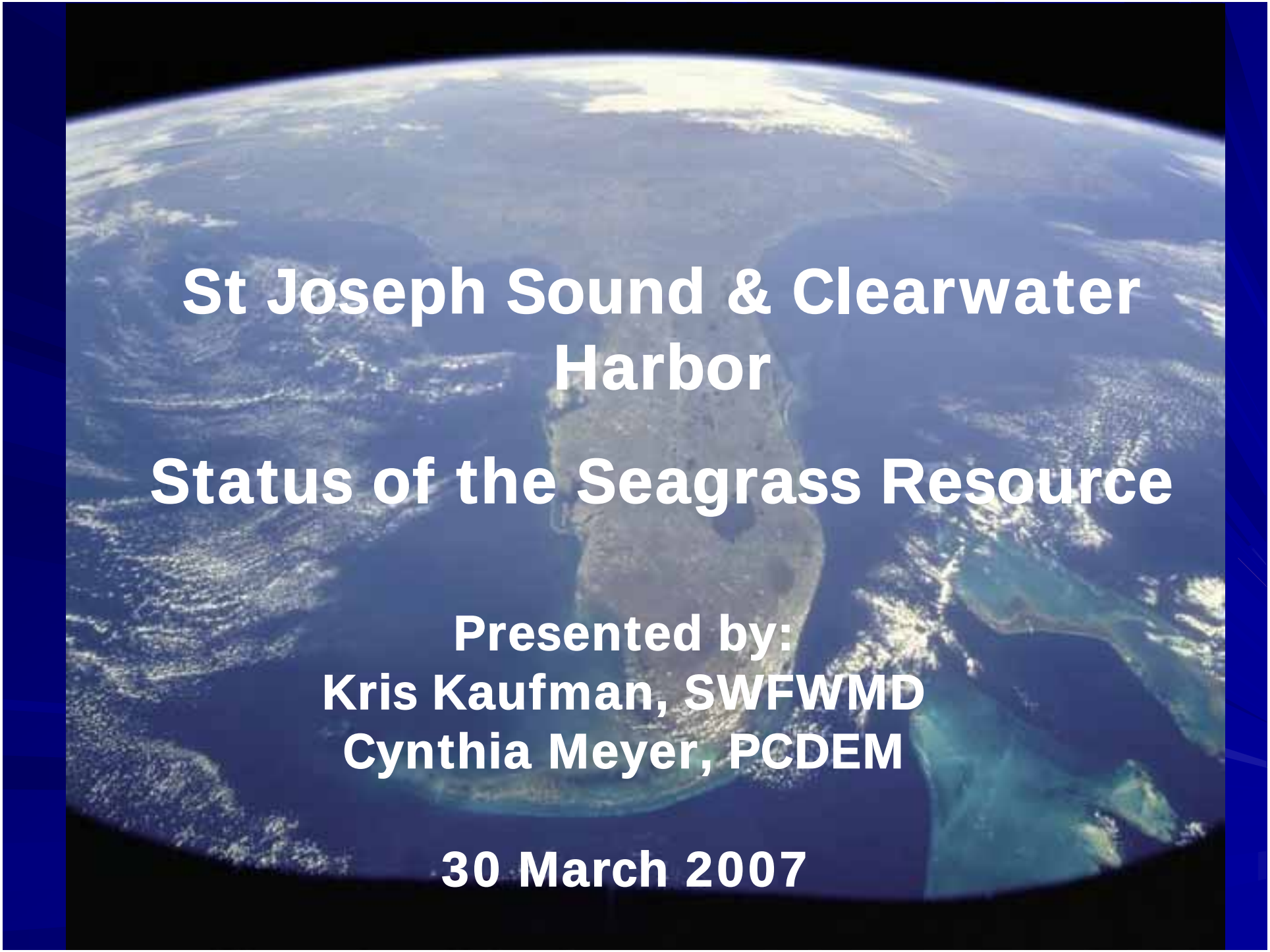


St Joseph Sound & Clearwater Harbor

Status of the Seagrass Resource

Presented by:
Kris Kaufman, SWFWMD
Cynthia Meyer, PCDEM

30 March 2007

STJS/CLWH Study Area

Area

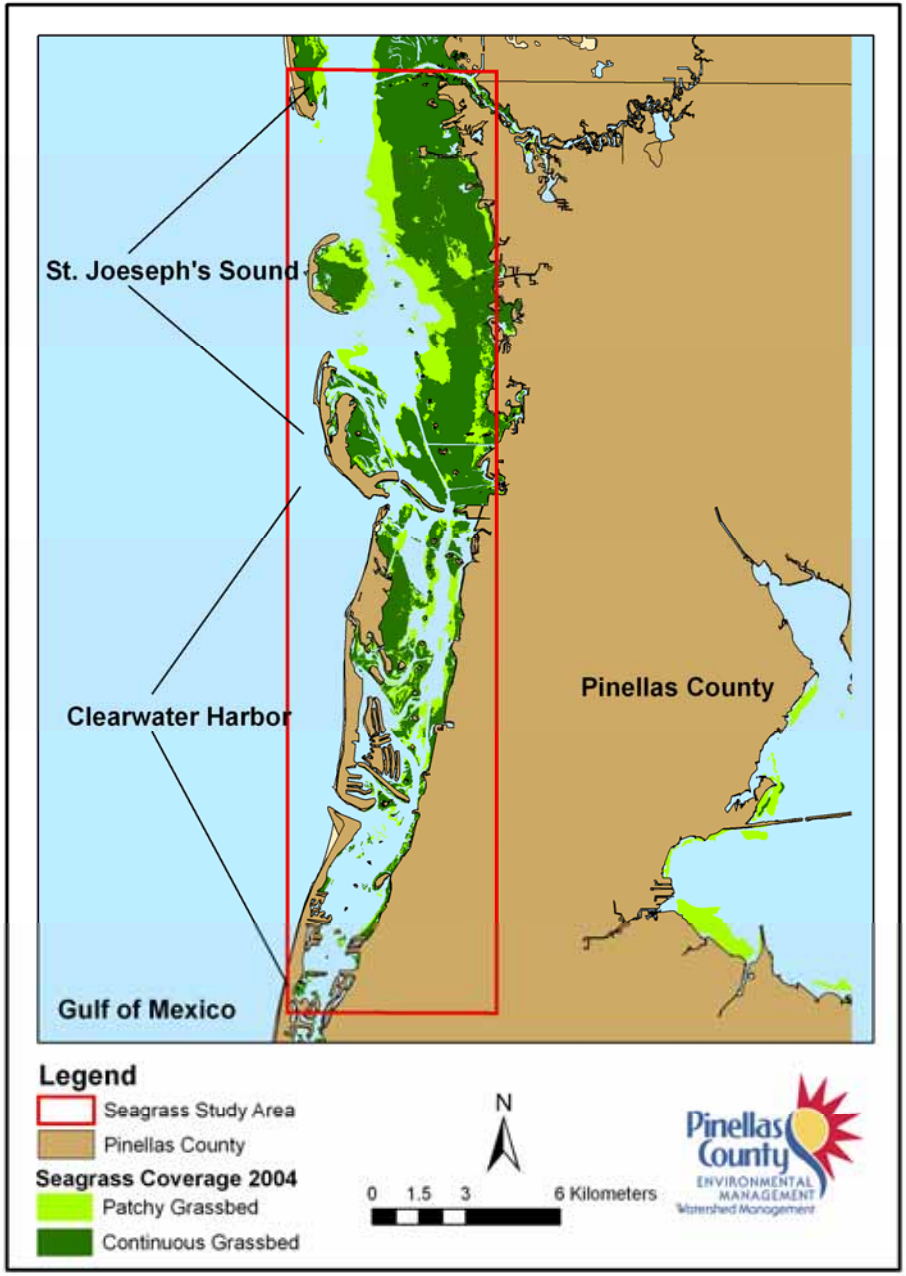
118 sq km

(29,000 acres)

