City of Naples
Climate Adaptation Plan

March 26, 2024

City Goals and Objectives for our Adaptation Plan

City Goals:

Increase resilience of Naples to the immediate and long-term threats of climate change hazards

Protect and enhance public assets, natural resources, and quality of life for all

Objectives of Adaptation Plan:

Identify key susceptibilities of public assets to climate hazards

Identify actionable strategies supported by City leadership and the community

Engage with regional stakeholders to maximize strategy, benefits and funding

Project Timeline

Climate Vulnerability Assessment completed
2020

2020-2021
COVID delays City funding for Adaptation Plan and New DEP Requirements

FDEP Resilient Florida grant funding received
2022

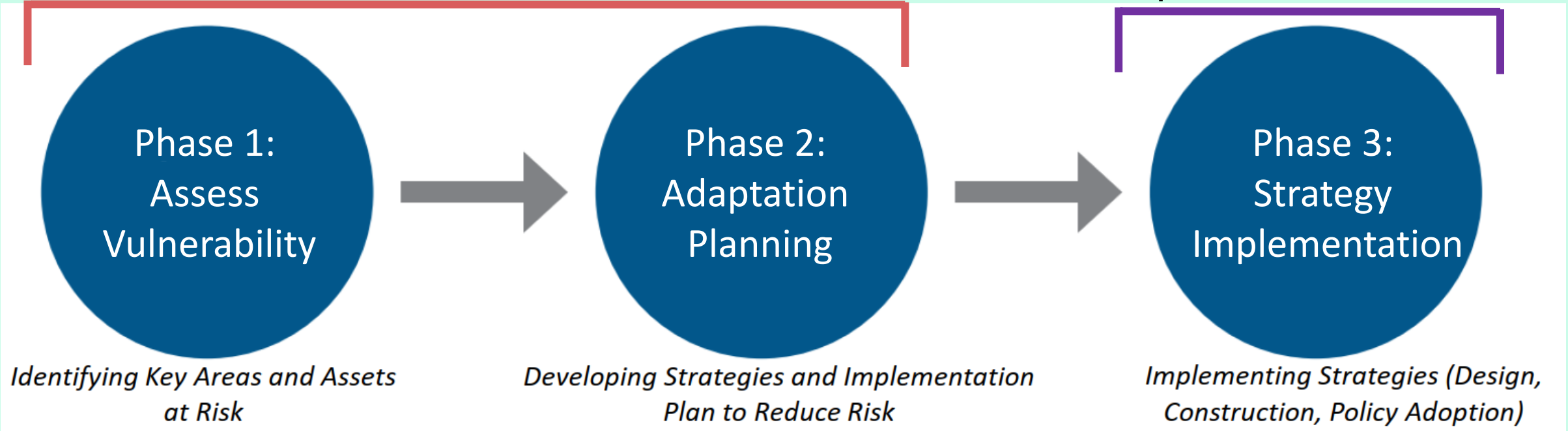
2023
Updated Vulnerability Assessment Completed
https://www.naplesgov.com/naturalresources/page/resiliency-and-sustainability

Adaptation Plan Finalized
2024

Adaptation Planning Process

Resilient Florida Planning Grants

Resilient Florida Implementation Grant



- Completed vulnerability assessment in 2020
- Updated in 2023 to comply with new Resilient Florida requirements

- Current phase of the project
- Will be finalized in mid-2024

- Prioritized projects are eligible for Resilient Florida implementation funds

Establish City Vulnerabilities - Criteria

Flooding Hazards

High Tides + Sea Level Rise

Rainfall + SLR

Coastal Storm + Sea Level Rise

- High frequency tidal flooding (high tide) + SLR
  - 2040, 2070
  - NOAA Intermediate Low and Intermediate High
- Rainfall (25-year, 72-hr event) + SLR
- Coastal storm (100-year storm event) + SLR
  - 2040, 2070
  - NOAA Intermediate Low and Intermediate High

Extreme Heat Hazard

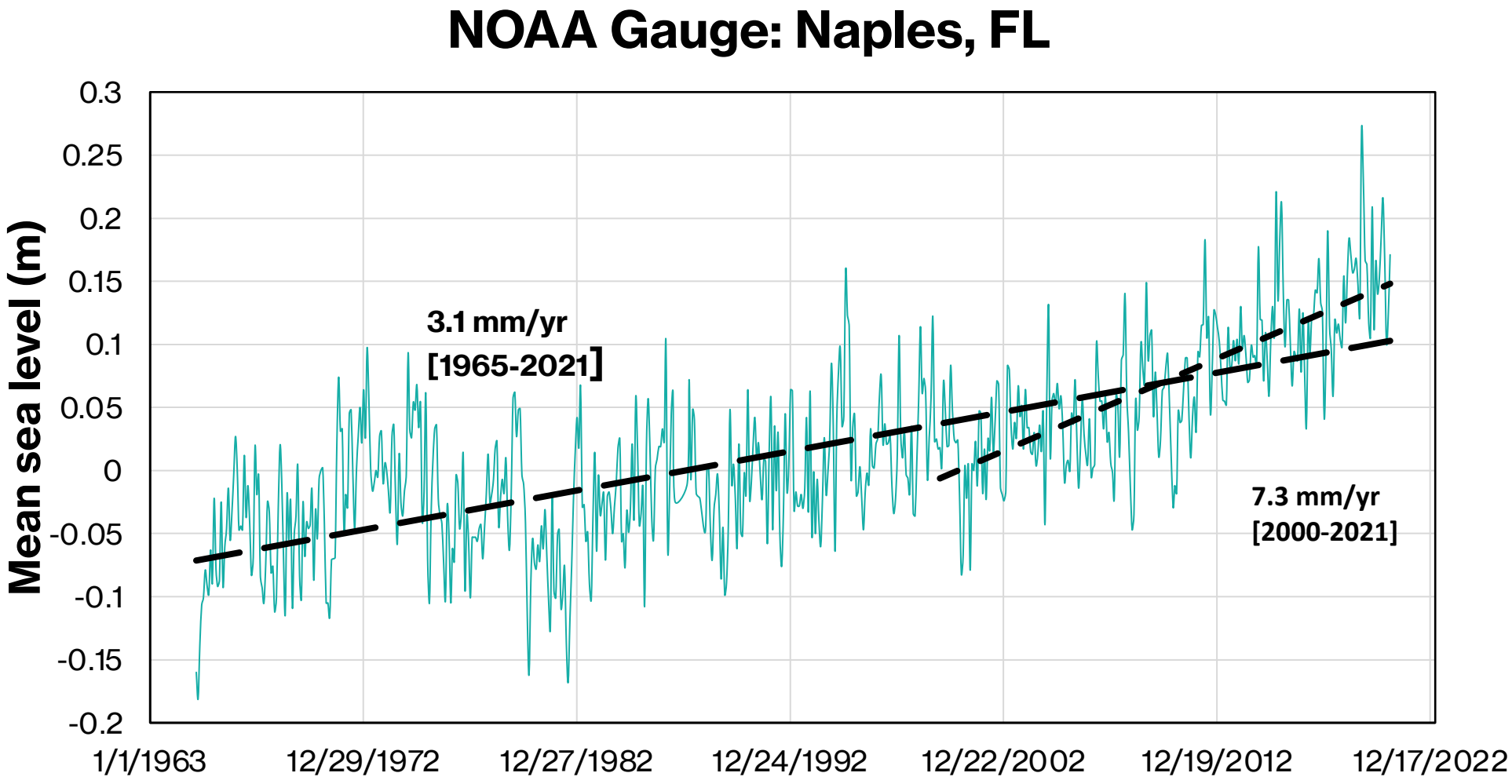
Extreme Heat

- Mean Daily Maximum Temperature
  - +4 degrees by mid century
  - +8 degrees by end of century
- Days above 95 degrees F
  - +60 days by mid century
  - +120 days by end of century

