Cruise Report for NOAA Ship *Nancy Foster* NF-19-01: Mapping Essential Fish Habitat in the US Caribbean to Inform MPA Management (2019)

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Cruise Report for NOAA Ship *Nancy Foster* NF-19-01: Mapping Essential Fish Habitat in the US Caribbean to Inform MPA Management (2019)

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Cruise Report for 'Mapping Essential Fish habitat in the US Caribbean to Inform MPA Management' 2019: NOAA Ship *Nancy Foster* NF-19-01

Objectives

In 2019, the National Oceanic and Atmospheric Administration (NOAA) undertook its fifteenth year of scientific operations in the US Caribbean aboard NOAA Ship *Nancy Foster*, funded by Coral Reef Conservation Program. The purpose of the work is to map and survey coral reef habitat in support of marine management objectives. The purpose of this cruise (project number NF-19-01) in particular was to collect multibeam sonar bathymetry, acoustic backscatter, ROV optical validation, and fishery acoustics within coastal waters of Puerto Rico and the US Virgin Islands. Scientists collected high-resolution multibeam and fishery acoustic data in mid-water depths approximately 11 to 3066 meters, in order to continue characterizing seafloor habitats within all U.S. States, Territories, and Commonwealths. Multibeam data was collected to conform to International Hydrographic Organization accuracy standards (IHO, 2019) under Order 1 (< 100m) and Order 2 (> 100m). The strategies developed for each survey area took into account the minimum depths, general bathymetry, and time allotment. Video and still images were collected by a remotely operated vehicle (ROV) to characterize habitat and biology, and ground truth mapping data. A manipulator was added in 2019 to allow for specimen collections. The specimens are vouchers for benthic corals observed in visual surveys.

Specifically, this expedition sought to:

(1) Collect a multibeam bathymetry dataset with 100% seafloor ensonification, along with multibeam backscatter suitable for seafloor characterization.
(2) Collect fishery acoustics data to characterize broad-scale fish abundance, biomass, and utilization patterns, as well as to locate and document fish spawning aggregations.
(3) Conduct visual surveys of areas mapped during the mission using a moderate-depth remotely operated vehicle (ROV). The vehicle has HD video and still frame camera capability to depths of 300 meters.
(4) Collect samples of deep-sea corals using the ROV manipulator, to use for the purposes of species identification and as voucher specimens for analyses of benthic imagery

Methodology

Seafloor mapping surveys

Bathymetry and backscatter data were collected using Kongsberg EM 710 and Kongsberg EM 2040 multibeam sonars. As in previous years, this cruise focused on mapping the shelf to the shallowest navigable depth possible, the shelf edge, and abyssal depth to the extent of the multibeam sonar range. Multibeam surveys were conducted each day after ROV operations and through the night into the next day until ROV operations resumed.

Water column fish acoustics fish surveys

Acoustic data in the water column were collected using the Kongsberg EK60 splitbeam echosounder. In order to allow for simultaneous detection of fish on the shallow reefs and plankton in deep scattering layers 150 to 500m during multibeam operations, the EK60 echosounder used a longer pulse length than previous surveys to allow for deeper sampling when surveying off the insular shelf.

CTD casts

During the multibeam operations, a total of 45 CTD casts were conducted using *Nancy Foster*'s OceanScience underway CTD (uCTD) and a Sea Bird SBE 19 SeaCAT Profiler CTD. Sound speed profiles were acquired at discrete locations within the survey area at least once every four hours, when significant changes in surface sound speed were observed, or when surveying in a new area. Depths for the CTD casts ranged from 11.54m – 951.22m.

ROV seafloor surveys

Seafloor surveys were conducted using the SubAtlantic Mohawk 18 ROV co-owned by National Marine Sanctuary Foundation and University of North Carolina at Wilmington Undersea Vehicle Program (https://uncw.edu/uvp/). During each seafloor survey, the ROV transited at an altitude of approximately 1 m above the seafloor at a speed over ground <0.5 knots. The ROV collected continuous data throughout each dive with the following equipment: (1) a high-definition, forward-looking Insite Pacific Mini Zeus II HD video camera 10x zoom, used to record each dive once on bottom until leaving for the surface, (2) a high-definition, forward-looking Kongsberg Maritime OE14-408 10 mp digital still camera 5x zoom and OE11-442 strobe with E-TTL metering to collect images of interesting biology and photograph transect paths, (3) parallel green Sidus SS501 50mW spot lasers and 2-50mW red lasers in precision mounted aluminum block used to scale images collected by the video and still cameras (4) a LinkQuest Tracklink 1500HA Ultra-short baseline (USBL) transponder linked to a Trimble SP461 GPS/heading receiver, which provided position information at <0.5 m accuracy every two seconds, (5) a tool skid mounted on the bottom of the ROV which includes an ECA Robotics five-function all electric manipulator arm, retractable bio box with three dividers, four rotatable collection buckets, and reversible/variable speed pump for suction hose usable by way of the manipulator to collect samples into 5 rotating 2-liter buckets, and (6) a SeaBird FastCAT 49 CTD which samples at 16Hz (16 samples per second).

ROV transects

ROV dives were planned as straight lines (or 'transects') of X to Y distance, climbing upslope on a steady heading from 200-300m depth to as shallow as 30m depth. The primary purpose of the visual surveys (or transects) was to validate and ground-truth the previously collected multibeam bathymetry. The secondary purpose was to document the diversity and abundance of sponges and corals. ROV dive transects were selected by identifying areas with a variety of relief changes and backscatter signature from multibeam operations the previous day or on previous cruises. The products used to plan dives included bathymetry, backscatter, slope, 'slope-of-the-slope' and principle components analysis created from spatial analysis in ArcGIS. During the visual transects, a downward facing digital still was taken at an interval of every three minutes from an altitude of approximately 1.3 meters. This was followed by a 360-degree rotation of the ROV to observe the surroundings. The speed over ground of the ROV was <0.5 knots when driving the transect, with the ship drifting at approximately the same speed on the transect heading. Video imagery was collected continuously from on-bottom to off-bottom, and digital frame grabs were collected approximately every 10 seconds.

Specimen collections

Several dives were dedicated to the collection of deep-sea coral samples, using the ROV manipulator, sample drawer, and suction device. The dives targeted the coordinates of corals observed in previous dives. The ROV surveyed in a zigzag pattern up the original survey line to

maximize coverage of the depth range at which the target species was noted to be present. Specimens were collected using the manipulator arm of the ROV. For each collected specimen, the date, time, latitude, longitude and depth was recorded at the time of collection.

Once specimens were retrieved onboard the ship, they were transferred to new containers and/or transported into the wet lab. The samples were maintained in the water from the collection box, and stored in the freezer to prevent any thermo-trauma to the specimen or degradation of genetic material. Samples were quickly photographed and a subsample was placed in a 15 mL tube, which was filled with cold 95% molecular grade ethanol and immediately returned in the shipboard -80C° freezer. After the initial subsample, any remaining material was placed in a heat-sealed bag with 30 ml of ethanol and also placed in the -80C° freezer for safe storage. Specimens of *Swiftia exserta* were also subsampled and frozen without ethanol preservative, in order to evaluate the potential presence of zooxanthellae. All samples remained in the -80C° freezer during the transit back to Charleston SC and were retrieved by NCCOS's Deep Coral Ecology Lab staff upon returning to port. The samples are located at the Hollings Marine Laboratory in Charleston, SC. They will be evaluated both genetically and morphologically, then submitted to Smithsonian Institution's National Museum of Natural History for archive.

Permits

The mapping and sampling were documented under multiple Environmental Reviews consistent with the National Environmental Policy Act (NEPA). NEPA reviews were conducted in 2016, 2017 and 2018. These were specific to the US Caribbean region, and included an analysis of most activities within the scope of NF-19-01. A fourth NEPA review was also conducted that was broadly regional in scope, intended to cover a breadth of activities for Southeast Deep Coral Initiative (SEDCI), a cross-line office multi-year initiative funded by NOAA Deep-Sea Coral Research Technology Program, and led by NCCOS. The Environmental Review analyzed a suite of activities - ROV surveys, acoustic mapping, and biological sampling of deep-sea corals, in the US Atlantic in years 2017-2019. For NF-19-01, Chief Scientist Tim Battista worked with Paula Whitfield, environmental compliance coordinator at NCCOS, to ensure 2019 fieldwork activities were within the scope of activities previously analyzed and thus in compliance with NEPA. Additionally, the lead biologist for NF-19-01, Dr. Peter Etnoyer, contacted the NOAA Southeast Regional Office (SERO) prior to the expedition in order to obtain a letter of acknowledgement (LOA) to permit collections of biological specimens during the expedition.

In addition, there have been two Endangered Species Act (ESA) and Essential Fish Habitat (EFH) consultations conducted previously for surveying and mapping work in the Caribbean, the first in 2016 and the second for SEDCI related activities in 2017. Both consultations (ESA, EFH for both years) resulted in a letter of concurrence (LOC) from the National Marine Fisheries Service. The LOCs (available on request) state that proposed activities may but are not likely to adversely affect ESA-listed species, nor have significant adverse effects on their critical habitat or on EFH. The original LOA allowing collection of biological specimens during SEDCI expeditions was issued by SERO on July 13, 2017, signed by Dr. Roy Crabtree, Regional Administrator. The LOA was amended on December 6, 2018 to include additional sampling activities in the Caribbean Sea, and this was signed by Andrew Strelcheck.

Funding

This was the fifteenth year of an ongoing scientific research mission onboard NOAA Ship *Nancy Foster* funded by NOAA's Coral Reef Conservation Program. Funds for the ROV sampling sled, production for the cruise report, and travel funds for deep coral biologists were provided through the Southeast Deep Coral Initiative, with financial support from NOAA's Deep Sea Coral Research and Technology Program.

Participants and itinerary

Scientists from NOAA NCCOS, University of North Carolina at Wilmington's Undersea Vehicle Program (UVP), and Solmar Hydro. All participants (Table 1) were aboard from July 1 to July 12, except for one person who returned to St. Thomas, USVI on July 8.

Participant list

Table 1. List of participants (not including ship crew) for expedition NF-19-01.

Name	Role	Affiliation	Email
Battista, Tim	Oceanographer	NOAA	tim.battista<at>noaa.gov
Ebert, Erik	Fishery Sci	NOAA	erik.ebert<at>noaa.gov
Egan, Katharine	Physical Sci	NOAA	katharine.egan<at>noaa.gov
Etnoyer, Peter	Physical Sci	NOAA	peter.etnoyer<at>noaa.gov
Glidden, Eric	ROV Operator	Contractor	gliddene<at>uncw.edu
Guthrie, Brendan	Physical Sci	NOAA	brendan.guthrie<at>noaa.gov
Kraus, Jennifer	Physical Sci	NOAA	jennifer.kraus<at>noaa.gov
Sautter, Will	Physical Sci	NOAA	will.sautter<at>noaa.gov
Shuler, Andrew	Physical Sci	NOAA	andrew.shuler<at>noaa.gov
Stecher, Mike	Hydrographer	Contractor	mike<at>solmarhydro.com
Taylor, Chris	Fishery Sci	NOAA	chris.taylor<at>noaa.gov
White, Jason	ROV Operator	Contractor	whitejh<at>uncw.edu

Expedition schedule

Expedition NF-19-01 commenced at 0900, July 1 with the vessel departing US Coast Guard San Juan, and arrived later that day on site at the St. Croix area of interest (AOI) northwest of the island. The ship departed the St. Croix AOI and arrived at the St. Thomas AOI on July 7. The ship briefly returned to island of St. Thomas on July 8 to return Mike Stecher. Two days of ROV operations, July 6 and July 11, were used specifically for biological sampling in areas designated during previous ground truthing dives. The ship returned to St. Thomas at 0500 on July 12. A full itinerary is provided, with a list of operations, in Table 2.

Operations

The general schedule of activity was to conduct ROV surveys during the day light hours (0800-1600) and to conduct acoustic mapping during the remaining hours (1600-0800). Multibeam/fish acoustic operations were conducted continuously each day after ROV operations had ended until the next day when ROV operations resumed. Fisheries acoustics collection occurred simultaneously with all multibeam sonar surveys via the Simrad EK60 Suite. It was anticipated that tow body ground truthing would be conducted 1-2 hours per day during optimum periods of the schedule, likely during the transition between standard ROV and multibeam activities. However, due to mechanical issues no usable tow-body data was collected.

Expedition schedule table

Table 2. Schedule of expedition NOAA Ship *Nancy Foster* NF-19-01.
MBES = Multibeam Echosounder. FA = Fish Acoustics

Date (local time)	Locality	Operations	Comment
7/1/2019	Transit to St. Croix	Arrive on site	MBES dockside testing, ROV testing, work on skid
7/2/2019	St. Croix AOI	Survey - MBES)= and FA (0005-1158) ; Conduct 2 ground truthing dives (1245-1715) with ROV; Survey – MBES and FA (1725-0000)	Tether wrapped on line at 16:41. Lines 1 and 2
7/3/2019	St. Croix AOI	Survey - MBES and FA (0001-0823); Conduct 2 ground-truth dives (0918-1157 and 1403-1605) with ROV; Survey - MBES and FA (1613-2009)	Delay for weather between 1st and 2nd ROV dives. Lines 3 and 4
7/4/2019	St. Croix AOI	Survey - MBES and FA (0020-0720); Conduct 2 ground truthing dives (1218-1712) with ROV ; Survey – MBES and FA (1719-0000)	Morning delay to calibrate EK60. HD video not recording until 15:53. SD was recording. Lines 8 and 7
7/5/2019	St. Croix AOI	Survey – MBES and FA (0001-0731); Conduct 4 ground truthing dives (0834-1656) with ROV; Survey – MBES and FA (1705-1926)	Lines 5, 10, 6 and 9
7/6/2019	St. Croix AOI **SAMPLE DAY**	Survey – MBES and FA (0119-0624); **Conduct 3 sample collecting dives** (0830-1600) with ROV; Survey – MBES and FA (1604-0000)	Collected 25 specimens. Missing bucket 2. CTD on at 65m depth. Lines 3(2x) and 4
7/7/2019	Transit to St. Thomas AOI	Survey – MBES and FA (0001-0252, 0626-0737) Conduct 2 ground truthing dives (0828-1339), attempt 3rd dive (1410-1448) with ROV Survey - MBES and FA (1550-0000)	On descent on the 3rd dive, the ROV died and wouldn't turn on. Couldn't do 3rd dive. Lines 11 and 12
7/8/2019	St. Thomas AOI	Survey – MBES and FA (0001-0840); Crew transfer, M Stecher, from *Nancy Foster* to St. Thomas. Conduct 4 ground truth dives (0935-1732) with ROV; Survey - MBES & FA (1738-0000)	No HD frame grabs after 15:12. Lines 13-16
7/9/2019	St. Thomas AOI	Survey – MBES and FA (0001-0759); Conduct 3 ground truthing dives (0902-1208,1332-1512) with ROV; Survey - MBES and FA (1713-0000)	Ship winch broke on 4th dive. Couldn't do 4th dive. Lines 20, 19 and 18
7/10/2019	St. Thomas AOI	Survey - MBES and FA (0001-0806); Attempt to conduct a seafloor matrix dive. (1036-1106) Conduct 3 ground truthing dives (1257-1800) with ROV; Survey - MBES and FA (1810-0000)	SFM attempt abandoned due to current and tracking issues. Last dive (26) short due to time constraints. Lines SFM, 21-23
7/11/2019	St. Thomas AOI **SAMPLE DAY**	Survey – MBES and FA (0001-0527); **Conduct 5 sampling dives** (0806-1630) with ROV; Conduct 1 ground truth dive to observe area of multibeam anomaly; Survey – MBES and FA (1852-0000)	Collected 16 specimens. Took footage of anthropogenic multibeam anomaly (crane cab?). Digital stills cam crashing on dive 30. No stills for last 2 dives. Lines 12-15 and 21
7/12/2019	Transit to St. Thomas, USVI	Survey – MBES and FA (0001-0432); Transit to St. Thomas, USVI.	

Summary of multibeam operations

A total of 178 square miles (461 km^2) of seafloor was mapped at depths ranging from 11-3066m. The spatial resolution of the final bathymetric surfaces ranged from 1m to 32m. The northwest shelf of St. Croix was previously unmapped and unexplored.

Multibeam data were processed by Solmar Hydro Inc., a marine engineering and surveying services company based in Portland Oregon. Final deliverables included fully processed bathymetry data, final bathymetry surfaces, and a final Descriptive Report (DR), approved by Mike Stecher on 02/26/2020 and sent to the Chief of Party - Tim Battista. The DR states that "the survey data meets or exceeds requirements as set forth in the NOS Hydrographic Surveys Specifications and Deliverables, Field Procedures Manual, Standing and Letter Instructions, and all HDB Technical Directives. The data are therefore adequate to supersede charted data in their common areas."

The survey was referred to as NF-19-01 during field acquisition and was later assigned by Atlantic Hydrographic Branch (AHB) to the Project Number ESD-AHB-20 after acquisition. The NOS Hydrographic Survey Number 'W00493' was provided after data acquisition had been completed. A pdf copy of the descriptive report will be available through NOS Hydrographic Data Base, specifically by searching NOS data and products for Survey 'W00493'.

Useful technical details in the report: The vertical datum for this project is Mean Lower Low Water. The horizontal datum for this project is North American Datum of 1983 (NAD 83). The projection used for this survey is Projected UTM Zone 20 North. Final bathymetric surfaces were exported from Caris software in the Bathymetrically Attributed Grid (BAG) format.

Per the Hydrographic Survey Specifications and Deliverables (HSSD) the bathymetric coverage was monitored by creating Combined Uncertainty and Bathymetric Estimator (CUBE) surfaces with resolutions of 1m, 2m, 4m, 8m, 16m and 32m while conducting the survey. The 16m CUBE surface images of the St. Croix and St. Thomas areas of interest can be seen in Figs 1 and 2.

Seafloor multibeam figures

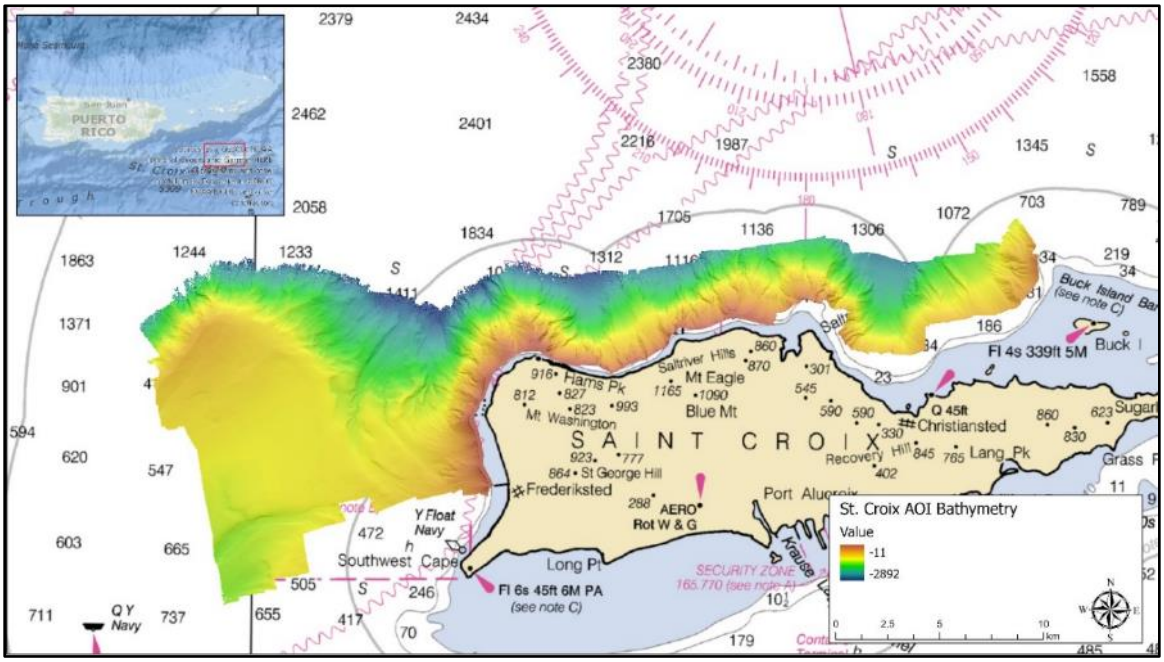

Figure 1. 16m CUBE surface of St. Croix area of interest.

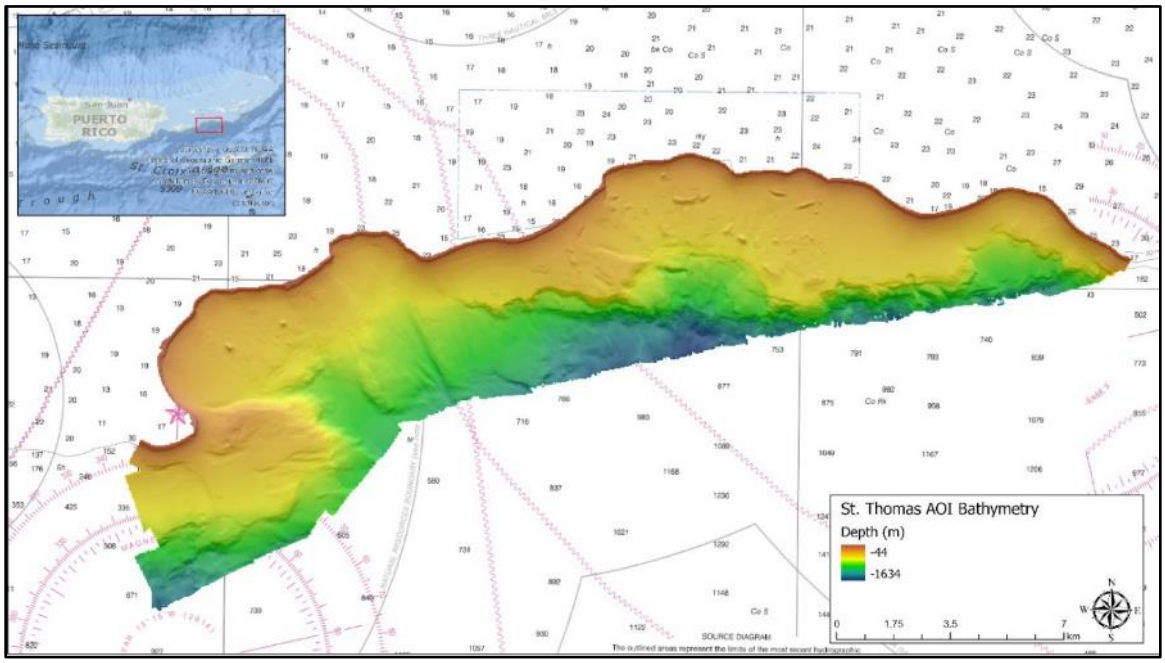

Figure 2. 16m CUBE surface of St. Thomas area of interest.

Summary of water column fish acoustics operations

Water column acoustic surveys were conducted during multibeam operations each day at sea. Over 500 linear nautical miles of water column were surveyed. Fish schools were detected on the shelf edge off St. Croix. The densities of fish detected are shown in Figure 3. There were several discrete areas in the highest class of density, from 10.6 – 30.8 fish/100 m^2. These were qualitatively lower than other areas surveyed in the U.S. Caribbean (Taylor et al., 2016). Validation was not conducted, but dominant species on previous surveys included creole wrasse *Clepticus parrae*, black durgeons *Melichthys niger*, a variety of damselfish (Pomacentridae), and larger fish such as ocean triggers (Balistidae) and jacks (Carangidae) (C. Taylor, NOAA, pers. comm.). Deep scattering layers of zooplankton and small pelagic fish were observed at 150, 300, and 500m on the shelf edge off St. Thomas (Fig. 4). Vertical migration was observed at dawn and dusk, rising as much as 300 m in 40 minutes (Fig. 5).

Water column fish acoustics figures

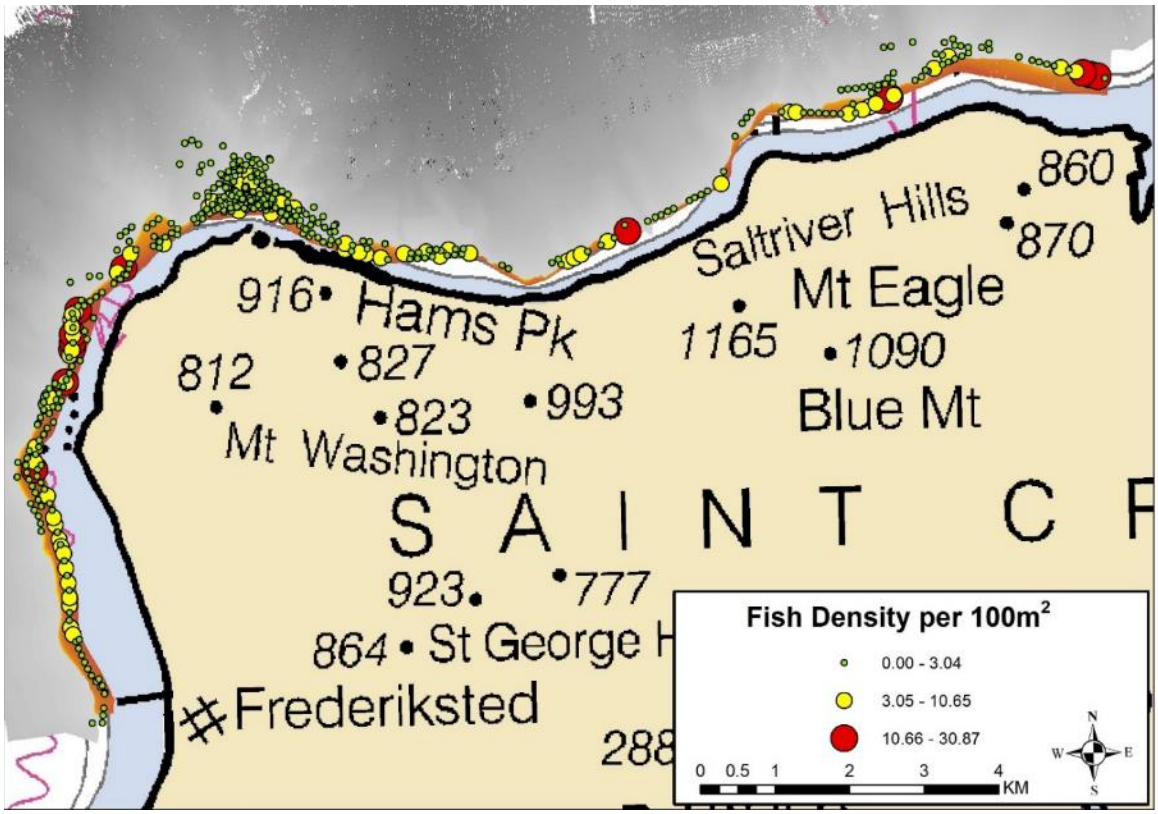

Figure 3. Density of fish of all size classes in the northwest region of St. Croix near Hams Bluff

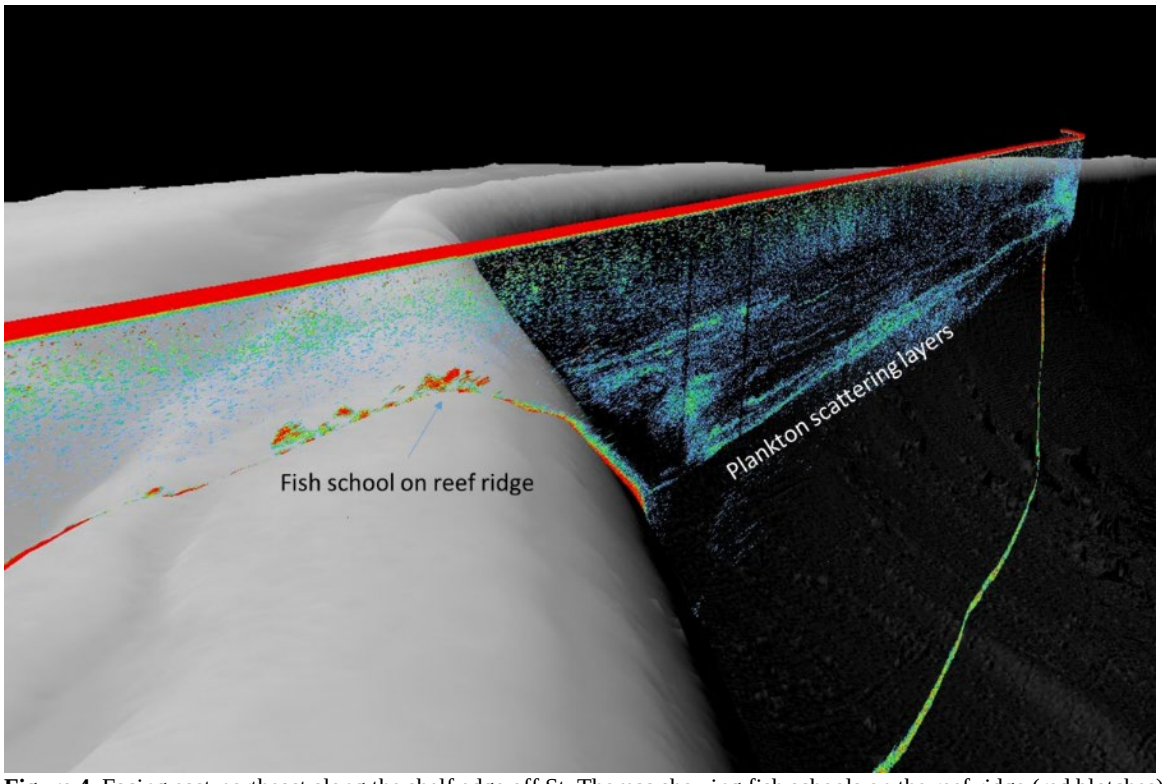

Figure 4. Facing east-northeast along the shelf edge off St. Thomas showing fish schools on the reef ridge (red blotches) and scattering layers off the shelf edge at 150 and 300m on July 10, 2019.

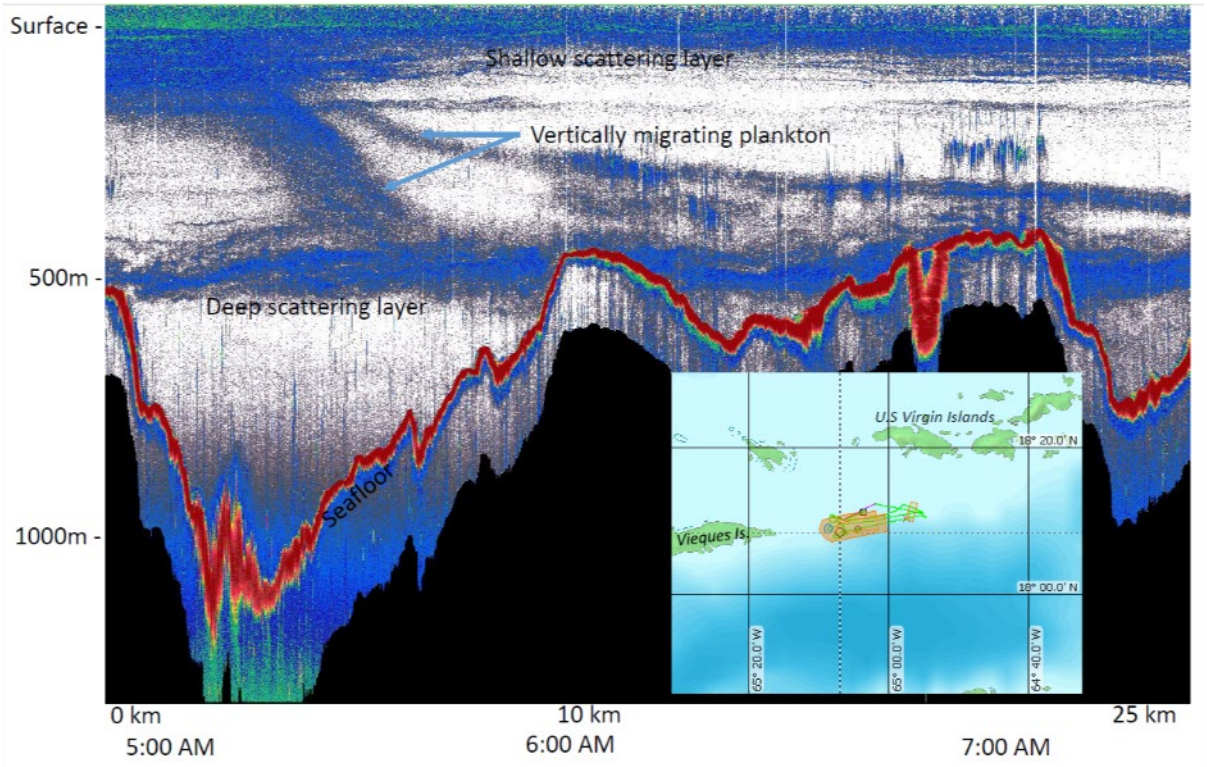

Figure 5. Early morning acoustic echogram during multibeam survey transects south of St. Thomas (crosshairs in inset) on July 10, 2019. Ship movement is from left to right. Depth is presented on the vertical axis and both time and distance along the transect are presented along the horizontal axis. Seafloor is shown as dark red as the depth varies along the survey of insular shelf edge. A persistent deep scattering layer of plankton and fish is shown in blue at 500m with a shallow scattering layer near the surface. Two migrating layers are also shown in blue moving downward in the water column at approximately sunrise.

Summary of CTD operations

A total of 45 CTD casts (Fig. 6) were conducted using *Nancy Foster*'s OceanScience underway CTD (uCTD) and a Sea Bird SBE 19 SeaCAT Profiler CTD. These casts were conducted during multibeam operations at least once every four hours. The location, time and depth of each cast can be found in Table 3. Vertical profiles of salinity and temperature for 3 of the casts are included in Figures 7-9.

CTD summary table

Table 3. Inventory of CTD casts conducted using the ship's OceanScience uCTD and SeaBird SBE 19. Coordinates with (*) are approximate estimates of the deployment location, based upon ship position, the depth of the CTD and general location.

CTD Number	Date (UTC)	Time (UTC)	Locality	Latitude	Longitude	Depth (m)
UCTD_DN183_1	07/02	3:27	Northwest St. Croix	17.877	-65.043	770
UCTD_DN183_2	07/02	7:30	West St. Croix	17.702	-64.911	529
UCTD_DN183_3	07/02	11:17	Northwest St. Croix	17.760	-64.895	61
UCTD_DN183_4	07/02	15:24	North Northwest St. Croix	17.771	-64.851	266
UCTD_DN183_5	07/02	21:25	West St. Croix	17.732	-64.899	52
UCTD_DN183_6	07/02	22:06	Northwest St. Croix	17.770	-64.910	778
UCTD_DN184_1	07/03	2:54	Northwest St. Croix	17.788	-64.974	781
UCTD_DN184_2	07/03	6:00	West Northwest St. Croix	17.747	-65.002	no data
UCTD_DN184_3	07/03	7:23	West St. Croix	17.688	-65.003	838
UCTD_DN184_4	07/03	10:25	Northwest St. Croix	17.776	-64.941	833
UCTD_DN184_5	07/03	20:13	North Northwest St. Croix	17.773	-64.881	175
UCTD_DN185_1	07/04	0:21	North Northwest St. Croix	17.784	-64.860	792
UCTD_DN185_2	07/04	4:40	Northwest St. Croix	17.795	-65.022	829
UCTD_DN185_3	07/04	7:11	North St. Croix	17.802	-64.809	856
UCTD_DN185_4	07/04	11:20	North St. Croix	17.769	-64.833	218
UCTD_DN185_5	07/04	21:19	North Northwest St. Croix	17.777	-64.866	155
UCTD_DN186_1	07/05	1:35	North St. Croix	17.816	-64.747	791
UCTD_DN186_2	07/05	5:19	West St. Croix	17.730	-64.946	841
UCTD_DN186_3	07/05	8:43	West Northwest St. Croix	17.755	-64.969	784
UCTD_DN186_4	07/05	11:21	West Northwest St. Croix	17.744	-64.905	104
UCTD_DN186_5	07/05	21:05	West Northwest St. Croix	17.753	-64.898	113
UCTD_DN186_6	07/05	23:08	West St. Croix	17.734	-64.896	12
SBE19CTD_DN187_1	07/06	5:19	West St. Croix	17.699	-64.943	885
SBE19CTD_DN187_2	07/06	10:24	North Northwest St. Croix	*17.816	*-64.856	951
UCTD_DN187_1	07/06	20:04	North Northwest St. Croix	17.775	-64.871	144
UCTD_DN187_2	07/06	23:30	North Northeast St. Croix	17.791	-64.722	512
UCTD_DN188_1	07/07	2:10	North Northwest St. Croix	17.798	-64.830	544
UCTD_DN188_2	07/07	10:26	Southwest St. Thomas	18.167	-65.084	330
UCTD_DN188_3	07/07	19:50	South St. Thomas	18.187	-64.963	24
UCTD_DN189_1	07/08	3:49	South St. Thomas	18.197	-64.980	48
UCTD_DN189_2	07/08	7:04	South St. Thomas	18.195	-64.960	25
UCTD_DN190_1	07/09	2:58	Southwest St. Thomas	18.182	-65.116	37
UCTD_DN190_2	07/09	5:56	Southwest St. Thomas	18.196	-65.068	32
UCTD_DN190_3	07/09	9:31	Southwest St. Thomas	18.186	-65.085	30
UCTD_DN190_4	07/09	21:22	South Southwest St. Thomas	18.195	-65.017	185
UCTD_DN190_5	07/09	23:03	Southwest St. Thomas	18.181	-65.087	32
UCTD_DN191_1	07/10	4:16	Southwest St. Thomas	18.158	-65.041	351
UCTD_DN191_2	07/10	8:12	South St. Thomas	18.176	-64.940	369
UCTD_DN191_3	07/10	11:08	Southwest St. Thomas	18.167	-65.060	476
UCTD_DN191_4	07/10	22:47	Southwest St. Thomas	18.164	-65.116	391
UCTD_DN192_1	07/11	2:58	South St. Thomas	18.189	-64.937	337
UCTD_DN192_2	07/11	6:15	Southwest St. Thomas	18.161	-65.157	282
UCTD_DN192_3	07/11	23:39	Southwest St. Thomas	18.144	-65.167	393
UCTD_DN193_1	07/12	3:56	Southwest St. Thomas	18.111	-65.141	no data
UCTD_DN193_2	07/12	7:20	Southwest St. Thomas	18.167	-65.155	35

CTD locations map

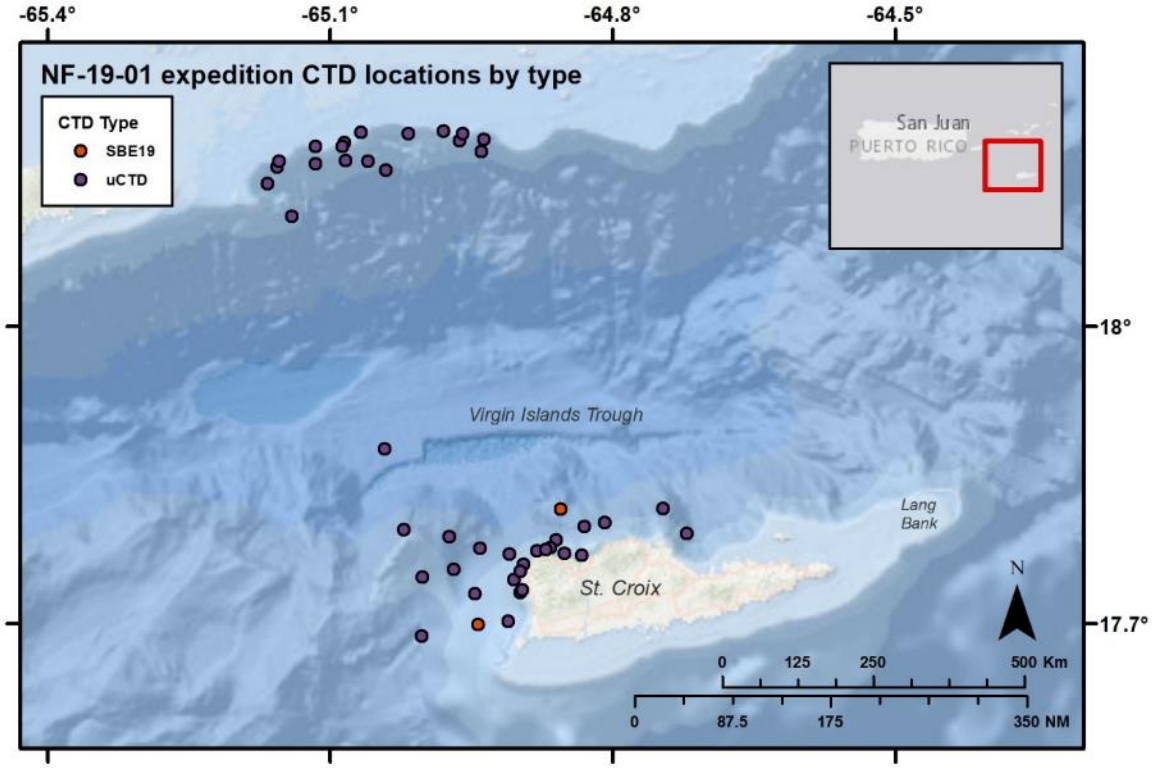

Figure 6. CTD locations during the expedition NOAA Ship *Nancy Foster* NF-19-01. The SBE19 cast to the north of the island is approximated, based upon the depth of the CTD and general location.

CTD vertical profiles

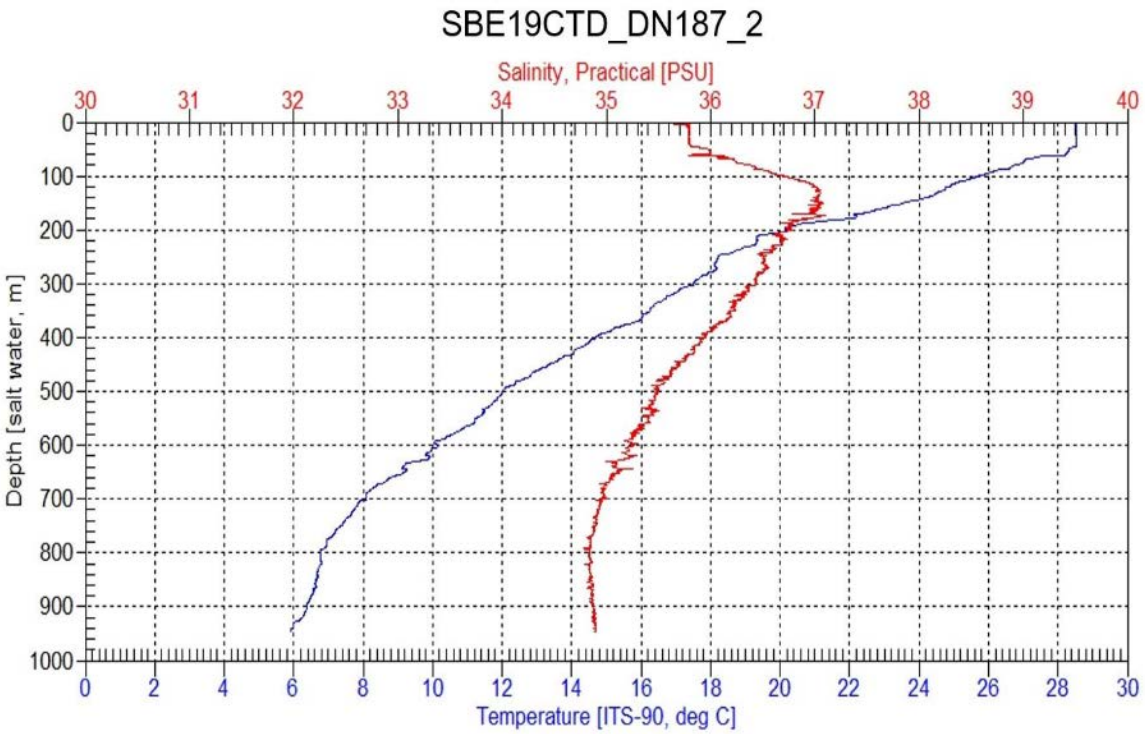

Figure 7. Depth profile of salinity (red) and temperature (blue) measured during a 951m SBE19 CTD cast North Northwest of St. Croix on July 6, 2019.

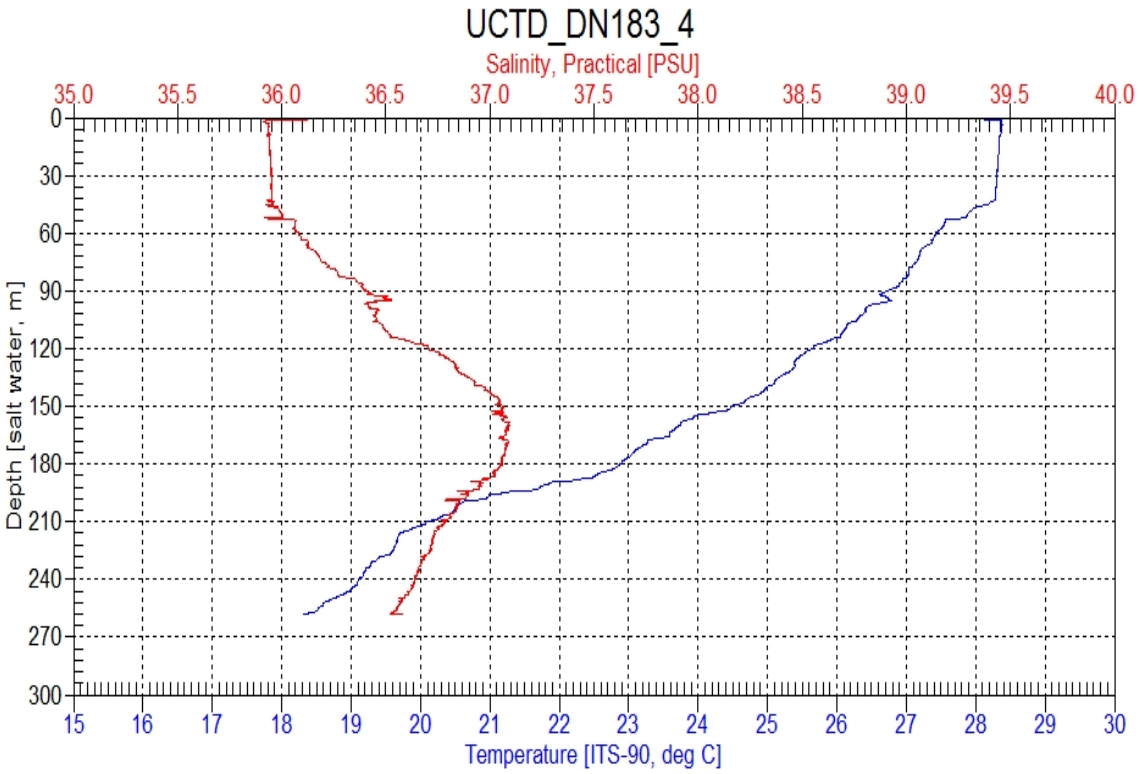

Figure 8. Depth profile of salinity (red) and temperature (blue) measured during a 266m uCTD cast North Northwest of St. Croix on July 2, 2019.

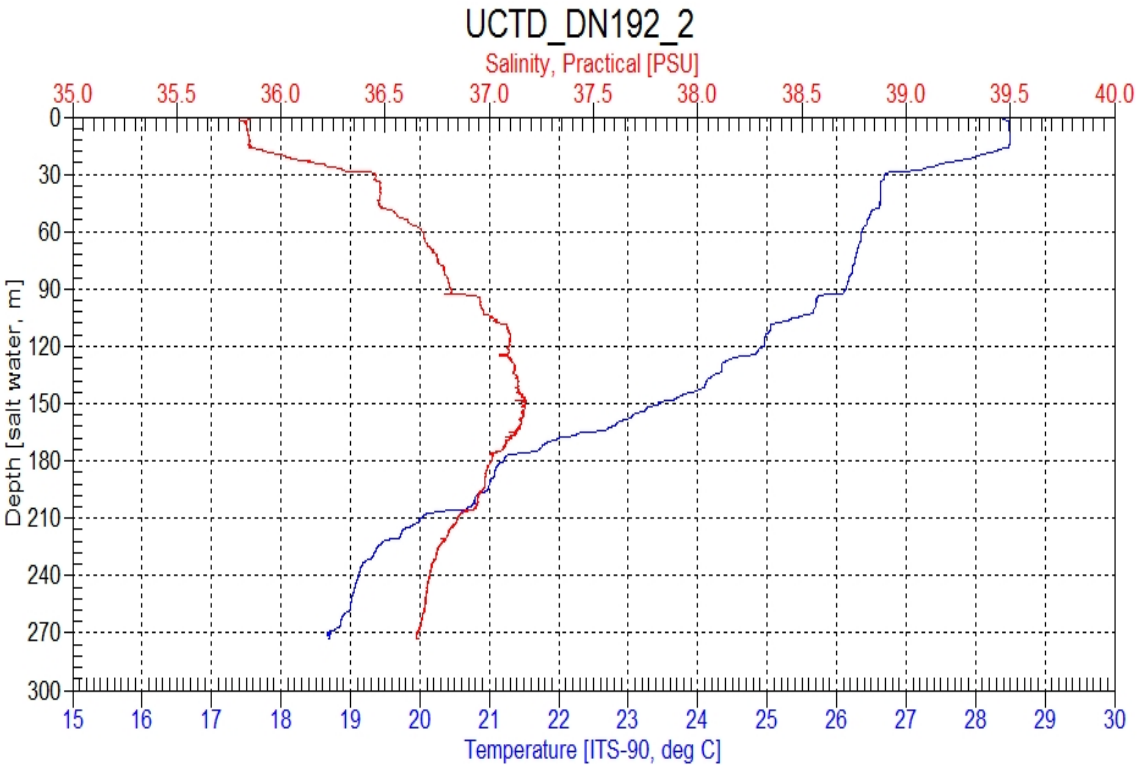

Figure 9. Depth profile of salinity (red) and temperature (blue) measured during a 282m uCTD cast Southwest of St. Thomas on July 11, 2019.

Summary of ROV operations

The ROV explored sites off the north, west and northwest coasts of St. Croix and south of St. Thomas (Table 4) for the purpose of ground truthing previously acquired multibeam data. The ROV transects varied in length from 55m to 1180m, with an average of 413m. Each ground truthing dive was referred to as a transect. There were 32 ROV dives (Figs. 10 and 11) ranging in depth from 45-285m, with 49 hours and 32 minutes of total bottom time. Of these dives, eight were strictly for sampling purposes. A total of 41 biological specimens were collected with the ROV manipulator arm (Table 5, Figures 12-53). On July 10, a seafloor matrix dive was attempted but was aborted due to equipment issues and current. The final dive of the cruise on July 11 visited a box-shaped multibeam anomaly with a strange signature. The feature was observed during multibeam mapping activities in the area. The signature was confirmed as a construction crane cab that had perhaps fallen off a barge. The ROV collected ample footage of the debris.

Summary of post-dive activities

Coral and sponge images included in Appendix 1 are representative of the organisms observed and collected for each dive. Organisms were identified using a collection of sponge and coral guides for the Caribbean, West Florida and the Gulf of Mexico (Bayer 1981, Diaz et al., 2019, Etnoyer et al., 2016 and Reed et al., 2017).

