NOAA Biological Monitoring

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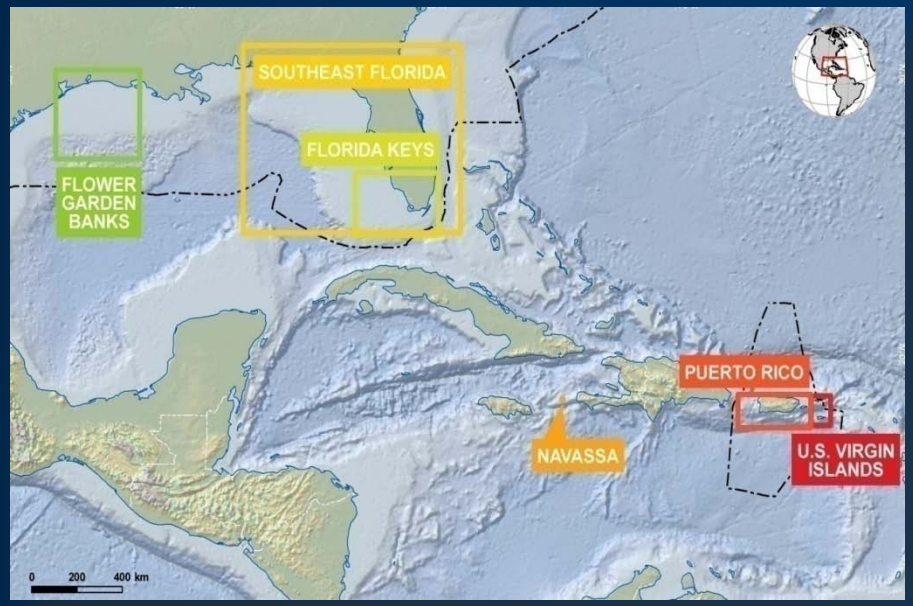
Why is Biological Monitoring Important for Management?

- Define biological change over time
  - Long Term (eg. climate change)
  - Mid-term (eg. fishing pressure)
  - Short-term Events(eg. hurricanes, disease, boat groundings)
- Implement & Evaluate Management Actions
- Define Temporal Trends in Ecosystem Condition
- Necessary for Integrated Mapping & Monitoring

* Monitoring tells us Condition and Changes in Resources, but not “why” – strategic & applied research is necessary!

