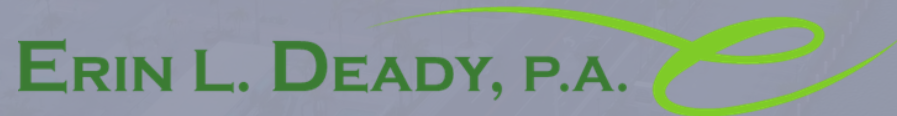




Climate Vulnerability Assessment

Regular City Commission Meeting | June 18, 2024

Project Team



Agenda

- Project Overview
- Vulnerability Results
- Adaptation Plan
- Path Forward
- Question and Answer



Project Background

Hollywood Climate Vulnerability Assessment (CVA) and Resilience Adaptation Plan (RAP):

- Funded by FDEP through Resilient Florida Grant
- Addresses climate risks due to environmental hazards, climate change, and sea level rise
- Aims to enhance resilience with a comprehensive approach

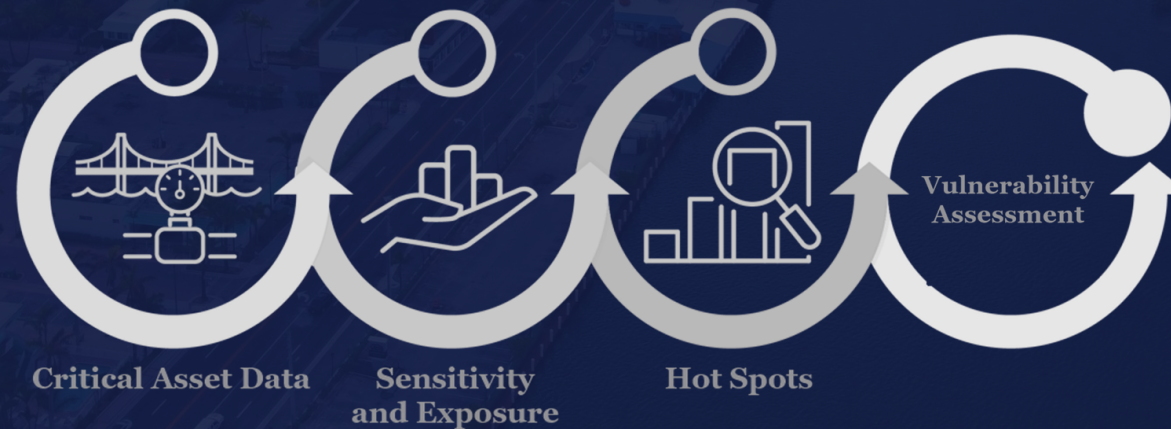
Project Objectives:

- Develop a cohesive strategy for resilience
- Address climate hazards, complying with state legislation
- Guide City actions and community partnerships
- Increase eligibility for State and Federal grant funding



Vulnerability Assessment

- **Assess** the impacts of climate threats on the City of Hollywood critical assets
- **Evaluate** Future flood scenarios and flood depths based on published data
- **Analyze** future extent of sea level rise, rainfall, tidal flooding, storm surge through multiple scenarios including compound flooding
- **Utilize** the City's local critical asset data
- **Prioritize** social equity and climate justice throughout project development and execution



Resilience Adaptation Plan

- ❑ The RAP will be informed by the **risks to City assets** identified in the CVA
- ❑ Enhance City-wide resilience by offering climate **adaptation strategies** based on identified risks
- ❑ **Prioritize projects** identified from CVA results, providing **a matrix** of adaptation and mitigation strategies including **short and long-term projects**
- ❑ **Funding analysis**
- ❑ **Implementation Plan**



Types of Critical Assets - Section 380.093 F. S.

Owned or maintained by the City of Hollywood and other Regionally Significant Assets

1. **Transportation**

- ✓ Roads, Bridges, Rail and Marinas
Ex: Hollywood Marina – 700 Polk St.

2. **Critical Infrastructure**

- ✓ Non-buildings, all utilities
Ex: Hollywood Utility Dept. – 1621 N. 14th Ave.

3. **Critical Facilities**

- ✓ Buildings, Schools, Health Care Services
Ex: Hollywood Hills HS – 5400 Stirling Rd.

4. **Natural, Cultural, & Historic Resources**

- ✓ Shorelines, Preservation Areas, Parks



**Note: The State's requirements for Vulnerability Assessments focus on assets*

Climate Threats

Sea Level Rise

- An increase in the level of the world's oceans as a result of the effects of climate change

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 a storm

Rainfall-Induced Flooding

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

Compound Flooding

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

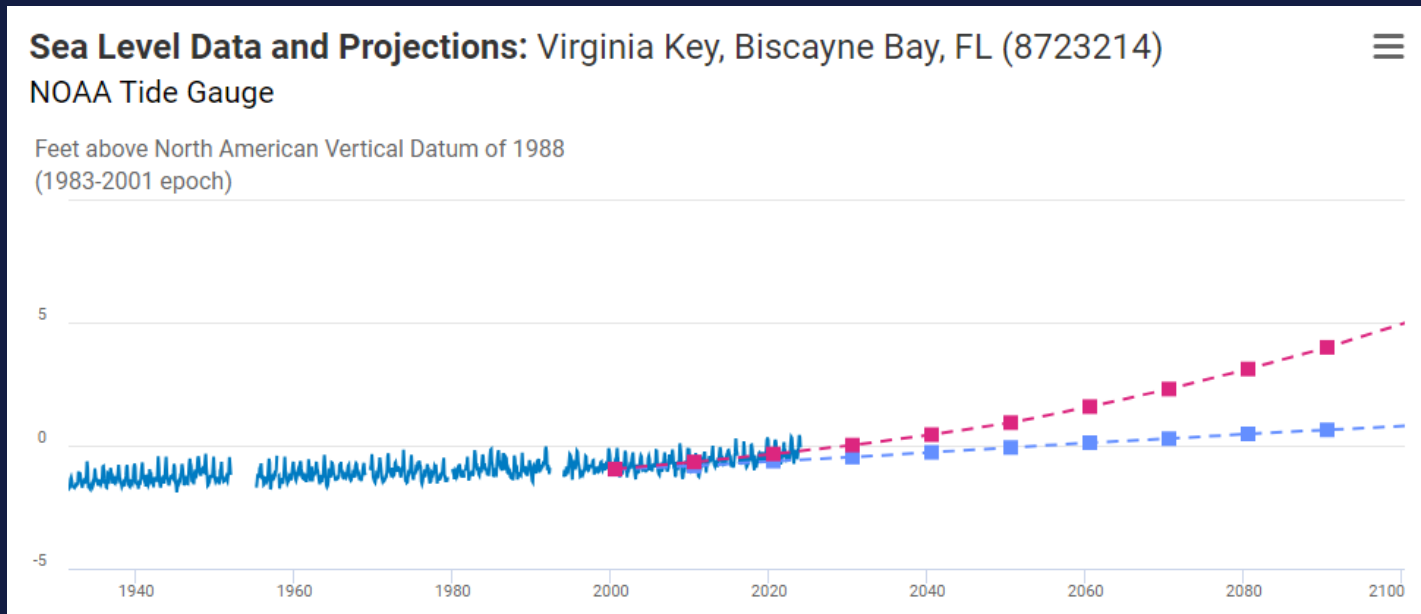


Exposure Analysis: Results

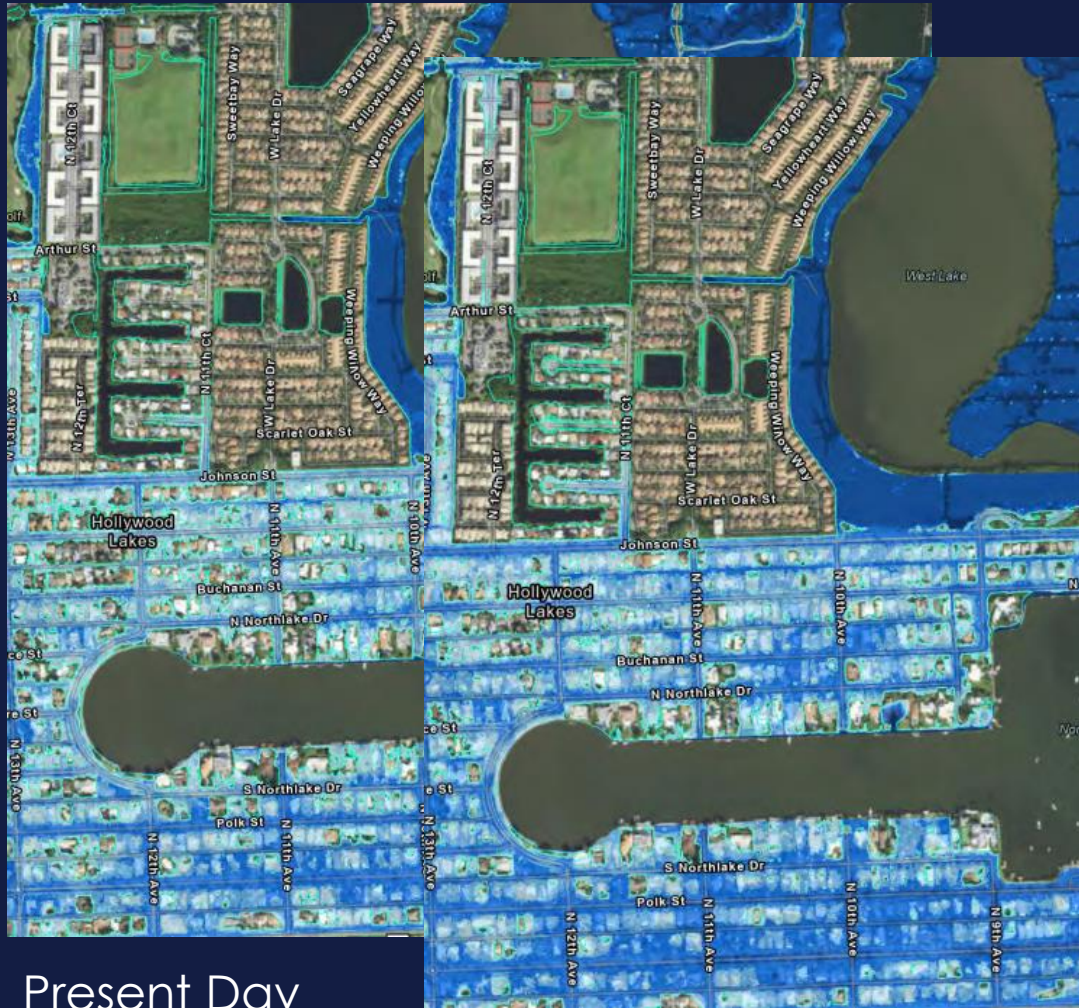
Exposure to Sea Level Rise

Key Facts

- 2040 → 1.4' increase in sea level
- 2070 → 3.3' increase in sea level
- 2100 → 6.0' increase in sea level



