
Long-term monitoring of a high-latitude coral reef system off southeast Florida, USA
NOVA SOUTHEASTERN UNIVERSITY
OCEANOGRAPHIC CENTER
BROWARD COUNTY
FLORIDA
NCRI
NATIONAL CORAL REEF INSTITUTE
FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION
FLORIDA

SE Florida Coral Reef Ecosystem Management – Monitoring Programs

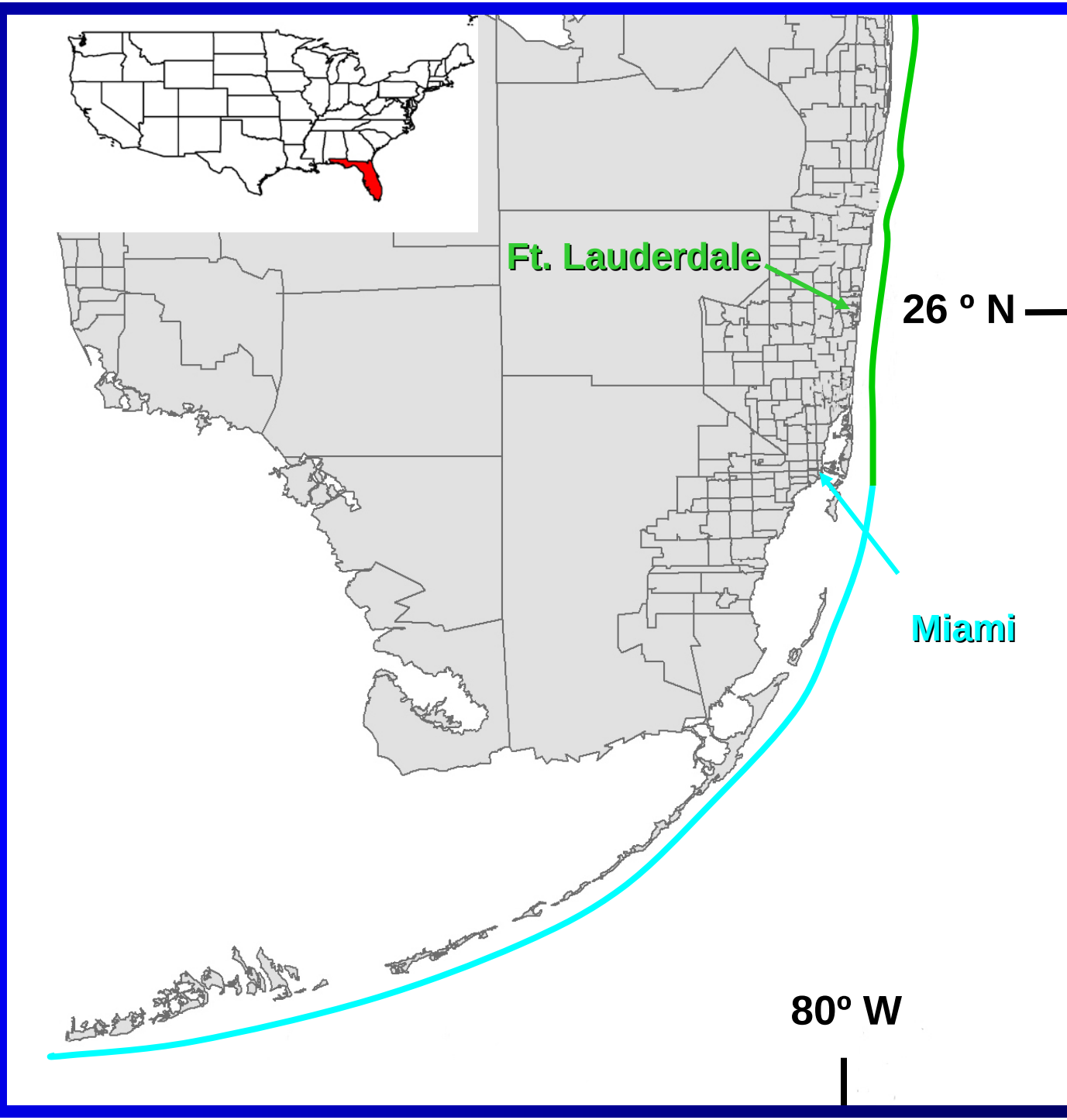
2 Monitoring Programs

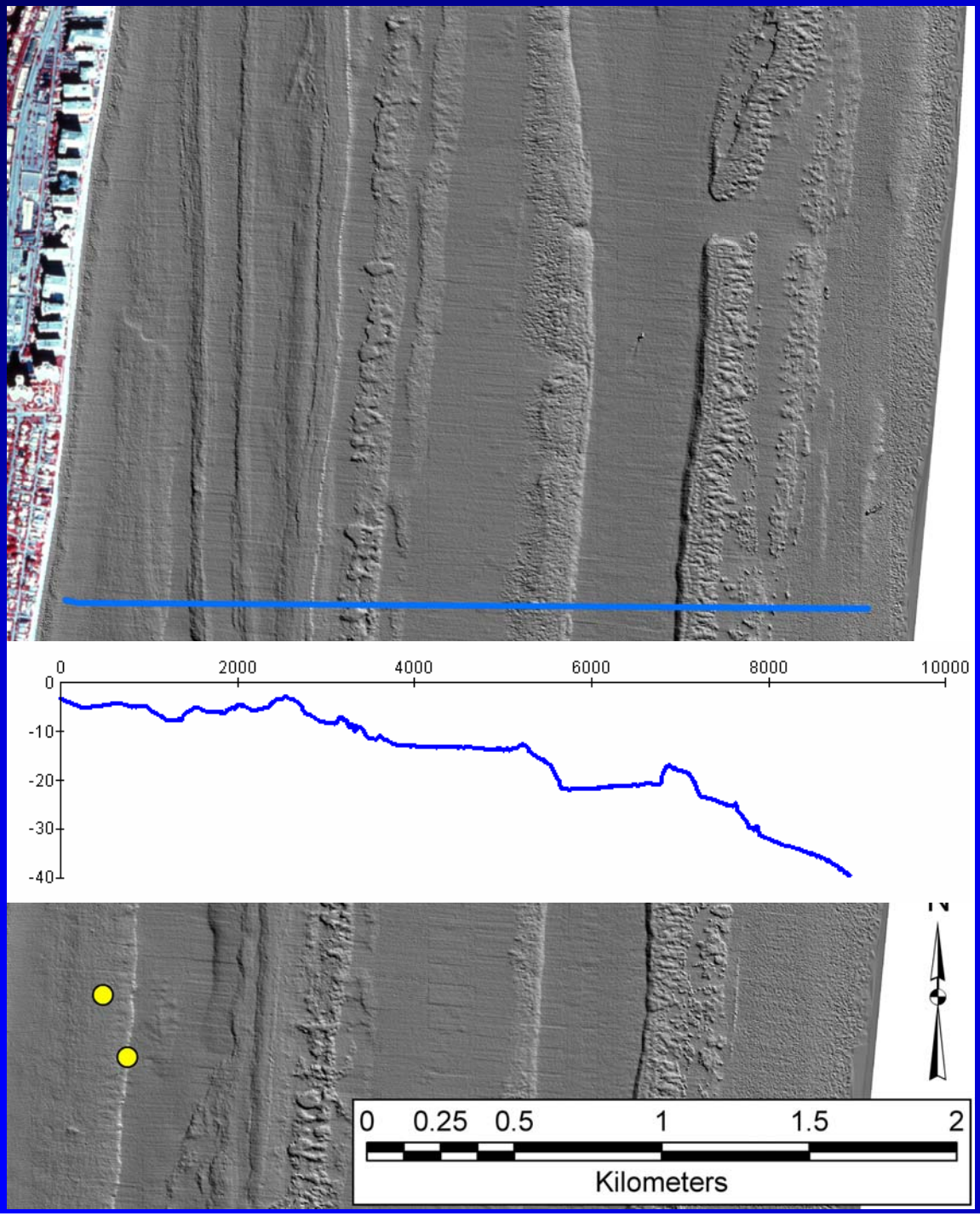
1. Local Management Level – Broward County Environmental Protection Department (EPD)

2. Regional Management Level – Florida Department of Environmental Protection (DEP) and Florida Wildlife Research Institute (FWRI) (SECREMP)

