REstoration, COordination, & VERification (RECOVER)

Advancing Evaluation and Assessment Tools in the Everglades' Southern Coastal Systems

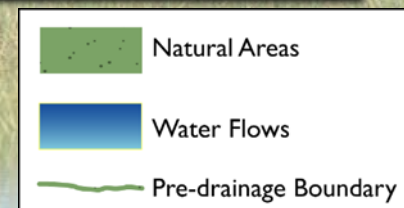Stephanie Verhulst, USACE

GEER April 22, 2025

Restoration, **Co**ordination, **Ver**ification

- **Interdisciplinary collaboration** of agencies, tribes, and institutions

- Conducts scientific and technical **evaluations** and **assessments** to improve the Comprehensive Everglades Restoration Plan's (CERP) ability to restore the south Florida ecosystem while providing for the region's other water-related needs

- Technical support to CERP with a **system-wide** and **integrative perspective**

CERP in the
Southern Coastal Systems

"Getting the water right"

Pre-drainage Flow

Current Flow

Restored Flow

KISSIMMEE VALLEY

BIG CYPRESS

EVERGLADES

Natural Areas

Water Flows

Pre-drainage Boundary

CERP in the
Southern Coastal Systems

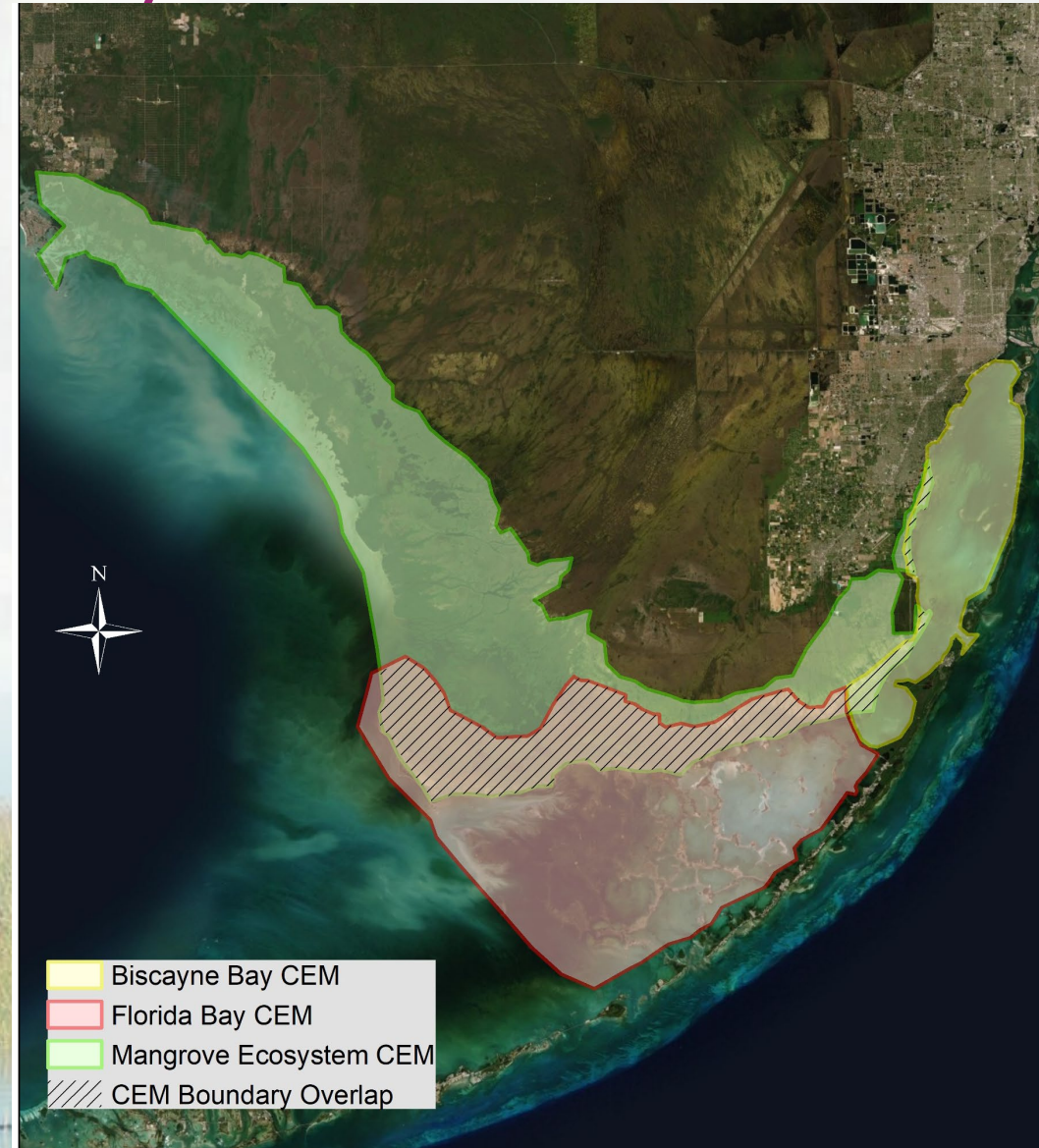**Impacts from altered water delivery**
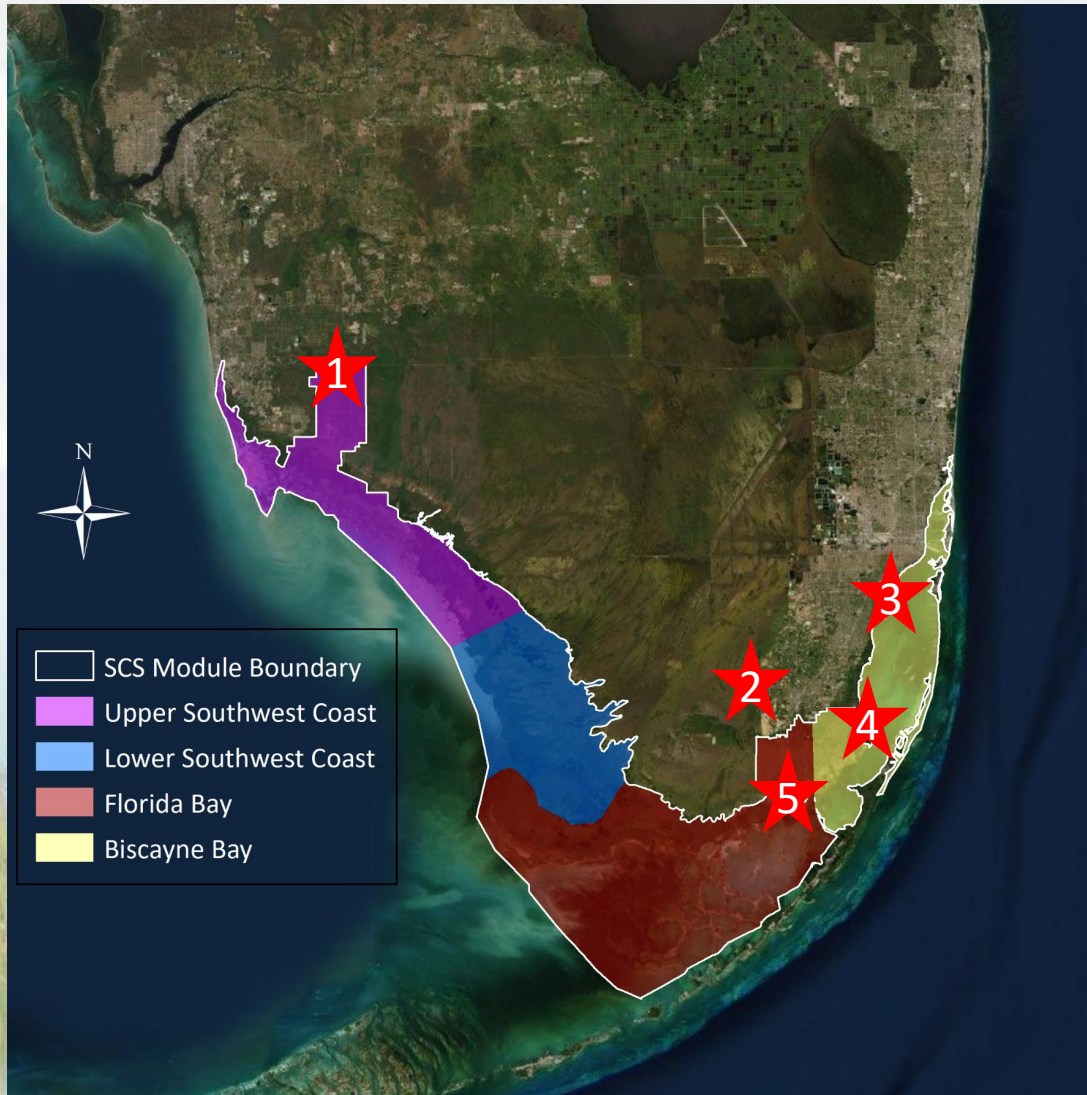
Florida Bay
- Seagrass

