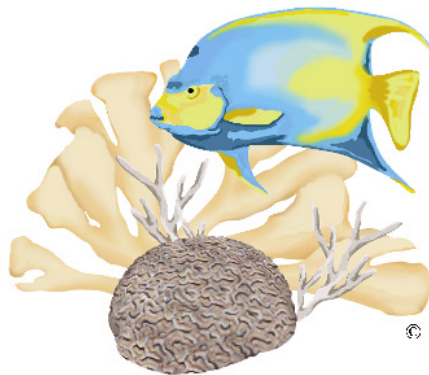


**Overview Presentation**  
**NCRI Continuing & New Projects**  
**FY 2004, 2005, & 2006**

**Drs. Richard Dodge & Bernhard Riegl**

**Center for Sponsored Coastal Ocean Research**  
**2<sup>nd</sup> Coral Reef Projects PI Meeting**  
**April 7– 8, 2004; Honolulu, Hawai'i**



**NCRI**  
NATIONAL CORAL REEF INSTITUTE

# Nova Southeastern University

*We go the distance...*



# Nova Southeastern University



- 10<sup>th</sup> Largest Independent Univ in Nation
- Over 20,000 enrollment
- Largest in Southeast US.
- 15 Divisions
- >\$220 million budget.
- 232 acres Main Campus
- Distance Ed
- New Library



# Overview: NSU Oceanographic Center

- 10 acres, Ft. Lauderdale
- Port Everglades entrance channel
- access to oceans & reefs
- Broad Phys. and Biol. Oceanography
- Full-time faculty & staff: 31
- MS, Ph.D. programs

Port Everglades  
Intracoastal  
to Atlantic

*The Mission of the Oceanographic Center is to carry out innovative, basic, and applied research and to provide high-quality, graduate and undergraduate education in a broad range of marine-science.*



# Overview: NSU & Oceanographic Center

- **Academics: BS:** Biology, Marine Biology, Environmental Science/Studies (with FCAS); **MS:** Coastal Zone Management; Marine Biology; Marine Environmental Sciences; **Ph.D.:** Oceanography

- **Research:**

**Physical Oceanography**

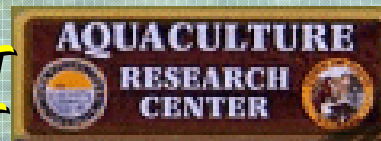
**Marine BioGeological Oceanography**

**Coral Reefs: Ecology/Monitoring/Assessment**

**Fish, Deep Sea, Micro, Molecular, Ballast**

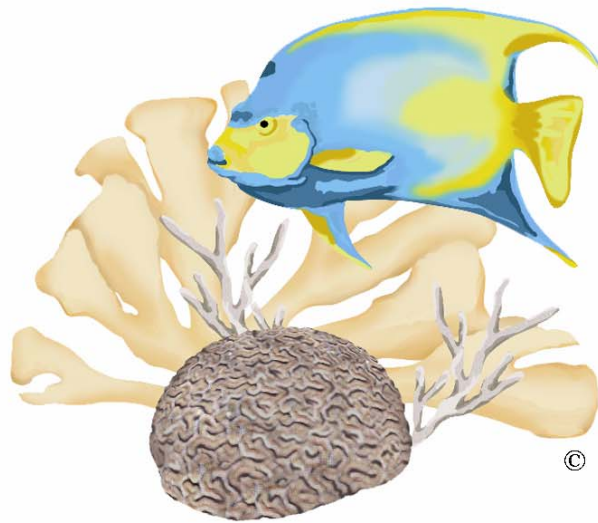
- **Internal Institutes:**

**NCRI, GHRI, ARC, Coastal Studies**



**Collaborative History: e.g.,**

**NOVA SOUTHEASTERN UNIVERSITY**  
**Oceanographic Center, Ft. Lauderdale,**  
**FL, announces the formation of**

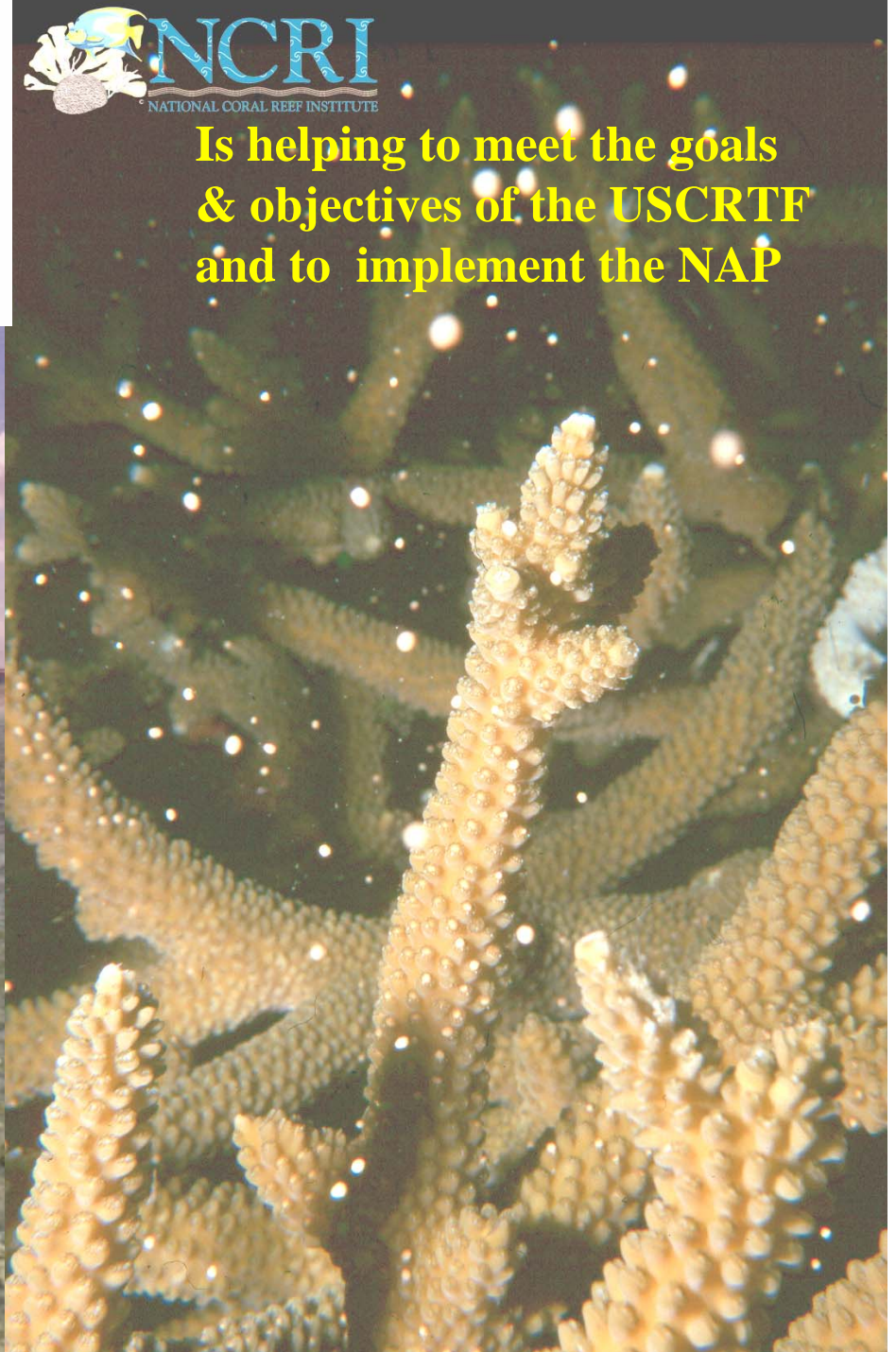


**NCRI**

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- **NCRI: National Coral Reef Institute:**  
**A Center for Coral Reef Assessment,**  
**Monitoring, and Restoration**





**Background:** Congressional Support “for the Establishment of a National Coral Reef Institute to Conduct Research on Coral Reef Assessment, Mitigation, Monitoring, and Restoration.”

**Rationale:** ID Gaps & Constraints in Reef Knowledge, Active Research & Funding; Hypothesis-Based Science Into Emerging Coral Reef Disciplines, Including Reef Restoration.



# Internatl. Conference Results

**Summary: coral reef research & management**  
51 papers, 768 pp, 2001 pub.

- Assessment
- Biodiversity and Community Dynamics
- Impacts and Stressors
- Monitoring
- Restoration
- foldout comparison of 18 monitoring programs

## Bulletin of MARINE SCIENCE

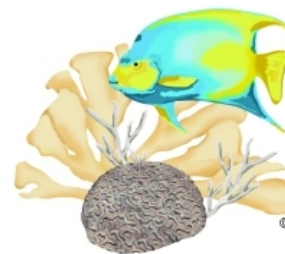
50<sup>TH</sup> ANNIVERSARY

(ISSN 0007-4977)

Volume 69

SEPTEMBER 2001

Number 2



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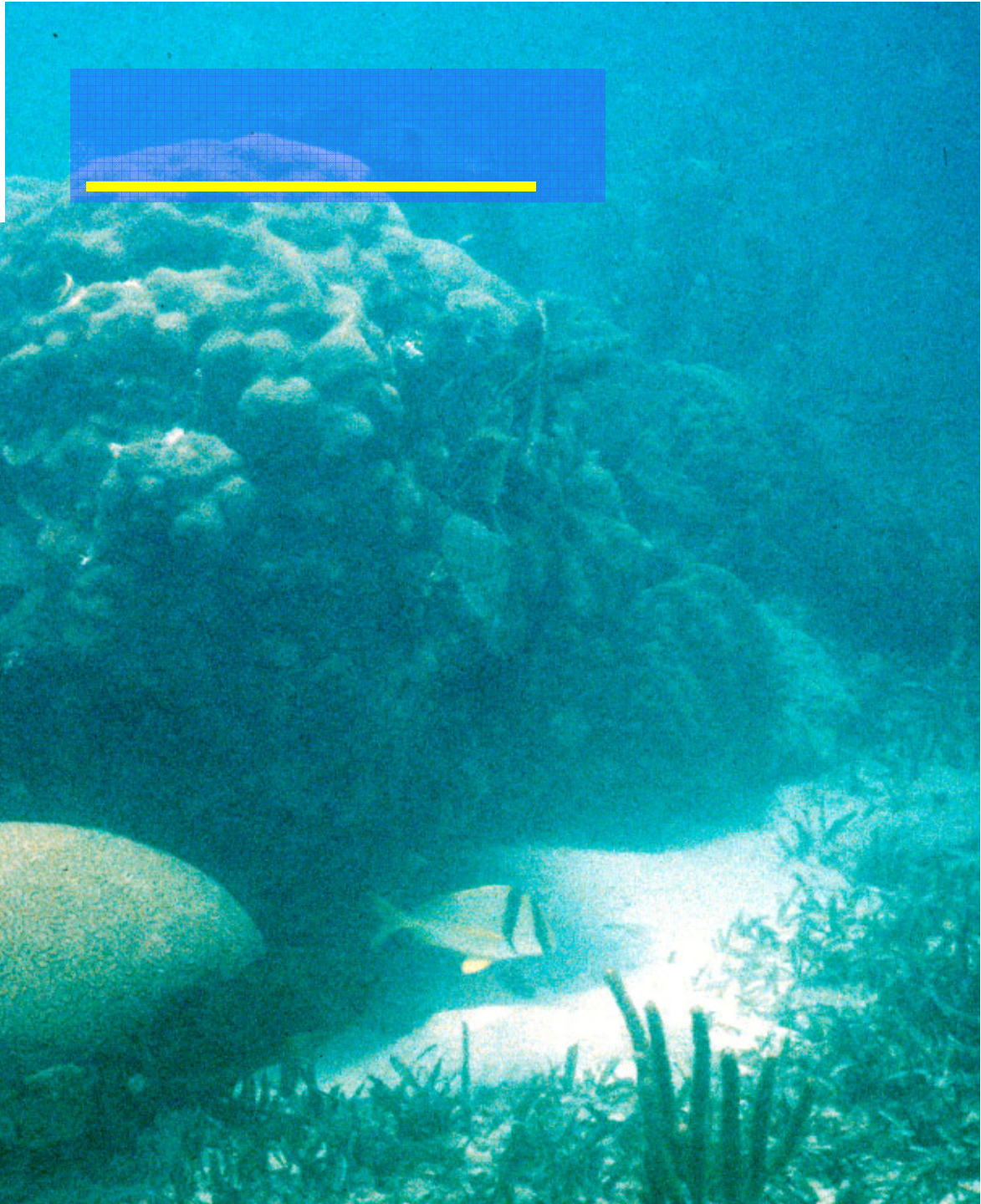
PROCEEDINGS OF THE  
INTERNATIONAL CONFERENCE ON SCIENTIFIC ASPECTS OF  
CORAL REEF ASSESSMENT, MONITORING, AND RESTORATION