Southeast Florida Reef System

1. Reef development generally described as extending north from the Keys only up to Biscayne Bay
2. Significant reef communities actually extend into Palm Beach County





Broward County (SE FLA) Reefs

- Veneer of organisms dominated by octocorals and sponges – lower stony coral cover than much of the Caribbean
- Shore parallel reef structures separated by extensive sand deposits

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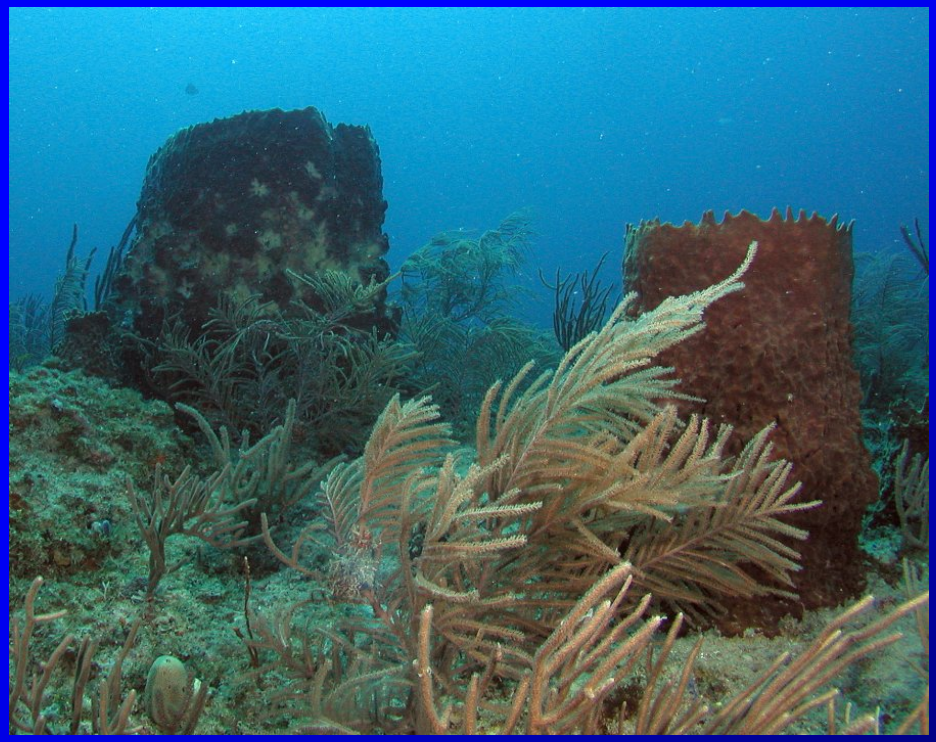
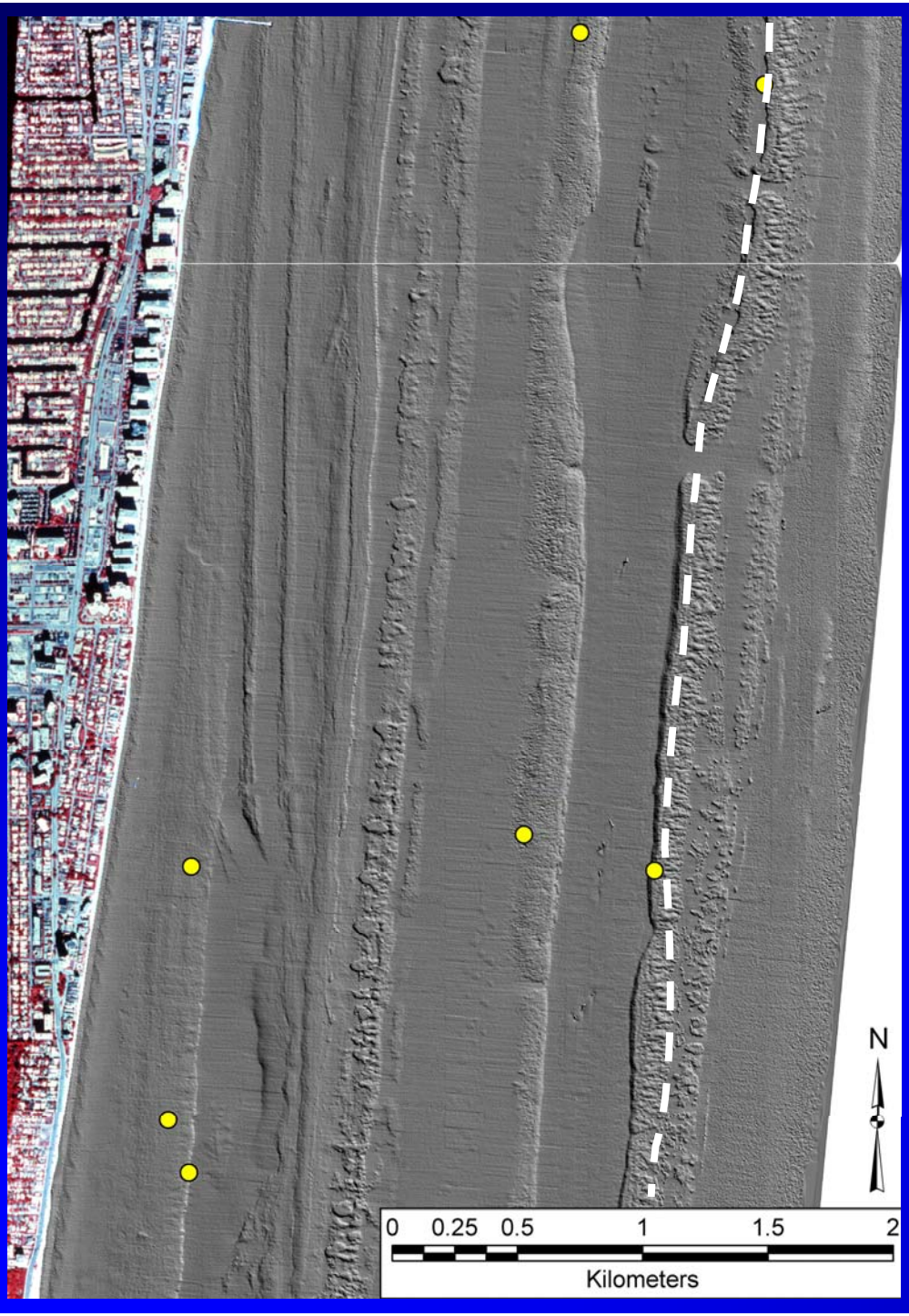
Broward County Reefs

