

NOAA Ship Nancy Foster Deepwater Mapping and Biological Resource Assessment Cruise Debrief:

Seafloor Characterization and Biological Resource Inventory of the Buck Island Reef National Monument (BIRNM, St. Croix), and the US Virgin Islands National Coral Reef Monument (VINCRM, St. John/Thomas)

February 22 – March 3, 2004



A Collaboration Between

National Oceanic & Atmospheric Administration (NOAA)
US National Park Service (NPS)
Triton Elics International, Inc.
USVI Division of Fish & Wildlife

MISSION OBJECTIVES

MAPPING

To explore the type and extent of habitats in selected portions of both National Monuments (BIRNM, VINCRM) using multi-beam sonar and towed video cameras.

BIOLOGICAL RESOURCE INVENTORY

To conduct spatially-coincident fish trap surveys and visual censuses (e.g. visual observation by divers) of fish, conch, and lobsters to characterize the populations of these resources within and outside the National Monuments.

INTEGRATION

To produce maps of the seafloor topography, and spatially-explicit models of how fish species utilize habitats using data collected during the mission.

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US National Park Service (NPS)
USVI Division of Fish & Wildlife (USVI)
Triton Elics International, Inc. (TE)



Deepwater Reef Biological Assessment Activities

Objectives



To conduct fish trap surveys and visual censuses (e.g. visual observation by divers) of fish, conch, and lobsters along deepwater reef sites that were being mapped to characterize the populations of these resources inside and outside of the US National Park Service Monuments.

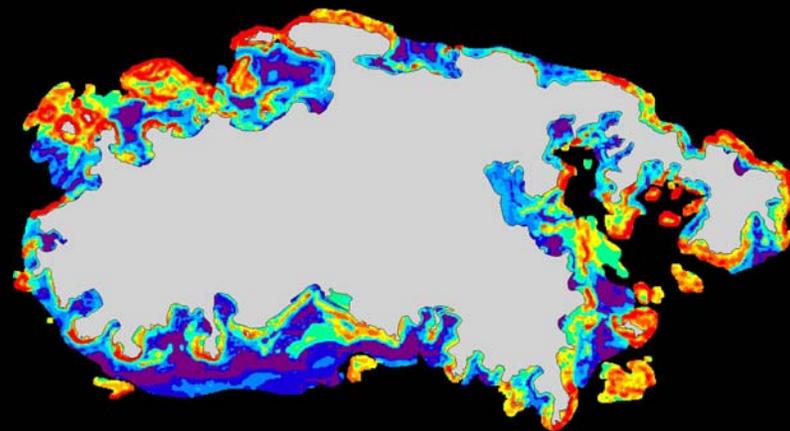


Fish Trapping Activities

- Size
- Weight
- Community Structure
 - Species Richness
 - Diversity
 - Rarity

SCUBA Activities

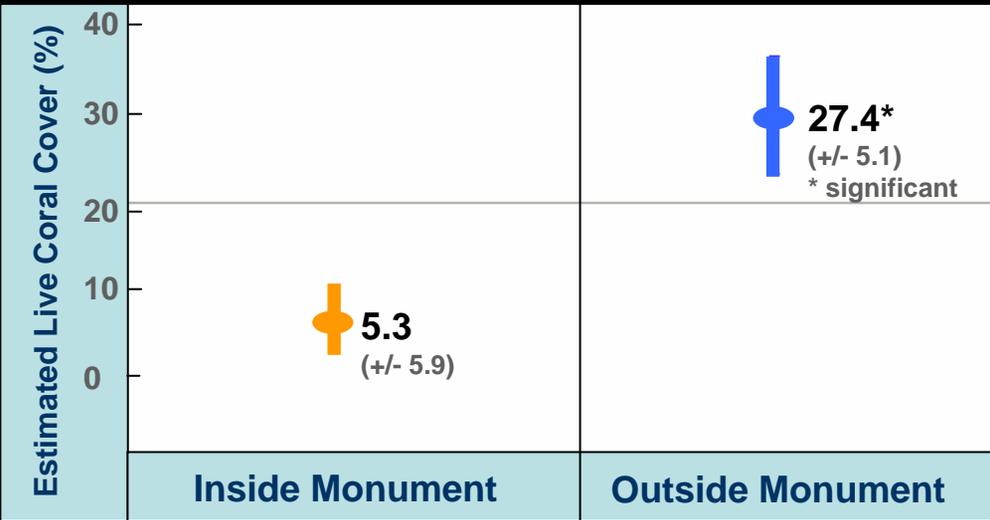
- Transects (Number & Size of all Taxa)
- Point Counts (Number & Size of all Taxa)
- Habitat Assessment
 - Habitat Type
 - Depth
 - Complexity (Rugosity)
 - Abiotic Footprint
 - Biotic Footprint



