

Scientific Program Management for Florida Bay and the Florida Keys

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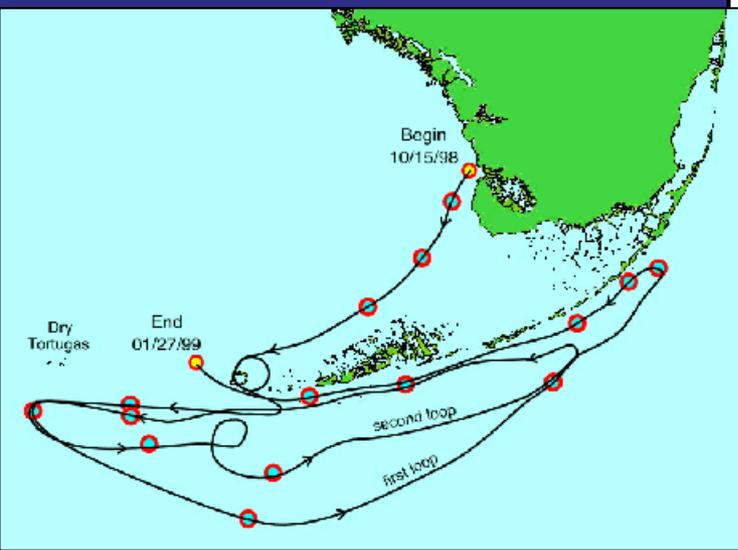
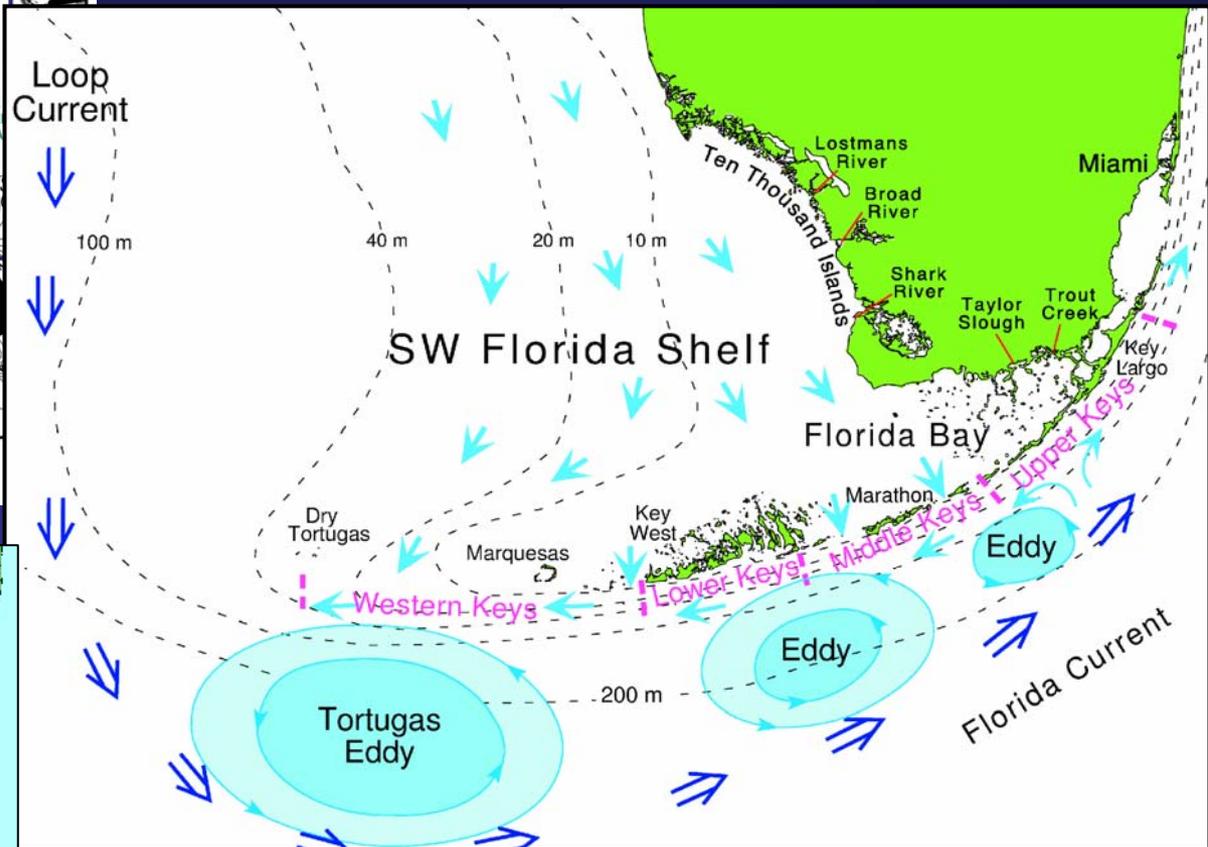
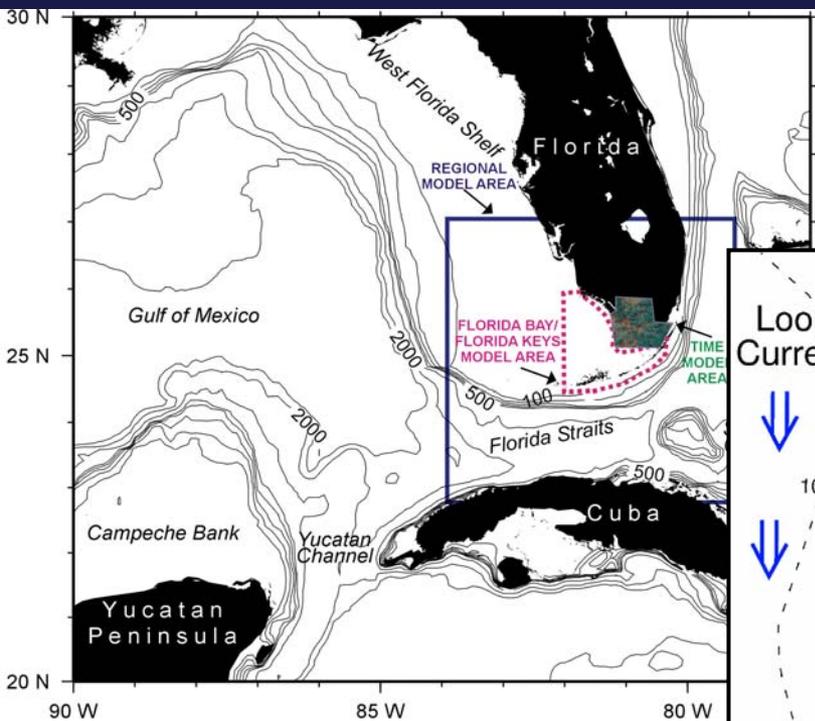
Outline

