 - SLR + High Tides + Storm Surge + Rainfall (100-year and 500-year storm event)

Vulnerability Assessment Components

SLC Update to 2021 VA pursuant to F.S. 380.93(3)(c)

- 1. Collect** – coordinate comprehensive County and Municipal GIS-based data collection
- 2. Inventory** – develop critical asset inventory from local datasets
- 3. Evaluate** – conduct exposure analysis to evaluate potential impacts of flood hazards
- 4. Identify** – conduct sensitivity analysis to identify critical assets vulnerable to impacts of flood hazards
- 5. Obtain and Incorporate** - elicit community stakeholder input and feedback for incorporation into assessment
- 6. Rank** – rank critical assets based on criticality and vulnerability to impacts from flood hazards
- 7. Summarize** – present findings through a report, tables, and maps



Flooding Hazards Evaluated

Sea Level Rise

- An increase in the level of the world's ocean waters due to increased surface water temperature (expansion) and melting ice maps (quantity)

High Tide Flooding

- Characterized by abnormally high tidal occurrences, leading to the temporary inundation of low-lying areas

Storm Surge Flooding

- An abnormal rise of ocean water generated by high tide and elevated water levels associated with a storm

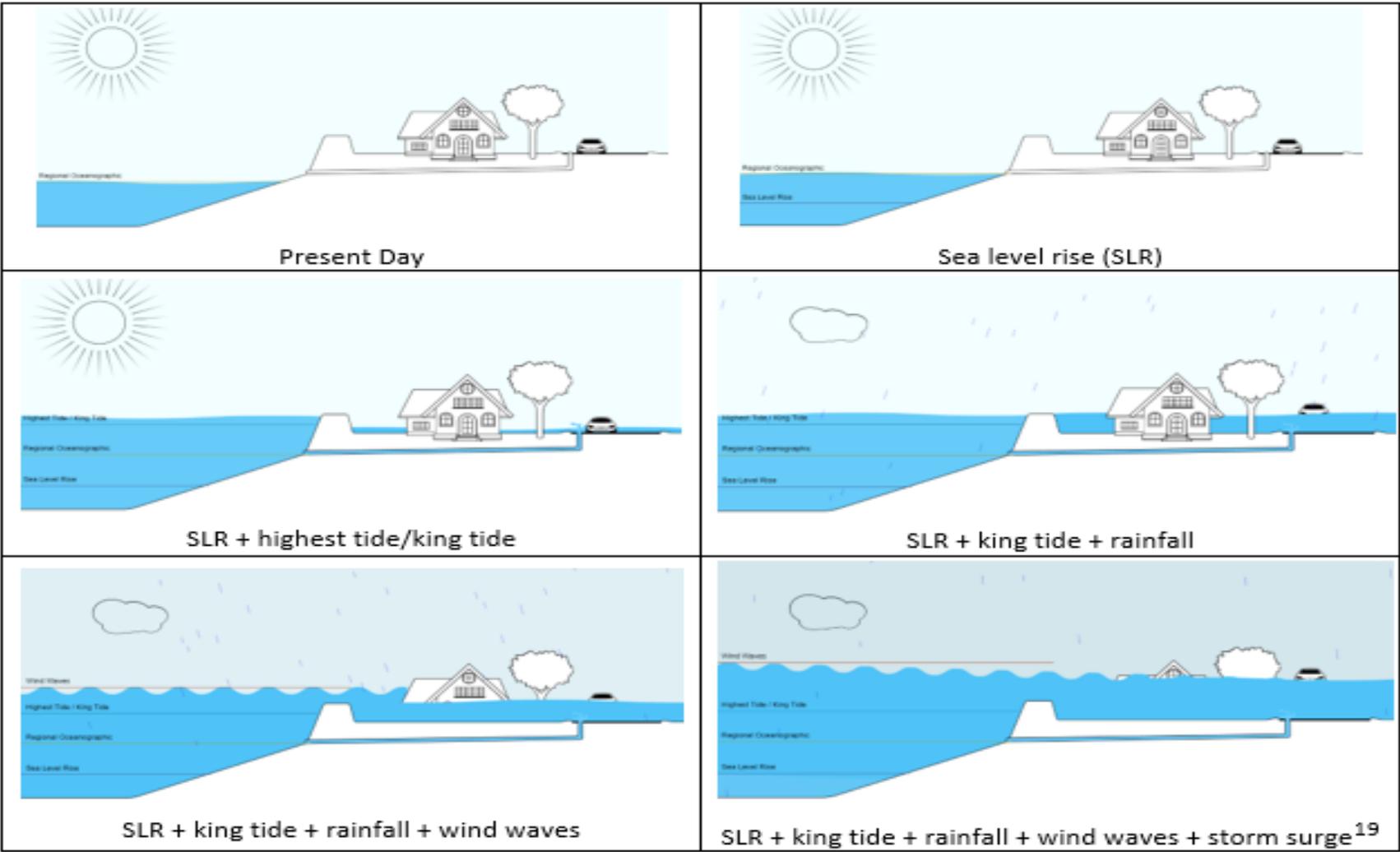
Rainfall-Induced Flooding

- Occurs when excessive rainfall overwhelms drainage/stormwater systems and natural waterways, leading to the inundation of normally non-flood-prone land

Compound Flooding

- The combination of tidal, storm surge, and rainfall-induced flooding

Compound Flooding Scenarios



Images taken from NOAA Understanding Stormwater Inundation: <https://coast.noaa.gov/stormwater-floods/understand/>

Critical Assets - Section 380.093 F.S

Owned or maintained by the county, cities, and other entities



- **Transportation Assets:** Transportation assets, airports and evacuation routes
- **Critical Infrastructure:** Wastewater, stormwater, drinking water facilities, energy, solid & hazardous waste, communications facilities
- **Critical community and emergency facilities:** emergency operation, fire, law enforcement, correctional and government facilities; shelters & staging areas, health care and emergency medical facilities, schools, affordable public housing
- **Natural, cultural, and historical resources:** Conservation lands, parks, shorelines, surface waters, wetlands, historical and cultural assets

Regionally Significant Assets

Critical assets that support the needs of communities spanning multiple geopolitical jurisdictions, including, but not limited to:

- Water resource facilities
- Regional medical centers
- Emergency operations centers
- Regional utilities
- Regional natural systems
- Major transportation hubs and corridors
- Airports
- Seaports