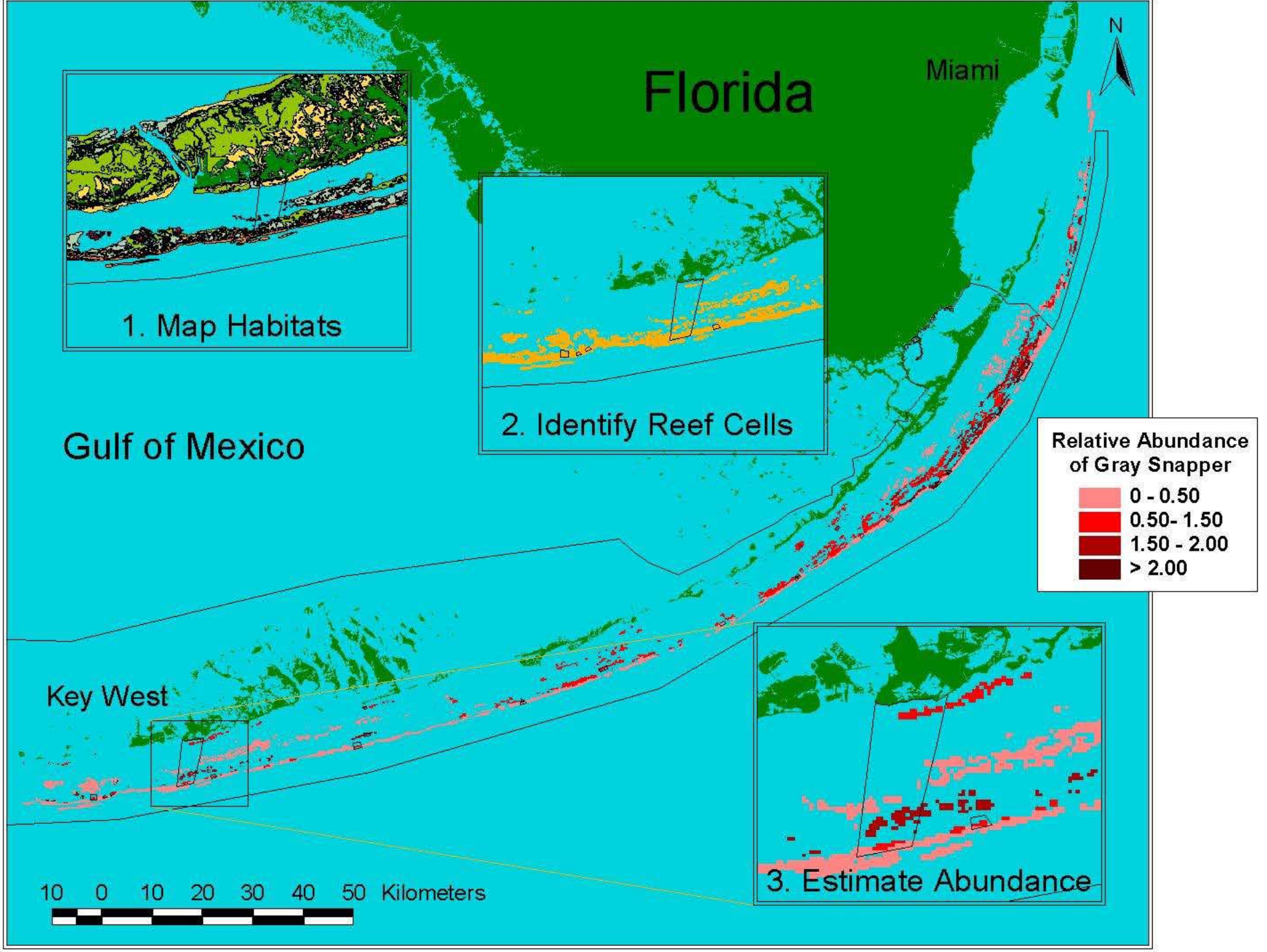
Summary of Key NOAA Capabilities

- NOS
  -Marine Spatial Planning
  -Coral Reef Ecosystem Assessments
  -MPA Efficacy
- NMFS
  - Conserve Habitat
  - Protect/ Protected Species
  - Stock Assessments
- OAR
  - Research Platforms
  - Technical Diving
  - Remote Sensing



Study Areas

*CRCP Monitoring Grants Enable Cooperative Studies with Local Partners (Apx $1.1mil/yr)


Florida
Miami
N
1. Map Habitats
2. Identify Reef Cells
Gulf of Mexico
Relative Abundance of Gray Snapper
0 - 0.50
0.50- 1.50
1.50 - 2.00
> 2.00
Key West
3. Estimate Abundance
10 0 10 20 30 40 50 Kilometers