- **Background**
- **Florida Bay and Adjacent Marine Systems interagency science program**
 - **Setting Research Priorities**
 - **Research Oversight and Guidance**
 - **Transition to Management Application**
- **Comprehensive Everglades Restoration Plan**
 - **Setting Research Priorities**
 - **Research Oversight and Guidance**
 - **Transition to Management Application**
- **Conclusions (Pros / Cons)**

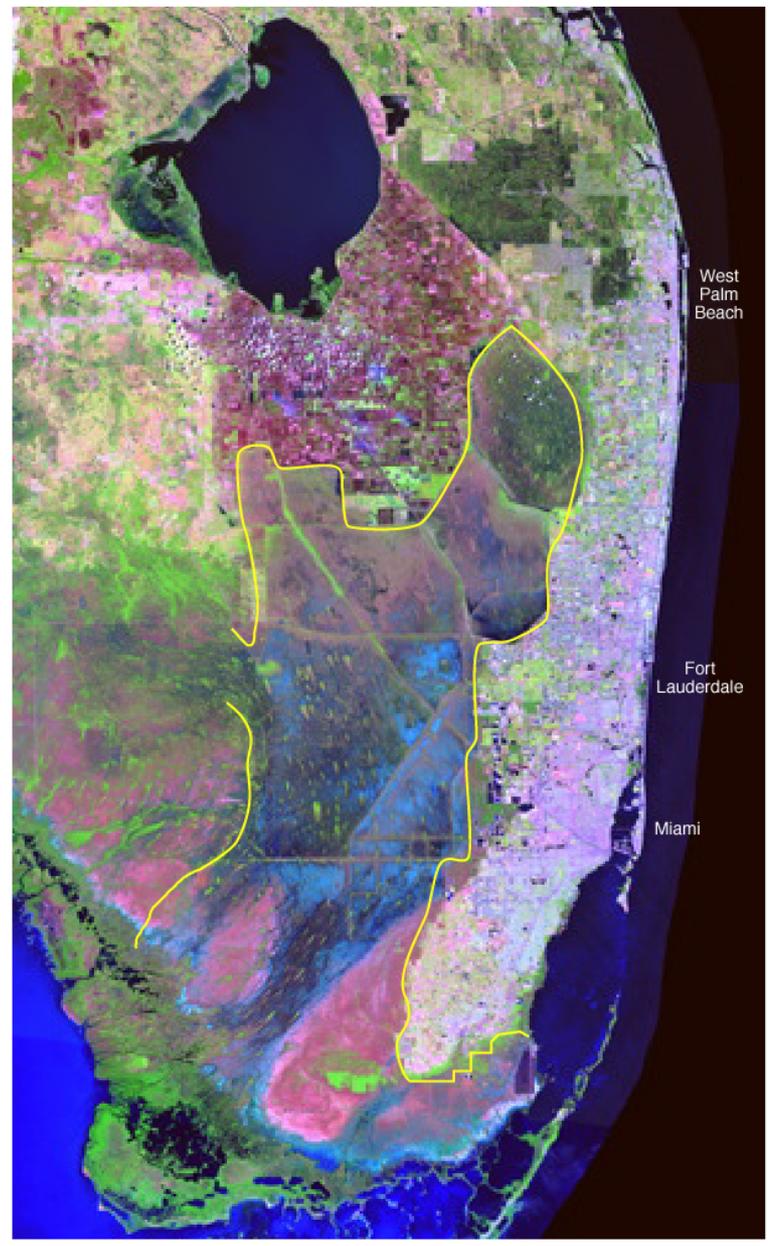
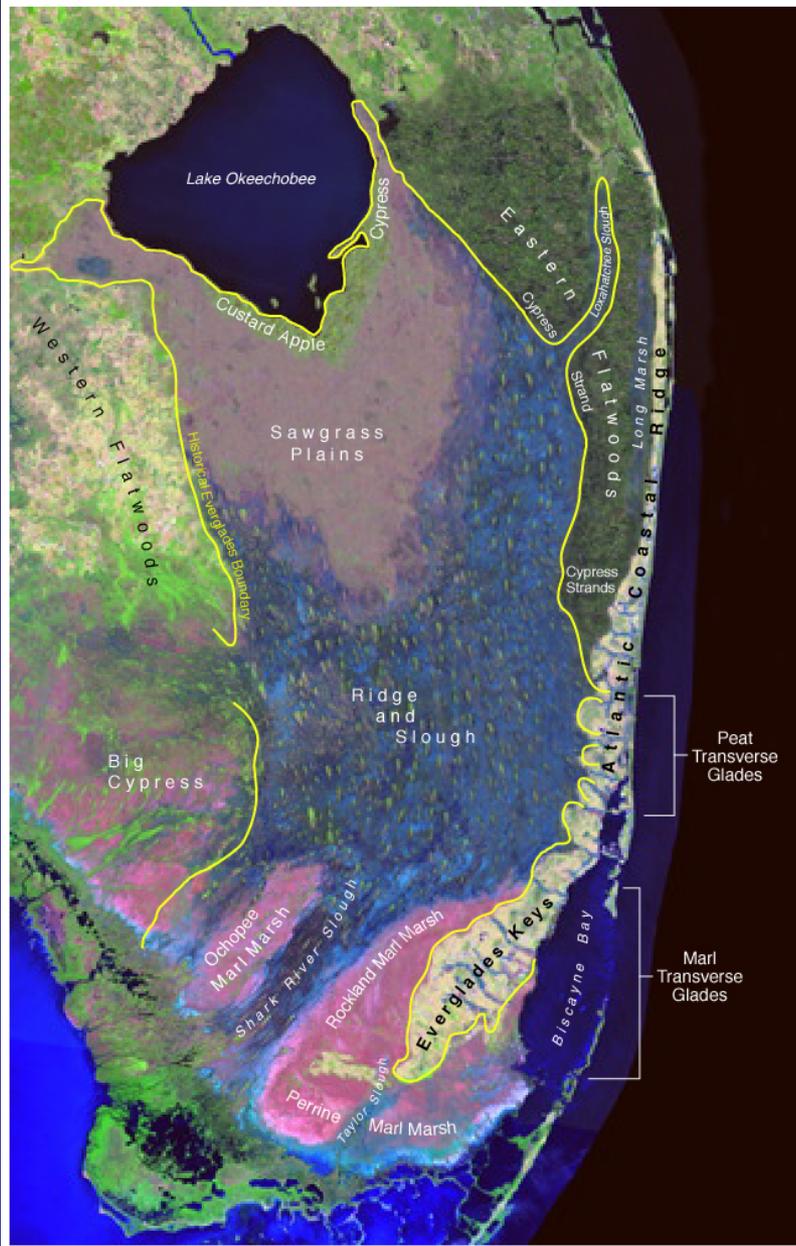
BACKGROUND



