Coastal Vulnerability Assessment Update

Public Meeting

February 20, 2025

5:30 – 7:30

JonesEdmunds

Agenda

- Review Project Background, Goals, and Scope
- Review Critical Asset Data Collection
- Review Inundation Modeling/Mapping Updates
- Marsh Baseline Survey
- Next Steps

Project Goals

- Update the City's Coastal Vulnerability Assessment to satisfy FDEP Resilient Florida Program guidelines and State Statutes (F.S. 380.093).
- Update future conditions tidal, storm-surge, and rainfall-driven flood mapping.
- Identify vulnerable critical community infrastructure.
- Complete a baseline survey of the City's coastal marsh.

ably with risk when measuring hazard impacts. NOAA provides a useful definition of vulnerability that informs the follow-on actions described later in this chapter (2010):

"The potential for loss of or harm/damage to exposed assets largely due to complex interactions among natural processes, land use decisions, and community resilience." [6]

Why do you need a Vulnerability Assessment?

A Vulnerability Assessment helps a community determine which structural and social assets are likely to be impacted by future coastal flooding and sea level rise.

Fla. Dept. of Environment Protection = FDEP
Sea Level Rise = SLR
Vulnerability Assessment = VA

Grant Funding

Project is 94% Grant Funded

Community Development Block Grant – Mitigation Program - $87k

- Flood Mapping Updates – Covered Today
- Marsh Baseline Survey – Covered Today
- Public Meetings
- Adaptation Plan Updates – Covered at Future Meeting

FDEP Resilient Florida Grant Program – Planning Grant - $65k

- Data Collection – Covered Today
- Flood Mapping Updates – Covered Today
- Sensitivity Analysis – Covered at Future Meeting
- Reporting

Recap: 2019/2021 Coastal VA

- 100% Grant Funded by the Florida Resilient Coastlines Program
- Completed in June 2019 and Updated in April 2021
- 100-Year Storm Surge and Rainfall Driven Flooding for 2044, 2069, and 2119
- Nuisance Flooding (MHHW)
- Used NOAA 2017 Intermediate-High Sea-Level-Rise Projections
- **Completed Prior to F.S. 380.093 and Resilient Florida Grant Program Guidelines/Requirements (RFGP)**

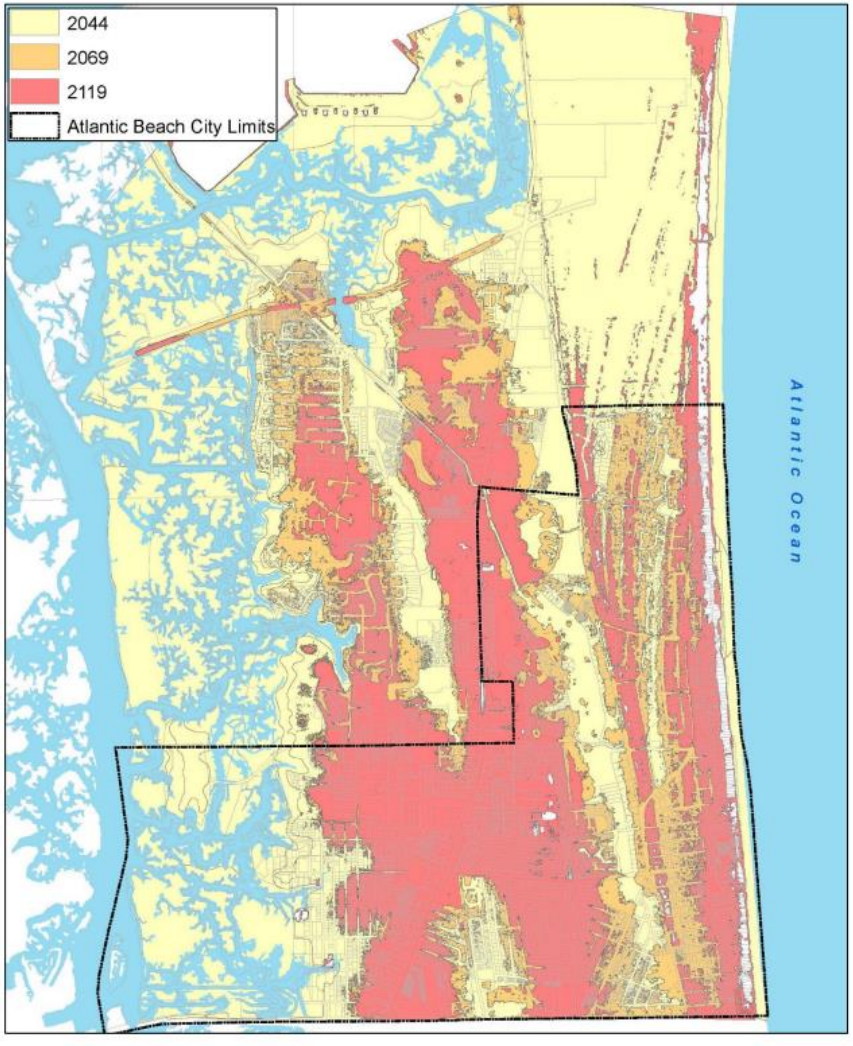


Figure 3-3 – Projected 100-Year Event Storm Surge

Resilient Florida Program Overview

Florida Senate Bill 1954 (May 12, 2021)

- **Established Resilient Florida Grant Program.**
- Directs FDEP to create a statewide Vulnerability Assessment.
- Directs FDEP to create a Statewide Flooding and SLR Resilience Plan.