Seagrass Beds

60 sq km

(15,000 acres)

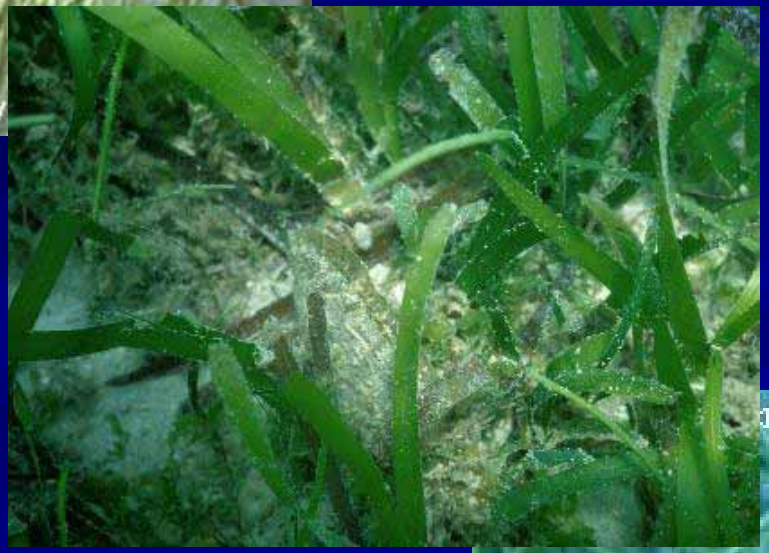


Halodule wrightii

Shoal Grass

Thalassia testudinum

Turtle Grass



Syringodium filiforme

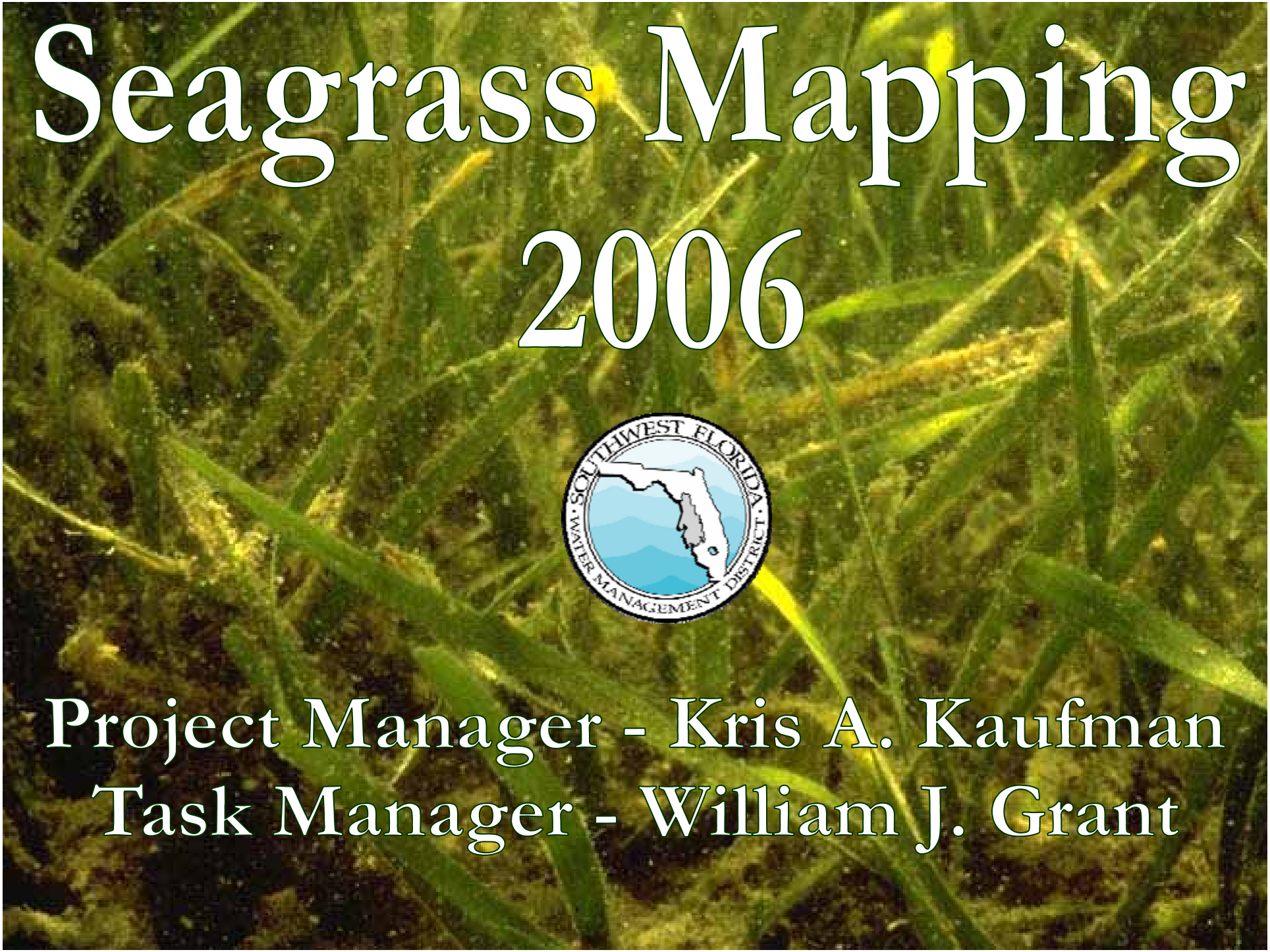
Manatee grass

Studies concentrating on the Seagrass Resource

- **Seagrass Mapping 1999- present**
- **Fixed Transect Monitoring 1998 – 2005**
- **CLWH/STJS Pilot Study 2006**

Additional Projects in the area

- **Ambient Water Quality Monitoring**



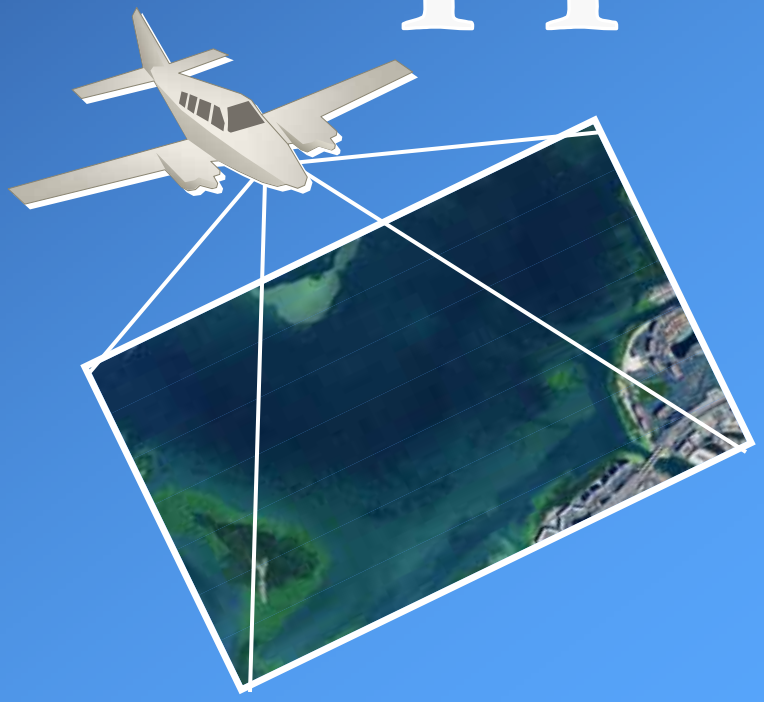
Seagrass Mapping 2006

Project Manager - Kris A. Kaufman
Task Manager - William J. Grant

Introduction

- Mapping Program began in 1988
- Monitor 5 estuaries
- Goal: Create spatially and thematically accurate maps of seagrass distribution and cover classification

