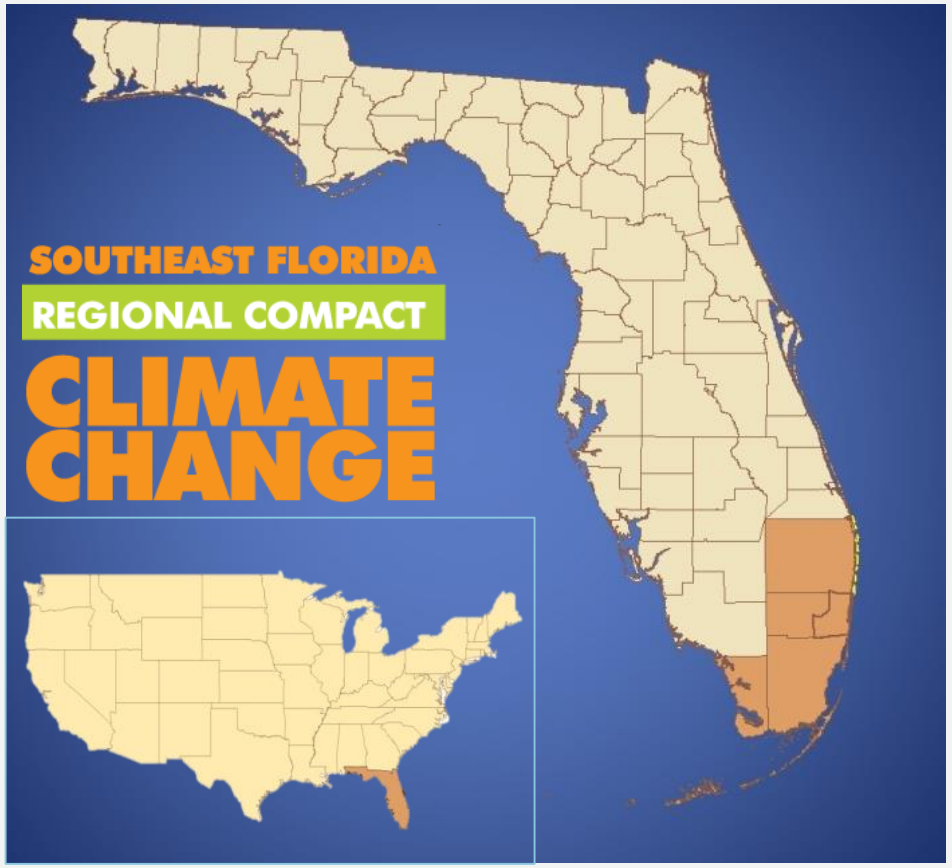
SOUTHEAST FLORIDA REGIONAL COMPACT

CLIMATE CHANGE

RCAP2.org

Hydrographic Services Review Panel, Federal Advisory Committee
April 2018



4 Counties, 109 Cities

- Policy Collaboration
- Regional Planning Baselines
  - Unified Sea Level Rise Projection
  - Inundation maps
  - GHG Emissions Baseline
- Regional Climate Action Plan
- Leadership Summits

2017 Summit

"Business of Resilience"

- Request for Evaluation of **Central and South Florida Flood Control System**
  - Expansion of Flood Protection System
- MOU with **Business Community**

2018 Summit in Miami Beach
October 24-25, 2018

URGENT NEEDS

Hollywood Marina with King Tides overflowing the boat ramp.
Water depth @ 1 foot 11 inches at the street entrance.
Tides enhanced by significant onshore winds, October 5, 2017.

Intracoastal seawall along South Lake in Hollywood during King Tides on October 6, 2017.

KING TIDES

Harrison Street looking east Towards the Intracoastal on October 5, 2017

Home along the street with vehicle wake into front yard

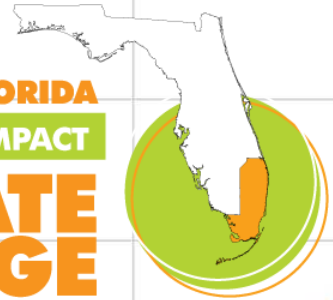
ACTIVE REDEVELOPMENT

Building elevations need to consider future conditions

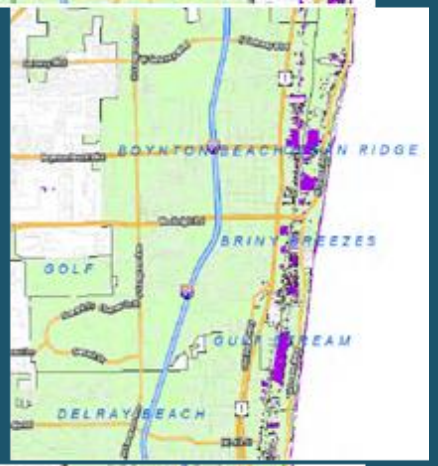
Unified Sea Level Rise Projection
(Southeast Florida Regional Climate Change Compact, 2015)

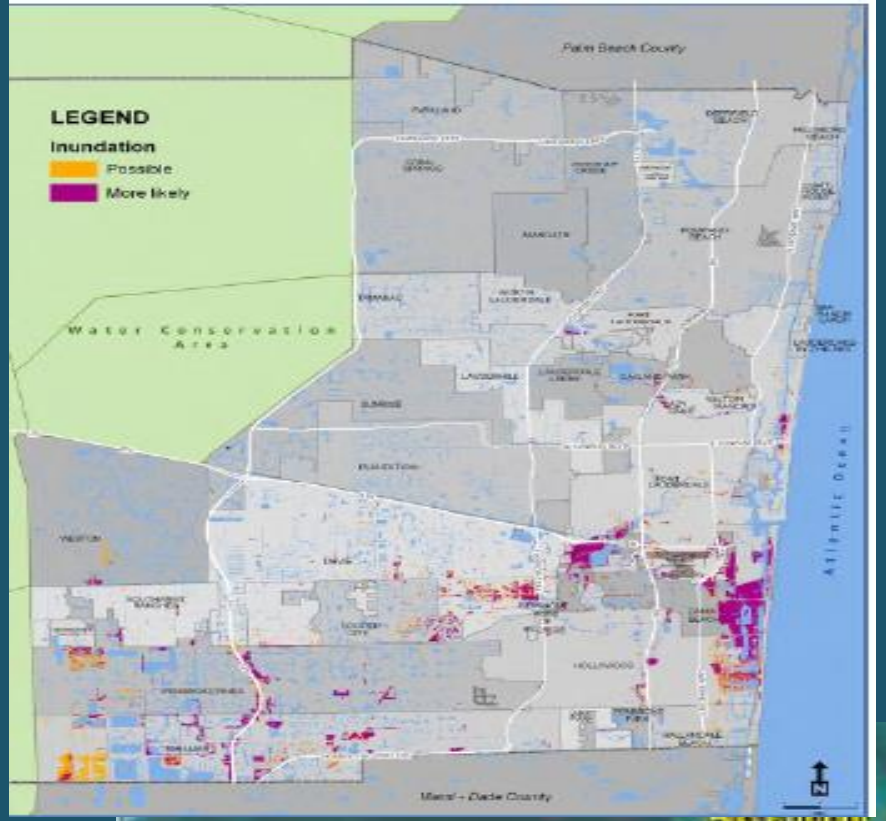
Year	IPCC AR5 Median (inches)	USACE High (inches)	NOAA High (inches)
2030	6	10	12
2060	14	26	34
2100	31	61	81