Example Integrated Model
 Spatially-articulated
 Estimate of Biological
 Diversity (Christensen, 2003)

Deepwater Biological Assessment Activities

Preliminary Results: Benthic Habitats

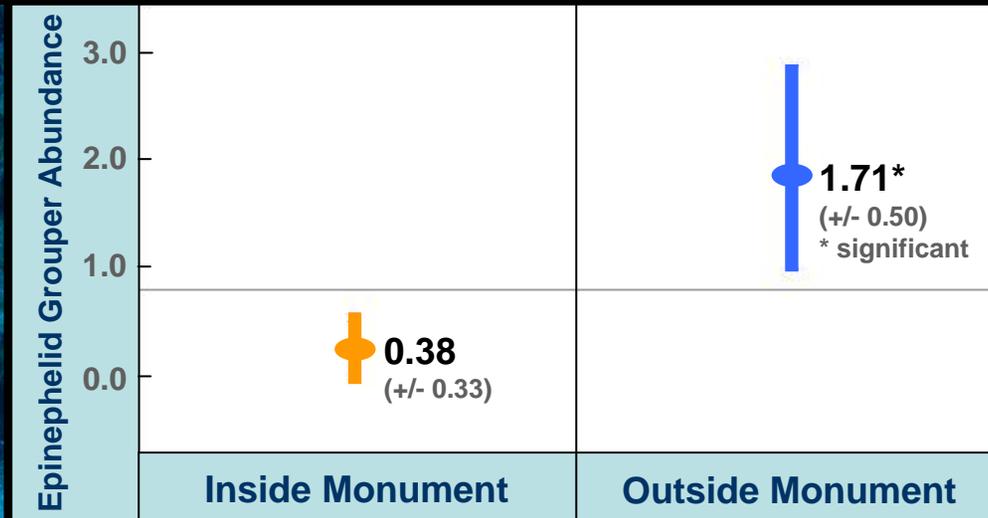


Further Habitat Data Analyses Indicating Significant Differences Among Sites Inside and Outside of the NPS Monument (Alpha = 0.05)

- Rugosity (Measure of Complexity): Higher Outside
- Percent Hardbottom: Higher Outside
- Percent Gorgonian Coverage: Higher Outside
- Percent Algal Turf Coverage: Higher Inside

Deepwater Biological Assessment Activities

Preliminary Results: Reef Fish Trapping Study



Summary Statistics for 24 Trap Sites in St. John

17 Species

43 Individuals

Size Class Distribution:

<15 cm: 21.9%

15-25 cm: 70.8%

25-35 cm: 6.6%

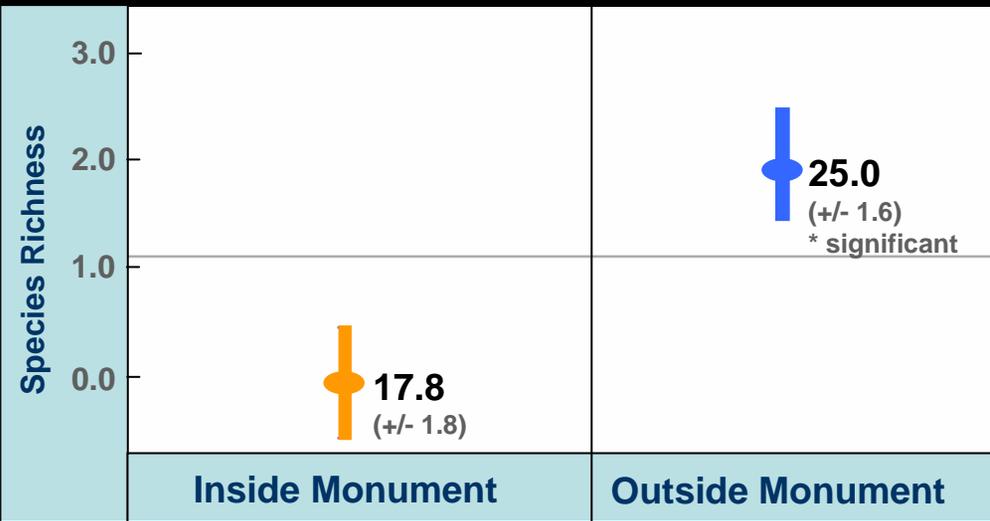
35+ cm: 0.7%

Trap Data Analyses Indicating **No** Significant Difference Among Sites Inside and Outside of the NPS Monument