Flooding Concerns

City of Naples

Naples Sea Level Trend 1965-2021



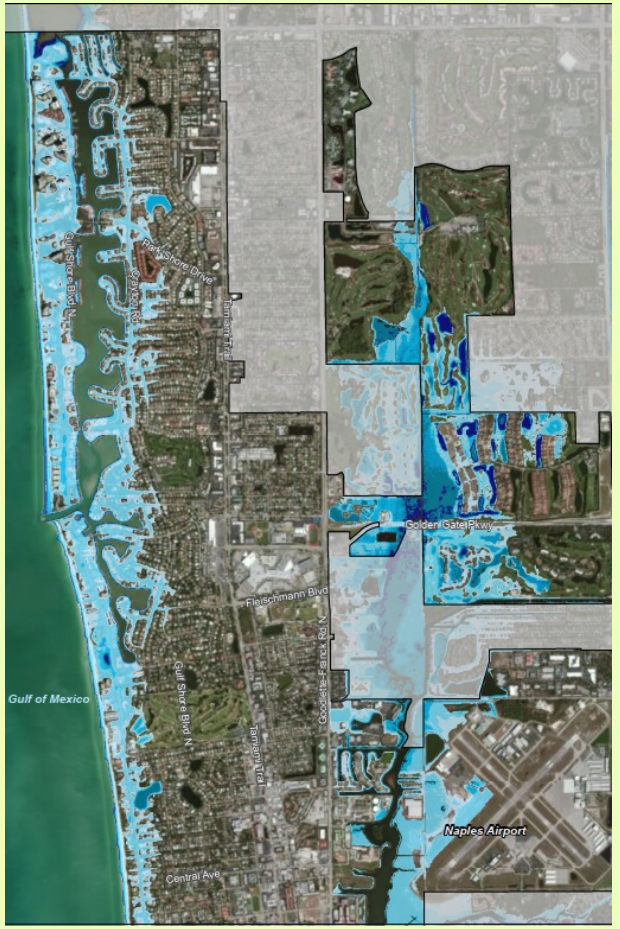
Climate Hazard Mapping
Existing Conditions (2020)

City Boundary
Precipitation Flood Extent

Water Depth (Feet)
0-1
1-2
2-3
3-4
4-5
5+

Rainfall and High Tide

100-Year Coastal Storm

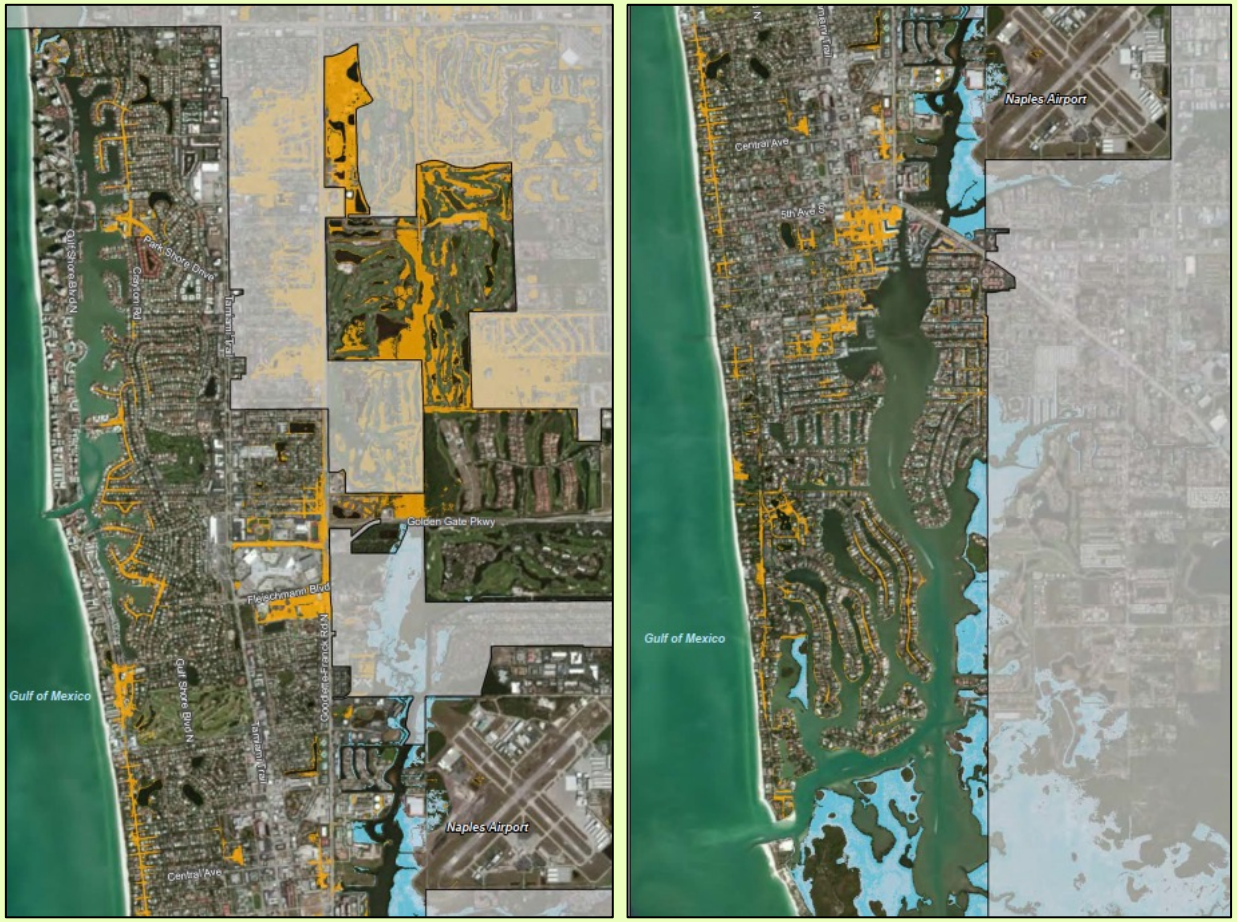


Climate Hazard Mapping
2040 Conditions
(+0.4 feet SLR, NOAA Intermediate Low)

