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Expedition Report: 2017 Southeast Deep Coral Initiative (SEDCI) expedition aboard NOAA Ship *Nancy Foster* (NF-17-08: August 12-31, 2017)

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Expedition Report: 2017 Southeast Deep Coral Initiative (SEDCI) expedition aboard NOAA Ship *Nancy Foster* (NF-17-08: August 12-31, 2017)

Daniel Wagner[1], Morgan Kilgour[2] & Peter J. Etnoyer[3]

[1] JHT, Incorporated, NOAA National Ocean Service, National Centers for Coastal Ocean Science, 219 Fort Johnson Road, Charleston, South Carolina 29412

[2] Gulf of Mexico Fishery Management Council, 2203 N Lois Avenue, Suite 1100, Tampa, Florida 33607

[3] NOAA National Ocean Service, National Centers for Coastal Ocean Science, 219 Fort Johnson Road, Charleston, South Carolina 29412

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National Ocean Service

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Expedition objectives

The objectives of the expedition were to survey, sample, and map deep-sea coral ecosystems in the eastern Gulf of Mexico and South Atlantic Bight between ~200-1000 m depths, focusing on priority areas identified by the Gulf of Mexico Fishery Management Council (GMFMC) and the South Atlantic Fishery Management Council (SAFMC). Specifically, this expedition sought to:

(1) conduct benthic surveys using a deep-water remotely operated vehicle (ROV) in areas that have been proposed for the establishment of new habitat areas of particular concern (HAPC) on the West Florida slope;
(2) collect biological specimens of deep-sea corals, sponges and their associated taxa using the manipulator arm of the ROV;
(3) collect multibeam bathymetry and backscatter data in areas that have not yet been mapped at a high resolution, focusing on areas of the West Florida slope and peripheries of existing coral HAPCs in the South Atlantic Bight;
(4) collect water samples and CTD data to support ongoing studies on seawater carbonate chemistry; and
(5) opportunistically collect water column acoustic data to characterize the relative abundance of pelagic fishes of the region.

Methodology

ROV seafloor surveys

Seafloor surveys were conducted on leg 1 of the expedition using the ROV *Odysseus* operated by Pelagic Research Services. During each seafloor survey, the ROV descended to the seafloor and transited at an altitude of 1-3 m off the bottom and a speed over ground of ~0.50 knots. The ROV was equipped with the following equipment that collected continuous data throughout each dive: (1) a high-definition, forward-looking camera (SubC 1Cam Alpha MK5 HD) that collected continuous video and photographs approximately every 5 seconds while the seafloor was in view, (2) parallel lasers projected 10 cm apart that were used to scale images collected by the camera, (3) a SBE 19plus SeaCat CTD profiler that collected conductivity, temperature, depth, salinity and dissolved oxygen every 0.25 seconds, and (4) a Trackpoint ultra-short baseline (USBL) sonar navigation system calculated the ROV's position in real time. The ROV-mounted CTD was only operational during some of the dives (1-4, 8, 12-14). Similarly, the USBL navigation system was only operational during the first four ROV dives of the expedition. For all other dives of the expedition (dives 5-14), ROV position was approximated using the ship position and heading, ROV tether length, ROV depth, as well as noteworthy features (e.g., ridges, mounds) seen during the dive that were cross-referenced with contours in existing multibeam data of the area.

On the first two ROV dives of the expedition, short transects, 5-15 minutes in duration and corresponding to a survey distance of ~100-300 m, were conducted at the beginning, middle, and end phases of each dive. During transects, the ROV was intended to transit at a constant altitude (~1 m), speed (~0.5 knots) and heading, with the camera maintaining a wide and fixed frame. However, strong currents hindered transiting at a constant height and speed over ground. As a result, the transect methodology was abandoned after the second dive of the expedition. Instead, scientists focused on taking photos approximately every 5 seconds while the ROV was moving consistently along the seafloor, and noting the predominant substrates encountered throughout each dive.

Specimen collections
A limited number of specimens were collected during seafloor surveys using the manipulator arm of the ROV *Odysseus*. For each collected specimen, the date, time (both in UTC), depth, latitude, and longitude (both from the ship position) were recorded at the time of collection. Once specimens were brought onto the deck of the ship, they were examined for commensal organisms, labeled, photographed, and inventoried into a database containing all relevant metadata. Any commensal organisms found on the specimens were separated and processed separately. Once photographed and labeled, specimens were preserved in non-denatured, 95% ethanol. Small clippings of most specimens were also preserved separately in 5% formalin, dry, liquid nitrogen, RNAlater® and Whatman Flinders Technology Associates (FTA®) cards.

Multibeam mapping surveys
Mapping operations consisted of collecting multibeam bathymetry and backscatter data with the ship's Kongsberg EM710 echosounder. During leg 1, mapping surveys were mostly conducted during nighttime or whenever the ROV was not in the water, and focused on areas in the 200-300 m depth range in the vicinity of proposed HAPCs on the West Florida slope. On leg 2, mapping surveys were conducted during both day and night, and focused on areas close to existing coral HAPCs off the south and east side of Florida at depths between 70-750 m. Additionally, leg 2 prioritized mapping shallow-water (<150 m) areas, as NOAA Ship *Nancy Foster* is one of the few ships in the NOAA fleet with mapping systems that can target these depths.

CTD casts and water sample collections
CTD casts were performed on both legs of the expedition in order to collect sound velocity profiles needed to calibrate the ship's multibeam echosounders, as well as to collect water column environmental data and seawater samples for carbon chemistry studies. CTD casts were conducted using the ship's SBE-32 Niskin bottle carousel with the attached SeaBird SBE 19 sensors. During each cast, continuous water column data on depth, fluorescence, salinity, and dissolved oxygen were collected. Additionally, during some CTD casts, 500 mL water samples were collected at predetermined depths between 20-1000 m, and preserved using 100 μL of saturated mercuric chloride for studies on seawater carbonate chemistry. These water samples were all sent to the U.S. Geological Survey Carbonate Analytical Laboratory in St. Petersburg after the expedition for measures on total alkalinity and total inorganic carbon. In addition to using the SBE-32 Niskin bottle carousel, during the second leg of the expedition some CTD casts were also performed using the underway CTD system of the ship. This system was not available during the first leg of the expedition, due to the space limitations on the deck caused by the large footprint of the ROV.

Water column acoustics surveys
The first leg of the expedition included the collection of water column acoustic data using the ship's Simrad EK60 fisheries acoustics suite. In general, water column acoustic data were collected at the same time as seafloor mapping surveys, and typically occurred at depths ranging between 200-300 m. Additionally, several targeted linear transects were conducted in each proposed HAPC. These ran from east to west, perpendicular to a deep ridge feature running from north to south near ~400-500 m depths, and over presumed *Lophelia pertusa* mound features.

Permits

Prior to the expedition, the expedition coordinator completed an informal consultation with Paula Whitfield, environmental officer at NOAA's National Centers for Coastal Ocean Science (NCCOS), under section 7 of the Endangered Species Act (ESA) in order to address any potential impacts on ESA-listed species and critical habitat. A letter of concurrence stating that the expedition will not adversely affect ESA-listed species, nor have insignificant effects on critical habitat, was issued on June 15, 2017. Additionally, the expedition coordinator contacted the NOAA Southeast Regional Office (SERO) prior to the expedition in order to obtain a permit to collect biological specimens during the expedition. A letter of acknowledgement allowing collection of biological specimens during the expedition was issued by SERO on July 13, 2017.

Expedition schedule

Expedition NF-17-08 consisted of two legs each targeting different geographic areas and different objectives (Figure 1). Leg 1 started in St. Petersburg, FL on August 12, and ended in St. Petersburg, FL on August 24. This first leg focused on surveying deep-water coral ecosystems on the West Florida Slope using a deep-water ROV in conjunction with mapping operations using the ship's multibeam and fisheries acoustics instruments. Leg 2 started in St. Petersburg, FL on August 27, and ended in Charleston, SC on August 31. The second focused on multibeam mapping and CTD operations off the south side of Florida and the *Oculina* Bank.

Table 1. Schedule of expedition NF-17-08 that surveyed deep-sea coral ecosystems on the West Florida Slope and South Atlantic Bight using ROV *Odysseus*, multibeam, mapping and CTD casts.

Date (UTC)	Locality	Operations
Leg 1 (August 12-24, 2017; St. Petersburg-St. Petersburg)		
8/12/2017	St. Petersburg	Departed at 1300 (EST), drills, multibeam
8/13/2017	Long Mound	ROV DIVE 1-2, CTD 1-2, multibeam
8/14/2017	Long Mound	ROV DIVE 2-2A, CTD 3-5, multibeam
8/15/2017	North Reed	ROV DIVE 3-4, CTD 6-7, multibeam
8/16/2017	Many Mounds	ROV DIVE 5-5A, CTD 8-10, multibeam
8/17/2017	North Reed	Boat transfer of ROV arm, ROV DIVE 6-7, multibeam
8/18/2017	North Reed	ROV DIVE 8-9, CTD 11, multibeam
8/19/2017	Many Mounds	ROV DIVE 10-11, CTD 12-13, multibeam
8/20/2017	Okeanos Ridge	ROV DIVE 12, CTD14, multibeam
8/21/2017	Transit	Transit to St. Petersburg for small boat transfer of injured crew
8/22/2017	North Wall	ROV DIVE 13, CTD 15-16, multibeam
8/23/2017	Okeanos Ridge	ROV DIVE 14, CTD 17, multibeam
8/24/2017	St. Petersburg	Arrived at 1100 (EST), unloaded gear and scientists
Leg 2 (August 24-27, 2017; St. Petersburg-Charleston)		
8/27/2017	St. Petersburg	Departed at 0800 (EST), briefings, transit to mapping site
8/28/2017	South Florida	Drills, multibeam, underway CTDs, multibeam
8/29/2017	*Oculina* Bank	Multibeam, underway CTDs, CTD 18, multibeam
8/30/2017	*Oculina* Bank	Multibeam, CTD 19, multibeam
8/31/2017	Charleston	Arrived at 1000 (EST)

Expedition map

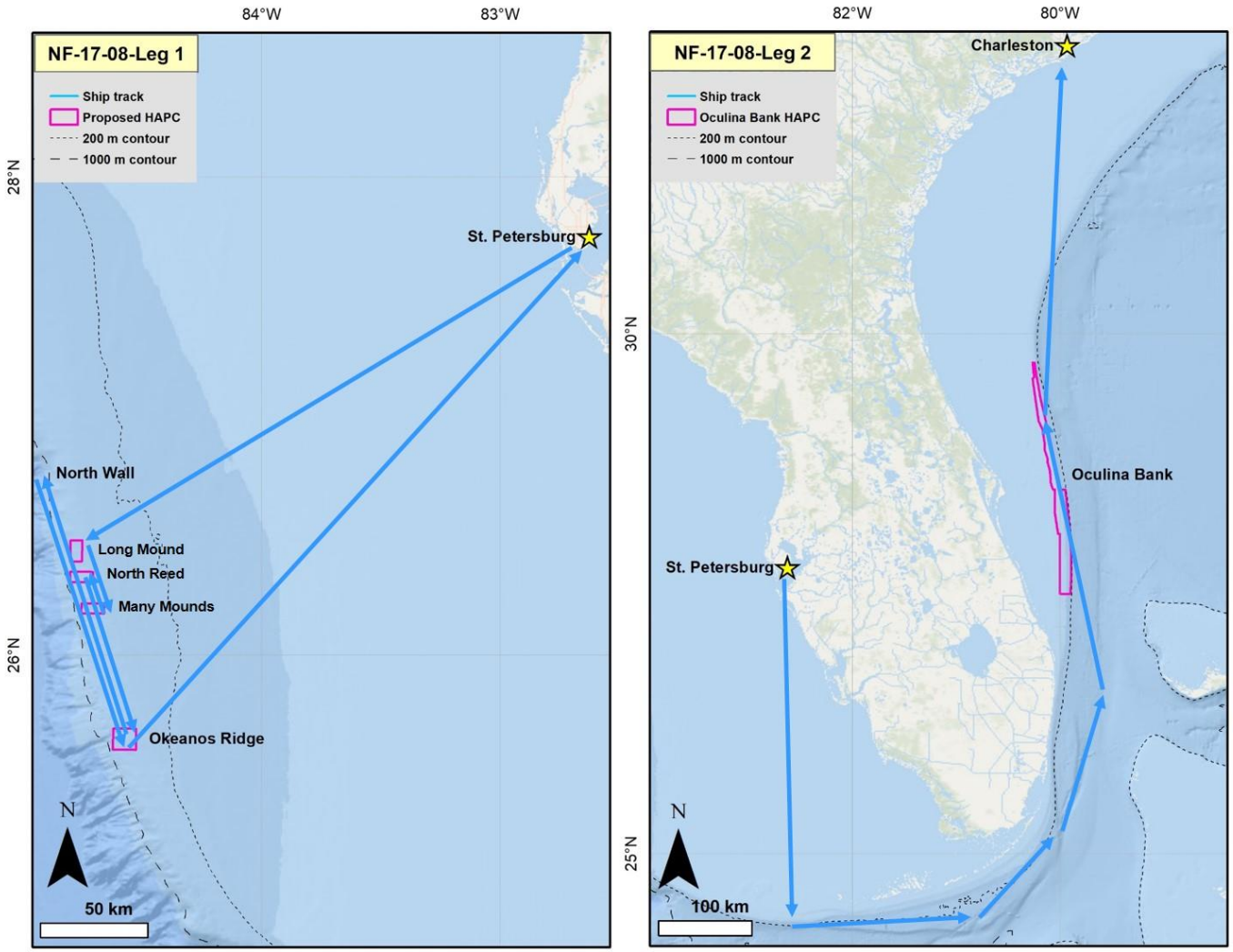


Figure 1. Map showing the operational area of both legs of expedition NF-17-08 aboard NOAA Ship *Nancy Foster* that surveyed deep-sea coral ecosystems on the West Florida Slope and South Atlantic Bight.

Expedition participants

The expedition included participation of scientists from numerous federal and academic institutions, including NOAA, Gulf of Mexico Fishery Management Council (GMFMC), South Atlantic Fishery Management Council (SAFMC), U.S. Geological Survey (USGS), Pelagic Research Services (PRS), Florida State University (FSU), University of South Florida (USF), College of Charleston (COC), Bethune-Cookman University (BCU), Florida A&M University (FAMU), Nelson Mandela University (NMU), Green Fire Productions (GP), and U.S. State Department Office of Marine Conservation (OMC) (Table 2; Figure 2).

Table 2. List of participants of the NF-17-08 expedition.