Aerial Mapping



Digital Technology

2004 Traditional True Color Film

520 images acquired
2 ft GSD (pixel resolution)
8 Bit

2006 Direct Digital Imagery

2,000 images acquired
1 ft GSD (pixel resolution)
12 Bit

Imagery Acquisition

Fly late fall, early winter – good clarity, prior to die back

Day of flight conditions:

- **Tides less than mean tide level**
- **Waves less than 2 feet**
- **Wind less than 10 knots**
- **Secchi greater than 2 meters**

Photointerpretation

- Delineate and classify SAV features
- Florida Land Use Cover Classification System (FLUCCS)
  - 5400: Bays and Estuaries
  - 6510: Tidal Flats
  - 9113: Seagrass, Patchy
  - 9116: Seagrass, Continuous
  - 9121: Attached Algae
- 0.5 acre Minimum Mapping Unit

Signature Example

Location: Boca Ciega Bay, St. Petersburg FL


1999 - 2006
Results

Seagrass Acreage

Year	1999	2001	2004	2006
Acreage	13,994	13,393	14,200	14,982
Acreage Change		- 601	+ 807	+ 782
Percent Change		- 4.5%	+ 6.0%	+ 5.5%

1999 – 2006: + 7.0%

SWFWMD Seagrass Change Analysis Map

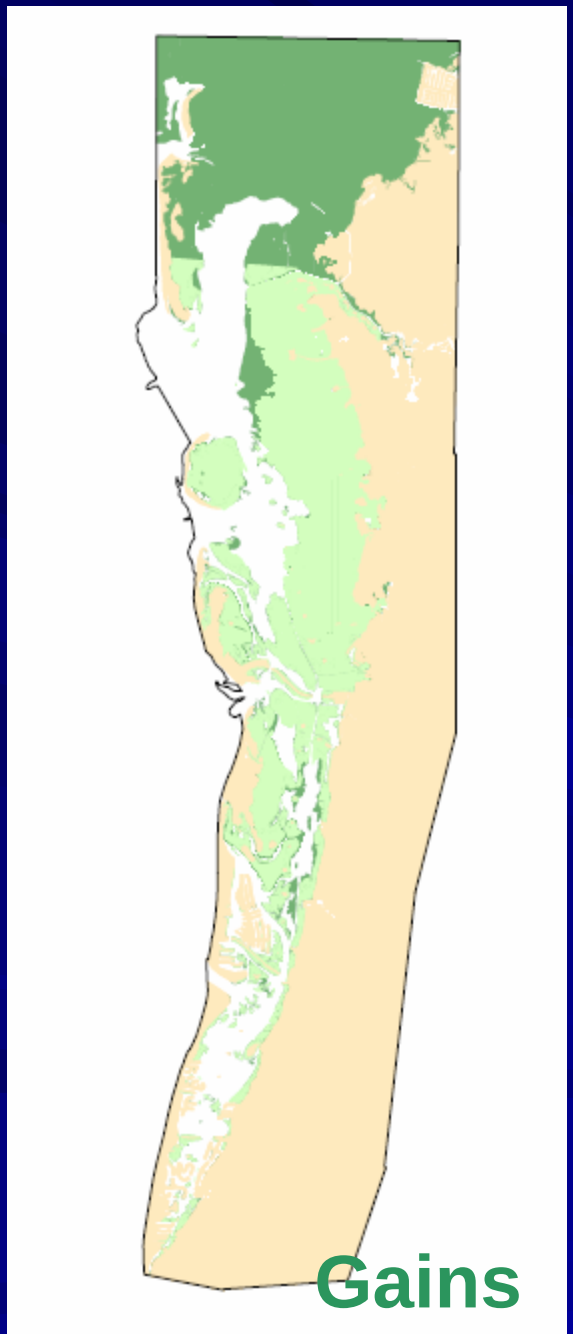
1999-2001

Legend

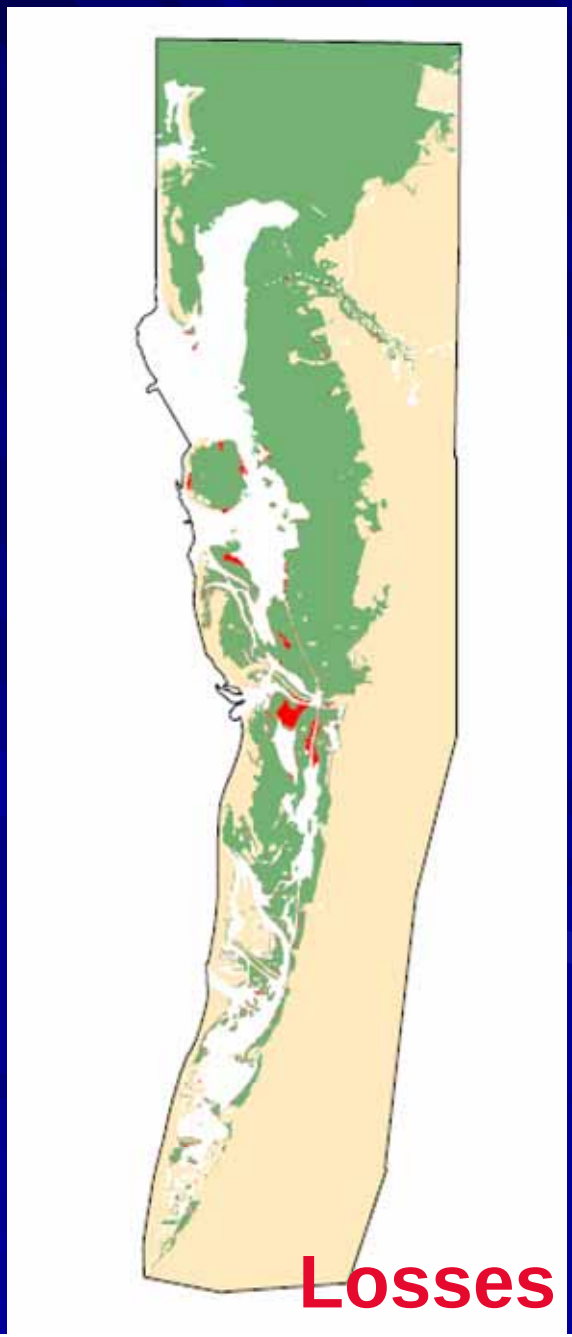
- Seagrass Gain
- Seagrass Loss
- Non-SAV Change
- No Change