NATIONAL CORAL REEF INSTITUTE

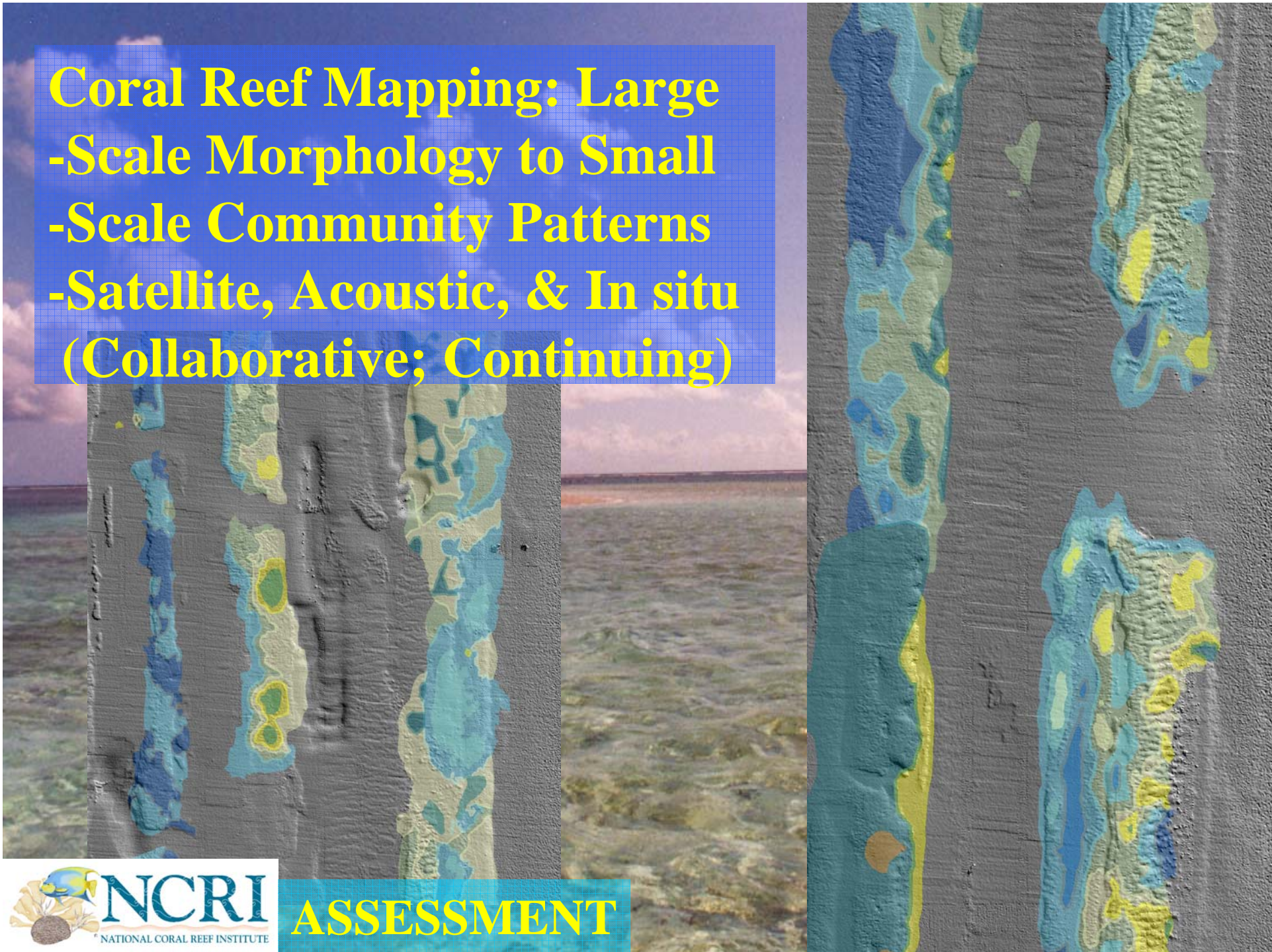
FORT LAUDERDALE, FLORIDA  
APRIL 14-16, 1999

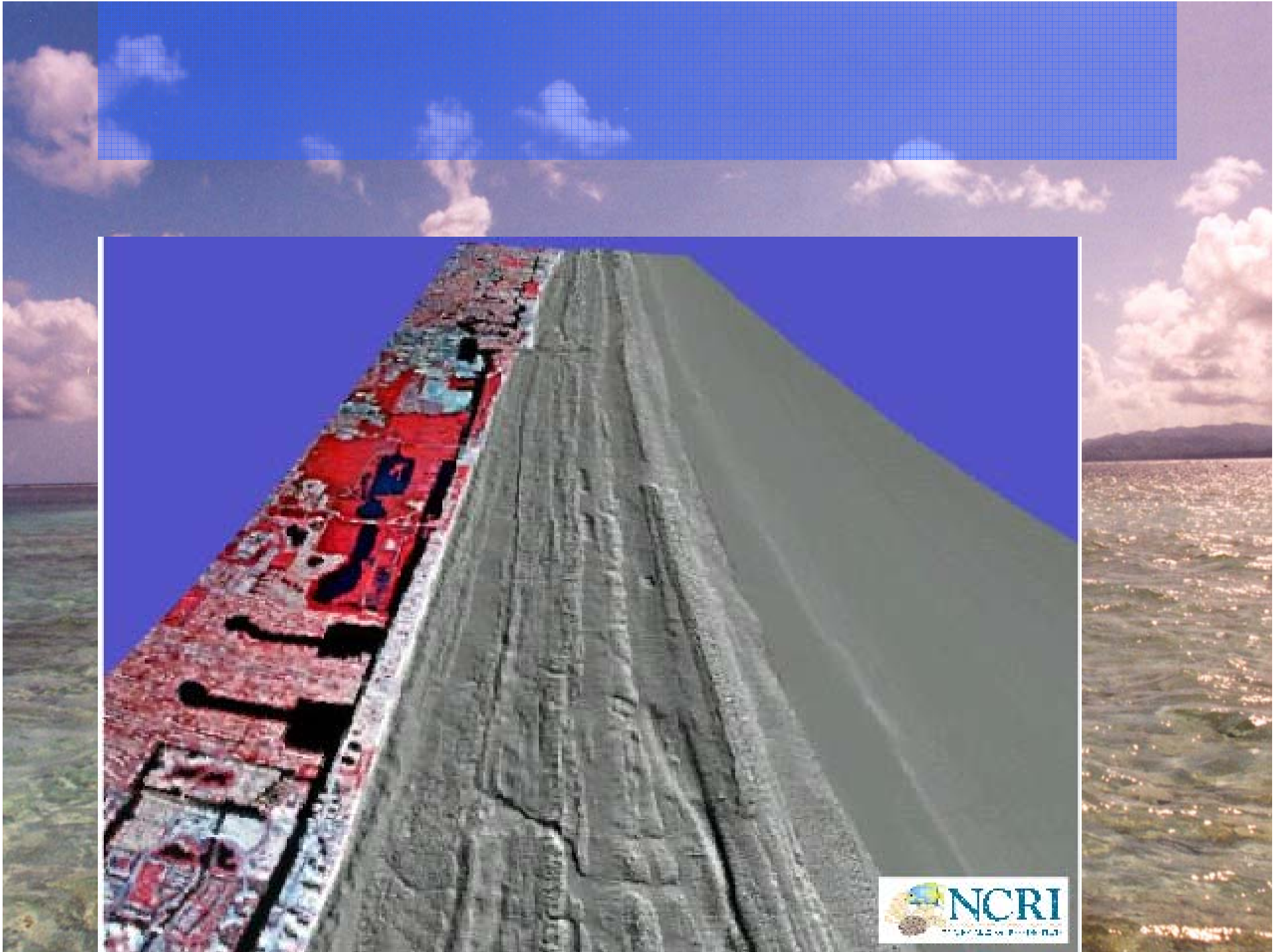
*James Darwin Thomas*  
Guest Editor





**Coral Reef Mapping: Large  
-Scale Morphology to Small  
-Scale Community Patterns  
-Satellite, Acoustic, & In situ  
(Collaborative; Continuing)**





# Marginal U.S. Reef Systems: Ecology, Genetics, Propagation, & Population Dynamics: *Acropora cervicornis*, Ft Lauderdale, FL (Continuing)



ASSESSMENT

# Fish Censuses of Southeast Florida

• **Survey of the Marine Fishes of Southeast Florida**  
(Collaborative with NOAA; Continuing)

• **Nearshore Hardbottom Fishes of Broward County**  
(Collaboration with Broward County, Continuing).