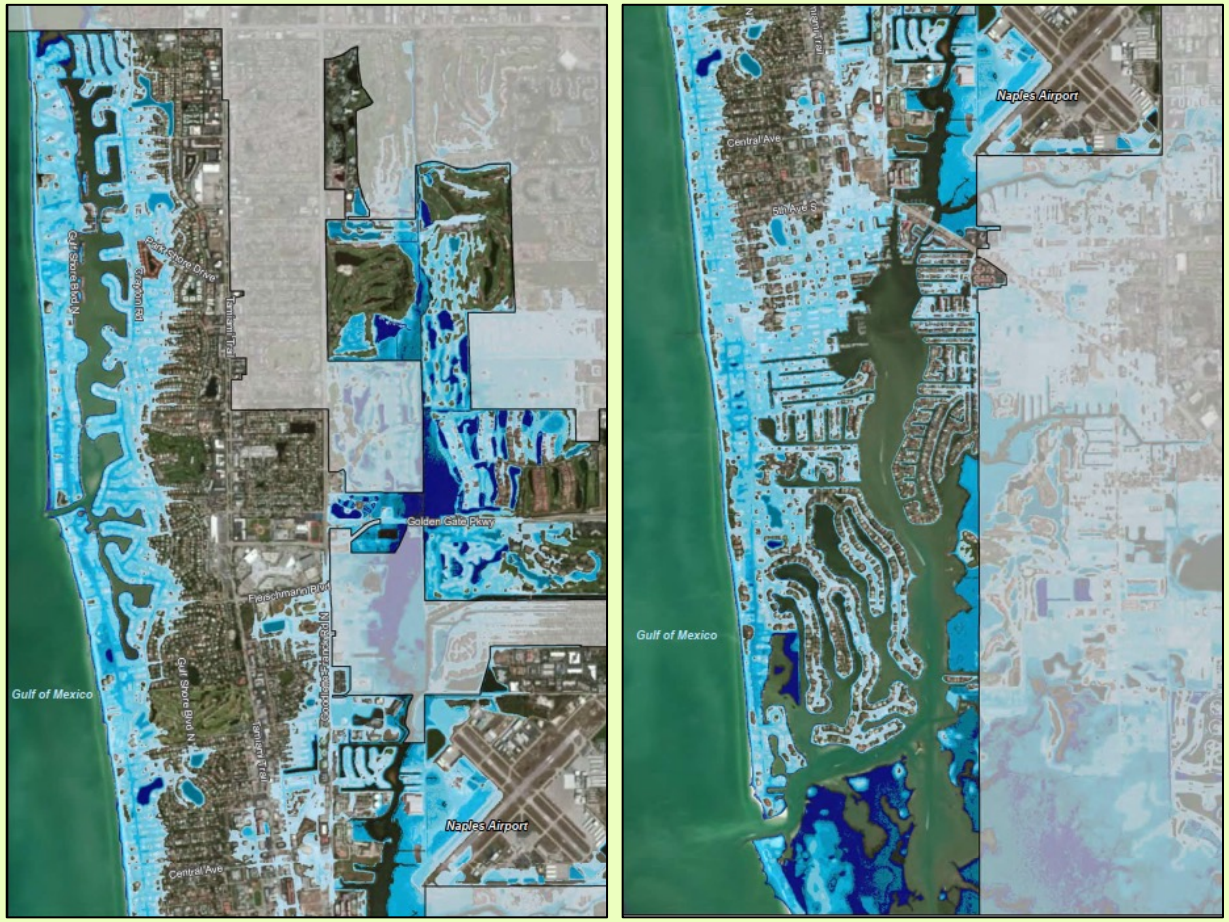
City Boundary
Precipitation Flood Extent

Water Depth (Feet)
0-1
1-2
2-3
3-4
4-5
5+

Rainfall and High Tide



100-Year Coastal Storm

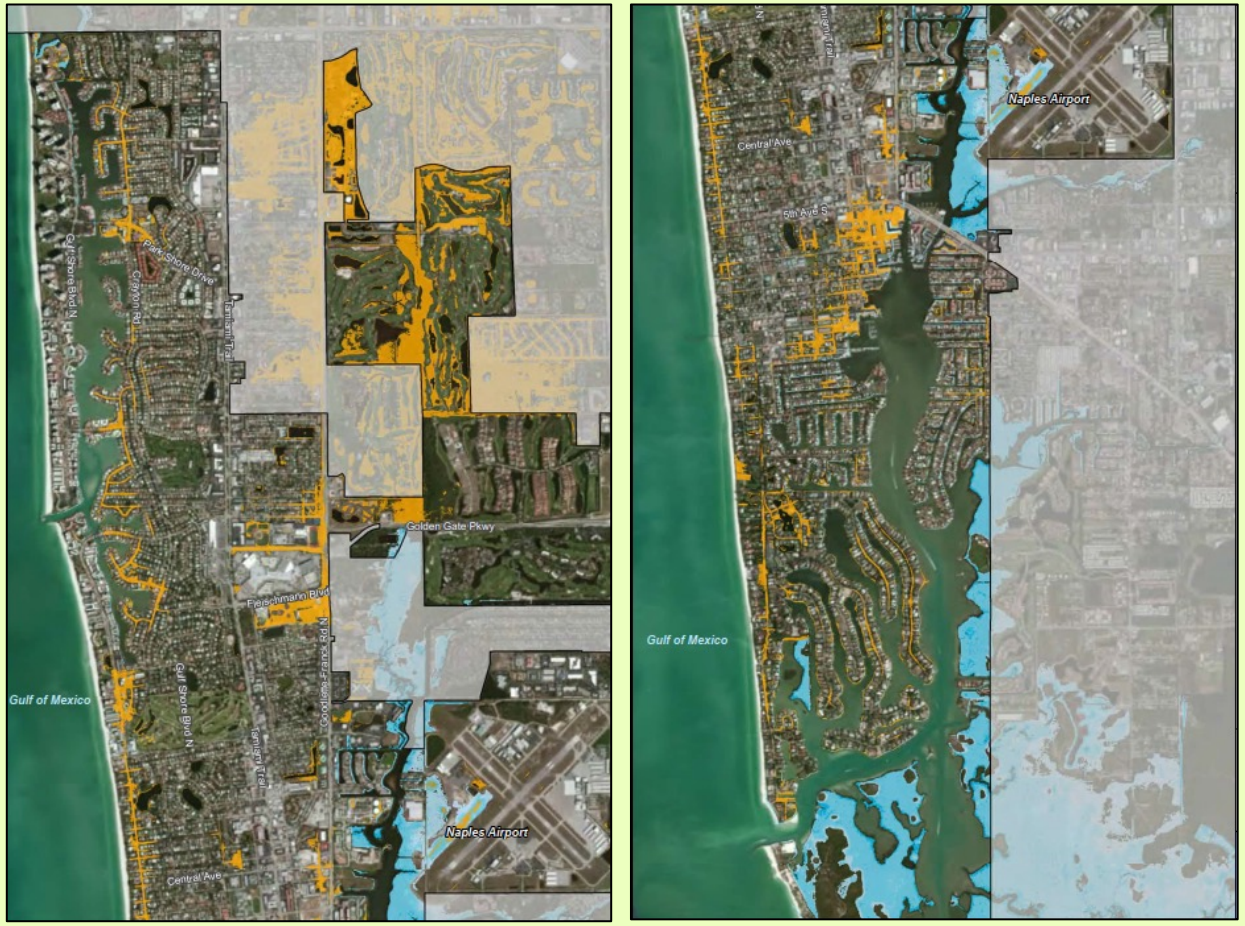


Climate Hazard Mapping
2070 Conditions
(+1.0 feet SLR, NOAA Intermediate Low)

