

# South Florida Coastal Habitats



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Edges of Our Estuaries Workshop, Guana Tolomato Matanzas NERR  
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# Coastal Habitat Integrated Mapping and Monitoring Program (CHIMMP)

- Ryan Moyer, Kara Radabaugh  
<https://myfwc.com/research/habitat/coastal-wetlands/projects/chimmp/>



Salt marshes (blue), mangroves (green)

# Oyster Integrated Mapping and Monitoring Program (OIMMP)

- Ryan Moyer, Kara Radabaugh, Steve Geiger;  
<http://ocean.floridamarine.org/OIMMP/>



Oyster reefs (brown)

# Coastal Wetlands of South Florida



- Mean tidal range of 0.5-0.8 m (1.7-2.7 ft)
- Mixed tides in SW FL, semidiurnal tides in SE FL
- Estuaries are predominantly bays with tidal inlets
- Salt marshes and mangrove forests, especially in SW FL

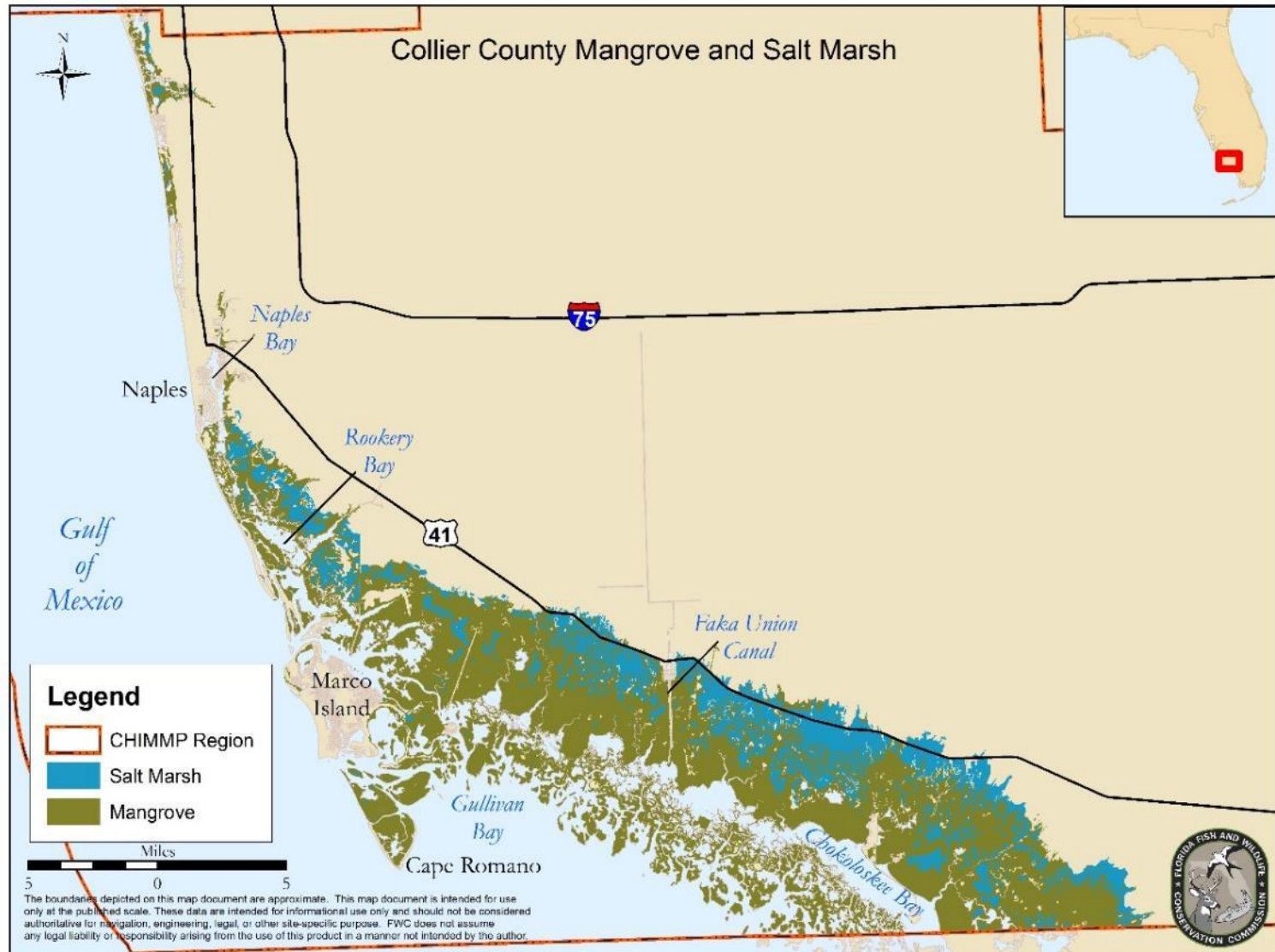


# Coastal Wetlands of South Florida





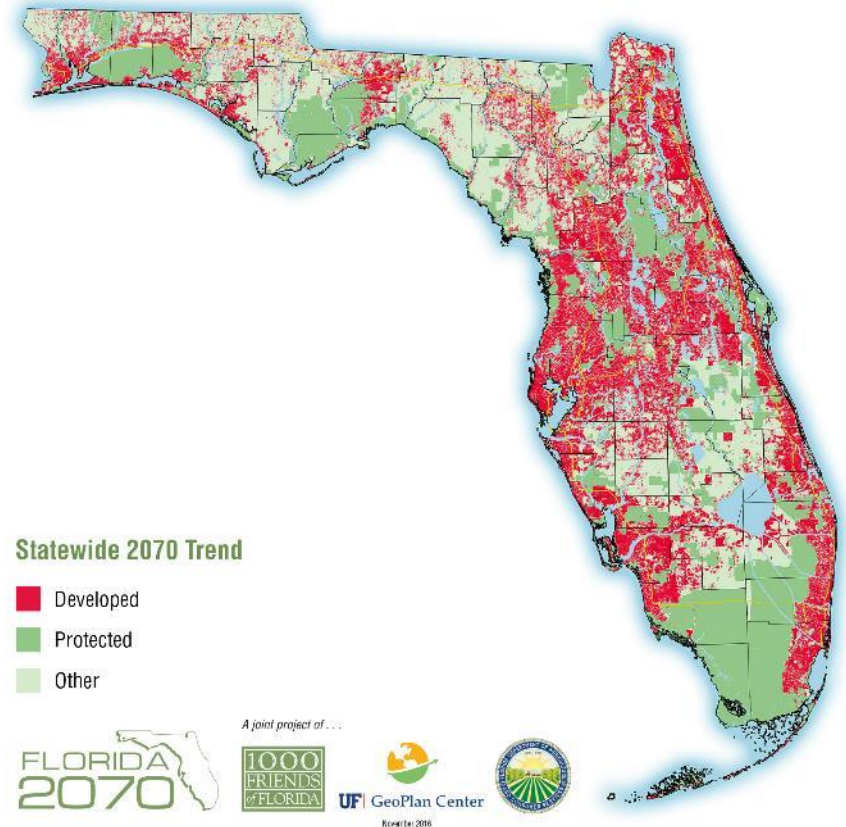
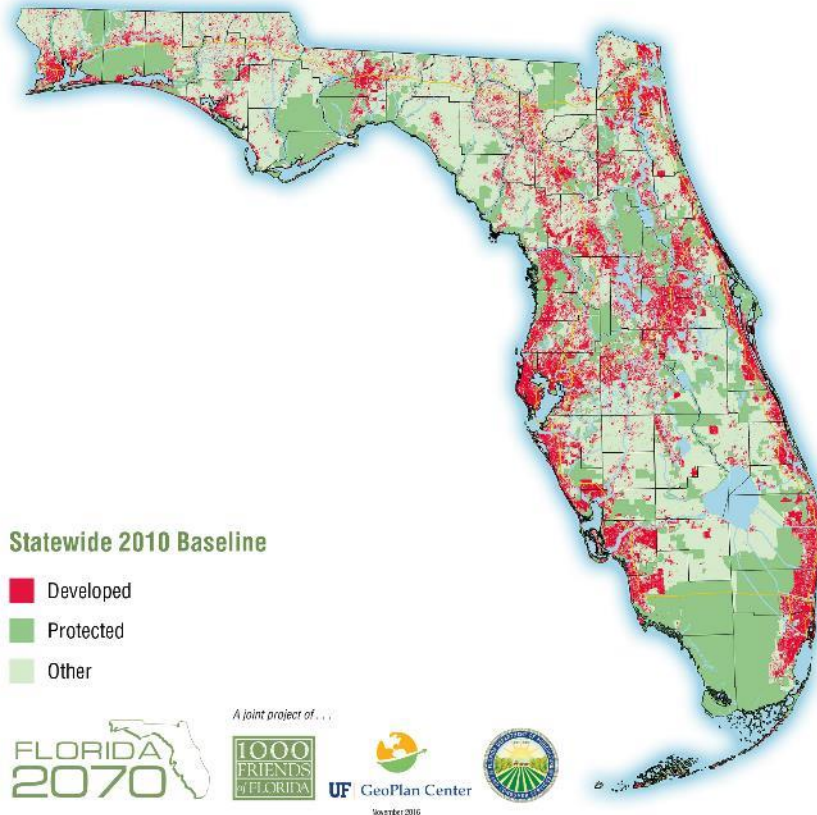
# Coastal Wetlands of South Florida