Biscayne Bay
- Benthic communities (seagrasses, sponges, corals)

Freshwater-Marine Ecotone Ecosystem
- Salinity gradient and sea level change in Everglades mangrove estuaries

Biscayne Bay CEM
Florida Bay CEM
Mangrove Ecosystem CEM
CEM Boundary Overlap

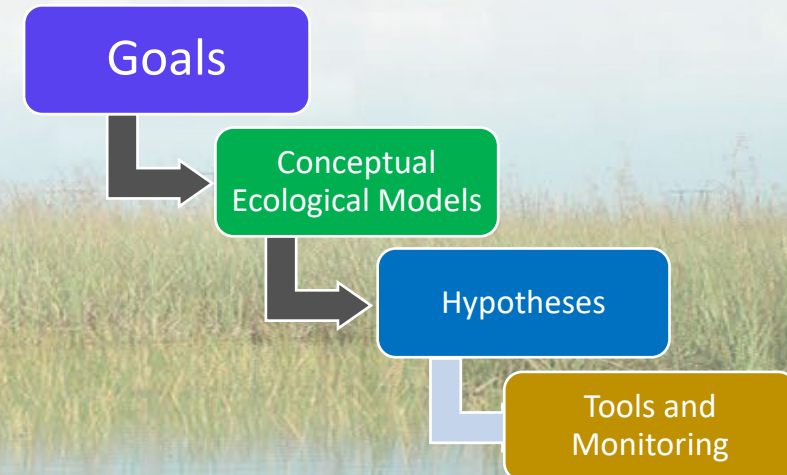# CERP in the Southern Coastal Systems

CERP Projects

1. Picayune Strand Restoration Project

2. C-111 Spreader Canal Western Project

3. Biscayne Bay Coastal Wetlands

4. Biscayne Bay Southeastern Everglades Ecosystem Restoration

5. Southern Everglades

CERP in the Southern Coastal Systems
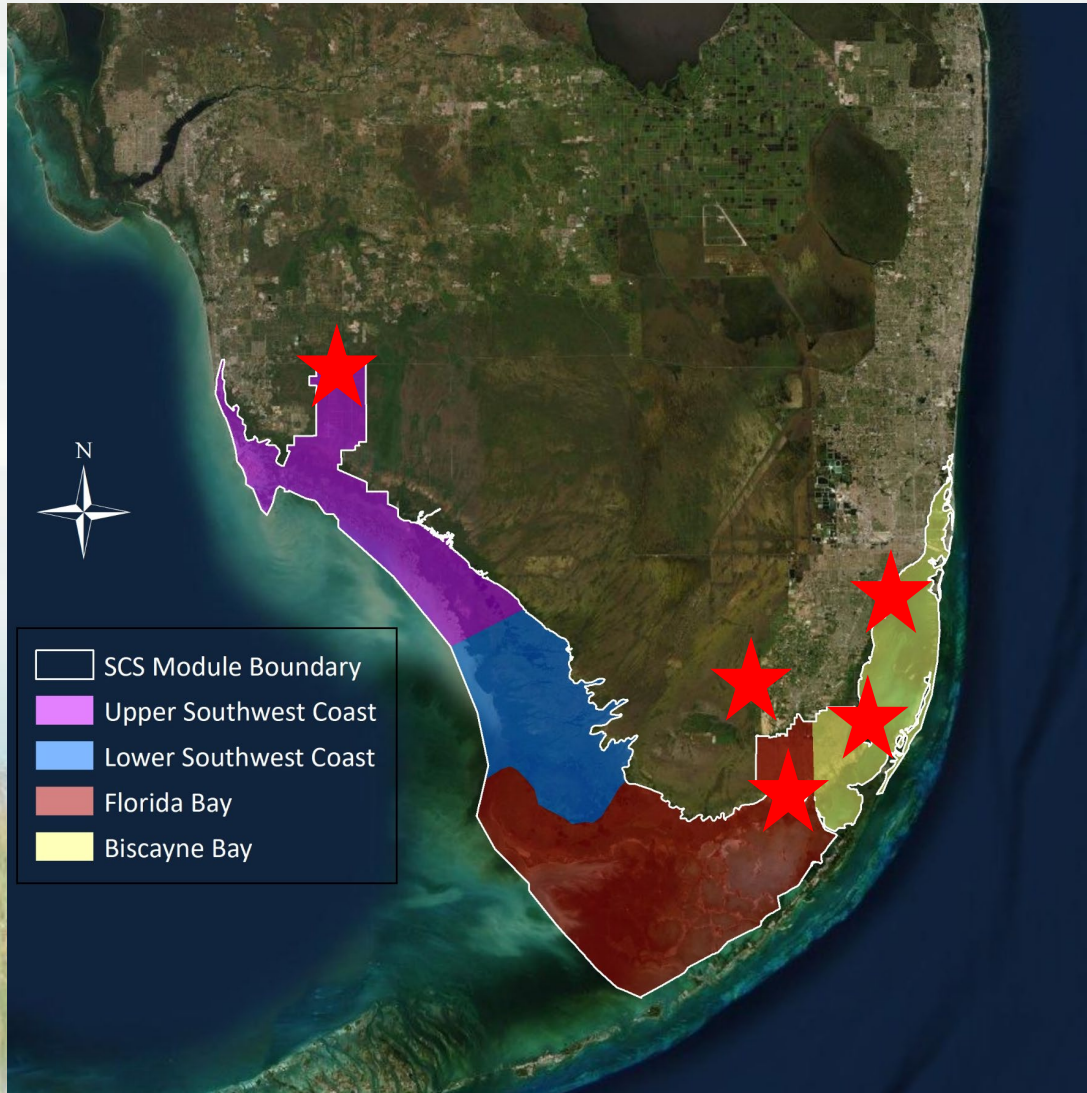
Primary Restoration Goals

- Reestablish conditions for the natural floral and faunal mosaic

- Reestablish an estuarine salinity gradient from nearshore to offshore

Goals → Conceptual Ecological Models → Hypotheses → Tools and Monitoring

SCS Module Boundary
Upper Southwest Coast
Lower Southwest Coast
Florida Bay
Biscayne Bay