- Number of Fishes Caught
- Weight of Fishes
- Number of Snappers & Grunts
- Weight of Snappers & Grunts
- Size of Groupers
- Weight of Groupers

Deepwater Biological Assessment Activities

Preliminary Results: Reef Fish Census



Summary Statistics for 28 Dive Sites in St. John

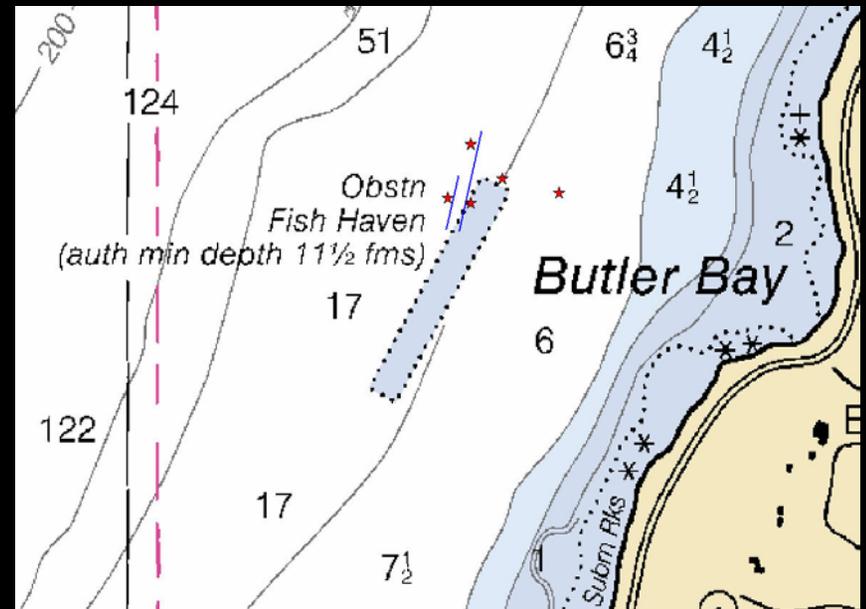
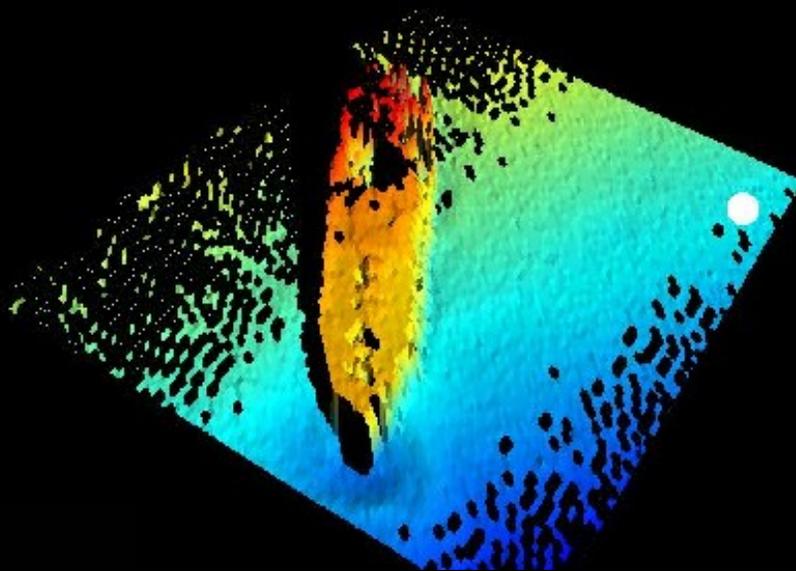
- 128 Species
- 8,274 Individuals
- Size Class Distribution:
 - <5 cm: 71.8%
 - 05-10 cm: 11.1%
 - 10-15 cm: 5.9%
 - 15-20 cm: 6.4%
 - 20-25 cm: 3.9%
 - 25-30 cm: 0.6%
 - 30-35 cm: 0.2%
 - 35+ cm: 0.1%