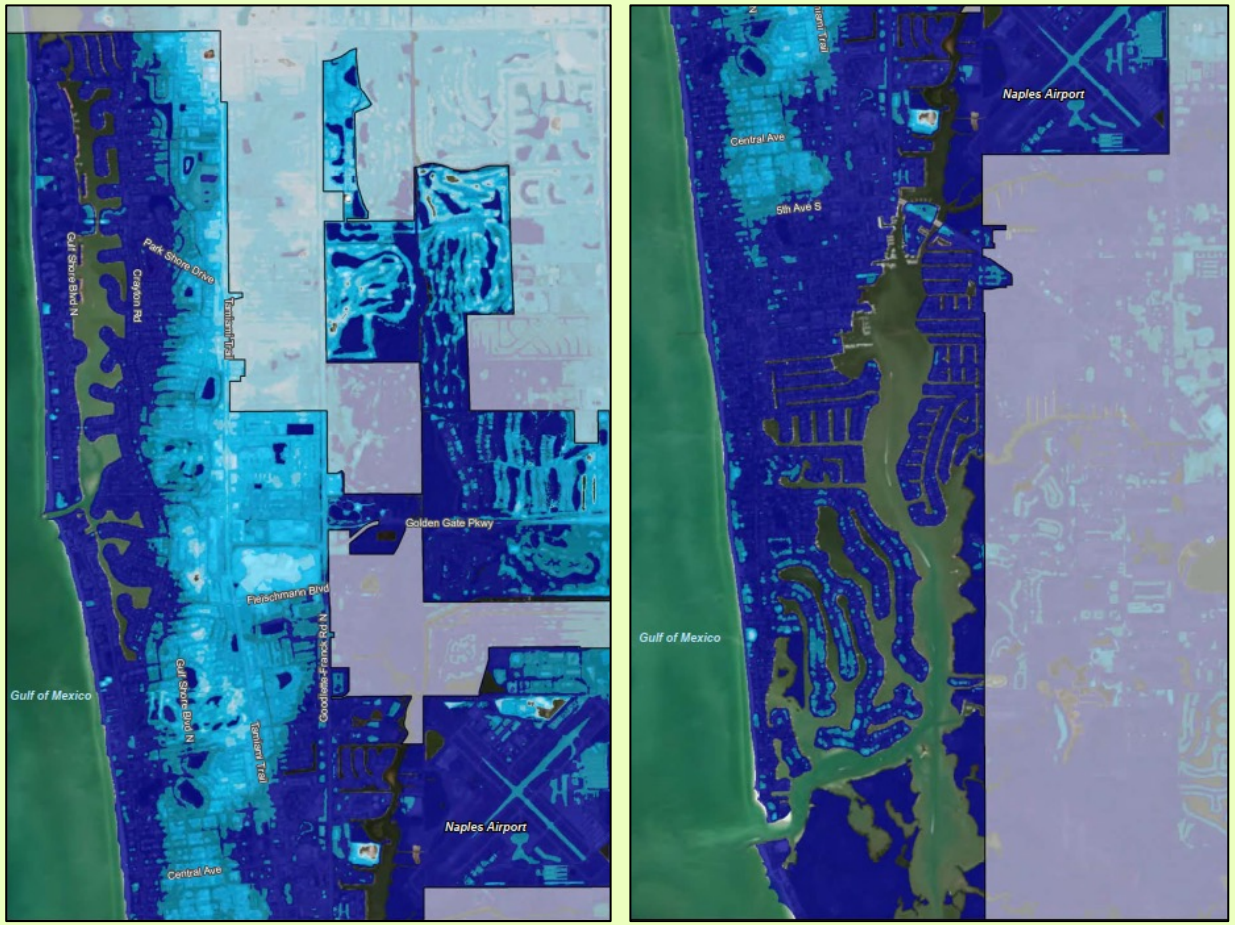
City Boundary
Precipitation Flood Extent

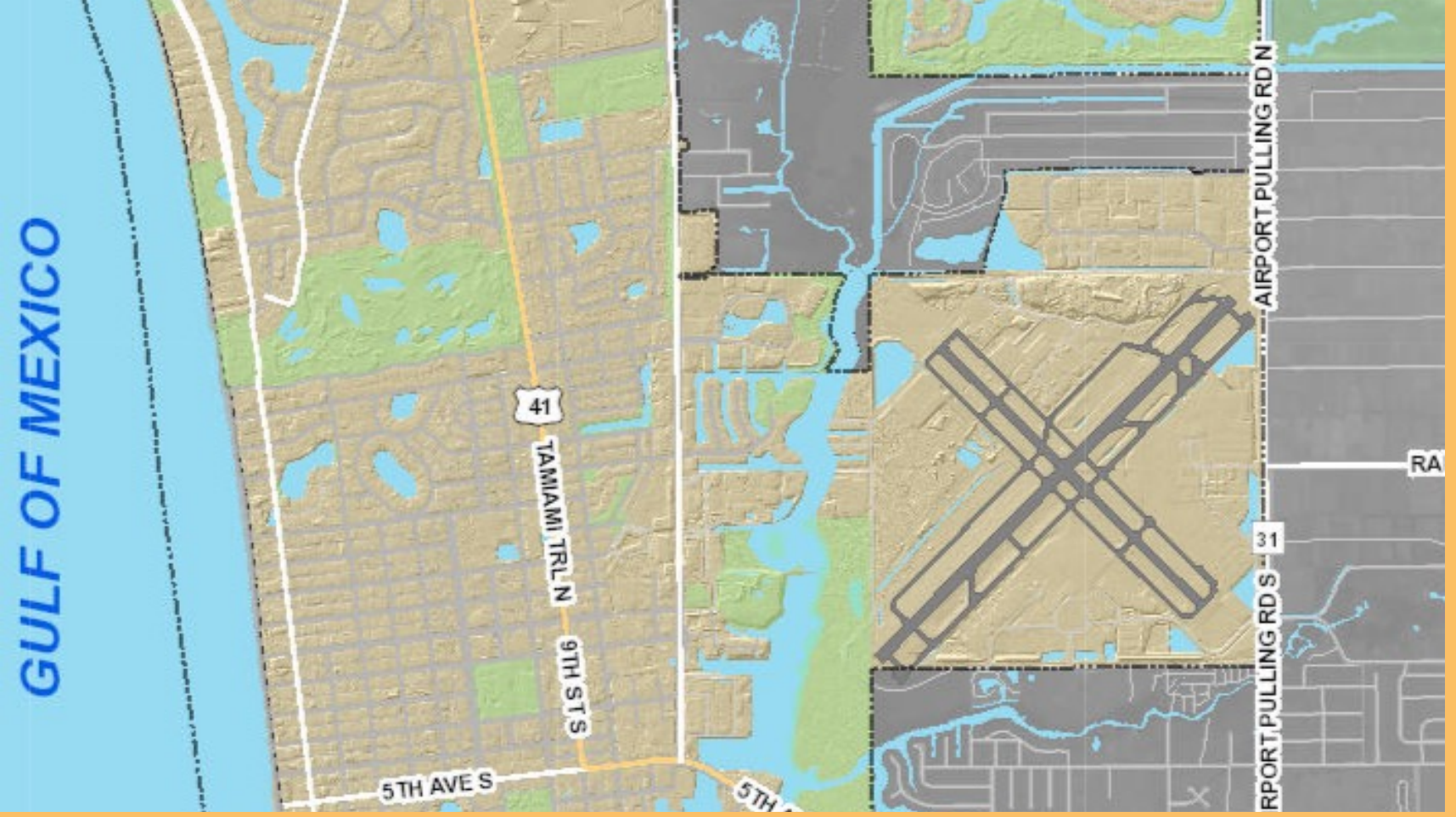
Water Depth (Feet)
0-1
1-2
2-3
3-4
4-5
5+