ROV dive location maps

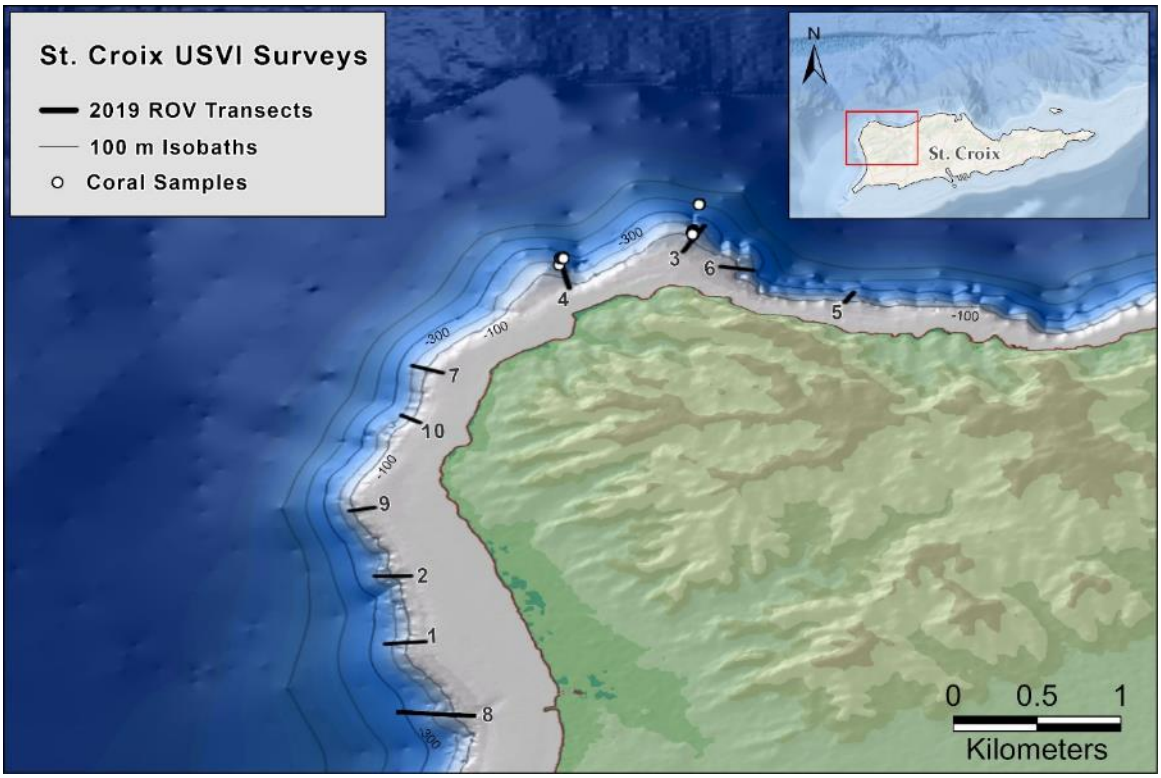

Figure 10. Map of St. Croix area of interest (AOI) ROV dive transects. Sample dives 11-13 took place on July 6 at previous dive sites where coral colonies were identified for sampling and are indicated with a white dot.

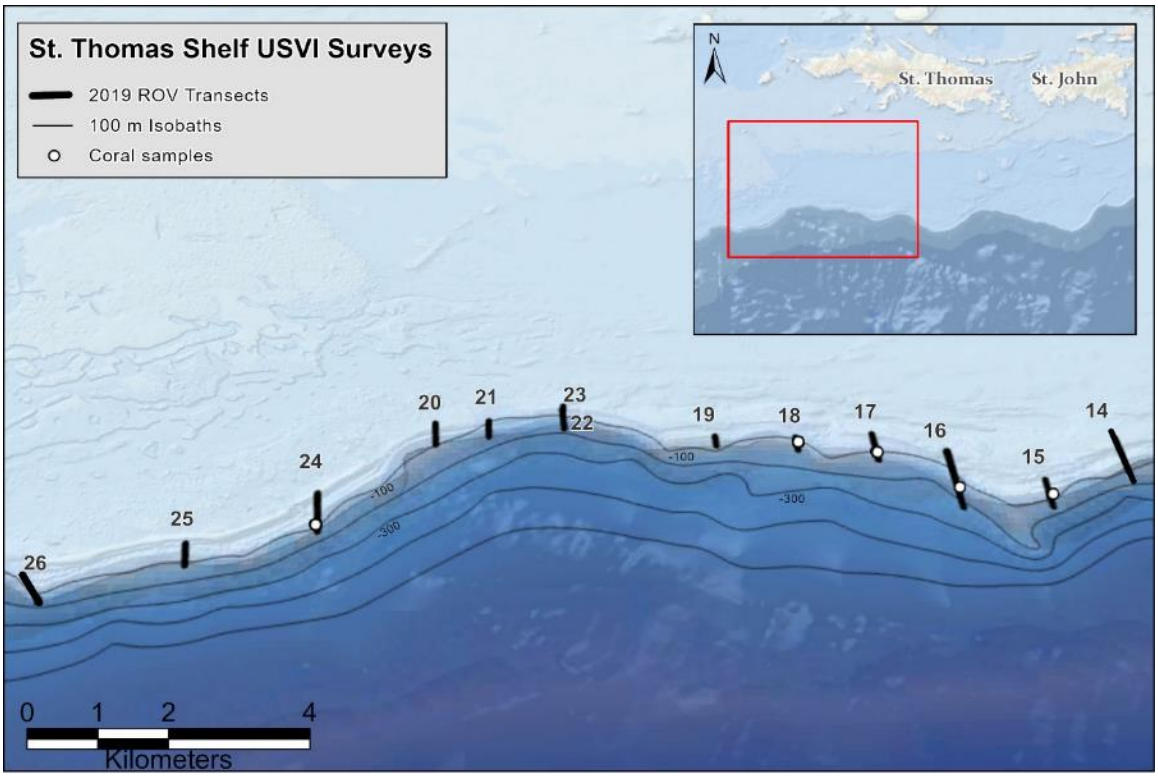

Figure 11. Map of St. Thomas area of interest (AOI) ROV dive transects. Sample dives 27-31 took place July 10-11 at previous dive sites where coral colonies were identified for sampling and are indicated with a white dot.

ROV dive summary table

Table 4. Summary information for the dives conducted by the ROV *Mohawk* during the NF-19-01 expedition. Dive type: T = transect, S = sampling

Dive number	Line number	Date (UTC)	Locality	On bottom latitude	On bottom longitude	On bottom depth (m)	Off bottom latitude	Off bottom longitude	Off bottom depth (m)	Bottom time (h:min)	Specimens collected	Dive type
Dive 01	Line 01	07/02	Frederiksted Pier	17.7231	-64.8997	272	17.7233	-64.8960	30	1:34	-	T
Dive 02	Line 02	07/02	Frederiksted Pier	17.7322	-64.9006	262	17.7322	-64.8972	35	1:31	-	T
Dive 03	Line 03	07/03	North St. Croix	17.7792	-64.8694	257	17.7757	-64.8715	50	2:09	-	T
Dive 04	Line 04	07/03	NW St. Croix	17.7744	-64.8828	263	17.7709	-64.8820	50	1:38	-	T
Dive 05	Line 08	07/04	NNW St. Croix	17.7700	-64.8558	271	17.7686	-64.8567	75	1:36	-	T
Dive 06	Line 07	07/04	NNW St. Croix	17.7731	-64.8650	283	17.7736	-64.8681	50	2:00	-	T
Dive 07	Line 05	07/05	West St. Croix	17.7606	-64.8967	265	17.7596	-64.8939	20	1:30	-	T
Dive 08	Line 10	07/05	West St. Croix	17.7138	-64.8974	290	17.7141	-64.8925	53	1:29	-	T
Dive 09	Line 06	07/05	West St. Croix	17.7411	-64.9027	170	17.7415	-64.9004	31	0:45	-	T
Dive 10	Line 09	07/05	West St. Croix	17.7539	-64.8978	243	17.7529	-64.8961	42	0:47	-	T
Dive 11	Line 03	07/06	NW St. Croix	17.7767	-64.8705	83	17.7763	-64.8706	63	2:12	15	S
Dive 12	Line 03	07/06	NW St. Croix	17.7793	-64.8698	233	17.7793	-64.8700	215	0:42	3	S
Dive 13	Line 04	07/06	NW St. Croix	17.7727	-64.8826	165	17.7727	-64.8829	67	1:30	6	S
Dive 14	Line 11	07/07	South St. Thomas	18.1914	-64.9440	265	18.1981	-64.9444	37	1:45	-	T
Dive 15	Line 12	07/07	South St. Thomas	18.1854	-64.9576	285	18.1902	-64.9576	50	1:33	-	T
Dive 16	Line 13	07/08	South St. Thomas	18.1856	-64.9713	285	18.1962	-64.9716	46	2:04	-	T
Dive 17	Line 14	07/08	South St. Thomas	18.1944	-64.9828	200	18.1996	-64.9831	44	1:14	-	T
Dive 18	Line 15	07/08	South St. Thomas	18.1966	-64.9953	198	18.1992	-64.9953	50	1:10	-	T
Dive 19	Line 16	07/08	South St. Thomas	18.1976	-65.0081	188	18.1996	-65.0082	41	0:37	-	T
Dive 20	Line 20	07/09	South St. Thomas	18.1986	-65.0526	160	18.2029	-65.0528	37	1:00	-	T
Dive 21	Line 19	07/09	South St. Thomas	18.2000	-65.0442	195	18.2033	-65.0443	40	0:54	-	T
Dive 22	Line 18	07/09	South St. Thomas	18.2014	-65.0321	206	18.2054	-65.0324	42	1:10	-	T
Dive 23	Line SFM	07/10	South St. Thomas	18.2051	-65.0323	43	--	--	43	0:30	-	T
Dive 24	Line 21	07/10	South St. Thomas	18.1834	-65.0696	190	18.1901	-65.0704	32	1:25	-	T
Dive 25	Line 22	07/10	South St. Thomas	18.1777	-65.0886	186	18.1815	-65.0891	38	1:03	-	T
Dive 26	Line 23	07/10	South St. Thomas	18.1722	-65.1088	195	18.1727	-65.1089	90	0:21	-	T
Dive 27	Line 12	07/11	St. Thomas	18.1871	-64.9575	121	18.1871	-64.9577	109	0:22	4	S
Dive 28	Line 13	07/11	St. Thomas	18.1886	-64.9715	118	18.1886	-64.9715	118	0:04	1	S
Dive 29	Line 14	07/11	South St. Thomas	18.1953	-64.9833	128	18.1952	-64.9831	127	0:09	2	S
Dive 30	Line 15	07/11	South St. Thomas	18.1972	-64.9953	154	18.1975	-64.9951	98	0:40	4	S
Dive 31	Line 21	07/11	South St. Thomas	18.1832	-65.0696	175	18.1836	-65.0697	144	0:34	5	S

Sample summary table

Table 5. Inventory of specimens collected during expedition NF-19-01.

Sample No.	Scientific Name	ROV Container	Dive No.	Time	ROV Lat	ROV Long	ROV Depth (m)
NF-19-01-Dive11-spec01	*Swiftia exserta*	Bucket 1	11	8:56	17.7767	-64.8705	93
NF-19-01-Dive11-spec02	*Swiftia exserta*	Bucket 2	11	9:00	17.7768	-64.8705	93
NF-19-01-Dive11-spec03	*Nicella*	Box 5	11	9:07	17.7768	-64.8705	93
NF-19-01-Dive11-spec04	NA	NA	NA	NA	NA	NA	NA
NF-19-01-Dive11-spec05	*Swiftia exserta*	Bucket 3	11	9:24	17.7767	-64.8705	84
NF-19-01-Dive11-spec06	*Nicella (orange variant)*	Bucket 3	11	9:30	17.7767	-64.8705	84
NF-19-01-Dive11-spec07	*Swiftia exserta*	Bucket 4	11	9:37	17.7767	-64.8705	84
NF-19-01-Dive11-spec08	*Swiftia exserta*	Bucket 5	11	9:42	17.7767	-64.8705	84
NF-19-01-Dive11-spec09	Antipatharia	Bucket5	11	9:48	17.7767	-64.8705	84
NF-19-01-Dive11-spec10	*Swiftia exserta*	Box 5	11	10:00	17.7766	-64.8706	86
NF-19-01-Dive11-spec11	Plexauridae	Bucket 1	11	10:10	17.7766	-64.8706	85
NF-19-01-Dive11-spec12	*Swiftia exserta*	Box4	11	10:15	17.7765	-64.8706	87
NF-19-01-Dive11-spec13	*Swiftia exserta*	Box3	11	10:19	17.7765	-64.8705	87
NF-19-01-Dive11-spec14	*Swiftia exserta*	Box2	11	10:30	17.7764	-64.8705	87
NF-19-01-Dive11-spec15	*Swiftia exserta*	Box1	11	10:36	17.7763	-64.8706	87
NF-19-01-Dive11-spec16	*Swiftia exserta (red polyp morph)*	Claw	11	10:37	17.7763	-64.8706	87
NF-19-01-Dive12-spec17	*Distochopora*	Box 4	12	12:55	17.7792	-64.8699	219
NF-19-01-Dive12-spec18	*Distochopora*	Box 4	12	13:00	17.7792	-64.8699	219
NF-19-01-Dive12-spec19	*Distochopora*	Box 4	12	13:12	17.7791	-64.8699	215
NF-19-01-Dive13-spec20	*Nicella (white variant)*	Box 3	13	14:23	17.7727	-64.8826	162
NF-19-01-Dive13-spec21	*Nicella (white variant)*	Box 2	13	14:37	17.7726	-64.8826	156
NF-19-01-Dive13-spec22	*Nicella (white variant)*	Box 1	13	14:52	17.7727	-64.8828	148
NF-19-01-Dive13-spec23	*Nicella (white variant)*	Box 4	13	15:04	17.7727	-64.8828	149
NF-19-01-Dive13-spec24	*Nicella (white variant)*	Bucket 1	13	15:12	17.7726	-64.8825	154
NF-19-01-Dive13-spec25	*Leptogorgia*	Claw	13	15:43	17.7723	-64.8829	94
NF-19-01-Dive27-spec26	*Nicella (white variant)*	Box	27	8:19	18.1871	-64.9575	121
NF-19-01-Dive27-spec27	*Nicella (orange variant)*	Box	27	8:25	18.1870	-64.9576	119
NF-19-01-Dive27-spec28	Orange Plexauridae	Box	27	8:33	18.1871	-64.9577	109
NF-19-01-Dive27-spec29	*Muricea sp.*	Claw	27	8:37	18.1871	-64.9577	109
NF-19-01-Dive28-spec30	*Muricea sp.*	Claw	28	9:30	18.1886	-64.9715	118
NF-19-01-Dive29-spec31	*Nicella (white variant)*	Box	29	10:37	18.1953	-64.9832	128
NF-19-01-Dive29-spec32	*Nicella (white variant)*	Claw	29	10:42	18.1952	-64.9831	127
NF-19-01-Dive30-spec33	*Swiftia exserta*	Box	30	11:51	18.1972	-64.9953	153
NF-19-01-Dive30-spec34	*Paramuricea*	Box	30	11:57	18.1972	-64.9953	155
NF-19-01-Dive30-spec35	*Scleracis*	Box	30	12:00	18.1972	-64.9954	156
NF-19-01-Dive30-spec36	Yellow Plexauridae	Claw	30	12:28	18.1975	-64.9951	98
NF-19-01-Dive31-spec37	*Paramuricea*	Box	31	15:48	18.1834	-65.0696	187
NF-19-01-Dive31-spec38	Chrysogorgiidae	Box	31	15:53	18.1834	-65.0695	185
NF-19-01-Dive31-spec39	*Villogorgia*	Box	31	16:03	18.1834	-65.0698	173
NF-19-01-Dive31-spec40	*Nicella (orange variant)*	Box	31	16:13	18.1835	-65.0696	164
NF-19-01-Dive31-spec41	*Paramuricea*	Claw	31	16:16	18.1835	-65.0696	163

Sample photographs

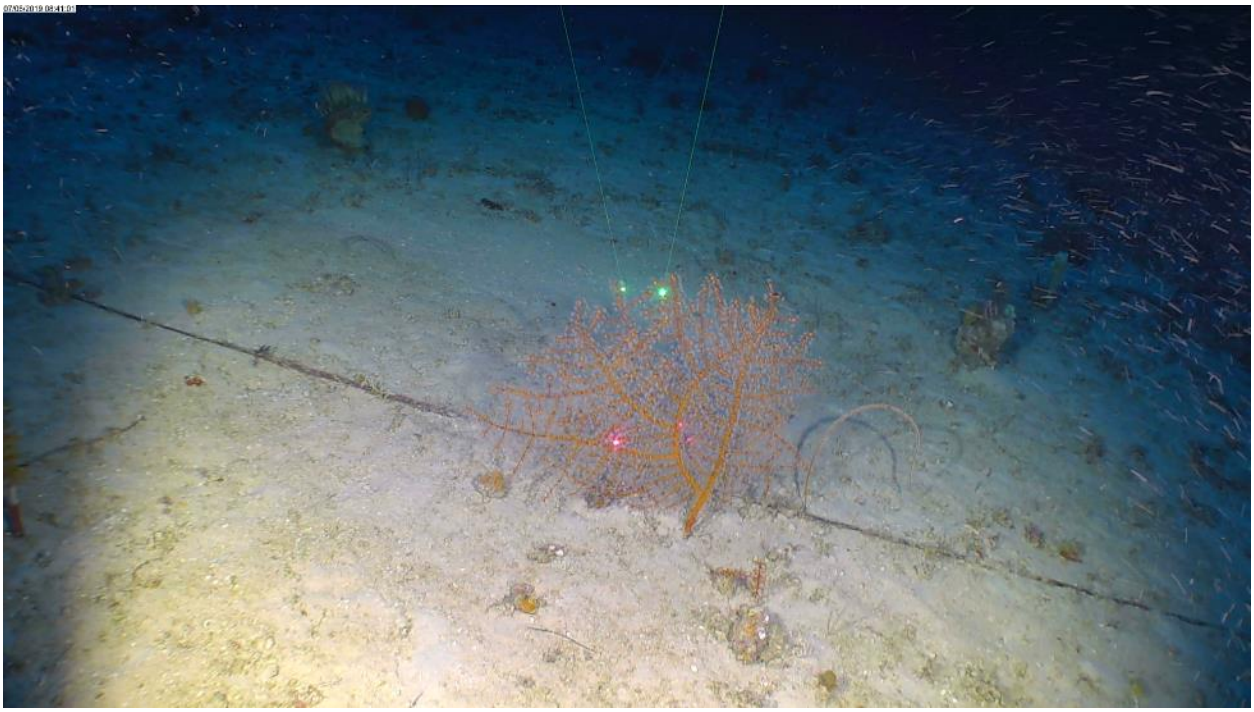

Figure 12. *In situ* image of *Swiftia exserta* (NF-19-01-Dive11-spec01) sample from Northwest St. Croix at 93 m.

Figure 13. *In situ* image of *Swiftia exserta* (NF-19-01-Dive11-spec02) sample from Northwest St. Croix at 93 m.

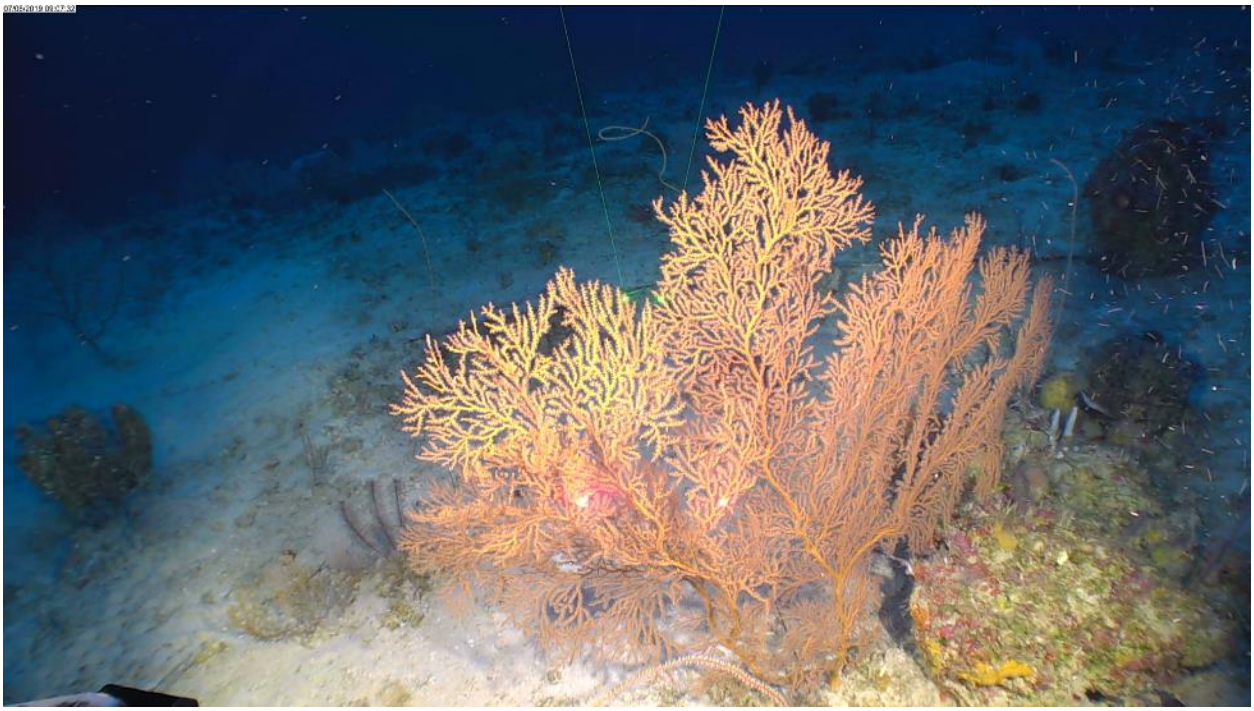

Figure 14. *In situ* image of *Nicella* sp. (NF-19-01-Dive11-spec03) sample from Northwest St. Croix at 93 m.

Figure 15. *In situ* image of *Swiftia exserta* (NF-19-01-Dive11-spec05) sample from Northwest St. Croix at 84 m.

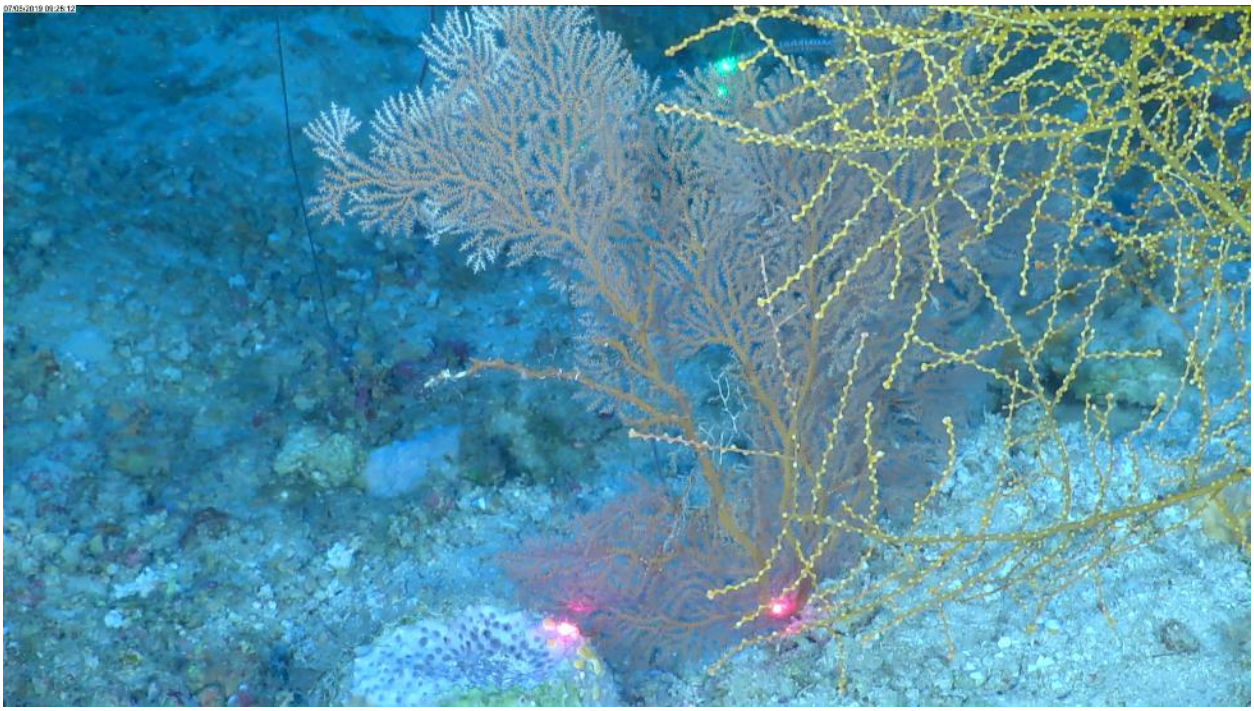

Figure 16. *In situ* image of *Nicella* sp. (NF-19-01-Dive11-spec06) sample from Northwest St. Croix at 84 m.

Figure 17. *In situ* image of *Swiftia exserta* (NF-19-01-Dive11-spec07) sample from Northwest St. Croix at 84 m.

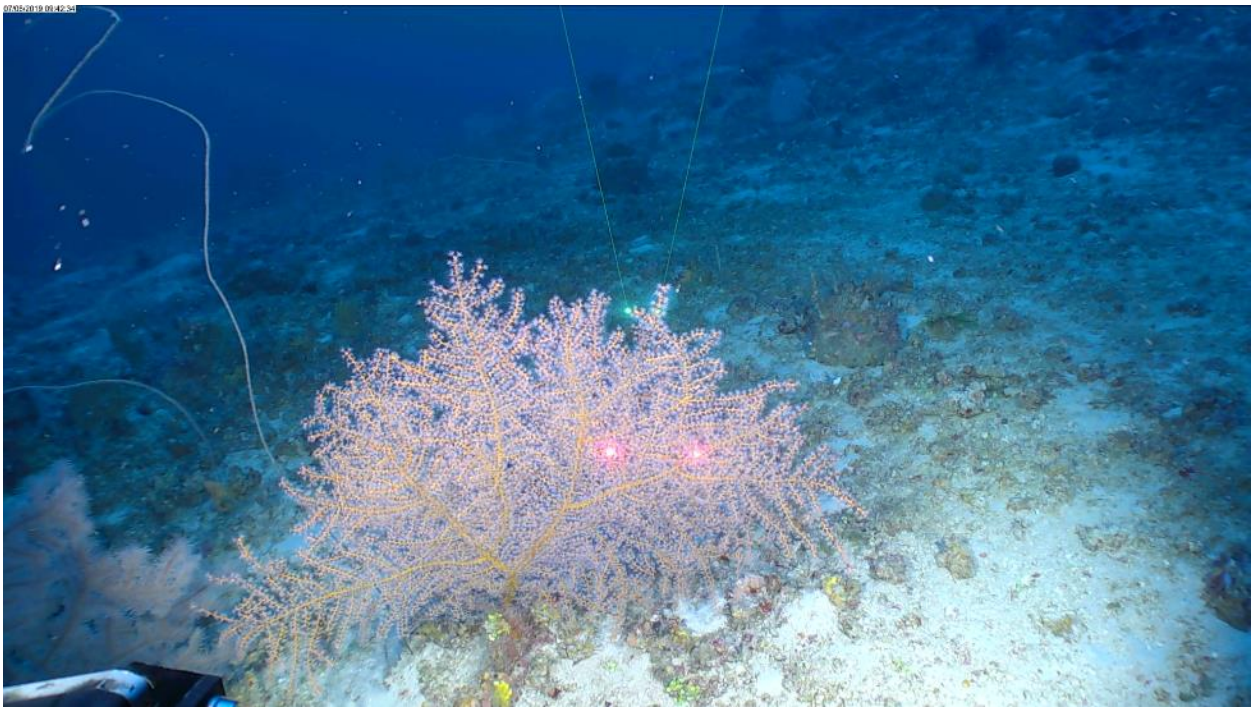

Figure 18. *In situ* image of *Swiftia exserta* (NF-19-01-Dive11-spec08) sample from Northwest St. Croix at 84 m.

Figure 19. *In situ* image of Antipatharia (NF-19-01-Dive11-spec09) sample from Northwest St. Croix at 84 m.

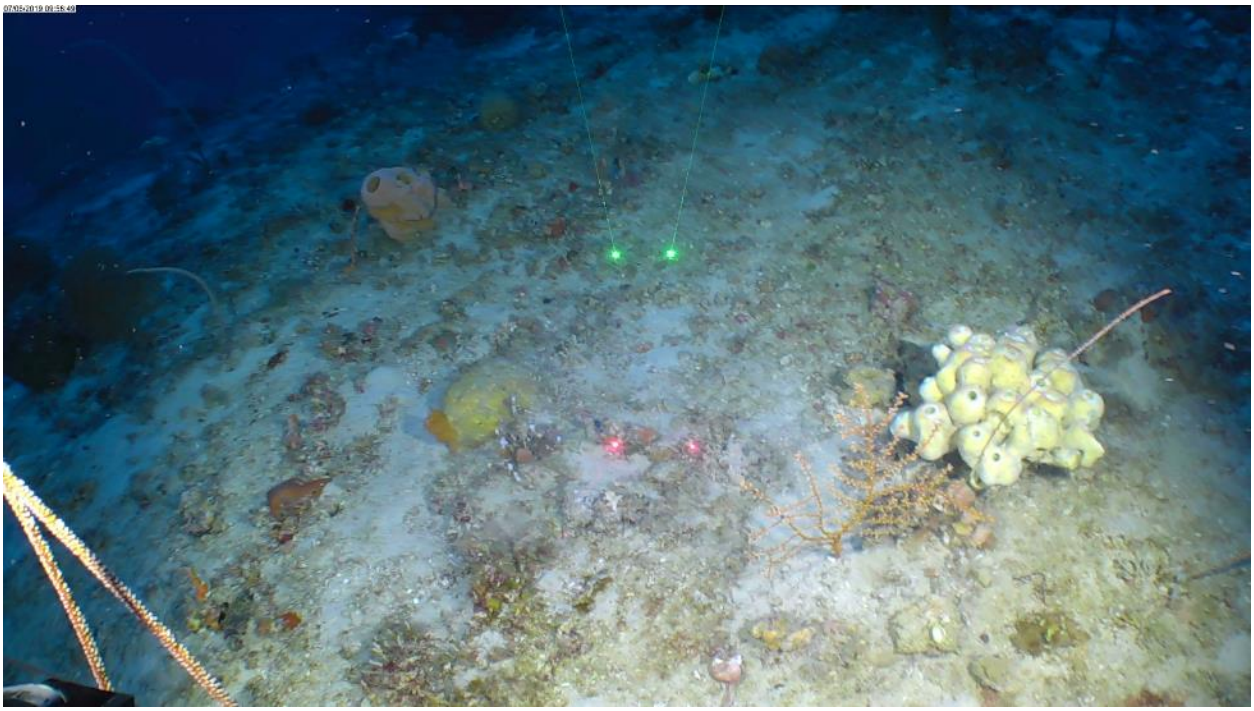

Figure 20. *In situ* image of *Swiftia exserta* (NF-19-01-Dive11-spec10) sample from Northwest St. Croix at 86 m.

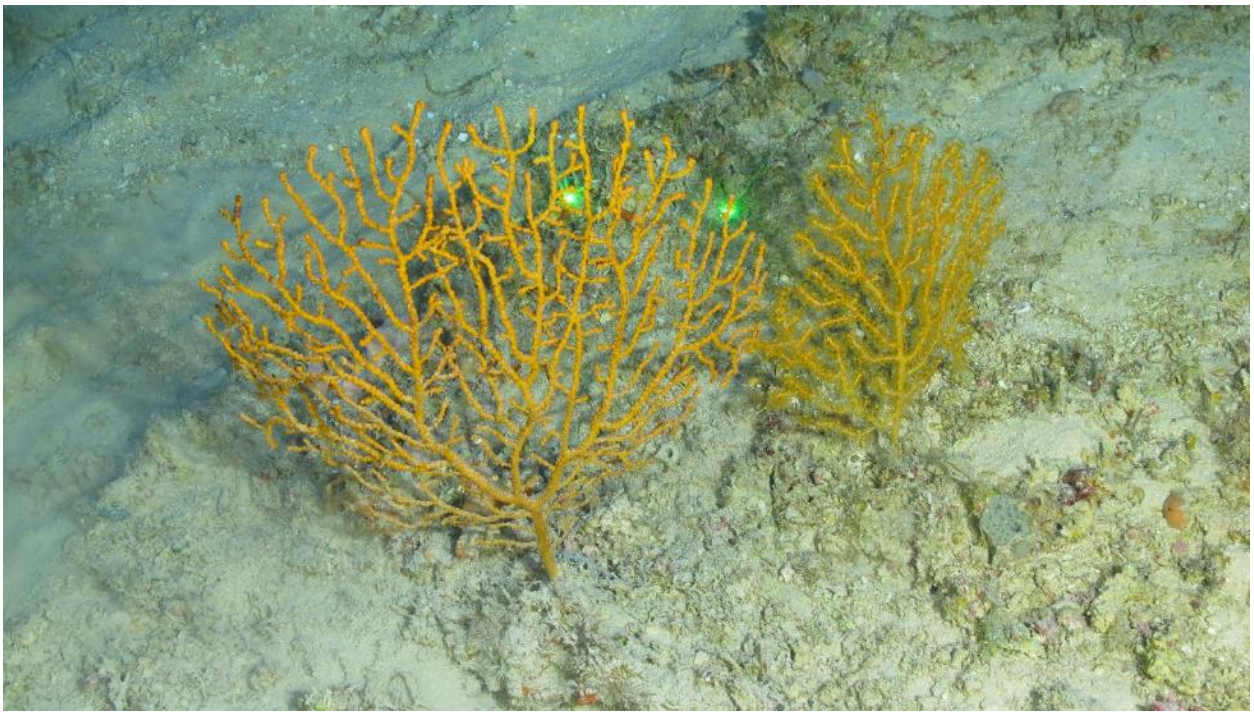

Figure 21. *In situ* image of Plexauridae (NF-19-01-Dive11-spec11) sample from Northwest St. Croix at 85 m.

Figure 22. *In situ* image of *Swiftia exserta* (NF-19-01-Dive11-spec12) sample from Northwest St. Croix at 87 m.

Figure 23. *In situ* image of *Swiftia exserta* (NF-19-01-Dive11-spec13) sample from Northwest St. Croix at 87 m.

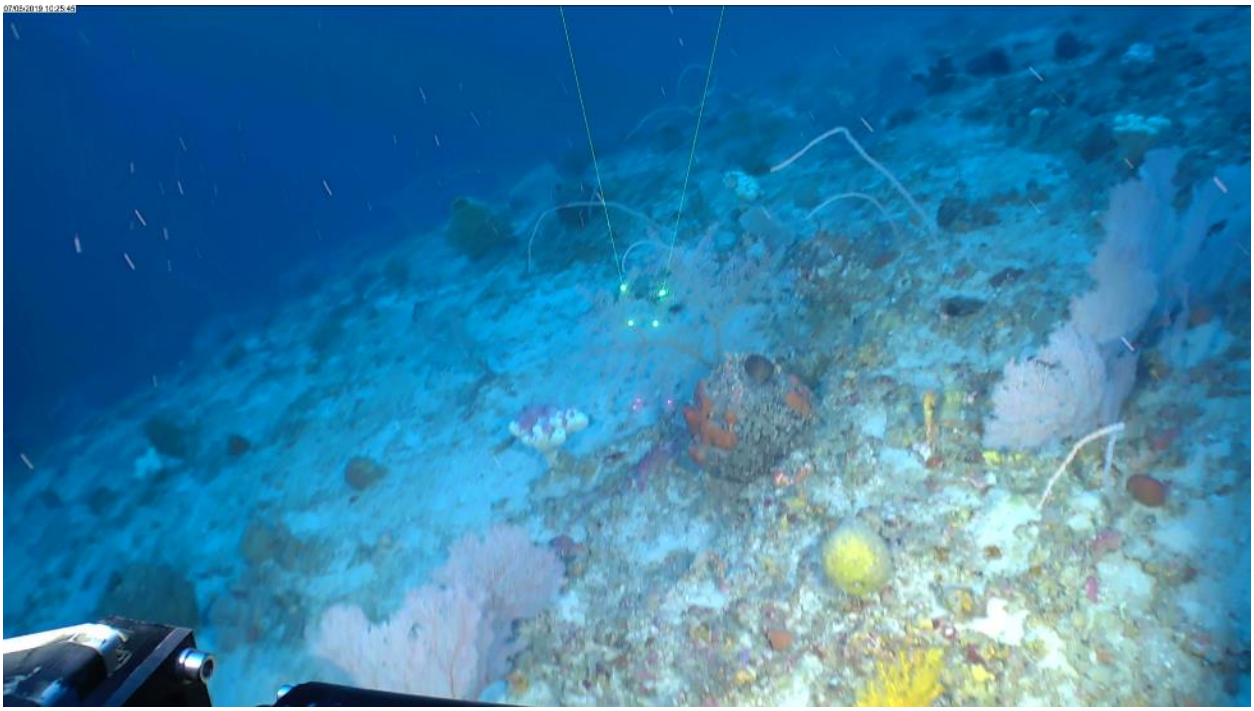

Figure 24. *In situ* image of *Swiftia exserta* (NF-19-01-Dive11-spec14) sample from Northwest St. Croix at 87 m.

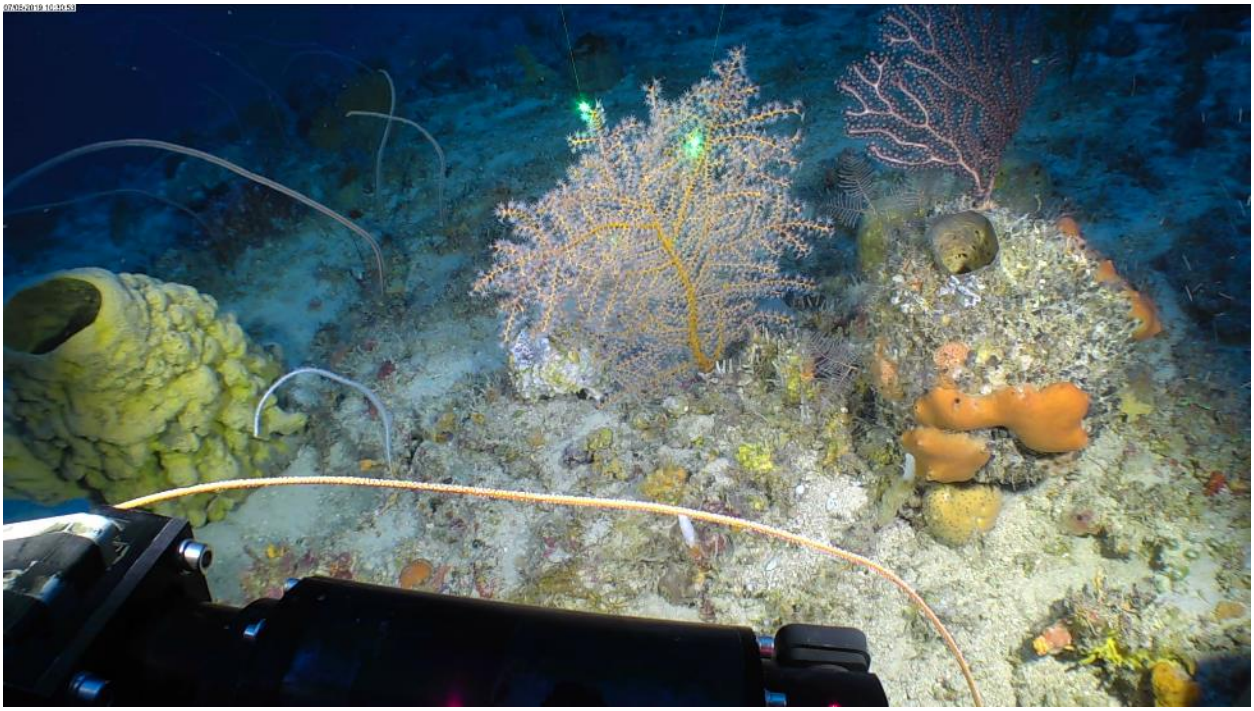

Figure 25. *In situ* image of *Swiftia exserta* (NF-19-01-Dive11-spec15) sample from Northwest St. Croix at 87 m.

Figure 26. *In situ* image of *Swiftia exserta* (NF-19-01-Dive11-spec16) sample with red polyps from Northwest St. Croix at 87 m.

Figure 27. On deck image of *Swiftia exserta* (NF-19-01-Dive11-spec16) sample with red polyps from Northwest St. Croix at 87 m.

Figure 28. *In situ* image of *Distichopora* sp. (NF-19-01-Dive12-spec17) sample from Northwest St. Croix at 219 m.

Figure 29. *In situ* image of *Distichopora* sp. (NF-19-01-Dive12-spec18) sample from Northwest St. Croix at 219 m.

Figure 30. On deck image of *Distichopora* sp. (NF-19-01-Dive12-spec18) sample from Northwest St. Croix at 219 m.

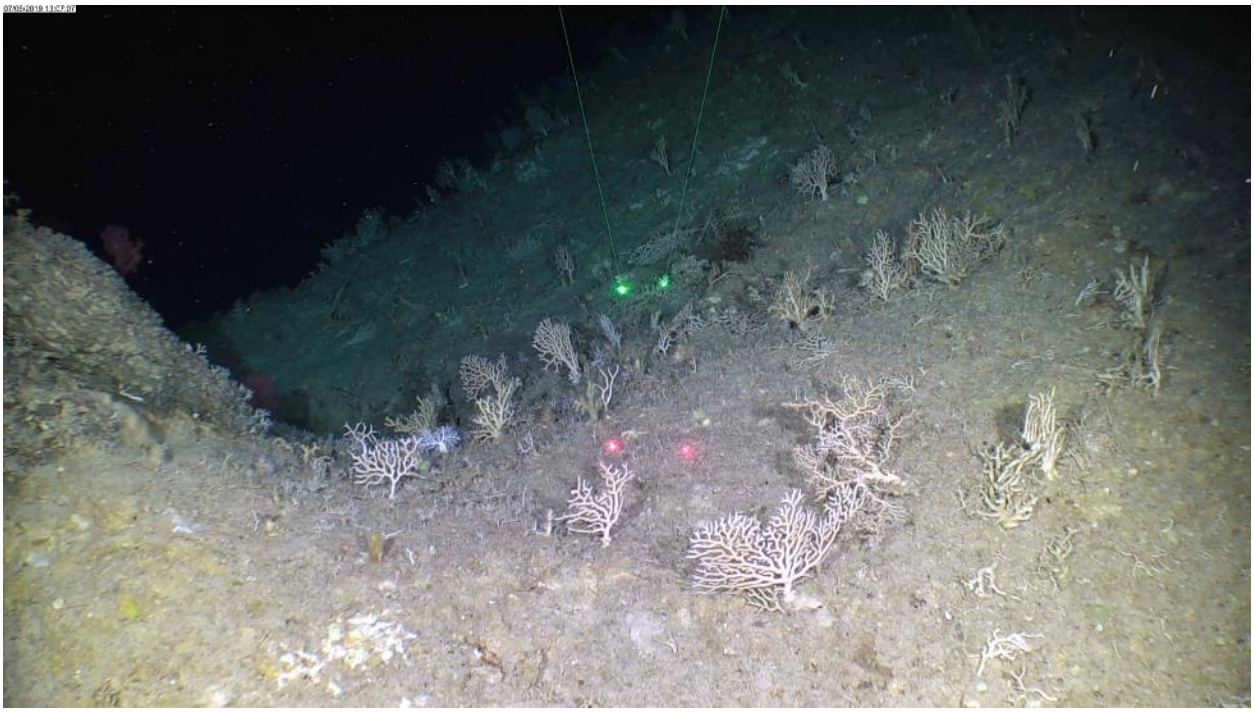

Figure 31. *In situ* image of *Distichopora* sp. (NF-19-01-Dive12-spec19) sample from Northwest St. Croix at 215 m.

Figure 32. On deck image of *Distichopora* sp. (NF-19-01-Dive12-spec19) sample from Northwest St. Croix at 215 m.

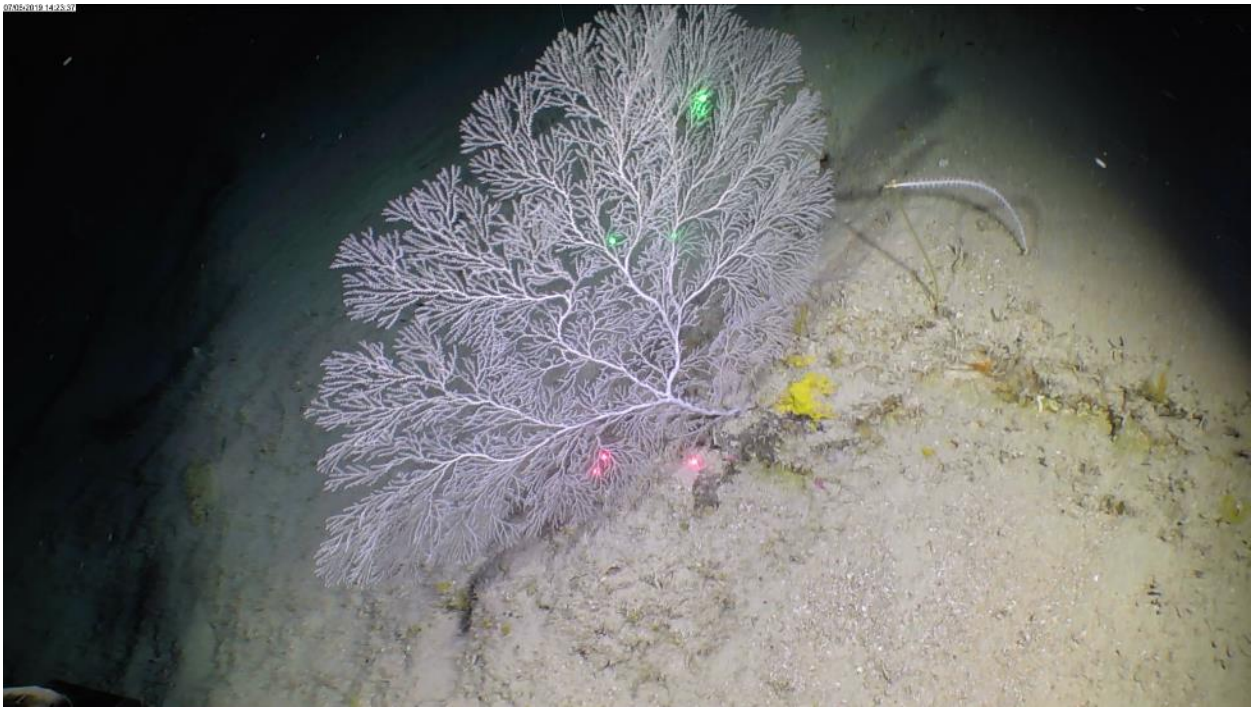

Figure 33. *In situ* image of *Nicella* (white variant) originally thought to be *Hypnogorgia pendula* (NF-19-01-Dive13-spec20) sample from Northwest St. Croix at 162 m.

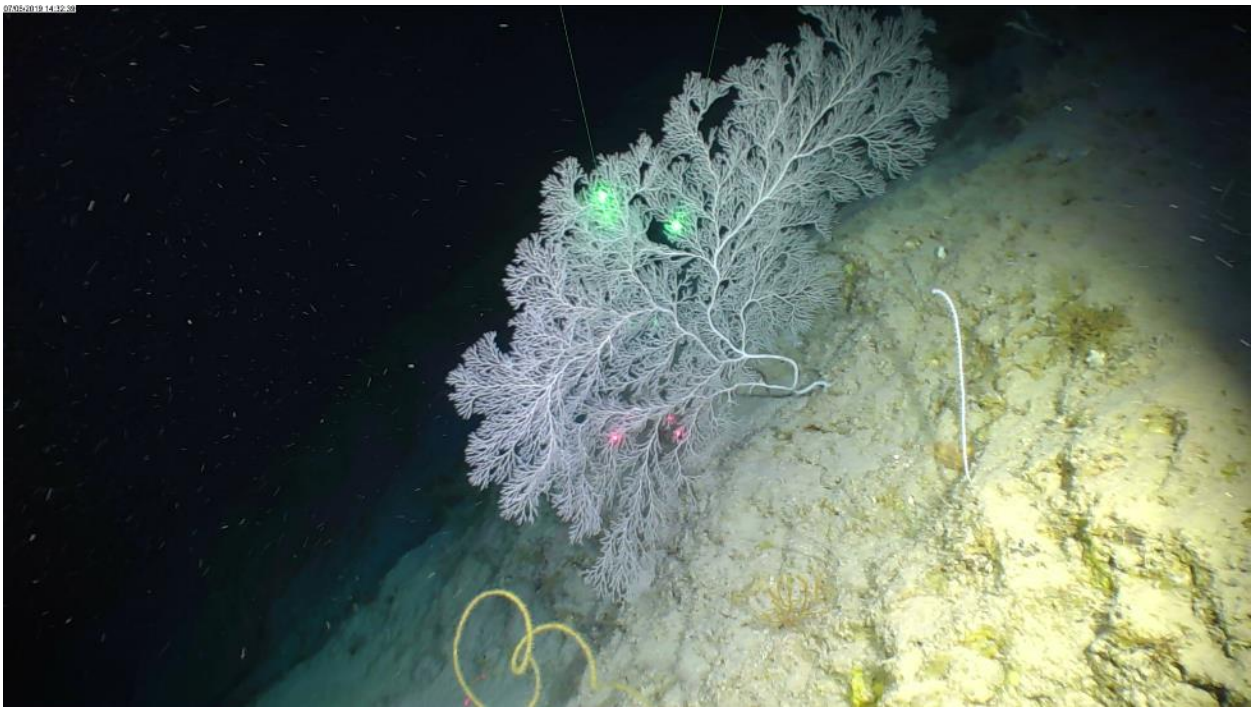

Figure 34. *In situ* image of *Nicella* (white variant) originally thought to be *Hypnogorgia pendula* (NF-19-01-Dive13-spec21) sample from Northwest St. Croix at 156 m.