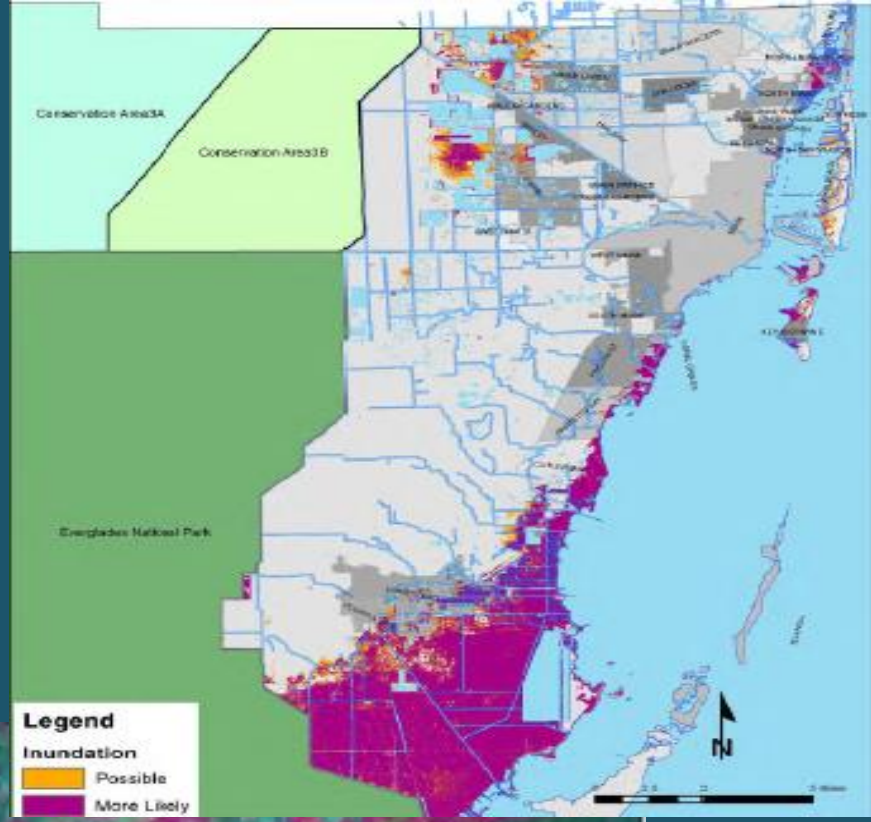
SOUTHEAST FLORIDA REGIONAL COMPACT CLIMATE CHANGE