Name	Role	Affiliation	Email
Leg 1 (August 12-24, 2017; St. Petersburg-St. Petersburg)			
Peter Etnoyer	Chief scientist	NOAA	peter.etnoyer@noaa.gov
Daniel Wagner	Expedition coordinator	NOAA	daniel.wagner@noaa.gov
Matt Poti	Modeler	NOAA	matthew.poti@noaa.gov
John Gray	Mapper	USF	jwgray@mail.usf.edu
Ralf Meyer	Videographer	GP	ralfhmeyer@gmail.com
Heather Coleman	Media	NOAA	heather.coleman@noaa.gov
Sandra Brooke	Biologist	FSU	sbrooke@fsu.edu
Stacey Harter	Biologist	NOAA	stacey.harter@noaa.gov
Morgan Kilgour	Biologist	GMFMC	morgan.kilgour@gulfcouncil.org
Katharine Coykendall	Biologist	USGS	dcoykendall@usgs.gov
Jesse Doren	ROV team lead	PRS	jdoren@pelagic-services.com
Kris Ingram	ROV pilot	PRS	ingramck@yahoo.com
Erik Hodges	ROV pilot/ET	PRS	ess.ehodges@gmail.com
Paul Sanacore	ROV pilot/ET	PRS	paulsanacore@aol.com
Jonathan Gallant	ROV navigator	PRS	jonathan.gallant@terraremote.com
Leg 2 (August 27-31; St. Petersburg-Charleston)			
Daniel Wagner	Chief scientist	NOAA	daniel.wagner@noaa.gov
Scott Cross	Data manager	NOAA	scott.cross@noaa.gov
Rachel Bassett	Data manager	NOAA	rachel.bassett@noaa.gov
Chip Collier	Biologist	SAFMC	chip.collier@safmc.net
Katie Geddes	Media	NOAA	katie.geddes@noaa.gov
Zoleka Filander	Biologist	NMU	zfilander@gmail.com
Zach Proux	Mapper	COC	prouxzs@g.cofc.edu
Rachel Fein	Mapper	COC	feinrl@g.cofc.edu
Evalynn Barbare	Mapper	COC	barbareer@g.cofc.edu
Leah Fine	Media	OMC	leahrfine@gmail.com
Tyler Hansberry	Mapper	FAMU	tylerhansberry@yahoo.com
Mallory Brooks	Media/biologist	BCU	mallory.d.brooks@students.cookman.edu

Figure 2. Photograph of scientists that participated in (top) leg 1 and (bottom) leg 2 of the NF-17-08 expedition aboard NOAA Ship *Nancy Foster*. (Top) From left to right: Peter Etnoyer, Daniel Wagner, Jesse Doren, Paul Sanacore, Tracey Sorgenfrei (ship crew), Kris Ingram, Stacey Harter, Jonathan Gallant, Erik Hodges, Katharine Coykendall, Heather Coleman, John Gray, Sandra Brooke, Morgan Kilgour, and Matt Poti. (Bottom) Back row from left to right: Zach Proux, Zoleka Filander, Rachel Bassett, Mallory Brooks, Evalynn Barbare, Rachel Fein, Chip Collier. Front row from left to right: Katie Geddes, Scott Cross, Daniel Wagner, Tyler Hansberry, and Leah Fine.

Results

ROV seafloor surveys

The ROV was deployed a total of 14 times during leg 1 of the expedition, but only 13 of these reached the bottom, as DIVE06 was recovered before reaching the seafloor due to mechanical issues with the ROV (Table 3). During DIVE02 and DIVE05, the ROV was pulled off the bottom mid-dive, and towed to a nearby location for the latter portion of the dive. The second part of those dives were inventoried separately (called DIVE02A and DIVE05A, respectively), although the video overlay still displayed the original name of the dive on the screen (DIVE02 and DIVE 05). Depth ranges explored during the 13 ROV dives ranged from 380-710 m, and bottom times ranged from 0:58-7:51 h, yielding a total bottom time of 51:22 h for the expedition (Table 3). ROV dives were performed inside three areas that are currently being proposed for new HAPCs by the GMFMC, including Long Mound, North Reed, Many Mounds, as well as a fourth area, Okeanos Ridge, that the GMFMC may consider in the future for HAPC status (Figure 3). A single ROV dive was also performed at a fifth locality, which was informally referred to as North Wall (Figure 3). This locality was not originally included in the expedition schedule, but added due to bad weather in the southern portion of the operational area of the expedition. Dive summaries of all ROV dives performed during the expedition, which include narratives of the dives, dive track maps, highlight photos, and plots of the CTD data collected by the ROV are presented in Appendix 1. Preliminary, time-referenced observations made during for each dive are presented in Appendix 3.

Specimen collections

A total of 53 specimens were collected during the expedition using the manipulator arm of the ROV, including three rocks and 50 biological specimens (Table 4). The rock samples were all collected because they had corals growing on them, and therefore allowed for easier collection of their coral host, but were kept for future geological studies. The biological specimens included 37 specimens that were purposely collected, as well as 13 specimens that were incidentally collected as commensal organisms on other samples. Biological specimens included fragments of 24 scleractinian corals (23 *Lophelia pertusa* and one *Madrepora oculata*), five black corals (four *Leiopathes glaberrima* and one *Stichopathes* sp.), four plexaurid corals (three *Paramuricea* sp. and one *Muriceides* sp.), two primnoid corals (*Plumarella* sp.), two bamboo corals (Isididae and *Cheliodonisis* sp.), one unknown gorgonian, one stylasterid coral (Stylasteridae), three gastropods (*Coralliophila aberrans*), two polychaetes (*Eunice norvegica*), two squat lobsters, two anemones (*Eumunida picta*), one sponge (*Phakellia* sp.), and one zoanthid (Table 4). Of the 23 *L. pertusa* specimens that were collected, fragments of 13 of them were kept alive in aquaria.

Following the expedition, all collected specimens were sent to various institutions for future studies. Voucher specimens of corals, sponges and squat lobsters were sent to Peter Etnoyer at the NOAA Deep Coral Ecology Laboratory. Ethanol-preserved subsamples of *L. glaberrima* were sent to Iliana Baums at Pennsylvania State University for studies on population connectivity. Ethanol-preserved *Paramuricea* sp. subsamples were sent to Andrea Quattrini at Harvey Mudd College for studies on population connectivity. Dried subsamples of *L. glaberrima* and *Paramuricea* sp. were sent to Brendan Roark at Texas A&M University for studies on age and growth. Formalin-preserved coral samples were sent to Sandra Brooke at the Florida State University Coastal and Marine Laboratory for histological studies on reproduction. *L. pertusa* subsamples preserved in ethanol, RNAlater®, liquid nitrogen and/or FTA® cards were sent to

Cheryl Morrison and Christina Kellogg at the USGS Leetown Science Center for genomic sequencing, as well as for studies on associated bacterial communities. *E. norvegica* samples were sent to Sophie Arnaud at the French Research Institute for the Sustainable Exploitation of the Sea (IFREMER) for studies on population connectivity. *C. aberrans* samples were sent to Jerry Harasewych at the Natural Museum of Natural History, Smithsonian Institution for taxonomic identification. Live *L. pertusa* aquarium cultures were transferred to Sandra Brooke at the Florida State University Coastal and Marine Laboratory for studies on coral reproduction. Rock samples were sent to John Gray at the University of South Florida St. Petersburg for geological studies. An inventory of all specimens that were collected using the ROV is presented in Table 4, and Appendix 2 includes *in situ* and laboratory photos of all collected specimens.

Multibeam mapping surveys

The total area of seafloor mapped during the expedition was 2,752 km^2. This included 2,272 km^2 on the West Florida Slope mapped during leg 1, and 480 km^2 off the south side of Florida and the *Oculina* Bank mapped during leg 2 (Figure 4). The area mapped during leg 1 was mostly at depths ranging between 200-300 m, and included a continuous ridge feature at approximately 250 m depth that should be explored in the future. The area mapped on leg 2 was mostly at depths shallower than 150 m, and showed some relief in close proximity of the existing *Oculina* Bank Coral HAPC.

CTD casts and water sample collections

A total of 19 CTD casts were conducted during the expedition to collect continuous water column environmental data (Figure 5). Maximum depths of CTD casts ranged between 85-1,000 m (Table 5; Figures 6-8). Eight CTD casts were only performed to collect water column data to calibrate the ship's multibeam echosounders, whereas eleven casts included the collection of water samples for studies on seawater carbonate chemistry (Table 5). A total of 69 individual water samples were collected for these studies (Table 5). In addition to CTD casts using the ship's CTD-carousel, leg 2 of the expedition also included five deployments of the ship's underway CTD system in order to calibrate the multibeam echosounders. Representative CTD depth profiles plots for the various localities that were surveyed during the expedition are presented in Figures 6-8.

Water column acoustics surveys

Water column acoustic data were collected using the EK60 echosounder over a total linear distance of over 276 km, including 125 km surveyed in transit from St. Petersburg to the proposed HAPC survey sites, 31 km around Okeanos Ridge, 80 km between Long Mound and Many Mounds, and 40 km around North Wall (Figure 9).

ROV dive summary table

Table 3. Summary information for the dives conducted by the ROV *Odysseus* during leg 1 the NF-17-08 expedition. Note that DIVE06 was aborted before reaching the bottom due to mechanical issues with the ROV (*=ROV USBL navigation system operational; †=ROV-mounted CTD operational).

Dive 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)	Distance covered (m)	Specimens collected (including commensals and rocks)
NF1708-DIVE01 *,†	8/13/2017	Long Mound	26.4799	-84.7858	460	26.4789	-84.7833	434	4:21	1,160	0
NF1708-DIVE02 *,†	8/14/2017	Long Mound	26.3992	-84.7655	416	26.3950	-84.7643	450	4:10	1,528	0
NF1708-DIVE02A *,†	8/14/2017	Long Mound	26.3945	-84.7596	415	26.3876	-84.7591	406	3:20	915	0
NF1708-DIVE03 *,†	8/15/2017	North Reed	26.3204	-84.7422	400	26.3060	-84.7367	407	3:48	2,545	0
NF1708-DIVE04 *,†	8/15/2017	North Reed	26.3205	-84.7540	480	26.3140	-84.7575	525	3:03	1,146	0
NF1708-DIVE05	8/16/2017	Many Mounds	26.2090	-84.7030	380	26.1928	-84.6996	390	4:08	2,778	0
NF1708-DIVE05A	8/16/2017	Many Mounds	26.1861	-84.7030	415	26.1764	-84.7048	449	1:45	704	0
NF1708-DIVE06	8/17/2017	North Reed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0
NF1708-DIVE07	8/17/2017	North Reed	26.3390	-84.7602	506	26.3369	-84.7602	517	0:58	355	1
NF1708-DIVE08 †	8/18/2017	North Reed	26.3300	-84.7600	525	26.3370	-84.7590	500	2:09	317	14
NF1708-DIVE09	8/18/2017	North Reed	26.3407	-84.7639	530	26.3380	-84.7593	498	3:18	495	8
NF1708-DIVE10	8/19/2017	Many Mounds	26.2095	-84.7285	510	26.2048	-84.7285	494	3:40	1,164	13
NF1708-DIVE11	8/19/2017	Many Mounds	26.2120	-84.7145	345	26.2059	-84.7116	430	3:40	1,334	7
NF1708-DIVE12 †	8/20/2017	Okeanos Ridge	25.6719	-84.5913	592	25.6600	-84.5830	492	2:01	2,991	2
NF1708-DIVE13 †	8/22/2017	North Wall	26.7629	-84.8650	539	26.7890	-84.8804	710	7:51	4,138	2
NF1708-DIVE14†	8/23/2017	Okeanos Ridge	25.6520	-84.5582	450	25.6404	-84.5523	450	3:10	2,372	6
								TOTAL	**51:22**	**13,166**	**53**

ROV dive locations map

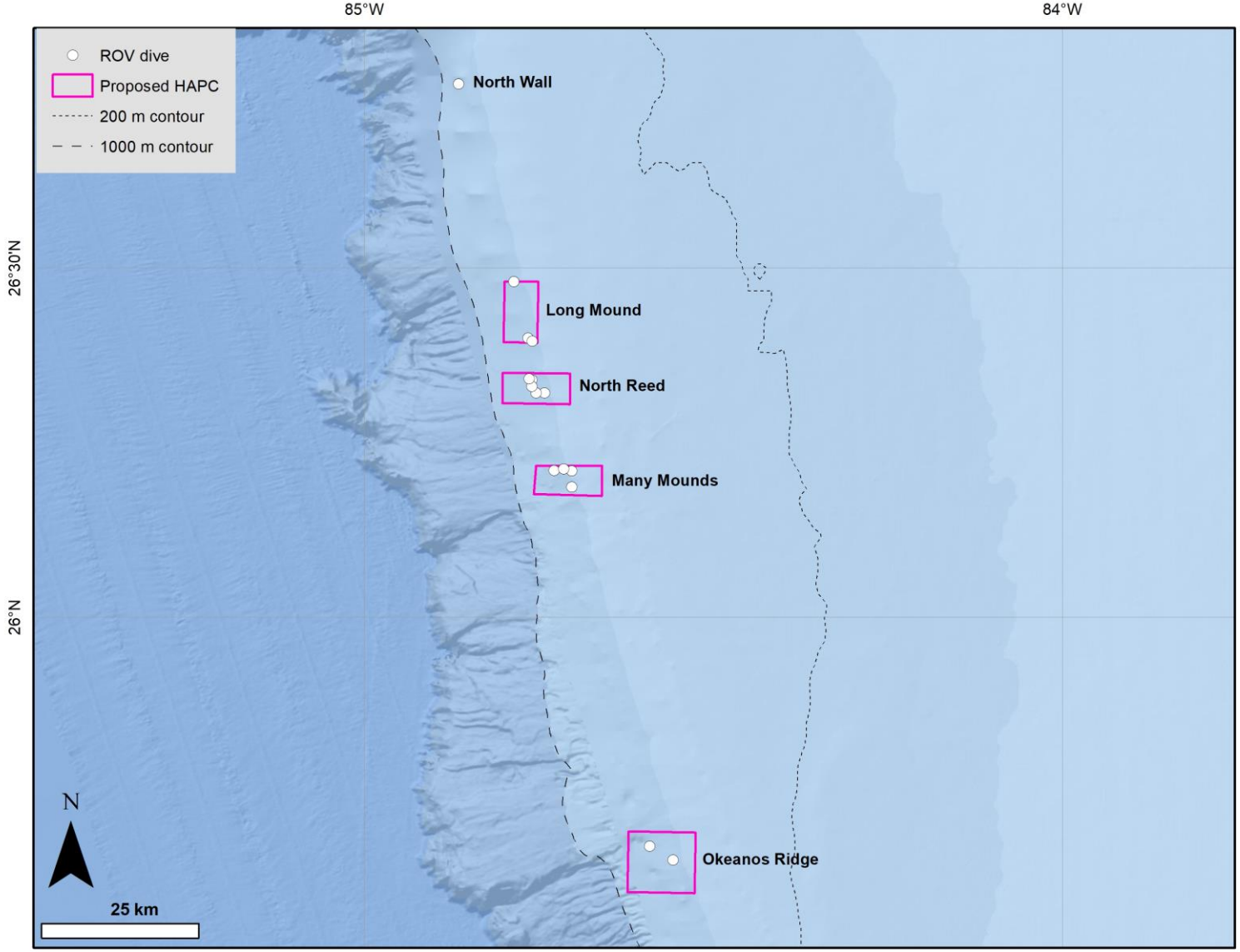


Figure 3. Map showing the location of the 13 dives conducted on the West Florida Slope by ROV *Odysseus* on Leg 1 of NF-17-08**.**

Specimen summary table

Table 4. Inventory of specimens collected using ROV *Odysseus* during leg 1 of the expedition. Note that latitudes and longitudes are from the ship navigation. Specimen NF1708-DIVE08-SPEC09 inadvertently came up on the sampling tray, and it was not possible to determine its sampling location and depth.