Rainfall and High Tide



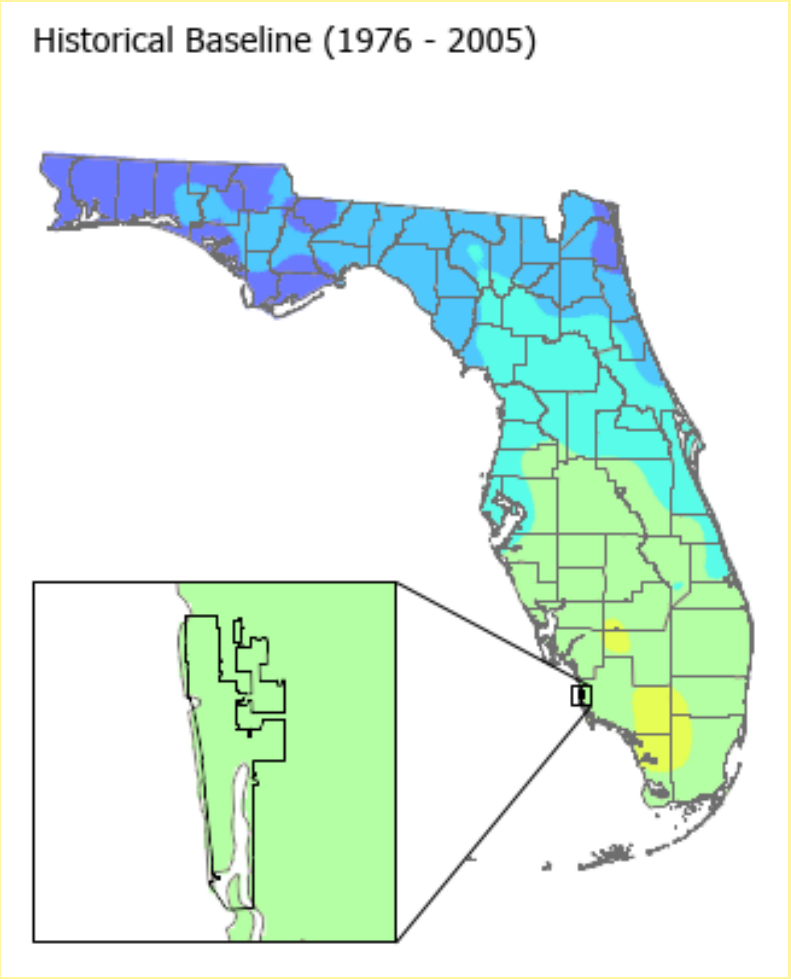
100-Year Coastal Storm

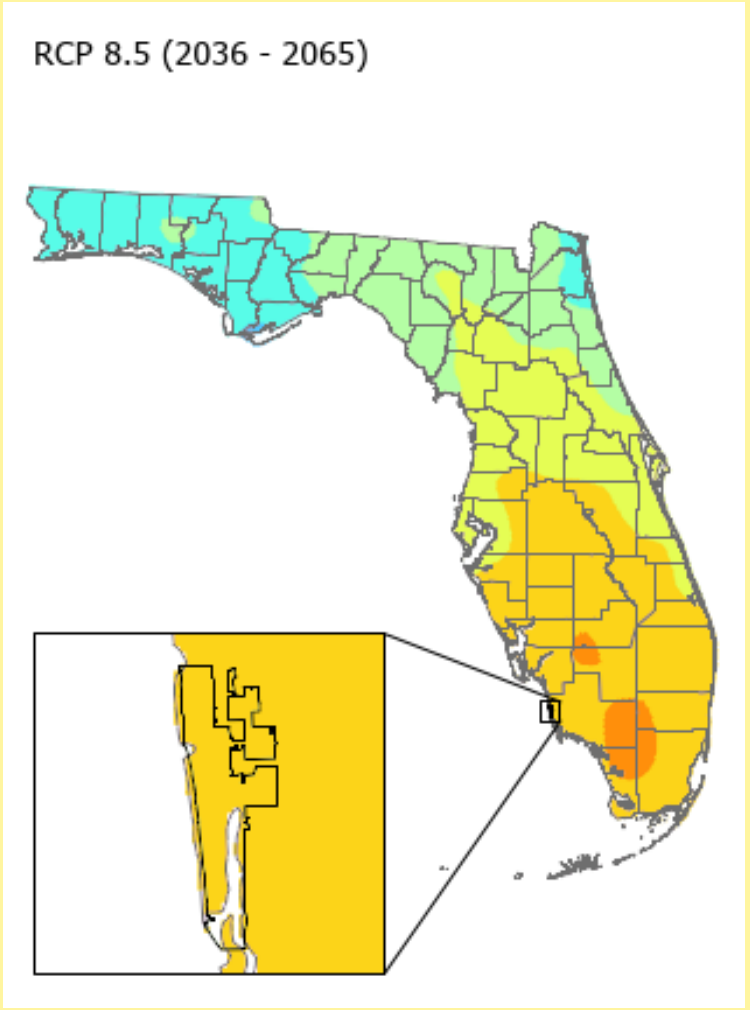


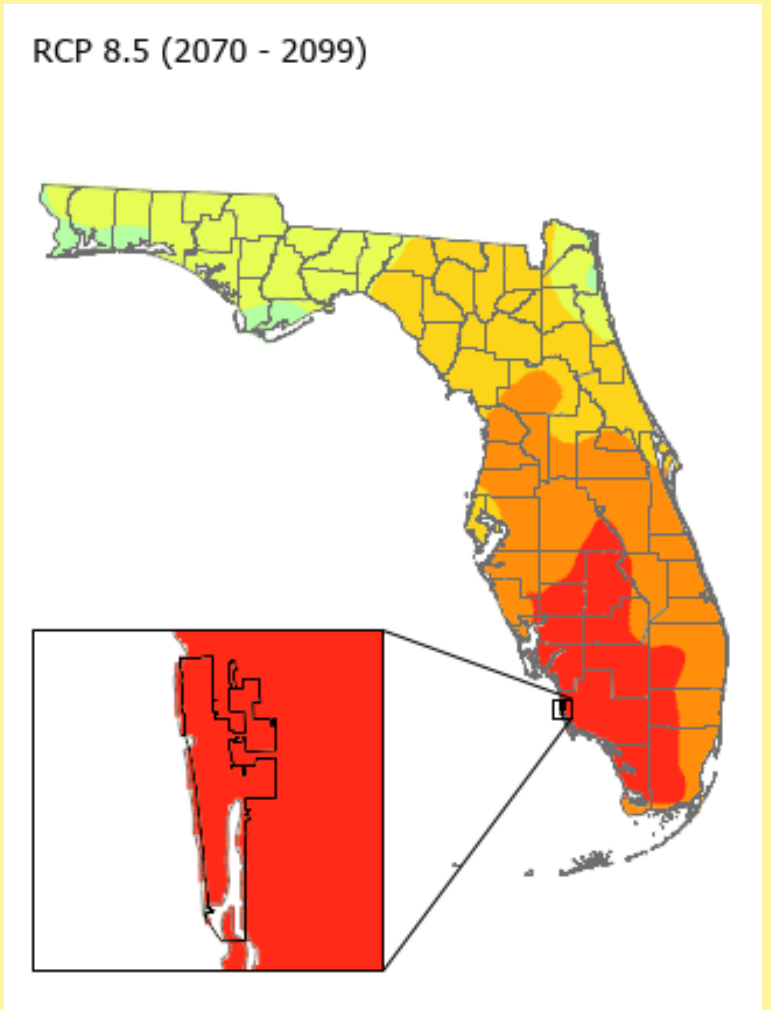


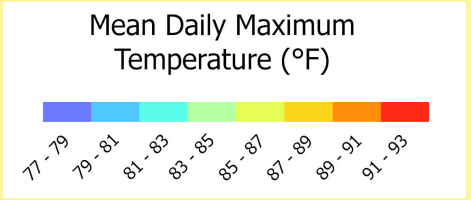
Heat Concerns

Climate Hazard Mapping: Extreme Heat

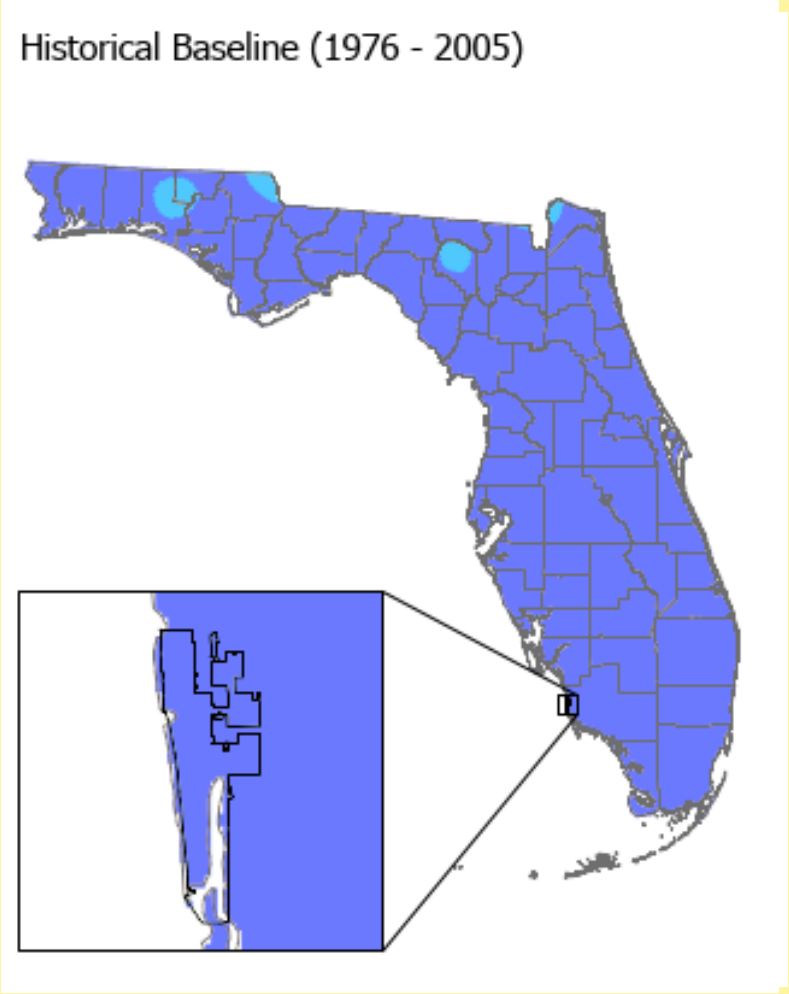


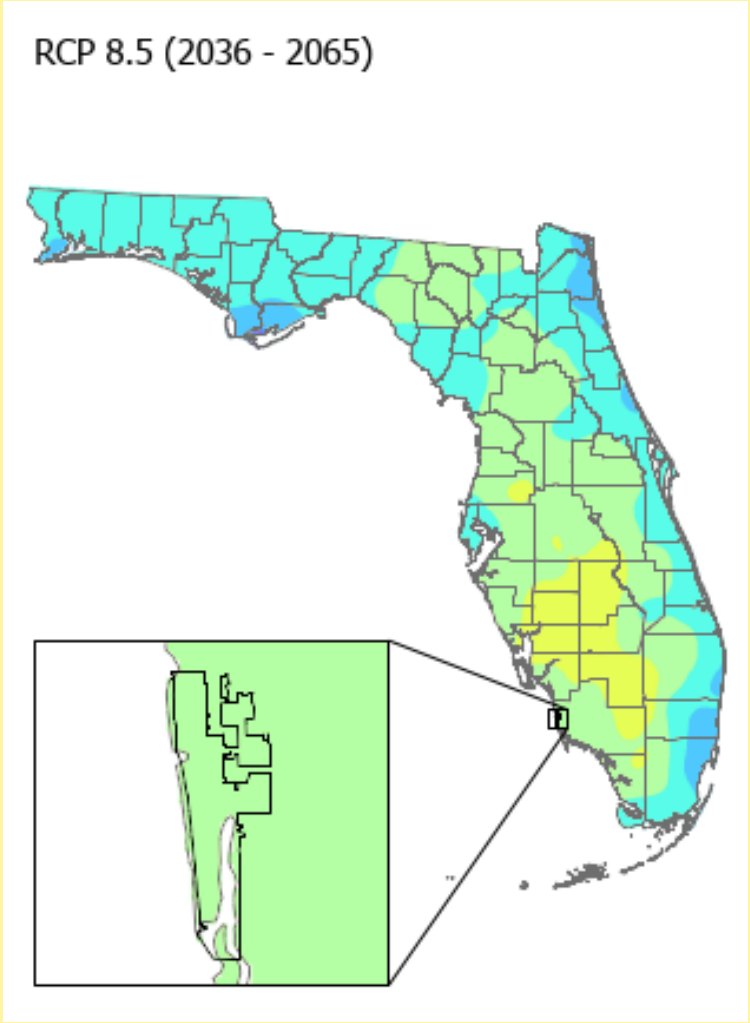


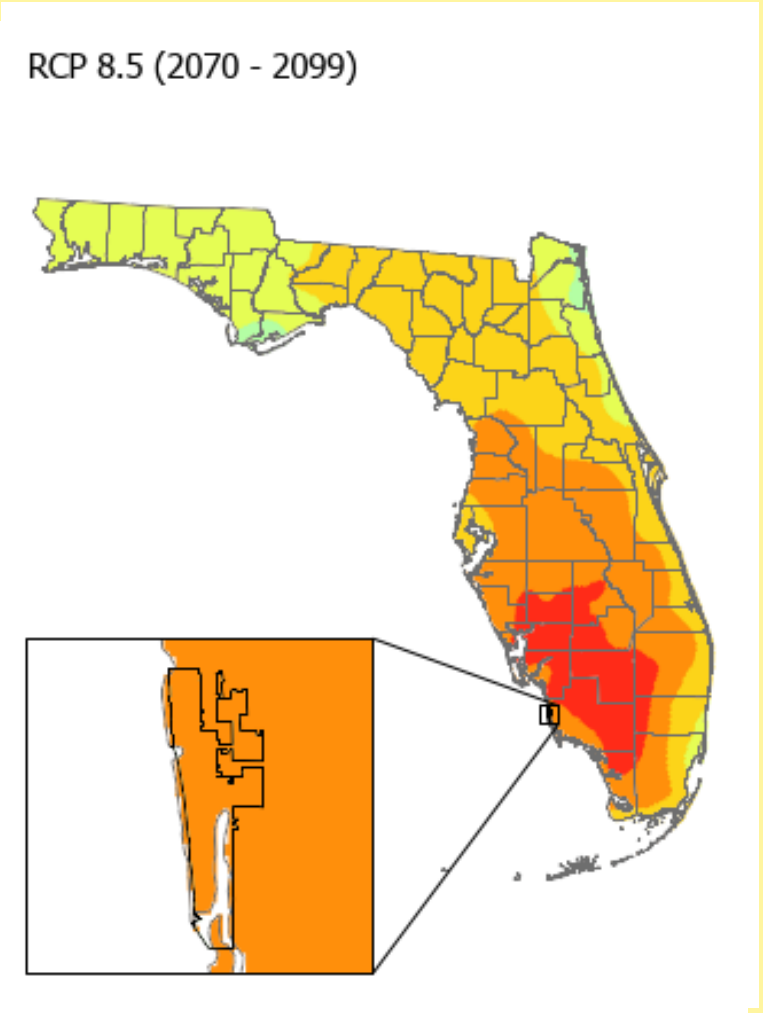


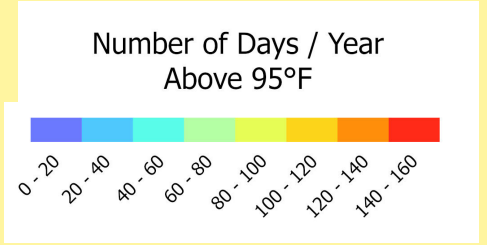


Climate Hazard Mapping: Extreme Heat









Climate Vulnerability Assessment Approach

Extreme Heat Hazard

Extreme Heat

