



# City of Sanibel Vulnerability Assessment Public Presentation



This work was funded in part through a grant agreement from the Florida Department of Environmental Protection's Office of Resilience and Coastal Protection Resilient Florida Program. The views, statements, findings, conclusions, and recommendations expressed herein are those of the author(s) and do not necessarily reflect the views of the State of Florida or any of its subagencies.



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Coastal & Marine Engineering

December 2025



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*City Manager*



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## City of Sanibel Council Members

**Mike Miller**  
Mayor

**Holly D. Smith**  
Vice Mayor

**Richard Johnson**  
Councilmember

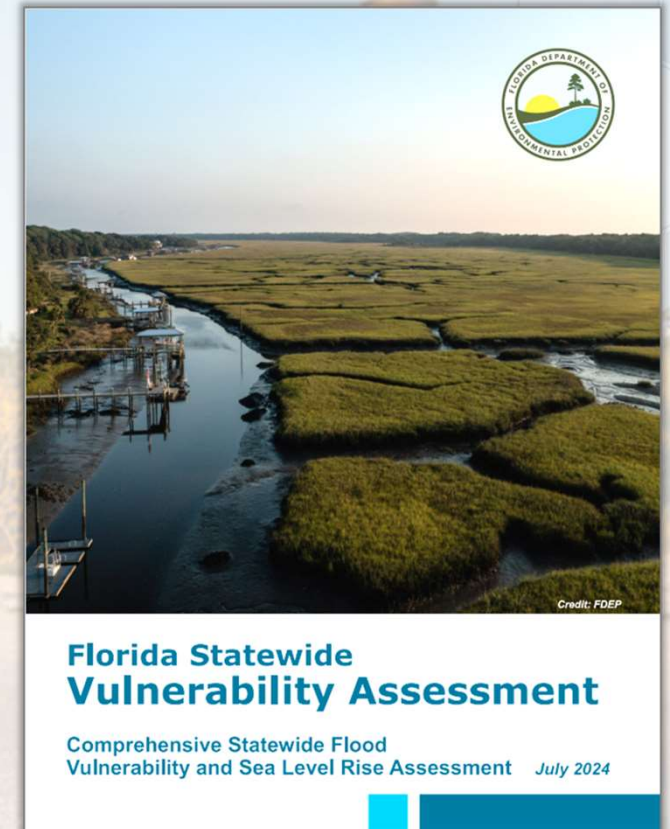
**Laura DeBruce**  
Councilmember

**John Henshaw**  
Councilmember



# Resilient Florida Grant Program and Statute

- Resilient Florida Program established in **May 2021** Senate Bill 1954 – Florida Statute (F.S.) 380.093
- **Florida is particularly vulnerable** to increasing severity and frequency of rainfall events, storm surge, tidal flooding, and sea level rise
- Program created opportunities to **support local governments** and to improve state's resilience to flooding and sea level rise
- Incentivized with grant eligibility



# Project Scope of Work

Task 0: Identify VA Data Standards

Task 1: Kick Off Meeting

Task 2: Acquire Background Data

Task 3: Public Outreach Meeting

Task 4: Exposure Analysis

Task 5: Sensitivity Analysis

Task 6: Public Presentation

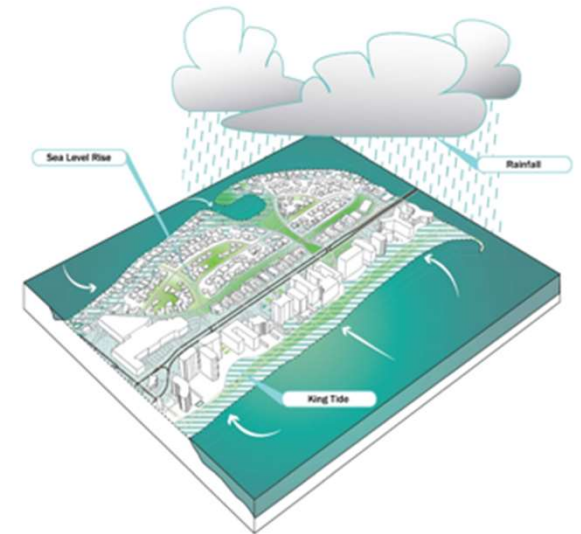
Task 7: Final VA Report

New: Adaptation Plan (25PLN22)

**Completed Work**

**Ongoing**

**Next Steps**



# Interdepartmental Coordination





# Task 1: Kick Off Meeting (December 4, 2024)



# Definitions

- **Critical Assets**

- Transportation Assets and Evacuation Routes
- Critical Infrastructure
- Critical Community and Emergency Facilities
- Natural, Cultural, and Historical Resources

- **Regionally Significant Assets** - Critical assets which support the needs of communities spanning multiple geopolitical jurisdictions, including, but not limited to, water resources facilities, medical centers, emergency operations centers, regional utilities, major transportation corridors, airports, and seaports.



# Task 2: Acquire Background Data



## **Transportation and Evacuation Routes**

- Airports
- Bridges
- Bus Terminals
- Ports
- Major Roadways
- Marinas
- Railroads
- Rail Facilities



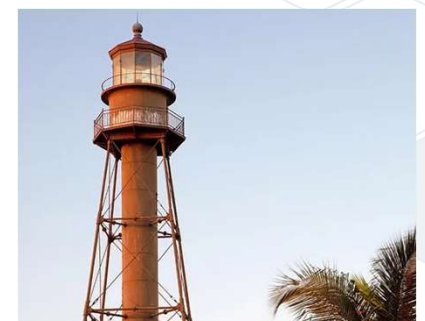
## **Critical Infrastructure**

- Communications
- Disaster Debris Sites
- Solid and Hazardous Waste Facilities
- Electrical Facilities
- Military Installations
- Drinking Water Facilities
- Wastewater Facilities
- Stormwater Facilities



## **Critical Community and Emergency Facilities**

- Affordable Public Housing
- Schools, Colleges, Universities
- Community Centers
- Disaster Recovery Centers
- Emergency Medical Facilities
- Emergency Operation Centers
- Fire stations
- Governmental Facilities
- Hospitals
- Law Enforcement facilities



## **Natural, Cultural, and Historical Resources**

- Conservation Lands
- Parks
- Shorelines
- Surface Waters
- Wetlands
- Historical and Cultural Assets