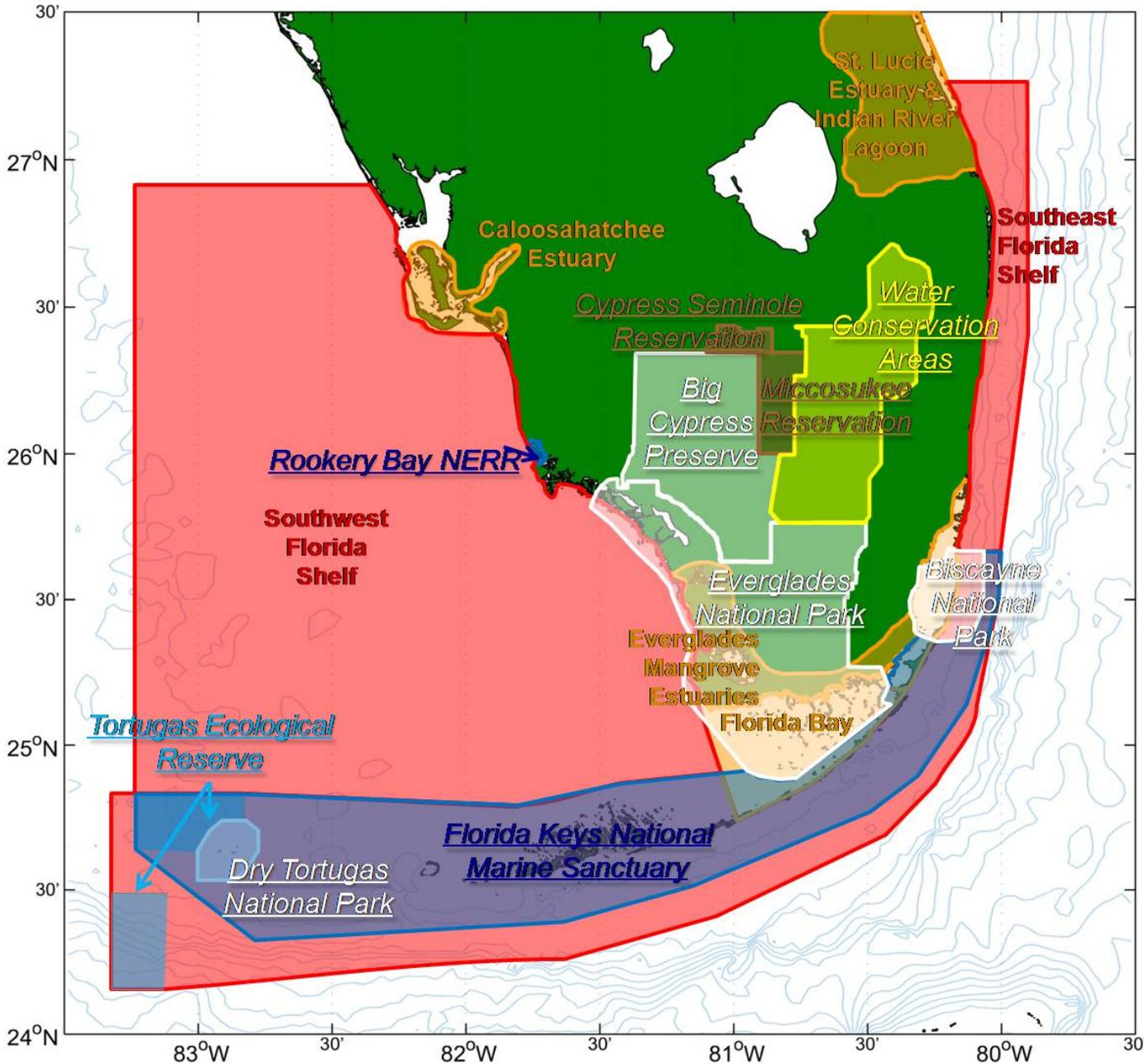
Physical processes closely couple the entire South Florida Coastal Ecosystem



Historic vs Current Everglades Landscape



South Florida Coastal Ecosystems, Management Units, and Agencies



Regulating Agencies:

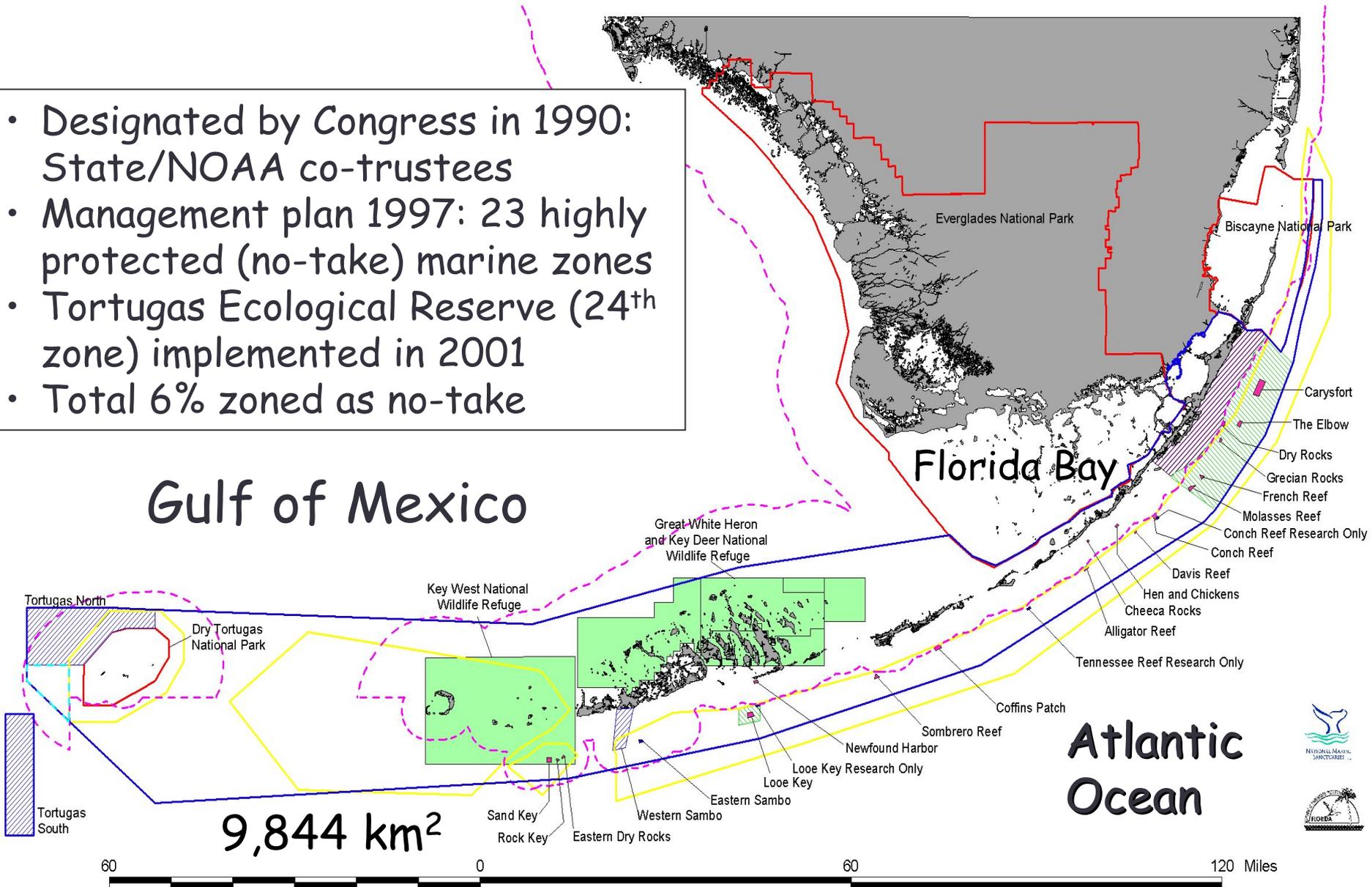
Agencies:

- DOI – NPS
- DOI - FWS
- NOAA – FKNMS
- NOAA – NMFS
- USEPA
- USACE
- SFWMD
- FFWCC
- FDEP

Florida Keys National Marine Sanctuary (FKNMS)

- Designated by Congress in 1990: State/NOAA co-trustees
- Management plan 1997: 23 highly protected (no-take) marine zones
- Tortugas Ecological Reserve (24th zone) implemented in 2001
- Total 6% zoned as no-take

Gulf of Mexico



9,844 km²

Atlantic Ocean



Ecological Changes in Florida Bay & Florida Keys

- ▶ Salinity increase in bay; saltwater intrusion and mangrove expansion in coastal marshes
- ▶ Seagrass dieoffs
- ▶ Increases in FKNMS macroalgae
- ▶ Algal blooms and high turbidity events
- ▶ Sponge die-offs
- ▶ Fisheries declines (lobster, shrimp, fin fish).
- ▶ Declines in charismatic species (crocodiles, roseate spoonbills, wading birds, manatees)
- ▶ Mass coral bleaching events, disease outbreaks, and overall decline in live coral cover

Florida Bay and Adjacent Marine Systems interagency science program and Program Management Committee:

FBAMS / PMC



Setting Research Priorities - FBAMS/PMC

- Public outcry lead to review by Boesch et al. (1993)
- Local State and Federal agency representatives wrote “Science Plan for Florida Bay (1994)” & established PMC
- PMC a “Community of Practice”
 - consensus building and coordination
 - identifies agency niches, needs for coherent ecosystem evaluation
 - focus on broad program (SFER/CERP) needs
- Strategic Plan revisions in 1997 and 2004 – Central Questions basis
- Feedback from multidisciplinary research teams, peer-reviewed conferences and workshops, agency management