- Mean Daily Maximum Temperature
  - +4 degrees by mid century
  - +8 degrees by end of century

- Days above 95 degrees F
  - +60 days by mid century
  - +120 days by end of century

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- 2023 was the hottest year on record.

- In 2023, Naples had 53 days of at least 2 hours of heat index values of 105° or higher.

Adaptation Strategy Overview

Asset Inventory

Different Assets Have Different Vulnerabilities

Transportation Assets and Evacuation Routes

- Streets, evacuation routes, traffic cabinets, City Dock, Airport

Critical Infrastructure

- Water, Wastewater, Stormwater, Electrical Utilities

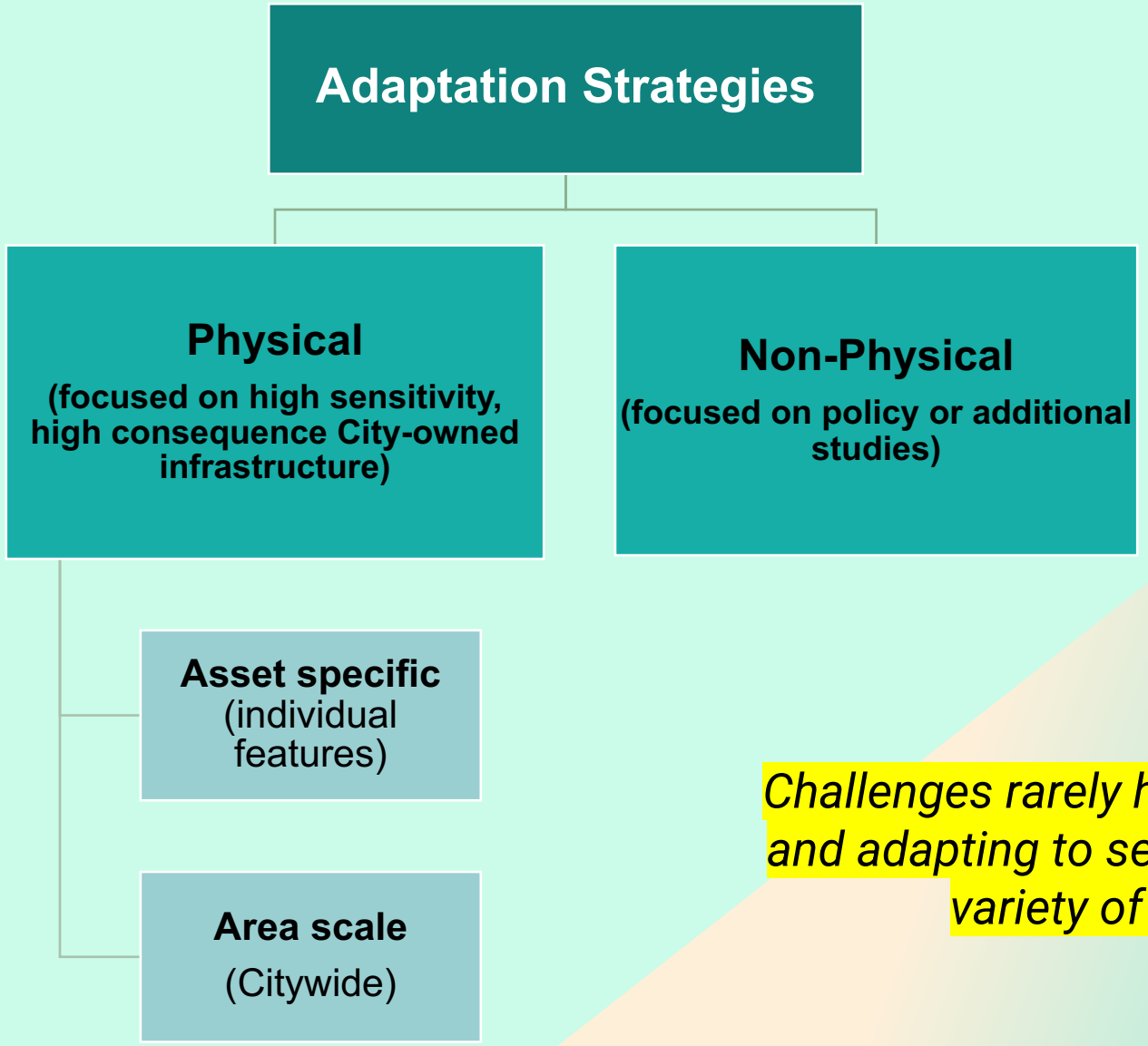
Critical Community and Emergency Facilities

- Police, Fire Stations, Local Government Facilities, Schools/Universities, Hospitals, Affordable Housing Areas, Economic Centers

Natural, Cultural, and Historical Resources

- Parks, Beaches/Dunes, Seagrass/wetland/mangrove/oyster reef areas, Historic District

Approaches to Adaptation



Challenges rarely have only one solution and adapting to sea level rise will take a variety of approaches.