Current RECOVER Tools in Southern Coastal Systems

Evaluation (model world)

- Florida Bay Salinity PM*
- Spotted Seatrout PM
- American Crocodile PM
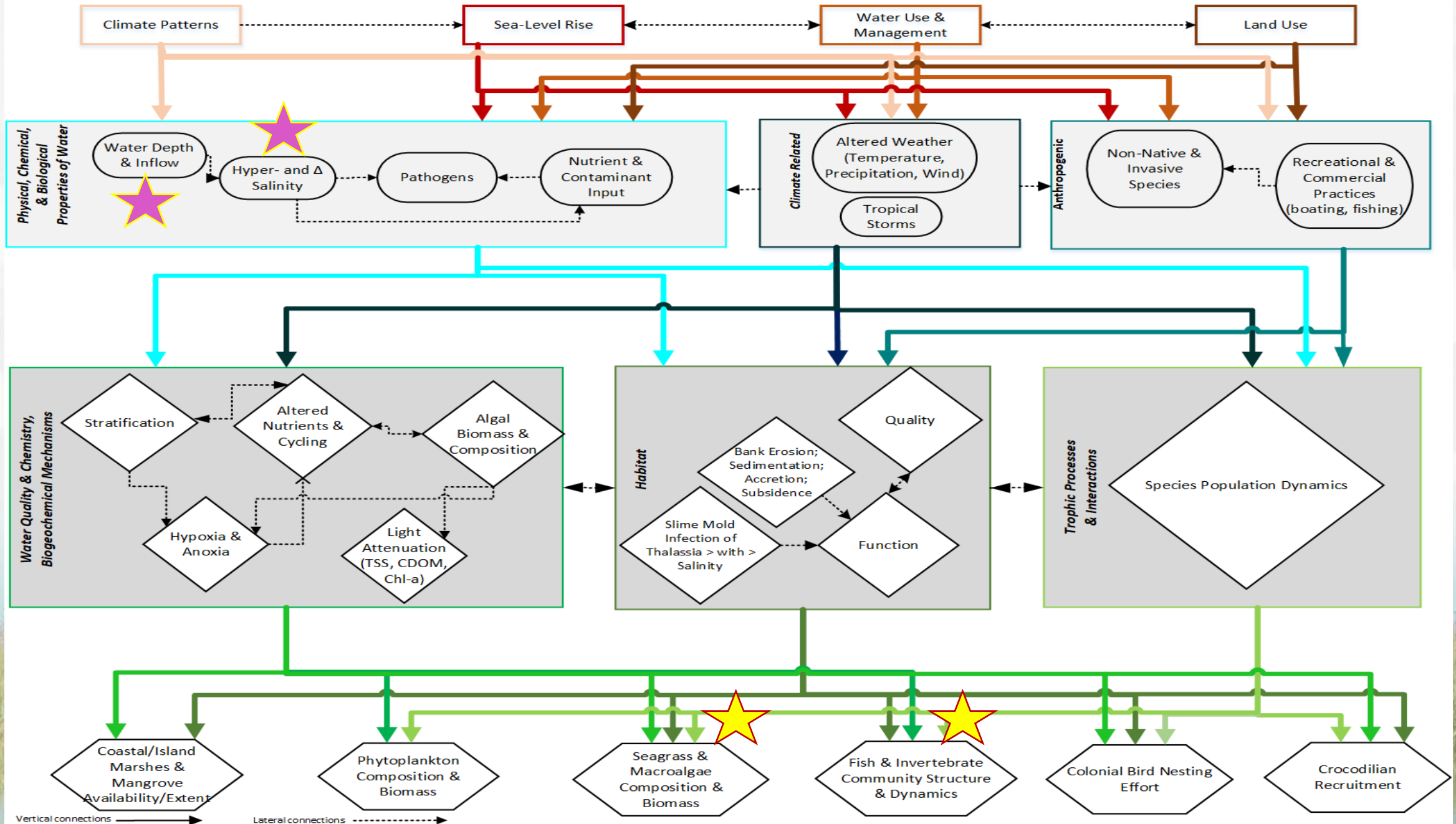- Estuarine Prey Fish Biomass Ecotool*

Assessment (real world)