# Task 2: Acquire Background Data



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0 0.25 0.5 1 Miles

Notes:

1. Background Imagery Date (Source): 2023 (Maxar)

1:67,000

Client:

City of Sanibel

Sheet Title:

Critical Community and  
Emergency Facilities

Sheet 1 of 1

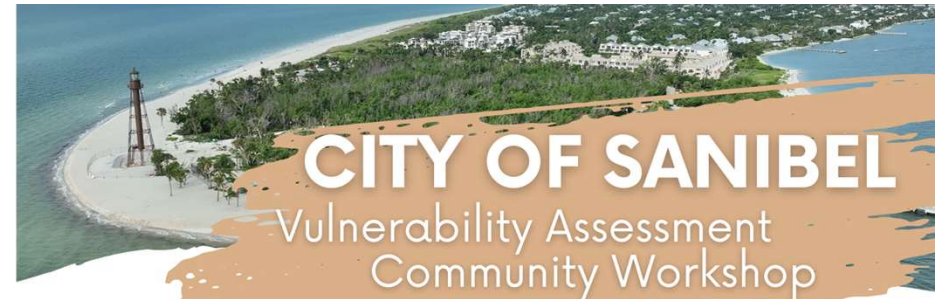
### Legend

- Affordable Public Housing
- Community Centers
- Emergency Medical Service
- Federal Government Facilities
- Fire Stations
- Law Enforcement Facilities
- Local Government Facilities
- Schools
- Municipal Boundary

# Task 3: Public Outreach Meeting (53 participants)



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## PLEASE JOIN US!

THURSDAY, APRIL 10  
5:30PM - 7:30PM @ BIG ARTS  
900 DUNLOP RD., SANIBEL, FL

### WORKSHOP FOCUS:

- City of Sanibel Vulnerability Assessment & Resilience Initiatives
  - What, When, How, & Why?
- The Resilient Florida Program
  - Funding Overview
- Critical Asset Inventory
- Preliminary Results of Study
  - Exposure Analysis
- Your Input!
  - Focus Areas & Risk
  - Ideas to make Sanibel more Resilient



LET'S PLAN FOR SANIBEL'S RESILIENT FUTURE TOGETHER!

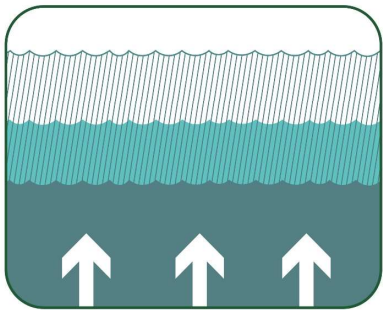
[www.mysanibel.com](http://www.mysanibel.com) | [sandnr@mysanibel.com](mailto:sandnr@mysanibel.com) | 239.472.3700



# Climate Hazard Data Standards

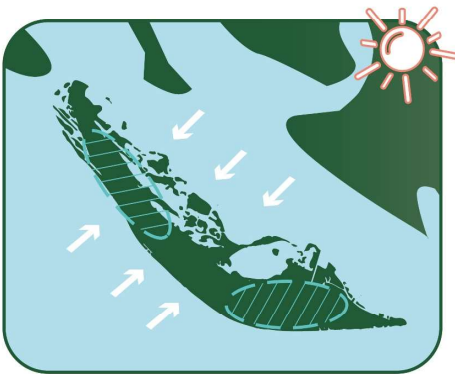
## SEA LEVEL RISE

Section 380.093 of the Florida Statutes requires using NOAA's 2022 sea level rise projections for the 2050 and 2080 planning horizons for vulnerability assessments. Specifically, the NOAA Intermediate Low and Intermediate sea level rise projections.



## HIGH TIDE FLOODING

Tidal flooding (known as sunny day flooding), including future high tide flooding, is to be mapped and geographically display the number of tidal flood days for each scenario and flooding for the Vulnerability Assessment.

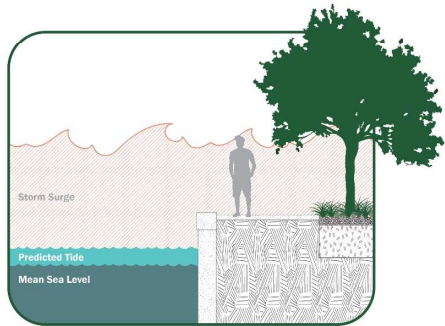
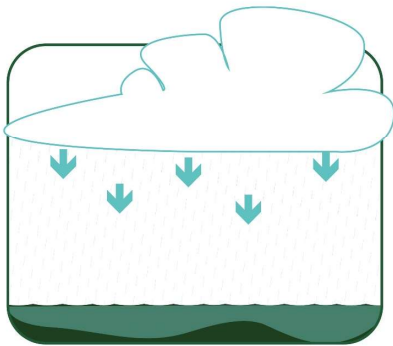


## COMPOUND FLOODING

To the extent practicable, the Vulnerability Assessment analyzes the compound flooding or combination of tidal, storm surge, and rainfall-induced flooding.

## EXTREME RAINFALL

Vulnerability assessments for rainfall-induced flooding must include the depth of rainfall-induced flooding for a 100-year storm and a 500-year storm, and use future rainfall conditions if available.