Adaptation Plan Considerations

Sensitivity to Flooding/Heat

- Electrical/mechanical equipment
- Infrastructure materials (corrosive to flooding or malleable to heat)
- Susceptible to increased frequency/duration of inundation or extreme heat
- Buried equipment or system components

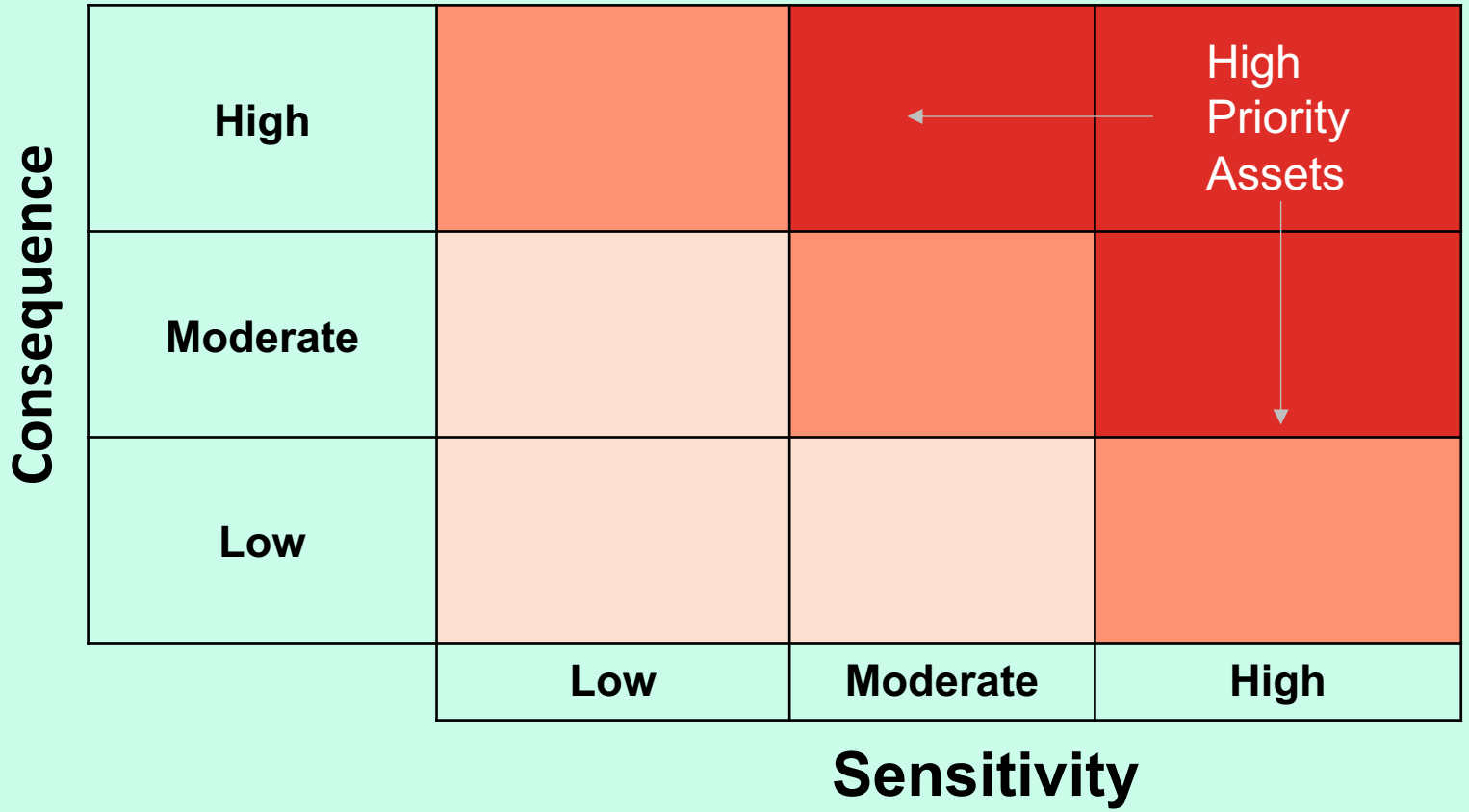
Consequence

- Life safety
- Level of service disruptions
- Public health effects
- Reduction in water quality
- Loss of jobs
- Damage/loss of habitat
- Impacts to cultural assets

Adaptation Plan: Prioritizing Assets

How vulnerable an asset is to the effects of climate change based on:

- Exposure
- Sensitivity
- Consequence



Project Evaluation Criteria
Consider the Following for Each Project

Engineering

1. Protects City's critical assets
2. Ability to adapt to climate considerations over time
3. Addresses multiple hazard types

Environment

1. Improves water quality
2. Protects, enhances, and expands sensitive habitats and ecosystem services
3. Reduces or offsets energy consumption or improves energy efficiency

Social Benefits

1. Improves public health metrics (e.g., public access and access to emergency services
2. Enhances resilience of the transportation network and supporting systems
3. Reduces risk of injury or loss of life

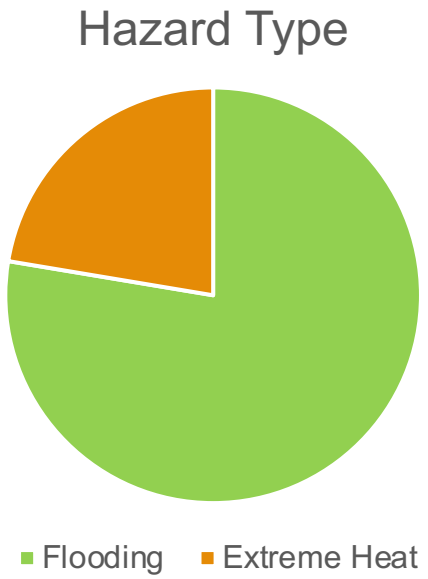
Implementation Feasibility

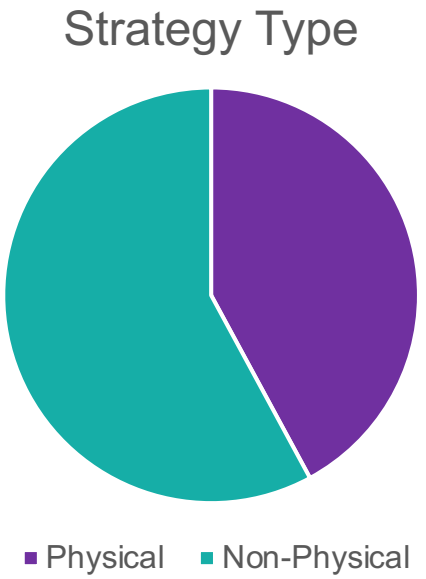
1. Funding/financing is partially or fully available
2. Capital and maintenance costs
3. Ability to implement given current policies and regulations

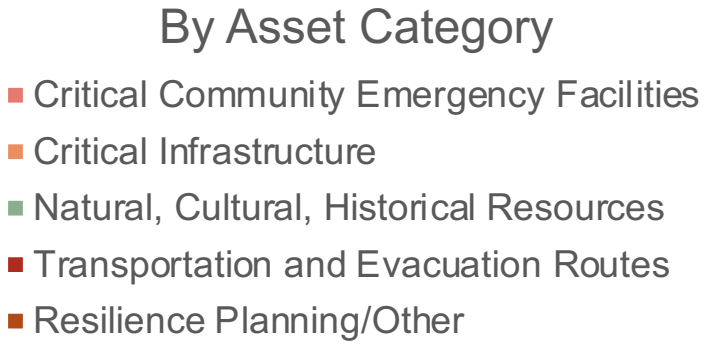
Proposed Strategies

- A total of 73 preliminary strategies were developed

- Most strategies aim to address flooding
  - 56 Flooding
  - 17 Extreme Heat







Incorporating Community Input

Final Project List

Questions??