Resilient Florida Grant Program

- Planning Grants - $19M (2021-22) / $28M (2022-23)
- Implementation Grants - $400M (2021-22) / $275M (2022-23)

F.S. 380.093 Overview

Current Established Requirements for FDEP Funded VAs

- Must encompass entire county or municipality.
- Must include all “critical assets” owned or maintained by applicant.
- Include depth of future high tide flooding.
- Include depth of current and future storm surge flooding (100-year event).
- Include depth of current and future rainfall-induced flooding (100-year & 500-year events).
- Use National Oceanic and Atmospheric Administration’s (NOAA) 2022 intermediate-low and intermediate sea-level-rise projections.
- Include 2050 and 2080 planning horizons.

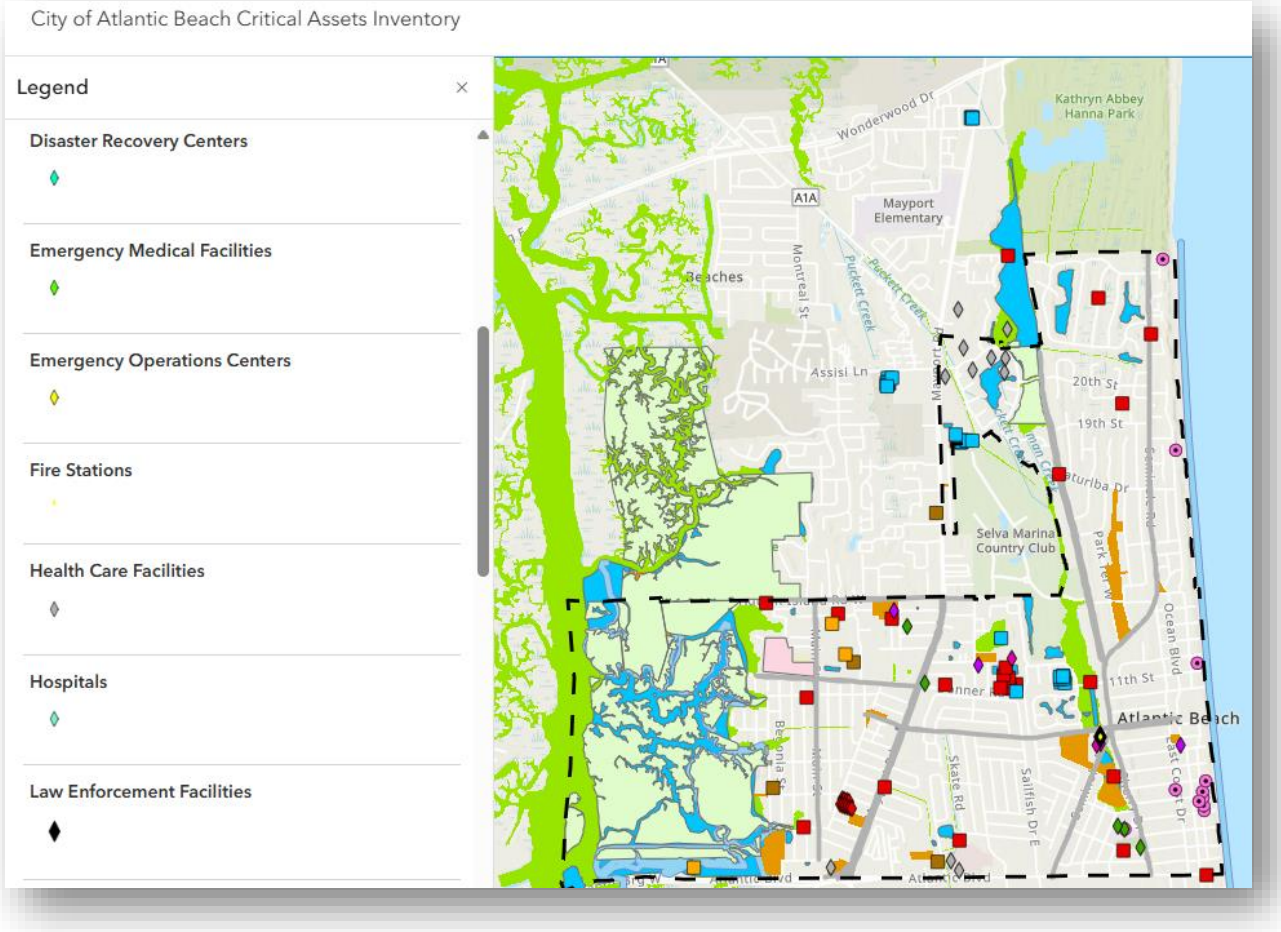
Data Collection: Critical Community Assets

Asset Type
Affordable Public Housing
Airports
Bridges
Bus Terminals
Colleges and Universities
Communications Facilities
Community Centers
Conservation Lands
Correctional Facilities
Disaster Debris Management Sites
Disaster Recovery Centers
Drinking Water Facilities
Electric Production and Supply Facilities
Emergency Medical Service Facilities
Emergency Operation Centers
Fire Stations
Health Care Facilities
Historical and Cultural Assets
Hospitals

Asset Type
Law Enforcement Facilities
Local Government Facilities
Logistical Staging Areas
Major Roadways
Marinas
Military Installations
Parks
Ports
Rail Facilities
Railroad Bridges
Risk Shelter Inventory
Schools
Shorelines
Solid and Hazardous Waste Facilities
State Government Facilities
Stormwater Treatment Facilities and Pump Stations
Surface Waters
Wastewater Treatment Facilities and Lift Stations
Water Utility Conveyance Systems
Wetlands

Data Collection: Critical Community Assets

- Mined from County, City, State, and Federal data sources.
- Inventory includes ~350 critical community assets.