Offshore Reef (3rd Reef)

– – – – Depth: 25-15 m (70-50 ft)

2.5 km offshore





● Reef Monitoring Sites

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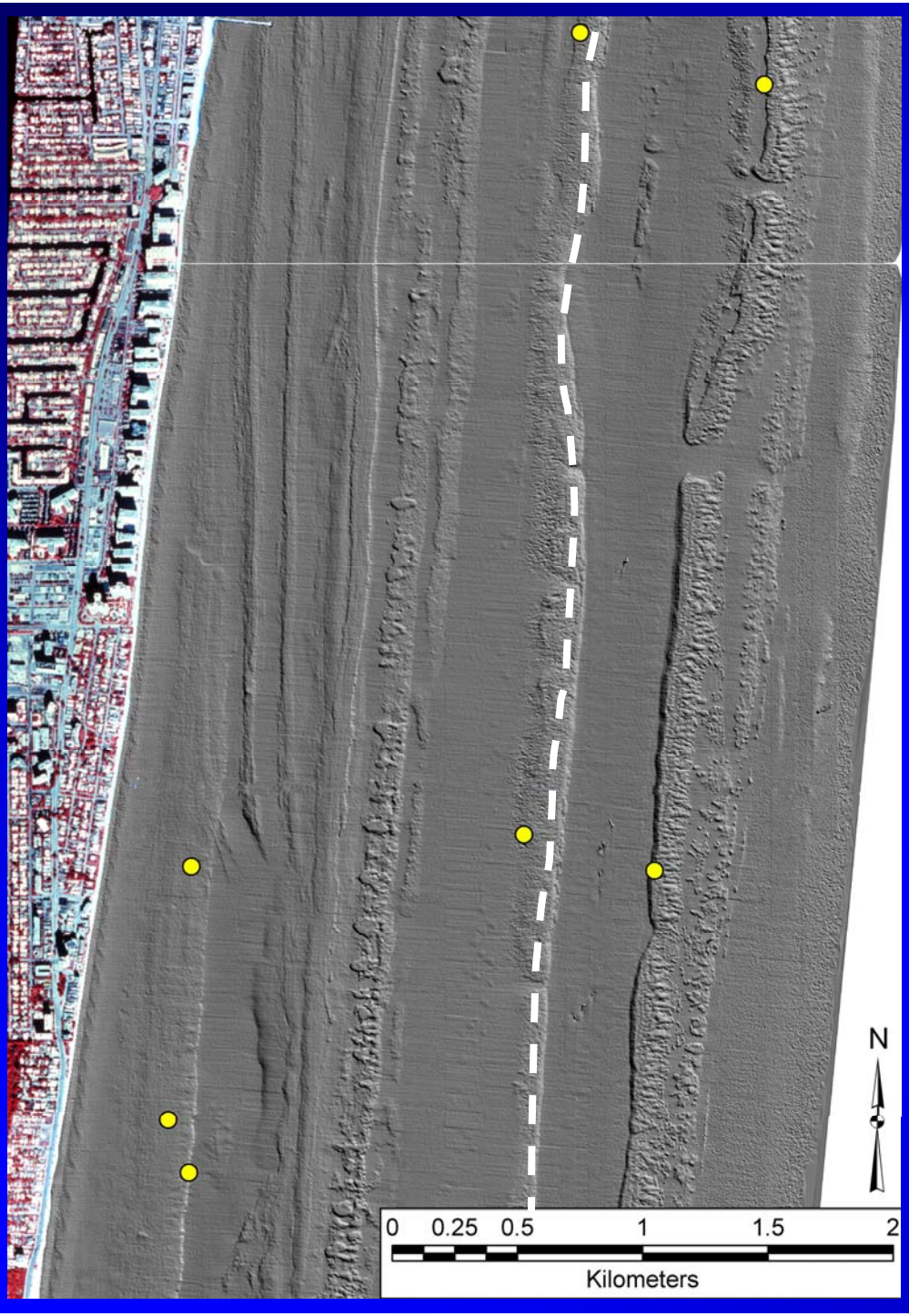