Further Census Data Analyses Indicating Significant Differences Among Sites Inside and Outside of the NPS Monument (Alpha = 0.05)

- Total Number of Individuals: **Higher Outside**
- Snapper/Grunt/Grouper size Class Distribution: **Larger Fish Outside**

Mission Mapping Activities

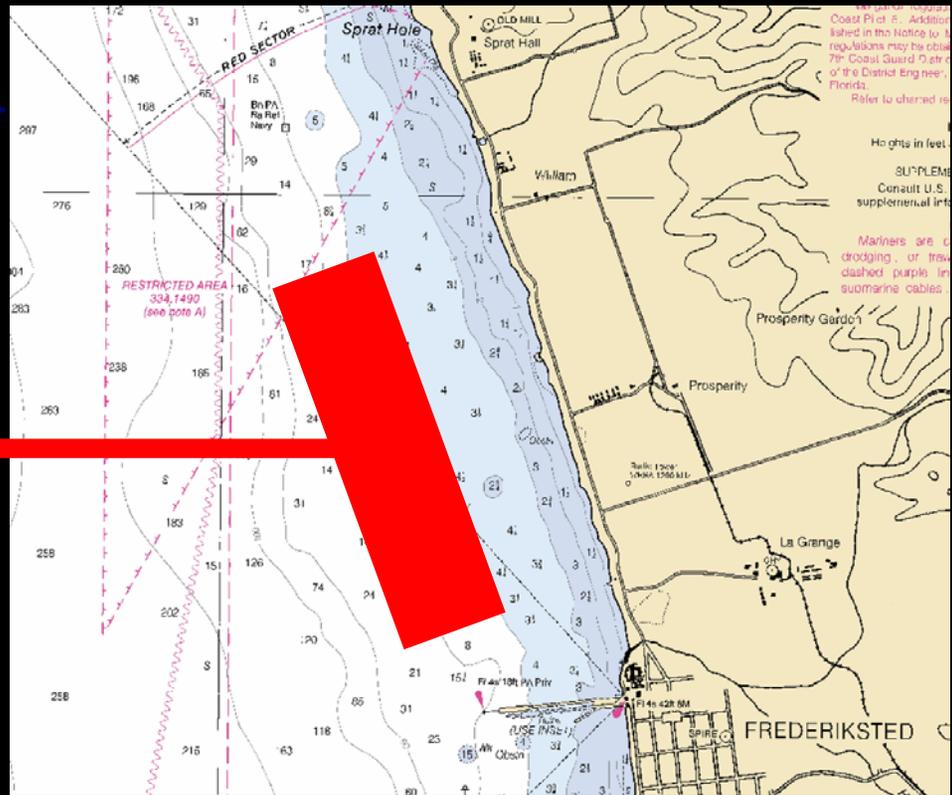
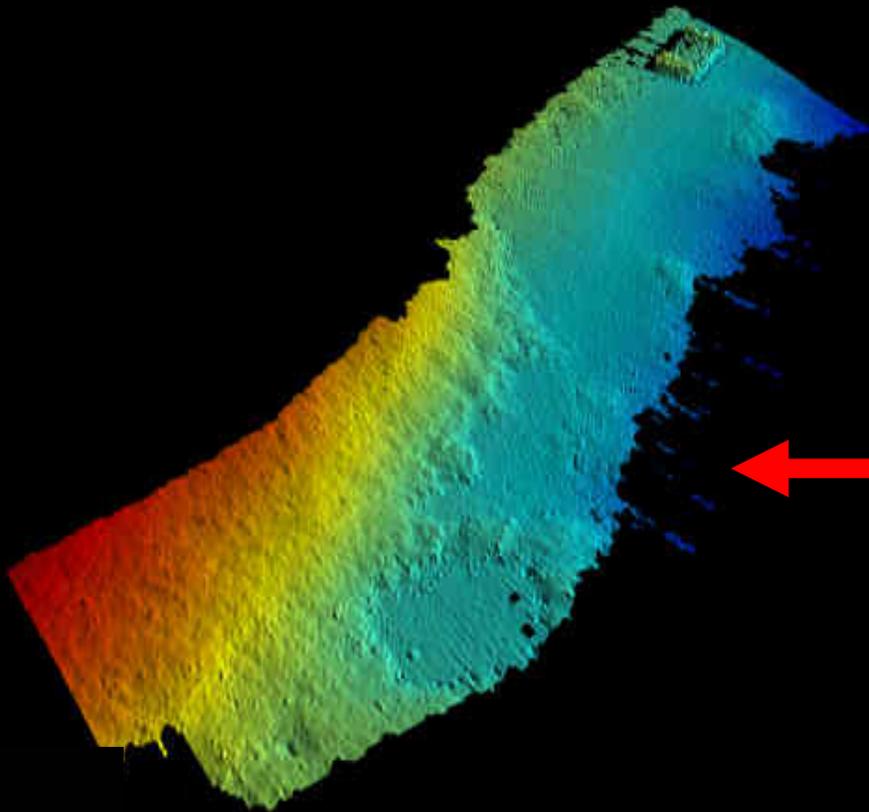
Preliminary Results



