

Baseline Fish and Benthic Habitat Characterization in the Flower Garden Banks National Marine Sanctuary

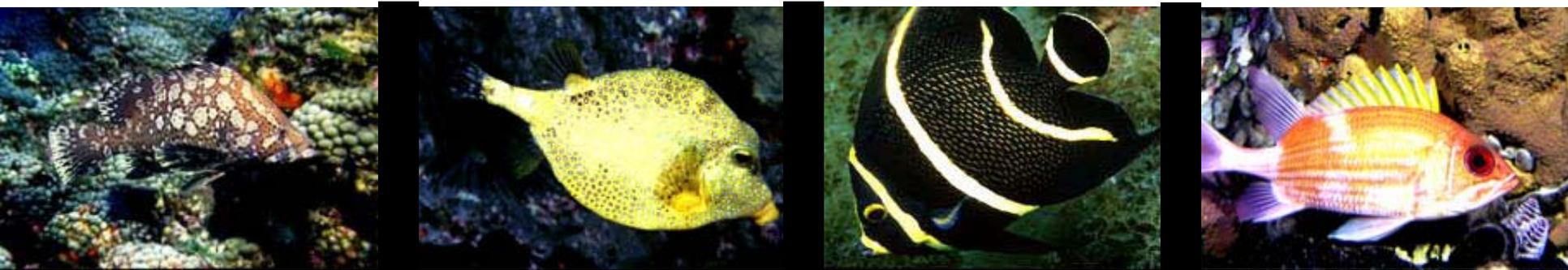
Randy Clark

NOAA Center for Coastal
Monitoring & Assessment



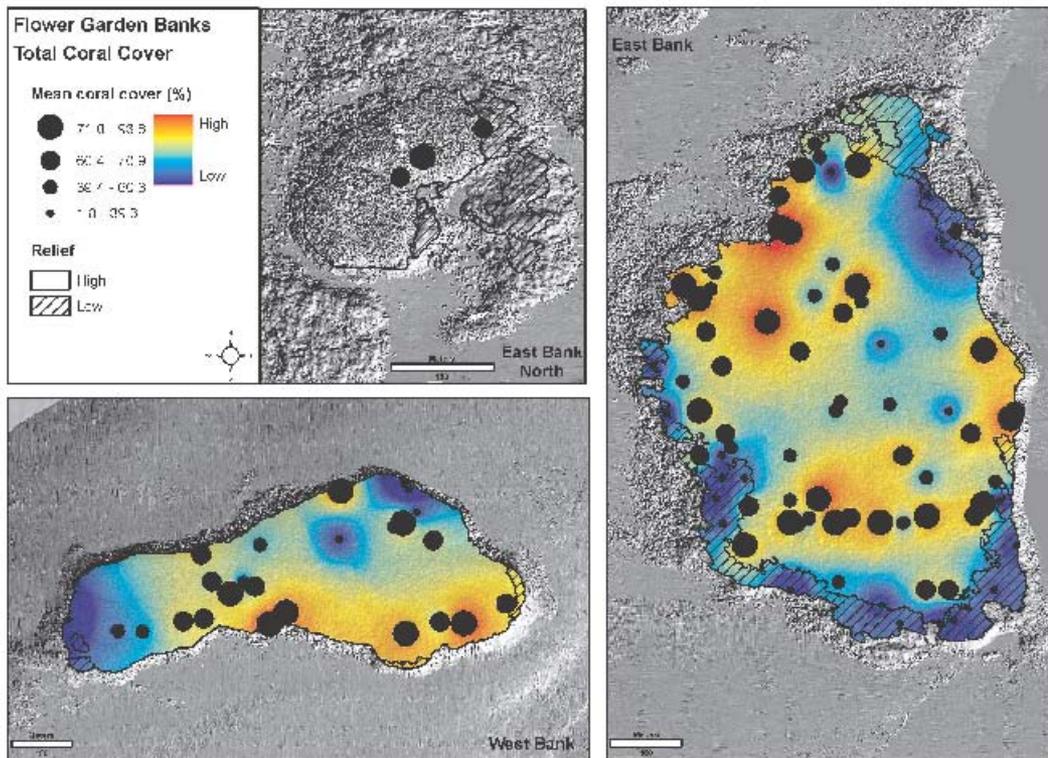
Outline

- Who are we and how did we get here?
- Who is NOAA's Biogeography Branch?
- Objectives, sampling design, and approach
- Preliminary results
- Next steps
- Challenges



NOAA's Biogeography Branch

Mission: To develop knowledge and products on living marine resource distributions and ecology and to provide managers and scientists with an improved ecosystem basis for making decisions



Our Strengths: robust spatial analysis and integrated assessments

Sanctuary Efforts To-Date



FLOWER GARDEN BANKS NATIONAL MARINE SANCTUARY

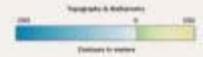
Contact Information
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flowergardenbanks.gov