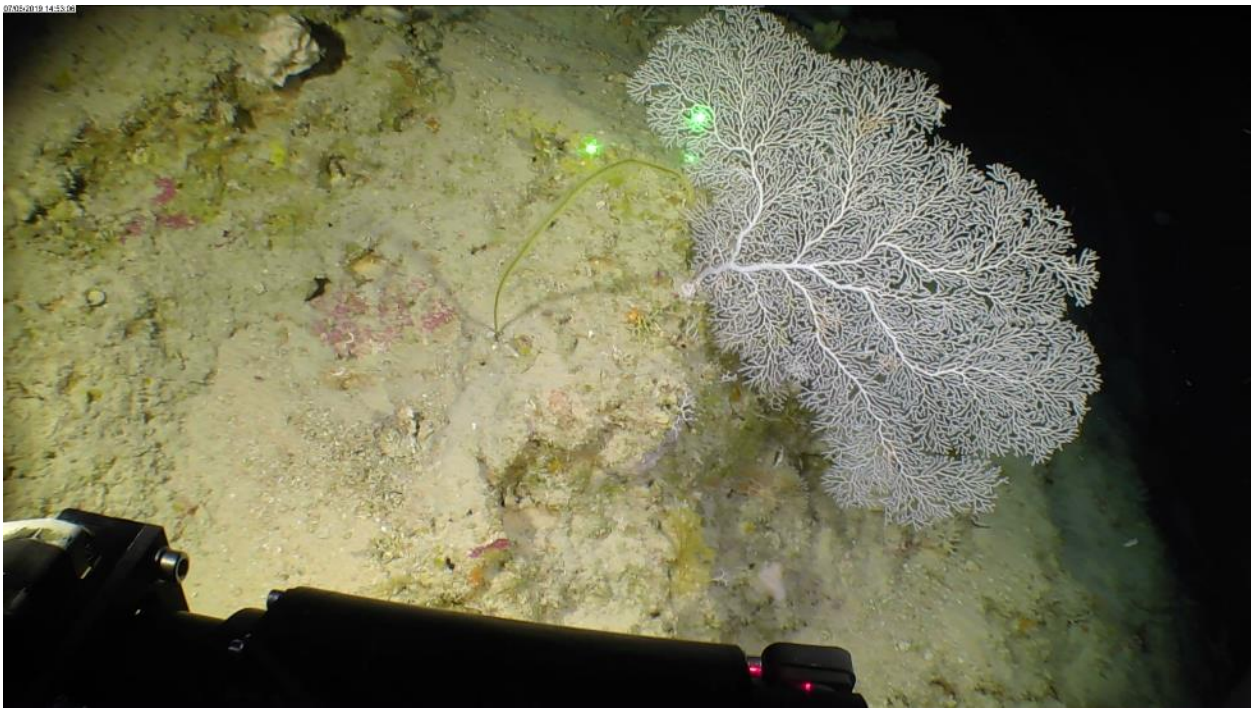

Figure 35. *In situ* image of *Nicella* (white variant) originally thought to be *Hypnogorgia pendula* (NF-19-01-Dive13-spec22) sample from Northwest St. Croix at 148 m.

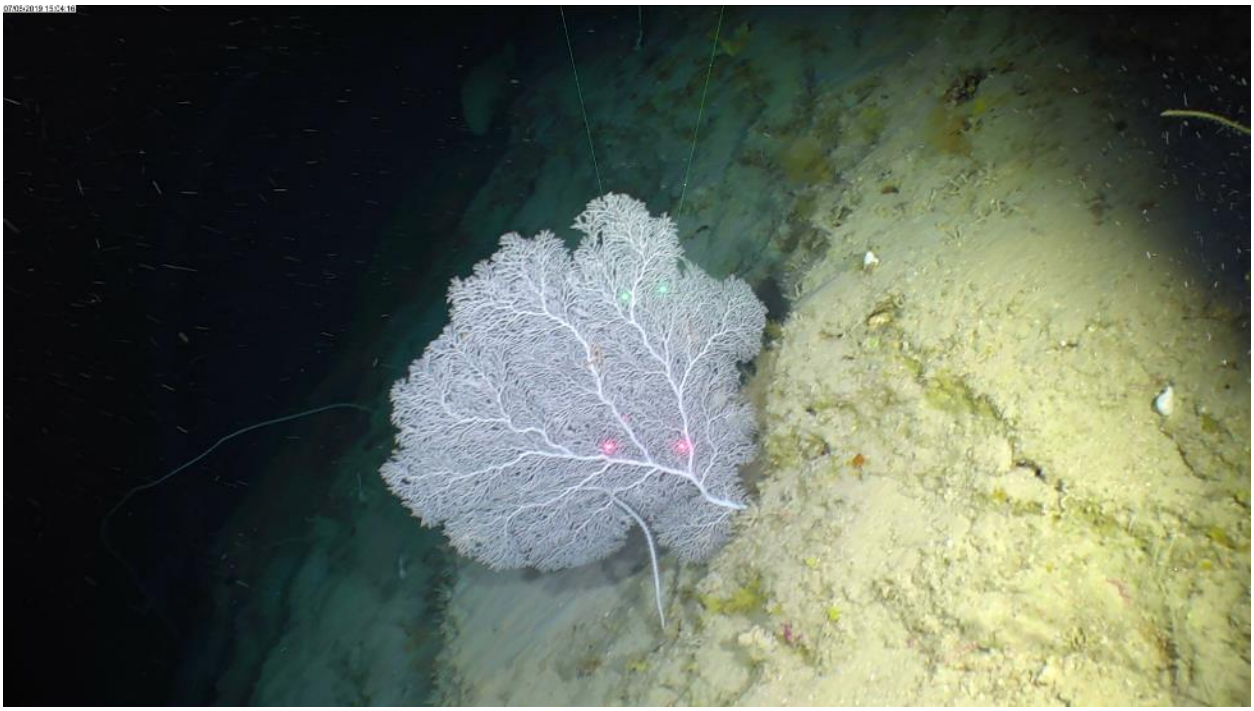

Figure 36. *In situ* image of *Nicella* (white variant) originally thought to be *Hypnogorgia pendula* (NF-19-01-Dive13-spec23) sample from Northwest St. Croix at 149 m.

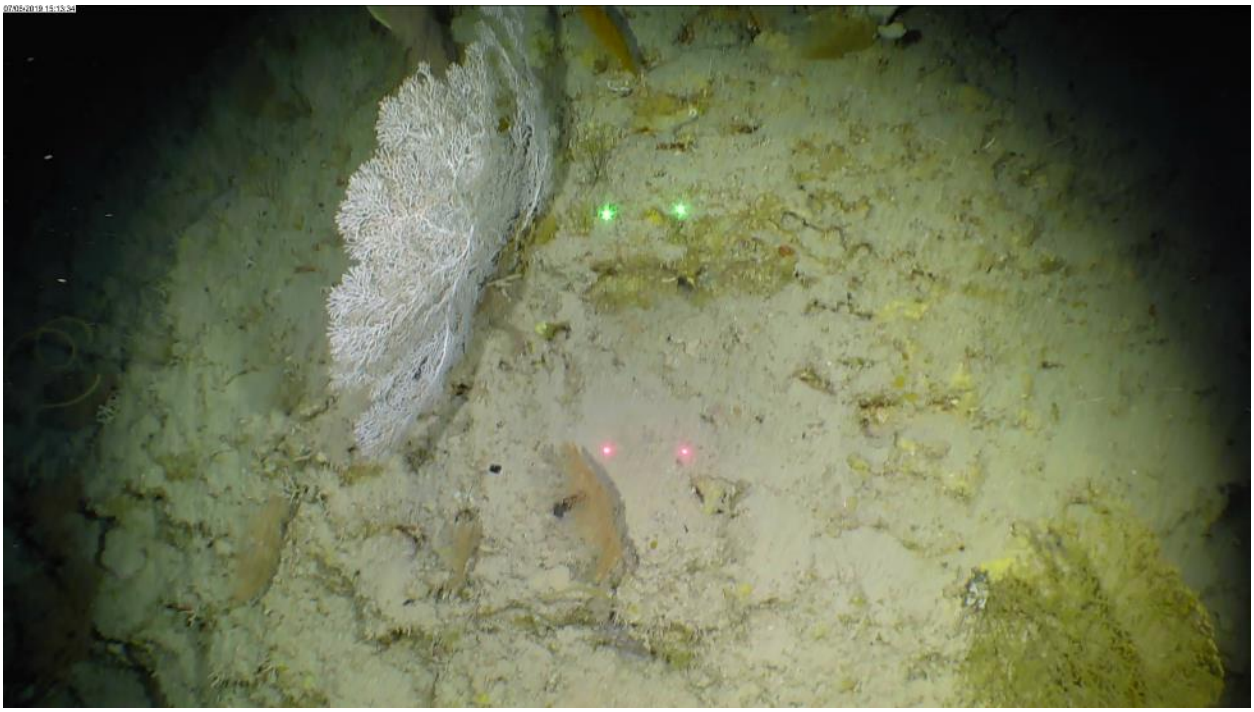

Figure 37. *In situ* image of *Nicella* (white variant) originally thought to be *Hypnogorgia pendula* (NF-19-01-Dive13-spec24) sample from Northwest St. Croix at 154 m.

Figure 38. *In situ* image of *Leptogorgia* sp. (NF-19-01-Dive13-spec25) sample from Northwest St. Croix at 94 m.

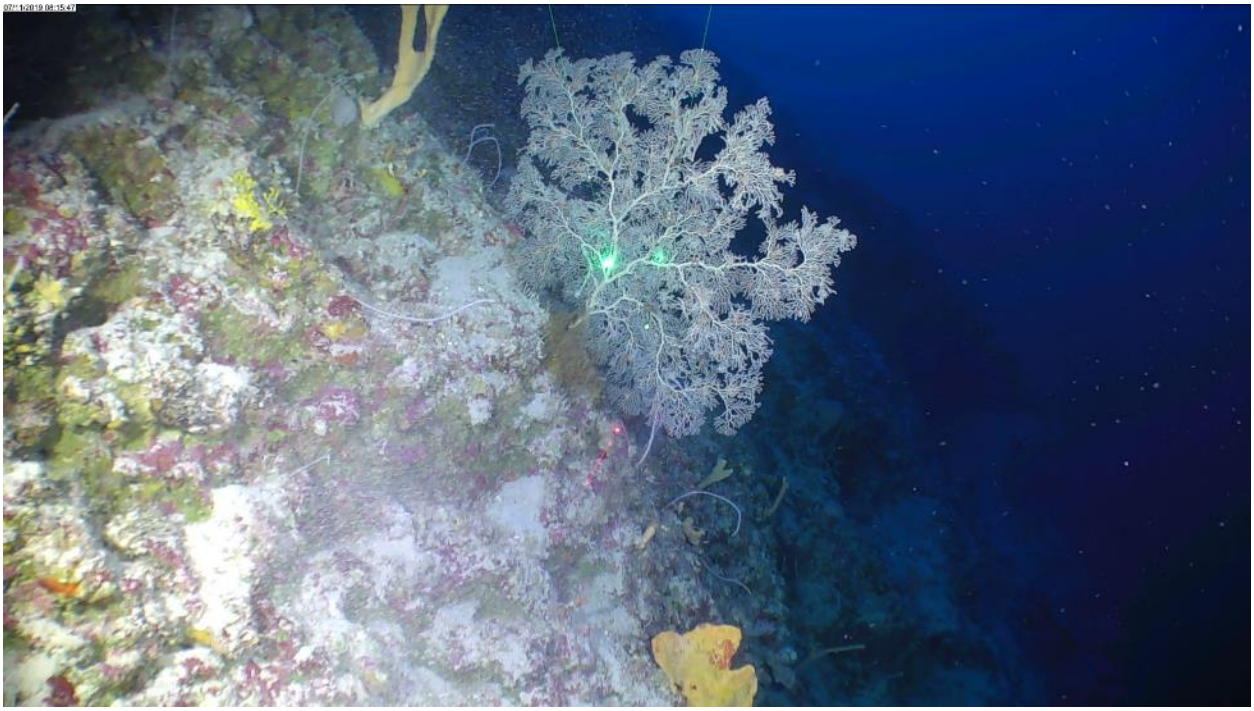

Figure 39. *In situ* image of *Nicella* (white variant) originally thought to be *Hypnogorgia pendula* (NF-19-01-Dive27-spec26) sample from St. Thomas at 121 m.

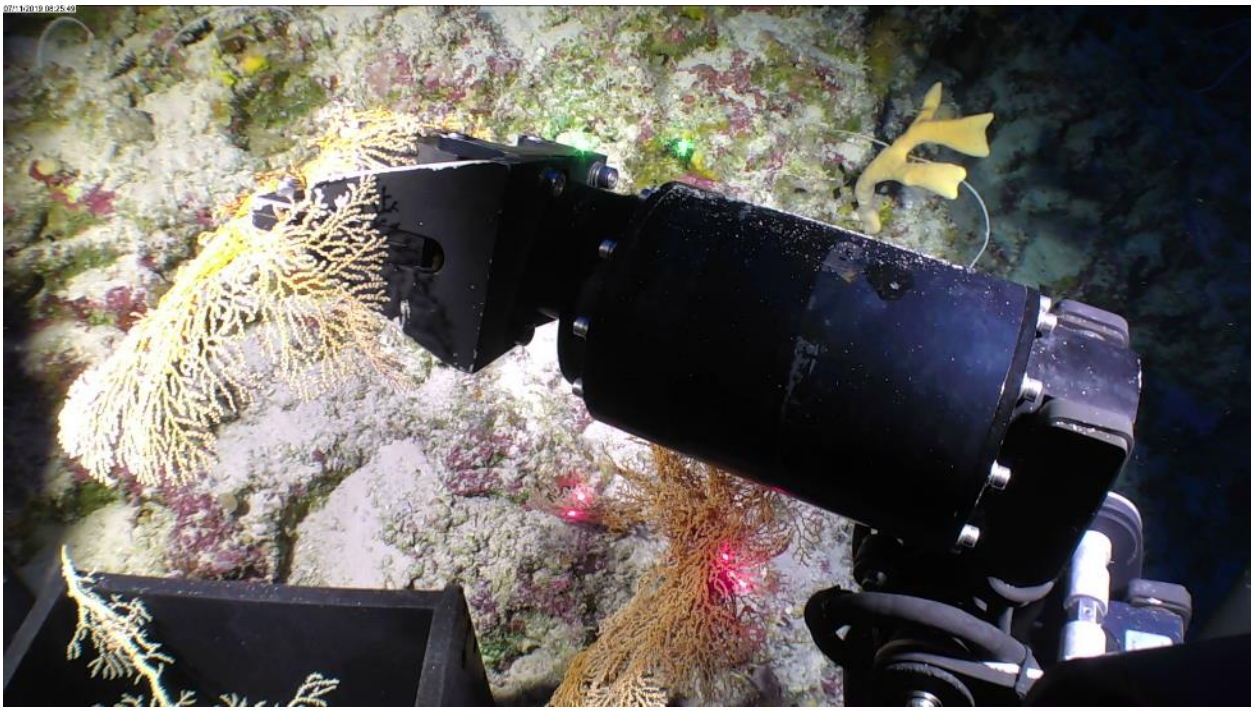

Figure 40. *In situ* image of *Nicella* sp. (NF-19-01-Dive27-spec27) sample from St. Thomas at 119 m.

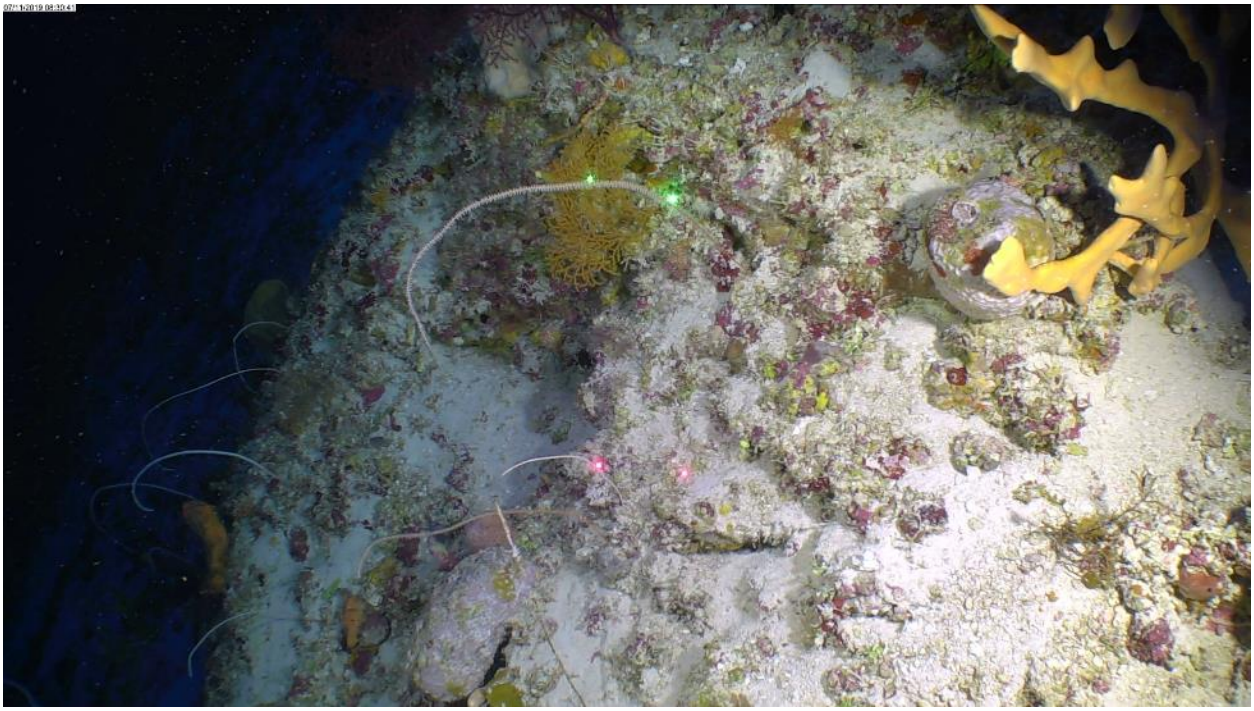

Figure 41. *In situ* image of orange Plexauridae (NF-19-01-Dive27-spec28) sample from St. Thomas at 109 m.

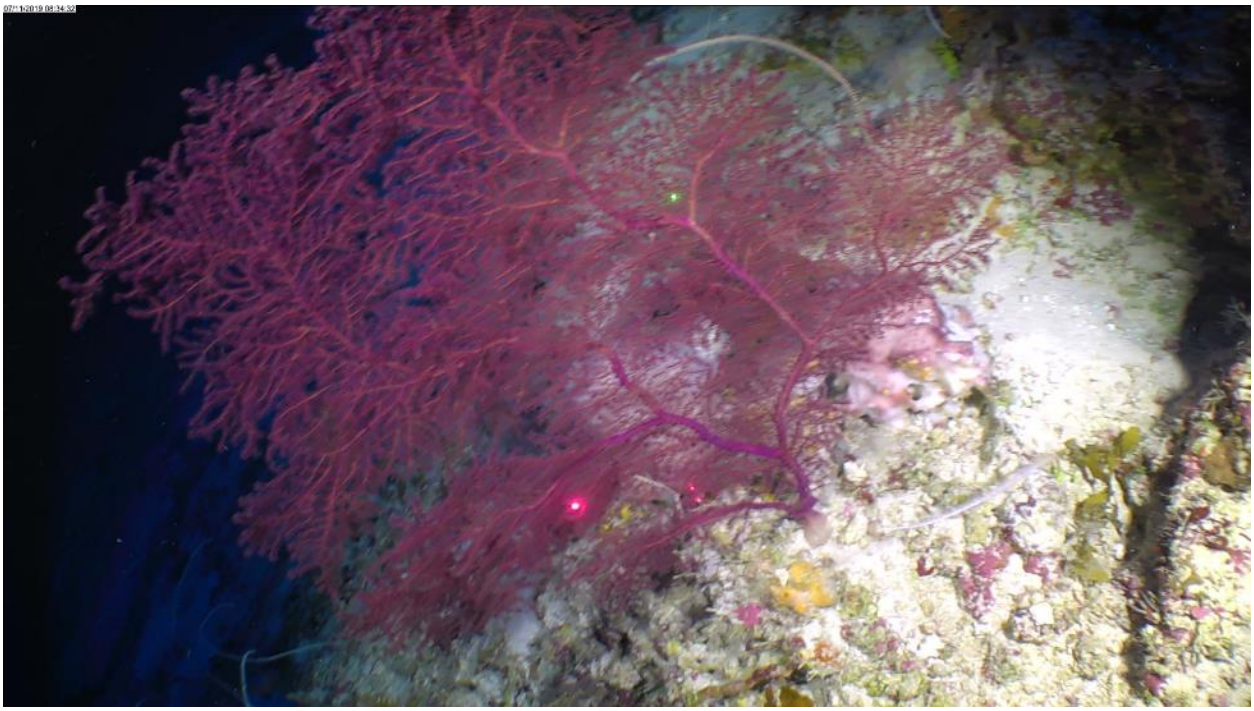

Figure 42. *In situ* image of *Muricea* sp. (NF-19-01-Dive27-spec29) sample from St. Thomas at 109 m.

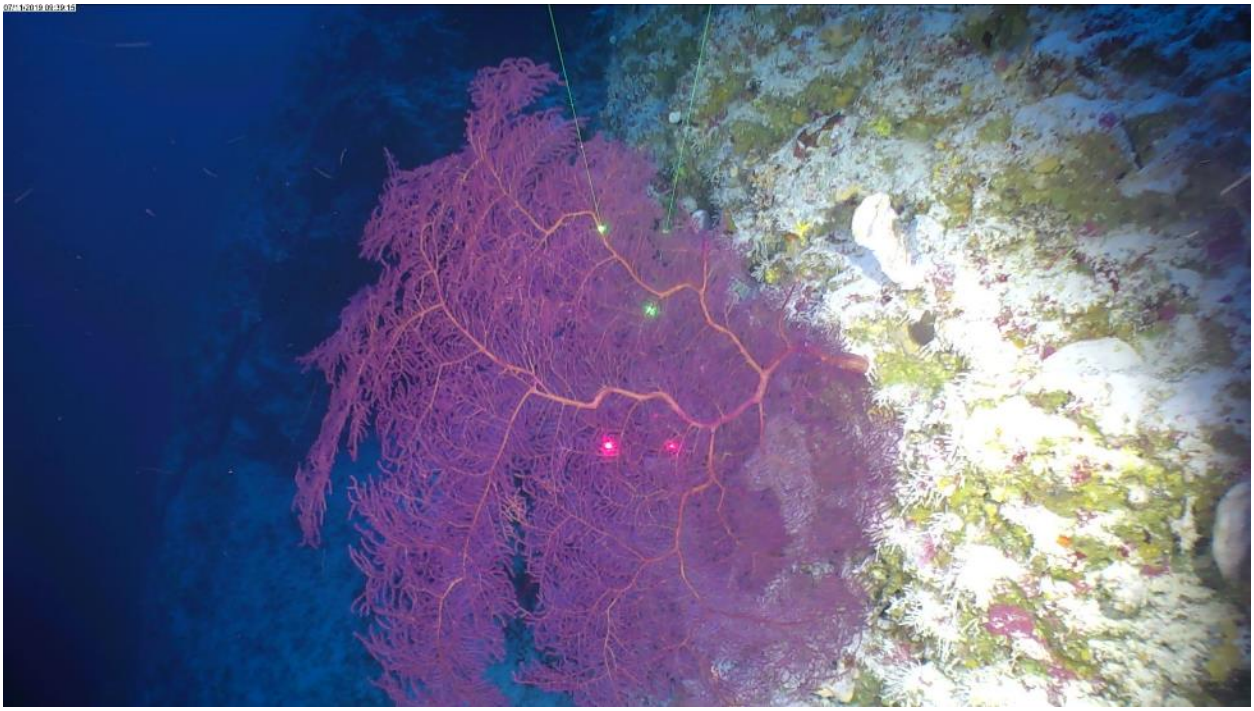

Figure 43. *In situ* image of *Muricea* sp. (NF-19-01-Dive28-spec30) sample from St. Thomas at 118 m.

Figure 44. *In situ* image of *Nicella* (white variant) originally thought to be *Hypnogorgia pendula* (NF-19-01-Dive29-spec31) sample from South St. Thomas at 128 m.

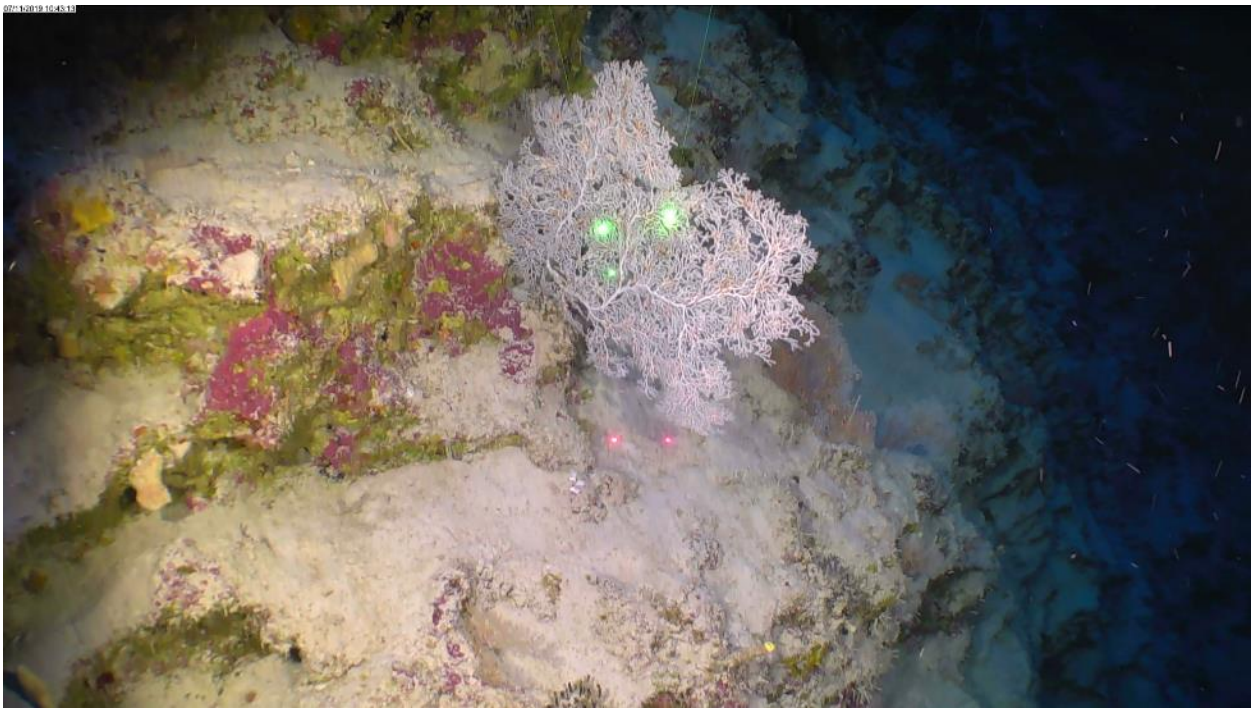

Figure 45. *In situ* image of *Nicella* (white variant) originally thought to be *Hypnogorgia pendula* (NF-19-01-Dive29-spec32) sample from South St. Thomas at 127 m.

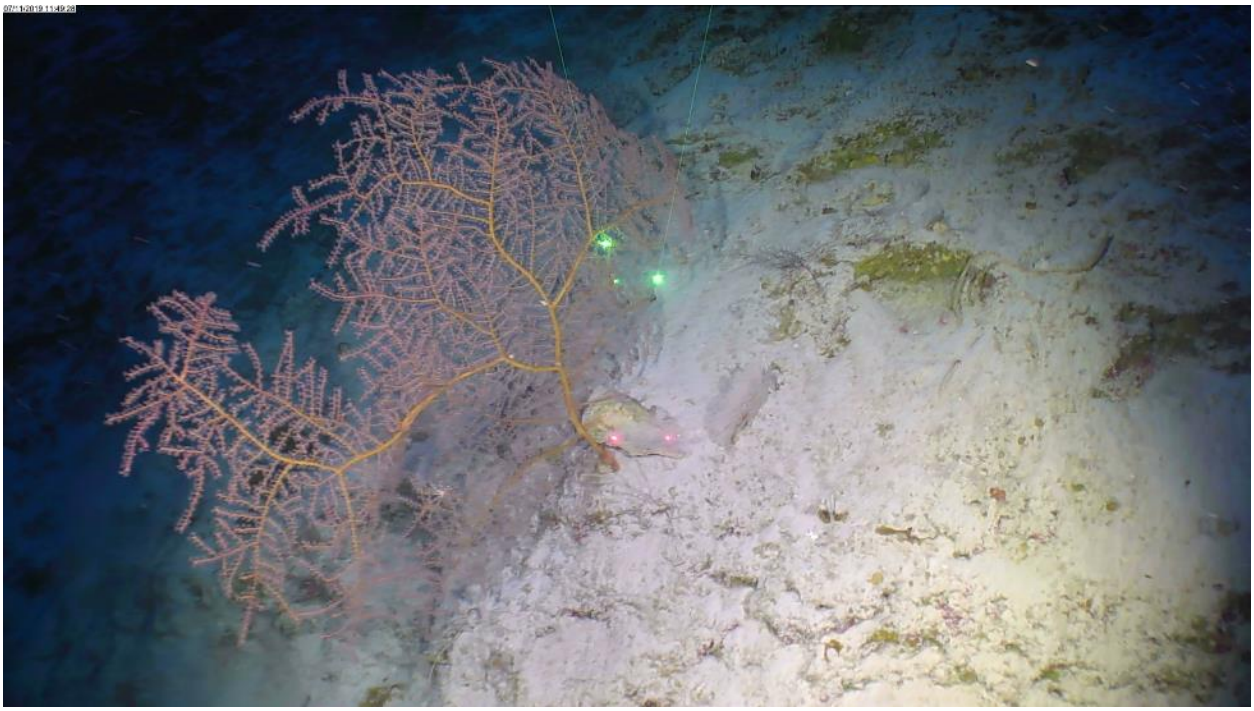

Figure 46. *In situ* image of *Swiftia exserta* (NF-19-01-Dive30-spec33) sample from South St. Thomas at 153 m.

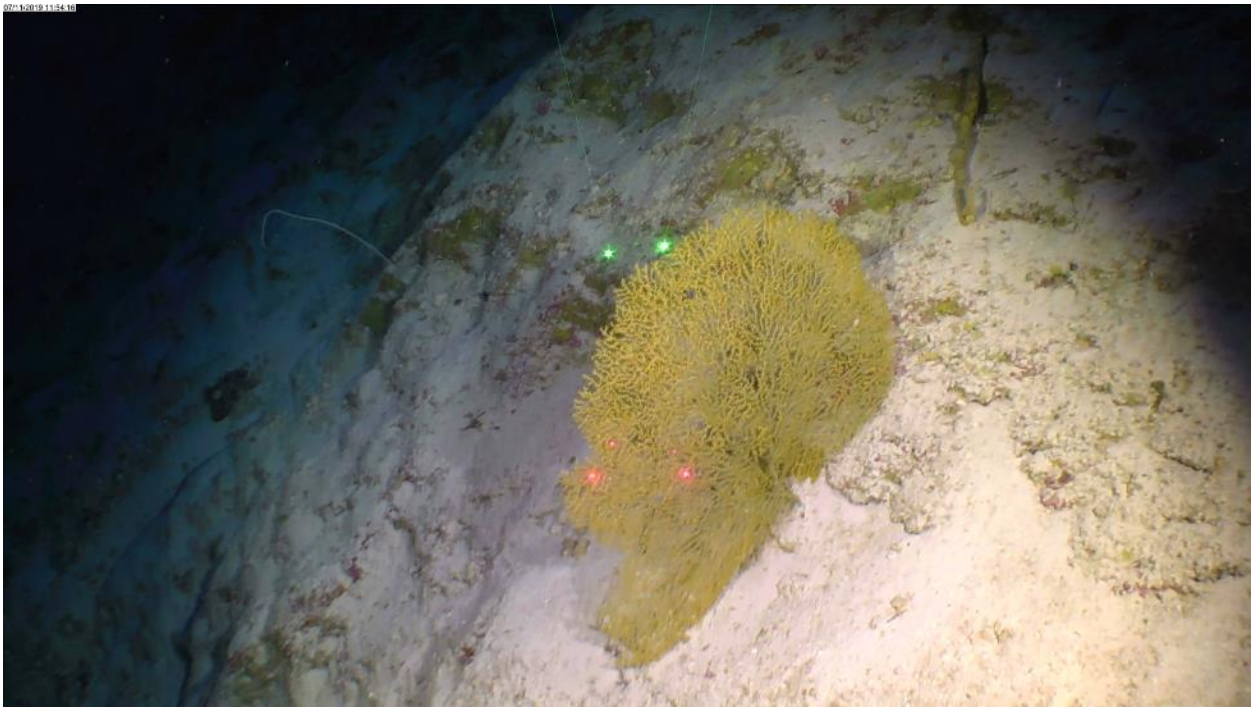

Figure 47. *In situ* image of *Paramuricea* sp. (NF-19-01-Dive30-spec34) sample from South St. Thomas at 155 m.

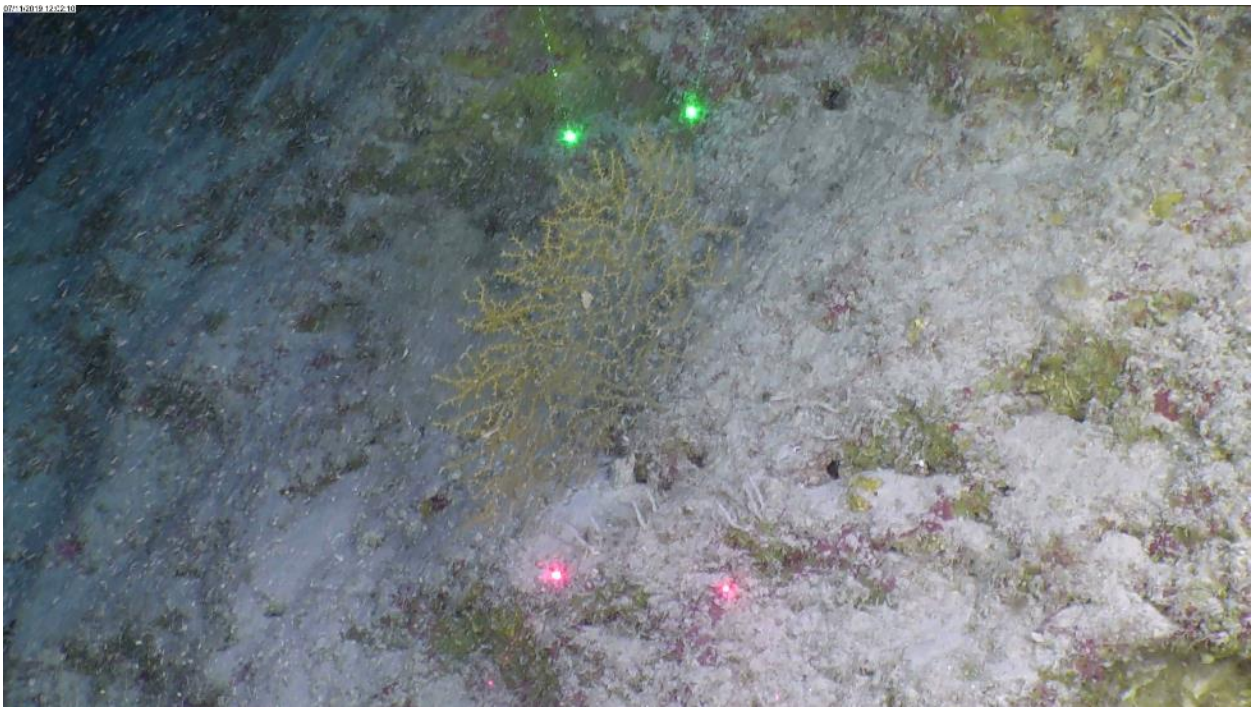

Figure 48. *In situ* image of *Scleracis* sp. (NF-19-01-Dive30-spec35) sample from South St. Thomas at 156 m.

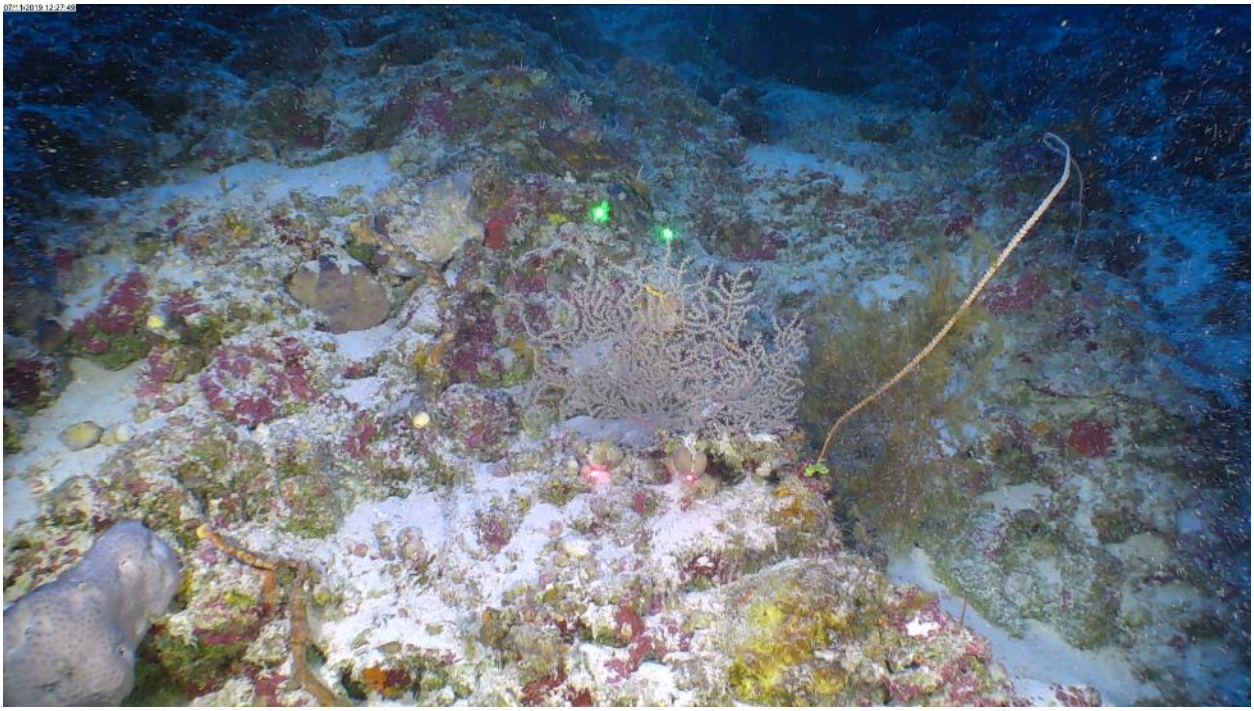

Figure 49. *In situ* image of a yellow Plexauridae (NF-19-01-Dive30-spec36) sample from South St. Thomas at 98 m.

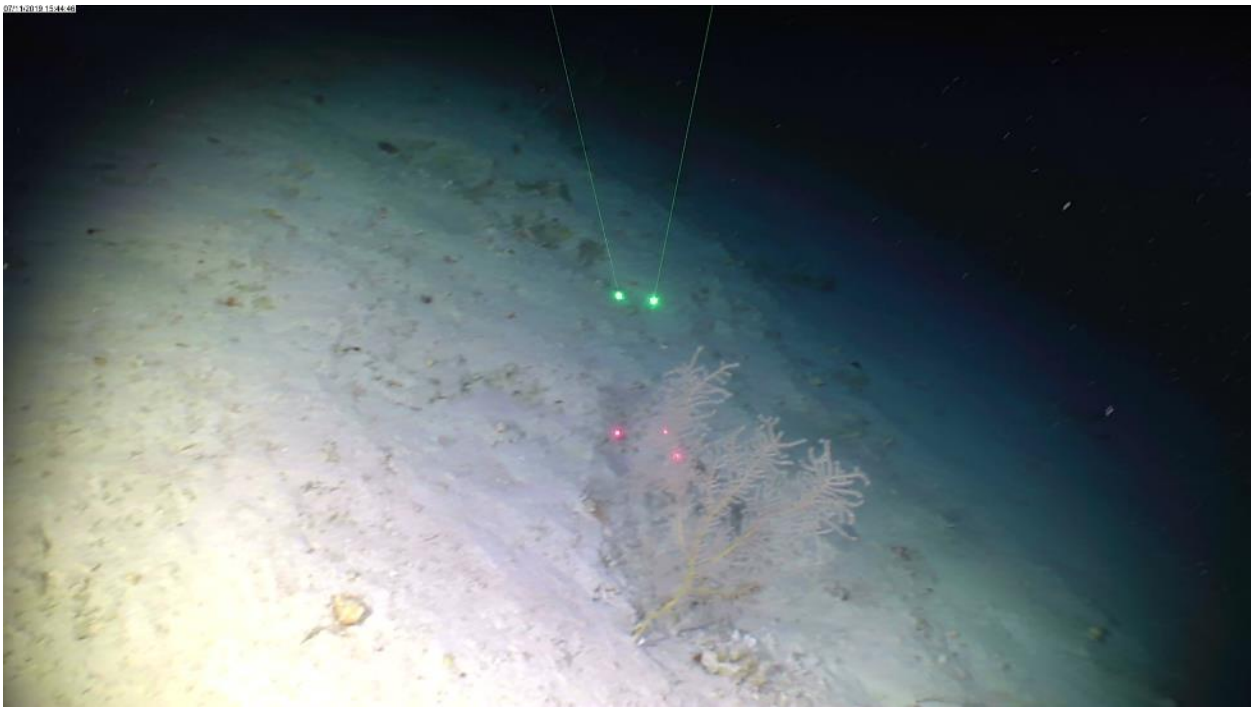

Figure 50. *In situ* image of a *Paramuricea* sp. (NF-19-01-Dive31-spec37) sample from South St. Thomas at 187 m.

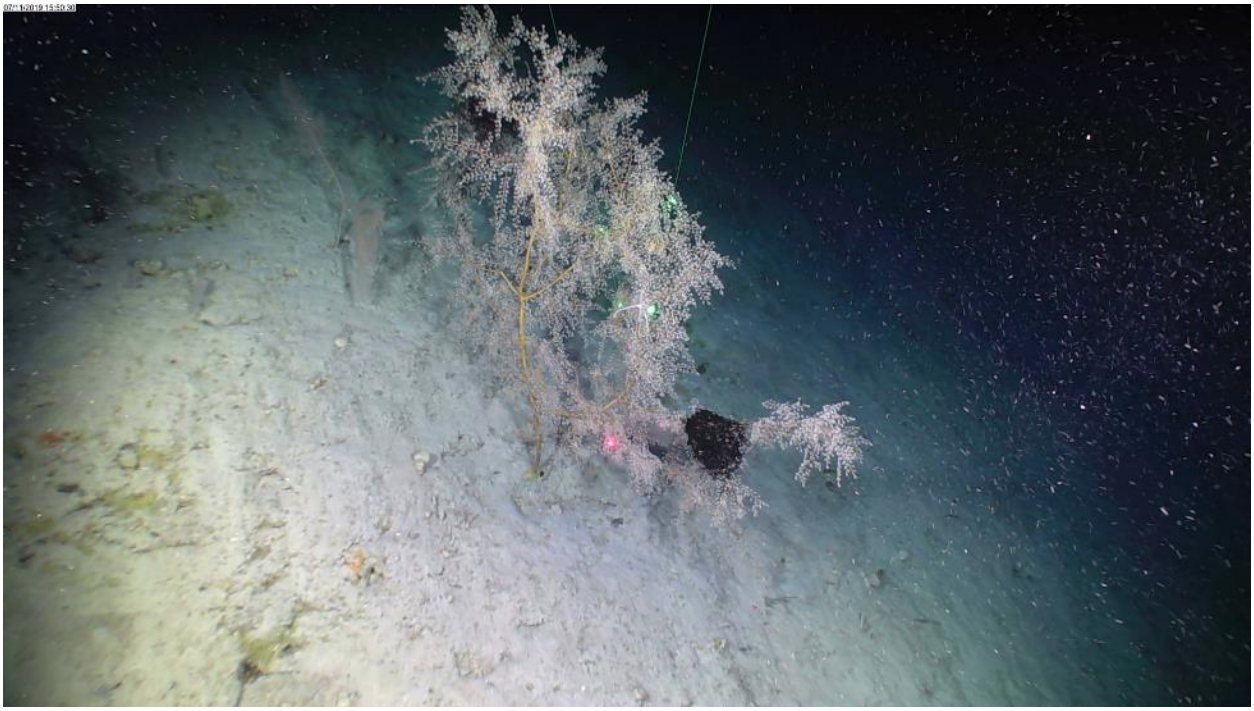

Figure 51. *In situ* image of a Chrysogorgiidae (NF-19-01-Dive31-spec38) sample from South St. Thomas at 185 m.

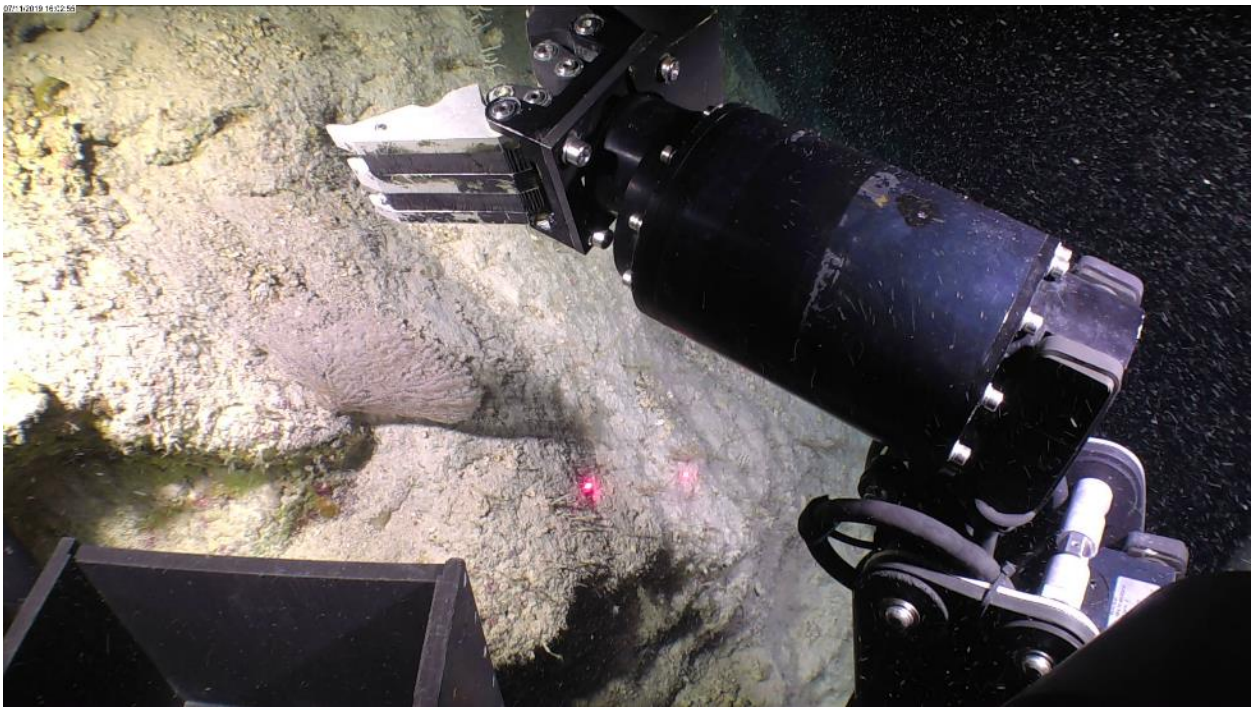

Figure 52. *In situ* image of a *Villogorgia* sp. (NF-19-01-Dive31-spec39) sample from South St. Thomas at 173 m.

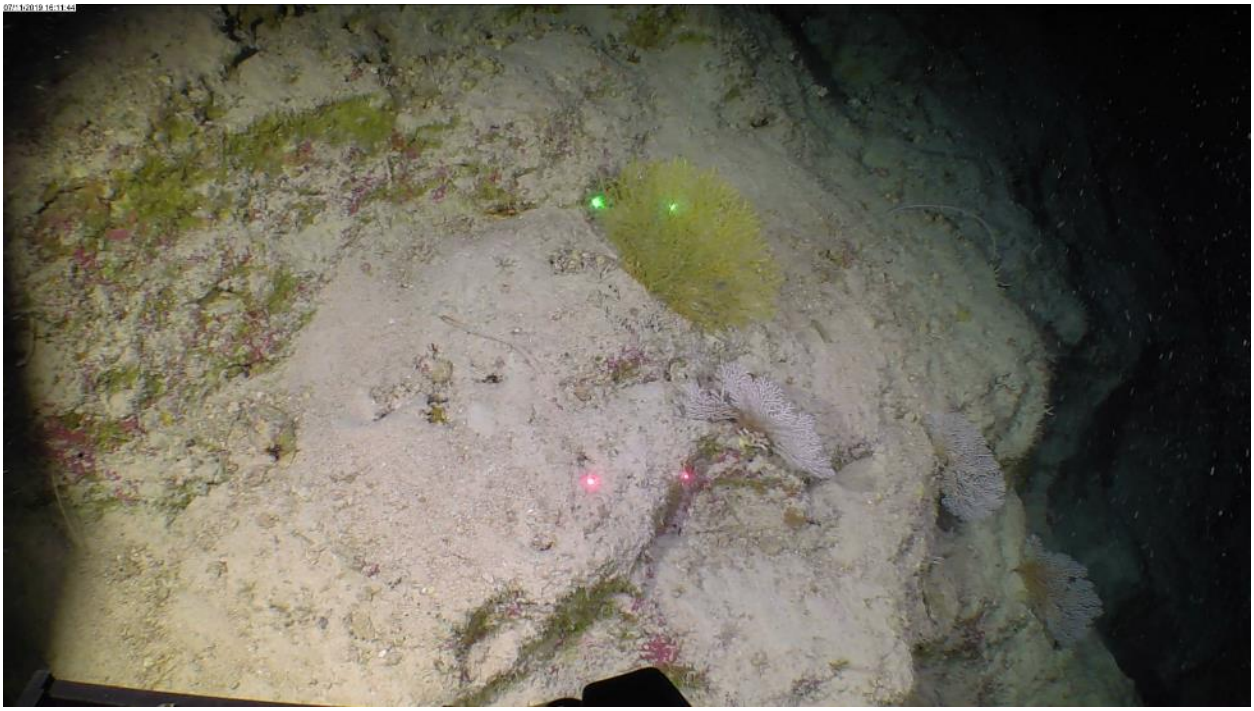

Figure 53. *In situ* image of *Nicella* sp. (pale colonies, NF-19-01-Dive31-spec40) and *Paramuricea* sp. (in yellow, NF-19-01-Dive31-spec41) samples from South St. Thomas at 163 m.

Acknowledgements

We thank the officers and crew of the NOAA Ship *Nancy Foster*. Special thanks to the ROV pilots Eric Glidden and Jason White, who exhibited superb skills in operating the ROV. We further thank the team of onboard scientists for all their hard work and dedication during the expedition. The scientific results and conclusions, as well as any views or opinions expressed herein, are those of the authors and do not necessarily reflect the views of NOAA nor the Department of Commerce.