Sample ID	Scientific name	Date (UTC)	Time (UTC)	Locality	Latitude	Longitude	Depth (m)	Preservation							
								95% EtOH (voucher)	95% EtOH (small vial)	5% for--rmalin	Dry	Liquid N_2	FTA card	RNA later	Live
NF1708-DIVE07-SPEC01	*Leiopathes glaberrima*	8/17/2017	21:43	North Reed	26.33694	-84.76018	517	X	2X	X	X				
NF1708-DIVE08-SPEC01	*Lophelia pertusa*	8/18/2017	14:30	North Reed	26.33714	-84.75942	503					X	X		
NF1708-DIVE08-SPEC02	*Lophelia pertusa*	8/18/2017	14:43	North Reed	26.33714	-84.75942	503					X	X		X
NF1708-DIVE08-SPEC03	*Lophelia pertusa*	8/18/2017	14:59	North Reed	26.33714	-84.75942	503					X	X		
NF1708-DIVE08-SPEC04	*Lophelia pertusa*	8/18/2017	15:10	North Reed	26.33706	-84.75948	503								
NF1708-DIVE08-SPEC04-CO1	*Coralliophila aberrans*	8/18/2017	15:10	North Reed	26.33706	-84.75948	503		X						
NF1708-DIVE08-SPEC04-CO2	*Eunice norvegica?* (with *Lophelia pertusa*)	8/18/2017	15:10	North Reed	26.33706	-84.75948	503				X				
NF1708-DIVE08-SPEC05	*Paramuricea* sp.	8/18/2017	15:15	North Reed	26.33706	-84.75948	503	X	X	X					
NF1708-DIVE08-SPEC05-C01	*Plumarella* sp.	8/18/2017	15:15	North Reed	26.33706	-84.75948	503		2X						
NF1708-DIVE08-SPEC05-C02	*Muriceides* sp.	8/18/2017	15:15	North Reed	26.33706	-84.75948	503		X						
NF1708-DIVE08-SPEC05-C03	Unknown Gorgonacea	8/18/2017	15:15	North Reed	26.33706	-84.75948	503		X						
NF1708-DIVE08-SPEC06	*Lophelia pertusa*	8/18/2017	15:27	North Reed	26.33706	-84.75948	503			X			X	X	X
NF1708-DIVE08-SPEC07	*Lophelia pertusa*	8/18/2017	15:32	North Reed	26.33706	-84.75948	503					X	X	X	X
NF1708-DIVE08-SPEC08	*Lophelia pertusa*	8/18/2017	15:38	North Reed	26.33707	-84.75948	503			X			X	X	
NF1708-DIVE08-SPEC09	*Madrepora oculata*	8/18/2017	?	North Reed	?	?	?	X							
NF1708-DIVE09-SPEC01	*Lophelia pertusa*	8/18/2017	18:33	North Reed	26.34071	-84.76385	510		X	X			X	X	X
NF1708-DIVE09-SPEC02	*Lophelia pertusa*	8/18/2017	18:50	North Reed	26.34071	-84.76385	510		X	X			X	X	X
NF1708-DIVE09-SPEC03	*Lophelia pertusa*	8/18/2017	19:25	North Reed	26.34071	-84.76385	504		X	X		X	X		X
NF1708-DIVE09-SPEC04	*Lophelia pertusa*	8/18/2017	19:36	North Reed	26.34071	-84.76385	504		X	X			X	X	X

Sample ID	Scientific name	Date (UTC)	Time (UTC)	Locality	Latitude	Longitude	Depth (m)	Preservation							
								95% EtOH (voucher)	95% EtOH (small vial)	5% for--rmalin	Dry	Liquid N_2	FTA card	RNA later	Live
NF1708-DIVE09-SPEC05	*Lophelia pertusa*	8/18/2017	19:50	North Reed	26.34071	-84.76385	504		X	X			X		
NF1708-DIVE09-SPEC06	*Lophelia pertusa*	8/18/2017	20:02	North Reed	26.34071	-84.76385	500		X	X		X	X		
NF1708-DIVE09-SPEC07	*Leiopathes glaberrima*	8/18/2017	20:46	North Reed	26.33794	-84.75932	506	X	X	X	X				
NF1708-DIVE10-SPEC01	*Lophelia pertusa*	8/19/2017	13:41	Many Mounds	26.20755	-84.7261	480		X	X		X	X	X	
NF1708-DIVE10-SPEC02	*Lophelia pertusa*	8/19/2017	13:53	Many Mounds	26.20757	-84.72608	478		X	X		X	X		X
NF1708-DIVE10-SPEC02-C01	*Coralliophila aberrans*	8/19/2017	13:53	Many Mounds	26.20757	-84.72608	478		X						
NF1708-DIVE10-SPEC03	*Lophelia pertusa*	8/19/2017	14:05	Many Mounds	26.20759	-84.72604	479		X	X		X	X		X
NF1708-DIVE10-SPEC03-C01	*Eunice norvegica*	8/19/2017	14:05	Many Mounds	26.20759	-84.72604	479		X						
NF1708-DIVE10-SPEC03-C02	*Coralliophila aberrans* (N=3)	8/19/2017	14:05	Many Mounds	26.20759	-84.72604	479		X						
NF1708-DIVE10-SPEC04	*Lophelia pertusa*	8/19/2017	14:16	Many Mounds	26.20759	-84.72605	476			X					X
NF1708-DIVE10-SPEC05	*Lophelia pertusa*	8/19/2017	14:18	Many Mounds	26.20759	-84.72605	476		X	X		X	X		X
NF1708-DIVE10-SPEC05	Chirostyloidea	8/19/2017	14:18	Many Mounds	26.20759	-84.72605	476		X						
NF1708-DIVE10-SPEC06	*Lophelia pertusa*	8/19/2017	14:36	Many Mounds	26.20758	-84.72606	478		X				X		
NF1708-DIVE10-SPEC07	*Paramuricea* sp.	8/19/2017	15:00	Many Mounds	26.20576	-84.72679	506	X	X	X	X				
NF1708-DIVE10-SPEC07-C01	Zoanthid	8/19/2017	15:00	Many Mounds	26.20576	-84.72679	506		X						
NF1708-DIVE10-SPEC07-C02	Crustacean	8/19/2017	15:00	Many Mounds	26.20576	-84.72679	506		X						
NF1708-DIVE10-SPEC08	*Lophelia pertusa* (pink)	8/19/2017	15:48	Many Mounds	26.40475	-84.7285	496		X	X		X	X	X	X
NF1708-DIVE11-SPEC01	*Phakellia* sp.	8/19/2017	19:36	Many Mounds	26.20852	-84.71134	432	X							
NF1708-DIVE11-SPEC02	*Plumarella* sp.	8/19/2017	19:38	Many Mounds	26.20852	-84.71134	432	X	X						
NF1708-DIVE11-SPEC03	Stylasteridae	8/19/2017	19:44	Many Mounds	26.20852	-84.71134	432		X		X				
NF1708-DIVE11-SPEC03GEO	Rock	8/19/2017	19:44	Many Mounds	26.20852	-84.71134	432				X				
NF1708-DIVE11-SPEC04	*Lophelia pertusa*	8/19/2017	20:29	Many Mounds	26.20725	-84.71101	432		X	X		X	X	X	X
NF1708-DIVE11-SPEC05	*Leiopathes glaberrima*	8/19/2017	21:15	Many Mounds	26.20588	-84.71156	430	X	2X	X	X				
NF1708-DIVE11-SPEC05-C01	Chirostyloidea	8/19/2017	21:15	Many Mounds	26.20588	-84.71156	430		X						

Sample ID	Scientific name	Date (UTC)	Time (UTC)	Locality	Latitude	Longitude	Depth (m)	Preservation							
								95% EtOH (voucher)	95% EtOH (small vial)	5% for--rmalin	Dry	Liquid N_2	FTA card	RNA later	Live
NF1708-DIVE11-SPEC05-C02	*Lophelia pertusa*	8/19/2017	21:15	Many Mounds	26.20588	-84.71156	430		X	X	X		X		
NF1708-DIVE12-SPEC01	*Lophelia pertusa*	8/20/2017	14:38	Okeanos Ridge	25.66988	-84.58431	521		X	X		X	X	X	X
NF1708-DIVE12-SPEC02	Isididae	8/20/2017	15:01	Okeanos Ridge	25.66941	-84.58402	515	X	X	X	X				
NF1708-DIVE13-SPEC01	*Stichopathes* sp.	8/22/2017	19:44	North Wall	26.78709	-84.87914	690	X	X	X					
NF1708-DIVE13-SPEC01GEO	Rock	8/22/2017	19:44	North Wall	26.78709	-84.87914	690				X				
NF1708-DIVE14-SPEC01	*Paramuricea* sp.	8/23/2017	13:25	Okeanos Ridge	25.65079	-84.55575	454	X	2X	X	X				
NF1708-DIVE14-SPEC01-C01	Commensal anemone	8/23/2017	13:25	Okeanos Ridge	25.65079	-84.55575	454		X						
NF1708-DIVE14-SPEC01-C02	Commensal anemone	8/23/2017	13:25	Okeanos Ridge	25.65079	-84.55575	454		X						
NF1708-DIVE14-SPEC02	*Chelidonisis* sp.	8/23/2017	13:41	Okeanos Ridge	25.64975	-84.55533	443	X	2X	X					
NF1708-DIVE14-SPEC03	*Leiopathes glaberrima*	8/23/2017	15:55	Okeanos Ridge	25.64036	-84.55229	446	X	2X	X	X				

Seafloor multibeam surveys map

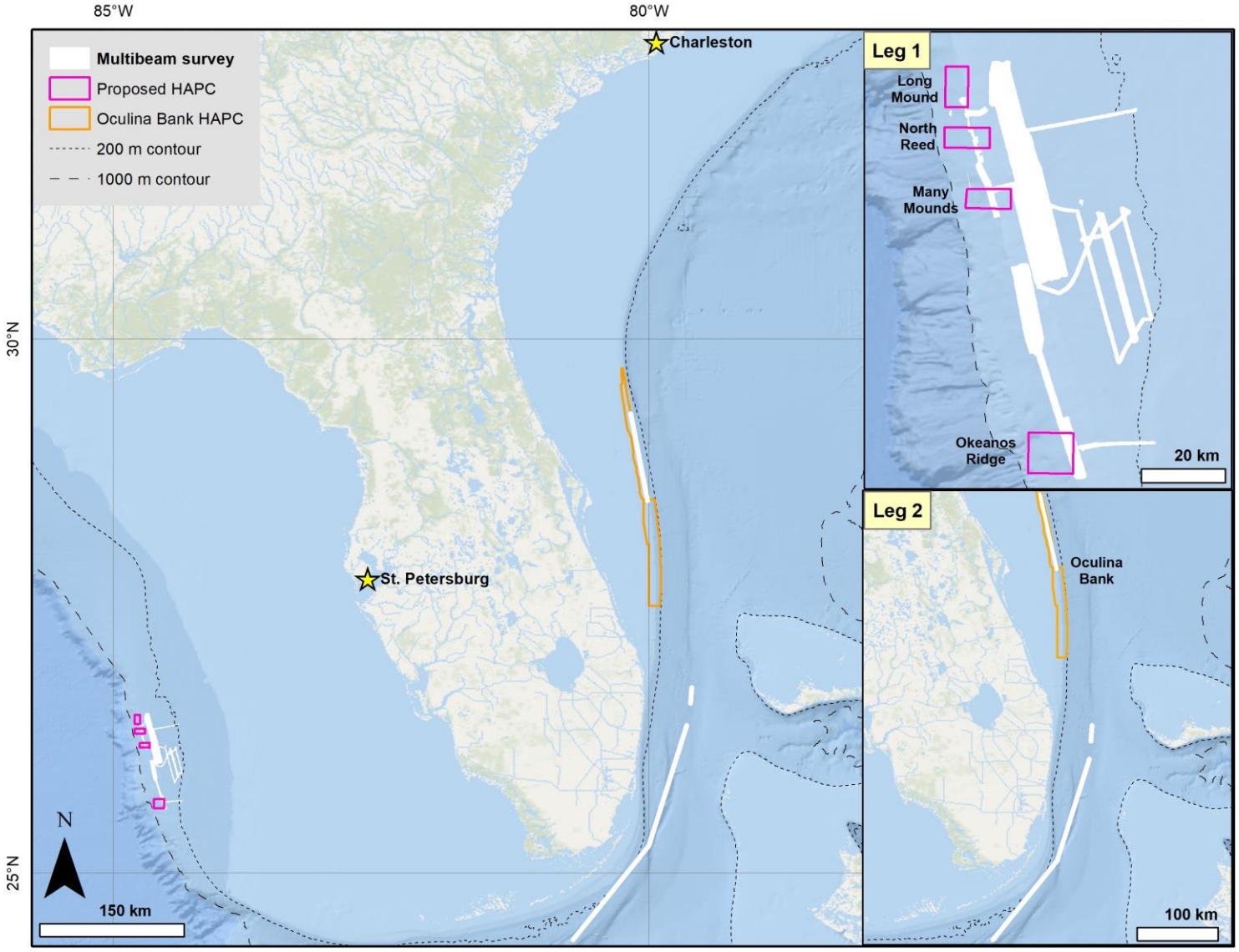


Figure 4. Map showing the locations of multibeam mapping surveys conducted during NF1708. Insets show the areas mapped during each leg of the expedition.

CTD summary table

Table 4. Inventory of CTD casts conducted using the ship's CTD-carousel with the SBE-9/11 plus sensors during the NF-17-08 expedition. Note that the table does not include the five CTD casts conducted using the ship's underway CTD system, which were performed during leg 2 of the expedition.

CTD number	Date (UTC)	Start time (UTC)	Locality	Latitude	Longitude	Max. depth (m)	Number of water samples collected	Depth range of collected water samples (m)
NF1708-CTD01	8/13/2017	19:40	Long Mound North	26.47844	-84.77192	310	0	N/A
NF1708-CTD02	8/13/2017	23:59	East of Long Mound	26.40183	-84.68350	270	0	N/A
NF1708-CTD03	8/14/2017	4:13	East of Many Mounds	26.22183	-84.63317	215	0	N/A
NF1708-CTD04	8/14/2017	6:00	Long Mouth South	26.40021	-84.76460	415	5	20-415
NF1708-CTD05	8/14/2017	6:50	Long Mouth South	26.39482	-84.76567	460	5	20-460
NF1708-CTD06	8/15/2017	6:00	North Reed	26.32208	-84.75275	480	5	20-480
NF1708-CTD07	8/15/2017	18:50	North Reed	26.30262	-84.73727	400	5	20-400
NF1708-CTD08	8/16/2017	0:37	East of Many Mounds	26.18550	-84.50483	212	0	N/A
NF1708-CTD09	8/16/2017	6:00	Many Mounds	26.20693	-84.71301	435	5	20-435
NF1708-CTD10	8/16/2017	18:45	Many Mounds	26.19103	-84.71210	460	5	20-460
NF1708-CTD11	8/18/2017	0:03	East of North Reed	26.28600	-84.63767	235	0	N/A
NF1708-CTD12	8/19/2017	1:56	East of Many Mounds	26.16867	-84.51850	205	0	N/A
NF1708-CTD13	8/19/2017	9:03	Southeast of North Reed	26.11950	-84.46333	210	0	N/A
NF1708-CTD14	8/20/2017	0:49	North of Okeanos Ridge	25.85650	-84.61167	420	0	N/A
NF1708-CTD15	8/22/2017	6:40	North Wall	26.76095	-84.90713	1000	12	20-1000
NF1708-CTD16	8/22/2017	18:45	North Wall	26.76864	-84.90272	1000	12	20-1000
NF1708-CTD17	8/23/2017	6:00	Okeanos Ridge	25.66118	-84.58226	500	5	20-500
NF1708-CTD18	8/23/2017	19:30	*Oculina* Bank	28.58403	-80.02228	100	5	20-100
NF1708-CTD19	8/23/2017	7:30	*Oculina* Bank	29.18645	-80.14912	85	5	20-85
						TOTAL	**69**	