# Threats to Coastal Wetlands in S. Florida

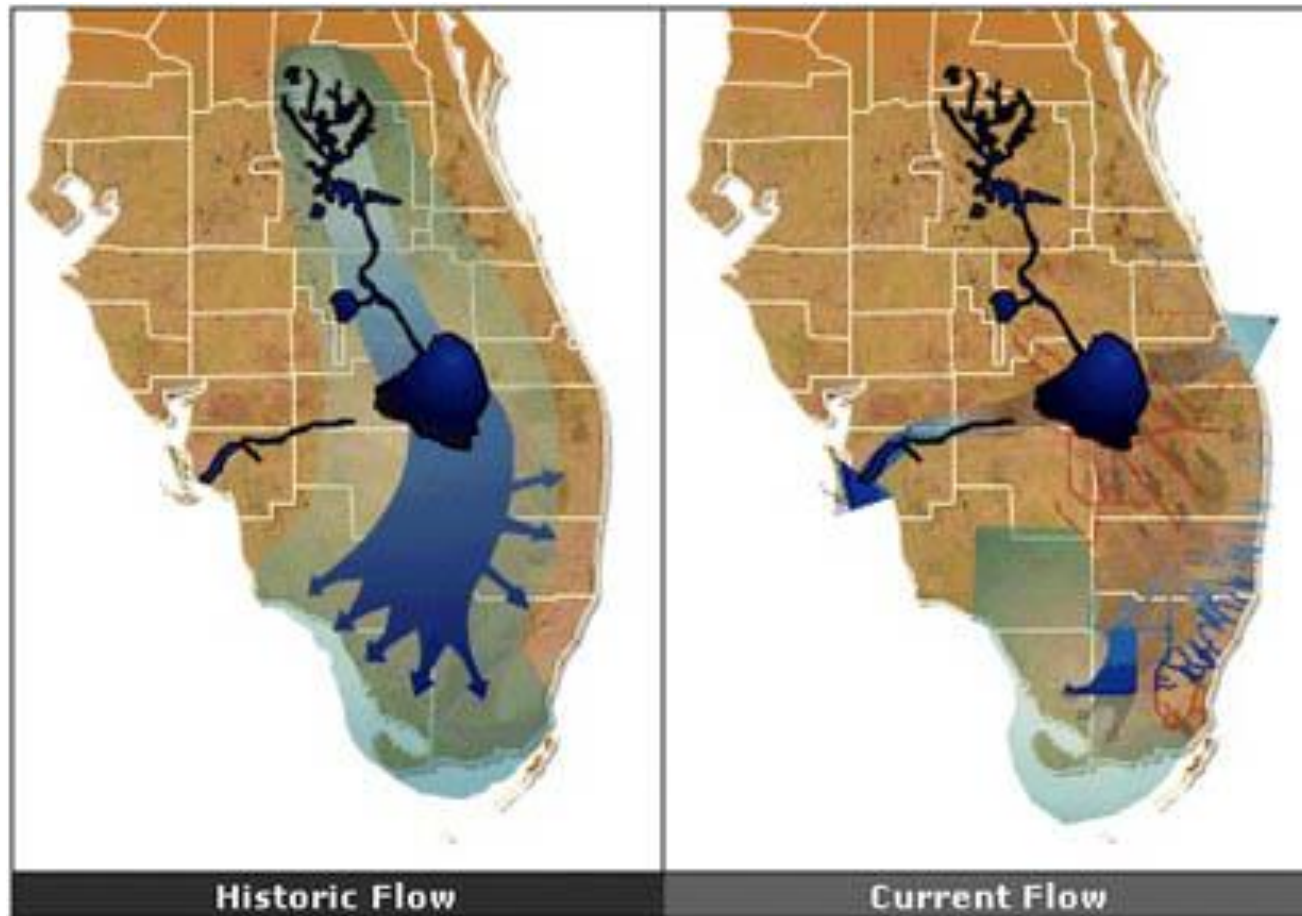
Of original wetland extent in Florida, 56% remains  
(Dahl 2005)