- Florida Bay Salinity
- Spotted Seatrout PM
- American Crocodile PM

In development

Submerged Aquatic Vegetation PM*

Florida Bay Coastal System Conceptual Ecological Model

Florida Bay Salinity

Greater freshwater flow

Salinity

Florida Bay Salinity

Less freshwater flow
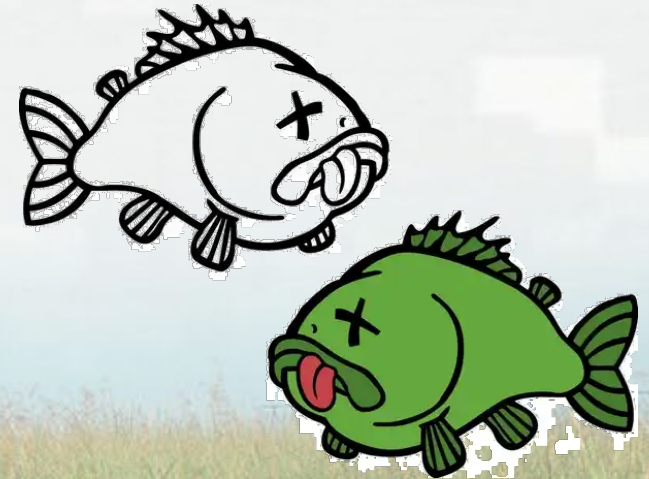
Salinity ↑

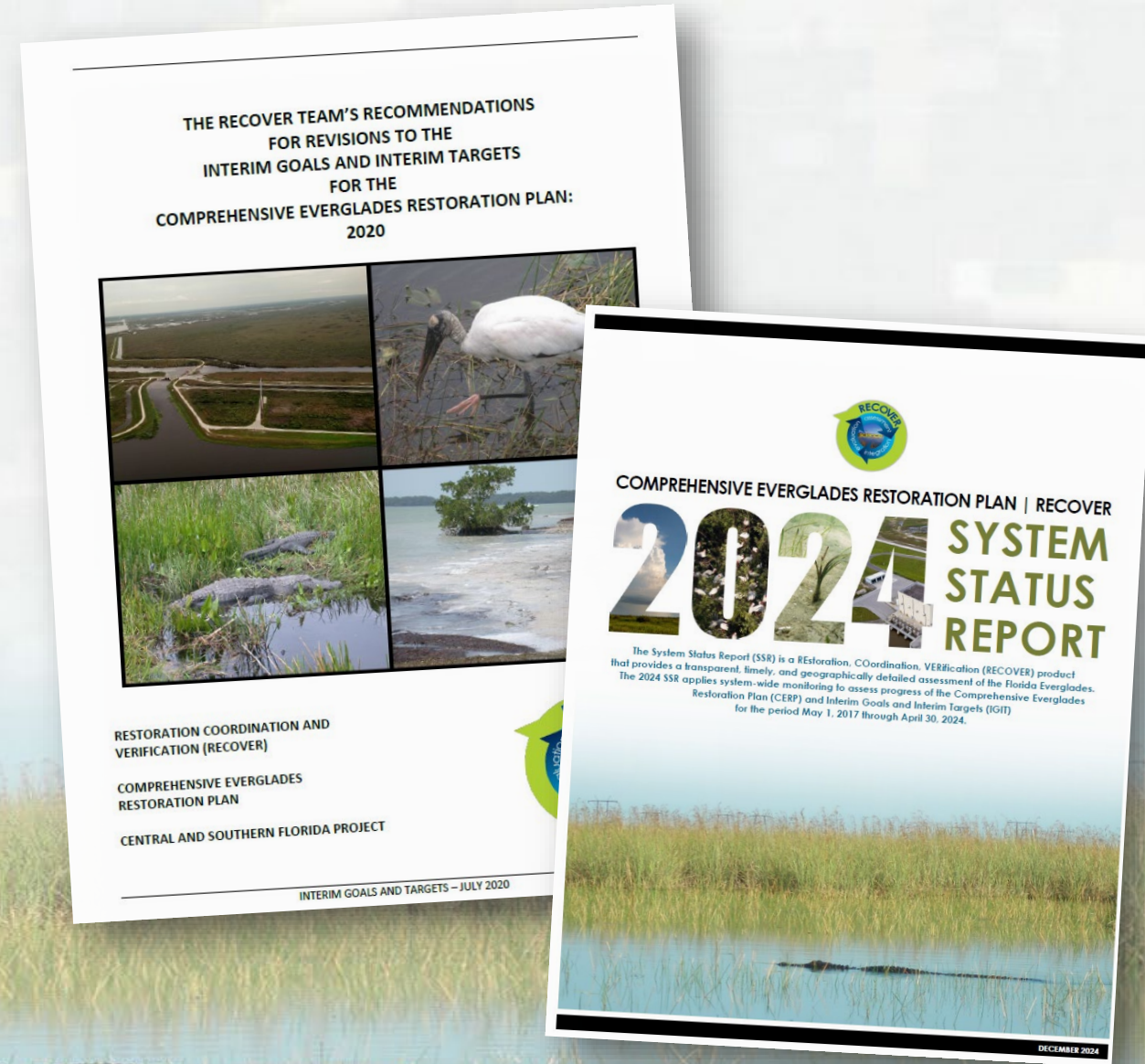# Florida Bay Salinity PM Modeling advancements

Capability:
- Evaluation – modeling salinity
- Assessment - conditions

Uses:
- Informs ecological indicators
- Interim Goal progress
- Project evaluation
- Status assessment

Limitations:
- Unable to evaluate salinity for Period of Record through 2016
- Spatial extent
- Extrapolation from stations across basins

THE RECOVER TEAM'S RECOMMENDATIONS
FOR REVISIONS TO THE
INTERIM GOALS AND INTERIM TARGETS
FOR THE