Updated Flood Mapping: Requirements

Scenarios/Planning Horizons

- Existing, 2050, and 2080 planning horizons
- Intermediate-low and Intermediate Sea-Level-Rise (SLR) Projections

Tidal/Sunny Day Flooding

- Existing and future high tide flooding
- Number of expected tidal flood days

Current and Future Storm Surge Flooding

- Use existing storm surge data
- Include 100-year flood event at a minimum

Current and Future Rainfall Induced Flooding

- Include 100-year and 500-year rainfall event
- Vary future boundary conditions based on SLR projections

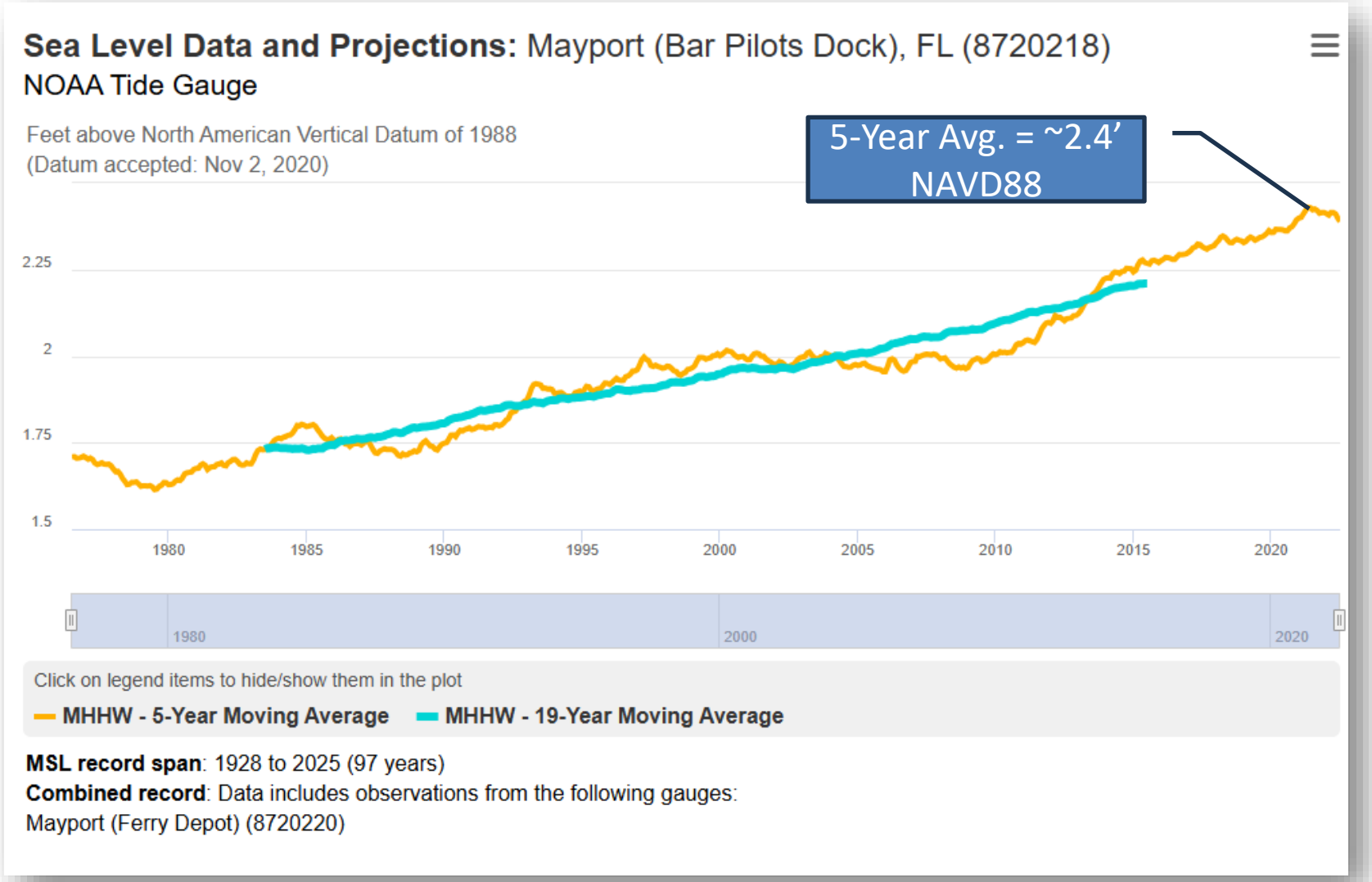
Updated Flood Mapping: Scenarios

- 20 scenarios are required by State Statute.
- City also chose to map combined surge and rainfall flooding for the 100-year event.