Habitats
• Coral reefs
• Algal canopy communities
• Seagrass

• Sand flats
• Penitents, seagrass meadows
• Deepwater coral communities

Key Species
• Star and Swell coral
• Groupers
• Manx ray

• Horseshoed shark
• Loggerhead sea turtle
• Whale shark



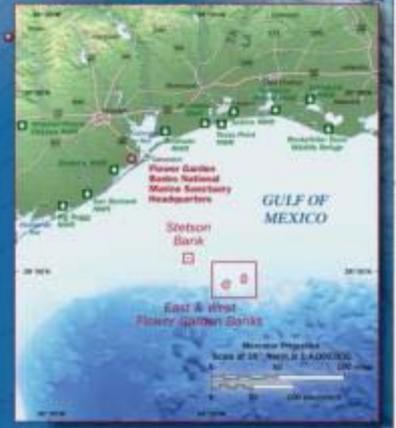
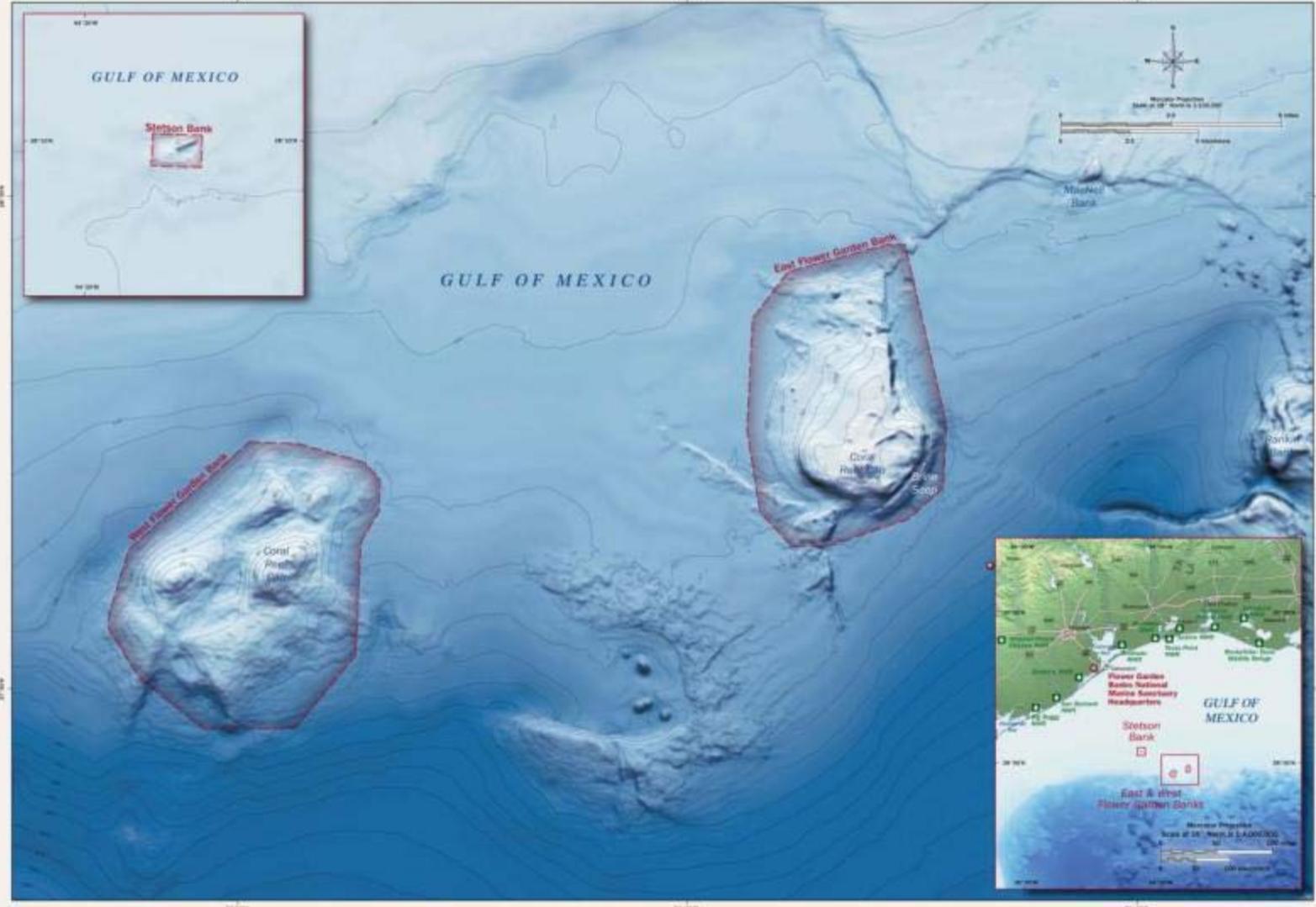
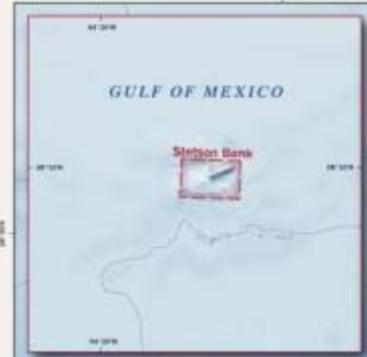
Map Key
 [Red outline] National Marine Sanctuary
 [Green circle] National Marine Sanctuary Office
 [Red circle] Other Park
 [Black outline] National Wildlife Refuge



FLOWER GARDEN BANKS NATIONAL MARINE SANCTUARY

Location
Roughly 125 miles south of the Texas/Louisiana border

Protected Area
50,000 acres
Designation
January 1992
October 1996, Station Banks

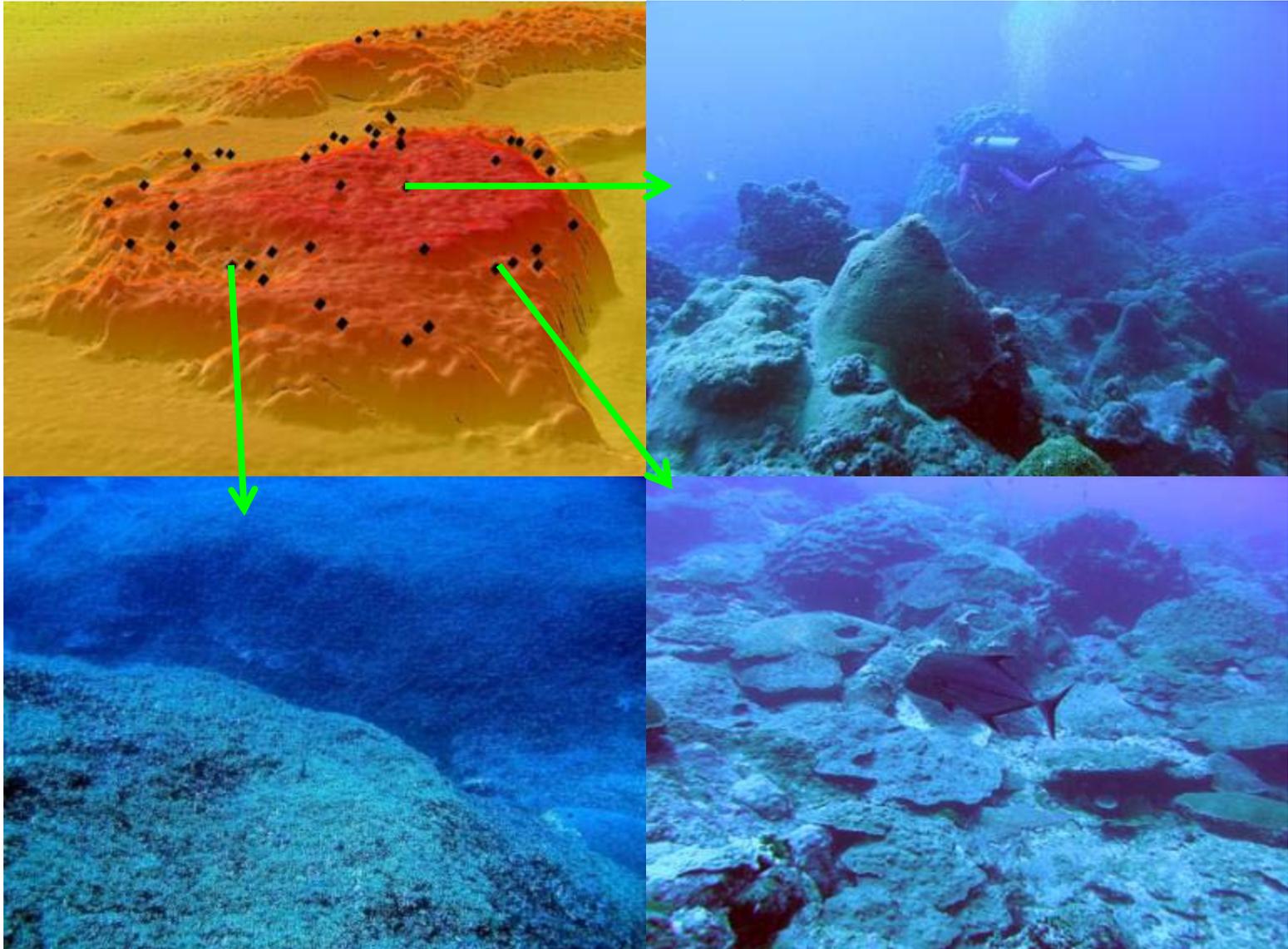


Objectives

- Fish community structure
- Density and mean-size of selected economically important taxa
- Spatial patterns of community structure and correlation with benthic features