Research Oversight and Guidance - FBAMS/PMC

- Distributed funding authority and individual project oversight
- Some agencies (FKNMS) virtually dependent upon partner agencies and NGOs for funding
- Multidisciplinary research teams with project-specific responsibilities
- Public Science Conferences and workshops with peer review
- Standing Science Oversight Panel
- FKNMS Technical Advisory Committee and Comprehensive Science Plan

Transition of Research to Management Application – FBAMS/PMC

- Science conferences – deliberate attempts to involve resource managers in the conferences
- Synthesis report in 2007
- Fact sheets, newsletters, radio, book for lay audience (in progress)
- Indicators and report cards developed, published, and delivered
- Models developed under the FBAMS umbrella – transition to management agencies
- Direct participation in CERP/RECOVER
- Many examples of direct input (e.g. FKNMS designation of Tortugas Ecological Reserve, MFL rule, water management operations plans, CERP projects, US 1 construction / phytoplankton bloom emergency response, “River of Grass” land purchase analysis)

KEY FINDINGS – SOUTHERN ESTUARIES

SUMMARY FINDING: Re-suspension of nutrients from the 2005 hurricane season resulted in algal blooms in many regions of the southern estuaries and may cause continued algal blooms in the bay for some time. However, this is expected to subside within a few additional years in lieu of further significant hurricane activity and if water flows to the southern estuaries is improved should return to predominantly green for all regions with the possible exception of BMB. If water flows do not improve the areas will probably remain yellow.

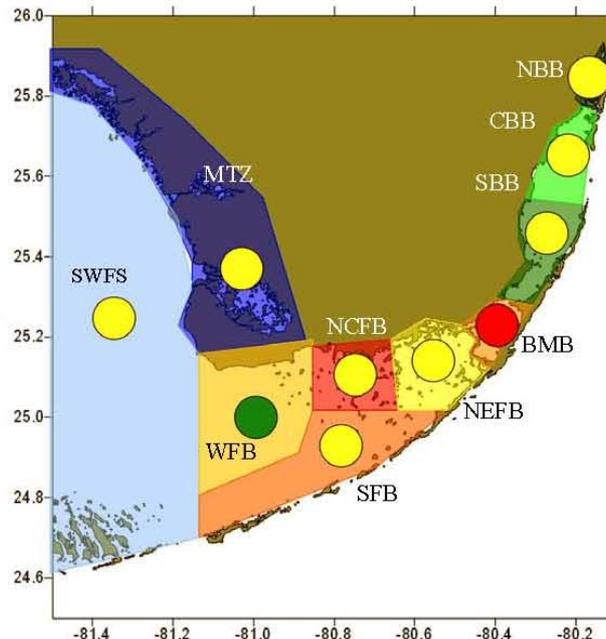


Figure 1. Map of Florida Bay regions with stoplight ratings by region

KEY FINDINGS:

1. The majority of regions assessed had significant algal bloom activity that appears to have been predominantly influenced by the heavy 2005 hurricane season aggravated for the eastern bay by road construction on US 1.
2. The majority of regions assessed had chlorophyll-*a* and algal blooms rated as moderate (yellow).
3. The majority of regions assessed where the chlorophyll-*a* was higher than the median do not appear to be indicative of long-term negative trends.
4. The most commonly occurring condition was large spatial coverage of algal blooms and elevated chlorophyll-*a* concentrations.
5. Overall eutrophic symptom expressions were geographically variable and appear to be explainable from existing phenomenological conditions of hurricane activity overall exacerbated by road construction along US 1 in the eastern areas of the bay.
6. If water flows are improved to the southern estuaries we expect the water quality to improve and the number and scale of algal blooms to diminish. However, under current water flow conditions there will probably be little or no improvement in the conditions in the southern estuaries.
7. Monitoring of Barnes, Manatee and Blackwater Sounds was critical to being able to detect the impacts of road construction along US 1.
8. Monitoring long term consequences of nutrient releases into the southern estuaries from both natural (e.g. hurricanes) and human causes (e.g. road construction) and the interactions of hydrological restoration (e.g. more fresh water flow into the southern estuaries, particularly Florida Bay) is critical to continuing the evaluation and assessment restoration for the southern estuaries.

A white egret is captured in mid-flight, its wings fully extended, against a background of lush green grass. The bird is positioned on the left side of the frame, facing right. The text 'Reviving THE river OF grass' is overlaid on the right side of the image.