Broward County Reefs

Mid Reef (2nd Reef)

– – – – Depth: 20-12 m (60-40 ft)

1.5 km offshore

● Reef Monitoring Sites

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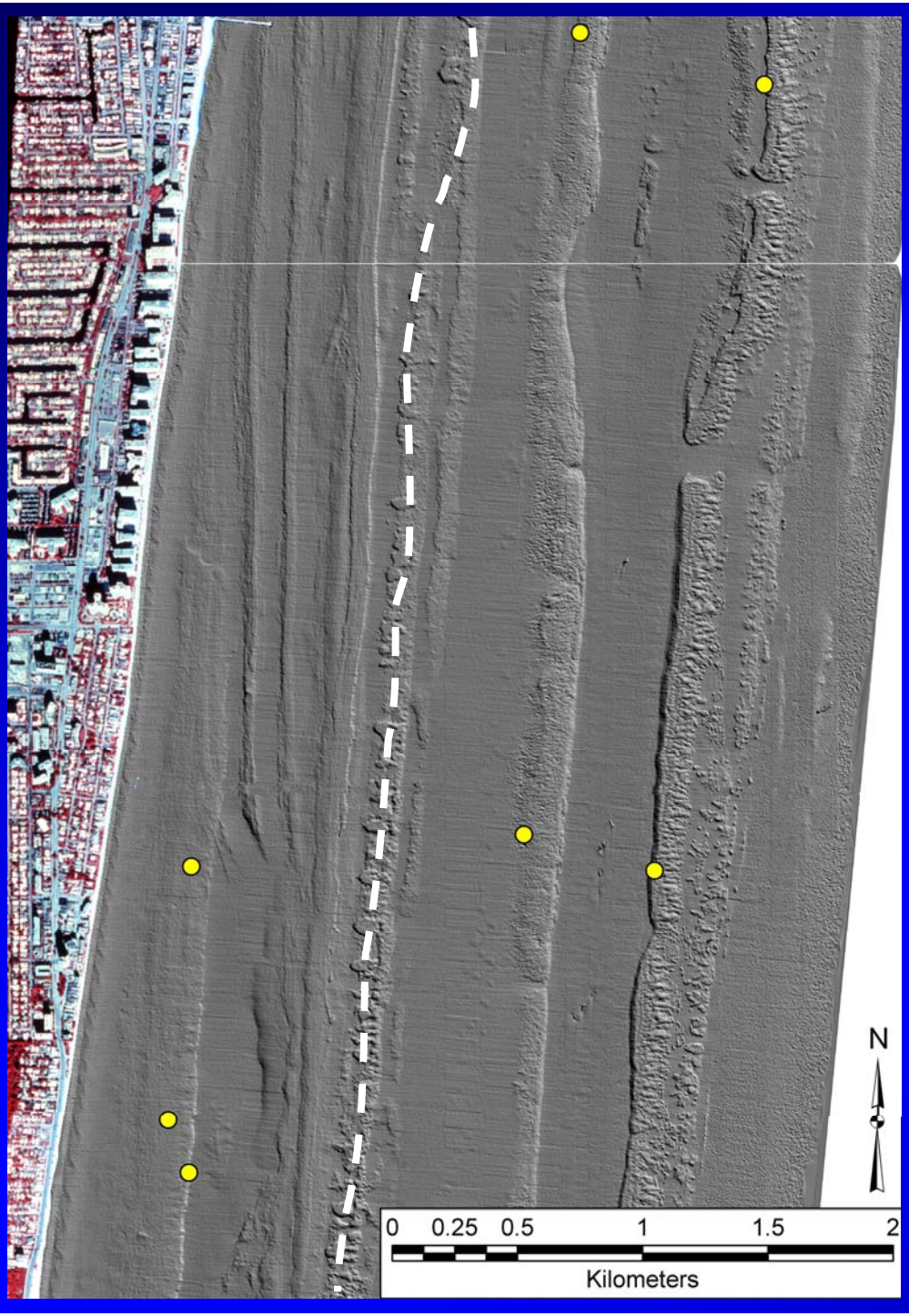
Broward County Reefs

Inshore Reef (1st Reef)

– – – – Depth: 5-10 m (15-30 ft)