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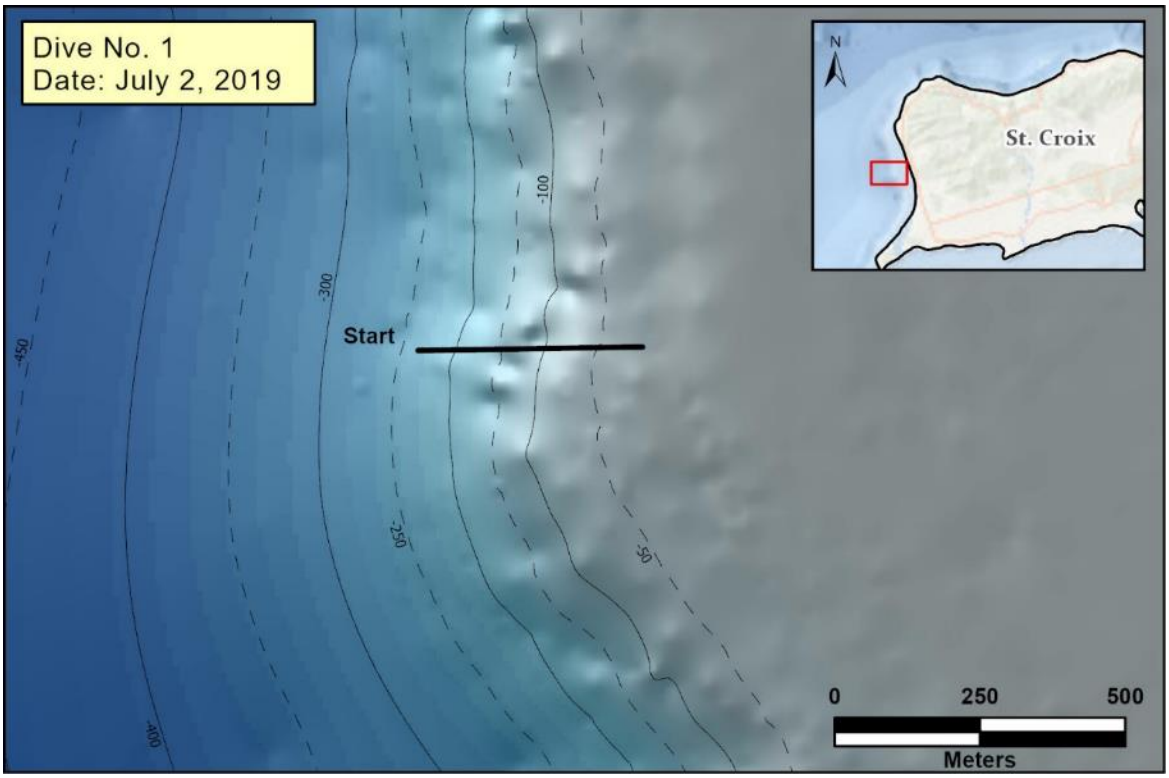
APPENDIX 1
DIVE SUMMARIES

Dive 01 – Line 01
Start Coordinates: 17.7231, -64.8997
Depth Range: 30-272 m

Site ID: Frederiksted Pier, West St. Croix
End Coordinates: 17.7233, -64.8960
Bottom Time: 1 hour 34 minutes

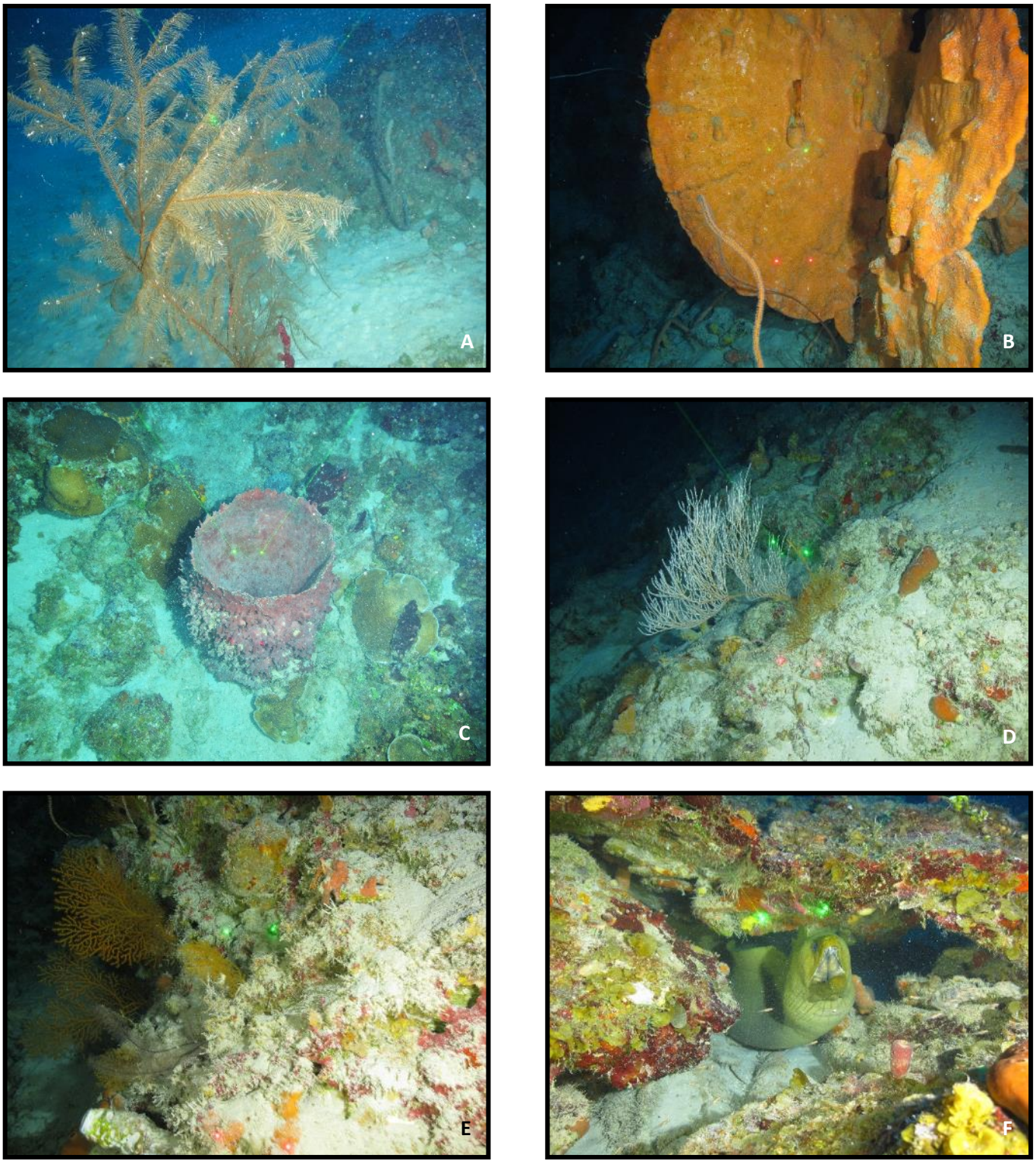


DIVE 1 - Line 1: Frederiksted Pier, West St. Croix; July 2, 2019

Map Caption. *Dive 1 surveyed a feature mapped the night before which identified low relief soft bottom leading into a steep high relief rock feature based upon the topographic relief and acoustic backscatter.*

Dive Summary:
The dive was on bottom at 13:06 EDT. Dive duration was 1:34. HD video was not recording for the first 16 minutes of the dive. The dive traversed the low relief soft bottom in a straight line and ascended the steep rock wall using a zigzag pattern. A downward facing digital still was taken every three minutes at an altitude of 1.3 meters followed by a 360-degree rotation of the ROV to observe the surroundings. The dive began at 272 meters with a silty mud bottom type, which transitioned to low relief rock with a sediment veneer, and then at 125 meters a steep ascent of the rock feature began. The steep rock feature contained many corals and sponges. In general, however, abundance of fish and corals was low.

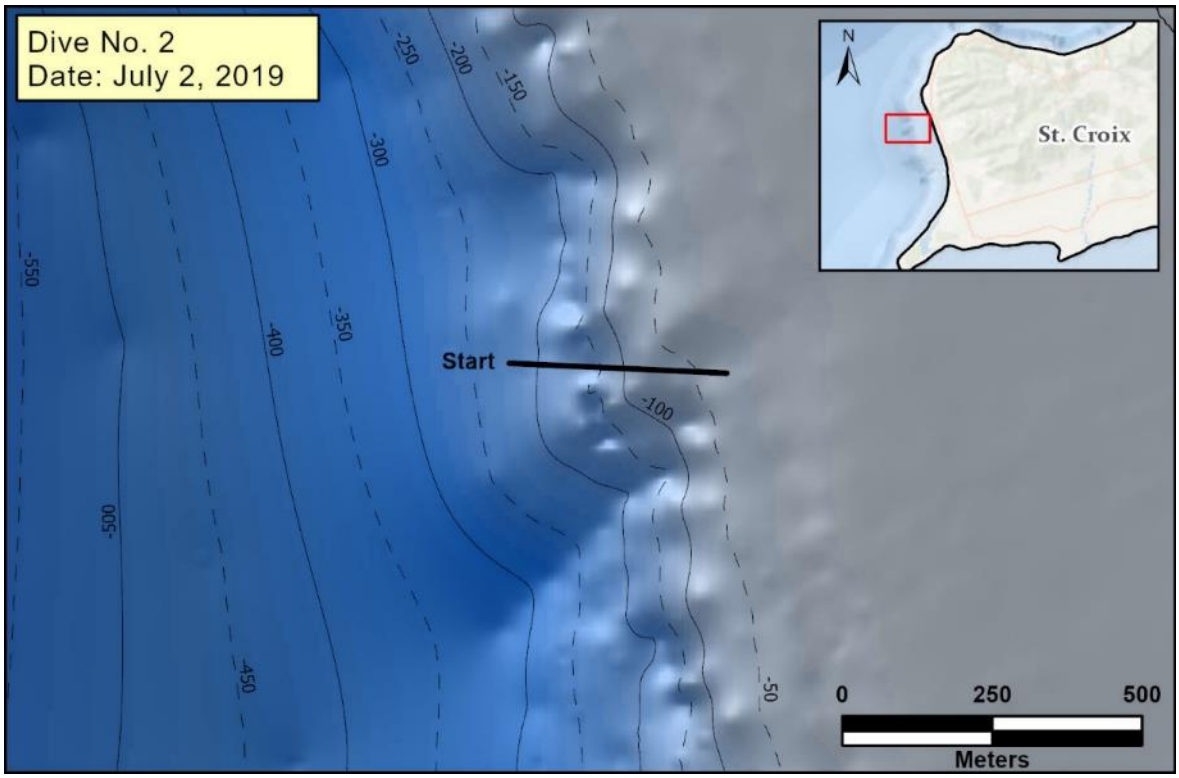
Coral species observed included at least two species of *Nicella*, yellow and orange Plexauridae, several black corals (including several *Stichopathes* in sediment), branching stony corals, *Chironepthya*, and *Ellisella barbadensis*. Several *Nicella* and Plexauridae showed significant signs of injury. Signs of injury mainly included denuded branches and hydrozoan overgrowth. Many colonies were buried in a layer of sediment. In addition to threats from sedimentation, there were also signs of impact from fishing line and debris. The only fish observed were a pair of butterflyfish, a single lionfish, and a single squirrelfish. After crossing 50 meters several aggregations of *Agaricia* and *Orbicella* were observed amongst which was a moray eel, observed around 42 meters shortly before the dive concluded.



Dive 1 – Line 1 took place at Frederiksted Pier west of St. Croix at depths ranging from 30 to 272 meters, using the ROV *Mohawk* aboard NOAA Ship *Nancy Foster.* A) Branching Antipatharia B) Orange elephant ear demosponge C) *Xestopongia muta* barrel sponge D) *Leptogorgia* sp., *Nicella* sp. and orange demosponges E) *Nicella* sp., Antipatharia and a vase sponge Aplysinidae on a sponge-encrusted rocky outcrop F) Moray eel among *Agaricia* sp. and *Orbicella* sp. at 42 m.

Dive 02 – Line 02
Start Coordinates: 17.7322, -64.9006
Depth Range: 35-262 m

Site ID: Frederiksted Pier, West St. Croix
End Coordinates: 17.7322, -64.8972
Bottom Time: 1 hour 31 minutes

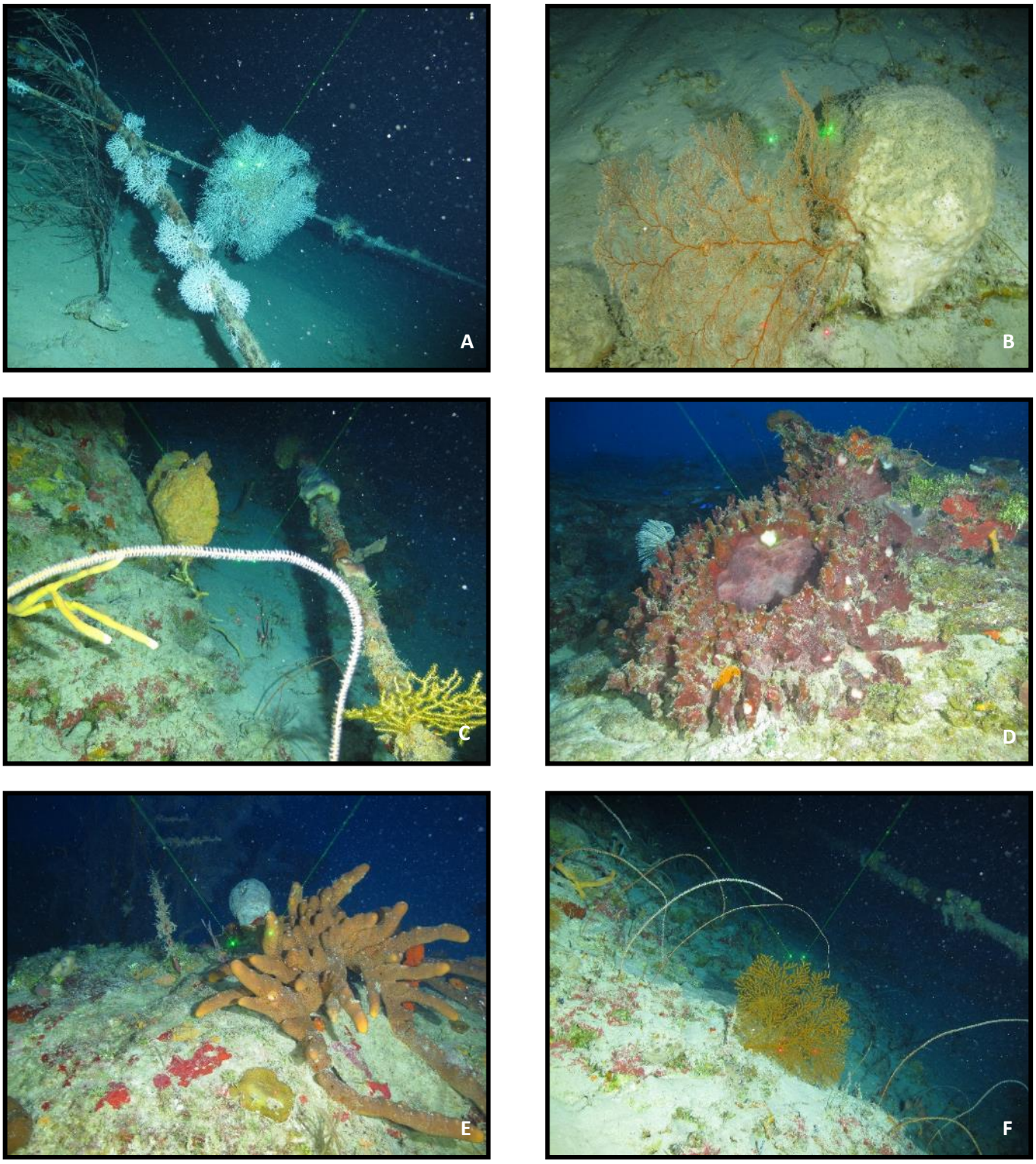


DIVE 2 - Line 2: Frederiksted Pier, West St. Croix; July 2, 2019

Map Caption. *Dive 2 surveyed an adjacent feature on the newly mapped area west of St. Croix. This area identified low-medium relief soft bottom habitat leading into a small canyon-like rock feature based upon the topographic relief and acoustic backscatter.*

Dive Summary:
The dive was on bottom at 15:30 EDT. Dive duration was 1:31 (Hr:min). When landing on bottom, a pipe or cable was observed that was present the entire dive. The dive traversed the lower relief soft bottom in a straight line following the observed pipe/cable. When entering the small canyon feature there was line debris overhead that entangled the ROV tether, once untangled the dive resumed on the top of the canyon wall. During the dive, a downward facing digital still was taken every three minutes at an altitude of 1.3 meters followed by a 360-degree rotation of the ROV to observe the surroundings. The dive began at 262 meters with a silty mud bottom type but quickly transitioned to higher relief rock with a sediment veneer, the steep rock leading into the canyon began around 86 meters. The pipe/cable observed through the entirety of the dive was heavily colonized by a range of corals

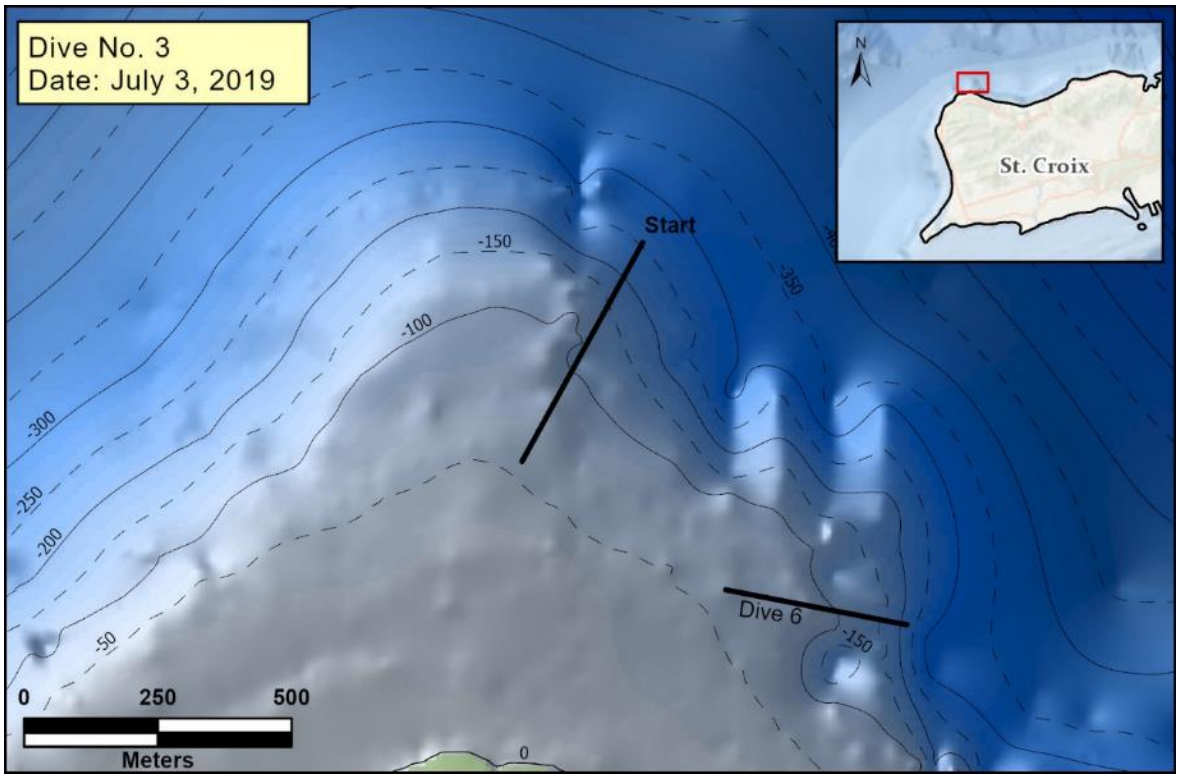
Corals observed included a white *Thesea*, branching stony corals, octocorals in Plexauridae and Ellisellidae, particularly *Ellisella* and *Nicella.* Signs of injury to octocorals were minimal. Marine debris was present. More fish were observed on this dive, but the rate of occurrence was still low. Species of fish included: sand darters, triggerfish, angelfish, grunts, and surgeonfish. The dive ended in a shallow water community around 35 meters. There were several instances of *Montastraea* and *Agaricia* deeper than 50 meters and several large aggregations of *Agaricia* and *Orbicella* around 40 meters.



Dive 2 – Line 2 took place at Frederiksted Pier west of St. Croix at depths ranging from 35 to 262 meters, using the ROV *Mohawk* aboard NOAA Ship *Nancy Foster.* A) Dead gorgonian coral and large patch of *Madracis* sp. growing on pipeline B) Large *Nicella* sp. growing on a spherical demosponge C) Yellow Plexauridae, sea whips *Stichopathes* sp. *and Ellisella* sp., branching sponge *Agelas* sp. and yellow plate-like sponge D) Large red spiky demosponge with white crinoid E) Large branching demosponge, white spherical sponge and many encrusting sponges F) *Ellisella* sp. sea whips, orange Plexauridae, numerous sponges.

Dive 03 – Line 03
Start Coordinates: 17.7792, -64.8694
Depth Range: 50-257 m

Site ID: North-Northwest St. Croix
End Coordinates: 17.7757, -64.8715
Bottom Time: 2 hours 9 minutes

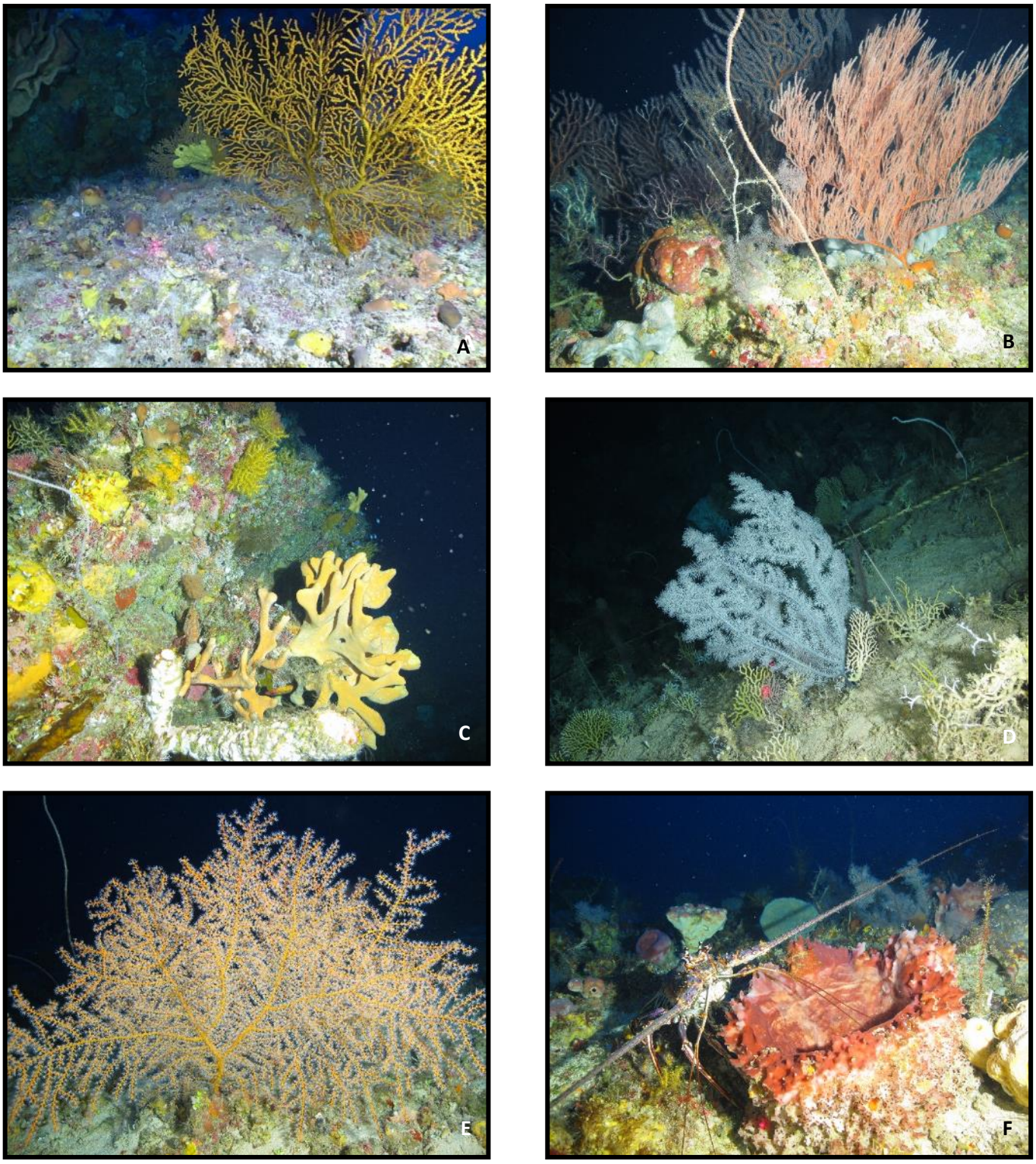


DIVE 3 - Line 3: North-Northwest St. Croix; July 3, 2019

Map Caption. *Dive 3 surveyed a final feature from the first days mapping work of the north shore of St. Croix. The mapped area indicated a medium-high feature based upon the topographic relief.*

Dive Summary:
The dive was on bottom at 9:41 EDT. Dive duration was 2:09 (Hr:min). After arriving on the seafloor the ROV rested on bottom for roughly 10 minutes while a GIS/Tracking issue was resolved. During this time, a school of Amberjack was observed. The bottom was steep exposed rock with occasional sections with a thin sediment veneer. During the dive, a downward facing digital still was taken every three minutes at an altitude of 1.3 meters followed by a 360-degree rotation of the ROV to observe the surroundings. Traversing up the wall, thickets of a variety of lace coral (Stylasteridae) were noted on rock protrusions from the wall, with *Thesea rubra* having colonized several of the under hangs of those protrusions. This community extended for approximately 30 meters and around 210 meters a community of black corals became the dominant community. At the top of the rock feature, around 100 meters, the bottom turned from rock to consolidated mudstone and a diverse dense aggregation of octocorals was observed starting around 110 meters and continuing to about 76 meters. This area likely met the density requirements to be considered a coral garden, and was marked as a likely sampling spot.

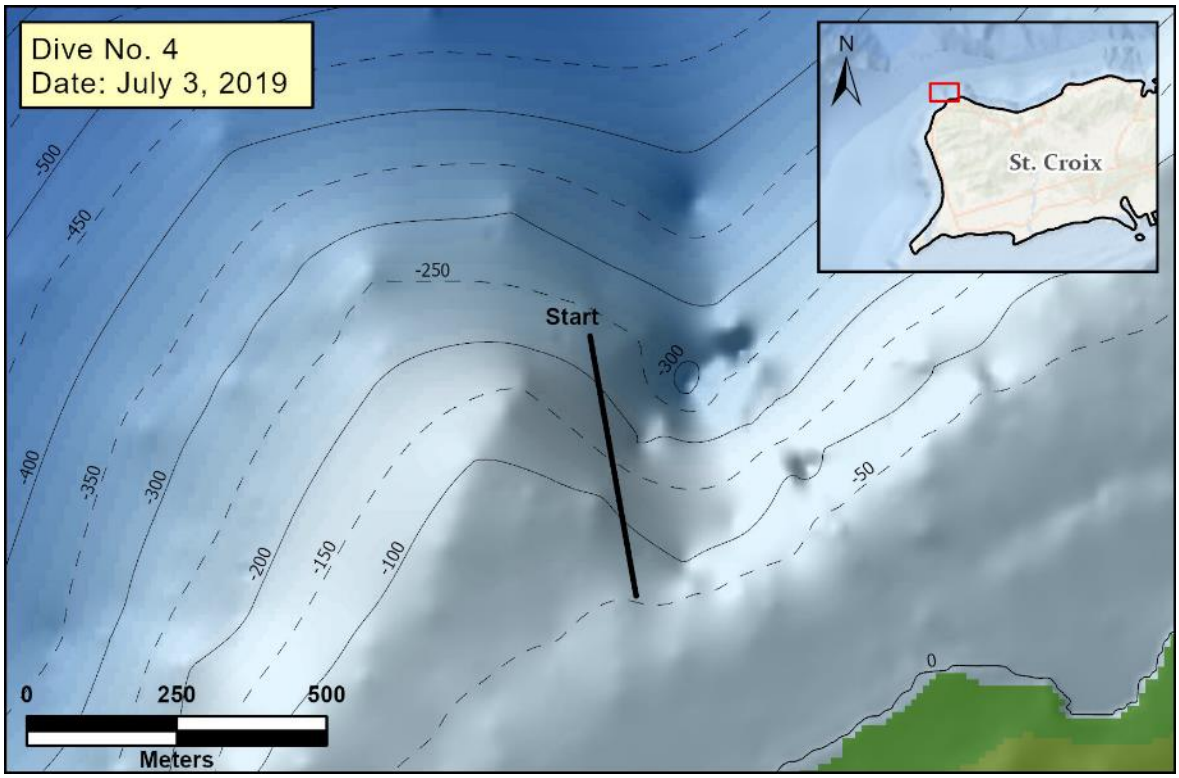
Coral species observed included three types of Stylasteridae, *Thesea rubra*, *Antipathes atlantica* and several other species of black corals, several *Chironepthya*, *Bebryce*, *Nicella*, Yellow and Orange Plexauridae (most likely *Placogorgia*), *Ellisella*, *Leptogorgia*, *Iciligorgia schrammi*, and several large *Swiftia exserta* colonies. Signs of injury were minimal, despite the prevelance of rope and fishing line. There were far more fish observed during this dive. Species of fish included several schools of jacks, snapper, and French Angelfish, among others. The dive ended shortly after crossing 50 meters but even at that depth, there were expansive fields of algae *Lobophora* and other algal cover.



Dive 3 – Line 3 took place north-northwest of St. Croix at depths ranging from 50 to 257 meters, using the ROV *Mohawk* aboard NOAA Ship *Nancy Foster.* A) Yellow Plexauridae, possibly *Placogorgia* sp. B) *Leptogorgia* sp., *Iciligorgia schrammi*, Antipatharia, *Ellisella barbadensis* sea whip, Geodiidae sponge C) Staghorn sponge Agelasidae, Aplysinidae sponge, yellow Plexauridae, yellow demosponges D) Branching Antipatharia, many *Distichopora* sp., rope debris E) *Swiftia exserta* F) Spiny lobster on *Xestopongia muta* barrel sponge.

Dive 04 – Line 04
Start Coordinates: 17.7744, -64.8828
Depth Range: 50-263 m

Site ID: Northwest of St. Croix
End Coordinates: 17.7709, -64.8820
Bottom Time: 1 hour 38 minutes

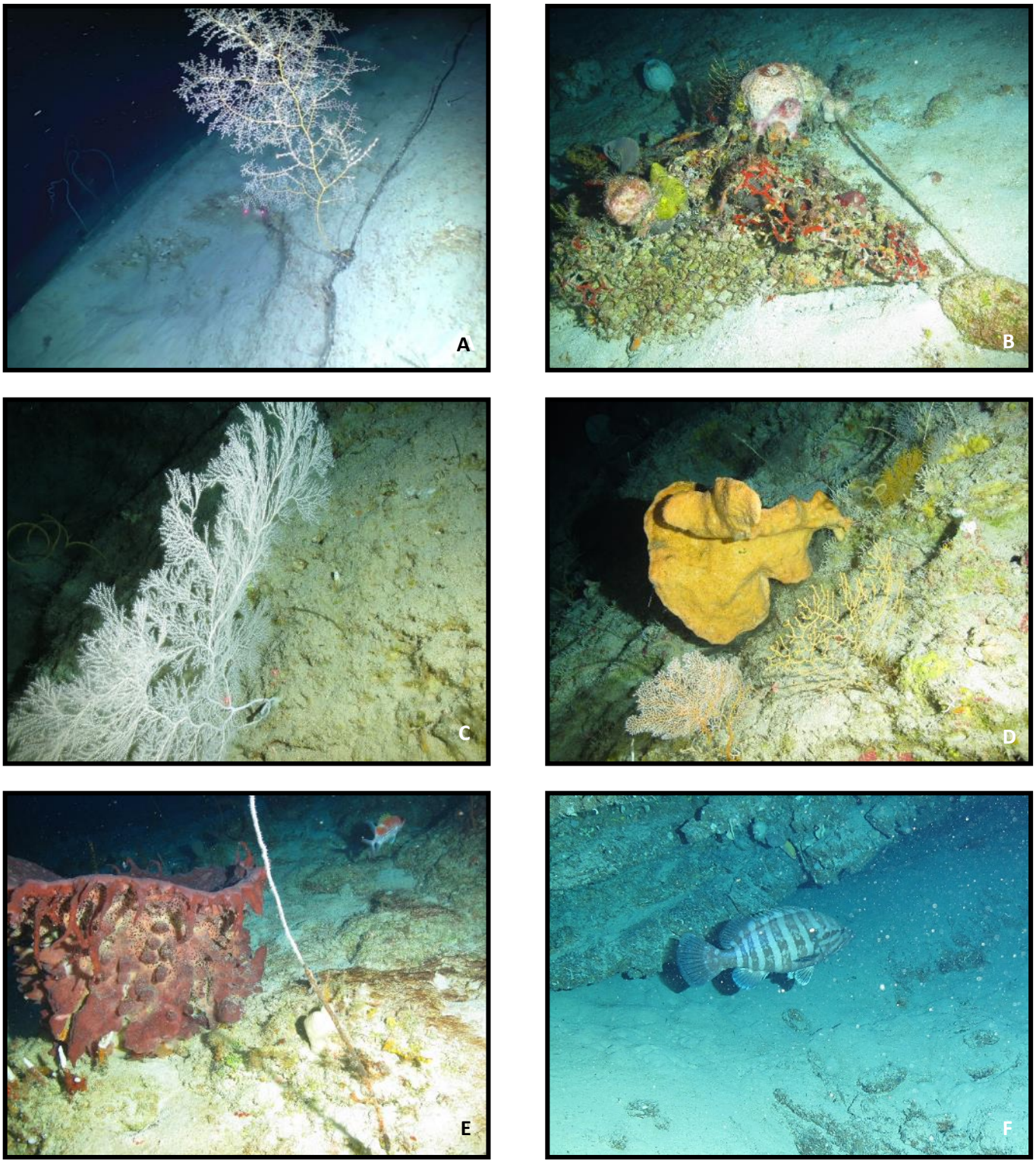


DIVE 4 - Line 4: Northwest St. Croix; July 3, 2019

Map Caption. *Dive 4 surveyed a feature identified during the second night of mapping and was off the northwest side of St. Croix. This area indicated a medium-high feature based upon the topographic relief.*

Dive Summary:
The dive was on bottom at 14:20 EDT after a delay for weather. Dive duration was 1:38 (Hr:min). During the dive, a downward facing digital still was taken every three minutes at an altitude of 1.3 meters followed by a 360-degree rotation of the ROV to observe the surroundings. The bottom was steep exposed rock slabs at the beginning of the dive. The originally intended direction of travel was not possible due to current but the new path traversed steep bare rock with sparse corals which gave way to steep live rock. The dive began at 263 meters and the first corals were not observed until 230 meters. Several thickets of *Stichopathes* and *Nicella* were observed at 200 and 160 meters respectively.

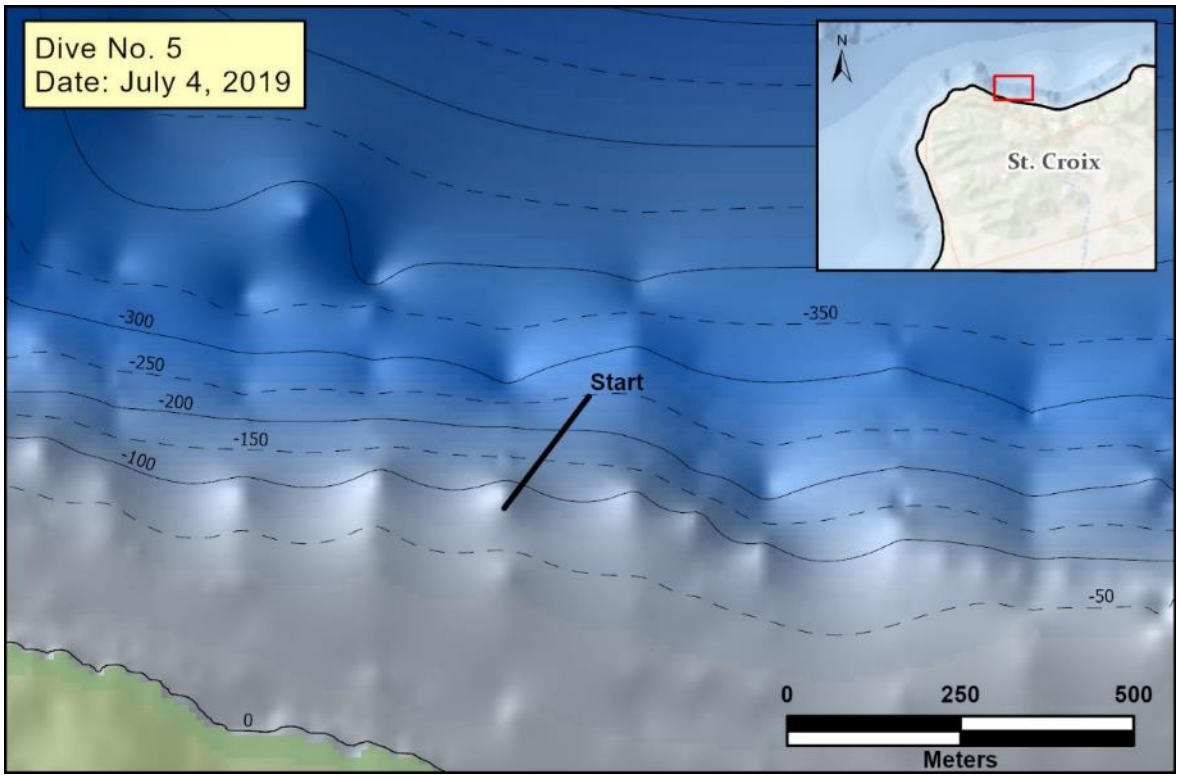
Coral species observed included branched Ellisellidae, *Stichopathes*, orange Plexauridae, Antipatharia, *Ellisella barbadensis*, and *Nicella*. Signs of injury were minimal despite the clear threat of line entanglement. There were far fewer fish observed than during the previous dive. Species of fish included, a single Misty Grouper, a school of jacks, and a few lionfish. The dive ended right at 50 meters over a sand flat with no signs of a shallow water community present.



Dive 4 – Line 4 took place northwest of St. Croix at depths ranging from 50 to 263 meters, using the ROV *Mohawk* aboard NOAA Ship *Nancy Foster*. A) Chrysogorgiidae B) Petrosiidae barrel sponge with red rim, Thorectidae yellow sponge, spherical sponge, gray plate-like sponges, white barrel sponge and red Axenellidae branching sponge. C) Unknown octocoral, possibly Ellisellidae D) Aplysinidae sponge, *Nicella* sp., *Stichopathes* sp. and yellow Plexauridae. E) *Xestopongia muta* barrel sponge F) Misty Grouper.

Dive 05 – Line 08
Start Coordinates: 17.7700, -64.8558
Depth Range: 75-271 m

Site ID: North-Northwest of St. Croix
End Coordinates: 17.7686, -64.8567
Bottom Time: 1 hour 36 minutes

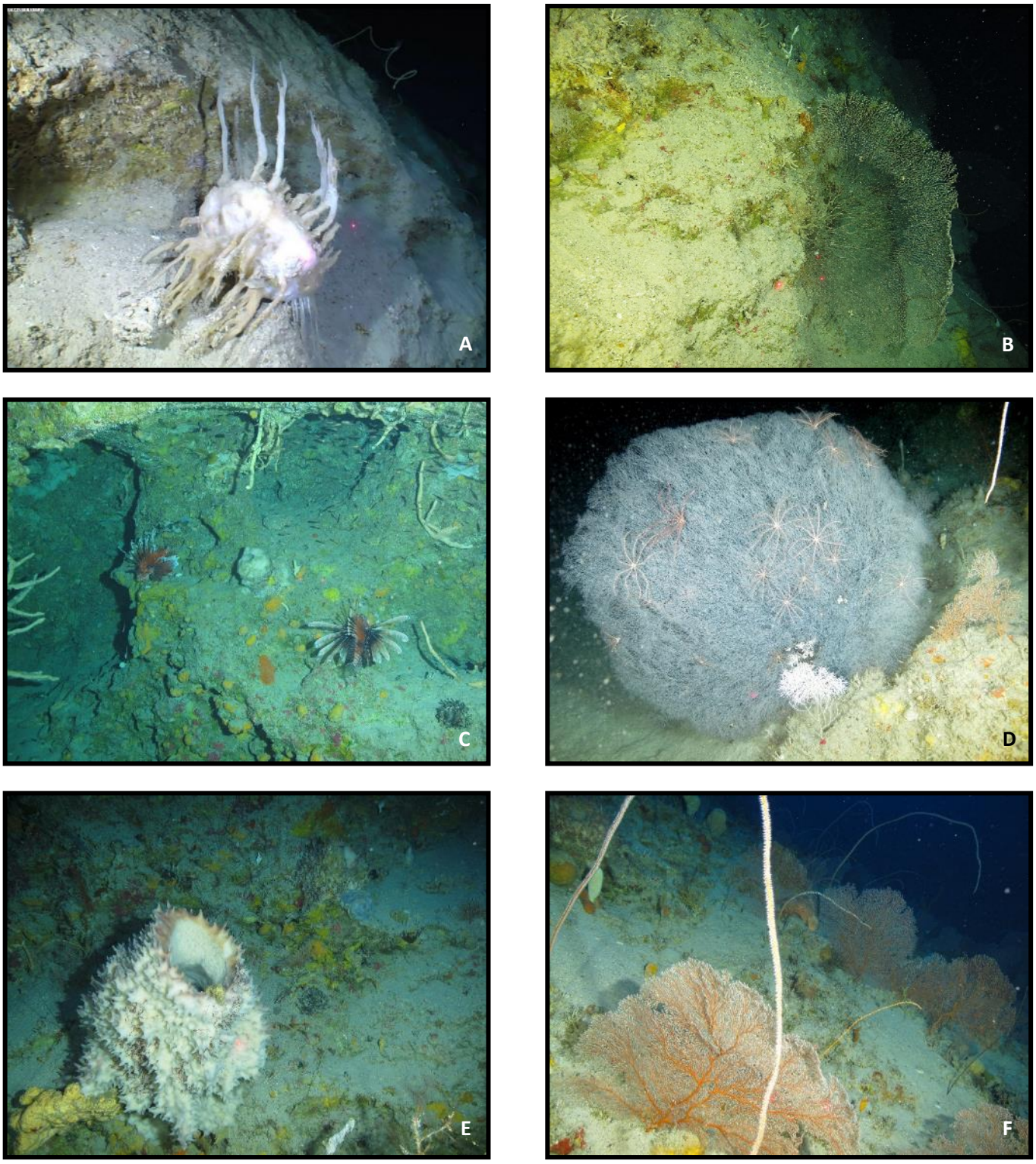


DIVE 5 - Line 8: North-Northwest St. Croix; July 4, 2019

Map Caption. *Dive 5 surveyed a feature identified during the second night of mapping and was off the north-northwest side of St. Croix. The mapped area indicated a high relief feature based upon the topographic relief.*

Dive Summary:
The dive was on bottom at 12:34 EDT after a delay in the morning to calibrate the EK60. Dive duration was 1:36 (Hr:min). During the dive, a downward facing digital still was taken every three minutes at an altitude of 1.3 meters followed by a 360-degree rotation of the ROV to observe the surroundings. The bottom was steep exposed rock slabs at the beginning of the dive, which gave way to steep rock with a sediment veneer. Rock was carbonate rock with layered geology. The dive began at 271 meters and was devoid of any biology until around 188 meters when a collection of octocorals appeared, primarily an assortment of Plexauridae and *Nicella.* Several colonies showed large circular patches of discoloration or injury at the base. Around 100 meters the ROV moved into an area of dense sponge cover before coming up on to a sandy plain.

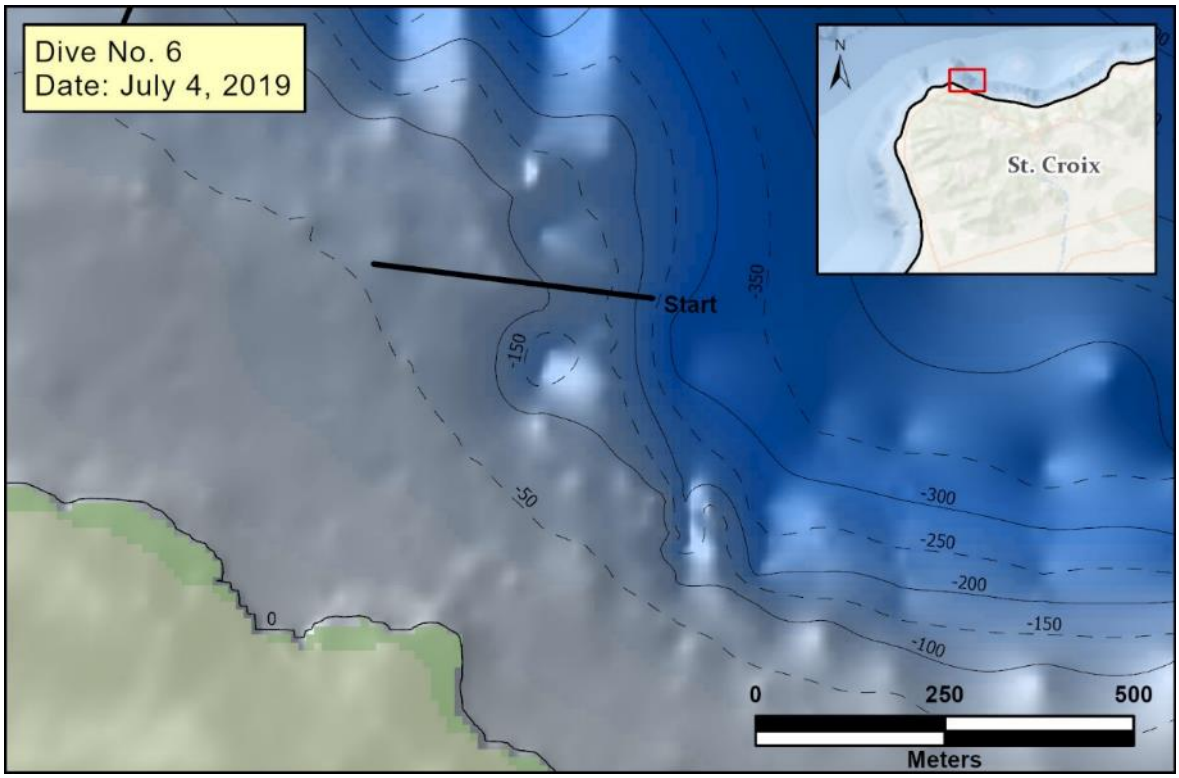
Coral species observed included branched cup corals, Ellisellidae, *Stichopathes*, an unknown red gorgonian, branching *Scleractinia*, Plexauridae, and *Nicella.* There were few fish observed during this dive. Species of fish included only a few poacher fish and a few lionfish. The dive ended before reaching 50 meters.



Dive 5 – Line 8 took place north-northwest of St. Croix at depths ranging from 75 to 271 meters, using the ROV *Mohawk* aboard NOAA Ship *Nancy Foster.* A) Sponge from the family Haplosclerida B) *Nicella* sp. with large circular injured area (predation) C) Lionfish among Haplosclerida fingerlike sponges D) Black coral covered with crinoids and a patch of white bryozoans, *Nicella* sp. and a small white gorgonian E) White barrel sponge F) Several *Nicella* sp. and *Ellisella barbadensis* sea whips.

Dive 06 – Line 07
Start Coordinates: 17.7731, -64.8650
Depth Range: 50-283 m

Site ID: North-Northwest of St. Croix
End Coordinates: 17.7736, -64.8681
Bottom Time: 2 hours

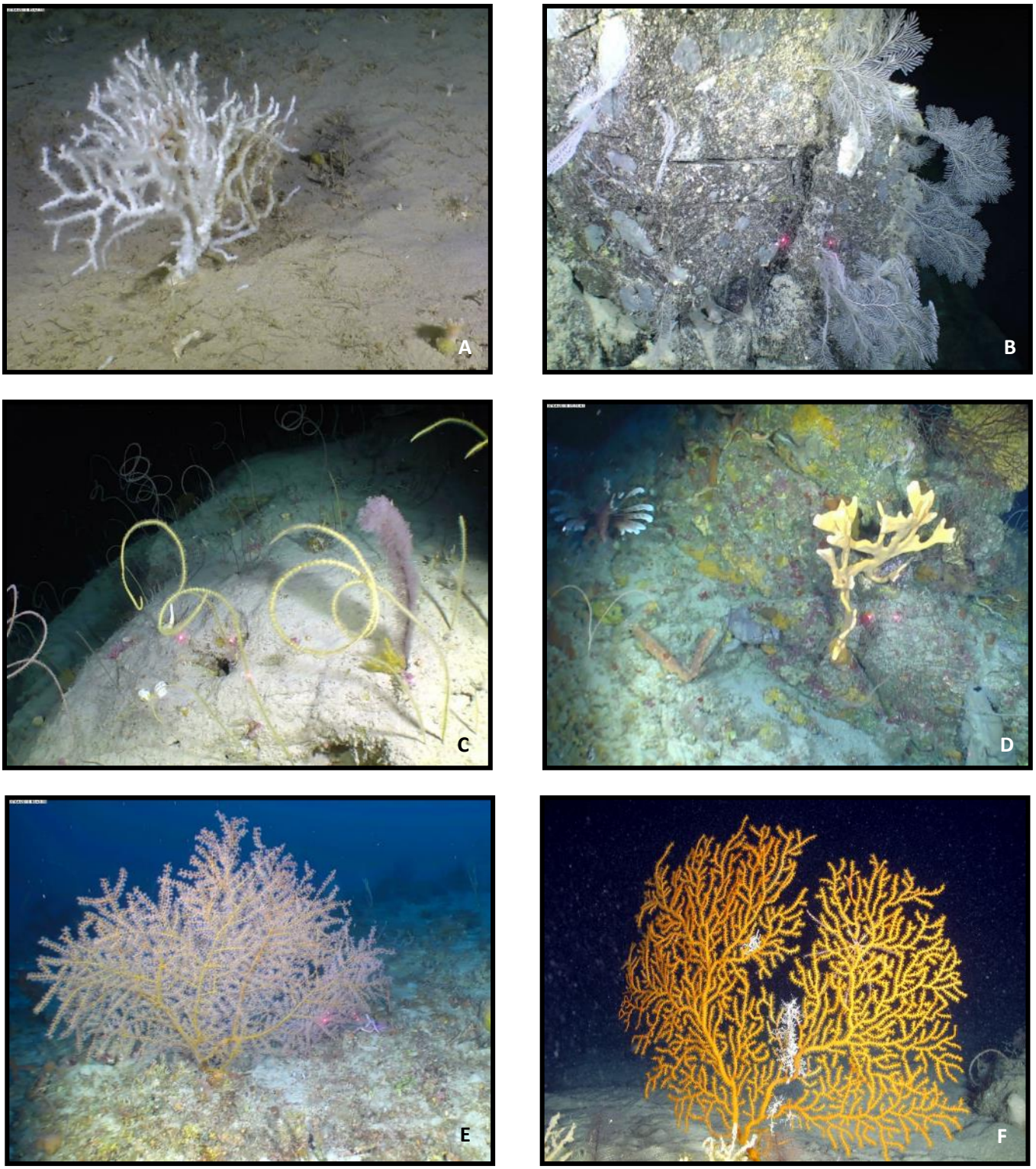


DIVE 6 - Line 7: North-Northwest St. Croix; July 4, 2019

Map Caption. *Dive 6 surveyed a feature identified during the second night of mapping and was off the north-northwest side of St. Croix. This area indicated a high relief feature based upon the topographic relief.*

Dive Summary:
The dive was on bottom at 15:02 EDT. Dive duration was 2:00 (Hr:min). During the dive, a downward facing digital still was taken every three minutes at an altitude of 1.3 meters followed by a 360-degree rotation of the ROV to observe the surroundings. The bottom was steep exposed sedimentary rock cliff that culminated in a sand flat with two large rock features. The dive began at 283 meters and contained a collection of sponges starting at the base of the cliff. A variety of coral species were present up the majority of the cliff face starting at 222 meters when, at 120 meters, sponges became dominant again. There were a mix of coral and sponges present at the edge of the cliff but both became sparse except for the rock features in the sand flat.