COMPREHENSIVE EVERGLADES RESTORATION PLAN:
2020

RESTORATION COORDINATION AND
VERIFICATION (RECOVER)

COMPREHENSIVE EVERGLADES
RESTORATION PLAN

CENTRAL AND SOUTHERN FLORIDA PROJECT

INTERIM GOALS AND TARGETS – JULY 2020

COMPREHENSIVE EVERGLADES RESTORATION PLAN | RECOVER
2024 SYSTEM STATUS REPORT

The System Status Report (SSR) is a REstoration, COordination, VERification (RECOVER) product that provides a transparent, timely, and geographically detailed assessment of the Florida Everglades. The 2024 SSR applies system-wide monitoring to assess progress of the Comprehensive Everglades Restoration Plan (CERP) and Interim Goals and Interim Targets (IGIT) for the period May 1, 2017 through April 30, 2024.

DECEMBER 2024

Florida Bay Salinity PM
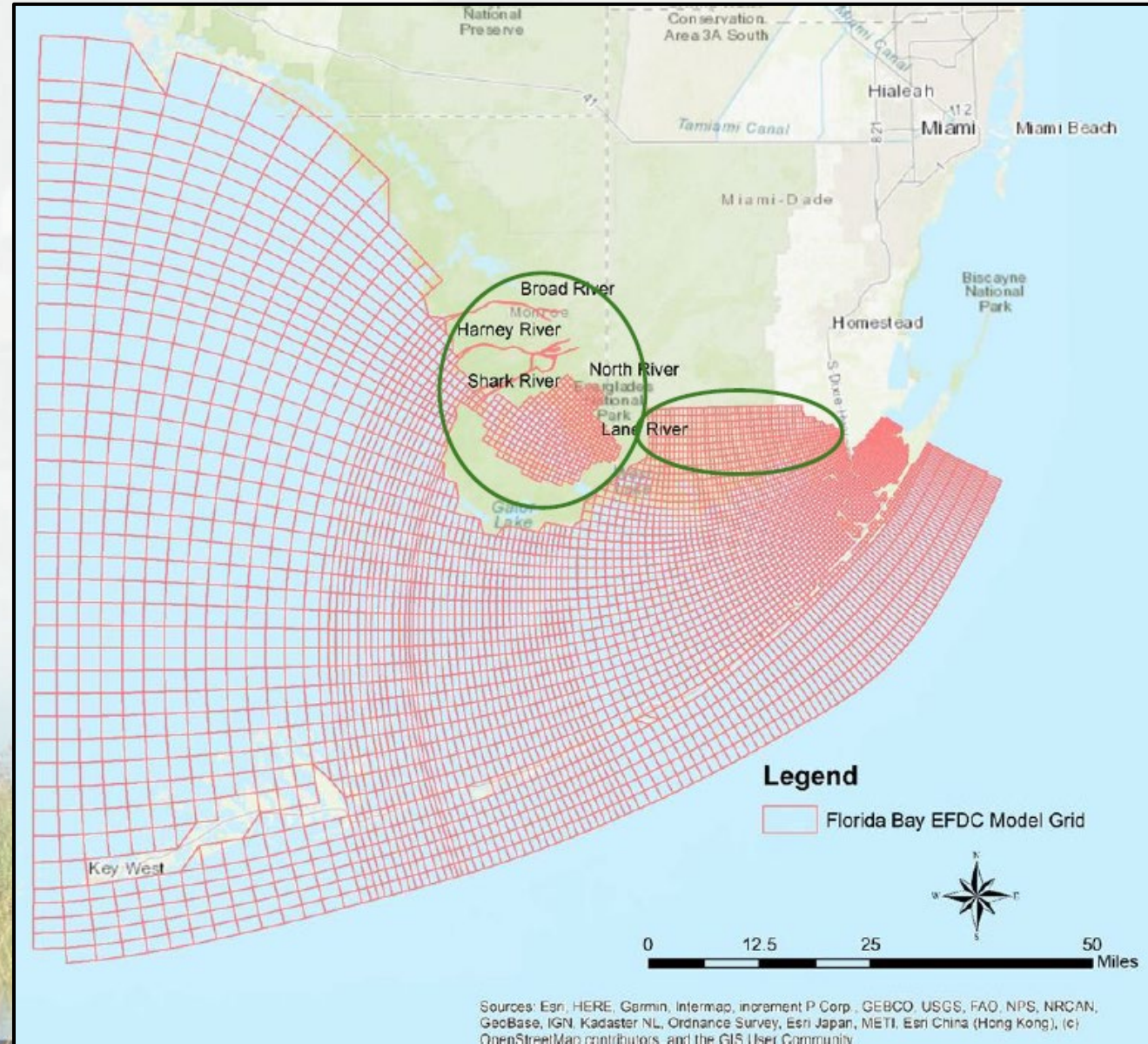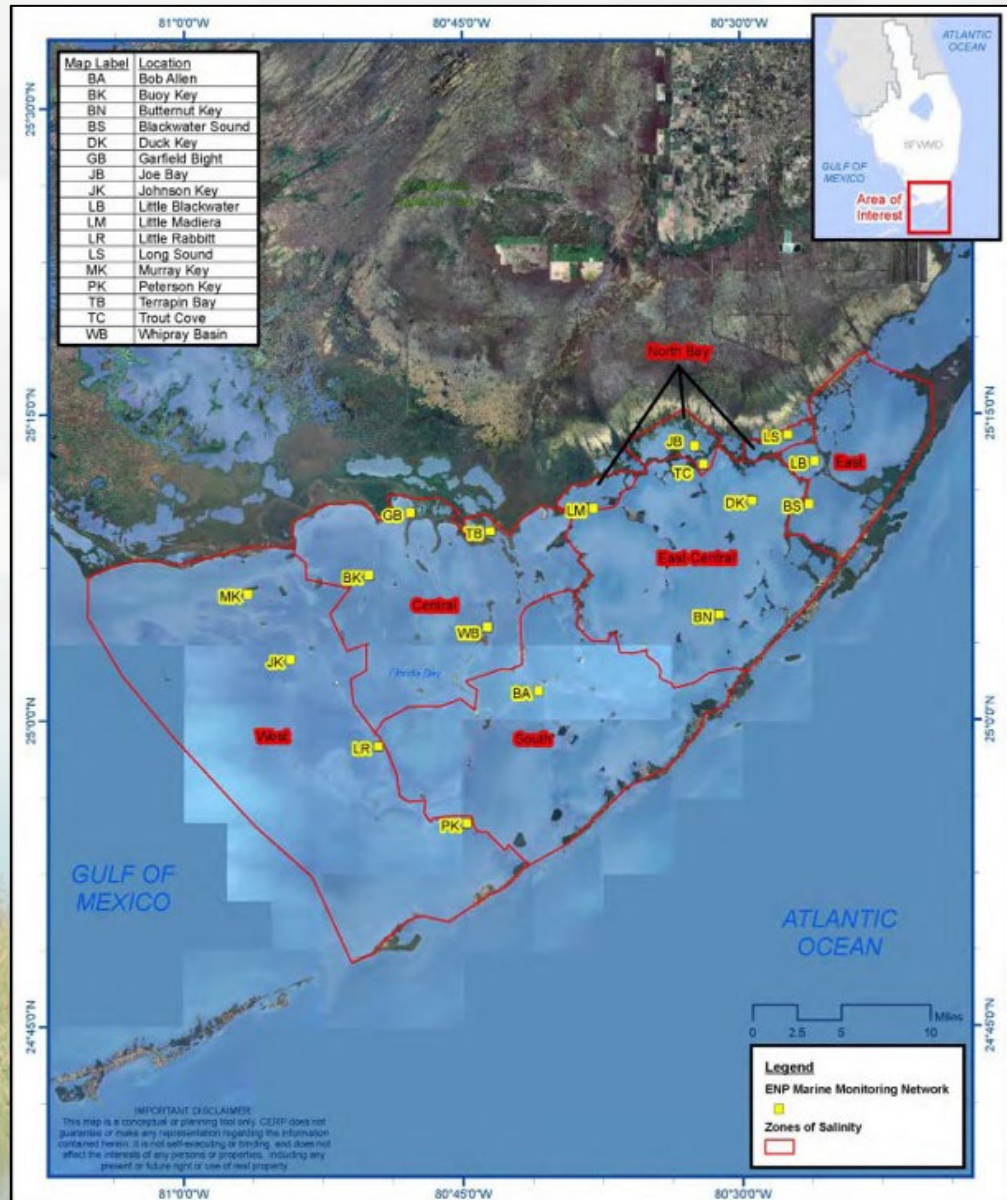
Modeling advancements