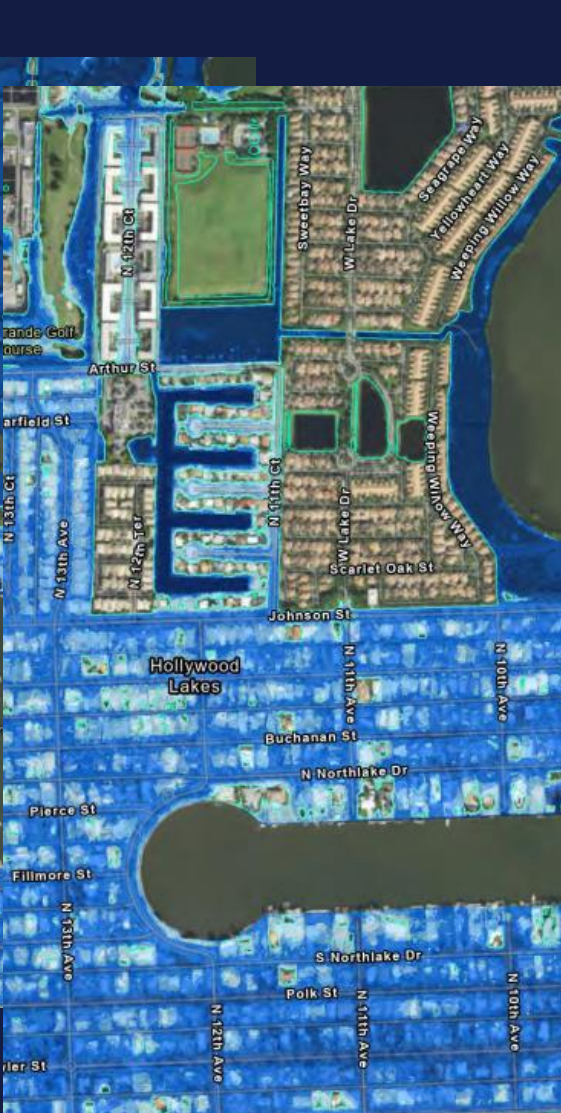
Sea Level Rise + High Tide Flooding



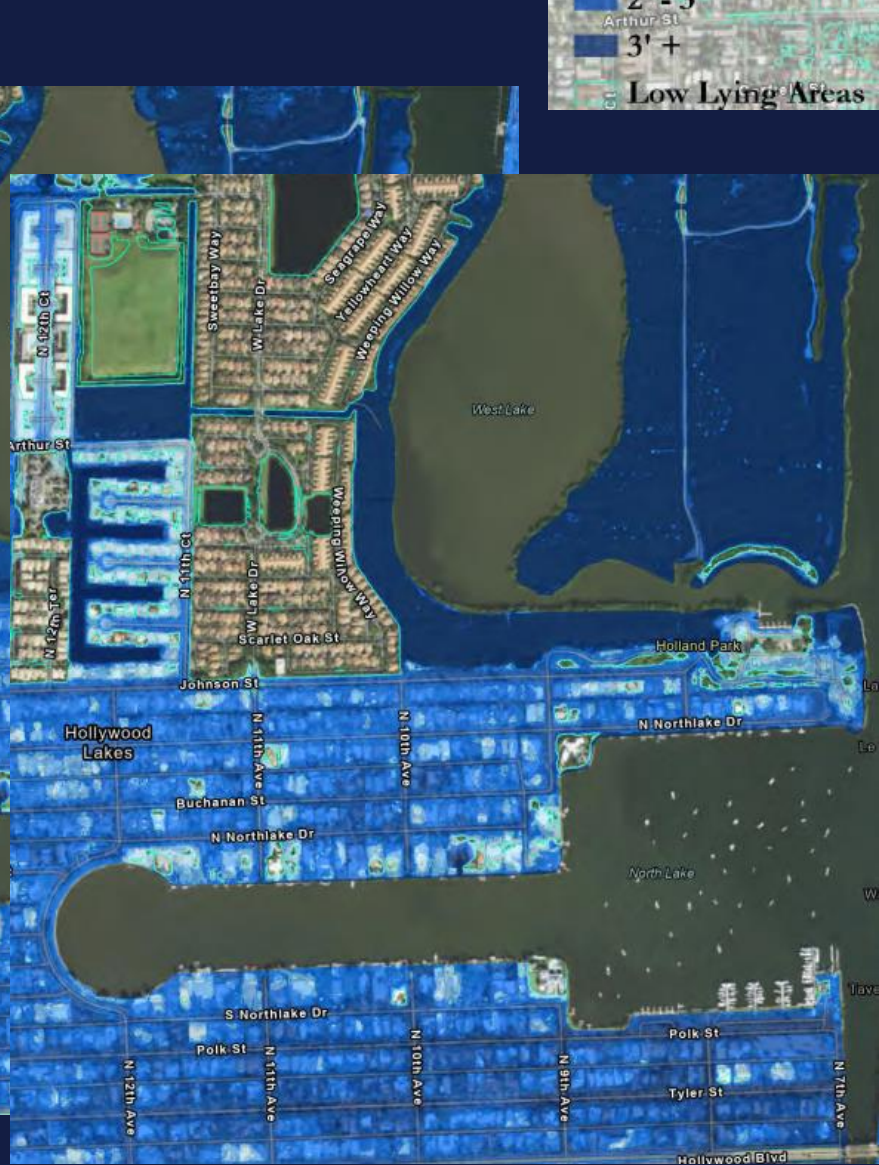
Present Day



2040



2070



2100

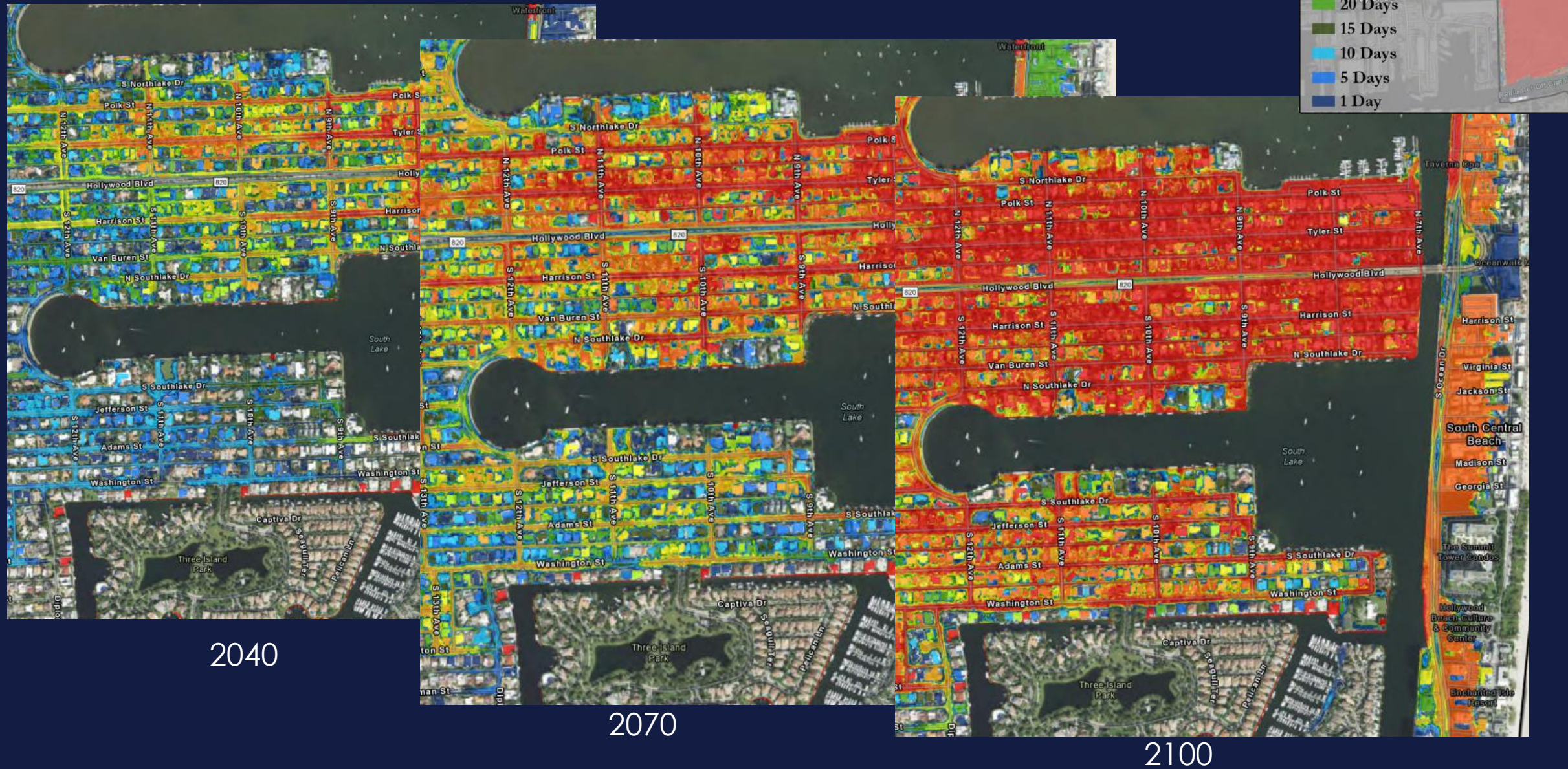


Low Lying Areas

Tidal Flooding

- Tidal flooding is defined as extreme high tide and King Tides
- The City of Hollywood currently experiences this type of flooding.
- The following maps display days of tidal flooding which will become more frequent when combined with SLR
- Blue areas display current conditions
- Red areas are those that experience more than 150 days of tidal flooding in the future