- Seagrass
- Beaches
- Tidal Flats
- Gulf of Mexico
- Bays and Estuaries
- Land

SWFWMD Seagrass Change Analysis Map 2004



Gains



Losses

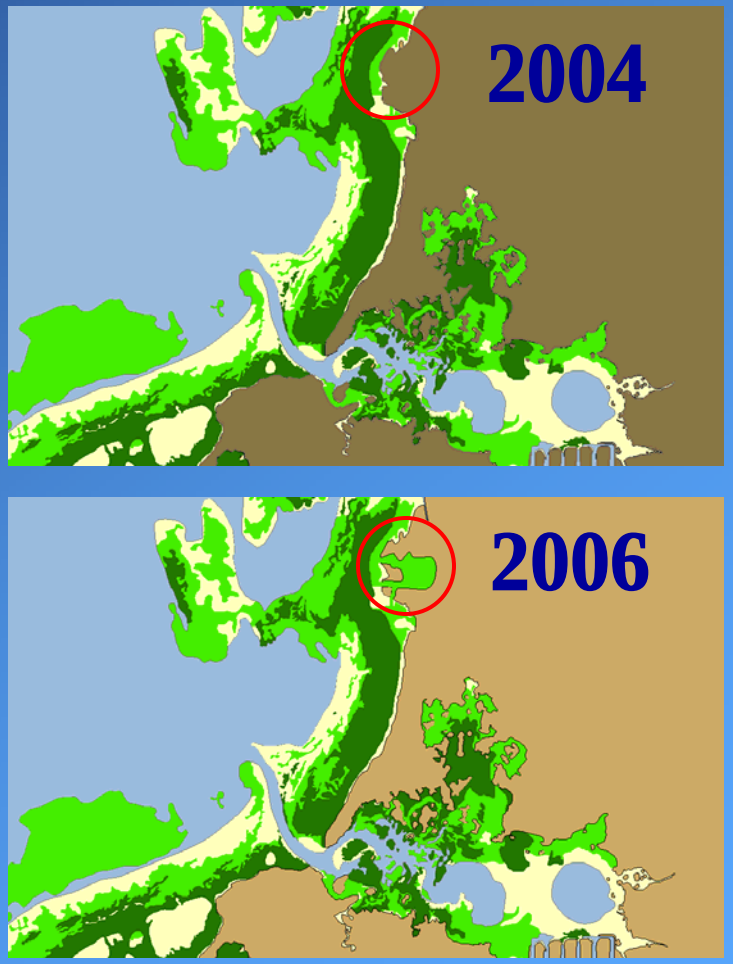
St. Joseph Sound/ Clearwater Harbor

- 14,982 acres
- 782 acre increase
- 5.5% change

Comparison of 2004 & 2006 Polygon Maps

- **Coastline updated for 2006**
- **Identification of deep seagrass not previously mapped**

Coastline Update Example



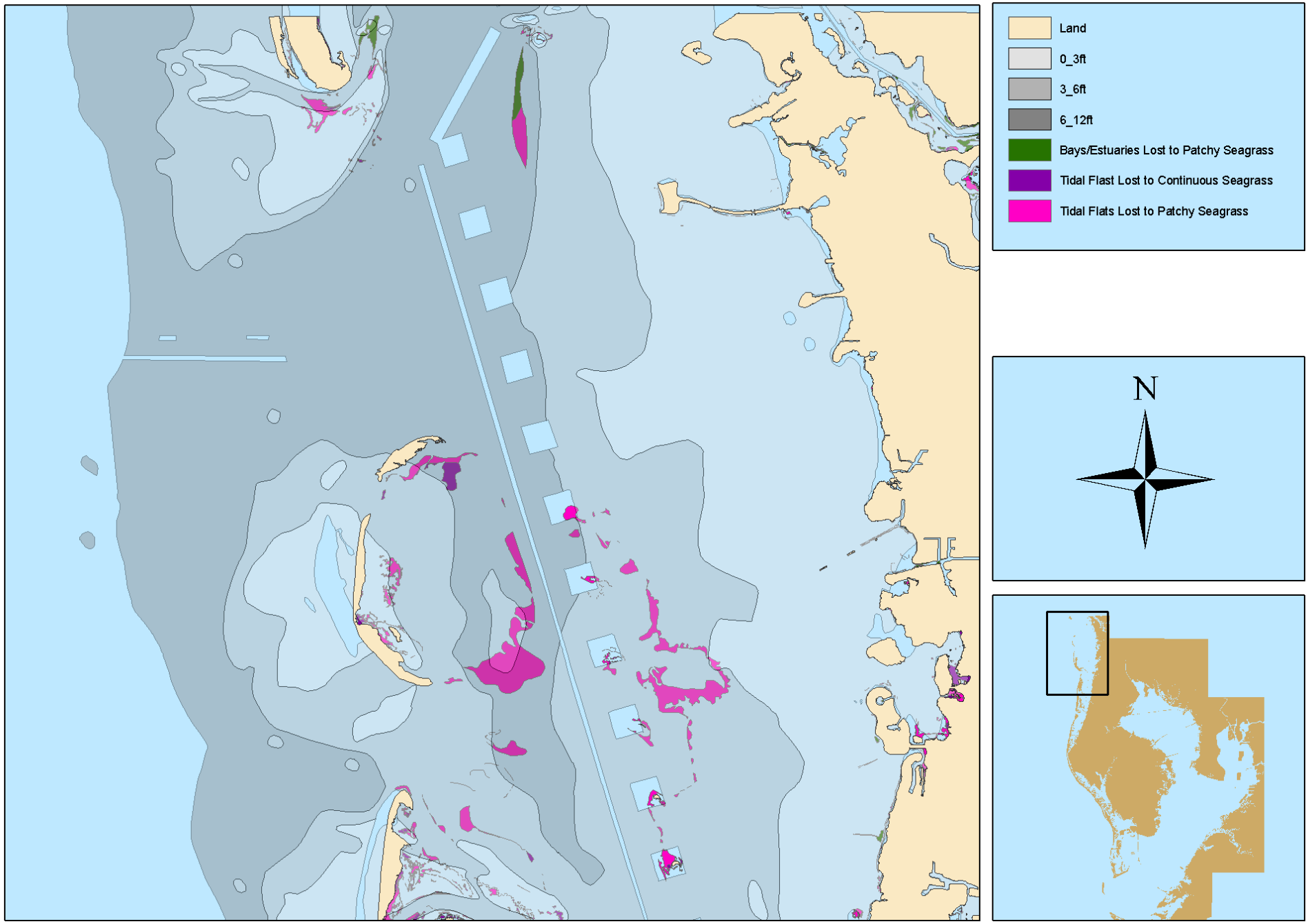
Coastline Update Continued

Acres of “land” in 2004 now seagrass in 2006

- SJS / CWH: 53.53 acres
- Tampa Bay: 118.88 acres
- Sarasota Bay: 62.85 acres
- Lemon Bay: 30.29 acres
- Charlotte Harbor: 125.21 acres

Seagrass Mapped in Deep Waters

St. Joseph Sound Seagrass Mapped within 6-12 ft Water During 2006

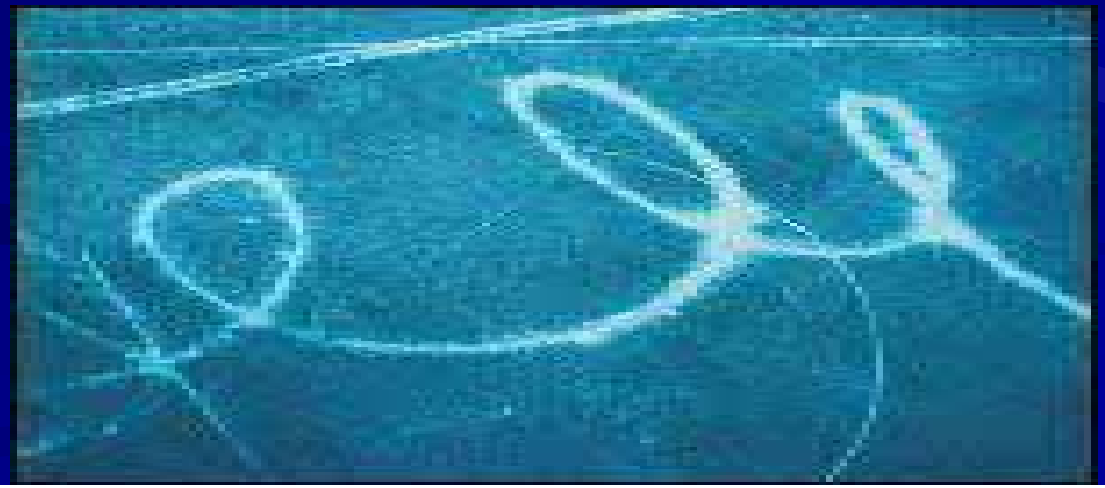


Seagrass Monitoring Programs

- Fixed Transects 1998-2003
- Stratified Random Transects 2006

Status of the Seagrass Beds

Conclusions



Seagrass Monitoring Programs

1998-2005: Fixed transects

3822 m of monitoring

15 transects (60-550 m)