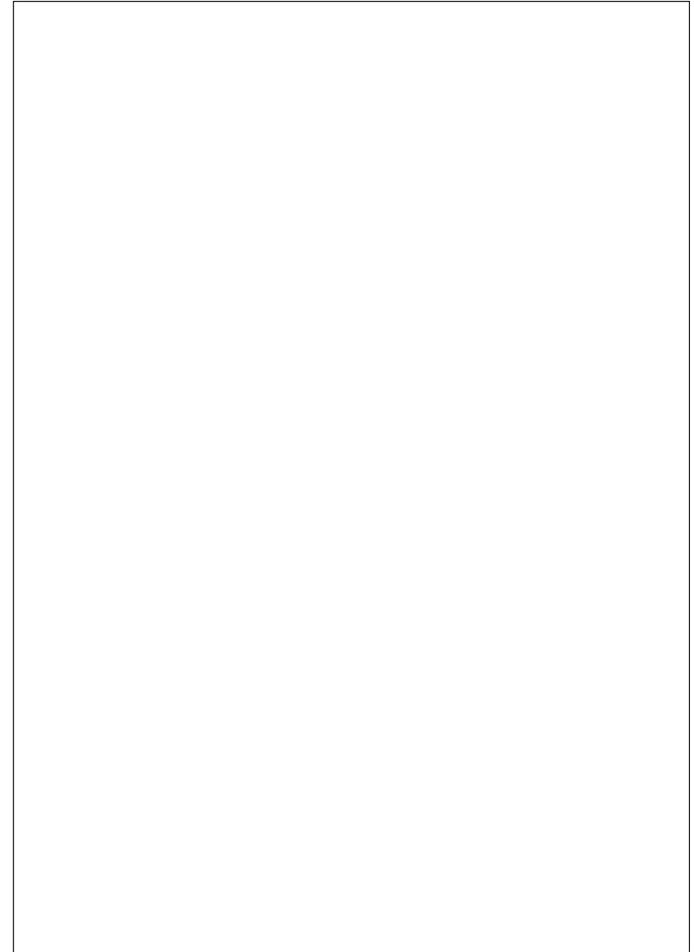
Flower Garden Banks NMS



Site Selection/GIS Tool



West Bank



East Bank

Field Methodology



Fish Transect (25 X 4 m)

- identification
- abundance
- size



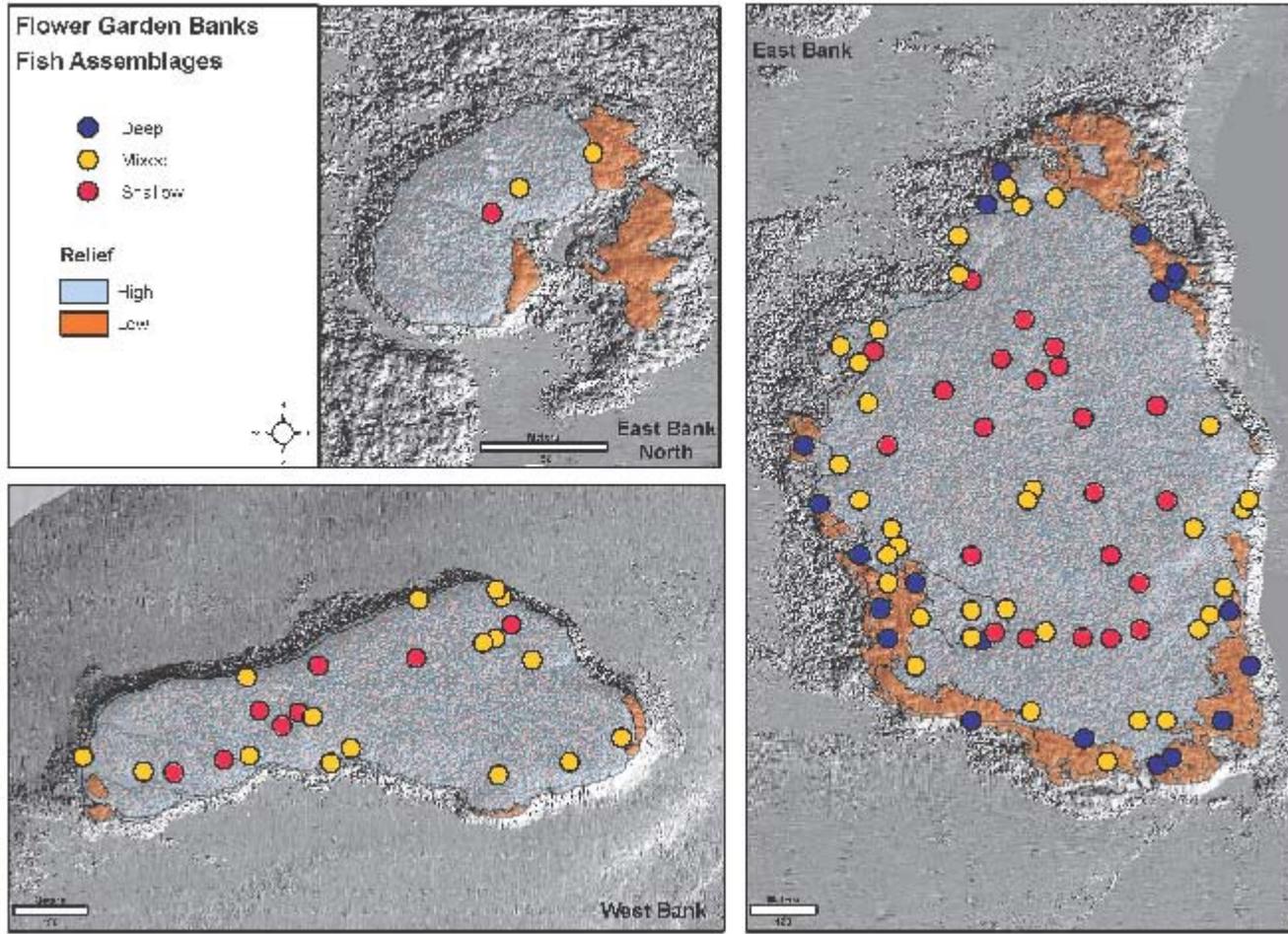
Benthic Composition (1m² quadrats)

- % cover of corals, algae, sponges
- auxiliary data – marine debris, macroinvertebrates