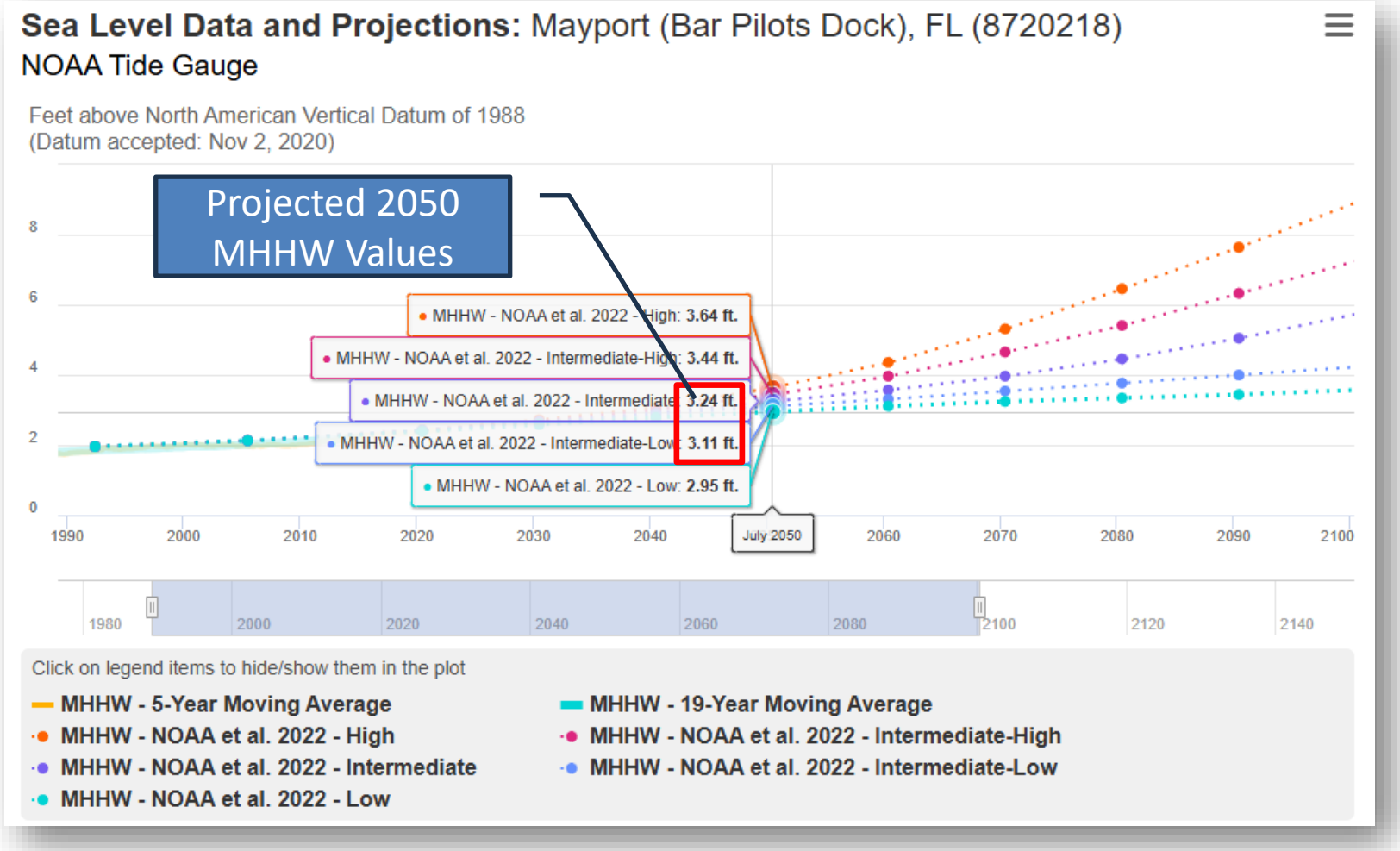
Flooding Type	MHHW+2’	100-Year	500-Year
Tidal/Sunny-Day Flooding			
Existing	X		
2050 Int-Low	X		
2080 Int	X		
2080 Int-Low	X		
2080 Int	X		
Rainfall Induced Flooding			
Existing		X	X
2050 Int-Low		X	X
2080 Int		X	X
2080 Int-Low		X	X
2080 Int		X	X
Storm Surge Flooding			
Existing		X	
2050 Int-Low		X	
2080 Int		X	
2080 Int-Low		X	
2080 Int		X	

Notes: **Orange** highlighted cells indicate required scenarios.
MHHW = Mean Higher High Water

Sea-Level-Rise Projections



Sea-Level-Rise Projections



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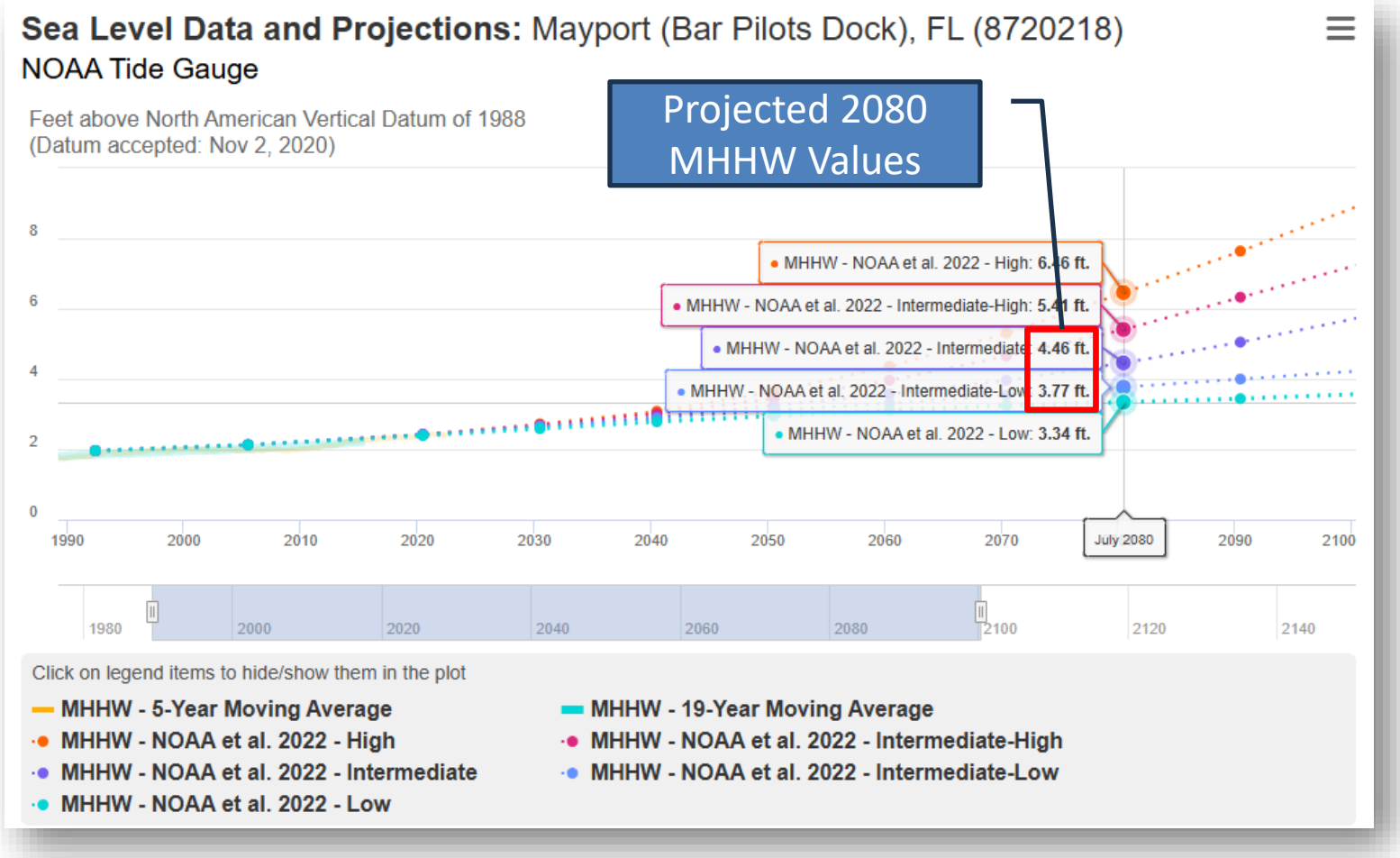