2006-present: Stratified Random Transects

1890 m of monitoring

63 transects (30 m per transect)

Fixed Transects

14 Transects

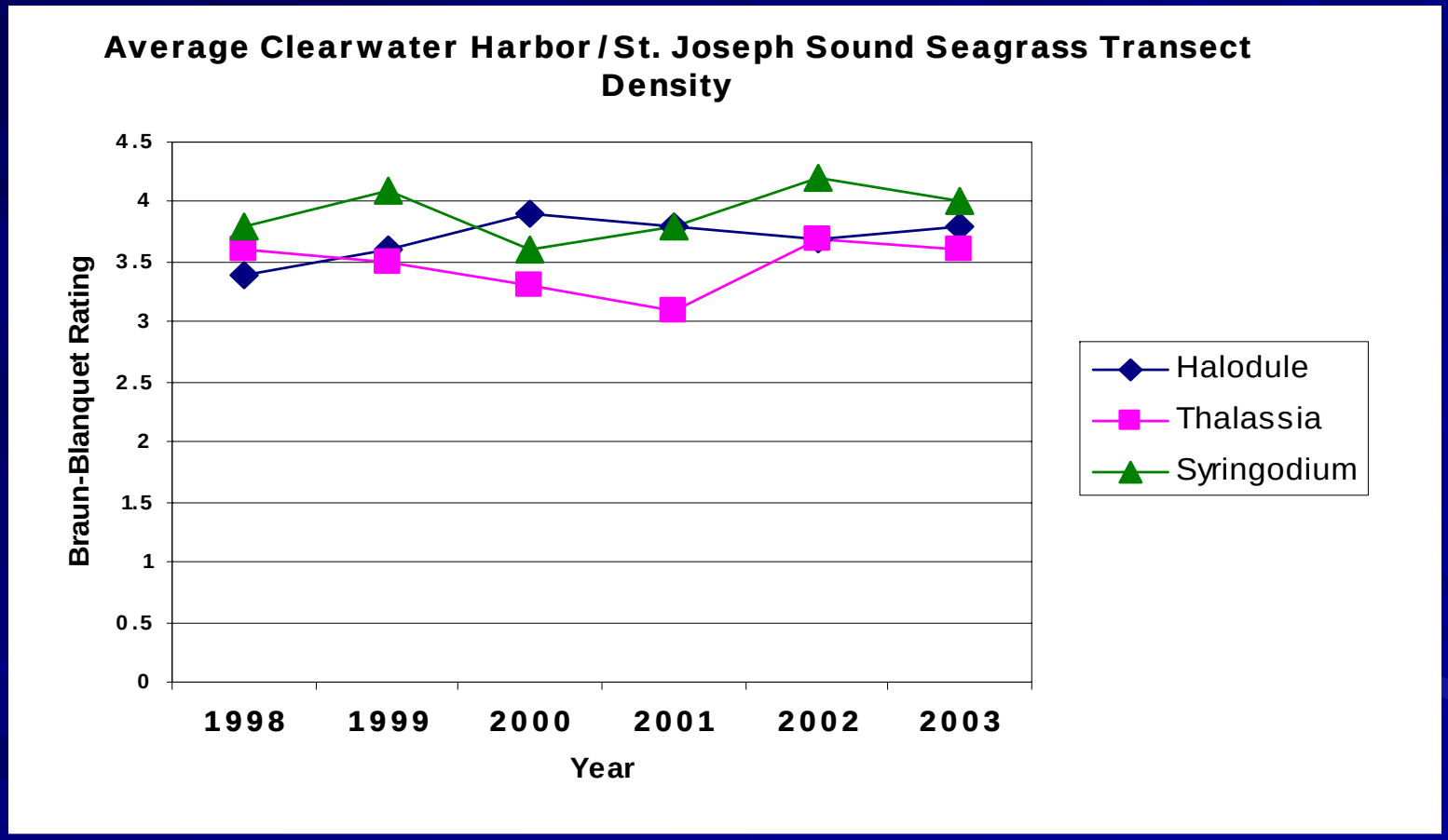
STSJ = 1 transect
(#15 aborted due to SHARKS)

CLWN = 7 transects

CLWS = 6 transects

Data Collection

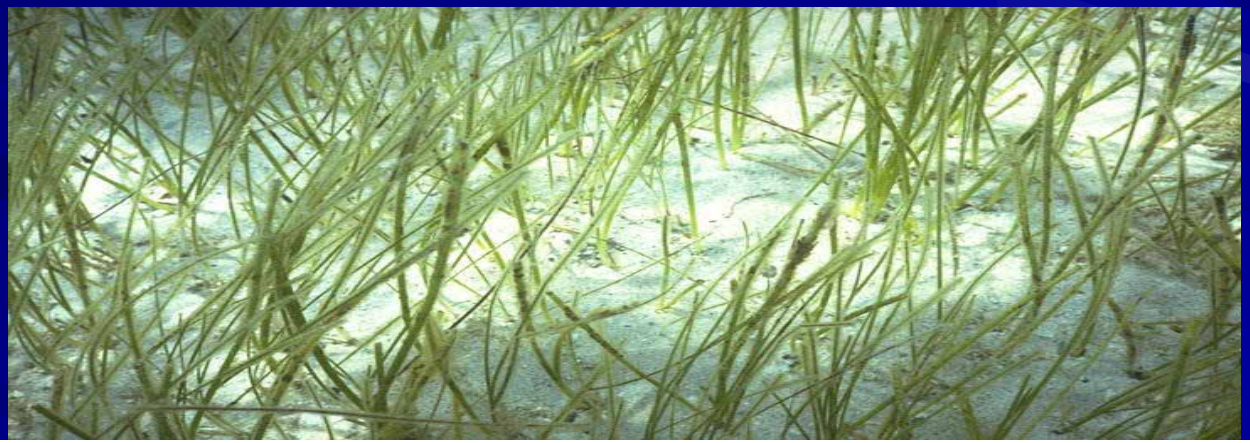
Results


Average Clearwater Harbor/St. Joseph Sound Seagrass Transect Density
Braun-Blanquet Rating
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
1998
1999
2000
2001
2002
2003
Year
Halodule
Thalassia
Syringodium

Stratified Random Design

Objectives:

- Characterize the seagrass beds
- Assess the status and trends of the seagrass resource.
- Identify the areas of concern
- Identify potential causes of seagrass variation