Humberto'd

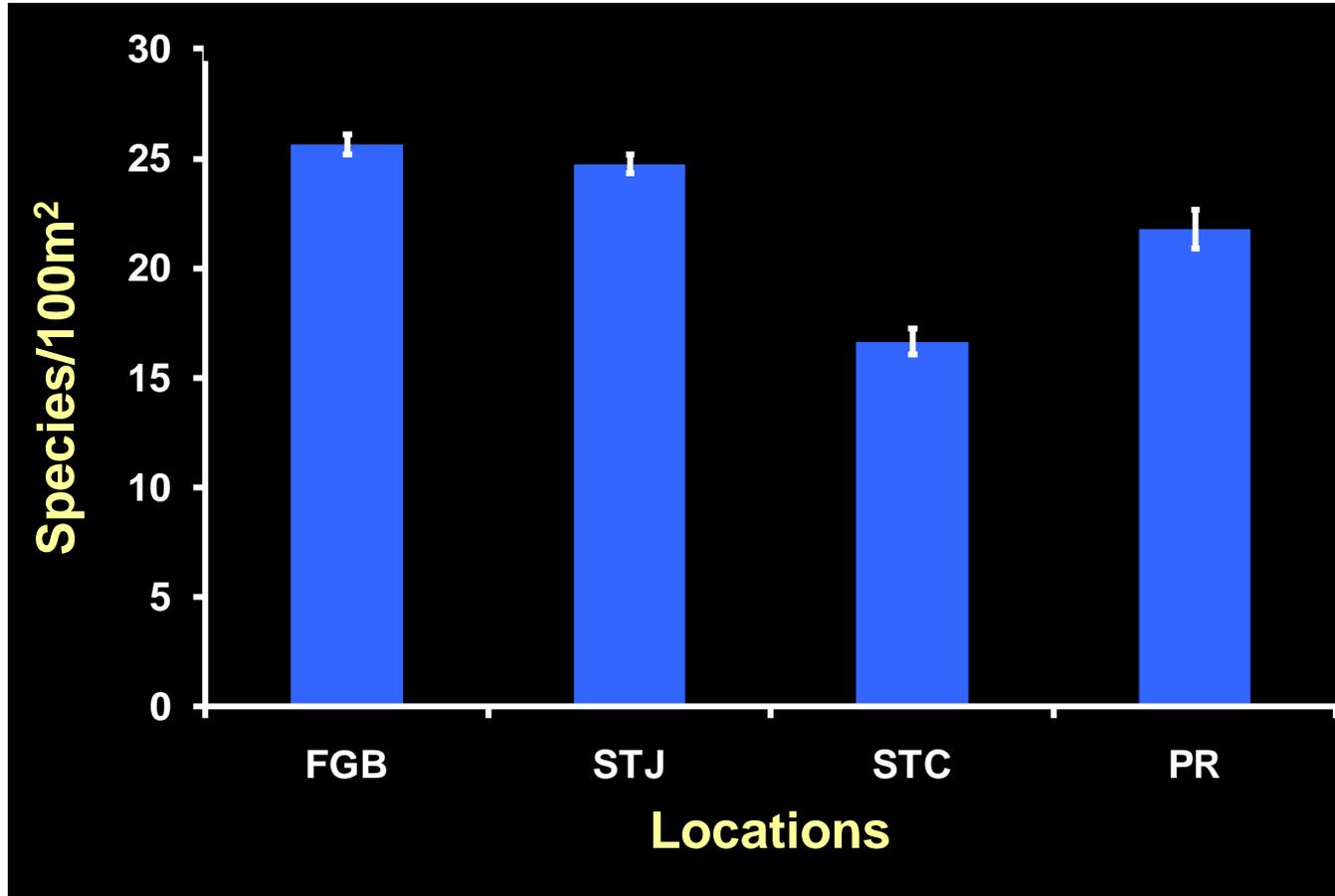


Spatial Groupings

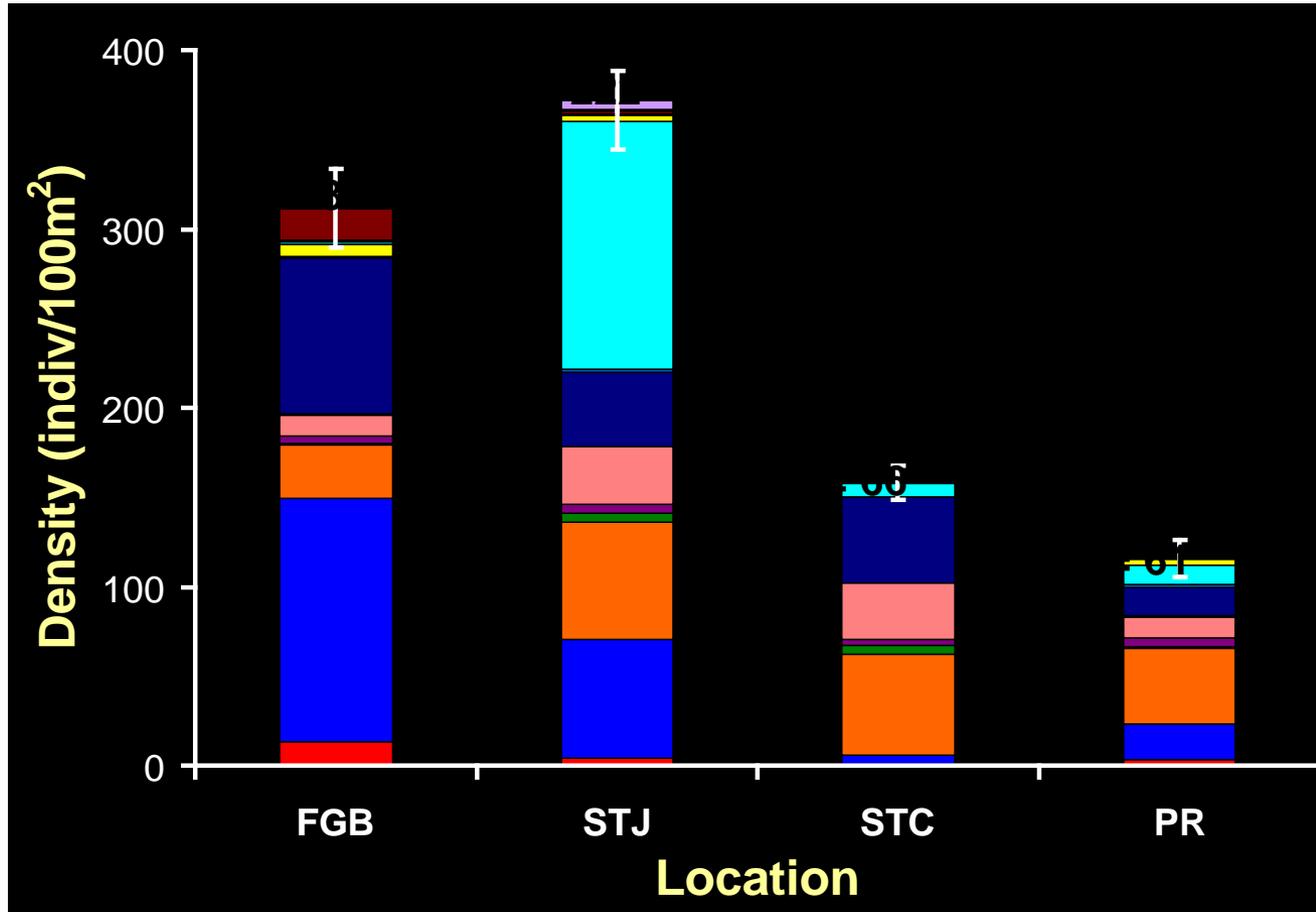


Mean Richness

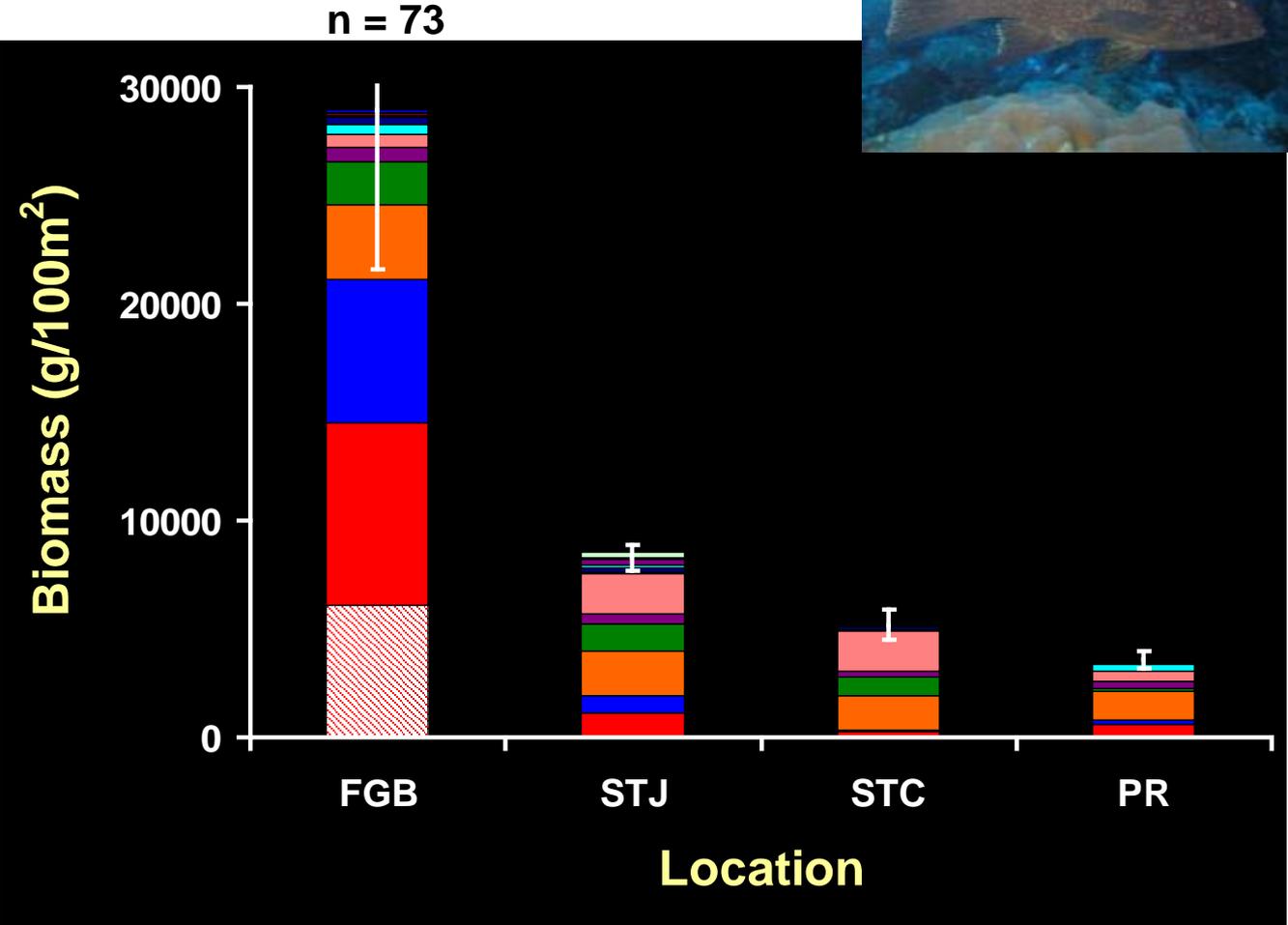
Sites > 60 ft depth



Mean Density



Mean Biomass



NWHI Comparison

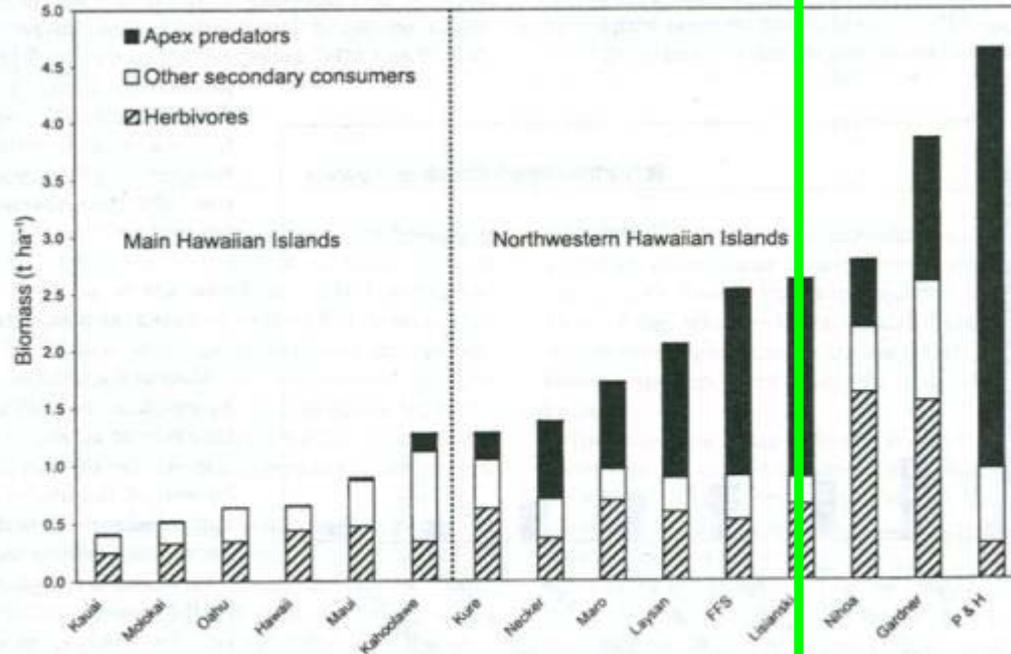
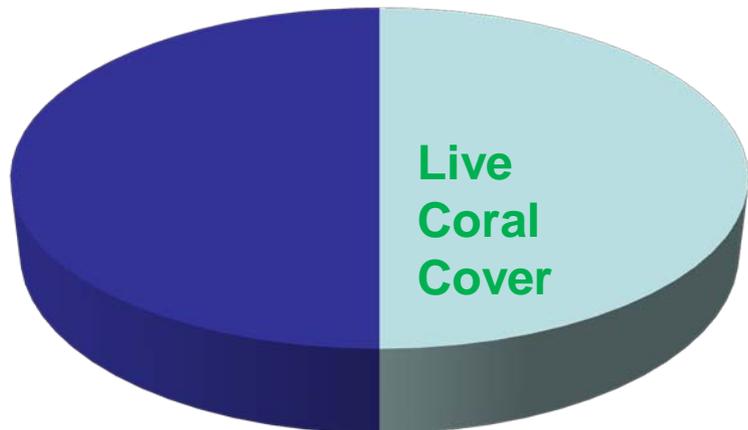


Fig. 3. Ranked (from left to right, lowest to highest) total grand mean biomass and grand mean