1.0 km offshore



● Reef Monitoring Sites

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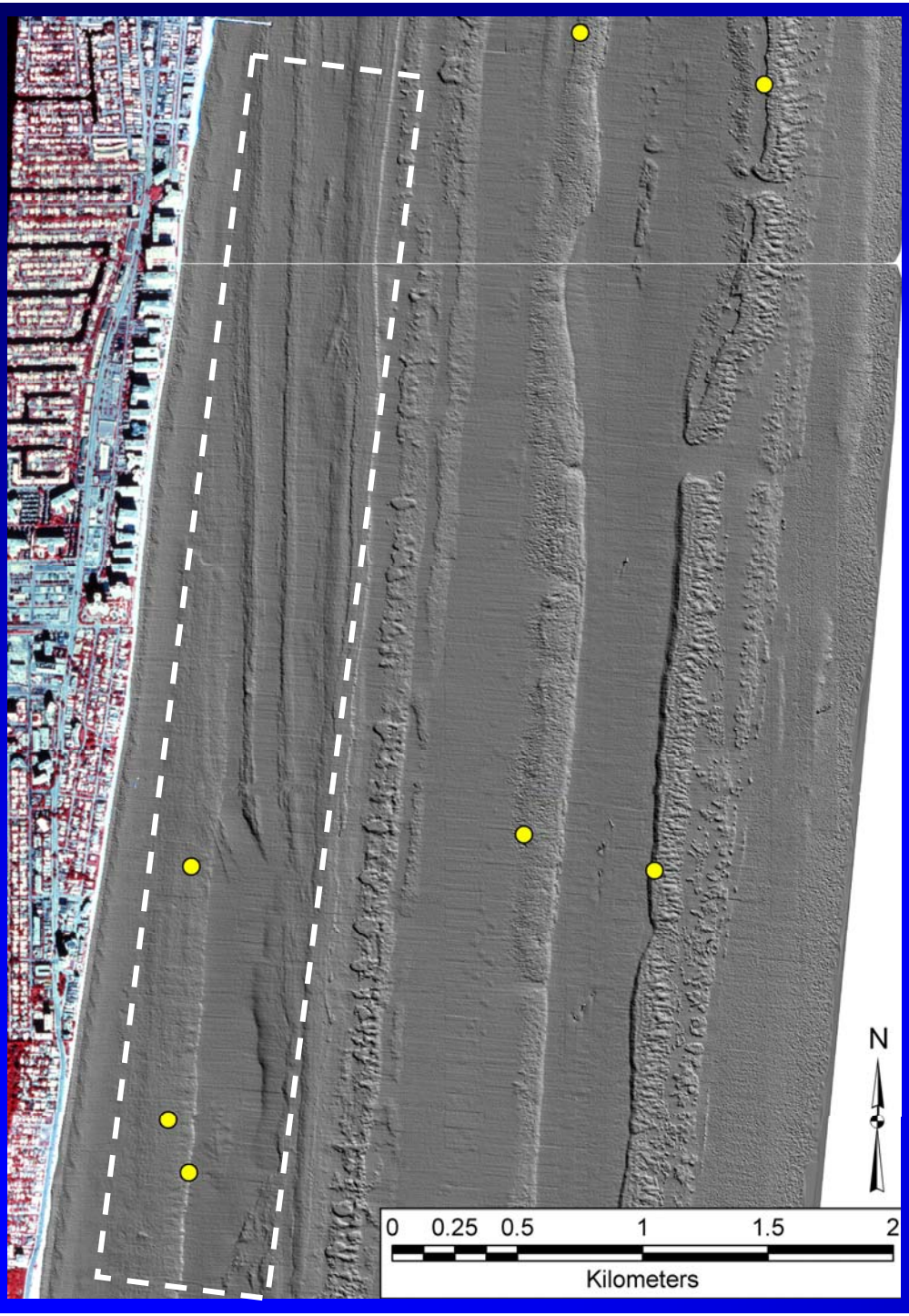
Broward County Reefs

Nearshore HB (1st Reef)
Depth: 3-7 m (10-20 ft)
0.25-1 km offshore



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South Florida Population

Yr 2000 Census

- **Broward = 1.6 million**
- **Miami-Dade = 2.2 million**
- **Palm Beach = 1.1 million**

Socioeconomic Study of Reefs in SE Florida (Yr 2000)

9.44 million person-days spent on the reefs per year (diving and fishing…> 60% = tourists) …use resulted in $1.1 billion in income

Anthropogenic Stressors

- Ports – 2 Ports in Broward with several major ports in adjacent Counties

- Ship Groundings – 4 in 2 yrs
- Sewer Outfalls
- Dredge Projects

Broward Reef Community

Stony Coral

- Species Richness = 40 (25 in Sites)
- Density = 2.8 colonies/m^2 (> 2cm)
- Coverage = 2.9% (<1% - >40%)

Octocorals

- Density = 8.8/m^2

Sponges

- Density = 11.3/m^2

Fishes

- Species Richness = 150


Expansion of the Coral Reef Evaluation and Monitoring Project To Southeast Florida
Florida Fish and Wildlife Conservation Commission
Florida Marine Research Institute
NOAA
National Oceanic and Atmospheric Administration
U.S. Department of Commerce
FLORIDA
MIAMI-DADE
DERM
United States Environmental Protection Agency
BROWARD COUNTY
FLORIDA
Nova Southeastern University
Oceanographic Center
NCRI
National Coral Reef Institute
Palm Beach County
Florida
ERM

Southeast Coral Reef Evaluation and Monitoring Project (SECREMP)