- Coastal development



# Threats to Coastal Wetlands in S. Florida

- Altered hydrology



# Threats to Coastal Wetlands in S. Florida

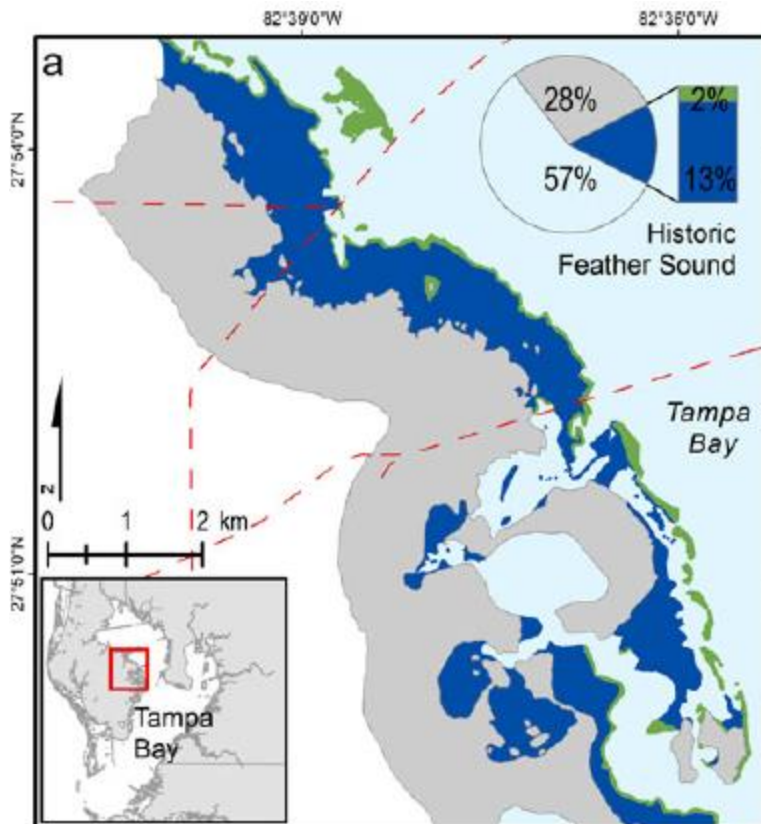
- Climate change and sea-level rise
- Hurricanes
- Other threats
  - Mangrove trimming
  - Erosion from boat wakes
  - Invasive vegetation



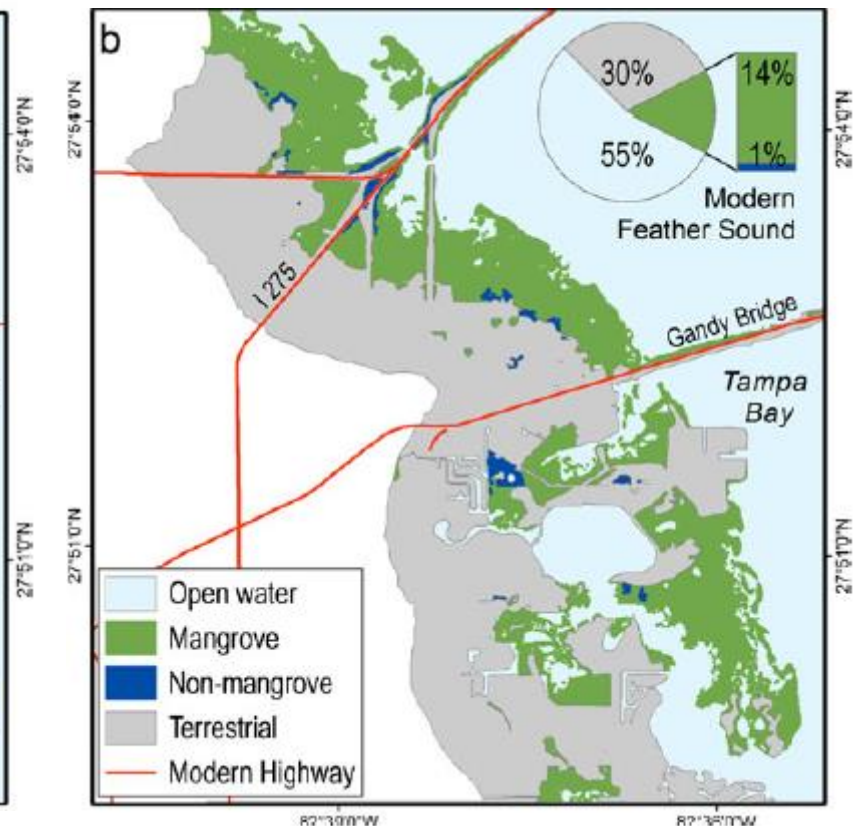
# Coastal Wetland Change Over Time

- Mangrove encroachment into salt marshes driven by lack of cold events and sea-level rise (Tampa Bay example, Raabe et al. 2012)