SoutheastFloridaClimateCompact.org



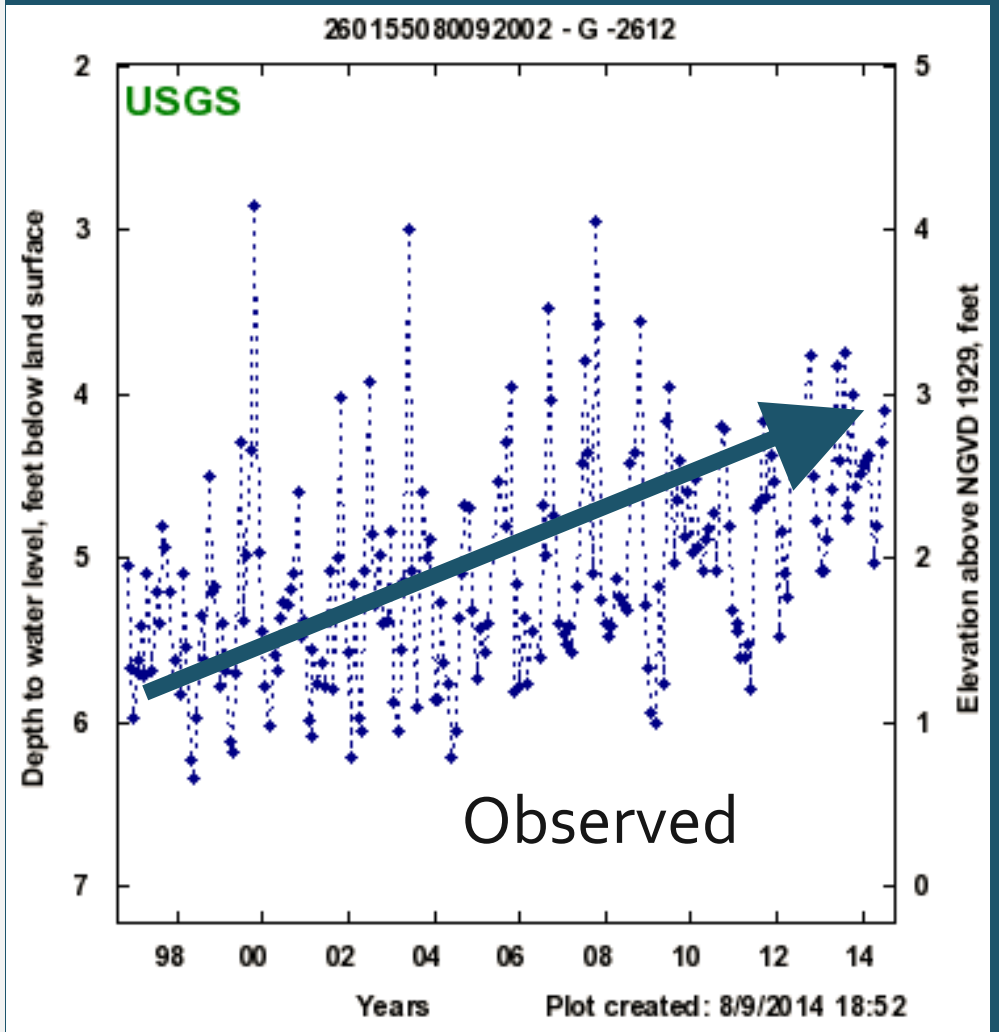




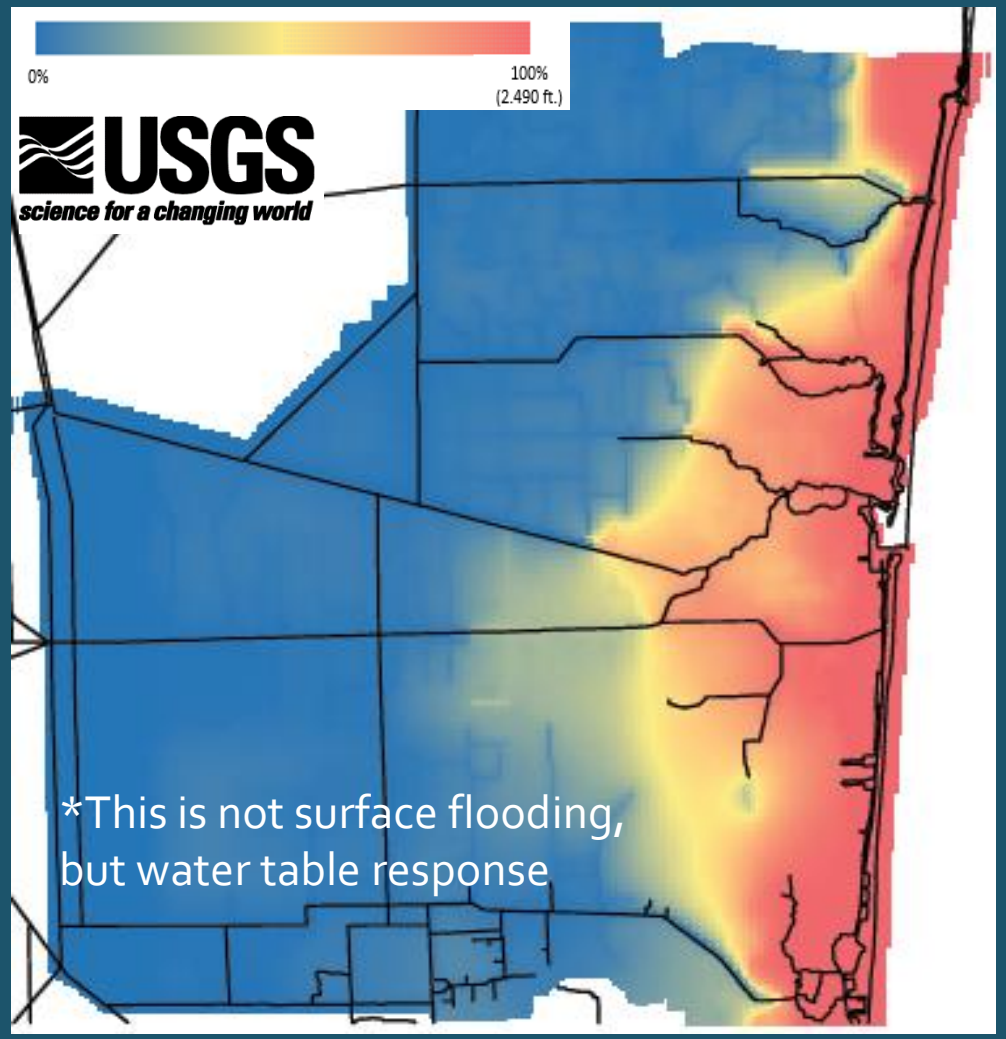
2 feet by 2060

GROUNDWATER RISE

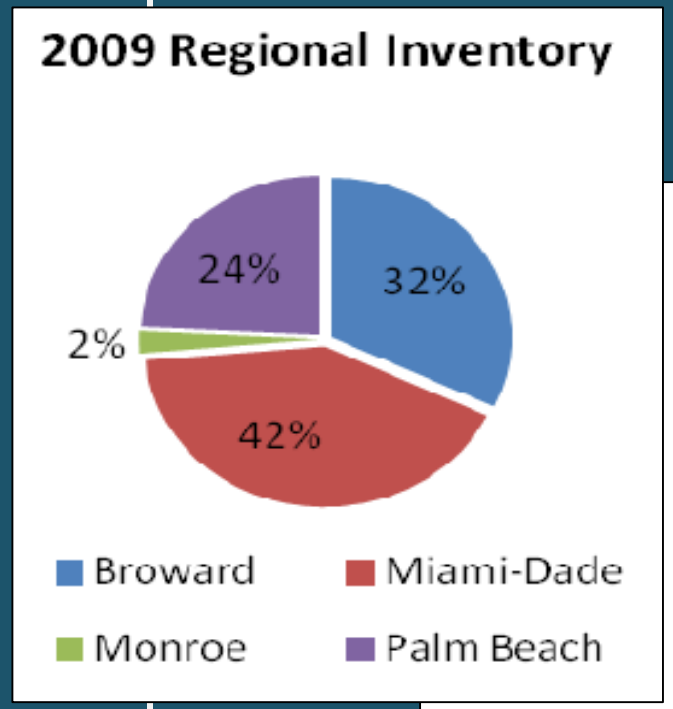
Depth to Water

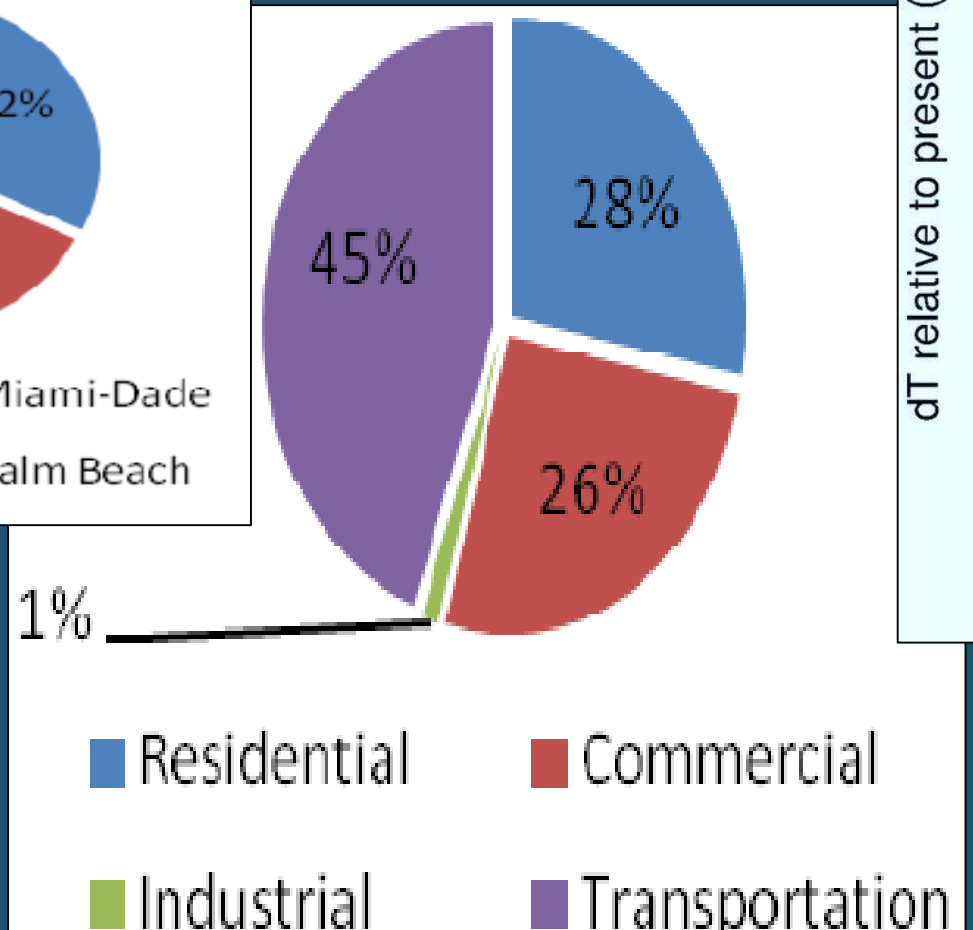


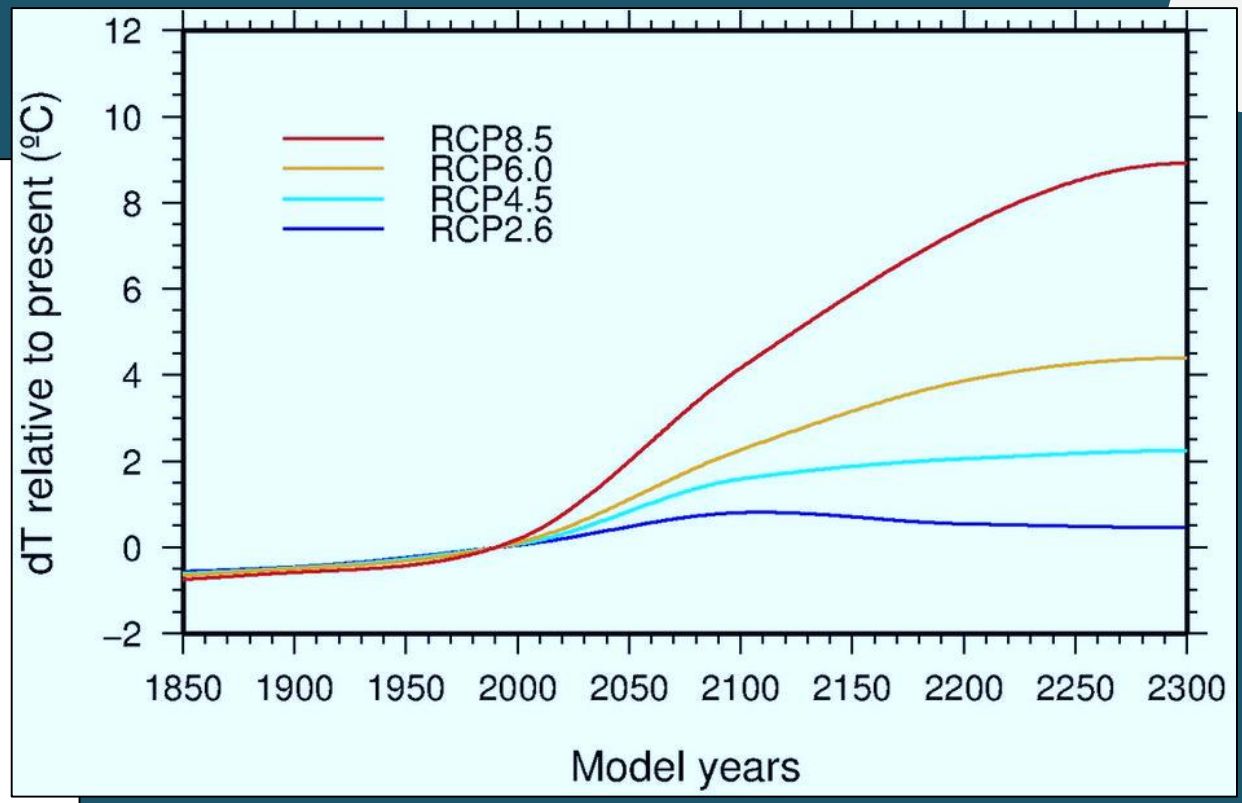
Predicted 2060-2070



65M TONS CO_2