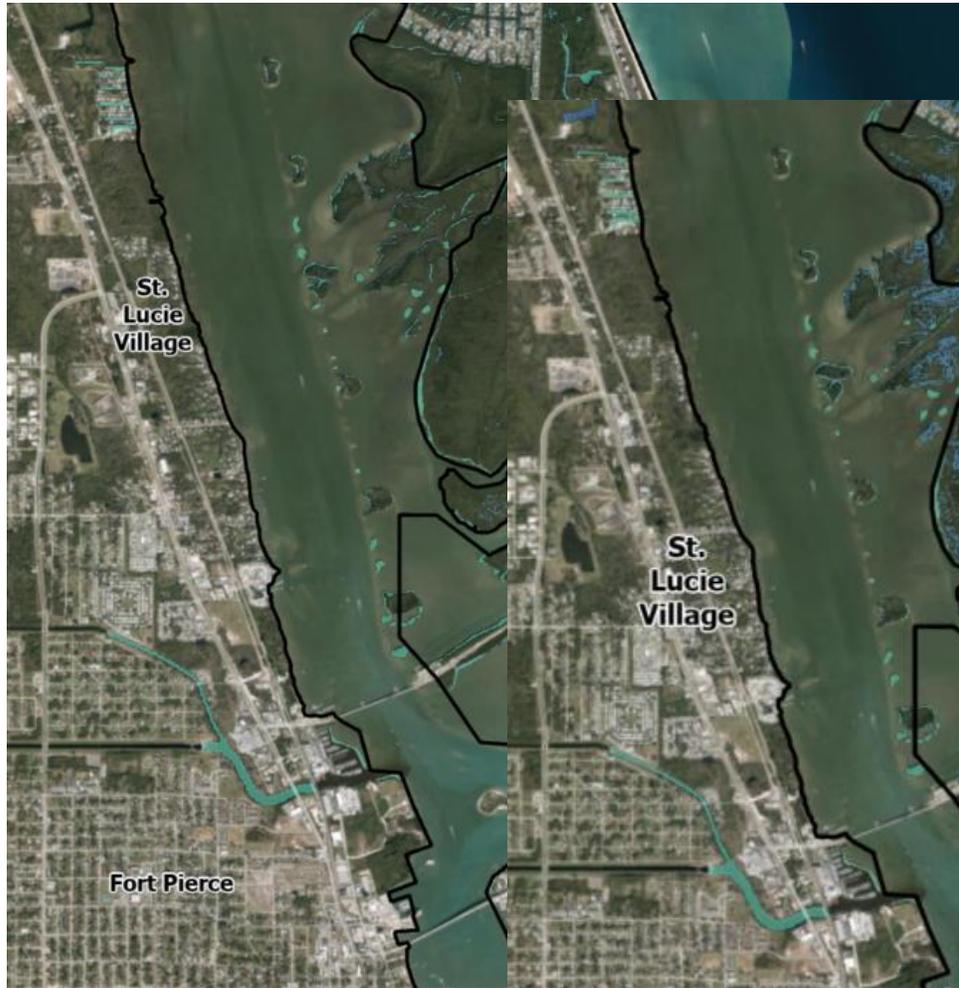
Exposure & Sensitivity Analyses

- Determine exposure to specific flood scenarios
- Identify sensitivity of Critical Assets at risk
- Rank assets to identify current and future project needs
- Obtain and incorporate public/stakeholder feedback