“Patch Test” (St. Croix, West)

Mission Mapping Activities

Preliminary Results

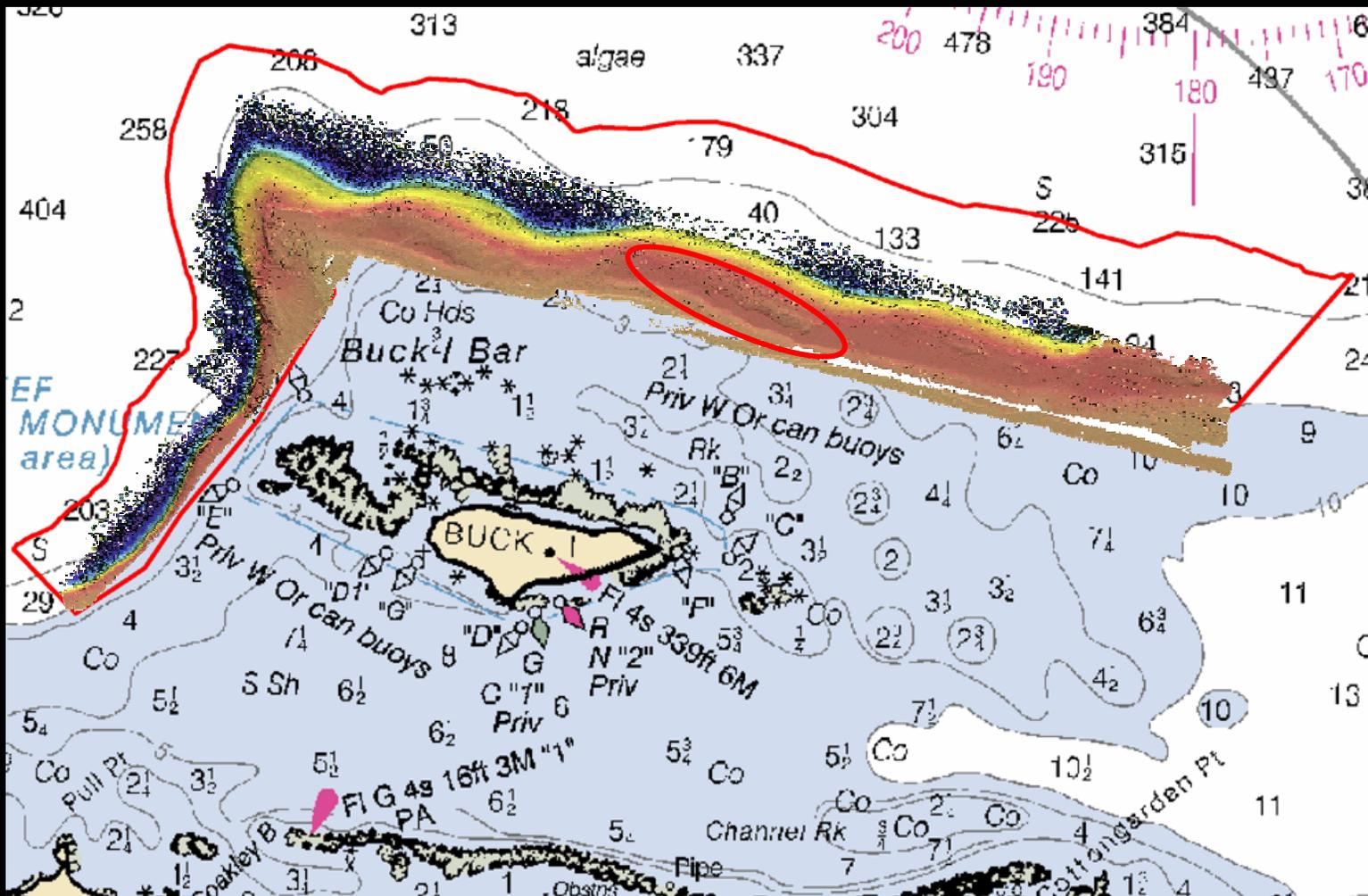


US Virgin Islands Division of Fish & Wildlife “Target of Opportunity” (St. Croix, West)

- 3.0 square nautical miles mapped (bathymetry, backscatter, and pseudo-sidescan)