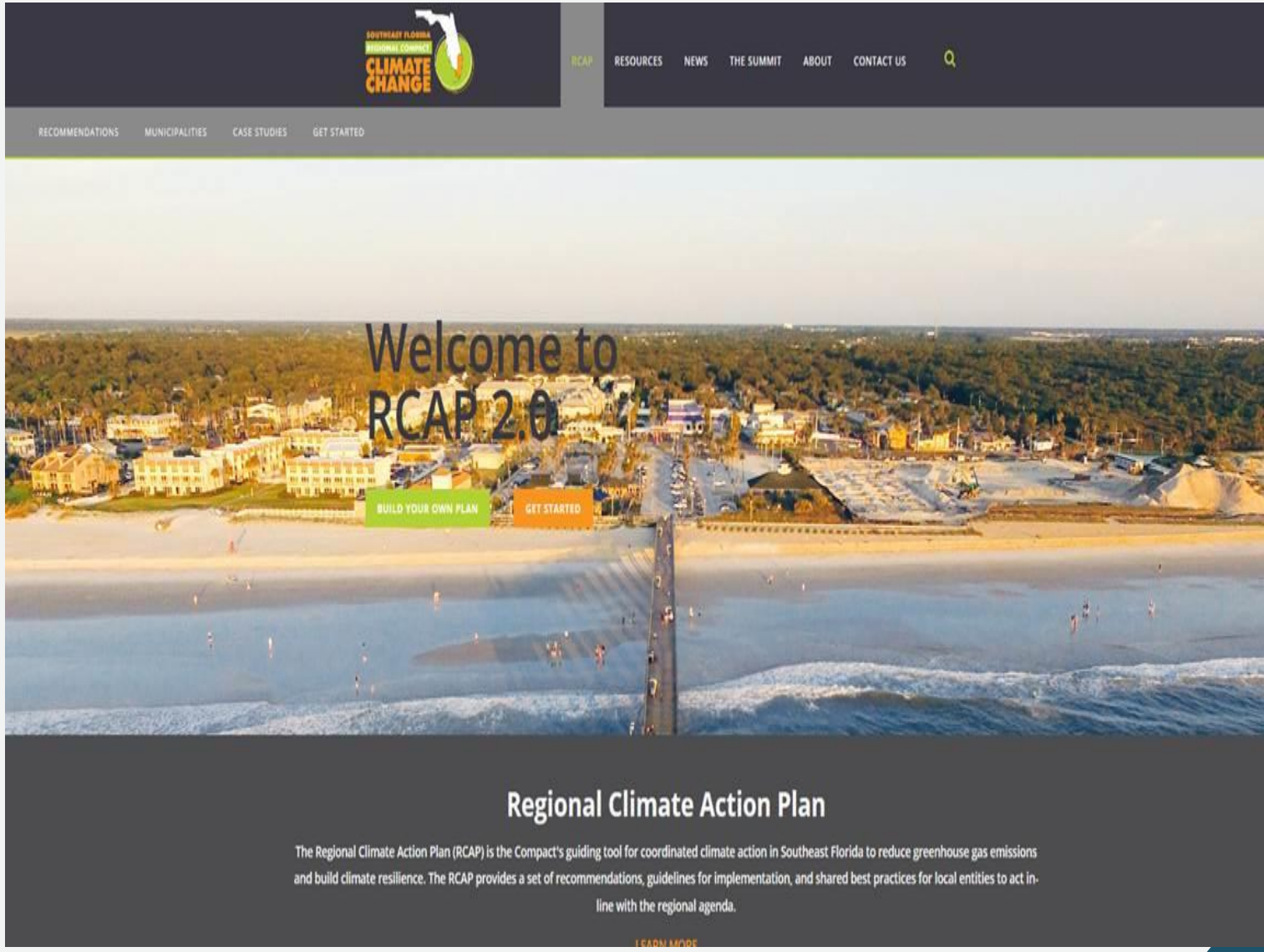

2009 Regional Inventory
24%
32%
2%
42%
Broward
Miami-Dade
Monroe
Palm Beach


45%
28%
26%
1%
Residential
Commercial
Industrial
Transportation


dT relative to present (ºC)
12
10
8
6
4
2
0
−2
RCP8.5
RCP6.0
RCP4.5
RCP2.6
1850
1900
1950
2000
2050
2100
2150
2200
2250
2300
Model years

