SEAGRASS AS INDICATORS OF ECOSYSTEM CHANGE IN SOUTH FLORIDA ESTUARIES

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CERP IMPLEMENTATION WILL ALTER THE VOLUME, TIMING, AND SPATIAL DISTRIBUTION OF FRESHWATER INFLOW, RETURNING THE SOUTH FLORIDA SYSTEM TO MORE NATURAL HYDROLOGICAL CONDITIONS.
CHANGES IN SEAGRASS COMMUNITY STRUCTURE WILL BE USED AS THE CENTRAL PERFORMANCE MEASURE TO ASSESS CERP SUCCESS IN SOUTH FLORIDA ESTUARIES
WHY MONITOR SEAGRASSES?

- Dominant benthic communities in the South Florida coastal waters likely to be affected by CERP.
- Most important primary producers.
- Provide critical fisheries habitat in South Florida region.
- Sensitive indicators of changes in water quality conditions.
THE GOAL OF FHAP-SF IS TO PROVIDE INFORMATION FOR THE SPATIAL ASSESSMENT OF INTER-ANNUAL VARIABILITY IN SEAGRASS COMMUNITIES, AND TO ESTABLISH A BASELINE TO MONITOR RESPONSES OF SEAGRASS COMMUNITIES TO WATER MANAGEMENT ALTERATIONS ASSOCIATED WITH CERP ACTVITIES.
SPECIFIC OBJECTIVES OF FHAP-SF ARE:

• TO DETERMINE THE DISTRIBUTION, ABUNDANCE, AND SPECIES COMPOSITION OF SEAGRASS AND BENTHIC MACROALGAL COMMUNITIES IN THE SOUTHERN ESTUARIES.

• TO DEVELOP A BASIC UNDERSTANDING OF RELATIONSHIPS AMONG WATER QUALITY PARAMETERS AND SAV COMMUNITY DYNAMICS.

• TO PROVIDE DATA TO SEPARATE ANTHROPOGENICALLY INDUCED CHANGES FROM NATURAL ECOSYSTEM VARIATION.

• TO VERIFY MODEL PREDICTIONS ON SPECIES AND ECOSYSTEM-LEVEL RESPONSES TO SYSTEM PERTURBATIONS.
**SAMPLING DESIGN:**

- Monitoring stations are determined using a systematic random-sampling design.

- Each location is divided into 30 tessellated hexagonal grid cells.

- Single sampling station randomly selected from each grid cell.
SEAGRASS DISTRIBUTION AND ABUNDANCE:

- SAV COVER IS VISUALLY ASSESSED USING A MODIFIED BRAUN-BLANQUET FREQUENCY/COVER ANALYSIS.
- EIGHT 0.25 M² QUADRATS ARE EXAMINED AT EACH STATION.
- MONITORING CONDUCTED ANNUALLY AT THE END OF THE DRY SEASON (MAY OR JUNE).

Braun/Blanquet Cover Abundance Scale

0.1 = Solitary shoot with small cover
0.5 = Few shoots with small cover
1.0 = Numerous shoots, < 5% cover
2.0 = Any number of shoots, 5-25% cover
3.0 = Any number of shoots, 26-50% cover
4.0 = Any number of shoots, 51-75% cover
5.0 = Any number of shoots, 76-100% cover
EPiphyte abundance and shoot morphometrics:

- Ten Thalassia shoots are collected at each site to determine epiphyte abundance and shoot morphometrics.
THALASSIA PHOTOSYNTHETIC CHARACTERISTICS:

• PHOTOSYNTHETIC EFFICIENCY IS MEASURED AT EACH STATION USING A PULSE-AMPLITUDE MODULATED (PAM) FLUORESCENCE METER.

• CHANGES IN PHOTOSYNTHETIC CHARACTERISTICS MAY BE EVIDENT BEFORE CHANGES IN SEAGRASS ABUNDANCE AND BIOMASS BECOME APPARENT.
PERMANENT TRANSECTS IN FLORIDA BAY:

- FIFTEEN 50 METER TRANSECTS.
- COINCIDENT WITH SERC-FIU WATER QUALITY MONITORING STATIONS.
- SAMPLED TWICE ANNUALLY - MAY AND OCTOBER.
- PARAMETERS INCLUDE BRAUN-BLANQUET SCORES, SHOOT DENSITY, STANDING CROP, EPIPHYTE BIOMASS, AND THALASSIA SHOOT MORPHOMETRICS.
No Plants  
51-75%  
76-100%

Halodule 1995

Halodule 2000 vs. 1995

Halodule 2000

Halodule 2007 vs. 2000

Halodule 2007

Halodule 2007 vs. 1995

Halodule 2007 vs. 1995

Halodule 2007 vs. 1995

Legend:
- No Plants
- <5%
- 6-25%
- 26-50%
- 51-75%
- 76-100%

±5%
±6-25%
±26-50%
±51-75%
±76-100%
Thalassia testudinum
Mean Braun-Blanquet Densities
1995-2007
Halodule wrightii
Mean Braun-Blanquet Densities
1995-2007
Syringodium filiforme
Mean Braun-Blanquet Densities
1995-2007

0.0 1.0 2.0 3.0 4.0

0 1 2 3 4

Madeira Bay
Eagle Key
Calusa Key
Crane Key
Twin Key
Whipray
Johnson Key
Rabbit Key
Rankin Lake
Blackwater Sound

(* Linear)
(* Quad)

Syringodium filiforme
Mean Braun-Blanquet Densities
1995-2007
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