CTD location maps

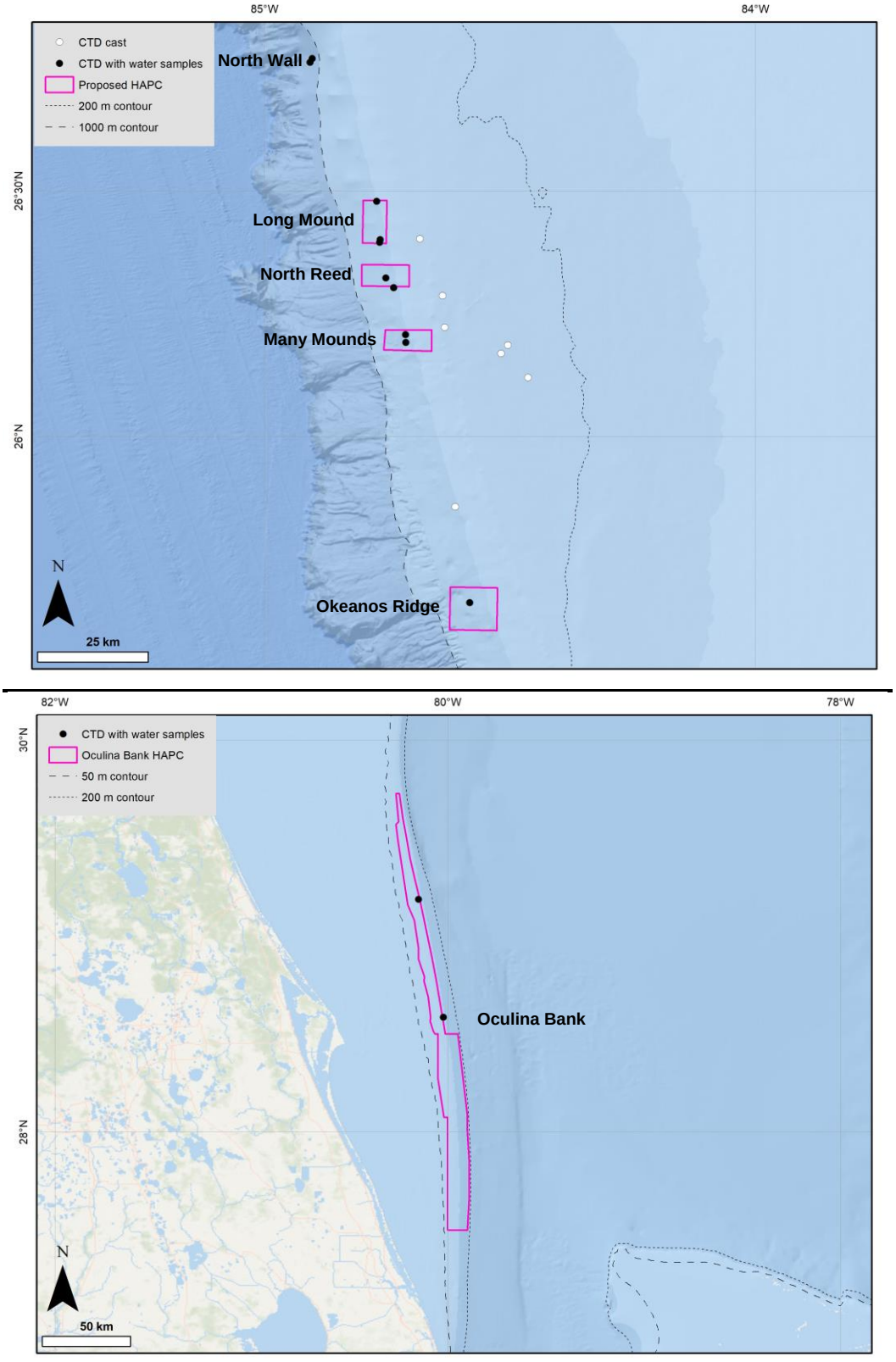


Figure 5. Map showing the locations of CTD casts conducted during (top) leg 1, and (bottom) leg 2 of NF-17-08. Note that the map does not include the five CTD casts conducted during leg 2 using the underway CTD system.

CTD vertical profiles

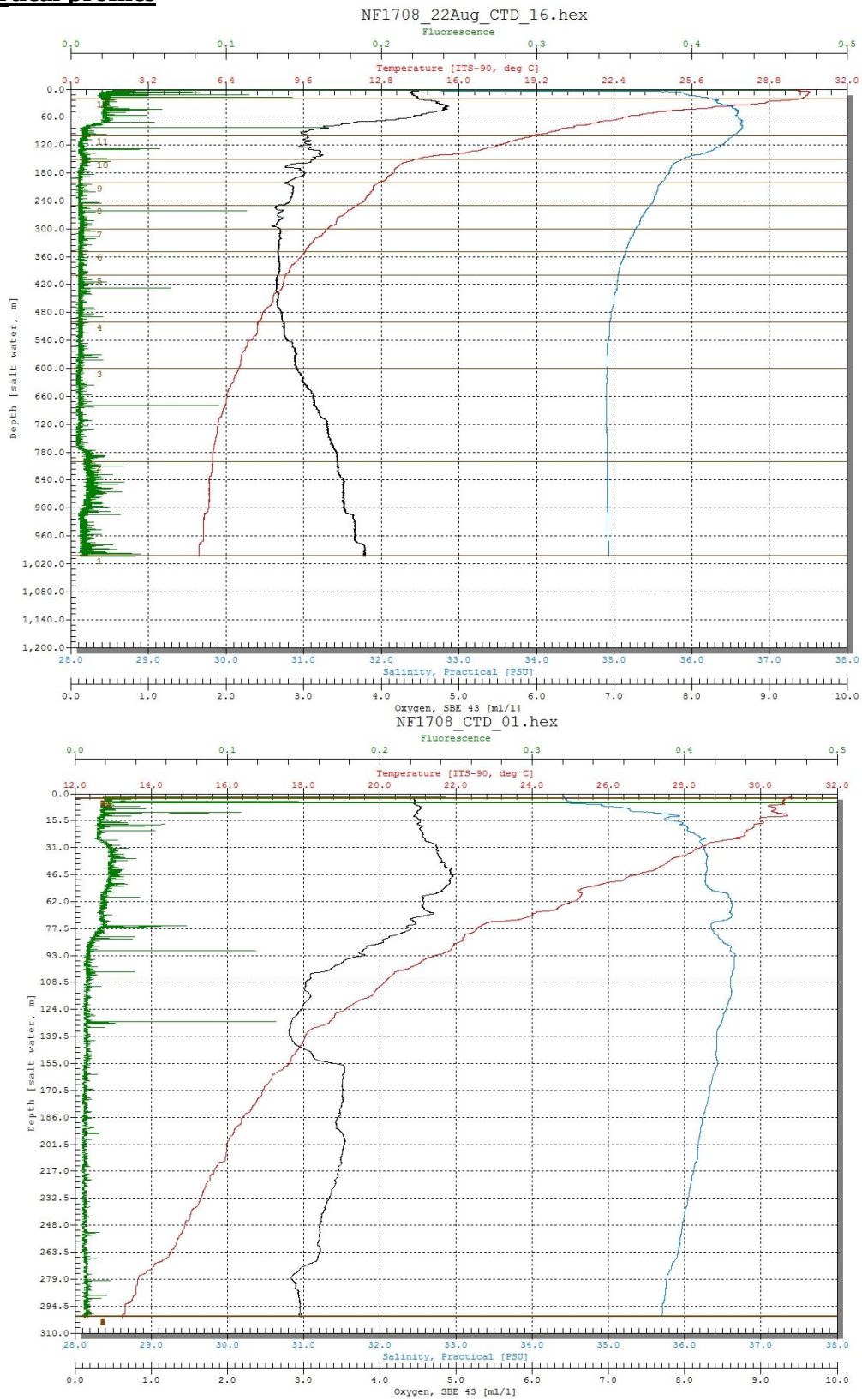


Figure 6. Depth profiles of fluorescence (green), dissolved oxygen (black), salinity (blue) and temperature (red) measured during CTD-casts conducted at (top) North Wall, and (bottom) Long Mound North.

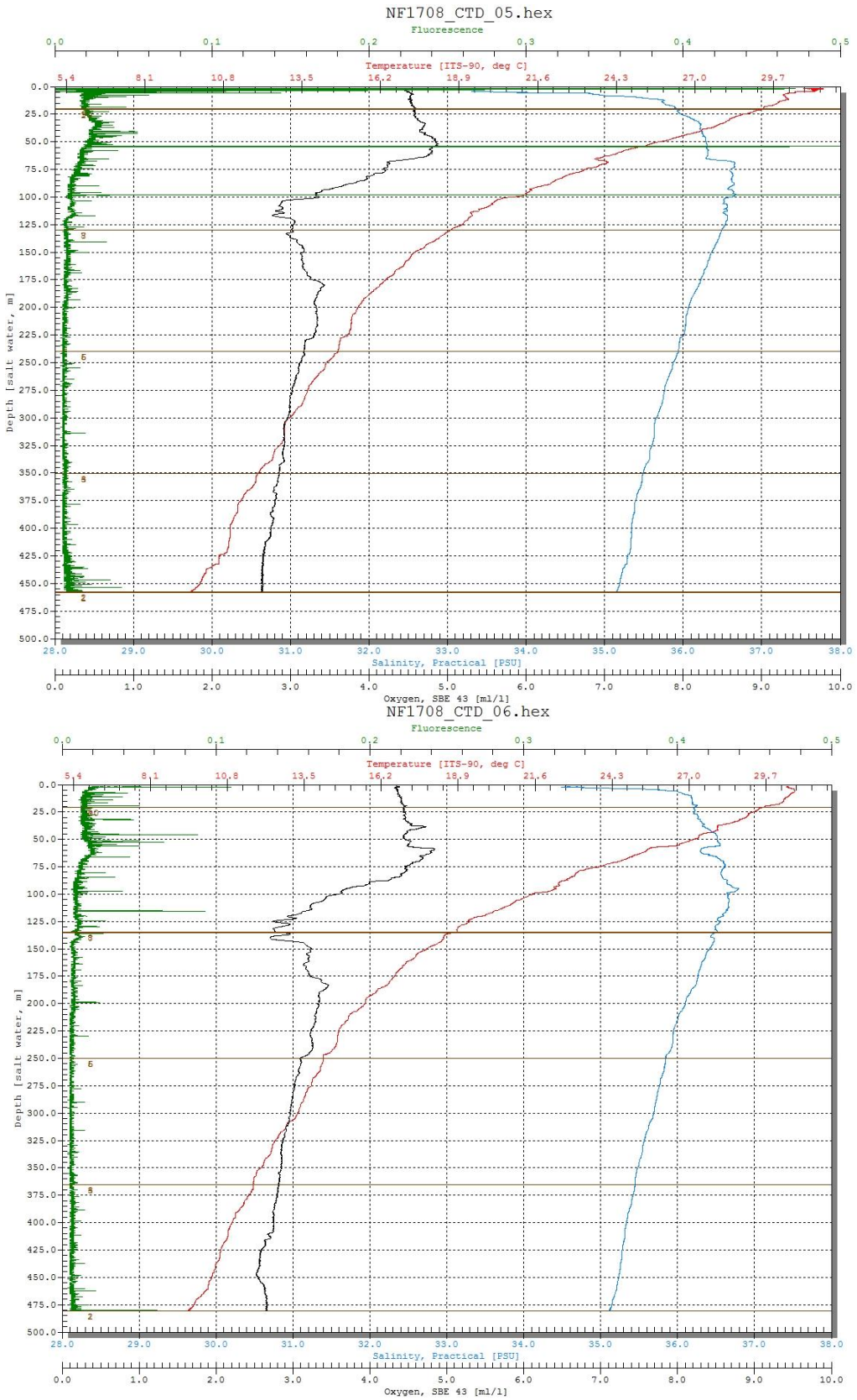


Figure 7. Depth profiles of fluorescence (green), dissolved oxygen (black), salinity (blue) and temperature (red) measured during CTD-casts conducted at (top) Long Mound South, and (bottom) North Reed.

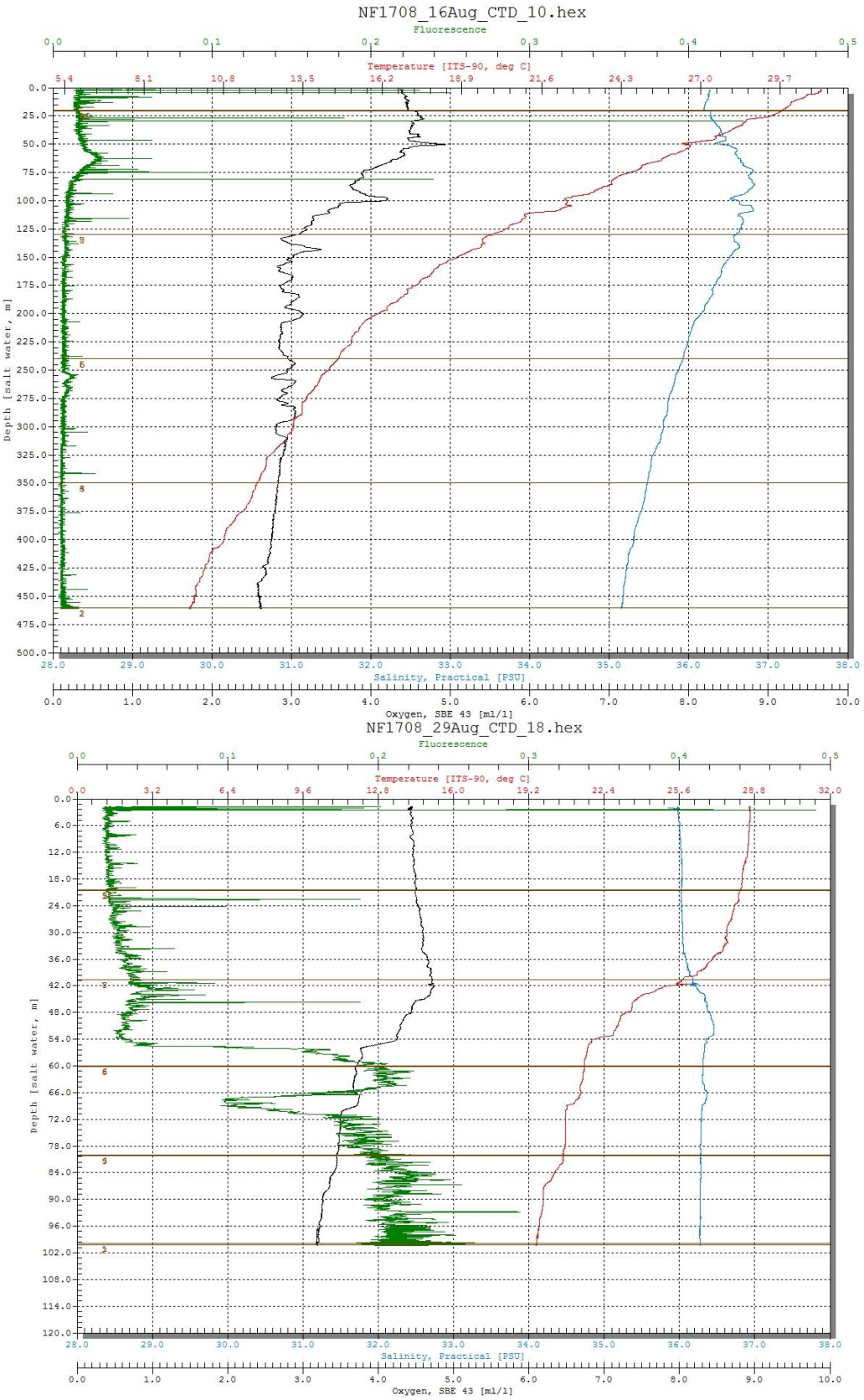


Figure 8. Depth profiles of fluorescence (green), dissolved oxygen (black), salinity (blue), and temperature (red) measured during CTD-casts conducted at (top) Many Mounds, and (bottom) *Oculina* Bank.