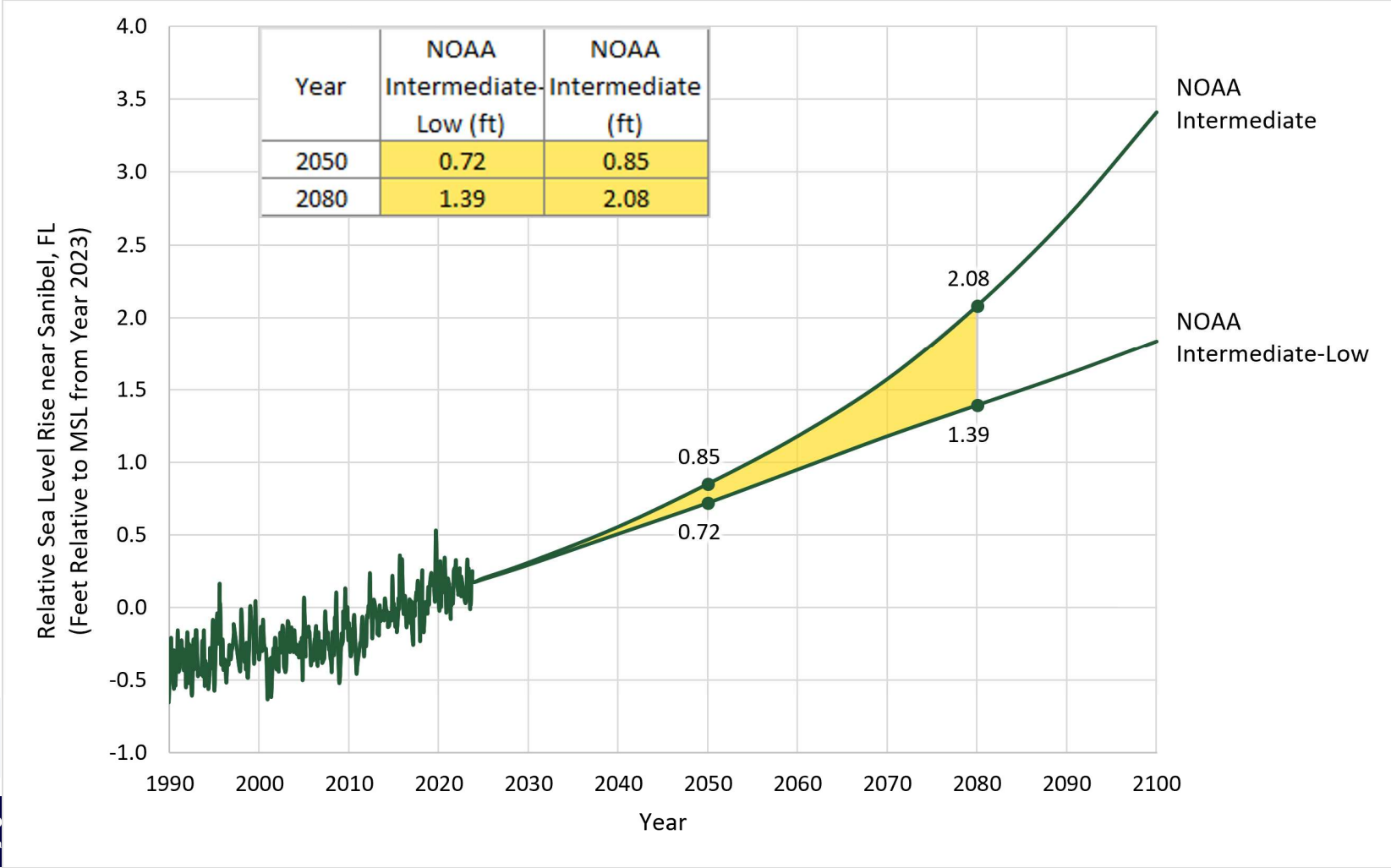


## STORM SURGE

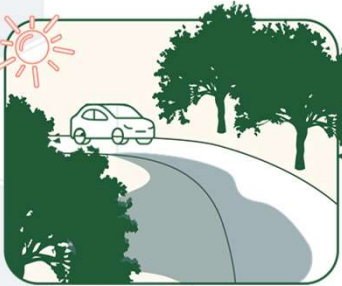
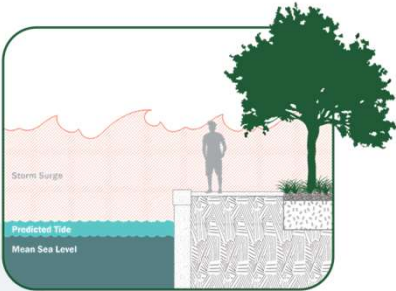
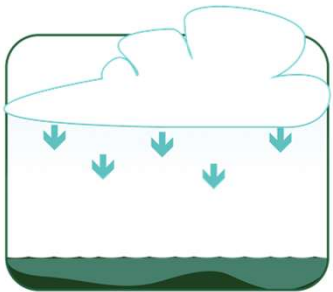
The Vulnerability Assessment requires the analysis of a storm surge flood event under current and future conditions to evaluate the exposure of a critical asset to storm surge flooding.



# Climate Hazard Data Standards



# Task 4: Exposure Analysis



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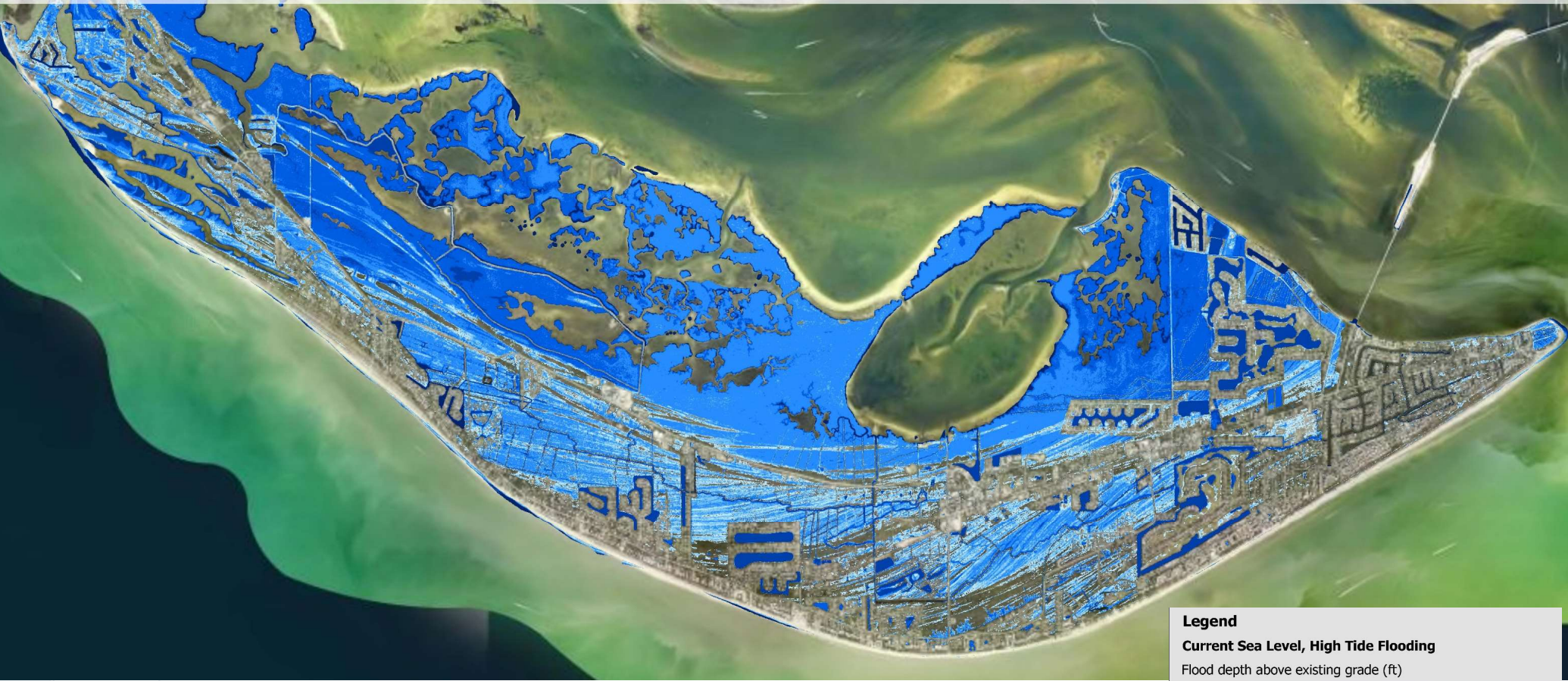