Regional Partners

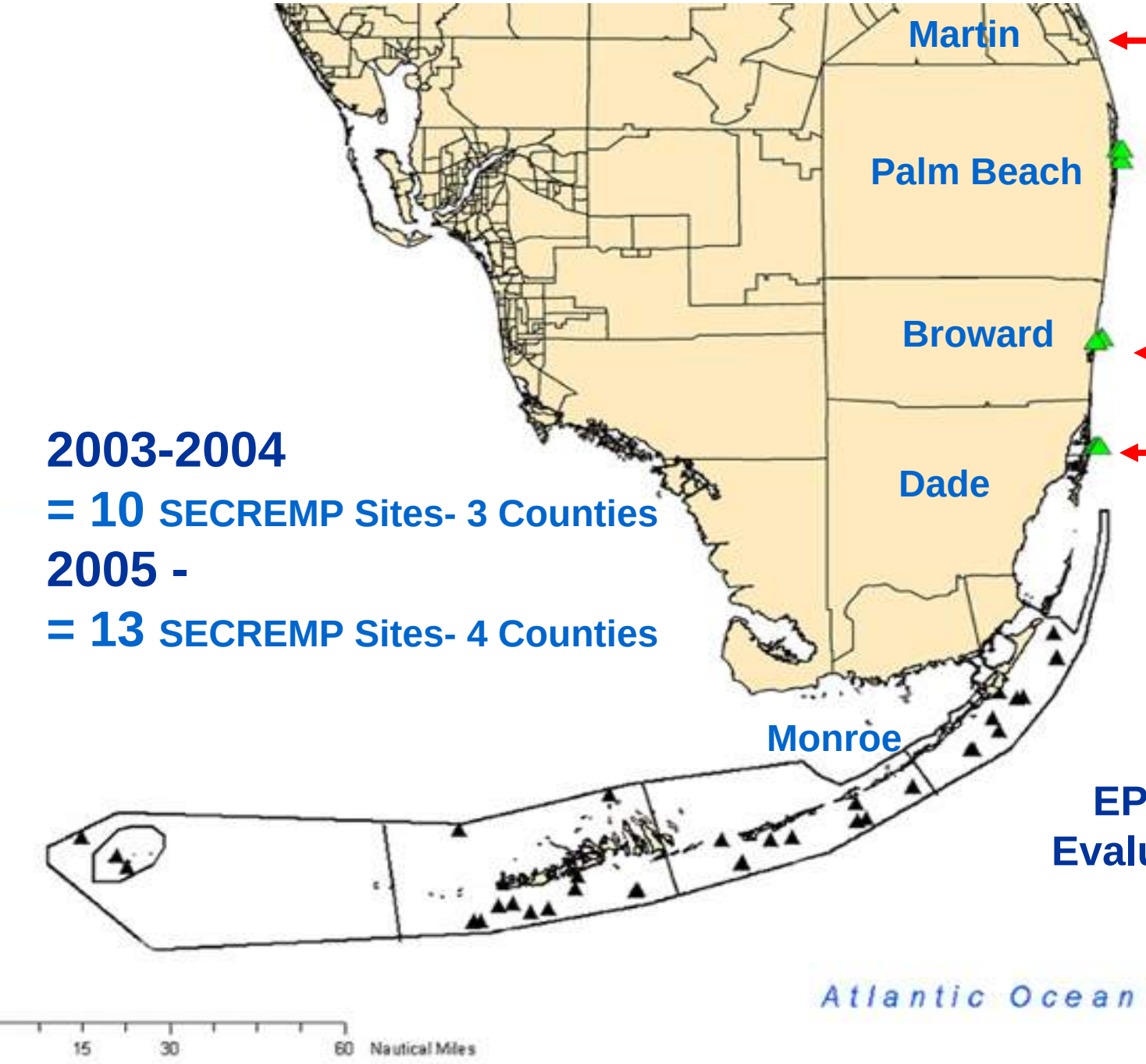
- FL Department of Environmental Protection (DEP)
- FWCC Florida Marine Research Institute (FWRI)
- NCRI/NSUOC

Reef Monitoring

- 2003 – FWRI & NCRI – established 10 sites in 3 Counties
- 2004 – NCRI – continue monitoring 10 sites
- 2005 - NCRI & FWRI – 10 sites + 3 new sites in Martin Co.

Purpose

Provide relevant and timely information on status and trends of Florida's coral reef and hard bottom resources with respect to coral species richness, benthic cover, and coral disease = Regional Management Level



North Extension to Southeast Florida

2003-2004

= 10 SECREMP Sites- 3 Counties

2005 -

= 13 SECREMP Sites- 4 Counties

EPA/NOAA Coral Reef Evaluation and Monitoring Project Florida Keys

SECREMP (Kinds of Geo-referenced Data):

- **Stony coral biodiversity:**

  Station Species Inventory- Station inventory of stony coral species presence

- **Benthic Cover (Coral + other Functional Groups):**

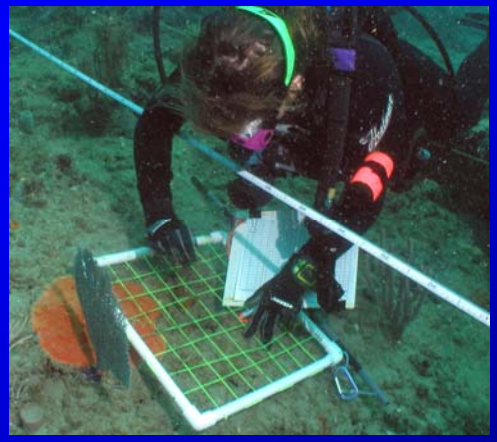
  Digital Video Transects- 3 trans filmed / station

- **Coral Disease, Bleaching:**

  Photo-documentation - determine condition and status of infected colonies

- **Bio-eroding Sponge:**

  Survey- Survey of the coral species effected and aerial extent of coverage for sponges of the genus Cliona.