Water column acoustic surveys map

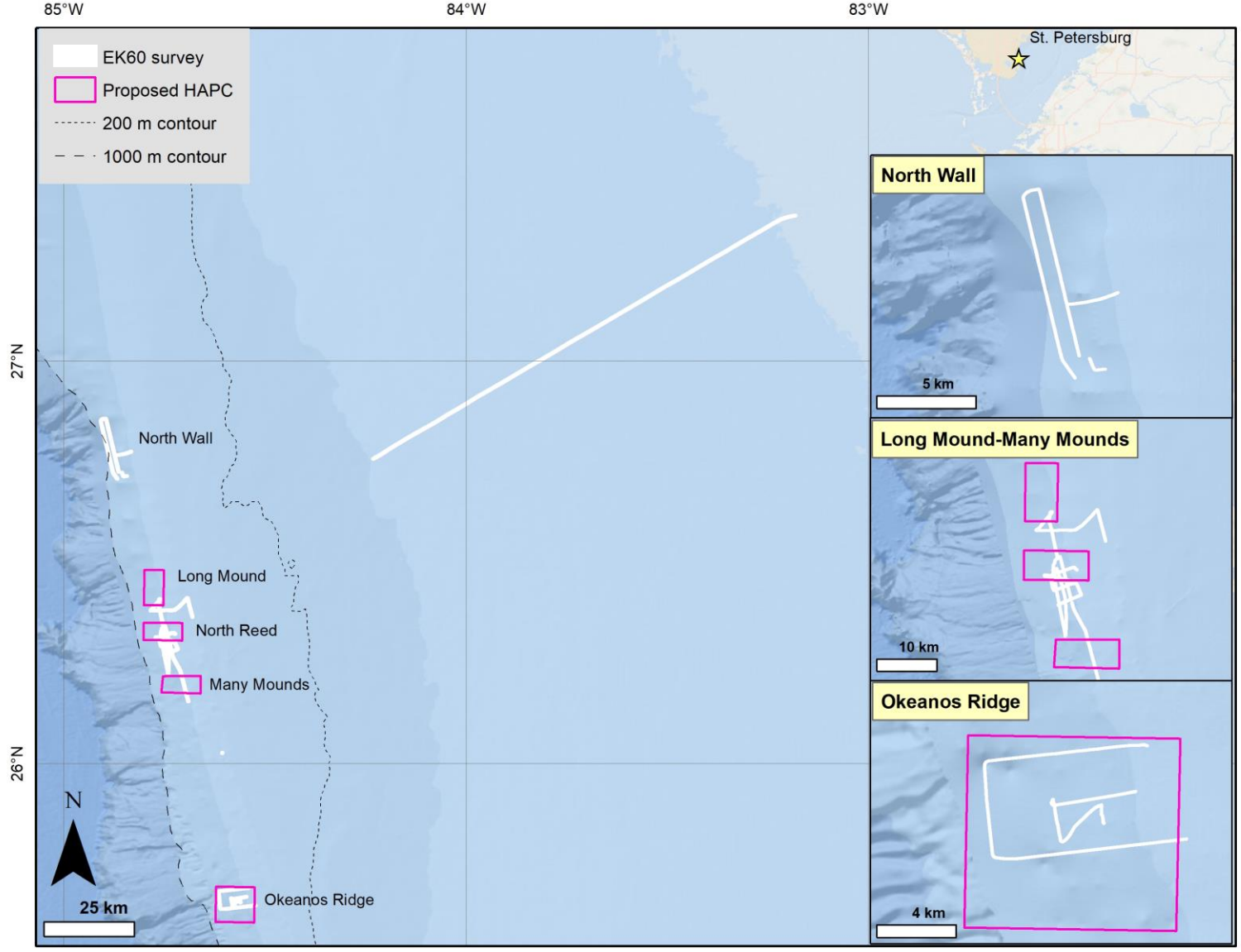


Figure 9. Map showing the locations of water column acoustic surveys conducted using the ship's EK60 sonar system during leg 1 of the expedition.

Outreach/Education

Information relating to the expedition, including background essays and regular updates while at sea, was featured on an expedition website hosted by the NOAA Office of Exploration and Research (http://oceanexplorer.noaa.gov/explorations/17sedci/welcome.html). Additionally, graduate students from University of South Florida, Florida A&M University, College of Charleston, and Nelson Mandela University participated in the expedition (Table 2). In addition to obtaining valuable hand-on experience conducting original research in the field, these students also obtained at-sea classroom instruction on various topics relating to deep-sea research. Finally, a professional videographer participated in the first leg of the expedition, during which he collected and edited material for an educational film that was produced following the expedition (http://oceanexplorer.noaa.gov/explorations/17sedci/logs/summary-video/summary-video.html).

Acknowledgements

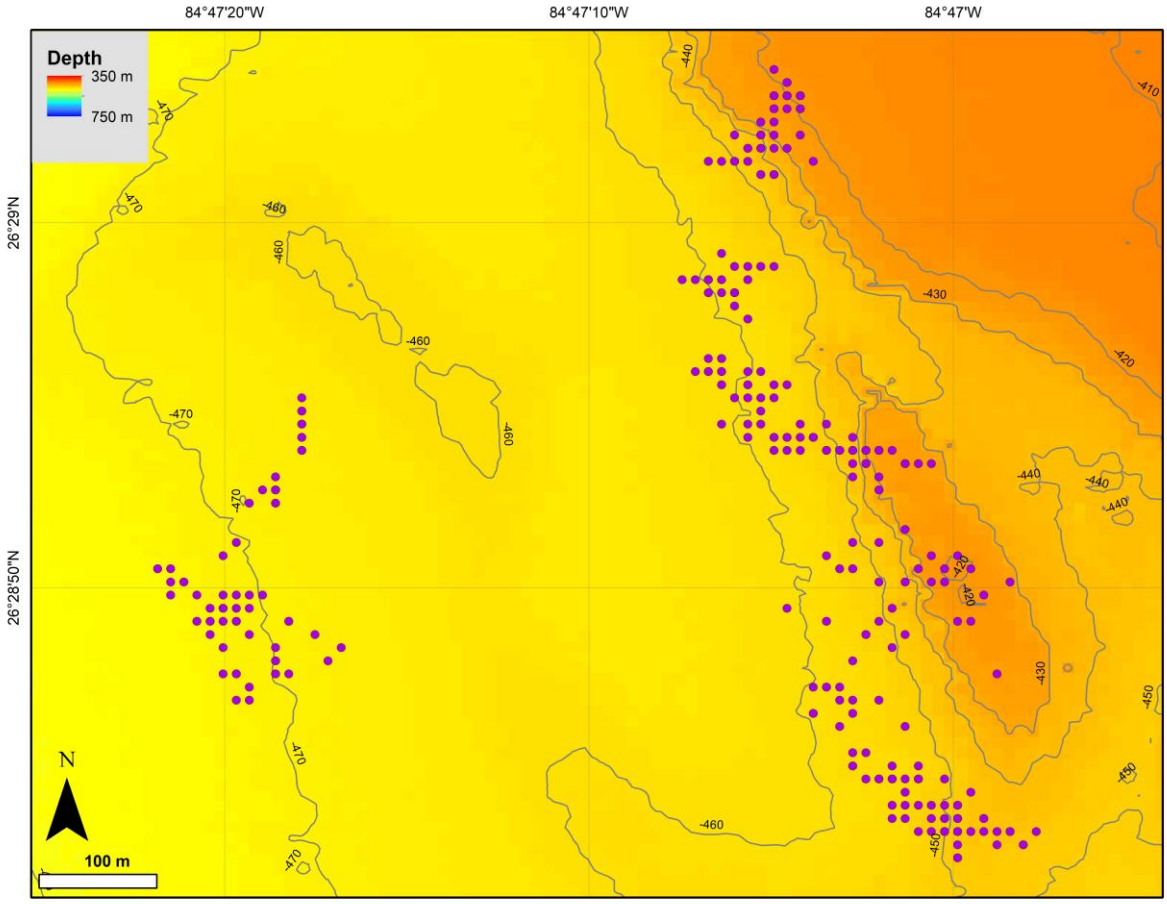
Special thanks to Tom Hourigan, Heather Coleman, and Andrew Shuler for providing insightful reviews and comments on an earlier version of this manuscript. We thank the officers and crew of NOAA Ship *Nancy Foster*, and in particular Commanding Officer Captain Donn Pratt and Operations Officer ENS Keith Hanson, who provided extraordinary support for all operations. Special thanks to the ROV team (Ed Cassano, Jesse Doren, Paul Sanacore, Erik Hodges, Kris Ingram and Jonathan Gallant) for all their relentless efforts to make the expedition a success. We further thank the team of onboard scientists for all their hard work and dedication during the expedition. Funding for the ROV contract was provided by NOAA's Deep Sea Coral Research and Technology Program through the Southeast Deep Coral Initiative. Ship time was provided by the NOAA Southeast Fisheries Science Center. Additional in-kind support was provided by several institutions that provided staff time for the scientists that participated in the expedition, including NOAA, Gulf of Mexico Fishery Management Council, South Atlantic Fishery Management Council, U.S. Geological Survey, Pelagic Research Services, Florida State University, University of South Florida, College of Charleston, Bethune-Cookman University, Florida A&M University, Nelson Mandela University, Green Fire Productions, and U.S. State Department Office of Marine Conservation 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.

Appendix 1: ROV dive summaries

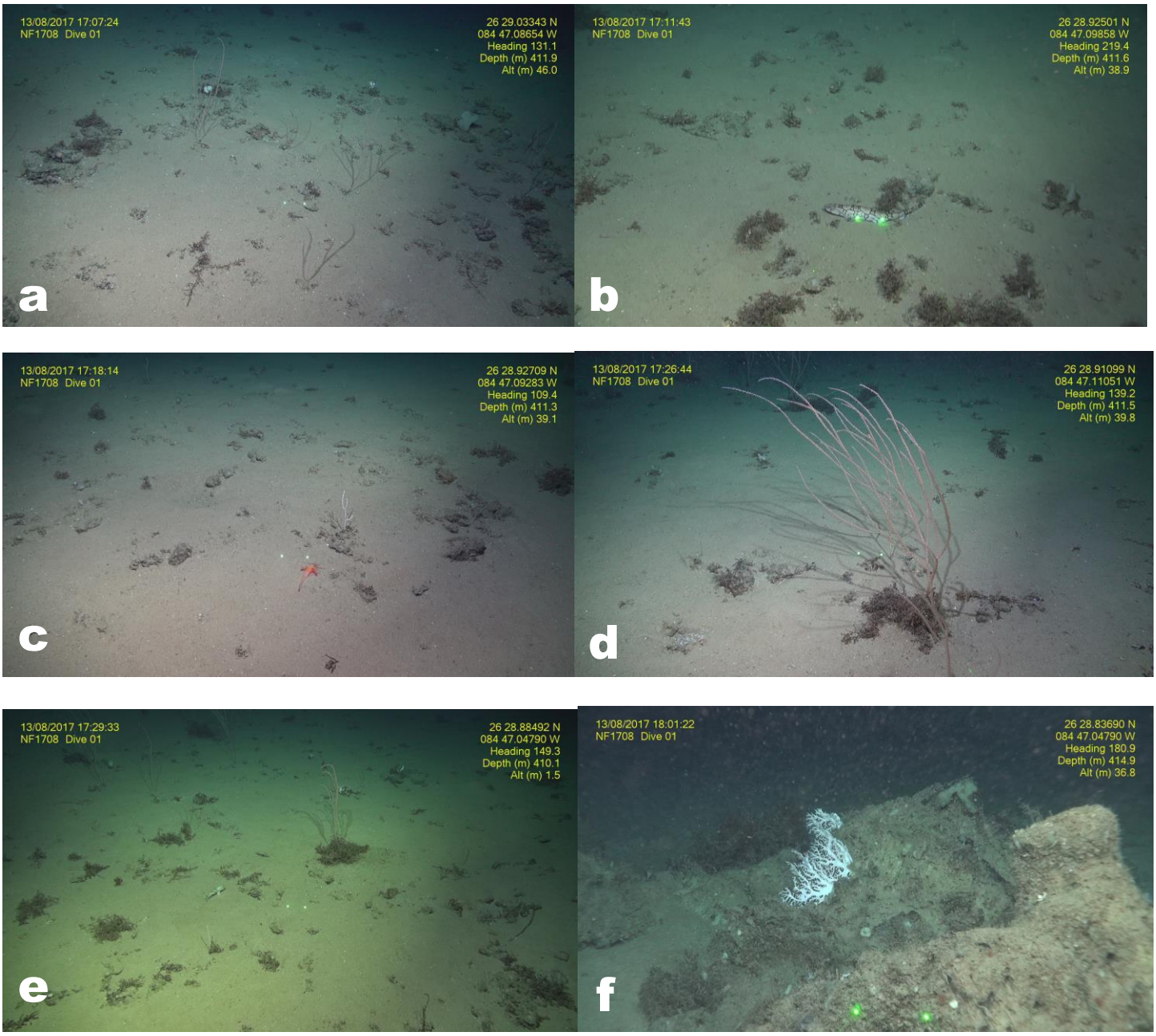
Dive number: NF1708-DIVE01
Date: 8/13/2017
Locality: Long Mound North
On bottom latitude & longitude: 26.4799, -84.7858
Off bottom latitude & longitude: 26.4789, -84.7833

Summary:

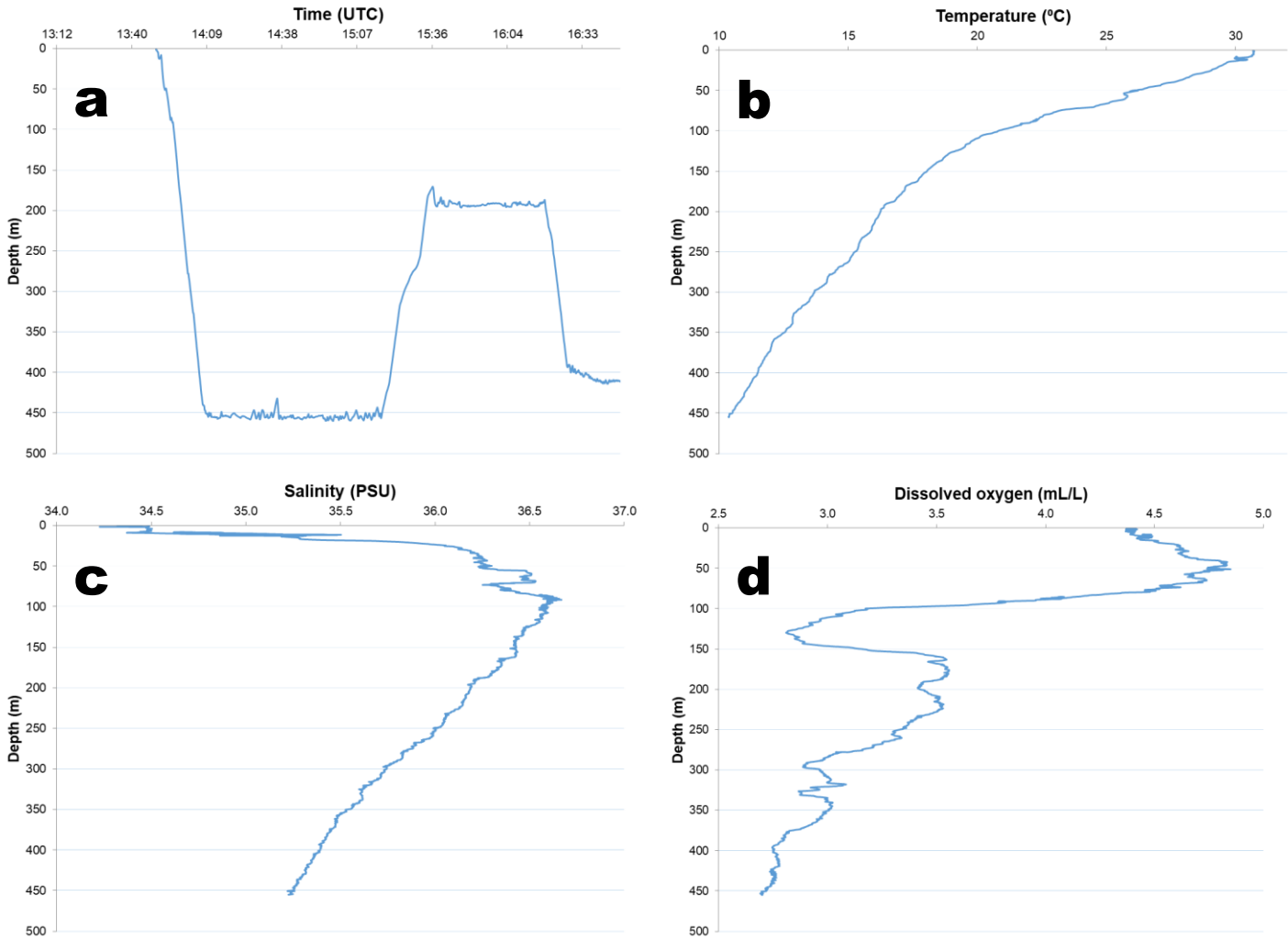
The dive landed on a flat bottom at 14:28 (UTC) at 460 m depth south of Waypoint 1, and then proceeded toward the Waypoint 1 location beginning at 14:46. Currents were strong, from the north-northeast. Geoposition was uncertain, only one of four transponders were operational during the dive. Neither the two transponders on the ROV, nor one on the clump weight could be detected. Species observed included black tip sharks, prawns, chain catshark, and several bamboo corals. Brown patches were present, presumably *Sargassum* sp. The ROV could not make northward or eastward progress as intended, so at 15:30 the ROV was pulled up to 170 m depth for a ship move of 270 m on bearing 050. A second transponder was detected on the ROV at 170 m depth. The ROV set down at 16:44 at 395 m depth. Two transects were conducted in the vicinity of Waypoints 2 and 3. The dive eventually encountered a rocky outcrop around 17:08, with a few *Stylaster* sp. colonies, sponges, and golden crabs. The fish were roughy, blackbelly rosefish, rosy dory, chain catshark, lanternbelly (*Synagrops* sp.), conger eel, dogfish, and shortbeard codling. Some debris was observed in the form of a soda can, plastic bag, paper wrapper, and a coil of fishing line. The dive ended near 434 m depth, where extensive hard bottom substrate was present, but only small patches of it had emergent epifauna. The ROV was recovered at 18:51. No samples were collected during the dive.



