NOAA CIOERT Report

Report Title: Characterization of Mesophotic Coral/Sponge Ecosystem Habitats in the Region of the Tortugas Ecological Reserves from ROV Dives during 2013 and 2014 R/V *Walton Smith* Cruises

R/V *Walton Smith*
UNCW *Super Phantom* ROV
FGNMS *Mohawk* ROV

Project Grant: NOAA Center for Sponsored Coastal Ocean Research- NA11NOS4780045
Project Title: Connectivity of the Pulley Ridge - South Florida Coral Reef Ecosystem

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December 15, 2016

This report resulted from our ROV surveys to characterize the mesophotic coral reef ecosystems at Pulley Ridge and Tortugas as part of a research grant funded by the National Oceanic and Atmospheric Administration (NOAA) Center for Sponsored Coastal Ocean Research under an award NA11NOS4780045 to the University of Miami (Project Title: "Connectivity of the Pulley Ridge - South Florida Coral Reef Ecosystem"). The ROV cruise data were collected, analyzed, and written by the following: CIOERT at HBOI/Florida Atlantic University- John Reed (Principal Investigator), Stephanie Farrington (research assistant), Dennis Hanisak (Lead and Project Manager); and National Marine Fisheries Service/Southeast Fisheries Science Center (NMFS/SEFSC)- Andy David, Stacey Harter. The University of Miami ship R/V *Walton Smith* was used along with the UNCW *Super Phantom* ROV and FGNMS *Mohawk* ROV The cruises were in collaboration with the University of Miami, HBOI-CIOERT, NOAA Fisheries, and the University of North Carolina at Wilmington (UNCW), Undersea Vehicles Program.

This report summarizes only the data that were collected within 24 1-km^2 random Blocks in the region of the Tortugas Ecological Reserves (TERs) during our cruises in 2013 and 2014. A total of 12 Blocks contained hard-bottom, mesophotic coral/sponge ecosystem habitat; 12 Blocks were entirely soft-bottom sediment. This Cruise Report provides detailed SEADESC (Southeastern United States Deep-Sea Corals) characterization of the benthic habitat and benthic macrobiota for each dive site.

ACKNOWLEDGEMENTS

We thank the NOAA Cooperative Institute for Ocean Exploration, Research, and Technology (CIOERT) at Harbor Branch Oceanographic Institute, Florida Atlantic University (HBOI-FAU), and the Robertson Coral Reef Research and Conservation Program at HBOI. The crew of University of Miami's ship R/V *Walton Smith* provided excellent support. The ROV pilots Lance Horn and Jason White of the *Mohawk* ROV (owned by the Flower Gardens National Marine Sanctuary, FGNMS) are especially thanked for their support and efforts which made this cruise success. This research was funded by the National Oceanic and Atmospheric Administration Center for Sponsored Coastal Ocean Research under award NA11NOS4780045 to the University of Miami (Project Title: "Understanding Coral Ecosystem Connectivity in the Gulf of Mexico – Pulley Ridge to the Florida Keys"). Ship and ROV time was funded in part by CIOERT at HBOI-FAU. This is Harbor Branch Oceanographic Institute Technical Report Number xxx.

RESULTS

Two cruises were dedicated in part to characterize and document the benthic habitat, macrobiota and fish in the region of the Tortugas Ecological Reserves (TERs). A total of 24 1-km^2 random blocks were surveyed; 12 were entirely on soft bottom and 12 contained hard-bottom or mesophotic coral/sponge ecosystem habitat. Details of methods are provided in the individual cruise reports.

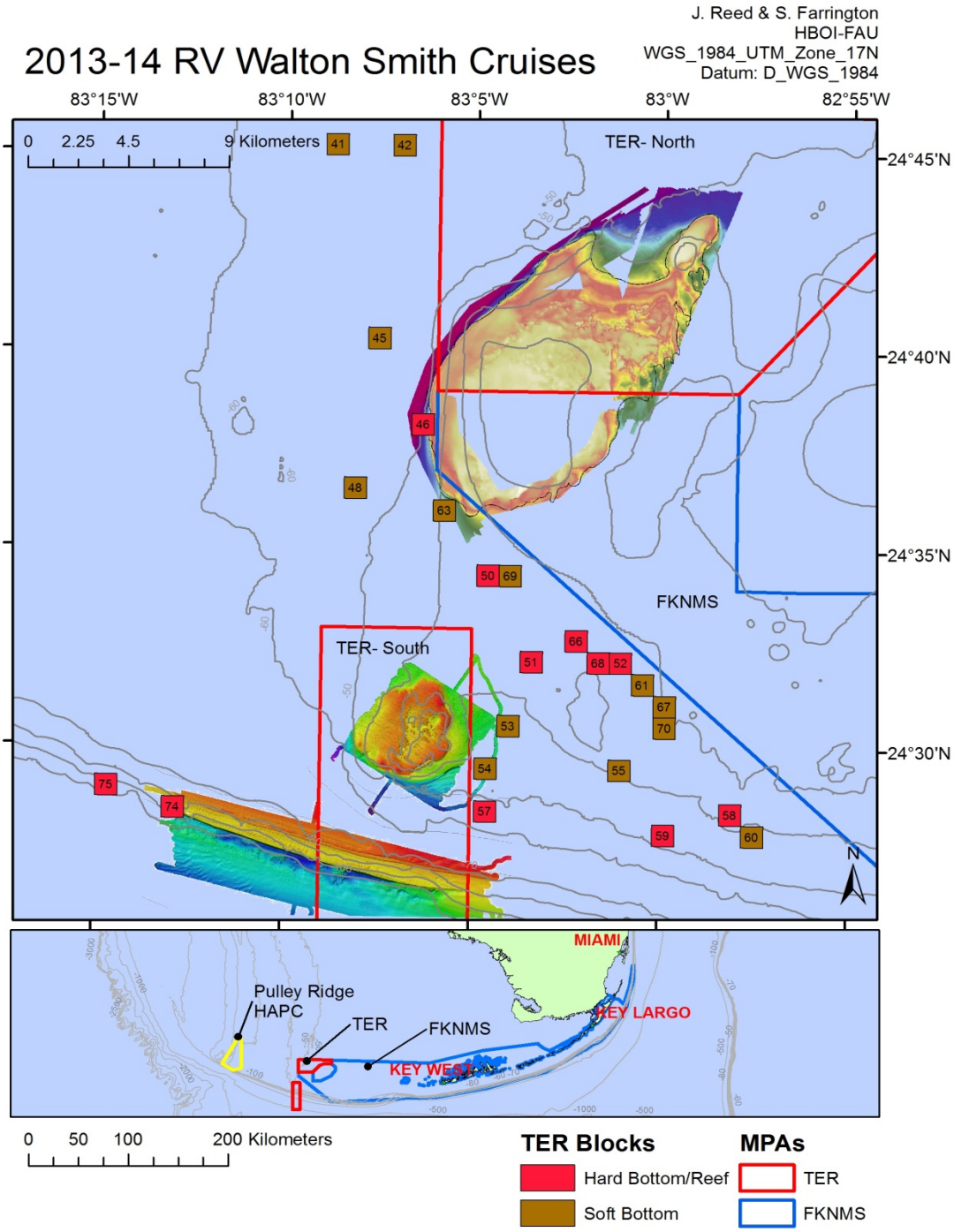


Figure 1. Random 1 km x 1 km blocks surveyed in the region of the Tortugas Ecological Reserves (TERs) during the 2013 and 2014 R/V *Walton Smith* cruises. The UNCW *Super Phantom* ROV was used in 2013 and the FGNMS *Mohawk* ROV was used in 2014. Tan blocks indicate soft-bottom habitat, red blocks contain hard-bottom, mesophotic reef habitat.

Table 2. ROV dives in 1-km^2 Blocks during 2013 and 2014 R/V *Walton Smith* cruises in the region of Tortugas Ecological Reserves (TERs). Bottom Habitat: soft bottom= mud/sand substrate; Reef, Miller's Ledge, North TER Ledge, and Hard Bottom= mesophotic coral/sponge reef habitat.

Dive Site Number	Type	Location	Block No.
ROV 13-16	Soft Bottom	Florida, West of N TER; Block 45, UNCW #2284, ROV 13-16	Block #045
ROV 13-17	Soft Bottom	Florida, West of N TER; Block 48, UNCW #2285, ROV 13-17	Block #048
ROV 13-18	Reef	Florida, West of N TER; Block 50, UNCW #2286, ROV 13-18	Block #050
ROV 13-19	Soft Bottom	Florida, West of N TER; NR-Block 1082, UNCW #2287, ROV 13-19	N/A
ROV 13-20	Soft Bottom	Florida, East of South TER; Block 54, UNCW #2288, ROV 13-20	Block #054
ROV 13-21	Soft Bottom	Florida, East of South TER; Block 57, UNCW #2289, ROV 13-21	Block #057
ROV 13-22	Hard Bottom	Florida, East of South TER; Block 59, UNCW #2290, ROV 13-22	Block #059
ROV 13-23	Hard Bottom (Block 058)	Florida, East of South TER; Block 60 & 58, UNCW #2291, ROV 13-23	Block #058, Block #060
ROV 13-24	Soft Bottom	Florida, West of North TER; Block 42, UNCW #2292, ROV 13-24	Block #042
ROV 13-25	Soft Bottom	Florida, West of North TER; Block 41, UNCW #2293, ROV 13-25	Block #041
ROV 13-26	Reef	Florida, East of South TER; Block 51, UNCW #2294, ROV 13-26	Block #051
ROV 13-27	Reef	Florida, East of South TER; Block 52, UNCW #2295, ROV 13-27	Block #052
ROV 13-28	Soft Bottom	Florida, East of South TER; Block 53, UNCW #2296, ROV 13-28	Block #053
ROV 13-29	Hard Bottom	Florida, East of South TER, Block 55, UNCW #2297, ROV 13-29	Block #057
ROV 13-30	Soft Bottom	Florida, East of South TER, Block 58, UNCW #2298, ROV 13-30	Block #058
ROV 14-17	Miller's Ledge	Tortugas, Miller's Ledge, Block 75; ROV 14-17, UNCW #96	Block #075
ROV 14-18	Miller's Ledge	Tortugas, Miller's Ledge, Block 74; ROV 14-18, UNCW #97	Block #074
ROV 14-19	Reef	Tortugas, Reef; Block 66 & 68; ROV 14-19, UNCW #98	Block #066, Block #068
ROV 14-20	Reef	Tortugas, Reef; Block 61; ROV 14-20, UNCW #99	Block #061
ROV 14-21	Soft Bottom	Tortugas, Soft Bottom; Block 69; ROV 14-21, UNCW #100	Block #069
ROV 14-22	Soft Bottom	Tortugas, Soft Bottom; Block 63; ROV 14-22, UNCW #101	Block #063
ROV 14-23	North TER Ledge	Tortugas, Reef, West of FKNMS. Block 46; ROV 14-23, UNCW #102	Block #046
ROV 14-24	Soft Bottom	Tortugas, Soft Bottom; Blocks 67 and 70; ROV 14-24, UNCW #103	Block #067, Block #070

Appendix 1 provides a SEADESC Report for each Block and ROV dive. This provides the following data for each dive site: cruise and ROV dive metadata, Dive Site number, Block number, figures showing each ROV dive track and habitat zones overlaid on multibeam sonar maps, dive track data (start and end latitude, longitude, depth), objectives, CTD plots, general description of the habitat and biota, images of the biota and habitat that characterize the dive site, and analyses of the photographic transects. Hard-bottom sites are listed in Table 2, and Appendix 1 is sorted by Dive Site number.

All sites are located outside the boundaries of the TERs and the Florida Keys National Marine Sanctuary (FKNMS). Of the hard-bottom, mesophotic reef sites, two dives are located along the Miller's Ridge (Blocks 74,75) and just west of the TER south. These blocks consist of hard bottom, rock escarpment, boulders and rubble. Block 46 lies on the western slope of the Tortugas but also outside of the FKNMS. This is an extensive linear, barrier-type reef that consists of numerous corals, gorgonians, sponges, and fish. The remaining mesophotic reef sites are primarily patch reefs at mesophotic depths and also west of the FKNMS boundaries. At one site we documented a large spawning aggregation of snapper and several huge goliath grouper.

CONCLUSIONS

This cruise and research has resulted in a rich set of new data discovering and characterizing the benthic communities and fish populations at mesophotic reef sites in the region of the Tortugas Ecological Reserves (TERs). These sites are located outside the protection of either the TERs or the Florida Keys National Marine Sanctuary (FKNMS). We have provided these data to the FKNMS managers for consideration is extending the boundaries to protect these areas.

APPENDIX 1

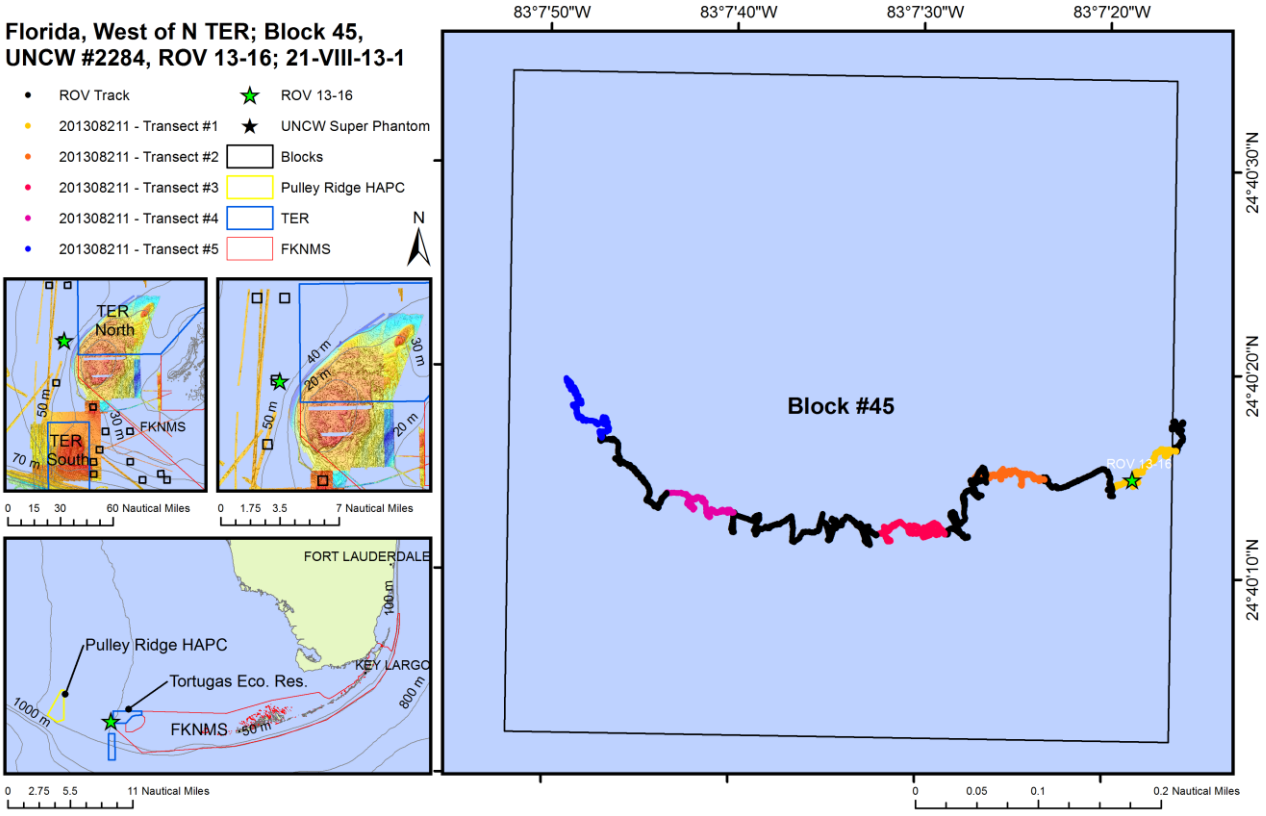
SEADESC REPORT
Characterizations and Analyses of Habitat and Benthic Biota of Deep-water Sites off the Tortugas

Provides the following data for each ROV dive site during the 2013 and 2014 cruises with the University of Miami ship *Walton Smith*, UNCW *Super Phantom* ROV, and FGNMS *Mohawk* ROV:

- Cruise and ROV dive metadata, Dive Site number, Block number; and objectives
- figures showing each ROV dive track and habitat zones overlaid on multibeam sonar maps
- ROV dive track data (start and end coordinates, time, and depth)
- CTD plots from shipboard casts and temperature profiles for each ROV dive
- images characterizing the habitat and biota for each dive site
- characterization of habitat, benthic biota, and fish populations for each dive site
- quantitative analyses of photo transects for each dive site including CPCe 4.1© Coral Point Count analysis of percent cover of benthic biota and substrate types

Dive Site: Florida, West of N TER; Block 45, UNCW #2284, ROV 13-16

General Location and Dive Track:



Site Overview:

Project:	University of Miami Pulley Ridge
Principal Investator:	Dennis Hanisak
PI Contact Info:	5600 U.S. 1, North, Fort Pierce, FL 34946
Website:	http://oceanexplorer.noaa.gov/explorations/13pulleyridge/welcome.html
Scientific Observers:	Dennis Hanisak, Glenn Taylor, Jason White, John Reed, Lance Horne, Stacy Harter, Stephanie Farrington
Data Management:	Access Database
ROV Navigation Data:	Trackpoint II
Ship Position System:	
Report Analyst:	
Date Compiled:	12/15/2016

Dive Overview:

Vessel:	R/V F.G. Walton Smith; Cruise #: WS -13-12
Sonar Data:	None Available
Purpose:	
ROV:	UNCW Super Phantom
ROV Sensors:	No Sensors Used
Date of Dive:	8/21/2013
Specimens:	
Digital Photos:	168
DVD:	3
Hard Drive:	1

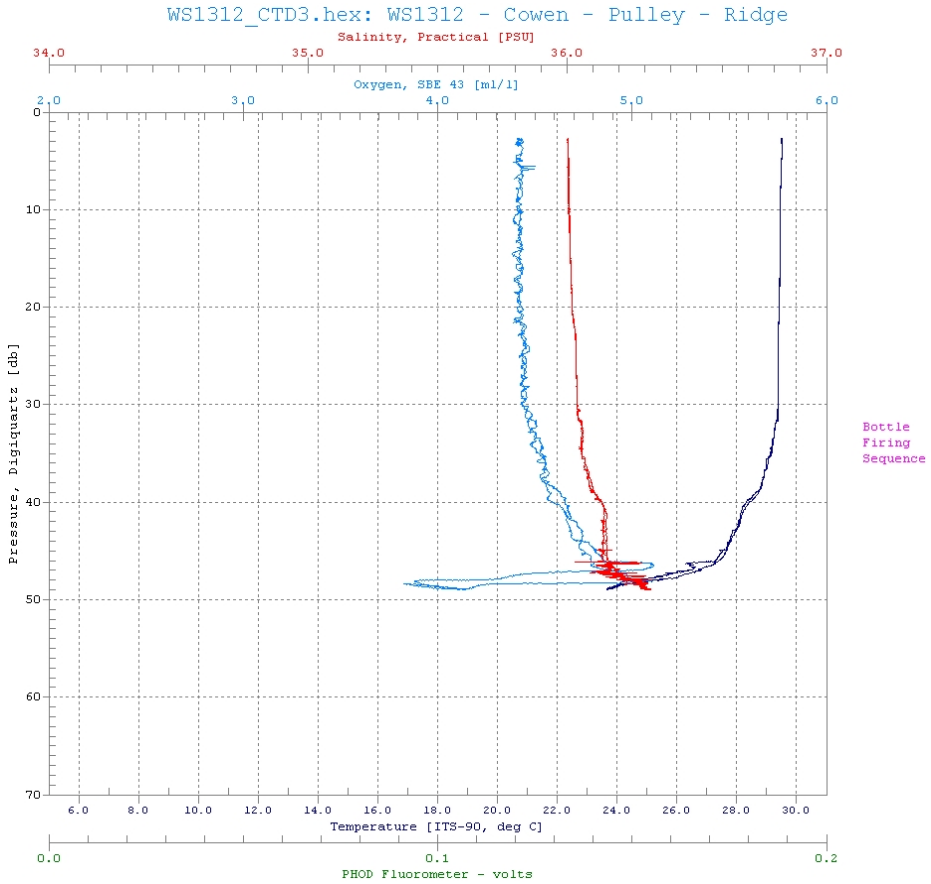
Dive Site: Florida, West of N TER; Block 45, UNCW #2284, ROV 13-16

Dive Data:

Minimum Bottom Depth (m):	55	**Total Transect Length (km):**	1.690				
Maximum Bottom Depth (m):	57	**Surface Current (kn):**	0.6				
On Bottom (Time- GMT):	8:51	**On Bottom (Lat/Long):**	24.67°N; -83.12°W				
Off Bottom (Time- GMT):	11:02	**Off Bottom (Lat/Long):**	24.67°N; -83.13°W				
Physical (bottom); Temp (°C):		**Salinity:**	**Visibility (ft):**	10	**Current (kn):**	0.25	

Physical Environment:

Distace from Dive site (km): 12.15



Shipboard CTD casts were made with the Sea-Bird 19. The ranges of the water column data recorded during CTD #3 are as follows: Depth Maximum: 48.6 m, Temperature: 23.7-29.5 °C, Conductivity: 53420-59304 (µS/cm), Pressure: 4-71 (PSI), Salinity: 36-36.3 (PSU), Sound Velocity: 1533.4-1545.9 (m/s), Oxygen Saturation: - (ml/l), Density: 1022.7-1025 (Kg/m³), Nitrogen Saturation: 8.2-8.9.

Dive Site: Florida, West of N TER; Block 45, UNCW #2284, ROV 13-16

Dive Imagery:

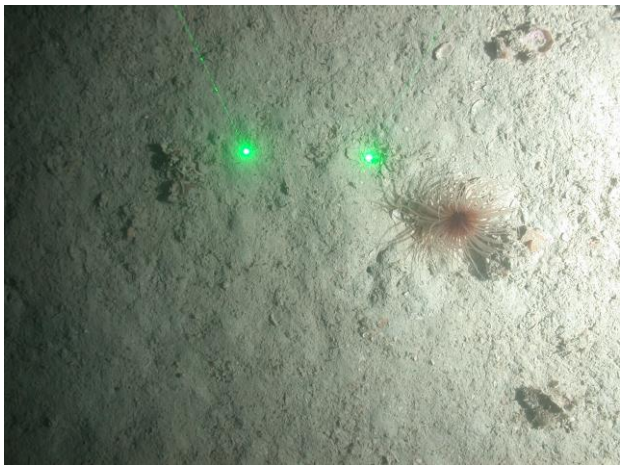


Figure 1: -56.2 m
Cerianthid on soft bottom

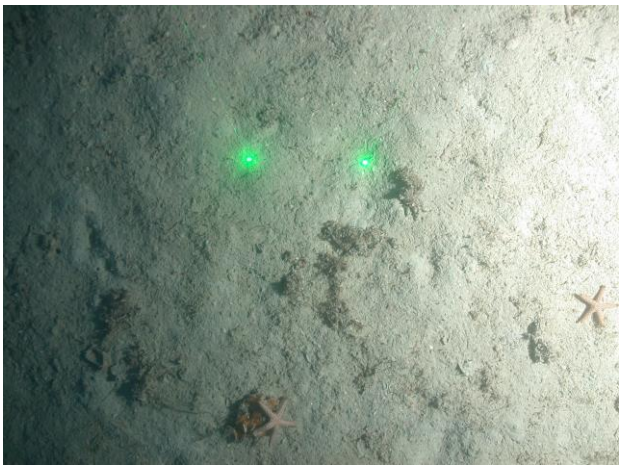


Figure 2: -56 m
Sea stars on soft bottom

Dive Site: Florida, West of N TER; Block 45, UNCW #2284, ROV 13-16

Dive Notes:

Objectives, Site Description, Habitat, Fauna:

Site/Objectives:
ROV 13-16, Site #- 21-VIII-13-1. Target Site -Florida, West of N TER, Block 45; UNCW #2284; Ground truth: NOAA Regional Bathymetric Chart: NOAA_Tortugas_Bank.TIF.

ROV Setup/Dive Events:
Video time ESDT. Dive Notes depth were recorded as total depth (ROV altitude + ROV depth in meters). COG is ROV heading. Events, habitat and fauna were recorded directly into Access database. Fish data were recorded by Harter in separate Access database which was added to the Access habitat database. Quantitative photos were taken every 30 seconds with a fixed digital camera (Scorpio Plus) pointing 90° down with parallel 10 cm green lasers, 1.5 m off the bottom. Video camera (standard digital) was angled ~ 20° forward looking with pair of 10 cm red lasers; second set of 3 green lasers were not used. GoPro (black) high definition video camera (setting- 1080/30p) was attached video bar on ROV. Video 2 seconds slower than EDST.

Five 100-m random transects were made to characterize each randomly selected 1 km x 1 km block. Each 100 m transect was conducted at ~0.25 kn at an altitude of <1 m, for 15-20 minutes until the ROV passed through a 100-m circle overlaid on the navigation screen; quantitative still images were taken every ~20 sec. Off transects between the photo transects were 10-15 minutes. Heading of transects were determined by flip of coin, depending in part on ship's maneuverability due to wind/current.

Site Description/Habitat/Biota:
MB- Block 45 is west of N TER; the NOAA Bathy chart shows a 56 m bathy line indicating a depression in the center of Block 45.
Five transects were conducted in Block 45, starting at center of the eastern border. The five transects ranged from 57 to 57.5 m depth.

XS 1: HD SW; 100% soft bottom with 5-10% cover of rubble; some bioturbation. Start: 8:58:46 AM, 57 m; end: 9:12:16 AM, 57 m. Hydroids, cidaroids, Cerianthid anemones- common.
Off Transect: HD W for 10 min, soft bottom with 5-10% cover of rubble.
XS 2: HD W; 100% soft bottom with 5-10% cover of rubble and 5-10 cm cobble. Start: 9:22:27 AM, 57 m; end: 9:37:26 AM, 57.25 m. Same biota, barren.
Off Transect: HD SW 3/4 knot; one grouper pit with unid. Fish.
XS 3: HD W. Start: 9:51:28 AM, 57.25 m; end: 10:06:55 AM, 57.25 m; about halfway across the depression on the chart; the bottom has an increase in cobble bottom, but no evidence of depression in video, depth change was 0.25 m. 100% soft bottom, same species.
Off Transect: 1/3 way across the "groove" on the NOAA chart. HD W to cover as much of the center of the "groove" as possible.
XS 4: HD W. Start: 10:27:00 AM, 57.0 m; end: 10:37:15 AM, 57 m. 100% soft bottom; 1-20% patchy rubble/cobble; same species. Shooting every 20 seconds at 1.5 m off bottom at .25 kts
Off Transect: HD NW at .75 kts; west border of the "depression" on the chart; 57.2 m.
XS 5: HD NW start: 10:51:18 AM, 57 m; end: 11:02:42 AM, 57.5 m. West of depression in chart;100% soft bottom; ECH - Echinoidea: Cidaroidea; few 20 cm OR demosponges, may be Lissodendoryx/Forcepia. Shooting every 20 seconds at 1.5 m off bottom at .25 kts.

Dominant Benthic Biota:

Dive Site: Florida, West of N TER; Block 45, UNCW #2284, ROV 13-16

Cidaroidea
Demospongiae- Lissodendoryx/Forcepia
Hydroida

Dominant Fish: lizardfish- Synodus sp., flounder - Bothidae, puffer, lionfish- Pterois volitans (2)

Dive Site: Florida, West of N TER; Block 45, UNCW #2284, ROV 13-16

CPCe Percent Cover Analysis:

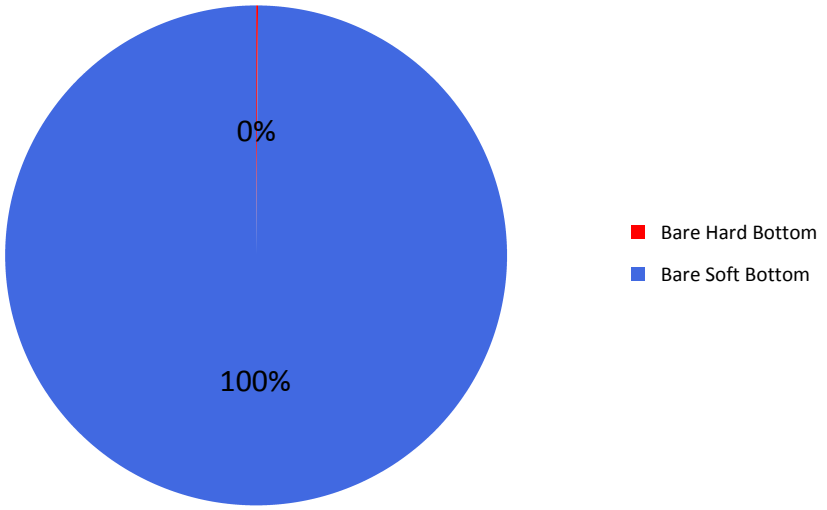


Figure 1. Percent cover of hard and soft bottom substrate at dive site 21-VIII-13-1. CPCe© points on organisms were scored as the underlying substrate (hard or soft).

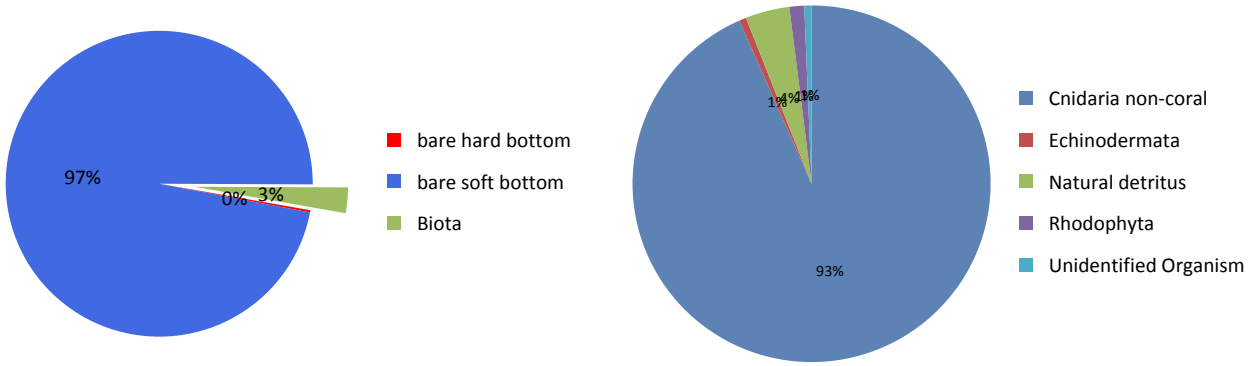


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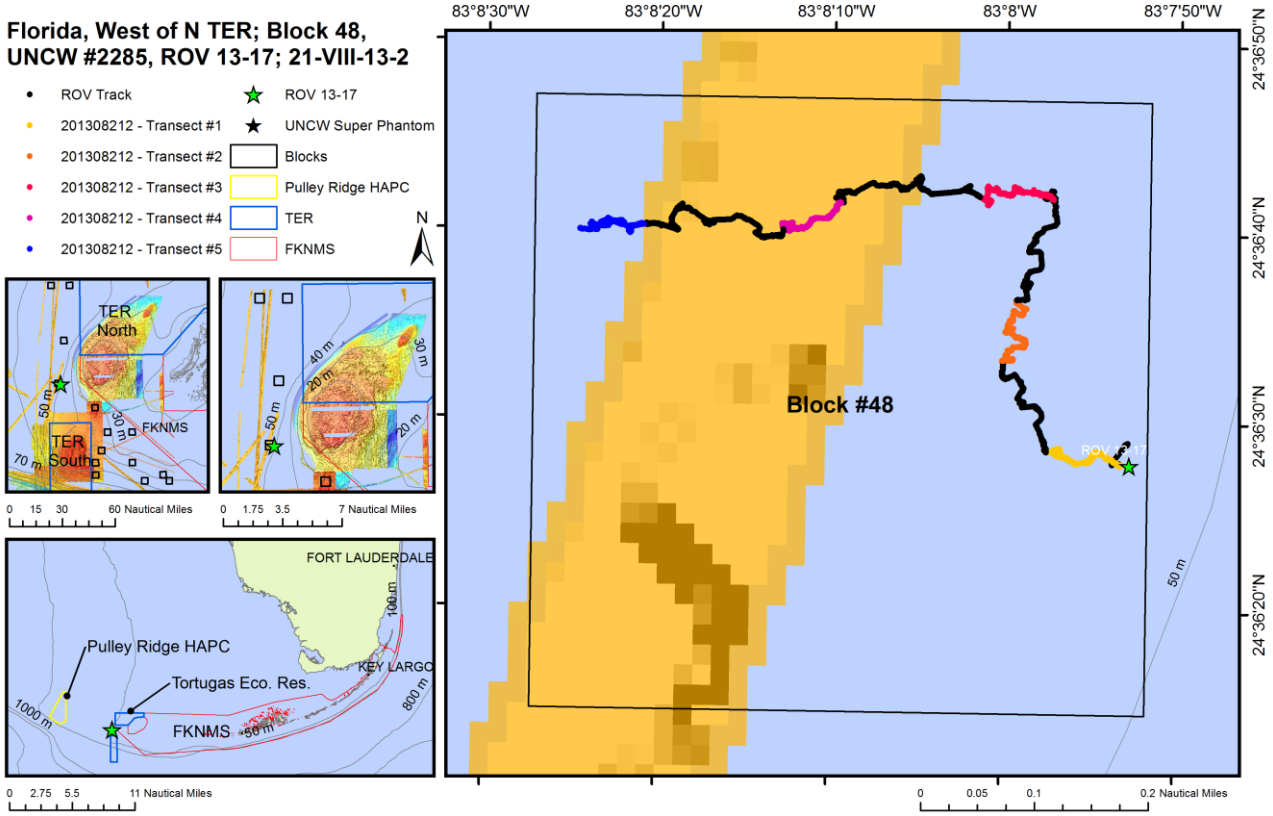
Figure 2. Percent cover of bare substrate and benthic macro-biota at dive site 21-VIII-13-1. A. CPCe percent cover of biota and bare substrate (hard or soft bottom). B. CPCe percent cover of biota and human debris.

Dive Site: Florida, West of N TER; Block 48, UNCW #2285, ROV 13-17

General Location and Dive Track:



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Data Management:	Access Database
ROV Navigation Data:	Trackpoint II
Ship Position System:	
Report Analyst:	
Date Compiled:	12/15/2016

Dive Overview:

Vessel:	R/V F.G. Walton Smith; Cruise #: WS -13-12
Sonar Data:	None Available
Purpose:	
ROV:	UNCW Super Phantom
ROV Sensors:	No Sensors Used
Date of Dive:	8/21/2013
Specimens:	
Digital Photos:	172
DVD:	2
Hard Drive:	1

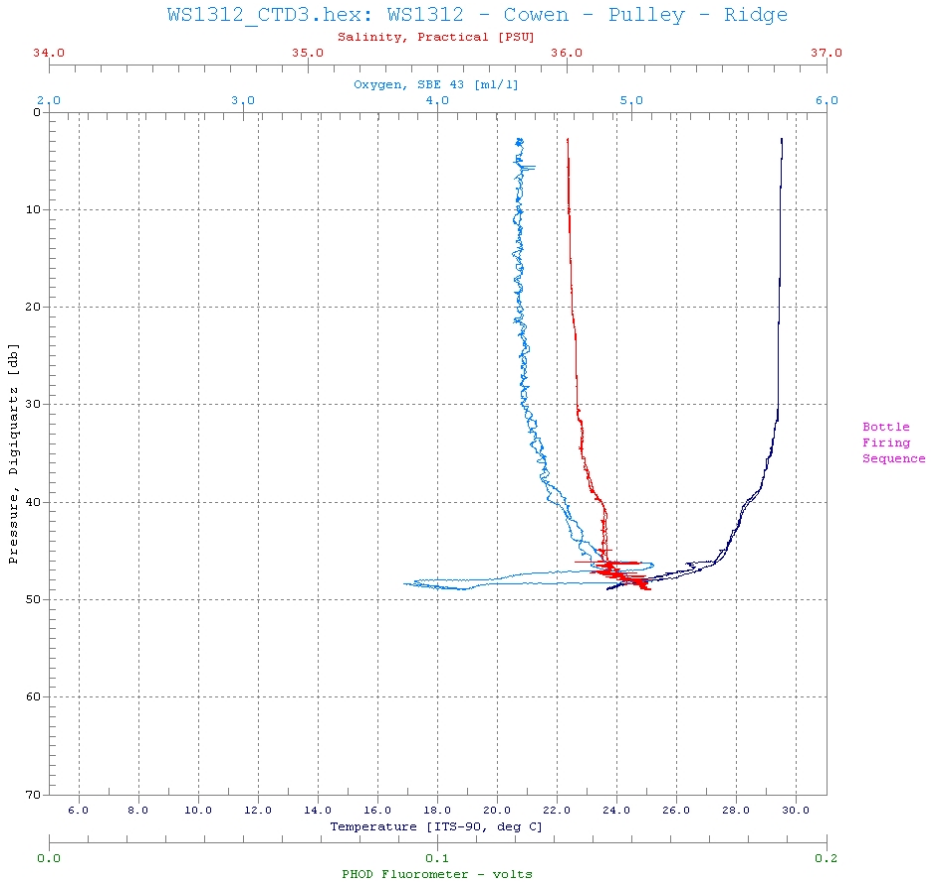
Dive Site: Florida, West of N TER; Block 48, UNCW #2285, ROV 13-17

Dive Data:

Minimum Bottom Depth (m):	44	**Total Transect Length (km):**	1.757				
Maximum Bottom Depth (m):	55	**Surface Current (kn):**	0.5				
On Bottom (Time- GMT):	12:29	**On Bottom (Lat/Long):**	24.61°N; -83.13°W				
Off Bottom (Time- GMT):	14:13	**Off Bottom (Lat/Long):**	24.61°N; -83.14°W				
Physical (bottom); Temp (°C):		**Salinity:**	**Visibility (ft):**	15	**Current (kn):**	0.25	

Physical Environment:

Distace from Dive site (km): 19.22



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Dive Site: Florida, West of N TER; Block 48, UNCW #2285, ROV 13-17

Dive Imagery:

Figure 1: -52.4 m
Sea star on soft bottom

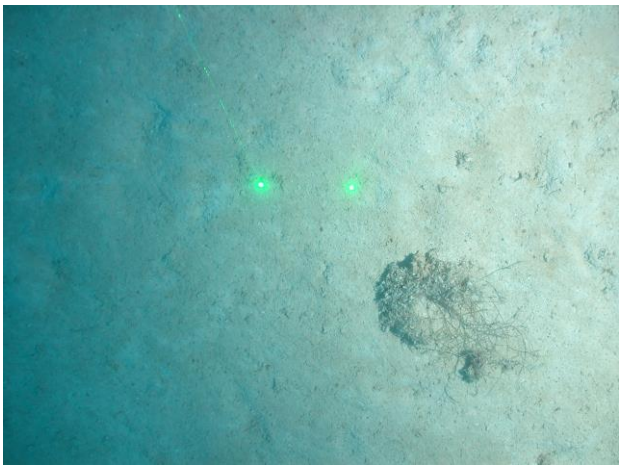


Figure 2: -52.4 m
Line on soft bottom

Dive Site: Florida, West of N TER; Block 48, UNCW #2285, ROV 13-17

Dive Notes:

Objectives, Site Description, Habitat, Fauna:

Site/Objectives:
ROV 13-17, Site #- 21-VIII-13-2. Target Site -Florida, West of N TER, Block 48; UNCW #2285; Ground truth: NOAA Regional Bathymetric Chart: NOAA_Tortugas_Bank.TIF.

ROV Setup/Dive Events:
Video time ESDT. Dive Notes depth were recorded as total depth (ROV altitude + ROV depth in meters). COG is ROV heading. Events, habitat and fauna were recorded directly into Access database. Fish data were recorded by Harter in separate Access database which was added to the Access habitat database. Quantitative photos were taken every 30 seconds with a fixed digital camera (Scorpio Plus) pointing 90° down with parallel 10 cm green lasers, 1.5 m off the bottom. Video camera (standard digital) was angled ~ 20° forward looking with pair of 10 cm red lasers; second set of 3 green lasers were not used. GoPro (white) high definition video camera (setting- 1080/30p) was attached video bar on ROV. Video 2 seconds slower than EDST. The ship's Knudsen depth finder reads 3 m shallower than the ROV bottom depth.

Five 100-m random transects were made to characterize each randomly selected 1 km x 1 km block. Each 100 m transect was conducted at ~0.25 kn at an altitude of <1 m, for 15-20 minutes until the ROV passed through a 100-m circle overlaid on the navigation screen; quantitative still images were taken every ~20 sec. Off transects between the photo transects were 10-15 minutes. Heading of transects were determined by flip of coin, depending in part on ship's maneuverability due to wind/current.

Site Description/Habitat/Biota:
Mb- Block 48 is west of N TER. The NOAA Bathy chart shows a 54 m bathy line indicating a depression in the center of Block 48.
Five transects were conducted in Block 48, starting at 54. The five transects ranged from 53.5 to 55 m depth. !00% Soft bottom.

XS 1: 100% SB, fine silty sand; moderate bioturbation. Start: 12:31:38 PM, 53.8 m; end: 12:43:57 PM 53.5 m. Barren; CNI - Actiniaria: Cerianthidae, ECH - Echinoidea: Cidaroidea, ECH - Asteroidea: Luidia alternata.
Off Transect: HD N for 10 min, 10 cm mound with an apical hole that a fish dove into.
XS 2: HD NNE: East side of the "depression" on the NOAA chart. Start 12:51:33 PM, 53.5; end 1:02:57 PM; 53.5. 100% sediment; moderate bioturbation; barren, Cidaroidea, Cerianthidae.
Off Transect: HD NE , 10 min; 30 cm circular brown patches on sand- Cyanobacteria or diatom mats? Common.
XS 3: HD west in the NE corner of block, between the 2 contour lines on the NOAA bathy chart. Start: 1:13:49 PM; 53.75 m; 1:26:21 PM, 54.25 m. 100% soft bottom, patchy rubble/cobble. Demospongiae: Ircinia campana, increase in rubble in the middle of the xs, Ircinia strobilina,
Off Transect: back on soft bottom; HD W for 10 min. 13:51 scallop swimming; Luidia alternata, Dictyoceratida, Lissodendoryx/Forcepia?
XS 4: Start 1:38:08 PM, 54.5; end 1:50:04 PM, 54.5 m; west of depression on chart; HD SW.. 100% soft bottom, some rubble; moderate bioturbation; Cidaroidea, Cerianthidae.
Off Transect: HD W for 10 min.
XS 5: NW corner of Block 48. HD W. Start 2:00:38 PM, 55; end 2:13:21 PM; 55 m. 100% sediment, moderate bioturbation; barren, ECH- 1- Luidia alternata.

Dominant Benthic Biota:

Dive Site: Florida, West of N TER; Block 48, UNCW #2285, ROV 13-17

Cerianthidae
Cidaroidea
Luidia alternata
Unid. Asteroidea

Dominant Fish: flounder - Bothidae; lizardfish- Synodus sp.; blenny - Blenniidae

Dive Site: Florida, West of N TER; Block 48, UNCW #2285, ROV 13-17

CPCe Percent Cover Analysis:

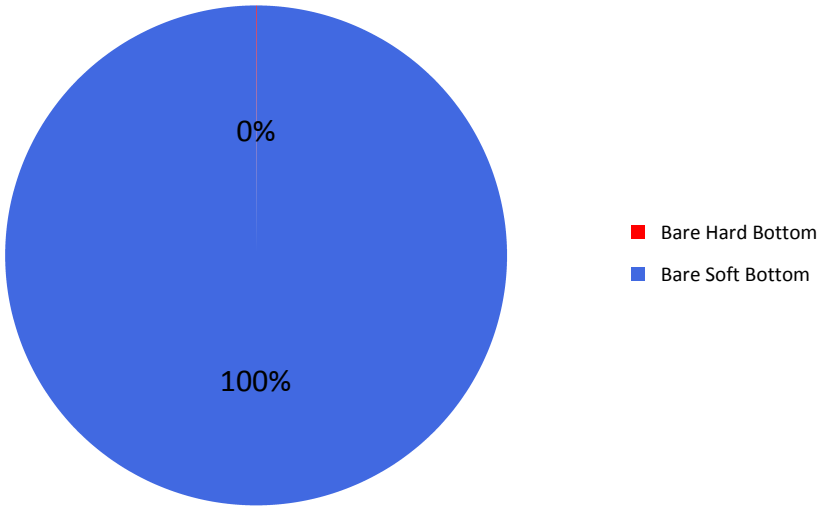
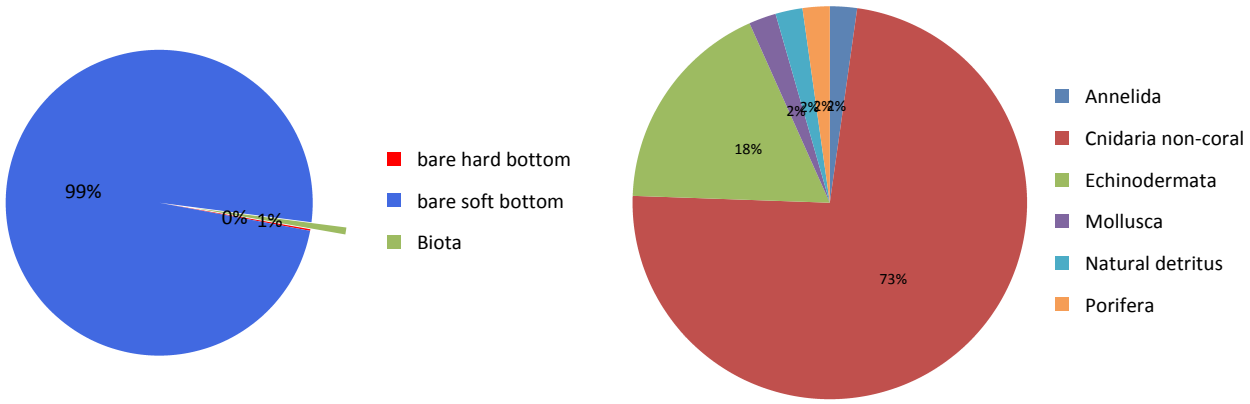


Figure 1. Percent cover of hard and soft bottom substrate at dive site 21-VIII-13-2. CPCe© points on organisms were scored as the underlying substrate (hard or soft).

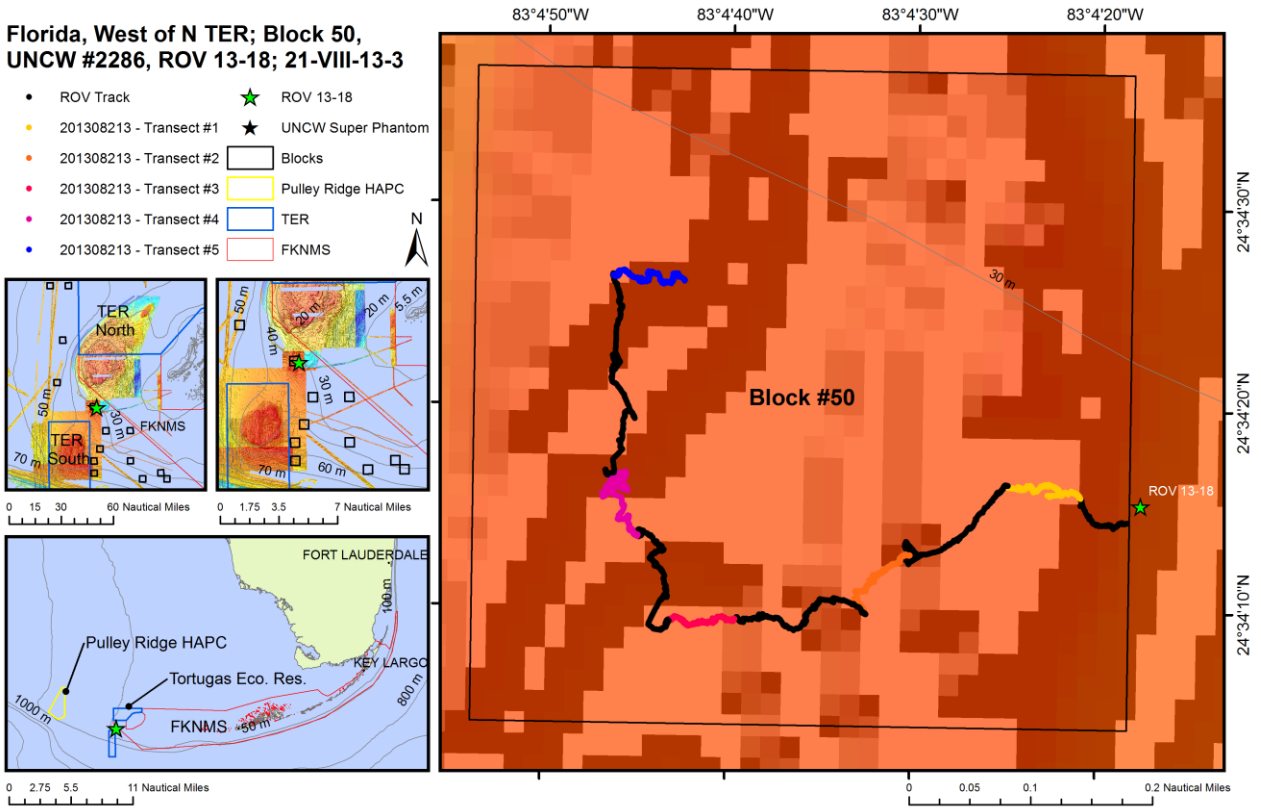


A B

Figure 2. Percent cover of bare substrate and benthic macro-biota at dive site 21-VIII-13-2. A. CPCe percent cover of biota and bare substrate (hard or soft bottom). B. CPCe percent cover of biota and human debris.