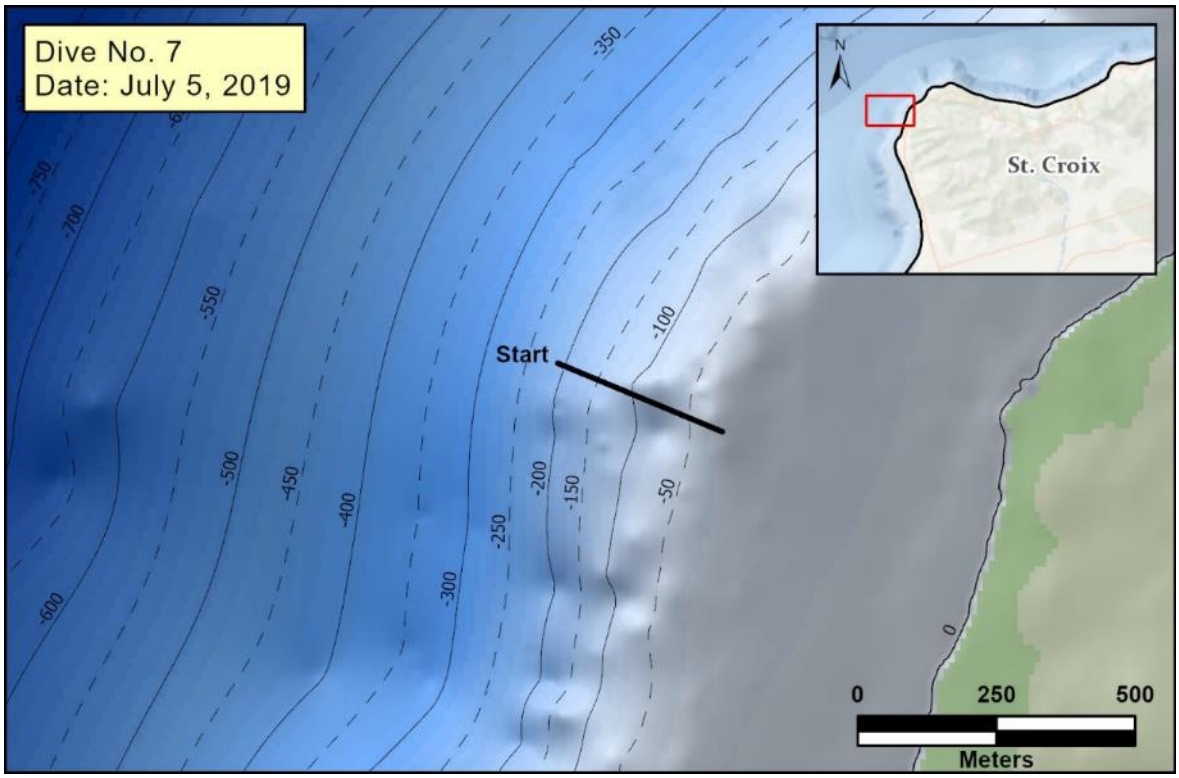
Coral species observed included *Callogorgia, Paramuricea, Madracis,* cup corals, *Ellisella, Stichopathes, Icilogorgia,* black "feather" corals, *Nicella, Leptogorgia,* and several *Swiftia exserta* on the edge of the cliff. There were many fish observed during this dive. Species of fish included, a butterflyfish, surgeonfish, snapper, lionfish, Queen Angelfish, creole fish, Graysby, Coney, Striped Grunts, squirrelfish, triggerfish and a large variety of brightly colored small reef fish. At the first rock feature after the edge of the cliff there were several instances of *Agaricia* at 75 meters. The dive concluded at 50 meters after traversing the second large rock feature identified in the sand flat.



Dive 6 – Line 7 took place north-northwest of St. Croix at depths ranging from 50 to 283 meters, using the ROV *Mohawk* aboard NOAA Ship *Nancy Foster.* A) Branching stony coral *Madracis* sp. B) *Callogorgia americana* C) *Stichopathes* sp., Antipatharia "feather coral", yellow gorgonian D) Antler sponge, yellow plate sponge, lionfish, *Iciligorgia schrammi* and *Ellisella barbadensis* E) *Swiftia exserta* F) Orange Plexauridae with light colored encrustation on central branches.

Dive 07 – Line 05
Start Coordinates: 17.7606, -64.8967
Depth Range: 20-265 m

Site ID: West of St. Croix
End Coordinates: 17.7596, -64.8939
Bottom Time: 1 hour 30 minutes

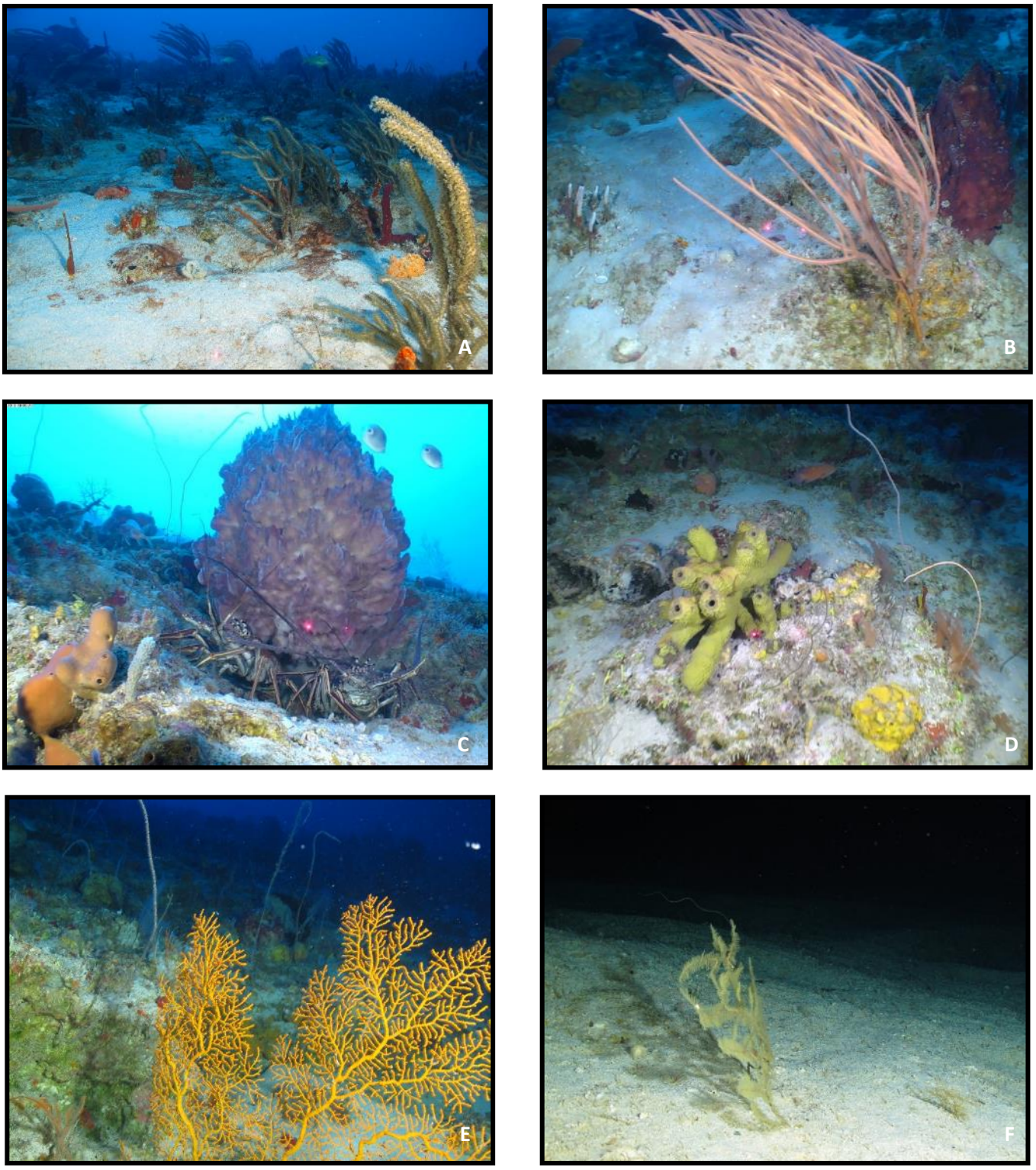


DIVE 7 - Line 5: West St. Croix; July 5, 2019

Map Caption. *Dive 7 set out to ground truth an area identified during mapping efforts earlier in the cruise and was off the west side of St. Croix. The mapped area indicated a low relief but with a series of either ridges or rock piles based upon the topographic relief.*

Dive Summary:
The dive was on bottom at 08:57 EDT. Dive duration was 1:30 (Hr:min). During the dive, a downward facing digital still was taken every three minutes at an altitude of 1.3 meters followed by a 360-degree rotation of the ROV to observe the surroundings. The bottom was gently sloping textured carbonate rock. The dive began at 265 meters and the first biology observed was a series of corals and sponges starting around 155 meters. Biology while never particularly dense, was consistent through the remainder of the dive, shifting to a shallow water community around 47 meters. The dive continued to explore the shallow water community until it reached 20 meters

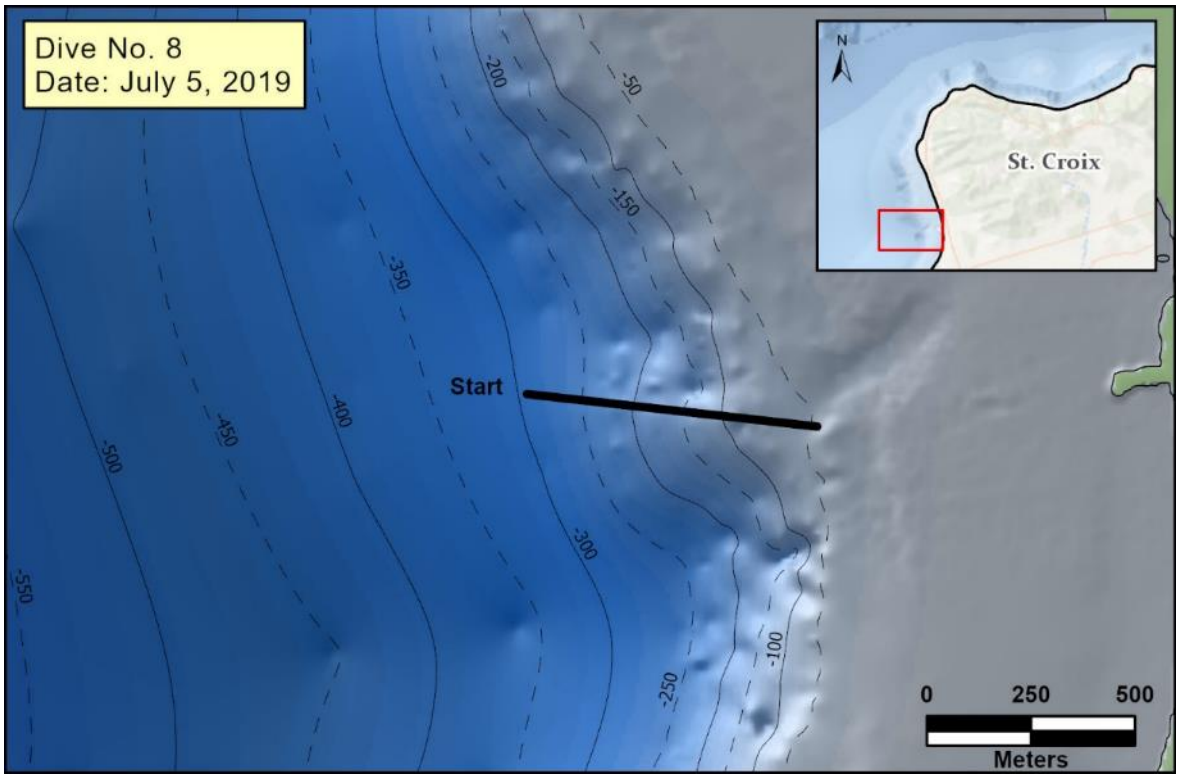
Coral species observed included *Ellisella barbadensis*, Primnoidae, *Paramuricea, Nicella,* black feather corals, orange Plexauridae, *Chironepthya*, and *Leptogorgia*. There were many fish observed including, butterflyfish, surgeonfish, squirrelfish, French Angelfish, and several spiny lobster. Other than biology this dive noted a derelict anchor and some line debris.



Dive 7 – Line 5 took place west of St. Croix at depths ranging from 20 to 265 meters, using the ROV *Mohawk* aboard NOAA Ship *Nancy Foster*. A) *Muricea elongata* and numerous sponges B) *Leptogorgia* sp., Haplosclerida white finger-like sponges and large red sponge C) Butterflyfish, spiny lobsters, Homosclerophorida sponge (orange), *Xestospongia muta* sponge D) Aplysina tube sponge, sea whips, yellow demosponge E) Orange Plexauridae and *Stichopathes* sp. F) Antipatharia black coral and small Plexauridae.

Dive 08 – Line 10
Start Coordinates: 17.7138, -64.8974
Depth Range: 53-290 m

Site ID: West of St. Croix
End Coordinates: 17.7139, -64.8983
Bottom Time: 1 hour 29 minutes

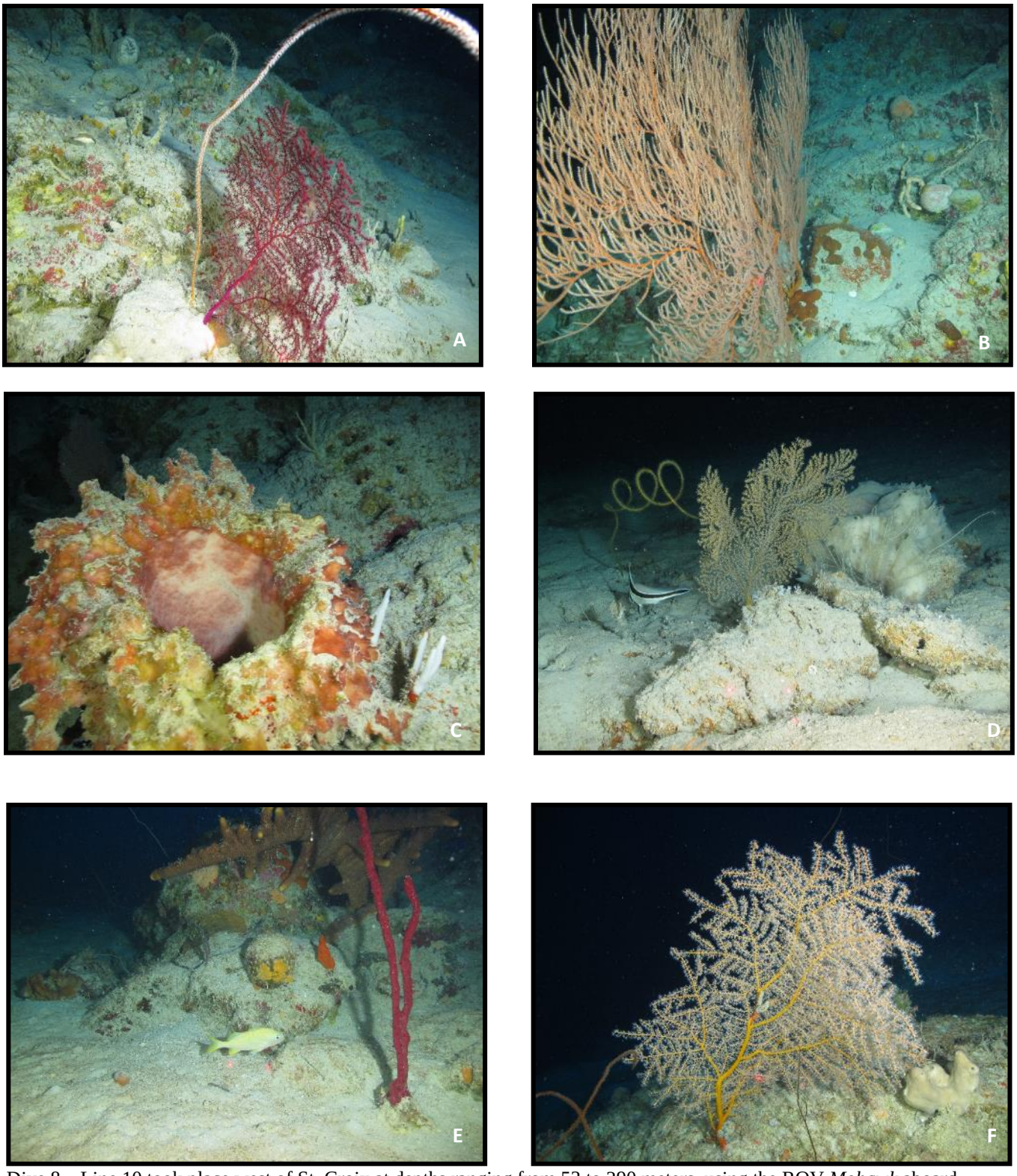


DIVE 8 - Line 10: West St. Croix; July 5, 2019

Map Caption. *Dive 8 set out to ground truth an area identified during mapping efforts earlier in the cruise and was off the west side of St. Croix. The mapped area indicated low relief leading to a wall feature.*

Dive Summary:
The dive was on bottom at 11:56 EDT. Dive duration was 1:29 (Hr:min). During the dive, a downward facing digital still was taken every three minutes at an altitude of 1.3 meters followed by a 360-degree rotation of the ROV to observe the surroundings. The dive started in soft sediment at 274 meters, a wall feature was reached at 124 meters, which then climbed to the top of the wall at 68 meters. The ROV then ran inland along the sand flat at the top and came off bottom around 58 meters.

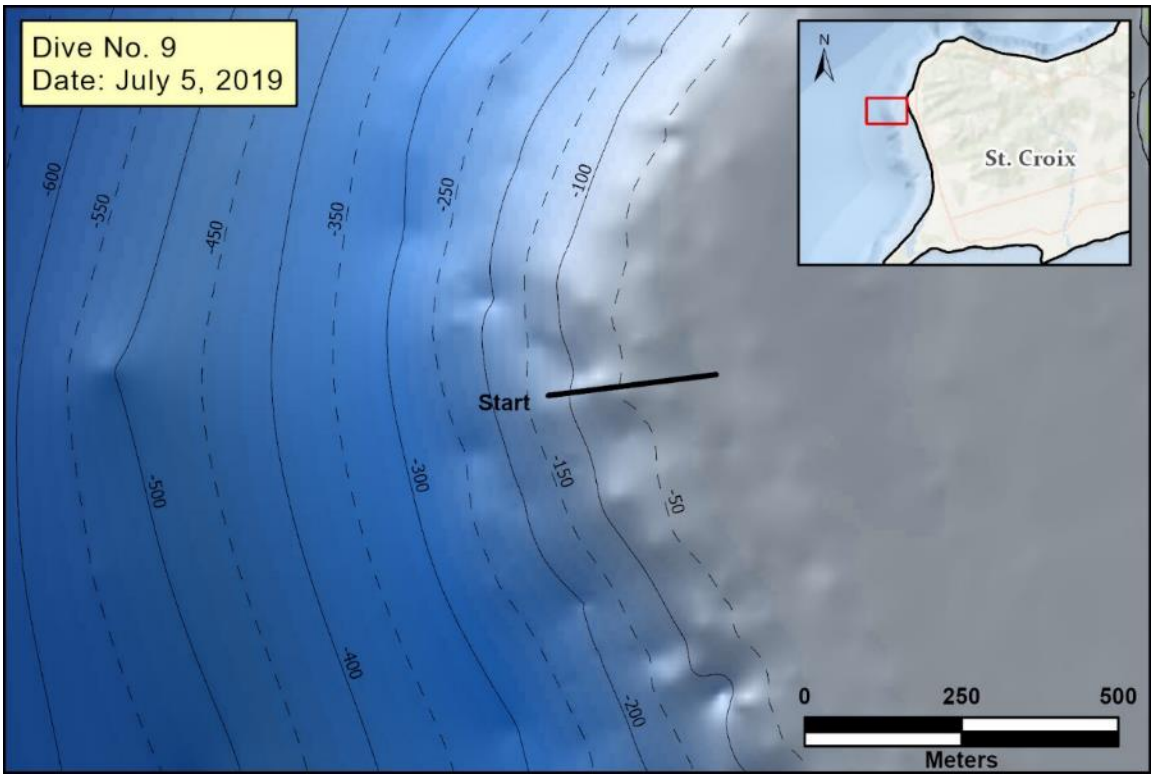
Coral species observed included *Stichopathes*, cup corals, *Madracis*, several Plexauridae species, and *Antipatharia*, *Swiftia exserta*, *Muricea* sp., *Leptogorgia*, and *Nicella*. Fish species observed included bigeye, scorpionfish, jackknife fish, triggerfish, and many other small reef fish. The dive concluded on a bacterial mat and saw several instances of debris ranging from plastic pollution to discarded pipes.



Dive 8 – Line 10 took place west of St. Croix at depths ranging from 53 to 290 meters, using the ROV *Mohawk* aboard NOAA Ship *Nancy Foster.* A) *Muricea* sp. and *Ellisella barbadensis* B) *Leptogorgia* sp. C) Haplosclerida white finger-like sponges, large barrel sponge D) Yellow Plexauridae, *Stichopathes* sp., large white sponge E) French Grunt, *Agelas conifera* brown tube sponge, round yellow sponge, red rope sponge – possibly .

Dive 09 – Line 06
Start Coordinates: 17.7411, -64.9027
Depth Range: 31-170 m

Site ID: West of St. Croix
End Coordinates: 17.7415, -64.9004
Bottom Time: 45 minutes

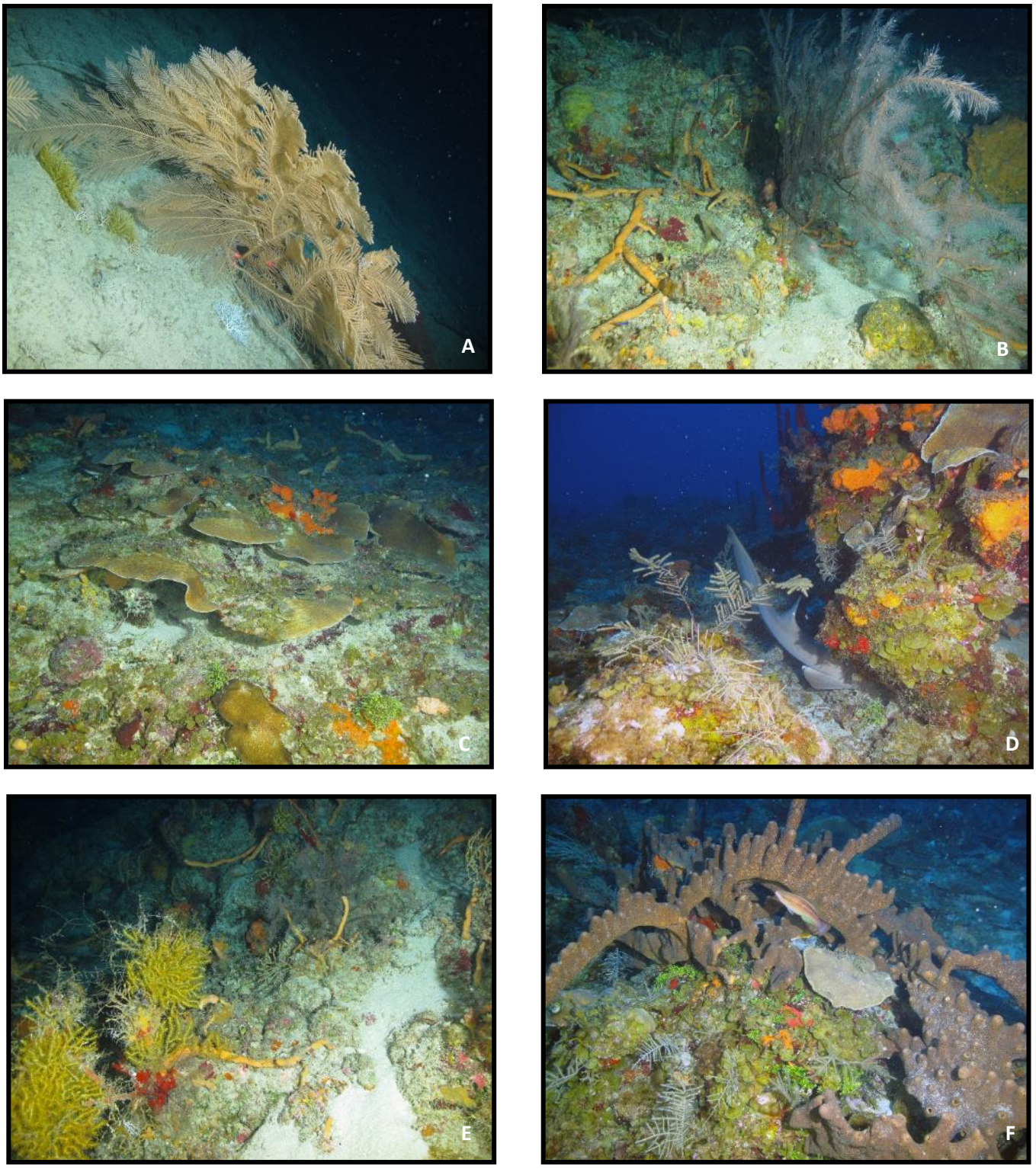


DIVE 9 - Line 6: West St. Croix; July 5, 2019

Map Caption. *Dive 9 set out to ground truth an area identified during mapping efforts earlier in the cruise and was off the west side of St. Croix. This area indicated medium relief terrain leading to a wall feature.*

Dive Summary:
The ROV was on bottom by 14:20 EDT. The dive duration was 0:45 minutes. During the dive, a downward facing digital still was taken every three minutes at an altitude of 1.3 meters followed by a 360-degree rotation of the ROV to observe the surroundings. The dive began at 170 meters, traversed up a medium grade incline until it reached a wall feature then climbed up the wall and ran out into the sand flat.

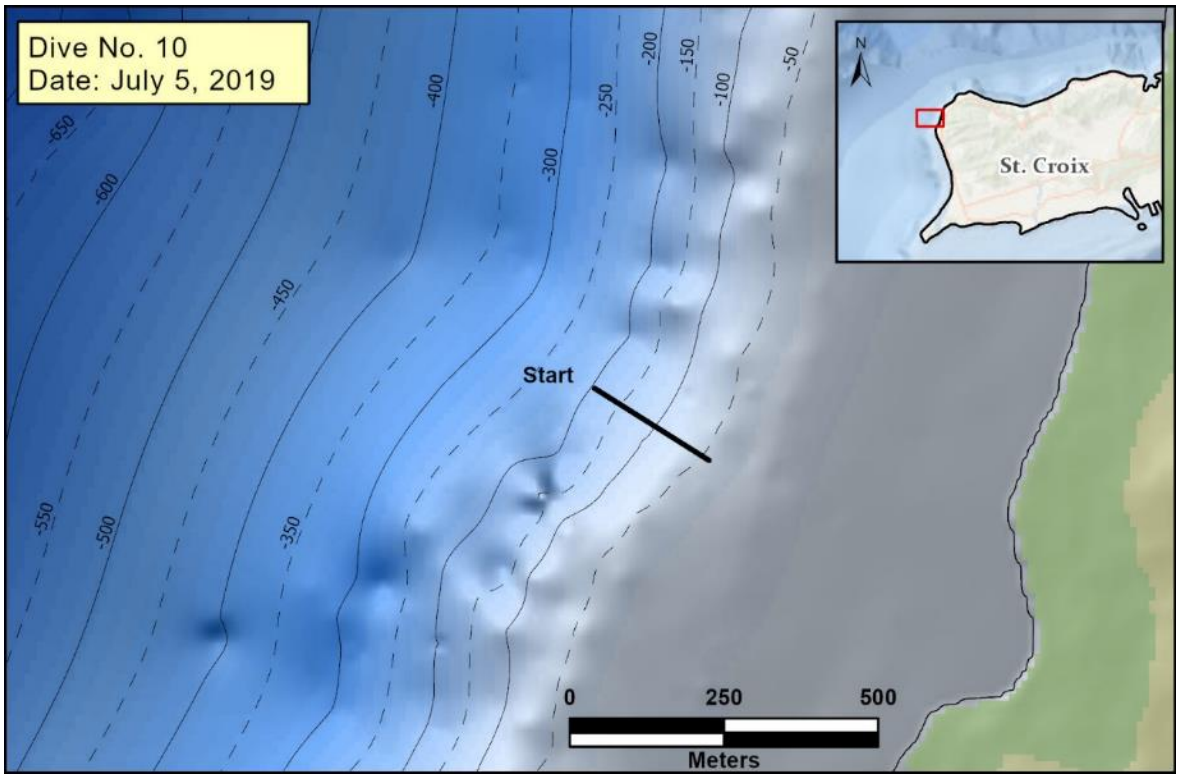
Coral species observed included *Callogorgia*, several species of Plexauridae, *Madracis*, and several species of black corals. Fish were highly abundant on this dive and included snapper, squirrelfish, butterflyfish, triggerfish, and many other small reef fish. At the end of the dive, an expansive aggregation of plate coral was present ranging from 52 meters to 30 meters. In this zone were many more reef fish and a Nurse Shark hiding underneath an eroded rock feature covered in plate corals.



Dive 9 – Line 6 took place west of St. Croix at depths ranging from 31 to 170 meters, using the ROV *Mohawk* aboard NOAA Ship *Nancy Foster*. A) *Callogorgia* sp., Stylasteridae lace coral, yellow Plexauridae B) Antipatharia black coral, Aplysinidae finger sponges, yellow demosponges C) *Agaricia* plate corals, orange Agelasidae sponges and numerous other sponges and algae D) Nurse Shark among plate sponges, orange Agelasidae sponges and white injured Plexauridae E) Injured yellow Plexauridae, Aplysinidae finger sponges, *Stichopathes* sp., Antipatharia black coral F) Wrasse among *Agelas conifera* brown tube sponge, white Plexauridae, plate sponge and algae.

Dive 10 – Line 09
Start Coordinates: 17.7539, -64.8978
Depth Range: 42-243 m

Site ID: West of St. Croix
End Coordinates: 17.7529, -64.8961
Bottom Time: 47 minutes

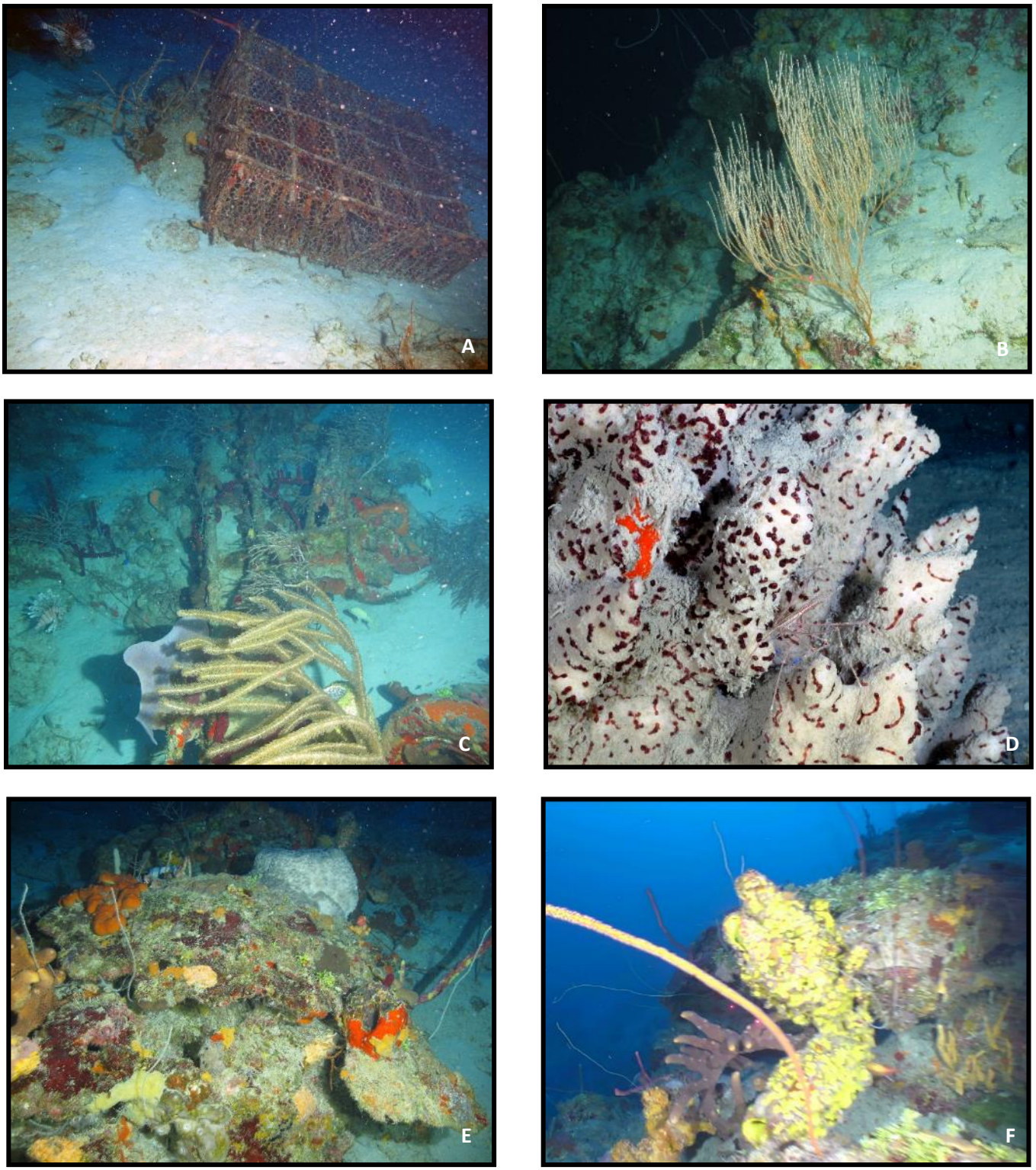


DIVE 10 - Line 9: West St. Croix; July 5, 2019

Map Caption. *Dive 10 set out to ground truth an area identified during mapping efforts earlier in the cruise and was off the west side of St. Croix. The mapped area indicated a canyon feature.*

Dive Summary:
The ROV was on bottom by 16:02 EDT. The dive duration was 0:47 minutes. During the dive, a downward facing digital still was taken every three minutes at an altitude of 1.3 meters followed by a 360-degree rotation of the ROV to observe the surroundings. The dive began at 243 meters, traversed to the base of the canyon feature at 156 meters and climbed the wall. The ROV reached the top of the canyon wall at 49 meters and surveyed the sand flat at the top of the canyon.

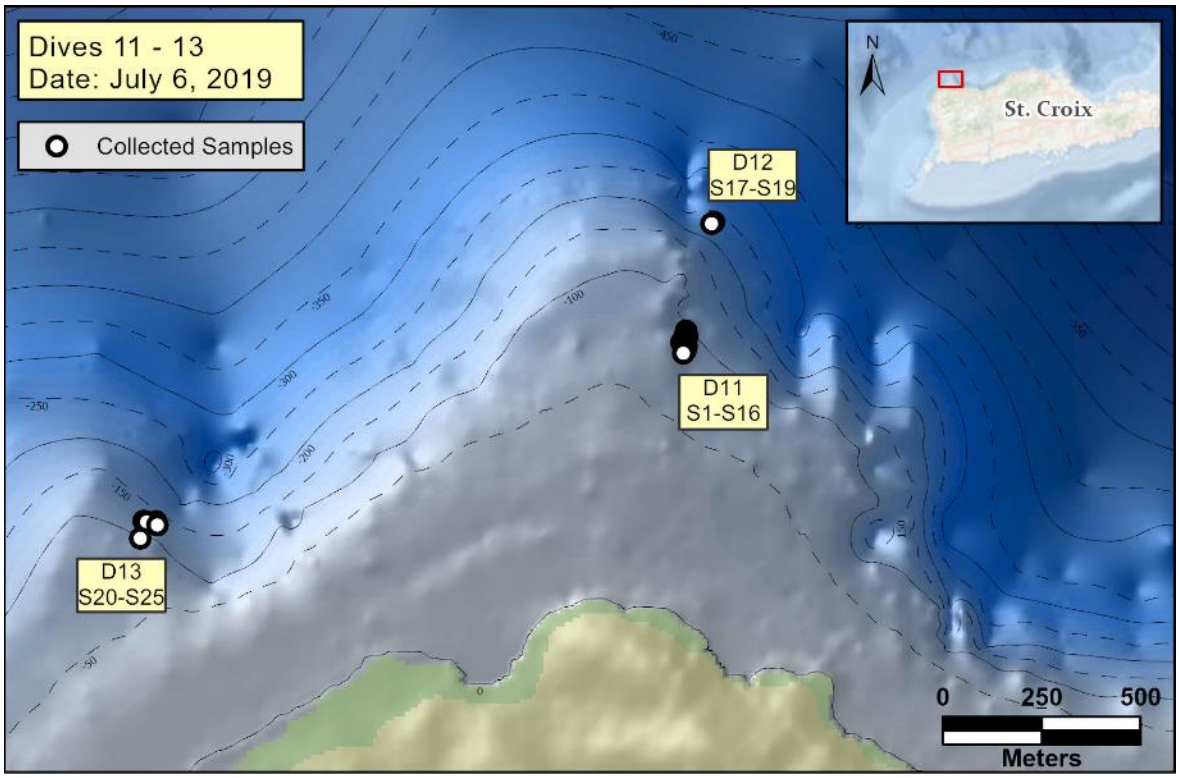
Coral species identified included several species of sea whips, several species of black corals, *Nicella*, and *Leptogorgia*. *Agaricia* was observed as deep as 60 meters. Many instances of debris were observed, both at the base and top of the canyon, including sheet metal and tires, machinery and pipes. Fish were present but not as abundant as during the previous dive. Lionfish, a few Coney and other small reef fish were observed. The dive concluded at 42 meters.



Dive 10 – Line 9 took place west of St. Croix at depths ranging from 42 to 243 meters, using the ROV *Mohawk* aboard NOAA Ship *Nancy Foster.* A) Derelict fish trap B) *Leptogorgia* sp. C) A lionfish near pipeline, *Muricea elongata*, red rope sponges, Plexauridae, many encrusting sponges and gray plate-like sponge D) Demosponge with arrow crab E) Large white barrel sponge, *Stichopathes* sp., encrusting sponges, red rope sponge, *Agelas conifera* brown tube sponge F) Large yellow demosponge, *Agelas conifera*, *Ellisella barbadensis*, Aplysinidae finger sponges, other sponges.

Dive 11 – Line 03
Start Coordinates: 17.7767, -64.8705
Depth Range: 63-83 m

Site ID: Northwest of St. Croix
End Coordinates: 17.7763, -64.8706
Bottom Time: 2 hours 12 minutes

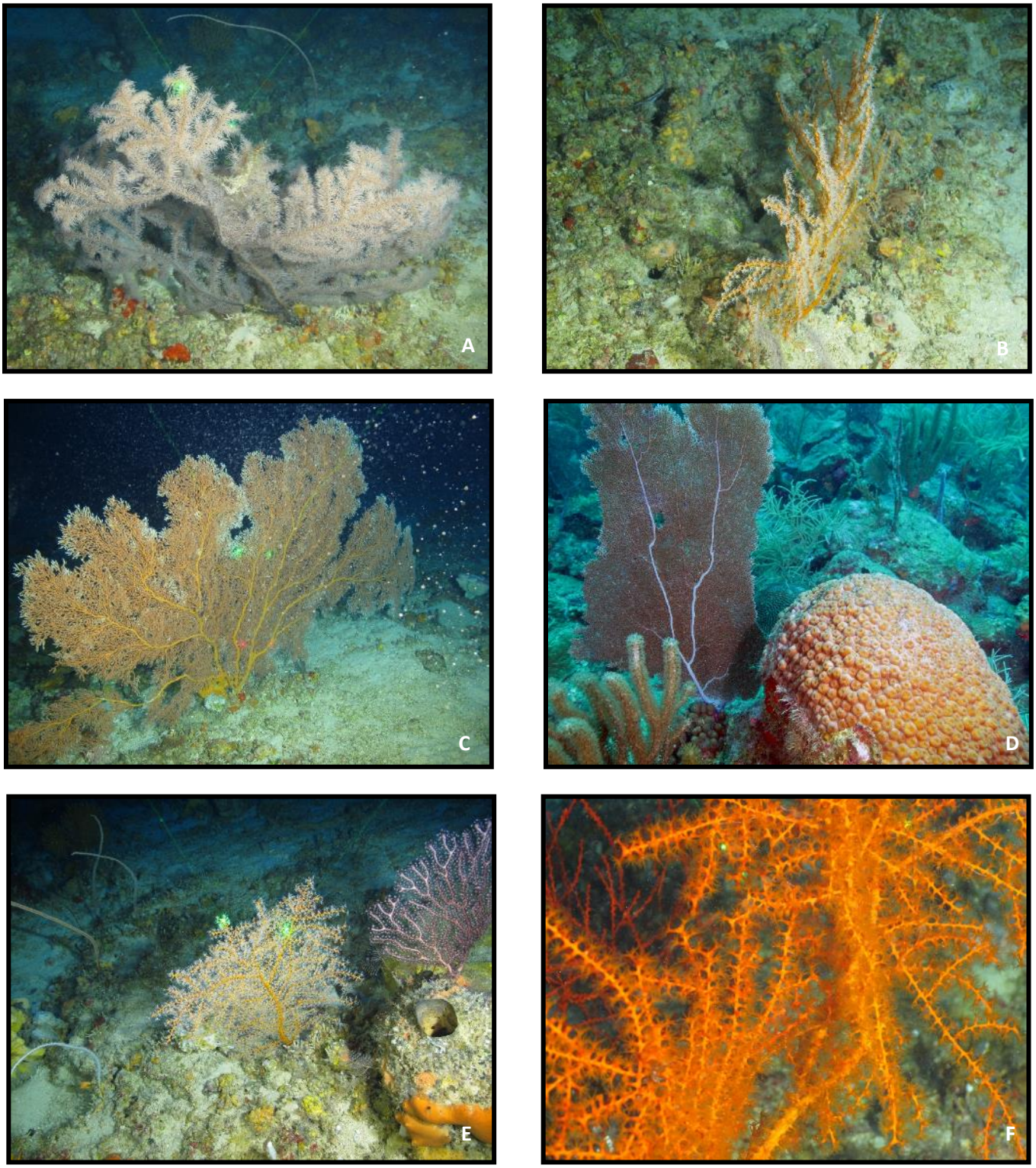


SAMPLING DIVE 11 - Line 3: Northwest St. Croix; July 6, 2019

Map Caption. *Dive 11 set out to sample Swiftia exserta and other key octocoral species observed while surveying Line 3. The 15 samples collected on dive 11 are indicated with white dots near the D11 label.*

Dive Summary:
The eleventh dive of the expedition targeted the coordinates of the deepest observed *Swiftia* colonies and proceeded to survey in zigzag pattern up the original survey line to maximize coverage of the depth range at which *Swiftia* was noted to be present.

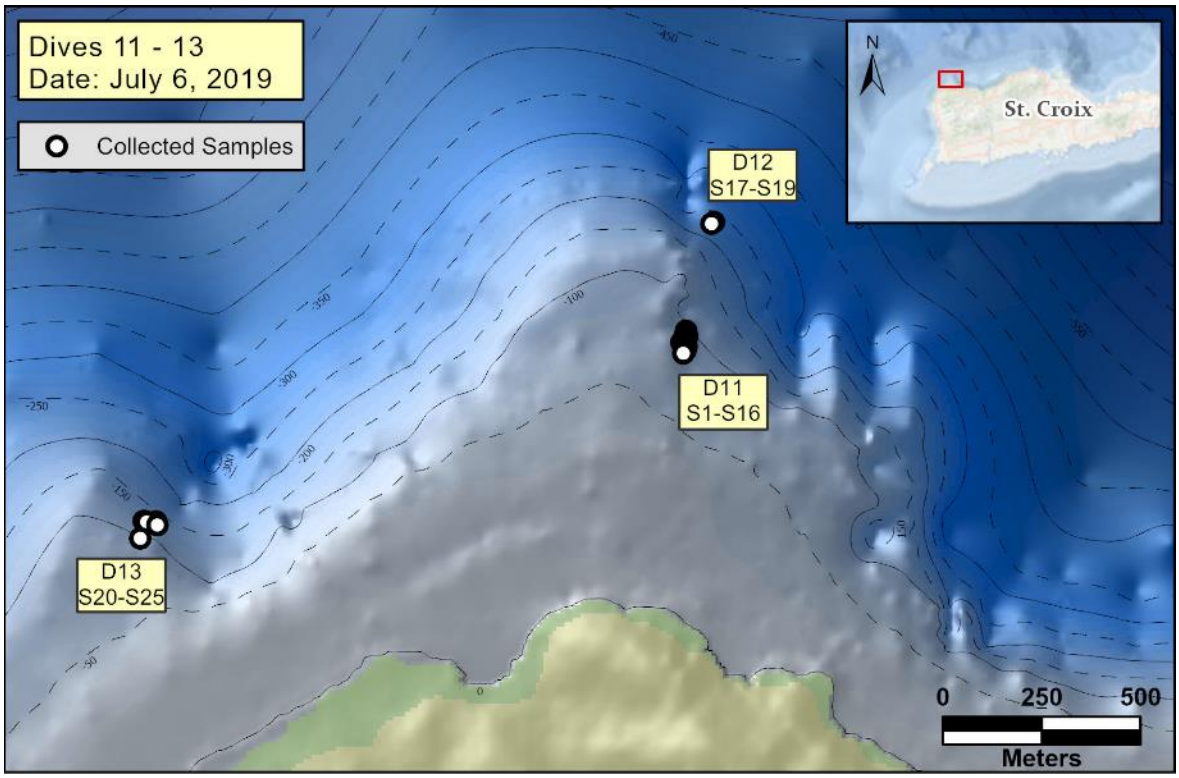
The ROV was on bottom at 8:37 EDT. The duration of the dive was 2:12 (Hr:min). The ROV landed at 83 meters and began searching for samples. The science team prioritized *Swiftia exserta* but also collected other common and conspicuous octocorals. In total 15 samples were collected, 11 *Swiftia,* 2 *Nicella*, 1 Antipatharia, and 1 orange Plexauridae.



Dive 11 – Line 3 took place northwest of St. Croix at depths ranging from 63 to 83 meters, using the ROV *Mohawk* aboard NOAA Ship *Nancy Foster*. A) Antipatharia B) *Swiftia exserta* C) *Nicella* sp. D) Gorgonian sea fan, *Montastraea* sp., *Muricea elongata* E) *Swiftia exserta* and *Icilogorgia schrammi* F) *Swiftia exserta* with red polyps.

Dive 12 – Line 03
Start Coordinates: 17.7793, -64.8698
Depth Range: 215-233 m

Site ID: Northwest of St. Croix
End Coordinates: 17.7793, -64.8700
Bottom Time: 42 minutes

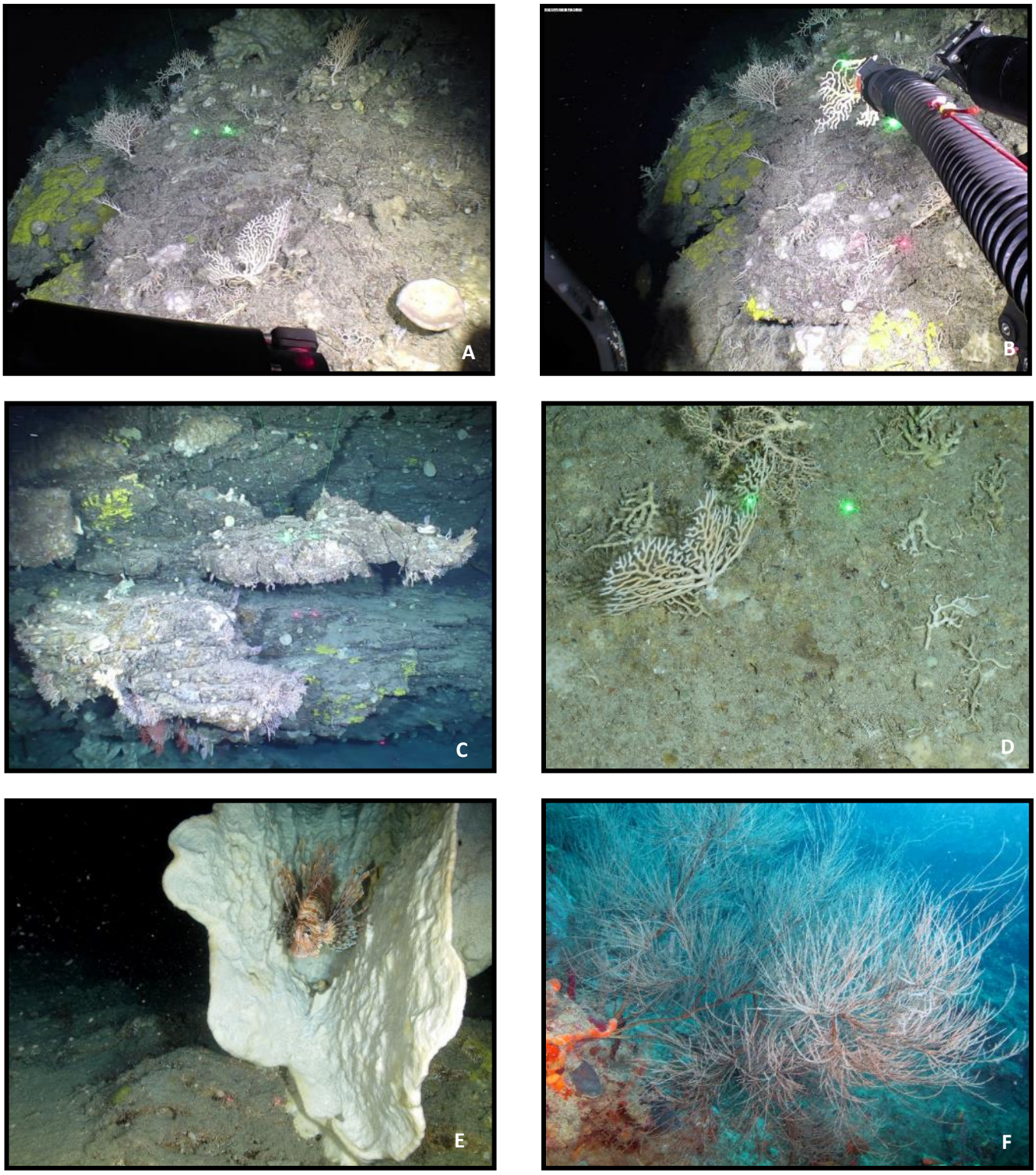


SAMPLING DIVE 12 - Line 3: Northwest St. Croix; July 6, 2019

Map Caption. *Dive 12 set out to sample an undetermined species of Distochopora and other key octocoral species observed while surveying Line 3. The 3 samples collected on dive 12 are indicated with white dots near the D12 label.*

Dive Summary:
The twelfth dive of the expedition targeted the coordinates of the deepest observed *Distochopora* observed and proceeded to survey in zigzag pattern up the original survey line to maximize coverage of the depth range at which *Distochopora* was noted to be present.