Modeling/Mapping Approaches

Rainfall-Induced Flooding

- Use City's Existing Stormwater Model
- 100- and 500-year/24-Hour Design Storm Events
- Modify Rainfall Depths for Future Conditions
- Modify Boundary Conditions for SLR
- Modify Runoff Parameters for Future Growth

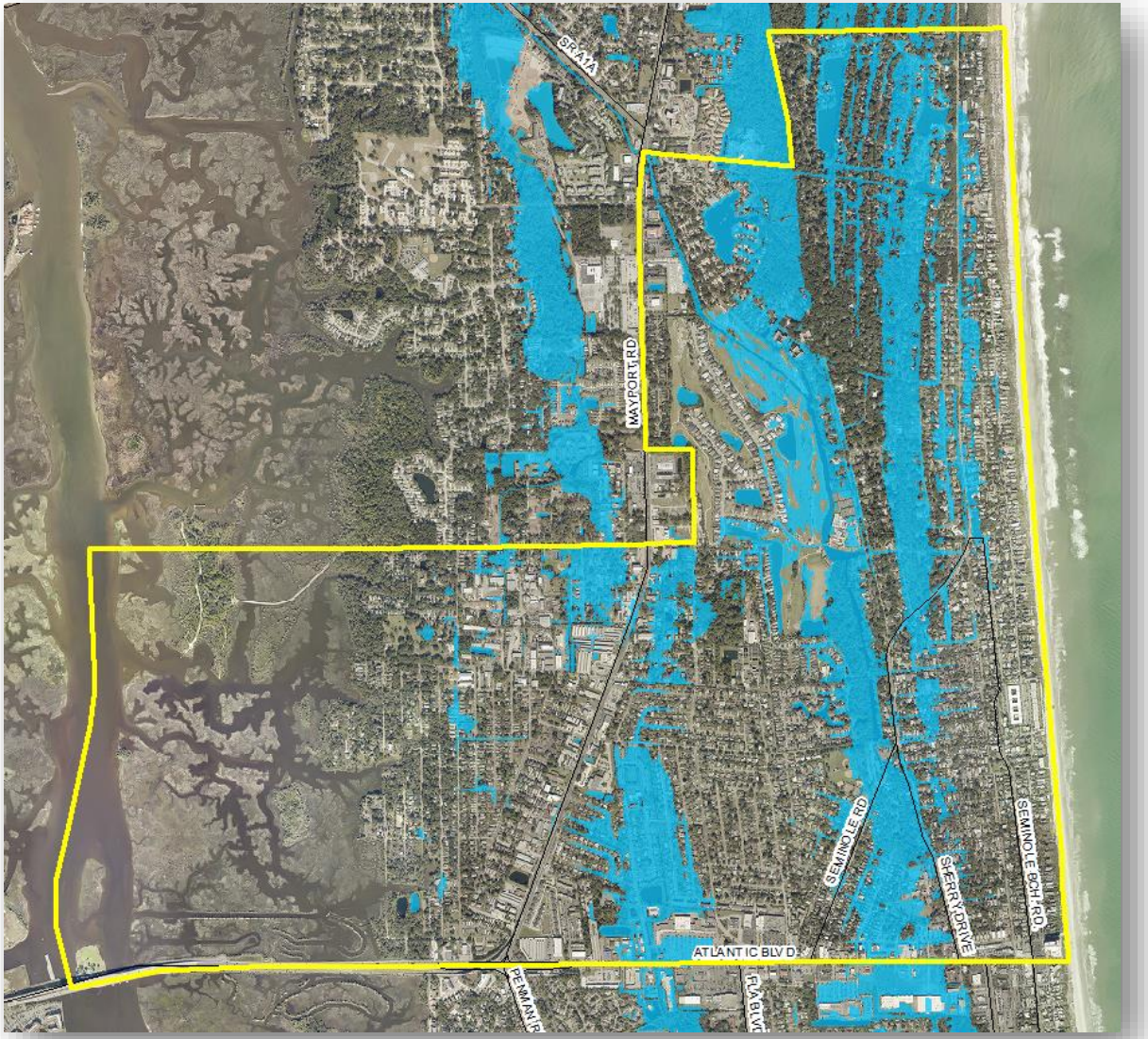
Storm Surge Flooding

- Use City's Modified FEMA Model
- Adjust Stillwater Elevations (SWELs) to Account for SLR
- Add Wave Action