Dive Site: Florida, West of N TER; Block 50, UNCW #2286, ROV 13-18

General Location and Dive Track:



Site Overview:

Project:	University of Miami Pulley Ridge
Principal Investator:	Dennis Hanisak
PI Contact Info:	5600 U.S. 1, North, Fort Pierce, FL 34946
Website:	http://oceanexplorer.noaa.gov/explorations/13pulleyridge/welcome.html
Scientific Observers:	Dennis Hanisak, Glenn Taylor, Jason White, John Reed, Lance Horne, Stacy Harter, Stephanie Farrington
Data Management:	Access Database
ROV Navigation Data:	Trackpoint II
Ship Position System:	
Report Analyst:	
Date Compiled:	12/15/2016

Dive Overview:

Vessel:	R/V F.G. Walton Smith; Cruise #: WS -13-12
Sonar Data:	None Available
Purpose:	
ROV:	UNCW Super Phantom
ROV Sensors:	No Sensors Used
Date of Dive:	8/21/2013
Specimens:	
Digital Photos:	167
DVD:	2
Hard Drive:	1

Dive Site: Florida, West of N TER; Block 50, UNCW #2286, ROV 13-18

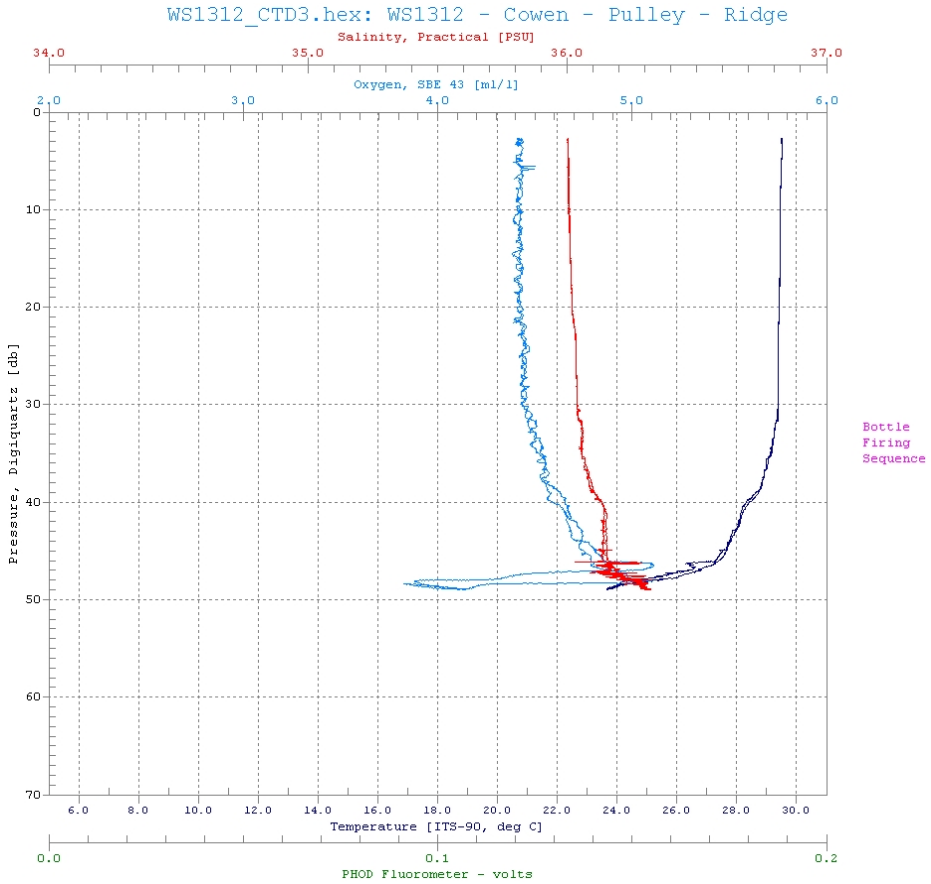
Dive Data:

Minimum Bottom Depth (m):	25	**Total Transect Length (km):**	1.686
Maximum Bottom Depth (m):	31	**Surface Current (kn):**	0.5
On Bottom (Time- GMT):	15:31	**On Bottom (Lat/Long):**	24.57°N; -83.07°W
Off Bottom (Time- GMT):	17:12	**Off Bottom (Lat/Long):**	24.57°N; -83.08°W

Physical (bottom); Temp (°C): **Salinity:** **Visibility (ft):** **Current (kn):** 0.5

Physical Environment:

Distace from Dive site (km): 23.11



Shipboard CTD casts were made with the Sea-Bird 19. The ranges of the water column data recorded during CTD #3 are as follows: Depth Maximum: 48.6 m, Temperature: 23.7-29.5 °C, Conductivity: 53420-59304 (µS/cm), Pressure: 4-71 (PSI), Salinity: 36-36.3 (PSU), Sound Velocity: 1533.4-1545.9 (m/s), Oxygen Saturation: - (ml/l), Density: 1022.7-1025 (Kg/m³), Nitrogen Saturation: 8.2-8.9.

Dive Site: Florida, West of N TER; Block 50, UNCW #2286, ROV 13-18

Dive Imagery:

Figure 1: -24.3 m
Fire corals and sponges grow on hardbottom

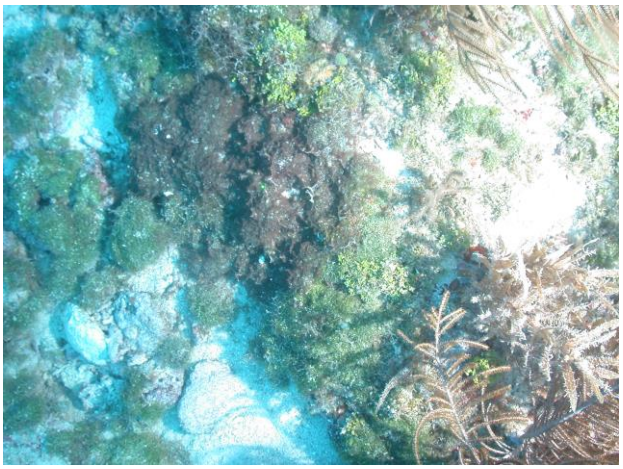


Figure 2: -24.7 m
Gorgonians, sponges and algae on hardbottom

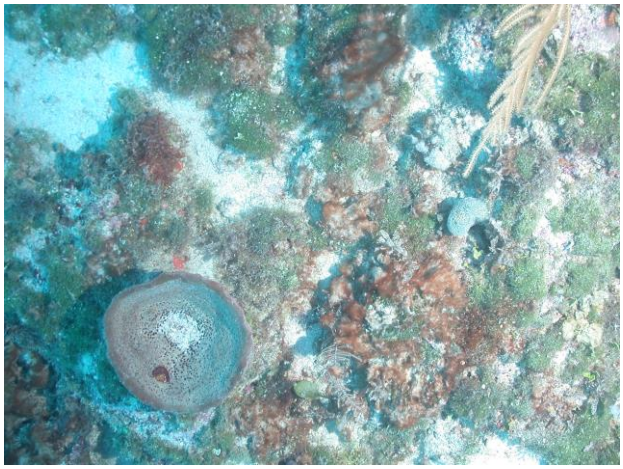


Figure 3: -25.6 m
Ircinia Campana and gorgonians on hardbottom

Figure 4: -24.3 m
Gorgonian on hardbottom

Dive Site: Florida, West of N TER; Block 50, UNCW #2286, ROV 13-18

Dive Notes:

Objectives, Site Description, Habitat, Fauna:

Site/Objectives:
ROV 13-18, Site #- 21-VIII-13-3. Target Site -Florida, West of N TER, Block 50; UNCW #2286; Ground truth: NOAA Regional Bathymetric Chart: NOAA_Tortugas_Bank.TIF.

ROV Setup/Dive Events:
Video time ESDT. Dive Notes depth were recorded as total depth (ROV altitude + ROV depth in meters). COG is ROV heading. Events, habitat and fauna were recorded directly into Access database. Fish data were recorded by Harter in separate Access database which was added to the Access habitat database. Quantitative photos were taken every 30 seconds with a fixed digital camera (Scorpio Plus) pointing 90° down with parallel 10 cm green lasers, 1.5 m off the bottom. Video camera (standard digital) was angled ~ 20° forward looking with pair of 10 cm red lasers; second set of 3 green lasers were not used. GoPro (black) high definition video camera (setting- 1080/30p) was attached video bar on ROV. Video 2 seconds slower than EDST. The ship's Knudsen depth finder reads 3 m shallower than the ROV bottom depth.

Five 100-m random transects were made to characterize each randomly selected 1 km x 1 km block. Each 100 m transect was conducted at ~0.25 kn at an altitude of <1 m, for 15-20 minutes until the ROV passed through a 100-m circle overlaid on the navigation screen; quantitative still images were taken every ~20 sec. Off transects between the photo transects were 10-15 minutes. Heading of transects were determined by flip of coin, depending in part on ship's maneuverability due to wind/current.

Site Description/Habitat/Biota:
Mb- Block 50 is west of N TER. The NOAA Bathy chart shows a contours of 30-38 m bathy lines indicating a sloping edge from the east to the west of Block 50. The ROV ground-truthing showed its depth to be 8 m shallower than the chart contours. Possibly the chart geotiff is shifted by ~750 m west.

Five transects were conducted in Block 50, starting at SE border and headed west across the steepest part of the slope on the NOAA chart. The five transects ranged from 29 to 25 m depth.
XS 1: Hard bottom patch reef with 80% cover HB, rock boulders/cobble, low relief <1.0 m, low slope, high rugosity. HD W across the block, approaching the 30 m contour line on chart. Start: 3:34:50 PM, 26 m; end: 3:47:39 PM; 25 m. Dominate biota: Pseudopterogorgia spp.- dominate, Plexaurella, Demospongiae: Haliclona rubens, Aplysina cauliformis/fulva, X. muta, Spheciospongia vesparium, Callyspongia plicifera, Niphates erecta, Niphates digitalis, Ircinia campana; algae- Sargassum, filamentous Chlorophyta,
Off Transect: HD W during transit 10 m in. Ghost lobster traps empty (3:48:52 PM).
XS 2: Hard bottom patch reef with 80% cover HB; 0.5 m relief, rock boulders/cobble. Bottom is not dropping off like the contour chart shows; ROV at 26 m, on contour of 31 m. HD SW across the block, approaching the 32 m line. Start: 3:55:24 PM, 26 m; end: 4:05:25 PM; 26.5 m. Pseudopterogorgia spp. - dominate; same spp as XS 1. 1 red grouper and small pit.
Off Transect: crossing the 34 m contour line on the NOAA bathy maps. HD west -boat debris; Agelas clathrodes.
XS 3: HD west; hard bottom and patch reefs, < 0.5 m relief, sediment between the 50% cover of HB, rock boulders. Start: 4:14:43 PM, 27.5 m; end: 4:26:29 PM, 28 m. At 4:23:51 PM changing to HB rubble pavement, gorgonacea decrease; becomes flatter. Contour reads 36 m at 28 m on ROV. Same biota as XS 1.
Off Transect: HD north for 10 min. There seems to be a 750 m shift in the NOAA bathy chart to the west.
XS 4: HD N; hard bottom and patch reefs, < 0.5 m relief, sediment between the 80% cover of HB boulders ranging from low relief rock boulders to pavement with sediment between. Start: 4:37:57 PM, 28 m; end:

Dive Site: Florida, West of N TER; Block 50, UNCW #2286, ROV 13-18

4:49:41 PM, 27 m. Pseudopterogorgia americana- dominate, same biota as XS 1.
Off Transect: Large 2 m diam Montastraea coral, Orbicella faveolata? at 4:55:43 PM- 24°34.3750'N, 83° 04.7666'W.
XS 5: HD E; hard bottom, patch reefs, < 0.5 m relief, sediment between the 90% cover of HB boulders ranging from low relief rock boulders to pavement with sediment between; low relief 0.5-1 m, low slope, high rugosity on reef areas. Start: 5:01:25 PM, 25.5 m; end: 5:12:41 PM, 25.7 m. Pseudopterogorgia americana- dominate, same biota as XS 1; one 15 cm Montastraea cavernosa.

Dominant Benthic Biota: see above.

Dominant Fish: bicolor damselfish- Stegastes partitus; yellowhead wrasse - Halichoeres garnoti; Bluehead wrasse - Ptereleotris calliura; Doctorfish - Acanthurus sp.; reef butterflyfish- Chaetodon sedentarius

Dive Site: Florida, West of N TER; Block 50, UNCW #2286, ROV 13-18

CPCe Percent Cover Analysis:

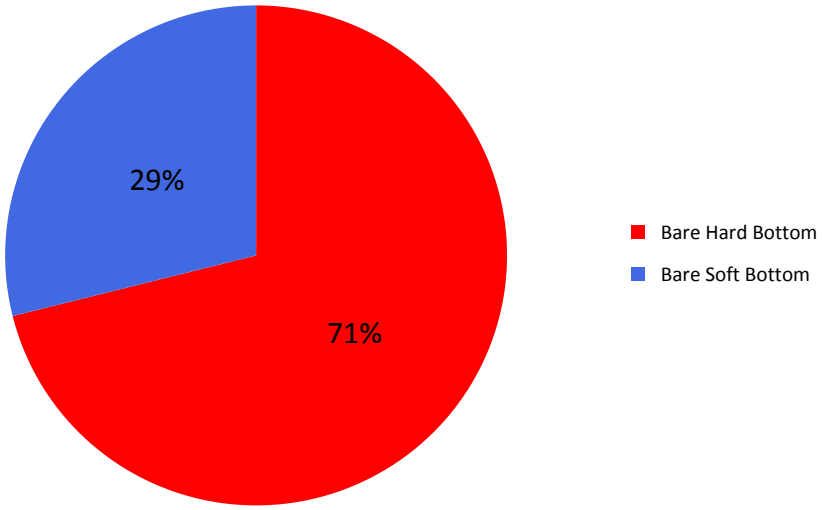
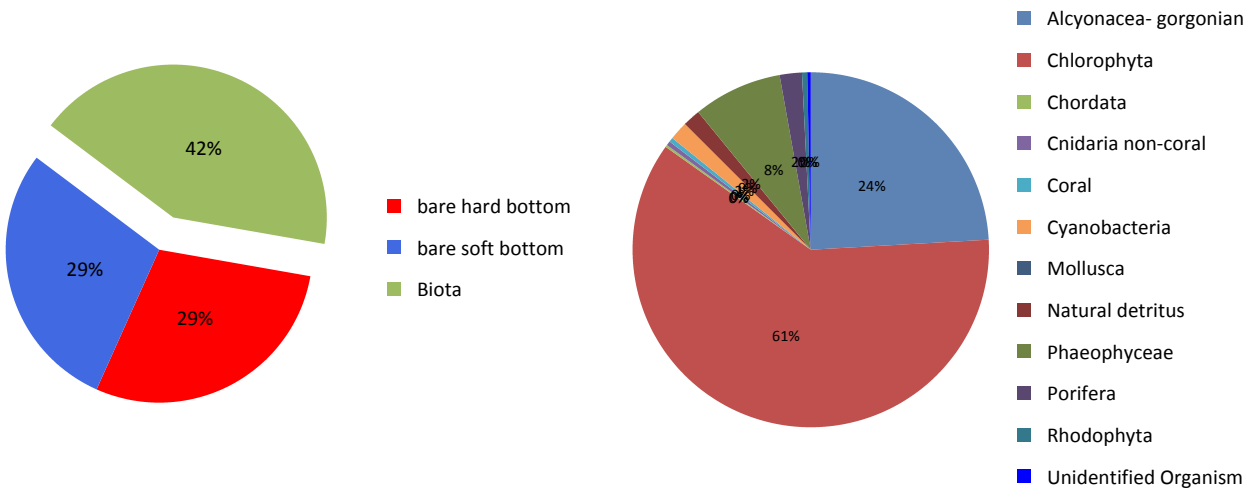


Figure 1. Percent cover of hard and soft bottom substrate at dive site 21-VIII-13-3. CPCe© points on organisms were scored as the underlying substrate (hard or soft).

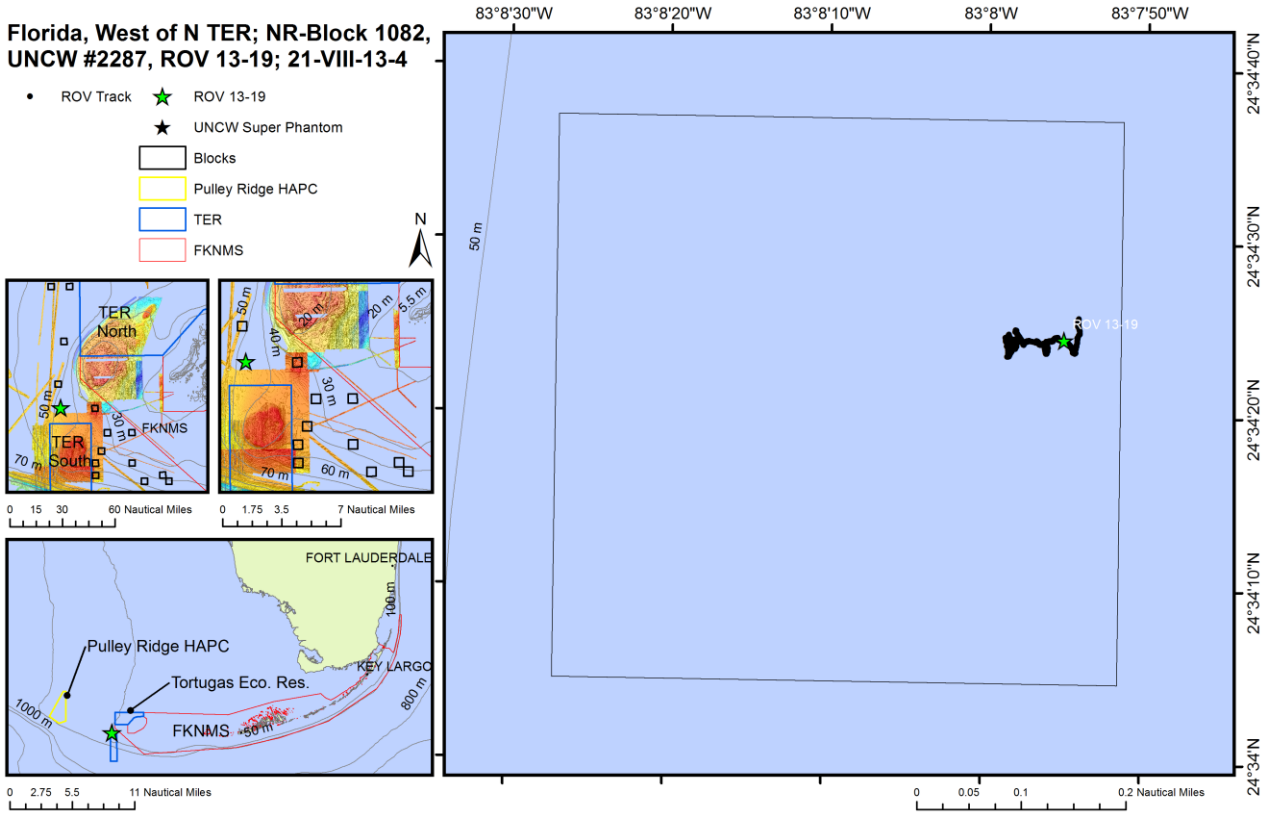


A B

Figure 2. Percent cover of bare substrate and benthic macro-biota at dive site 21-VIII-13-3. A. CPCe percent cover of biota and bare substrate (hard or soft bottom). B. CPCe percent cover of biota and human debris.

Dive Site: Florida, West of N TER; NR-Block 1082, UNCW #2287, not a random block survey, ROV 13-19

General Location and Dive Track:



Site Overview:

Project:	University of Miami Pulley Ridge
Principal Investator:	Dennis Hanisak
PI Contact Info:	5600 U.S. 1, North, Fort Pierce, FL 34946
Website:	http://oceanexplorer.noaa.gov/explorations/13pulleyridge/welcome.html
Scientific Observers:	Dennis Hanisak, Glenn Taylor, Jason White, John Reed, Lance Horne, Stacy Harter, Stephanie Farrington
Data Management:	Access Database
ROV Navigation Data:	Trackpoint II
Ship Position System:	
Report Analyst:	
Date Compiled:	12/15/2016

Dive Overview:

Vessel:	R/V F.G. Walton Smith; Cruise #: WS -13-12
Sonar Data:	None Available
Purpose:	
ROV:	UNCW Super Phantom
ROV Sensors:	No Sensors Used
Date of Dive:	8/21/2013
Specimens:	
Digital Photos:	
DVD:	0
Hard Drive:	1

Dive Site: Florida, West of N TER; NR-Block 1082, UNCW #2287, not a random block survey, ROV 13-19

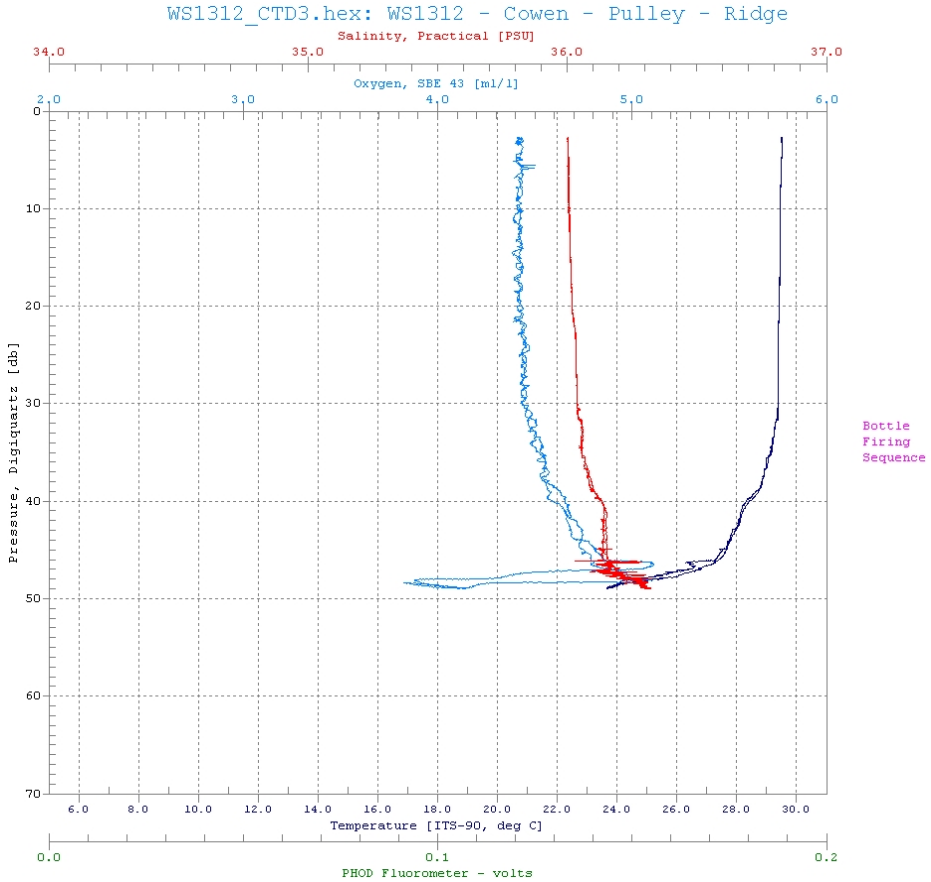
Dive Data:

Minimum Bottom Depth (m):	50	**Total Transect Length (km):**	0.255
Maximum Bottom Depth (m):	50	**Surface Current (kn):**	
On Bottom (Time- GMT):	18:20	**On Bottom (Lat/Long):**	24.57°N; -83.13°W
Off Bottom (Time- GMT):	18:39	**Off Bottom (Lat/Long):**	24.57°N; -83.13°W

Physical (bottom); Temp (°C): **Salinity:** **Visibility (ft):** **Current (kn):**

Physical Environment:

Distace from Dive site (km): 22.99



Shipboard CTD casts were made with the Sea-Bird 19. The ranges of the water column data recorded during CTD #3 are as follows: Depth Maximum: 48.6 m, Temperature: 23.7-29.5 °C, Conductivity: 53420-59304 (µS/cm), Pressure: 4-71 (PSI), Salinity: 36-36.3 (PSU), Sound Velocity: 1533.4-1545.9 (m/s), Oxygen Saturation: - (ml/l), Density: 1022.7-1025 (Kg/m³), Nitrogen Saturation: 8.2-8.9.

Dive Site: Florida, West of N TER; NR-Block 1082, UNCW #2287, not a random block survey, ROV 13-19

Dive Notes:

Objectives, Site Description, Habitat, Fauna:

Site/Objectives:
ROV 13-19, Site #- 21-VIII-13-4. Target Site -Florida, West of N TER, NR Block 1082; UNCW #2287; Ground truth: NOAA Regional Bathymetric Chart: NOAA_Tortugas_Bank.TIF.

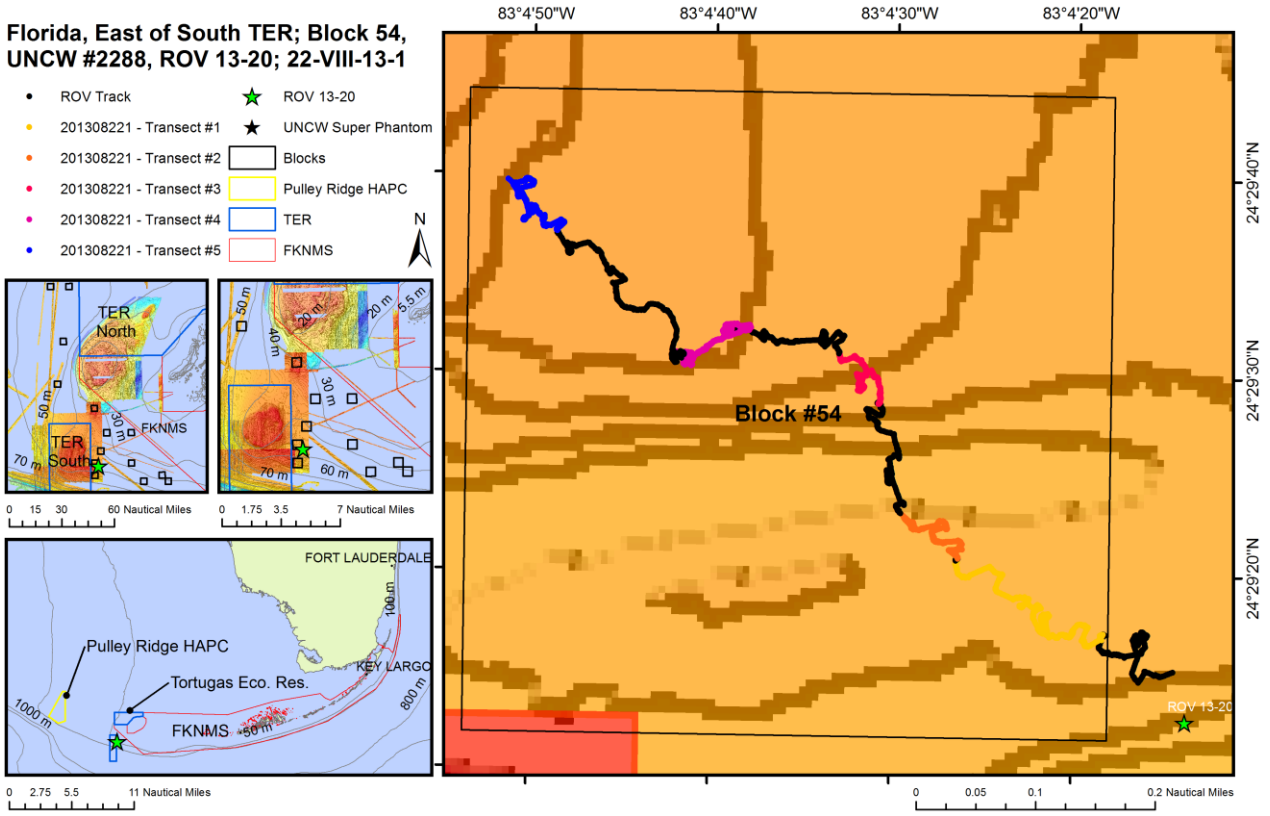
ROV Setup/Dive Events:
Video time ESDT. Dive Notes depth were recorded as total depth (ROV altitude + ROV depth in meters). COG is ROV heading. Events, habitat and fauna were recorded directly into Access database. Fish data were recorded by Harter in separate Access database which was added to the Access habitat database. Quantitative photos were taken every 30 seconds with a fixed digital camera (Scorpio Plus) pointing 90° down with parallel 10 cm green lasers, 1.5 m off the bottom. Video camera (standard digital) was angled ~ 20° forward looking with pair of 10 cm red lasers; second set of 3 green lasers were not used. Video 2 seconds slower than EDST. The ship's Knudsen depth finder reads 3 m shallower than the ROV bottom depth.
Conducted fathometer survey from 30 m to 50 m to look for site to drop grouper traps. Found sites with low relief features and school of fish over bottom on fathometer. Conducted short ROV dive to verify.

Site Description/Habitat/Biota:
NR Block 1082 is west of N TER.
Short dive to ground-truth fathometer survey for grouper habitat. Flat sand bottom at 50.5 m depth. Found 0.5 m relief ledge with schools of small fish and 1 red grouper, and lionfish. Another fathometer feature was noted with fish school 1/2 mile to the east. Fish traps laid along these two sites.

Dominant Fish: lionfish (2)

Dive Site: Florida, East of South TER; Block 54, UNCW #2288, ROV 13-20

General Location and Dive Track:



Site Overview:

Project:	University of Miami Pulley Ridge
Principal Investator:	Dennis Hanisak
PI Contact Info:	5600 U.S. 1, North, Fort Pierce, FL 34946
Website:	http://oceanexplorer.noaa.gov/explorations/13pulleyridge/welcome.html
Scientific Observers:	Dennis Hanisak, Glenn Taylor, Jason White, John Reed, Lance Horne, Stacy Harter, Stephanie Farrington
Data Management:	Access Database
ROV Navigation Data:	Trackpoint II
Ship Position System:	
Report Analyst:	
Date Compiled:	12/15/2016

Dive Overview:

Vessel:	R/V F.G. Walton Smith; Cruise #: WS -13-12
Sonar Data:	None Available
Purpose:	
ROV:	UNCW Super Phantom
ROV Sensors:	No Sensors Used
Date of Dive:	8/22/2013
Specimens:	
Digital Photos:	178
DVD:	2
Hard Drive:	1

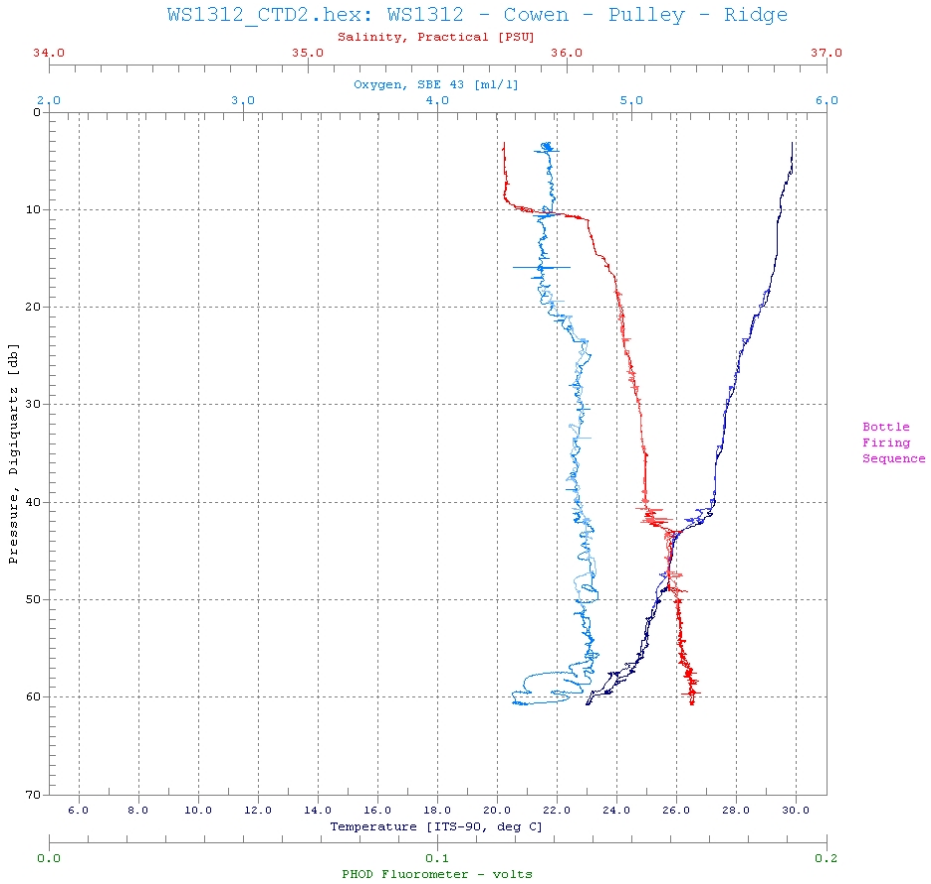
Dive Site: Florida, East of South TER; Block 54, UNCW #2288, ROV 13-20

Dive Data:

Minimum Bottom Depth (m):	43	**Total Transect Length (km):**	2.104				
Maximum Bottom Depth (m):	48	**Surface Current (kn):**	0.8				
On Bottom (Time- GMT):	10:47	**On Bottom (Lat/Long):**	24.49°N; -83.07°W				
Off Bottom (Time- GMT):	12:40	**Off Bottom (Lat/Long):**	24.49°N; -83.08°W				
Physical (bottom); Temp (°C):		**Salinity:**	**Visibility (ft):**	30	**Current (kn):**	0.25	

Physical Environment:

Distace from Dive site (km): 9.00



Shipboard CTD casts were made with the Sea-Bird 19. The ranges of the water column data recorded during CTD #2 are as follows: Depth Maximum: 60.4 m, Temperature: 23-29.9 °C, Conductivity: 52886-59316 (µS/cm), Pressure: 4.5-88.2 (PSI), Salinity: 35.7-36.5 (PSU), Sound Velocity: 1532-1546.2 (m/s), Oxygen Saturation: - (ml/l), Density: 1022.4-1025.3 (Kg/m^3), Nitrogen Saturation: 8.1-9.

Dive Site: Florida, East of South TER; Block 54, UNCW #2288, ROV 13-20

Dive Imagery:

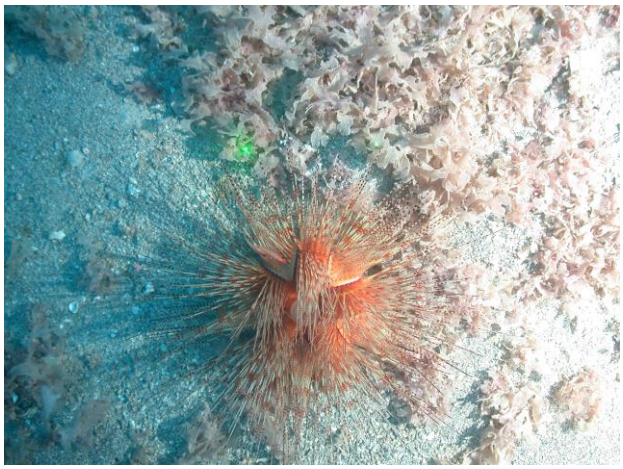


Figure 1: -42.6 m
Urchin and loose *Martensia* on soft bottom

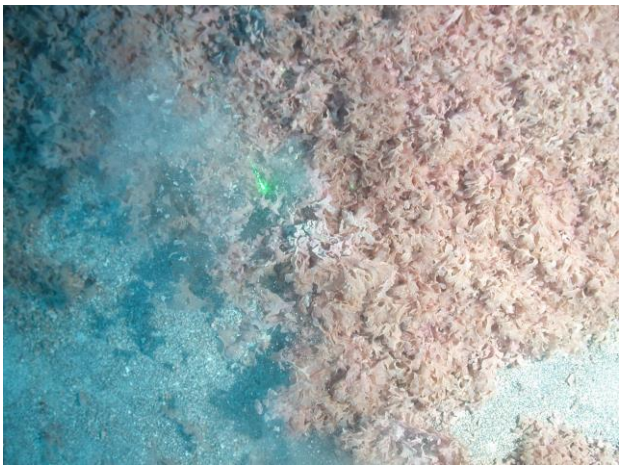


Figure 2: -44.3 m
Loose *Martensia* on soft bottom

Dive Site: Florida, East of South TER; Block 54, UNCW #2288, ROV 13-20

Dive Notes:

Objectives, Site Description, Habitat, Fauna:

Site/Objectives:
ROV 13-20, Site #- 22-VIII-13-1. Target Site -East of South TER; Block 54; UNCW #2288; Ground truth: NOAA Regional Bathymetric Chart: NOAA_Tortugas_Valleys_IMG.img and rileys_hump_02.sd.tif

ROV Setup/Dive Events:
Video time ESDT. Dive Notes depth were recorded as total depth (ROV altitude + ROV depth in meters). COG is ROV heading. Events, habitat and fauna were recorded directly into Access database. Fish data were recorded by Harter in separate Access database which was added to the Access habitat database. Quantitative photos were taken every 30 seconds with a fixed digital camera (Scorpio Plus) pointing 90° down with parallel 10 cm green lasers, 1.5 m off the bottom. Video camera (standard digital) was angled ~ 20° forward looking with pair of 10 cm red lasers; second set of 3 green lasers were not used. GoPro (black) high definition video camera (setting- 1080/30p) was attached video bar on ROV. Video 3 seconds slower than EDST. The ship's Knudsen depth finder reads 3 m shallower than the ROV bottom depth.

Five 100-m random transects were made to characterize each randomly selected 1 km x 1 km block. Each 100 m transect was conducted at ~0.25 kn at an altitude of <1 m, for 15-20 minutes until the ROV passed through a 100-m circle overlaid on the navigation screen; quantitative still images were taken every ~20 sec. Off transects between the photo transects were 10-15 minutes. Heading of transects were determined by flip of coin, depending in part on ship's maneuverability due to wind/current.

Site Description/Habitat/Biota:
The NOAA Bathy chart shows contours of 46-50 m bathy lines indicating a sloping edge from the N to the S in Block 54. *The ROV ground-truthing showed its depth to be 8 m shallower than the chart contours. Possibly the chart geotiff is shifted by ~750 m west.*

Five transects were conducted in Block 54, starting at SE corner and headed west. The five transects ranged from 43.2 to 47.2 m depth.
Landed east of Block 54; 100% soft sediment, med/course sand and shell hash, flat no relief; dense thick loose algae maybe ALG - Rhodophyta: *Martensia pavonia*, flat bifurcate blade with crenulated edge; Kallymenia- flat perforated blade.
XS 1: HD W: 100% soft sediment, med/course with sand shell hash, flat no relief; 5 cm thick layer of dense algae Rhodophyta: *Martensia pavonia* Start: 10:57:19 AM, 47.2 m; end: 11:07:31 AM, 47m.
Off Transect: HD NW for 10 min at .25 kts; CNI - Actiniaria: Epicystis crucifer.
XS 2: HD NW: 100% soft sediment, med/course sand and shell hash, flat no relief; 5 cm thick layer of dense algae, same as XS 1. Start: 11:16:37 AM, 47 m; end: 11:28:16 AM, 47.25. Echinoidea: Meoma ventricosa.
Off Transect: HD N for transit; over valley in the small strip of MB, 48 m
XS 3: HD NW: 100% soft sediment, med/course sand and shell hash, flat no relief; 5 cm thick layer of dense algae, same as XS 1. Start: 11:37:31 AM, 47 m; end: 11:47:36 AM, 45.5.
Off Transect: HD W.
XS 4: HD SW: 100% soft sediment, med/course sand and shell hash, flat no relief; 5 cm thick layer of dense algae, same as XS 1. Start: 11:59:35 AM, 44.5 m; end: 12:14:26 PM, 44.5 m . BRY - Hippoporidra; HUM - beam or box.
Off Transect: HD NW; Other algae sparse including: Udotea, Halimeda, Codium.
XS 5: HD NW: 100% soft sediment, med/course sand and shell hash, flat no relief; 5 cm thick layer of dense algae, same as XS 1; a few scattered boulders- rare; other algae- Caulerpa prolifera. Start: 12:26:49 PM,

43.5 m; end: 12:40:59 PM, 43.25.

Dominant Fish: unid wrasse- Halichoeres sp.; greenblotch parrotfish- Sparisoma atomarium; razorfish - Xyrichtys sp.; Bandtail puffer - Sphoeroides spengleri; sand perch - Diplectrum formosum; yellowtail reef fish- Chromis enchrysurus

WE PULLED UP THE ALGAE IN THE FISH TRAPS ON 08/23/2013 - DENNIS HAS CONFIRMED Martensia pavonia-- HE IS "PRETTY CERTAIN THAT IS WHAT IT IS" - DIVE NOTES WERE UPDATED TO REFLECT THIS * 8/23/2013

Dive Site: Florida, East of South TER; Block 54, UNCW #2288, ROV 13-20

CPCe Percent Cover Analysis:

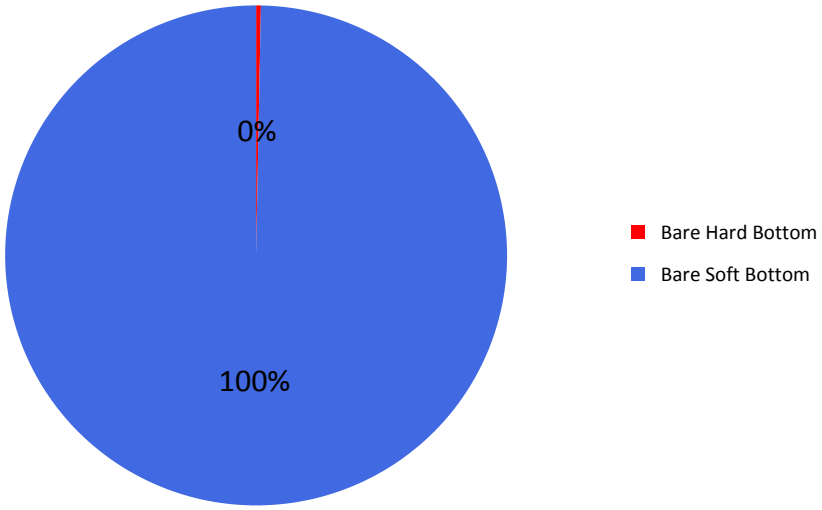
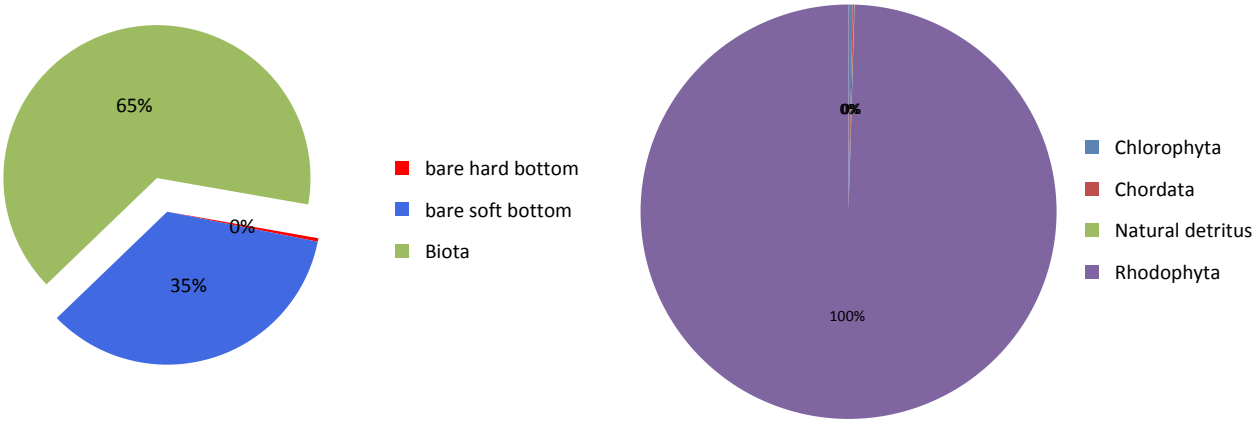


Figure 1. Percent cover of hard and soft bottom substrate at dive site 22-VIII-13-1. CPCe© points on organisms were scored as the underlying substrate (hard or soft).

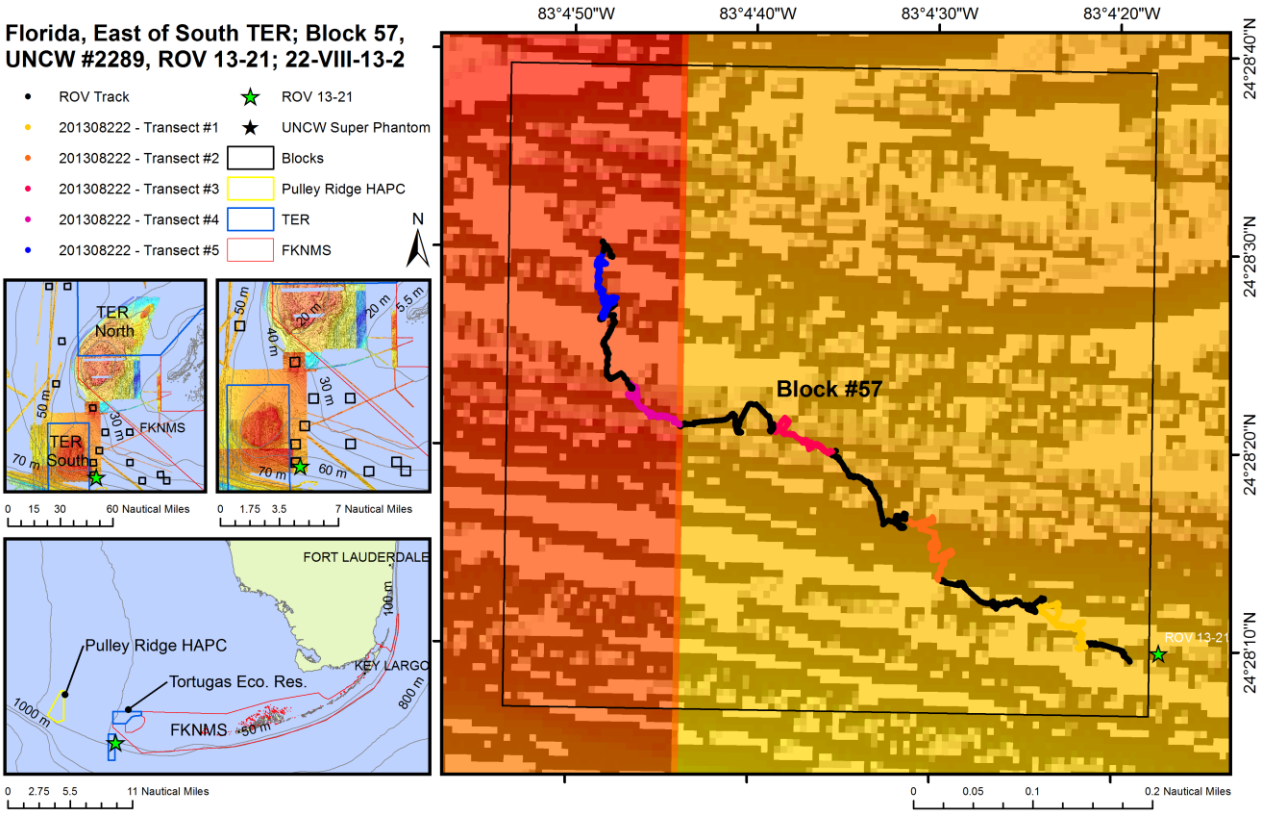


A B

Figure 2. Percent cover of bare substrate and benthic macro-biota at dive site 22-VIII-13-1. A. CPCe percent cover of biota and bare substrate (hard or soft bottom). B. CPCe percent cover of biota and human debris.

Dive Site: Florida, East of South TER; Block 57, UNCW #2289, ROV 13-21

General Location and Dive Track:



Site Overview:

Project:	University of Miami Pulley Ridge
Principal Investator:	Dennis Hanisak
PI Contact Info:	5600 U.S. 1, North, Fort Pierce, FL 34946
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Scientific Observers:	Dennis Hanisak, Glenn Taylor, Jason White, John Reed, Lance Horne, Stacy Harter, Stephanie Farrington
Data Management:	Access Database
ROV Navigation Data:	Trackpoint II
Ship Position System:	
Report Analyst:	
Date Compiled:	12/15/2016

Dive Overview:

Vessel:	R/V F.G. Walton Smith; Cruise #: WS -13-12
Sonar Data:	None Available
Purpose:	
ROV:	UNCW Super Phantom
ROV Sensors:	No Sensors Used
Date of Dive:	8/22/2013
Specimens:	
Digital Photos:	165
DVD:	2
Hard Drive:	1

Dive Site: Florida, East of South TER; Block 57, UNCW #2289, ROV 13-21

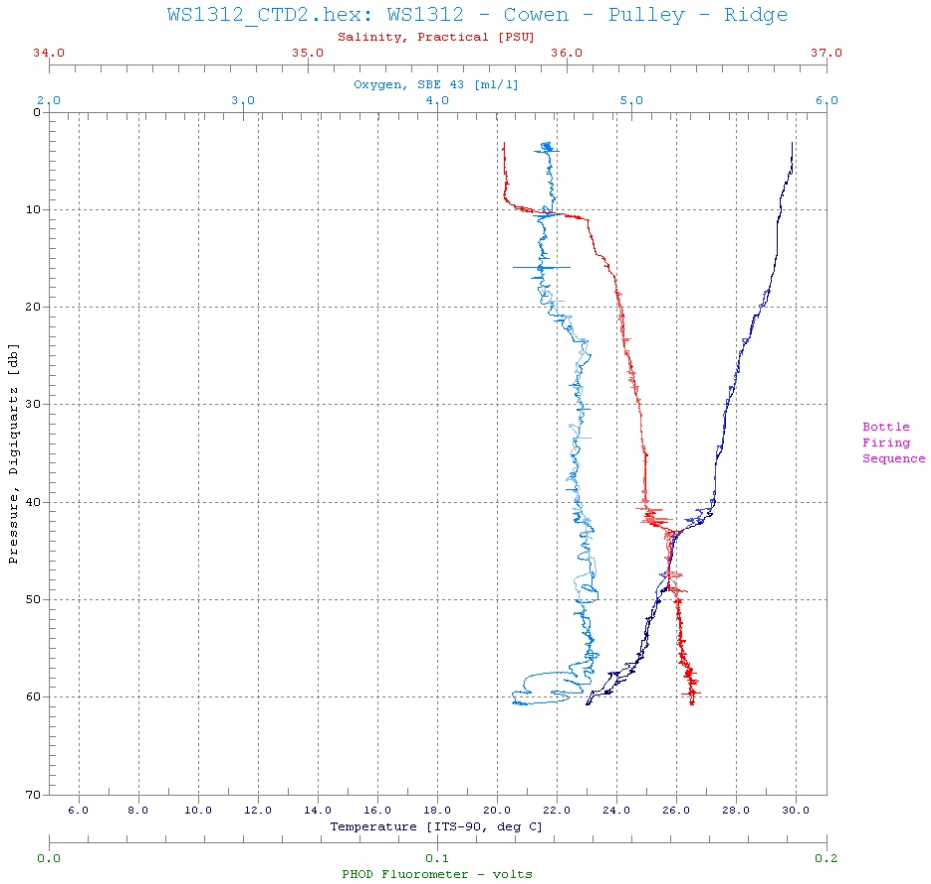
Dive Data:

Minimum Bottom Depth (m):	52	**Total Transect Length (km):**	1.545
Maximum Bottom Depth (m):	56	**Surface Current (kn):**	0.5
On Bottom (Time- GMT):	13:39	**On Bottom (Lat/Long):**	24.47°N; -83.07°W
Off Bottom (Time- GMT):	15:12	**Off Bottom (Lat/Long):**	24.48°N; -83.08°W

Physical (bottom); Temp (°C): **Salinity:** **Visibility (ft):** **Current (kn):**

Physical Environment:

Distace from Dive site (km): 8.88



Shipboard CTD casts were made with the Sea-Bird 19. The ranges of the water column data recorded during CTD #2 are as follows: Depth Maximum: 60.4 m, Temperature: 23-29.9 °C, Conductivity: 52886-59316 (µS/cm), Pressure: 4.5-88.2 (PSI), Salinity: 35.7-36.5 (PSU), Sound Velocity: 1532-1546.2 (m/s), Oxygen Saturation: - (ml/l), Density: 1022.4-1025.3 (Kg/m^3), Nitrogen Saturation: 8.1-9.