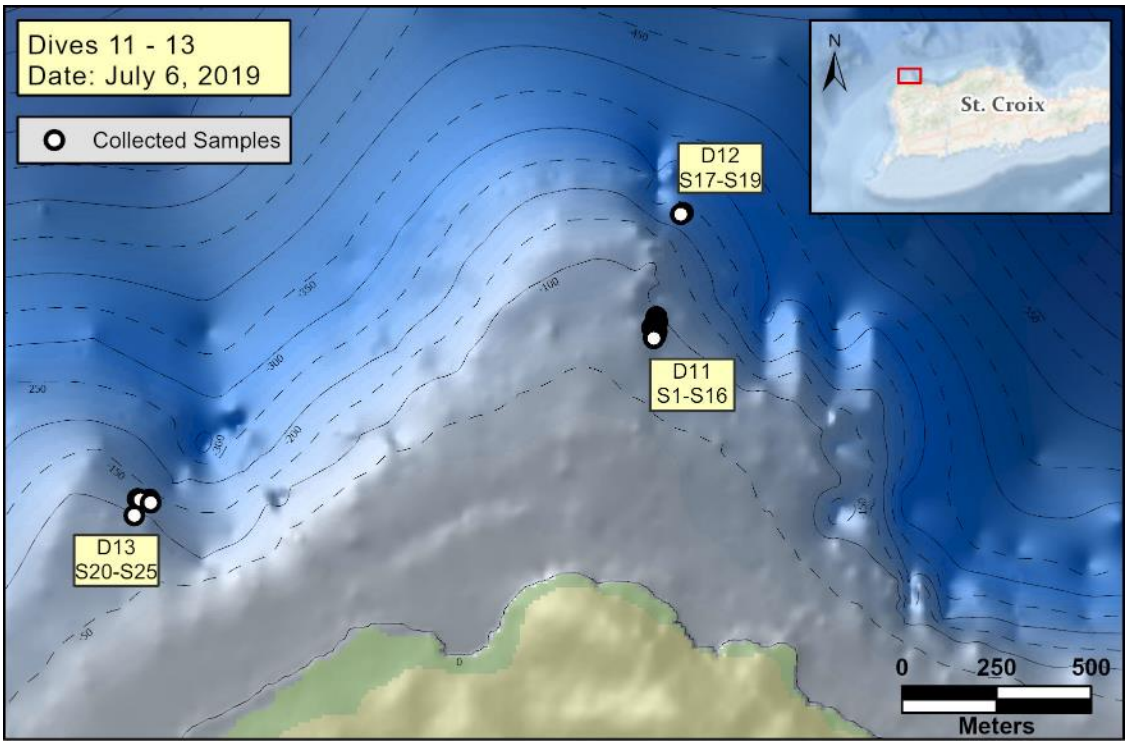
The ROV was on bottom at 12:30 EDT. The duration of the dive was 0:42 minutes. The ROV landed at 233 meters and began searching for samples. The science team prioritized *Distochopora* but considered collecting other coral, but given the steep terrain conditions for sampling were less than ideal, the team focused solely on the priority species. Three samples of *Distochopora* were collected.



Dive 12 – Line 3 took place northwest of St. Croix at depths ranging from 215 to 233 meters, using the ROV *Mohawk* aboard NOAA Ship *Nancy Foster.* A) *In situ* image of sampled *Distichopora* sp. and numerous sponges B) Sampling *Distichopora* sp. C) Ledges covered with Stylasterid corals, sponges, *Distichopora* sp. and *Thesea rubra* hanging below. D) *Distichopora* sp. E) Lionfish in *Agelas* sp. demosponge F) *Antipathes caribbeana.*

Dive 13 – Line 04
Start Coordinates: 17.7727, -64.8826
Depth Range: 67-165 m

Site ID: Northwest of St. Croix
End Coordinates: 17.7727, -64.8829
Bottom Time: 1 hour 30 minutes

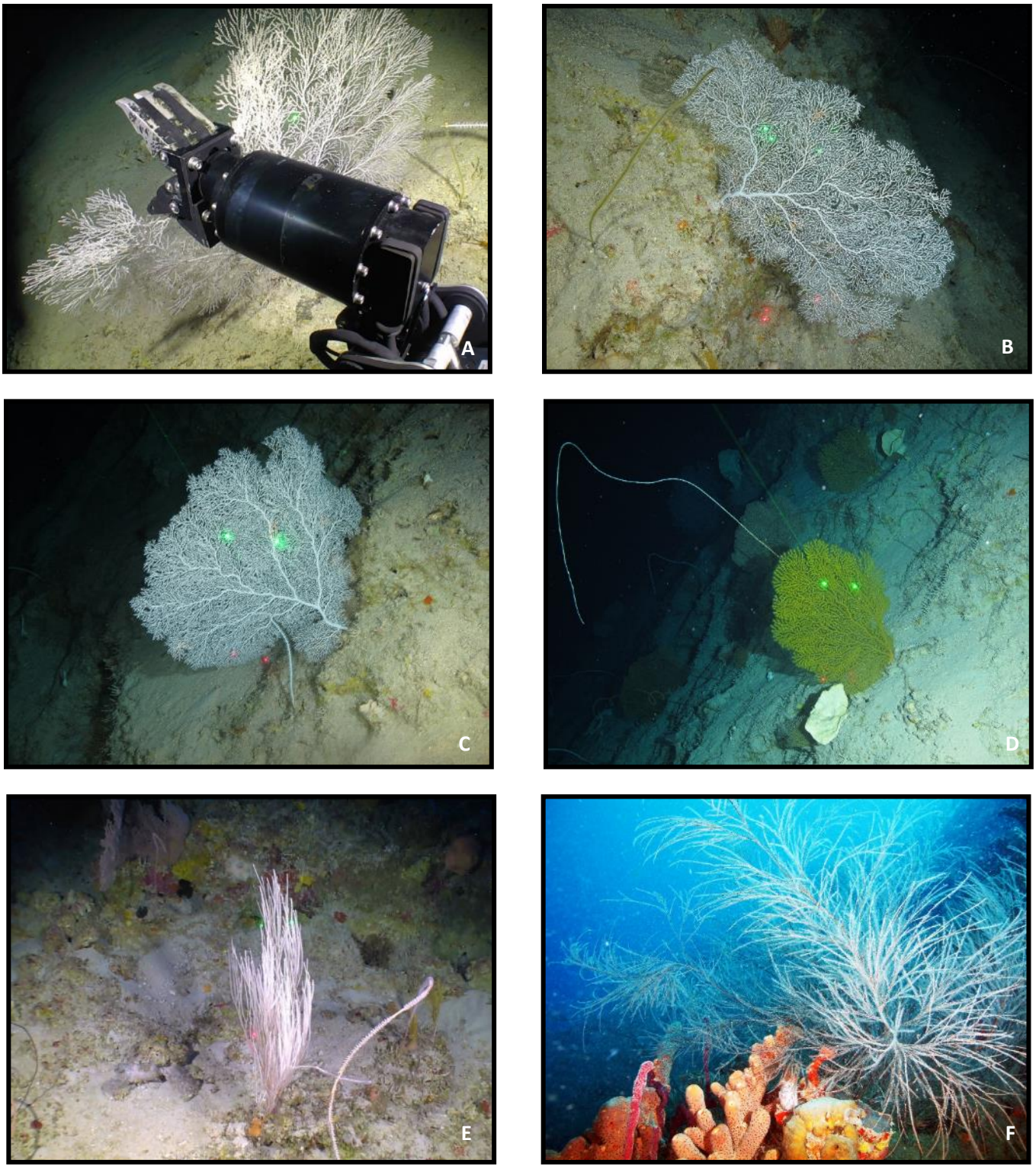


SAMPLING DIVE 13 - Line 4: Northwest St. Croix; July 6, 2019

Map Caption. *Dive 13 set out to sample Nicella sp. (white variant) pendula and other key octocoral species observed while surveying Line 4. The 6 samples collected on dive 13 are indicated with white dots near the D13 label.*

Dive Summary:
The thirteenth dive of the expedition targeted the coordinates of the only observed *Nicella sp. (white variant)* and ran along that depth contour to attempt to find other colonies of *Nicella sp. (white variant).*

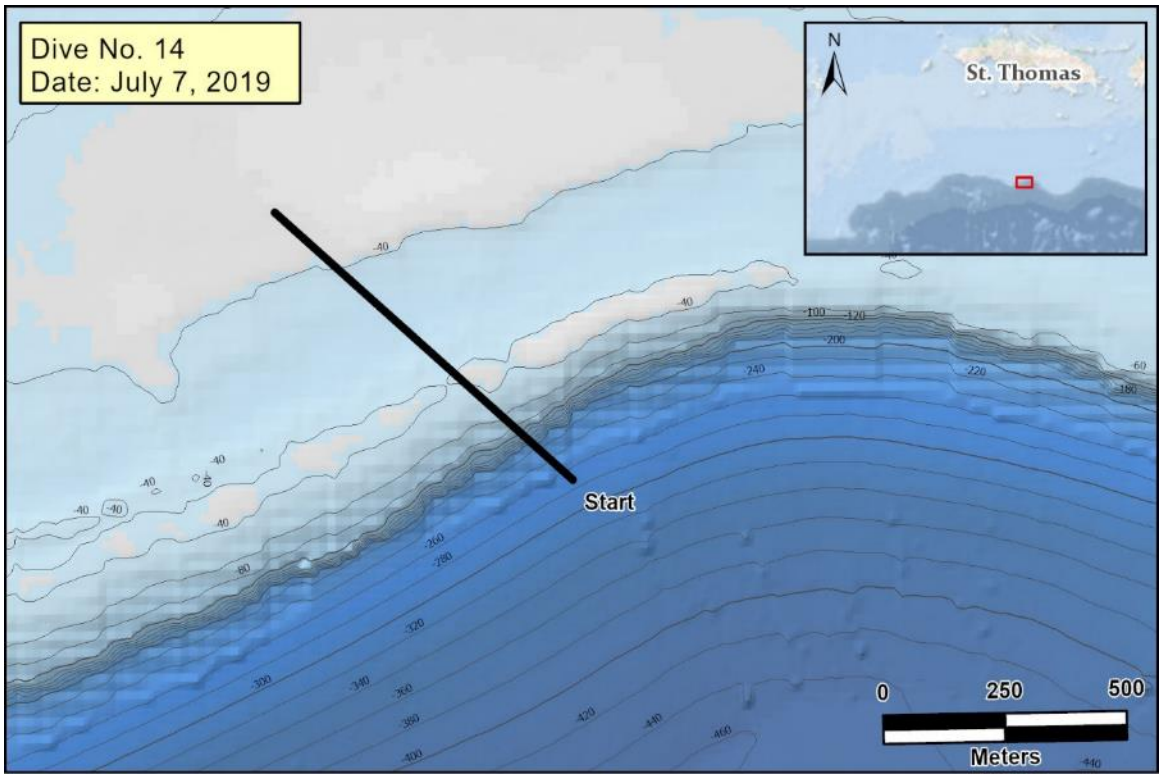
The ROV was on bottom at 14:20 EDT. The duration of the dive was 1:30 (Hr:min). The ROV landed at 165 meters and began searching for samples. The ROV found its first *Nicella sp. (white variant)* at 161 meters, which was deeper than the one observed during the previous survey in the area. The steepness of the terrain made sampling challenging, so the science team focused only on sampling *Nicella sp. (white variant)* while on the wall. After collecting five *Nicella sp. (white variant),* the ROV traversed to the top of the wall, but with limited time and a sample lodged in the tubing of the slurp sampler. A *Leptogorgia* was collected and carried to the surface in the claw.



Dive 13 – Line 4 took place northwest of St. Croix at depths ranging from 67 to 175 meters, using the ROV *Mohawk* aboard NOAA Ship *Nancy Foster*. A) Sampling *Nicella sp. (white variant) pendula* B) *Nicella sp. (white variant) pendula* C) *Nicella sp. (white variant) pendula* D) Yellow Plexauridae, white plate-like demosponges and sea whips E) *Leptogorgia* sp., *Ellisella barbadensis*, gorgonian corals in the background F) *Antipathes caribbeana*, red rope sponge, *Agelas* sp. demosponges.

Dive 14 – Line 11
Start Coordinates: 18.1914, -64.9440
Depth Range: 37-265 m

Site ID: South St. Thomas
End Coordinates: 18.1981, -64.9444
Bottom Time: 1 hour 45 minutes

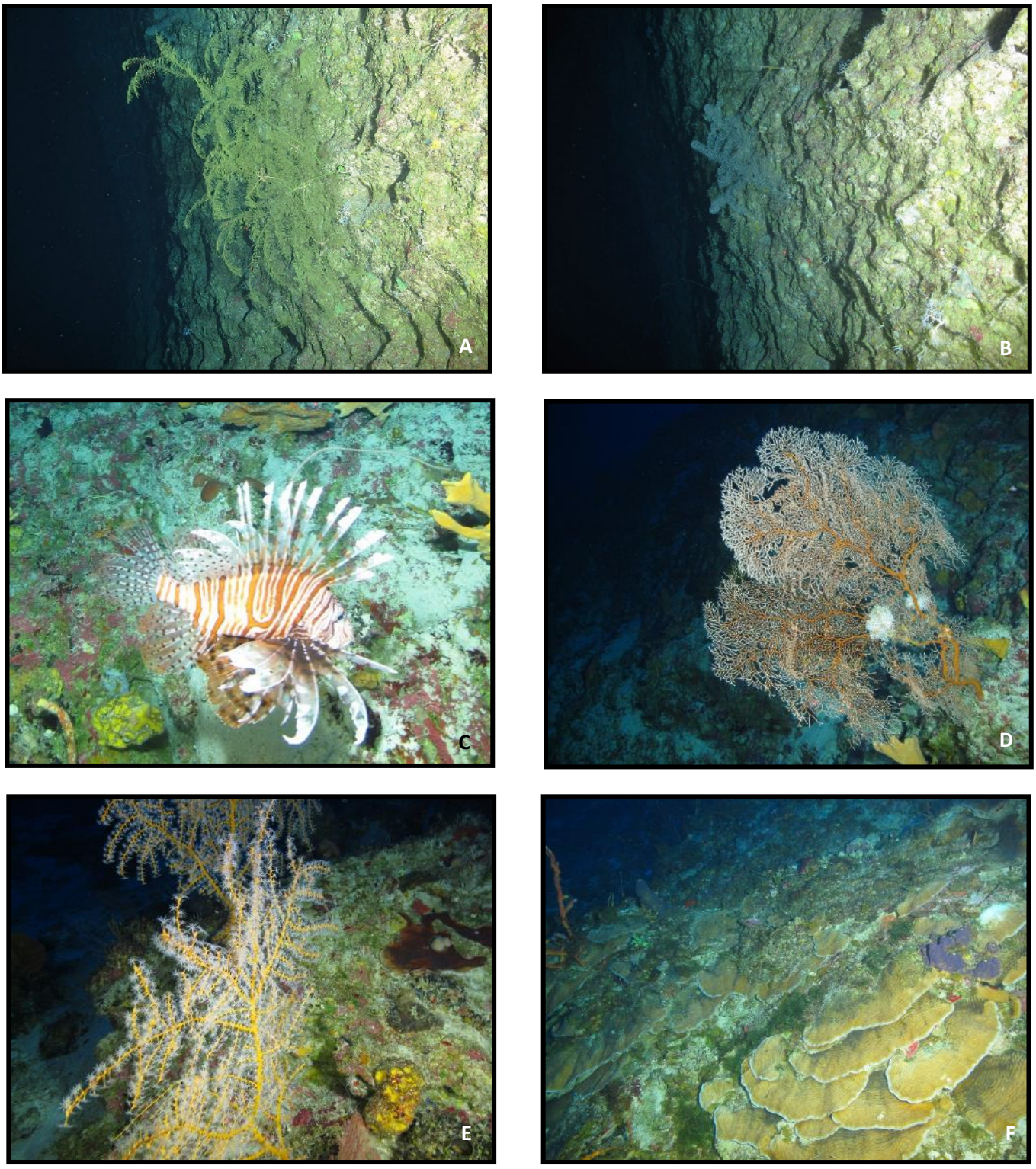


DIVE 14 - Line 11: South St. Thomas; July 7, 2019

Map Caption. *Dive 14 set out to survey features identified in multibeam data south of St. Thomas during a previous expedition. The path planned over the multibeam data covered a flat expanse leading to a wall feature that then lead to a mild incline followed by flat terrain heading towards shore.*

Dive Summary:
The ROV was on bottom by 8:52 EDT. The dive duration was 1:45 (Hr:min). During the dive, a downward facing digital still was taken every three minutes at an altitude of 1.3 meters followed by a 360-degree rotation of the ROV to observe the surroundings. The dive began at 265 meters in soft bottom with patches of cobble. As the ROV traversed towards the wall feature identified in the multibeam, occasional exposed sedimentary rock slabs were present starting at 227 meters. They started at a medium grade and became vertical at 169 meters. The wall was notable for its pockmark texture and many crags. Shortly after the wall went vertical, the umbilical snagged on the wall and had to be dislodged. The wall crested at 88 meters and the terrain quickly switched to sand and rocks. *Agaricia* was observed at 93 meters, and a field of algal nodules were present at 81 meters. The shallow water reef community became present at 74 meters.

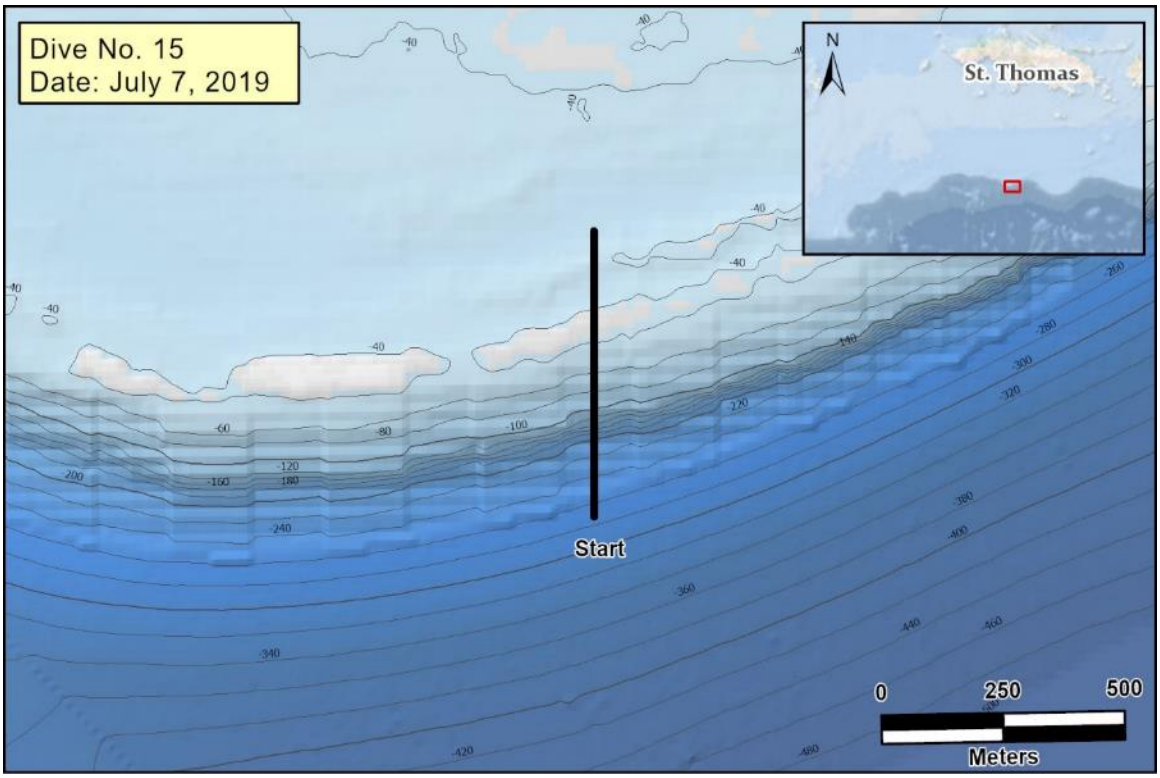
The species of corals observed during the dive included several species of Antipatharia including *Elatopathes* and possible *Plumapathes* among several others. Also present were some small colonies of *Nicella sp. (white variant)*, varieties of white and yellow Plexauridae, and several Stylasterid corals. *Nicella* continues to be the most common sea fan in this region and that was the case on this dive as well. This dive also contained a very large variety of fish, including squirrelfish, bigeye, snapper, amberjack, roughie, lionfish, Nassau Grouper, Speckled Hind, barracuda, Queen Angelfish, Tiger Grouper and many other species of small reef fish.



Dive 14 – Line 11 took place south of St. Thomas at depths ranging from 37 to 265 meters, using the ROV *Mohawk* aboard NOAA Ship *Nancy Foster*. A) *Elatopathes abietina* B) Antipatharia, possibly *Plumapathes* sp. C) Lionfish among sponges D) *Nicella* sp. with bryozoans growing on it E) *Swiftia exserta* with yellow demosponge and encrusting sponges F) *Agaricia* sp. plate corals.

Dive 15 – Line 12
Start Coordinates: 18.1854, -64.9576
Depth Range: 50-285 m

Site ID: South St. Thomas
End Coordinates: 18.1902, -64.9576
Bottom Time: 1 hour 33 minutes

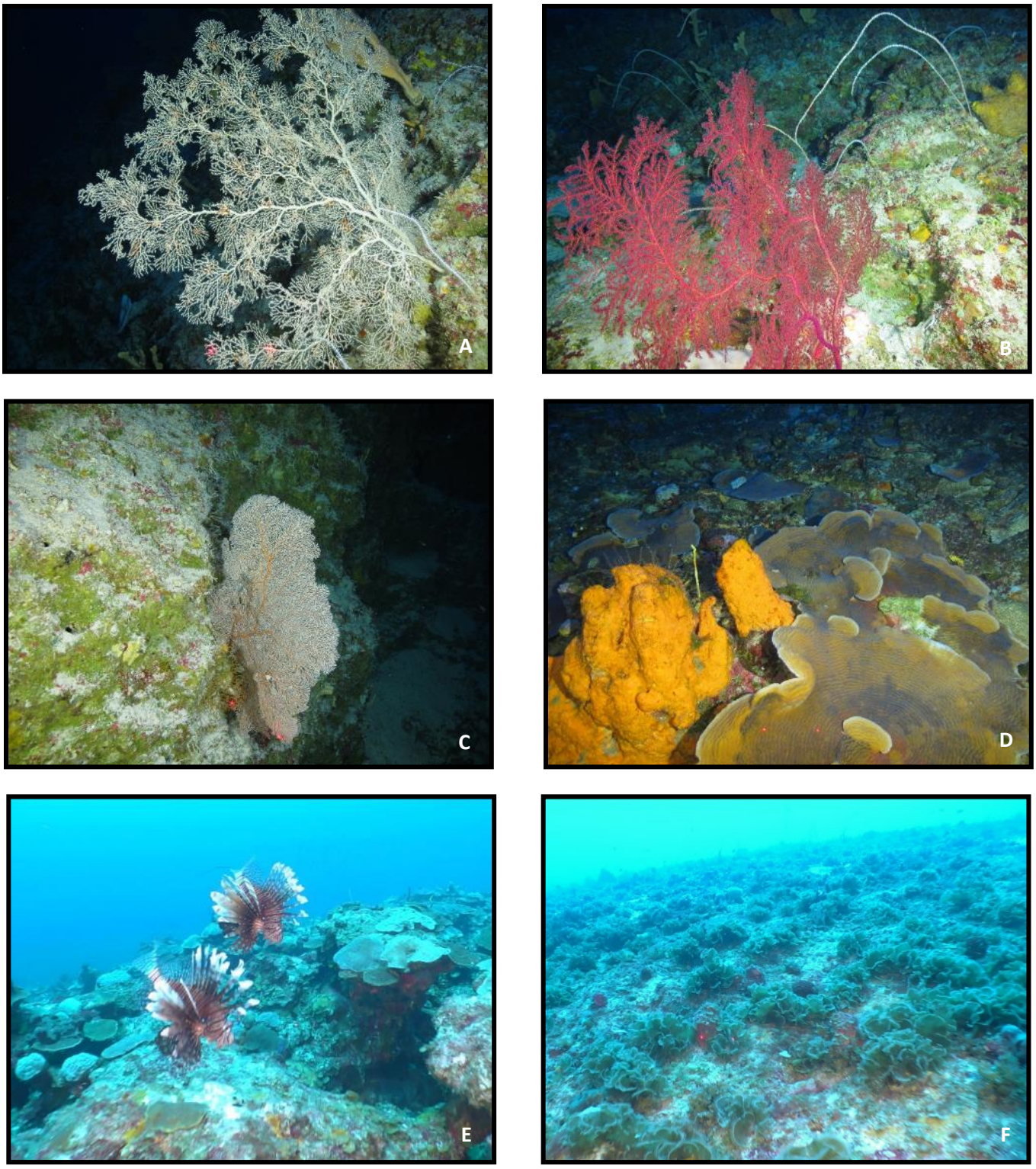


DIVE 15 - Line 12: South St. Thomas; July 7, 2019

Map Caption. *Dive 15 set out to survey features identified in multibeam data south of St. Thomas during a previous expedition. The path planned over the multibeam data covered a flat expanse leading to a wall feature that then lead to a mild incline followed by flat terrain heading towards shore.*

Dive Summary:
The ROV was on bottom by 12:00 EDT. The dive duration was 1:33 (Hr:min). During the dive, a downward facing digital still was taken every three minutes at an altitude of 1.3 meters followed by a 360-degree rotation of the ROV to observe the surroundings. The dive began at 285 meters in soft bottom with a mild slope. As the ROV traversed towards the wall feature identified in the multibeam occasional exposed sedimentary rock became more prevalent at 180 meters. The ROV reached the wall feature around 169 meters. The wall was again notable for its pockmark texture and many crags. The ROV began experiencing more frequent and prolonged power outages. Shortly before the ROV reached the top of the wall, the science team marked the location of another *Nicella sp. (white variant),* in close vicinity to two color morphs of *Muricea* sp. The ROV crested the wall at 100 meters and the terrain quickly switched to sand and rocks. *Agaricia* was observed at 87 meters and the community switched to a shallow water reef community shortly thereafter.

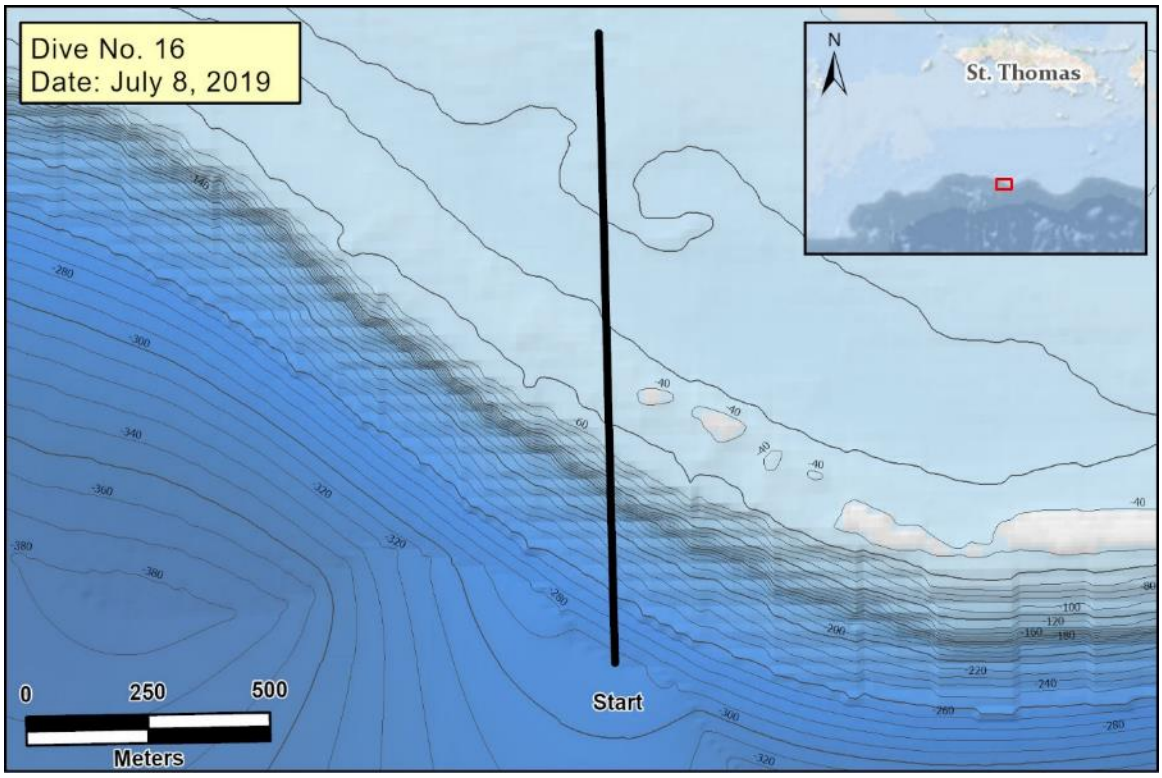
The species of corals observed on the wall were fairly minimal despite finding another cluster of priority targets for sampling. Coral species present other than *Nicella sp. (white variant)* and *Muricea*, only included *Nicella* and a variety of sea whips. The dominant habitat feature deeper than 80 meters were the sponges. On this dive, the fish were really only present after cresting the hill. Fish species observed included squirrelfish. butterflyfish, several species of snapper and grouper, lionfish, barracuda, angelfish, a trunkfish, Blue Tang, surgeonfish, and many other species of small reef fish. The shallow water reef was also severely degraded in several spots and completely over run with algae. Also of note on this dive was coral encrusted science gear deployed at 45 meters. The depths towards the end of the dive started to decrease despite maintaining a shoreward direction. At recovery, the depth increased to 50 meters but the bottom still had a dense algal cover.



Dive 15 – Line 12 took place south of St. Thomas at depths ranging from 50 to 285 meters, using the ROV *Mohawk* aboard NOAA Ship *Nancy Foster.* A) *Nicella sp. (white variant) pendula* B) *Muricea* sp. C) *Nicella* sp. D) *Agaricia* sp. and orange Agelasidae demosponge E) Lionfish among *Agaricia* sp. and encrusting sponges F) Algae field.

Dive 16 – Line 13
Start Coordinates: 18.1856, -64.9713
Depth Range: 46-285 m

Site ID: South St. Thomas
End Coordinates: 18.1962, -64.9716
Bottom Time: 2 hours 04 minutes

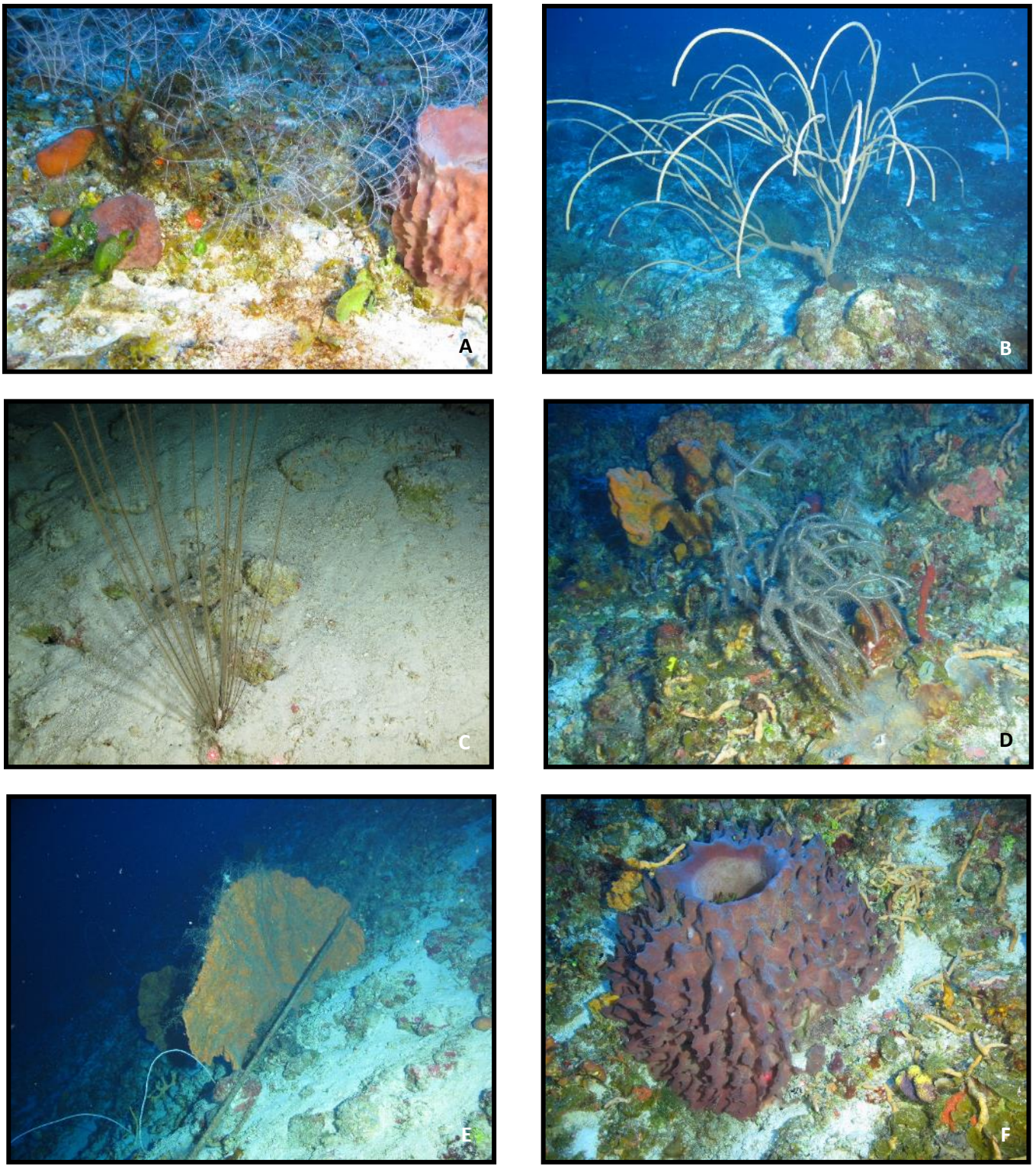


DIVE 16 - Line 13: South St. Thomas; July 8, 2019

Map Caption. *Dive 16 set out to survey features identified in multibeam data south of St. Thomas during a previous expedition. The path planned over the multibeam data covered moderate slope leading to a wall feature after which the terrain leveled out towards shore.*

Dive Summary:
The ROV was on bottom by 9:46 EDT. The dive duration was 2:04 (Hr:min). During the dive, a downward facing digital still was taken every three minutes at an altitude of 1.3 meters followed by a 360-degree rotation of the ROV to observe the surroundings. The dive began at 285 meters in soft bottom with a mild slope. Shortly after landing, the ROV found a cable that remained present through the entire dive. At 235 meters, sedimentary rock became more exposed and the slope increased. These rocks contained algae starting around 190 meters and the ROV reached the wall feature around 170 meters. The wall was again notable for its pockmark texture and many crags. Around 147 meters sea fans and sponges become prevalent. There were several potential sampling targets along this section of wall most notably a large *Muricea* sp. The ROV crested the wall at 52 meters and the terrain quickly switched to sand and rocks. *Agaricia* was first observed at 91 meters and the community switched to a shallow water reef community before cresting the wall. After cresting the wall, habitat alternated between sand flats, algal fields, low relief pavement reef, and highly rugose plate coral aggregations.

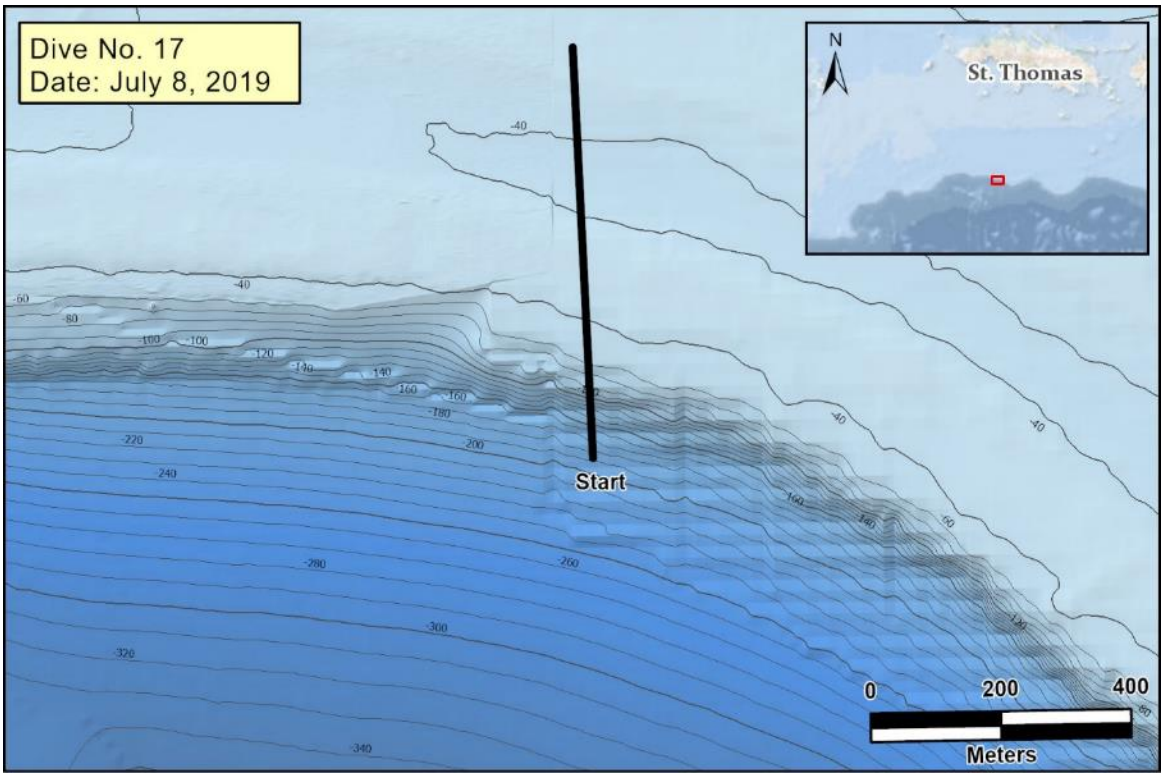
The species of corals observed on the wall were fairly minimal despite the cluster of priority targets for sampling. Coral species present other than *Muricea*, orange Plexauridae, and *Nicella*, included *Antipathes furcata*, *Antipathes caribbeana*, and a variety of sea whips. The majority of the dive was spent over zooxanthellate plate coral communities, predominantly populated by *Agaricia*, *Orbicella*, and *Montastraea*. Several species of snapper were also present, along with several Graysby and Coney, Bar Jacks, lionfish, and an assortment of small reef fish.



Dive 16 – Line 13 took place south of St. Thomas at depths ranging from 46 to 285 meters, using the ROV *Mohawk* aboard NOAA Ship *Nancy Foster*. A) *Antipathes caribbeana*, *Xestospongia* sp. barrel sponge, algae and demosponges B) Plexaura rod coral C) *Antipathes furcata* D) *Muricea elongata*, orange Agelas sponge, red rope sponge, Aplysinidae finger sponges E) *Stichopathes* sp. and orange elephant ear demosponges near cable on seafloor. F) *Xestospongia* sp. barrel sponge and repl finger sponges.

Dive 17 – Line 14
Start Coordinates: 18.1944, -64.9828
Depth Range: 44-200 m

Site ID: South St. Thomas
End Coordinates: 18.1996, -64.9831
Bottom Time: 1 hour 14 minutes

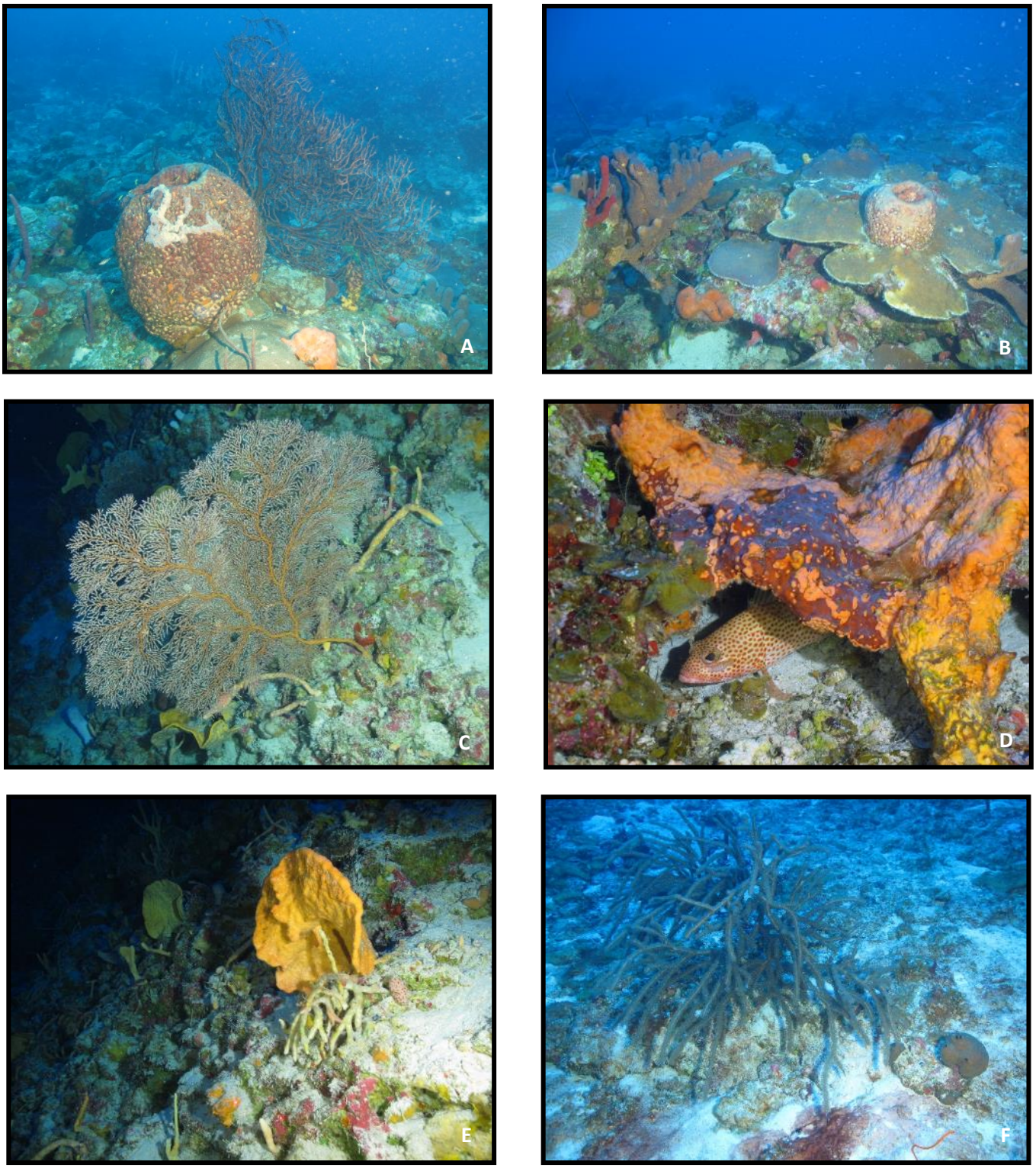


DIVE 17 - Line 14: South St. Thomas; July 8, 2019

Map Caption. *Dive 17 set out to survey features identified in multibeam data south of St. Thomas during a previous expedition. The path planned over the multibeam data covered moderate slope leading to a wall feature after which the terrain leveled out towards shore.*

Dive Summary:
The ROV was on bottom by 12:40 EDT. The dive duration was 1:14 (Hr:min). During the dive, a downward facing digital still was taken every three minutes at an altitude of 1.3 meters followed by a 360-degree rotation of the ROV to observe the surroundings. The dive began at 200m on sand with scattered rock, this transitioned to a combination of cobble and rubble before ascending a wall. After reaching the top of the wall the habitat and community switched to a plate coral-dominated mesophotic reef. This area is notable compared to other dives to date, because the wall featured a large cave around 97 meters.

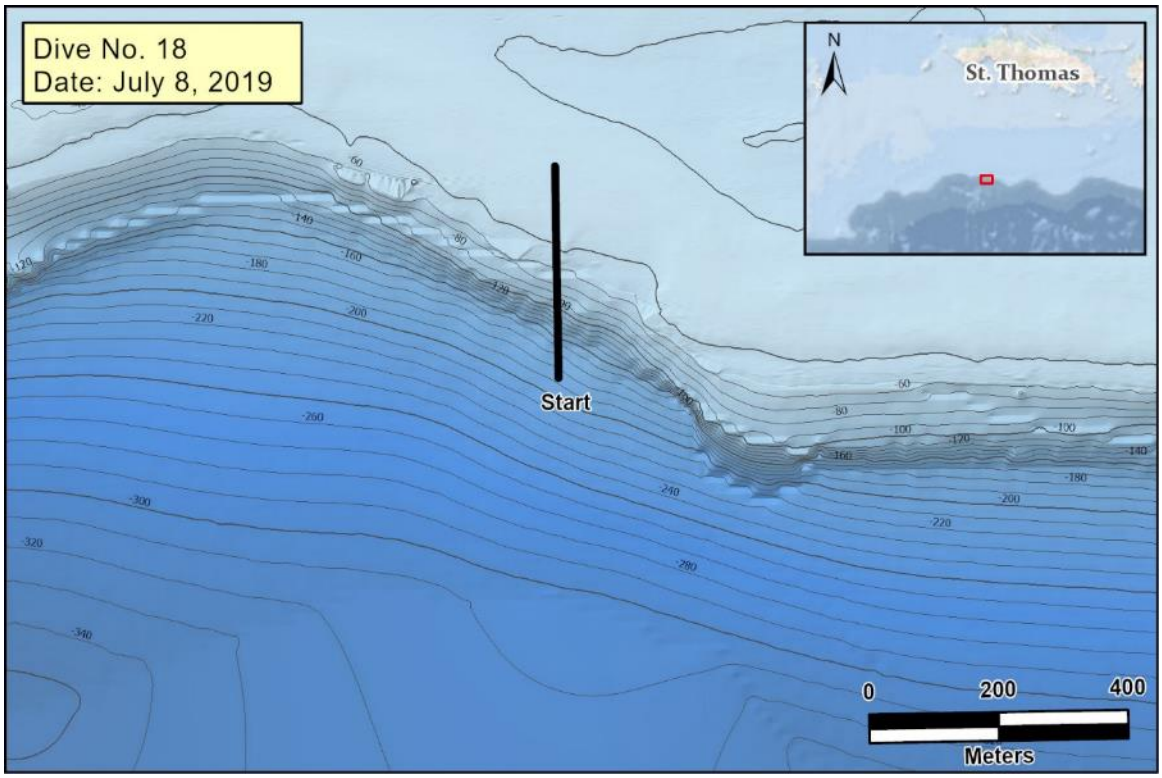
During the dive, *Distochopora* and cup corals along with a few species of black corals were noted prior to the wall. During the ascent of the wall, small yellow gorgonians were noted, as well as a *Nicella sp. (white variant)* marked for sampling as well as a large *Nicella* also marked for sampling. The mesophotic reef was dominated by *Agaricia* and *Orbicella*. This dive contained many fish at the start of the dive, including a barracuda. The mesophotic reef contained a variety of small reef fish.



Dive 17 – Line 14 took place south of St. Thomas at depths ranging from 44 to 200 meters, using the ROV *Mohawk* aboard NOAA Ship *Nancy Foster*. A) *Icilogorgia schrammi* behind large barrel demosponge B) *Agelas conifera* brown tube sponge, plate coral, barrel sponge, red rope sponge, other encrusting sponges C) *Nicella* sp., Aplysinidae finger sponges and yellow plate sponge D) Graysby under large Agelasidae demosponge and leafy algae E) Orange and yellow elephant ear sponges, finger sponges, antler sponges and encrusting sponges F) Large Plexaura octocoral and Geodiidae sponge.