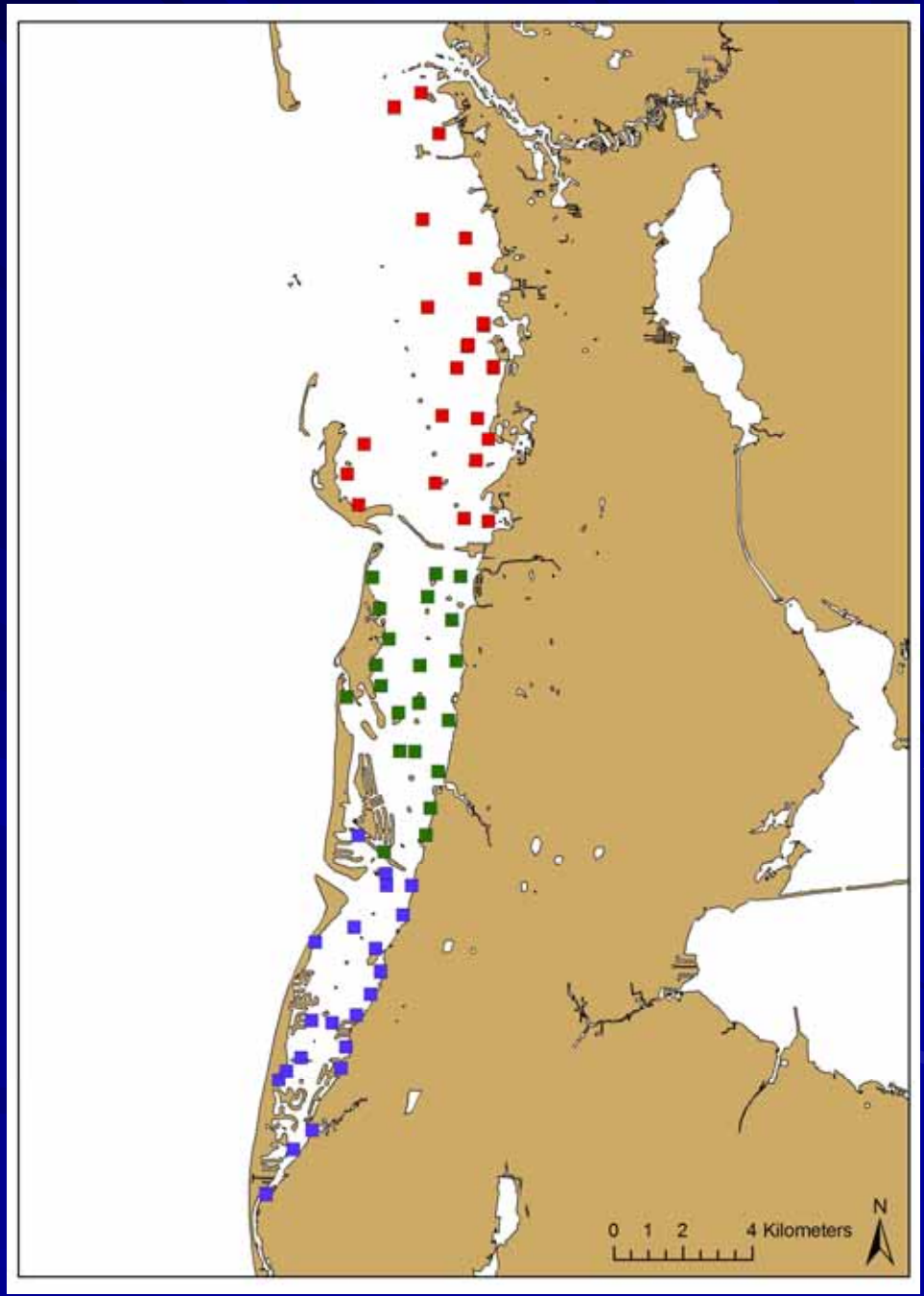
Stratified Random Program

63 Transects

STJS- 21 transects

CLWN- 21 transects

CLWS- 21 transects

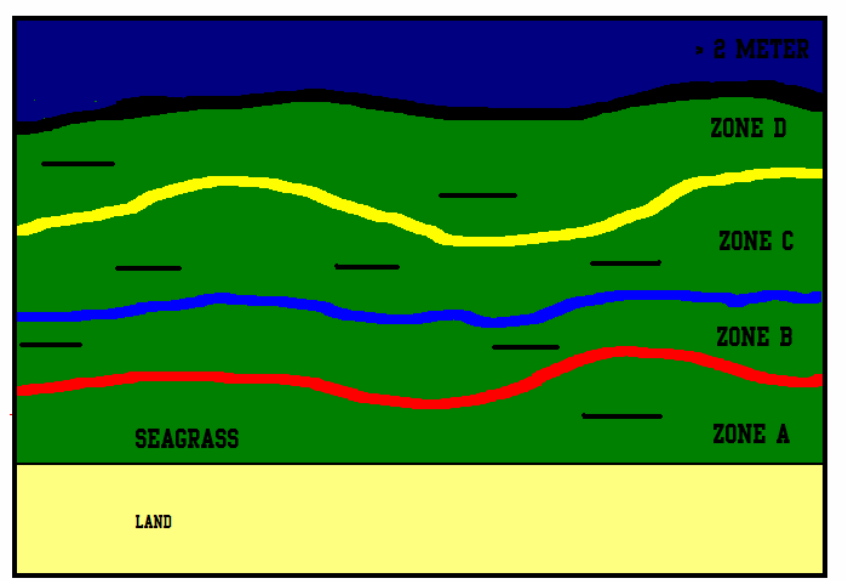


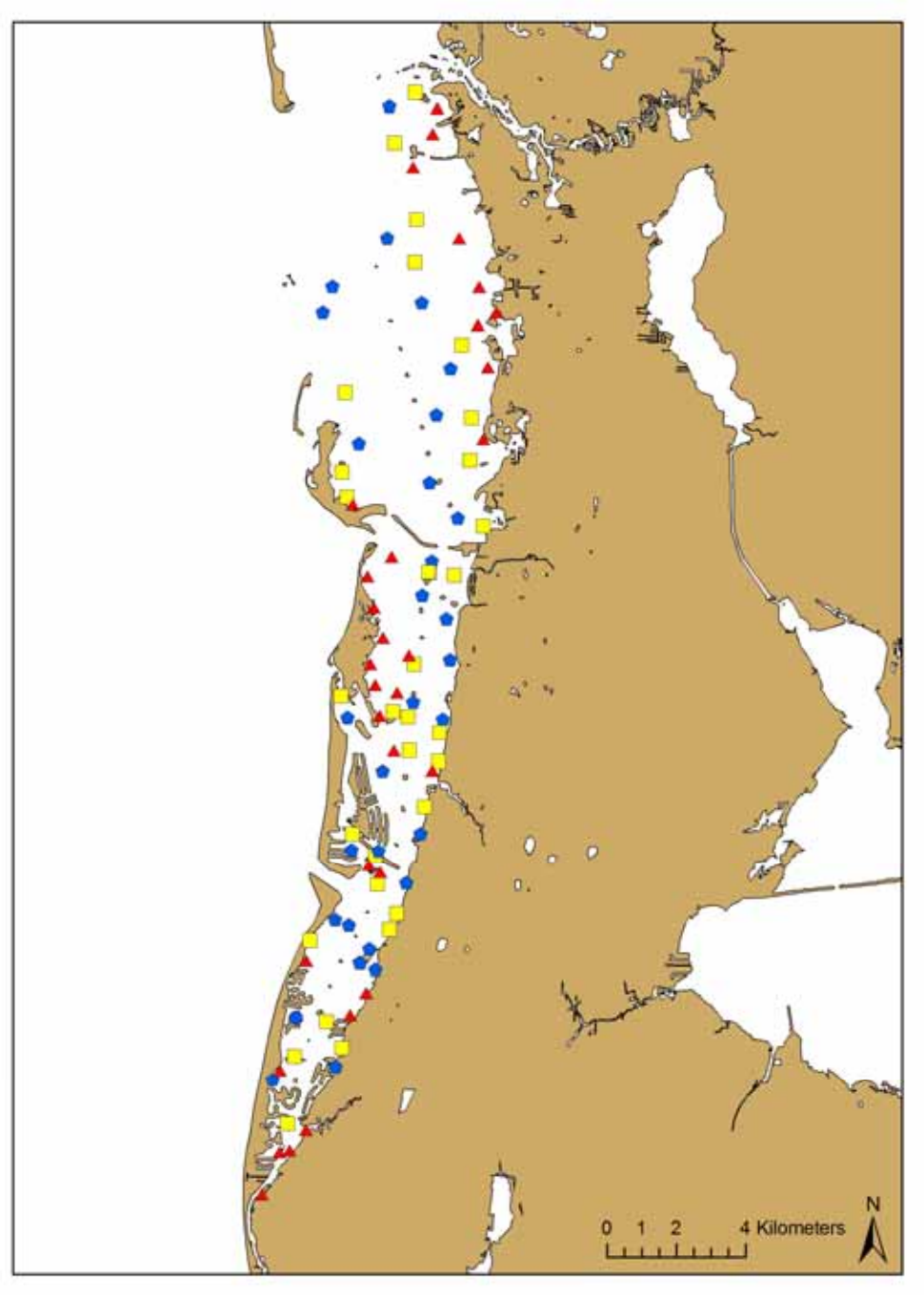
Stratification

3 strata

3 depth zones