1875



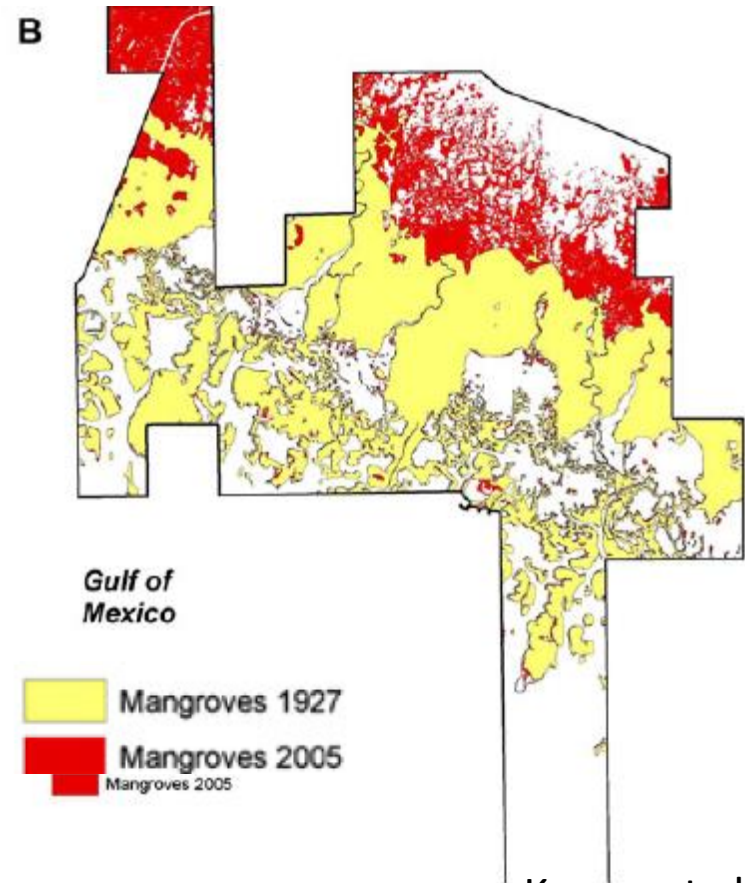
2000



# Coastal Wetland Change Over Time

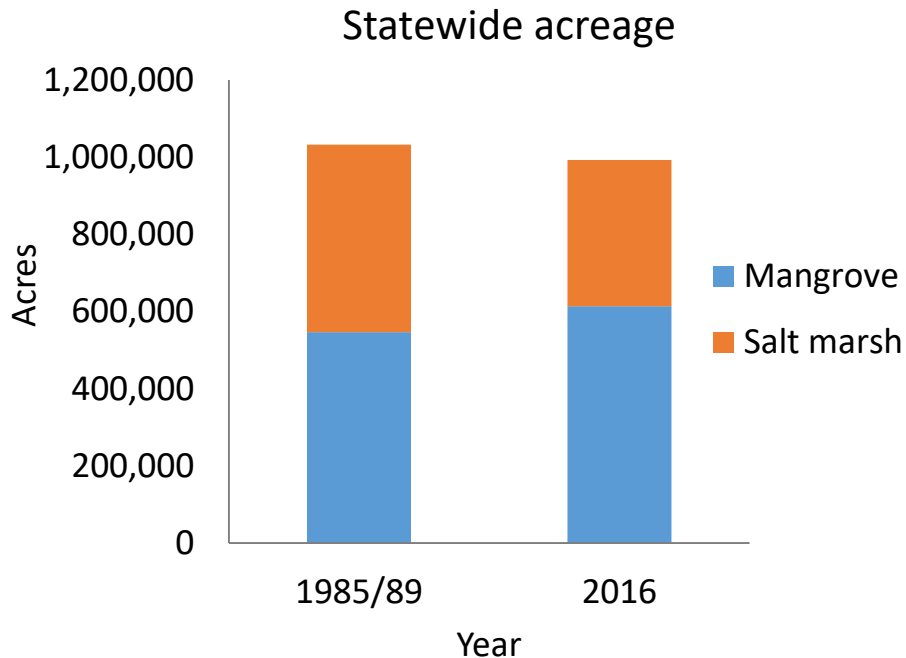
- Inland mangrove encroachment driven by altered hydrology and sea-level rise

(Ten Thousand Islands example, Krauss et al. 2011)



Krauss et al. 2011

# Mangrove Encroachment



Data source: FWC 1985/89 land cover maps and Cooperative Land Cover v. 3.2

Statewide, in the past 30 years:

- Mangrove extent increased 12%
- Salt marsh extent decreased 22%
- Total extent of coastal wetlands decreased 4%





# Oyster Reefs of South Florida



- Reefs present in Southwest Florida (Tampa Bay to Everglades)
- Limited extent in Southeast Florida (high development, high salinity)

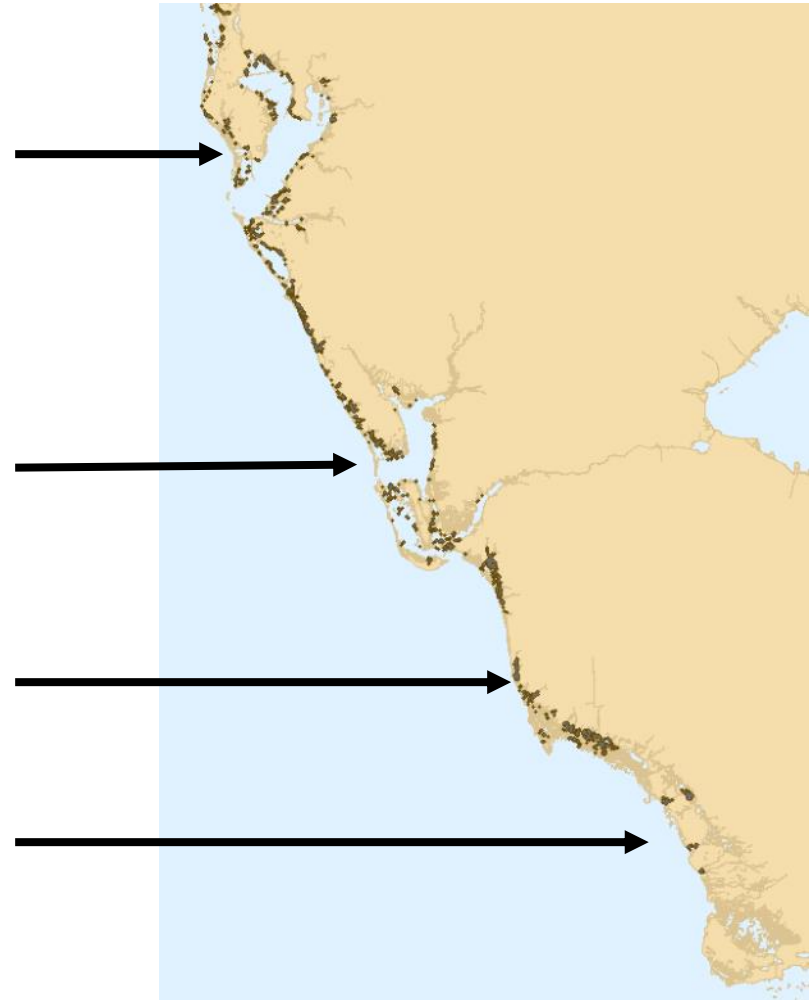
# Oyster Reefs of South Florida





# Oyster reef change over time

- **Tampa Bay** has lost over 90% of oyster reefs (Estevez 2010, Kaufman 2017)
- **Charlotte Harbor** has lost 90% of its oyster reefs since the 1950s (Boswell et al. 2012)
- **Naples Bay** lost 80% of its oyster reefs (Schmid et al. 2006)
- **Everglades** oyster reefs have shifted inland, following salinity regimes (Volety et al. 2009)