Map showing the dive track of DIVE01 on the north end of Long Mound. Dive tracks were created using data from the ROV's Trackpoint navigation system.



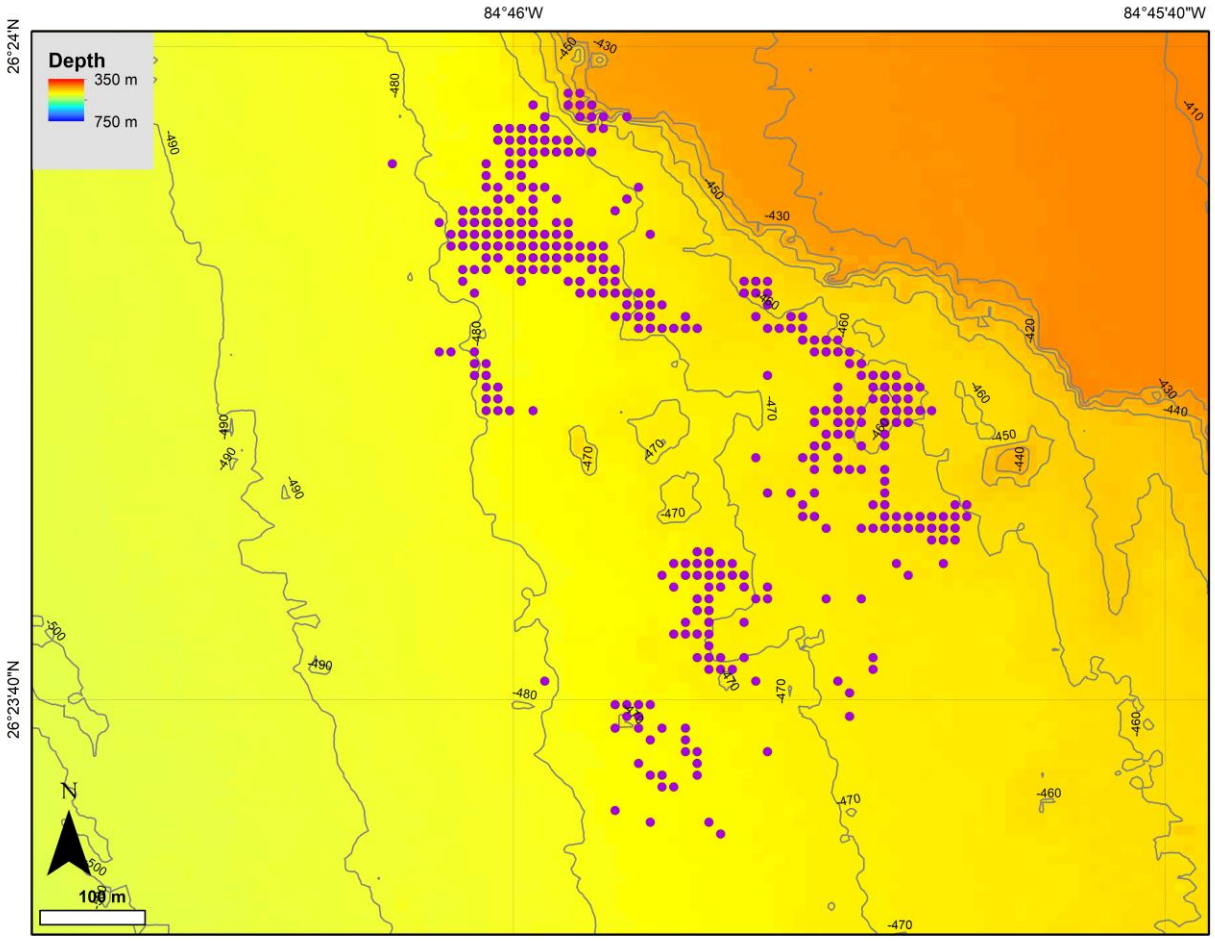
Highlight images collected during DIVE01 at Long Mound. **a.** Sponges and bamboo corals (Isididae); **b.** the catshark *Scyliorhinus rotifer* next to patches of *Sargassum* sp.; **c.** a *Peristedion* sp. fish next to a bamboo coral (Isididae); **d.** a bamboo coral (Isididae) next to patches of *Sargassum* sp.; **e.** a *Synagrops* sp. fish, sea star, and bamboo coral (Isididae) next to patches of *Sargassum* sp.; and **f.** stylasterid corals (*Stylaster* sp.) next to *Sargassum* sp. patches.



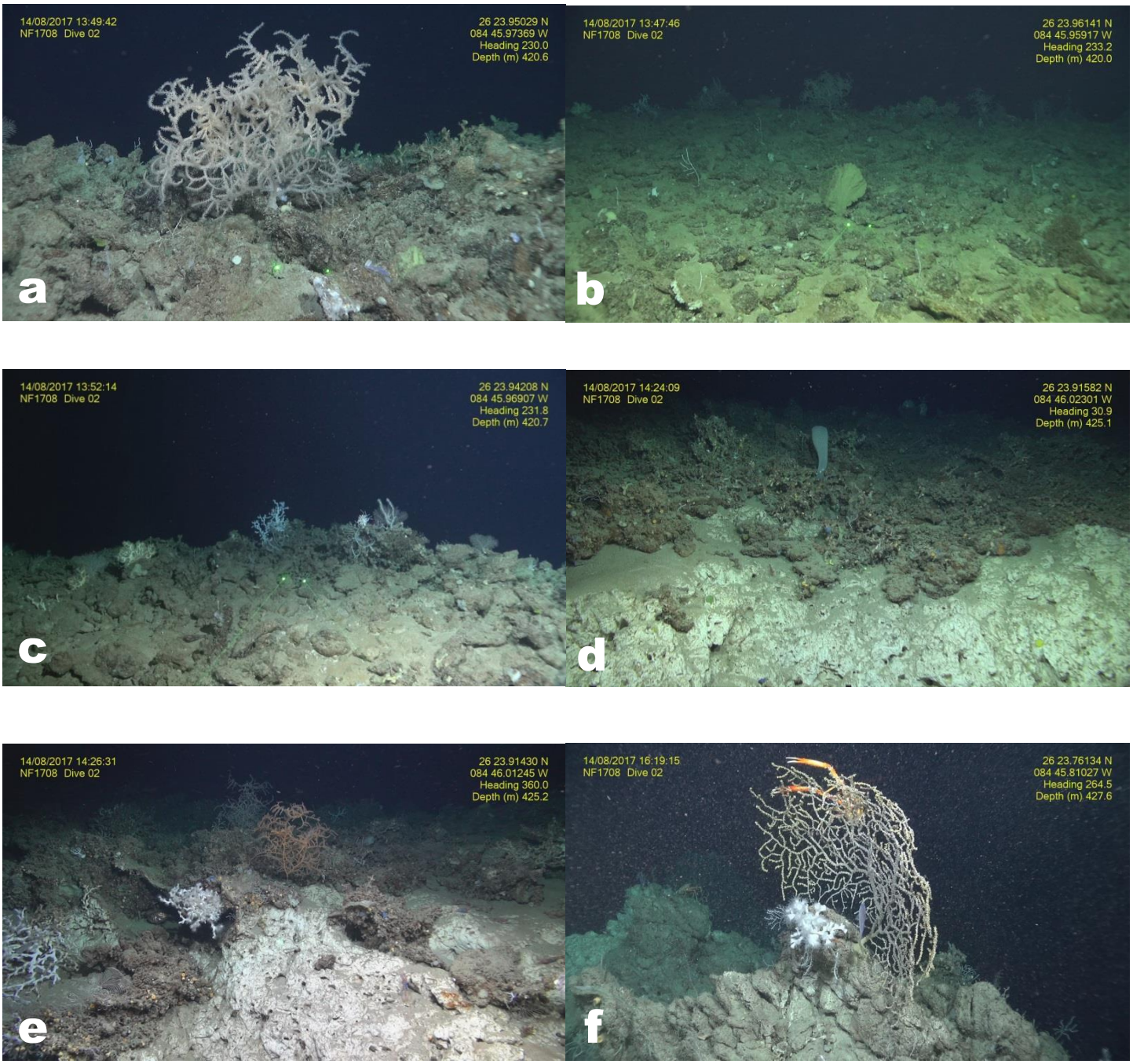
Depth profiles of **a.** UTC time, **b.** temperature, **c.** salinity, and **d.** dissolved oxygen measured by the CTD sensors that were attached to the ROV on DIVE01 at Long Mound. Note that depth profiles for temperature, salinity and dissolved oxygen (**b-d**) only include data collected during the downcast portion of the dive. Also note that the ROV was pulled off the bottom at 15:30 h UTC, and towed midwater at a depth of 170 m before being set back down on the seafloor at 16:30; the CTD sensors stopped logging at 17:12, approximately 1.5 h before the end of the dive (**a**).

Dive number: NF1708-DIVE02
Date: 8/14/2017
Locality: Long Mound South
On bottom latitude & longitude: 26.3992, -84.7655
Off bottom latitude & longitude: 26.3950, -84.7643

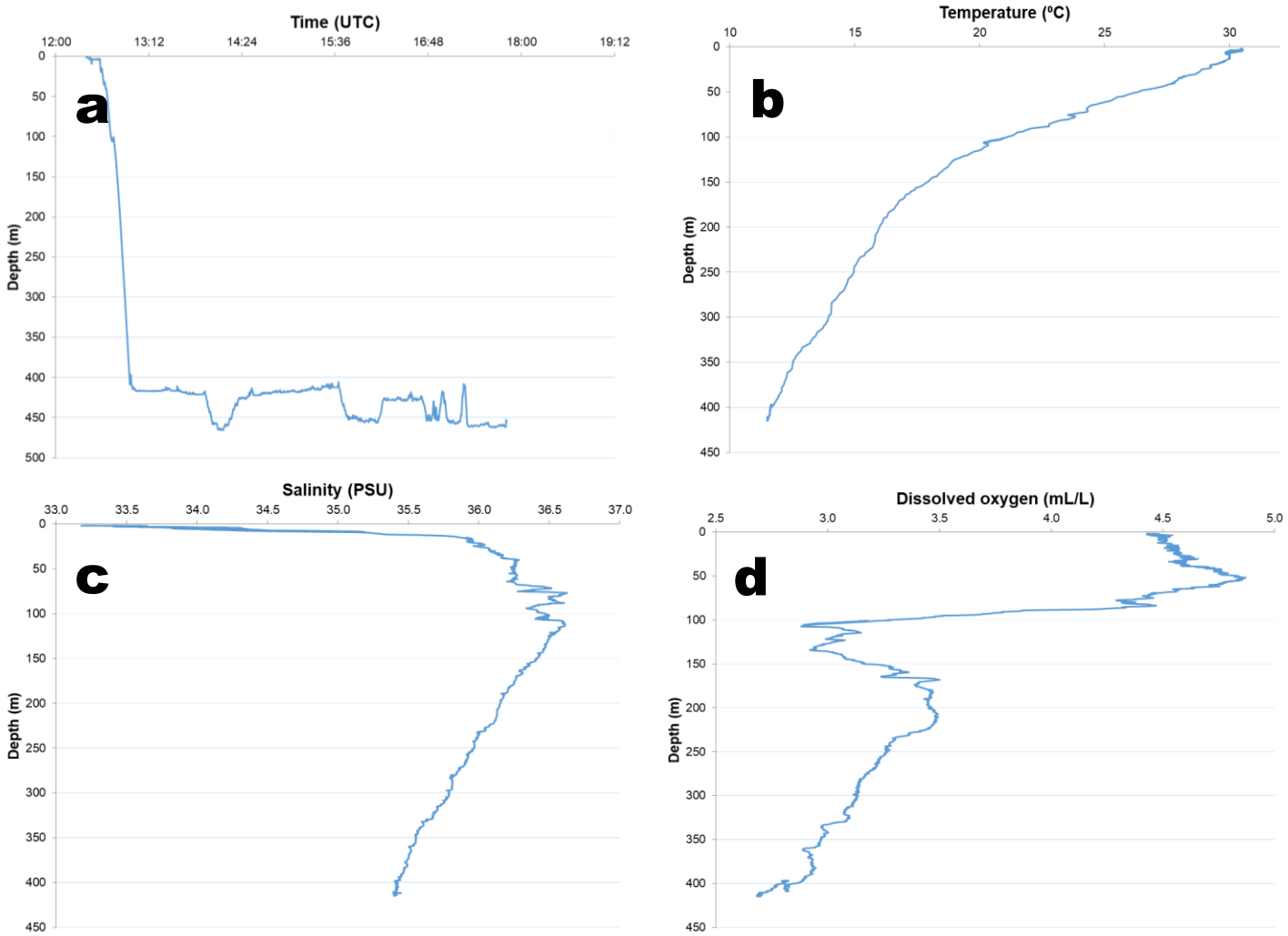
Summary:
The dive landed on a flat bottom at 12:59 (UTC) at 416 m depth near Waypoint 1, and proceeded to seek the scarp feature. The presumed depth of Waypoint 1 was 470 m. The problem was diagnosed as a 70 m offset in the Trackpoint software that positioned the ROV east (and shallower) of the intended location. The ROV moved west to acquire the scarp feature. The drop-off was occupied by several colonies of *Leiopathes glaberrima*, *Lophelia pertusa*, and *Plumarella* sp., as well as numerous fish including *Laemonema* sp., *Benthocometes* sp., roughy, beardfish, blackbelly rosefish, goosefish, redeye gaper, chain catshark, lanternbelly, and dogfish. Two transects were conducted of 5 and 12 minutes duration along the scarp at 416 m depth. The ROV descended the wall to 465 m depth and conducted two more transects, ending at 418 m depth at 14:15. The dive proceeded without transects until 17:57. Transects were problematic due to topography, currents, and piloting. Instead, photos were snapped nearly continuously throughout the dive. The ROV proceeded west across a large flat area, and was beset by currents from the northwest. The ship struggled to maintain northward progress, so the ship towed the ROV back to the east to reacquire the wall target where a lee was present (26º23.267'N, 84º45.628'W) at 18:50 UTC. The second part of the dive was called "Dive 2A", but the screen showed Dive 2.



Map showing the dive track of DIVE02 at Long Mound South. Dive tracks were created using data from the ROV's Trackpoint navigation system.