• **Multivariate Examination of Spatial Patterns of  
Grunt (Haemulidae) Recruitment** (Continuing)



**ASSESSMENT**

# Molecular Genetic Assessment

Relationship between Life-History Traits, Population Connectivity, & Biodiversity in Coral Reef Invertebrates  
Application to Marine Protected Area Design  
(Continuing)

## Coral Calcification and Climate Change:

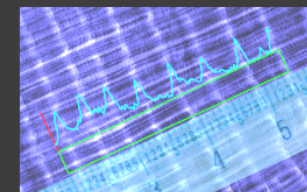
Sclerochronology, Data Extraction & Comparison Tools, Temperature Monitoring, Laboratory Experimentation



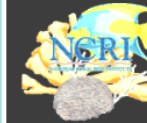
# CoralXDS

Version 2.6

Coral X-radiography  
Densitometry System



## ASSESSMENT



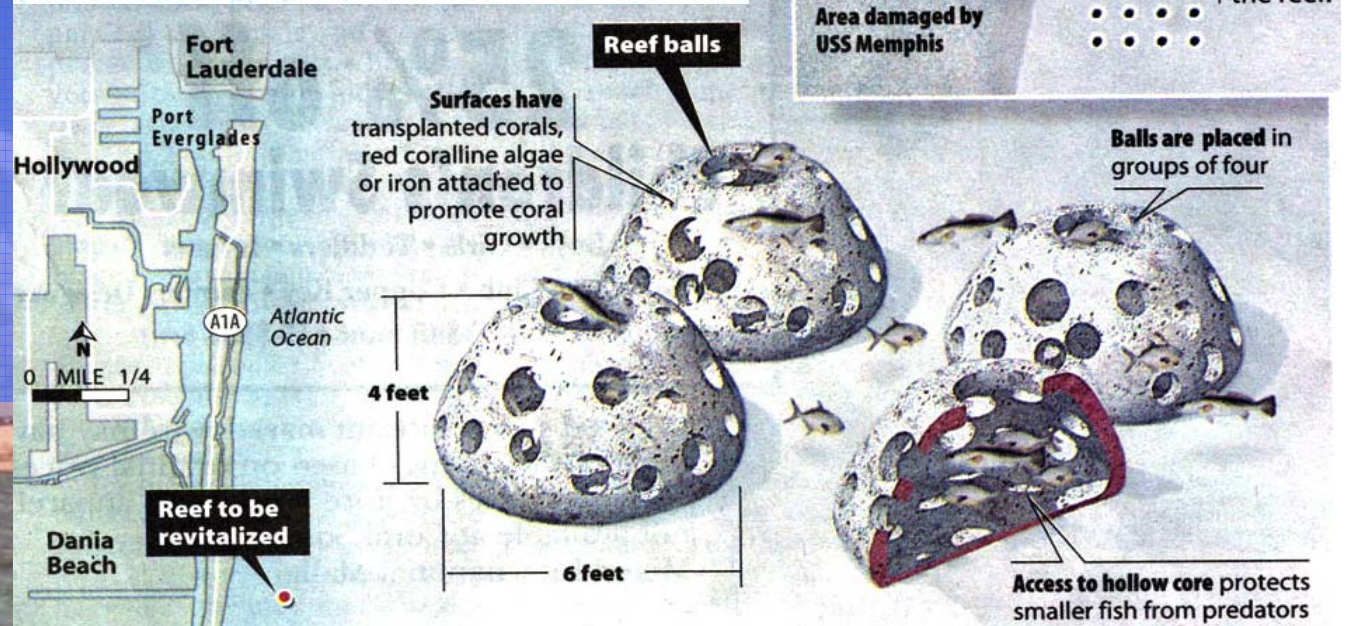
Kevin E. Kohler  
Kevin P. Helmle  
Richard E. Dodge



# Restoration Design and Monitoring (Collaborative with Broward Co; Cont.)

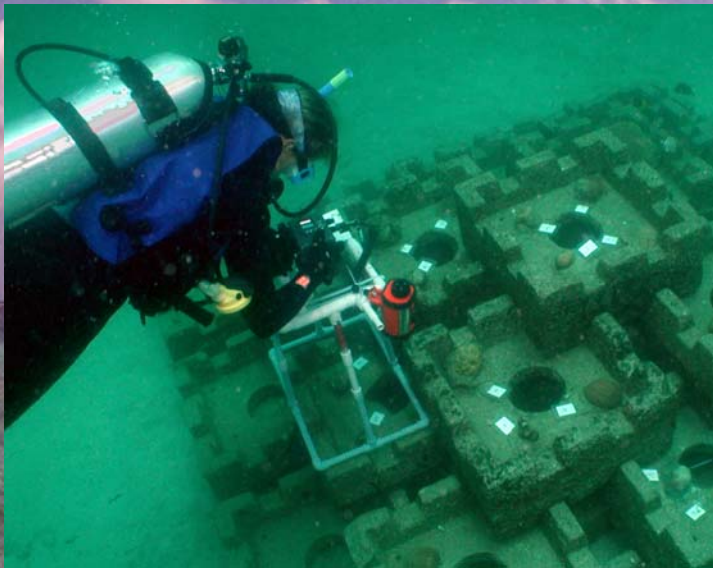
## Restoring a damaged reef

Crews working for Broward County and Nova Southeastern University will place 160 concrete, meteor-like balls near where a submarine destroyed part of a coral reef seven years ago. A look at the project that will provide homes for marine life:



# Increasing Fish Assemblage Richness & Abundance on Concrete Artificial Reefs with a Novel Invertebrate Recruiting Substrate. (New)

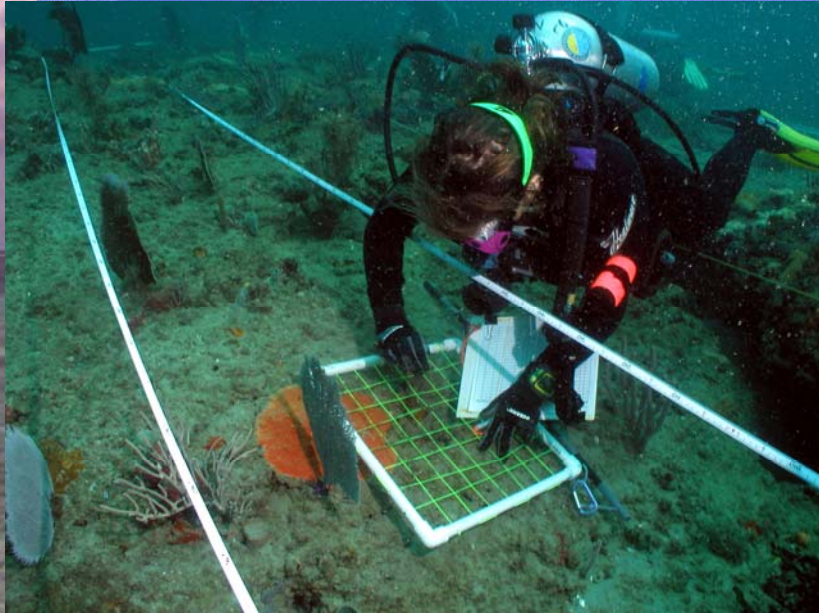
# Establishment and Maintenance of a Coral Nursery (Collaborative w/ Broward Co. DPEP & NFWF; Continuing w/BC DPEP)



Comparison of Fish at Selected Artificial Reefs and Natural Substrate in Southeast Florida (Collaborative with Broward Co. DPEP; Continuing)



# Expansion of the Coral Reef Evaluation & Monitoring Project (CREMP) to Southeast Florida (Collaborative with Florida DEP, FWC, and FMRI)