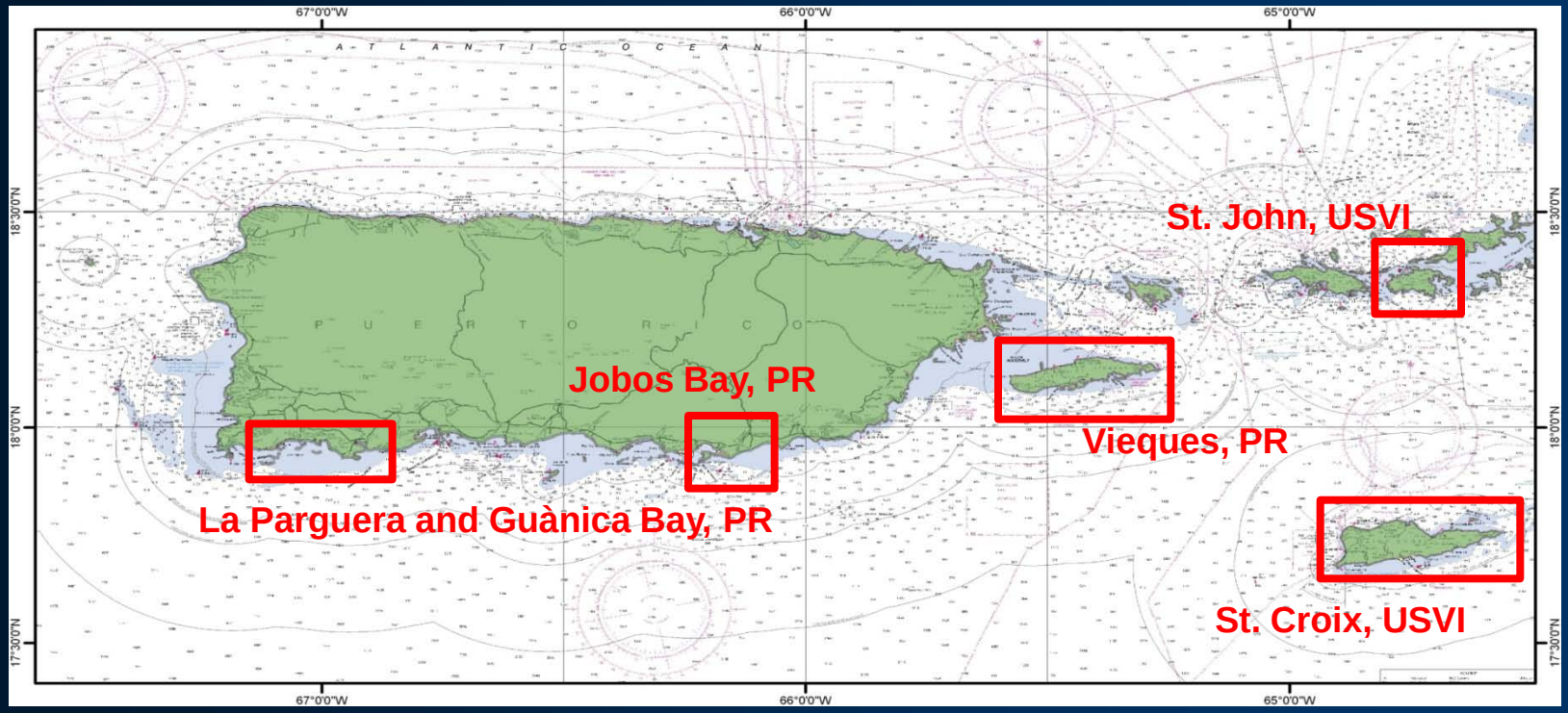
-Florida Keys Reef Fish:
-Sampling Allocations 1979-2005

–Black grouper

NOAA Capabilities

Biological Monitoring Locations - US Caribbean

ECOSYSTEM ASSESSMENTS (Biogeo 2001-2009)