Tidal Flooding



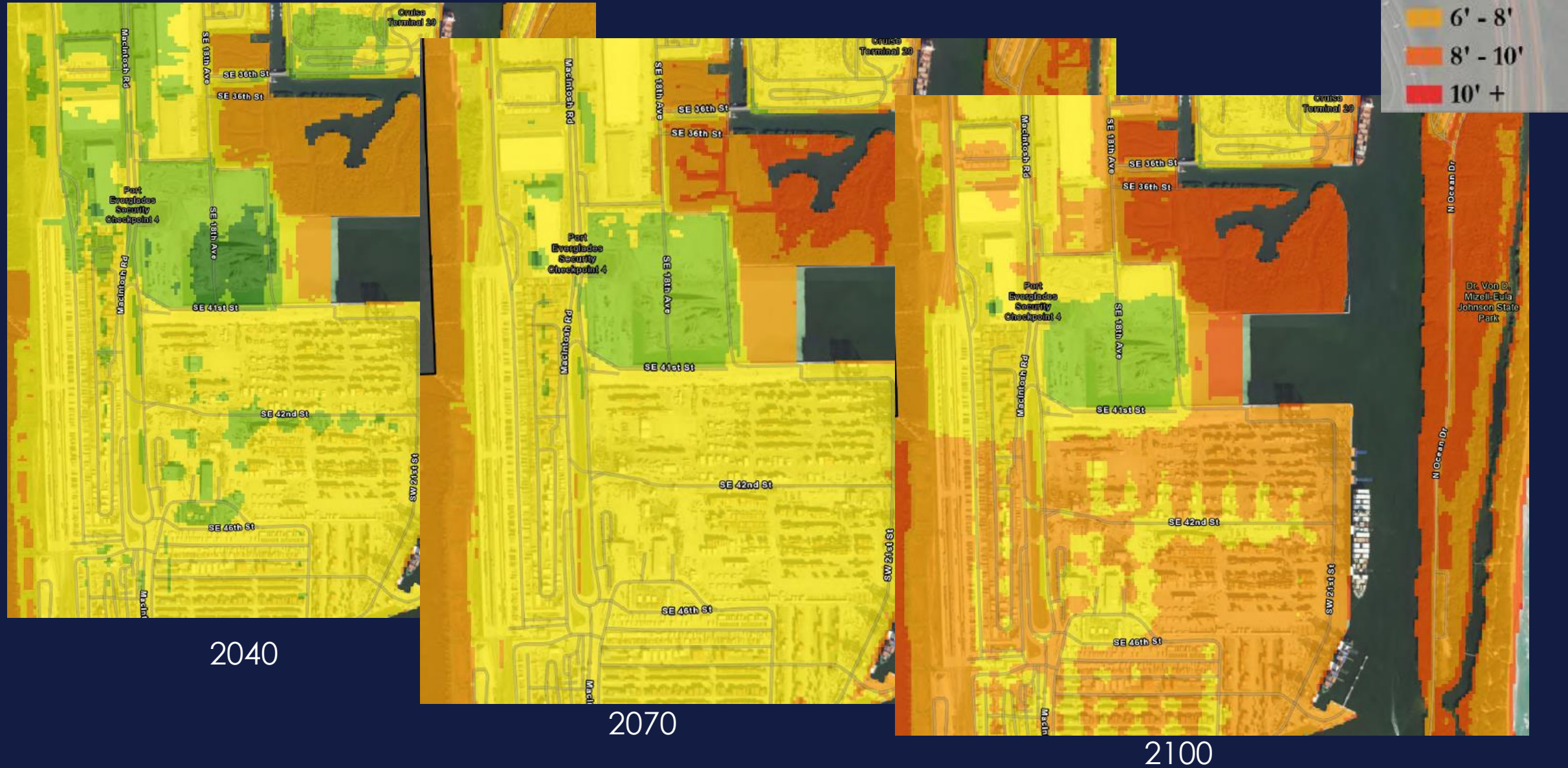
Exposure to Storm Surge

Key Facts

- Current Storm Surge Projections (2023)
 - 100 yr – up to 5 ft
 - 500 yr – up to 9 ft
- Future Projections 100 yr.
 - 2040 + 1.4' (SLR) = 7 ft max.
 - 2070 + 3.3' (SLR) = 12 ft max.
 - 2100 + 6.0' (SLR) = 15 ft max.



Storm Surge (100-Year)



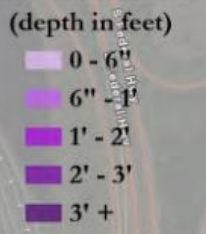
Exposure to Rainfall Induced Flooding

Key Facts

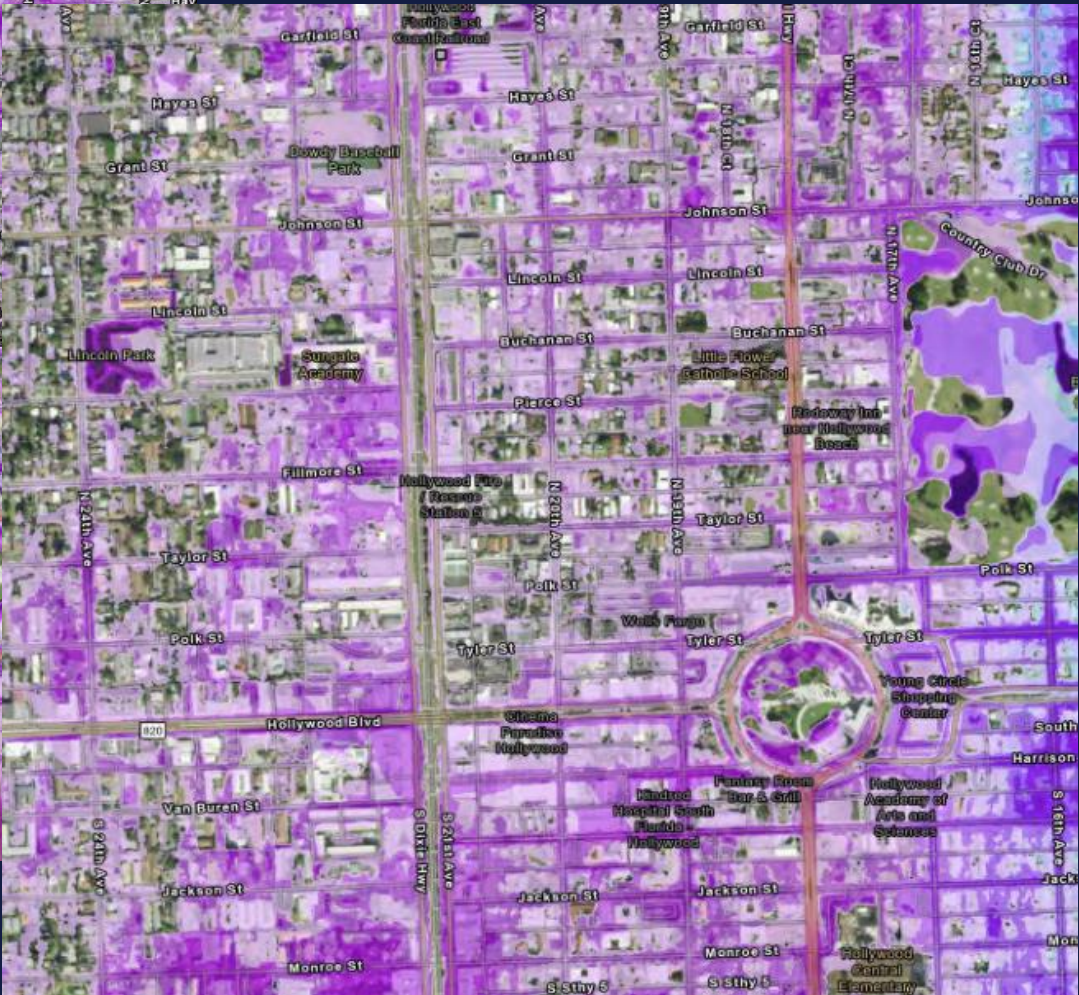
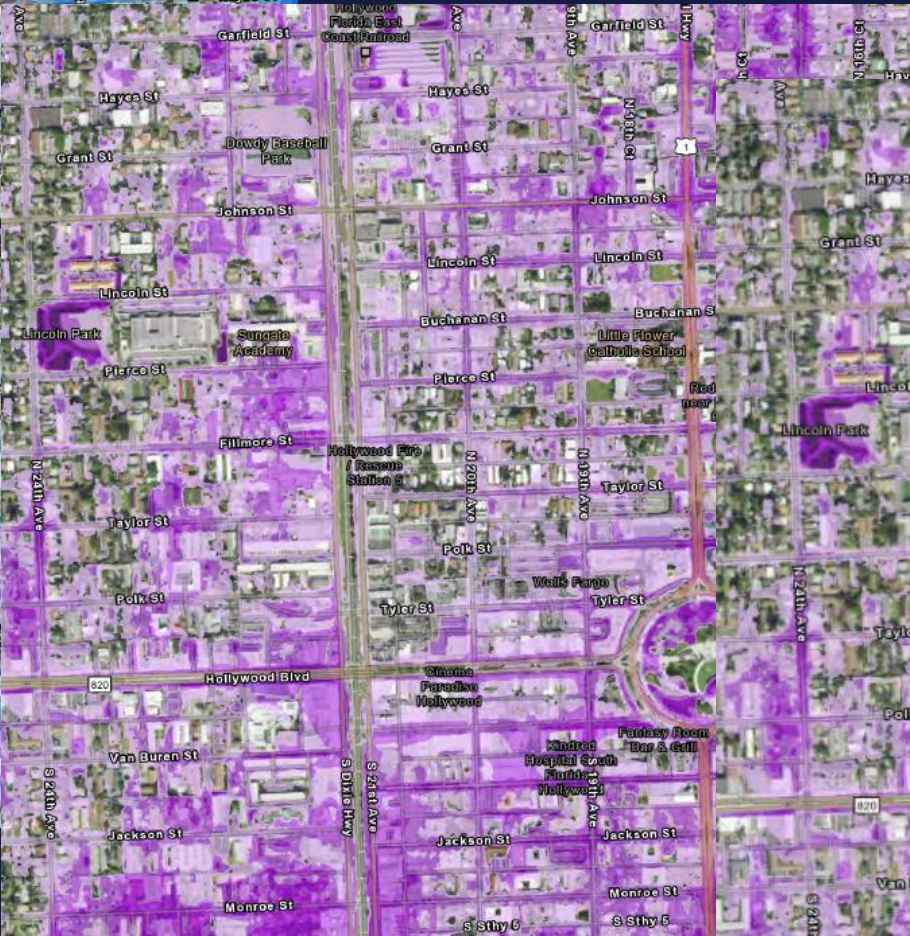
- Current Value
 - 25 yr 24 hr – 11.3" avg.
 - 50 yr 24 hr – 13.4" avg.
 - 100 yr 24 hr – 15.5" avg.
 - 500 yr 24 hr – 21.2 " avg.
- Future Value
 - 25 yr 24 hr
 - 90% Confidence ~ 13.4"
 - Average increase: 2"
 - 100 yr 24 hr
 - 90% Confidence ~ 18.4"
 - Average increase: 3"