Station Layout

Species Inventory

Video Transects

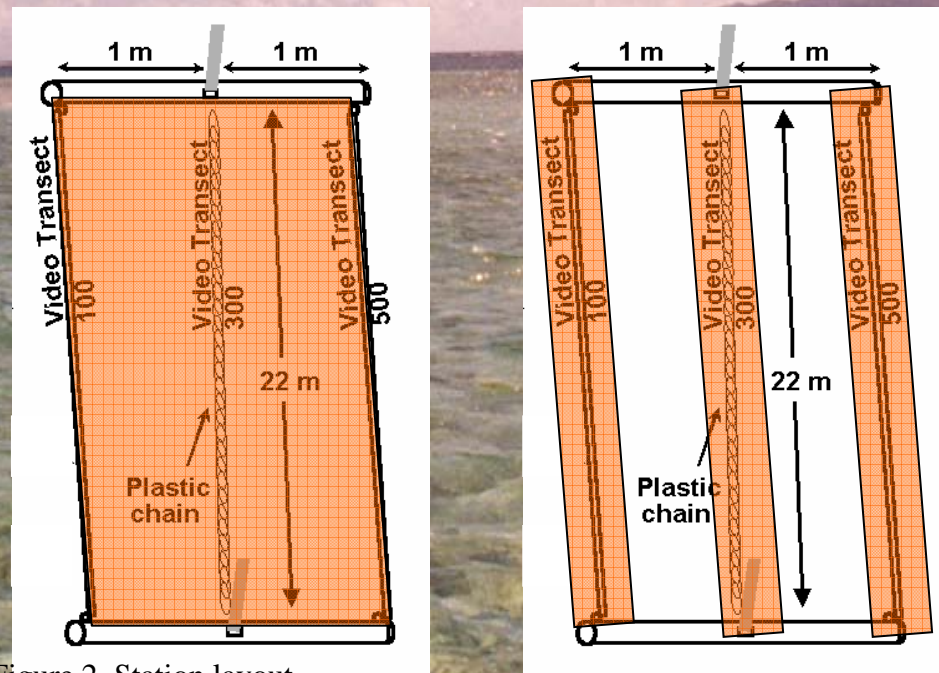
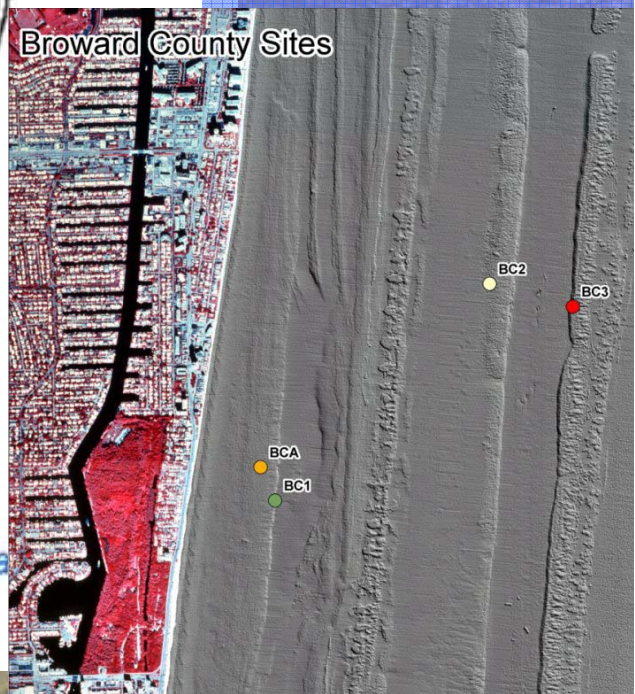
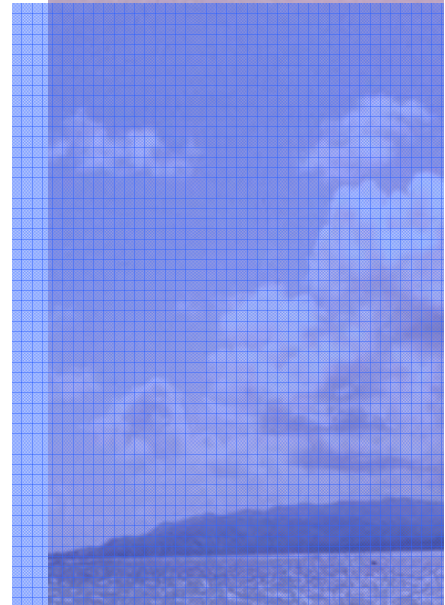
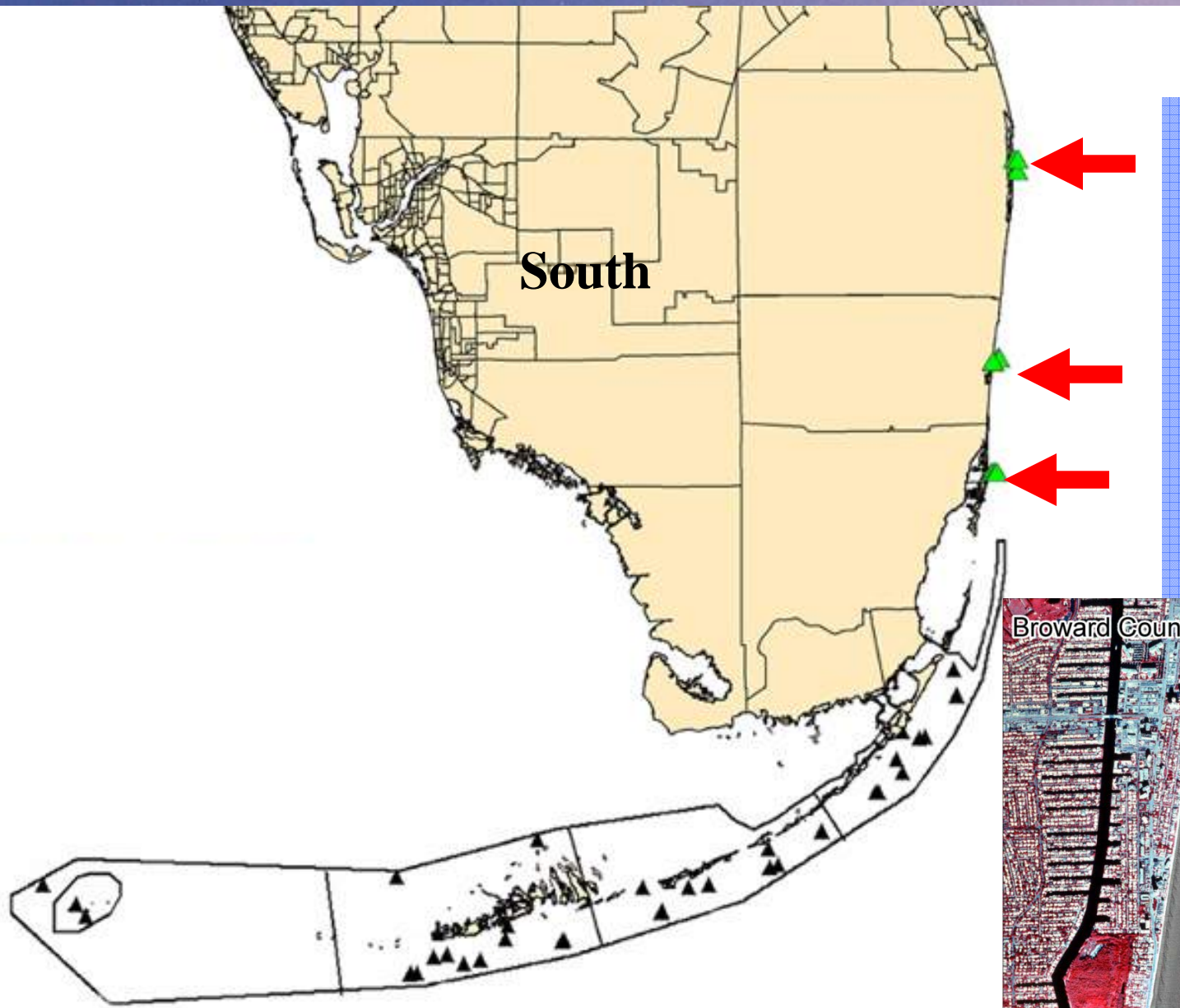
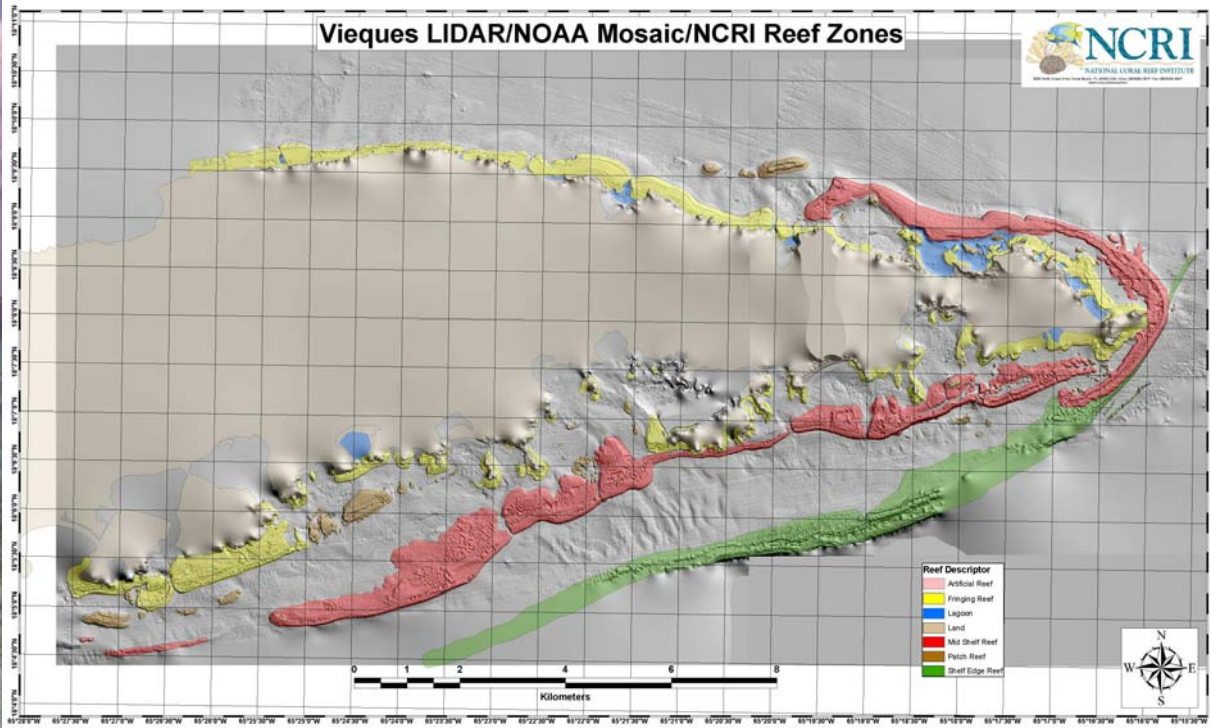


Figure 2. Station layout



Atlantic Ocean



# The NCRI Monitoring Network

“A combined in situ/remotely sensed, long-term, shallow-ocean observatory system, which tracks changes in the ocean’s most diverse ecosystem”



**MONITORING**



**Benthic Habitats**  
*of the Florida Keys*

DEPARTMENT OF ENVIRONMENTAL PROTECTION  
FLORIDA

NOAA  
NATIONAL OCEANOGRAPHIC AND ATMOSPHERIC ADMINISTRATION  
U.S. DEPARTMENT OF COMMERCE

GIS by ESRI

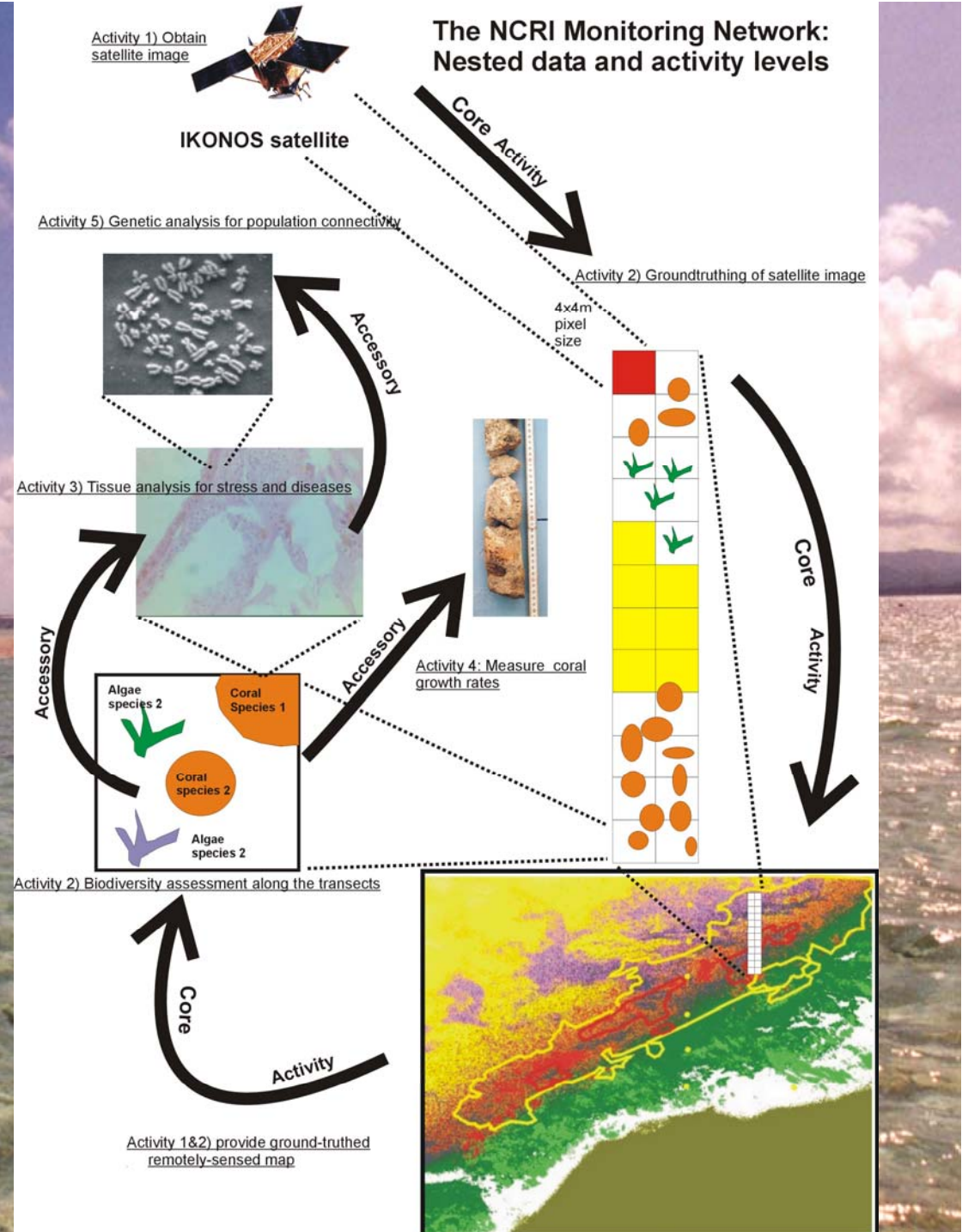
**Benthic Habitats of  
Puerto Rico and  
the U.S. Virgin Islands**