Sampling Effort

La Parguera
1,395 visual surveys

Guanica Bay
TBD 2009/2010

Jobos Bay
TBD 2009/2010

Vieques
75 visual surveys

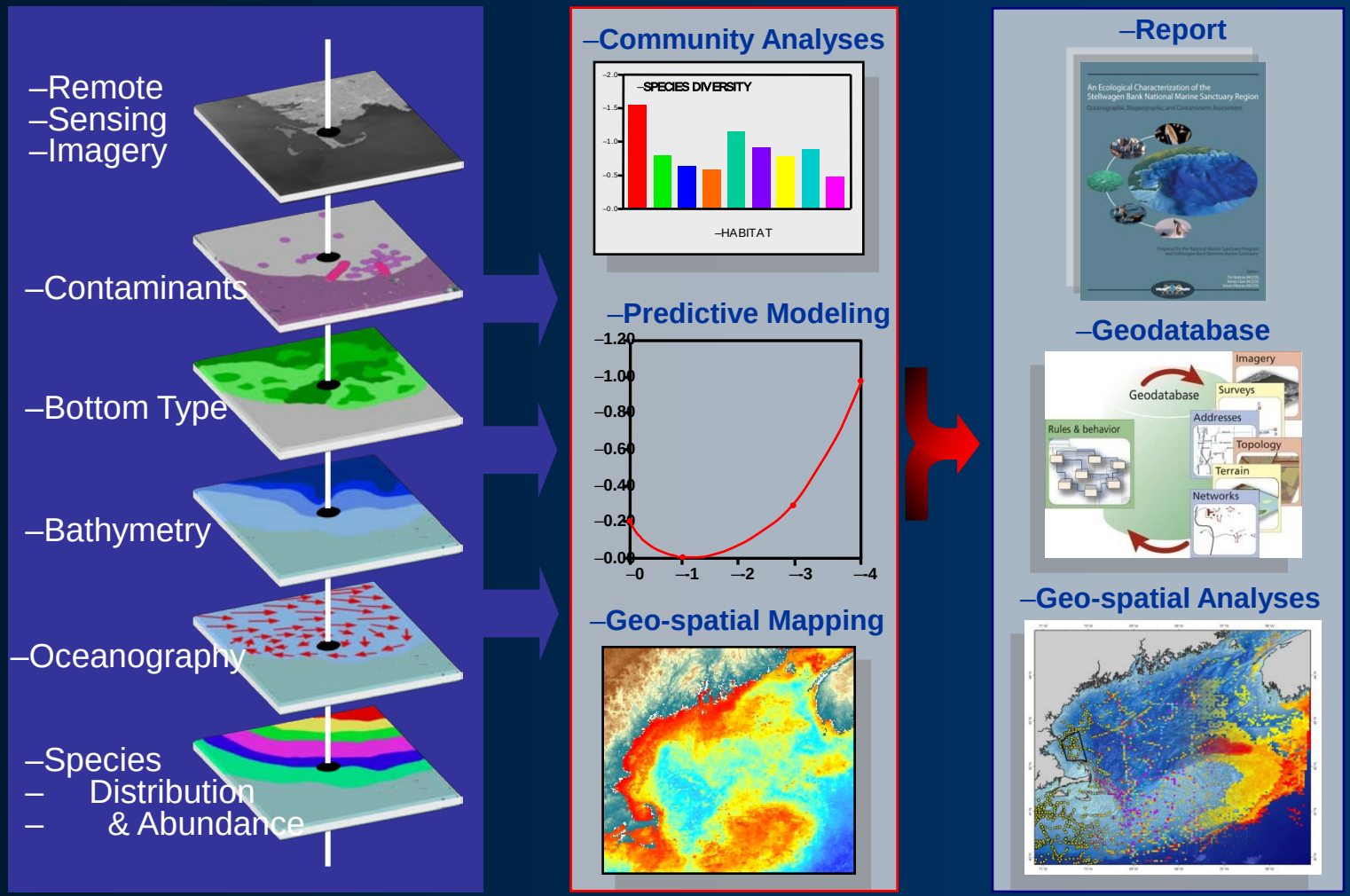
St. John
1,188 visual surveys

Buck Island (St. Croix)
1,619 visual surveys

Flower Garden Banks
105 visual surveys

NOAA Capabilities

Integrated Ecosystem Assessments



NOAA Capabilities

Biological Monitoring

CORE MONITORING CAPABILITIES

Capability 1 : Ecosystem Based Assessments
Habitat and living marine resources; sampling designs