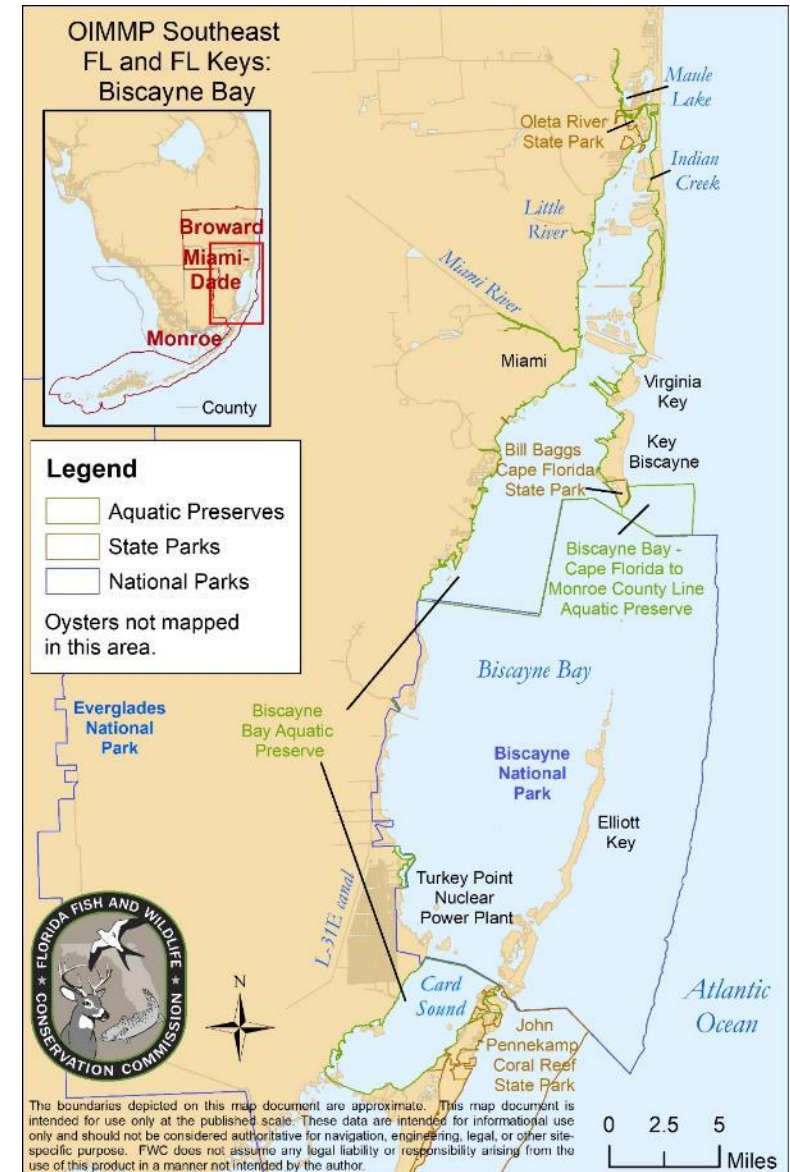


<http://geodata.myfwc.com/datasets/oyster-beds-in-florida>



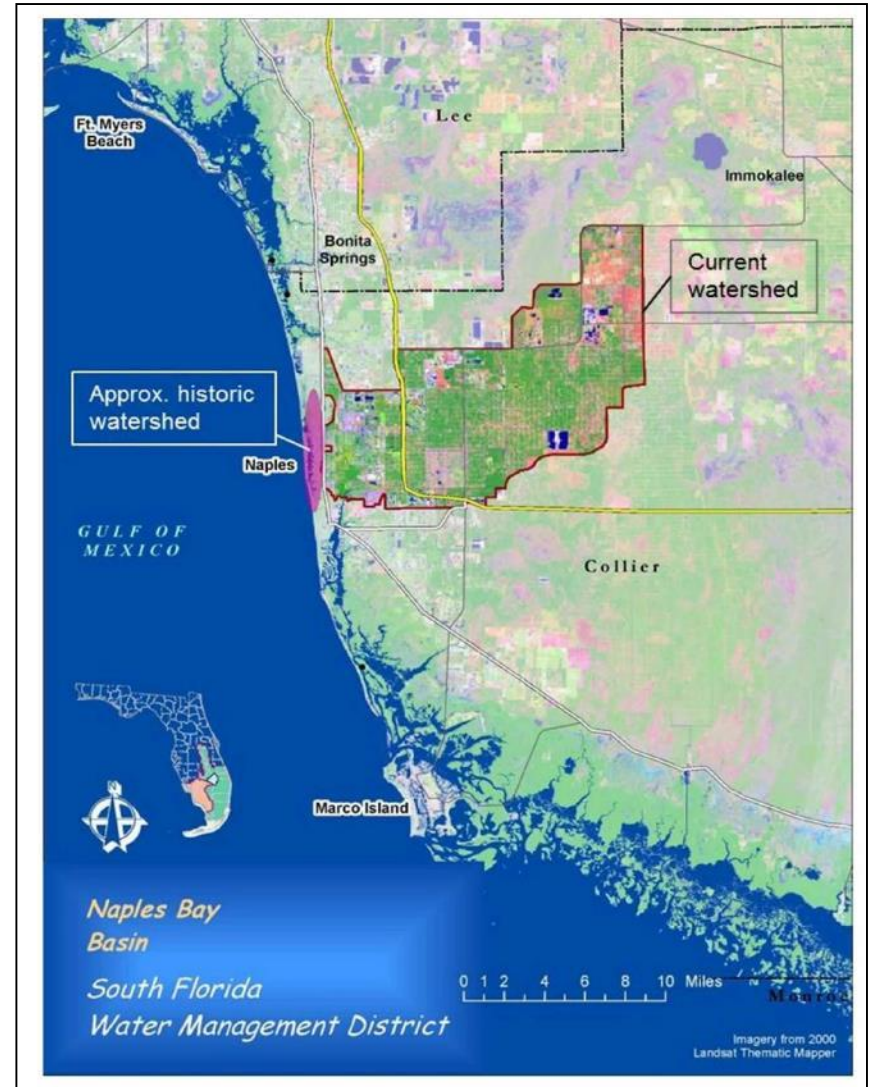
# Oyster reef change over time

- Biscayne Bay lost all oyster reefs (Meeder et al. 2001)
  - Occasional oysters on seawalls and mangrove roots