Reviving
THE river OF grass

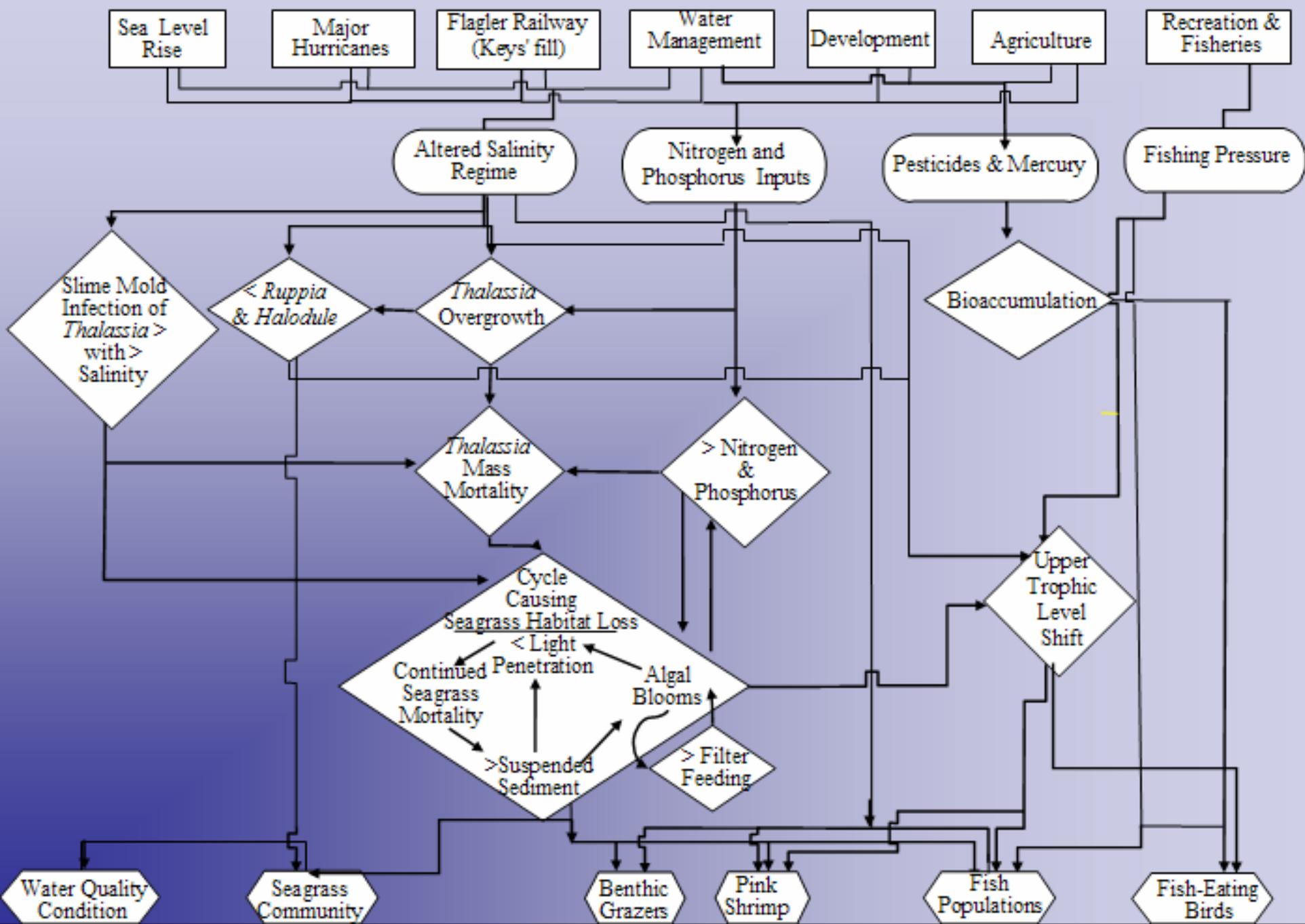
**Comprehensive Everglades Restoration Plan and
REstoration COordination and VERification:**

CERP / RECOVER

Setting Research Priorities - CERP/RECOVER

- CERP science led by RECOVER
- Conceptual Ecological Models to identify key attributes and performance measures
- Specification of performance measures and target
- System-wide RECOVER Monitoring and Assessment Plans
- Restoration Project-specific monitoring plans