Rainfall



Rainfall



Present Day

2040

2070

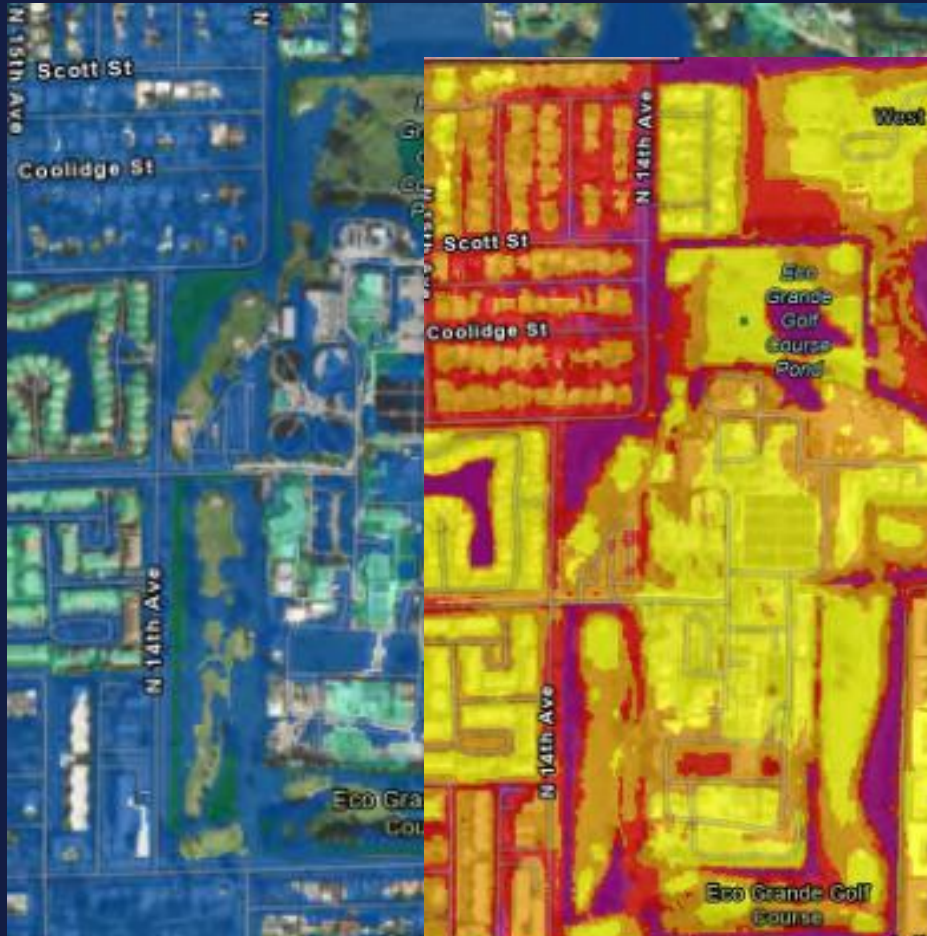
Exposure to Combo/Stacking Flood Scenarios

Key Facts

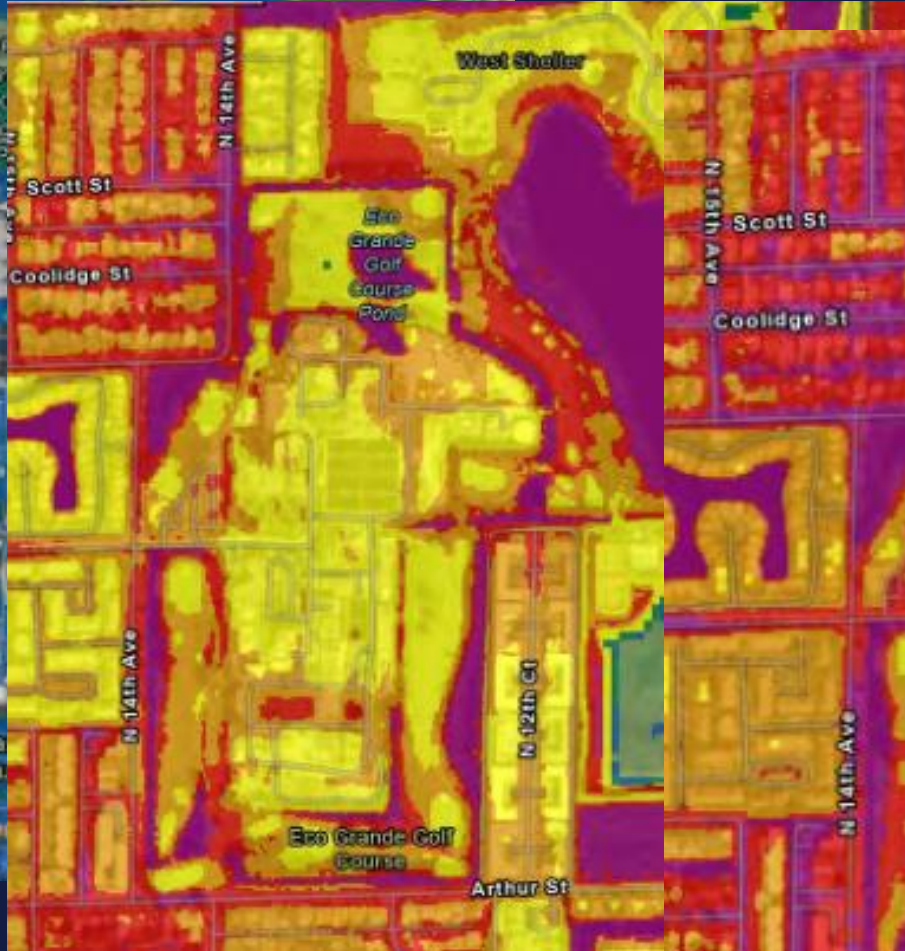
- The following maps display worst case scenario of:
 - 500-year storm
 - Extreme rainfall event
 - High tide conditions
 - Future SLR projections
- SLR Inundation modifies the mean high-water line
- Surge impacts are large but temporary in nature, caused by storm force winds pushing water onto land
- *Note*: Future rainfall modeling does not account for updates to existing stormwater infrastructure*