APPROACH

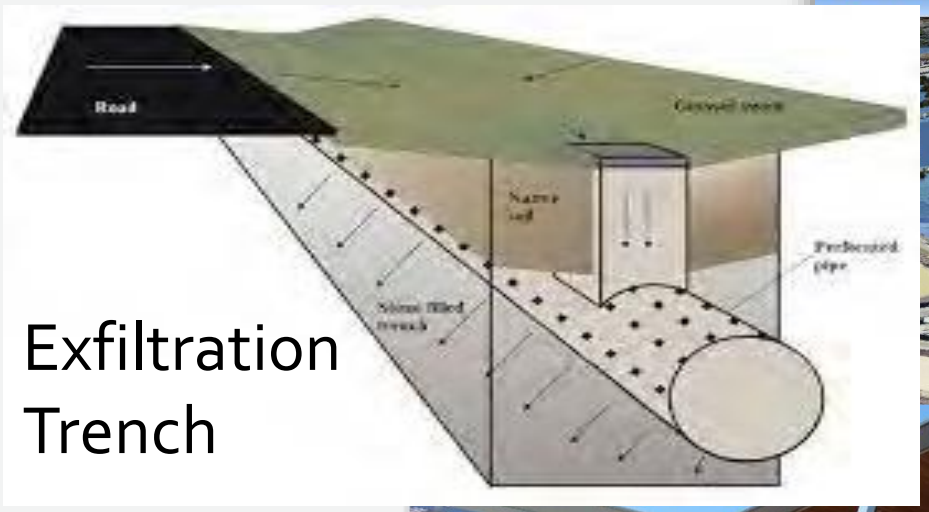
Regional Climate Action Plan 2.0



www.southeastfloridaclimatecompact.org

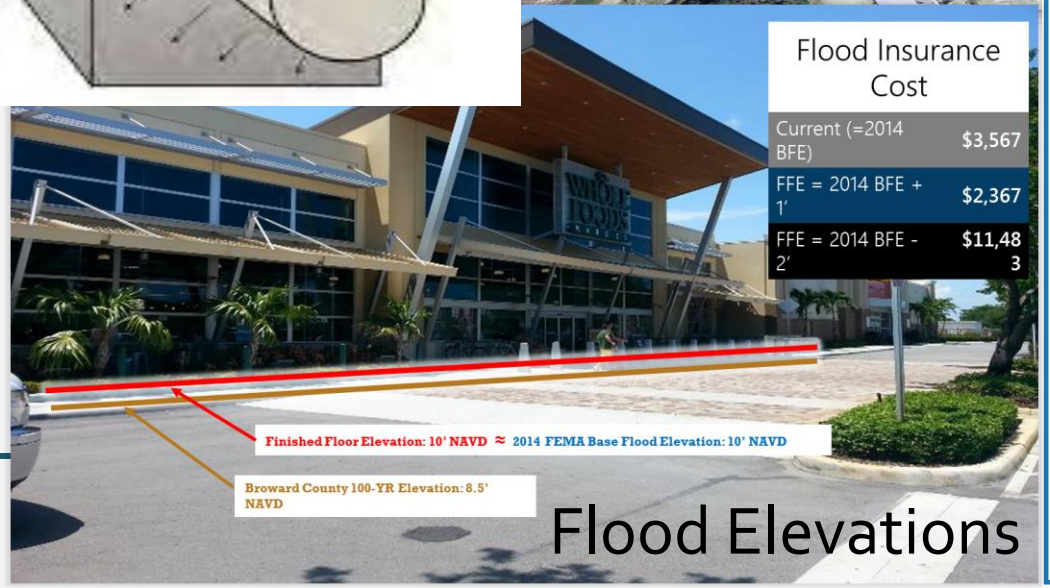
RCAP2.org

Future Conditions Map Series

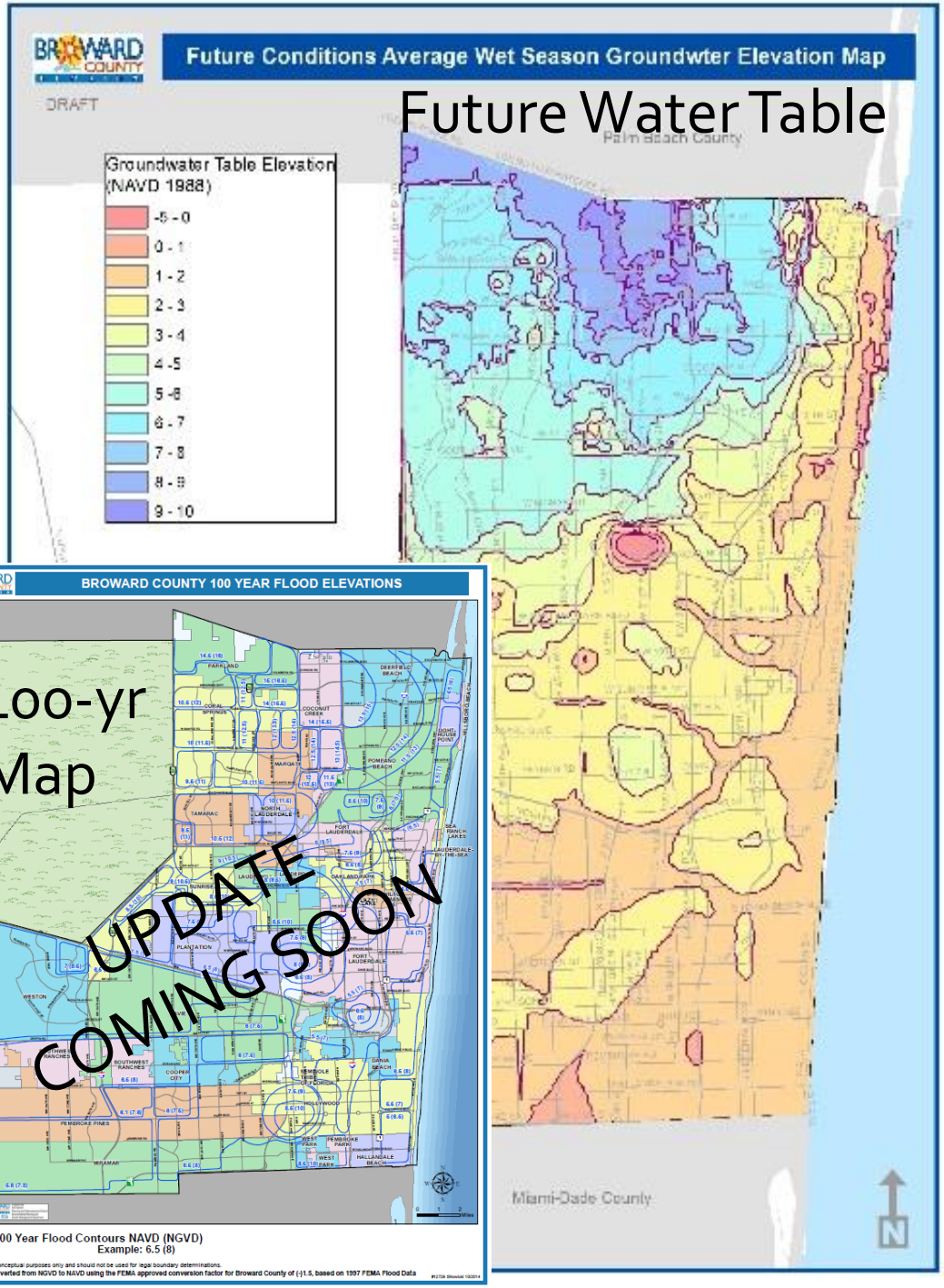


Exfiltration Trench

Risk



Flood Elevations



Future Water Table

100-yr Map

UPDATE COMING SOON

BROWARD COUNTY FLORIDA

Roadway Elevation & Condition

Adjacent Property Elevation

Driveway Access

Space for Drainage Improvements

ROW Requirements

Electrical And Water/Sewer Utilities

Elevation of Water Table

Water Quality Requirements For Permitting

Stormwater System Maintenance Costs Including Staff

MONROE COUNTY

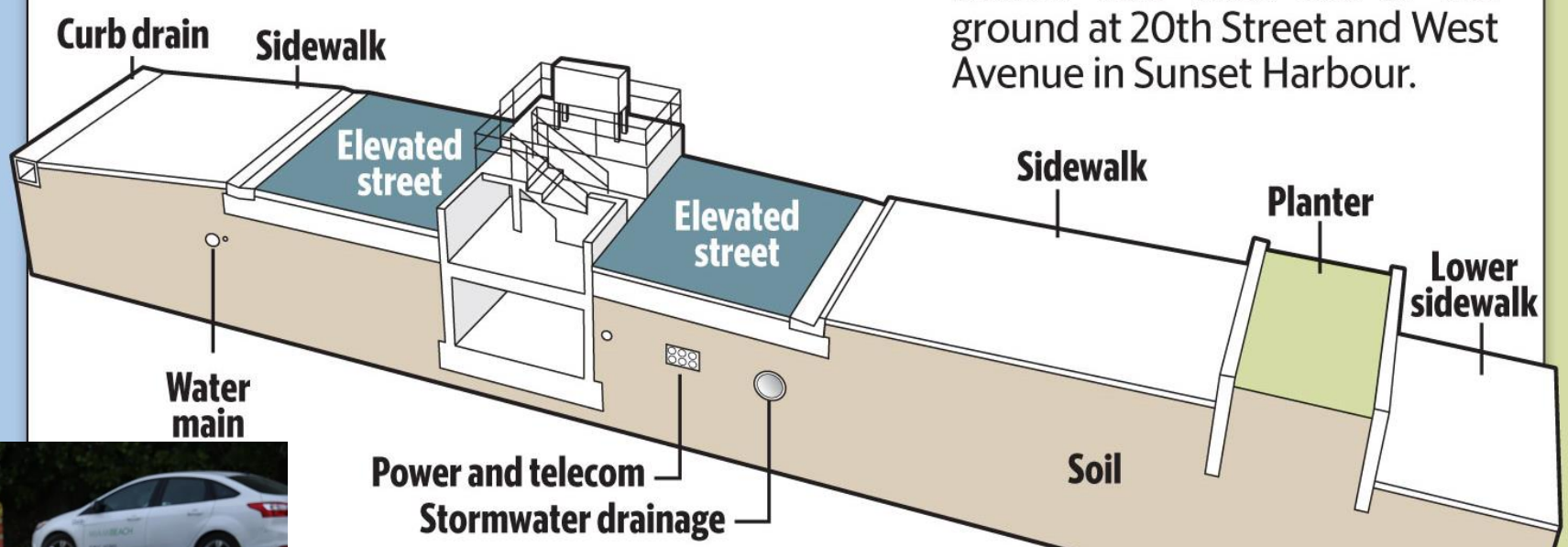
MIAMIBEACH

RISING ABOVE

Do Not Use without Permission

20th Street at pump station 3

The control panel for a pump station now rises out of the ground at 20th Street and West Avenue in Sunset Harbour.