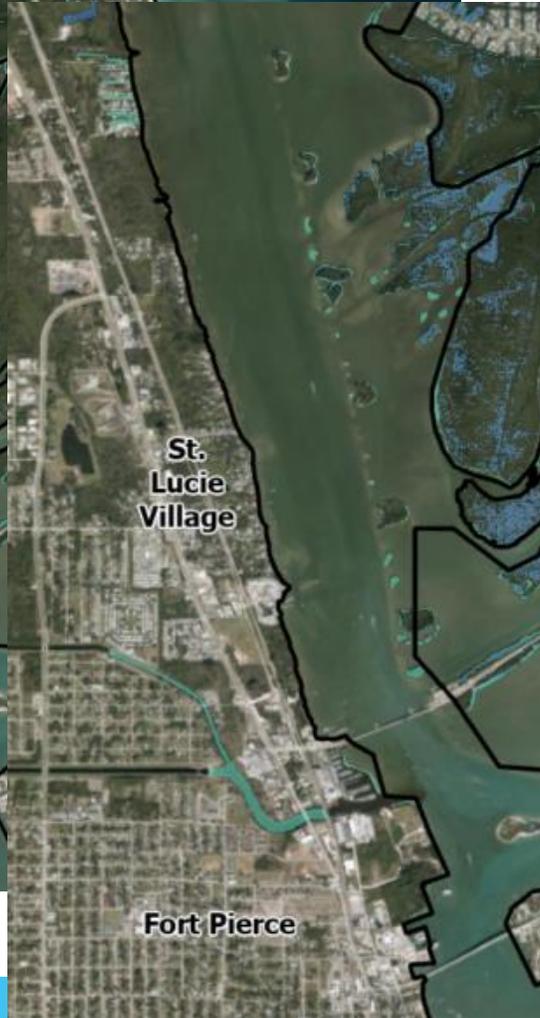


Aquafence Floodwall

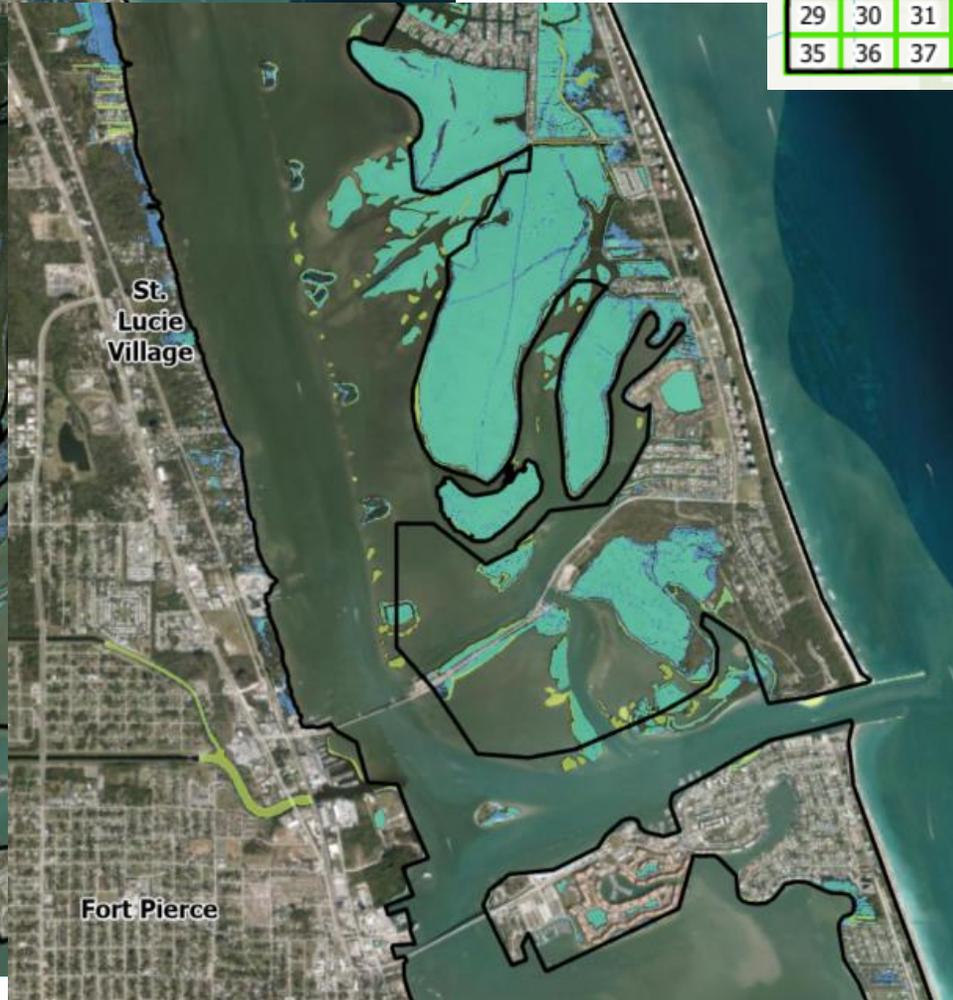
Sea Level Rise



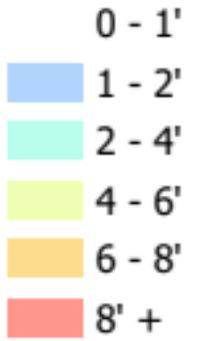
Present Day



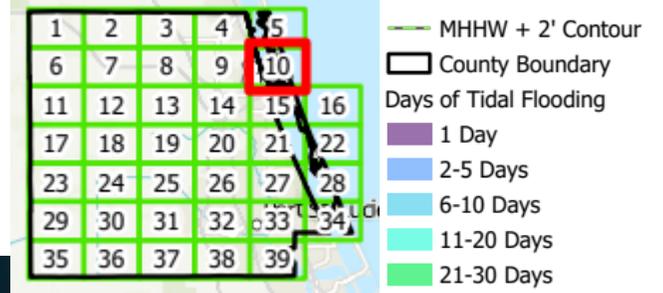
NIH 2040



NIH 2070



Days of Tidal Flooding

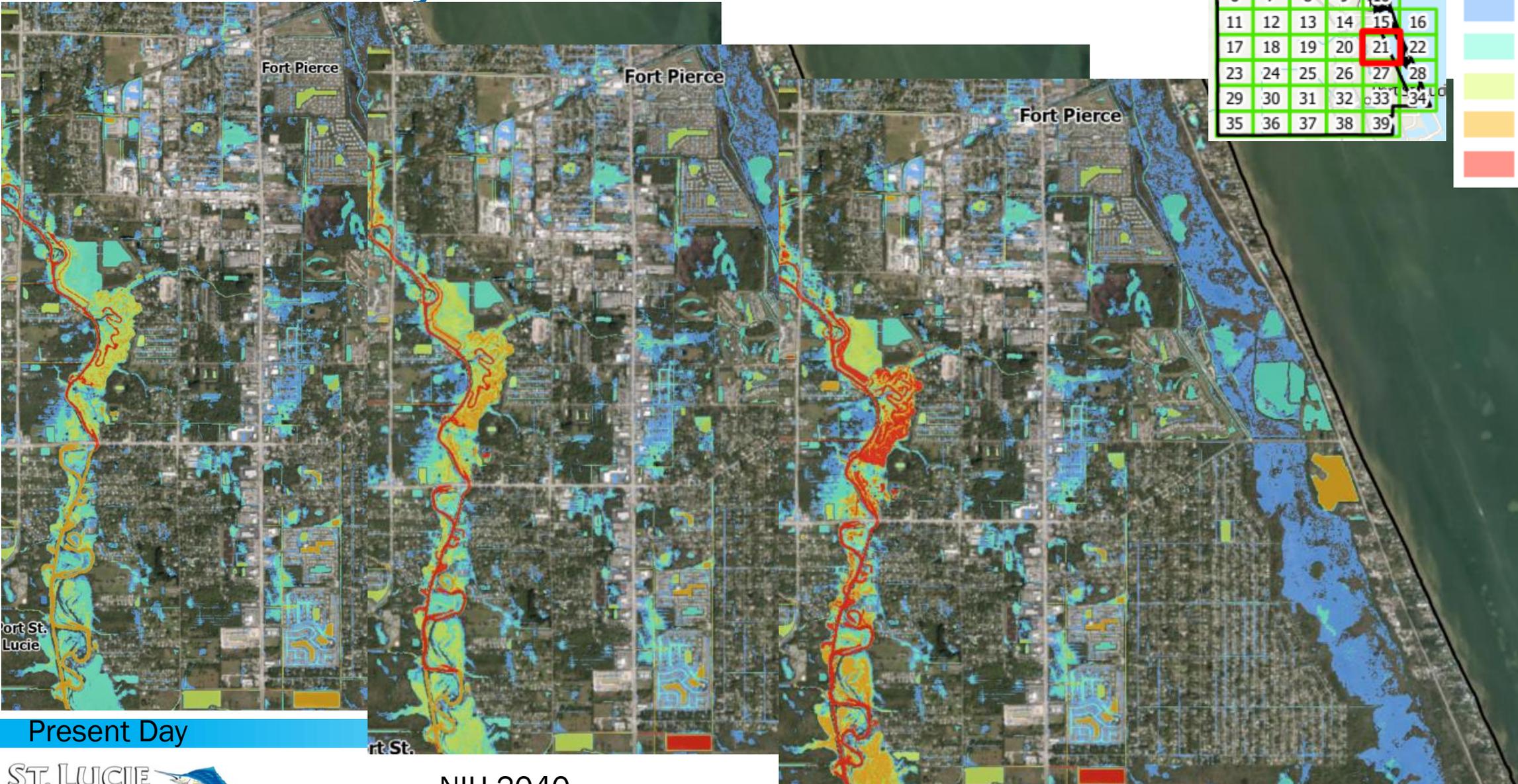


Historic (2005-2023)