Multi-linear Regression Equations → Environmental Fluid Dynamics Code Model
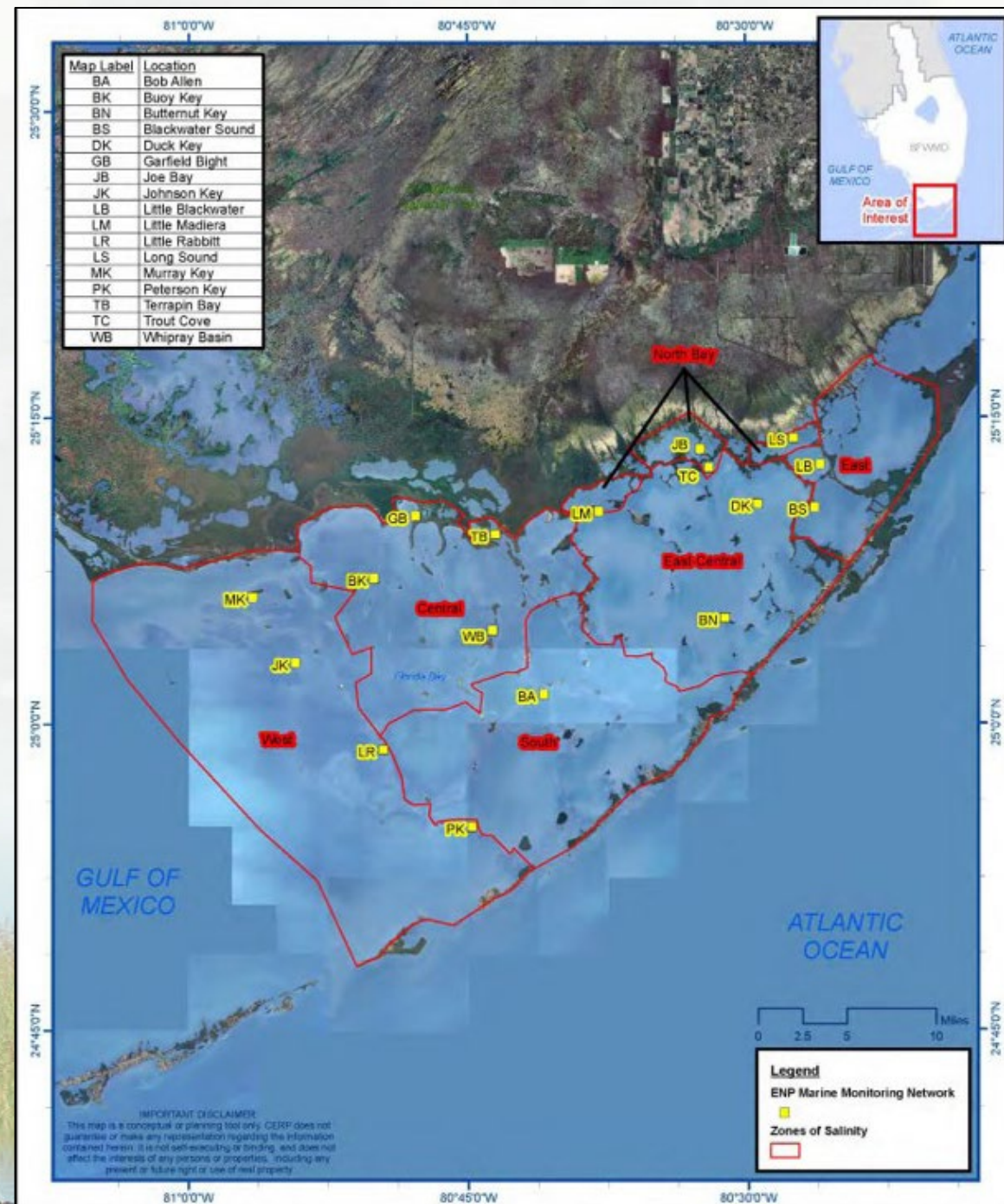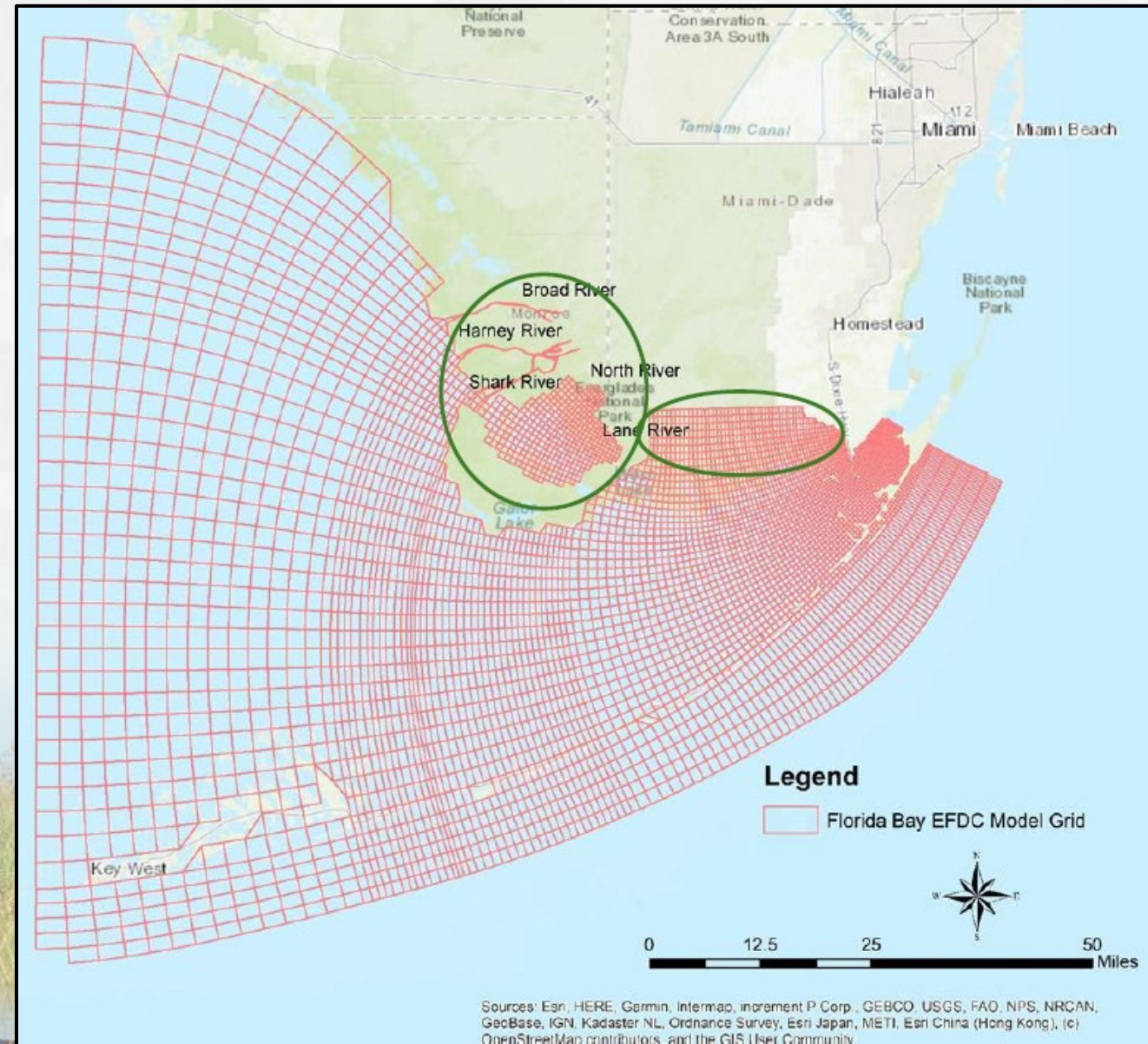
Florida Bay Salinity PM Modeling advancements