# Threats to Oyster Reefs in South FL

- Altered hydrology
  - Channelization of freshwater flow
  - Salinity extremes (both high and low)
  - Predation, disease, parasitism, stress, etc.
  - Harmful algal blooms



# Threats to Oyster Reefs in South FL

- Habitat loss
  - Coastal development
  - Dredging
  - Harvesting, shell mining
- High temperatures
  - Reduces resistance to other stressors
  - Decreases dissolve oxygen solubility
- Climate change, sea-level rise
- Other threats
  - Pollution
  - Erosion due to boat wakes
  - Competition with invasive species





# Management efforts

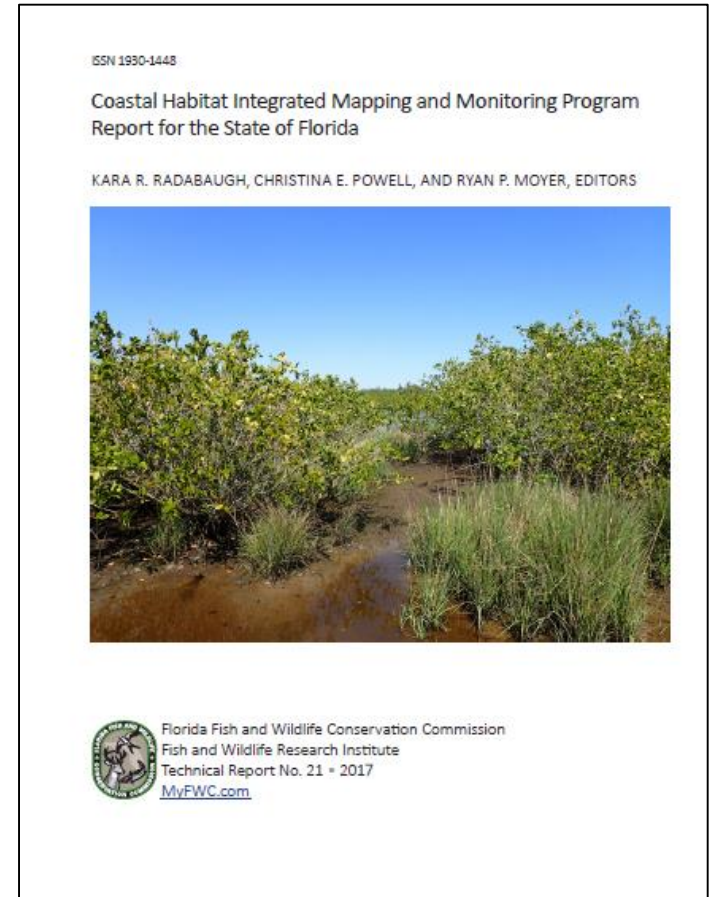
- Coastal wetlands and oyster reefs
  - Reduce channelization, promote sheet flow (CERP)
  - Environmental protections
  - Habitat restoration, creation of living shorelines
- Oysters
  - Shelling efforts, creation of new reefs
- Coastal wetlands
  - Conservation of remaining wetlands
  - Restoration of stressed wetlands

# Research/Management Needs

- Oyster needs
  - Oyster fisheries management plan
  - Fill mapping gaps
  - Some oysters survive in high salinity. Determine oyster genetic diversity and habitat characteristics of these populations
- Coastal wetlands needs
  - Coordinated monitoring with similar methodology
  - Frequent mapping updates need to track mangrove expansion
  - Continue studying if rates of accretion will match increasing sea-level rise

# CHIMMP and OIMMP Information

- Statewide CHIMMP report:  
<http://myfwc.com/research/habitat/coastal-wetlands/projects/chimmp/>
- OIMMP report in prep (2019 publication)
- FWC's compilation of oyster maps available for download:  
<http://geodata.myfwc.com/datasets/oyster-beds-in-florida>
- OIMMP and CHIMMP workshop presentations:  
<http://ocean.floridamarine.org/OIMMP/>  
<http://ocean.floridamarine.org/CHIMMP/>
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## Questions?