Mission Mapping Activities

Preliminary Results

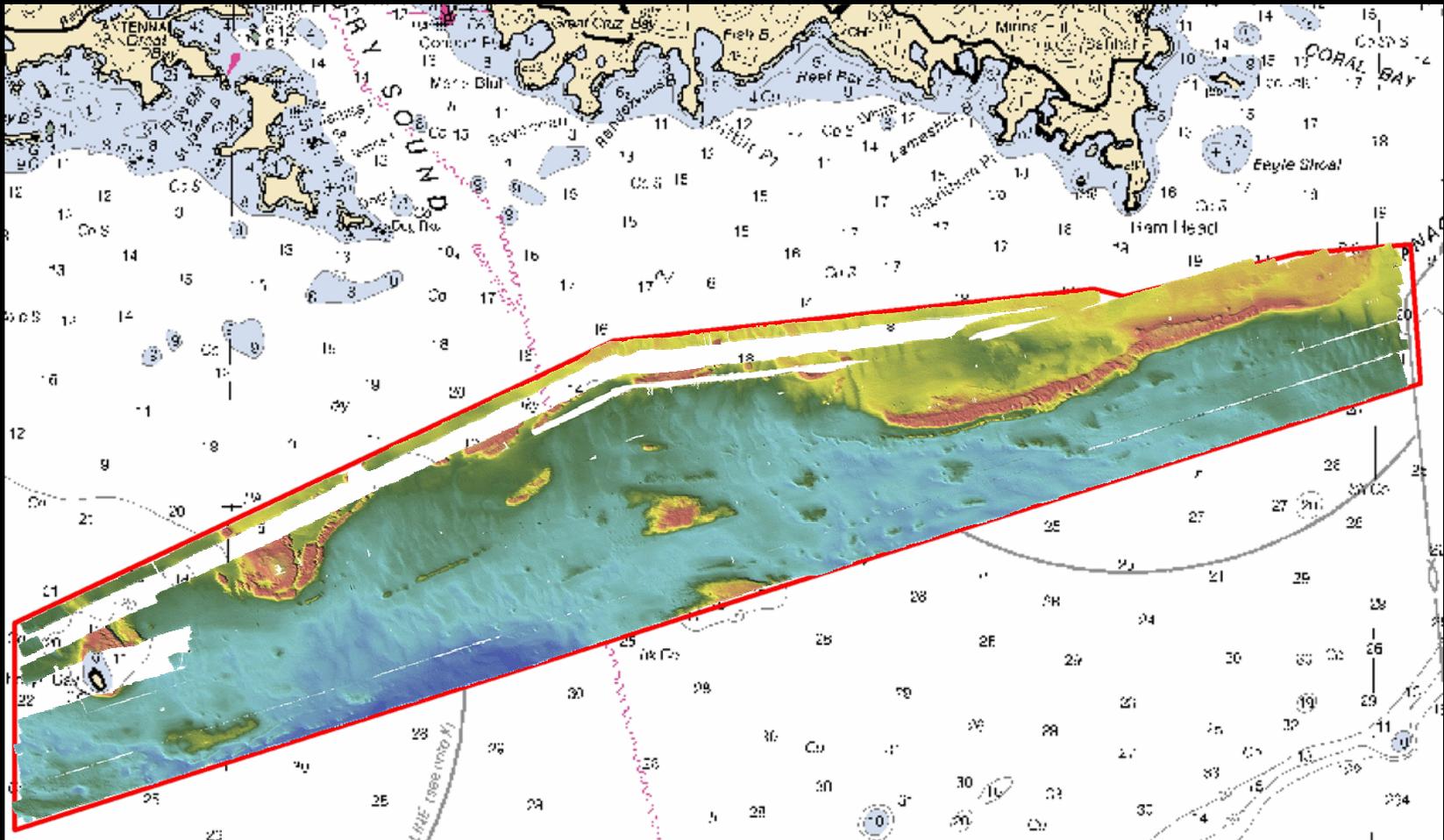


Buck Island Reef National Monument (BIRNM)

- 3.0 square nautical miles mapped (bathymetry, backscatter, and pseudo-sidescan)