NIH 2040

NIH 2070

Rainfall: 100-year 24 hour

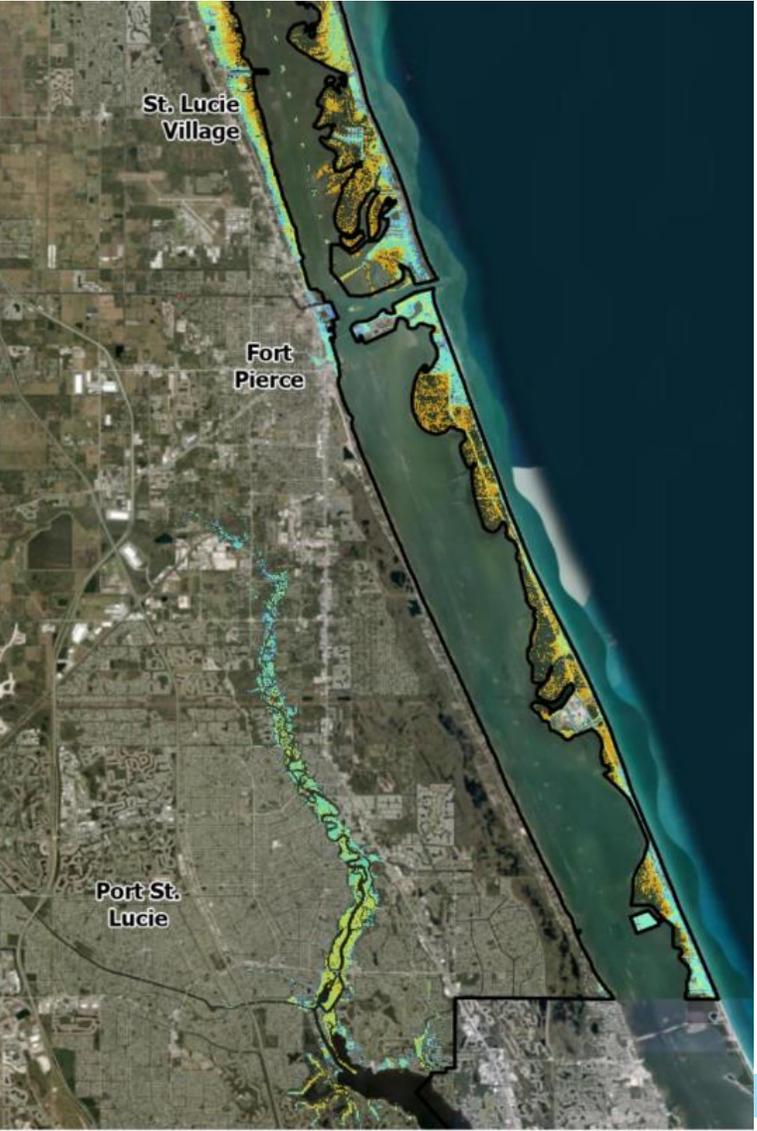


Present Day

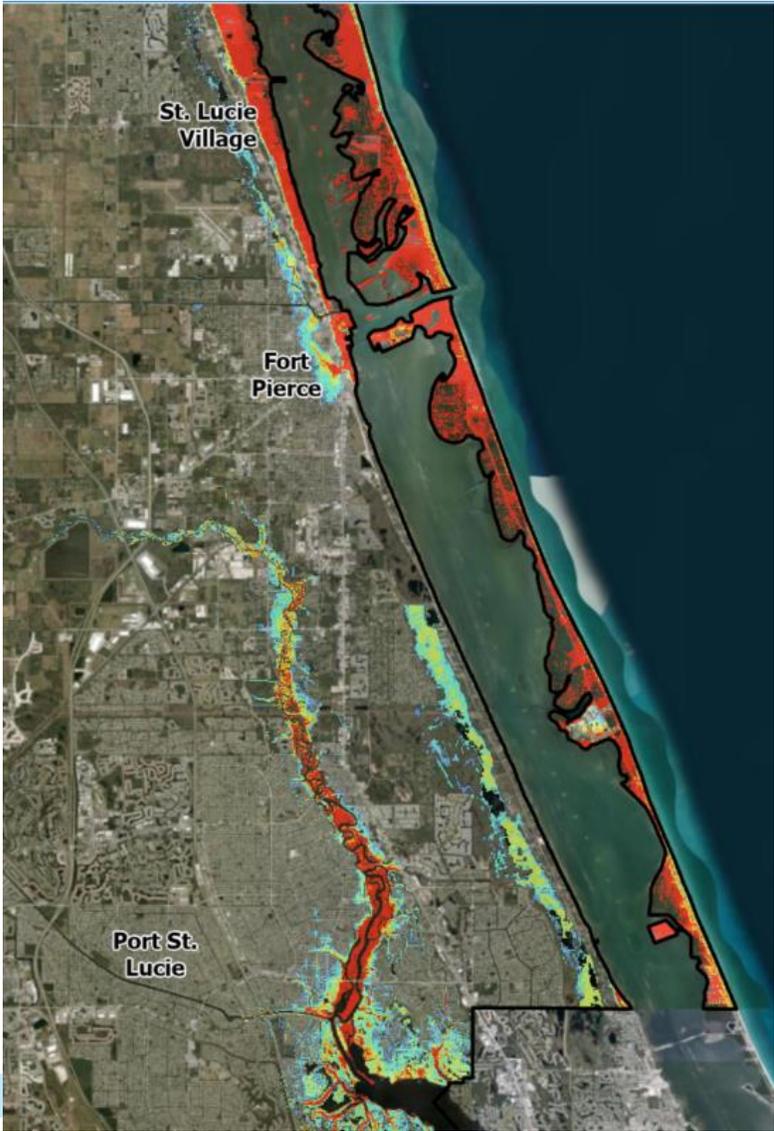
NIH 2040

NIH 2070

Storm Surge: Present Day



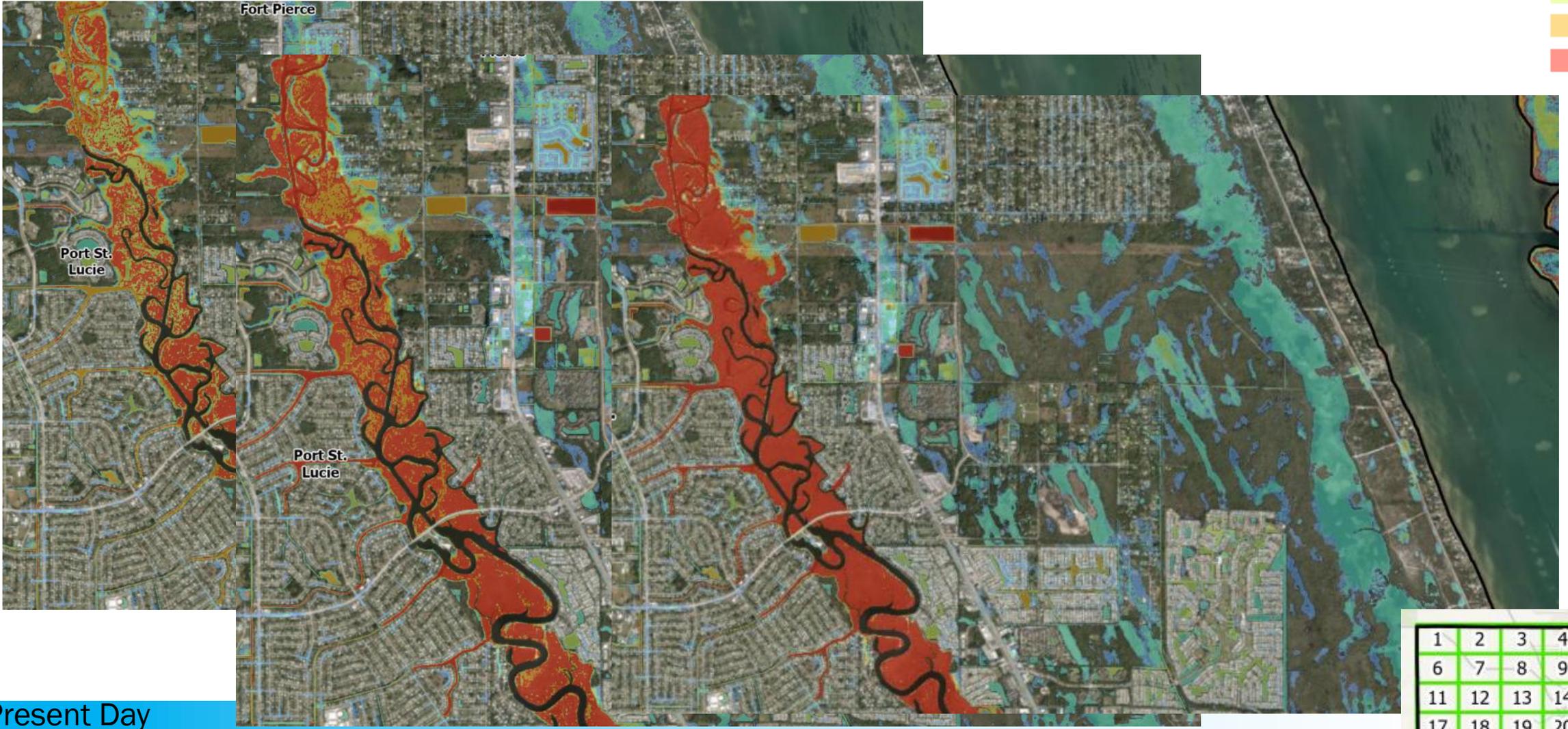
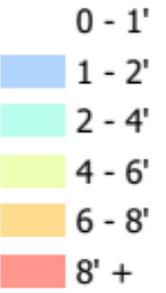
Category 3



Category 5



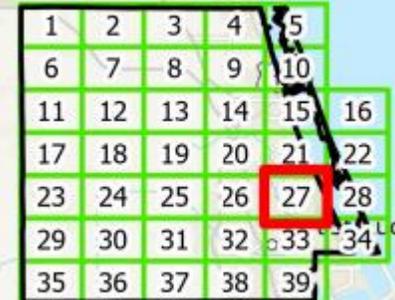
Compound Flooding : 100 yr 24 hr Rainfall + Cat 3 SS