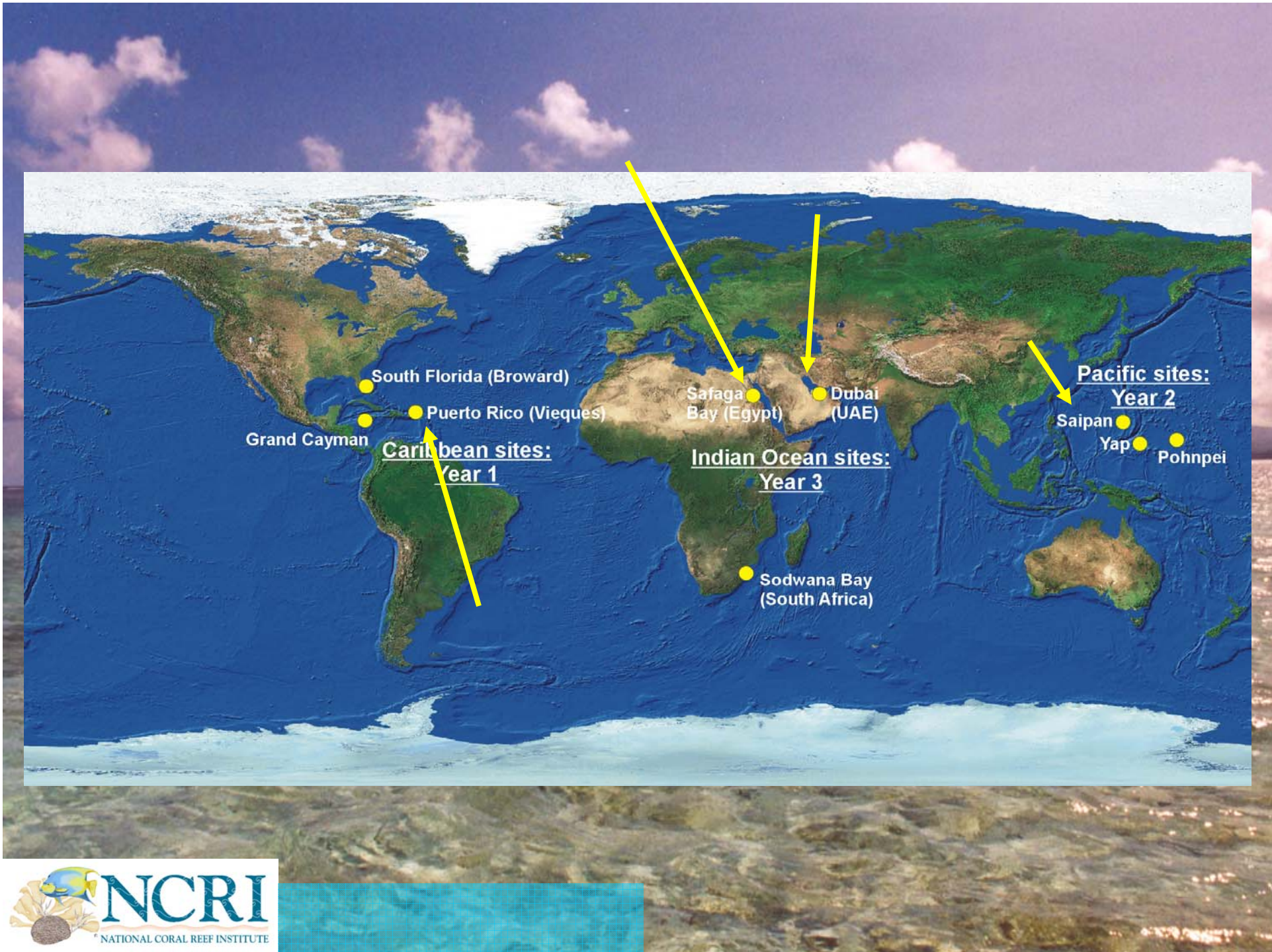
NATIONAL CENTERS FOR COASTAL OCEAN SCIENCE  
BIOGEOGRAPHY PROGRAM  
COASTAL SERVICES CENTER

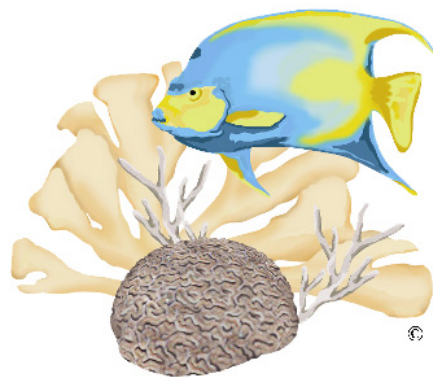
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# No!

This is something new...  
it is a monitoring network  
that harnesses new  
technologies while staying  
connected and compatible  
with and drawing from  
already established  
methods and programs  
which allows minimization  
of cost but maximization  
of data!!!!!!!!!!!!  
...and thus can ensure  
long-term usefulness,  
durability, and continuity  
of the programs!





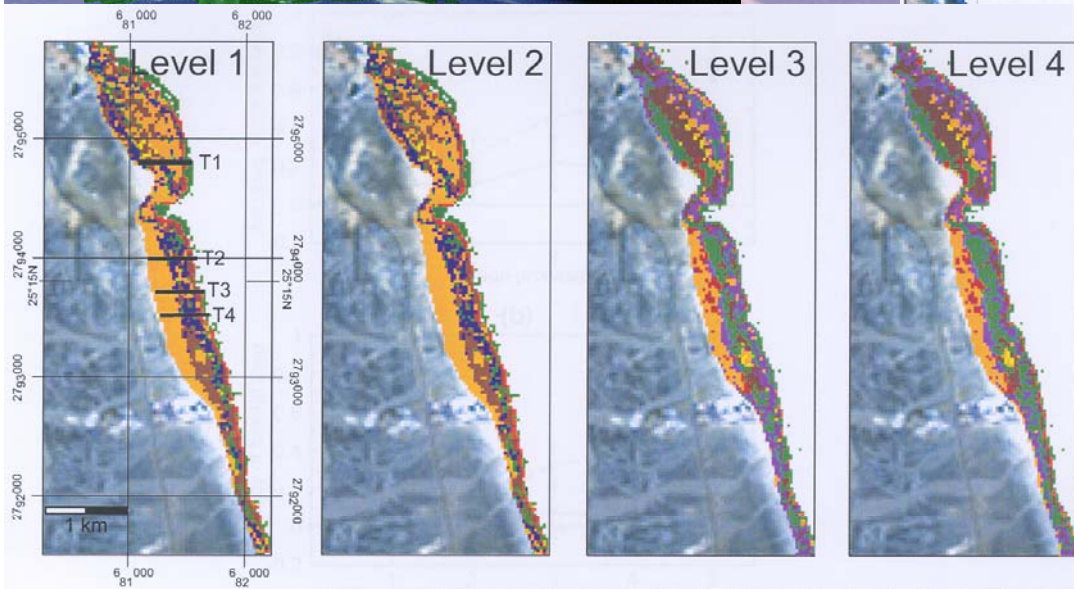
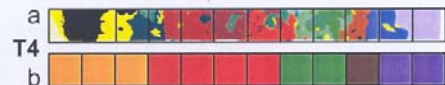
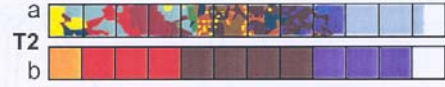
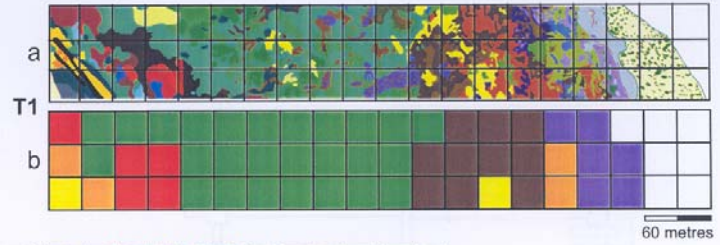
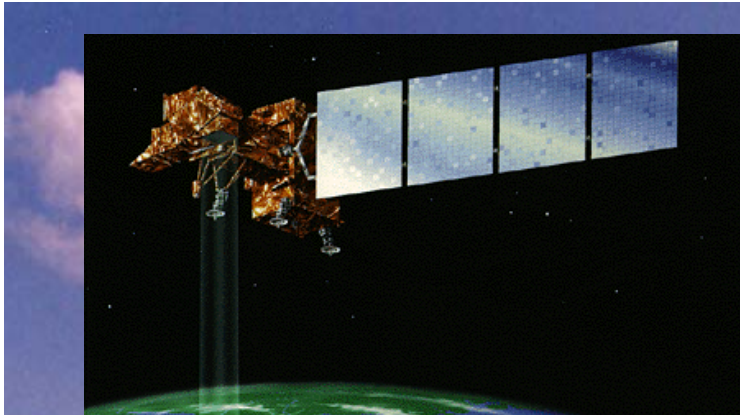