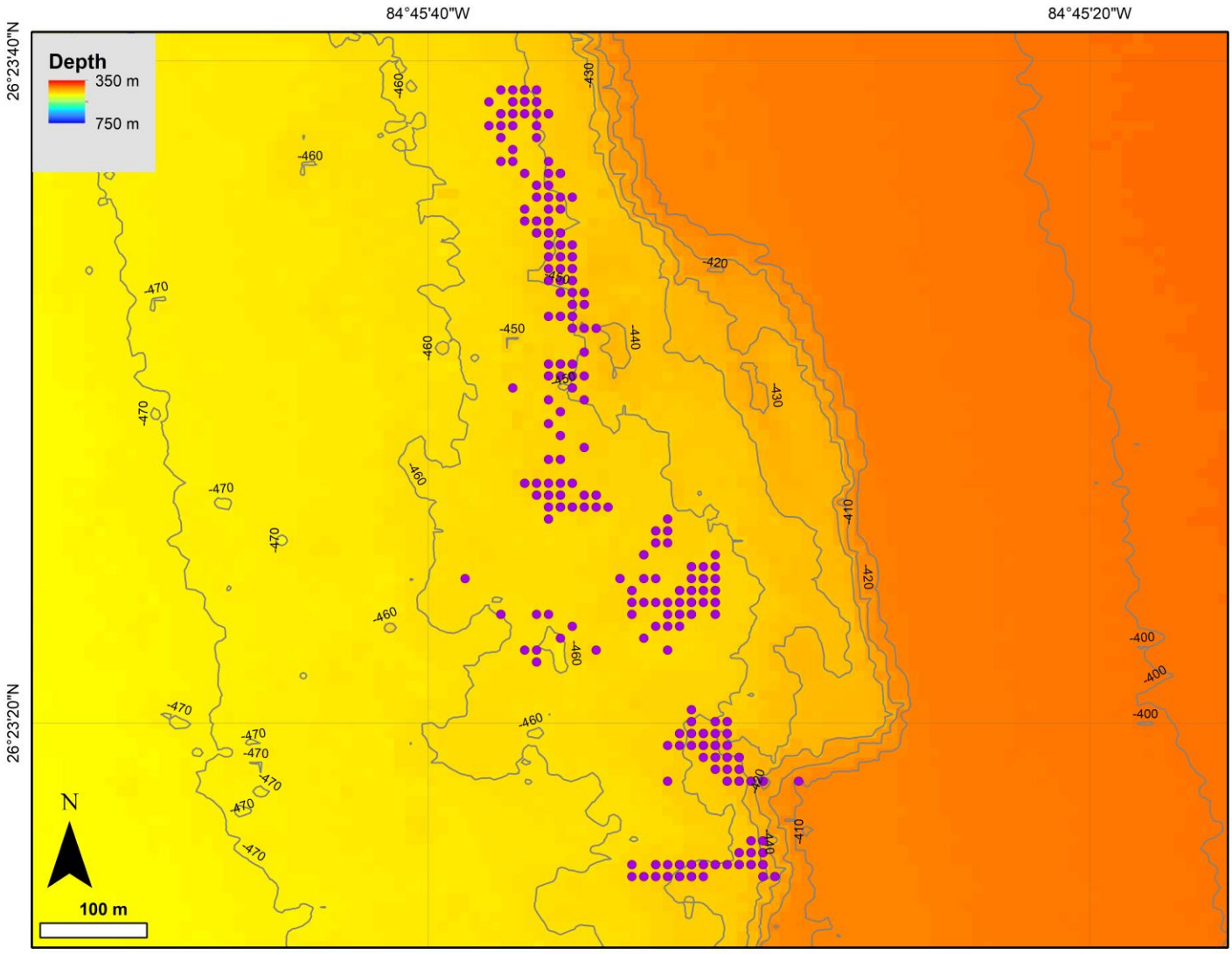
Highlight images collected during DIVE02 at Long Mound South **a.** *Leiopathes glaberrima* colony; **b.** diverse assemblage including various **s**ponges, bamboo corals, *L. glaberrima*, and *Muriceides* sp.; **c.** shrimp, sponges, *Lophelia pertusa*, Stylasteridae, Isididae, and *Plumarella* sp; **d.** Glass sponge next to dead patches of *L. pertusa*; **e.** *L. glaberrima*, *L. pertusa*, Stylasteridae, *Plumarella* sp., and *Hoplostethus occidentalis*, shrimp; **f.** *Paramuricea* sp. colony with several commensal species including *Benthocometes* sp., *L. pertusa*, *Muriceides* sp., and *Eumunida picta*.



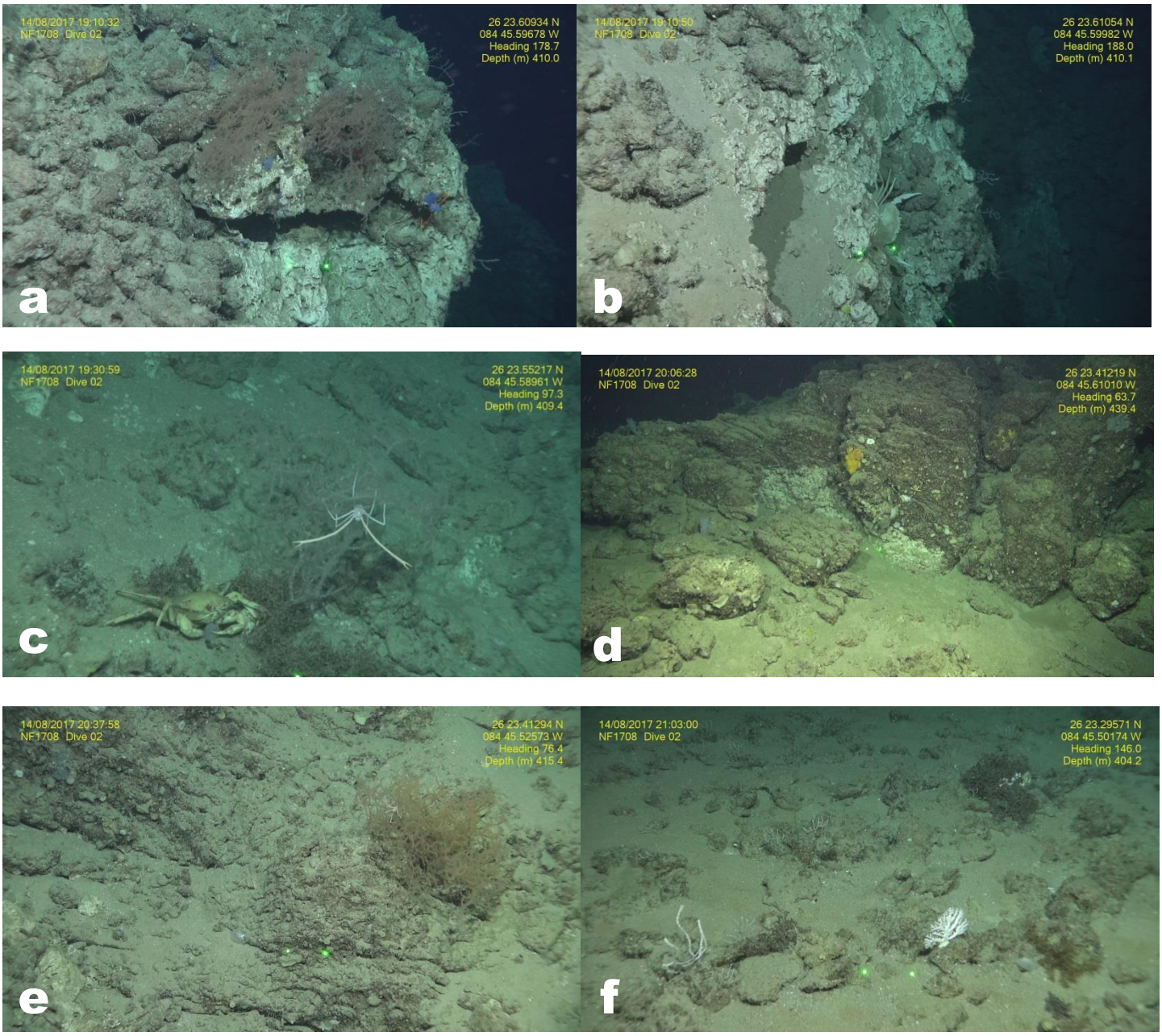
Depth profiles of **a.** UTC time, **b.** temperature, **c.** salinity, and **d.** dissolved oxygen measured by the CTD sensors that were attached to the ROV on DIVE02 at Long Mound South. Note that depth profiles for temperature, salinity and dissolved oxygen (**b-d**) only include data collected during the downcast portion of the dive. Also note that the time depth profile only includes data collected during first part of the dive, until the ROV had to be pulled off the bottom and towed at 17:47 UTC.

Dive number: NF1708-DIVE02A
Date: 8/14/2017
Locality: Long Mound South
On bottom latitude & longitude: 26.3945, -84.7596
Off bottom latitude & longitude: 26.3876, -84.7591

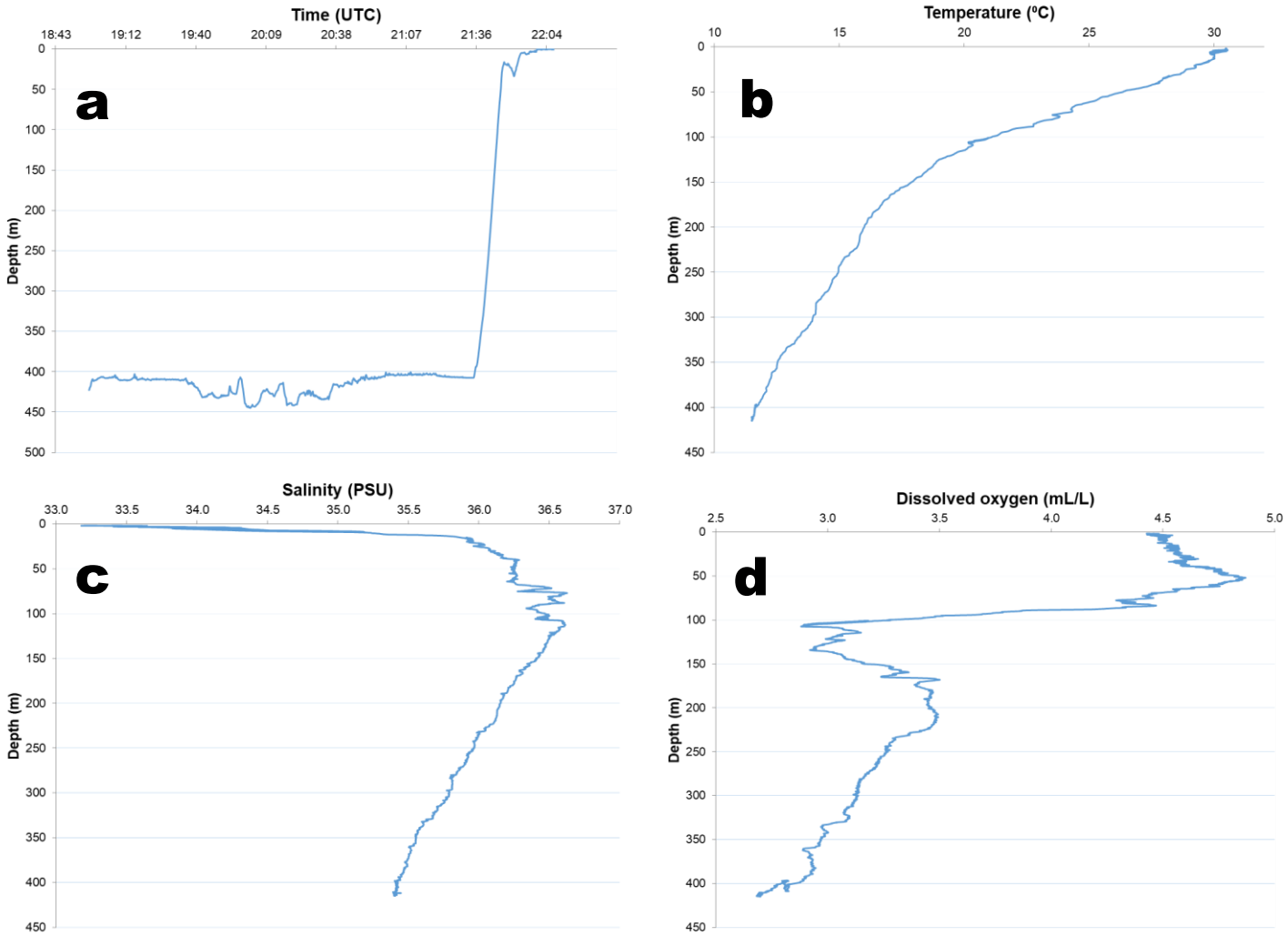
Summary:
The second part of Dive 2 started at 18:57 UTC and was called “Dive 2A”, but the screen showed Dive 2. This part of the dive observed octopus, rosy dory, redeye gaper, sponges, *Leiopathes glaberrima*, *Plumarella* sp., *Stylaster* sp., and blackbelly rosefish, *Benthocometes* sp. (associated with *L. glaberrima*), roughy, scorpionfish, lanternbelly, conger eel, and beardfish. No samples were collected due to hydraulic problems with the manipulator arms. No transects were conducted. The science team decided to modify the transect protocol.



Map showing the dive track of DIVE02A at Long Mound South. Dive tracks were created using data from the ROV’s Trackpoint navigation system.



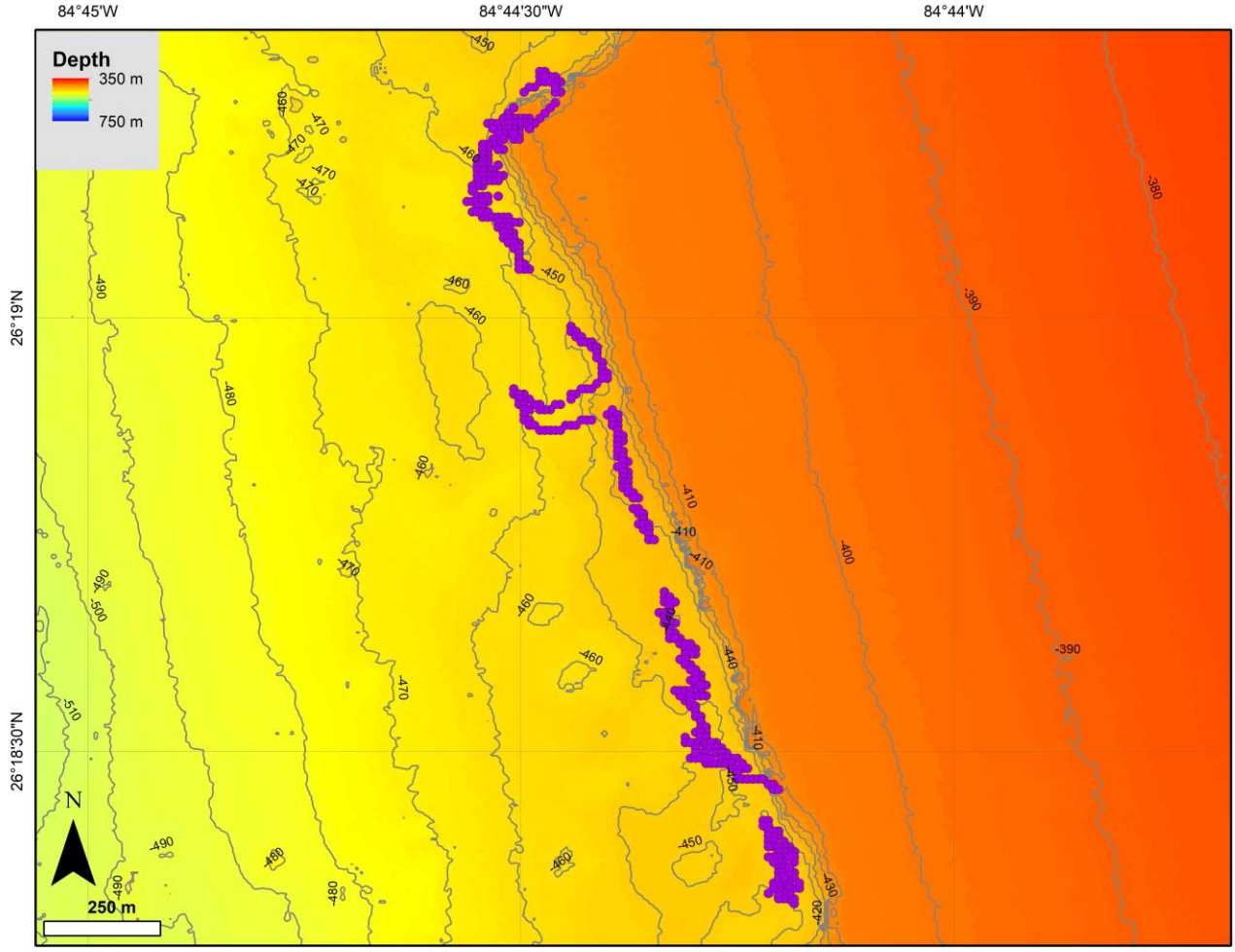
Highlight images collected during DIVE02A on Long Mound South **a.** two *Leiopathes glaberrima* colonies next to sponges, *Muriceides* sp. and *Eumundia picta*; **b.** Golden crab *Chaceon fenneri* next to *Muriceides* sp. colonies **c.** *L. glaberrima* colony with commensal squat lobster (Chirostyloidae) and a golden crab (*Chaceon fenneri*); **d.** an octopus, sponges, and a sea star; **e.** *L. glaberrima* colony with commensal squat lobster (Chirostyloidae); and **f.** diverse coral assemblage including colonies of *Muriceides* sp., Stylasteridae and Isididae.