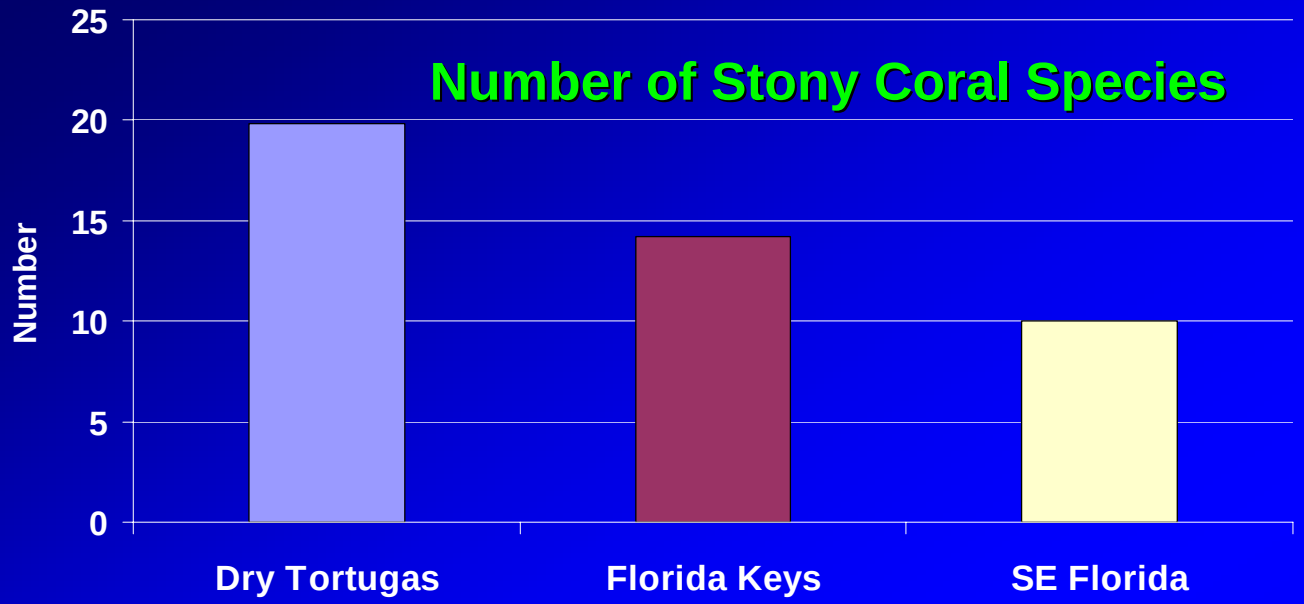
SECREMP

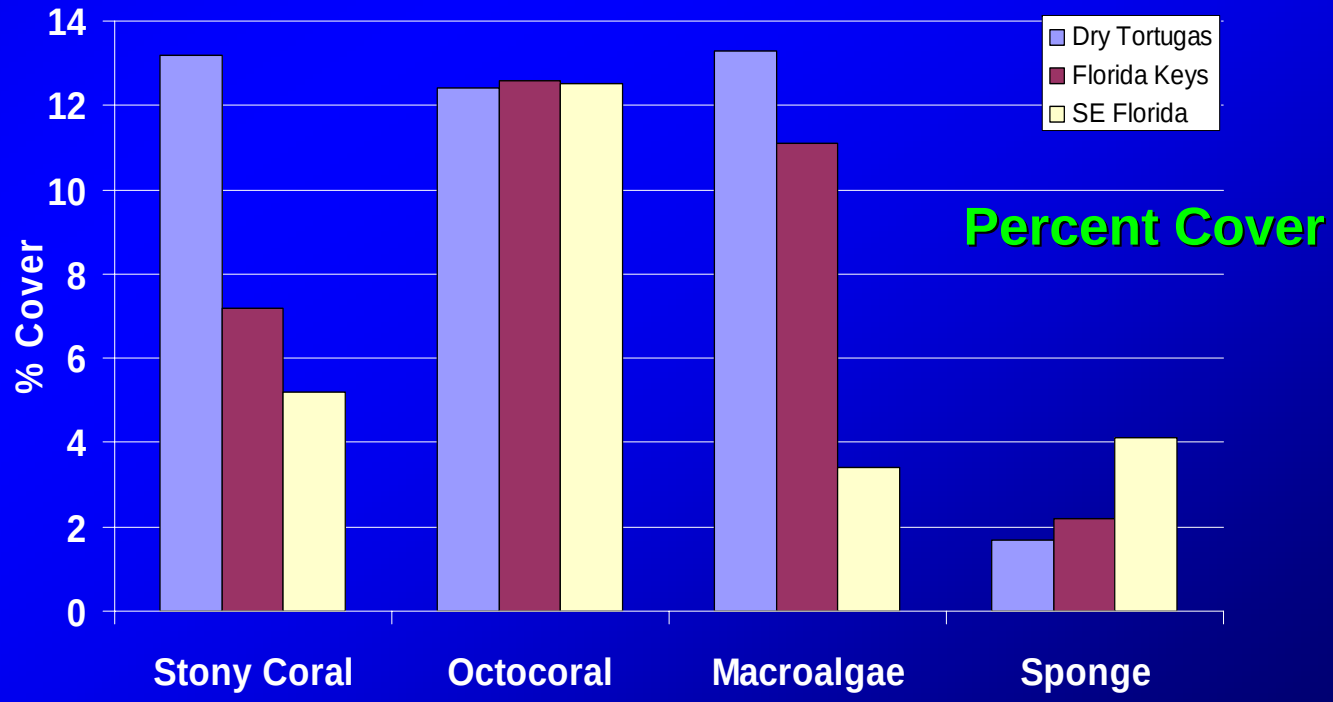
Coral Diseases: 2003 - 2004

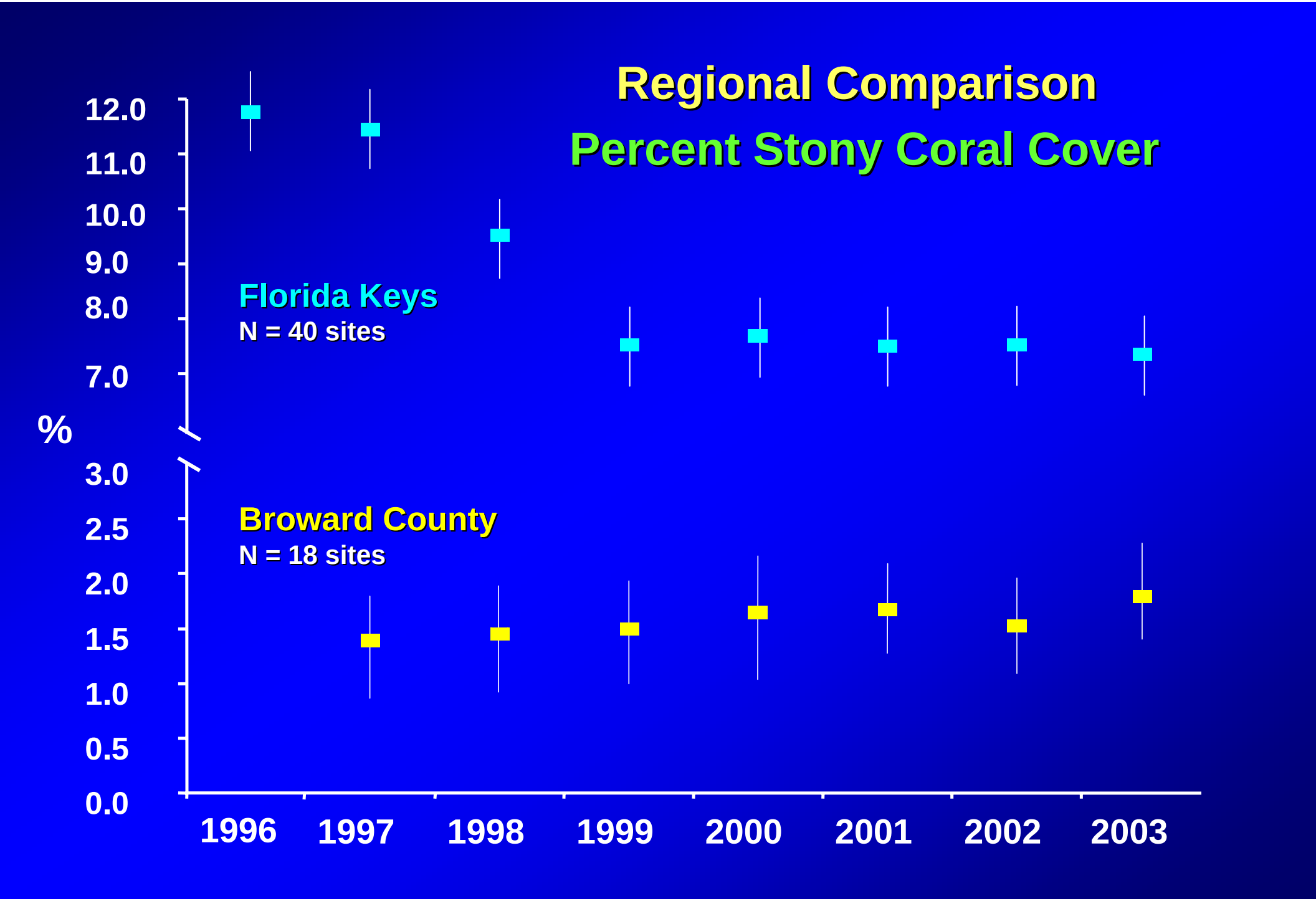
Year	No. Sites	No. Stations	No. Colonies
2003	7	7	NA
2004	4	8	22

Species	2003	2004
Solenastrea bournoni	P	1
Dichocoenia stokesii	P	1
Diploria clivosa	P	1
Montastrea cavernosa	P	0
Montastrea annularis	P	1
Siderastrea siderea	P	18

Regional Comparisons 2003






Regional Comparison
Percent Stony Coral Cover
12.0
11.0
10.0
9.0
8.0
7.0
%
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Florida Keys
N = 40 sites