Dive 18 – Line 15
Start Coordinates: 18.1966, -64.9953
Depth Range: 50-198 m

Site ID: South St. Thomas
End Coordinates: 18.1992, -64.9953
Bottom Time: 1 hour 10 minutes

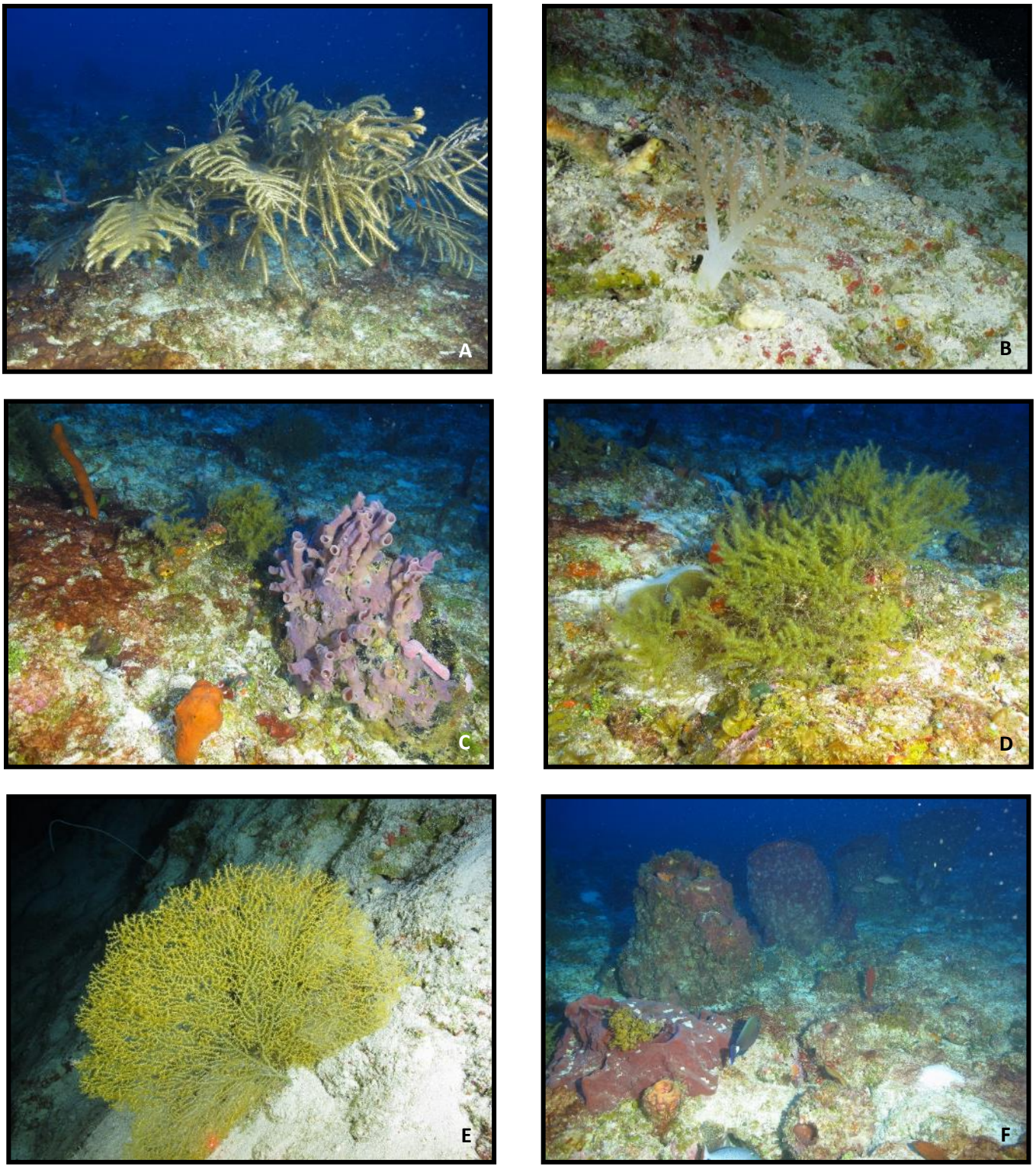


DIVE 18 - Line 15: South St. Thomas; July 8, 2019

Map Caption. *Dive 18 set out to survey features identified in multibeam data south of St. Thomas during a previous expedition. The multibeam data suggested moderate slope leading to a wall feature after which the terrain leveled out towards shore.*

Dive Summary:
The ROV was on bottom by 14:55 EDT. The dive duration was 1:10 (Hr:min). During the dive, a downward facing digital still was taken every three minutes at an altitude of 1.3 meters followed by a 360-degree rotation of the ROV to observe the surroundings. The dive began at 198m on sand with cobble and rubble before ascending a wall. After reaching the top of the wall the habitat and community switched to a plate coral-dominated mesophotic reef.

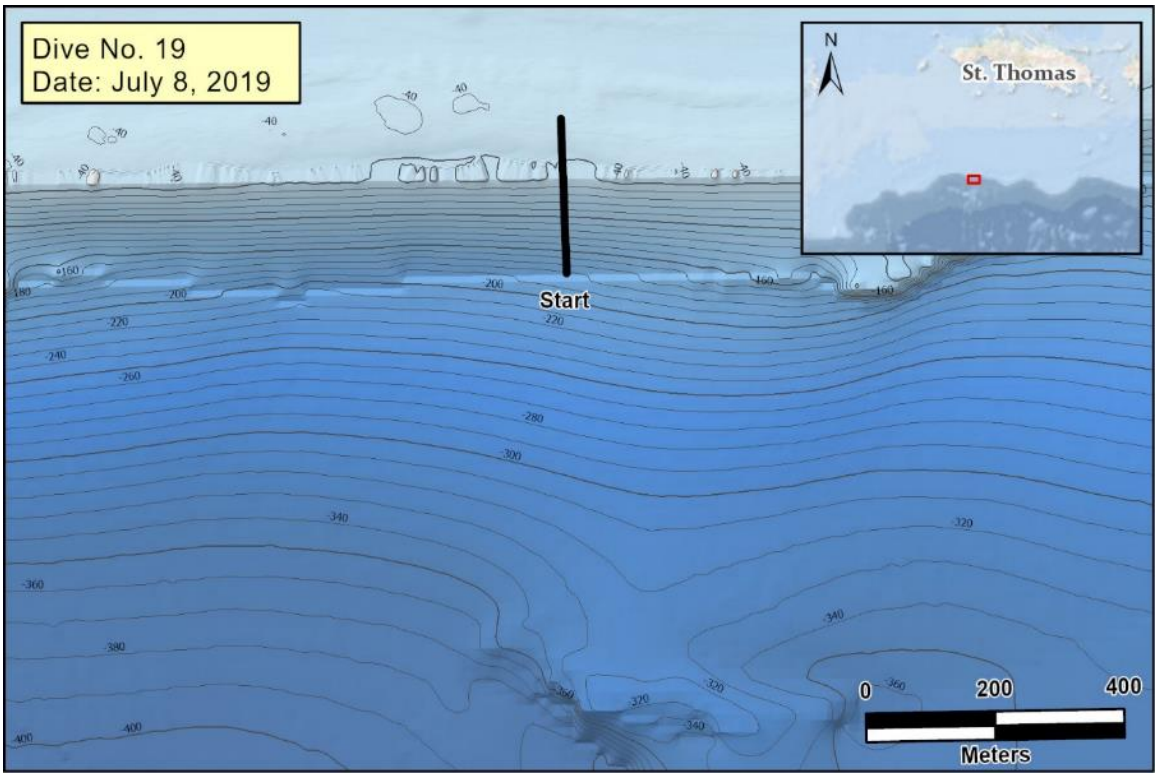
This dive proved to be a target-rich environment for potential sampling. There were many large yellow Plexauridae including a possible *Paramuricea*, orange Plexauridae, and *Nicella*. In addition, there was the occasional Antipatharia. In addition to corals, there were many fish at all depths, but primarily small reef fish. Most notably at the end of the dive, a Nurse Shark was observed.



Dive 18 – Line 15 took place south of St. Thomas at depths ranging from 50 to 198 meters, using the ROV *Mohawk* aboard NOAA Ship *Nancy Foster*. A) *Pseudoterogorgia* sp. B) *Chironephthya* sp. C) *Aplysina archeri* stove-pipe sponge, orange demosponges and yellow feathery algae *Bryopsis* sp. D) Large yellow feathery algae *Bryopsis* sp. E) Yellow Plexauridae F) Several *Xestospongia* sp. barrel sponges.

Dive 19 – Line 16
Start Coordinates: 18.1976, -65.0081
Depth Range: 41-188 m

Site ID: South St. Thomas
End Coordinates: 18.1996, -65.0082
Bottom Time: 37 minutes

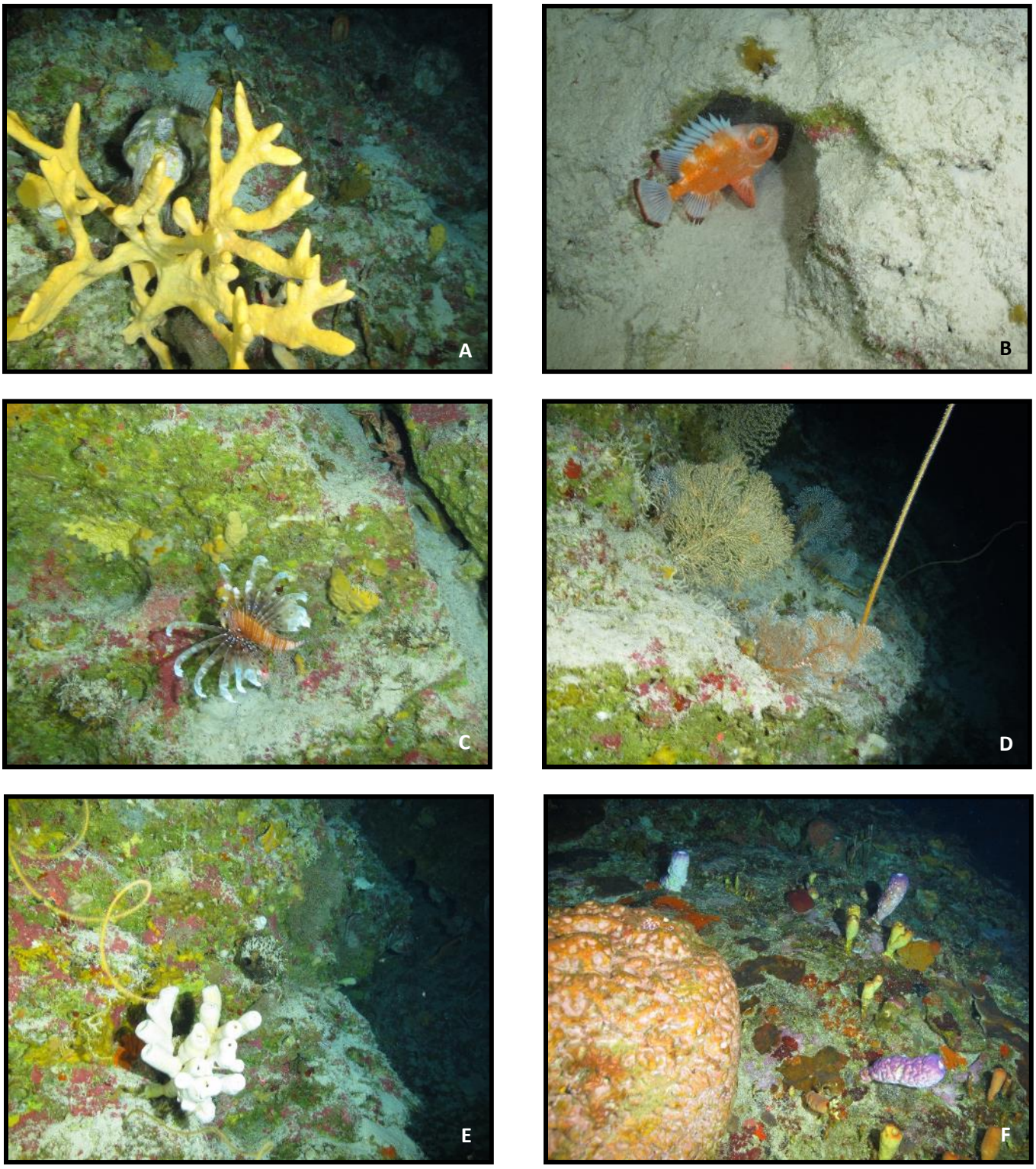


DIVE 19 - Line 16: South St. Thomas; July 8, 2019

Map Caption. *Dive 19 set out to survey features identified in multibeam data south of St. Thomas provided by the mapping team from this expedition. The multibeam data was not complete for the entire depth range of the dive, but suggested varying relief where there had previously been low relief after the wall feature.*

Dive Summary:
The ROV was on bottom by 16:45 EDT. The dive duration was 0:37 minutes. During the dive, a downward facing digital still was taken every three minutes at an altitude of 1.3 meters followed by a 360-degree rotation of the ROV to observe the surroundings. The dive began at 188m on sand with exposed sedimentary rock. This transitioned to a rock wall with large crags and overhangs. After reaching the top of the wall the habitat and community switched to a plate coral-dominated mesophotic reef.

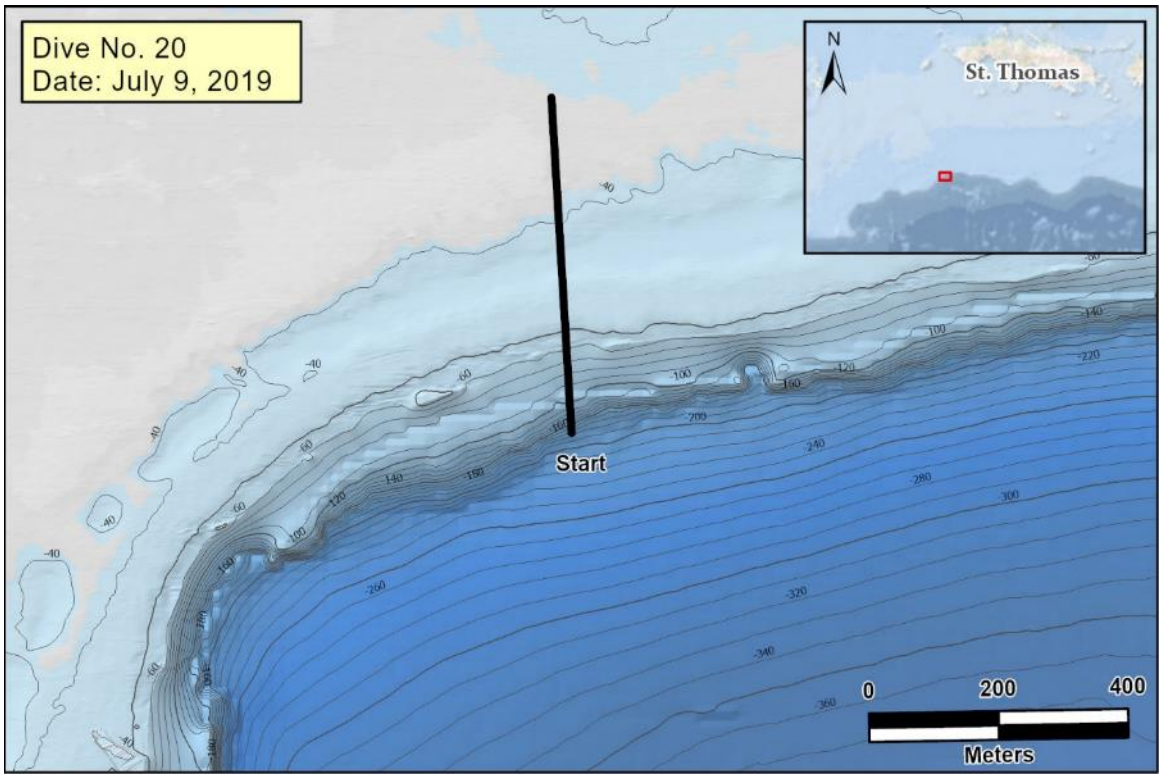
This dive, while devoid of many corals, still provided a small area of interest with a possible *Villogorgia*, along with more *Nicella* and yellow Plexauridae, which were all marked for potential collection. *Agaricia* was again documented deeper than its current range would suggest, with several documented at 94 meters. In addition to corals, there were many fish at all depths, but primarily small reef fish. Most notably, a Hogfish was observed at the end of the dive.



Dive 19 – Line 16 took place south of St. Thomas at depths ranging from 41 to 188 meters, using the ROV *Mohawk* aboard NOAA Ship *Nancy Foster*. A) Antler sponge B) Bigeye C) Lionfish and crab D) *Nicella* sp., *Stichopathes* sp., yellow Plexauridae E) *Stichopathes* sp. and tube sponges F) *Agaricia* sp., Aplysinidae purple tube sponges, orange and yellow tube sponges, large barrel sponge.

Dive 20 – Line 20
Start Coordinates: 18.1986, -65.0526
Depth Range: 37-160 m

Site ID: South St. Thomas
End Coordinates: 18.2029, -65.0528
Bottom Time: 1 hour

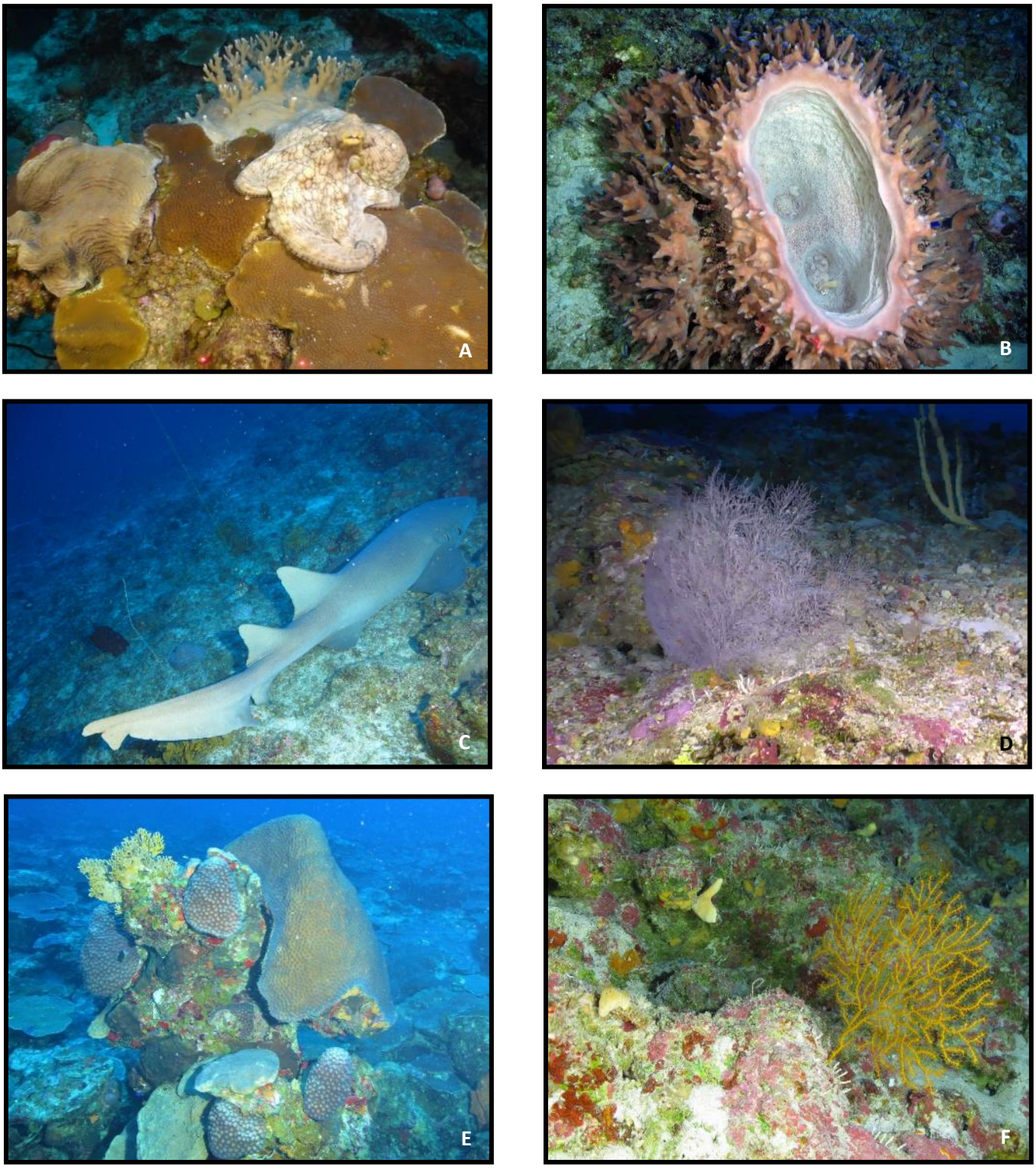


DIVE 20 - Line 20: South St. Thomas; July 9, 2019

Map Caption. *Dive 20 set out to survey features identified in multibeam data south of St. Thomas provided by the mapping team from this expedition. The multibeam data showed a similar profile to the other dives thus far south of St. Thomas.*

Dive Summary:
The ROV was on bottom by 9:10 EDT. The dive duration was 1:00 (Hr:min). During the dive, a downward facing digital still was taken every three minutes at an altitude of 1.3 meters followed by a 360-degree rotation of the ROV to observe the surroundings. The dive began at 160m on exposed sedimentary rock and transitioned immediately to a rock wall with large crags and overhangs. After reaching the top of the wall, the habitat and community switched to a plate coral-dominated mesophotic reef.

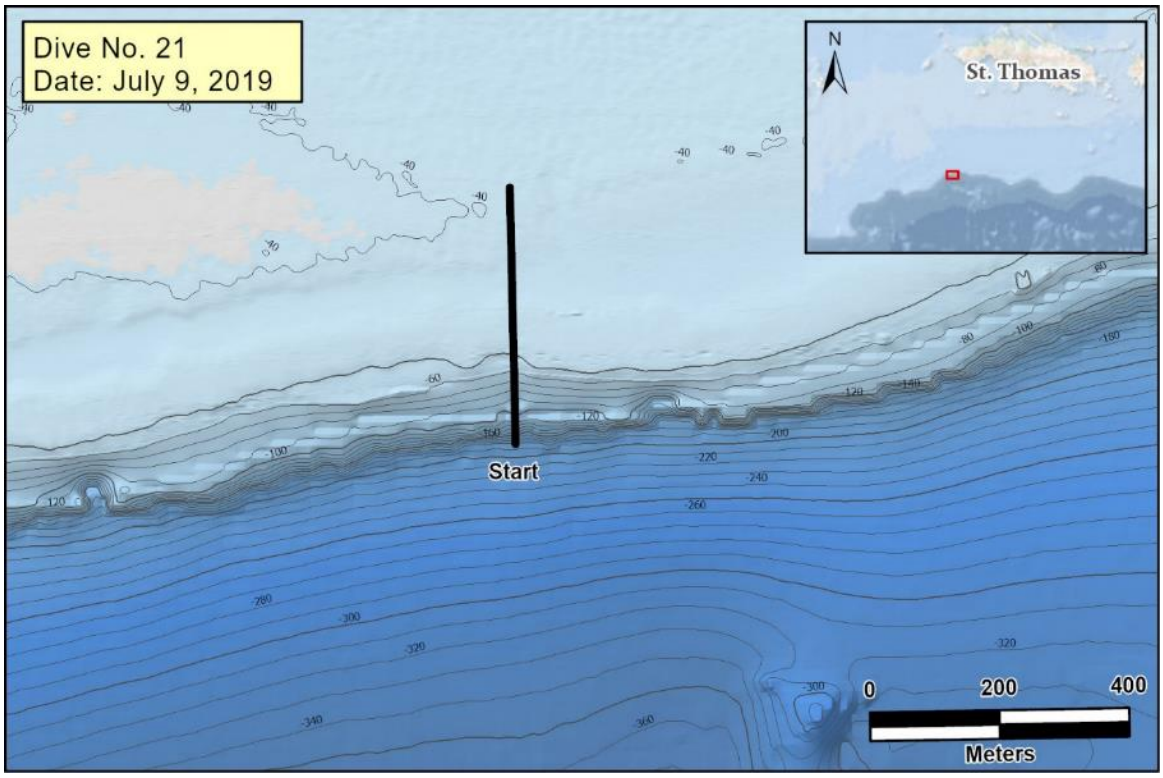
This dive had impressive biology throughout its entire duration. There were many corals and sponges along the wall during the ascent. Coral species observed included *Antipathes atlantica*, orange Plexauridae, *Nicella*, and several species of sea whips. *Agaricia* was again documented deeper than its current range would suggest with one documented at 97 meters. In addition to corals, there were many fish and other megafauna, several species of grouper and snapper, a Hogfish, two Nurse Sharks, a Common Octopus, Rock Beauty Angelfish, lionfish and other small reef fish.



Dive 20 – Line 20 took place south of St. Thomas at depths ranging from 37-160 meters, using the ROV *Mohawk* aboard NOAA Ship *Nancy Foster*. A) *Octopus vulgaris* on patch of *Montastraea* sp., *Agaricia* sp. with fire coral in the background B) Large barrel sponge with small blue and yellow reef fish C) Nurse Shark D) *Antipathes atlantica* with finger-like sponge E) *Monastraea* sp., *Agaricia* sp. encrusting sponges and fire coral F) Orange Plexauridae, antler sponges and encrusting sponges.

Dive 21 – Line 19
Start Coordinates: 18.2000, -65.0442
Depth Range: 40-195 m

Site ID: South St. Thomas
End Coordinates: 18.2033, -65.0443
Bottom Time: 54 minutes

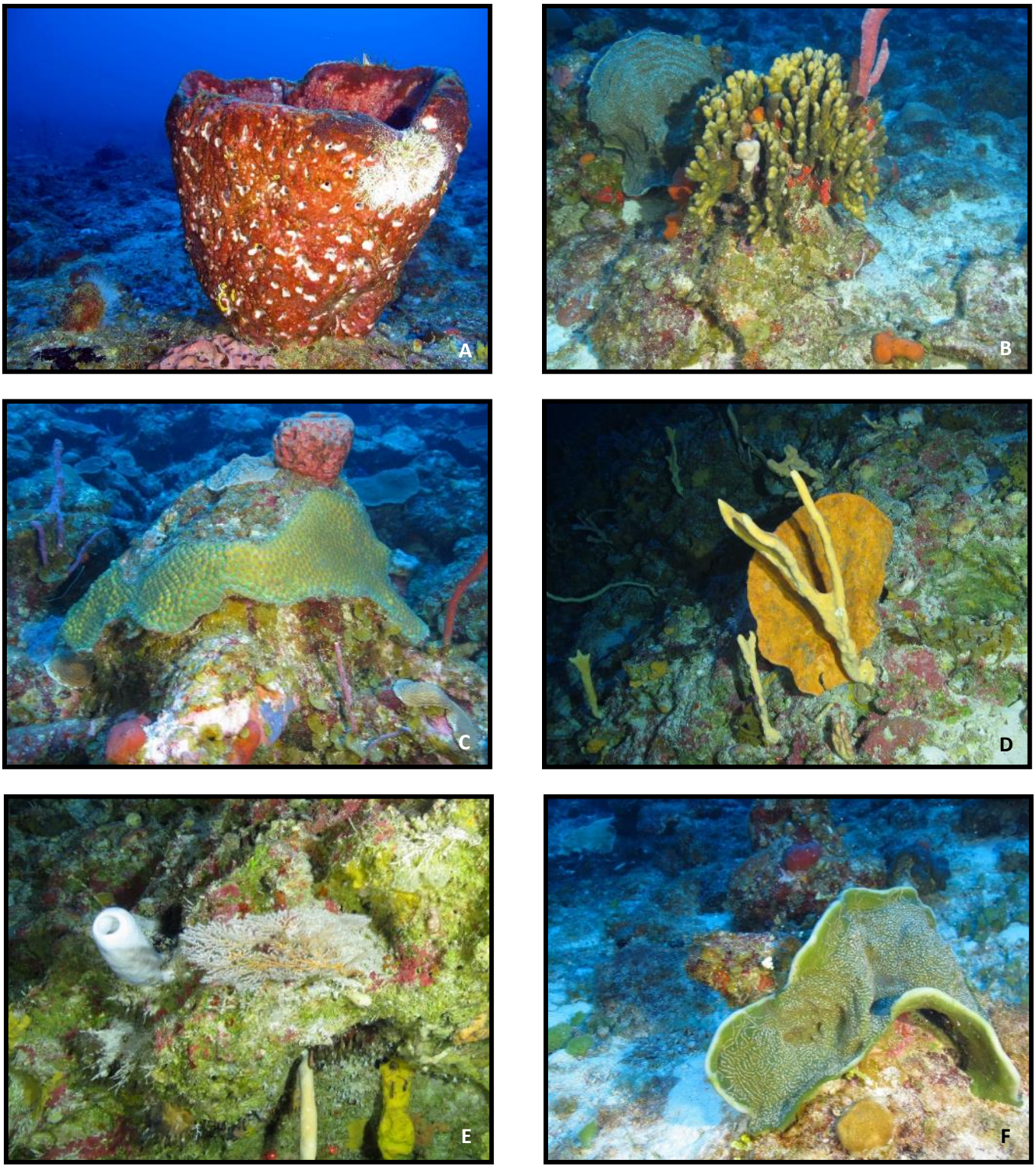


DIVE 21 - Line 19: South St. Thomas; July 9, 2019

Map Caption. *Dive 21 set out to survey features identified in multibeam data south of St. Thomas provided by the mapping team from this expedition. The multibeam data showed a similar profile to the other dives thus far south of St. Thomas.*

Dive Summary:
The ROV was on bottom by 11:07 EDT. The dive duration was 0:54 minutes. During the dive, a downward facing digital still was taken every three minutes at an altitude of 1.3 meters followed by a 360-degree rotation of the ROV to observe the surroundings. The dive began at 195m on sand covered carbonate rock and transitioned quickly to a rock wall with large pockmarks, crags, and overhangs. At the start of the dive there was a derelict Chevron fish trap with its escape door secured open. The wall began at 175 meters and the top was reached around 95 meters. The habitat then switched to fields of algal nodules with patches of more rugose terrain featuring a plate coral-dominated mesophotic reef.

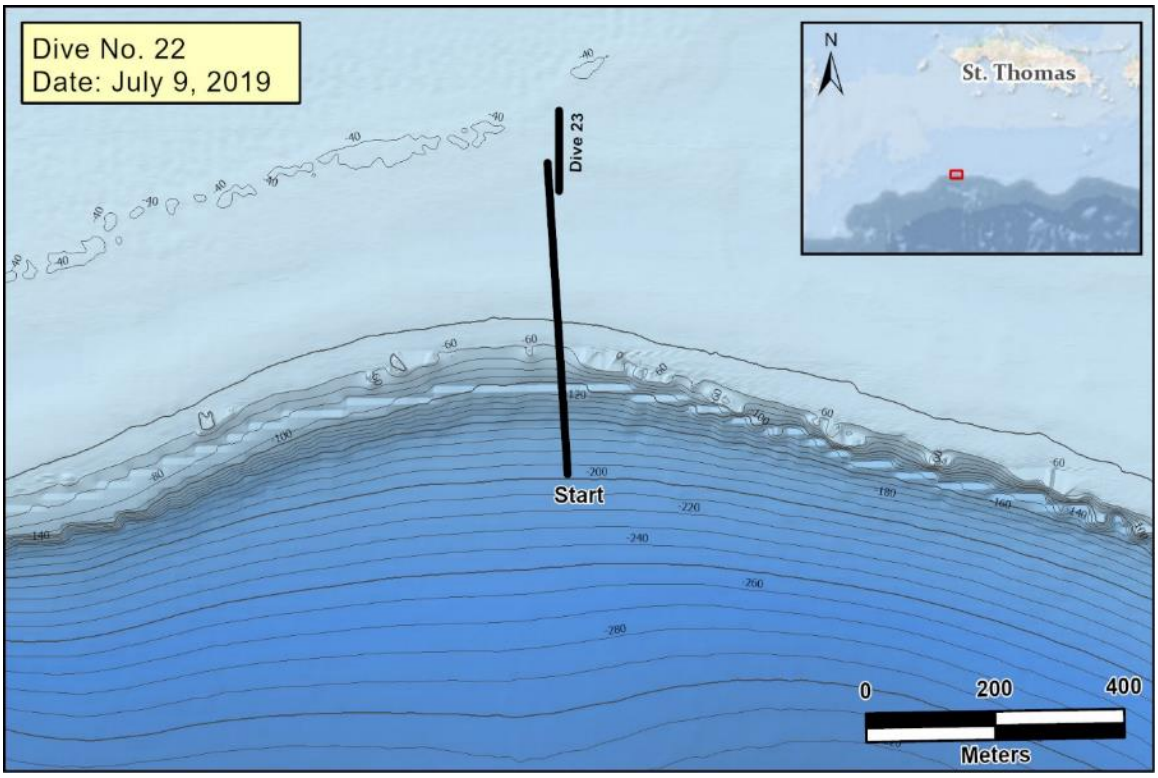
This dive had relatively sparse coral coverage along the wall, which was primarily populated by sponges. The only coral species along the wall were *Nicella* colonies. *Agaricia* was again documented at 97 m, which is deeper than its currently known range. Fish were relatively abundant this dive, species present included, lionfish, amberjack, several species of grouper, and a puffer fish, Bar Jack and Crevalle Jacks, as well as several species of small reef fish.



Dive 21 – Line 19 took place south of St. Thomas at depths ranging from 40-195 meters, using the ROV *Mohawk* aboard NOAA Ship *Nancy Foster*. A) *Xestospongia* sp. barrel sponge B) *Madracis* sp., *Agaricia* sp. red rope sponge, orange and white demosponges C) *Montastraea* sp. draping over a rock, *Orbicella* sp., *Agaricia* sp., small red demosponge, red rope sponge D) Antler sponges, leafy algae, orange elephant ear *Agelas* sp. E) *Nicella* sp., *Aplysina* sp. tube sponge, other demosponges, encrusting sponges and algae F) *Agaricia* sp., Geodiidae sponge, leafy algae and red demosponges possibly in the family Petrosiidae.

Dive 22 – Line 18
Start Coordinates: 18.2014, -65.0321
Depth Range: 42-206 m

Site ID: South St. Thomas
End Coordinates: 18.2054, -65.0324
Bottom Time: 1 hour 10 minutes

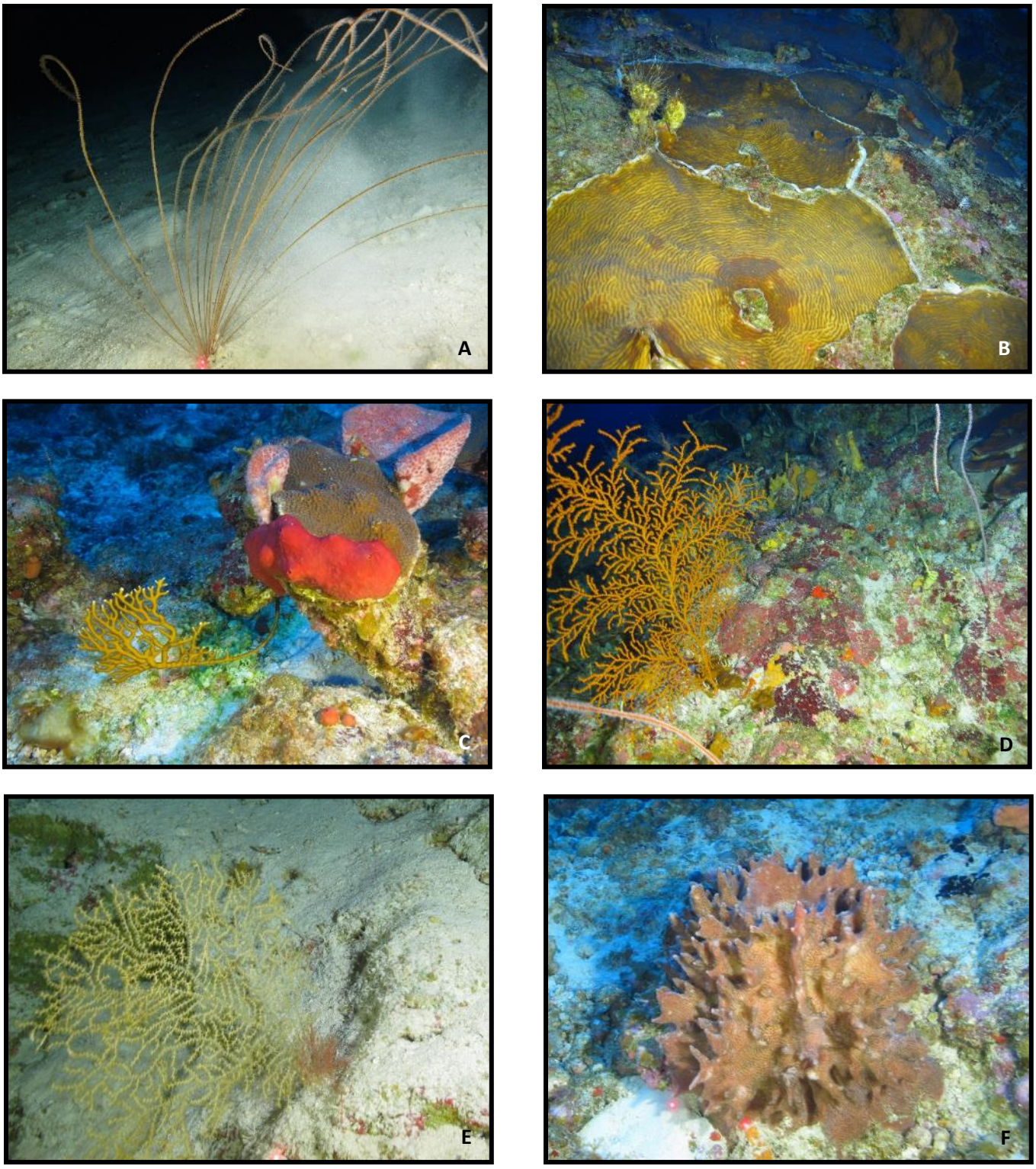


DIVE 22 - Line 18: South St. Thomas; July 9, 2019

Map Caption. *Dive 22 set out to survey features identified in multibeam data south of St. Thomas provided by the mapping team from this expedition. The multibeam data again showed a similar profile to the other dives thus far south of St. Thomas.*

Dive Summary:
The ROV was on bottom by 13:40 EDT. The dive duration was 1:10 (Hr:min). During the dive, a downward facing digital still was taken every three minutes at an altitude of 1.3 meters followed by a 360-degree rotation of the ROV to observe the surroundings. The dive began at 206m on sand with rubble and a gentle slope eventually leading to a rock wall with large pockmarks, crags, and overhangs. The top of the wall was around 83 meters after which the habitat switched to fields of algal nodules with patches of more rugose terrain featuring a plate coral-dominated mesophotic reef.

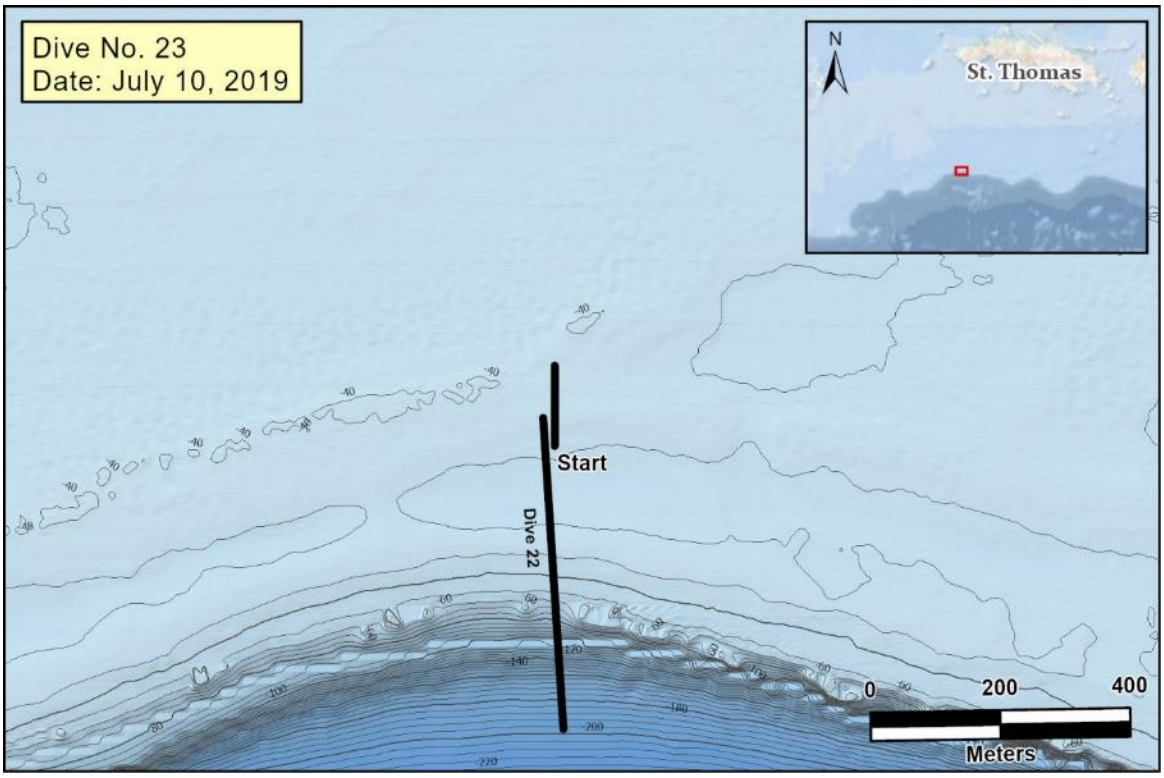
This dive had impressive coral coverage along the wall, which included an *A. furcata*-like black coral, *Paramuricea*, *Swiftia*, *Nicella* and several orange Plexauridae. The mesophotic community was dominated by *Agaricia*, and *Montastraea. Agaricia* was again documented deeper than its currently known range, with one documented at 96 meters. Fish were relatively abundant but not as notable as the previous two dives, noting only lionfish and several species of small reef fish.



Dive 22 – Line 18 took place south of St. Thomas at depths ranging from 42-206 meters, using the ROV *Mohawk* aboard NOAA Ship *Nancy Foster*. A) *Antipathes furcate* B) *Agaricia* sp. and yellow demosponges C) Fire coral, *Monastraea* sp., red Spirastrella, large plate-like demosponges D) Orange Plexauridae, *Ellisella* sp. sea whips, *Agaricia* sp., orange and yellow demosponges E) *Paramuricea* sp. F) *Xestospongia* sp.

Dive 23 – Line SFM
Start Coordinates: 18.2051, -65.0323
Depth Range: 43 m

Site ID: South St. Thomas
End Coordinates: 18.2051, -65.0323
Bottom Time: 30 minutes



DIVE 23 - Line SFM: South St. Thomas; July 10, 2019

Map Caption. *Dive 23 set out to attempt to conduct a seafloor matrix over a section of mesophotic reef marked during dive 22.*

Dive Summary:
Unfortunately, given a myriad of issues ranging from current to tracking issues, the attempt to conduct a SFM was abandoned and the ROV was recovered, though it sat on bottom for about 30 minutes attempting to run a grid pattern.

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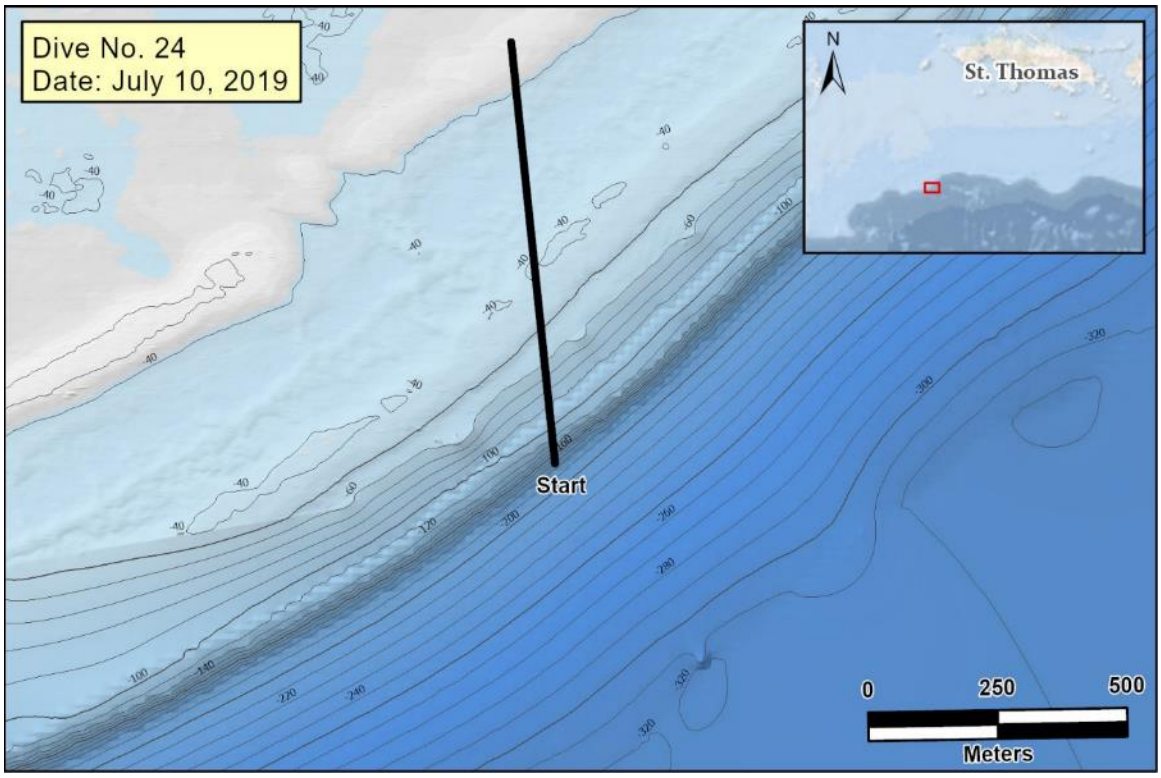
Dive 24 – Line 21
Start Coordinates: 18.1834, -65.0696
Depth Range: 32-190 m

Site ID: South St. Thomas
End Coordinates: 18.1901, -65.0704
Bottom Time: 1 hour 25 minutes

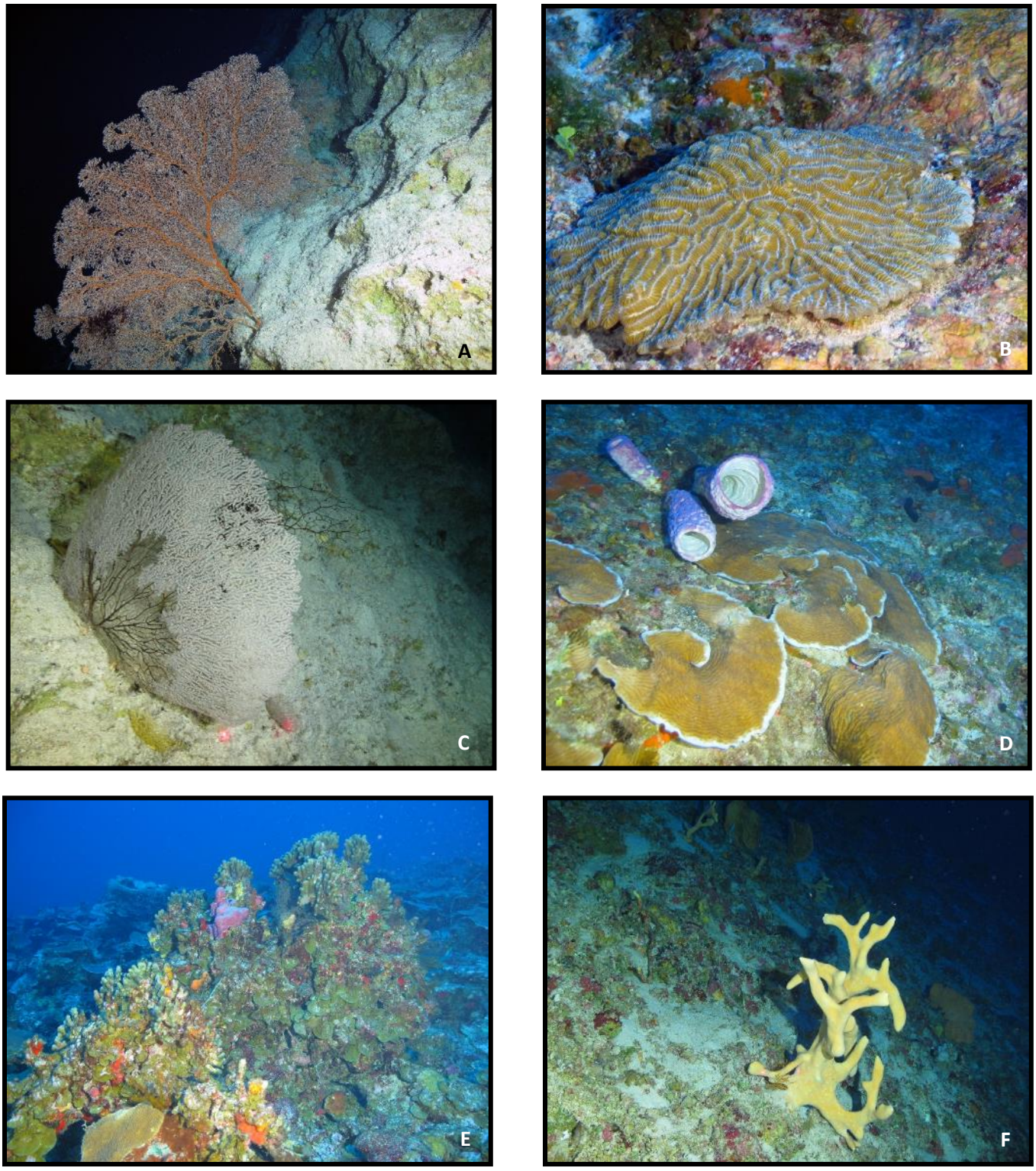


DIVE 24 - Line 21: South St. Thomas; July 10, 2019

Map Caption. *Dive 24 set out to survey features identified in multibeam data south of St. Thomas provided by the mapping team from this expedition. The multibeam data again showed a similar profile to the other dives thus far south of St. Thomas.*

Dive Summary:
The ROV was on bottom by 13:14 EDT. The dive duration was 1:25 (Hr:min). During the dive, a downward facing digital still was taken every three minutes at an altitude of 1.3 meters followed by a 360-degree rotation of the ROV to observe the surroundings. The dive began at 190m on sand with rubble and a gentle slope eventually leading to a rock wall with large pockmarks, crags, and overhangs. The top of the wall was reached around 83 meters, after which the habitat switched to fields of algal nodules with patches of more rugose terrain featuring a plate coral-dominated mesophotic reef.

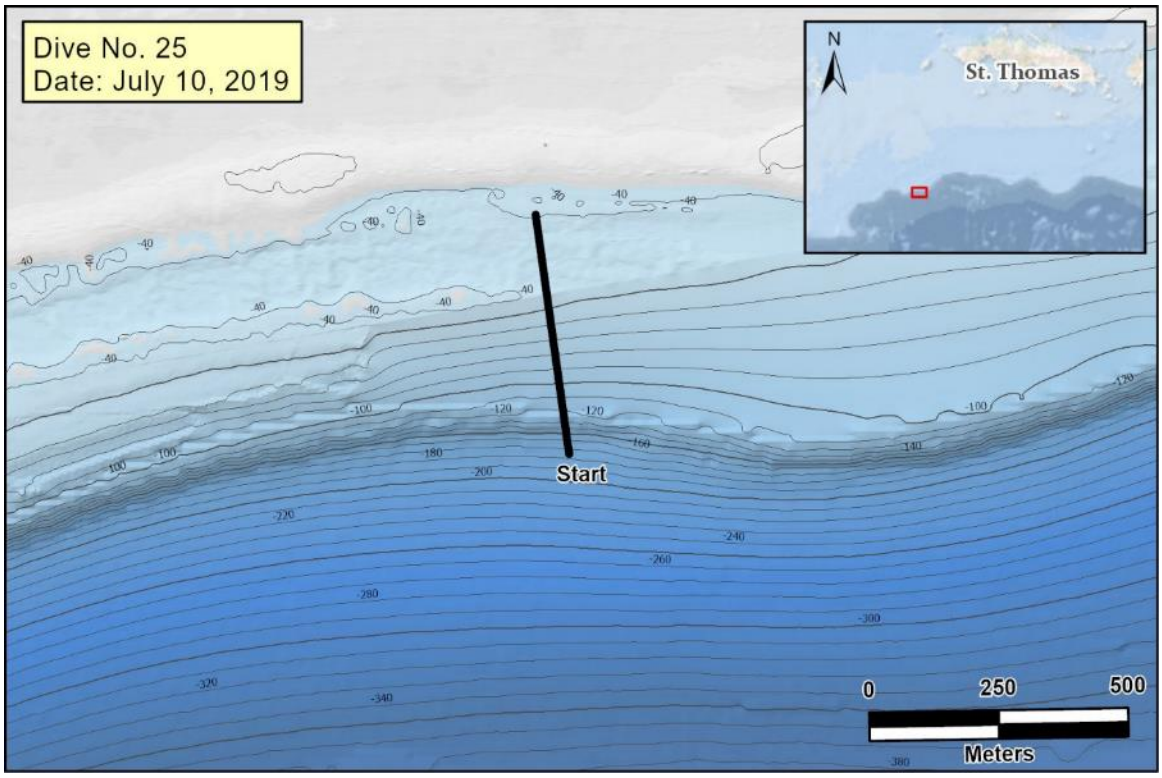
Prior to the wall, the corals present were primarily black corals, and an occasional *Villogorgia*. The main coral observed along the wall was the Orange Plexauridae that has been prevalent on these dives, while the majority of the wall was populated by a diversity of sponges. The mesophotic community was dominated by *Agaricia,* and *Montastraea*. Fish were relatively abundant on the top of the wall, and several grouper were observed, along with other small reef fish and a school of jacks.