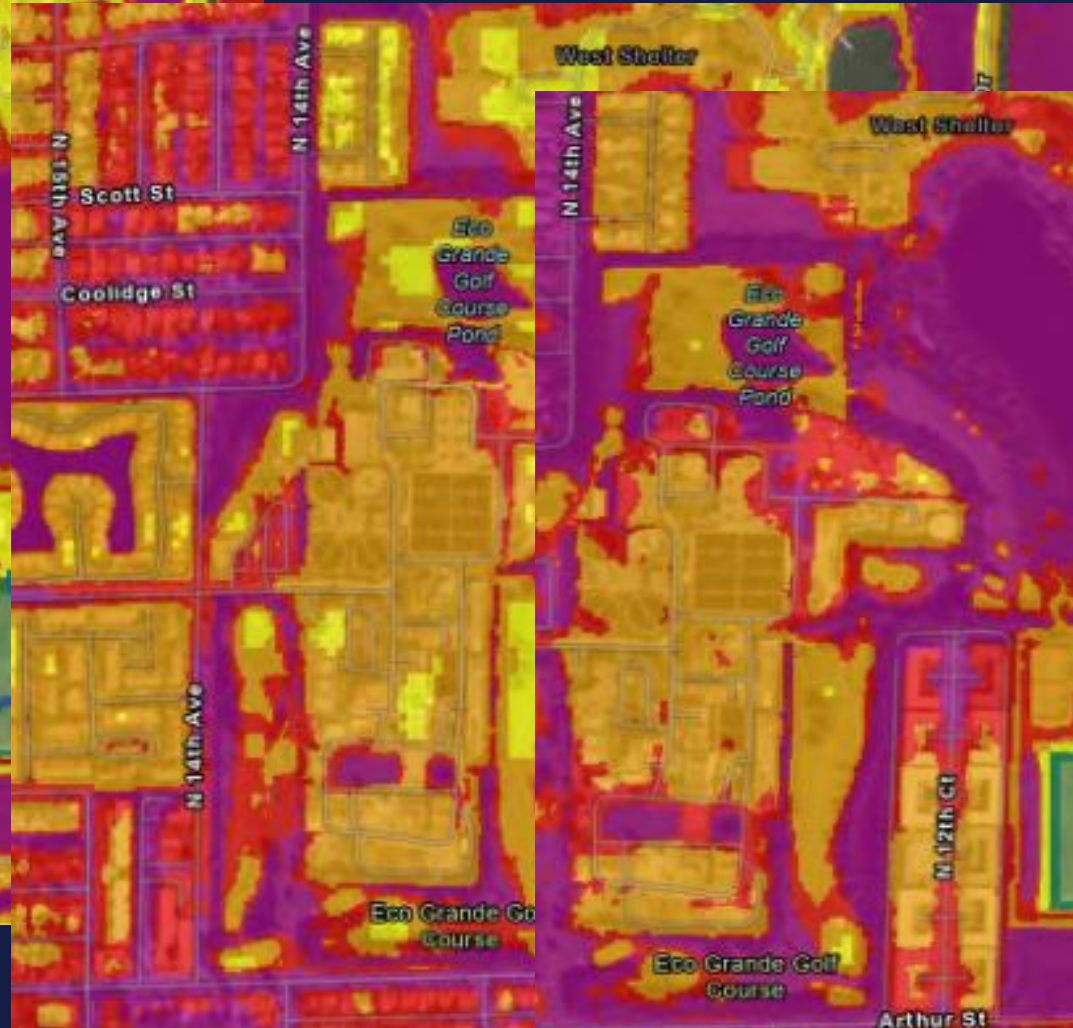
Combination Flooding



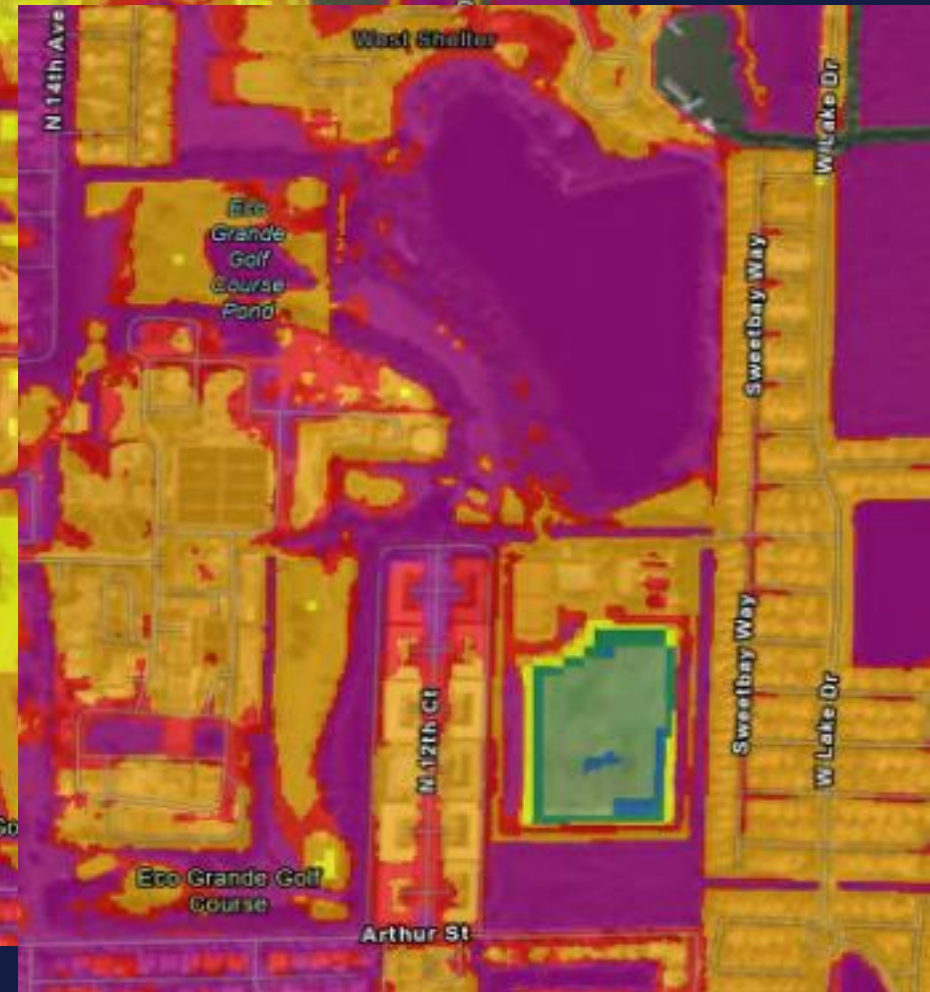
Present Day



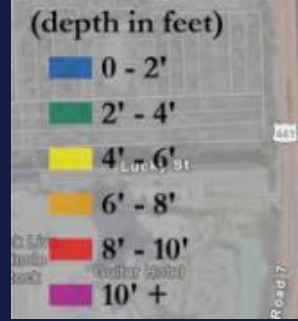
2040



2070



2100



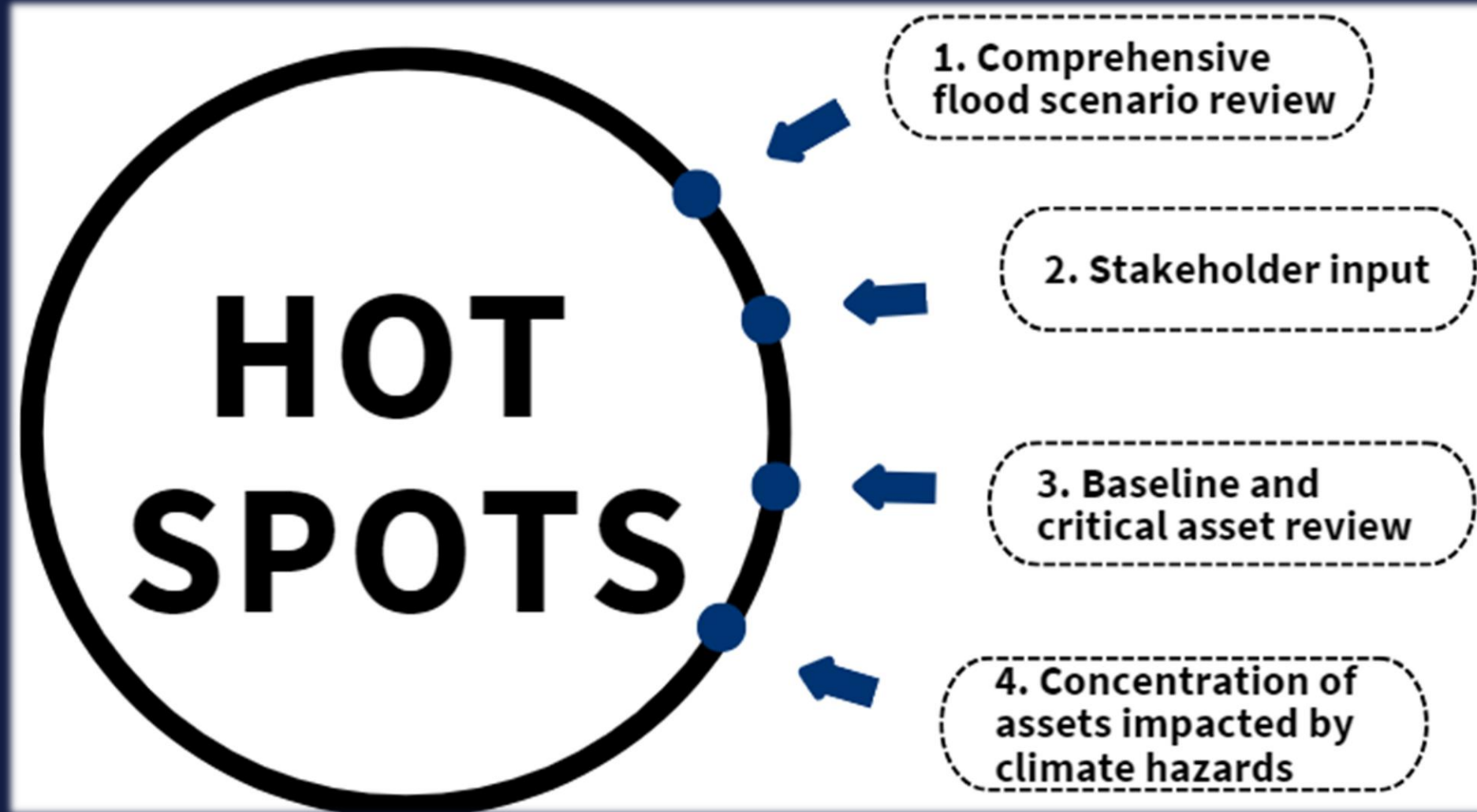
An aerial photograph of a coastal city, likely Miami, showing a river flowing through the urban landscape towards the ocean. The city is densely packed with buildings, and the ocean is visible in the foreground. A large, white, semi-transparent circle is centered over the image, framing the text. The text "Sensitivity Analysis" is written in a bold, white, sans-serif font across the middle of the circle.