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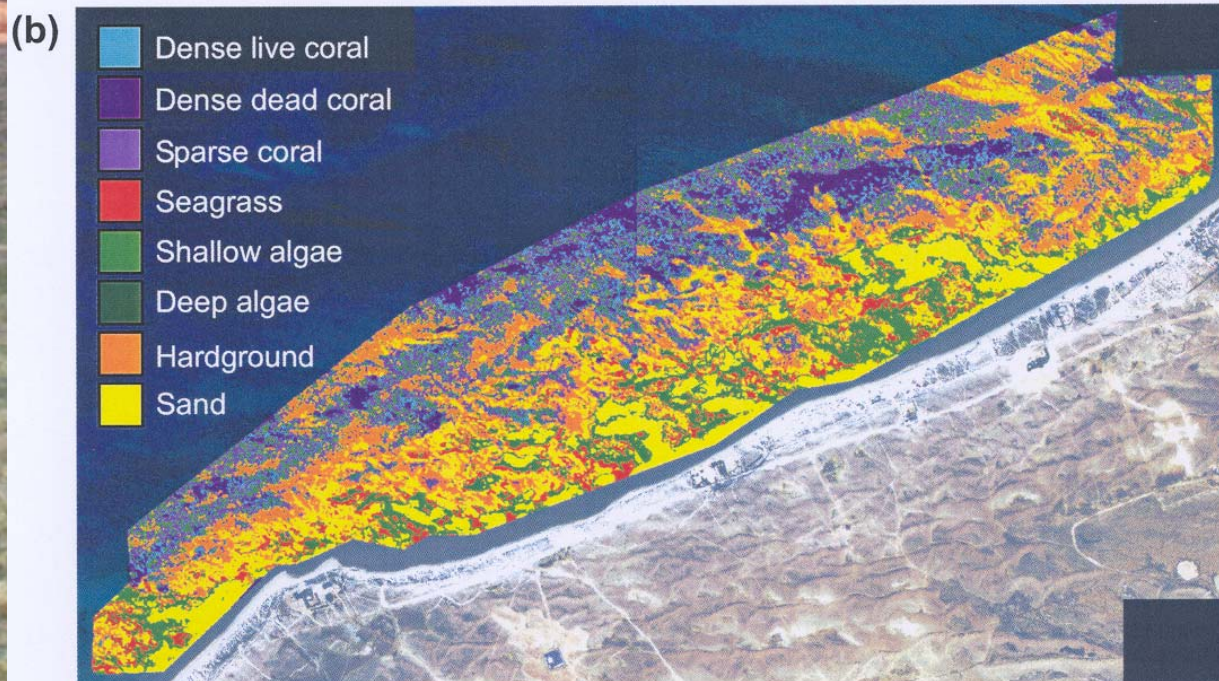
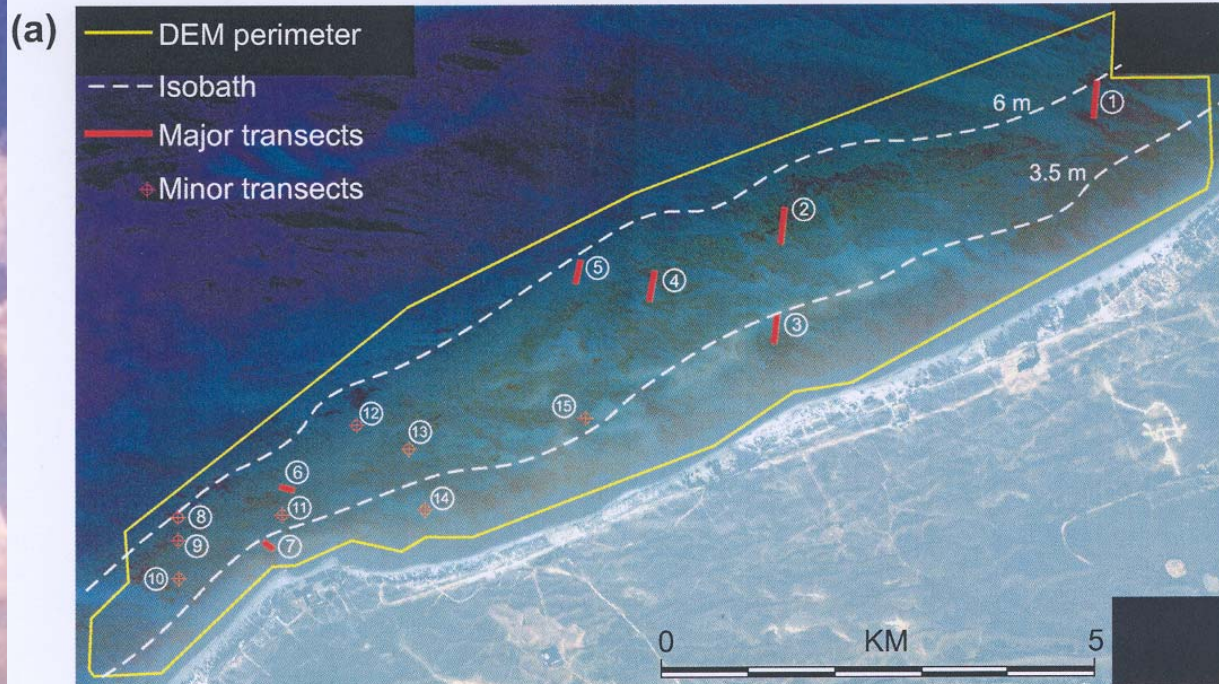
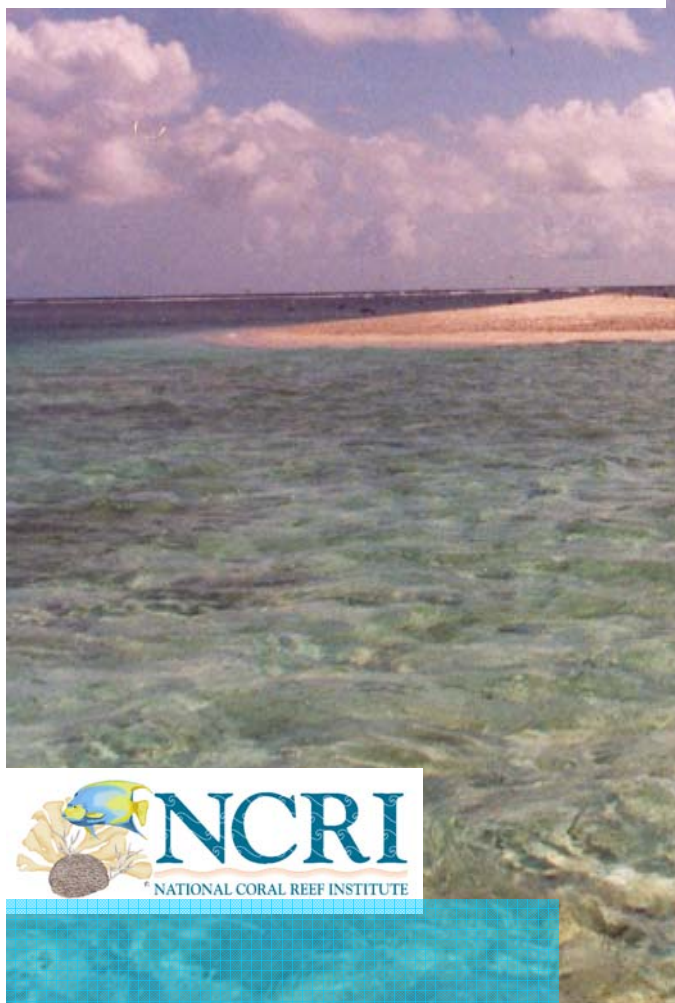
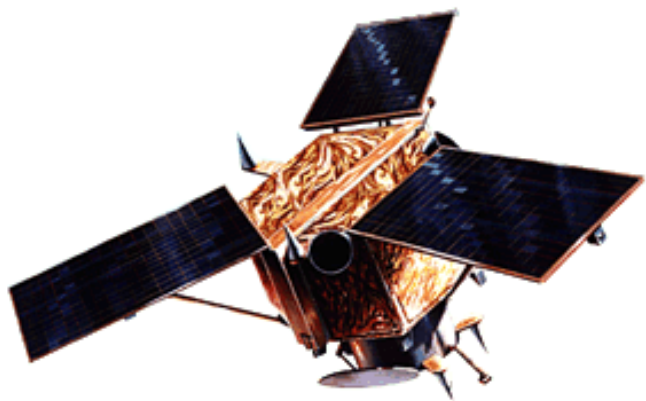


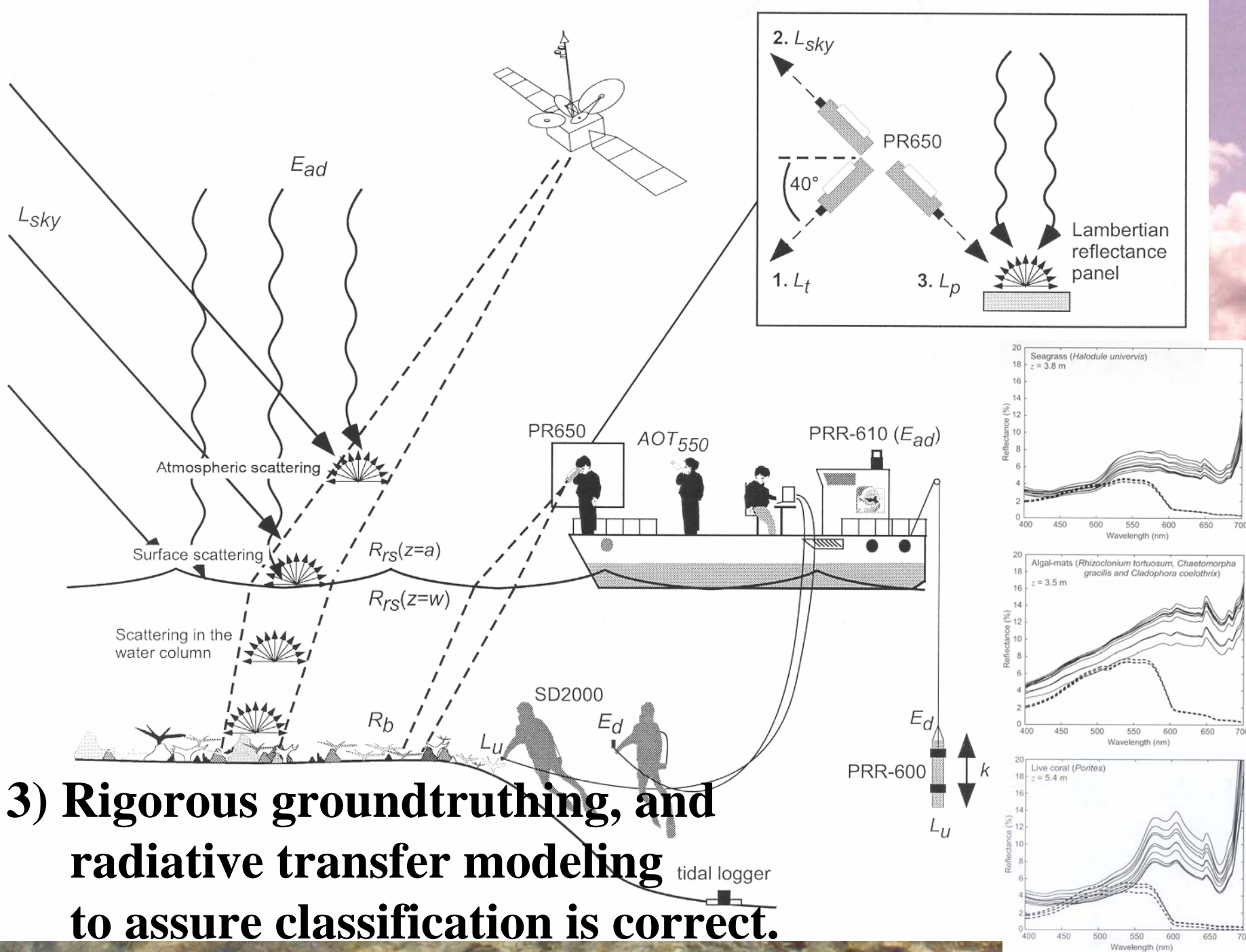




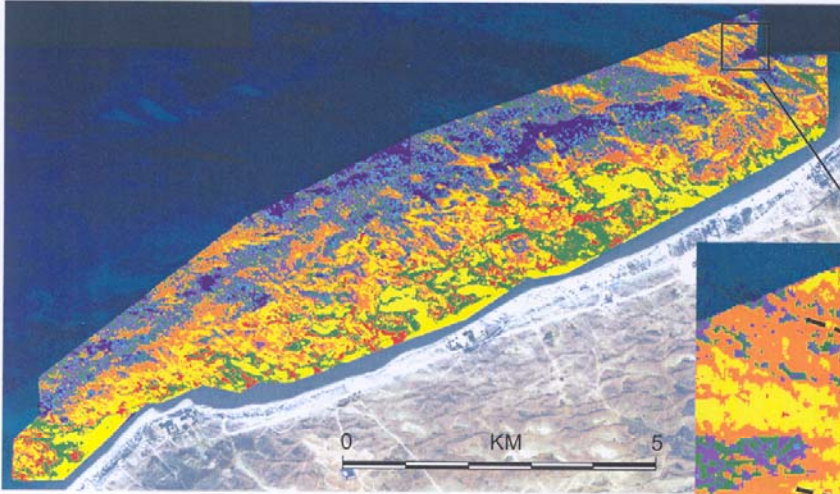
- Sand
- Aggregated rubble
- Macro-algae community type 1
- Macro-algae community type 2
- Seagrass < 50% density
- Seagrass > 50% density
- Algal mats / turf
- Water > 15 m depth