biomass by trophic level for all reefs surveyed in the main Hawaiian islands and northwestern Hawaiian islands. FFS = French Frigate Shoals; P & H = Pearl and Hermes

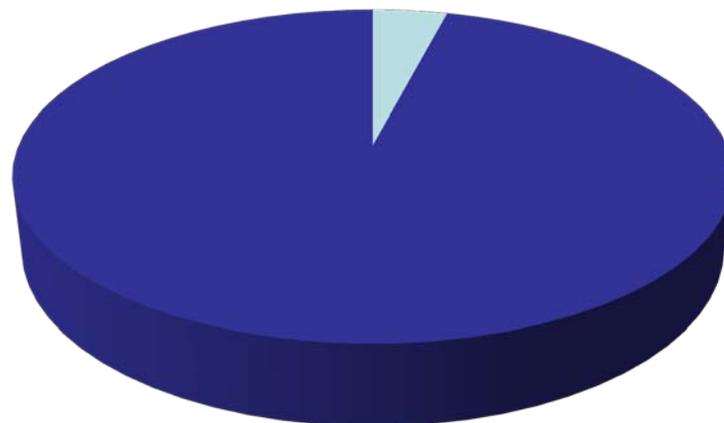
Friedlander AM, DeMartini EE (2002) Contrasts in density, size, and biomass of reef fishes between the northwestern and the main Hawaiian islands: The effects of fishing down apex predators. *Mar Ecol Prog Ser* 230:253–264