Florida Bay Salinity PM Modeling advancements

Value added:

- Improved regional ability for evaluation

- Concurrent-ish efforts for Submerged Aquatic Vegetation PM
    - Allow for potential better alignment between indicator targets

- Opportunity for continued review of the science and incorporation of new data

Estuarine Prey Fish Biomass Ecotool

Capability:
Evaluation – Prey biomass
Assessment – No

Uses:

- Informs prey fish biomass available for wading birds and other consumers
- Planning tool: Determine an acceptable range of conditions (salinity and water depth)

Limitations:

- Spatial extent
- System changes due to invasive fish
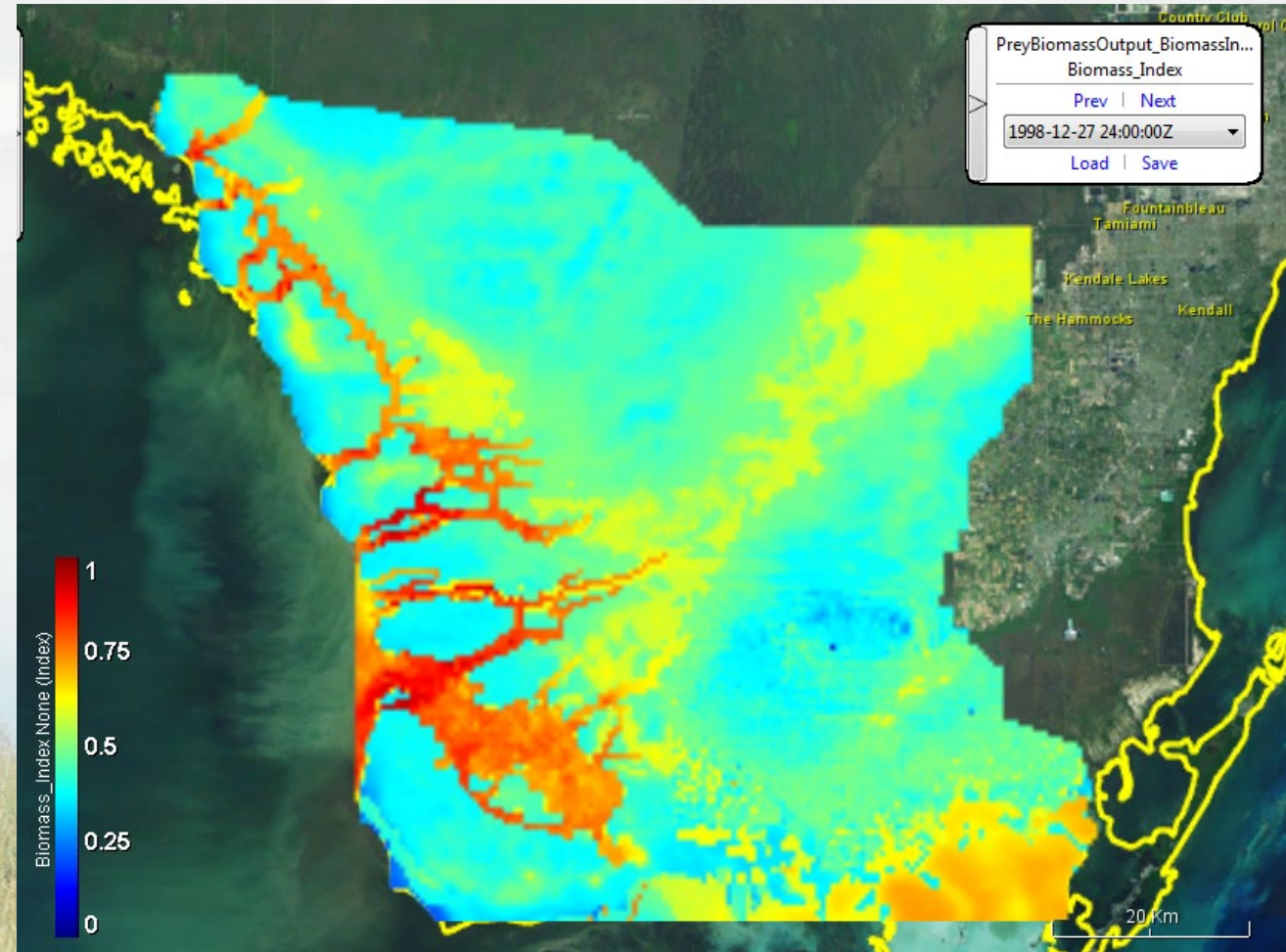
Prey Fish Biomass Model
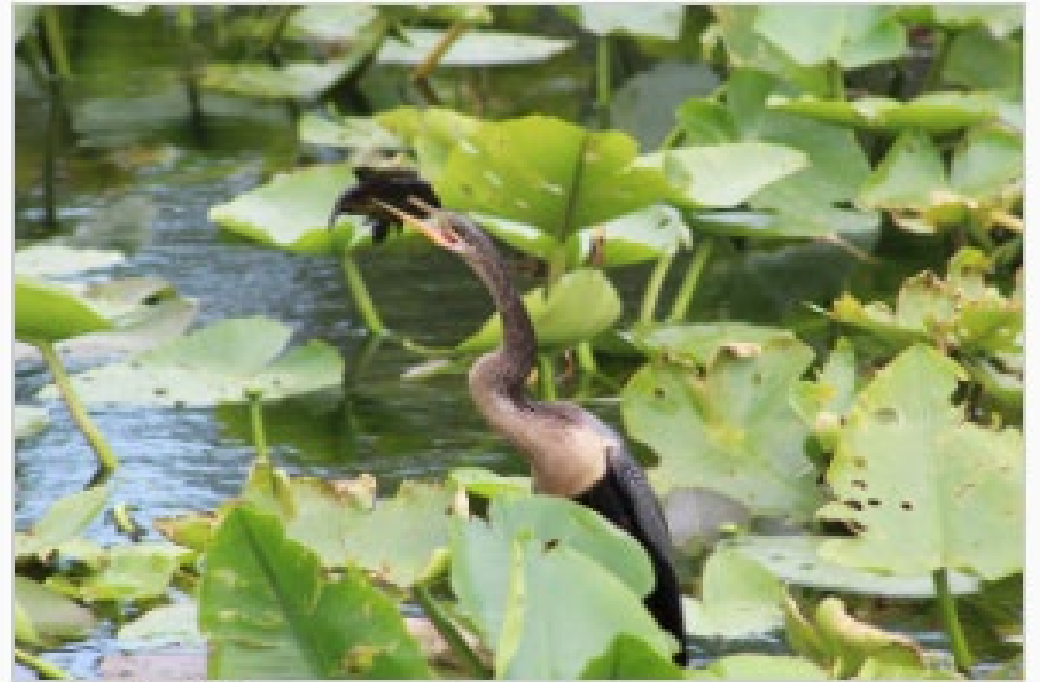
Photo by ENP

JEM Joint Ecosystem Modeling

Estuarine Prey Fish Biomass Ecotool

Modeling advancements

Tides and Inflows in the Mangroves of the Everglades (TIME)
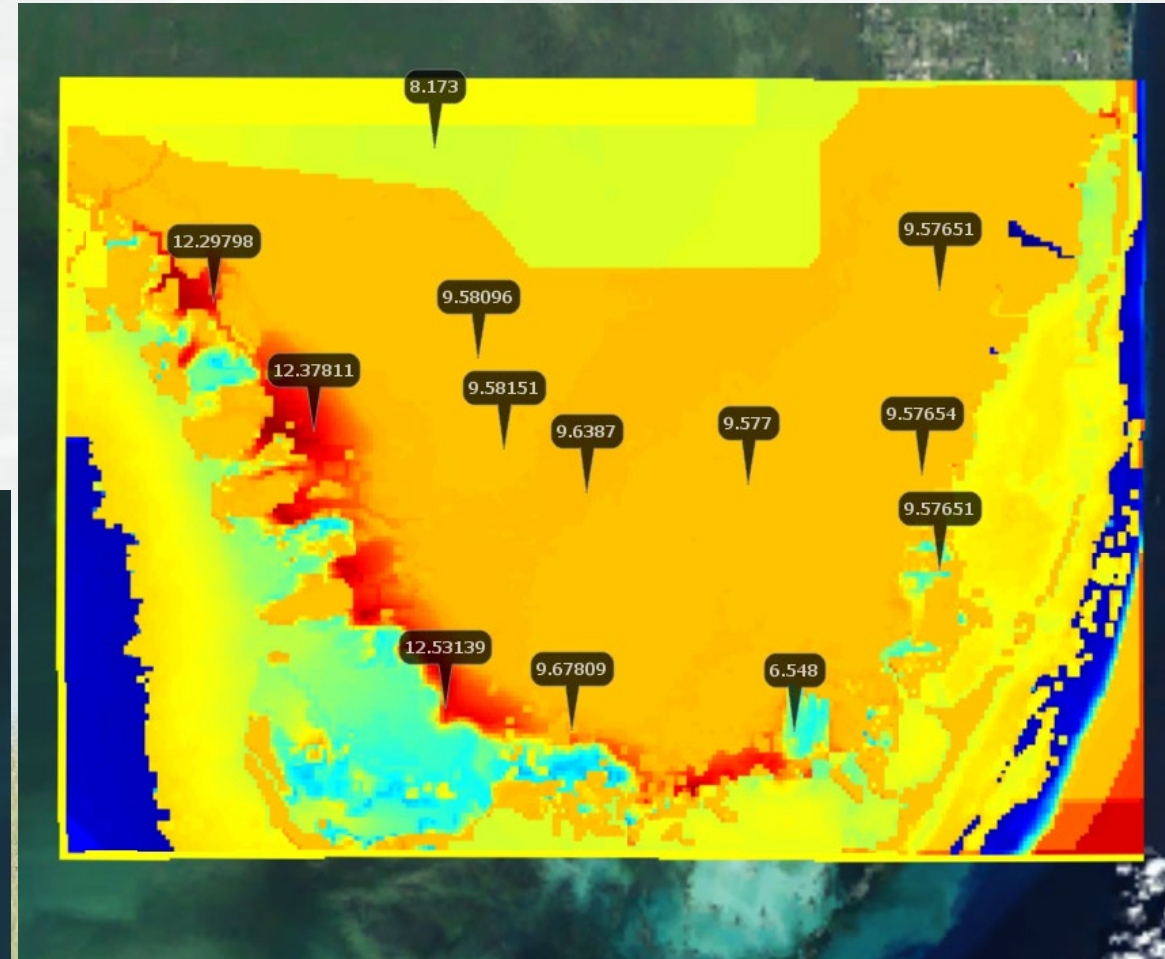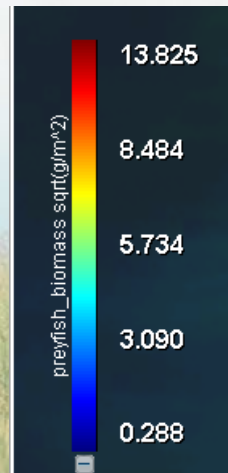