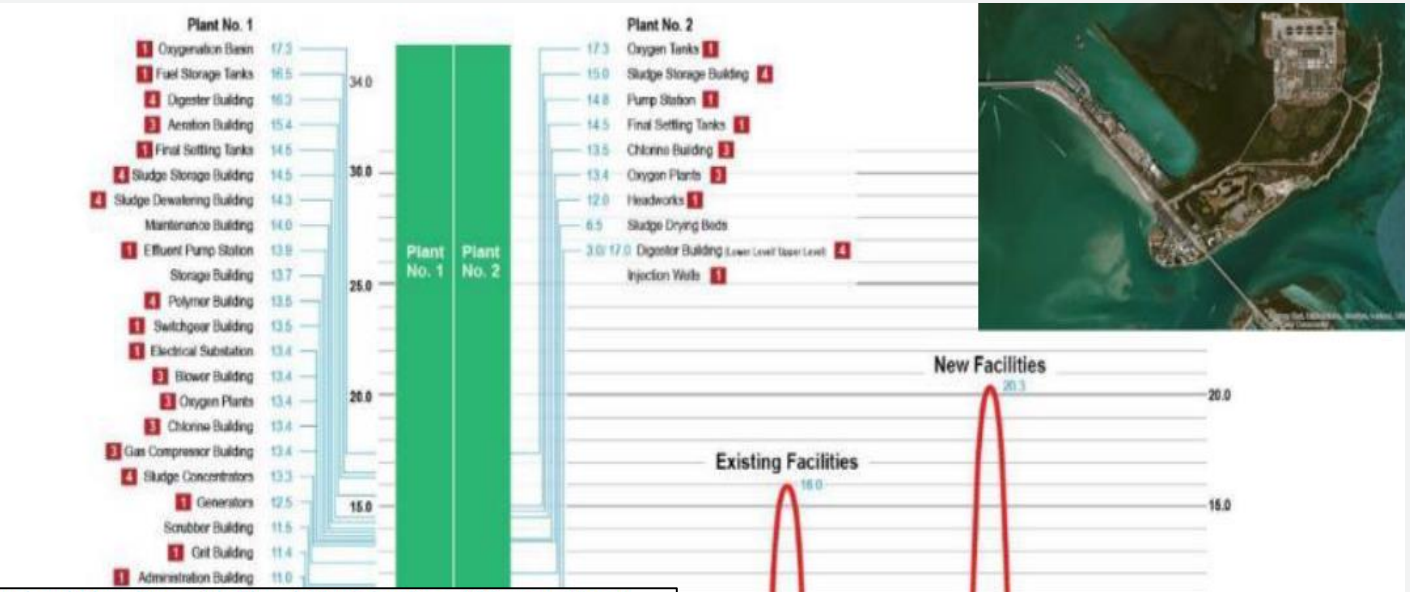


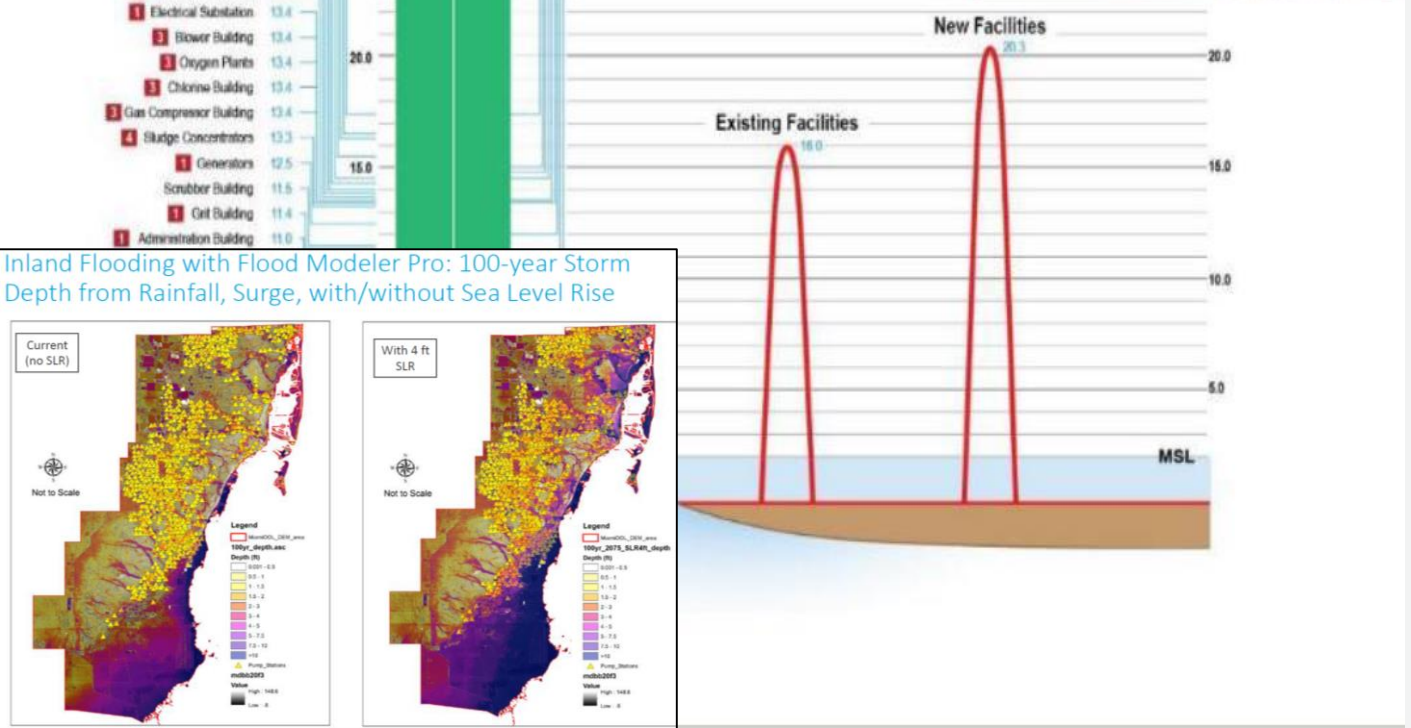
Source: City of Miami Beach

MARCO RUIZ mruiz@miamiherald.com

Miami Dade County

MDWASD
Operationalizing Resilience





Inland Flooding with Flood Modeler Pro: 100-year Storm Depth from Rainfall, Surge, with/without Sea Level Rise

Hardening Design Guidelines

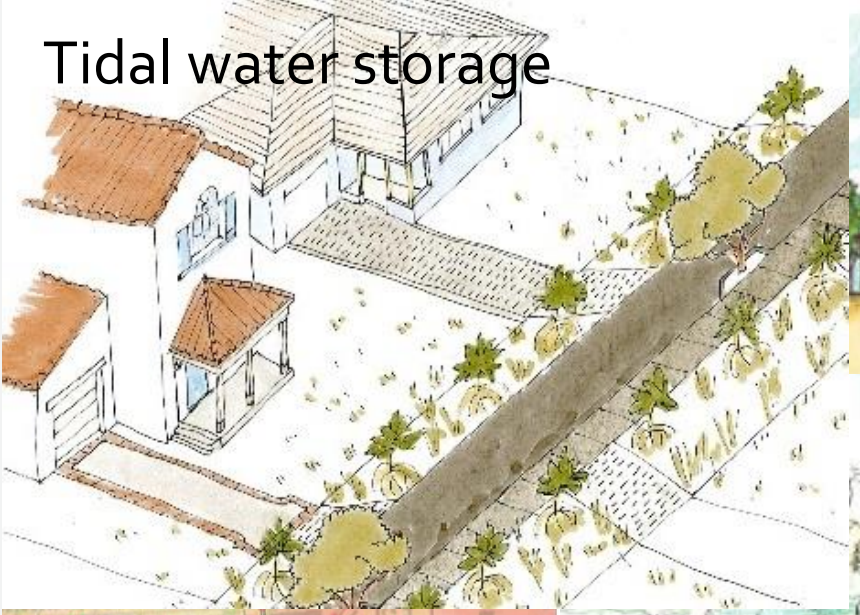
- Facility flood control costs developed for critical facilities above design flood elevation
- Example for Central District WWTP
  - Existing Facility @16 NGVD
  - New Facility a@ 20.3 NGVD
- Includes
  - Free Board of 2 feet (ASCE)
  - Safety Factor of 1 foot (based on mean high water)
  - Sea Level Rise of 4 feet (USACE High in 2075)

REGIONAL ECONOMICS

- Reducing climate risk across sectors
- Adaptation through redevelopment
- Reducing insurance premiums
- 40% loss can be averted cost-effectively
  - 10% GDP loss to climate
  - $1 spent on natural infrastructure = $20 saved
- Sustain financial and real estate markets