Capability 2: Acropora and other Protected Species
Support ESA requirements

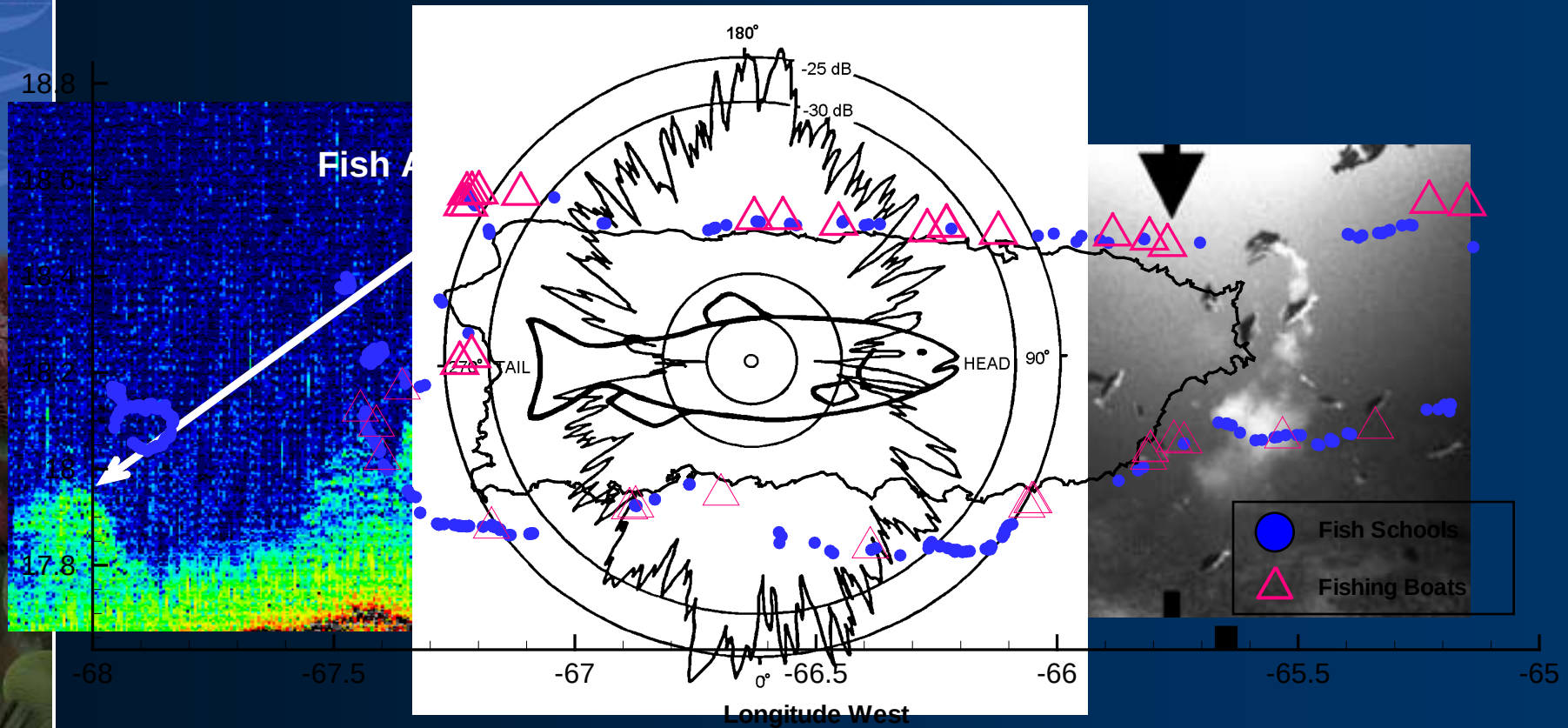
Capability 3: Fishery Dependent & Independent Monitoring
Reef fish visual census; Acoustic Surveys, Stock Assessments

Capability 4: Spawning Aggregation id/monitoring.
Maps, habitat features, spawning activity

Capability 5: Strategic & Applied Research to Inform Managers
Explain & Understand Monitoring Results