**Modified  
Bathtub  
Model**

**Dynamic  
Model**

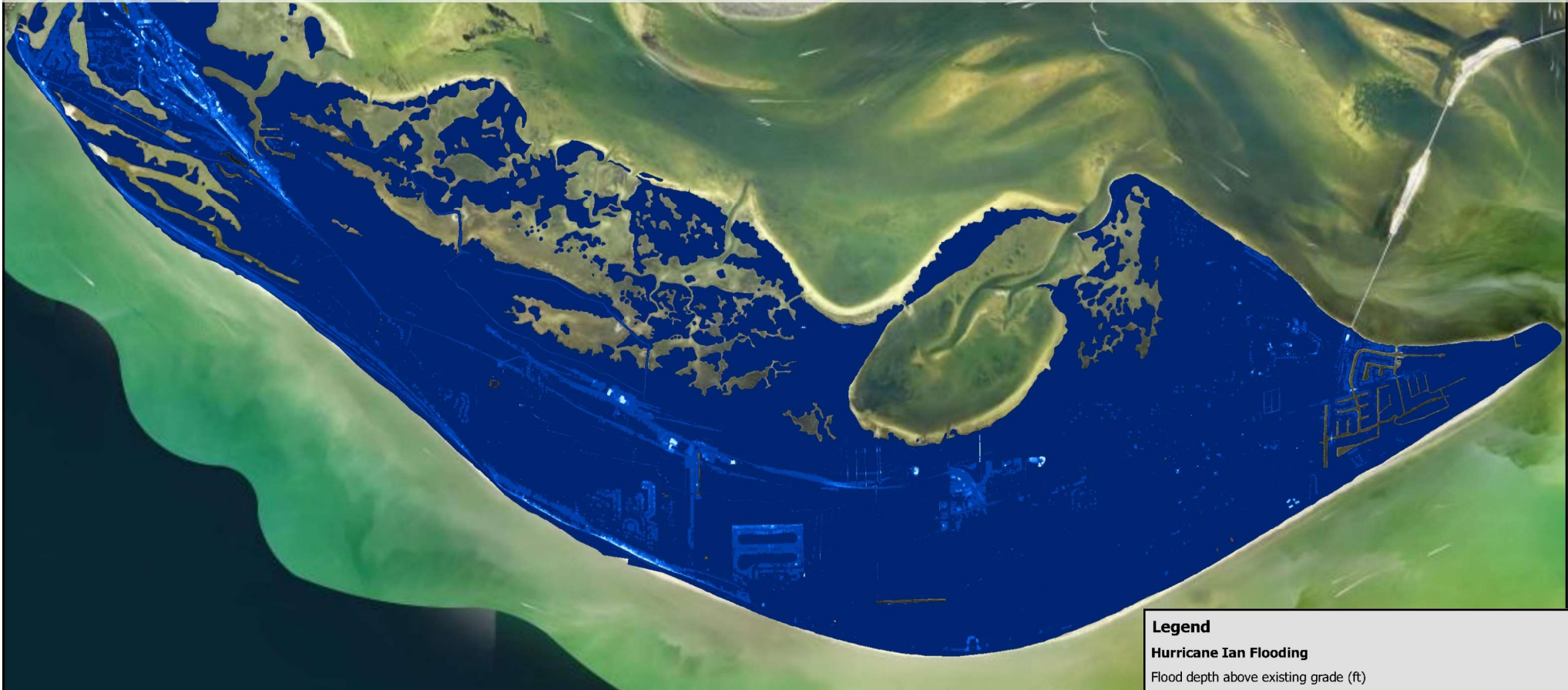
Scenario No.	Rainfall	Sea Level Rise Projection	Planning Horizon	Tidal Condition	Future Rainfall Change Factor
1	N/A	N/A	2023 - Current	HTF	N/A
2	N/A	2022 NOAA Intermediate Low	2050	HTF	N/A
3	N/A	2022 NOAA Intermediate	2080	HTF	N/A
4	N/A	2022 NOAA Intermediate Low	2050	HTF	N/A
5	N/A	2022 NOAA Intermediate	2080	HTF	N/A
6	N/A	N/A	2023 - Current	100-yr SS	N/A
7	N/A	2022 NOAA Intermediate Low	2050	100-yr SS	N/A
8	N/A	2022 NOAA Intermediate	2080	100-yr SS	N/A
9	N/A	2022 NOAA Intermediate Low	2050	100-yr SS	N/A
10	N/A	2022 NOAA Intermediate	2080	100-yr SS	N/A
11	N/A	N/A	2023 - Current	500-yr SS	N/A
12	100-yr	N/A	2023 - Current	MHHW	N/A
13	100-yr	2022 NOAA Intermediate	2050	MHHW	1.29
14	100-yr	2022 NOAA Intermediate	2050	100-yr SS	1.29
15	500-yr	N/A	2023 - Current	MHHW	N/A