Dive Site: Florida, East of South TER; Block 57, UNCW #2289, ROV 13-21

Dive Imagery:

Figure 1: -53.9 m
Yellow funnel cake sponge

Figure 2: -52 m
Loose *Martensia* and sponges on soft bottom

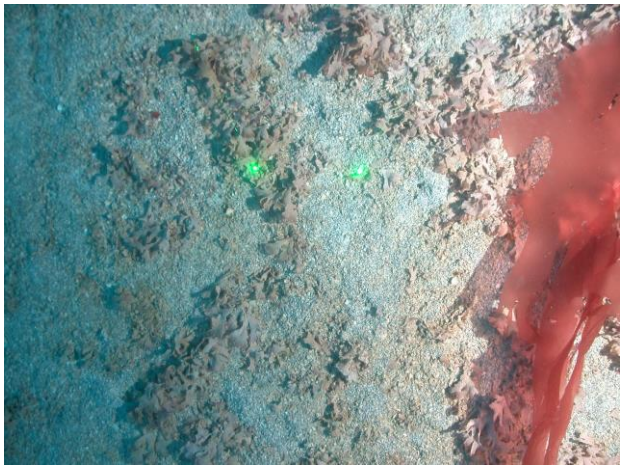


Figure 3: -51 m
Loose red algae and *Martensia* on soft bottom

Dive Site: Florida, East of South TER; Block 57, UNCW #2289, ROV 13-21

Dive Notes:

Objectives, Site Description, Habitat, Fauna:

Site/Objectives:
ROV 13-21, Site #- 22-VIII-13-2. Target Site -East of South TER; Block 57; UNCW #2289; Ground truth: NOAA Regional Bathymetric Chart: NOAA_Tortugas_Valleys_IMG.img

ROV Setup/Dive Events:
Video time ESDT. Dive Notes depth were recorded as total depth (ROV altitude + ROV depth in meters). COG is ROV heading. Events, habitat and fauna were recorded directly into Access database. Fish data were recorded by Harter in separate Access database which was added to the Access habitat database. Quantitative photos were taken every 30 seconds with a fixed digital camera (Scorpio Plus) pointing 90° down with parallel 10 cm green lasers, 1.5 m off the bottom. Video camera (standard digital) was angled ~ 20° forward looking with pair of 10 cm red lasers; second set of 3 green lasers were not used. GoPro (black) high definition video camera (setting- 1080/30p) was attached video bar on ROV (with only a single small battery). Video 2 seconds slower than EDST. The ship's Knudsen depth finder reads 3 m shallower than the ROV bottom depth.

Five 100-m random transects were made to characterize each randomly selected 1 km x 1 km block. Each 100 m transect was conducted at ~0.25 kn at an altitude of <1 m, for 15-20 minutes until the ROV passed through a 100-m circle overlaid on the navigation screen; quantitative still images were taken every ~20 sec. Off transects between the photo transects were 10-15 minutes. Heading of transects were determined by flip of coin, depending in part on ship's maneuverability due to wind/current.

Site Description/Habitat/Biota:
The NOAA Bathy chart shows a contours of 56-62 m bathy lines indicating a sloping edge from the N to the S in Block 57. Seems as though the NOAA chart is shifted 500 m to the north based on depths recorded by ROV.

Five transects were conducted in Block 57, starting at SE corner and headed NW. The five transects ranged from 52 to 55.7 m depth. Landed SE corner Block 57; medium coarse sand; with scattered rocks/ small patch reefs; 10-20 % cover of rubble/cobble.

XS 1: HD NW: Start: 1:43:28 PM, 55.7 m; end 1:54:19 PM, 55.5 m. Soft bottom with 30% rubble. Ascidiacea; Didemnidae, Demospongiae: Niphates erecta, Callyspongia plicifera, Aiochoroia crassa; sand tilefish burrows.
Off Transect: HD NW for 10 minutes 3/4 kts; 2m diam patch reef, sediment/rubble. CNI - Antipathidae: Tanacetipathes, Geodia neptuni complex, Ircinia campana; red grouper; 24°28.2006'N, 83°04.4422'W; entered algal zone at end of transit.
XS 2: HD N: Start: 2:02:04 PM, 55.5 m; end 2:13:56 PM, 52 m. Flat sediment, 100% soft bottom, Medium coarse sand/shell hash. Some rubble which dissipates into 100% sediment in the middle of xs. 30-50% cover ALG - Rhodophyta: *Martensia pavonia* - more color than in previous dive where it was loose; maybe alive/attached.
Off Transect: HD NW for 10 min.
XS 3: HD N: Start: 2:22:13 PM, 53 m; end 2:32:55 PM, 54 m. Flat sediment, 100% soft bottom, medium coarse sand/shell hash. 30-50% cover ALG - Rhodophyta: *Martensia pavonia* - more color maybe alive/attached.
Off Transect: HD W 10 min.

Dive Site: Florida, East of South TER; Block 57, UNCW #2289, ROV 13-21

XS 4: HD NW Start: 2:38:03 PM, 53.5 m; end 2:50:19 PM, 54 m. Flat sediment, 100% soft bottom, medium coarse sand/shell hash. 30-50% ALG - Rhodophyta: *Martensia pavonia* - more color maybe alive/attached: Coral- Manicina areolata.
Off Transect: HD N for 10 min: mostly soft, few patch reefs, < 5 m diam; then back into soft sediment with the algae.
XS 5: HD N: Start: 2:58:43 PM, 54.5 m; end 3:10:41 PM, 53 m. 100% soft bottom, 30-50% of algae, and Didemnidae. Rubble; transect runs into a patch reef at 3:01:52 PM with Antipatharians.

Dominant Fish: yellowtail reef fish- Chromis enchrysurus; unid wrasse- Halichoeres sp.; bicolor damselfish- Stegastes partitus; lionfish- Pterois volitans (7); reef butterflyfish- Chaetodon sedentarius; orangeback bass- Serranus annularis; tattler - Serranus phoebe

WE PULLED UP THE ALGAE IN THE FISH TRAPS ON 08/23/2013 - DENNIS HAS CONFIRMED Martensia pavonia-- HE IS "PRETTY CERTAIN THAT IS WHAT IT IS" - DIVE NOTES WERE UPDATED TO REFLECT THIS * 8/23/2013

Dive Site: Florida, East of South TER; Block 57, UNCW #2289, ROV 13-21

CPCe Percent Cover Analysis:

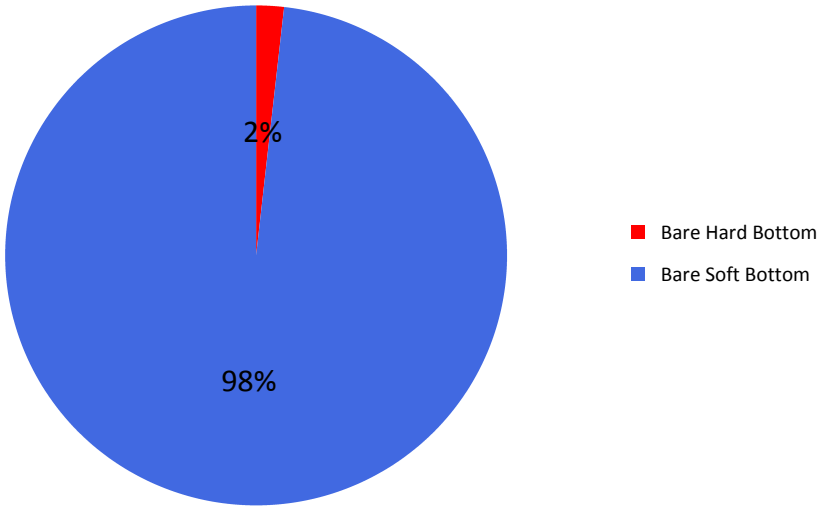
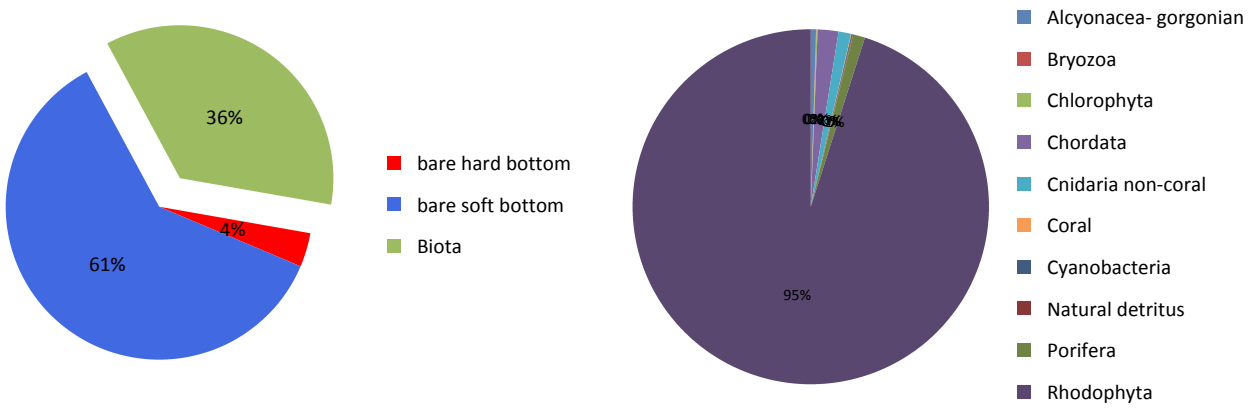


Figure 1. Percent cover of hard and soft bottom substrate at dive site 22-VIII-13-2. CPCe© points on organisms were scored as the underlying substrate (hard or soft).

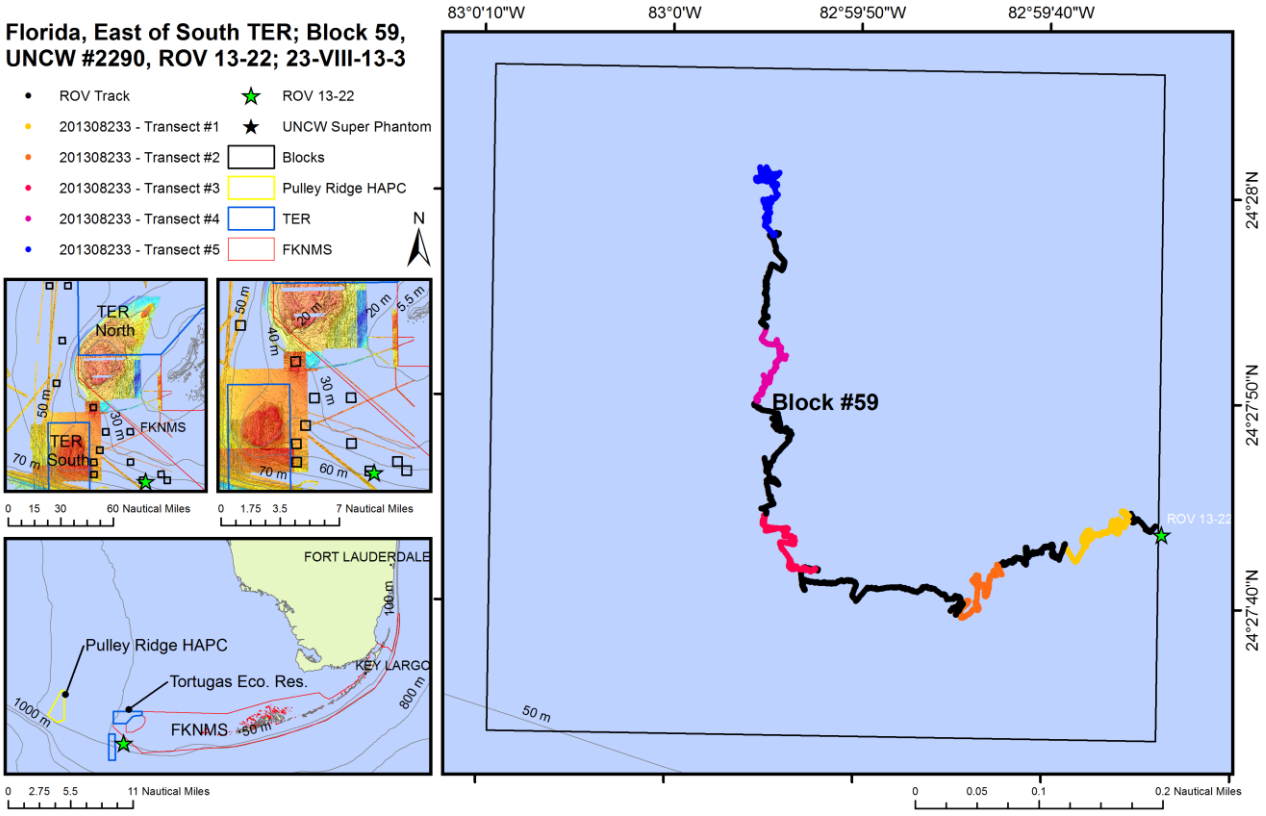


A B

Figure 2. Percent cover of bare substrate and benthic macro-biota at dive site 22-VIII-13-2. A. CPCe percent cover of biota and bare substrate (hard or soft bottom). B. CPCe percent cover of biota and human debris.

Dive Site: Florida, East of South TER; Block 59, UNCW #2290, ROV 13-22

General Location and Dive Track:



Site Overview:

Project:	University of Miami Pulley Ridge
Principal Investator:	Dennis Hanisak
PI Contact Info:	5600 U.S. 1, North, Fort Pierce, FL 34946
Website:	http://oceanexplorer.noaa.gov/explorations/13pulleyridge/welcome.html
Scientific Observers:	Dennis Hanisak, Glenn Taylor, Jason White, John Reed, Lance Horne, Stacy Harter, Stephanie Farrington
Data Management:	Access Database
ROV Navigation Data:	Trackpoint II
Ship Position System:	
Report Analyst:	
Date Compiled:	12/15/2016

Dive Overview:

Vessel:	R/V F.G. Walton Smith; Cruise #: WS -13-12
Sonar Data:	None Available
Purpose:	
ROV:	UNCW Super Phantom
ROV Sensors:	No Sensors Used
Date of Dive:	8/23/2013
Specimens:	
Digital Photos:	173
DVD:	2
Hard Drive:	1

Dive Site: Florida, East of South TER; Block 59, UNCW #2290, ROV 13-22

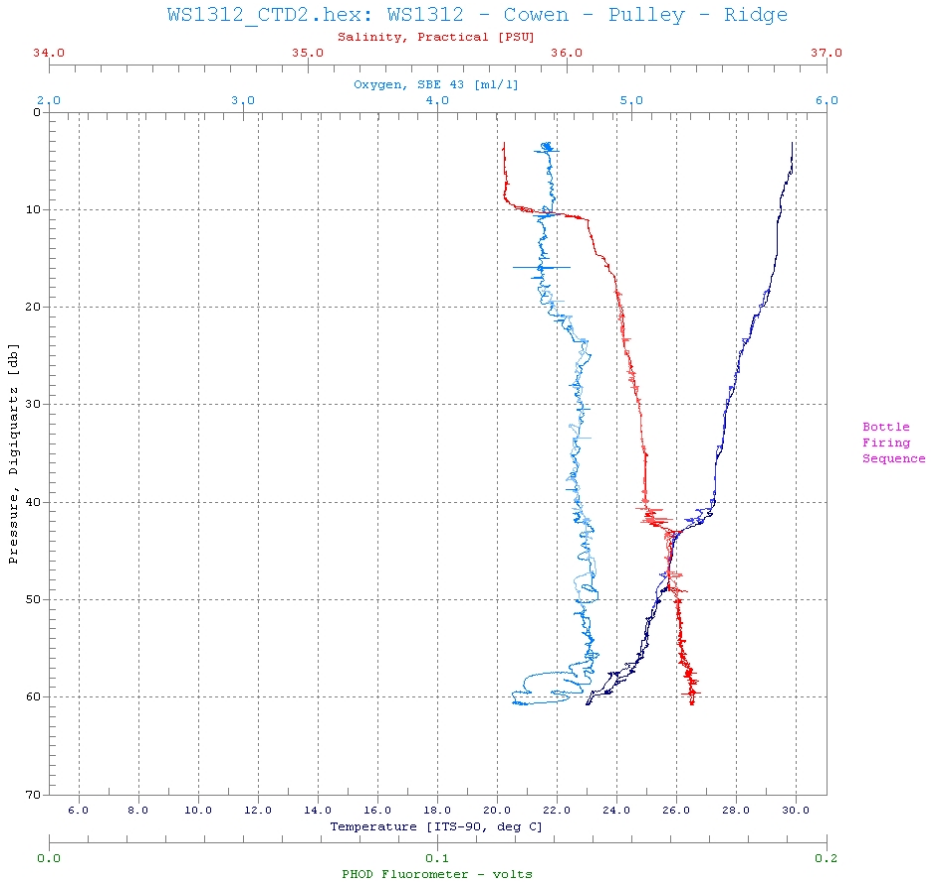
Dive Data:

Minimum Bottom Depth (m):	44	**Total Transect Length (km):**	1.561
Maximum Bottom Depth (m):	50	**Surface Current (kn):**	0.4
On Bottom (Time- GMT):	12:45	**On Bottom (Lat/Long):**	24.46°N; -82.99°W
Off Bottom (Time- GMT):	14:30	**Off Bottom (Lat/Long):**	24.47°N; -83°W

Physical (bottom); Temp (°C): **Salinity:** **Visibility (ft):** 30 **Current (kn):** 0.25

Physical Environment:

Distace from Dive site (km): 16.91



Shipboard CTD casts were made with the Sea-Bird 19. The ranges of the water column data recorded during CTD #2 are as follows: Depth Maximum: 60.4 m, Temperature: 23-29.9 °C, Conductivity: 52886-59316 (µS/cm), Pressure: 4.5-88.2 (PSI), Salinity: 35.7-36.5 (PSU), Sound Velocity: 1532-1546.2 (m/s), Oxygen Saturation: - (ml/l), Density: 1022.4-1025.3 (Kg/m^3), Nitrogen Saturation: 8.1-9.

Dive Site: Florida, East of South TER; Block 59, UNCW #2290, ROV 13-22

Dive Imagery:

Figure 1: -48.7 m
Sponges and algae on hardbottom

Figure 2: -42.2 m
Gorgonians on hardbottom

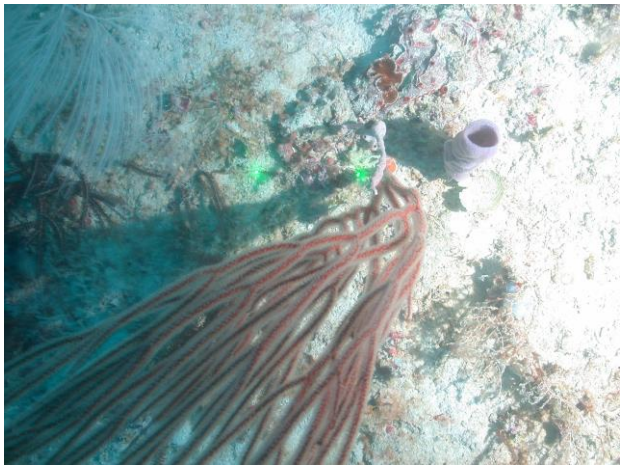


Figure 3: -42.2 m
Gorgonians on Hardbottom

Figure 4: -42.2 m
Gorgonians on soft bottom

Dive Site: Florida, East of South TER; Block 59, UNCW #2290, ROV 13-22

Dive Notes:

Objectives, Site Description, Habitat, Fauna:

Site/Objectives:
ROV 13-22, Site #- 23-VIII-13-3. Target Site -East of South TER; Block 59; UNCW #2290; Ground truth: NOAA Regional Bathymetric Chart: NOAA_Agassiz_Valley_IMG.img

ROV Setup/Dive Events:
Video time ESDT. Dive Notes depth were recorded as total depth (ROV altitude + ROV depth in meters). COG is ROV heading. Events, habitat and fauna were recorded directly into Access database. Fish data were recorded by Harter in separate Access database which was added to the Access habitat database. Quantitative photos were taken every 30 seconds with a fixed digital camera (Scorpio Plus) pointing 90° down with parallel 10 cm green lasers, 1.5 m off the bottom. Video camera (standard digital) was angled ~ 20° forward looking with pair of 10 cm red lasers; second set of 3 green lasers were not used. GoPro (black) high definition video camera (setting- 1080/30p) was attached video bar on ROV (with only a single small battery). Video 1 seconds slower than EDST. The ship's Knudsen depth finder reads 3 m shallower than the ROV bottom depth.

Five 100-m random transects were made to characterize each randomly selected 1 km x 1 km block. Each 100 m transect was conducted at ~0.25 kn at an altitude of <1 m, for 15-20 minutes until the ROV passed through a 100-m circle overlaid on the navigation screen; quantitative still images were taken every ~20 sec. Off transects between the photo transects were 10-15 minutes. Heading of transects were determined by flip of coin, depending in part on ship's maneuverability due to wind/current.

Site Description/Habitat/Biota:
The NOAA Bathy chart shows a contours of 44-48 m bathy lines indicating a sloping edge from the N to the S in Block 59. Contours of the bathy chart were 3 m shallower then ROV depth.

Five transects were conducted in Block 59, starting at SE corner. The five transects ranged from 45 to 49.75 m depth.
XS 1: HD SW, flat bottom soft sediment, with 10-20% rubble/cobble and small 1-2 m patch reefs, flat, low rugosity. Dense Rhodophyta: Kallymenia- perforated red blade, Chlorophyta- Dictyosphaeria? - bubble mat, Didemnidae, Aplysina cauliformis, Callyspongia plicifera Start: 12:48:07 PM, 48.5 m; end 1:01:49 PM, 49.2 m.
Off Transect: SW for 10 min .75kts.
XS 2: HD S: crossing contour of NOAA chart which is the 46 m line, ROV depth 46 m. Flat bottom soft sediment, with 10-30 % rock rubble/cobble and small 1-2 m patch reefs, flat, low rugosity. Rhodophyta: Kallymenia and branching Demosponges, Rhodophyta- red branching bushy. Habitat changes to sand/rubble Start: 1:12:13 PM, 49 m; end 1:24:13 PM, 50 m.
Off Transect: HD W, 10 min; dead vase sponges, Coral- Favia fragum.
XS 3: HD NW; flat, no slope, no relief, no rugosity, soft bottom, 10-30% sparse rubble/cobble, small 1-2 m patch reefs, sparse biota; same as XS. Start: 1:36:19 PM, 49.75 m; end 1:46:29 PM, 49.75 m.
Off Transect: HD N for 10 min. came across a 5 m diam patch reef with Coral- Montastraea cavernosa (1), 10-15 cm, healthy.
XS 4: HD NE, Hard bottom 50% cover, low relief patch reefs. Sponges and Gorgonians dominate; Plexaurella nutans - dense, X. muta 50 cm, Aplysina, Spheciospongia vesparium, I. campana; algae disappeared. Start: 1:56:51 PM, 45.5 m; end 2:07:25 PM, 43.5 m.
Off Transect: HD NW, 25 cm M. cavernosa, Pseudopterogorgia, Eunicia.

Dive Site: Florida, East of South TER; Block 59, UNCW #2290, ROV 13-22

XS 5: NE- 100% SB with occasional 1-2 m patch reefs; habitat turns to sand shell hash. Same biota on patch reefs. Start: 2:16:59 PM, 45.75 m; end 2:30:05 PM, 45.5 m.

Dominant Fish: bicolor damselfish- Stegastes partitus; yellowtail reef fish- Chromis enchrysurus; reef butterflyfish- Chaetodon sedentarius; orangeback bass- Serranus annularis; unid squirrelfish- Holocentrus sp.; chalk bass- Serranus tortugarum; tattler - Serranus phoebe

Dive Site: Florida, East of South TER; Block 59, UNCW #2290, ROV 13-22

CPCe Percent Cover Analysis:

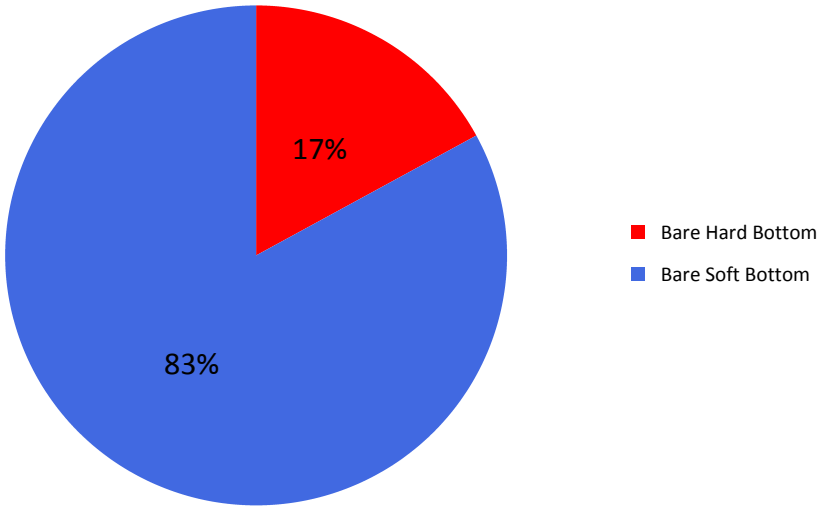
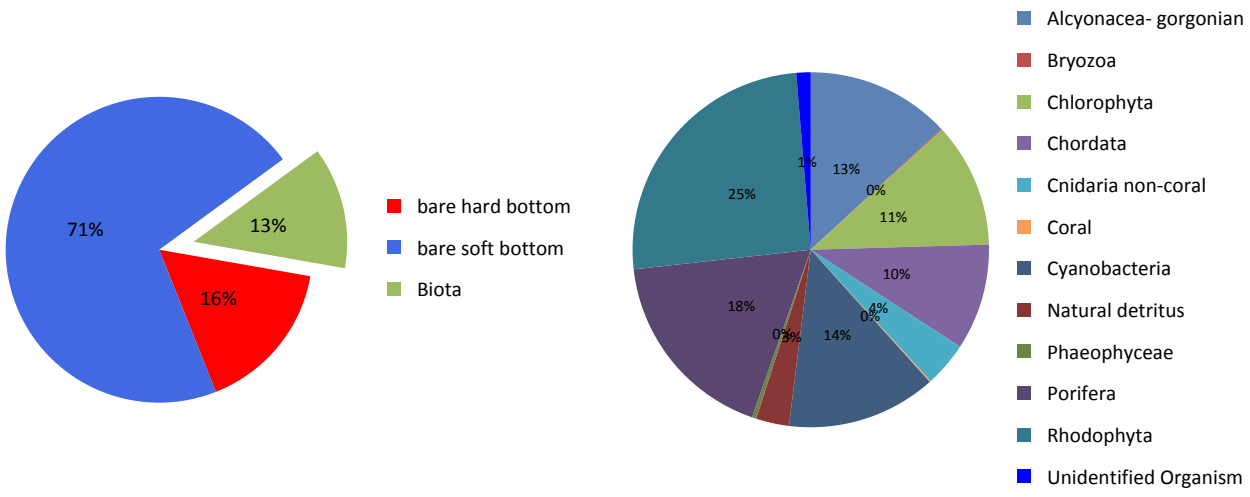


Figure 1. Percent cover of hard and soft bottom substrate at dive site 23-VIII-13-3. CPCe© points on organisms were scored as the underlying substrate (hard or soft).

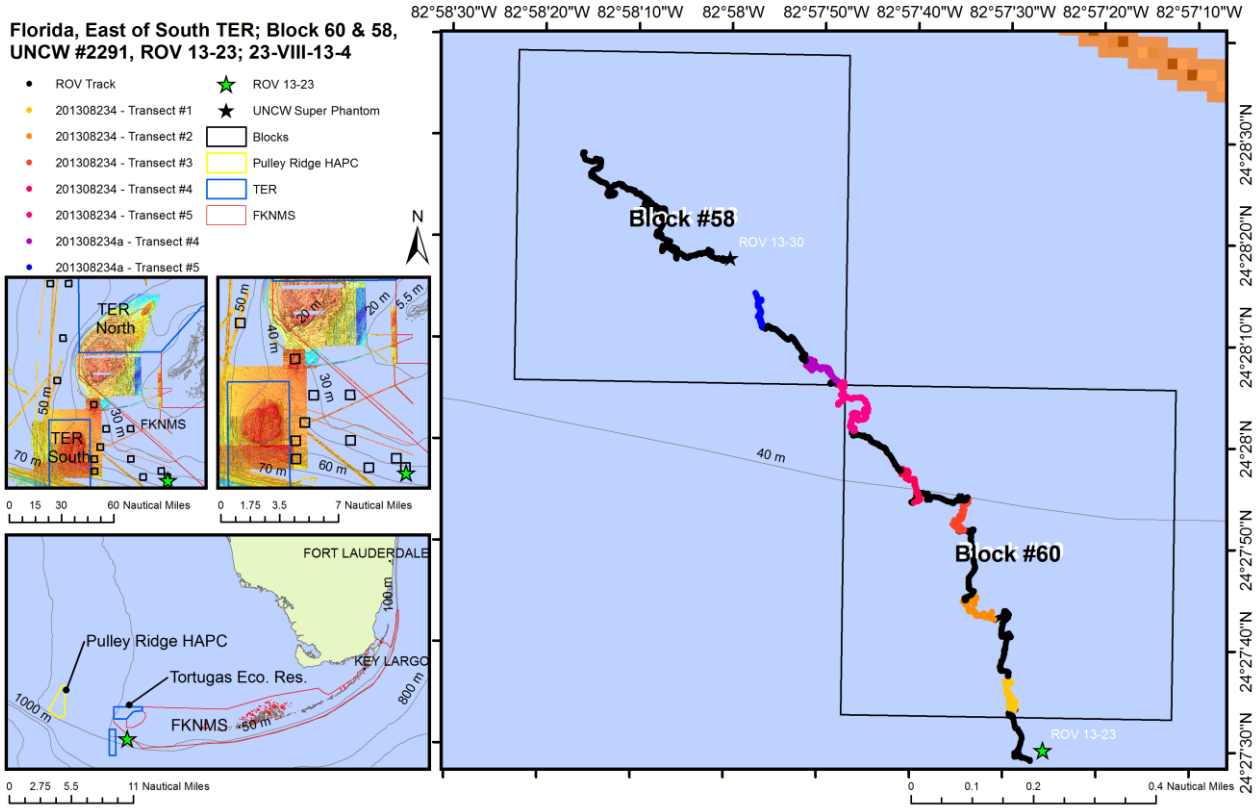


A B

Figure 2. Percent cover of bare substrate and benthic macro-biota at dive site 23-VIII-13-3. A. CPCe percent cover of biota and bare substrate (hard or soft bottom). B. CPCe percent cover of biota and human debris.

Dive Site: Florida, East of South TER; Block 60 & 58, UNCW #2291, ROV 13-23

General Location and Dive Track:



Site Overview:

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Scientific Observers:	Dennis Hanisak, Glenn Taylor, Jason White, John Reed, Lance Horne, Stacy Harter, Stephanie Farrington
Data Management:	Access Database
ROV Navigation Data:	Trackpoint II
Ship Position System:	
Report Analyst:	
Date Compiled:	12/15/2016

Dive Overview:

Vessel:	R/V F.G. Walton Smith; Cruise #: WS -13-12
Sonar Data:	None Available
Purpose:	
ROV:	UNCW Super Phantom
ROV Sensors:	No Sensors Used
Date of Dive:	8/23/2013
Specimens:	
Digital Photos:	234
DVD:	3
Hard Drive:	1

Dive Site: Florida, East of South TER; Block 60 & 58, UNCW #2291, ROV 13-23

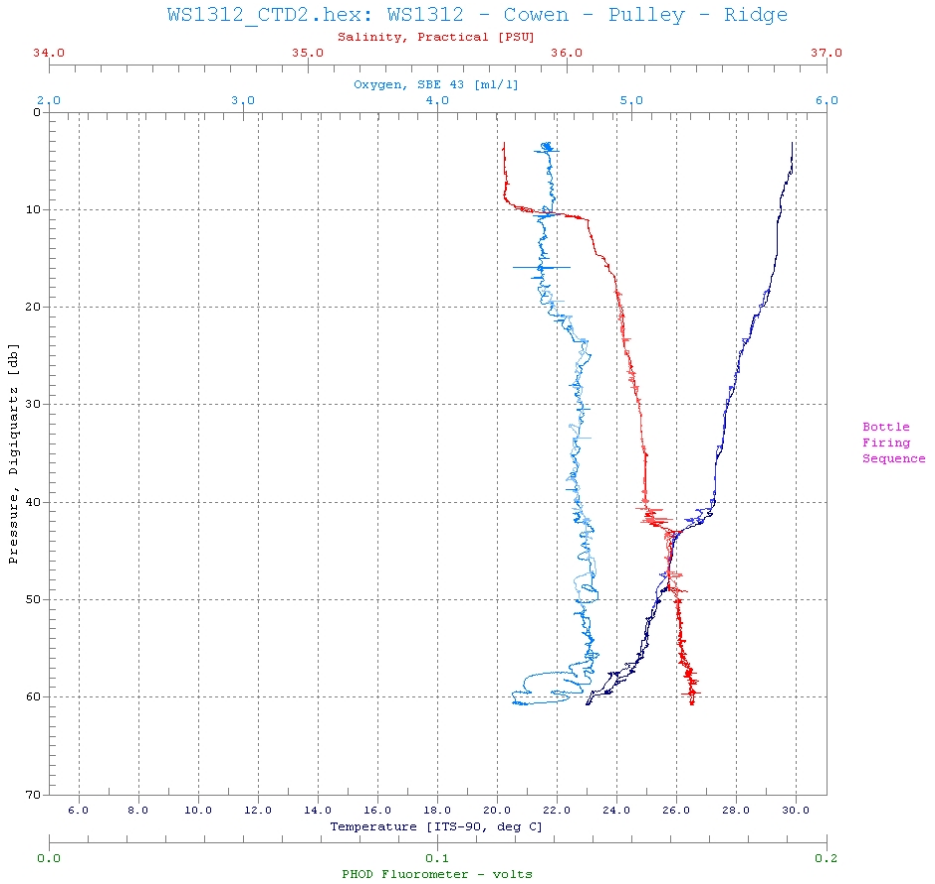
Dive Data:

Minimum Bottom Depth (m):	40	**Total Transect Length (km):**	2.574
Maximum Bottom Depth (m):	45	**Surface Current (kn):**	0.4
On Bottom (Time- GMT):	15:27	**On Bottom (Lat/Long):**	24.46°N; -82.96°W
Off Bottom (Time- GMT):	18:01	**Off Bottom (Lat/Long):**	24.47°N; -82.97°W

Physical (bottom); Temp (°C): **Salinity:** **Visibility (ft):** 15 **Current (kn):**

Physical Environment:

Distace from Dive site (km): 20.54



Shipboard CTD casts were made with the Sea-Bird 19. The ranges of the water column data recorded during CTD #2 are as follows: Depth Maximum: 60.4 m, Temperature: 23-29.9 °C, Conductivity: 52886-59316 (µS/cm), Pressure: 4.5-88.2 (PSI), Salinity: 35.7-36.5 (PSU), Sound Velocity: 1532-1546.2 (m/s), Oxygen Saturation: - (ml/l), Density: 1022.4-1025.3 (Kg/m^3), Nitrogen Saturation: 8.1-9.

Dive Site: Florida, East of South TER; Block 60 & 58, UNCW #2291, ROV 13-23

Dive Imagery:

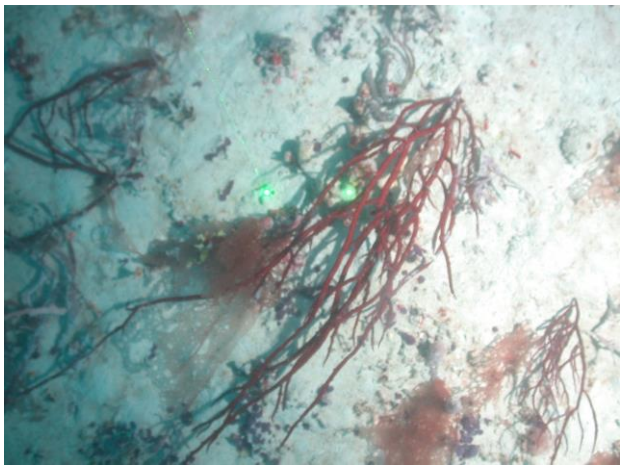


Figure 1: -42.8 m
Gorgonians on hardbottom

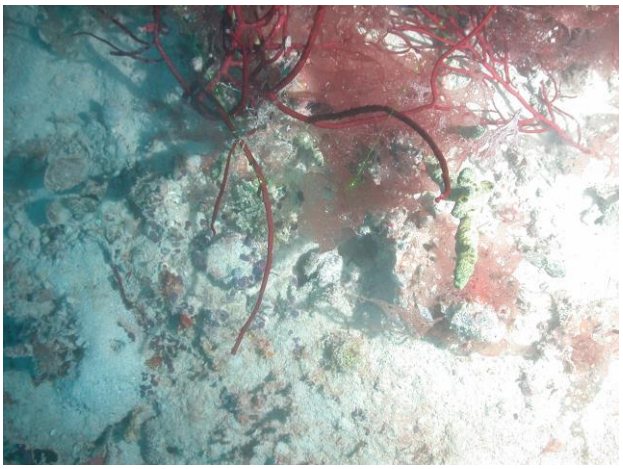


Figure 2: -41.2 m
Gorgonians and red algae on hardbottom

Dive Site: Florida, East of South TER; Block 60 & 58, UNCW #2291, ROV 13-23

Dive Notes:

Objectives, Site Description, Habitat, Fauna:

Site/Objectives:
ROV 13-23, Site #- 23-VIII-13-4. Target Site -East of South TER; Block 60 & 58; UNCW #2291; Ground truth: NOAA Regional Bathymetric Chart: NOAA_Agassiz_Valley_IMG.img

ROV Setup/Dive Events:
Video time ESDT. Dive Notes depth were recorded as total depth (ROV altitude + ROV depth in meters). COG is ROV heading. Events, habitat and fauna were recorded directly into Access database. Fish data were recorded by Harter in separate Access database which was added to the Access habitat database. Quantitative photos were taken every 30 seconds with a fixed digital camera (Scorpio Plus) pointing 90° down with parallel 10 cm green lasers, 1.5 m off the bottom. Video camera (standard digital) was angled ~ 20° forward looking with pair of 10 cm red lasers; second set of 3 green lasers were not used. GoPro (black) high definition video camera (setting- 1080/30p) was attached video bar on ROV. Video 1 seconds slower than EDST. The ship's Knudsen depth finder reads 3 m shallower than the ROV bottom depth.

Five 100-m random transects were made to characterize each randomly selected 1 km x 1 km block. Each 100 m transect was conducted at ~0.25 kn at an altitude of <1 m, for 15-20 minutes until the ROV passed through a 100-m circle overlaid on the navigation screen; quantitative still images were taken every ~20 sec. Off transects between the photo transects were 10-15 minutes. Heading of transects were determined by flip of coin, depending in part on ship's maneuverability due to wind/current.

Block 60:
Site Description/Habitat/Biota:
The NOAA Bathy chart shows a contours of 42 m bathy lines indicating a flat bottom in Block 60. Landed in NR-Block 632; flat sediment, with rubble and algae

Five transects were conducted in Block 60, starting at border and headed xx. The five transects ranged from xx to xx m depth. flat sediment, with rubble and algae

XS 1: HD N, Start: 3:34:29 PM, 44.5 m; end: 3:45:56 PM, 44 m. Flat bottom, 100% sediment, 5-10% rubble, patches of algae and sponges on rubble and cobble; Kallymenia, bushy red, Callyspongia plicifera, Spheciospongia vesparium.
Off Transect: HD N for 10 min; Ircinia campana, Haliclona rubens, Holopsamma; most of the sponges covered in Kallymenia; many dead Ircinia campana and Spheciospongia vesparium- smothered by algae?
XS 2: HD NW - Start: 3:57:06 PM, 43.5 m; end: 4:08:34 PM, 43.5 m. Flat bottom, 100% sediment, some rubble - patches of Kallymenia 10% cover. 1 red grouper and small pit. Changes to soft bottom - no biota.
Off Transect: HD N for 10 min: red grouper: 24°27.8214'N, 82°57.5556'W
XS 3: HD NE - Start: 4:19:36 PM; 42.75; End: 4:32:46 PM; 42 m; Flat bottom, 100% sediment, 5-20% cover of rubble, cobble, patchy rock with algae and sponges. Kallymenia, bushy red- Gracilaria?, Demospongiae- same as prior.
Off Transect: HD W for 10 min.
XS 4: HD N - Start: 4:41:30 PM, 42 m; end: 4:54:37 PM, 42 m. Flat bottom, 100% sediment, some1-20% rubble, sparse - 0.25 m relief rock outcrops, with Kallymenia, bushy red- Gracilaria?, Demospongiae- several dead I. campana; Coral- Siderastrea; ART - Panulirus argus, 1- red grouper -24°27.9590'N, 82°57.6832'W.
Off Transect: HD NW
XS 5: HD N: Start: 5:04:47 PM, 41.5 m; end: 5:20:21 PM, 41 m. Flat bottom, 100% flat sediment with 1-20%

cover of rubble and small patches of cobble; encrusted with red algae and sponges; Kallymenia, same biota; 1- red grouper -24°28.0573'N, 82°57.7465'W.

Off Transect: HD NW to SE corner of adjacent Block 58.

Block 58

The NOAA Bathy chart shows a contours of 32 - 38 m bathy lines and possible mound on the NE corner of Block 58. Bathy chart shifted; ROV depth >3 m than the NOAA chart contours. Conducted two transects- then ran out of time.

XS 1: HD NW: Start: 5:29:59 PM, 41 m; end: 5:41:51 PM, 41 m. Flat bottom, no relief, no rugosity, 100% sediment, 1-10% cover of rubble and cobble, and 1 m rubble piles with algae and sponges; Kallymenia, Spheciospongia vesparium, Aplysina rope sponges, Niphates erecta, 1 lobster.

Off Transect: HD NW 10 min; 1 lionfish.

XS 2: HD NW: Start: 5:49:42 PM, 40.75 m; end: 6:01:11 PM, 40 m. Flat bottom, no relief, no rugosity; same habitat and biota as previous XS; Several dead Spheciospongia vesparium and Ircinia campana; Demospongiae: Clathreidae?- bushy red.

End of dive - no more time.

Dominant Fish: yellowtail reef fish- Chromis enchrysurus; tattler - Serranus phoebe; bicolor damselfish- Stegastes partitus; reef butterflyfish- Chaetodon sedentarius; unid wrasse- Halichoeres sp.

Dive Site: Florida, East of South TER; Block 60 & 58, UNCW #2291, ROV 13-23

CPCe Percent Cover Analysis:

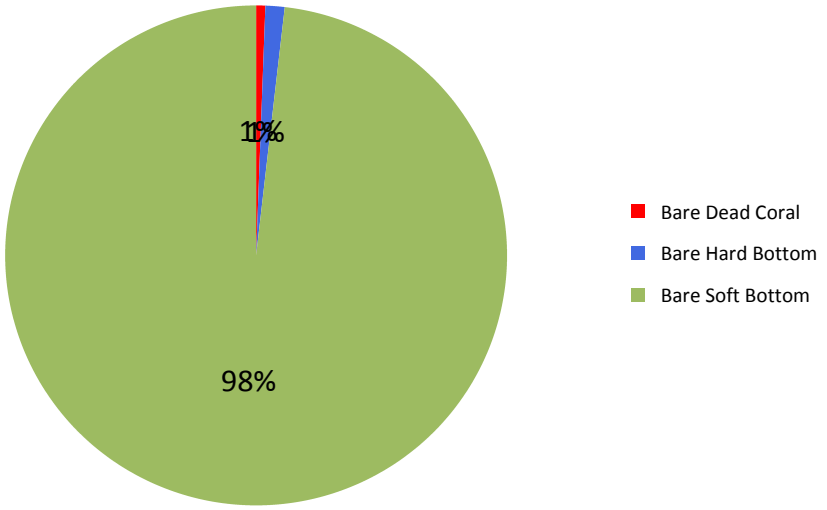
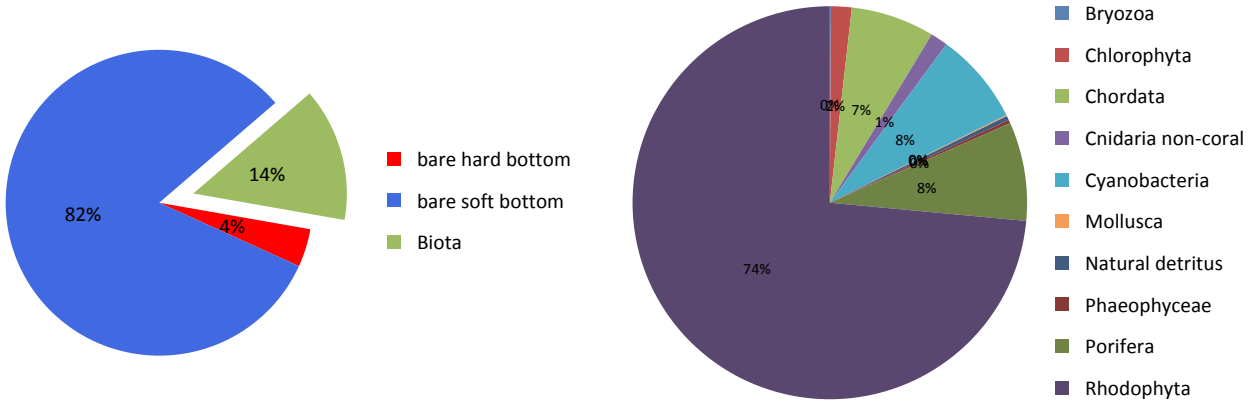


Figure 1. Percent cover of hard and soft bottom substrate at dive site 23-VIII-13-4. CPCe© points on organisms were scored as the underlying substrate (hard or soft).

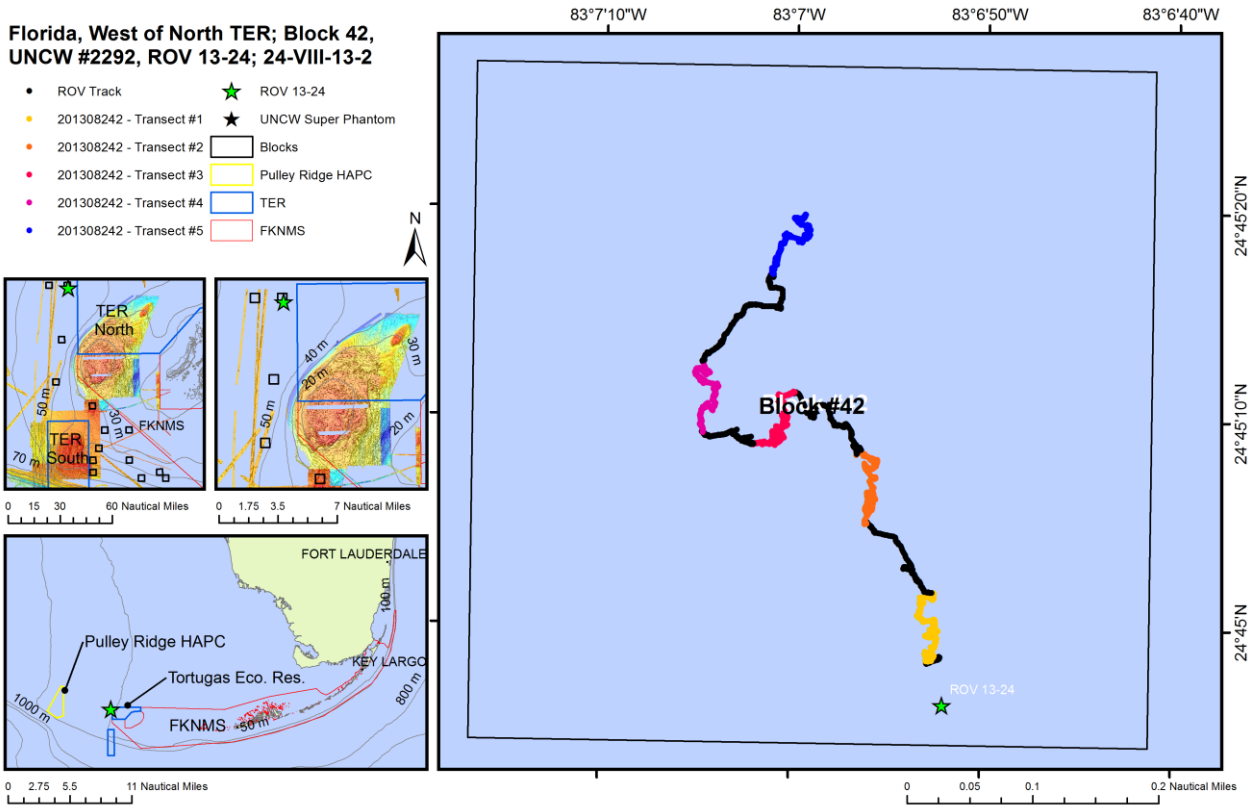


A B

Figure 2. Percent cover of bare substrate and benthic macro-biota at dive site 23-VIII-13-4. A. CPCe percent cover of biota and bare substrate (hard or soft bottom). B. CPCe percent cover of biota and human debris.

Dive Site: Florida, West of North TER; Block 42, UNCW #2292, ROV 13-24

General Location and Dive Track:



Site Overview:

Project:	University of Miami Pulley Ridge
Principal Investator:	Dennis Hanisak
PI Contact Info:	5600 U.S. 1, North, Fort Pierce, FL 34946
Website:	http://oceanexplorer.noaa.gov/explorations/13pulleyridge/welcome.html
Scientific Observers:	Dennis Hanisak, Glenn Taylor, Jason White, John Reed, Lance Horne, Stacy Harter, Stephanie Farrington
Data Management:	Access Database
ROV Navigation Data:	Trackpoint II
Ship Position System:	
Report Analyst:	
Date Compiled:	12/15/2016

Dive Overview:

Vessel:	R/V F.G. Walton Smith; Cruise #: WS -13-12
Sonar Data:	None Available
Purpose:	
ROV:	UNCW Super Phantom
ROV Sensors:	No Sensors Used
Date of Dive:	8/24/2013
Specimens:	
Digital Photos:	180
DVD:	2
Hard Drive:	1

Dive Site: Florida, West of North TER; Block 42, UNCW #2292, ROV 13-24

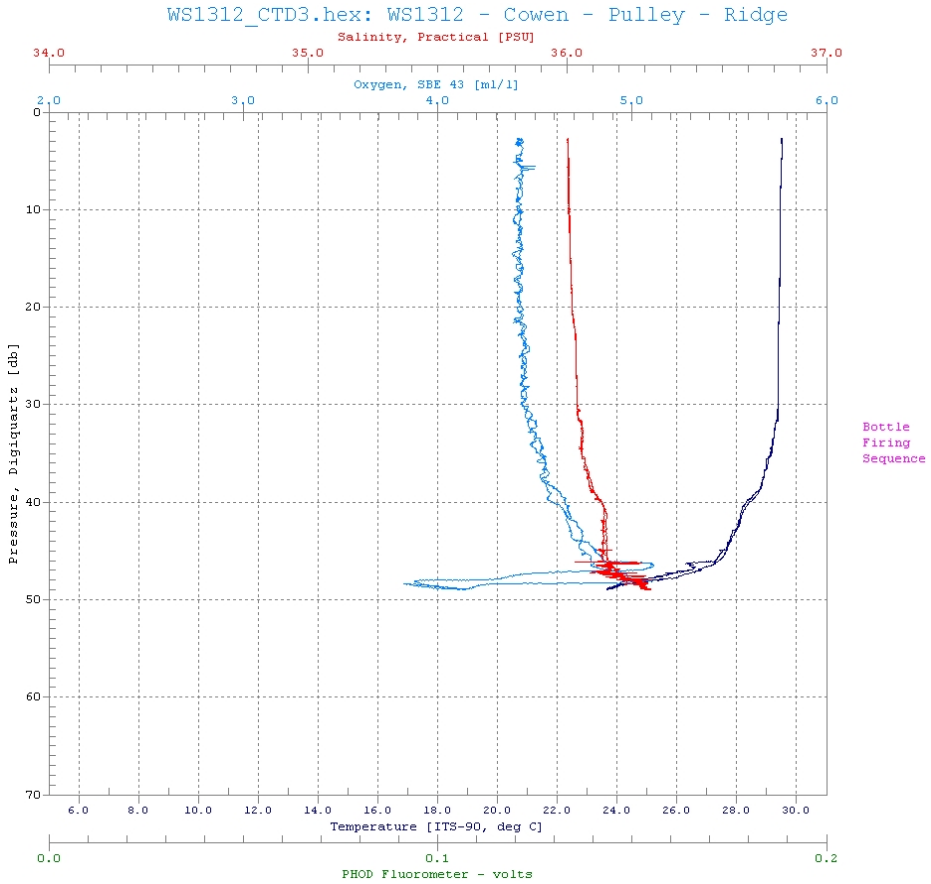
Dive Data:

Minimum Bottom Depth (m):	46	**Total Transect Length (km):**	1.379
Maximum Bottom Depth (m):	57	**Surface Current (kn):**	0.6
On Bottom (Time- GMT):	12:48	**On Bottom (Lat/Long):**	24.75°N; -83.11°W
Off Bottom (Time- GMT):	14:43	**Off Bottom (Lat/Long):**	24.76°N; -83.12°W

Physical (bottom); Temp (°C): **Salinity:** **Visibility (ft):** 30 **Current (kn):**

Physical Environment:

Distace from Dive site (km): 3.69



Shipboard CTD casts were made with the Sea-Bird 19. The ranges of the water column data recorded during CTD #3 are as follows: Depth Maximum: 48.6 m, Temperature: 23.7-29.5 °C, Conductivity: 53420-59304 (µS/cm), Pressure: 4-71 (PSI), Salinity: 36-36.3 (PSU), Sound Velocity: 1533.4-1545.9 (m/s), Oxygen Saturation: - (ml/l), Density: 1022.7-1025 (Kg/m³), Nitrogen Saturation: 8.2-8.9.