Mission Mapping Activities

Preliminary Results

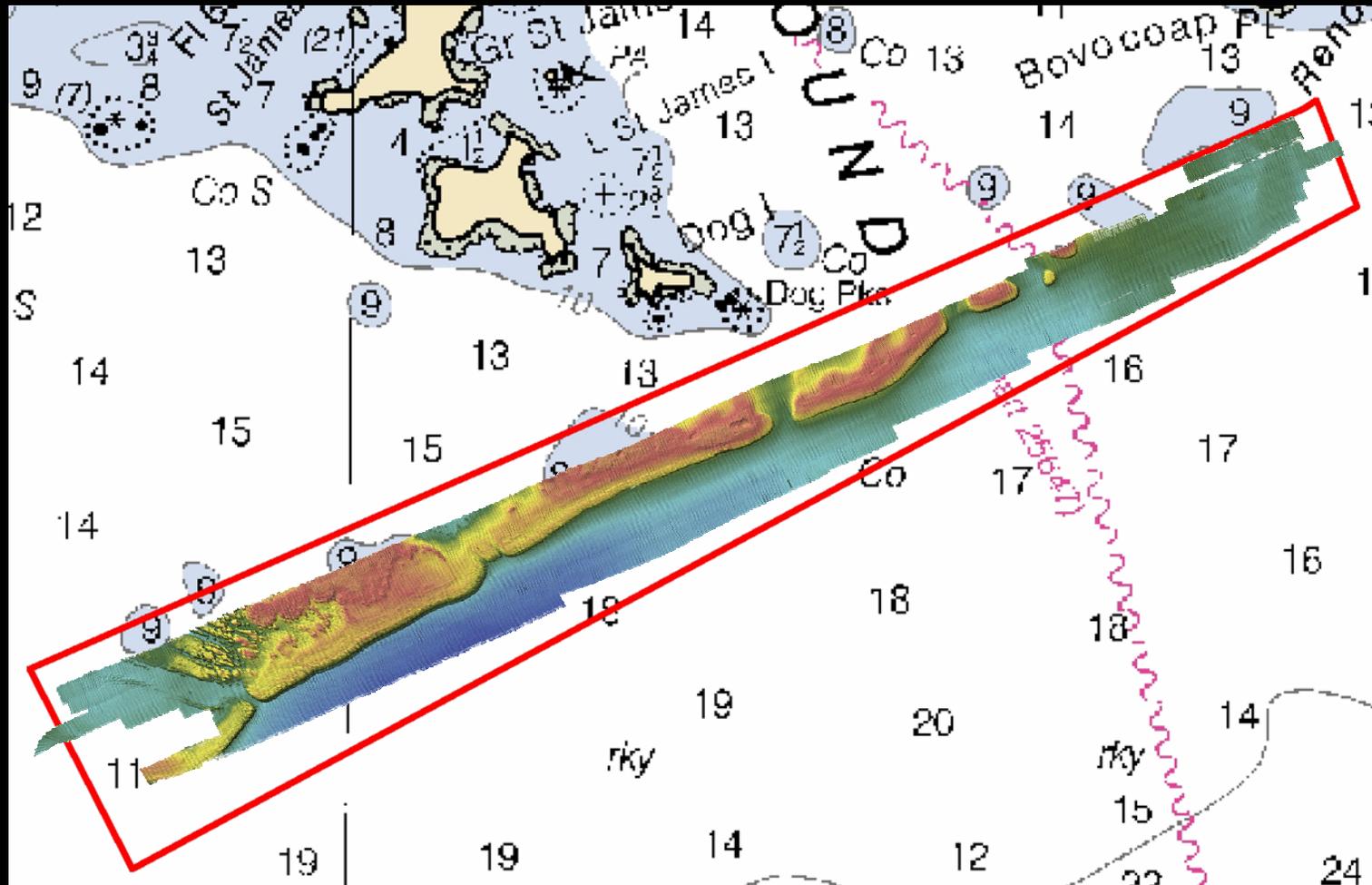


US Virgin Islands National Coral Reef Monument (VINCRM; Mid Shelf Reef "East")

- 34 square nautical miles mapped (bathymetry, backscatter, and pseudo-sidescan)

Mission Mapping Activities

Preliminary Results



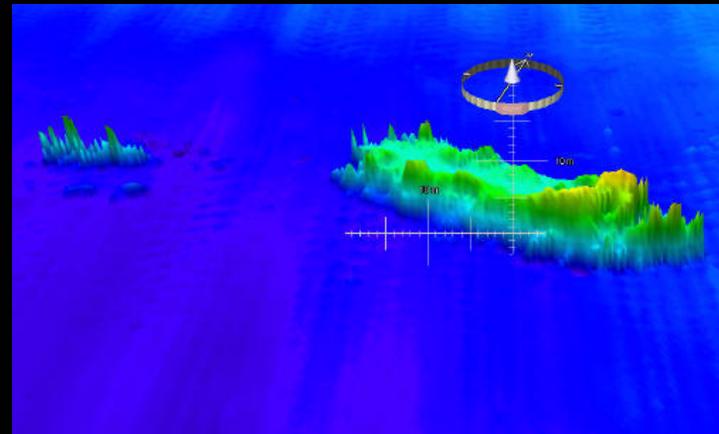
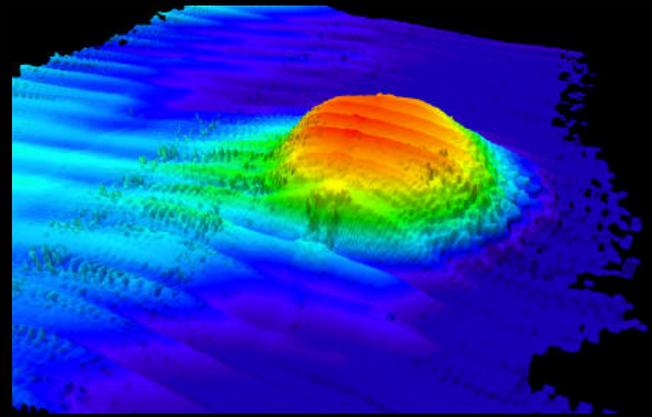
US Virgin Islands: “Mid Shelf Reef West” (Not Within National Monuments)

- 5.8 square nautical miles (bathymetry, backscatter, and pseudo-sidescan)

Deepwater Coral Mapping Activities

Summary

- Despite conducting a multi-purpose (i.e. survey and diving) mission, the NCCOS/OCS partnership cruise demonstrated that multiple objectives can be achieved. Based on the experiences of this cruise, NCCOS believes they can optimize scheduling even further to maximize data collection to support multiple efforts.
- Several Dangers to Navigation were identified that will be included in chart updates.
- A previously uncharted ship wreck south of St. John was surveyed.



Deepwater Coral Mapping Activities

Next Steps

- 1) NCCOS will contract the post-process "cleaning" of the data. These will be provided to the Pacific Hydrographic Branch for QA/QC and smooth tide correction. PHB will return the data to NCCOS once the data have been certified to meet hydrographic standards. Estimated timeframe to completion: 2-3 months for each component.

- 2) NCCOS will continue to explore collaboration and partnerships so as characterize biologically-based seafloor habitats from the combination of bathymetry, backscatter, and pseudo-sidescan. Estimated timeframe to completion: 6-8 months for preliminary products.

- 3) Begin pre-mission planning for USVI surveying Year 2: Identify AOI's; pursue funding; pursue appropriate complement of personnel, platform, and survey systems; integrate results of Steps 1 and 2. Estimated timeframe to begin planning: 6-8 months for preliminary products.