Florida Bay Conceptual Ecological Model



RECOVER Southern Estuaries Monitoring and Assessment Module

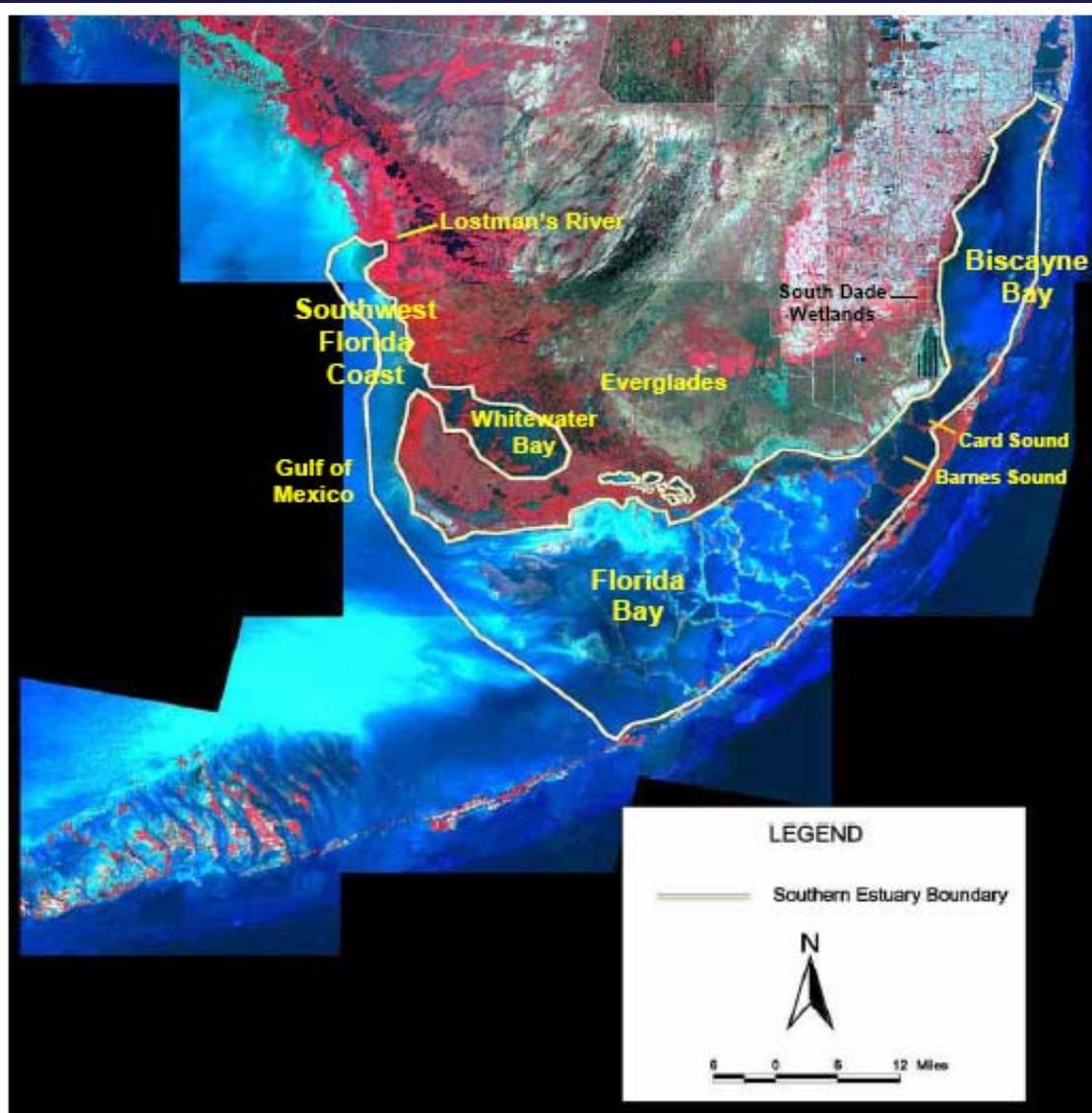


Figure 3-22: Southern Estuaries within the Influence of CERP

Research Oversight and Guidance - **CERP/RECOVER**

- Funding primarily by USACE and SFWMD with defined managers for SE Module domain
- High dependence on non-RECOVER funds (limited oversight)
- Fine scale scrutiny (patchy) by CERP / QA Oversight Team
- CISRERP (NRC Subcommittee) with high-level peer review
- Feedback from Module teams, Project Delivery Teams

Transition of Research to Management Application - **CERP/RECOVER**

- Adaptive Management input by RECOVER leadership (within restoration management organization)
- System Status Report (in particular SE Module domain)
- Interim Goals/Interim Targets Report
- Project evaluations (primarily model-based)
- Restoration scenario evaluations

Conclusions - FBAMS/PMC

- Pros

- Broad interagency cooperation

- Diverse perspectives

- Link to wider goals of South Florida Ecosystem Restoration

- Broad applications – links to multiple agencies

- Scientific progress / synthesis (conferences and 2007 report)

- Rigor and openness of peer review

- Cons

- No mandate / requirement

- Purely volunteer – depends on shared commitment

- No paid staff

- Difficulty of maintaining funding stream

- Links to management diffuse

Conclusions: CERP/RECOVER

- Pros

 - Defined long term funding

 - Mandate in Federal regulation, SFWMD agreement

 - Defined inputs to management process

- Cons

 - Purely CERP

 - Management centralized in two agencies

 - Large dependence upon non-CERP funds

 - Volunteerism / high demands for staff

 - Reality of Adaptive Management

 - (when it costs more / takes longer)

 - Engineer – scientist culture clash (is anybody listening?)