Dive Site: Florida, West of North TER; Block 42, UNCW #2292, ROV 13-24

Dive Imagery:

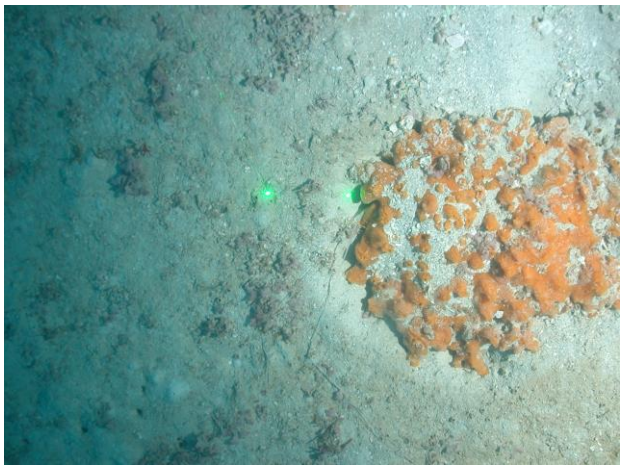


Figure 1: -54.7 m
Sponge on soft bottom

Figure 2: -55.5 m
Sea star on soft bottom

Dive Site: Florida, West of North TER; Block 42, UNCW #2292, ROV 13-24

Dive Notes:

Objectives, Site Description, Habitat, Fauna:

Site/Objectives:
ROV 13-24, Site #- 24-VIII-13-2. Target Site -West of North TER; Block 42; UNCW #2292; Ground truth: NOAA Regional Bathymetric Chart: NOAA_Tortugas_Bank.TIF

ROV Setup/Dive Events:
Video time ESDT. Dive Notes depth were recorded as total depth (ROV altitude + ROV depth in meters). COG is ROV heading. Events, habitat and fauna were recorded directly into Access database. Fish data were recorded by Harter in separate Access database which was added to the Access habitat database. Quantitative photos were taken every 30 seconds with a fixed digital camera (Scorpio Plus) pointing 90° down with parallel 10 cm green lasers, 1.5 m off the bottom. Video camera (standard digital) was angled ~ 20° forward looking with pair of 10 cm red lasers; second set of 3 green lasers were not used. GoPro (black) high definition video camera (setting- 1080/30p) was attached video bar on ROV. Database time set to ROV Nav and video time; ESDT. The ship's Knudsen depth finder reads 3 m shallower than the ROV bottom depth.

Five 100-m random transects were made to characterize each randomly selected 1 km x 1 km block. Each 100 m transect was conducted at ~0.25 kn at an altitude of <1 m, for 15-20 minutes until the ROV passed through a 100-m circle overlaid on the navigation screen; quantitative still images were taken every ~20 sec. Off transects between the photo transects were 10-15 minutes. Heading of transects were determined by flip of coin, depending in part on ship's maneuverability due to wind/current.

Site Description/Habitat/Biota:
The NOAA Bathy chart shows a flat bottom in Block 42.
Five transects were conducted in Block 42, starting at SE corner and headed N. The five transects ranged from 56.75 to 56.5 m depth.
On bottom, 100% silty/fine sand sediment bottom with 10-30% cover of drift algae; Rhodophyta: Martensia pavonia.

XS 1: HD NW- Start: 12:50:38 PM, 56.75 m; end: 1:06:39 PM, 56.5 m. 100% sediment bottom with 1-30% cover of drift algae; Rhodophyta: Martensia pavonia; Eucidaris? Cidaroid urchins common; blue goby sediment burrows; Demospongiae: Forcepia/Lissodendoryx?- thick encrusting, lobate, bright orange in 30 cm patches- common. Many patches had either orange filefish or orange octopus associated.
Off Transect: HD NW: video of sea horse! At @ 1:09 pm.
XS 2: HD N- Start: 1:13:12 PM, 56.5 m; end: 1:28:51 PM, 56.7 m. 100% sediment bottom with 10-30% cover of drift algae; moderate bioturbation; Rhodophyta: Martensia pavonia; Corallimorpharia; Cerianthidae; Octopus; Luidia; Hippoporidra.
Off Transect: HD NW 10 min; good video of octopus; Siliquaria encrusted dark red branching sponge.
XS 3: HD SW: Start: 1:38:15 PM, 56.5 m; end: 2:03:23 PM, 56.7 m. 100% sediment, flat; Demospongiae: Forcepia/Lissodendoryx?; Blue goby sediment burrows; urchins, calico scallops in a pile.
Off Transect: HD W for 10 minutes: Octopus, 2' slipper lobsters HOPPING on the bottom; Portunidae
XS 4: HD N Start: 2:09:47 PM, 56.7 m; end: 2:22:27 PM, 56.7m. 100% sediment, flat; slipper lobster; Corallimorpharia; same biota.
Off Transect: HD NE for 10 min; Martensia pavonia; Callyspongia? Sp. Cluster of tubes w/ zoanthids.
XS 5: HD NE Start: 2:31:22 PM, 56.7 m; end: 2:43:51 PM, 56.7 m. 100% sediment, flat; same habitat and biota but not as dense.

Dive Site: Florida, West of North TER; Block 42, UNCW #2292, ROV 13-24

Dominant Fish: blue goby - Ptereleotris calliura; flounder - Bothidae; filefish - Monacanthus sp.; lizardfish- Synodus sp.; sand perch - Diplectrum formosum

Dive Site: Florida, West of North TER; Block 42, UNCW #2292, ROV 13-24

CPCe Percent Cover Analysis:

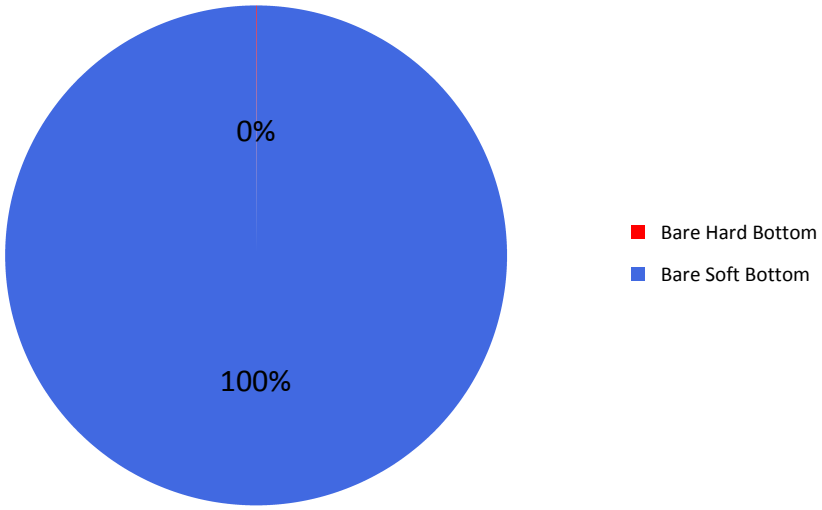
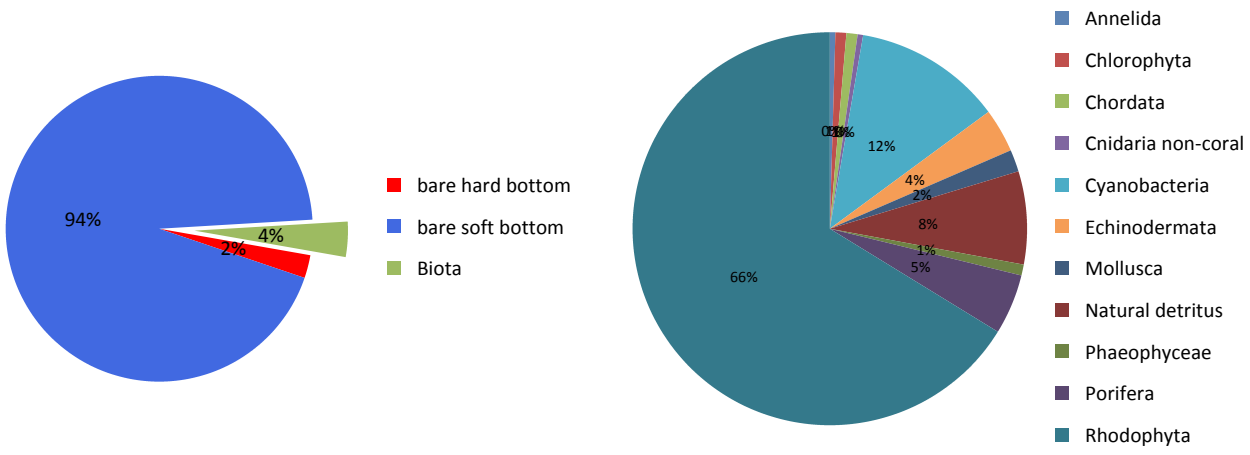


Figure 1. Percent cover of hard and soft bottom substrate at dive site 24-VIII-13-2. CPCe© points on organisms were scored as the underlying substrate (hard or soft).

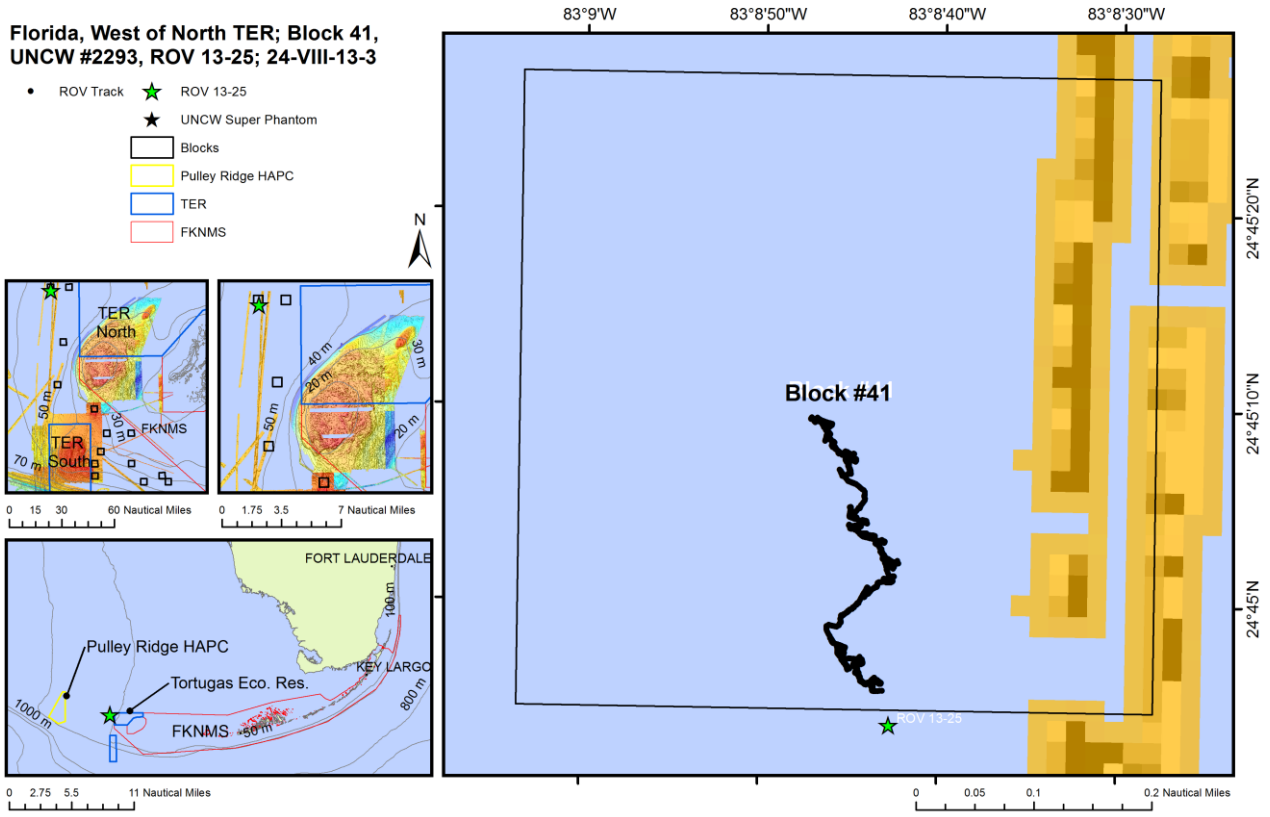


A B

Figure 2. Percent cover of bare substrate and benthic macro-biota at dive site 24-VIII-13-2. A. CPCe percent cover of biota and bare substrate (hard or soft bottom). B. CPCe percent cover of biota and human debris.

Dive Site: Florida, West of North TER; Block 41, UNCW #2293, ROV 13-25

General Location and Dive Track:



Site Overview:

Project:	University of Miami Pulley Ridge
Principal Investator:	Dennis Hanisak
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Data Management:	Access Database
ROV Navigation Data:	Trackpoint II
Ship Position System:	
Report Analyst:	
Date Compiled:	12/15/2016

Dive Overview:

Vessel:	R/V F.G. Walton Smith; Cruise #: WS -13-12
Sonar Data:	None Available
Purpose:	
ROV:	UNCW Super Phantom
ROV Sensors:	No Sensors Used
Date of Dive:	8/24/2013
Specimens:	
Digital Photos:	100
DVD:	1
Hard Drive:	1

Dive Site: Florida, West of North TER; Block 41, UNCW #2293, ROV 13-25

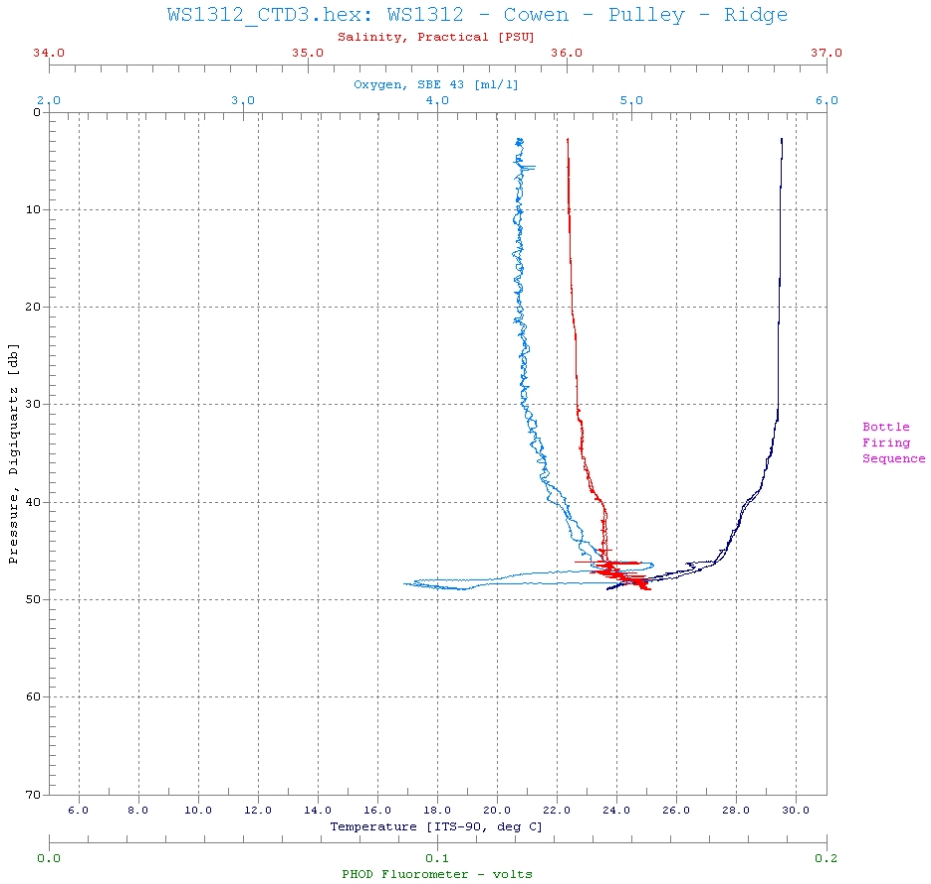
Dive Data:

Minimum Bottom Depth (m):	58	**Total Transect Length (km):**	0.746
Maximum Bottom Depth (m):	58	**Surface Current (kn):**	0.5
On Bottom (Time- GMT):	15:30	**On Bottom (Lat/Long):**	24.75°N; -83.15°W
Off Bottom (Time- GMT):	16:30	**Off Bottom (Lat/Long):**	24.75°N; -83.15°W

Physical (bottom); Temp (°C): **Salinity:** **Visibility (ft):** **Current (kn):**

Physical Environment:

Distace from Dive site (km): 5.97



Shipboard CTD casts were made with the Sea-Bird 19. The ranges of the water column data recorded during CTD #3 are as follows: Depth Maximum: 48.6 m, Temperature: 23.7-29.5 °C, Conductivity: 53420-59304 (µS/cm), Pressure: 4-71 (PSI), Salinity: 36-36.3 (PSU), Sound Velocity: 1533.4-1545.9 (m/s), Oxygen Saturation: - (ml/l), Density: 1022.7-1025 (Kg/m³), Nitrogen Saturation: 8.2-8.9.

Dive Site: Florida, West of North TER; Block 41, UNCW #2293, ROV 13-25

Dive Imagery:

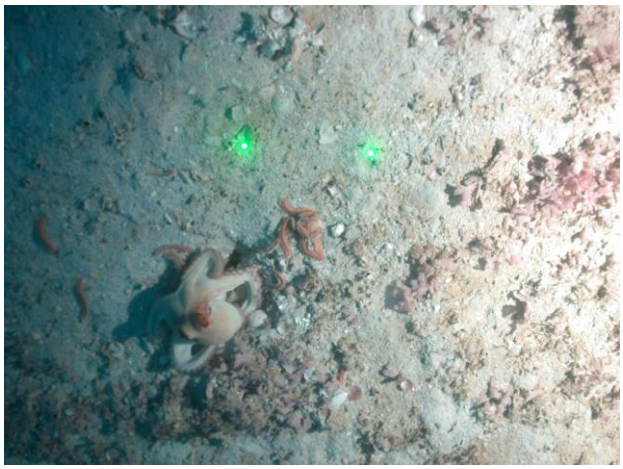


Figure 1: -57 m
Octopus on soft bottom

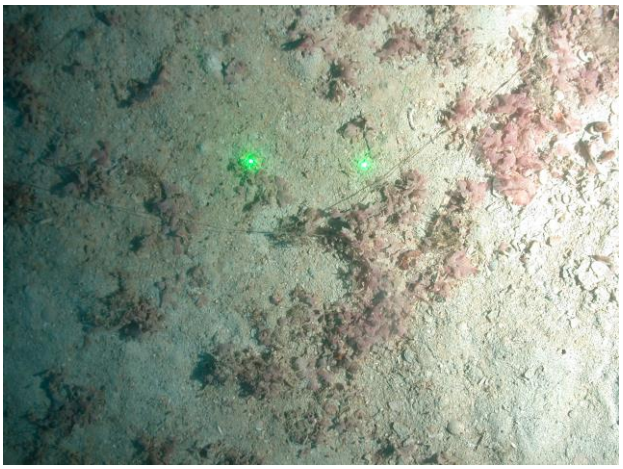


Figure 2: -57 m
Martensia on soft bottom

Dive Site: Florida, West of North TER; Block 41, UNCW #2293, ROV 13-25

Dive Notes:

Objectives, Site Description, Habitat, Fauna:

Site/Objectives:
ROV 13-25, Site #- 24-VIII-13-3. Target Site -West of North TER; Block 41; UNCW #2293; Ground truth: NOAA Regional Bathymetric Chart: NOAA_Tortugas_Bank.TIF

ROV Setup/Dive Events:
Video time ESDT. Dive Notes depth were recorded as total depth (ROV altitude + ROV depth in meters). COG is ROV heading. Events, habitat and fauna were recorded directly into Access database. Fish data were recorded by Harter in separate Access database which was added to the Access habitat database. Quantitative photos were taken every 30 seconds with a fixed digital camera (Scorpio Plus) pointing 90° down with parallel 10 cm green lasers, 1.5 m off the bottom. Video camera (standard digital) was angled ~ 20° forward looking with pair of 10 cm red lasers; second set of 3 green lasers were not used. GoPro (black) high definition video camera (setting- 1080/30p) was attached video bar on ROV. Database time set to ROV Nav and video time; ESDT. The ship's Knudsen depth finder reads 3 m shallower than the ROV bottom depth.

Three 100-m random transects were made to characterize each randomly selected 1 km x 1 km block. Each 100 m transect was conducted at ~0.25 kn at an altitude of <1 m, for 15-20 minutes until the ROV passed through a 100-m circle overlaid on the navigation screen; quantitative still images were taken every ~20 sec. Off transects between the photo transects were 10-15 minutes. Heading of transects were determined by flip of coin, depending in part on ship's maneuverability due to wind/current.

Site Description/Habitat/Biota:
The NOAA Bathy chart shows a flat bottom in Block 42. Only three transects were conducted due to time constraints.
Three transects were conducted in Block 42, starting at south border and headed N. The three transects ranged from 58 to 58.25 m depth. On bottom: 100 % silty/soft sediment, flat, no relief, low rugosity, moderate bioturbation, pits and 5-10 cm mounds.

XS 1: HD NW: Start: 3:32:42 PM, 58.25m; end: 3:47:24 PM, 58 m. 100 % silty/soft sediment, shell hash, flat, no relief, low rugosity, moderate bioturbation, pits and 5-10 cm mounds; Rhodophyta: Martensia pavonia, ART - Stenorhynchus seticornis, Echinoidea: Eucidaris?; Demospongiae- brown branching.
Off Transect: HD NE for 8 min; goby in 10 cm mounds; 2" slipper lobster hopping on bottom.
XS 2: HD NW: Start: 3:54:11 PM, 58m; end: 4:11:20 PM, 58 m. 100 % silty/soft sediment, flat, no relief, low rugosity, moderate bioturbation, pits and 3-5 cm mounds, some shell hash with algae; fairly barren; Luidia alternata, SED - burrow (Blue goby), Squid, Echinoidea: Cidaroidea; came across an octopus in a hole with 6-20 fire worms all around it- good video: Hermodice cucullata?
Off Transect: HD N for 8 min: Demospongiae- new, lumpy lobate; Ircinia campana.
XS 3: HD NW: Start: 4:17:45PM, 58.25 m; end: 4:30:59 PM, 58 m. 100 % silty/soft sediment, flat, no relief, low rugosity, moderate bioturbation, pits and 3-5 cm mounds, some shell hash with algae; Xestospongia muta, pipefish.
Unable to completer transects 4 and 5. Out of time - Have to pick up light traps 18 miles away before it gets dark.

Dominant Fish: blue goby - Ptereleotris calliura; flounder - Bothidae; sea robin - Triglidae; Bandtail puffer - Sphoeroides spengleri; filefish - Monacanthus sp.; lizardfish- Synodus sp.

Dive Site: Florida, West of North TER; Block 41, UNCW #2293, ROV 13-25

CPCe Percent Cover Analysis:

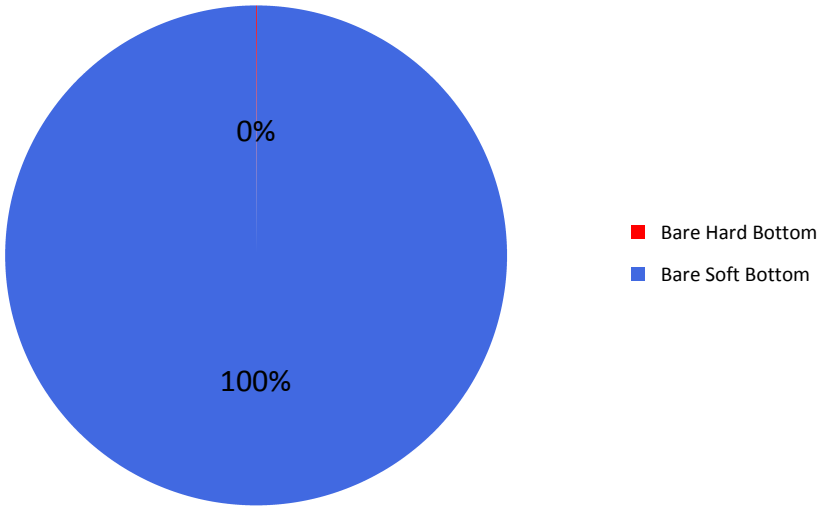
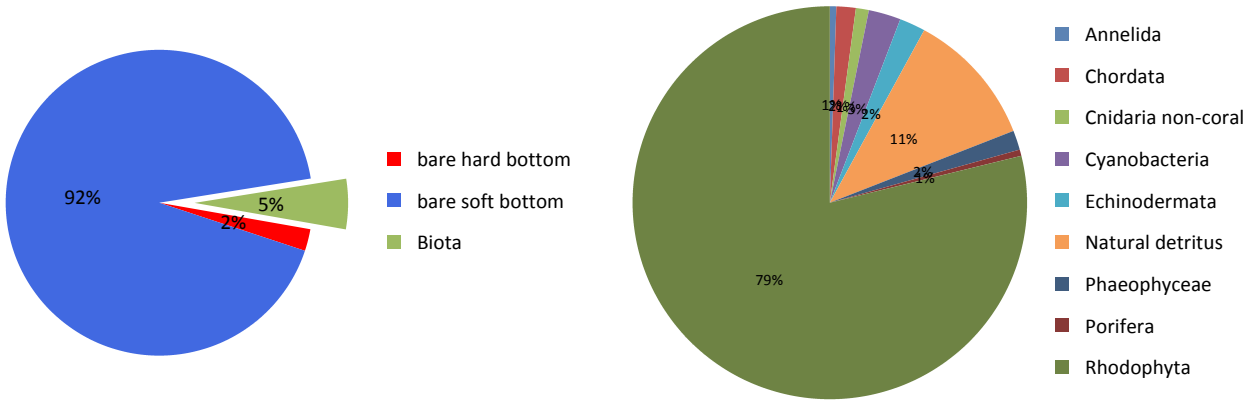


Figure 1. Percent cover of hard and soft bottom substrate at dive site 24-VIII-13-3. CPCe© points on organisms were scored as the underlying substrate (hard or soft).

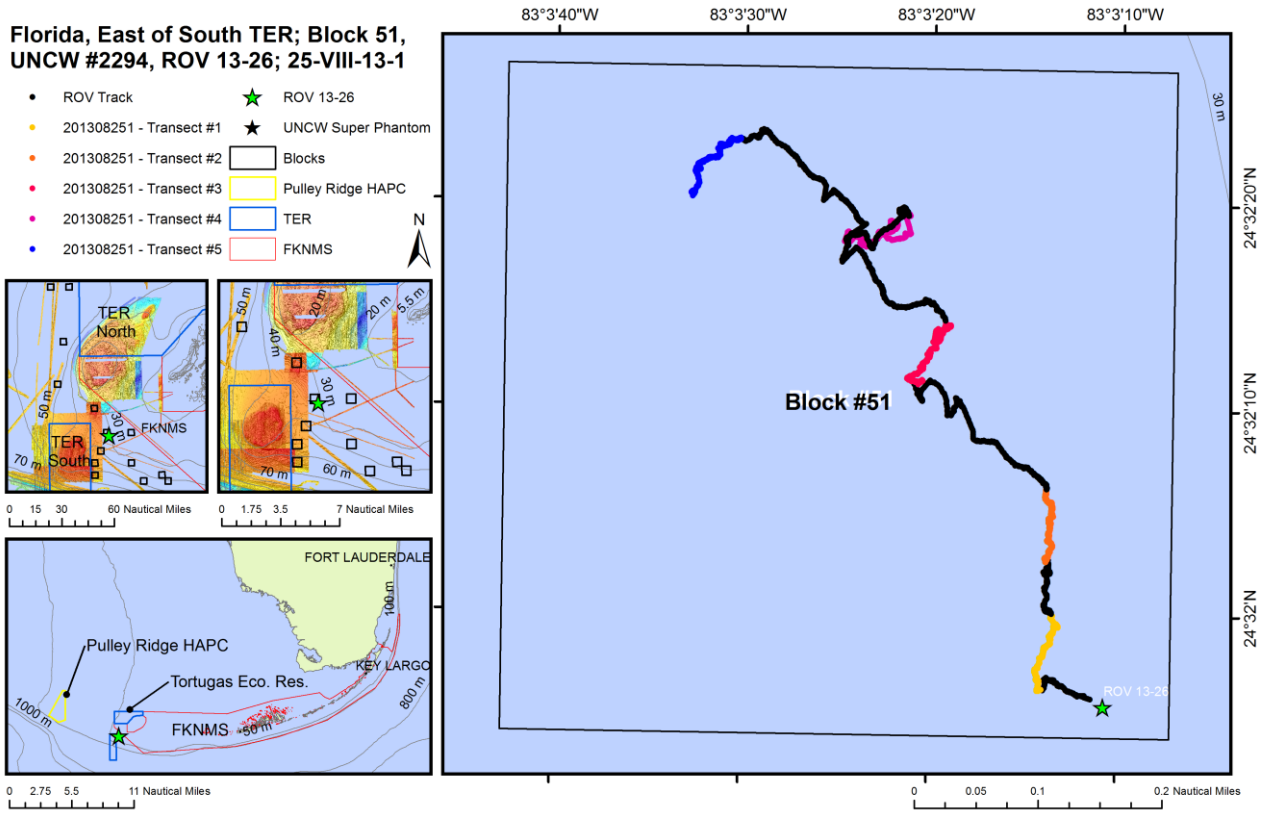


A B

Figure 2. Percent cover of bare substrate and benthic macro-biota at dive site 24-VIII-13-3. A. CPCe percent cover of biota and bare substrate (hard or soft bottom). B. CPCe percent cover of biota and human debris.

Dive Site: Florida, East of South TER; Block 51, UNCW #2294, ROV 13-26

General Location and Dive Track:



Site Overview:

Project:	University of Miami Pulley Ridge
Principal Investator:	Dennis Hanisak
PI Contact Info:	5600 U.S. 1, North, Fort Pierce, FL 34946
Website:	http://oceanexplorer.noaa.gov/explorations/13pulleyridge/welcome.html
Scientific Observers:	Dennis Hanisak, Glenn Taylor, Jason White, John Reed, Lance Horne, Stacy Harter, Stephanie Farrington
Data Management:	Access Database
ROV Navigation Data:	Trackpoint II
Ship Position System:	
Report Analyst:	
Date Compiled:	12/15/2016

Dive Overview:

Vessel:	R/V F.G. Walton Smith; Cruise #: WS -13-12
Sonar Data:	None Available
Purpose:	
ROV:	UNCW Super Phantom
ROV Sensors:	No Sensors Used
Date of Dive:	8/25/2013
Specimens:	
Digital Photos:	166
DVD:	3
Hard Drive:	1

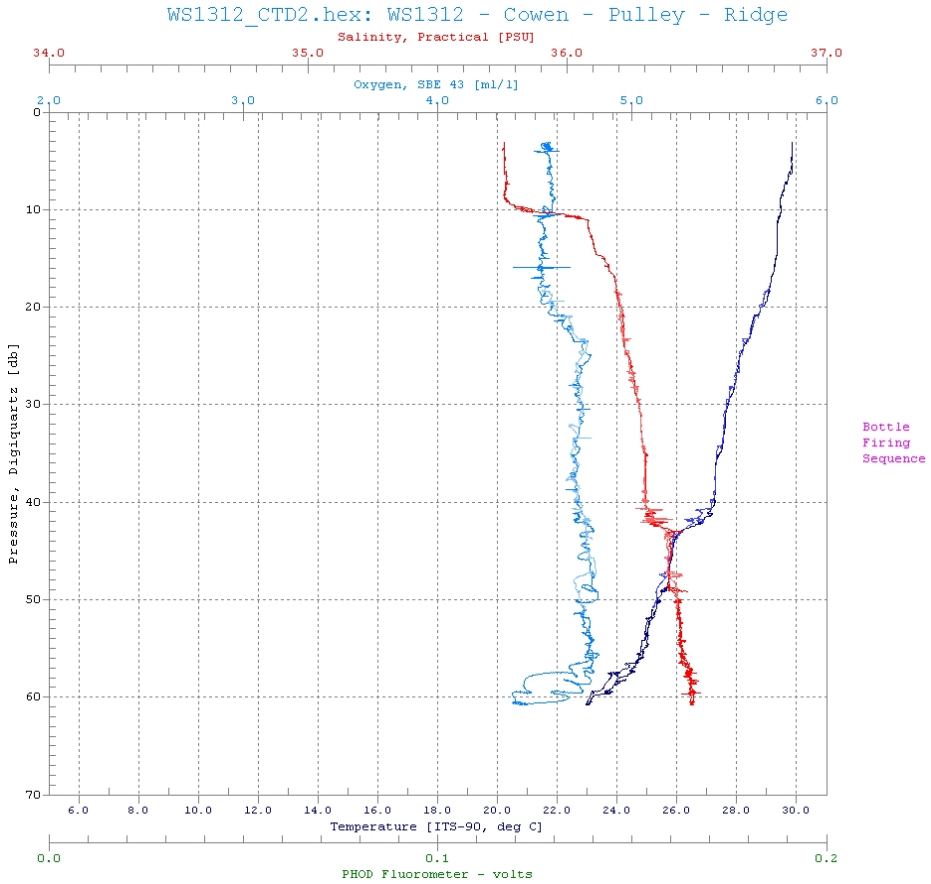
Dive Site: Florida, East of South TER; Block 51, UNCW #2294, ROV 13-26

Dive Data:

Minimum Bottom Depth (m):	32	**Total Transect Length (km):**	1.805				
Maximum Bottom Depth (m):	35	**Surface Current (kn):**	0.4				
On Bottom (Time- GMT):	10:19	**On Bottom (Lat/Long):**	24.53°N; -83.05°W				
Off Bottom (Time- GMT):	12:32	**Off Bottom (Lat/Long):**	24.54°N; -83.06°W				
Physical (bottom); Temp (°C):		**Salinity:**	**Visibility (ft):**	30	**Current (kn):**	0.25	

Physical Environment:

Distace from Dive site (km): 12.31



Shipboard CTD casts were made with the Sea-Bird 19. The ranges of the water column data recorded during CTD #2 are as follows: Depth Maximum: 60.4 m, Temperature: 23-29.9 °C, Conductivity: 52886-59316 (µS/cm), Pressure: 4.5-88.2 (PSI), Salinity: 35.7-36.5 (PSU), Sound Velocity: 1532-1546.2 (m/s), Oxygen Saturation: - (ml/l), Density: 1022.4-1025.3 (Kg/m^3), Nitrogen Saturation: 8.1-9.

Dive Site: Florida, East of South TER; Block 51, UNCW #2294, ROV 13-26

Dive Imagery:

Figure 1: -32.4 m
Callyspongia and gorgonians on hardbottom

Figure 2: -32 m
Gorgonian and sponges on hardbottom

Dive Site: Florida, East of South TER; Block 51, UNCW #2294, ROV 13-26

Dive Notes:

Objectives, Site Description, Habitat, Fauna:

Site/Objectives:
ROV 13-26, Site #- 25-VIII-13-1. Target Site -East of South TER; Block 51; UNCW #2294; Ground truth: NOAA Regional Bathymetric Chart: NOAA_Tortugas_Bank.TIF

ROV Setup/Dive Events:
Video time ESDT. Dive Notes depth were recorded as total depth (ROV altitude + ROV depth in meters). COG is ROV heading. Events, habitat and fauna were recorded directly into Access database. Fish data were recorded by Harter in separate Access database which was added to the Access habitat database. Quantitative photos were taken every 30 seconds with a fixed digital camera (Scorpio Plus) pointing 90° down with parallel 10 cm green lasers, 1.5 m off the bottom. Video camera (standard digital) was angled ~ 20° forward looking with pair of 10 cm red lasers; second set of 3 green lasers were not used. GoPro (unknown) high definition video camera (setting- 1080/30p) was attached video bar on ROV. Database time set to ROV Nav and video time; ESDT. The ship's Knudsen depth finder reads 3 m shallower than the ROV bottom depth.

Five 100-m random transects were made to characterize each randomly selected 1 km x 1 km block. Each 100 m transect was conducted at ~0.25 kn at an altitude of <1 m, for 15-20 minutes until the ROV passed through a 100-m circle overlaid on the navigation screen; quantitative still images were taken every ~20 sec. Off transects between the photo transects were 10-15 minutes. Heading of transects were determined by flip of coin, depending in part on ship's maneuverability due to wind/current.

Site Description/Habitat/Biota:
The NOAA Bathy chart shows 36-38 m bathy lines sloping from east to west in Block 51.
Five transects were conducted in Block 51, starting at SE corner and headed N. The five transects ranged from 34 to 35 m depth. On bottom: 100% sediment flat; moderate bioturbation; with Chlorophyta: Caulerpa and Cyanobacteria/Diatom cover.

XS 1: HD N; Start: 8/25/13 10:23:16 AM, 35 m; end: 10:38:14 AM, 35 m. 100% Soft bottom sand and sparse shell hash; dense cover of algae, crossing the NOAA chart we are crossing the 36 m, ROV at 35 m deep, ship fathometer 32 m. Flat, mild bioturbation; with Chlorophyta: Caulerpa prolifera, C. sertularioides and Cyanobacteria/Diatom cover, filamentous red; Eucidaris; Meoma trails.
Off Transect: HD N for 10 min, looking up close to ID stuff; 100% soft bottom, 60-80% cover of various algae species. Changed to patch reef at 10:48:04 AM.
XS 2: HD N: Start: 8/25/13 10:50 AM, 34.5 m; end: 11:05:49 AM, 34 m. Patch reef over entire transect; becomes more patchy (30-80%cover at 10:57; low relief, flat mod/high rugosity, < 0.5 m relief. Demosponges and Gorgonians dominate, dense X. muta, Aplysina hollow-tube, Axinella corregata, Aplysina cauliformis, I. campana; Plexaurella nutans, Pseudopterogorgia; Sargassum, Eudistoma; Bicolor damsels (abundant); Agaricia agaracites (1), Coral- Montastraea cavernosa (7; 10-30 cm, healthy). Good site for diver collections: 24°32.0517'N, 83°03.2249'W.
Off Transect: HD NW 10 min, large barracuda, patch reef ends at 24°32.1140'N, 83°03.2389'W; soft bottom, bioturbation; Coral- Montastraea cavernosa (1).
XS 3: HD NE: Start: 8/25/13 11:18:36 AM, 34.5 m; end: 11:33:48 AM, 34.75 m. 100% sediment with algae, flat. Same biota as T1; dense Cyanobacteria mats, Halimeda; Demospongiae: Dysidea etheria,
Off Transect: HD NW for 10 min: Mantis shrimp - Lysosquilla?
XS 4: HD E: Start: 8/25/13 11:42:58 AM, 34.5m; end: 11:57:49 AM, 34.75 m. Same habitat and biota as T2;

moderate bioturbation, barren except 80% cover Cyanobacteria and filamentous algae.
Off Transect: HD W for 10 min then NW for another 5 min. One small patch reef ~1 m wide with variety of sessile fauna.
XS 5: HD SW: Start: 8/25/13 12:15:42 PM, 34.5m; end: 12:32:17 PM, 34.75 m. 100% soft bottom, same habitat and biota as previous, Dysidea etheria, ALG - Chlorophyta: Caulerpa sertularioides, Caulerpa plicifera.

Dominant Fish: yellowtail reef fish- Chromis enchrysurus; unid wrasse- Halichoeres sp.; bicolor damselfish- Stegastes partitus; reef butterflyfish- Chaetodon sedentarius; razorfish - Xyrichtys sp.; sharpnose puffer- Canthigaster rostrata

Dive Site: Florida, East of South TER; Block 51, UNCW #2294, ROV 13-26

CPCe Percent Cover Analysis:

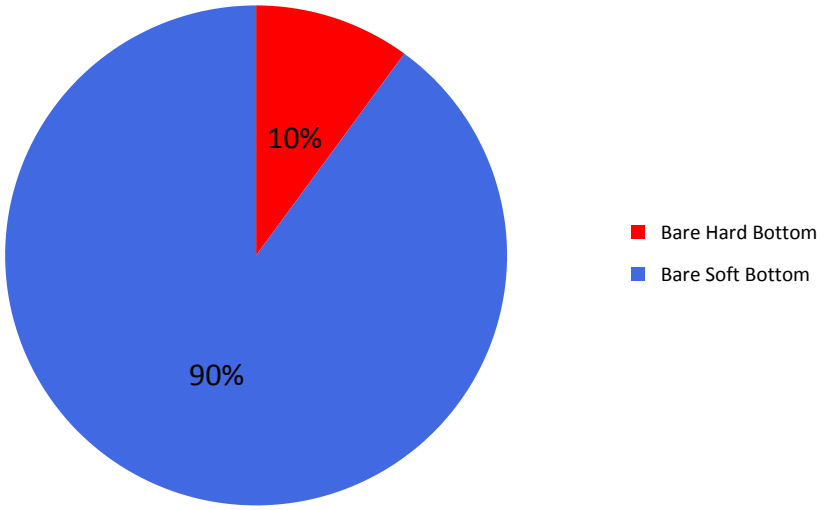
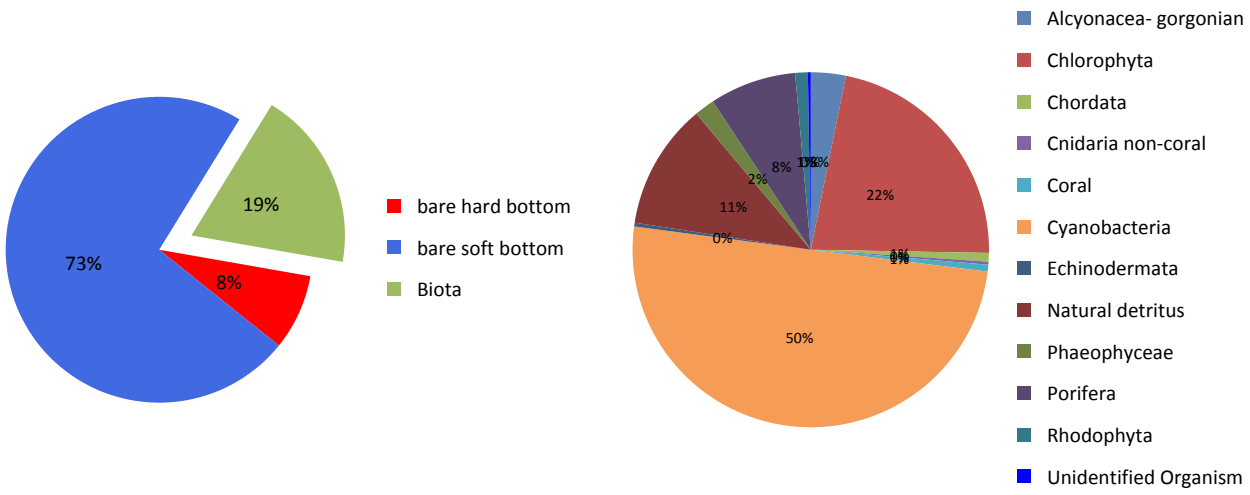


Figure 1. Percent cover of hard and soft bottom substrate at dive site 25-VIII-13-1. CPCe© points on organisms were scored as the underlying substrate (hard or soft).

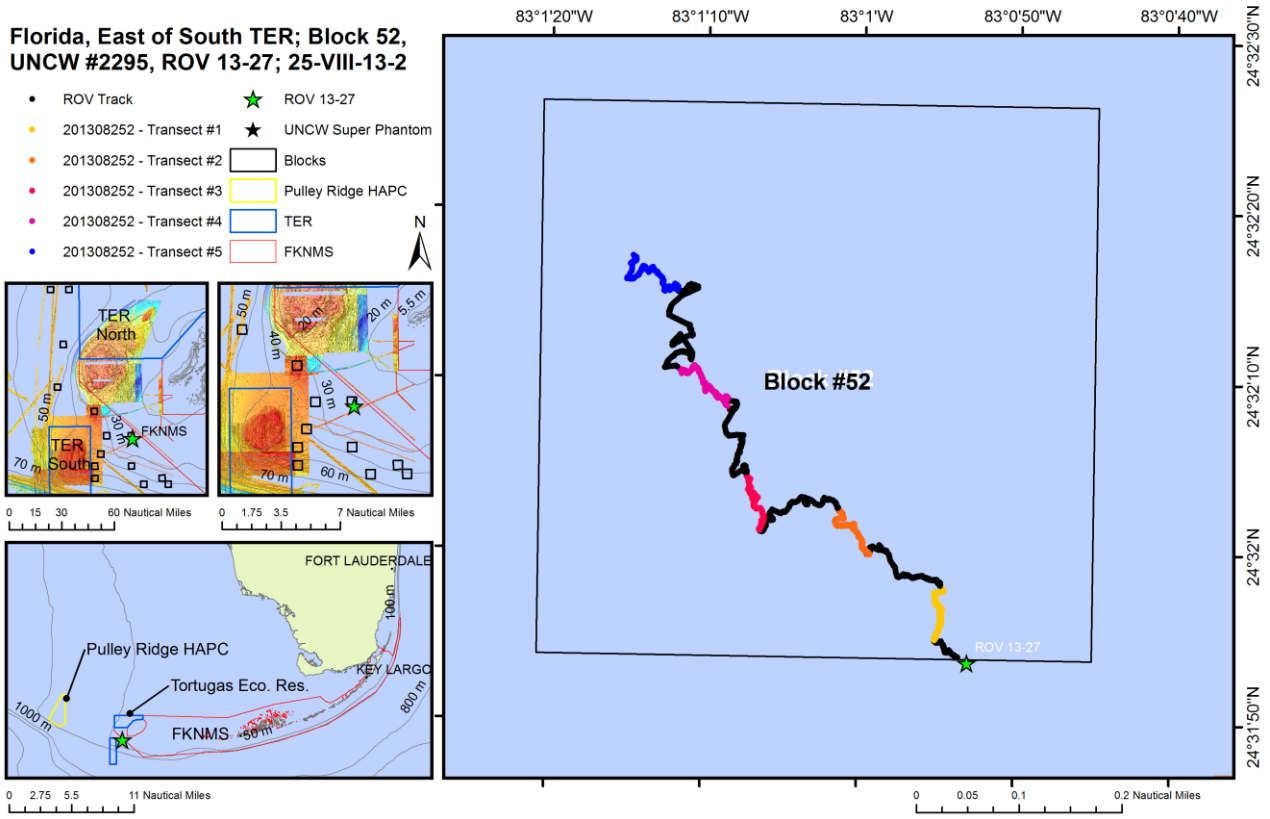


A B

Figure 2. Percent cover of bare substrate and benthic macro-biota at dive site 25-VIII-13-1. A. CPCe percent cover of biota and bare substrate (hard or soft bottom). B. CPCe percent cover of biota and human debris.

Dive Site: Florida, East of South TER; Block 52, UNCW #2295, ROV 13-27

General Location and Dive Track:



Site Overview:

Project:	University of Miami Pulley Ridge
Principal Investator:	Dennis Hanisak
PI Contact Info:	5600 U.S. 1, North, Fort Pierce, FL 34946
Website:	http://oceanexplorer.noaa.gov/explorations/13pulleyridge/welcome.html
Scientific Observers:	Dennis Hanisak, Glenn Taylor, Jason White, John Reed, Lance Horne, Stacy Harter, Stephanie Farrington
Data Management:	Access Database
ROV Navigation Data:	Trackpoint II
Ship Position System:	
Report Analyst:	
Date Compiled:	12/15/2016

Dive Overview:

Vessel:	R/V F.G. Walton Smith; Cruise #: WS -13-12
Sonar Data:	None Available
Purpose:	
ROV:	UNCW Super Phantom
ROV Sensors:	No Sensors Used
Date of Dive:	8/25/2013
Specimens:	2
Digital Photos:	166
DVD:	2
Hard Drive:	1

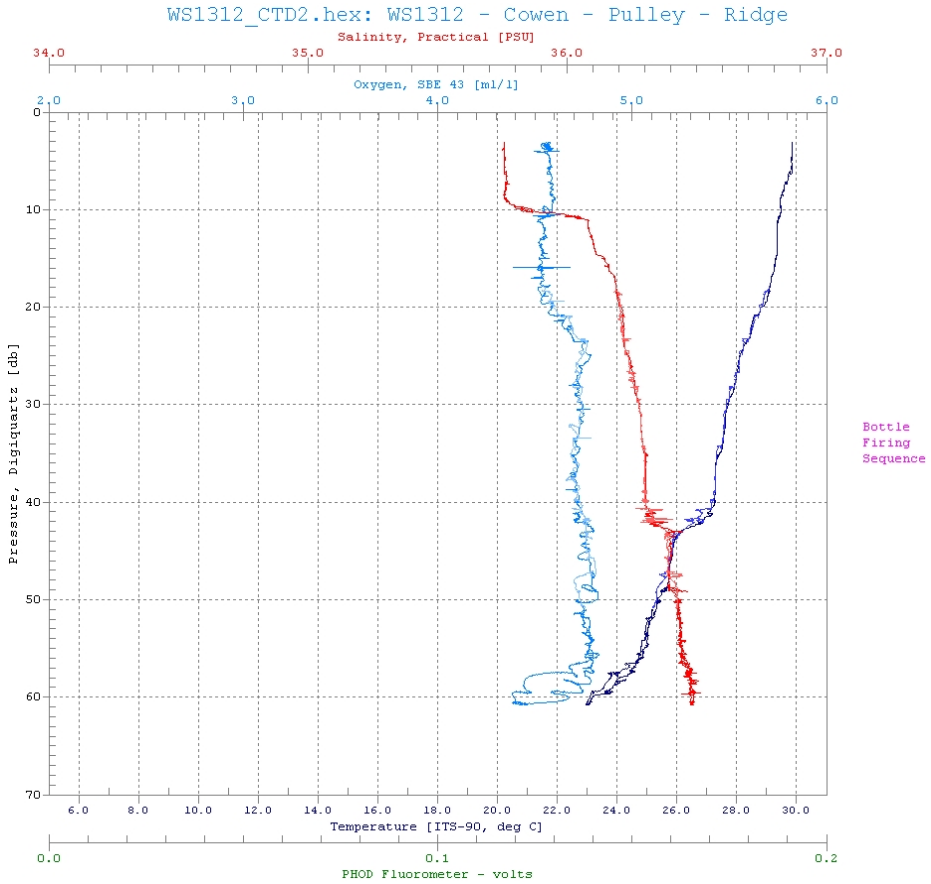
Dive Site: Florida, East of South TER; Block 52, UNCW #2295, ROV 13-27

Dive Data:

Minimum Bottom Depth (m):	29	**Total Transect Length (km):**	1.591
Maximum Bottom Depth (m):	34	**Surface Current (kn):**	0.3
On Bottom (Time- GMT):	13:23	**On Bottom (Lat/Long):**	24.53°N; -83.01°W
Off Bottom (Time- GMT):	15:23	**Off Bottom (Lat/Long):**	24.54°N; -83.02°W
Physical (bottom); Temp (°C):		**Salinity:**	**Visibility (ft):** 15 **Current (kn):**

Physical Environment:

Distace from Dive site (km): 15.77



Shipboard CTD casts were made with the Sea-Bird 19. The ranges of the water column data recorded during CTD #2 are as follows: Depth Maximum: 60.4 m, Temperature: 23-29.9 °C, Conductivity: 52886-59316 (µS/cm), Pressure: 4.5-88.2 (PSI), Salinity: 35.7-36.5 (PSU), Sound Velocity: 1532-1546.2 (m/s), Oxygen Saturation: - (ml/l), Density: 1022.4-1025.3 (Kg/m^3), Nitrogen Saturation: 8.1-9.