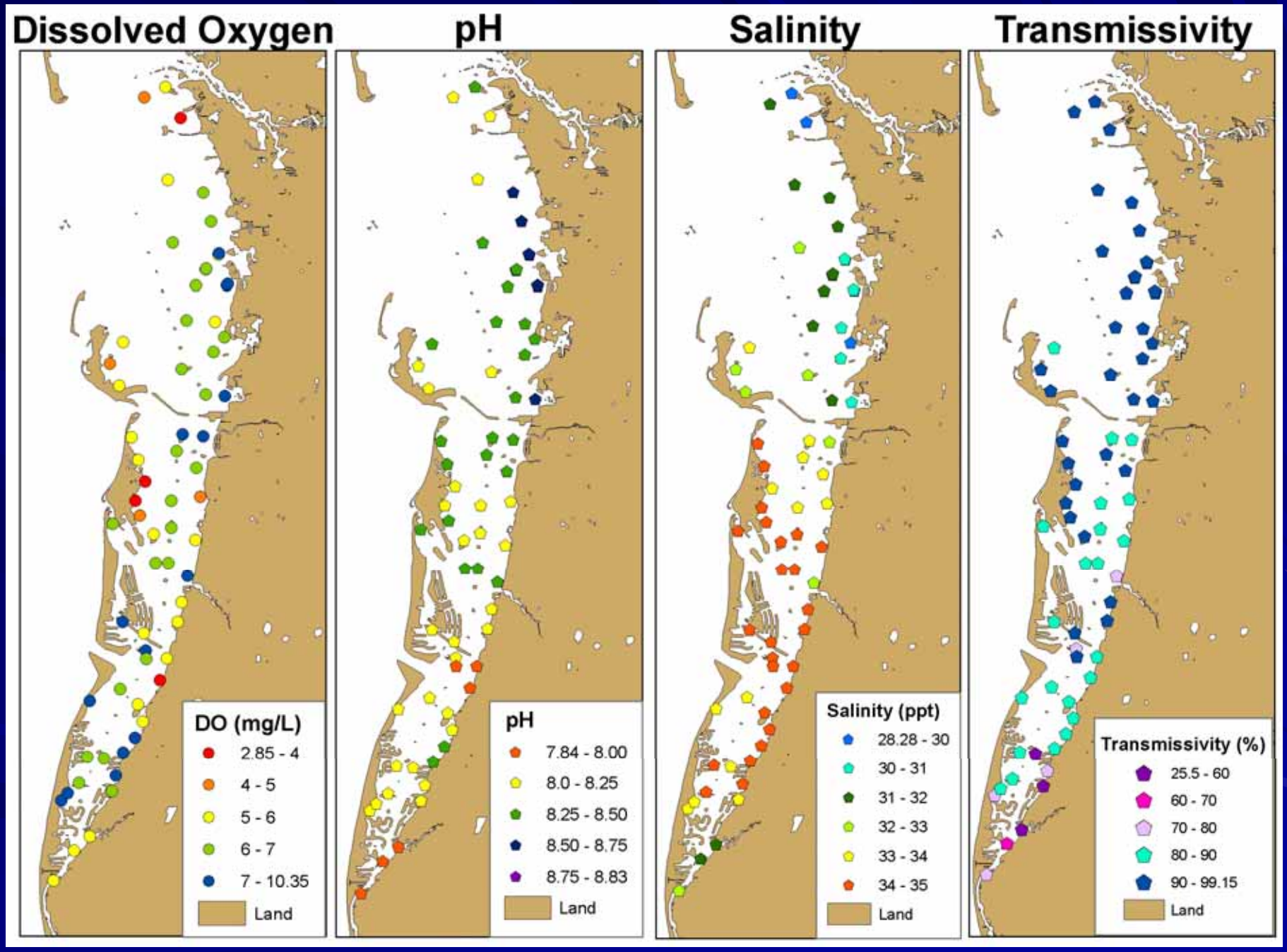
7 transects in each





Water Quality Metrics

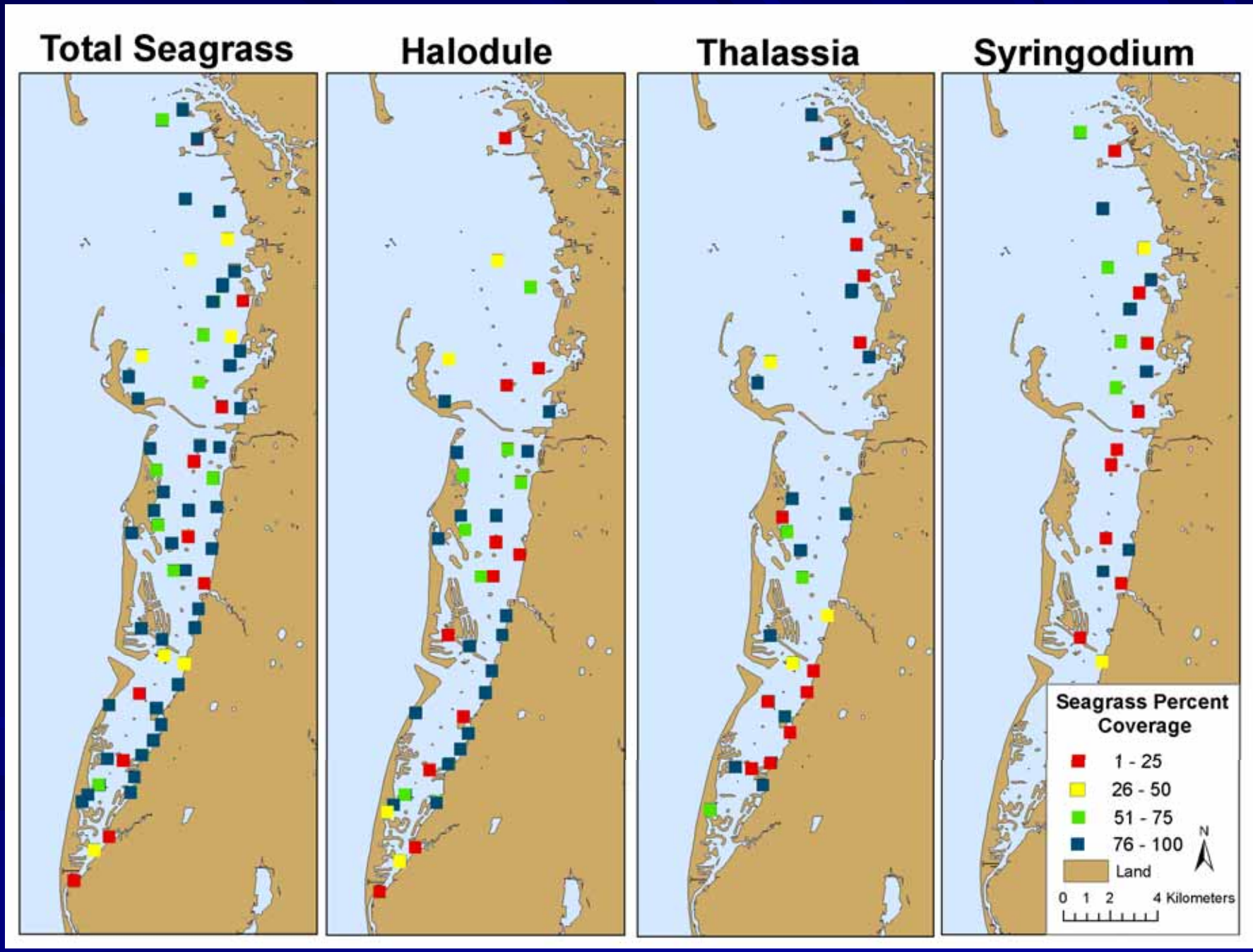
Strata	DO (mg/L)	pH	Salinity (ppt)	Transmissivity %
STJS	6.27	8.25	31.16	95
CLWN	5.93	8.0	33.67	89
CLWS	6.65	8.0	33.90	79