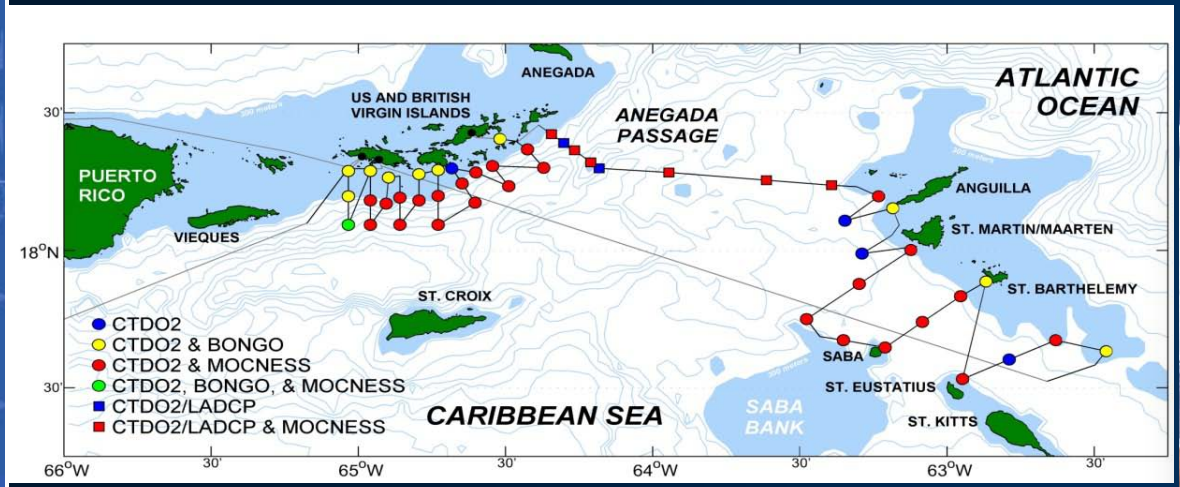
Spawning Aggregation identification and monitoring

1. Location & Timing of Spawning Aggregations
2. Fish size based on target strength
3. Aggregation shape
4. Direct correlation of spatial distribution with fishing boats



Define & Monitor Ecological Connectivity Over Multiple Spatial & Temporal Scales

Regional larval movements



Fine scale fish tracking

NOAA Capabilities

Biological Monitoring

CORE MONITORING CAPABILITIES

Capability 6: Ecological Forecasting & Modeling
Biological diversity, management scenarios

Capability 7: Natural & Human Induced Event Monitoring
Response to bleaching, groundings

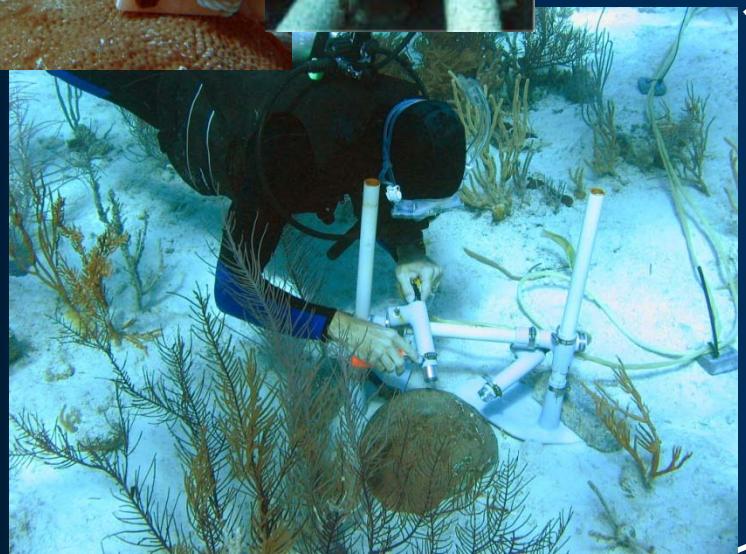
Capability 8: Monitoring of Mesophotic and Deep Reefs
ROVs, AUVs, acoustics