Dive 24 – Line 21 took place south of St. Thomas at depths ranging from 32-190 meters, using the ROV *Mohawk* aboard NOAA Ship *Nancy Foster*. A) *Nicella* sp. B) *Meandrina meandrites* brain coral C) *Villogorgia* sp. with bare branches at the base, perhaps due to predation D) *Aplysina* sp. tube sponges, *Agaricia* sp. E) *Porites* sp. *Agaricia* sp., Antipatharia, *Montastraea* sp., numerous demosponges F) Antler sponge.

Dive 25 – Line 22
Start Coordinates: 18.1777, -65.0886
Depth Range: 38-186 m

Site ID: South St. Thomas
End Coordinates: 18.1815, -65.0891
Bottom Time: 1 hour 03 minutes

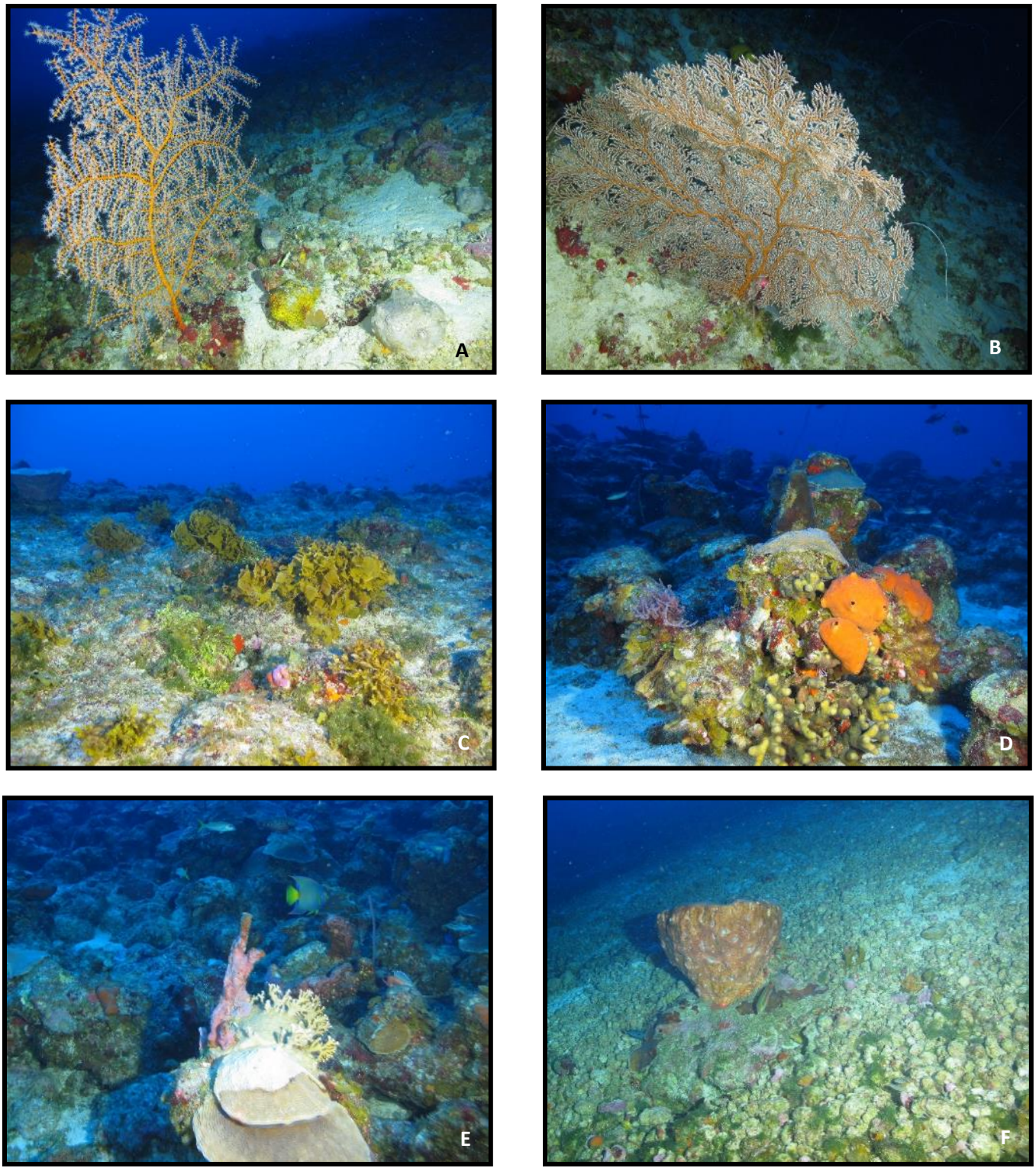


DIVE 25 - Line 22: South St. Thomas; July 10, 2019

Map Caption. *Dive 25 set out to survey features identified in multibeam data south of St. Thomas provided by the mapping team from this expedition. The multibeam data again showed a similar profile to the other dives thus far south of St. Thomas.*

Dive Summary:
The ROV was on bottom by 15:31 EDT. The dive duration was 1:03 (Hr:min). During the dive, a downward facing digital still was taken every three minutes at an altitude of 1.3 meters followed by a 360-degree rotation of the ROV to observe the surroundings. The dive began at 186m on sand with rubble and a gentle slope eventually leading to a rock wall with large pockmarks, crags, and overhangs. The top of the wall was reached around 79 meters after which the habitat switched to fields of algal nodules with patches of more rugose terrain featuring a plate coral-dominated mesophotic reef.

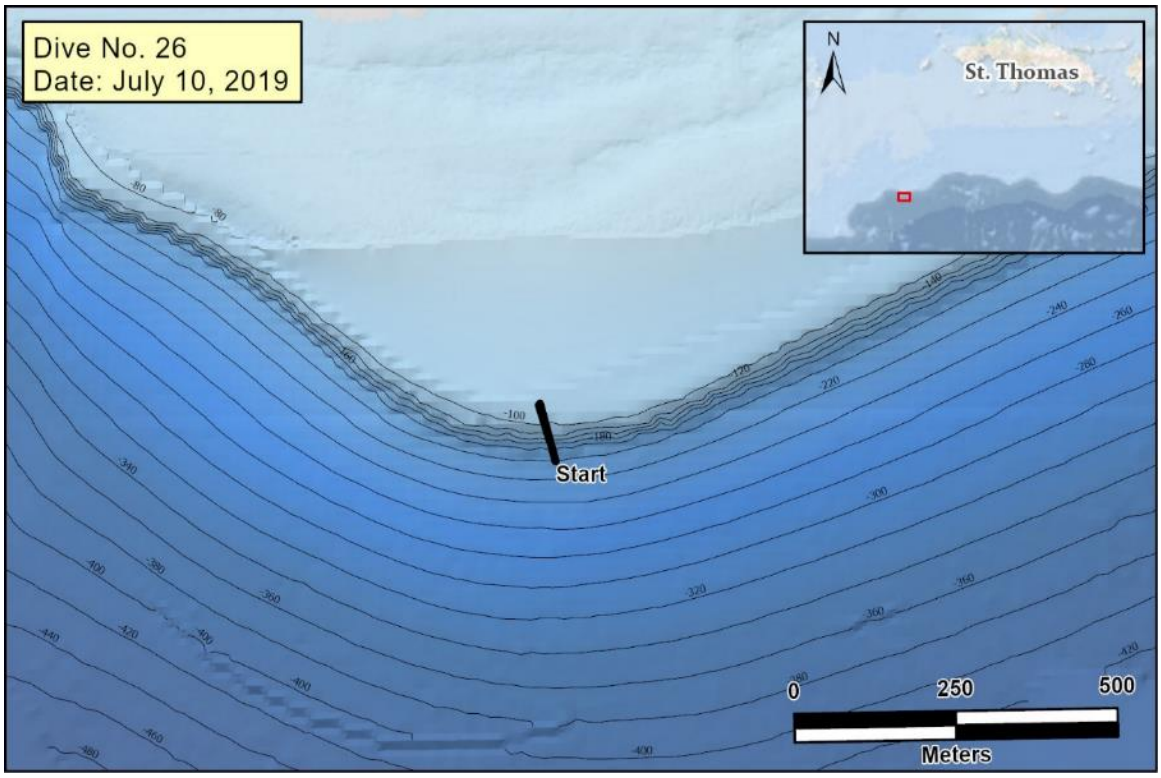
Prior to the wall, the corals present were a few *Swiftia*-like yellow gorgonians. The main coral observed along the wall was *Nicella*, including several large colonies. Just before the top of the wall was a large *Swiftia exserta* at 87 meters that was marked as a possible collection. While corals were present, the majority of the wall was populated by a diversity of sponges. The mesophotic community was dominated by *Agaricia*, *Orbicella* and *Montastraea*. Fish were relatively abundant on the top of the wall, and several groupers were observed along with other small reef fish and a school of snapper.



Dive 25 – Line 22 took place south of St. Thomas at depths ranging from 38-186 meters, using the ROV *Mohawk* aboard NOAA Ship *Nancy Foster*. A) *Swiftia exserta*, yellow and white demosponges, algal nodules B) *Nicella* sp., *Stichopathes* sp., *Ellisella* sea whips C) Lettuce algae D) *Madracis* sp., *Agaricia* sp., *Callyspongia* sp., orange demosponges, brown chimney sponge E) *Orbicella* reef with many reef fish, potentially diseased *Agaricia* sp., fire coral, purple tube sponge F) Large barrel sponge among algal nodules.

Dive 26 – Line 23
Start Coordinates: 18.1722, -65.1088
Depth Range: 90-195 m

Site ID: South St. Thomas
End Coordinates: 18.1727, -65.1089
Bottom Time: 21 minutes

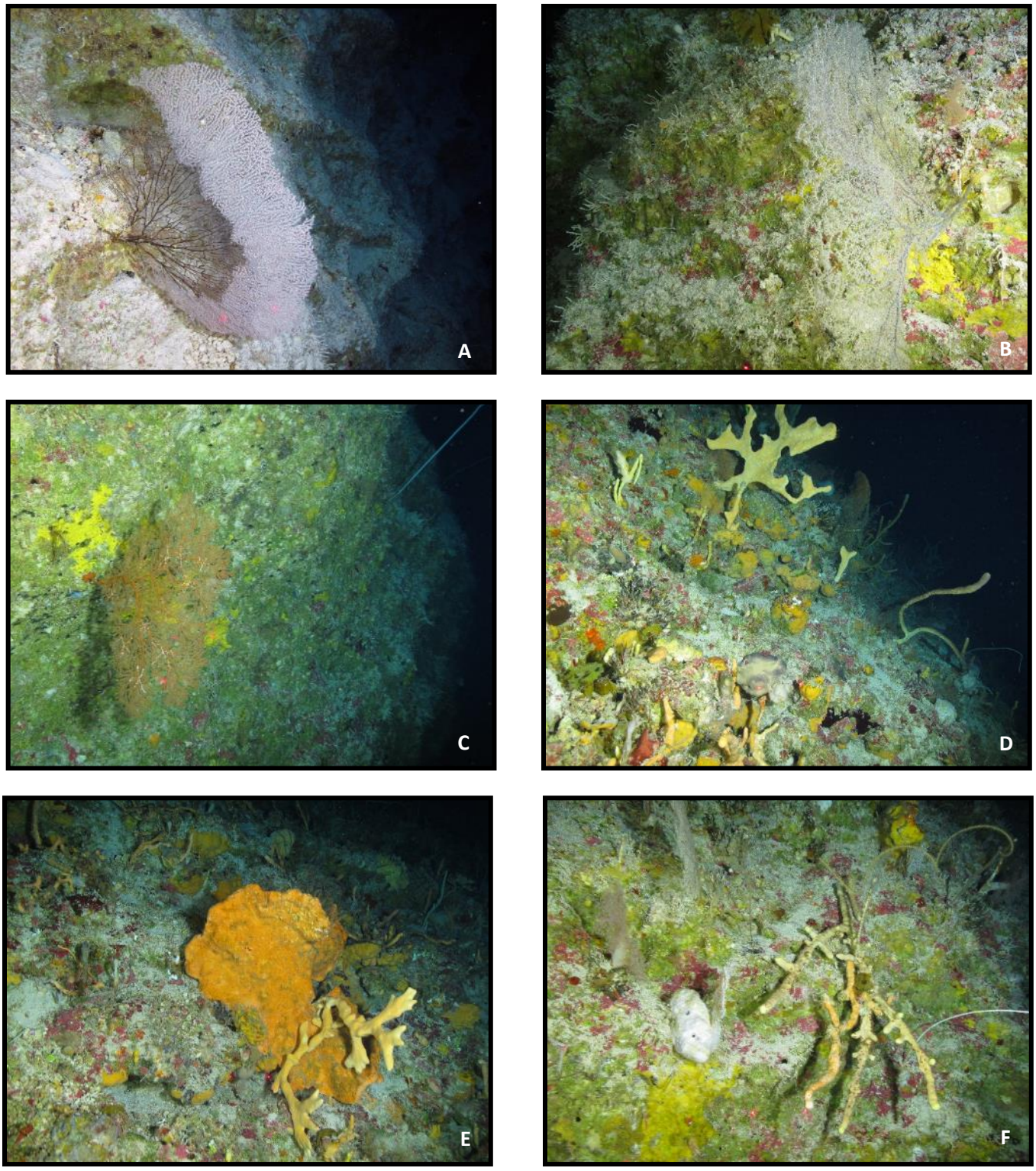


DIVE 26 - Line 23: South St. Thomas; July 10, 2019

Map Caption. *Dive 26 set out to survey features identified in multibeam data south of St. Thomas provided by the mapping team from this expedition. The multibeam data again showed a similar profile to the other dives thus far south of St. Thomas.*

Dive Summary:
The ROV was on bottom by 15:29 EDT. The dive duration was 0:21 minutes due to time constraints. During the dive, a downward facing digital still was taken every three minutes at an altitude of 1.3 meters followed by a 90-degree look turn in each direction to observe the surroundings. The dive began at 195m at the base of a rock wall and climbed as much of the wall as time would allow.

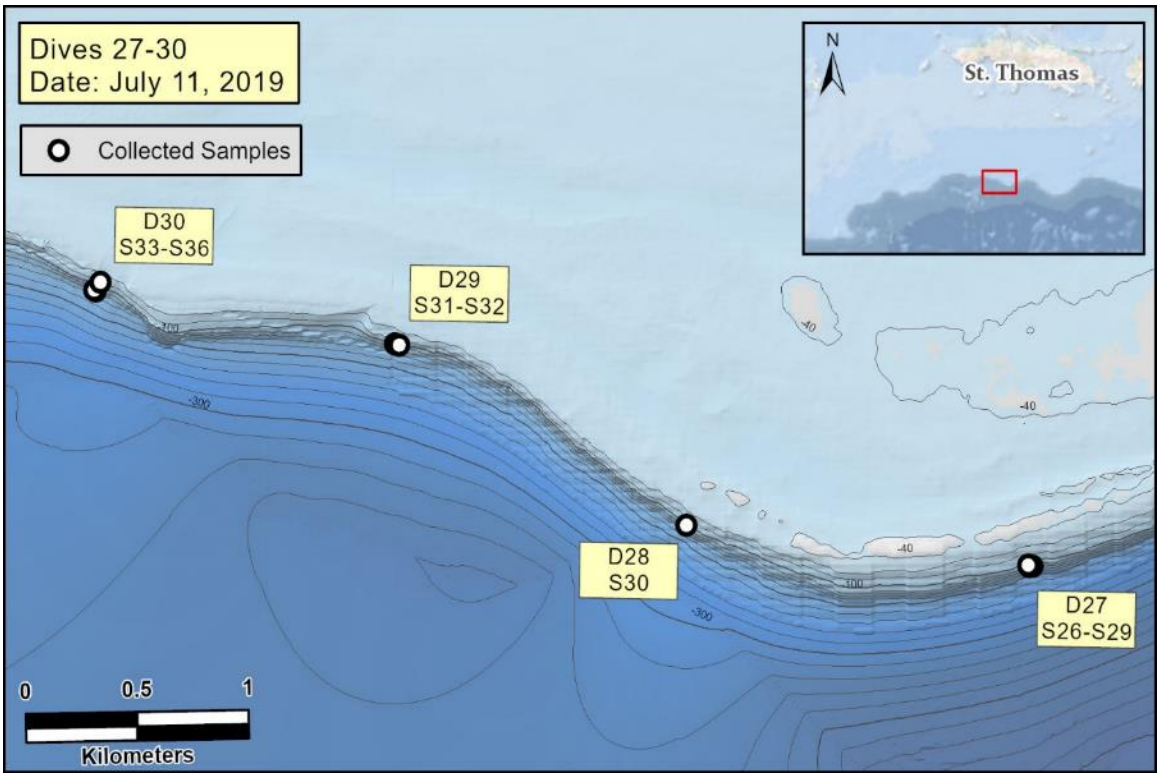
During the climb of the rock wall, several *Villogorgia* were observed, in addition to *Ellisella*, a black feather coral, and *Chironepthya*. Most notably, as time was expiring, several purple *Muricea* sp. were noted and marked for potential collection.



Dive 26 – Line 23 took place south of St. Thomas at depths ranging from 90-195 meters, using the ROV *Mohawk* aboard NOAA Ship *Nancy Foster*. A) Pale colored sea fan coral, with bare branches at the base possibly *Villogorgia* sp. B) *Ellisella* sp. C) *Nicella* sp. D) Antler sponges, *Aplysina* finger sponges, orange and yellow demosponges E) Orange elephant ear *Agelas* sponge, antler sponge, orange demosponges, *Aplysina* finger sponges F) *Stichopathes* sp., *Chironepthya* sp., *Aplysina* finger sponges, white demosponge, yellow demosponges, *Nicella* sp.

Dive 27 – Line 12
Start Coordinates: 18.1871, -64.9575
Depth Range: 109-121 m

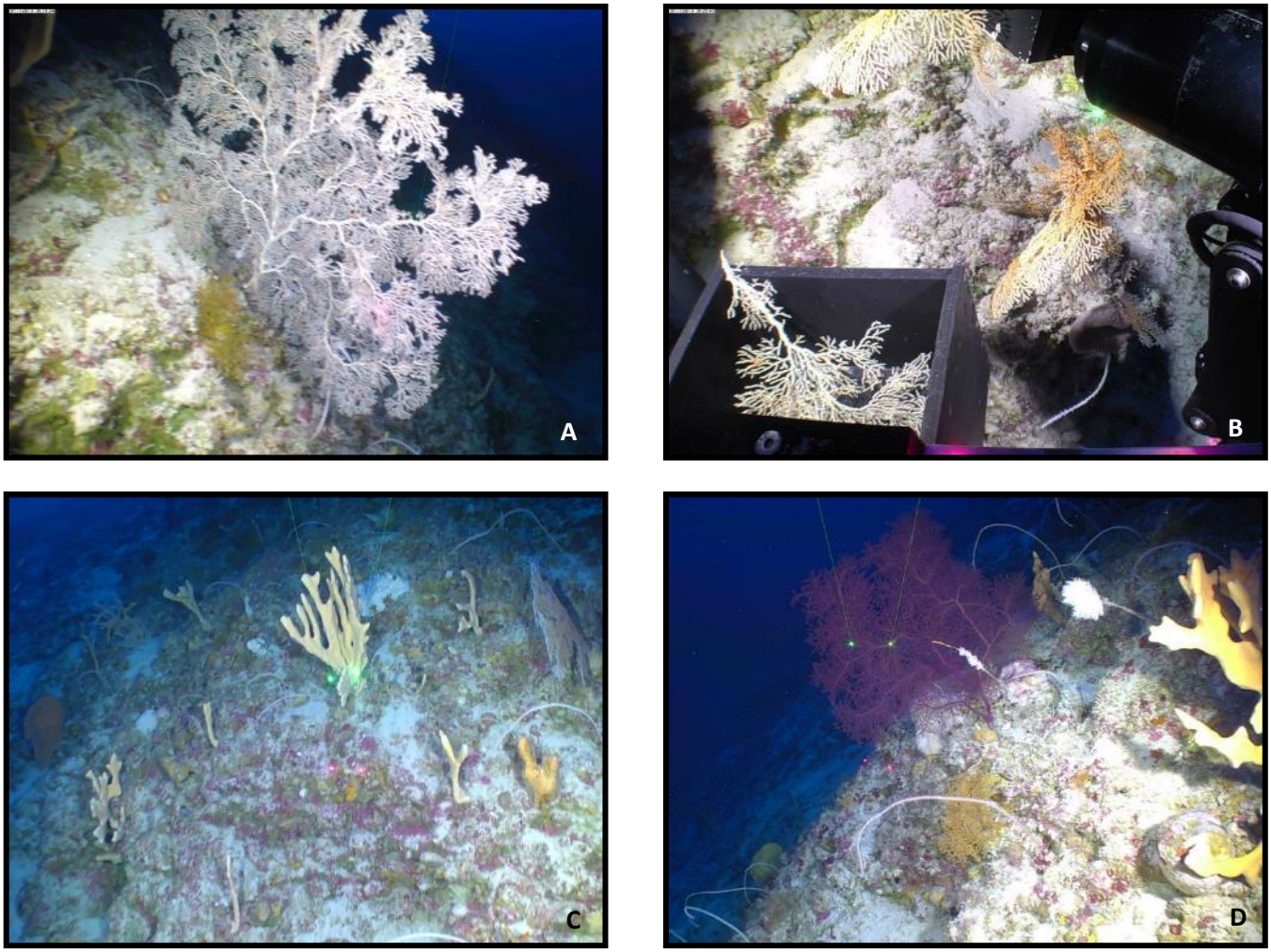
Site ID: St. Thomas
End Coordinates: 18.1871, -64.9577
Bottom Time: 22 minutes



SAMPLING DIVE 27 - Line 12: St. Thomas; July 11, 2019

Map Caption. *Dive 27 returned to the location of dive 15 where what was presumed to be Nicella sp. (white variant) and Muricea sp. were observed. The 4 samples collected on dive 27 are indicated with white dots near the D27 label.*

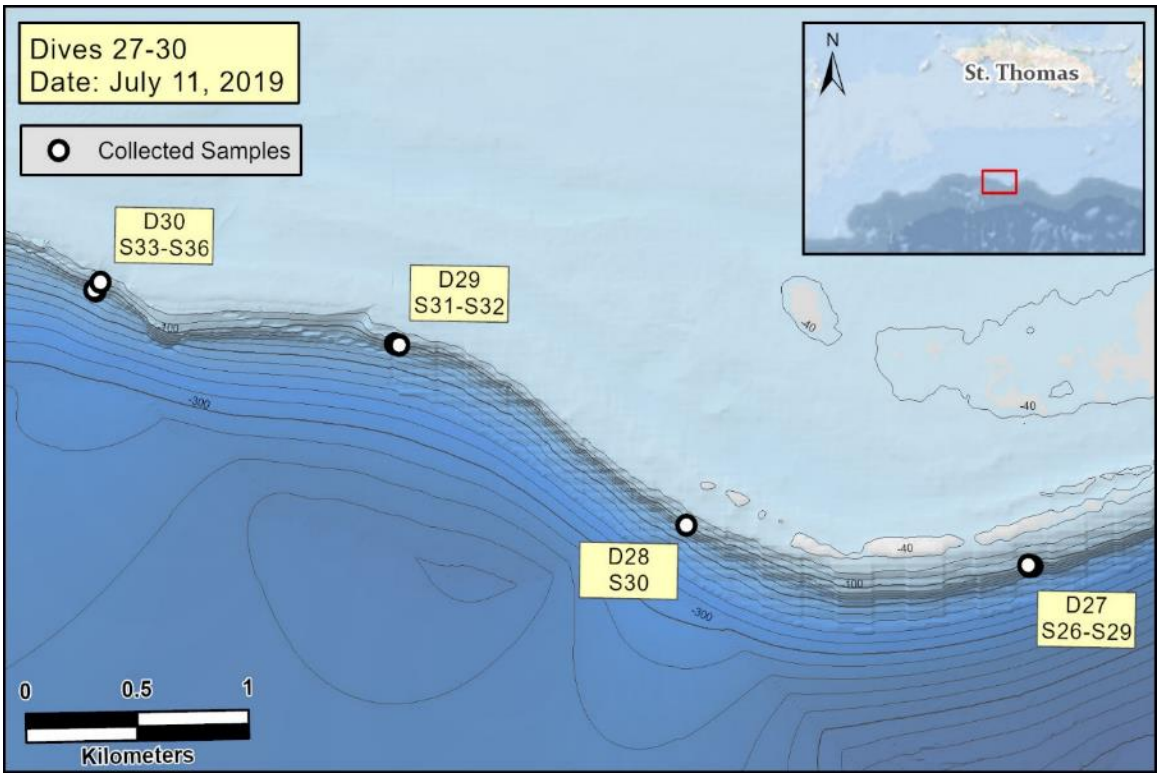
Dive Summary:
The ROV was on bottom by 08:15 EDT. The target specimen of *Nicella sp. (white variant)* and first sample of the dive was collected by 8:19 at a depth of 121 meters. Additional species were targeted opportunistically. A *Nicella* colony was collected at 8:25, an unidentified orange plex was collected at 8:33 and *Muricea* sp. colony was collected at 8:37 at 111 meters. The ROV returned to the surface after completing the collection of the *Muricea* sample.



Dive 27 – Line 12 took place at St. Thomas at depths ranging from 109-121 meters, using the ROV *Mohawk* aboard NOAA Ship *Nancy Foster.* A) *Nicella sp. (white variant) pendula* B) *Nicella* sp. C) Antler sponges, sea whips, orange elephant ear sponge, demosponge and *Nicella* sp. D) *Muricea* sp., orange Plexauridae, antler sponge, *Aplysina* finger sponges, Geodiidae sponge, sea whips and demosponges.

Dive 28 – Line 13
Start Coordinates: 18.1886, -64.9715
Depth Range: 118-118 m

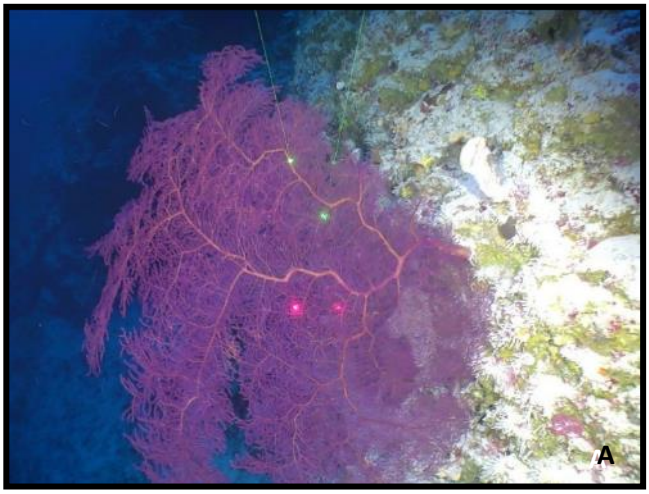
Site ID: St. Thomas
End Coordinates: 18.1886, -64.9715
Bottom Time: 04 minutes

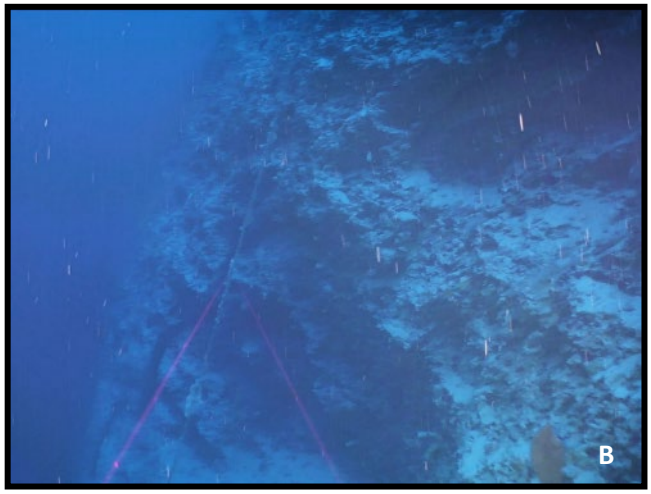


SAMPLING DIVE 28 - Line 13: St. Thomas; July 11, 2019

Map Caption. *Dive 28 returned to the location of dive 16 where Muricea sp. had been observed. The 1 sample collected on dive 28 is indicated with white dots near the D28 label.*

Dive Summary:
The ROV was on bottom by 09:36 EDT. Additional species were not pursued in an effort to increase the spatial coverage of the sampling effort. The ROV began its return to the ship by 9:40 EDT.

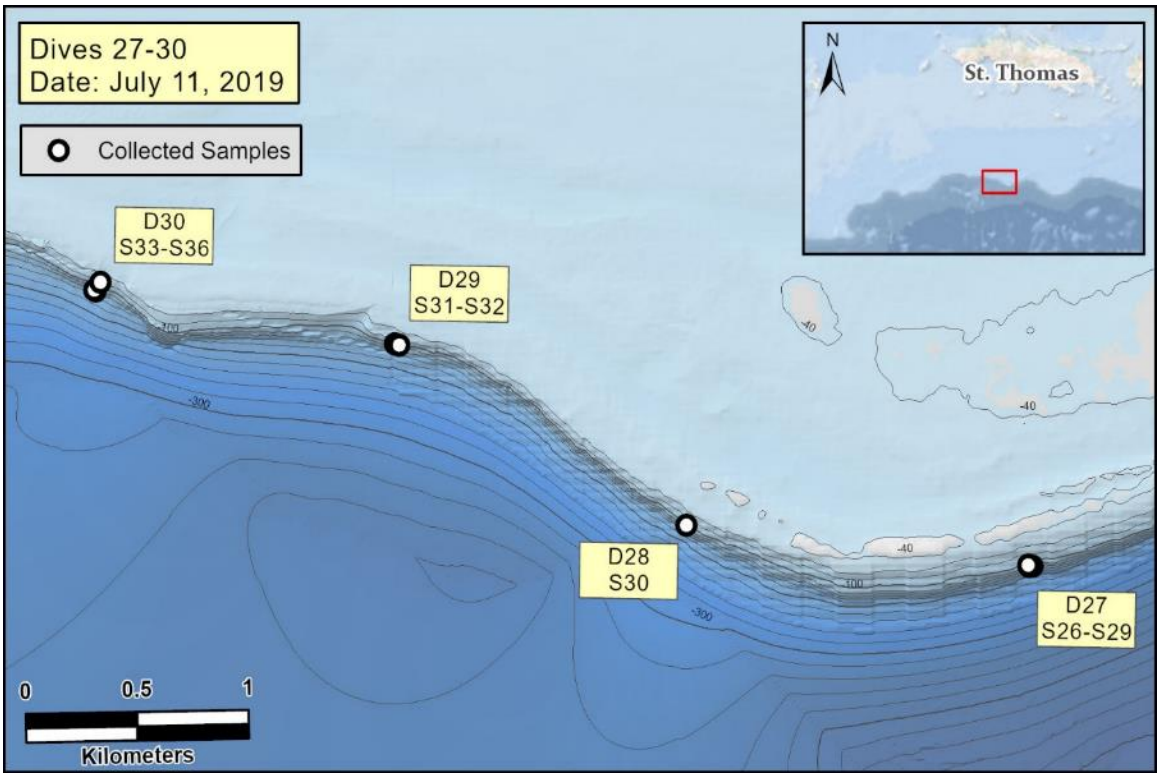




Dive 28 – Line 13 took place at St. Thomas at 118 meters, using the ROV *Mohawk* aboard NOAA Ship *Nancy Foster*. A) *Muricea* sp. B) View of wall being traversed by ROV.

Dive 29 – Line 14
Start Coordinates: 18.1953, -64.9833
Depth Range: 127-128 m

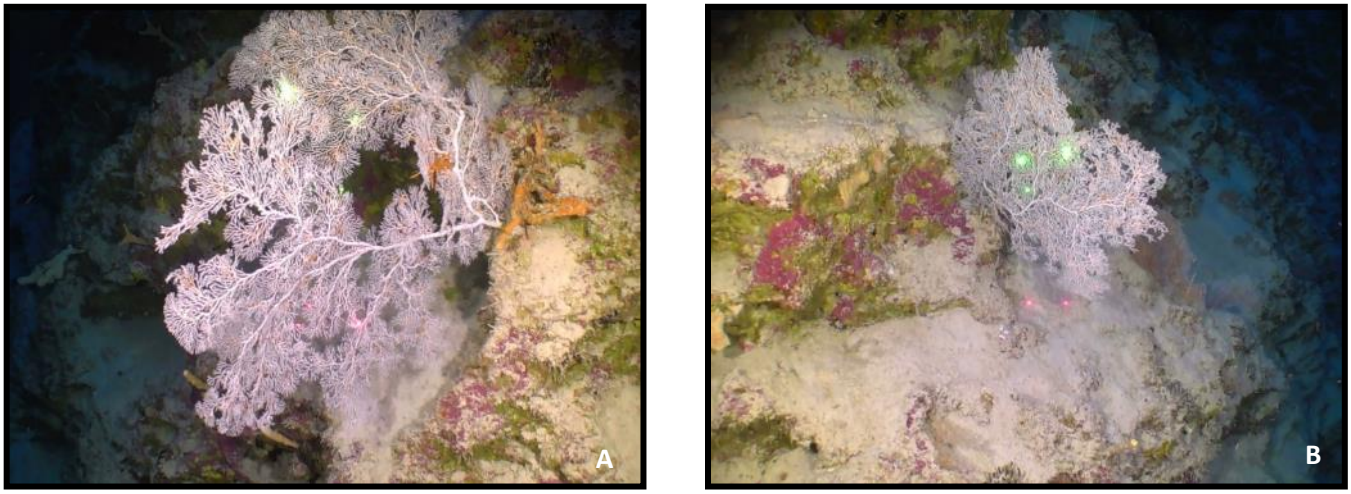
Site ID: South St. Thomas
End Coordinates: 18.1952, -64.9831
Bottom Time: 09 minutes



SAMPLING DIVE 29 - Line 14: South St. Thomas; July 11, 2019

Map Caption. *Dive 29 returned to the location of dive 17 where multiple Nicella sp. (white variant) colonies had been observed. The 2 samples collected on dive 29 are indicated with white dots near the D29 label.*

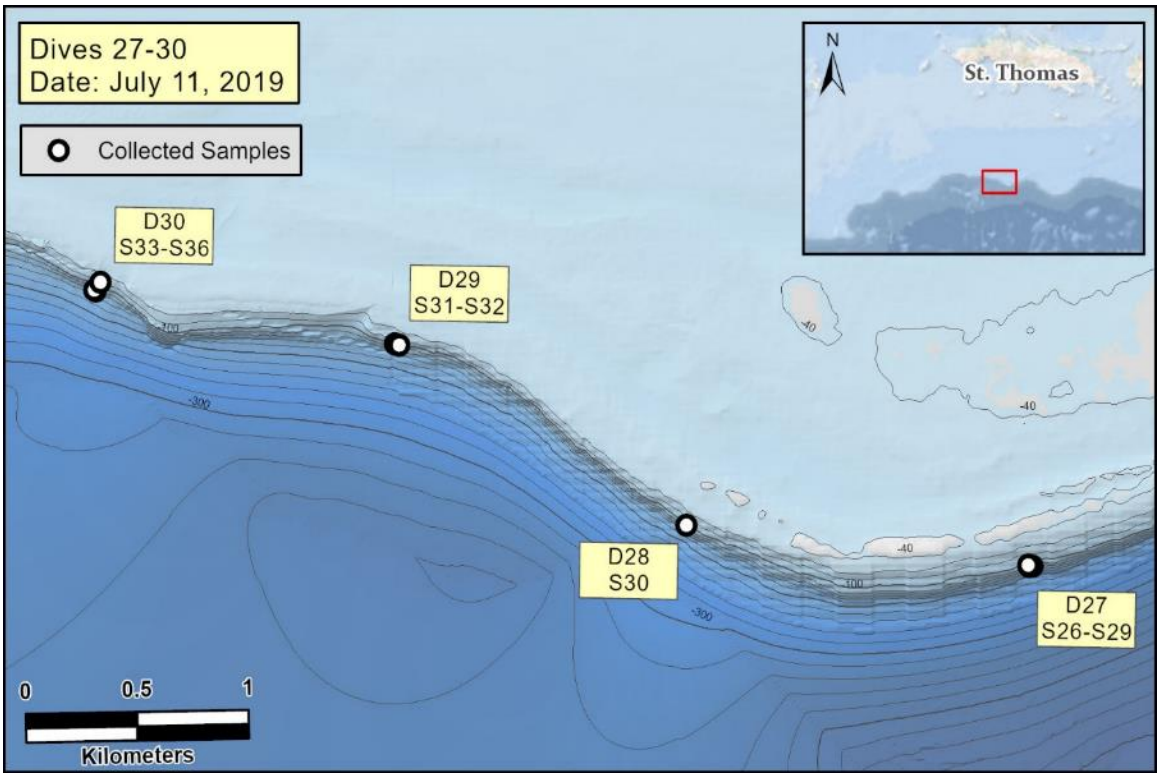
Dive Summary:
The ROV reached bottom by 10:35 EDT. The first colony of *Nicella sp. (white variant)* was collected by 10:37 EDT from a depth of 128 meters, additional species were not targeted on this dive, however a second colony of *Nicella sp. (white variant)* was collected at 10:42 from roughly the same depth before the ROV returned to the surface.



Dive 29 – Line 14 took place south of St. Thomas at depths ranging from 127-128 meters, using the ROV *Mohawk* aboard NOAA Ship *Nancy Foster*. A) *Nicella sp. (white variant)* sp. B) *Nicella sp. (white variant)* sp.

Dive 30 – Line 15
Start Coordinates: 18.1972, -64.9953
Depth Range: 98-154 m

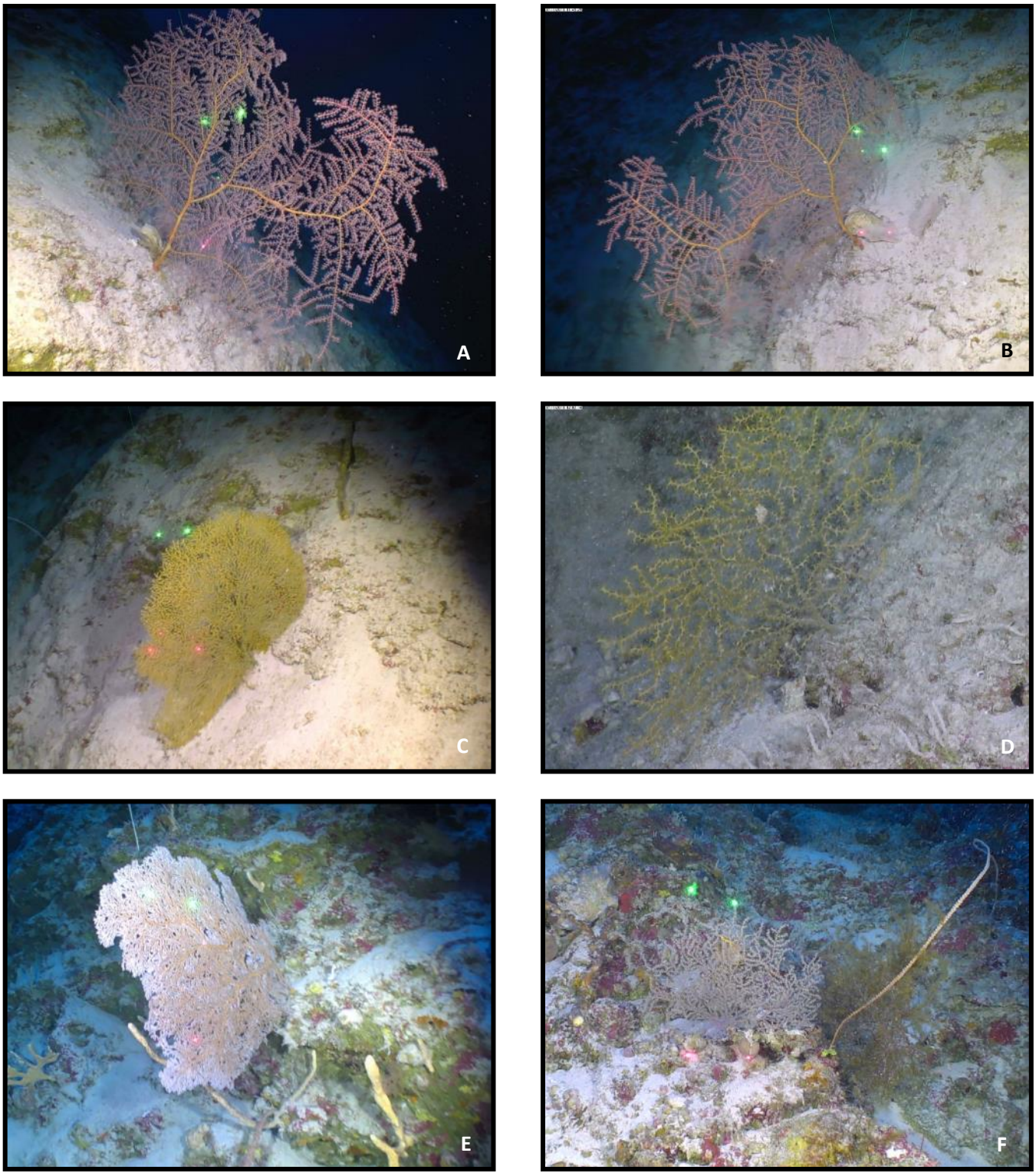
Site ID: South St. Thomas
End Coordinates: 18.1975, -64.9951
Bottom Time: 40 minutes



SAMPLING DIVE 30 - Line 15: South St. Thomas; July 11, 2019

Map Caption. *Dive 30 returned to the location of dive 18 where Swiftia exserta and a number of other species of interest had been observed. The 4 samples collected on dive 30 are indicated with white dots near the D30 label.*

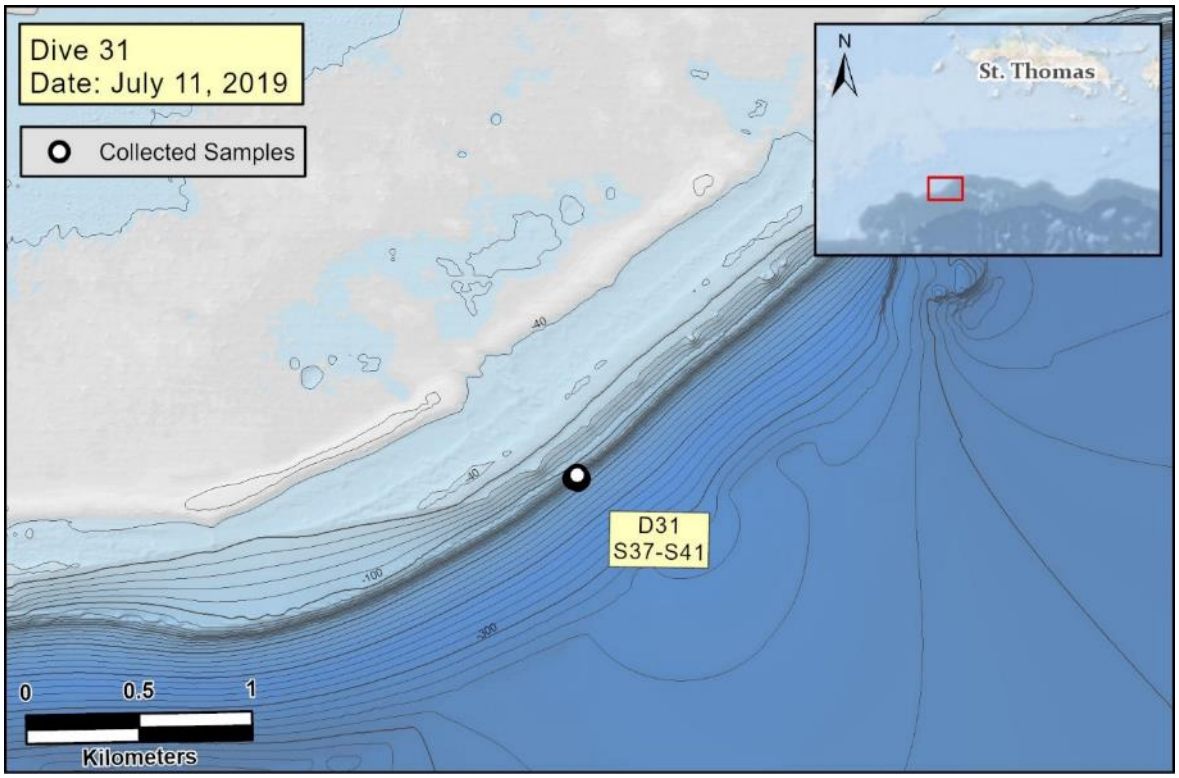
Dive Summary:
The ROV was on bottom by 11:48 EDT, and had found and collected the target specimen of *Swiftia exserta* by 11:51 at a depth of 154 meters. The ROV collected an additional *Paramuricea* specimen from the same depth at 11:57 and a *Scleracis* specimen at 12:00, both were collected at the same depth as the *Swiftia*. The ROV continued to ascend the associated wall and stopped to collect one final specimen of an unknown yellow Plexauridae at 12:28 at a depth of 98 meters. After this collection the ROV immediately began its ascent to the surface.



Dive 30 – Line 15 took place south of St. Thomas at depths ranging from 98-154 meters, using the ROV *Mohawk* aboard NOAA Ship *Nancy Foster*. A) *Swiftia exserta* B) *Swiftia exserta* C) *Paramuricea* sp. D) *Scleracis* sp. E) *Nicella* sp. among antler sponges and *Aplysina* finger sponges F) Yellow Plexauridae, *Ellisella* sea whip, and yellow feathery algae *Bryopsis* sp.

Dive 31 – Line 21
Start Coordinates: 18.1832, -65.0696
Depth Range: 144-175 m

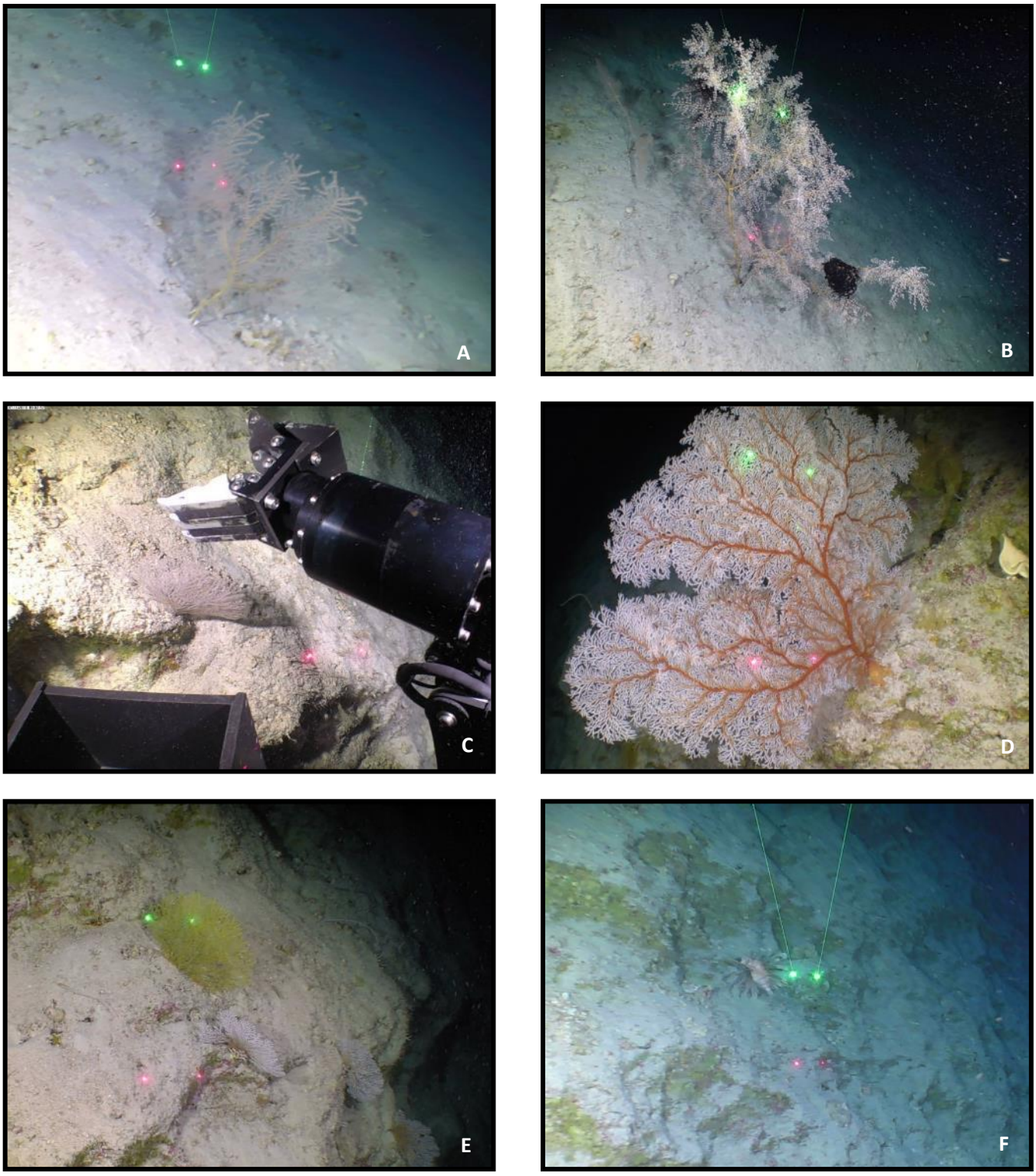
Site ID: South St. Thomas
End Coordinates: 18.1836, -65.0697
Bottom Time: 34 minutes



SAMPLING DIVE 31 - Line 21: South St. Thomas; July 11, 2019

Map Caption. *Dive 31, the final collection dive, was delayed until a target location with workable wind and current conditions could be found. The location was dive 24 with a diversity of taxa. The 5 samples collected on dive 31 are indicated with white dots near the D31 label.*

Dive Summary:
The ROV was on bottom by 15:43 and began its search for specimens at 175 meters depth. The original target of the dive was a series of black corals, which were not collected in lieu of building a higher diversity of octocoral specimens. A *Paramuricea* was the first target of the dive and collection was complete by 15:48. A *Chrysogorgia*-like colony was the next specimen sampled which was at 15:53. *Villogorgia* was sampled at 16:03 and *Nicella* sampled at 16:13. A final sample of *Paramuricea* was collected at 16:16. Immediately after collection was complete, the ROV returned to the surface.



Dive 31 – Line 21 took place south of St. Thomas at depths ranging from 144-175 meters, using the ROV *Mohawk* aboard NOAA Ship *Nancy Foster*. A) *Paramuricea* sp. B) Chrysogorgiidae and Primnoidae C) *Villogorgia* sp. D) *Nicella* sp. and a demosponge E) *Paramuricea* sp. and *Nicella* sp. F) Lionfish.

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