MOVING FORWARD

Tidal water storage



Interconnected water storage

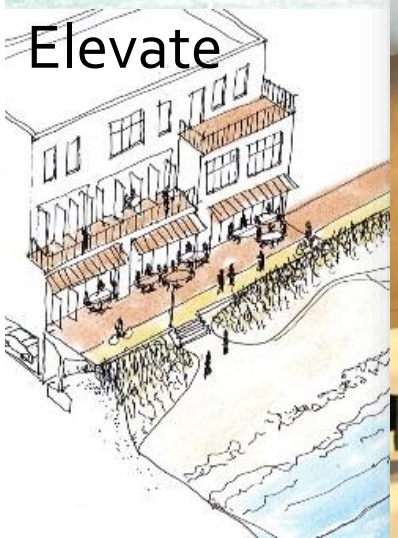
Larger, multi-purpose dunes

Restore low-lying areas

Reconnect hydrology

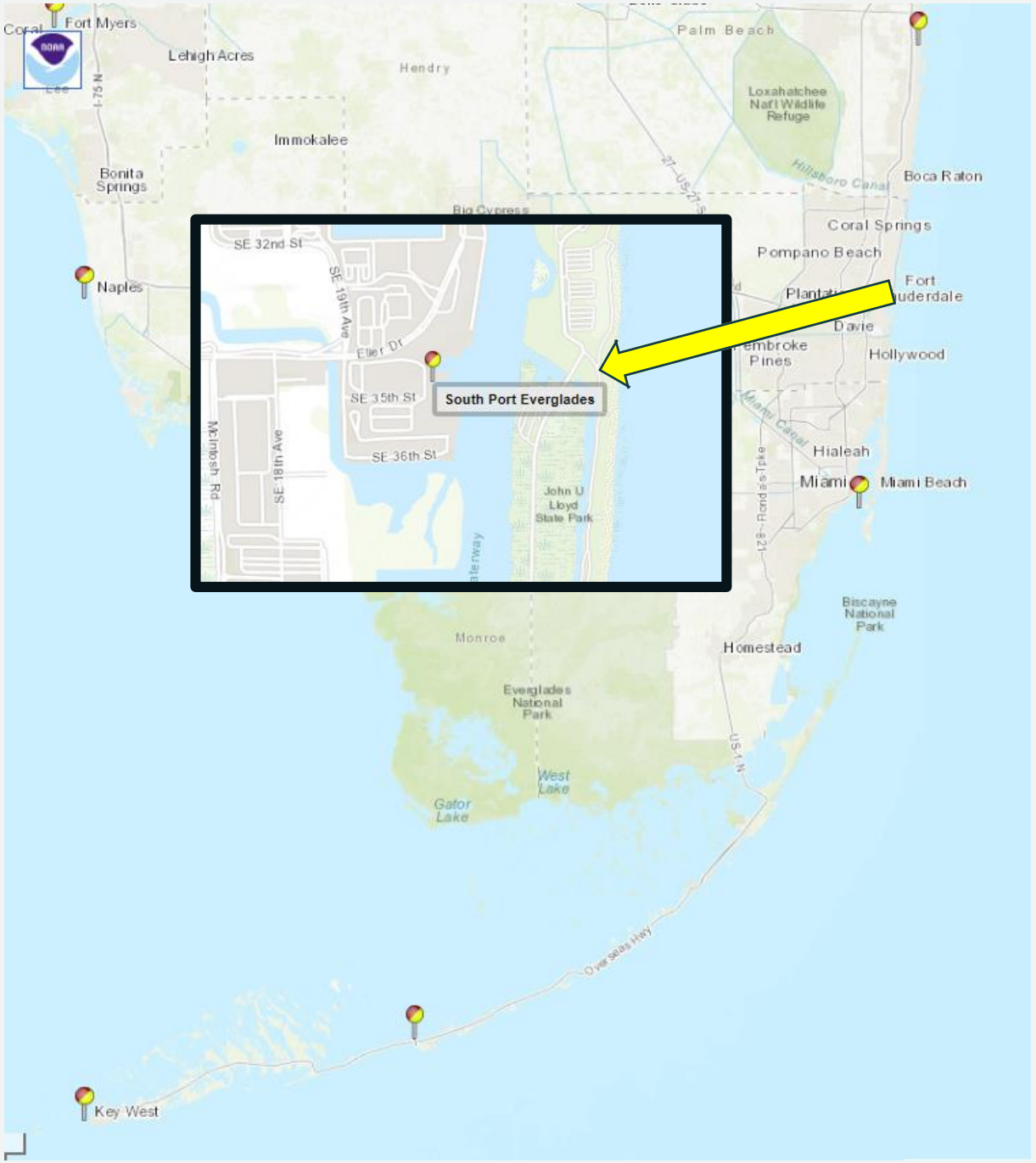
New living shorelines

Elevate



Regional Monitoring Network

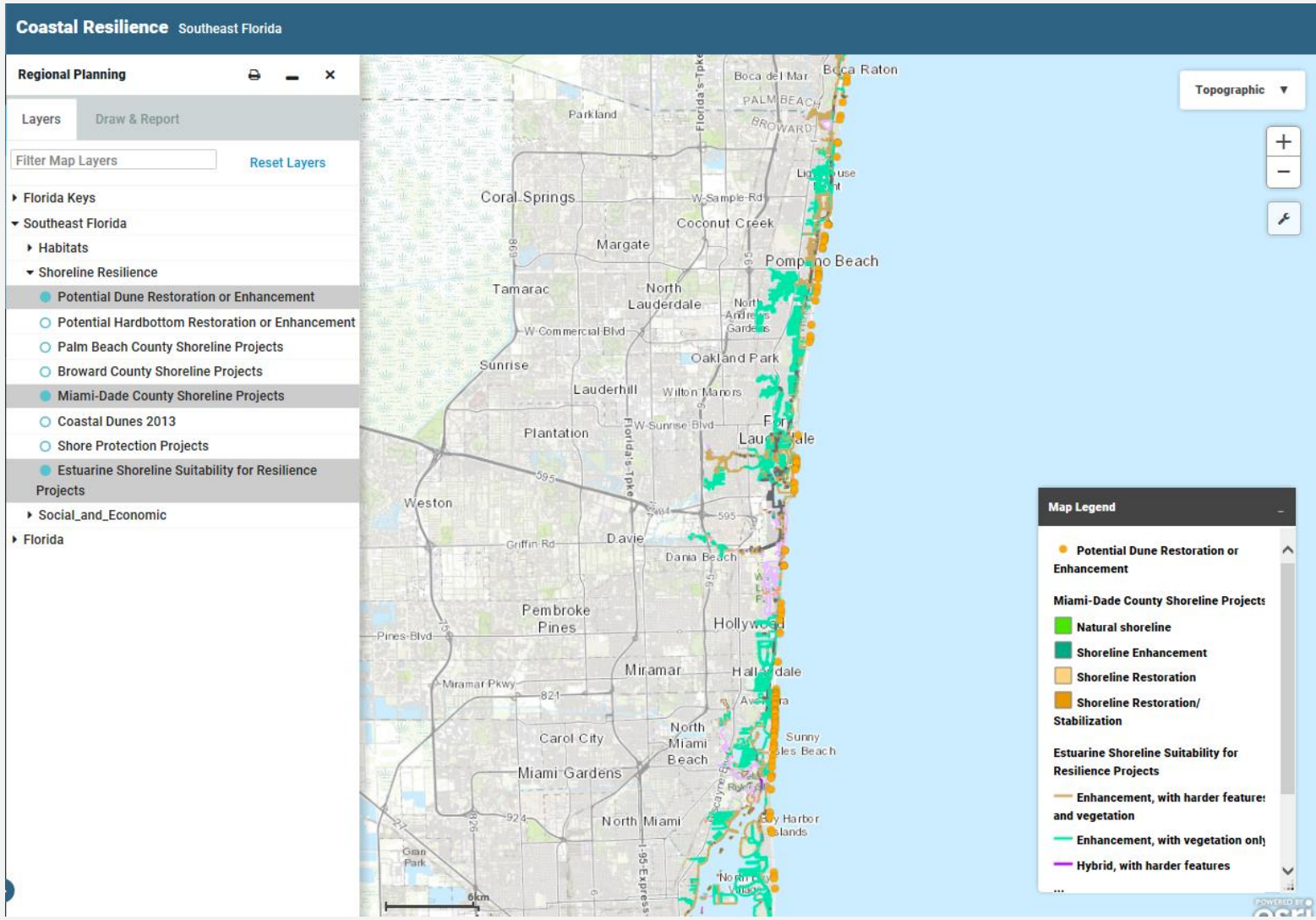
NOAA PORTS County and City gauges



Coastal Resilience Toolkit

Compilation of project and feasibility data

Shoreline Resilience Working Group



The Nature Conservancy

http://maps.coastalresilience.org/seflorida/#

LEGISLATIVE REQUESTS 2018-19

- Proposed FDEP budget contains $1,000,000

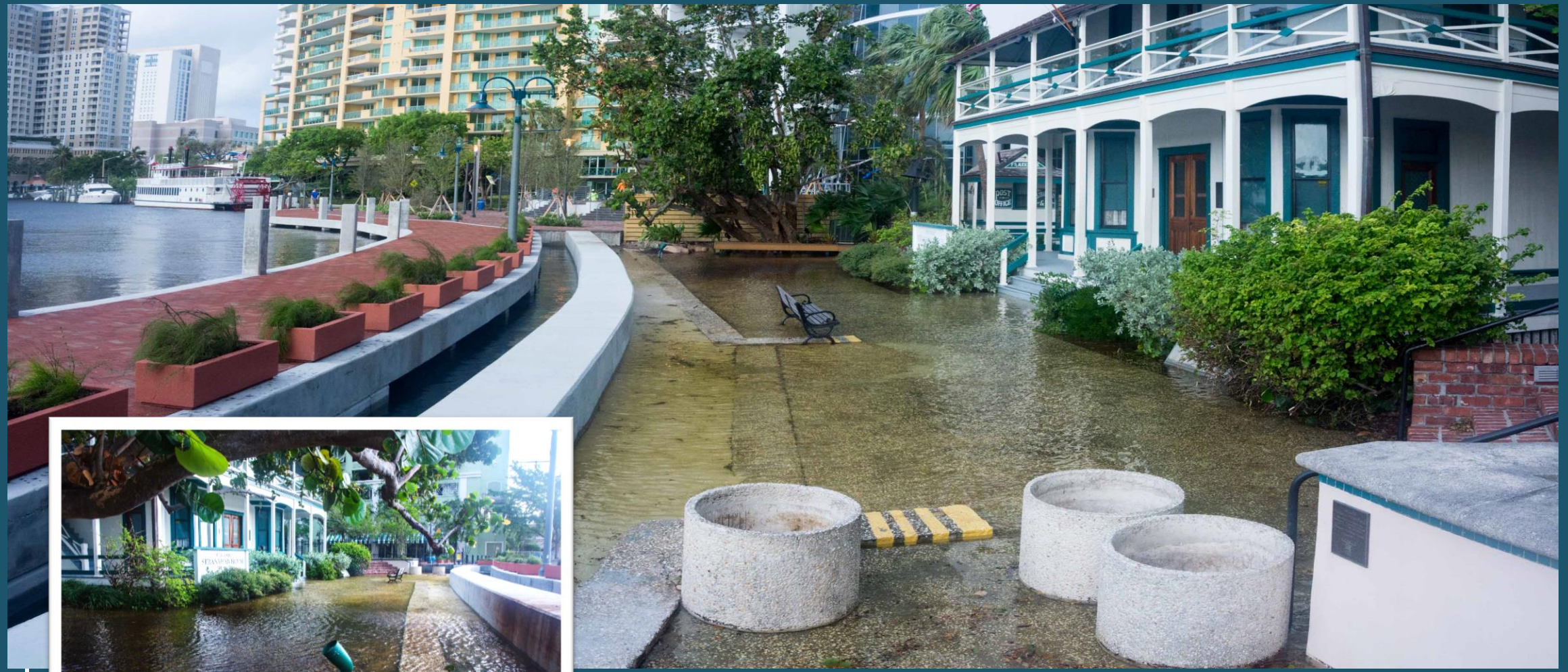
  - Continue water quality and coral disease projects

- Southeast Florida Coral Reef Ecosystem Conservation Area - HB 53 and SB 232

  - Sovereign submerged lands and state waters offshore Martin, Palm Beach, Broward and Miami-Dade Counties

Also endorsed by the Southeast Florida Coastal Ocean Task Force and jointly by the South Florida Regional Planning Council and the Treasure Coast Planning Council