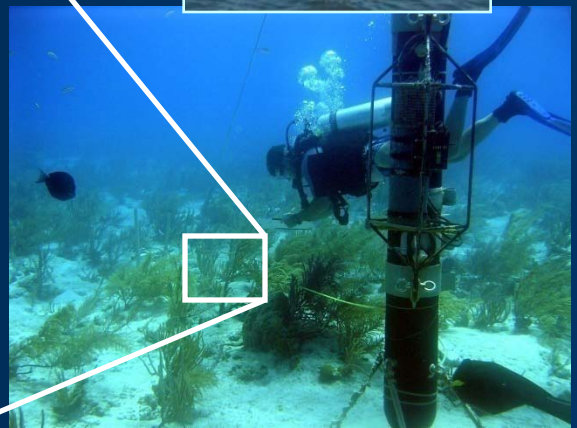
Capability 9: Design & Evaluate MPAs and MPA Networks
Seascape ecology, biogeography, MPA efficacy,

–Black Grouper, Exploited, ~~–Protected~~ and Fished

–Fishery Regulations minimum length: 1985 - 18”, Feb 1990 - 20”,Dec 1998- 24”, Jan 1 2001 – 22”; 1986 -

–PAM fluorometry:
–Coral Health in Near Real-Time!
– Damage from bleaching may be done by the time satellite-based bleaching alerts reach critical levels





Key Management Outcomes and Support from Acropora monitoring

RESPONSE AND COORDINATION

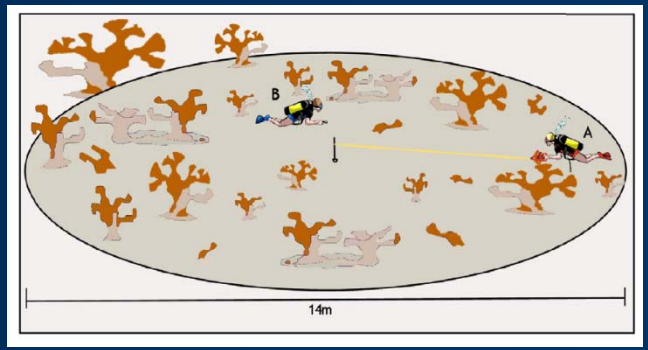
- *A.cervicornis* disease outbreak/response
- Detected via targeted monitoring efforts
- notice to and action by FKNMS.

SUPPORT ESA LISTINGS

- 'Pre-emptive' assessment and research activities greatly enhanced NOAA's ability to respond to subsequent ESA listing petition.

ISLAND ASSESSMENTS

- Habitat Maps (e.g. Navassa)
- *Acropora* spp. occurrence maps
- Fishery characterization
- 'best available science' called upon by CFMC



Key Management Outcomes and Support from Ecosystem Monitoring

MARINE PROTECTED AREA DESIGN & EVALUATION

- Zoning for Anchoring (Buck Island)
- Evaluation of MPA Efficacy (FL Keys, VI)
- Define/Modify Boundaries (VI, FL, RNA)