Coral Community

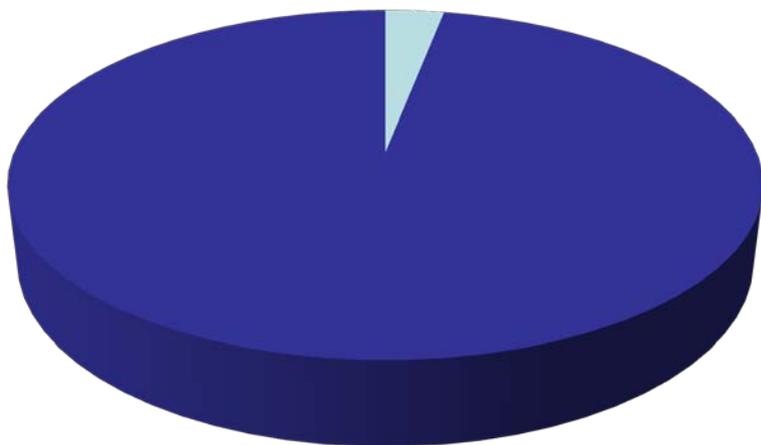
FGBNMS



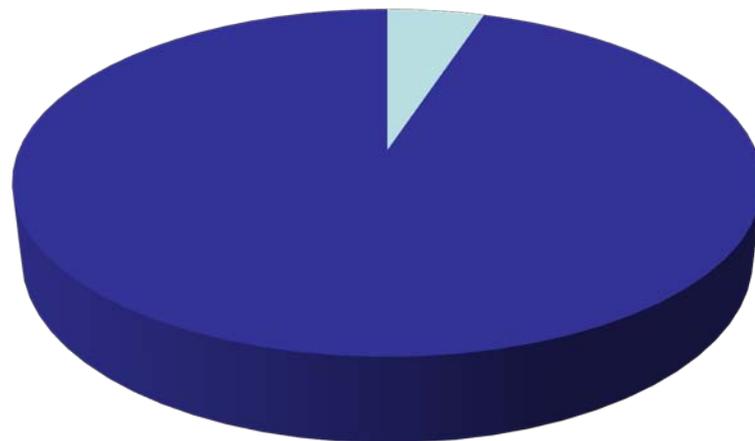
SW Puerto Rico



St Croix



St John



Conclusions

- A comparatively pristine ecosystem
 - Coral cover ~ 50%
 - High topographic complexity
 - Fish community structured differently
 - 3-dimensional
 - High biomass & diverse trophic level
- Future Direction
 - Baseline for management decisions
 - Across all depths
 - Multiple survey technologies (ROVs, acoustics, technical diving)

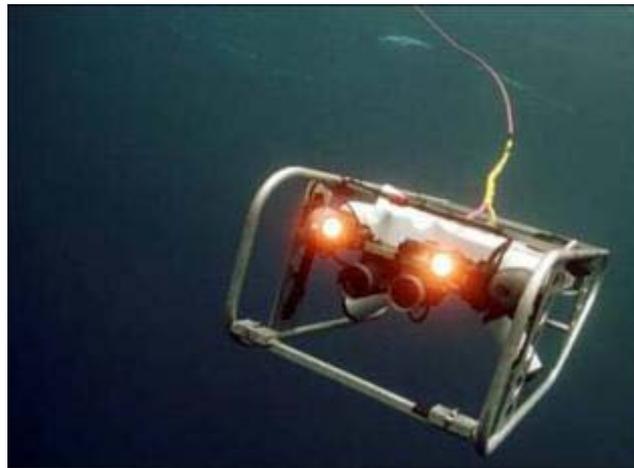
Mgmt Plan Review: Public Scoping

- 82 formal comments.
One petition to close the sanctuary with 336 signatures.
- 54 (66%) addressed “fishing”
- 43 of those 54 recommended "no fishing" or "no take zones"
- 5 comments “no change”

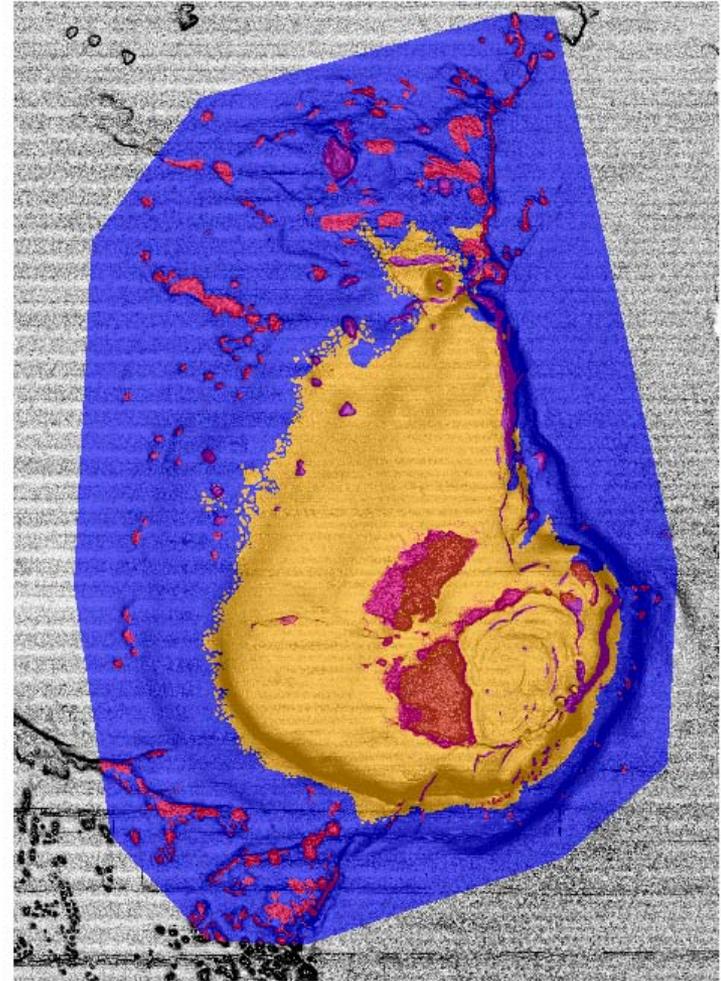
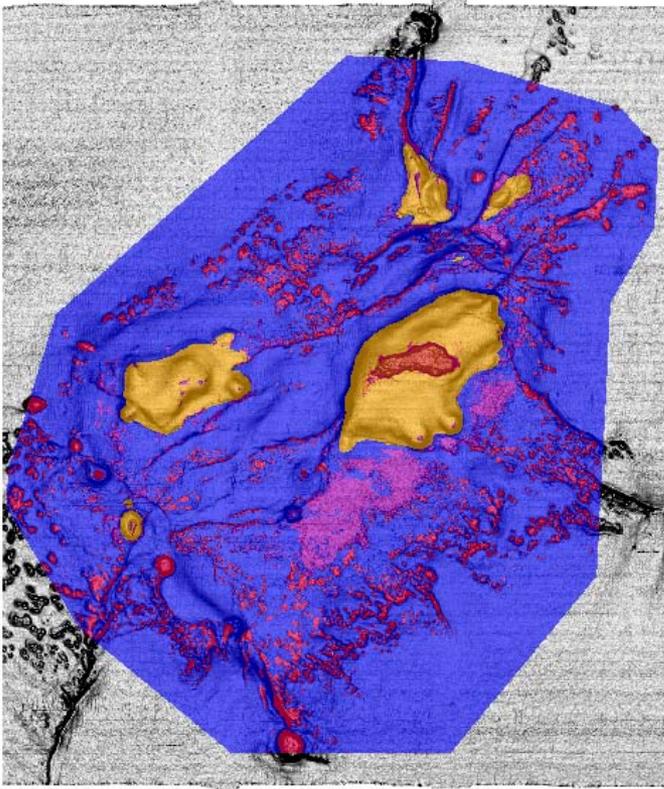