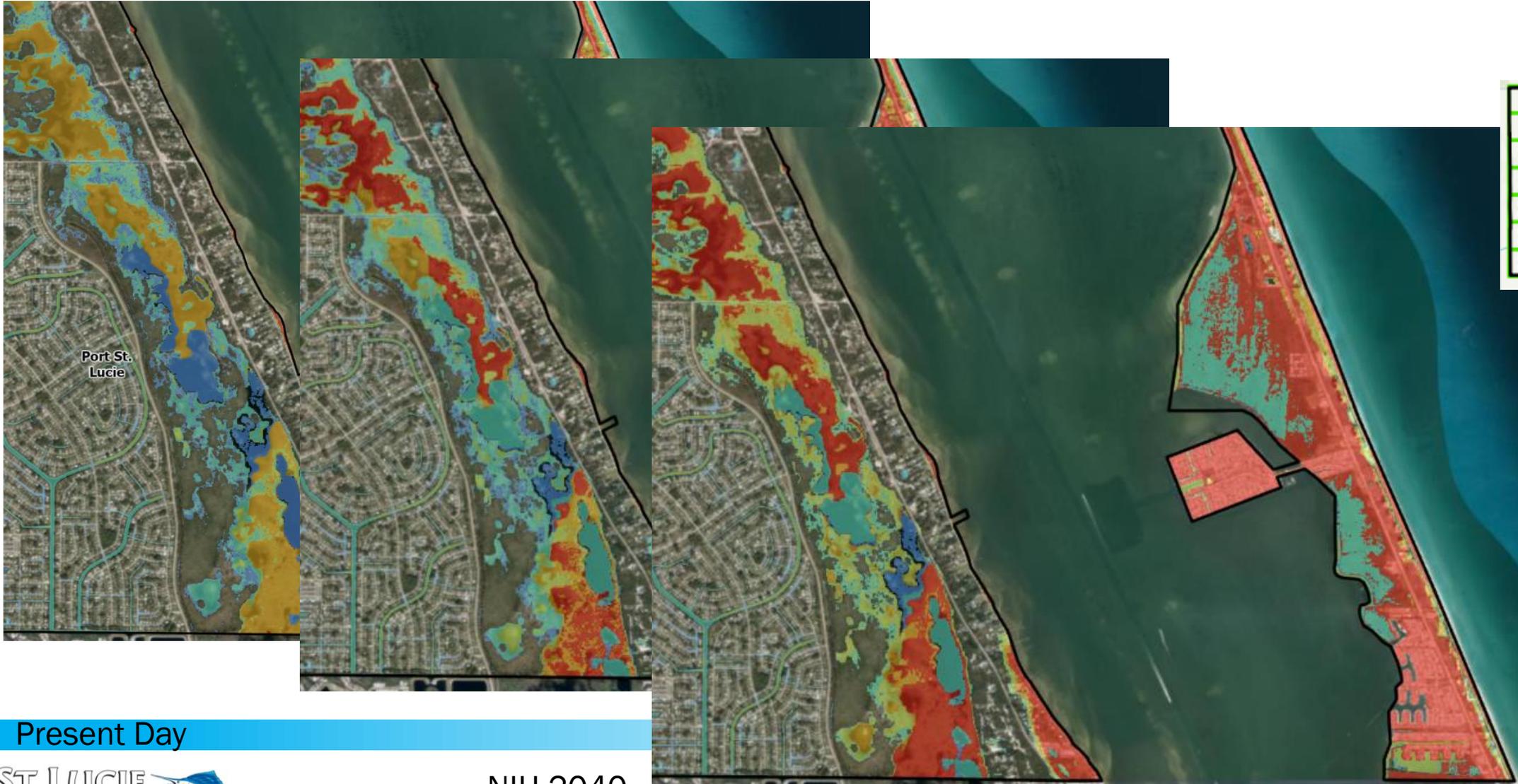
Present Day

NIH 2040

NIH 2070



Compound Flooding – 25 yr 24 hr Rainfall + Cat 5 SS



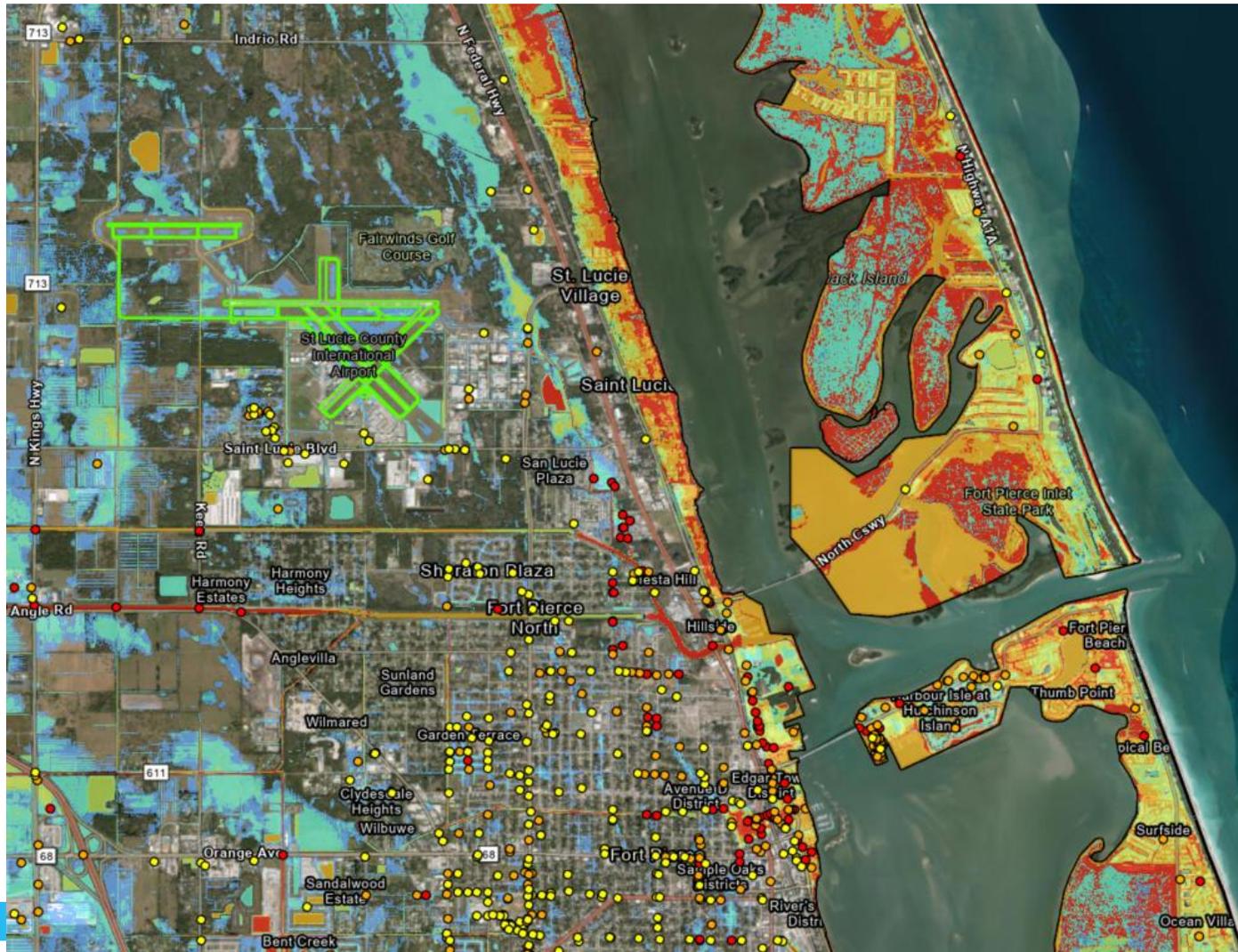
Present Day

NIH 2040

NIH 2070



Prioritized Critical Assets and Exposure



- County Boundary
- Airport Runway

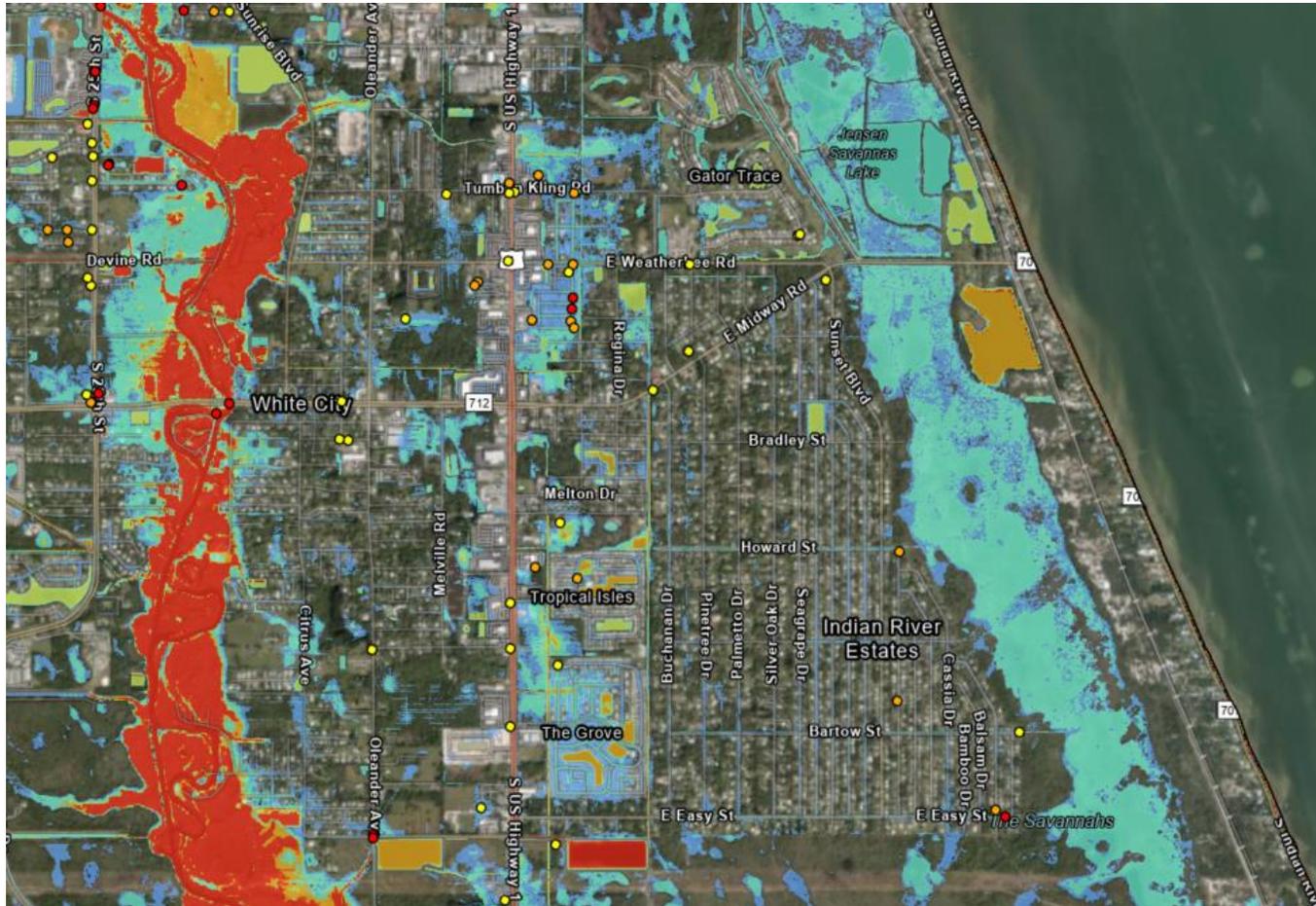
- Critical Assets**
- High - 1 and 2
 - Medium - 3 and 4
 - Low - 5