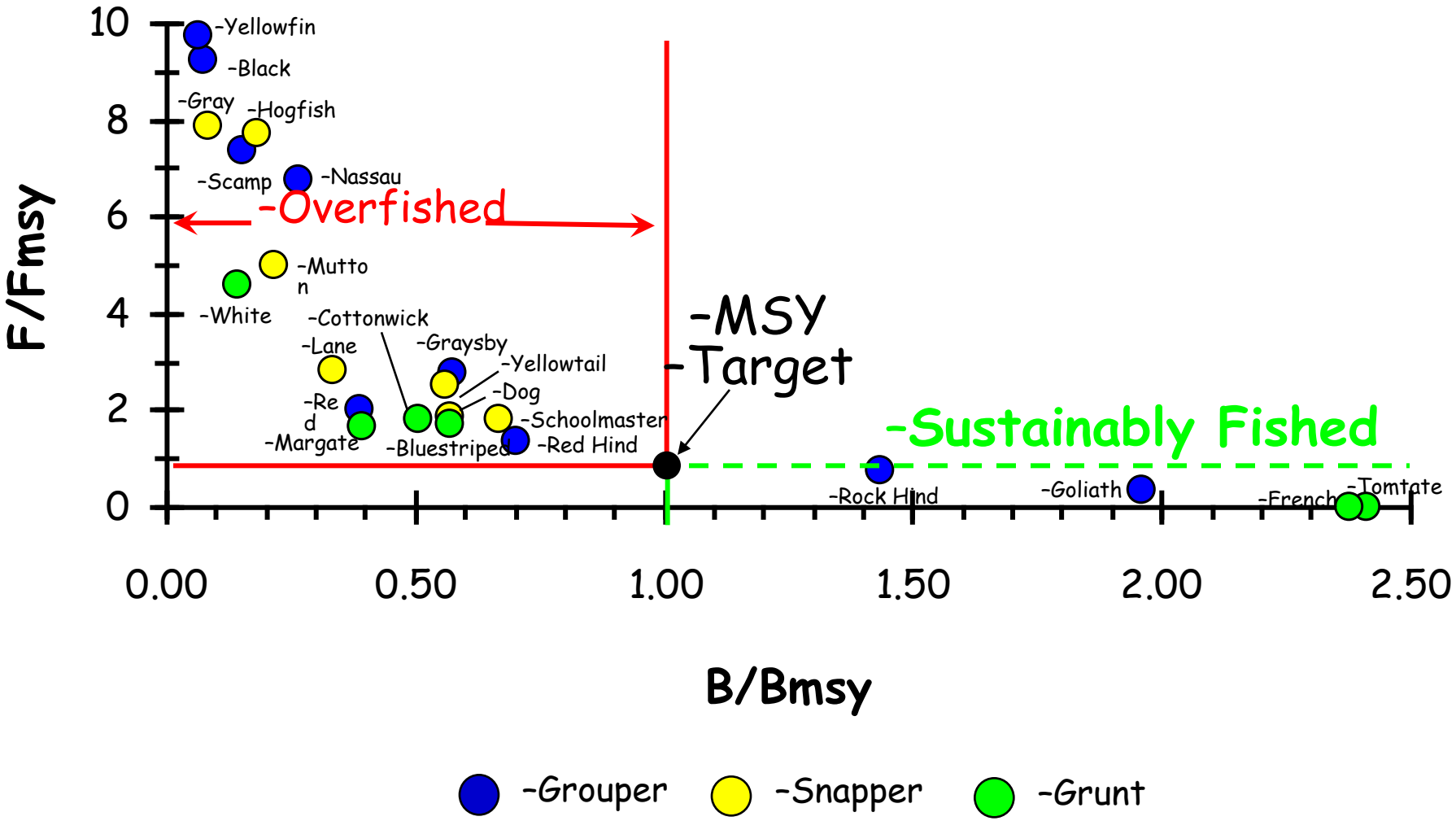
EVALUATING ECOSYTEM CONDITION

- Monitoring to Evaluate Mgt Actions (Fishing impacts, FLA, Carib)
- Impacts from ship/boat Groundings (FLA, Carib)
- Fishing Impacts (FLA Keys, Carib)

WATERSHED MODELING/ANALYSIS

- Contaminant Impacts (Puerto Rico)
- Ecological Linkages (Food Webs - Puerto Rico)
- Watershed Models (Jobos Bay)

-Florida Keys Reef Fish Community Baseline



NOAA Capabilities

Biological Monitoring

DATA & PRODUCT AVAILABILTY

Data to Managers & Scientists

***Web sites**
***Maps**
***Reports**
***Peer Reviewed**
***Training/Meetings**
***Consultations**