Dive Site: Florida, East of South TER; Block 52, UNCW #2295, ROV 13-27

Dive Imagery:

Figure 1: -28.7 m
Montastraea and sponges on reef

Figure 2: -28.1 m
Montastraea and sponges on reef

Figure 3: -30.8 m
Gorgonians and sponges on reef

Figure 4: -31.6 m
Gorgonian on hardbottom

Dive Site: Florida, East of South TER; Block 52, UNCW #2295, ROV 13-27

Dive Notes:

Objectives, Site Description, Habitat, Fauna:

Site/Objectives:
ROV 13-27, Site #- 25-VIII-13-2. Target Site -East of South TER; Block 52; UNCW #2295; Ground truth: NOAA Regional Bathymetric Chart: NOAA_Tortugas_Bank.TIF

ROV Setup/Dive Events:
Video time ESDT. Dive Notes depth were recorded as total depth (ROV altitude + ROV depth in meters). COG is ROV heading. Events, habitat and fauna were recorded directly into Access database. Fish data were recorded by Harter in separate Access database which was added to the Access habitat database. Quantitative photos were taken every 30 seconds with a fixed digital camera (Scorpio Plus) pointing 90° down with parallel 10 cm green lasers, 1.5 m off the bottom. Video camera (standard digital) was angled ~ 20° forward looking with pair of 10 cm red lasers; second set of 3 green lasers were not used. GoPro high definition video camera (setting- 1080/30p) was attached video bar on ROV. Database time set to ROV Nav and video time; ESDT. The ship's Knudsen depth finder reads 3 m shallower than the ROV bottom depth.

Five 100-m random transects were made to characterize each randomly selected 1 km x 1 km block. Each 100 m transect was conducted at ~0.25 kn at an altitude of <1 m, for 15-20 minutes until the ROV passed through a 100-m circle overlaid on the navigation screen; quantitative still images were taken every ~20 sec. Off transects between the photo transects were 10-15 minutes. Heading of transects were determined by flip of coin, depending in part on ship's maneuverability due to wind/current.

Site Description/Habitat/Biota:
The NOAA Bathy chart shows 36-38 m bathy lines sloping from east to west in Block 52.
Five transects were conducted in Block 52, starting at SE corner and headed N. The five transects ranged from 29 to 32 m depth.

XS 1: HD N: Start: 1:26:57 PM, 32.5 m; end: 1:42:43 PM, 32.7 m. Flat sand with small patch reefs, 2-3 m diam, 1 m relief. Dominated by gorgonians and sponges: Pseudopterogorgia, Plexaurella, Eunicia; Demosponges- Callyspongia plicifera, N. Erecta, Mycale laxissima, coral- Montastraea cavernosa (common- 10 cm -7), Mycitaphilia, Meandrites, Solenastrea. With in XS there were patches of sediment with dense Cyanobacteria. good Diver spot: 24°31.9424'N, 83°00.9101'W 32 m.
Off Transect: HD NW for 10 min; soft bottom: changing to patchy hard bottom at 1:45. Montastraea cavernosa 30 cm, Iciligorgia schrammi.
XS 2: HD NW: Start: 1:50 PM, 32.5 m; end: 2:05:50 PM, 30.5 m. Several patch reefs, 0.5 m relief; dense and diverse hard corals. Dominated by gorgonians and sponges. Same biota: Demosponges - Iotrocota birotulata; hard coral, Pseudodiploria strigosa, Siderastrea siderea, M. cavernosa (25 cm); lionfish (3).
Off Transect: HD west for 10 min.
XS 3: HD N: Start: 2:18:21 PM, 30 m; end: 2:34:58 PM, 30.5 m. Several patch reefs; 0.5-1 m relief, 0 slope and low relief, high rugosity; diverse biota, biota same; Montastraea cavernosa - common; Demospongiae: Agelas clathrodes, Aplysina cauliformis, N. digitalis, C. vaginalis: most relief at 24°32.0433'N, 83°01.1101'W- 2 m relief.
Off Transect: HD N; 25 cm M. cavernosa, hemispherical 10% dead- white and green algae on dead area; 25 cm M. Cav. 100% bleached; 20 cm M. Cav. 1/2 dead, 1/2 bleached, Cleona in dead zone; 25 cm M. Cav. 1/2 old dead w/ Cleona; 1/2 m M.c. 100% old dead.
XS 4: HD NW: Start: 2:45:37 PM, 31 m; end: 2:59:37 PM, 32 m. Patch reef, 1 m moderate relief, high rugosity, low slope. Same biota, plus Ellisella barbadensis.

Dive Site: Florida, East of South TER; Block 52, UNCW #2295, ROV 13-27

Off Transect: HD N for 10 min.
XS 5: HD NW: Start: 3:10:03 PM, 30.25 m; end: 3:23:04 PM, 29 m. Numerous patch reefs, 1-2 m relief, same biota; 3 color morphs of M. Cavernosa together: red, brown and purple; M. Cav. common, Coral- Siderastrea siderea- bleached, 3 dolphins (mammals).

Dominant Fish: bicolor damselfish- Stegastes partitus; unid wrasse- Halichoeres sp.; reef butterflyfish- Chaetodon sedentarius; yellowtail reef fish- Chromis enchrysurus; Doctorfish - Acanthurus sp.; purple Reeffish- Chromis scotti; yellowhead wrasse - Halichoeres garnoti; Bluehead wrasse - Thalassoma bifasciatum,"; spotted goatfish- Pseudupeneus maculatus; cocoa damselfish or Beaugregory - Pomacanthus sp.

Dive Site: Florida, East of South TER; Block 52, UNCW #2295, ROV 13-27

CPCe Percent Cover Analysis:

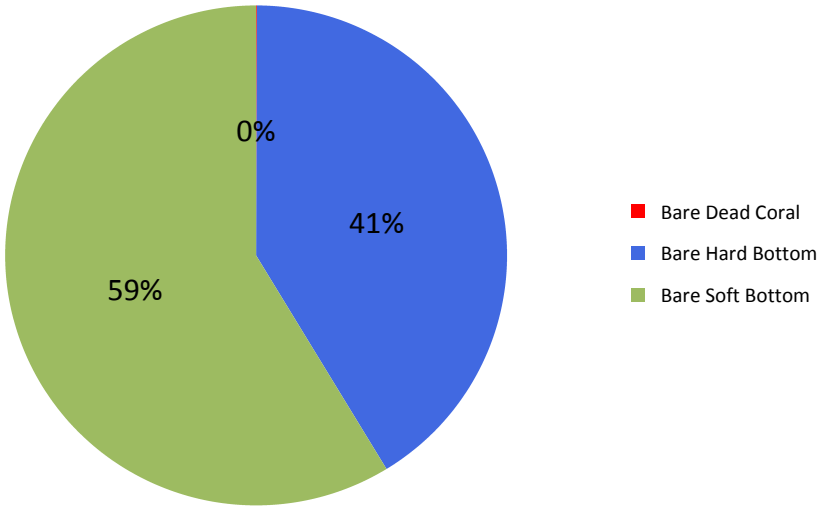
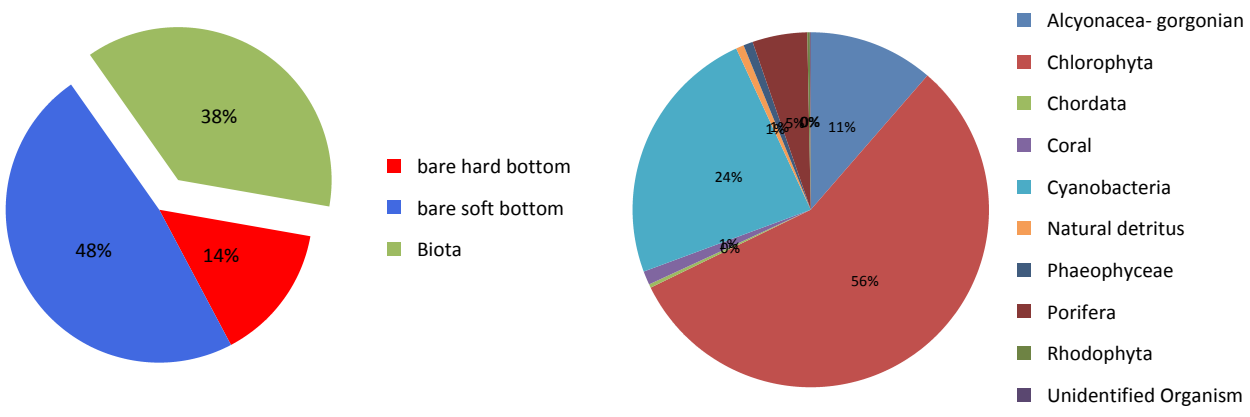


Figure 1. Percent cover of hard and soft bottom substrate at dive site 25-VIII-13-2. CPCe© points on organisms were scored as the underlying substrate (hard or soft).

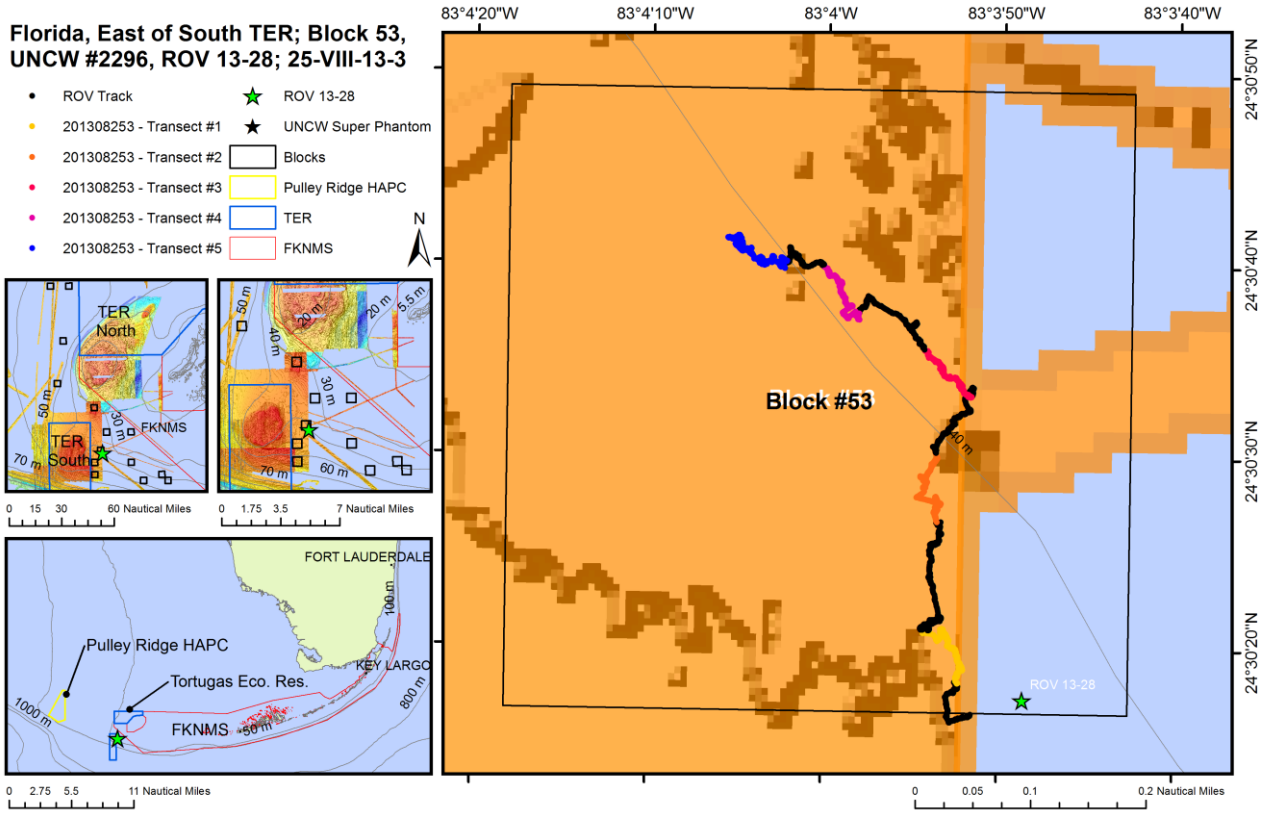


A B

Figure 2. Percent cover of bare substrate and benthic macro-biota at dive site 25-VIII-13-2. A. CPCe percent cover of biota and bare substrate (hard or soft bottom). B. CPCe percent cover of biota and human debris.

Dive Site: Florida, East of South TER; Block 53, UNCW #2296, ROV 13-28

General Location and Dive Track:



Site Overview:

Project:	University of Miami Pulley Ridge
Principal Investator:	Dennis Hanisak
PI Contact Info:	5600 U.S. 1, North, Fort Pierce, FL 34946
Website:	http://oceanexplorer.noaa.gov/explorations/13pulleyridge/welcome.html
Scientific Observers:	Dennis Hanisak, Glenn Taylor, Jason White, John Reed, Lance Horne, Stacy Harter, Stephanie Farrington
Data Management:	Access Database
ROV Navigation Data:	Trackpoint II
Ship Position System:	
Report Analyst:	
Date Compiled:	12/15/2016

Dive Overview:

Vessel:	R/V F.G. Walton Smith; Cruise #: WS -13-12
Sonar Data:	None Available
Purpose:	
ROV:	UNCW Super Phantom
ROV Sensors:	No Sensors Used
Date of Dive:	8/25/2013
Specimens:	
Digital Photos:	165
DVD:	2
Hard Drive:	1

Dive Site: Florida, East of South TER; Block 53, UNCW #2296, ROV 13-28

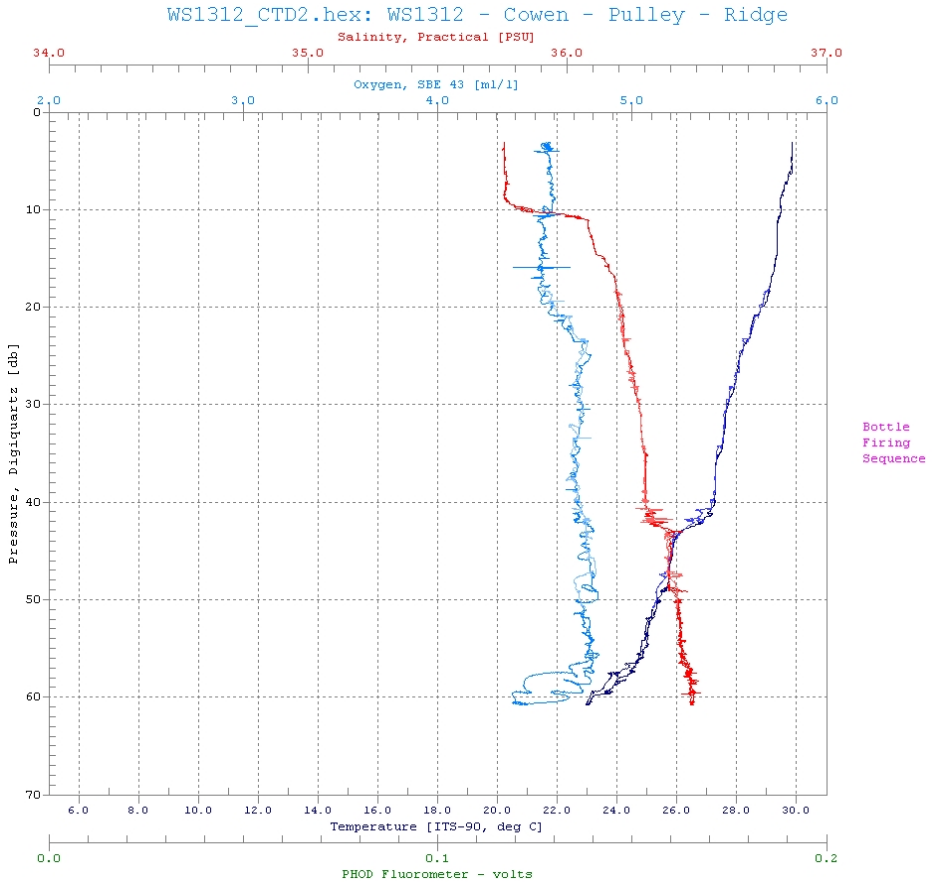
Dive Data:

Minimum Bottom Depth (m):	43	**Total Transect Length (km):**	1.374
Maximum Bottom Depth (m):	44	**Surface Current (kn):**	0.5
On Bottom (Time- GMT):	16:23	**On Bottom (Lat/Long):**	24.5°N; -83.06°W
Off Bottom (Time- GMT):	18:10	**Off Bottom (Lat/Long):**	24.51°N; -83.07°W

Physical (bottom); Temp (°C): **Salinity:** **Visibility (ft):** **Current (kn):** 0.25

Physical Environment:

Distace from Dive site (km): 10.11



Shipboard CTD casts were made with the Sea-Bird 19. The ranges of the water column data recorded during CTD #2 are as follows: Depth Maximum: 60.4 m, Temperature: 23-29.9 °C, Conductivity: 52886-59316 (µS/cm), Pressure: 4.5-88.2 (PSI), Salinity: 35.7-36.5 (PSU), Sound Velocity: 1532-1546.2 (m/s), Oxygen Saturation: - (ml/l), Density: 1022.4-1025.3 (Kg/m^3), Nitrogen Saturation: 8.1-9.

Dive Site: Florida, East of South TER; Block 53, UNCW #2296, ROV 13-28

Dive Imagery:

Figure 1: -41.8 m
Caulerpa and loose *Martensia* on soft bottom

Figure 2: -42.6 m
Seagrass and Martensia on soft bottom

Dive Site: Florida, East of South TER; Block 53, UNCW #2296, ROV 13-28

Dive Notes:

Objectives, Site Description, Habitat, Fauna:

Site/Objectives:
ROV 13-28, Site #- 25-VIII-13-3. Target Site -East of South TER; Block 53; UNCW #2296; Ground truth: NOAA Regional Bathymetric Chart: NOAA_Tortugas_Bank.TIF and rileys_hump_02.sd.tif

ROV Setup/Dive Events:
Video time ESDT. Dive Notes depth were recorded as total depth (ROV altitude + ROV depth in meters). COG is ROV heading. Events, habitat and fauna were recorded directly into Access database. Fish data were recorded by Harter in separate Access database which was added to the Access habitat database. Quantitative photos were taken every 30 seconds with a fixed digital camera (Scorpio Plus) pointing 90° down with parallel 10 cm green lasers, 1.5 m off the bottom. Video camera (standard digital) was angled ~ 20° forward looking with pair of 10 cm red lasers; second set of 3 green lasers were not used. GoPro high definition video camera (setting- 1080/30p) was attached video bar on ROV. Database time set to ROV Nav and video time; ESDT. The ship's Knudsen depth finder reads 3 m shallower than the ROV bottom depth.

Five 100-m random transects were made to characterize each randomly selected 1 km x 1 km block. Each 100 m transect was conducted at ~0.25 kn at an altitude of <1 m, for 15-20 minutes until the ROV passed through a 100-m circle overlaid on the navigation screen; quantitative still images were taken every ~20 sec. Off transects between the photo transects were 10-15 minutes. Heading of transects were determined by flip of coin, depending in part on ship's maneuverability due to wind/current.

Site Description/Habitat/Biota:
The NOAA Bathy chart shows 42 m bathy lines sloping from N east to S west in Block 53.
Five transects were conducted in Block 53, starting at SE corner and headed N. The five transects ranged from 43 to 44 m depth.

XS 1: HD N: Start: 4:29:03 PM, 44 m; end: 4:42:19 PM, 44 m. 100% soft bottom, silty sand with 70-90 % cover of Martensia pavonia - (drift), Caulerpa prolifera, Kallymenia, Avrainvillea, Halimeda, Caulerpa sertularioides.
Off Transect: HD N for 10 min. Pile of rope with bunch of fish.
XS 2: HD N: Start: 4:56:59 PM, 43.5 m; end: 5:08:56 PM, 43.5 m. 100% soft bottom, silty sand with 70-90 % cover of Martensia pavonia - loose and Caulerpa prolifera; biota the same as XS 1.
Off Transect: HD NE for 10 min.
XS 3: HD NW: Start: 5:16:26 PM, 43.5 m; end: 5:32:10 PM, 43.5 m. 100% soft bottom, silty sand with 70-90 % cover of Martensia pavonia - loose and Caulerpa prolifera; same biota.
Off Transect: HD NW for 10 min.
XS 4: HD NW: Start: 5:40:26 PM, 43.5 m; end: 5:52:19 PM, 43.5 m. 100% soft bottom, silty sand with 70-90 % cover of Martensia pavonia - loose and Caulerpa prolifera; same biota.
Off Transect: HD NW 5 min.
XS 5: HD NW: Start: 5:57:43 PM, 43 m; end: 6:10:49 PM, 43 m. 100% soft bottom, silty sand with 70-90 % cover of Martensia pavonia - loose and Caulerpa prolifera; same biota as previous XS; MOL- Gastropod: milk? Conch- common.

Dominant Fish: parrotfish - Sparisoma sp.; filefish - Monacanthus sp.; sand perch - Diplectrum formosum; Bandtail puffer - Sphoeroides spengleri; blue goby - Ptereleotris calliura; razorfish - Xyrichtys sp.

Dive Site: Florida, East of South TER; Block 53, UNCW #2296, ROV 13-28

CPCe Percent Cover Analysis:

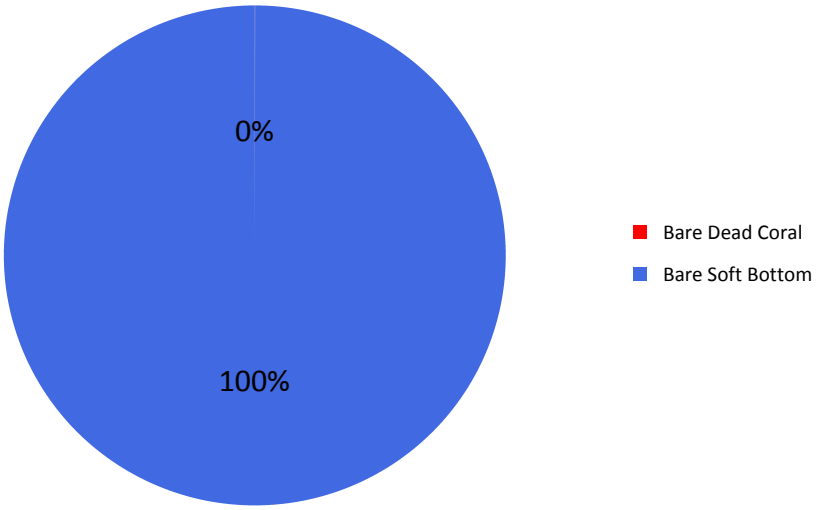
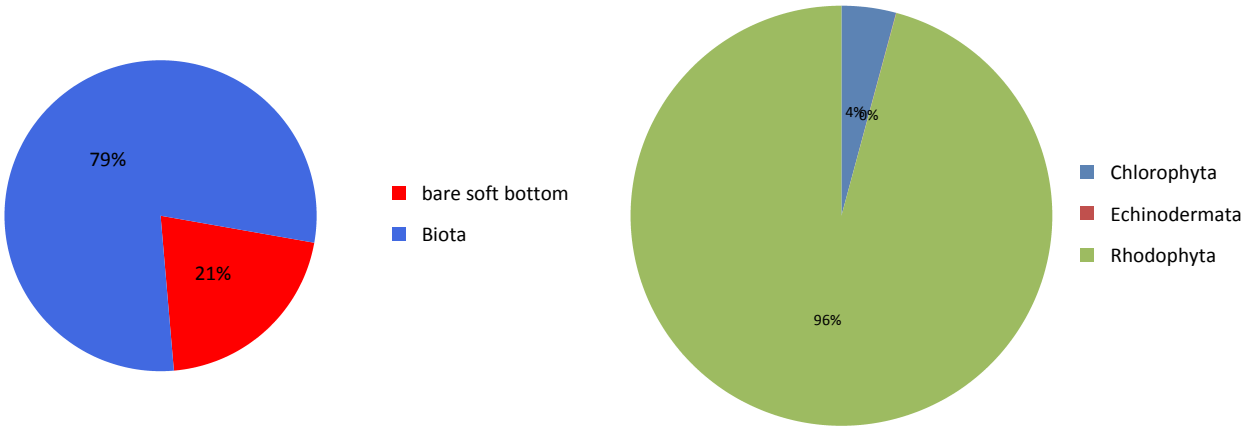


Figure 1. Percent cover of hard and soft bottom substrate at dive site 25-VIII-13-3. CPCe© points on organisms were scored as the underlying substrate (hard or soft).

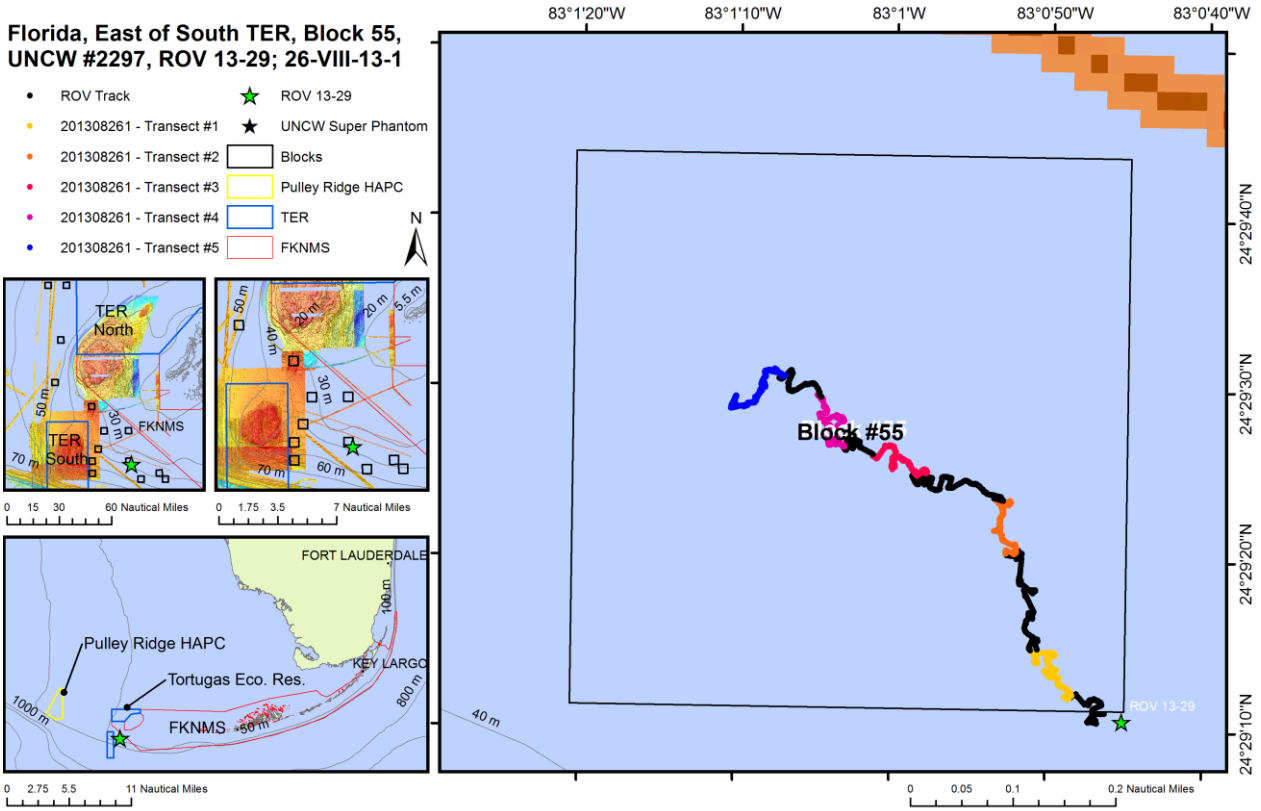


A B

Figure 2. Percent cover of bare substrate and benthic macro-biota at dive site 25-VIII-13-3. A. CPCe percent cover of biota and bare substrate (hard or soft bottom). B. CPCe percent cover of biota and human debris.

Dive Site: Florida, East of South TER, Block 55, UNCW #2297, ROV 13-29

General Location and Dive Track:



Site Overview:

Project:	University of Miami Pulley Ridge
Principal Investator:	Dennis Hanisak
PI Contact Info:	5600 U.S. 1, North, Fort Pierce, FL 34946
Website:	http://oceanexplorer.noaa.gov/explorations/13pulleyridge/welcome.html
Scientific Observers:	Dennis Hanisak, Glenn Taylor, Jason White, John Reed, Lance Horne, Stacy Harter, Stephanie Farrington
Data Management:	Access Database
ROV Navigation Data:	Trackpoint II
Ship Position System:	
Report Analyst:	
Date Compiled:	12/15/2016

Dive Overview:

Vessel:	R/V F.G. Walton Smith; Cruise #: WS -13-12
Sonar Data:	None Available
Purpose:	
ROV:	UNCW Super Phantom
ROV Sensors:	No Sensors Used
Date of Dive:	8/26/2013
Specimens:	
Digital Photos:	164
DVD:	2
Hard Drive:	1

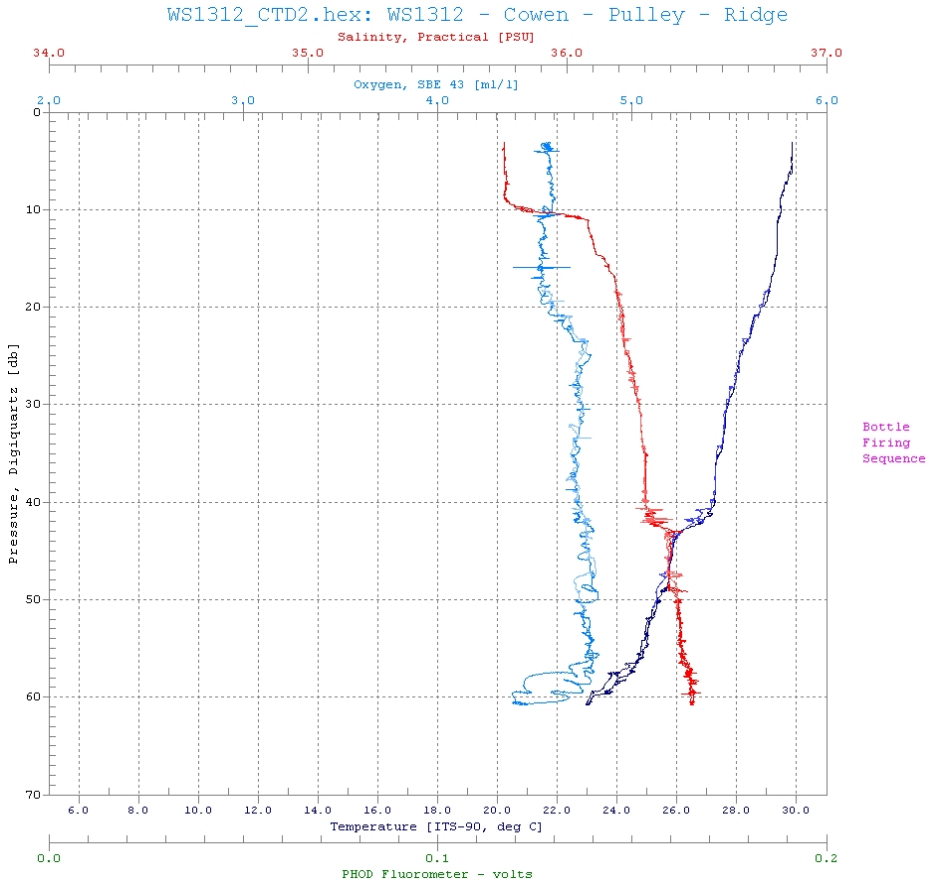
Dive Site: Florida, East of South TER, Block 55, UNCW #2297, ROV 13-29

Dive Data:

Minimum Bottom Depth (m):	40	**Total Transect Length (km):**	1.554				
Maximum Bottom Depth (m):	41	**Surface Current (kn):**	0.5				
On Bottom (Time- GMT):	10:44	**On Bottom (Lat/Long):**	24.49°N; -83.01°W				
Off Bottom (Time- GMT):	12:17	**Off Bottom (Lat/Long):**	24.49°N; -83.02°W				
Physical (bottom); Temp (°C):		**Salinity:**	**Visibility (ft):**	15	**Current (kn):**	0.25	

Physical Environment:

Distace from Dive site (km): 14.84



Shipboard CTD casts were made with the Sea-Bird 19. The ranges of the water column data recorded during CTD #2 are as follows: Depth Maximum: 60.4 m, Temperature: 23-29.9 °C, Conductivity: 52886-59316 (µS/cm), Pressure: 4.5-88.2 (PSI), Salinity: 35.7-36.5 (PSU), Sound Velocity: 1532-1546.2 (m/s), Oxygen Saturation: - (ml/l), Density: 1022.4-1025.3 (Kg/m^3), Nitrogen Saturation: 8.1-9.

Dive Site: Florida, East of South TER, Block 55, UNCW #2297, ROV 13-29

Dive Imagery:

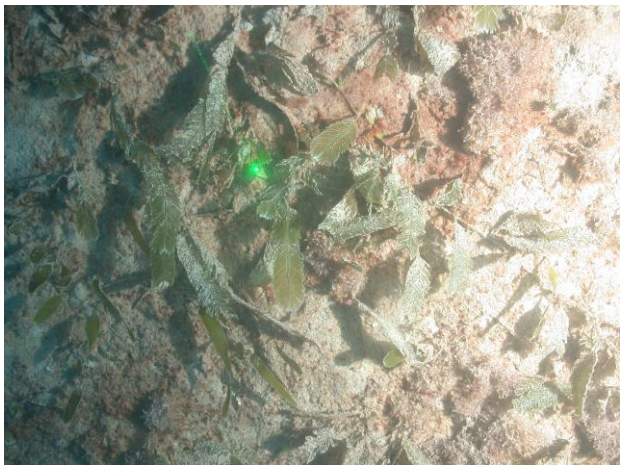


Figure 1: -39.1 m
Caulerpa and seagrass on soft bottom

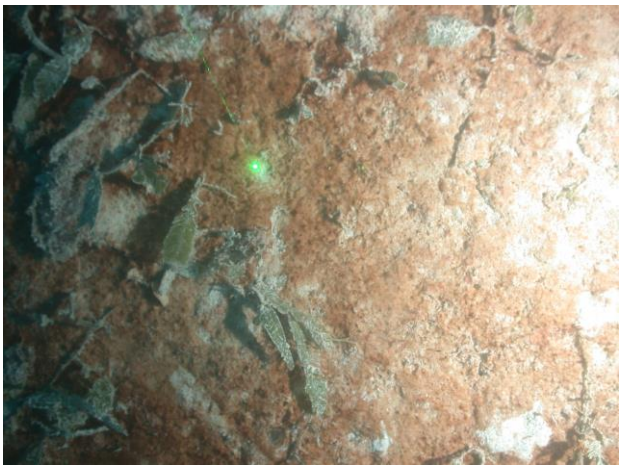


Figure 2: -39.1 m
Seagrass and Cyanophyta on soft bottom

Dive Site: Florida, East of South TER, Block 55, UNCW #2297, ROV 13-29

Dive Notes:

Objectives, Site Description, Habitat, Fauna:

Site/Objectives:
ROV 13-29, Site #- 26-VIII-13-1. Target Site -East of South TER; Block 55; UNCW #2297; Ground truth: NOAA Regional Bathymetric Chart: NOAA_Agassiz_Valley_IMG.img

ROV Setup/Dive Events:
Video time ESDT. Dive Notes depth were recorded as total depth (ROV altitude + ROV depth in meters). COG is ROV heading. Events, habitat and fauna were recorded directly into Access database. Fish data were recorded by Harter in separate Access database which was added to the Access habitat database. Quantitative photos were taken every 30 seconds with a fixed digital camera (Scorpio Plus) pointing 90° down with parallel 10 cm green lasers, 1.5 m off the bottom. Video camera (standard digital) was angled ~ 20° forward looking with pair of 10 cm red lasers; second set of 3 green lasers were not used. GoPro high definition video camera (setting- 1080/30p) was attached video bar on ROV. Database time set to ROV Nav and video time; ESDT. The ship's Knudsen depth finder reads 3 m shallower than the ROV bottom depth.

Five 100-m random transects were made to characterize each randomly selected 1 km x 1 km block. Each 100 m transect was conducted at ~0.25 kn at an altitude of <1 m, for 15-20 minutes until the ROV passed through a 100-m circle overlaid on the navigation screen; quantitative still images were taken every ~20 sec. Off transects between the photo transects were 10-15 minutes. Heading of transects were determined by flip of coin, depending in part on ship's maneuverability due to wind/current.

Site Description/Habitat/Biota:
The NOAA Bathy chart shows 40-42 m bathy lines sloping from NE to SW in Block 55.
Five transects were conducted in Block 55, starting at center. The five transects ranged from 40 to 41 m depth.

XS 1: HD NW: Start: 10:49:01 AM, 41 m; end: 10:58:57 AM, 41 m. 100 % soft bottom, sand, moderate bioturbation. Dominate biota: Dense cyanobacteria mats, Caulerpa prolifera, C. sertularioides, Kallymenia, Udotea, fine filamentous red algae; Meoma tracks.
Off Transect: HD N for 10 min. Blue goby with 10 cm mounds.
XS 2: HD N: Start: 11:07:54 AM, 40.5 m; end: 11:19:10 AM, 40 m. Same habitat and same biota; 11:18 good video of pair of seahorses.
Off Transect: HD W for 10 min.
XS 3: HD NW: Start: 11:28:41 AM, 40 m; end: 11:40:23 AM, 40 m. Same habitat and same biota; sickly looking bottom, all cyanobacteria.
Off Transect: HD W for 5 min.
XS 4: HD NW: Start: 11:46 AM, 40 m; end: 11:58:18 AM, 40 m. Same habitat and same biota.
Off Transect: HD NW for 5 min.
XS 5: HD SW: Start: 12:02:48 PM, 40 m; end: 12:17:33 PM, 40.5 m. Same habitat and same biota.

Dominant Fish: filefish - Monacanthus sp.; blue goby - Ptereleotris calliura; Bandtail puffer - Sphoeroides spengleri; unid wrasse- Halichoeres sp.; sand perch - Diplectrum formosum; sea horse - Hippocampus sp.

Dive Site: Florida, East of South TER, Block 55, UNCW #2297, ROV 13-29

CPCe Percent Cover Analysis:

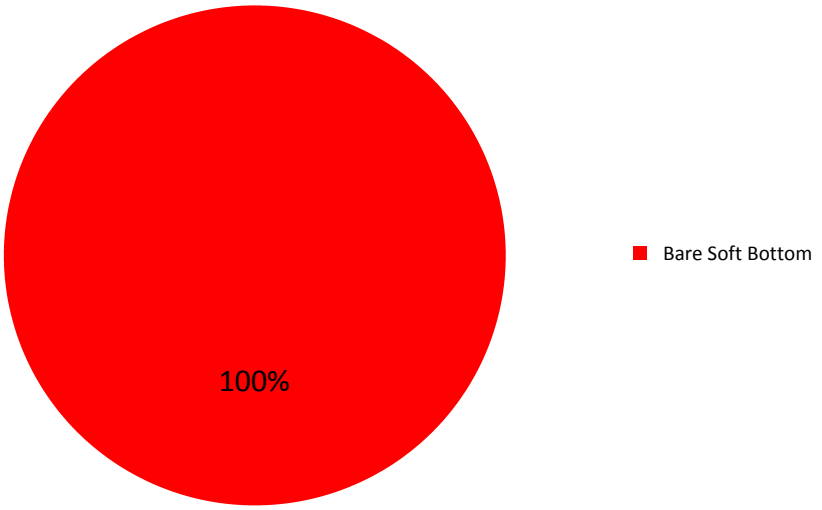
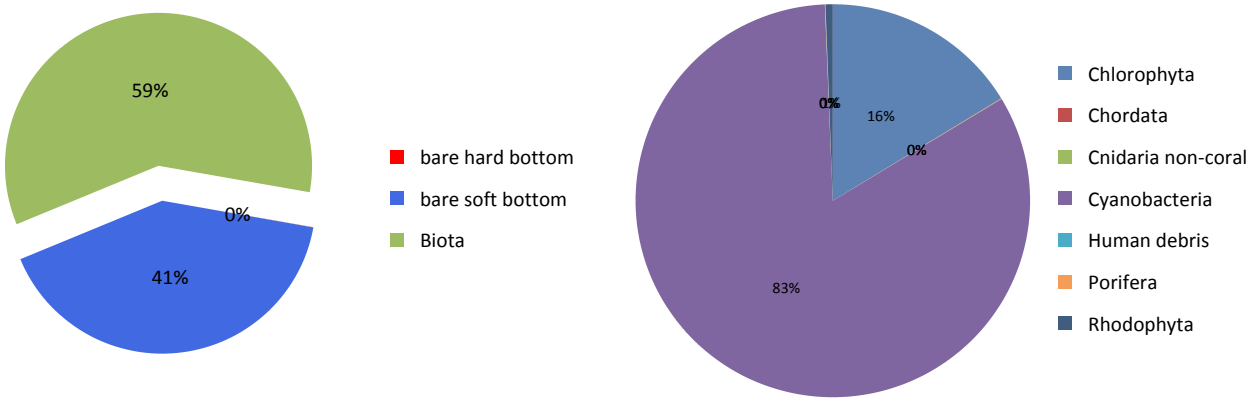


Figure 1. Percent cover of hard and soft bottom substrate at dive site 26-VIII-13-1. CPCe© points on organisms were scored as the underlying substrate (hard or soft).

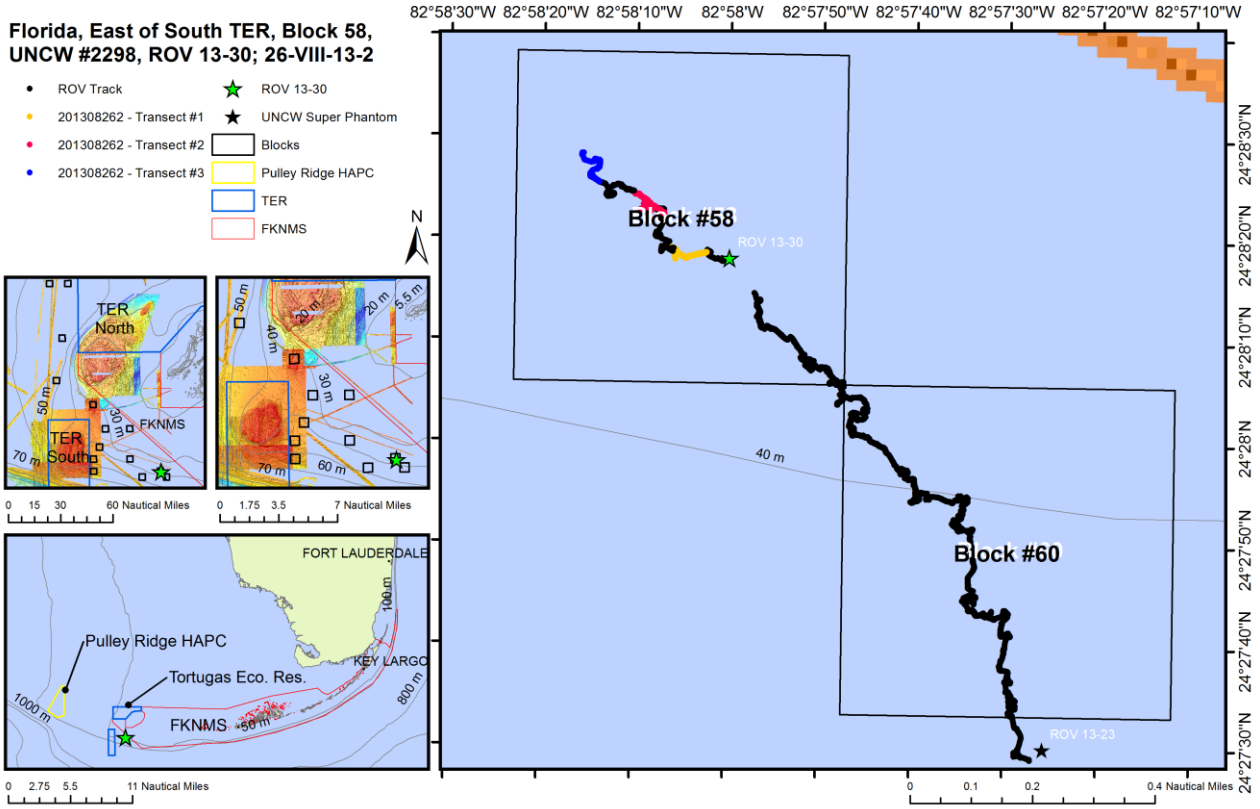


A B

Figure 2. Percent cover of bare substrate and benthic macro-biota at dive site 26-VIII-13-1. A. CPCe percent cover of biota and bare substrate (hard or soft bottom). B. CPCe percent cover of biota and human debris.

Dive Site: Florida, East of South TER, Block 58, UNCW #2298, ROV 13-30

General Location and Dive Track:



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ROV Navigation Data:	Trackpoint II
Ship Position System:	
Report Analyst:	
Date Compiled:	12/15/2016

Dive Overview:

Vessel:	R/V F.G. Walton Smith; Cruise #: WS -13-12
Sonar Data:	None Available
Purpose:	
ROV:	UNCW Super Phantom
ROV Sensors:	No Sensors Used
Date of Dive:	8/26/2013
Specimens:	
Digital Photos:	100
DVD:	1
Hard Drive:	1

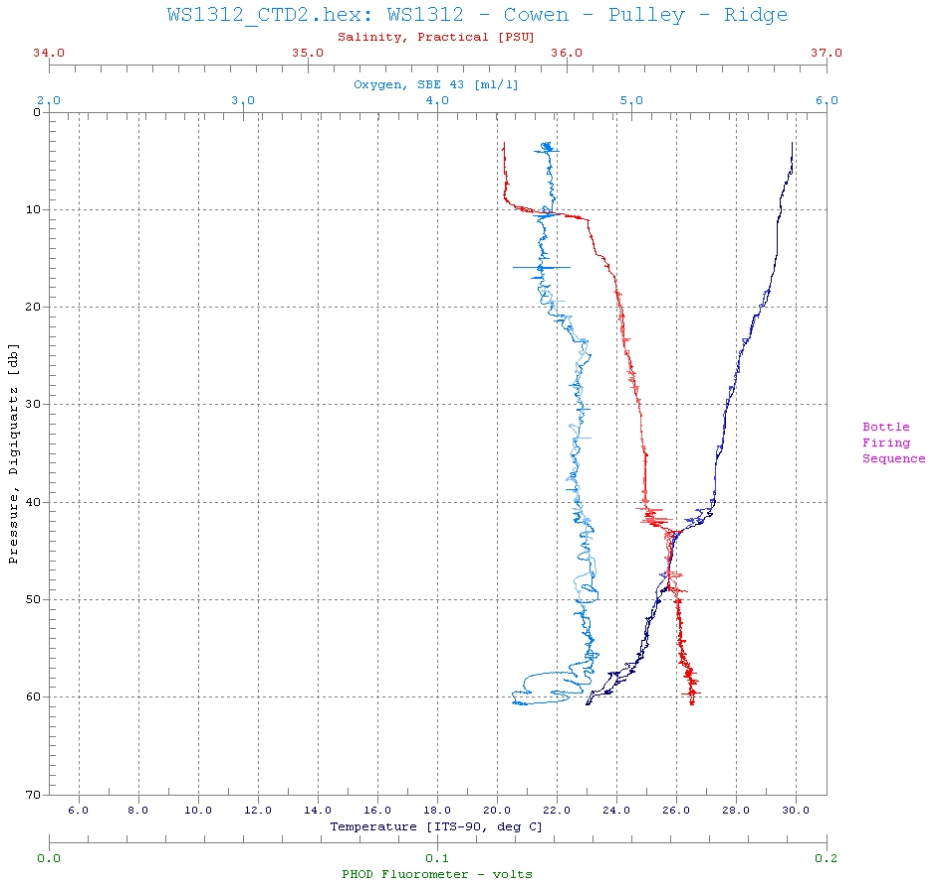
Dive Site: Florida, East of South TER, Block 58, UNCW #2298, ROV 13-30

Dive Data:

Minimum Bottom Depth (m):	34	**Total Transect Length (km):**	0.921
Maximum Bottom Depth (m):	41	**Surface Current (kn):**	0.6
On Bottom (Time- GMT):	13:12	**On Bottom (Lat/Long):**	24.47°N; -82.97°W
Off Bottom (Time- GMT):	14:03	**Off Bottom (Lat/Long):**	24.47°N; -82.97°W
Physical (bottom); Temp (°C):		**Salinity:**	**Visibility (ft):** 25 **Current (kn):**

Physical Environment:

Distace from Dive site (km): 19.47



Shipboard CTD casts were made with the Sea-Bird 19. The ranges of the water column data recorded during CTD #2 are as follows: Depth Maximum: 60.4 m, Temperature: 23-29.9 °C, Conductivity: 52886-59316 (µS/cm), Pressure: 4.5-88.2 (PSI), Salinity: 35.7-36.5 (PSU), Sound Velocity: 1532-1546.2 (m/s), Oxygen Saturation: - (ml/l), Density: 1022.4-1025.3 (Kg/m^3), Nitrogen Saturation: 8.1-9.