Sensitivity Analysis

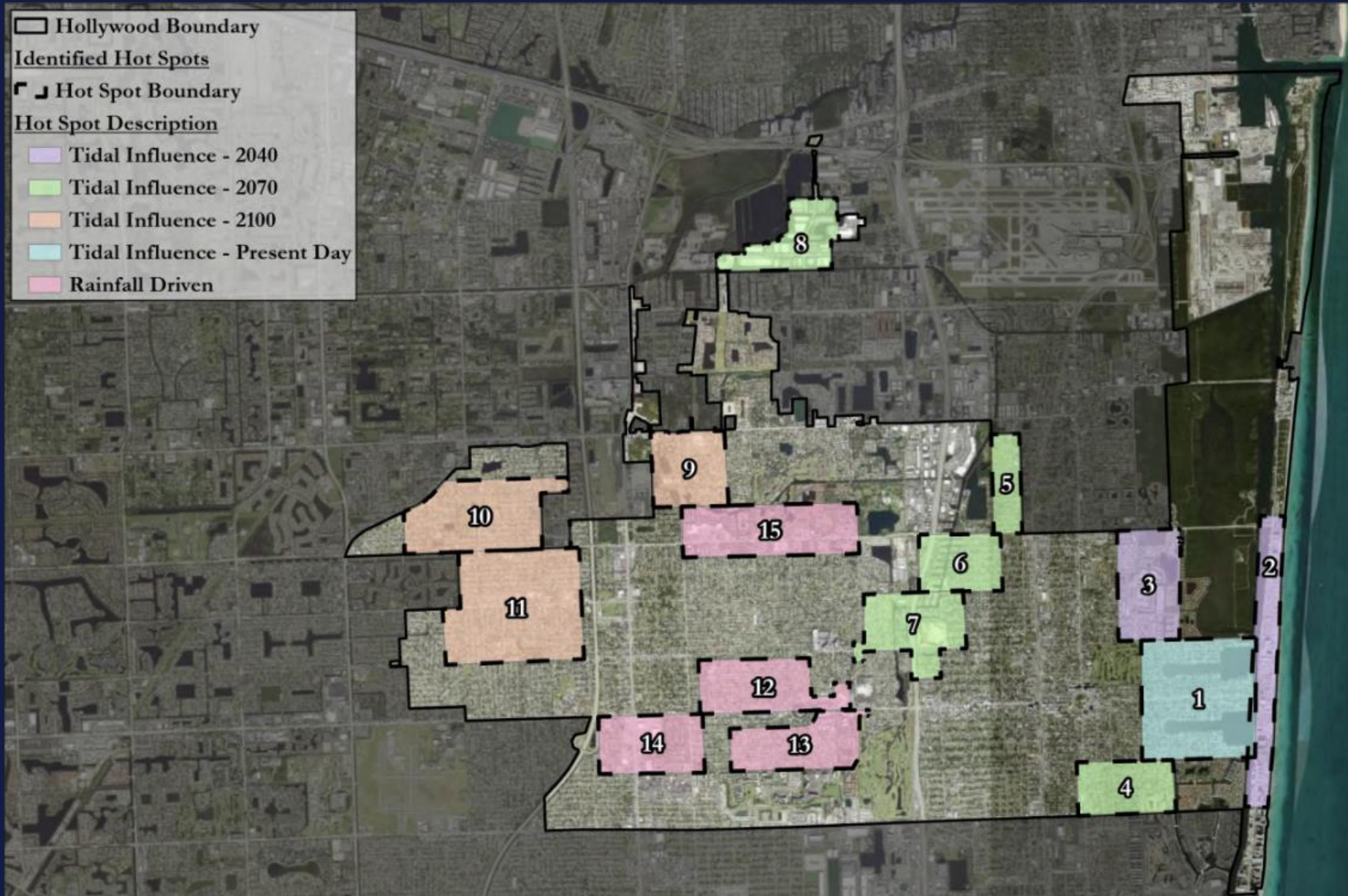
Sensitivity Analysis: 4 Step Process



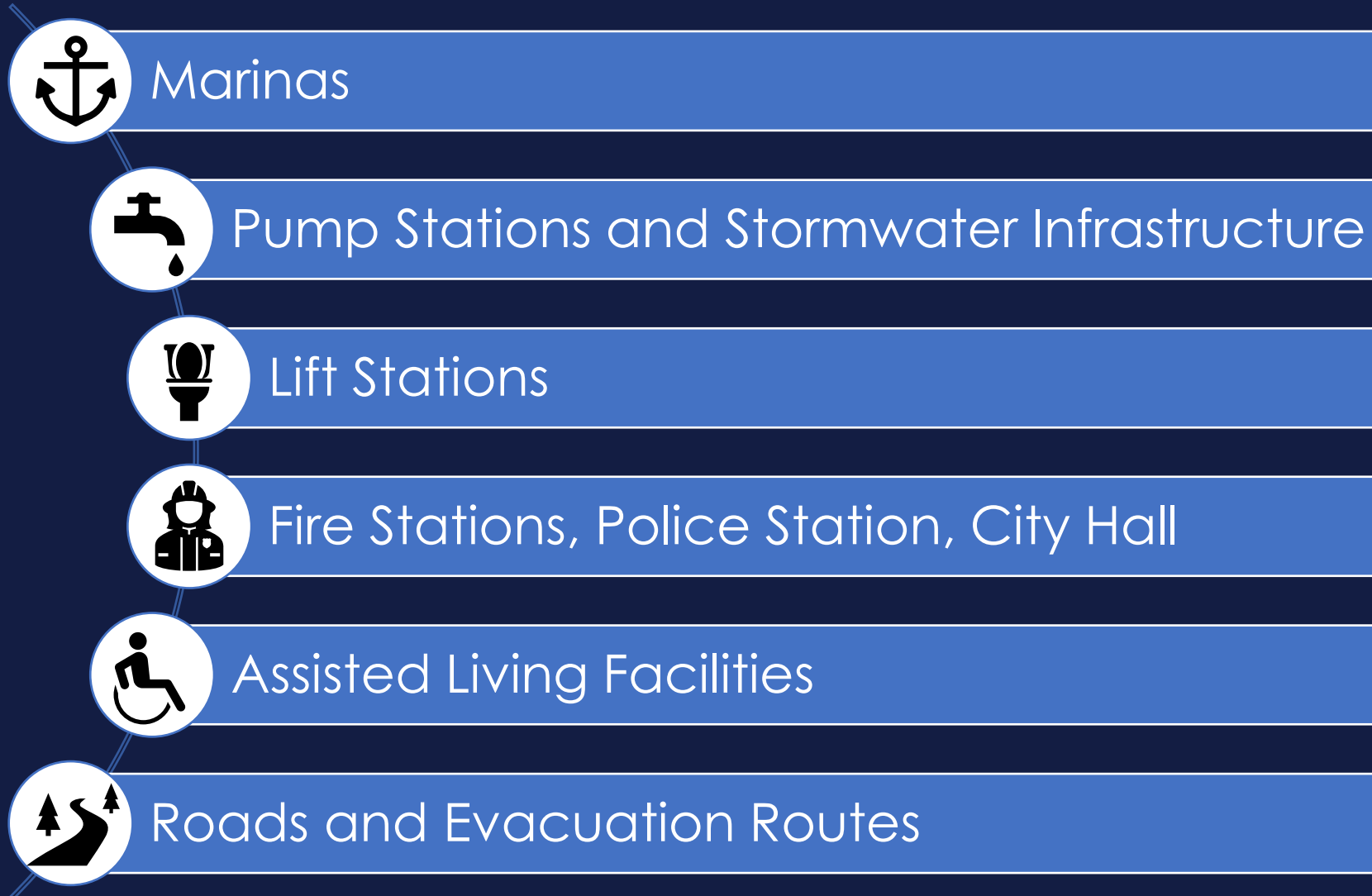
Flooding Hot Spots



Hot Spot Overview Map



Examples of Assets within Hotspots



Hot Spot #1



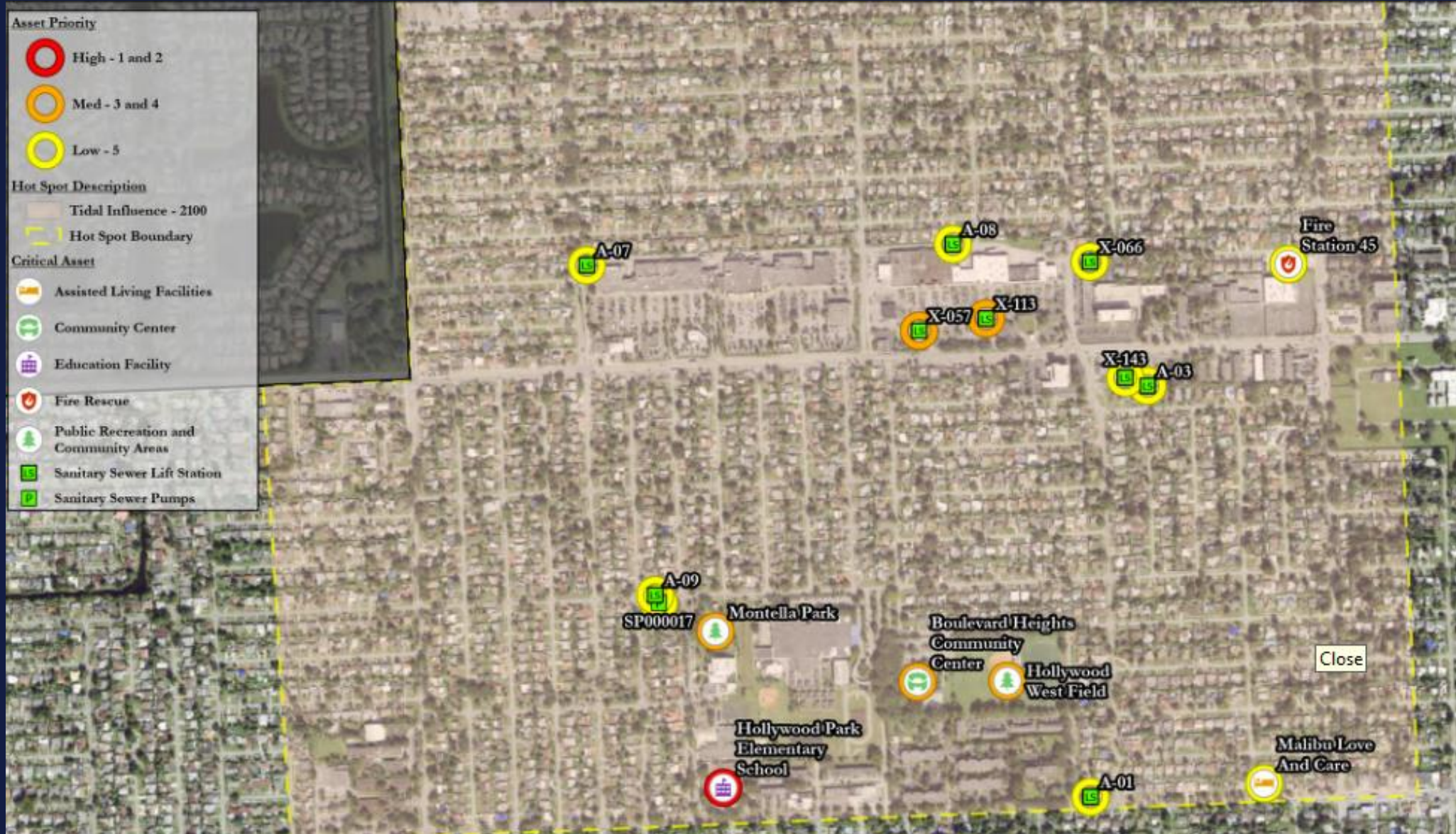
Hot Spot #2



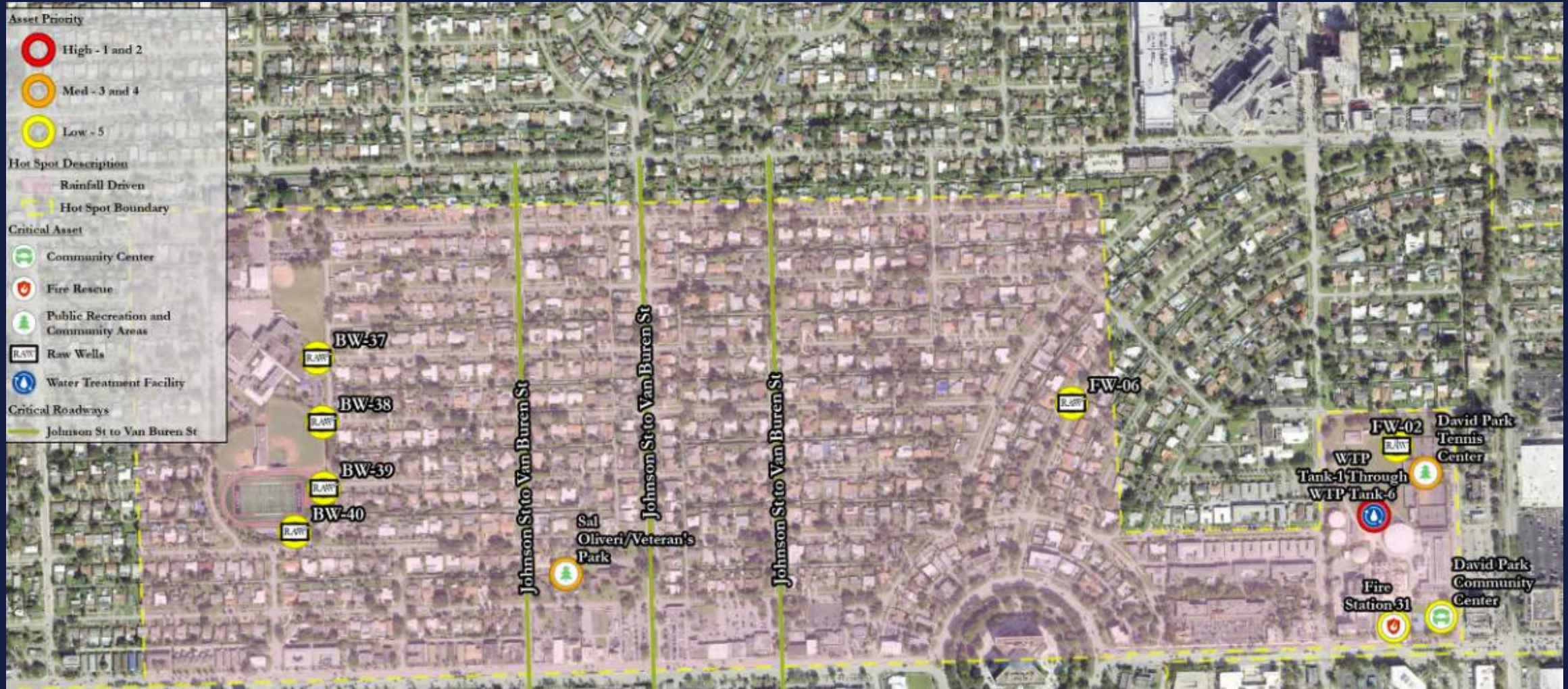
Hot Spot #10



Hot Spot #11



Hot Spot #12



Notable Assets Prioritized for Adaptation

- Hollywood Broadwalk
- Beach Culture & Community Center
- Hollywood Marina
- Lift Stations
- Boulevard Heights Community Center
- Communication Towers
- Garfield Parking Garage
- Pump Stations
- Roadways: Park Rd, Taft St, Johnson St, and others