## Task 4: Exposure Analysis





# Task 4: Exposure Analysis



## Legend

### Hurricane Ian Flooding

Flood depth above existing grade (ft)



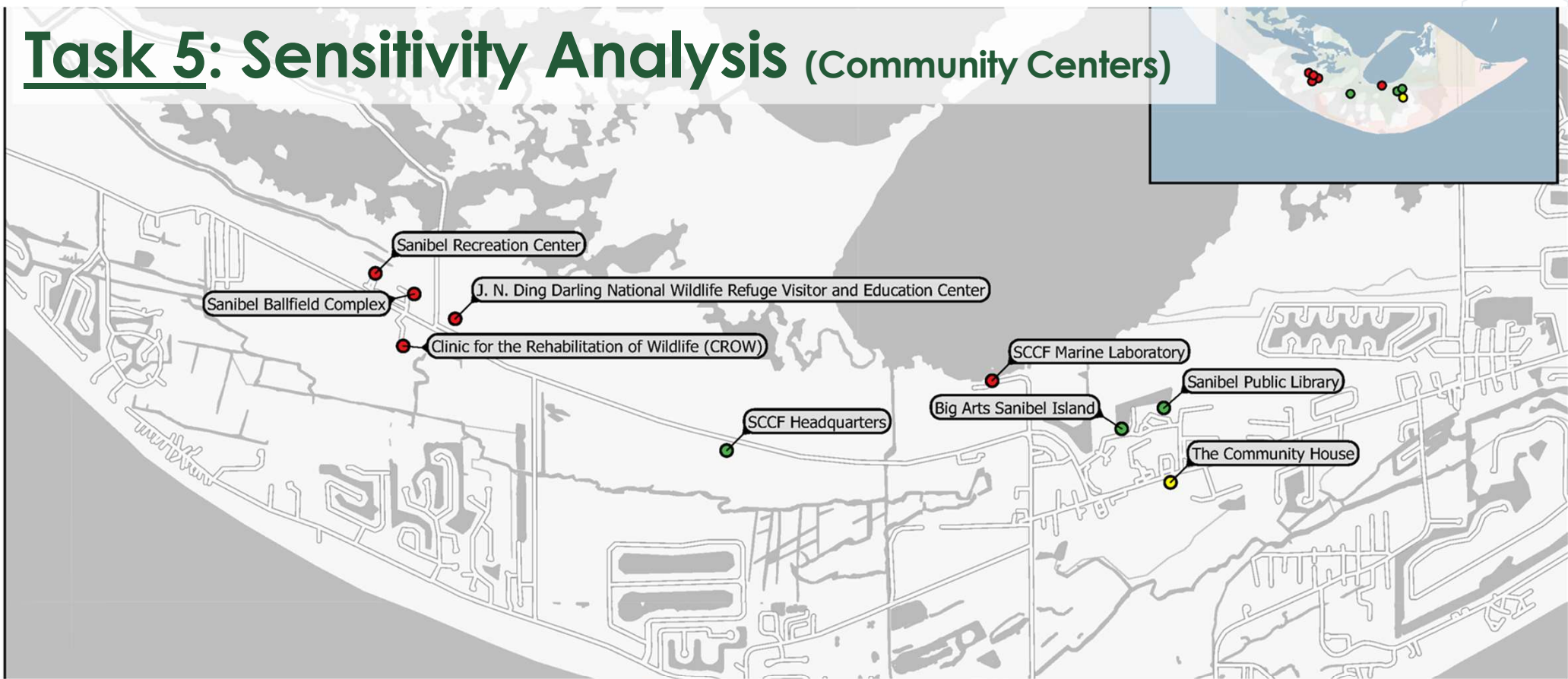
# Task 5: Sensitivity Analysis

Risk Score =  
Criticality Score x Vulnerability Score

Scoring	Severity of Impacts	Criticality of Services
1	Not Sensitive	Least Critical
2	Slightly Sensitive	Slightly Critical
3	Moderately Sensitive	Moderately Critical
4	Very Sensitive	Very Critical
5	Most Sensitive	Most Critical

				Flood Depths (ft)																		
				High Tide Scenarios					Storm Surge Scenarios					Rainfall and Compound Flood Scenarios								
Asset Name	Asset Class	Asset Type	Asset Owner	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Criticality Score	Vulnerability Score	Risk Score	Sensitivity
Big Arts Sanibel Island	Critical Community and Emergency Facilities	Community Centers	City of Sanibel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	1.0	1.9	0.0	0.0	4.2	0.0	3.2	0.2	0.8	Low Sensitivity
Sanibel City Hall	Critical Community and Emergency Facilities	Local Government Facilities	City of Sanibel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	1.2	2.0	0.0	0.0	4.4	0.0	3.8	0.3	1.0	Low Sensitivity
Sanibel Police Department	Critical Community and Emergency Facilities	Law Enforcement Facilities	City of Sanibel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	1.2	2.0	0.0	0.0	4.4	0.0	5.0	0.3	1.3	Low Sensitivity
Sanibel Public Works	Critical Community and Emergency Facilities	Local Government Facilities	City of Sanibel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.3	0.3	4.8	0.3	5.0	0.4	1.9	Low Sensitivity
Sanibel Recreation Center	Critical Community and Emergency Facilities	Community Centers	City of Sanibel	0.2	0.8	0.5	0.9	0.4	0.8	1.7	2.0	1.7	2.5	2.8	0.5	0.5	7.2	0.5	4.4	1.9	8.4	High Sensitivity
The Sanibel School	Critical Community and Emergency Facilities	Schools	Lee County School Board	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.3	0.8	2.0	1.2	0.0	0.0	5.4	0.0	4.4	0.4	2.0	Low Sensitivity