2070 100yr. 24hr. Rainfall + Category 3 Storm Surge + 2070 NIH Flooding

- 0-1'
- 1-2'
- 2-4'
- 4-6'
- 6-8'
- 8'+

NIH 2070 100yr Cat 3

Prioritized Critical Assets and Exposure



County Boundary

Critical Assets

- High-1 and 2
- Medium-3 and 4
- Low-5

2070 100yr. 24hr. Rainfall + Category 3 Storm Surge + 2070 NIH Flooding

- 0-1'
- 1-2'
- 2-4'
- 4-6'
- 6-8'
- 8'+

NIH 2070 100yr Cat 3

Critical Assets: Composite Vulnerability Scoring

Horizon Index:
Timing of flooding impacts
Weight = 0.4

Risk Level	Time Horizon	Flooding Exposure Year	Weight
High	Near Term	Present Day	0.45
	Near Term	2040	0.30
Moderate	Mid Term	2070	0.20
Low	Long Term	2100	0.05
Total			1.00

Risk Index:
Type of flooding impacts
Weight = 0.15

Risk Level	Flooding Hazard	Weight
High	Rainfall and Sea Level Rise	0.45
	Rainfall	0.30
Moderate	Sea Level Rise	0.15
Low	Rainfall, Sea Level Rise, and Storm Surge (Compound Flooding)	0.10
Total		1.00

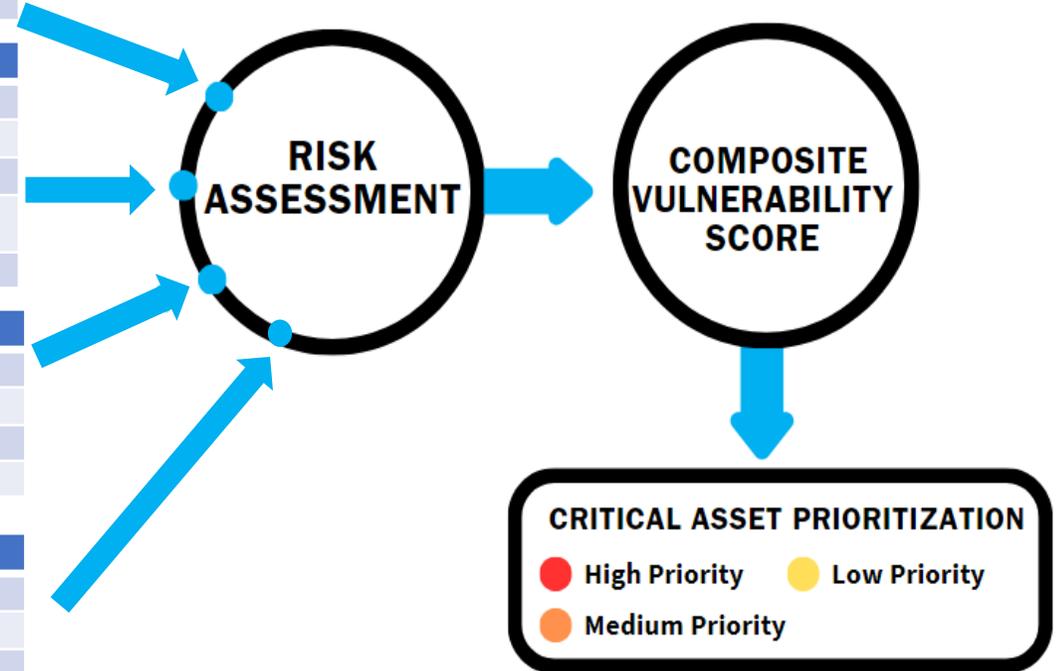
Impact Index:
Average Flood Depth
Weight = 0.15

Risk Level	Average Flooding Depth (feet)	Weight
High	>3	0.50
Moderate	2-3	0.35
Low	1-<2	0.15
Total		1.00

Asset Criticality Index:
Level of asset criticality
Weight = 0.3

Risk Level	Critical Asset Tier	Weight
High	Primary	0.45
	Secondary	0.35
Moderate	Tertiary	0.15
Low	Quaternary	0.05
Total		1.00

CRITICAL ASSET PRIORITIZATION:

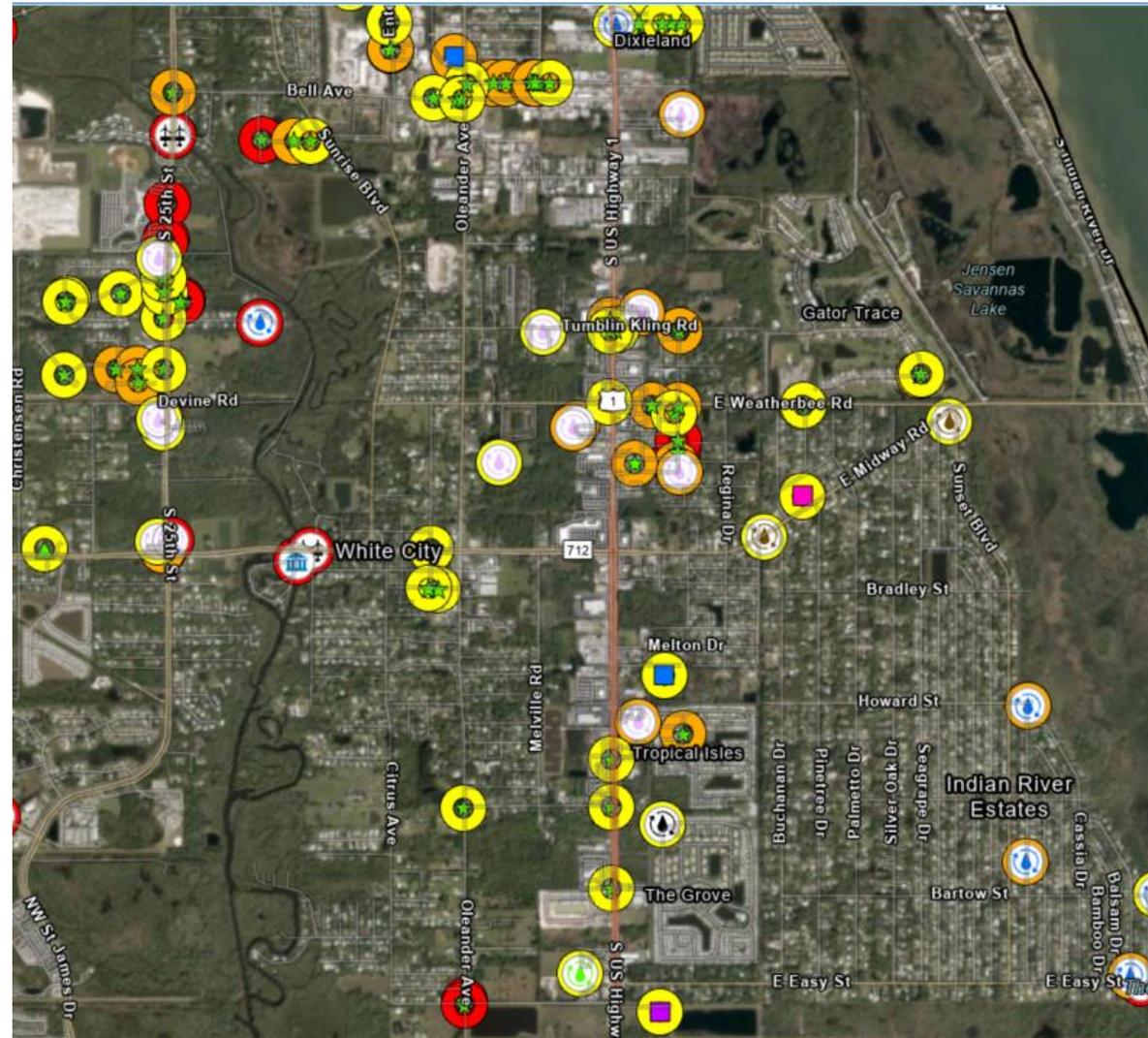


Results:

Tier 1 & 2 Assets

White City Area

Asset Category	Asset Type
Transportation	Bridges
Critical Infrastructure	Sub Stations
Critical Community	Shelter

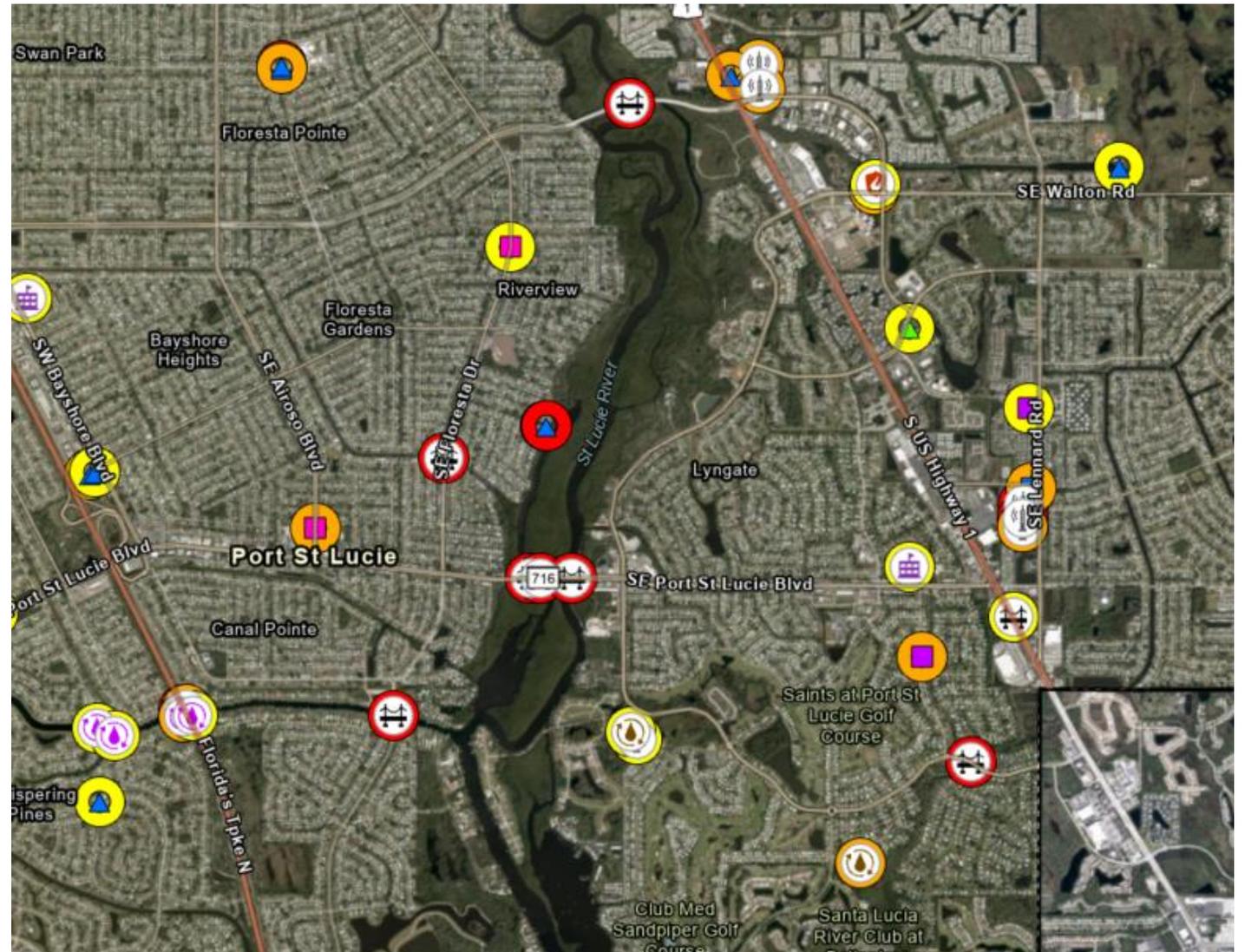


Results:

Tier 1 & 2 Assets

Port St Lucie

Asset Category	Asset Type
Transportation	Bridges
Critical Infrastructure	Sub Stations
Critical Community	Shelter

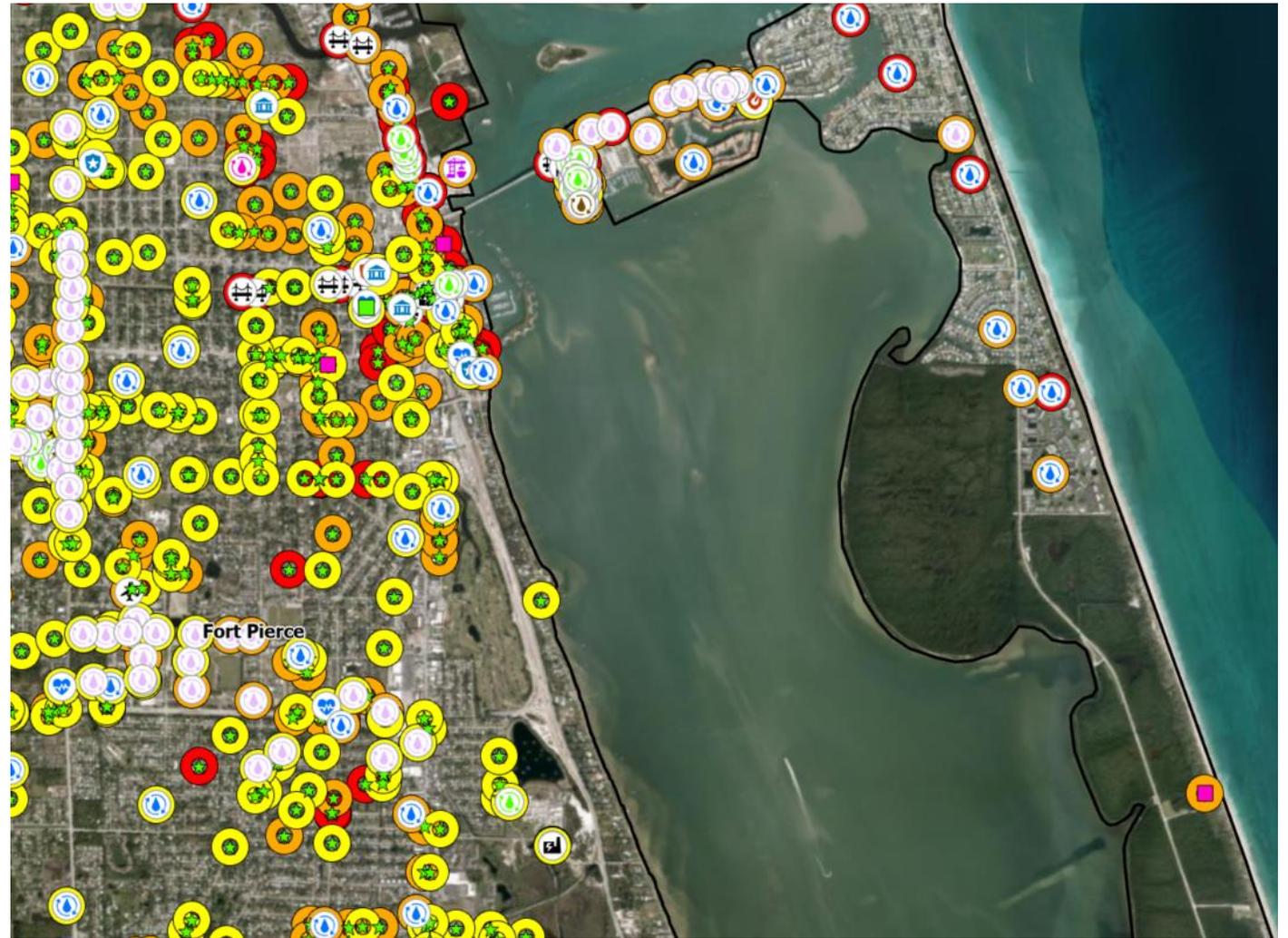


Results

Tier 1&2 Assets

Fort Pierce

Asset Category	Asset Type
Transportation	Bridges & Port
Critical Infrastructure	Water Utilities, Electric Utilities
Critical Community	Fire Stations, Police Stations, Shelters