Experimental Closure

- 3 years to collect baseline data
 - Shallow Coral Cap - 110'
 - Deep Coral Cap - 150'
 - Deeper Habitats ~ 400'
 - Acoustic Technology – throughout



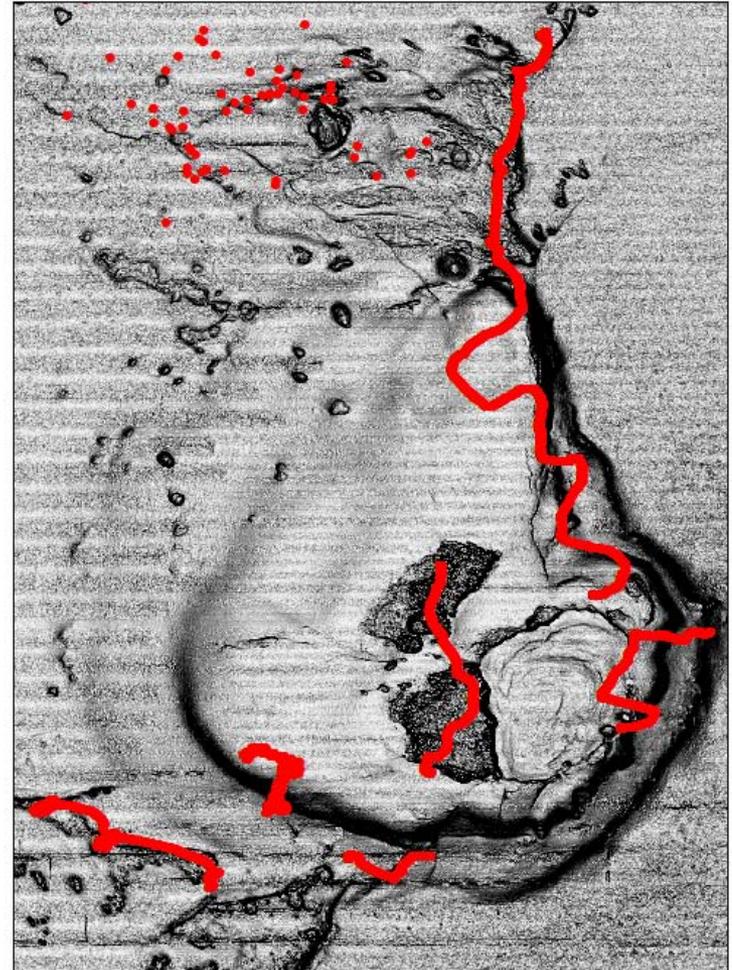
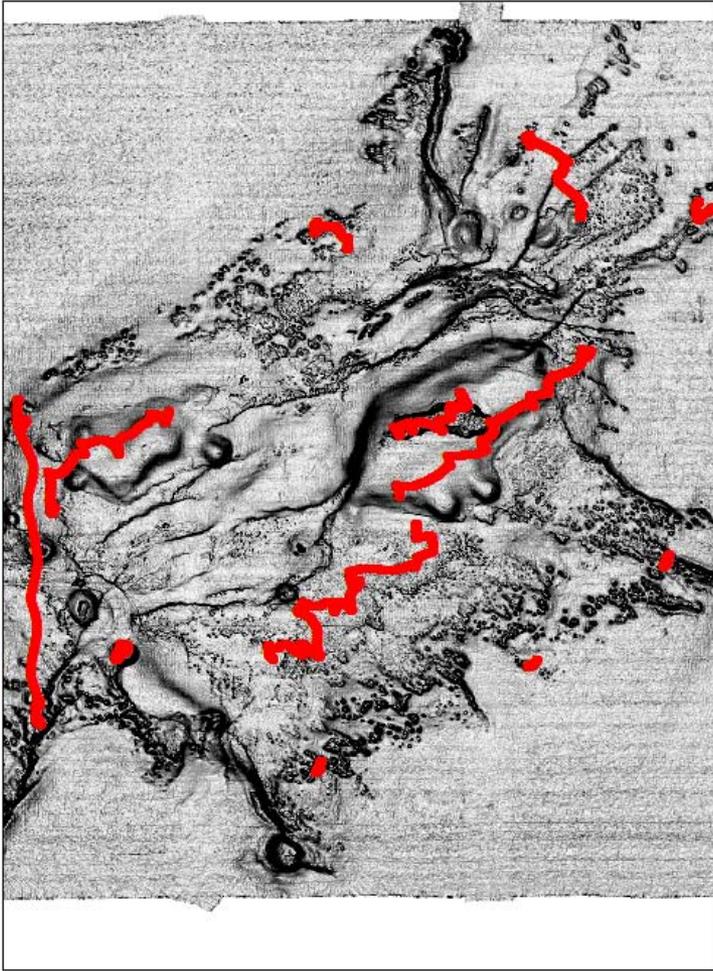
Sampling-Habitat Map