# Task 5: Sensitivity Analysis (Community Centers)



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0 0.17 0.35 0.7 Miles



1:269,616

Spatial Reference  
Name: NAD 1983 StatePlane Florida West FIPS 0902 Feet

Project:  
City of Sanibel  
Vulnerability Assessment

Sensitivity Analysis Maps:  
Community Centers  
Page 1 of 1

## Legend

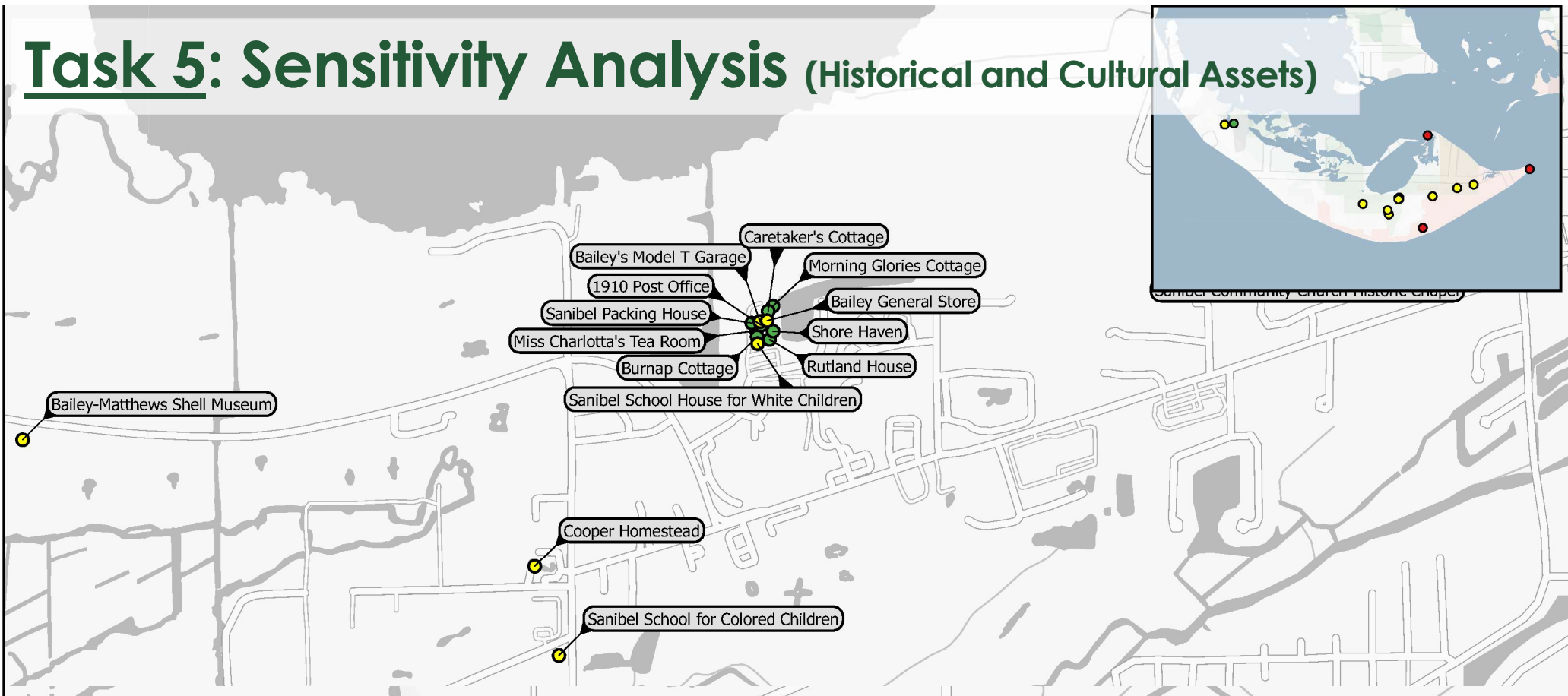
Sensitivity

- Not Sensitive
- Low Sensitivity
- Medium Sensitivity
- High Sensitivity

Background Imagery Source: ESRI



# Task 5: Sensitivity Analysis (Historical and Cultural Assets)



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Spatial Reference  
Name: NAD 1983 StatePlane Florida West FIPS 0902 Feet  
1:269,616