2011 Estuarine Prey Fish Biomass version

Estuarine Prey Fish Biomass Ecotool

Modeling advancements

Tides and Inflows in the Mangroves of the Everglades (TIME)

→

Biscayne and Southern Everglades Coastal Transect (BISECT)

Estuarine Prey Fish Biomass Ecotool
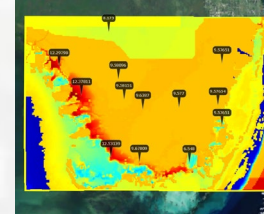
Ecological advancements

Photo credit: J. Rehage

Sampling sites in north Florida Bay

Estuarine Prey Fish Biomass Ecotool

Tool update accomplishments

☑ Structural model (TIME → BISECT)

☑ Extend dataset that informs model

⚠ Invasive Species (Mayan cichlids)
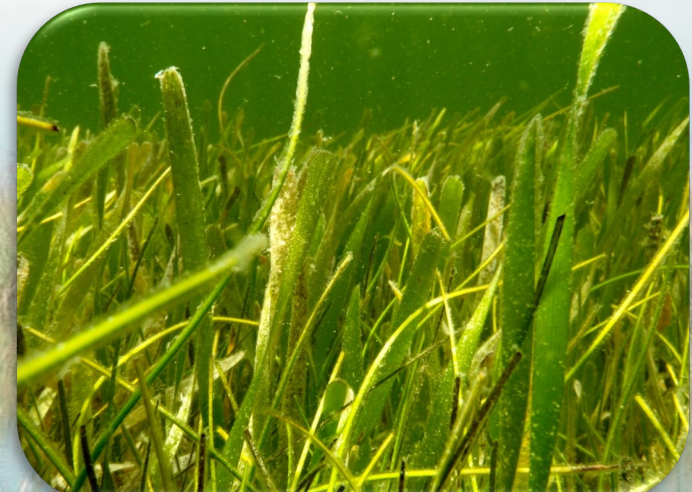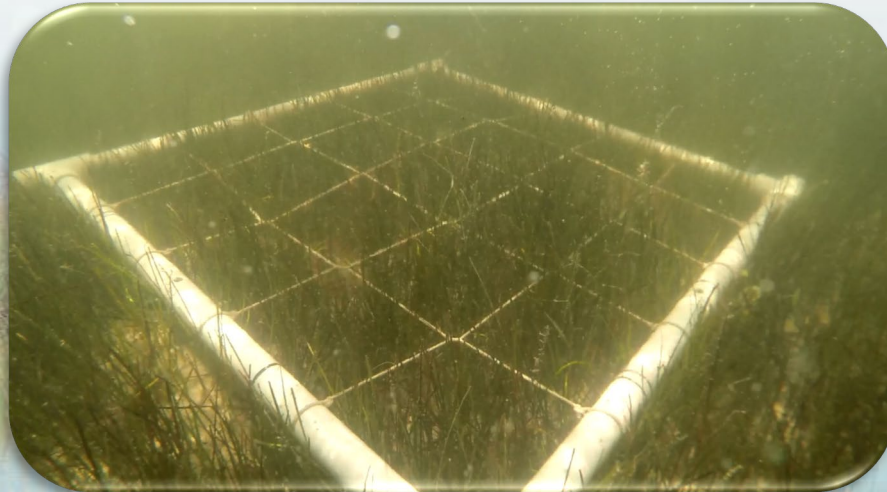
Submerged Aquatic Vegetation PM

In Development

GOALS

Capability:
Evaluation
Assessment

Uses:
- Regionwide
- Align monitoring metrics

Tool advancements benefit
Southern Coastal Systems

- Improved capabilities to evaluate CERP project planning and to assess real world conditions

- Provides opportunity to develop, update, and align restoration targets across the Southern Coastal Systems

- Expands spatial extent of evaluation and assessment
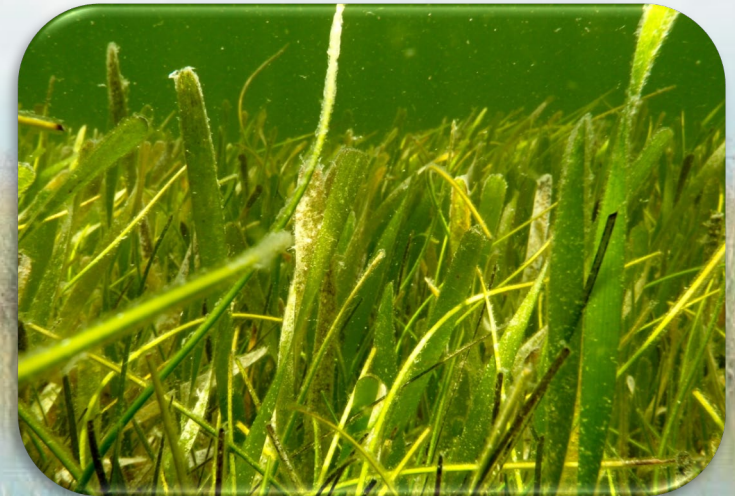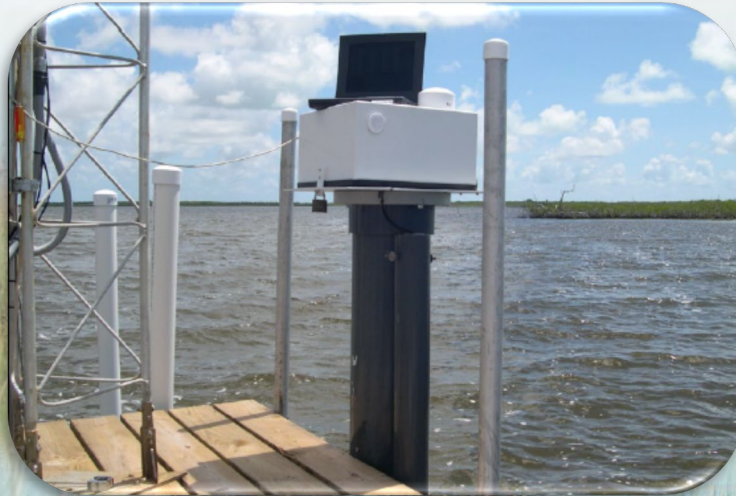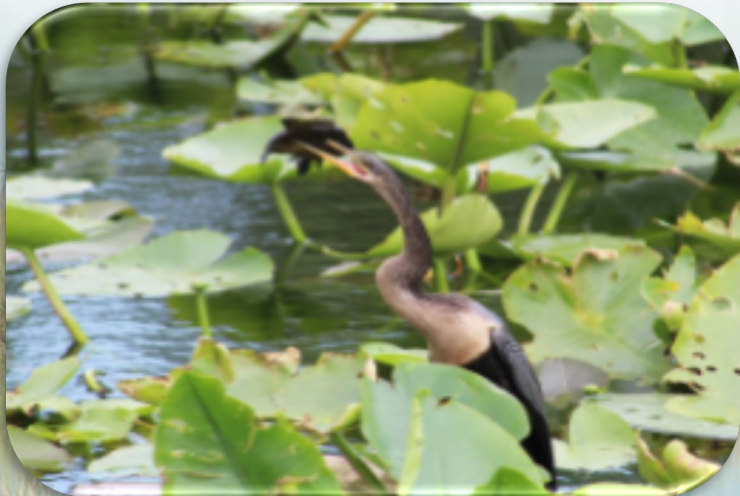
Thank you!

Acknowledgements

USACE & SFWMD & NPS

USGS & Audubon

Restoration Coordination &Verification (RECOVER) Team Members

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