- Sunset Golf Course/Park
- Water Towers
- Wastewater Treatment Plant
- Fire Headquarters, Training Facility, and Stations 40, 45, 105



Adaptation Strategies in Flooding Hot Spots



**Infrastructure
hardening or
relocation**



**Green and
nature based
solutions**



**Community
education,
programs, and
readiness**

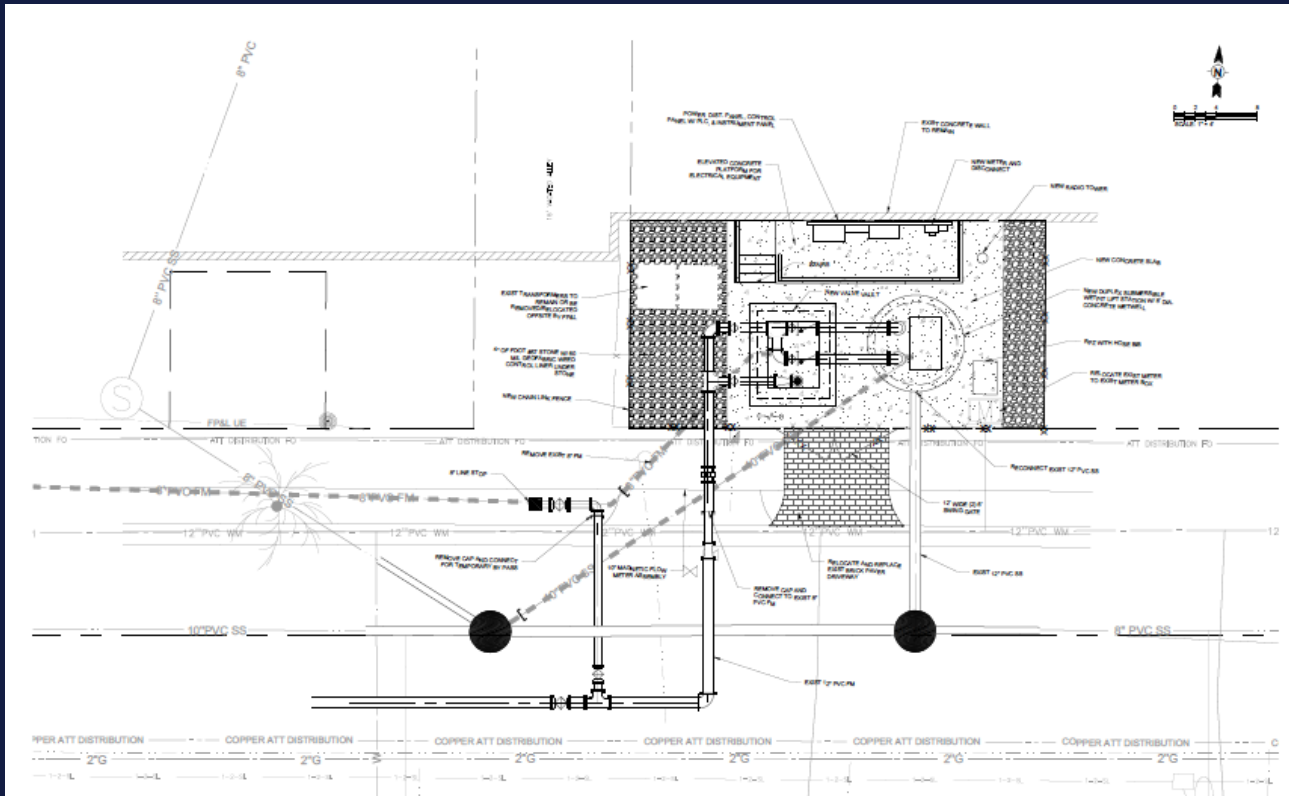


**Emergency
management
planning**



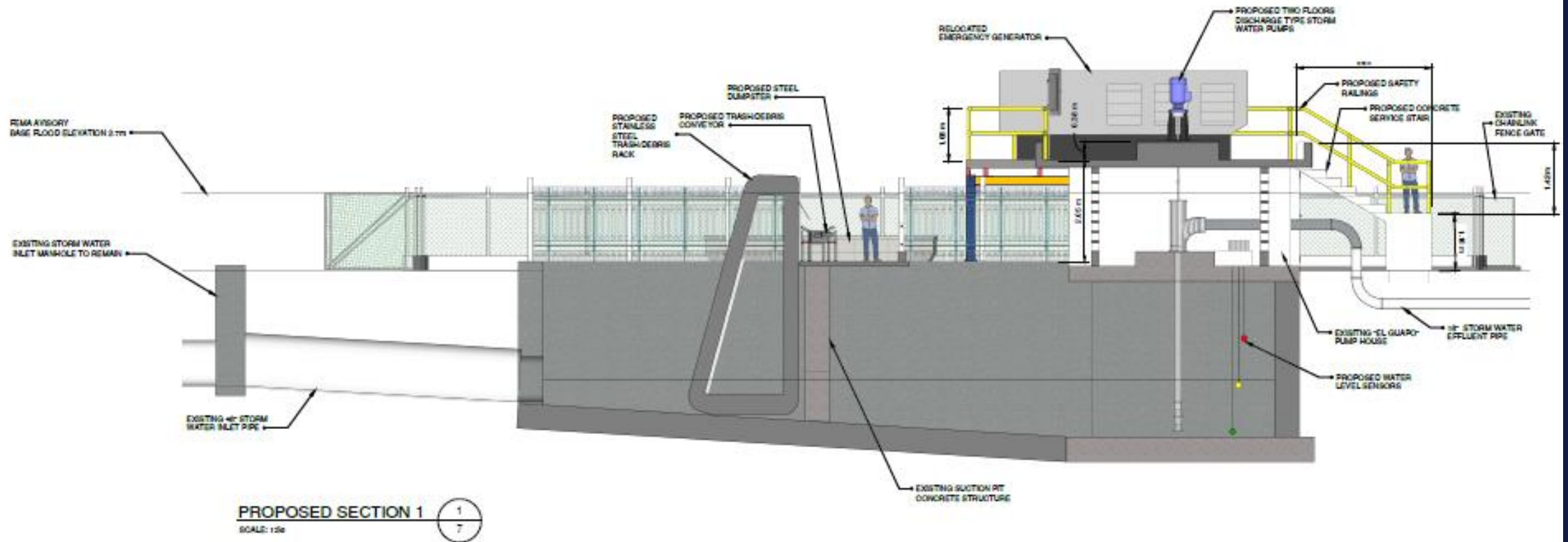
**Land use and
code guidelines**

Wastewater Pump Station Improvements



- Electrical and mechanical equipment protected from physical damage from the FEMA 100-year flood.
- SLR was also considered when determining the final elevation of the site and equipment