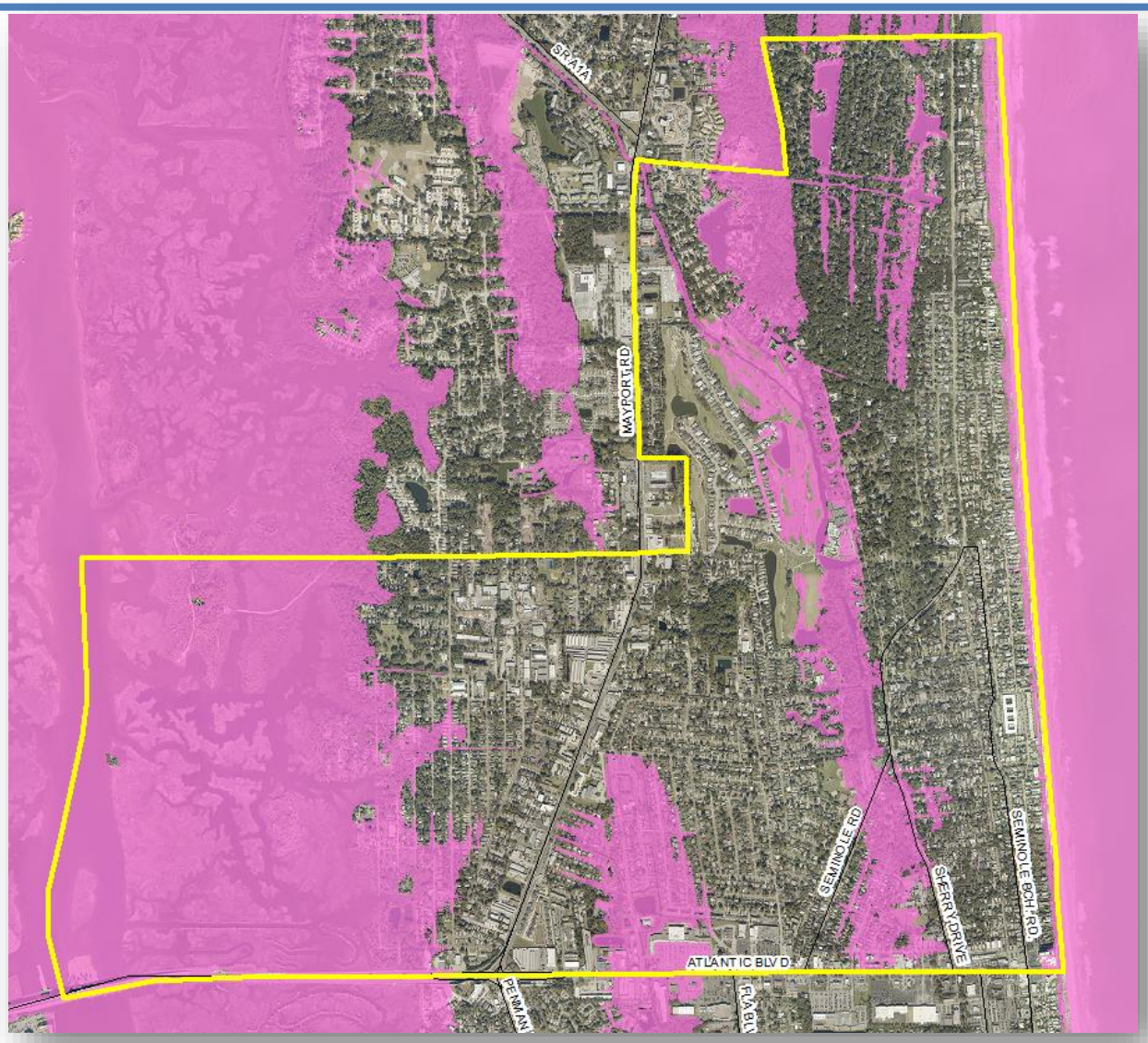
Tidal Flooding

- MHHW Elevation + 2-feet

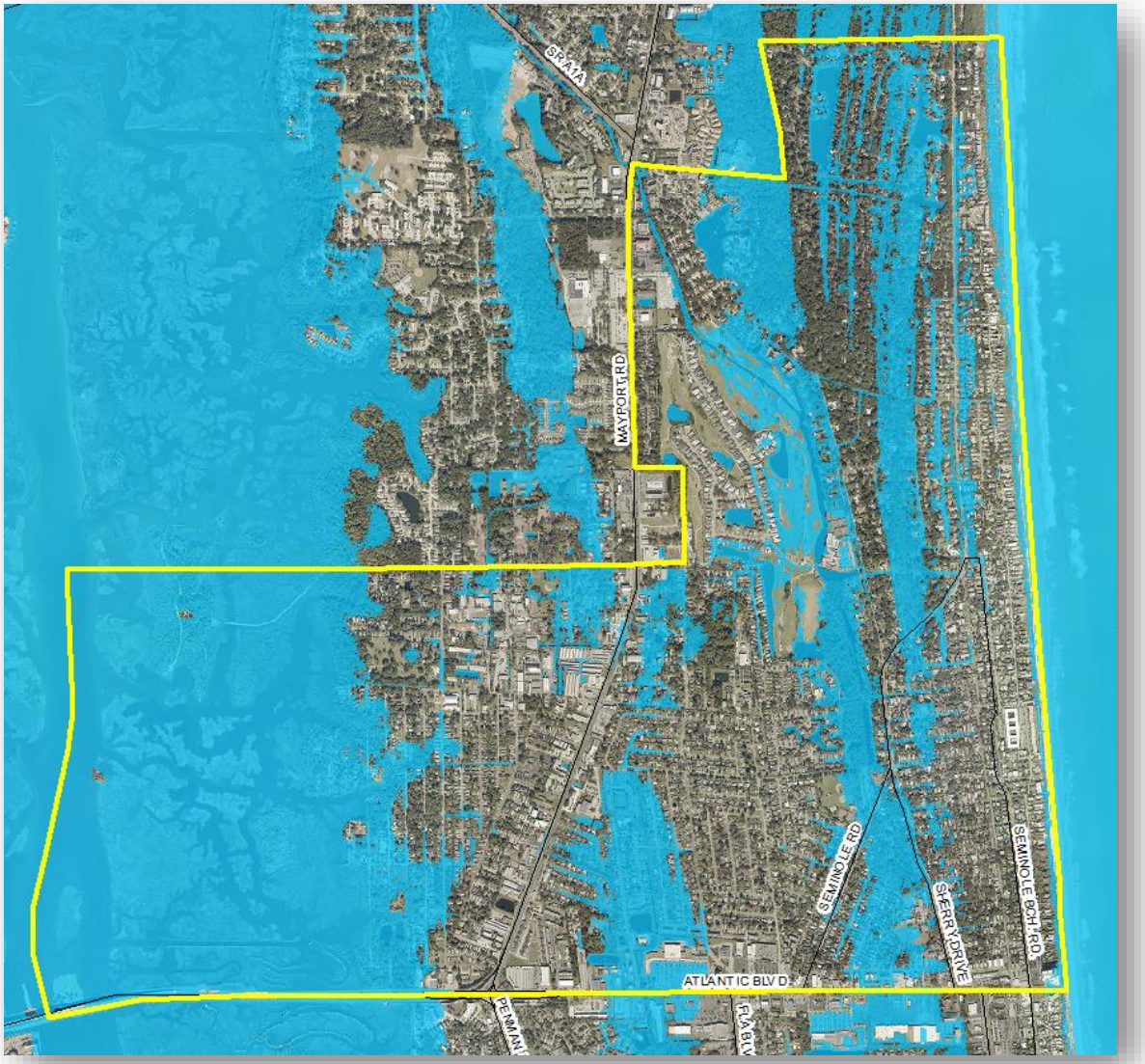
100-Year/2050/Int Rainfall Flooding



100-Year/2050/Int Storm Surge Flooding



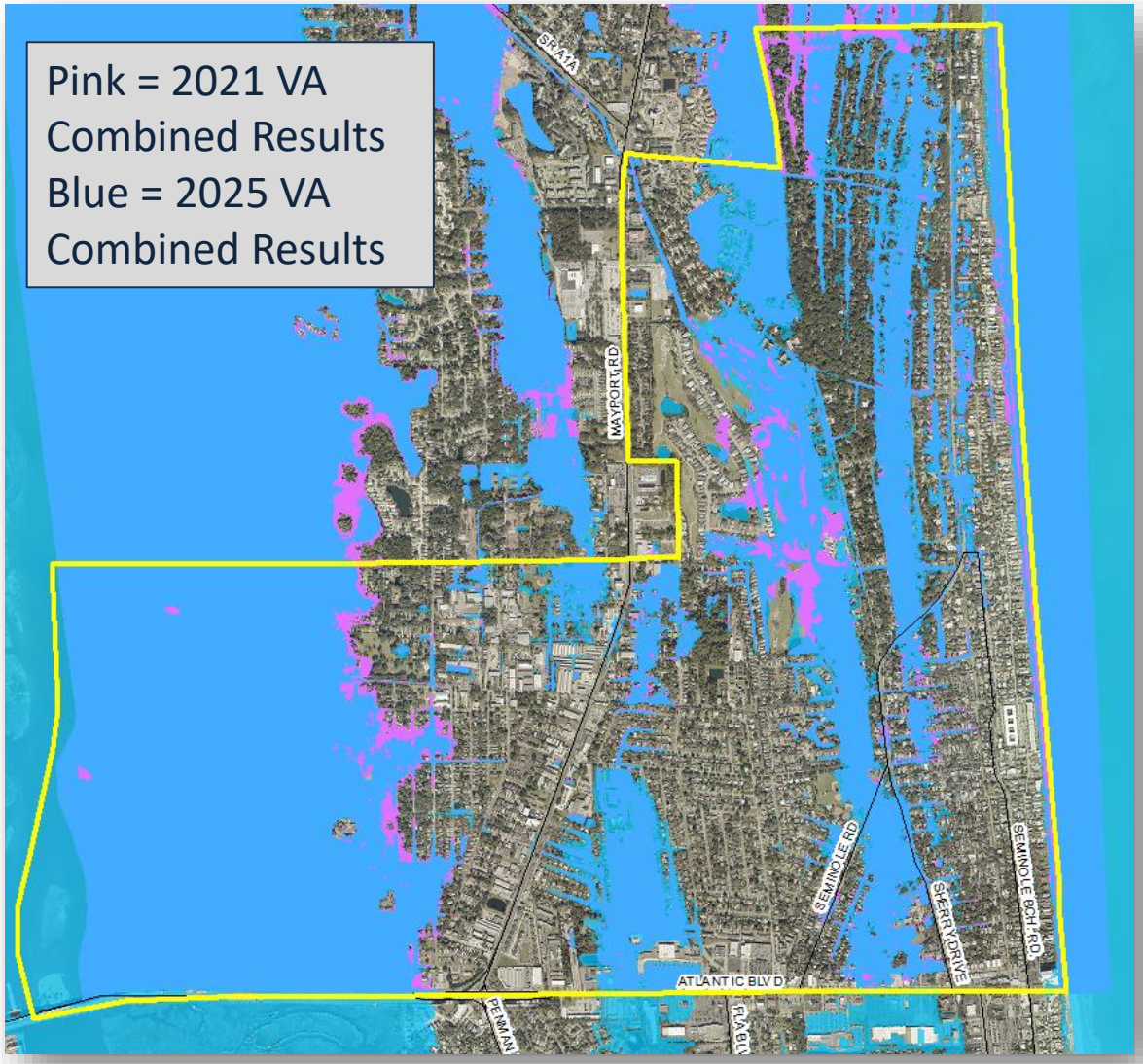
100-Yr/2050/Int Combined Flooding



Comparison to Previous Results

Key Differences

- 2007 vs. 2018 FDEM LiDAR for Inundation Mapping
- 2044 Intermediate-High NOAA 2017 vs. 2050 Intermediate NOAA 2022 = Slightly Reduced Surge Inundation Extent
- Rainfall Change Factors Not Used Previously = Expanded Rainfall Inundation Extent