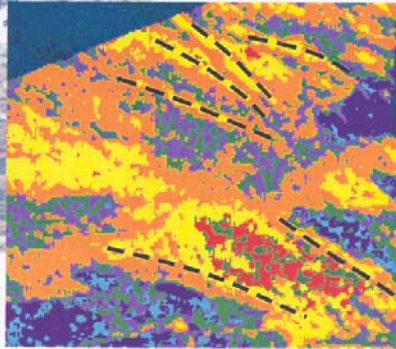




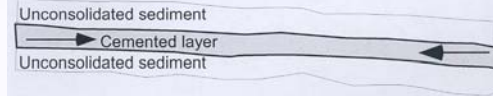
(a)



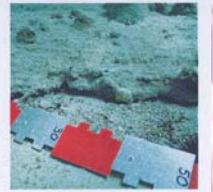
(b)



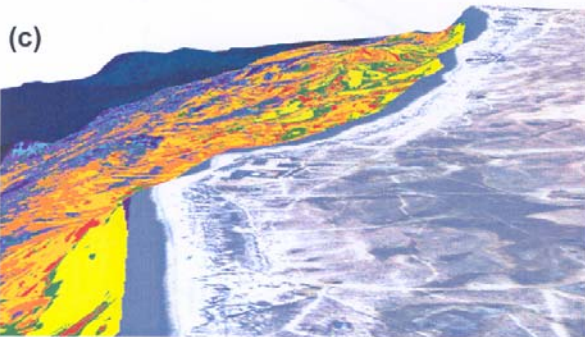
(a)



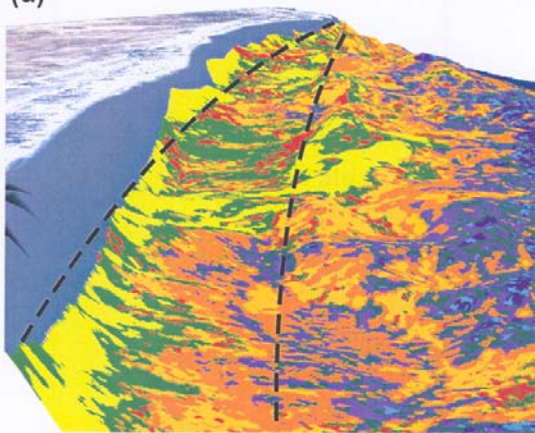
(b)



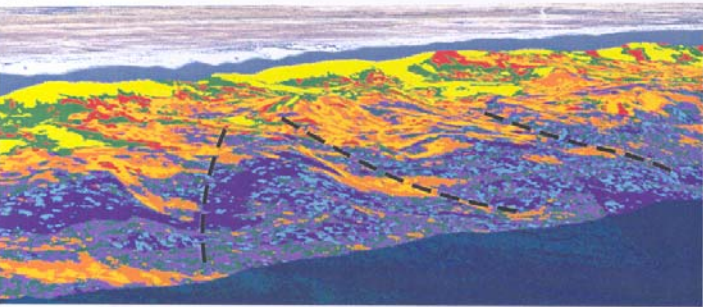
(c)



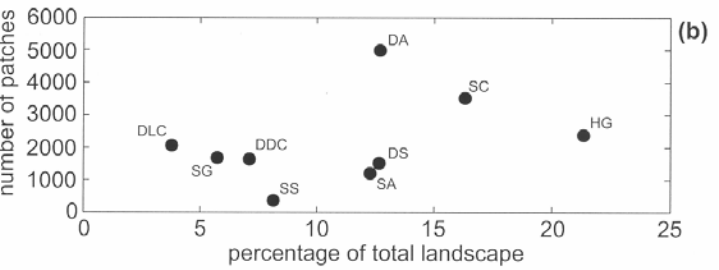
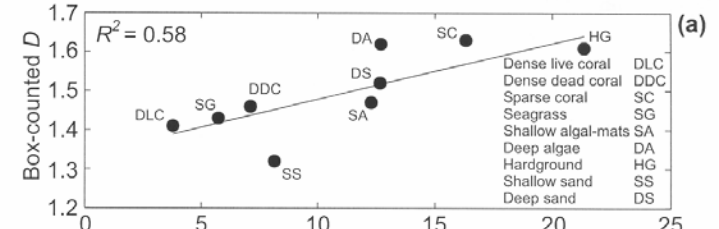
(d)

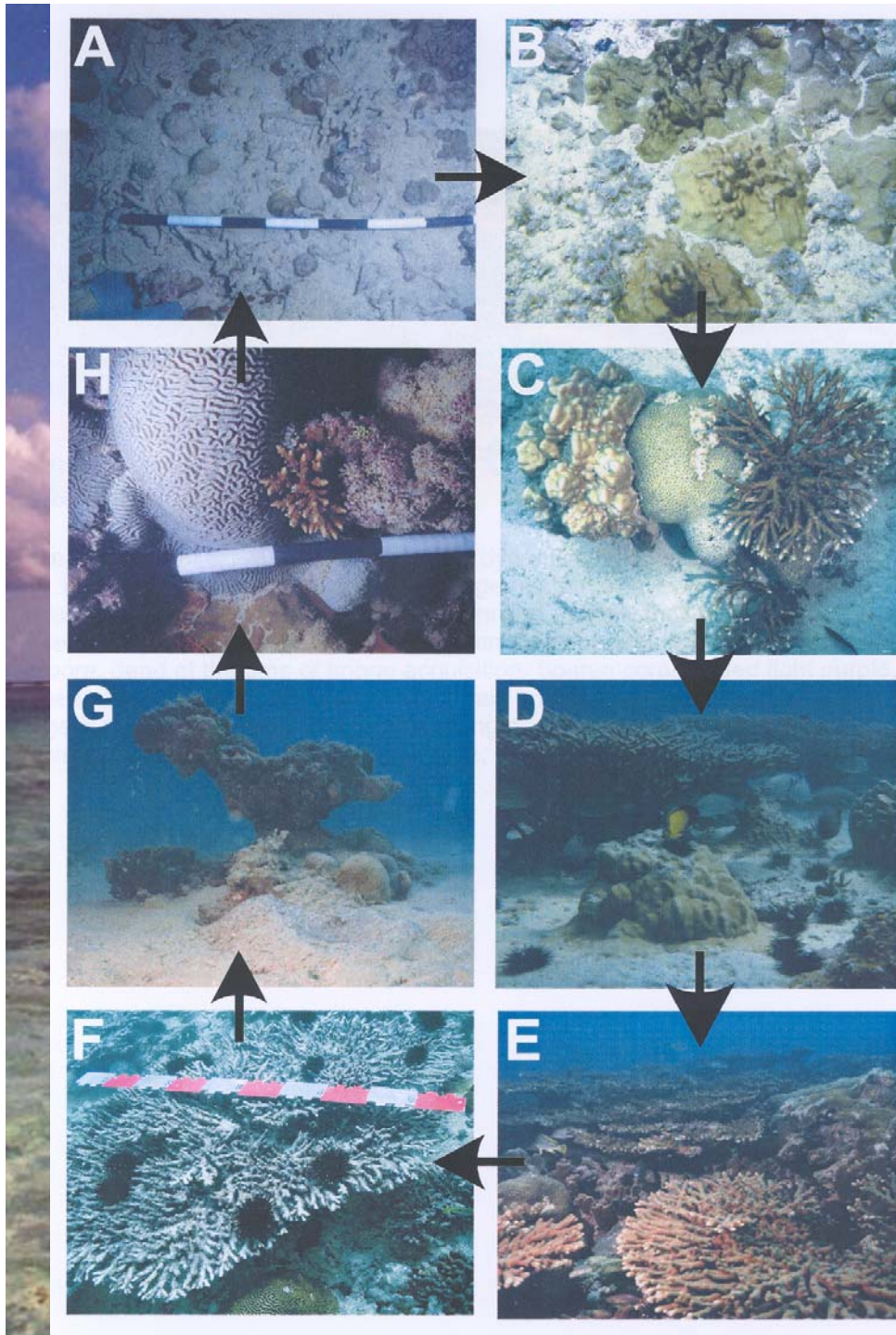


(e)

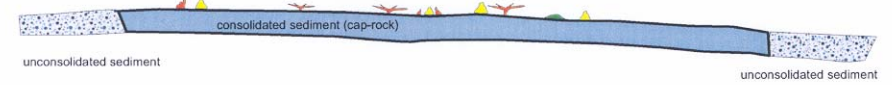


- Dense live coral
- Dense dead coral
- Sparse coral
- Seagrass
- Shallow algae
- Deep algae
- Hardground
- Sand