Dive Site: Florida, East of South TER, Block 58, UNCW #2298, ROV 13-30

Dive Imagery:

Figure 1: -34.3 m
Kallymenia, sponges and gorgonians on hard bottom

Figure 2: -32.6 m
Niphates and sponges on hardbottom

Figure 3: -33.1 m
Sponges and gorgonians on hardbottom

Figure 4: -35.4 m
Gorgonians on hardbottom

Dive Site: Florida, East of South TER, Block 58, UNCW #2298, ROV 13-30

Dive Notes:

Objectives, Site Description, Habitat, Fauna:

Site/Objectives:
ROV 13-30, Site #- 26-VIII-13-2. Target Site -East of South TER; Block 58 (Con't from Dive 13-23); UNCW # 2298; Ground truth: NOAA Regional Bathymetric Chart: NOAA_Agassiz_Valley_IMG.img

ROV Setup/Dive Events:
Video time ESDT. Dive Notes depth were recorded as total depth (ROV altitude + ROV depth in meters). COG is ROV heading. Events, habitat and fauna were recorded directly into Access database. Fish data were recorded by Harter in separate Access database which was added to the Access habitat database. Quantitative photos were taken every 30 seconds with a fixed digital camera (Scorpio Plus) pointing 90° down with parallel 10 cm green lasers, 1.5 m off the bottom. Video camera (standard digital) was angled ~ 20° forward looking with pair of 10 cm red lasers; second set of 3 green lasers were not used. GoPro high definition video camera (setting- 1080/30p) was attached video bar on ROV. Database time set to ROV Nav and video time; ESDT. The ship's Knudsen depth finder reads 3 m shallower than the ROV bottom depth.

Three (remaining) 100-m random transects were made to characterize each randomly selected 1 km x 1 km block. Each 100 m transect was conducted at ~0.25 kn at an altitude of <1 m, for 15-20 minutes until the ROV passed through a 100-m circle overlaid on the navigation screen; quantitative still images were taken every ~ 20 sec. Off transects between the photo transects were 10-15 minutes. Heading of transects were determined by flip of coin, depending in part on ship's maneuverability due to wind/current.

Site Description/Habitat/Biota:
The NOAA Bathy chart shows 42-48 m bathy lines sloping from NW to SE Block 58.
Three transects (#3-5) were conducted in Block 58, starting at center. Transects 1 and 2 were conducted previously during Dive 13-23. Transects 3-5 ranged from 41 to 34 m depth.

XS 3: HD W: Start: 1:15:48 PM, 40.25 m; end: 1:25:24 PM, 41 m. 100% sediment, moderate bioturbation, low rugosity, flat; sand with 1-10% cover of rubble and cobble (10 cm) with algae and sponges attached; Cyanobacteria, Udotea, Kallymenia, Hippoporidra.
Off Transect: HD N for 10 min; Haliclona rubens; re-pu thin branching Gracilaria?, Halimeda, Codium, Plexaurella nutans?; beginning of patch reef: 1:32.
XS 4: HD NW: Start: 1:34:31 PM, 37.5 m; end: 1:44:24 PM, 35.5 m. Patch reef, 0.5-1 m relief, rock boulders; Sponges and gorgonians dominate: Demospongiae: Xestospongia muta- common, Aplysina fulva/cauliformis, Holopsamma, Aiolochroia crassa, Callyspongia plicifera; Gorgonacea: Plexaurella, Pseudopterogorgia; Montastraea cavernosa (5@ 10-20 cm healthy), Agaricia agaricites (1) parrotfish, lionfish.
Good diver spot: 24°28.3861'N ,82°58.1314'W, 35.3 m.
Off Transect: HD NW 10 min: back on soft bottom with sediment/rubble/cobble and a few scattered boulders; Madracis decactis; turned to 100% sediment with cyanobacteria.
XS 5: HD N: Start: 1:52:16 PM, 34.5 m; end:2:03:07 PM, 34 m. Patch reef and patchy boulders on flat sediment, <0.5 m relief rocks, low rugosity; same species as XS 4: Montastraea cavernosa (5@ 10-20 cm healthy, no bleaching); Ellisella barbadensis. Possible dive site: 24°28.4418'N, 82°58.2424'W, 33.5 m.

Dominant Fish: bicolor damselfish- Stegastes partitus; Doctorfish - Acanthurus sp.; greenblotch parrotfish- Sparisoma atomarium; reef butterflyfish- Chaetodon sedentarius; yellowhead wrasse - Halichoeres garnoti; yellowtail reef fish- Chromis enchrysurus; blue chromis- Chromis cyanea; rock beauty- Holacanthus tricolor; sharpnose puffer- Canthigaster rostrata; tattler - Serranus phoebe

Dive Site: Florida, East of South TER, Block 58, UNCW #2298, ROV 13-30

CPCe Percent Cover Analysis:

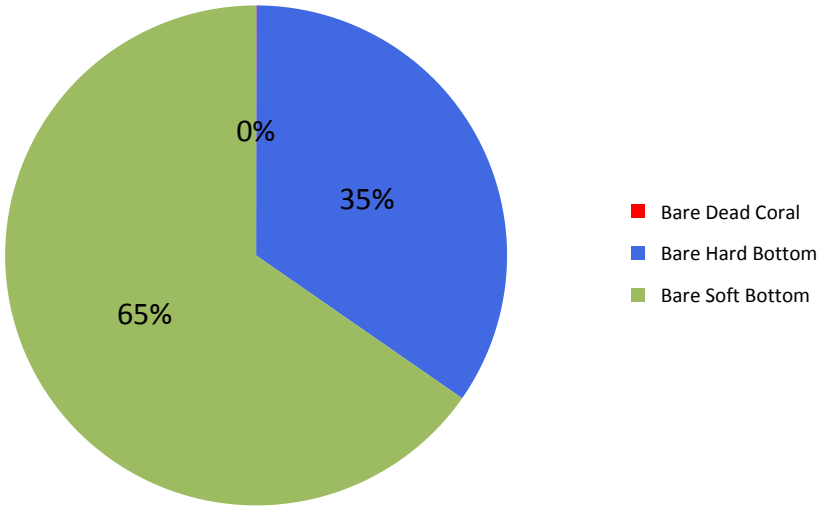
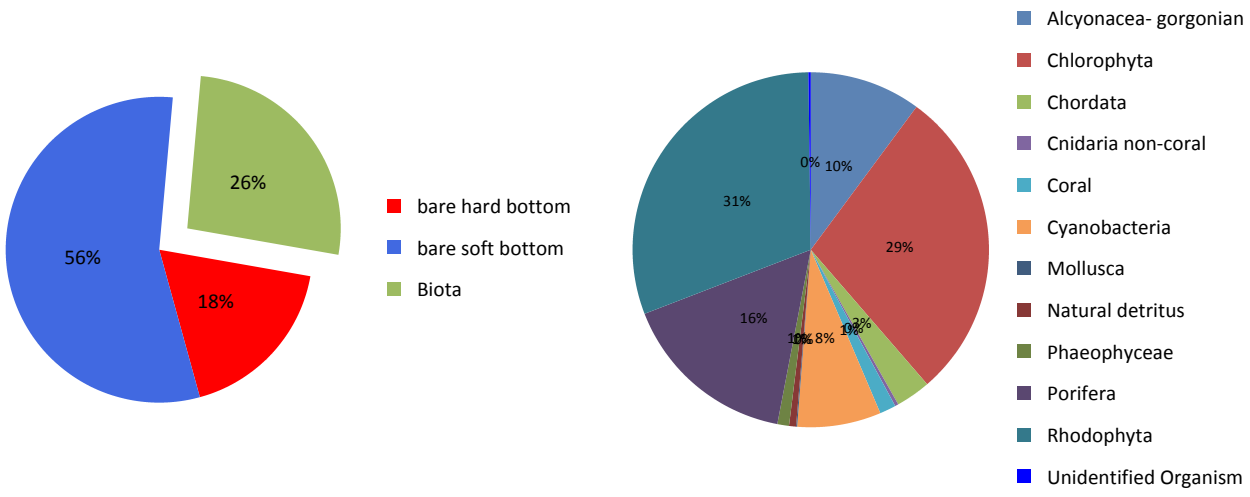


Figure 1. Percent cover of hard and soft bottom substrate at dive site 26-VIII-13-2. CPCe© points on organisms were scored as the underlying substrate (hard or soft).

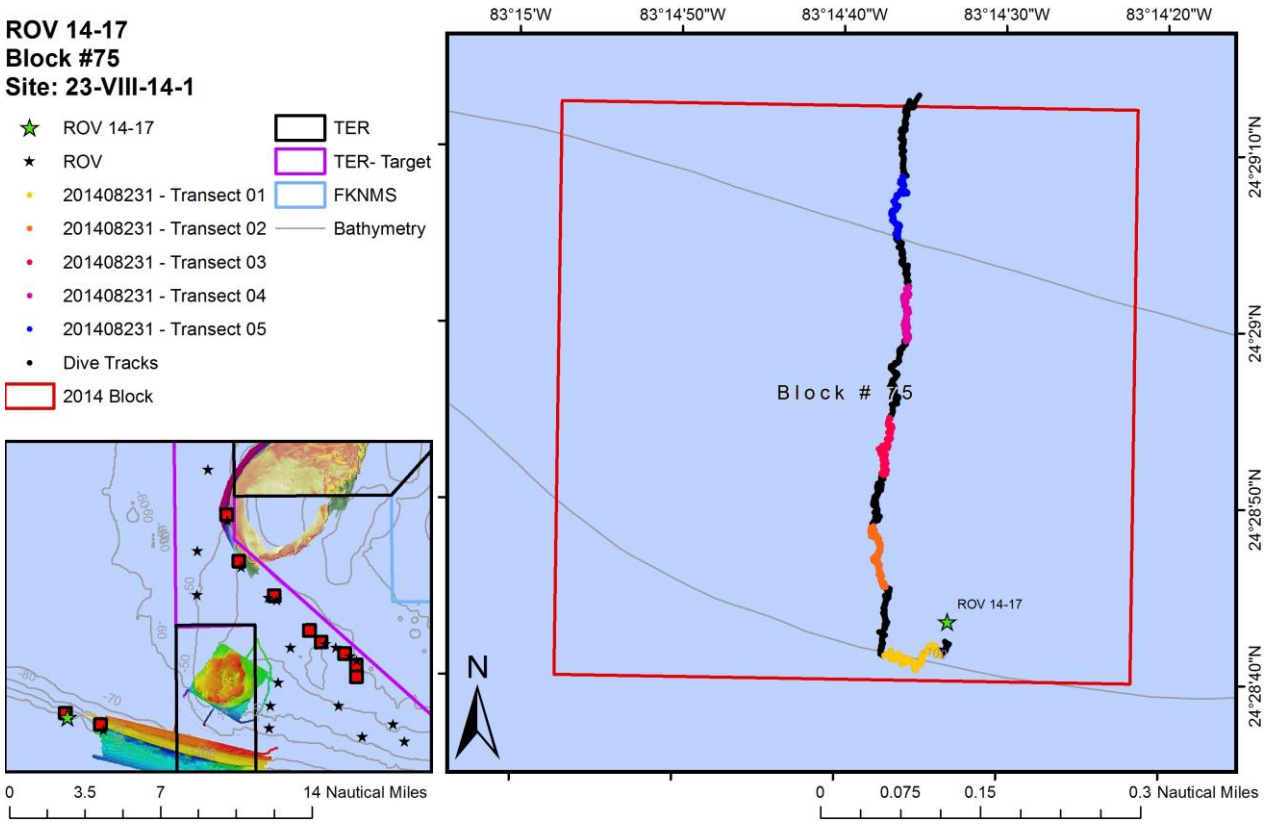


A B

Figure 2. Percent cover of bare substrate and benthic macro-biota at dive site 26-VIII-13-2. A. CPCe percent cover of biota and bare substrate (hard or soft bottom). B. CPCe percent cover of biota and human debris.

Dive Site: Tortugas, Miller's Ledge, Block 75; ROV 14-17, UNCW #96

General Location and Dive Track:



Site Overview:

Project:	Pulley Ridge Mesophotic Reef Connectivity Project
Principal Investigator:	Dr. Robert Cowen, PhD
PI Contact Info:	Hatfield Marine Science Center/OSU 2030 Marine Science Dr., Newport, OR 97365
Website:	www.oceanexplorer.noaa.gov
Scientific Observers:	Dennis Hanisak, Heather Moe, Jason White, John Reed, Lance Horne, Stephanie Farrington
Data Management:	Access Database
ROV Navigation Data:	Trackpoint II
Ship Position System:	DGPS
Report Analyst:	John Reed, Stephanie Farrington
Date Compiled:	12/15/2016

Dive Overview:

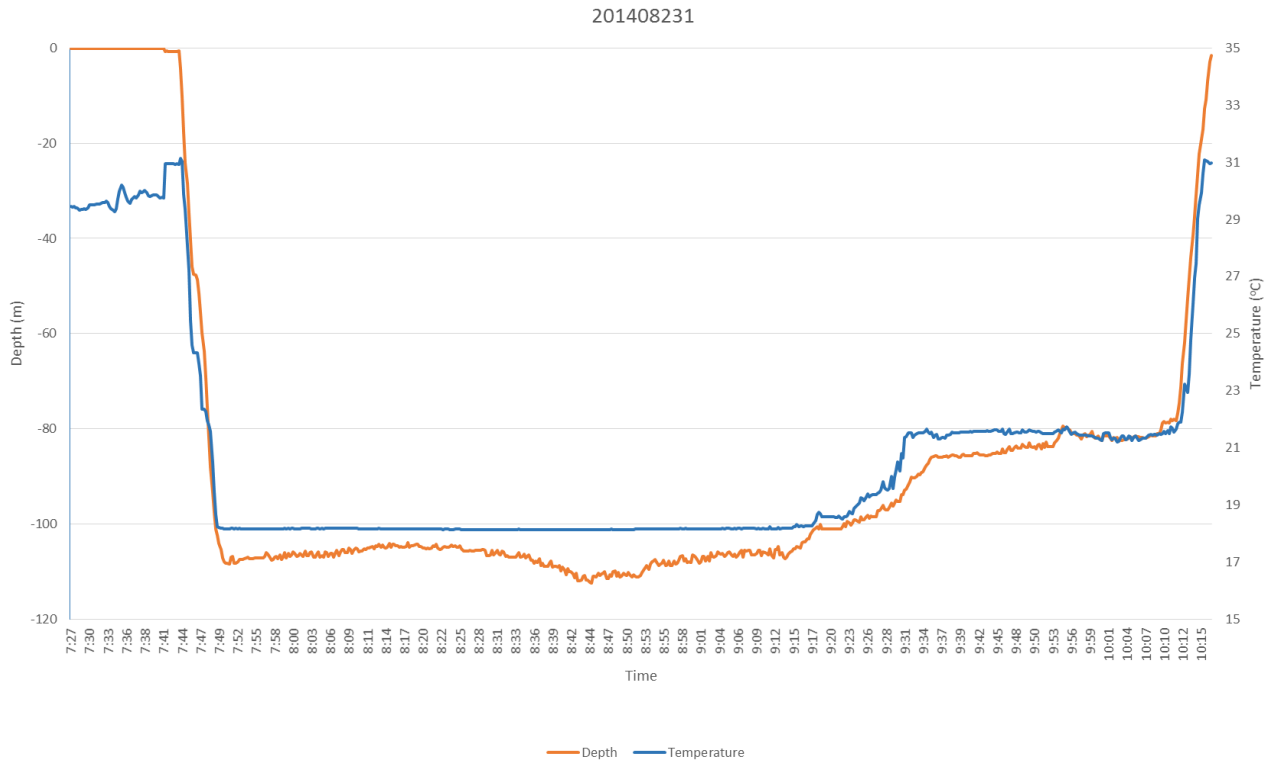
Vessel:	R/V Walton Smith
Sonar Data:	None Available
Purpose:	Conduct ROV video/photo transects; collect grouper for tagging and genetic samples; light traps, CTD, and ISIS plankton tows
ROV:	Mohawk ROV
ROV Sensors:	Temperature (°C), Depth (m)
Date of Dive:	8/23/2014
Specimens:	
Digital Photos:	191
DVD:	3
Hard Drive:	1

Dive Site: Tortugas, Miller's Ledge, Block 75; ROV 14-17, UNCW #96

Dive Data:

Minimum Bottom Depth (m):	83	**Total Transect Length (km):**	0.945				
Maximum Bottom Depth (m):	112	**Surface Current (kn):**	0.5				
On Bottom (Time- GMT):	7:53	**On Bottom (Lat/Long):**	24.48°N; -83.24°W				
Off Bottom (Time- GMT):	10:13	**Off Bottom (Lat/Long):**	24.49°N; -83.24°W				
Physical (bottom); Temp (°C):	18.13	**Salinity:**		**Visibility (ft):**	45	**Current (kn):**	0.25

Physical Environment:



Temperature and depth (pressure) were collected with a Sea-Bird 39 Temperature Recorder attached to the ROV (recording descent, bottom data and ascent). The ranges of the bottom data recorded during ROV 14-17 are as follows: Depth Maximum: 112.4 m, Temperature: 18.1-21.7 °C.

Dive Site: Tortugas, Miller's Ledge, Block 75; ROV 14-17, UNCW #96

Dive Imagery:

Figure 1: -107.4 m
Large bounder on rocky hardbottom

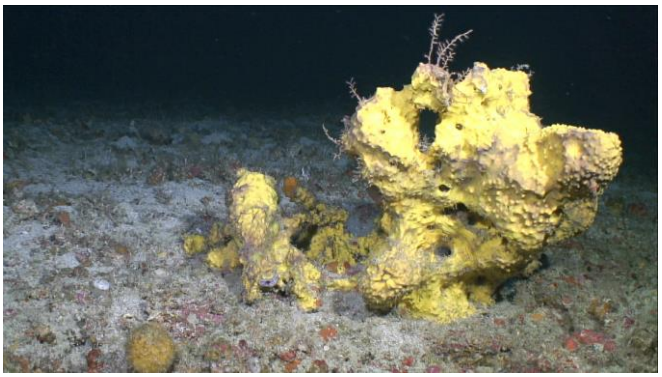


Figure 2: -86.2 m
Aiolochroia crassa on hardbottom

Figure 3: -107 m
Anthiids on hardbottom

Figure 4: -106.9 m
Grouper on hardbottom

Dive Site: Tortugas, Miller's Ledge, Block 75; ROV 14-17, UNCW #96

Dive Notes:

Objectives, Site Description, Habitat, Fauna:

Site/Objectives:
ROV 14-17, Site #- 23-VIII-14-1, UNCW Dive #96. Target Site -Tortugas, Millers Ledge, Block 75. Ground truth: NOAA Regional Bathymetric Chart: NOAA_Bathy_Chart_Tortugas_Valleys_IMG & NOAA_Bathy_Chart_Tortugas_Bank, Live GPS Log- 201408231.shp; conduct ROV video/photo transects.

ROV Setup/Dive Events:
Video time ESDT. Dive Notes depth were recorded as total depth (ROV altitude + ROV depth in meters). COG is ROV heading. Events, habitat and fauna were recorded directly into Access database. Fish data were recorded by H. Moe (NOAA NMFS) in separate Access database which was added to the Access habitat database. Quantitative photos were taken every 30 seconds with a fixed digital camera (Kongsberg OE14-408, with resolution of 3648x2736 pixels) pointing 90° down, 1.3 m off the bottom, set digital still camera to Tv Mode, fixed S1/125, with auto F-Stop, ISO 100, auto focus. Forward looking Video camera (Insite Pacific Mini Zeus high definition CMOS color zoom camera with 2,000,000 effective pixels) was angled ~20° down. Both cameras had a pair of parallel 10 cm green lasers for scale. Seabird 39 temperature recorder was attached to the ROV. Date/time of video and digital still camera, ROV CTD and ROV Nav were set to ESDT.

Five 100-m random transects were made to characterize each randomly selected 1 km x 1 km block. Each 100 m transect was conducted at ~0.25 kn at an altitude of ~1.3 m, for 15-20 minutes until the ROV passed through a 100-m radius circle overlaid on the navigation screen; quantitative still images were taken every ~ 30 sec. Off transects between the photo transects were 10-15 minutes. Heading of transects were determined by flip of coin, depending in part on ship's maneuverability due to wind/current.

Block 75
Site Description/Habitat/Biota:
The NOAA Bathy chart shows 100 m bathy lines running east and west Block 75. (likely the NOAA chart is shifted to the SW from reality, 110 m bathy line = 107 m)
Five transects were conducted in Block 75, starting at SE corner and headed NW. The five transects ranged from 112 at base of slope to 83 m depth at top of slope.

XS 1: HD NW: Start: 7:58:42 AM, 110 m; 8:19:26 AM: TIME, 105.5m. Attempting to run xs parallel to the depth contour several hundred meters south of the apparent Millers Ledge. 30% hard bottom, low relief, cobble and rubble with scattered 0.5 m boulders. Dominated by small encrusting sponges, Spirastrellidae, scattered white comatulids and Stylocidaris urchins. Tatler, roughtongue bass, anthiids, lizard fish.
Off Transect: HD N for 15 min. HD North to get closer to the base of the wall, sand dunes with rolling bottom covered on ribble/cobble and small boulders. Hydroids, demosponges, orange gorgonian. Chaetodon aya.

XS 2: HD N: Start: 8:31:09 AM, 107 m; end: 8:48:03 AM, 112 m. Similar to XS 1, 50% cover of rock pavement, boulder, rubble, flat and oval boulders, 50-100 cm, < 1/2 m relief. Crab, orange starfish, Spirasteridae, Davidaster crinoid. Pile of longline, Heiniken bottle, Sargassum detritus.
Off Transect: HD N for 15 min. Sediment with rock boulders changing to rock mounds (108.5 m), moderate relief, highly rugose, low slope (overall -up to the north). Boulder with 2 lionfish, longline.

XS 3: HD N: Start: 8:59:11 AM, 109.2 m; end: 9:12:54 AM, 107.5m. Near base of slope; 70% hard bottom,

boulders 1-2 m diameter, eroded, rugged; large rolling hummoky bottom, rock mounds are 1-2 m tall; moderate relief, higly rugose, low slope (overall -up to the north). Scamp eating and caching fish, anthiids, 1-speckled hind (species critically endangered), more scamp.
Off Transect: HD N for 15 min; 9:12 am, depth 107.5 m. Still at base of wall.

XS 4: HD N: Start: 9:23:56 AM, 101 m; end: 9:36:32 AM, 89 m. Transect up slope although not apparent in video, <10o. 70% hard bottom, rubble/cobble bottom is variable from rock rub/cob to rock boulders and ledges and erroded ledges, 1/2 m relief. Longline, Spirastrellidae, 1 m boulder with roughtongue bass, rock beauty, lionfish- 2.
Off Transect: HD N for 15 min; 9:36 am, 89 m. At 86 m deep which was the top of the wall on dives to the east, there was no slope > 10 deg. Pavement, scattered 1/2 m boulders, flat. Yellow Verongida, demospongia common, Auletta, Placospongia, Ircinia strobilina.. Reef butterfly, squirrelfish.

XS 5: HD N: Start: 9:47:08 AM, 85.5 m; end: 10:03:45 AM, 83 m. Top of what is left of Millers' Ledge. 70% hard bottom, pavement with sediment veneer, 25-50 cm boulders scatttered, rubble/cobble. Dense sponges, Davidaster, Astrophorid massive w/ encrusting yellow sponge, Auiletta, Telesto. 81 pavement. Ledge at 82 m, 1 m rock slabs. Black grouper, scamp, spotfin hogfish, few lionfish,
Off Transect: HD N for to edge of block; Start 10:03 am, 83 m; end- 10:12 am, 79.2 m. Sand and rubble, sand ridges. Two spot flamefish, basketstar.

Dive Site: Tortugas, Miller's Ledge, Block 75; ROV 14-17, UNCW #96

CPCe Percent Cover Analysis:

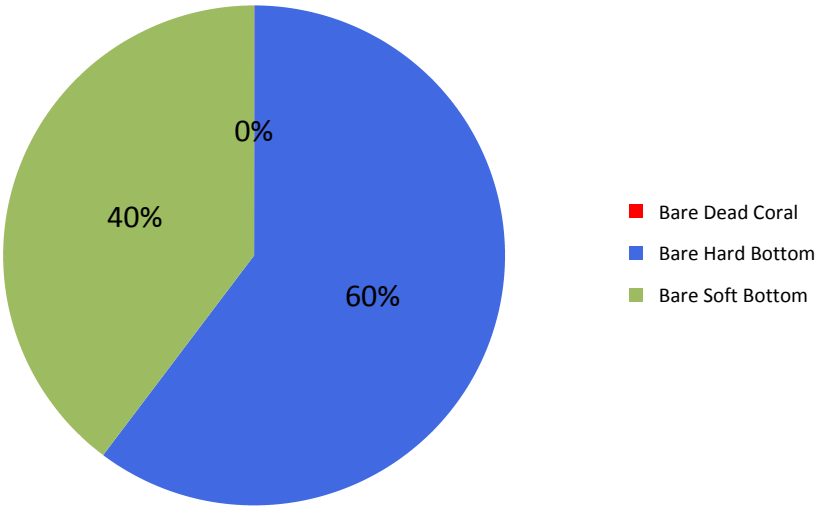
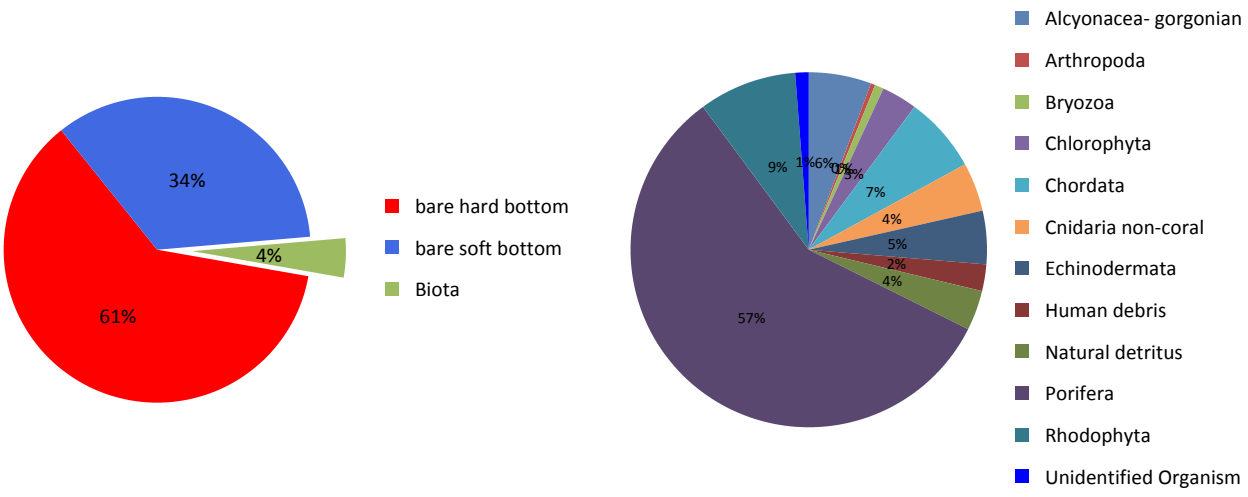


Figure 1. Percent cover of hard and soft bottom substrate at dive site 23-VIII-14-1. CPCe© points on organisms were scored as the underlying substrate (hard or soft).

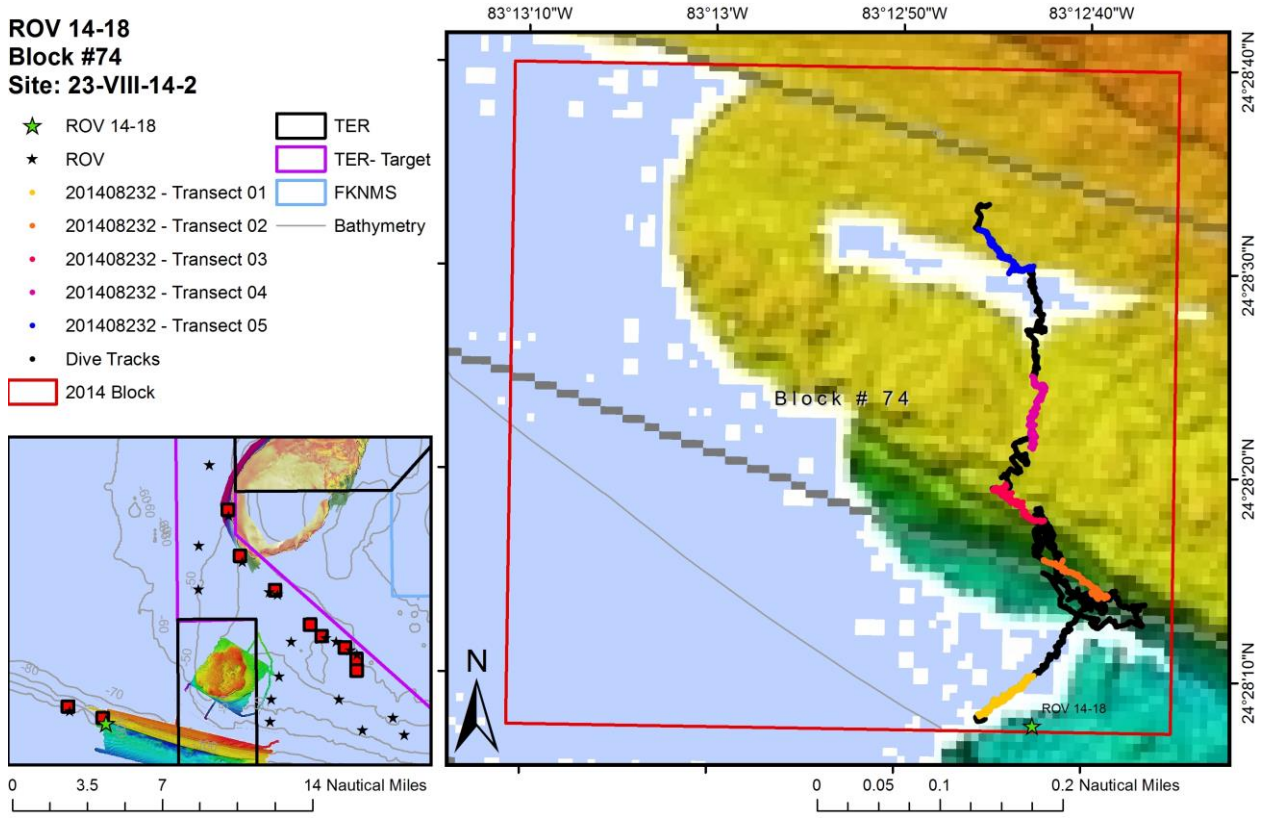


A B

Figure 2. Percent cover of bare substrate and benthic macro-biota at dive site 23-VIII-14-1. A. CPCe percent cover of biota and bare substrate (hard or soft bottom). B. CPCe percent cover of biota and human debris.

Dive Site: Tortugas, Miller's Ledge, Block 74; ROV 14-18, UNCW #97

General Location and Dive Track:



Site Overview:

Project:	Pulley Ridge Mesophotic Reef Connectivity Project
Principal Investigator:	Dr. Robert Cowen, PhD
PI Contact Info:	Hatfield Marine Science Center/OSU 2030 Marine Science Dr., Newport, OR 97365
Website:	www.oceanexplorer.noaa.gov
Scientific Observers:	Dennis Hanisak, Heather Moe, Jason White, John Reed, Lance Horne, Stephanie Farrington
Data Management:	Access Database
ROV Navigation Data:	Trackpoint II
Ship Position System:	DGPS
Report Analyst:	John Reed, Stephanie Farrington
Date Compiled:	12/15/2016

Dive Overview:

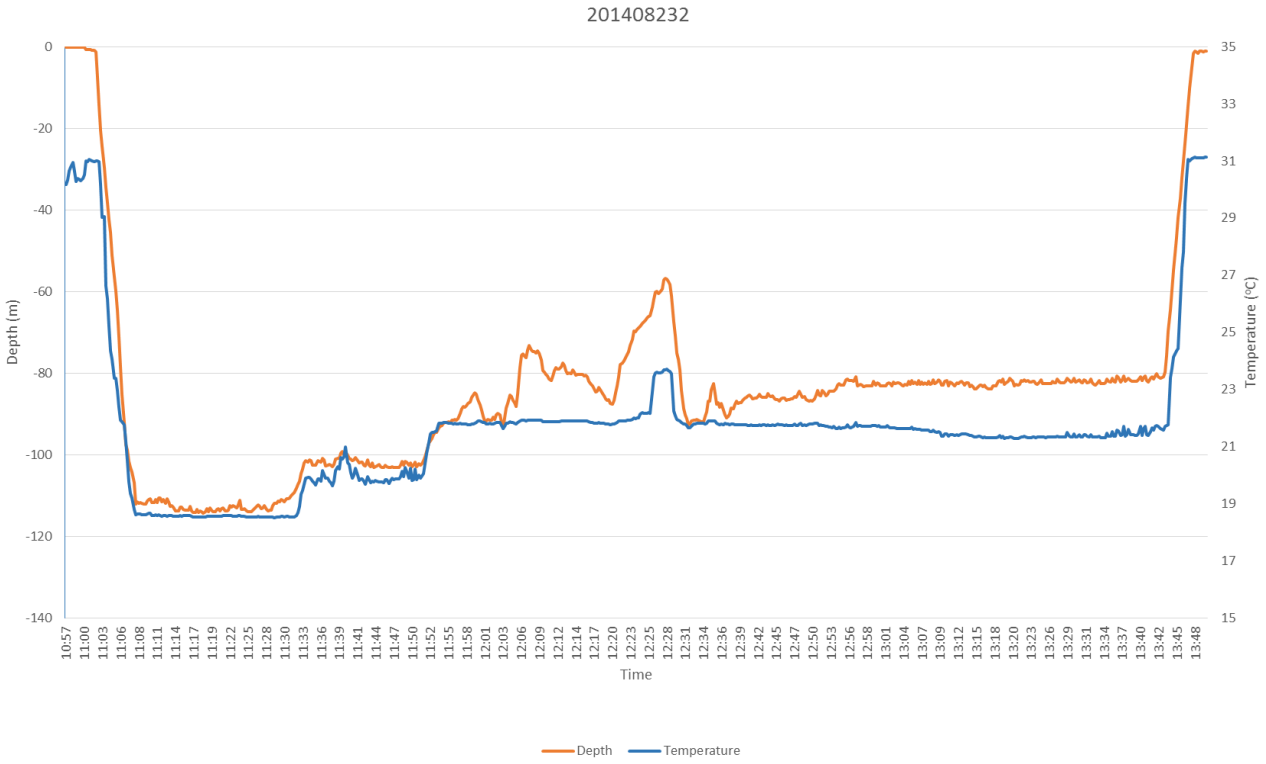
Vessel:	R/V Walton Smith
Sonar Data:	millers ridge_2
Purpose:	Conduct ROV video/photo transects; collect grouper for tagging and genetic samples; light traps, CTD, and ISIS plankton tows
ROV:	Mohawk ROV
ROV Sensors:	Temperature (°C), Depth (m)
Date of Dive:	8/23/2014
Specimens:	
Digital Photos:	170
DVD:	3
Hard Drive:	1

Dive Site: Tortugas, Miller's Ledge, Block 74; ROV 14-18, UNCW #97

Dive Data:

Minimum Bottom Depth (m):	82.5	**Total Transect Length (km):**	0.745
Maximum Bottom Depth (m):	115.2	**Surface Current (kn):**	0.5
On Bottom (Time- GMT):	11:10	**On Bottom (Lat/Long):**	24.47°N; -83.21°W
Off Bottom (Time- GMT):	13:45	**Off Bottom (Lat/Long):**	24.48°N; -83.21°W
Physical (bottom); Temp (°C):	18.62	**Salinity:**	**Visibility (ft):** **Current (kn):**

Physical Environment:



Temperature and depth (pressure) were collected with a Sea-Bird 39 Temperature Recorder attached to the ROV (recording descent, bottom data and ascent). The ranges of the bottom data recorded during ROV 14-18 are as follows: Depth Maximum: 114.4 m, Temperature: 18.5-23.7 °C.

Dive Site: Tortugas, Miller's Ledge, Block 74; ROV 14-18, UNCW #97

Dive Imagery:

Figure 1: -113.2 m
Spidercrab on hardbottom

Figure 2: -114.6 m
Madracis on hardbottom

Figure 3: -82.4 m
Yellow ball sponge

Figure 4: -83 m
Strawberry coral

Dive Site: Tortugas, Miller's Ledge, Block 74; ROV 14-18, UNCW #97

Dive Notes:

Objectives, Site Description, Habitat, Fauna:

Site/Objectives:
ROV 14-18, Site #- 23-VIII-14-2, UNCW Dive #97. Target Site -Tortugas, Millers Ledge, Block 74;. Ground truth: NOAA Regional Bathymetric Chart: NOAA_Bathy_Chart_Tortugas_Valleys_IMG, & geotif- millers ridge_2.jpg, Live GPS Log- 201408232.shp; conduct ROV video/photo transects.

ROV Setup/Dive Events:
Video time ESDT. Dive Notes depth were recorded as total depth (ROV altitude + ROV depth in meters). COG is ROV heading. Events, habitat and fauna were recorded directly into Access database. Fish data were recorded by H. Moe (NOAA NMFS) in separate Access database which was added to the Access habitat database. Quantitative photos were taken every 30 seconds with a fixed digital camera (Kongsberg OE14-408, with resolution of 3648x2736 pixels) pointing 90° down, 1.3 m off the bottom, set digital still camera to Tv Mode, fixed S1/125, with auto F-Stop, ISO 100, auto focus. Forward looking Video camera (Insite Pacific Mini Zeus high definition CMOS color zoom camera with 2,000,000 effective pixels) was angled ~20° down. Both cameras had a pair of parallel 10 cm green lasers for scale. Seabird 39 temperature recorder was attached to the ROV. Date/time of video and digital still camera, ROV CTD and ROV Nav were set to ESDT.

Five 100-m random transects were made to characterize each randomly selected 1 km x 1 km block. Each 100 m transect was conducted at ~0.25 kn at an altitude of ~1.3 m, for 15-20 minutes until the ROV passed through a 100-m radius circle overlaid on the navigation screen; quantitative still images were taken every ~ 30 sec. Off transects between the photo transects were 10-15 minutes. Heading of transects were determined by flip of coin, depending in part on ship's maneuverability due to wind/current.

Site Description/Habitat/Biota:
geotif- millers ridge_2.jpg shows Millers Ledge passing midway through Block 74.
Five transects were conducted in Block 74, starting at SE corner and headed NNW. The five transects ranged from 115.2 to 82.5 m depth.

XS 1: HD NE: Start: 11:12:19 AM, 113 m; end: 11:25:45 AM, 115.2 m. ~100 meters south of Millers' Ledge; 6 km west of South TER border. 10-90% cover hard bottom, 5-10 cm cobble, rock pavement, rock slabs, < 1/2 m relief. Later sand with rock rubble/cobble, 30-50% cove. Biota was dominated by encrusting sponges; majid crab. Madrepora oculata, 3-5 cm, white, sighted scattered throughout; cup coral, Stylocidaris. Lizardfish.
Off Transect: HD NE for 15 min; start 11:25 am, 114.2 m; end- 11:32 am, 102.9 m. 100 m SW of ledge; 50% hard bottom, sediment with rubble/cobble, rolling rock hills and boulders

XS 2: HD NW: 11:37:00 AM, 102m; end: 11:52:11 AM, 103.5 m. Base of Miller's ledge starting upslope and running parallel to slope. Low slope, low rugosity, 70% hard bottom, cobble/rubble, small boulders rock slabs, <.5 m relief. Barren with some encrusting sponges and anthiids. Sponges sparse, no gorgonians. Chaetodon aya, anthiids.
Off Transect: HD NNE for 15 min; start- 11:52 am, 103.5 m. Continue upslope, same bottom. 93 m near top, rock pavement, slope <10o. Tanacetipathes hirta, encrusting sponges,Narcissia trigonaria. Top of slope at 88m; flat rock slabs, <1/2 m relief, 50-70% cover, scamp.

12:03 to 12:38- Squaw came through, 25 kn winds, ROV off bottom.

Dive Site: Tortugas, Miller's Ledge, Block 74; ROV 14-18, UNCW #97

XS 3: HD NW: Start: 12:38:37 PM, 92 m; end: 12:52:57 PM, 86.7 m. Transect along and parallel to top edge of slope. 88 m top of slope. Cobble/rubble 10-20 cm, boulders 30-50 cm, rock slabs wth <1/2 m relief, upper edge about 30o slope, but no large ledges. Sponges dominant, no algae, no gorgonians, Auletta. Squirrel fish, anthiids, yellowtaiil reeffiish. Changes to flat top at the upper ridge, 88 m, pavment/rubble; Cinachyrella common, Antipathes fans.
Off Transect: HD NW for 15 min. 86.7 m, on top terrace. 90% pavement w/ sediment veneer, fractures with 10-20 cm ledges, stripped grunt. 83 m end.

XS 4: HD N: Start: 1:00:45 PM, 83.6 m; end: 1:16:22 PM, 84 m. LR rock outcrops 10-20 cm. Terrace top. 70-100% hard bottom, pavement, sediment veneer, 10-20 cm relief ledges. Cinachyrella common, Aplysina, Astrophorida barrel w/ yellow encrusting sponge, Stylaster, orange gorgonians. Scamp, graysby, few lionfish. Two longlines.
Off Transect: HD N for 15 min. Flat sediment with rubble/cobble; changing between rock pavement w/ sediment mounds and larger rock boulders. Dominagted by sponges, Oceanapia, Nidalia, Eucidaris, Ascidiacea.

XS 5: HD NW: Start: 1:27:33 PM, 83 m; end: 1:44:06 PM, 82.5m. Similar to XS 4. Top of terrace, 50-70% hard bottom, pavement, rubble, boulders 30-50 cm with 30 cm relief. Demosponges dominant, hydroids, Cinachyrella, Ircinia, Davidaster, Antipatharia, Didemnidae. No gorgonians. FIrst algae sighted- pink CCA on cobble, 83 m. End 82.5 m.

Dive Site: Tortugas, Miller's Ledge, Block 74; ROV 14-18, UNCW #97

CPCe Percent Cover Analysis:

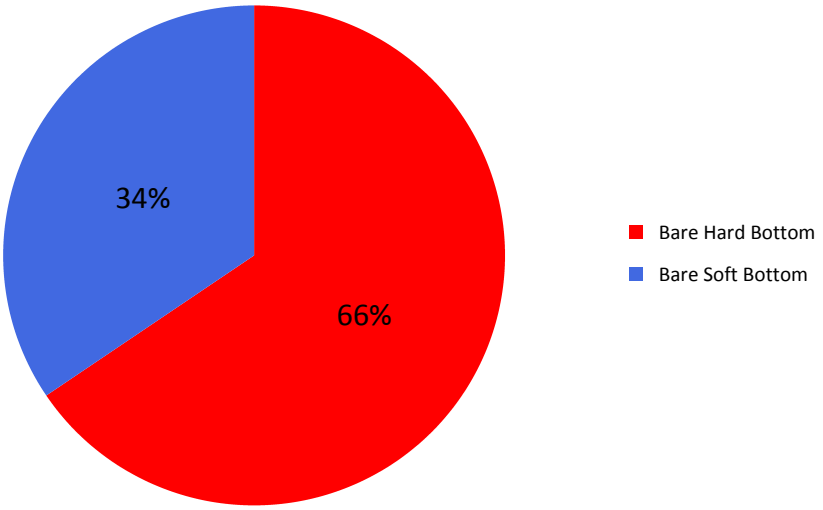
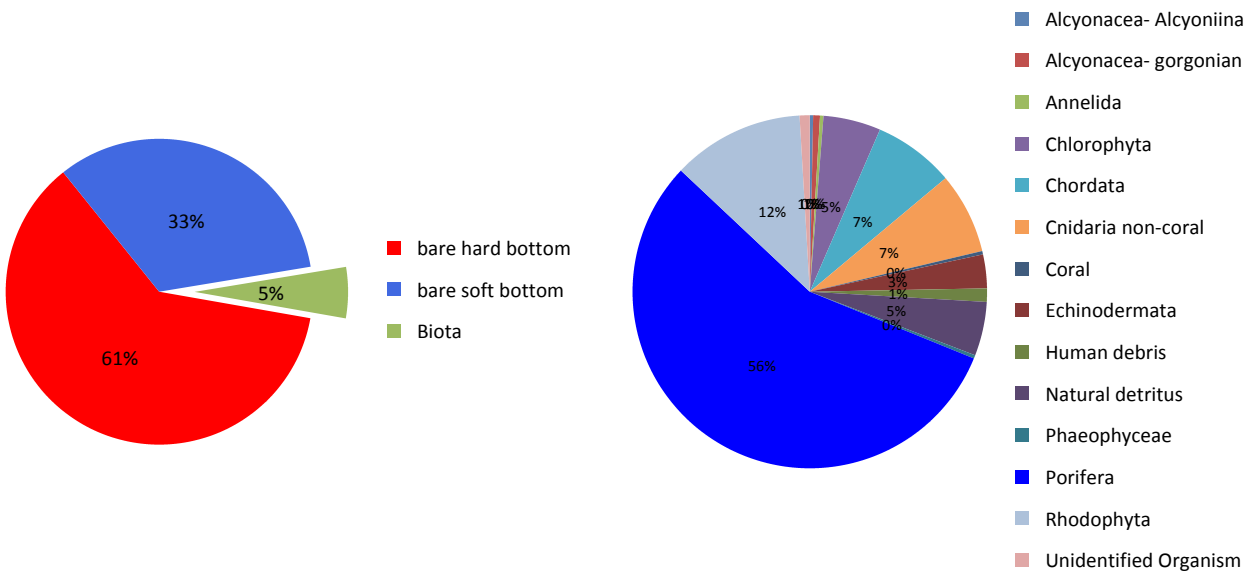


Figure 1. Percent cover of hard and soft bottom substrate at dive site 23-VIII-14-2. CPCe© points on organisms were scored as the underlying substrate (hard or soft).

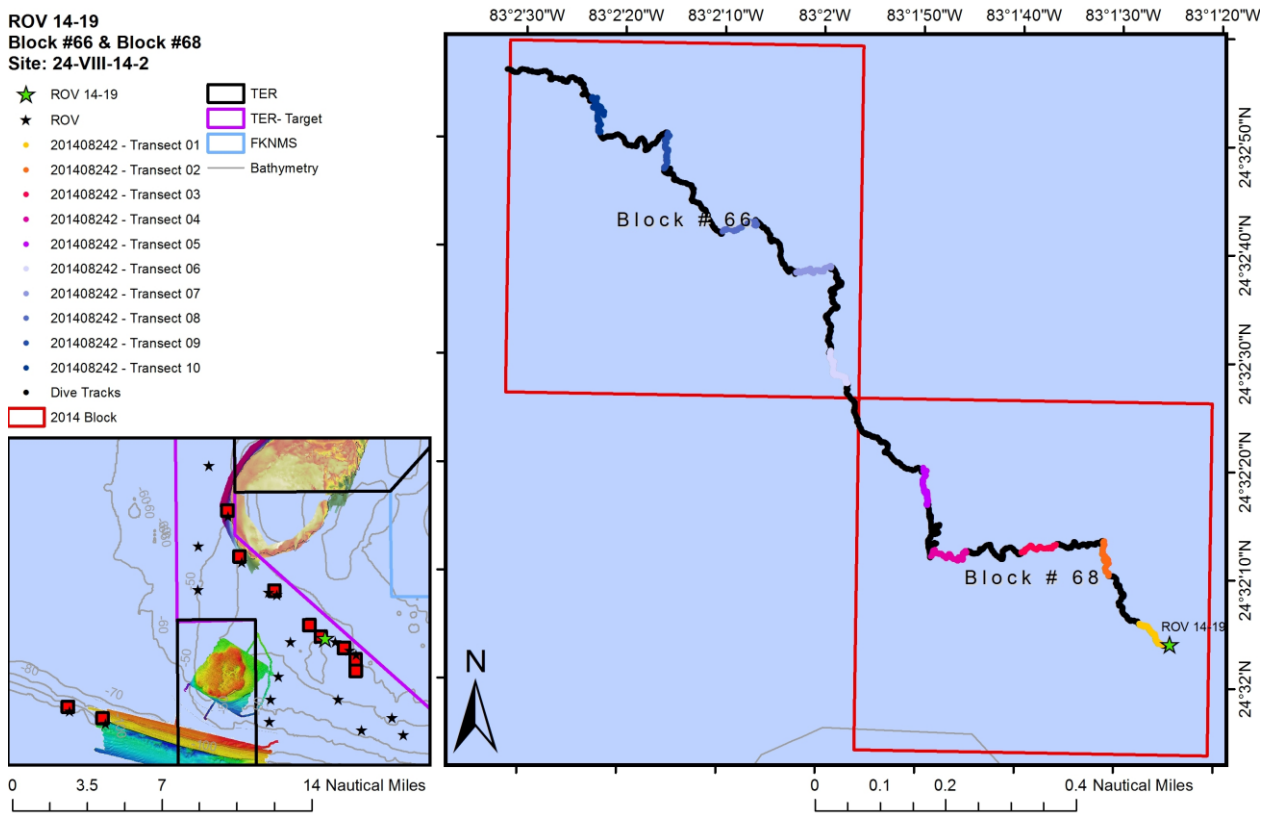


A B

Figure 2. Percent cover of bare substrate and benthic macro-biota at dive site 23-VIII-14-2. A. CPCe percent cover of biota and bare substrate (hard or soft bottom). B. CPCe percent cover of biota and human debris.