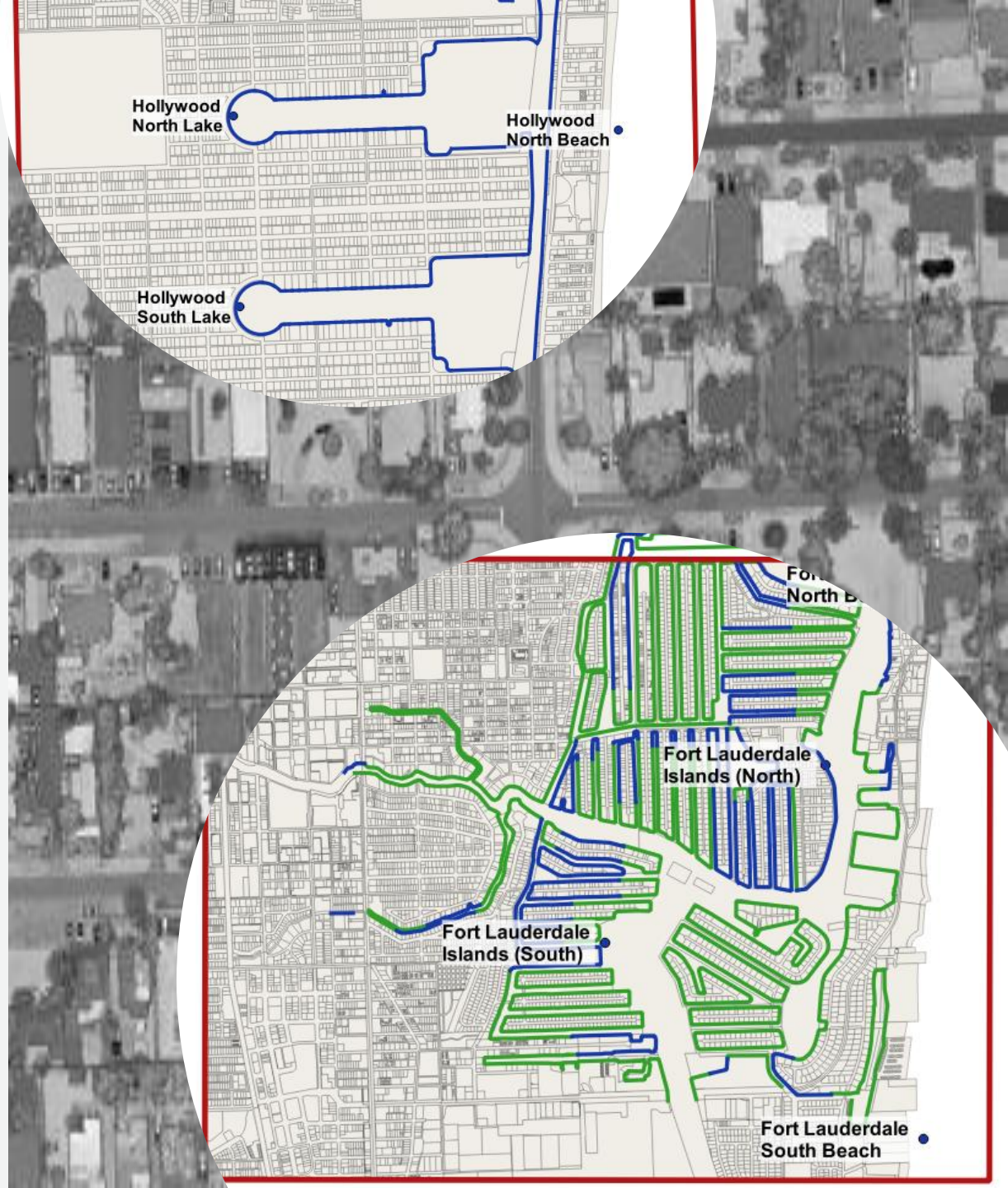
REGIONAL RESILIENCE INFRASTRUCTURE STANDARDS



- Adaptation Action Areas in redevelopment
- Innovations in material science and design

USACE Resiliency Study Update

- Seawalls included
- Resolution increased, 10 meter minimum
- Model cells refined to allow flow along typical paths overland not just in canals
- FEMA used average water levels for southeast Florida
- Broward levels are actually 0.4 higher than average, included in USACE study
- Have flexibility to run storm at high tide as scenario, FEMA randomizes start of tide



Regional Priority Needs

SOUTHEAST FLORIDA REGIONAL COMPACT CLIMATE CHANGE

- Active offshore wave buoys and gulfstream monitoring
- Nearshore current data to support turbidity analyses
- Bathymetry in intracoastal to support resilience studies and projects
- High water marks, real time monitoring of storm characteristics
- Anticipated scouring projections with sea level rise
- Data for South Atlantic Division Resiliency Study
- Support for design manual revisions by state agencies
- Expedited access to post-storm data