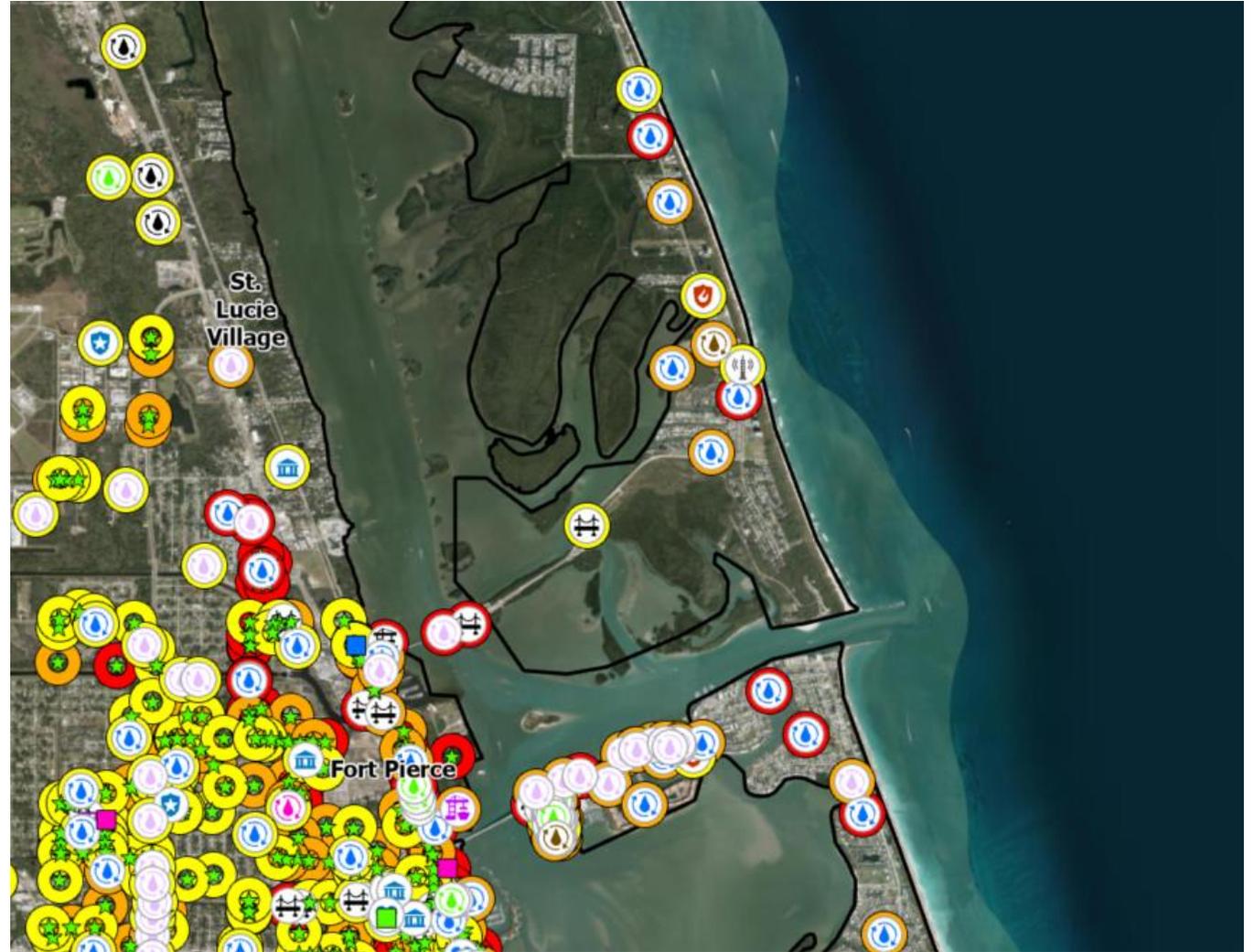


Results:

Tier 1 & 2 Assets

St Lucie Village

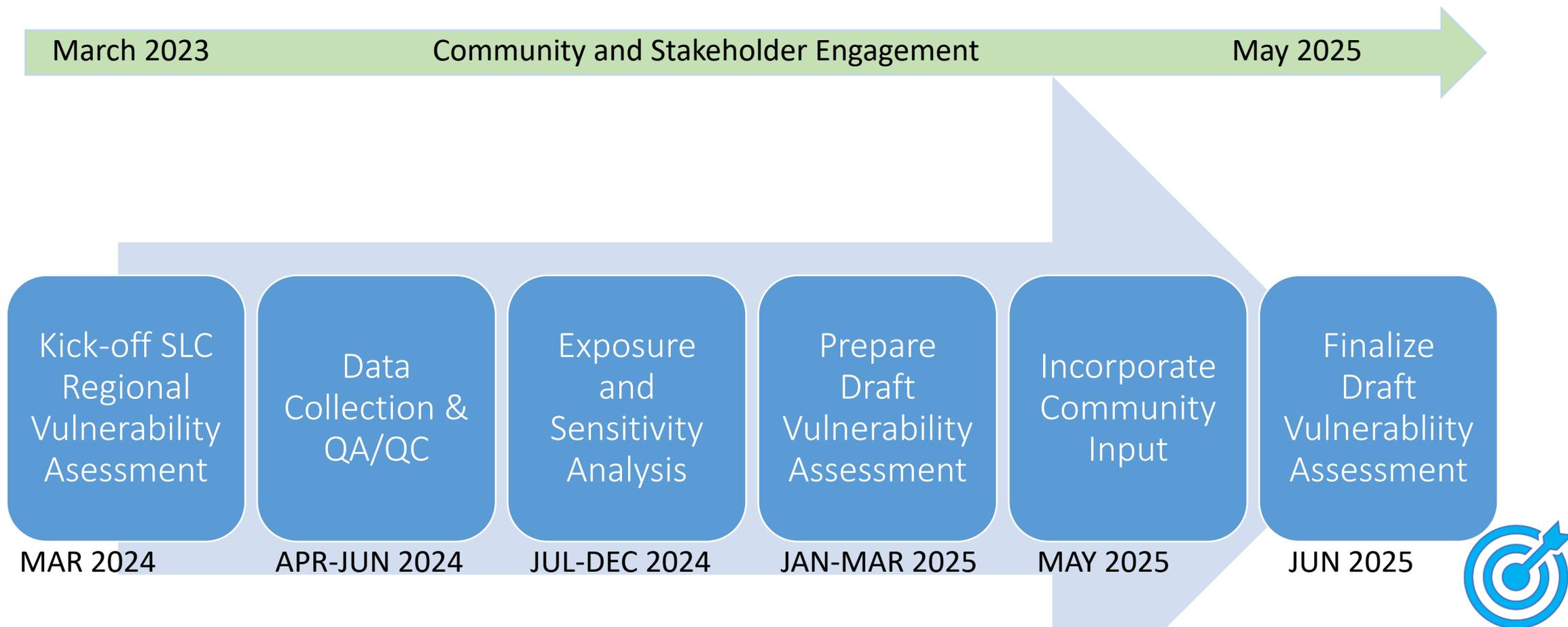
Asset Category	Asset Type
Transportation	Bridges
Critical Infrastructure	Water Utilities, Solid Waste
Critical Community	Police Stations, Shelters, Schools



Key Takeaways

- St. Lucie County will be affected by increased flooding risks and there are areas of increasing vulnerability in the community
- St. Lucie County, Port St. Lucie, Fort Pierce and St. Lucie Village are proactively addressing resilience by doing the following:
 - Identify critical community assets at risk
 - Look to align local, state and federal resources with needs of the entire community
 - Qualify for future Resilience Florida Grant funding
- Final Vulnerability Assessment will integrate all input and comments from the community workshops and feedback from public presentations
- Final Vulnerability Assessment slated to be brought before County and City Boards to consider adoption.

RVA Project Schedule



Thank You!

ST. LUCIE
COUNTY
FLORIDA



Discussion
and
Questions