Dive Site: Tortugas, Reef; Block 66 & 68; ROV 14-19, UNCW #98

General Location and Dive Track:



Site Overview:

Project:	Pulley Ridge Mesophotic Reef Connectivity Project
Principal Investigator:	Dr. Robert Cowen, PhD
PI Contact Info:	Hatfield Marine Science Center/OSU 2030 Marine Science Dr., Newport, OR 97365
Website:	www.oceanexplorer.noaa.gov
Scientific Observers:	Dennis Hanisak, Heather Moe, Jason White, John Reed, Lance Horne, Stephanie Farrington
Data Management:	Access Database
ROV Navigation Data:	Trackpoint II
Ship Position System:	DGPS
Report Analyst:	John Reed, Stephanie Farrington
Date Compiled:	12/15/2016

Dive Overview:

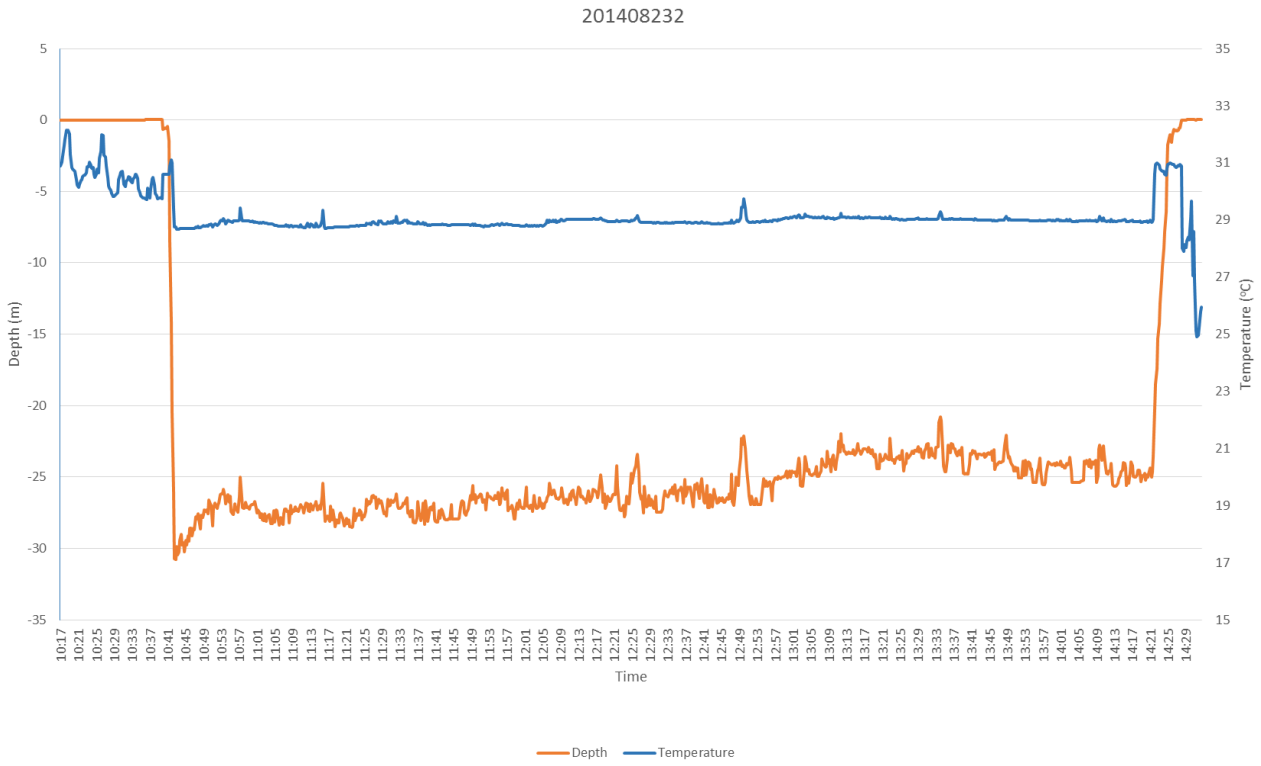
Vessel:	R/V Walton Smith
Sonar Data:	None Available
Purpose:	Conduct ROV video/photo transects; collect grouper for tagging and genetic samples; light traps, CTD, and ISIS plankton tows
ROV:	Mohawk ROV
ROV Sensors:	Temperature (°C), Depth (m)
Date of Dive:	8/24/2014
Specimens:	
Digital Photos:	350
DVD:	4
Hard Drive:	1

Dive Site: Tortugas, Reef; Block 66 & 68; ROV 14-19, UNCW #98

Dive Data:

Minimum Bottom Depth (m):	27.5	**Total Transect Length (km):**	2.490
Maximum Bottom Depth (m):	31.8	**Surface Current (kn):**	0.2
On Bottom (Time- GMT):	10:44	**On Bottom (Lat/Long):**	24.53°N; -83.02°W
Off Bottom (Time- GMT):	14:24	**Off Bottom (Lat/Long):**	24.55°N; -83.04°W
Physical (bottom); Temp (°C):	28.87	**Salinity:**	**Visibility (ft):** 20 **Current (kn):**

Physical Environment:



Temperature and depth (pressure) were collected with a Sea-Bird 39 Temperature Recorder attached to the ROV (recording descent, bottom data and ascent). The ranges of the bottom data recorded during ROV 14-19 are as follows: Depth Maximum: 30.8 m, Temperature: 28.7-29.7 °C.

Dive Site: Tortugas, Reef; Block 66 & 68; ROV 14-19, UNCW #98

Dive Imagery:

Figure 1: -23.5 m
Atlantic goliath grouper (*Epinephelus itajara*) swims on a reef

Figure 2: -27 m
Pseudodiploria strigosa brain coral grows on the edge of the reef

Figure 3: -28.2 m
Soft corals on reef

Figure 4: -27.6 m
Gobies under a rock

Dive Site: Tortugas, Reef; Block 66 & 68; ROV 14-19, UNCW #98

Dive Notes:

Objectives, Site Description, Habitat, Fauna:

Site/Objectives:
ROV 14-19, Site #- 24-VIII-14-2, UNCW Dive #98. Target Site -Tortugas, Block 68 & 66. Ground truth: NOAA Regional Bathymetric Chart: 2010_pulley_10m.tif, live GPS Log- 201408173.shp; conduct ROV video/photo transects.

ROV Setup/Dive Events:
Video time ESDT. Dive Notes depth were recorded as total depth (ROV altitude + ROV depth in meters). COG is ROV heading. Events, habitat and fauna were recorded directly into Access database. Fish data were recorded by H. Moe (NOAA NMFS) in separate Access database which was added to the Access habitat database. Quantitative photos were taken every 30 seconds with a fixed digital camera (Kongsberg OE14-408, with resolution of 3648x2736 pixels) pointing 90° down, 1.3 m off the bottom, set digital still camera to Tv Mode, fixed S1/125, with auto F-Stop, ISO 100, auto focus. Forward looking Video camera (Insite Pacific Mini Zeus high definition CMOS color zoom camera with 2,000,000 effective pixels) was angled ~20° down. Only the digital still camera had a pair of parallel 10 cm green lasers for scale. Seabird 39 temperature recorder was attached to the ROV. Date/time of video and digital still camera, ROV CTD and ROV Nav were set to ESDT. Low salinity of shipboard CTD was verifiied in the evening CTD cast down to 5 m.

Five 100-m random transects were made to characterize each randomly selected 1 km x 1 km block (block 68 & 66). Each 100 m transect was conducted at ~0.25 kn at an altitude of ~1.3 m, for 15-20 minutes until the ROV passed through a 100-m radius circle overlaid on the navigation screen; quantitative still images were taken every ~30 sec. Off transects between the photo transects were 10-15 minutes. Heading of transects were determined by flip of coin, depending in part on ship's maneuverability due to wind/current.

Block 68
Site Description/Habitat/Biota:
The NOAA Bathy chart shows 26 m bathy lines in the western side of Block 68.
Five transects were conducted in Block 68, starting at SE corner and headed W/NW. The five transects ranged from 27.5 to 31.8 m depth.

XS 1: HD NW: Start: 10:46:12 AM, 31.8 m; end: 10:57:49 AM, 28.2 m. Sand at beginning then large patch reef entire dive and off transect, so about 200 m long; with 1 m relief, high rugosity, flat. Biota was dominated by Xestospongia muta, Pseudopterogorgia sp., Callyspongia vaginalis, Pseudopterogorgia americana, Montastraea cavernosa- abundant, Aplysina cauliformis, Undaria (Agaricia) agaricites, Niphates, Gorgonia ventalina, Agelas clathrodes, Eunicea spp.
Off Transect: HD NW for 15 min. Patchy patch reefs, <1 m relief. Same biota; also Iotrochota birotulata, Aiochoroia crassa, Microdictyon? filamentous green common on the rock, Penicillus, Dictyota. End of reef.

XS 2: HD NW: Start: 11:09:18 AM, 29 m; end: 11:17:22 AM, 28.5 m. Patch reef petered out on sediment with few scattered hard bottom patches; 90% soft bottom; barren except on small boulders, low relief, with same reef species but in a lot less abundance, sand tile mounds, Plexaura sp. Patch reef reappears for a short distance 3/4 of the way through.
Off Transect: HD W for 15 min. Patch reef peters out again, same species; also Eusmilia fastigiata coral.

XS 3: HD W: Start: 11:26:29 AM, 28.5 m; end: 11:36:33 AM, 28 m. Similar to XS 1, patch reef, <1 m relief. Similar biota; M. cavernosa; also Pseudodiploria strigosa, Ellisella barbadensis. Good place for diver

collections of M. cavernosa at 11:33:40 AM- 24°32.2154'N, 83°01.6390'W; 28.5 m.
Off Transect: HD W for 15 min; 28 m. Same bottom; also Pterogorgia anceps, sand tillefish mounds, Udotea cups common on sand, Siderastrea siderea, Agaricia fragilis?, Callyspongia plicifera, Scolymia, Niphates erecta.

XS 4: HD W: Start: 11:47:12 AM, 28.2 m; end: 11:59:00 AM, 28 m. Similar to XS 1; low reilief patch reefs. Biota similar; also 2 red grouper. Good place for diver collections of M. cavernosa at 11:57:51 AM- 24° 32.2020'N, 83°01.8025'W; 30-50 cm diameter, all healthy
Off Transect: HD N for 15 min; 28 m. Patchy patch reefs, < 1 m. Coral - Meandrina meandrites, Montastraea cavernosa - common; 30 cm M. Cavernosa appears slightly bleached, 4 adjacent M. Cavernosa brown; rock with 5 M. Cavernosa; another rock w/ 5 M.c.

XS 5: HD N: Start: 12:08:51 PM, 27.5 m; end: 12:19:24 PM, 28m. Similar to XS 1; patch reefs <1 m relief. Good place for diver collections of M. cavernosa at 12:14:30 PM- 24°32.3061'N,, 83°01.8221'W; 28 m. Meandrina, 30-50 cm M. Cavernosa common, red grouper in hole, P. Strigosa. Bleached coral in photo, 1 m Agaricia cuculata? partially bleached.
Off Transect: HD NW 300 m to Block 66. Patch reef disappearing and becomes sand with algae.

Block 66
Site Description/Habitat/Biota:
The NOAA Bathy chart shows 26 & 28 m bathy lines on the west side of Block 66.
Five transects were conducted in Block 66, starting at SE corner and headed N/NW. The five transects ranged from 24.8 to 27.5 m depth.

XS 1 (6): HD NW: Start: 12:32:51 PM, 27.7 m; end: 12:41:55 PM, 27.5 m. 100% sediment; biota was dominated by algae: Udotea cups, Caulerpa sertulariodes.
Off Transect: HD N for 15 min. Sediment with sand tile mounds and green alga; some rock with Spheciospongia vesparium loggerhead sponge.

XS 2 (7): HD NW: Start: 12:56:35 PM, 27 m; end: 1:03:31 PM, 26.1 m. Similar to XS 1 (6); 100% soft bottom; sparse rock with sponges. Same biota.
Off Transect: HD NW for 15 min. Soft bottom at the beginning, changes to increase off rubble/cobble/boulders with reef species, gorgonians and sponges; M. Cavernosa reappears, X.muta, I. strobiliina, C.vaginalis. Ghost lobster trap-empty.

XS 3 (8): HD W: Start: 1:13:00 PM, 25 m; end: 1:21:16 PM, 24.8 m. 100 pavement with sediment veneer, X. muta, S. Vesparium, dense Udotea on sediment, I. campana.
Off Transect: HD NW for 15 min, 24.5 m. 100% pavement w\ sediment veneer. Came across a (15 m diam) reef with 1 m relief, with a 4' goliath, hundreds of grey snapper (spawning aggregation?), scamp groupers, few lionfiish (only ones seen on entire dive), dense corals 24°32.7815'N, 83°02.2330'W- 30-50 cm M. cavernosa common, 1-2 m P. strigosa.

XS 4 (9): HD N: Start: 1:37:18 PM, 24.8 m; end: 1:48:03 PM, 25 m. Low relief patch reef, pavement, mostly sediment. Gorgonacea, sponges, Udotia, Ircinia, S. vesparium, X. muta.
Off Transect: HD W for 15 min, 25 m. 100% hard bottom reef habitat, flat pavement with dense biota, same shallow reef species.

XS 5 (10): HD NW: Start: 1:59:03 PM, 25.7 m; end: 2:11:12 PM, 25 m. Patchy flat hard bottom with reef

species and soft bottom patches; 50% exposed pavement. Sponges and gorgonacea common but not dense. On sand- Penicillus, Udotea, Sargassum attached.
Off Transect: HD N to edge of block. Similar hard bottom. Ghost lobster pot, no line, empty; 3 hogfish, 1 red grouper.

Dive Site: Tortugas, Reef; Block 66 & 68; ROV 14-19, UNCW #98

CPCe Percent Cover Analysis:

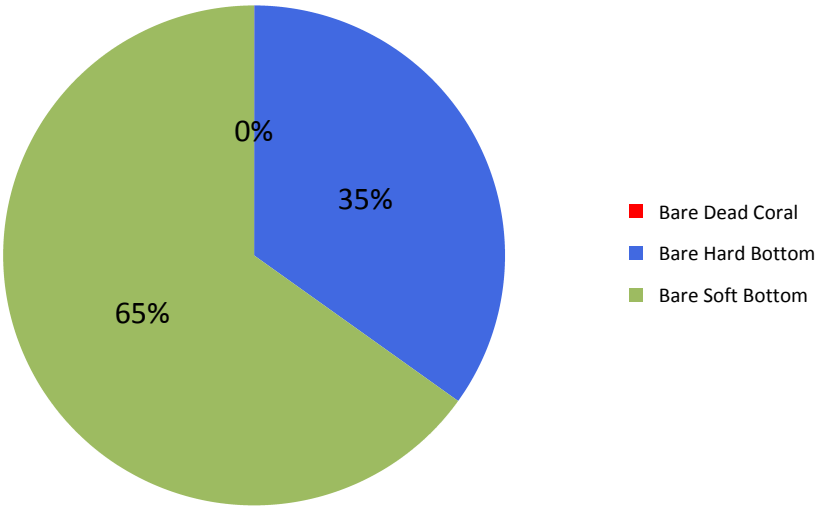
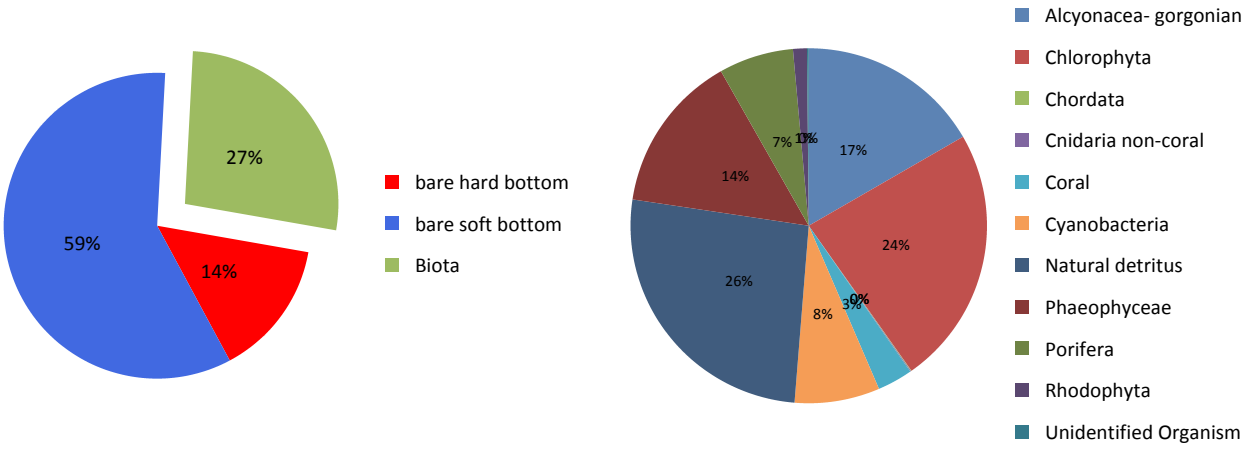


Figure 1. Percent cover of hard and soft bottom substrate at dive site 24-VIII-14-2. CPCe© points on organisms were scored as the underlying substrate (hard or soft).

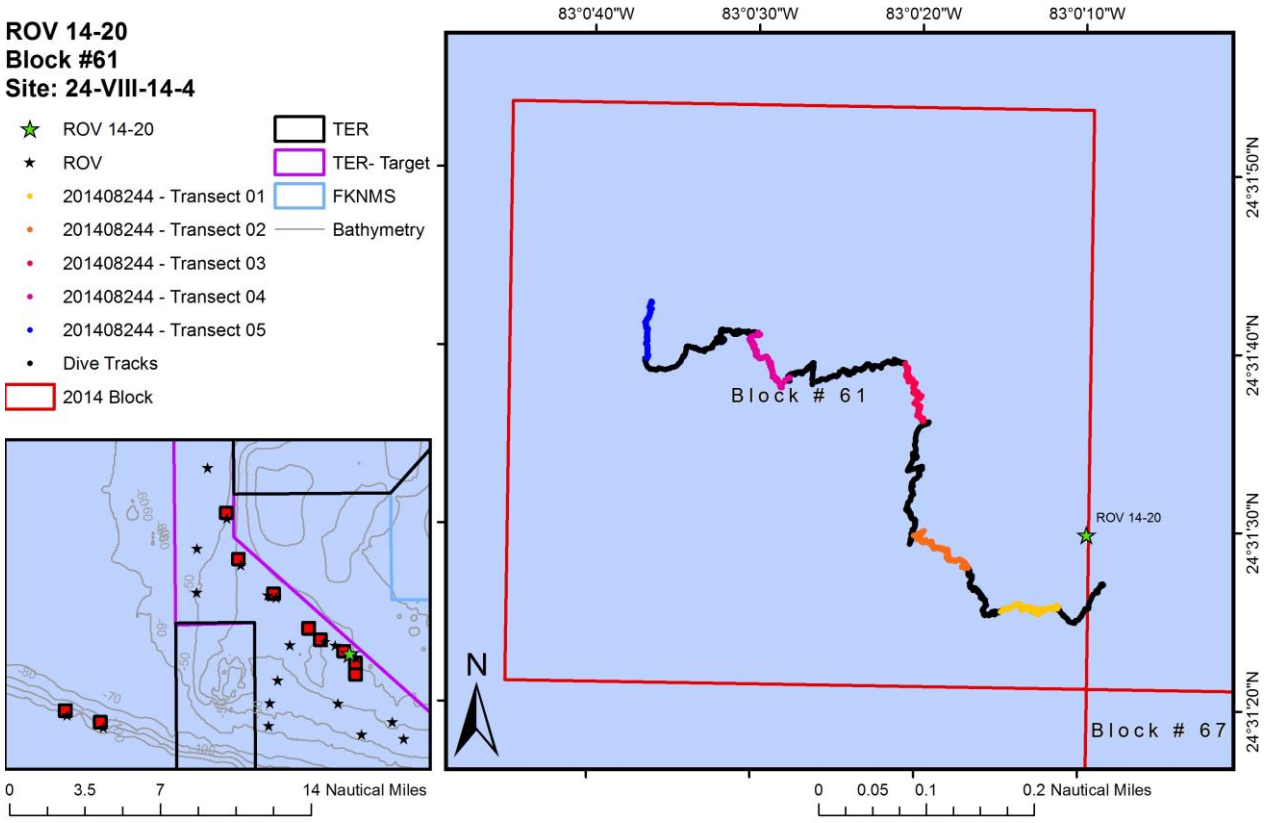


A B

Figure 2. Percent cover of bare substrate and benthic macro-biota at dive site 24-VIII-14-2. A. CPCe percent cover of biota and bare substrate (hard or soft bottom). B. CPCe percent cover of biota and human debris.

Dive Site: Tortugas, Reef; Block 61; ROV 14-20, UNCW #99

General Location and Dive Track:



Site Overview:

Project:	Pulley Ridge Mesophotic Reef Connectivity Project
Principal Investigator:	Dr. Robert Cowen, PhD
PI Contact Info:	Hatfield Marine Science Center/OSU 2030 Marine Science Dr., Newport, OR 97365
Website:	www.oceanexplorer.noaa.gov
Scientific Observers:	Dennis Hanisak, Heather Moe, Jason White, John Reed, Lance Horne, Stephanie Farrington
Data Management:	Access Database
ROV Navigation Data:	Trackpoint II
Ship Position System:	DGPS
Report Analyst:	John Reed, Stephanie Farrington
Date Compiled:	12/15/2016

Dive Overview:

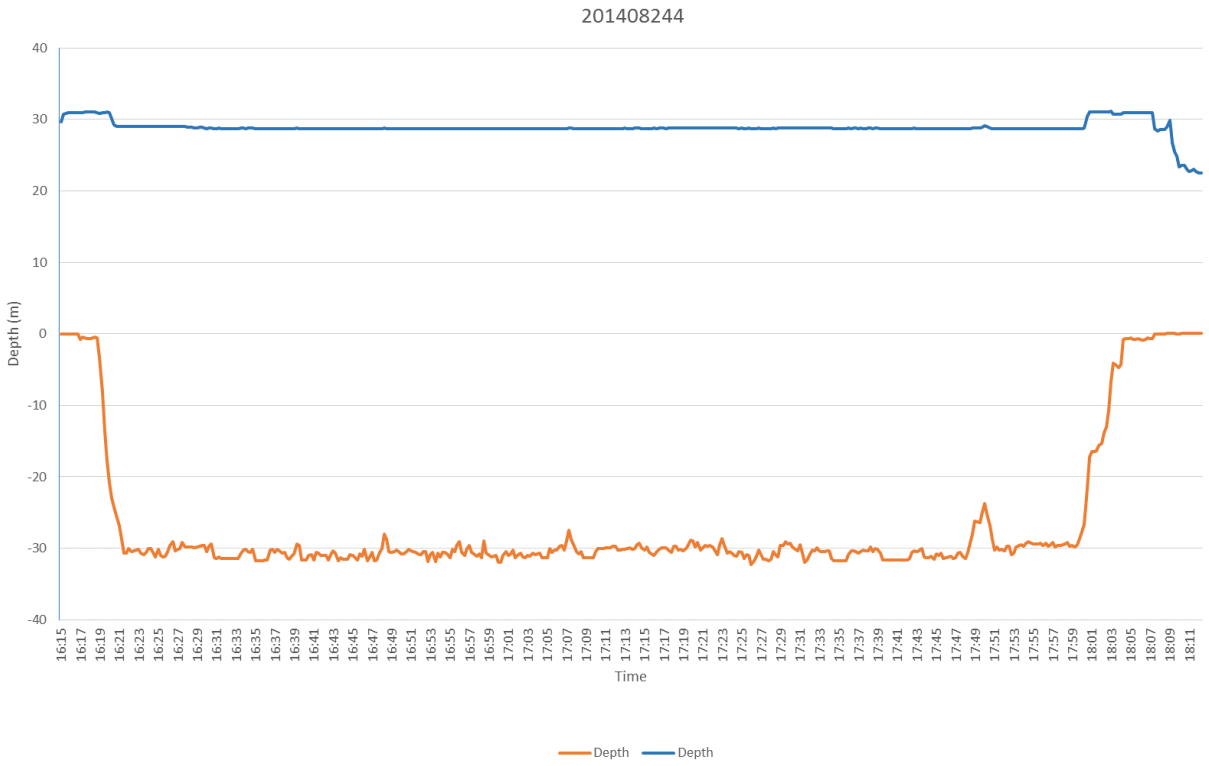
Vessel:	R/V Walton Smith
Sonar Data:	None Available
Purpose:	Conduct ROV video/photo transects; collect grouper for tagging and genetic samples; light traps, CTD, and ISIS plankton tows
ROV:	Mohawk ROV
ROV Sensors:	Temperature (°C), Depth (m)
Date of Dive:	8/24/2014
Specimens:	
Digital Photos:	154
DVD:	2
Hard Drive:	1

Dive Site: Tortugas, Reef; Block 61; ROV 14-20, UNCW #99

Dive Data:

Minimum Bottom Depth (m):	31	**Total Transect Length (km):**	0.918
Maximum Bottom Depth (m):	32.5	**Surface Current (kn):**	N/A
On Bottom (Time- GMT):	16:23	**On Bottom (Lat/Long):**	24.52°N; -83°W
Off Bottom (Time- GMT):	18:01	**Off Bottom (Lat/Long):**	24.53°N; -83.01°W
Physical (bottom); Temp (°C):	28.71	**Salinity:**	**Visibility (ft):** 30 **Current (kn):**

Physical Environment:



Temperature and depth (pressure) were collected with a Sea-Bird 39 Temperature Recorder attached to the ROV (recording descent, bottom data and ascent). The ranges of the bottom data recorded during ROV 14-20 are as follows: Depth Maximum: 32.3 m, Temperature: 28.7-29.2 °C.

Dive Site: Tortugas, Reef; Block 61; ROV 14-20, UNCW #99

Dive Imagery:

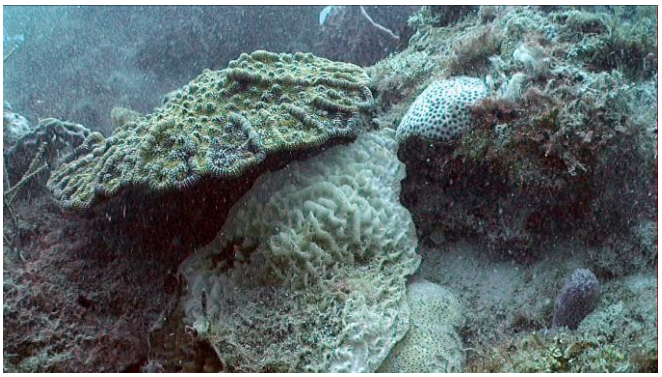


Figure 1: -30.8 m
Mycetophyllia aliciae, recently dead Agariciids coral and *Siderastrea radians* on the reef.

Figure 2: -30.7 m
Field of shaving-brush green algae (*Penicillus dumetosus*) on soft bottom

Figure 3: -31.7 m
Dichocoenia stokesii and *Montastraea annularis*

Figure 4: -30 m
Montastraea corals on hardbottom reef

Dive Site: Tortugas, Reef; Block 61; ROV 14-20, UNCW #99

Dive Notes:

Objectives, Site Description, Habitat, Fauna:

Site/Objectives:
ROV 14-20, Site #- 24-VIII-14-4, UNCW Dive #99. Target Site -Tortugas, Block 61;. Ground truth: NOAA Regional Bathymetric Chart: 2010_pulley_10m.tif, Live GPS Log- 201408244.shp; conduct ROV video/photo transects.

ROV Setup/Dive Events:
Video time ESDT. Dive Notes depth were recorded as total depth (ROV altitude + ROV depth in meters). COG is ROV heading. Events, habitat and fauna were recorded directly into Access database. Fish data were recorded by H. Moe (NOAA NMFS) in separate Access database which was added to the Access habitat database. Quantitative photos were taken every 30 seconds with a fixed digital camera (Kongsberg OE14-408, with resolution of 3648x2736 pixels) pointing 90° down, 1.3 m off the bottom, set digital still camera to Tv Mode, fixed S1/125, with auto F-Stop, ISO 100, auto focus. Forward looking Video camera (Insite Pacific Mini Zeus high definition CMOS color zoom camera with 2,000,000 effective pixels) was angled ~20° down. Only digital still camera had a pair of parallel 10 cm green lasers for scale. Seabird 39 temperature recorder was attached to the ROV. Date/time of video and digital still camera, ROV CTD and ROV Nav were set to ESDT.

Five 100-m random transects were made to characterize each randomly selected 1 km x 1 km block. Each 100 m transect was conducted at ~0.25 kn at an altitude of ~1.3 m, for 15-20 minutes until the ROV passed through a 100-m radius circle overlaid on the navigation screen; quantitative still images were taken every ~ 30 sec. Off transects between the photo transects were 10-15 minutes. Heading of transects were determined by flip of coin, depending in part on ship's maneuverability due to wind/current.

Site Description/Habitat/Biota:
The NOAA Bathy chart shows 32 m bathy lines inside Block 61.
Five transects were conducted in Block 61, starting at SE corner and headed W/NW. The five transects ranged from 31 to 32.5 m depth.

XS 1: HD W: Start: 4:27:40 PM, 31.5 m; end: 4:40:25 PM, 32.2 m. 100% soft sediment bottom, silty, thin layer of flocculant detritus on surface; bioturbation with 5-10 cm mounds, depressions, and dense 2-3 mm holes. Barren at first, sand tilefish mound.
Off Transect: HD W for 10 min, 32.2. M. 100% soft bottom then came across small patch reef, < 1m relief; Eudistoma, Montastraea cavernosa, Dictyota sp., Pseudopterogorgia, Eunicia sp., Xestospongia muta, Niphates digitalis, filamentous Chlorophyta on rock, Aplysina cauliformis. 20 cm M. Cavernosa, 10 cm Dichocoenia, 1/2-1 m round boulders with reef biota scattered on sediment.

XS 2: HD NW: Start: 4:49:06 PM, 32 m; end: 4:59:36 PM, 32.5 m. 100% soft sedimnent, small bioterbation pits. Few scattered boulders 0.5-1 m diameter w/ reef fauna, patch with 1-2 m tall boulders with reef fauna. M. cavernosa.
Off Transect: HD N for 10 min, 32.5 m. 1/2 to 1 m rock boulders on soft sediment. N. Erecta, iciligorgia schrammi common 2--3', X. muta, M. cavernosa, C. vaginalis, Elliisella barbadensis, Porites asteroides, 20 cm Undaria agaricites 100% bleached, 10 cm Siderastrea siderea bleached, 20 cm Meandrites danae- green.

XS 3: HD N: Start: 5:11:10 PM, 31.6 m; end: 5:23:41 PM, 32 m. Patchy patch reefs, <1m boulders covered in typical reef fauna, silty bottom. 50 cm M. cavernosa, Mussa angulosa. 3 M.cav (brown, green and bleacheds

side by side, or same colony), red boring sponge Cliona. Most Agaricia of entire dive were partially of completely bleached.
Off Transect: HD W for 15 min 32 m. Soft bottom w/ 1/2-`1 m boulders and patch reefs. Changes to soft bottom

XS 4: HD NW: Start: 5:33:43 PM, 32.2 m; end: 5:45:33 PM, 32 m. 100% sediment with flocculant detritus on surfaces. Alage starts to appear: dense Caulerpa sertulariodes, Halimeda, Udotea cups, Caulerpa prolifera.
Off Transect: HD NW for 15 min, 32 m. 100% sediment with algae.

XS 5: HD N: Start: 5:54:59 PM, 31.2 m; end: 6:01:13 PM, 31 m. 100% soft bottom w/ algae: Caulerpa, Udotea cups- Cyathiformis sp.

Dive Site: Tortugas, Reef; Block 61; ROV 14-20, UNCW #99

CPCe Percent Cover Analysis:

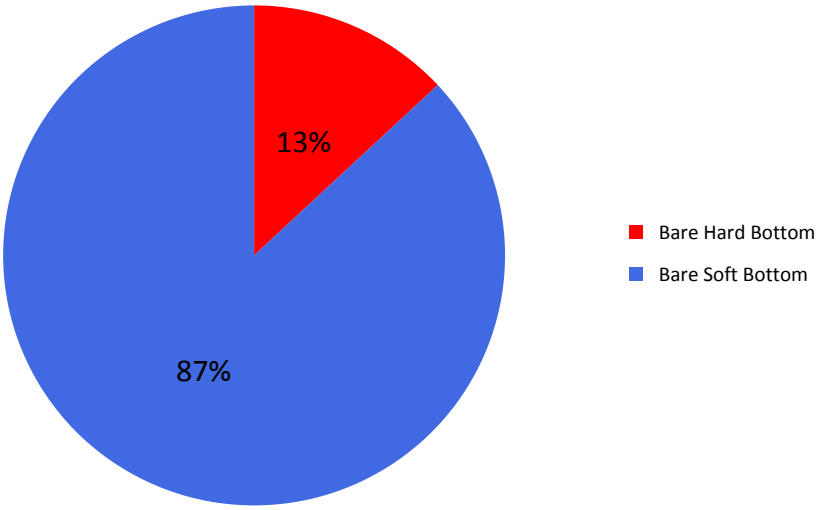
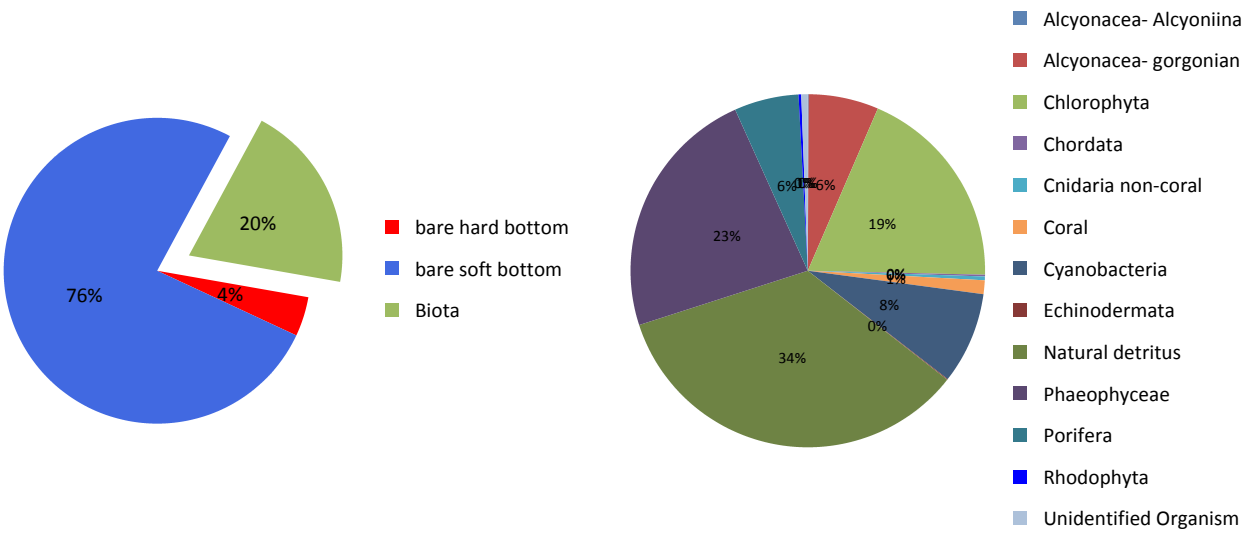


Figure 1. Percent cover of hard and soft bottom substrate at dive site 24-VIII-14-4. CPCe© points on organisms were scored as the underlying substrate (hard or soft).

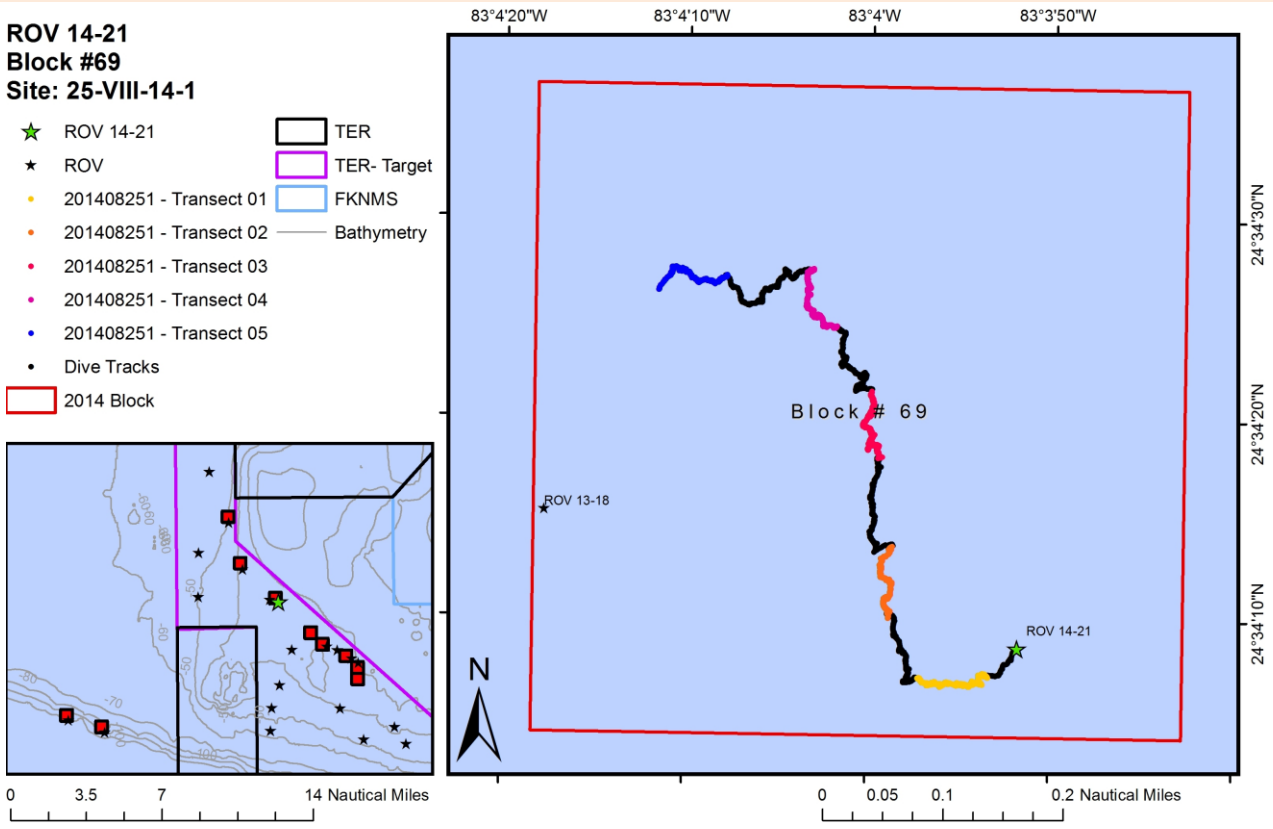


A B

Figure 2. Percent cover of bare substrate and benthic macro-biota at dive site 24-VIII-14-4. A. CPCe percent cover of biota and bare substrate (hard or soft bottom). B. CPCe percent cover of biota and human debris.

Dive Site: Tortugas, Soft Bottom; Block 69; ROV 14-21, UNCW #100

General Location and Dive Track:



Site Overview:

Project:	Pulley Ridge Mesophotic Reef Connectivity Project
Principal Investigator:	Dr. Robert Cowen, PhD
PI Contact Info:	Hatfield Marine Science Center/OSU 2030 Marine Science Dr., Newport, OR 97365
Website:	www.oceanexplorer.noaa.gov
Scientific Observers:	Dennis Hanisak, Heather Moe, Jason White, John Reed, Lance Horne, Stephanie Farrington
Data Management:	Access Database
ROV Navigation Data:	Trackpoint II
Ship Position System:	DGPS
Report Analyst:	John Reed, Stephanie Farrington
Date Compiled:	12/15/2016

Dive Overview:

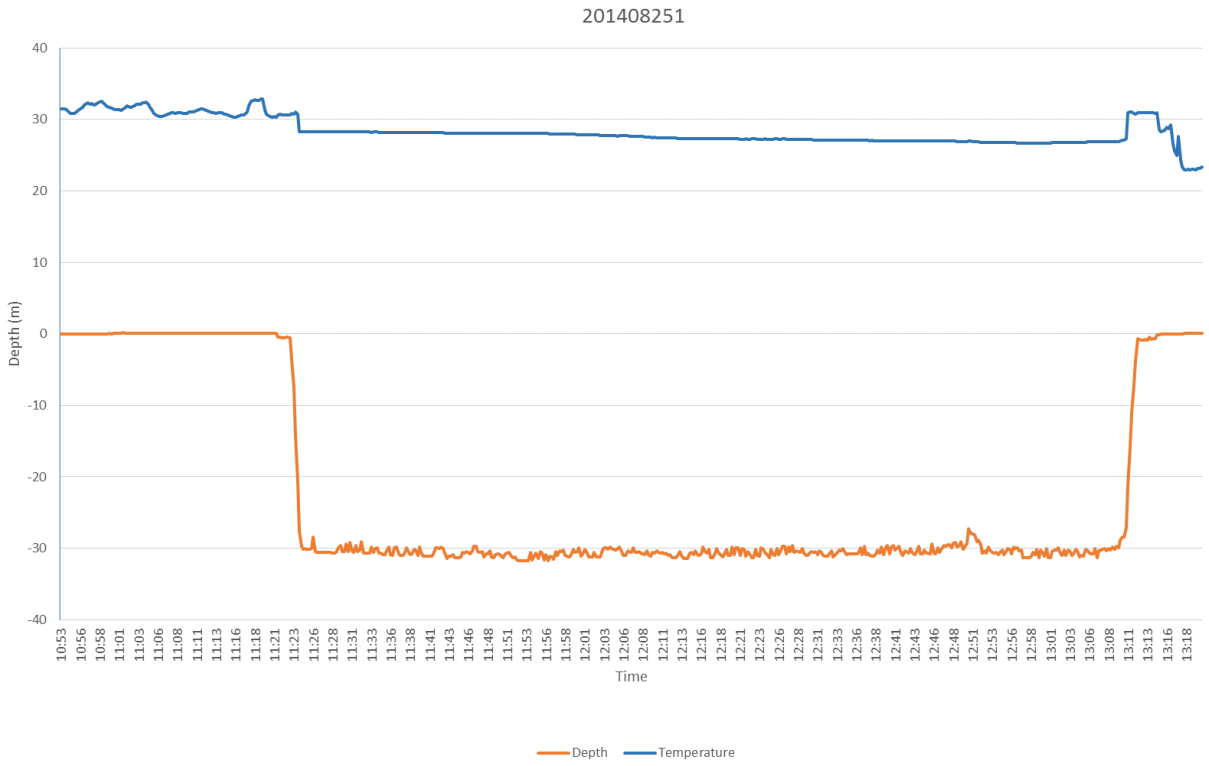
Vessel:	R/V Walton Smith
Sonar Data:	None Available
Purpose:	Conduct ROV video/photo transects; collect grouper for tagging and genetic samples; light traps, CTD, and ISIS plankton tows
ROV:	Mohawk ROV
ROV Sensors:	Temperature (°C), Depth (m)
Date of Dive:	8/25/2014
Specimens:	
Digital Photos:	155
DVD:	2
Hard Drive:	1

Dive Site: Tortugas, Soft Bottom; Block 69; ROV 14-21, UNCW #100

Dive Data:

Minimum Bottom Depth (m):	31.2	**Total Transect Length (km):**	1.393
Maximum Bottom Depth (m):	32.2	**Surface Current (kn):**	0.3
On Bottom (Time- GMT):	11:26	**On Bottom (Lat/Long):**	24.57°N; -83.06°W
Off Bottom (Time- GMT):	13:11	**Off Bottom (Lat/Long):**	24.58°N; -83.07°W
Physical (bottom); Temp (°C):	26.70	**Salinity:**	**Visibility (ft):** **Current (kn):**

Physical Environment:



Temperature and depth (pressure) were collected with a Sea-Bird 39 Temperature Recorder attached to the ROV (recording descent, bottom data and ascent). The ranges of the bottom data recorded during ROV 14-21 are as follows: Depth Maximum: 31.8 m, Temperature: 26.7-30.9 °C.

Dive Site: Tortugas, Soft Bottom; Block 69; ROV 14-21, UNCW #100

Dive Imagery:

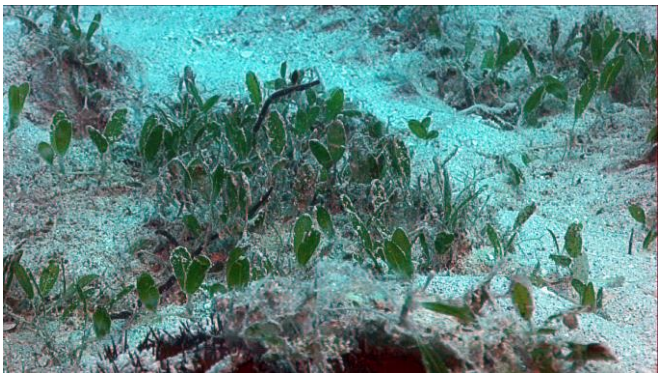


Figure 1: -31.2 m
Halophila decipiens seagrass

Figure 2: -31.4 m
Triplofusus giganteus on soft bottom

Dive Site: Tortugas, Soft Bottom; Block 69; ROV 14-21, UNCW #100

Dive Notes:

Objectives, Site Description, Habitat, Fauna:

Site/Objectives:
ROV 14-21, Site #- 25-VIII-14-1, UNCW Dive #100. Target Site -Tortugas, Block 69, 4 km west of FKNMS boundary; Ground truth: NOAA Regional Bathymetric Chart:NOAA_Bathy_Chart_Tortugas_Bank, Live GPS Log- 201408251.shp; conduct ROV video/photo transects.

ROV Setup/Dive Events:
Video time ESDT. Dive Notes depth were recorded as total depth (ROV altitude + ROV depth in meters). COG is ROV heading. Events, habitat and fauna were recorded directly into Access database. Fish data were recorded by H. Moe (NOAA NMFS) in separate Access database which was added to the Access habitat database. Quantitative photos were taken every 30 seconds with a fixed digital camera (Kongsberg OE14-408, with resolution of 3648x2736 pixels) pointing 90° down, 1.3 m off the bottom, set digital still camera to Tv Mode, fixed S1/125, with auto F-Stop, ISO 100, auto focus. Forward looking Video camera (Insite Pacific Mini Zeus high definition CMOS color zoom camera with 2,000,000 effective pixels) was angled ~20° down. Only digital still camera had a pair of parallel 10 cm green lasers for scale. Seabird 39 temperature recorder was attached to the ROV. Date/time of video and digital still camera, ROV CTD and ROV Nav were set to ESDT.

Five 100-m random transects were made to characterize each randomly selected 1 km x 1 km block. Each 100 m transect was conducted at ~0.25 kn at an altitude of ~1.3 m, for 15-20 minutes until the ROV passed through a 100-m radius circle overlaid on the navigation screen; quantitative still images were taken every ~ 30 sec. Off transects between the photo transects were 10-15 minutes. Heading of transects were determined by flip of coin, depending in part on ship's maneuverability due to wind/current.

Site Description/Habitat/Biota:
The NOAA Bathy chart shows 28 m bathy lines circling the outside of the Block 69.
Five transects were conducted in Block 69, starting at SE corner and headed N/NW. The five transects ranged from 31.2 to 32.2 m depth.

XS 1: HD W: Start: 11:28:08 AM, 31.5 m; end: 11:44:43 AM, 31.9 m. 100% sediment with 10-30 cm mounds and depressions bioturbation, ~10% algal cover; biota was domithgnated by C. prolifera, Penicillus dumentosus, Udotea cyathiformis, Halophila decipens sea grass sparse; several small 10 cm conch- fighting conch?
Off Transect: HD N for 15 min. Same habitat; MOL - Gastropoda - Strombus atlanticus, fighting conch?

XS 2: HD N: Start: 11:55:15 AM, 32.2 m; end: 12:07:48 PM, 31.5m. Similar to XS 1 with Udotea fans, snapper, Halimeda incrassata.
Off Transect: HD N for 15 min. Same Bottom

XS 3: HD N: Start: 12:16:23 PM, 31.5 m; end: 12:28:26 PM, 31.2m. Similar to XS 1.
Off Transect: HD N for 10 min. Soft bottom with Meoma ventricosa sea biscuits and tracks.

XS 4: HD NW: Start: 12:38:14 PM, 31.2 m; end: 12:51 pm, 31.0 m. Similar to XS 1.
Off Transect: HD W for 15 min. Same habitat and biota.

XS 5: HD W: Start: 12:59:56 PM, 31.7 m; end: 13:11 pm, 31.5 m. Similar to XS 1, Udotea cups and fans,

Dive Site: Tortugas, Soft Bottom; Block 69; ROV 14-21, UNCW #100

cyanobacteria patches. Came across small area of patchy hard bottom reef with typical reef habitat: Callyspongia vaginalis, Dictyota, Halimeda, Niphates erecta, Ircinia campana, Pseudopterogorgia, sand tilefish burrows.

Dive Site: Tortugas, Soft Bottom; Block 69; ROV 14-21, UNCW #100

CPCe Percent Cover Analysis:

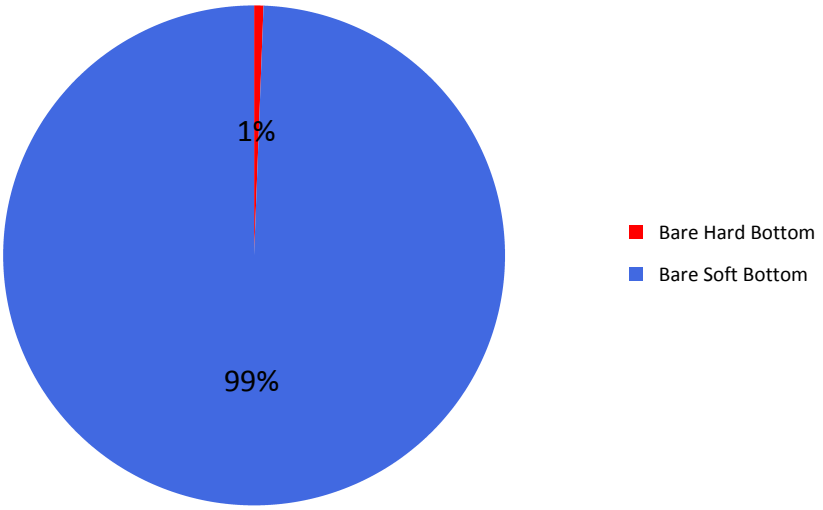
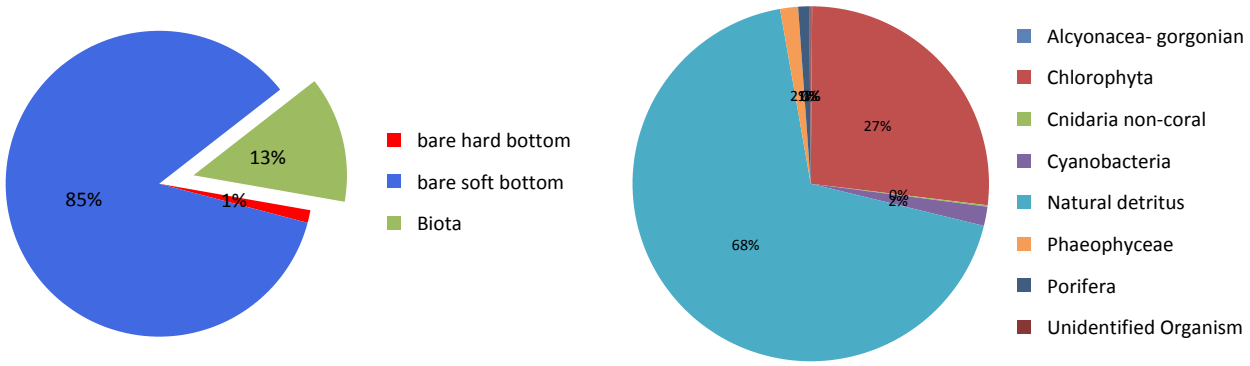


Figure 1. Percent cover of hard and soft bottom substrate at dive site 25-VIII-14-1. CPCe© points on organisms were scored as the underlying substrate (hard or soft).