Project:  
City of Sanibel  
Vulnerability Assessment

Sensitivity Analysis Maps:  
Historical and Cultural Assets

Page 2 of 3

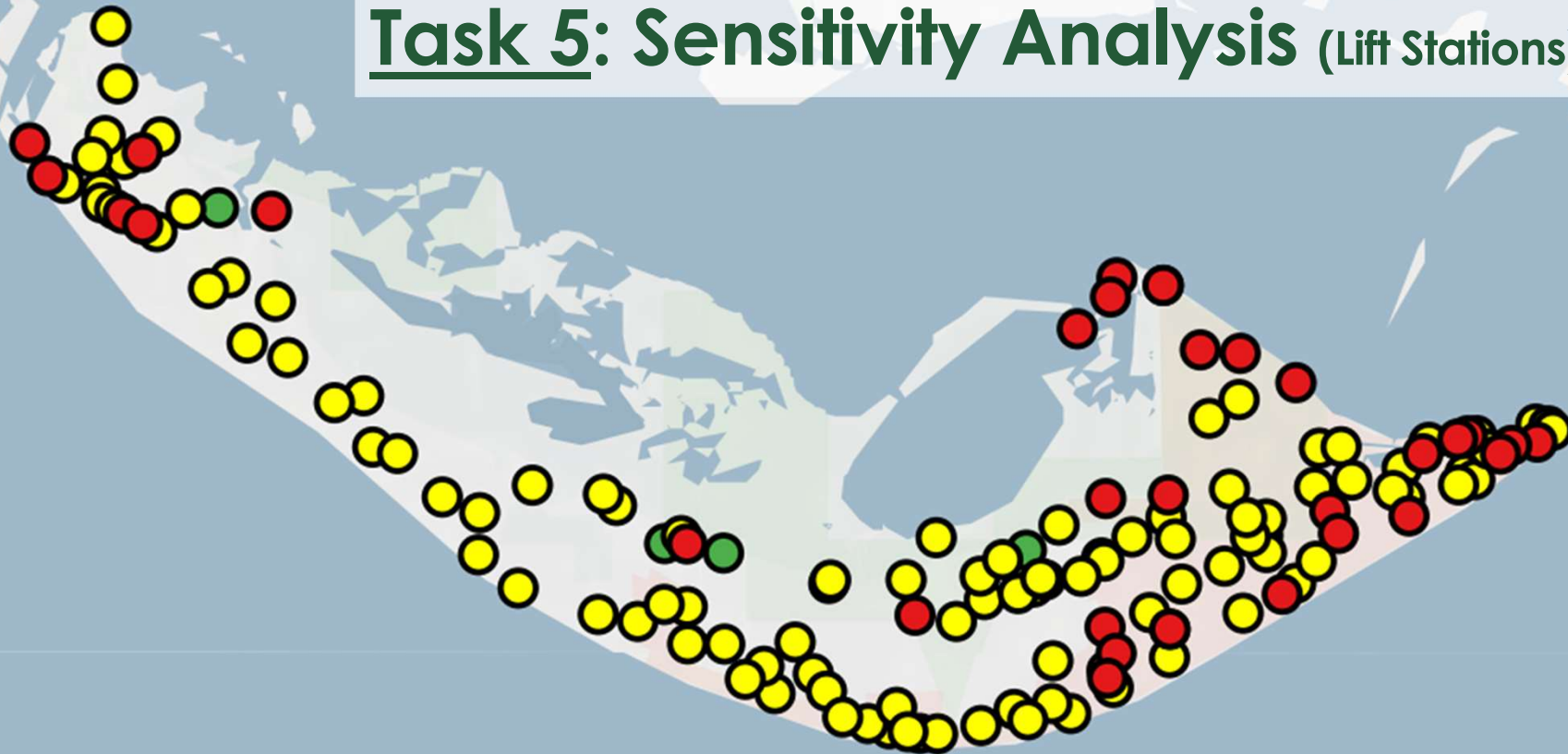
## Legend

Sensitivity

- Not Sensitive
- Low Sensitivity
- Medium Sensitivity
- High Sensitivity

Background Imagery Source: ESRI

# Task 5: Sensitivity Analysis (Lift Stations)



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Spatial Reference  
Name: NAD 1983 StatePlane Florida West FIPS 0902 Feet

Project:  
City of Sanibel  
Vulnerability Assessment

Sensitivity Analysis Maps:  
  
Lift Stations  
Page 2 of 3

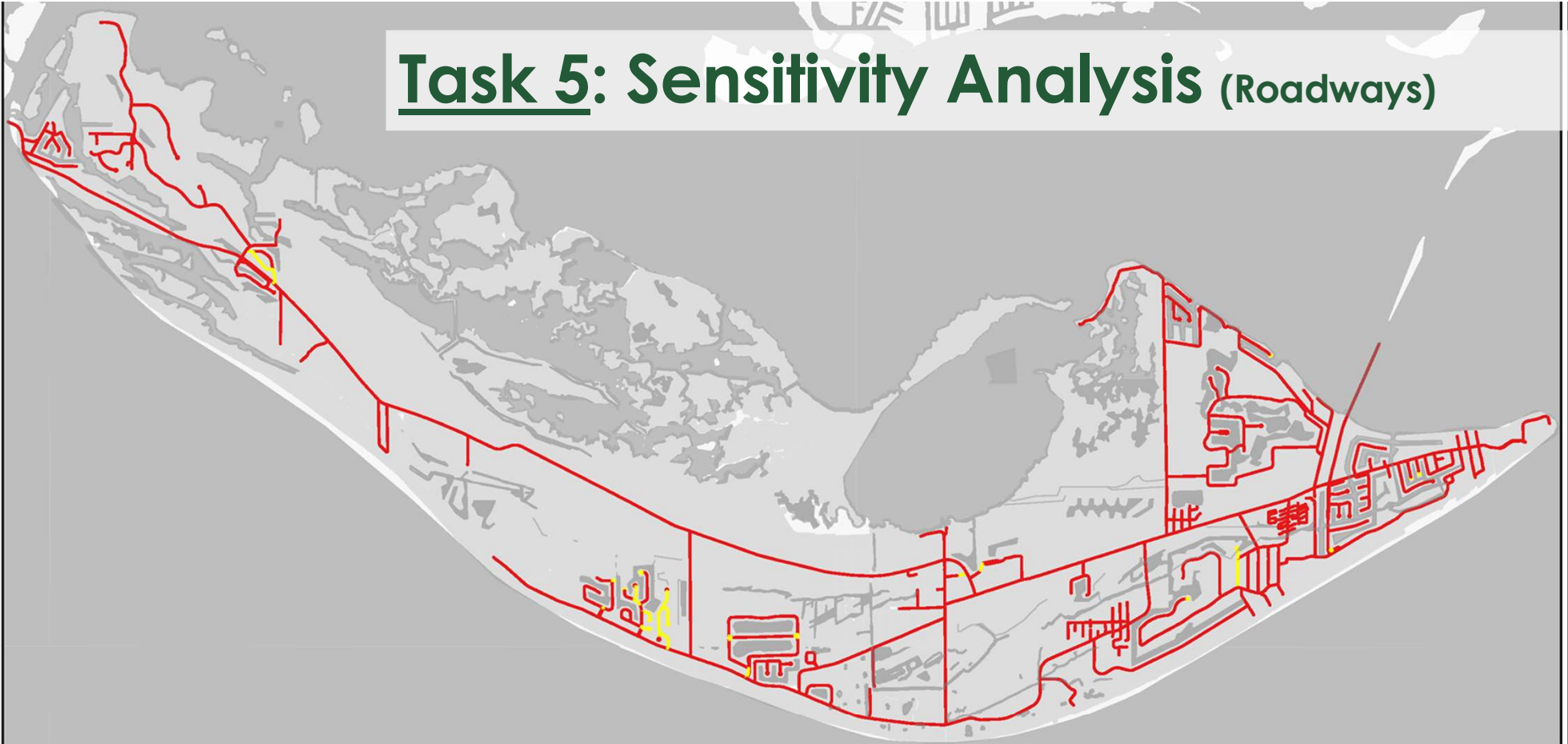
## Legend

Sensitivity

- Not Sensitive
- Low Sensitivity
- Medium Sensitivity
- High Sensitivity

Background Imagery Source: ESRI

## Task 5: Sensitivity Analysis (Roadways)



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0 0.35 0.7 1.4 Miles



1:269,616

Spatial Reference  
Name: NAD 1983 StatePlane Florida West FIPS 0902 Feet

Project:  
City of Sanibel  
Vulnerability Assessment

Sensitivity Analysis Maps:  
  
Roadways  
  
Page 1 of 1

### Legend

Sensitivity

- Not Sensitive
- Low Sensitivity
- Medium Sensitivity
- High Sensitivity

Background Imagery Source: ESRI



# Top 5 Critical Assets per Class

## Transportation and Evacuation Routes

1. Sanibel Police Dock
2. Tarpon Bay Explorers Boat Ramp
3. Tarpon Bay Rd. Bridge Over the Sanibel River
4. Sanibel Island Public Boat Ramp
5. Donax St Bridge Over the Sanibel River