Elevate electrical and mechanical equipment above FEMA flood elevation + SLF + Storm Surge



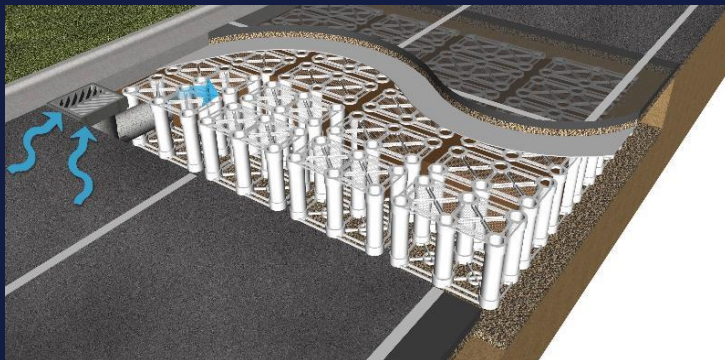
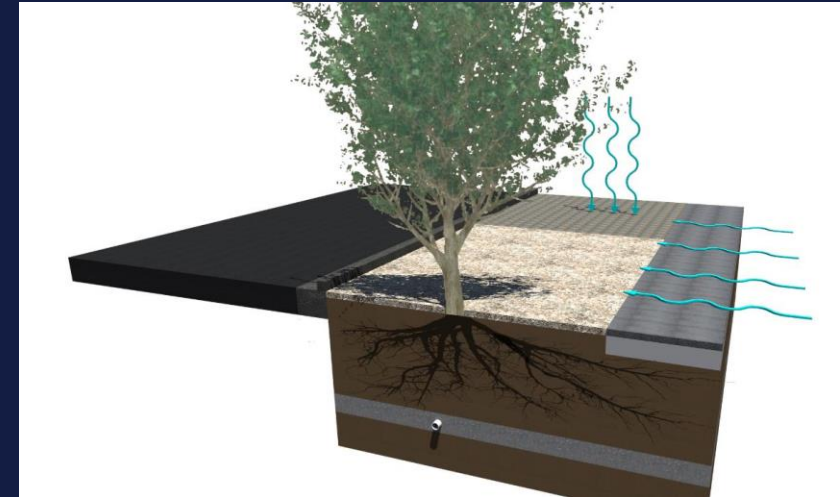
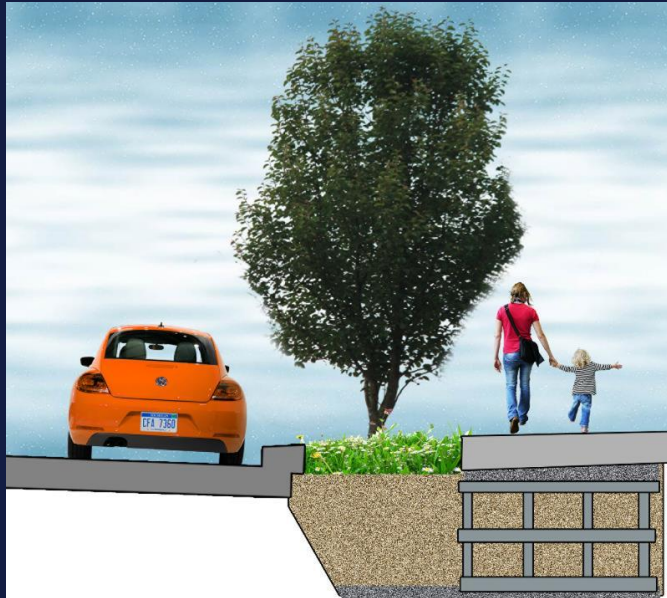
Flood Mitigation Concepts

Temporary Flood Panels



Flood walls for dry floodproofing of buildings

Stormwater Management Concepts



Stormwater Concepts – subsurface storage and water quality measures under walkways; green space

Nature Based Solutions

- Erosion Control
- Wave Breakwater
- Energy Dissipation
- Water Quality Improvements
- Habitat Creation



Shoreline Breakwaters



Oyster Reef Creation



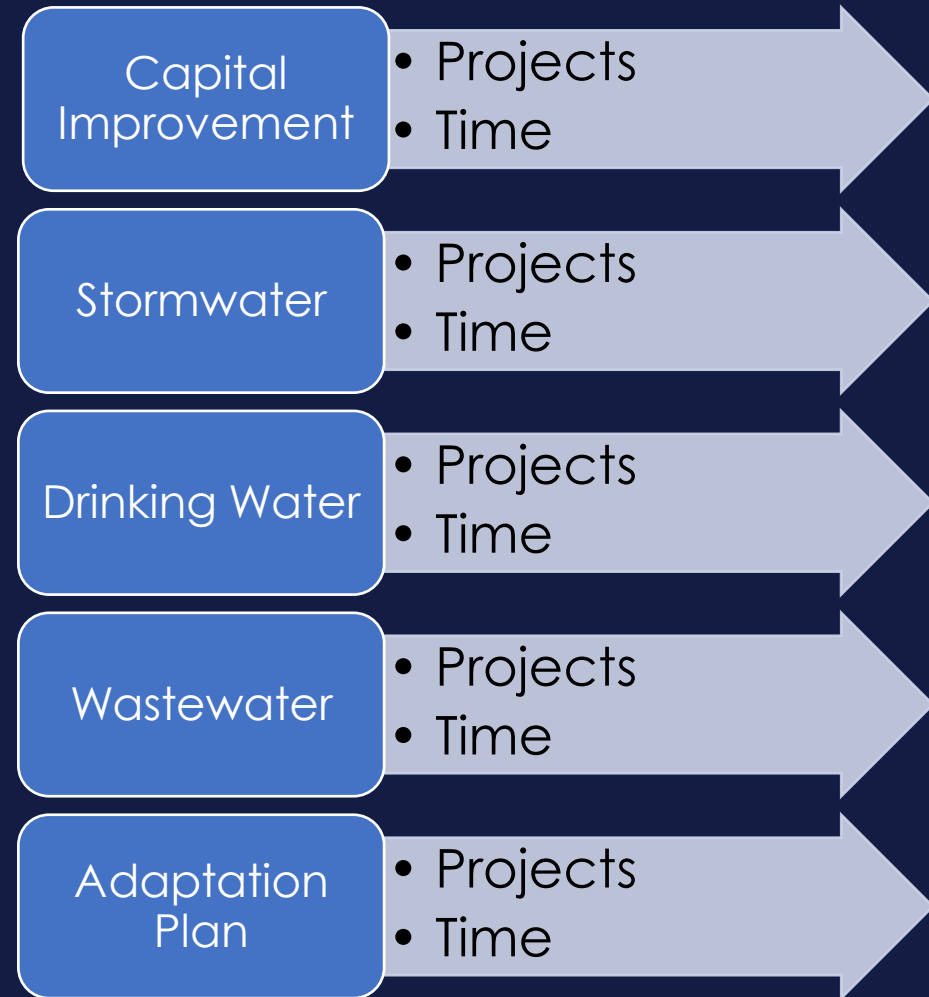
Mangrove Planters

Peril of Flood Compliance

- RF Grant Task: Draft of the Coastal Element of the Comprehensive Plan to comply with Section 163.3178(2)(f), F.S. known as the “Peril of Flood” Amendments
- The City is currently updating their Comprehensive Plan - these proposed amendments can be adopted as part of this process
- Examples:
 - ✓ Develop and adopt Land Development Regulations provisions specific to vulnerable areas
 - ✓ Update the Floodplain Management and Landscape Code sections
 - ✓ Link future cycles of Community Rating System scoring with completion of its Vulnerability Assessment to incorporate sea level rise projections

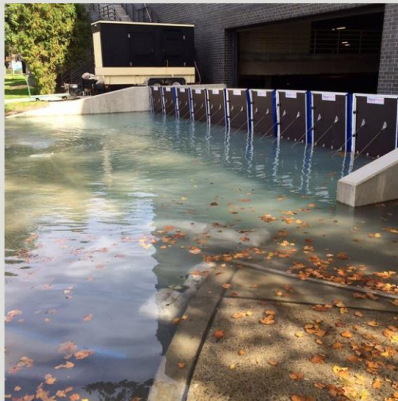
Hollywood's Existing Plans

- Capital Improvement Plan
- Stormwater Master Plan
- Drinking Water Master Plan
- Wastewater Master Plan
- **Climate Adaptation Plan**
 - **50 Prioritized Projects**
 - **Policy Recommendations**



Adaptation Plan Overview

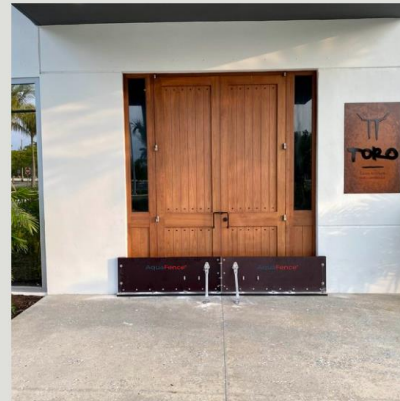
- Assess Adaptive Capacity
- Identification of Adaptation Strategies
- Evaluate Project Feasibility
- Prioritize Projects
- Funding Analysis
- Implementation Plan



FloodWall



FlashWall



FloodBarricade

Path Forward

- ✓ Submit Vulnerability Assessment and Adaptation Plan to FDEP
 - ID Adaptation Strategies
 - Evaluate Project Feasibility
 - Prioritize Projects
 - Funding Analysis
- ✓ Peril of Flood Compliance & Comprehensive Plan Review
- Project Completion: June 30, 2024
- Qualify for RF Grant Funding

Implement Projects!





Thank you!

www.hollywoodfl.org

Community Partners:



TETRA TECH



CLEARVIEW
—GEOGRAPHIC—

ERIN L. DEADY, P.A.