Broward County
N = 18 sites
1996
1997
1998
1999
2000
2001
2002
2003

Cyanobacteria – *Lyngbya* sp.

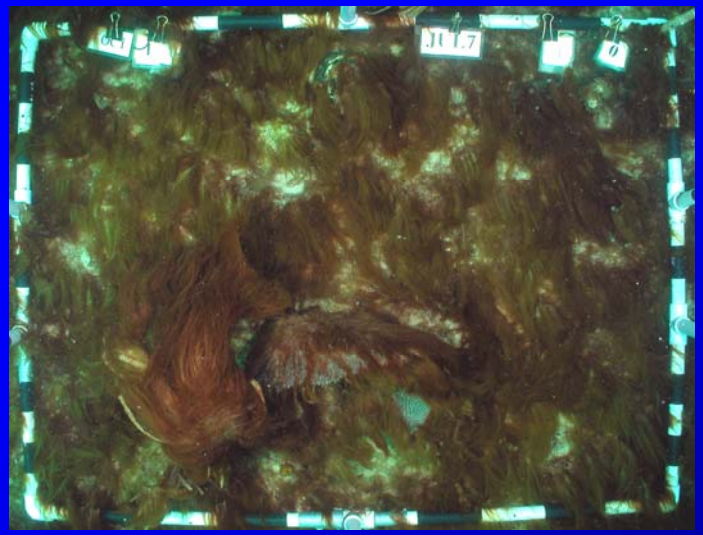
Example: 1 County Monitoring Site

Octocoral density

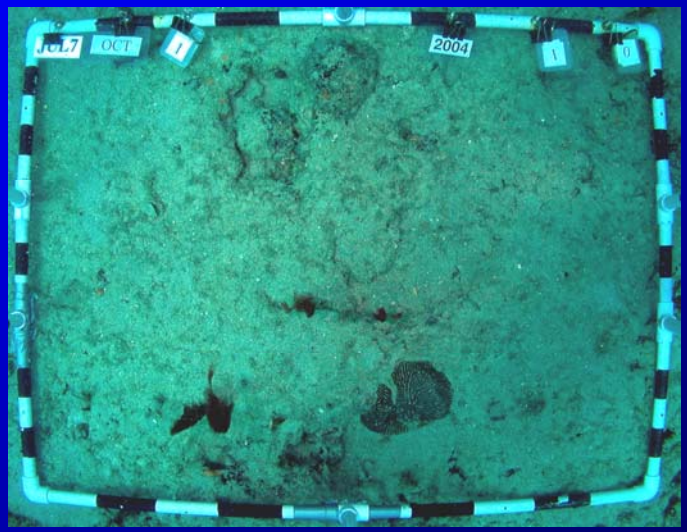
- **2002 – 2.4m^2**
- **2003 – 1.1 m^2**
- **2004 – 0.7m^2**

2002

2003



2004



FWRI – Carl Beaver, Walt Jaap, Mike Callahan, Jim Kidney, Selena Kupfner, Shannon Wade

NSUOC/NCRI - Brian Ettinger, Dan Fahy, Elizabeth Fahy, Shaun Gill, Jamie Monty, Lauren Shuman, Brian Walker, Lance Robinson

BC EPD – Ken Banks, Lou Fisher, Dave Stout, Joe Ligas