## Critical Infrastructure

1. Beach Rd. Weir
2. Tarpon Bay Weir
3. Sanibel Captiva Rd. Seawall
4. Bailey Rd. North End Disaster Debris MGMT Site
5. S7 Drinking Water Well

## Critical Community and Emergency Facilities

1. Sanibel Highlands (CHR)
2. J.N. Ding Darling National Wildlife Refuge  
Visitor and Education Center
3. Riverview (CHR)
4. Sanibel Recreation Center
5. F.I.S.H. of Sanibel-Captiva (2422 Periwinkle Way)

## Natural, Cultural, and Historical Resources

1. J.N. Ding Darling National Wildlife Refuge
2. Woodring House
3. SCCF Conservation Lands
4. Bay Drive Coastline
5. Boat Ramp Beach Park

# Top 10 Critical Assets Overall

1. **Beach Rd. Weir**
2. **Tarpon Bay Weir**
3. **Sanibel Captiva Rd Seawall**
4. **Sanibel Police Dock**
5. J.N. Ding Darling National Wildlife Refuge
6. Tarpon Bay Explorers Boat Ramp
7. Woodring House
8. **Bailey Rd. North End Disaster Debris MGMT Site**
9. S7 Drinking Water Well
10. S8 Drinking Water Well

**Yellow = City-owned**



16 mi<sup>2</sup> of land area  
15 mi of shoreline

# City of Sanibel Vulnerability Assessment Key Findings

Over  
6,000  
residents

High Tide Flooding Scenarios **5**

**6** Storm Surge Flooding Scenarios

Rainfall Flooding Scenarios **2**

**2** Compound Flooding Scenarios

**64%** of the city  
experiences flooding  
from elevated high tides

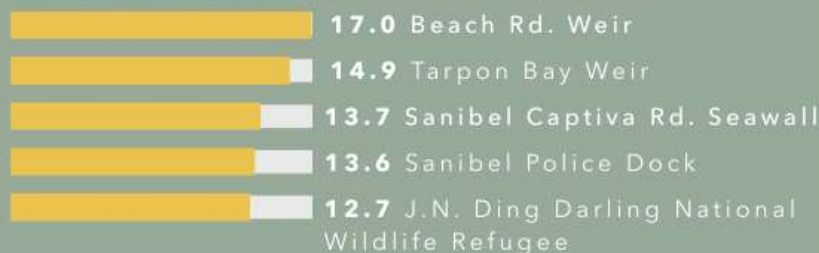
**99%** of the city  
experiences flooding from  
100-year storm surge

**88%** of the city  
experiences flooding from  
100-year rainfall events



Sanibel's **294**  
critical assets were  
assessed via risk  
score

## Top 5 Critical Assets at Risk:



## Top Roads at Risk

Periwinkle Way

Dixie Beach Blvd.

Tarpon Bay Rd.

## 2050:

Intermediate: **0.85 ft**

Intermediate Low: **0.72 ft**

## 2080:

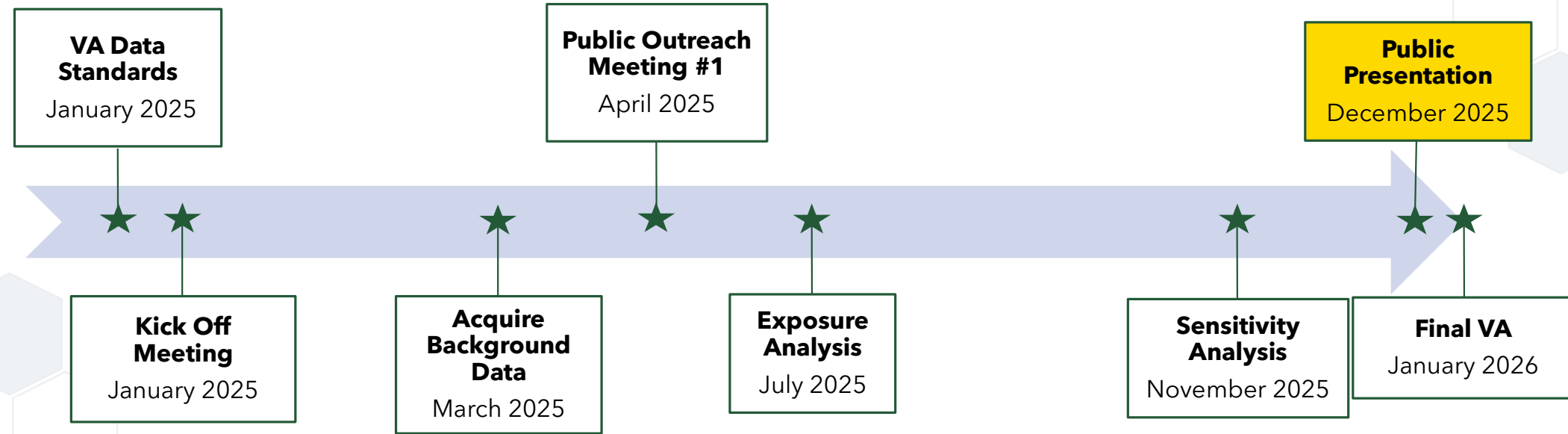
Intermediate: **2.08 ft**

Intermediate Low: **1.39 ft**

Sea Level Rise values are relative to 2023



# Task 6: Public Presentation



# Next Steps (Adaptation Plan)

- The City of Sanibel recently received Resilient Florida Adaptation Planning grant funds
- Adopt policies that support adaptation projects
  - Sanibel Plan updates
  - Future land use categories for coastal risk areas
- Raise elevations of buildings, roads, etc.
- Floodproof and harden infrastructure
- Provide incentives to invest in green infrastructure and conserve green space
  - Use nature to help with flood protection, drainage, and water absorption
- Expand stormwater storage and management projects (parks)
- Convert impervious to pervious surface areas where feasible
- Develop a GIS-based resiliency software for real-world uploads
  - Photograph/report flooding, highlight City projects, and receive flood alerts
- Submit adaptation projects to Statewide Resilience Plan for funding consideration through the Resilient Florida Program

# Questions?

# Thank you!

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