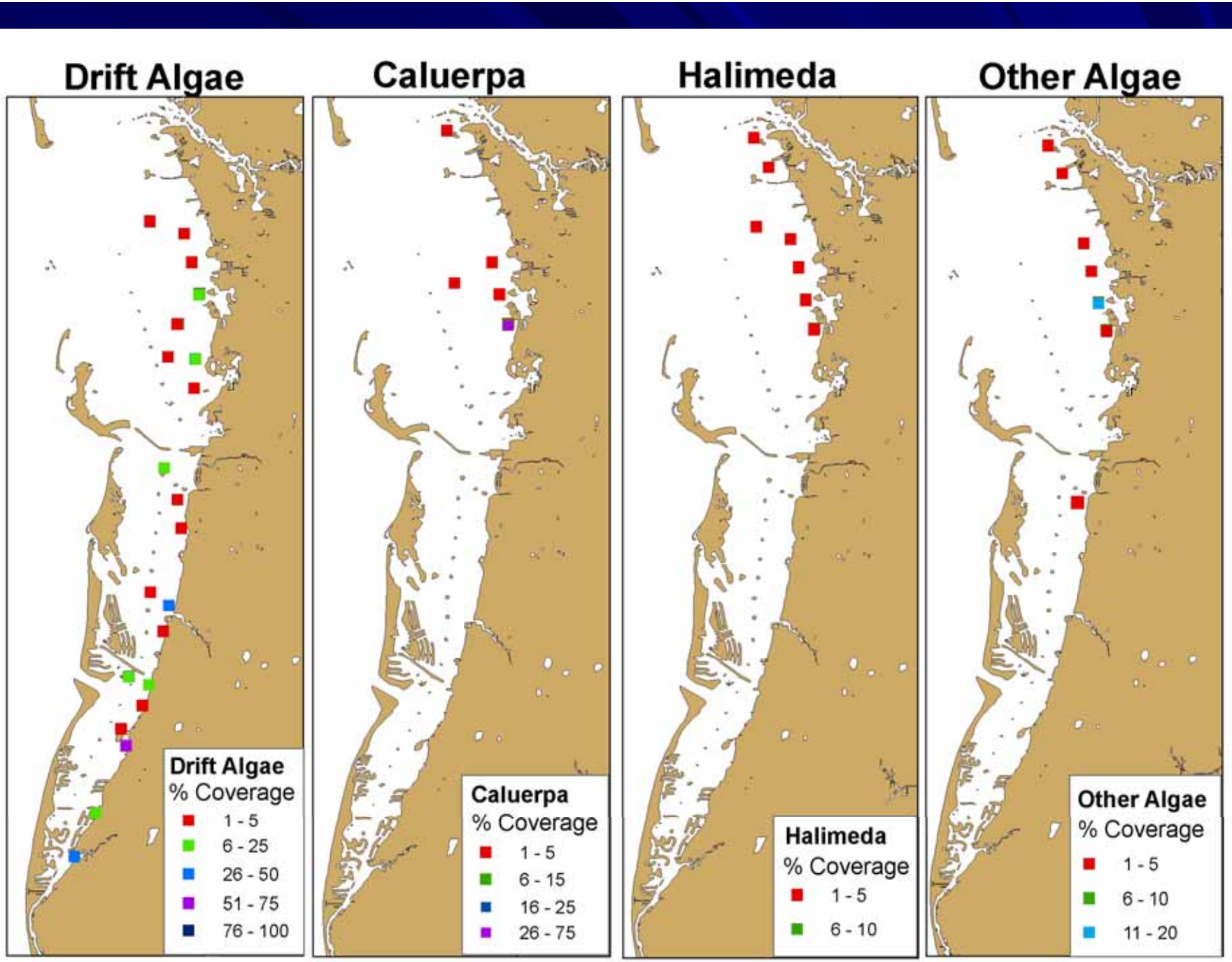

Dissolved Oxygen
DO (mg/L)
2.85 - 4
4 - 5
5 - 6
6 - 7
7 - 10.35
Land
pH
pH
7.84 - 8.00
8.0 - 8.25
8.25 - 8.50
8.50 - 8.75
8.75 - 8.83
Land
Salinity
Salinity (ppt)
28.28 - 30
30 - 31
31 - 32
32 - 33
33 - 34
34 - 35
Land
Transmissivity
Transmissivity (%)
25.5 - 60
60 - 70
70 - 80
80 - 90
90 - 99.15
Land

Seagrass Abundance & Composition

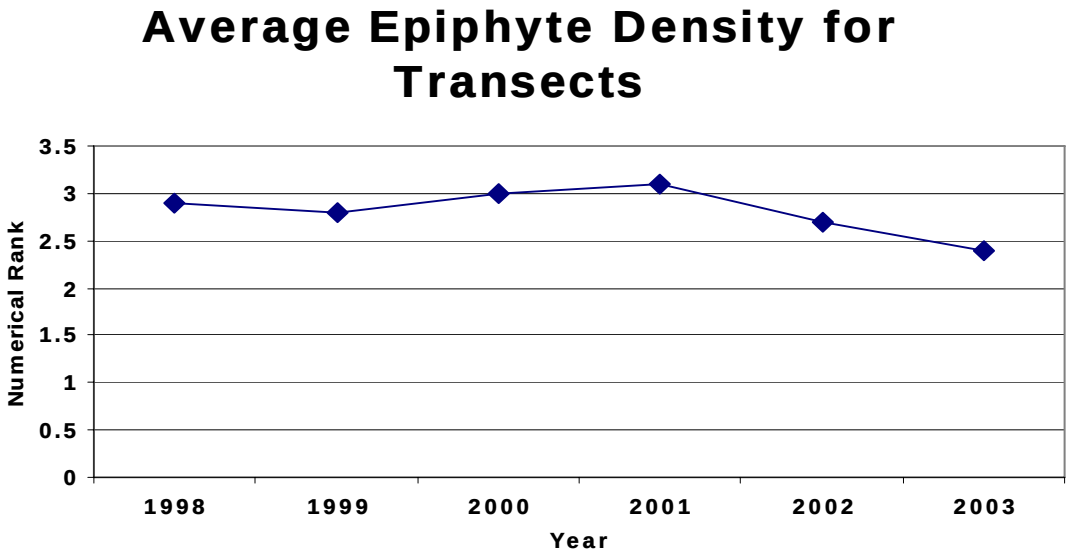
Percent Coverage

Strata	Total SAV	Halodule	Thalassia	Syringodium
STJS	**71**	10	**30**	**30**
CLWN	68	42	20	6
CLWS	63	**43**	19	1
Depth				
A (0-0.5m)	66	33	**27**	5
B (0.51-1.2m)	**76**	**38**	26	11
C (1.2 m+)	61	24	16	**20**


Total Seagrass
Halodule
Thalassia
Syringodium
Seagrass Percent Coverage
1 - 25
26 - 50
51 - 75
76 - 100
Land
N
0 1 2 4 Kilometers


Drift Algae
Caluerpa
Halimeda
Other Algae
Drift Algae
% Coverage
1 - 5
6 - 25
26 - 50
51 - 75
76 - 100
Caluerpa
% Coverage
1 - 5
6 - 15
16 - 25
26 - 75
Halimeda
% Coverage
1 - 5
6 - 10
Other Algae
% Coverage
1 - 5
6 - 10
11 - 20

Epiphytes



2006 Mean Epiphyte Density 2.5

Conclusions

- Studies suggest that grassbeds are currently stable with an increase in acreage since 1999

- Combining Aerial Mapping and monitoring to assess the status and trends

- Improving Methods to provide statistically defensible results and greater geographic extent