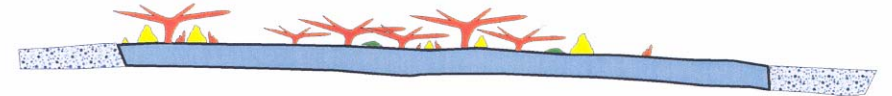
(1) Recruitment onto hardground



(2) Establishment of community



(3) Climax stage with competitive displacement of weaker species



(4) Bleaching and selective, compensatory mortality

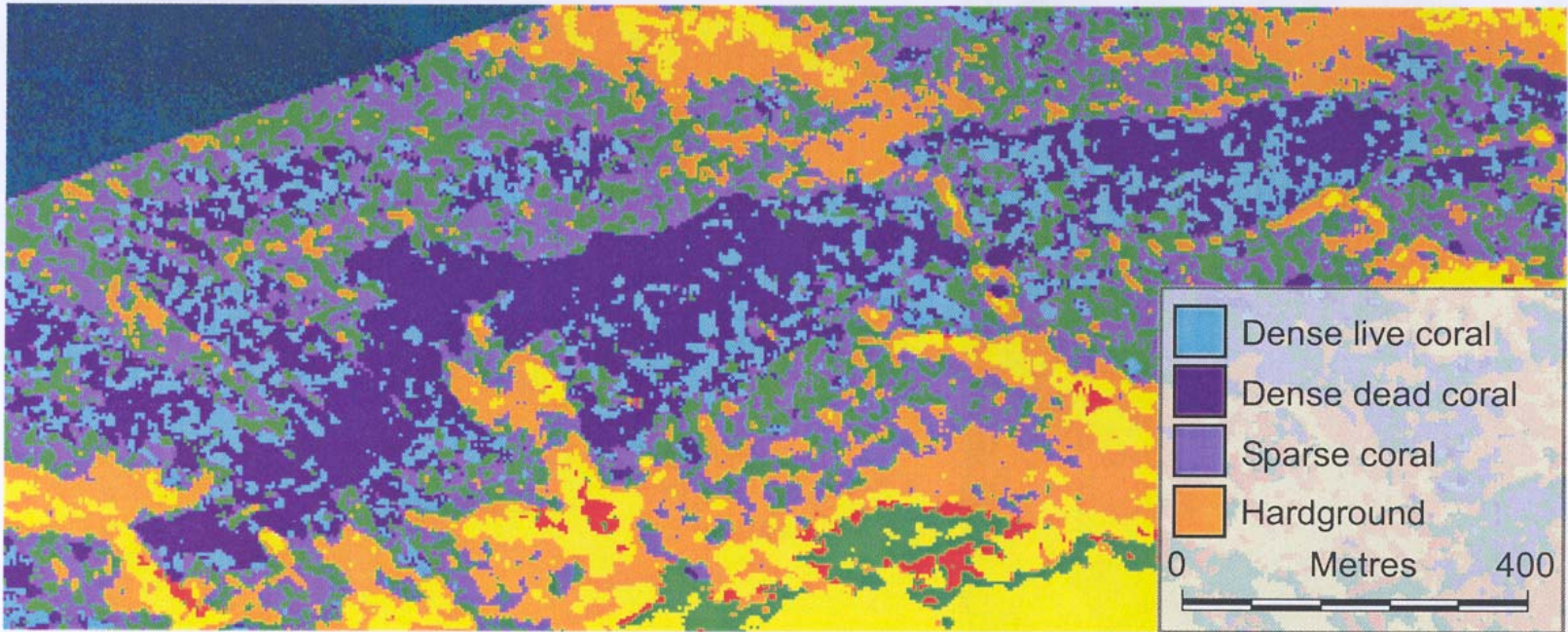


(5) Framework breakdown and new recruitment

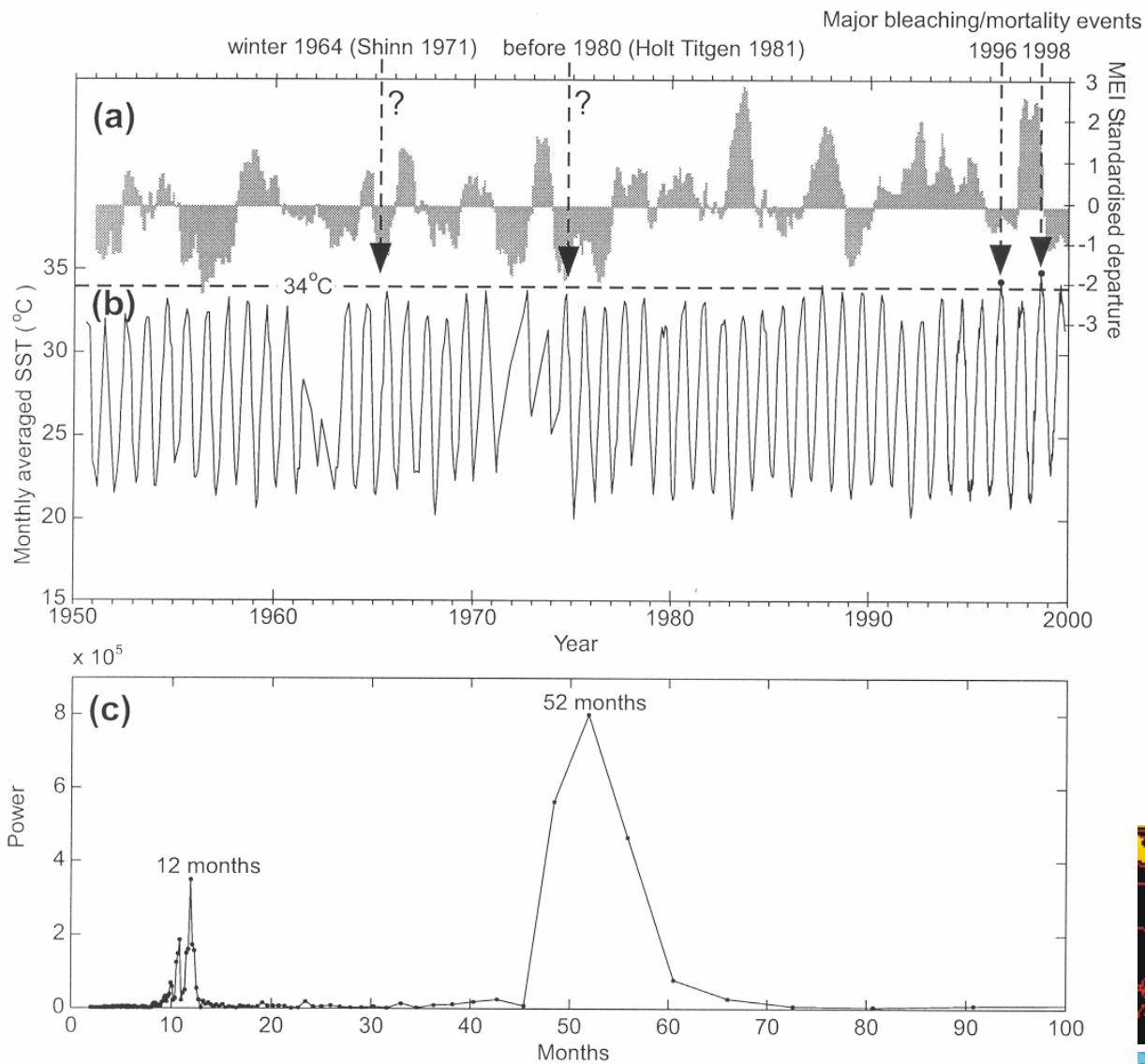


(6) Re-establishment of community and lateral spread

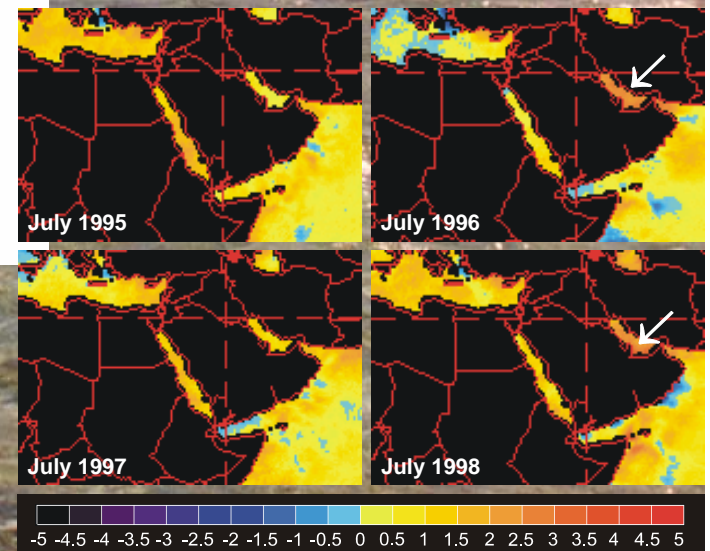






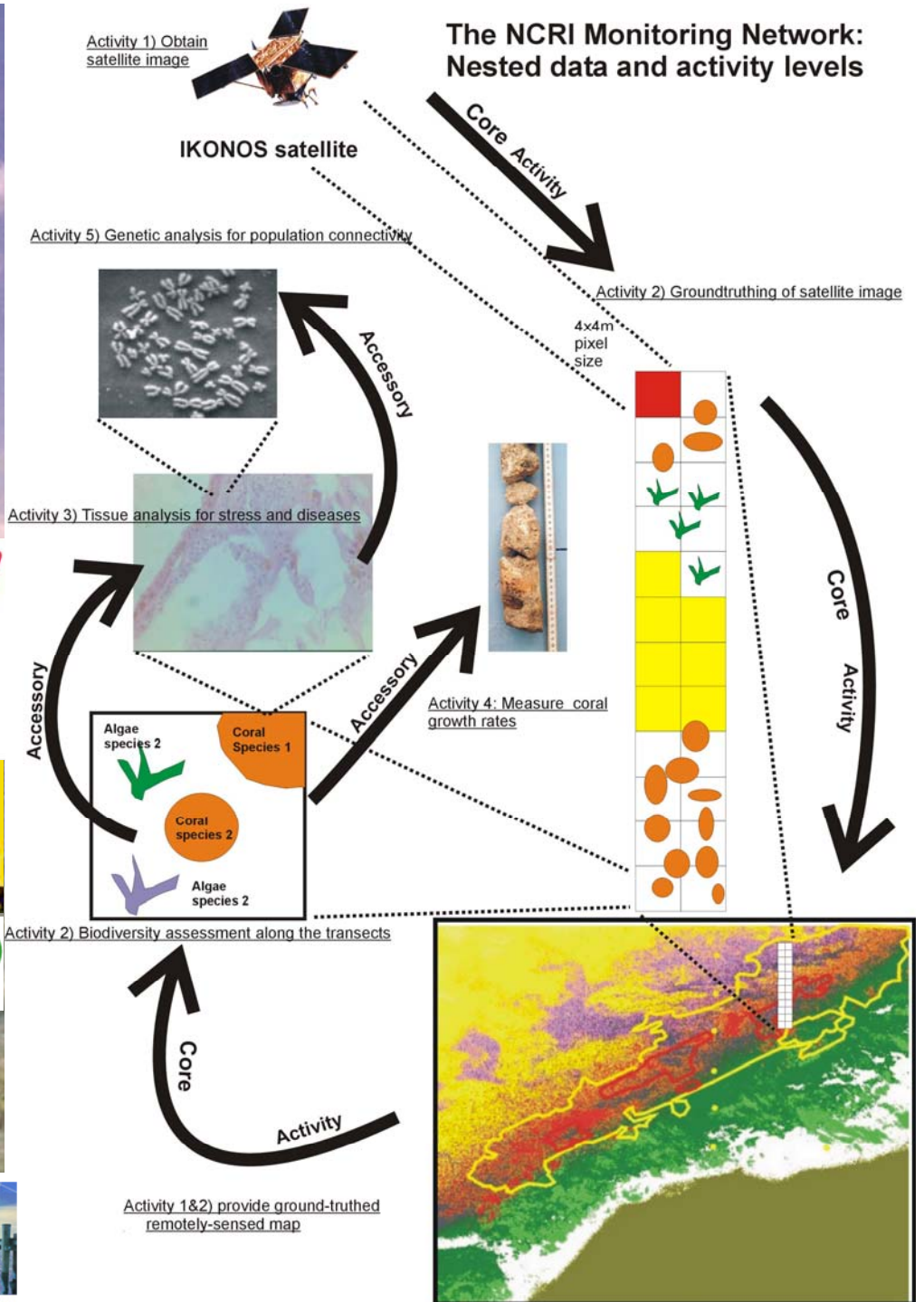


7) couple with environmental time-series data, to understand community history and development models of future.



MONITORING





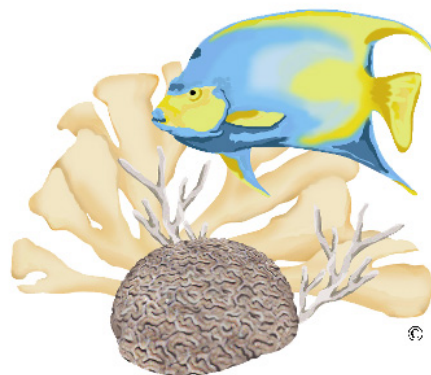
# Making Information resulting from NCRI programs available to Managers

- Projects and partnerships with Broward County & other counties of SE Florida
- Support & participate in SEFAST, LAS
- Partner & collaborate with State of Florida  
DEP/FMRI
- Partner & collaborate with federal agencies including  
USGS, NOAA, NMFS, DOI
- Conference & meeting sponsorships
- **REPORTS & SCIENTIFIC PUBLICATIONS**

**Overview Presentation**  
**NCRI Continuing & New Projects**  
**FY 2004, 2005, & 2006**

**Drs. Richard Dodge & Bernhard Riegl**

**Center for Sponsored Coastal Ocean Research**  
**2<sup>nd</sup> Coral Reef Projects PI Meeting**  
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