Marsh Baseline Survey

Purpose/Reason

- Monitor marsh extents over time to quantify impacts from sea-level-rise.
- The City's marsh provides critical habitat as well as flood protection during tropical storms and hurricanes.

Methodology

- High-resolution (3-cm) RGB aerial imagery collected.
- High-resolution multispectral imagery collected.
- Primary marsh habitats mapped using ArcGIS

Marsh Baseline Survey

Mapped 6 Primary Habitats

- Water – 164 ac.
- Juncus Gerardii – 94 ac.
- Saltgrass – 2 ac.
- Spartina – 126 ac.
- Juncus and Spartina Mix – 56 ac.
- Wooded / Non-Marsh Grass Areas – 130 ac.

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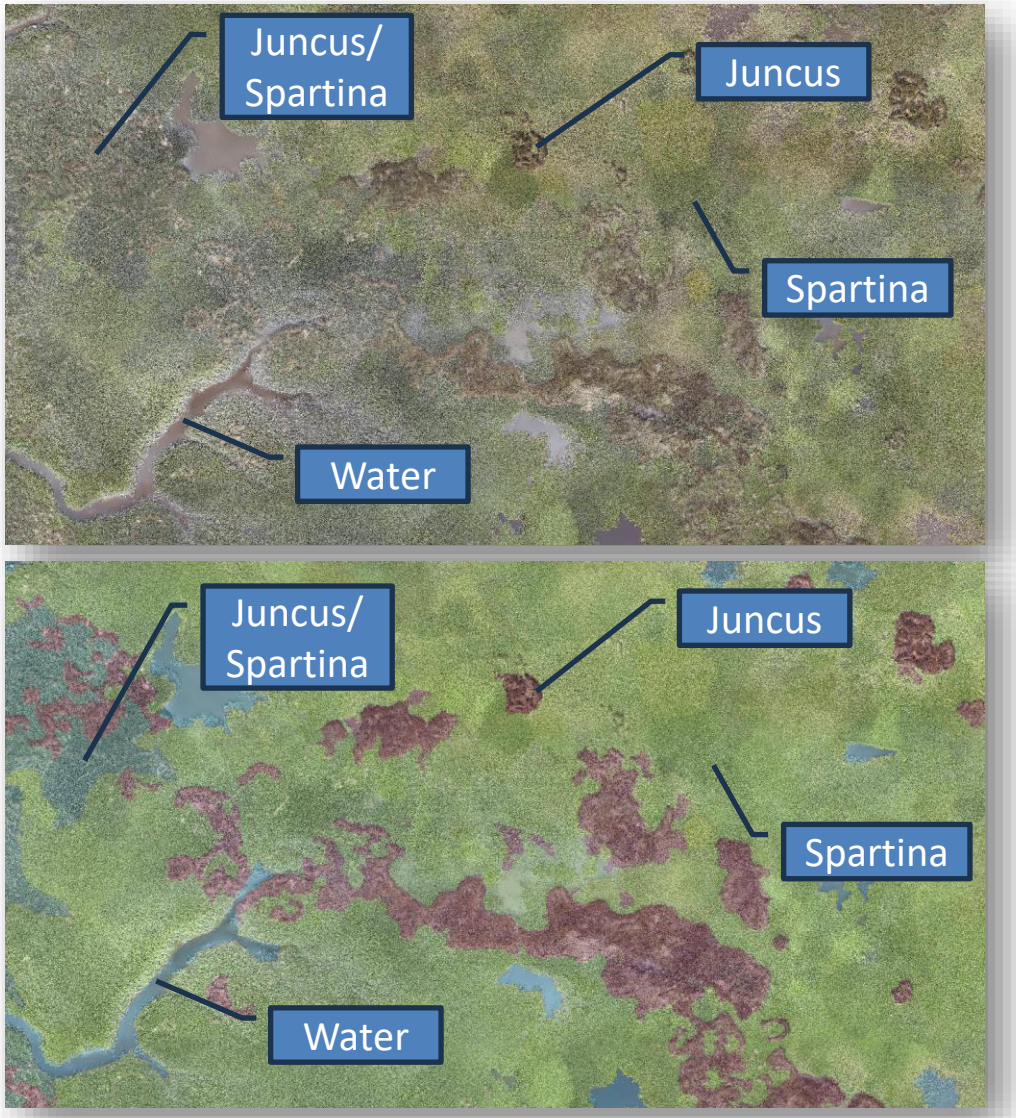

Next Steps

- Complete the Vulnerability Assessment update and revise the Vulnerability Assessment Report.
- Identify vulnerable critical community assets and rank/prioritize them.
- Identify adaptation strategies and projects to improve the City's flood resilience.
- Public Meeting #2
- Update the City's Adaptation Plan Report.

Questions?