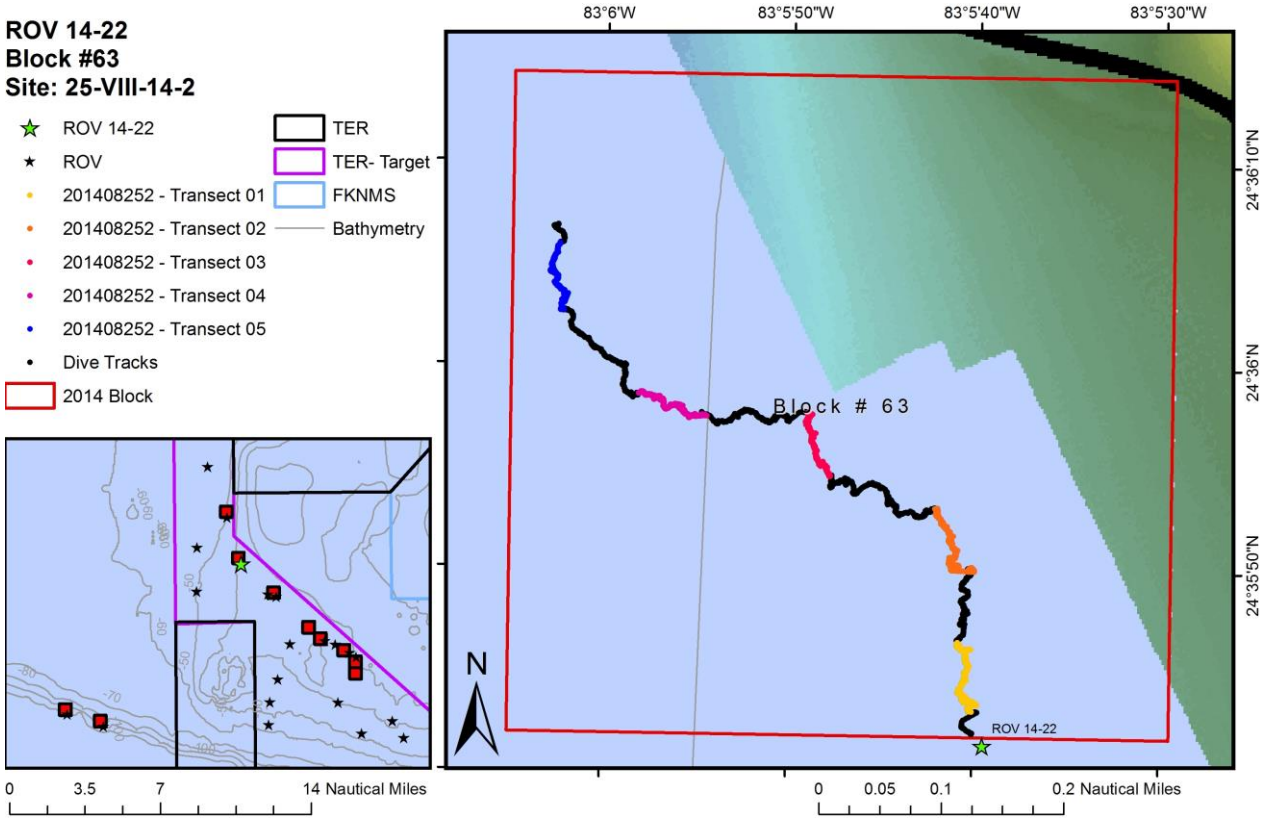


A B

Figure 2. Percent cover of bare substrate and benthic macro-biota at dive site 25-VIII-14-1. A. CPCe percent cover of biota and bare substrate (hard or soft bottom). B. CPCe percent cover of biota and human debris.

Dive Site: Tortugas, Soft Bottom; Block 63; ROV 14-22, UNCW #101

General Location and Dive Track:



Site Overview:

Project:	Pulley Ridge Mesophotic Reef Connectivity Project
Principal Investigator:	Dr. Robert Cowen, PhD
PI Contact Info:	Hatfield Marine Science Center/OSU 2030 Marine Science Dr., Newport, OR 97365
Website:	www.oceanexplorer.noaa.gov
Scientific Observers:	Dennis Hanisak, Heather Moe, Jason White, John Reed, Lance Horne, Stephanie Farrington
Data Management:	Access Database
ROV Navigation Data:	Trackpoint II
Ship Position System:	DGPS
Report Analyst:	John Reed, Stephanie Farrington
Date Compiled:	12/15/2016

Dive Overview:

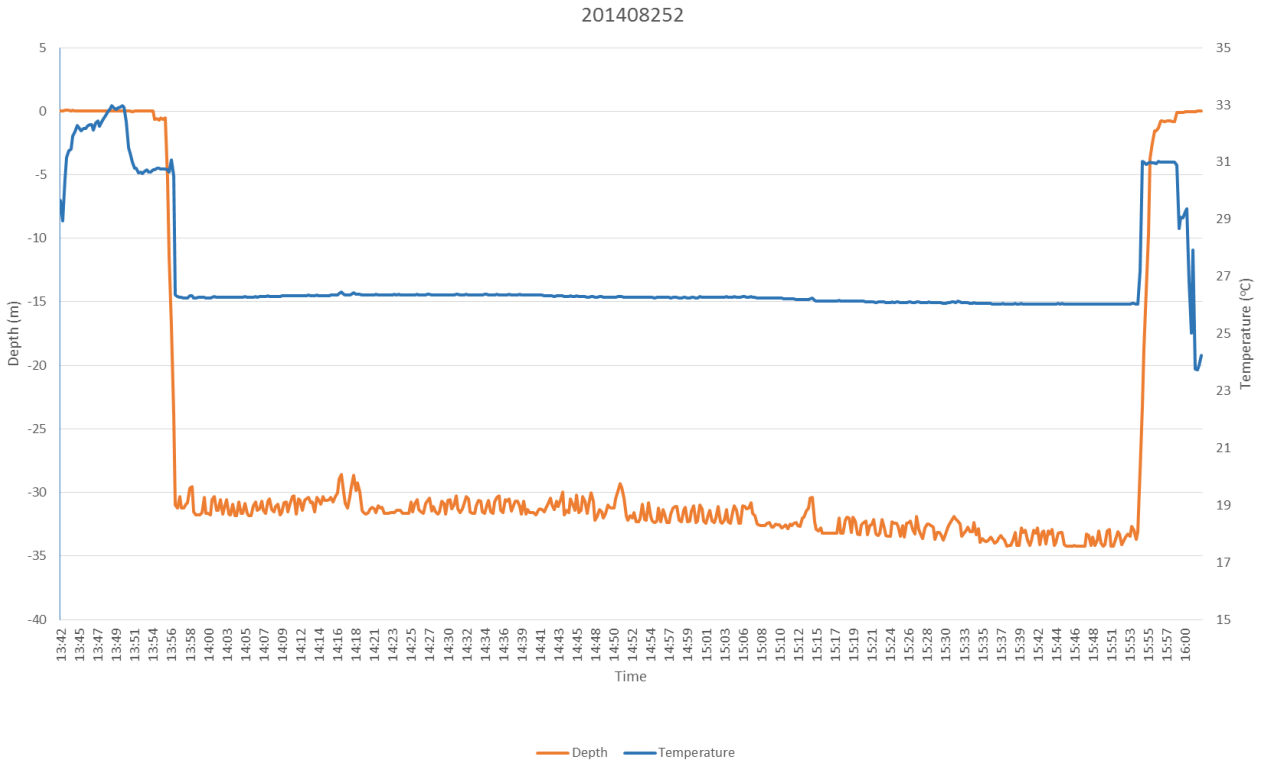
Vessel:	R/V Walton Smith
Sonar Data:	NCCOS&FKNMS_multibeam.tif
Purpose:	Conduct ROV video/photo transects; collect grouper for tagging and genetic samples; light traps, CTD, and ISIS plankton tows
ROV:	Mohawk ROV
ROV Sensors:	Temperature (°C), Depth (m)
Date of Dive:	8/25/2014
Specimens:	
Digital Photos:	159
DVD:	2
Hard Drive:	1

Dive Site: Tortugas, Soft Bottom; Block 63; ROV 14-22, UNCW #101

Dive Data:

Minimum Bottom Depth (m):	31.9	**Total Transect Length (km):**	1.000
Maximum Bottom Depth (m):	34.5	**Surface Current (kn):**	0.2
On Bottom (Time- GMT):	13:58	**On Bottom (Lat/Long):**	24.59°N; -83.09°W
Off Bottom (Time- GMT):	15:56	**Off Bottom (Lat/Long):**	24.6°N; -83.1°W
Physical (bottom); Temp (°C):	26.03	**Salinity:**	**Visibility (ft):** **Current (kn):**

Physical Environment:



Temperature and depth (pressure) were collected with a Sea-Bird 39 Temperature Recorder attached to the ROV (recording descent, bottom data and ascent). The ranges of the bottom data recorded during ROV 14-22 are as follows: Depth Maximum: 34.3 m, Temperature: 26-26.4 °C.

Dive Site: Tortugas, Soft Bottom; Block 63; ROV 14-22, UNCW #101

Dive Imagery:

Figure 1: -32 m
Mixed *Caulerpa* spp. and *Halophila decipiens*

Figure 2: -33.6 m
Caulerpa prolifera on sediment

Dive Site: Tortugas, Soft Bottom; Block 63; ROV 14-22, UNCW #101

Dive Notes:

Objectives, Site Description, Habitat, Fauna:

Site/Objectives:
ROV 14-22, Site #- 25-VIII-14-2, UNCW Dive #101. Target Site -Tortugas, Block 63, west of FKNMS. Ground truth: NOAA Regional Bathymetric Chart: NOAA_Bathy_Chart_Tortugas_Bank and edge of NCCOS&FKNMS_multibeam.tif, Live GPS Log- 201408252.shp; conduct ROV video/photo transects. The NOAA chart appears to have shifted 0.5 km to the west.

ROV Setup/Dive Events:
Video time ESDT. Dive Notes depth were recorded as total depth (ROV altitude + ROV depth in meters). COG is ROV heading. Events, habitat and fauna were recorded directly into Access database. Fish data were recorded by H. Moe (NOAA NMFS) in separate Access database which was added to the Access habitat database. Quantitative photos were taken every 30 seconds with a fixed digital camera (Kongsberg OE14-408, with resolution of 3648x2736 pixels) pointing 90° down, 1.3 m off the bottom, set digital still camera to Tv Mode, fixed S1/125, with auto F-Stop, ISO 100, auto focus. Forward looking Video camera (Insite Pacific Mini Zeus high definition CMOS color zoom camera with 2,000,000 effective pixels) was angled ~20° down. Both cameras had a pair of parallel 10 cm green lasers for scale. Seabird 39 temperature recorder was attached to the ROV. Date/time of video and digital still camera, ROV CTD and ROV Nav were set to ESDT. ****Only the DVD got recorded; the high def and standard def video did not get saved somehow.

Five 100-m random transects were made to characterize each randomly selected 1 km x 1 km block. Each 100 m transect was conducted at ~0.25 kn at an altitude of ~1.3 m, for 15-20 minutes until the ROV passed through a 100-m radius circle overlaid on the navigation screen; quantitative still images were taken every ~ 30 sec. Off transects between the photo transects were 10-15 minutes. Heading of transects were determined by flip of coin, depending in part on ship's maneuverability due to wind/current.

Site Description/Habitat/Biota:
The NOAA Bathy chart shows 32 -42 m bathy lines increaseing east to west in Block 63.
Five transects were conducted in Block 66, starting at SE corner and headed N add W. The five transects ranged from 31.9 to 34.5 m depth.

XS 1: HD N: Start: 2:01:20 PM, 32.5 m; end: 2:16:43 PM, 32 m. 100% soft bottom, 100% covered with Caulerpa spp. and bioturbated with 10-30 cm mounds and depressions. Caulerpa prolifera, C. sertulariodes, Udotea cyanthiformis, Penicillus, P. mucosus, Dysidea etheria.
Off Transect: HD N for 15 min. Soft bottom; same habitat.

XS 2: HD NW: Start: 2:27:48 PM, 31.9 m; end: 2:41:26 PM, 32 m. Similar to XS 1, same biota, some large patches of Cyanobacteria.
Off Transect: HD NW for 15 min. Same habitat and biota.

XS 3: HD NW: Start: 2:55:16 PM, 32.6 m; end: 3:08:28 PM, 32.6m. Similar to XS 1; same habitat and biota.
Off Transect: HD W for 15 min. Soft bottom

XS 4: HD W: Start: 3:17:42 PM, 33.5m; end: 3:31:09 PM, 33.9 m. Similar to XS 1; same habitat and biota.
ff Transect: HD W for 15 min. Soft bottom

Dive Site: Tortugas, Soft Bottom; Block 63; ROV 14-22, UNCW #101

XS 5: HD N: Start: 3:40:07 PM, 34.5 m; end: 3:55:07 PM, 34.5 m. Similar to XS 1; same habitat and biota.

Dive Site: Tortugas, Soft Bottom; Block 63; ROV 14-22, UNCW #101

CPCe Percent Cover Analysis:

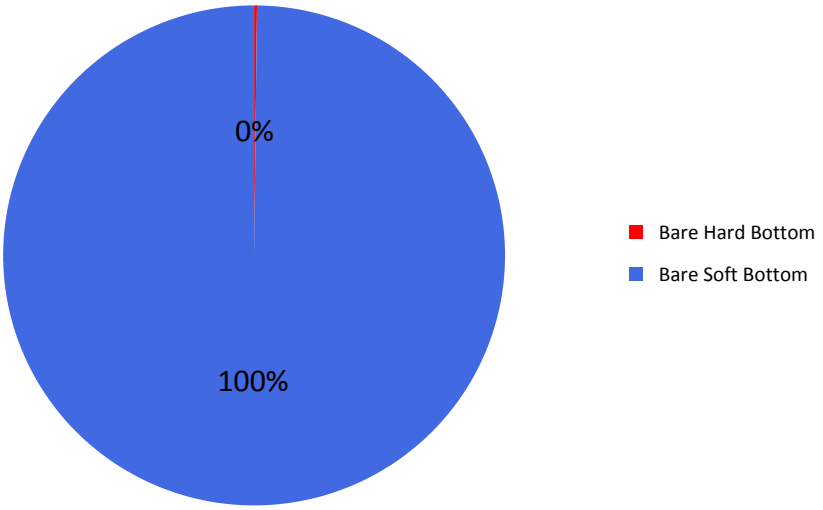
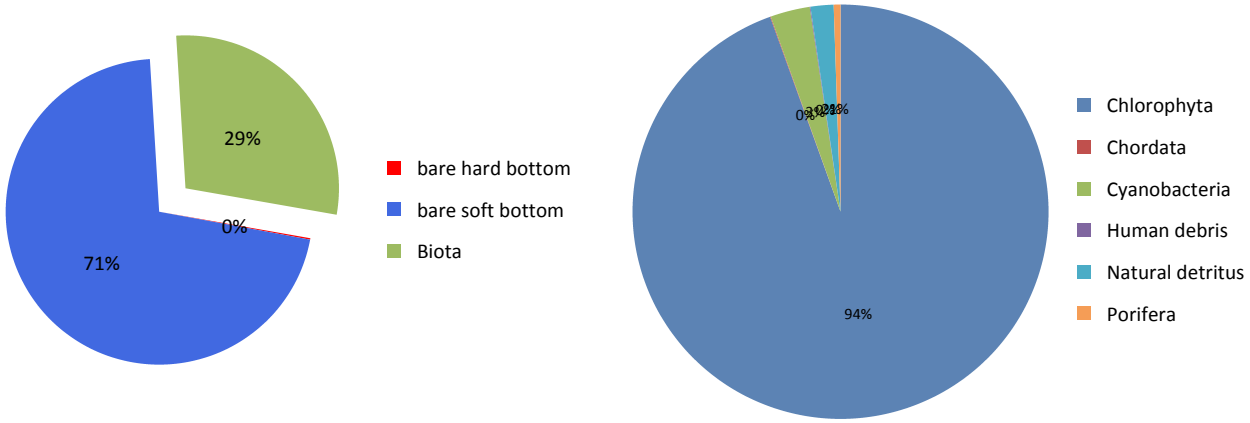


Figure 1. Percent cover of hard and soft bottom substrate at dive site 25-VIII-14-2. CPCe© points on organisms were scored as the underlying substrate (hard or soft).

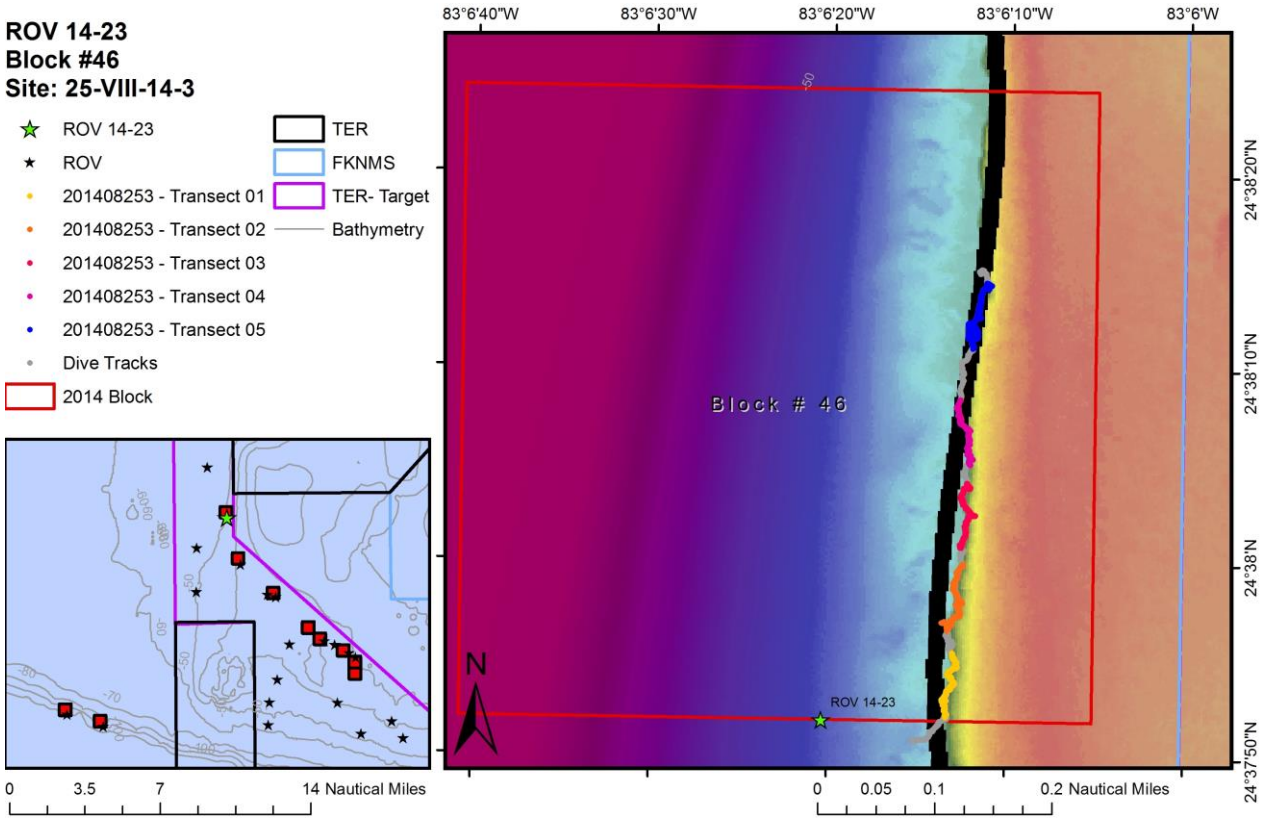


A B

Figure 2. Percent cover of bare substrate and benthic macro-biota at dive site 25-VIII-14-2. A. CPCe percent cover of biota and bare substrate (hard or soft bottom). B. CPCe percent cover of biota and human debris.

Dive Site: Tortugas, Reef, West of FKNMS. Block 46; ROV 14-23, UNCW #102

General Location and Dive Track:



Site Overview:

Project:	Pulley Ridge Mesophotic Reef Connectivity Project
Principal Investigator:	Dr. Robert Cowen, PhD
PI Contact Info:	Hatfield Marine Science Center/OSU 2030 Marine Science Dr., Newport, OR 97365
Website:	www.oceanexplorer.noaa.gov
Scientific Observers:	Dennis Hanisak, Heather Moe, Jason White, John Reed, Lance Horne, Stephanie Farrington
Data Management:	Access Database
ROV Navigation Data:	Trackpoint II
Ship Position System:	DGPS
Report Analyst:	John Reed, Stephanie Farrington
Date Compiled:	12/15/2016

Dive Overview:

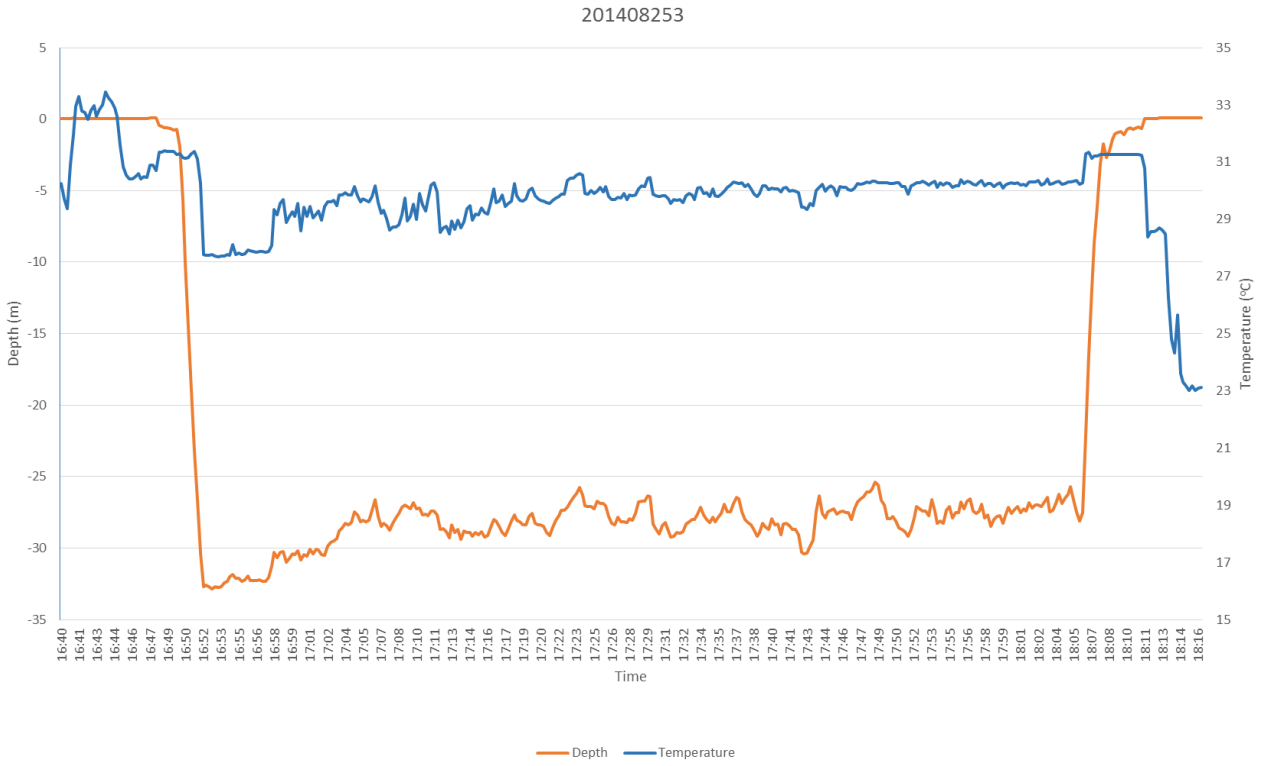
Vessel:	R/V Walton Smith
Sonar Data:	NCCOS&FKNMS_multibeam.tif
Purpose:	Conduct ROV video/photo transects; collect grouper for tagging and genetic samples; light traps, CTD, and ISIS plankton tows
ROV:	Mohawk ROV
ROV Sensors:	Temperature (°C), Depth (m)
Date of Dive:	8/25/2014
Specimens:	
Digital Photos:	179
DVD:	2
Hard Drive:	1

Dive Site: Tortugas, Reef, West of FKNMS. Block 46; ROV 14-23, UNCW #102

Dive Data:

Minimum Bottom Depth (m):	27	**Total Transect Length (km):**	0.741
Maximum Bottom Depth (m):	30.8	**Surface Current (kn):**	0.3
On Bottom (Time- GMT):	16:54	**On Bottom (Lat/Long):**	24.63°N; -83.1°W
Off Bottom (Time- GMT):	18:08	**Off Bottom (Lat/Long):**	24.64°N; -83.1°W
Physical (bottom); Temp (°C):	27.69	**Salinity:**	**Visibility (ft):** **Current (kn):**

Physical Environment:



Temperature and depth (pressure) were collected with a Sea-Bird 39 Temperature Recorder attached to the ROV (recording descent, bottom data and ascent). The ranges of the bottom data recorded during ROV 14-23 are as follows: Depth Maximum: 32.9 m, Temperature: 27.7-30.6 °C.

Dive Site: Tortugas, Reef, West of FKNMS. Block 46; ROV 14-23, UNCW #102

Dive Imagery:

Figure 1: -27.9 m
Montastraea cavernosa on a healthy reef outside of the FKNMS

Figure 2: -27.9 m
A nurse shark (*Ginglymostoma cirratuml*) rest on the fringing reef

Figure 3: -28.4 m
Coral on reef

Figure 4: -27 m
Reef

Dive Site: Tortugas, Reef, West of FKNMS. Block 46; ROV 14-23, UNCW #102

Dive Notes:

Objectives, Site Description, Habitat, Fauna:

Site/Objectives:
ROV 14-23, Site #- 25-VIII-14-3, UNCW Dive #102. Target Site -Tortugas, Block 46, ~200 m west of FKNMS boundary. Ground truth: NOAA Regional Bathymetric Chart: NOAA_Bathy_Chart_Tortugas_Bank and edge of NCCOS&FKNMS_multibeam.tif, Live GPS Log- 201408253.shp; conduct ROV video/photo transects. The NOAA chart appears to have shifted 0.5 km to the west.

ROV Setup/Dive Events:
Video time ESDT. Dive Notes depth were recorded as total depth (ROV altitude + ROV depth in meters). COG is ROV heading. Events, habitat and fauna were recorded directly into Access database. Fish data were recorded by H. Moe (NOAA NMFS) in separate Access database which was added to the Access habitat database. Quantitative photos were taken every 30 seconds with a fixed digital camera (Kongsberg OE14-408, with resolution of 3648x2736 pixels) pointing 90° down, 1.3 m off the bottom, set digital still camera to Tv Mode, fixed S1/125, with auto F-Stop, ISO 100, auto focus. Forward looking Video camera (Insite Pacific Mini Zeus high definition CMOS color zoom camera with 2,000,000 effective pixels) was angled ~20° down. Both cameras had a pair of parallel 10 cm green lasers for scale. Seabird 39 temperature recorder was attached to the ROV. Date/time of video and digital still camera, ROV CTD and ROV Nav were set to ESDT.

Five 100-m random transects were made to characterize each randomly selected 1 km x 1 km block. Each 100 m transect was conducted at ~0.25 kn at an altitude of ~1.3 m, for 15-20 minutes until the ROV passed through a 100-m radius circle overlaid on the navigation screen; quantitative still images were taken every ~ 30 sec. Off transects between the photo transects were 10-15 minutes. Heading of transects were determined by flip of coin, depending in part on ship's maneuverability due to wind/current.

Site Description/Habitat/Biota:
Geotiff shows ridge at 30 m outside the FKNMS in Block 46.
Five transects were conducted in Block 46, starting at SE corner and headed N along west ridge of Tortugas bank. Entire dive coverd 500 m along the top edge of the fore reef. Base of reef is flat sand at 33.4 m; 20-30o slope of fore reeff to top at 27.0 m over ~ 15 m width; 1 m rock relief, rugose and rugged surface; dense biota and coral. Fiive transects from 27 to 30.8 m depth; mostly along the top edge of the fore reef slope.

XS 1: HD NE: Start: 5:00:13 PM, 30.8 m; end: 5:13:38 PM, 28 m. Typical reef habitat 30.8 m in the sand with 30o slope on fore reef to the east; top 27.7 m; rugged eroded rock on slope with 1-1.5 m relief. Biota was dominated by M. cavernosa, Pseudopterogorgia americana, Xestospongia muta, Plexaura sp., Pseudoplexaura, Euniicea, Plexaurella, Aplysina cauliformis or fulva, Niphates digitalis, Pseudodiploria strigosa, Iotrochota birotulata, Cliona delitrix. Very abundant M. cavernosa, 10 cm to 50 cm, possibly 100 cm; various colors but some appear very light, possibly bleached. Abandoned long line along top of reef. 5' nurse shark.
Off Transect: HD N for 15 min. Top of reef on fore reef slope; 1 m M. cavernosa, Lobophora, lite M. cavernosa.

XS 2: HD N: Start: 5:20:05 PM, 28m; end: 17:20 cm, 28.2 m. Fore reef and top edge; reef flattens out, 28 m on top. Loads of M. cavernosa in light browm, grey, and white/green, Undaria agaricites- white, 1 m Orbicella, flat encrusting; 30 cm M. cavernosa- lite bleached?, conical pagoda like M. cavernosa common on

top of reef; Aplysina cauliformis, 1 lionfish, hog snapper common.
Off Transect: HD N for 3 min (running low on bottom time). Continue north along top edge of reef. Fishing boat laying lobster pots to the east of us.

XS 3: HD xx: Start: 5:33:49 PM, 29.6 m; end: 5:43:38 PM, 29 m. Similar to XS 1, fore reef, 30o slope, eroded rock, 1 m relief, high rugosity. Loads of M. cavernosa, Orbicella flat plates common, some 1 m diameter, Porites porites? (thick branches), Pseudodiploria strigosa, Mycetophyllia; some corals with signs of bleaching. Black grouper.
Off Transect: HD N for 3 min. Transect along base, depth 32.0 m in sand.

XS 4: HD xx: Start: 5:45:54 PM, 32 m; end: 5:54:13 PM, 28 m. Similar to XS 1; continue transect along top edge of reef; 1.5 m relief, 30o slope, high rugoisty,. Mycetophyllia sp., Montastraea cavernosa- very abundant, Agaricia or Undaria partially bleached; Aplysina fulva; scamp.
Off Transect: HD N for 3 min. Continue transect along fore reef.

XS 5: HD N: Start: 5:58:30 PM, 27.5 m; end: 6:06:39 PM, 27 m. Similar to XS 1, continue transect along top edge of fore reef. Pagoda like M. cavernosa, 50-100 cm on top of eroded pillars of rock on top of the reef- many of these are light colored or lightly bleached. 3' bushy black coral.

Dive Site: Tortugas, Reef, West of FKNMS. Block 46; ROV 14-23, UNCW #102

CPCe Percent Cover Analysis:

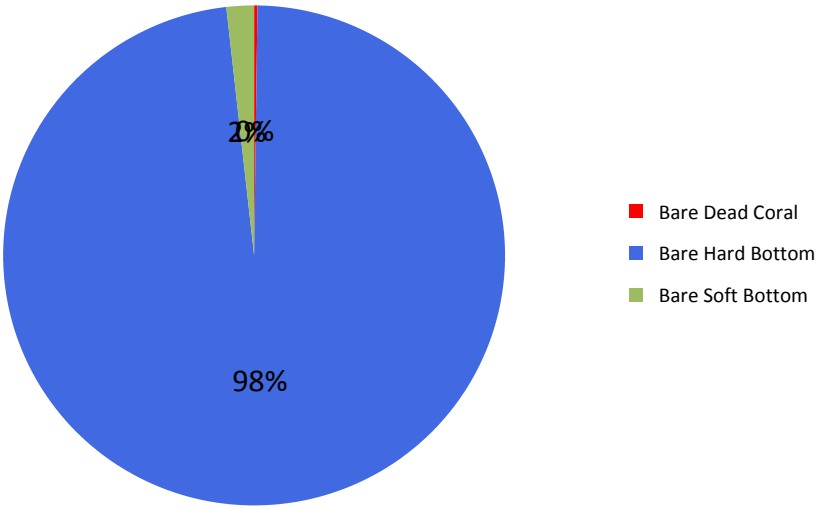
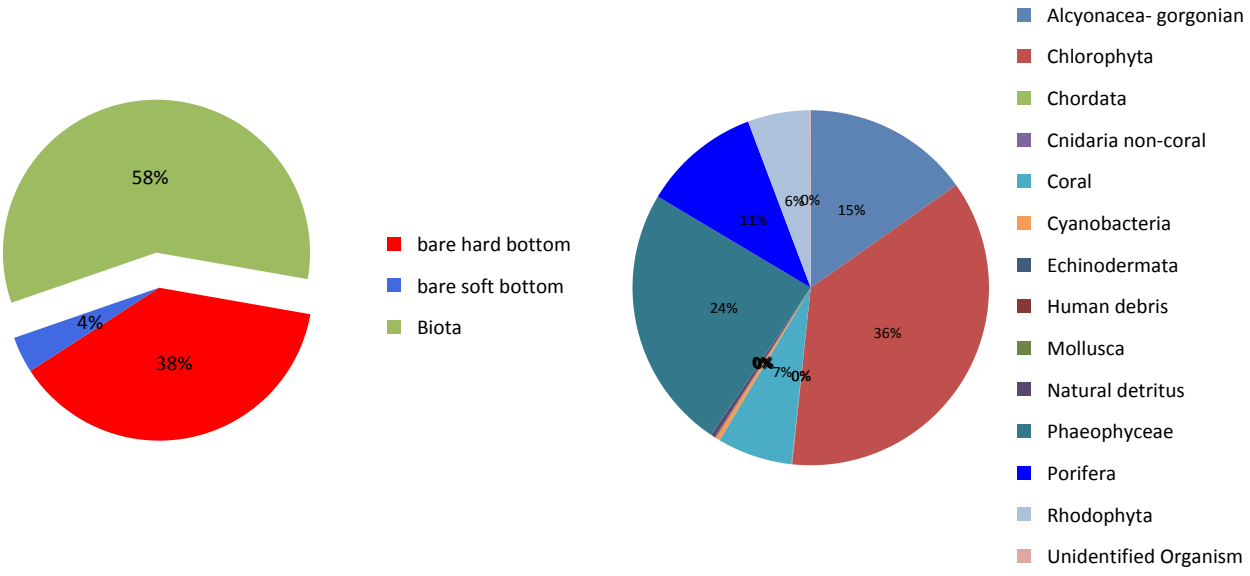


Figure 1. Percent cover of hard and soft bottom substrate at dive site 25-VIII-14-3. CPCe© points on organisms were scored as the underlying substrate (hard or soft).

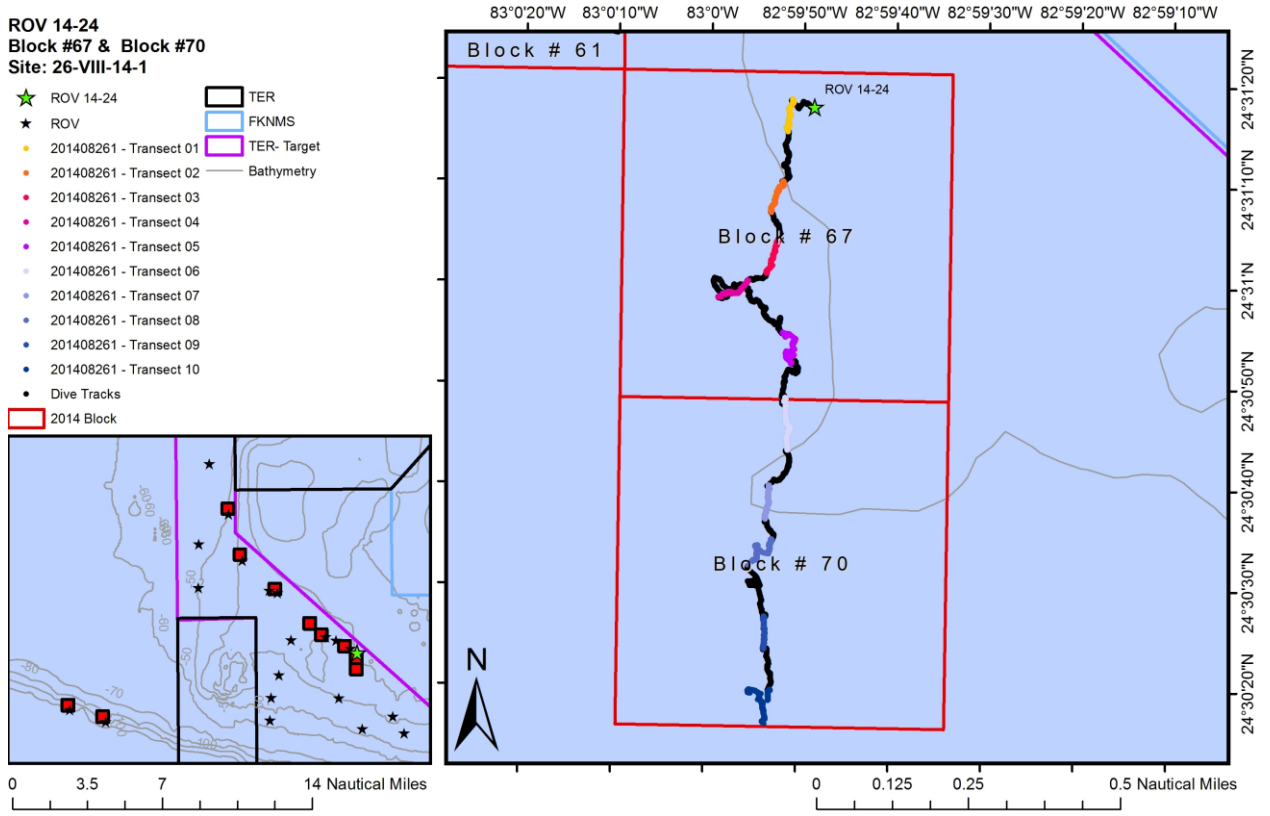


A B

Figure 2. Percent cover of bare substrate and benthic macro-biota at dive site 25-VIII-14-3. A. CPCe percent cover of biota and bare substrate (hard or soft bottom). B. CPCe percent cover of biota and human debris.

Dive Site: Tortugas, Soft Bottom; Blocks 67 and 70; ROV 14-24, UNCW #103

General Location and Dive Track:



Site Overview:

Project:	Pulley Ridge Mesophotic Reef Connectivity Project
Principal Investigator:	Dr. Robert Cowen, PhD
PI Contact Info:	Hatfield Marine Science Center/OSU 2030 Marine Science Dr., Newport, OR 97365
Website:	www.oceanexplorer.noaa.gov
Scientific Observers:	Dennis Hanisak, Heather Moe, Jason White, John Reed, Lance Horne, Stephanie Farrington
Data Management:	Access Database
ROV Navigation Data:	Trackpoint II
Ship Position System:	DGPS
Report Analyst:	John Reed, Stephanie Farrington
Date Compiled:	12/15/2016

Dive Overview:

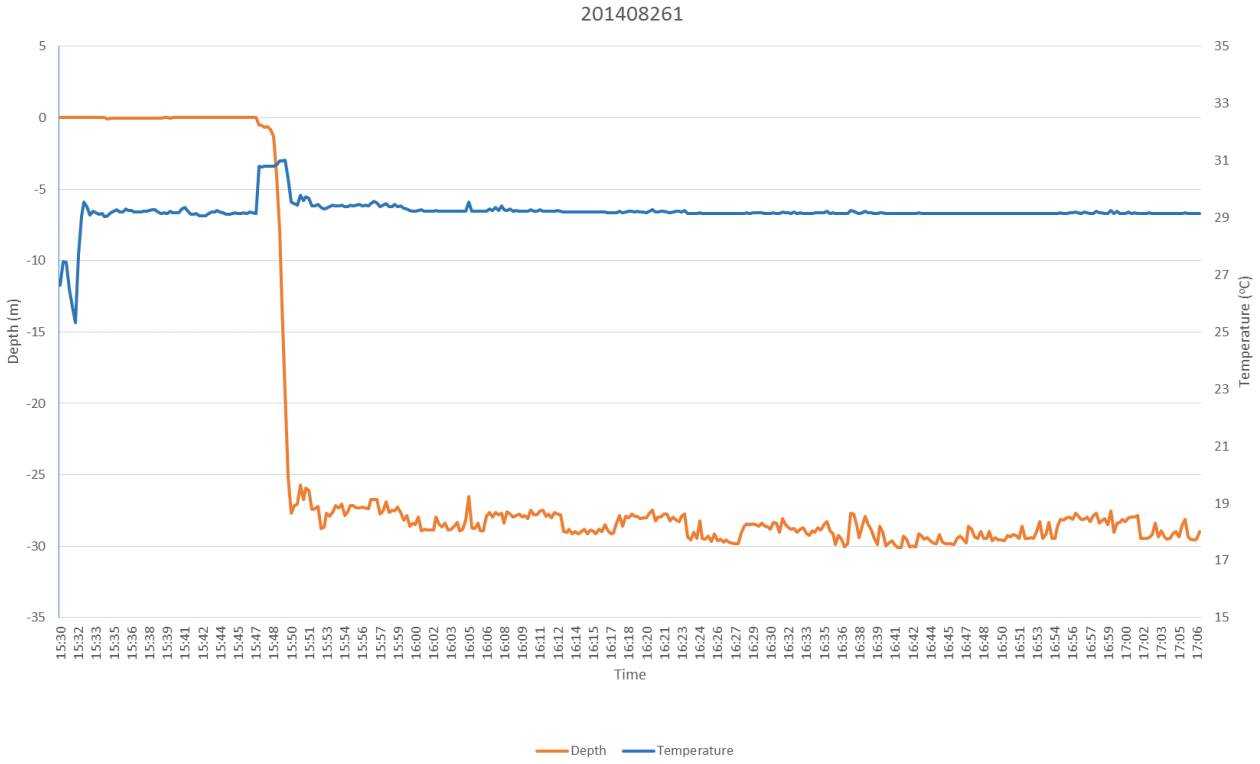
Vessel:	R/V Walton Smith
Sonar Data:	None Available
Purpose:	Conduct ROV video/photo transects; collect grouper for tagging and genetic samples; light traps, CTD, and ISIS plankton tows
ROV:	Mohawk ROV
ROV Sensors:	Temperature (°C), Depth (m)
Date of Dive:	8/26/2014
Specimens:	
Digital Photos:	332
DVD:	3
Hard Drive:	1

Dive Site: Tortugas, Soft Bottom; Blocks 67 and 70; ROV 14-24, UNCW #103

Dive Data:

Minimum Bottom Depth (m):	30	**Total Transect Length (km):**	1.927
Maximum Bottom Depth (m):	33	**Surface Current (kn):**	0.3
On Bottom (Time- GMT):	15:52	**On Bottom (Lat/Long):**	24.52°N; -83°W
Off Bottom (Time- GMT):	18:26	**Off Bottom (Lat/Long):**	24.5°N; -83°W
Physical (bottom); Temp (°C):	29.17	**Salinity:**	**Visibility (ft):** **Current (kn):**

Physical Environment:



Temperature and depth (pressure) were collected with a Sea-Bird 39 Temperature Recorder attached to the ROV (recording descent, bottom data and ascent). The ranges of the bottom data recorded during ROV 14-24 are as follows: Depth Maximum: 32.4 m, Temperature: 29.1-31 °C.

Dive Site: Tortugas, Soft Bottom; Blocks 67 and 70; ROV 14-24, UNCW #103

Dive Imagery:

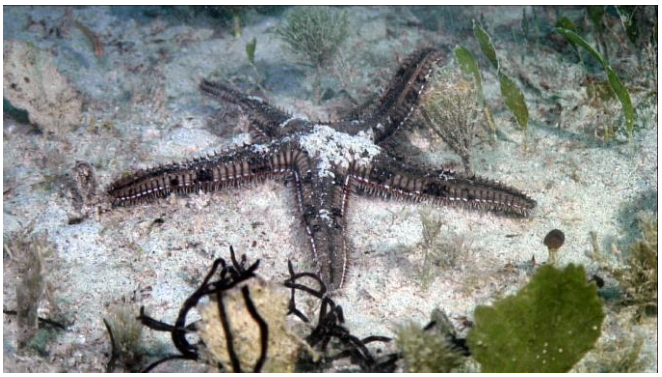


Figure 1: -32.2 m
Luidia alternata on sediment

Figure 2: -29.1 m
Mixed *Caulerpa* spp. field

Dive Site: Tortugas, Soft Bottom; Blocks 67 and 70; ROV 14-24, UNCW #103

Dive Notes:

Objectives, Site Description, Habitat, Fauna:

Site/Objectives:
ROV 14-24, Site #- 26-VIII-14-1, UNCW Dive #103. Target Site -Tortugas, Block 67 & 70. Ground truth: NOAA Regional Bathymetric Chart: 2010_pulley_10m.tif, Live GPS Log- 201408261.shp; conduct ROV video/photo transects.

ROV Setup/Dive Events:
Video time ESDT. Dive Notes depth were recorded as total depth (ROV altitude + ROV depth in meters). COG is ROV heading. Events, habitat and fauna were recorded directly into Access database. Fish data were recorded by H. Moe (NOAA NMFS) in separate Access database which was added to the Access habitat database. Quantitative photos were taken every 30 seconds with a fixed digital camera (Kongsberg OE14-408, with resolution of 3648x2736 pixels) pointing 90° down, 1.3 m off the bottom, set digital still camera to Tv Mode, fixed S1/125, with auto F-Stop, ISO 100, auto focus. Forward looking Video camera (Insite Pacific Mini Zeus high definition CMOS color zoom camera with 2,000,000 effective pixels) was angled 15° down. Both cameras had a pair of parallel 10 cm green lasers for scale. Seabird 39 temperature recorder was attached to the ROV. Date/time of video and digital still camera, ROV CTD and ROV Nav were set to ESDT.

Five 100-m random transects were made to characterize each randomly selected 1 km x 1 km block. Each 100 m transect was conducted at ~0.25 kn at an altitude of ~1.3 m, for 15-20 minutes until the ROV passed through a 100-m radius circle overlaid on the navigation screen; quantitative still images were taken every ~ 30 sec. Off transects between the photo transects were 10-15 minutes. Heading of transects were determined by flip of coin, depending in part on ship's maneuverability due to wind/current.

Block 67
Site Description/Habitat/Biota:
The NOAA Bathy chart shows nothing.
Five transects were conducted in Block 67, starting at North edge headed S. The five transects ranged from 28.5 to 30.5 m depth.

XS 1: HD S: Start: 3:54:50 PM, 28.5 m; end: 4:01:14 PM, 29m. 100 % soft bottom sediment with algae, moderate bioturbation. Biota was dominated by Caulerpa prolifera, C. Sertulariodes, Penicillus dumentosus, Udotea cyathiformis, Halimeda incrasata. Heavy line on bottom.
Off Transect: HD S for 15 min. Same habitat and biota. Also black spagetti sponge- Haliiclona? sp.

XS 2: HD S: Start: 3:54:50 PM, 28.5 m; end: 4:14:30 PM, 29.5 m. Similar to XS 1.
Off Transect: HD S for 4 min. Same habitat and biota.

XS 3: HD S: Start: 4:18:53 PM, 29.5 m; end: 4:25:02 PM, 29.8m. Similar to XS 1. Also Halophila decipens.
Off Transect: HD SW for 5 min. Same habitat and biota.

XS 4: HD S: Start: 4:29:08 PM, 30 m; end: 4:37:37 PM, 30.5 m. Similar to XS 1.
Off Transect: HD SW for 20 min. Same habitat and biota.

XS 5: HD SE: Start: 4:56:27 PM, 29.8 m; end: 5:03:31 PM, 29.8 m. Similar to XS 1.
Off Transect: HD S to block 70. Same habitat and biota. Also Filograna sp.

Dive Site: Tortugas, Soft Bottom; Blocks 67 and 70; ROV 14-24, UNCW #103

Block 70

Site Description/Habitat/Biota:

The NOAA Bathy chart shows nothing.

Five transects were conducted in Block 70, starting at North edge headed S. The five transects ranged from 30 to 33 m depth.

XS 1(6): HD S: Start: 5:17:14 PM, 30 m; end: 5:24:12 PM, 29 m. 100% soft bottom with cover of algae; biota was dominated by same species as previous box: Caulerpa sertularioides, Caulerpa prolifera, Udotea cyathiformis, Halimeda incrassata. Also Dictyota sp.and brown encrusting ascidians on algae. Algae less dense.

Off Transect: HD S for 5 min. Same habitkat; filamentous red algae common. Dead Udotea common, Haliclona spagetti sponge, schools of scad fish.

XS 2(7): HD S: Start: 5:32:37 PM, 30 m; end: 5:38:32 PM, 31m. Similar to XS 1. Also Halophila decipens.

Off Transect: HD S for 5 min. Same habitat. Also Filograna sp.

XS 3(8): HD S: Start: 5:43:45 PM, 31.3 m; end: 5:52:47 PM, 31.5 m. Similar to XS 1.

Off Transect: HD S for 5 min. Same habitat, also white with spots Holothurian, dense filamentous red algae, Penicillus dumentosus.

XS 4(9): HD S: Start: 6:00:10 PM, 31.8 m; end: 6:05:54 PM, 32.0 m. Similar to XS 1.

Off Transect: HD S for 5 min. Same bottom plus Luidia alternata.

XS 5(10): HD S: Start: 6:11:02 PM, 32.7m; end: 6:26:09 PM, 33 m. Similar to XS 1. Loss of power to ROV for 5 minutes, then contd. Transect. Halophila decipens.

Last dive of cruise.

Dive Site: Tortugas, Soft Bottom; Blocks 67 and 70; ROV 14-24, UNCW #103

CPCe Percent Cover Analysis:

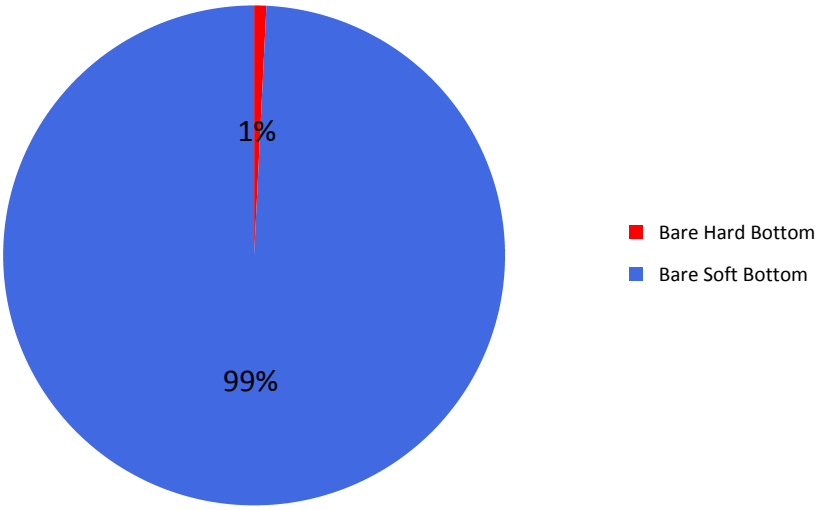
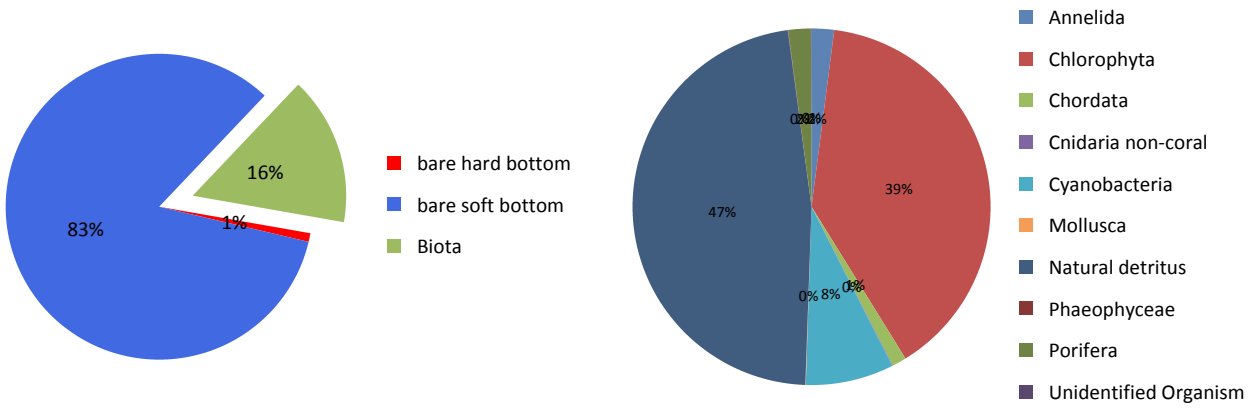


Figure 1. Percent cover of hard and soft bottom substrate at dive site 26-VIII-14-1. CPCe© points on organisms were scored as the underlying substrate (hard or soft).



A B

Figure 2. Percent cover of bare substrate and benthic macro-biota at dive site 26-VIII-14-1. A. CPCe percent cover of biota and bare substrate (hard or soft bottom). B. CPCe percent cover of biota and human debris.