2010 – Sampling Plan

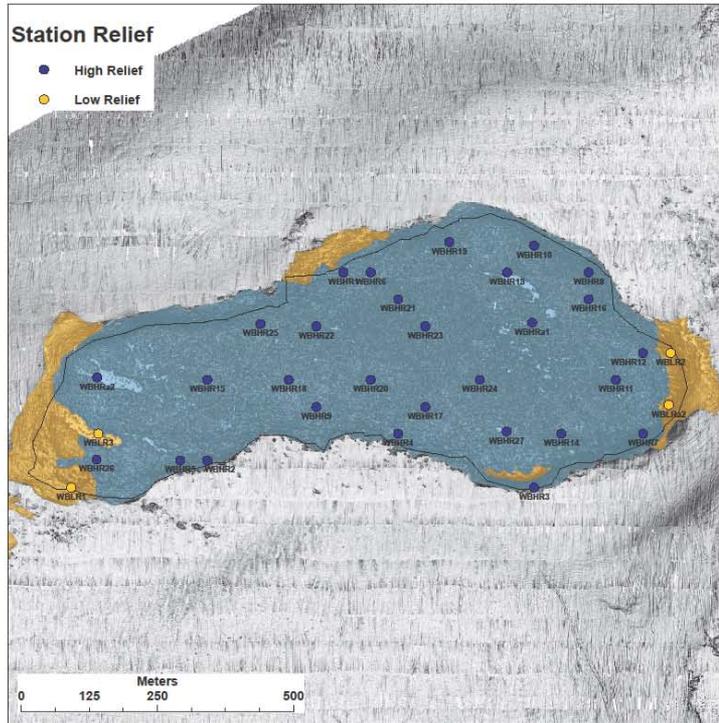


2010 – ROV



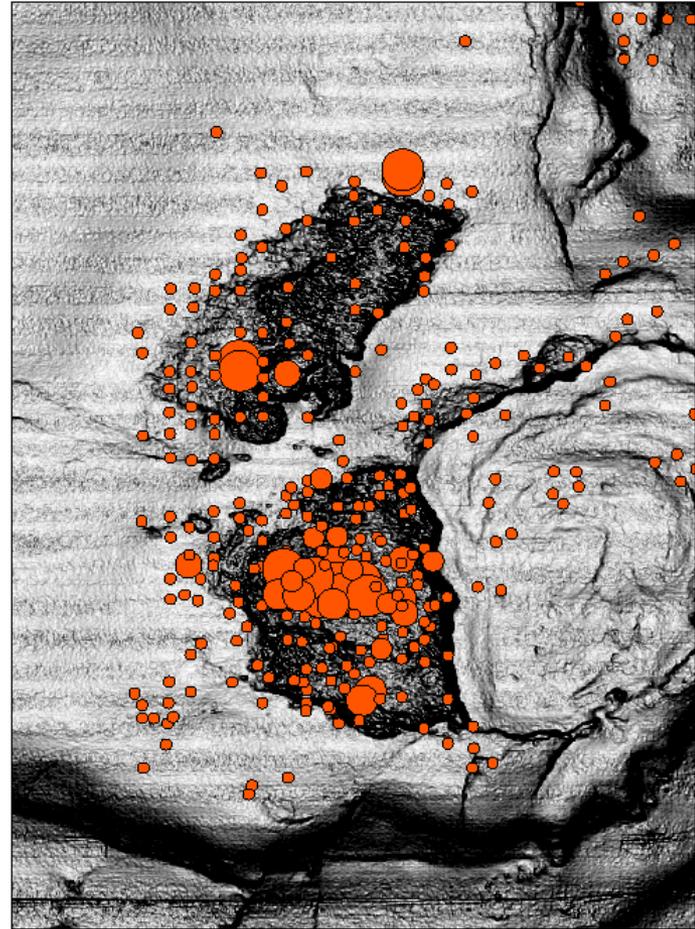
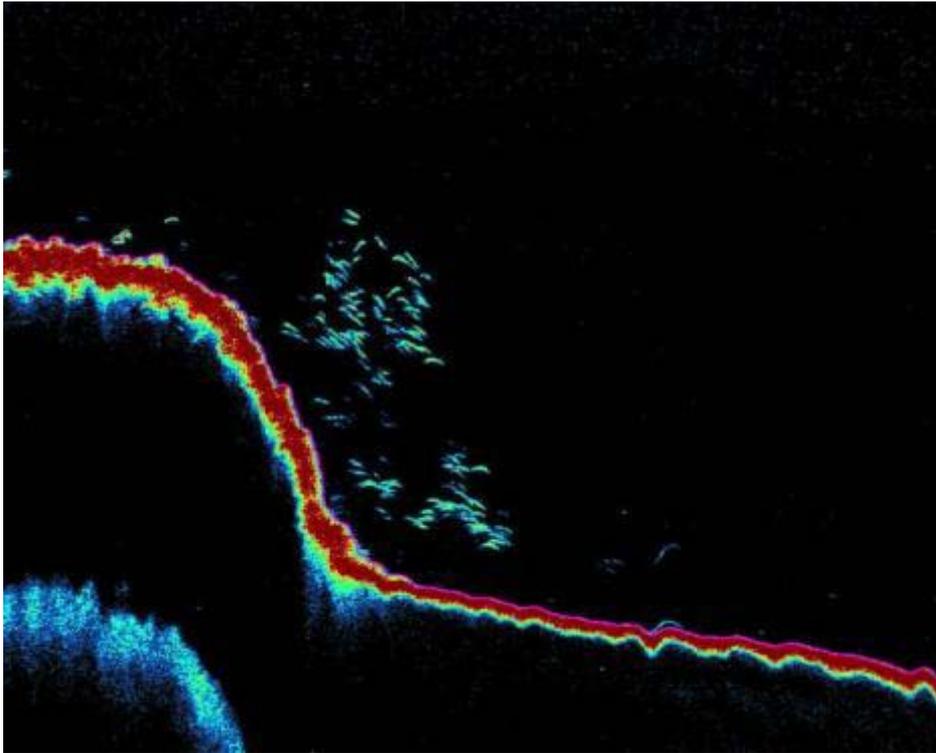
2010 – Shallow Coral Cap

FLOWER GARDEN BANKS NMS CORAL CAP DIVING CRUISE Sept 7-14, 2010



Strata	Sites Needed	Sites Available	8-Sep	9-Sep	10-Sep	11-Sep	12-Sep
West Bank Low Relief	3	5					
West Bank High Relief	27	29					
East Bank Low Relief	7	9					
East Bank High Relief	38	40					

2010 – Acoustic



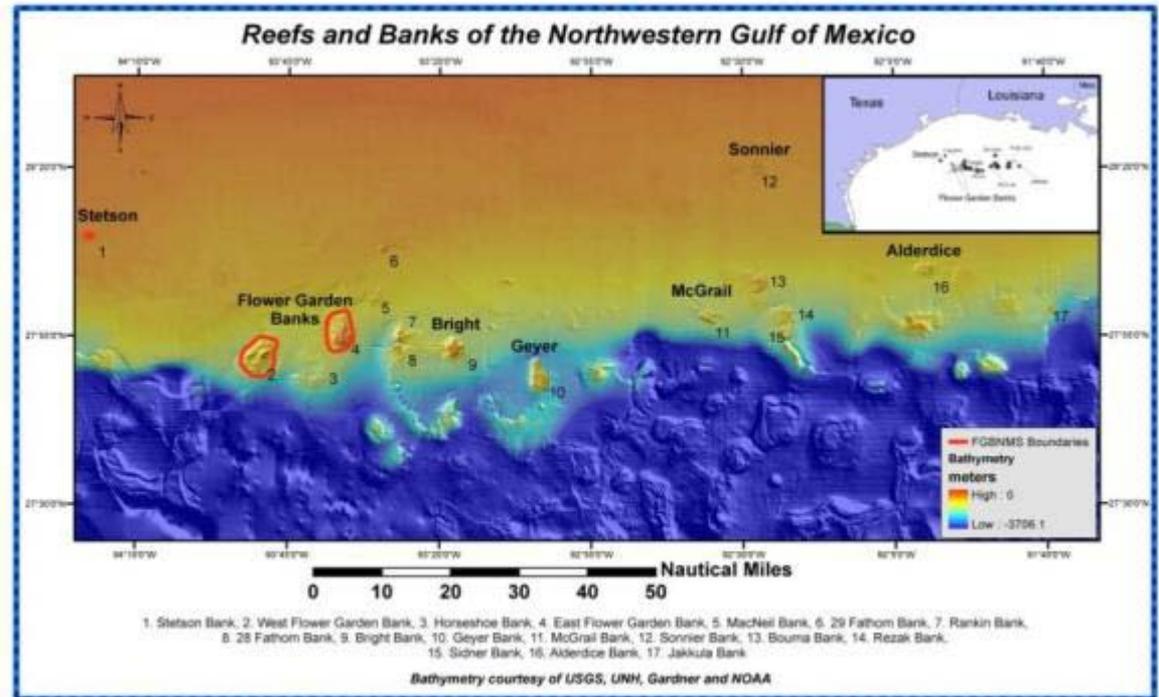
Next Steps

- ROV/Acoustic Cruise May 2011
- Shallow Coral Cap/Acoustic Cruise August 2011
- Deep Coral Cap/Acoustic Cruise September 2011
- Data Analysis



Challenges

- Fishing effort
- Enforcement
- Understanding recruitment & connectivity



Acknowledgments

- NOAA's National Center for Coastal Ocean Science
- Biogeography Branch & Center for Coastal Fisheries and Habitat
- Flower Garden Banks National Marine Sanctuary
- Crew of NOAA ship Nancy Foster & R/V Manta
- CIOERT



More Information

http://ccma.nos.noaa.gov/ecosystems/sanctuaries/fgb_nms

http://ccma.nos.noaa.gov/ecosystems/sanctuaries/fgb_closure.html