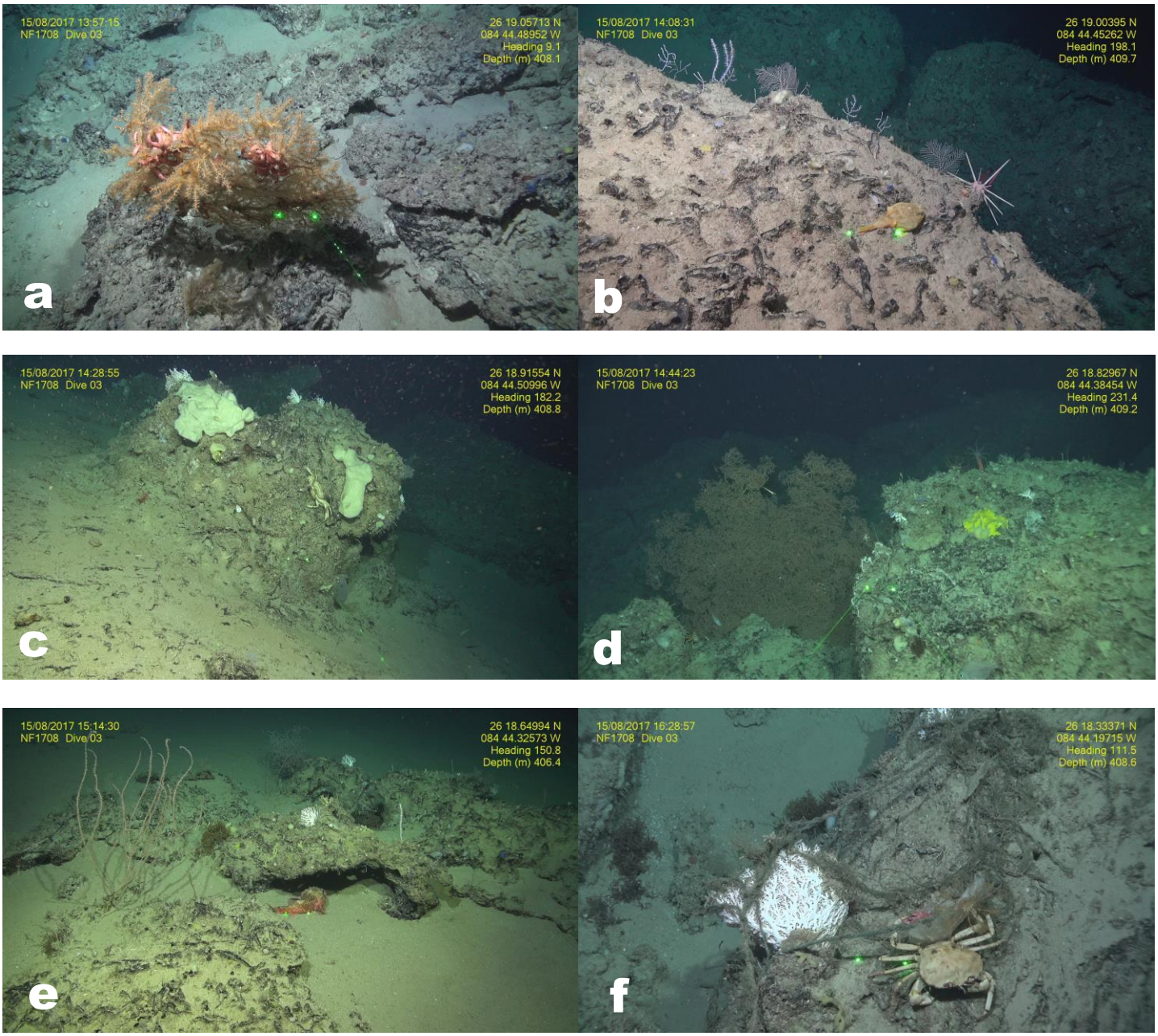
Depth profiles of **a.** UTC time, **b.** temperature, **c.** salinity, and **d.** dissolved oxygen measured by the CTD sensors that were attached to the ROV on DIVE02-2A at Long Mound South. Note that depth profiles for temperature, salinity and dissolved oxygen (**b-d**) only include data collected during the downcast portion of the dive, which occurred while the ROV descended to the seafloor at the beginning of DIVE02. Also note that the time depth profile only includes data collected during the second portion of the dive (DIVE02A) that started after the ROV was put back on the seafloor after a ship move around 18:57 UTC.

Dive number: NF1708-DIVE03
Date: 8/15/2017
Locality: North Reed
On bottom latitude & longitude: 26.3204, -84.7422
Off bottom latitude & longitude: 26.3060, -84.7367

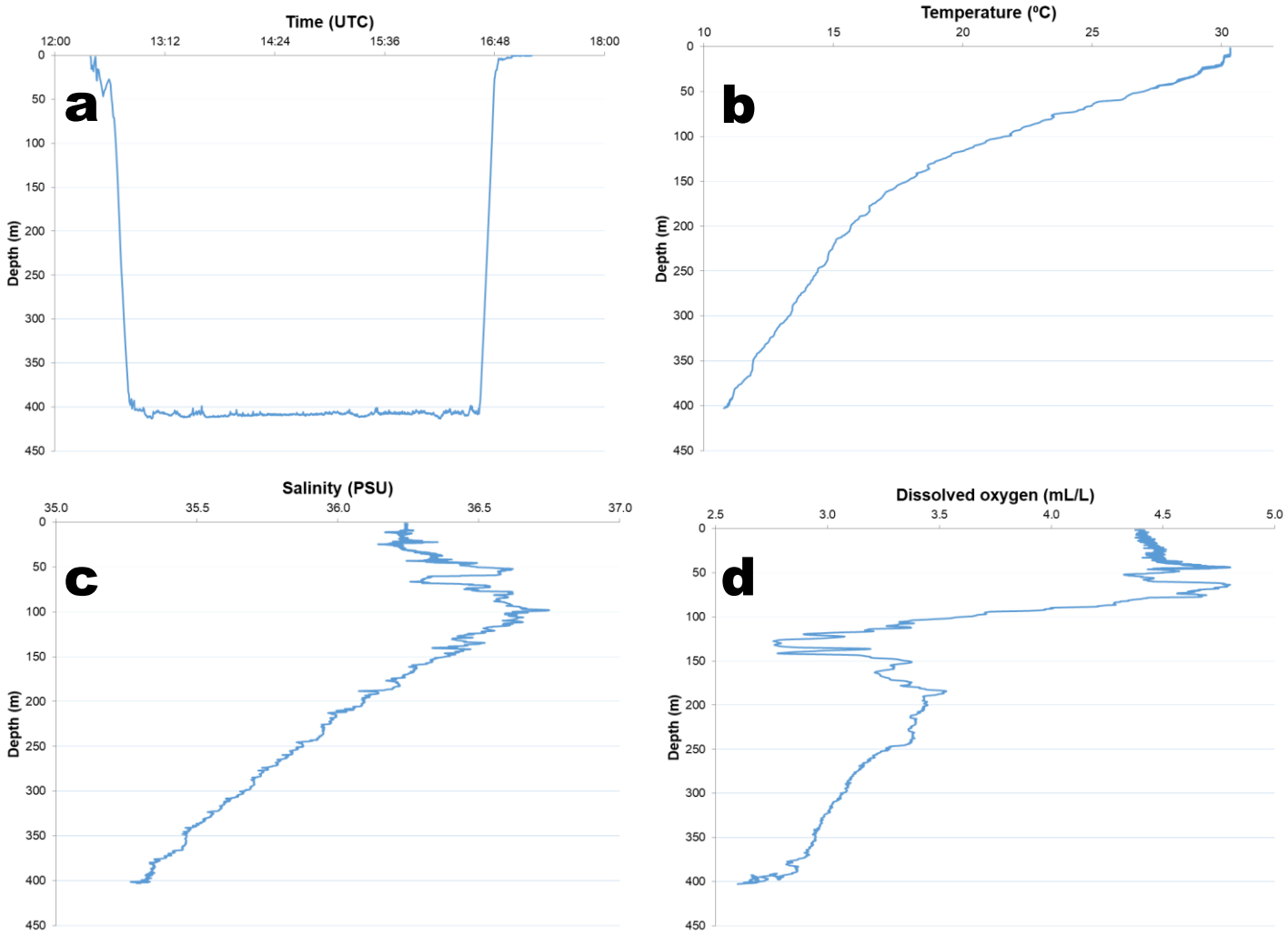
Summary:
The dive landed adjacent to the ridge feature at 12:52 UTC at 400 m depth near Waypoint 4, and proceeded to seek out the scarp feature, which was encountered within several minutes. Currents were very strong at the surface (2 knots), but less than 20 cm/s below 100 m depth. Tracking seemed to have improved. The spatial offset appeared to be negligible at times, but highly variable throughout the dive. The dive progressed in the southeastern direction. Piloting was excellent, with the ROV moving quickly and close to the bottom with minimal pulls from the vessel. Corals and sponges were observed nearly continuously along the course of the dive. Hundreds of excellent images were acquired. The list of corals observed included numerous *Leiopathes glaberrima* black corals, bamboo corals, *Muriceides* sp., *Stylaster* sp., and *Paramuricea* sp., *Bathyalcyon* sp., *Anthomastus* sp., and Aquaumbridae. Sponges resembling *Phakellia* sp. were numerous. Mobile invertebrates included golden crabs, squat lobsters, pelagic tunicates, and crinoids. Fish species observed included swallowtail bass, Darwin's slimehead, *Laemonema* sp., blackbelly rosefish, conger eel, tinselfish, lanternbelly, *Benthocometes* sp., *Chaunax* sp., thornyback scorpionfish, rosy dory, and Alphonsino. The dive left the bottom at 16:40 after transiting 1.5 km on the seafloor.



Map showing the dive track of DIVE03 at the North Reed site. Dive tracks were created using data from the ROV's Trackpoint navigation system.



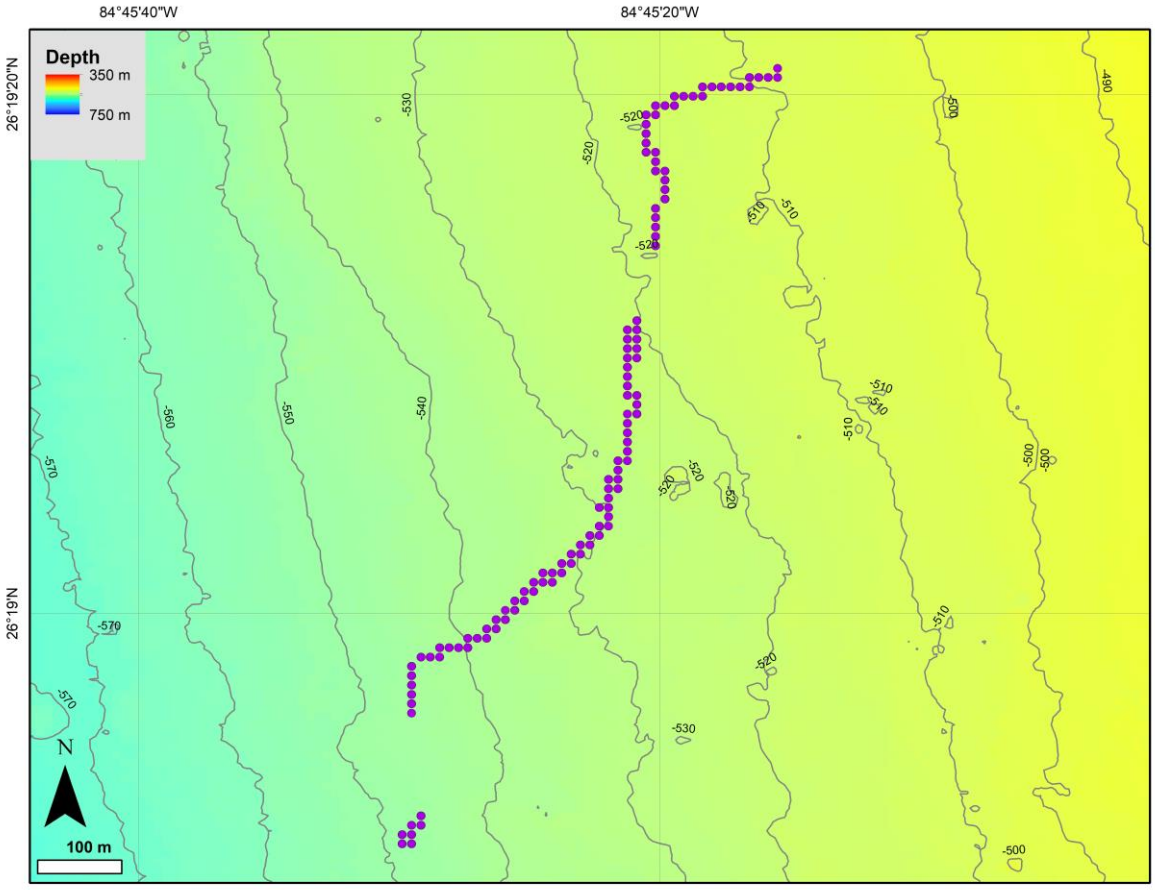
Highlight images collected during DIVE03 at North Reed site. **a.** a large *Paramuricea* sp. colony with commensal brittle stars (*Asteroschema* sp.); **b.** *Chaunax stigmaeus* fish next to urchin, sponges, Isididae, *Plumarella* sp., and *Muriceides* sp.; **c.** a diverse assemblage on a rock outcrop that included sponges, Stylasteridae, *Chaceon fenneri*, and *Pyrosoma*? sp.; **d.** large *Leiopathes glaberrima* colony with commensal *Eumunida picta* next to *Benthocometes* sp., *Hoplostethus occidentalis*, unidentified octocorals, sponges, Stylasteridae, and *Bathyalcyon* sp.; **e.** *Trachyscorpia cristulata* fish next to unidentified octocorals, sponges, Isididae, Stylasteridae, and *L. glaberrima*; and **f.** rope tangled on Stylasteridae colony next to *Helicolenus dactylopterus*, crinoid, and golden crab *Chaceon fenneri*.



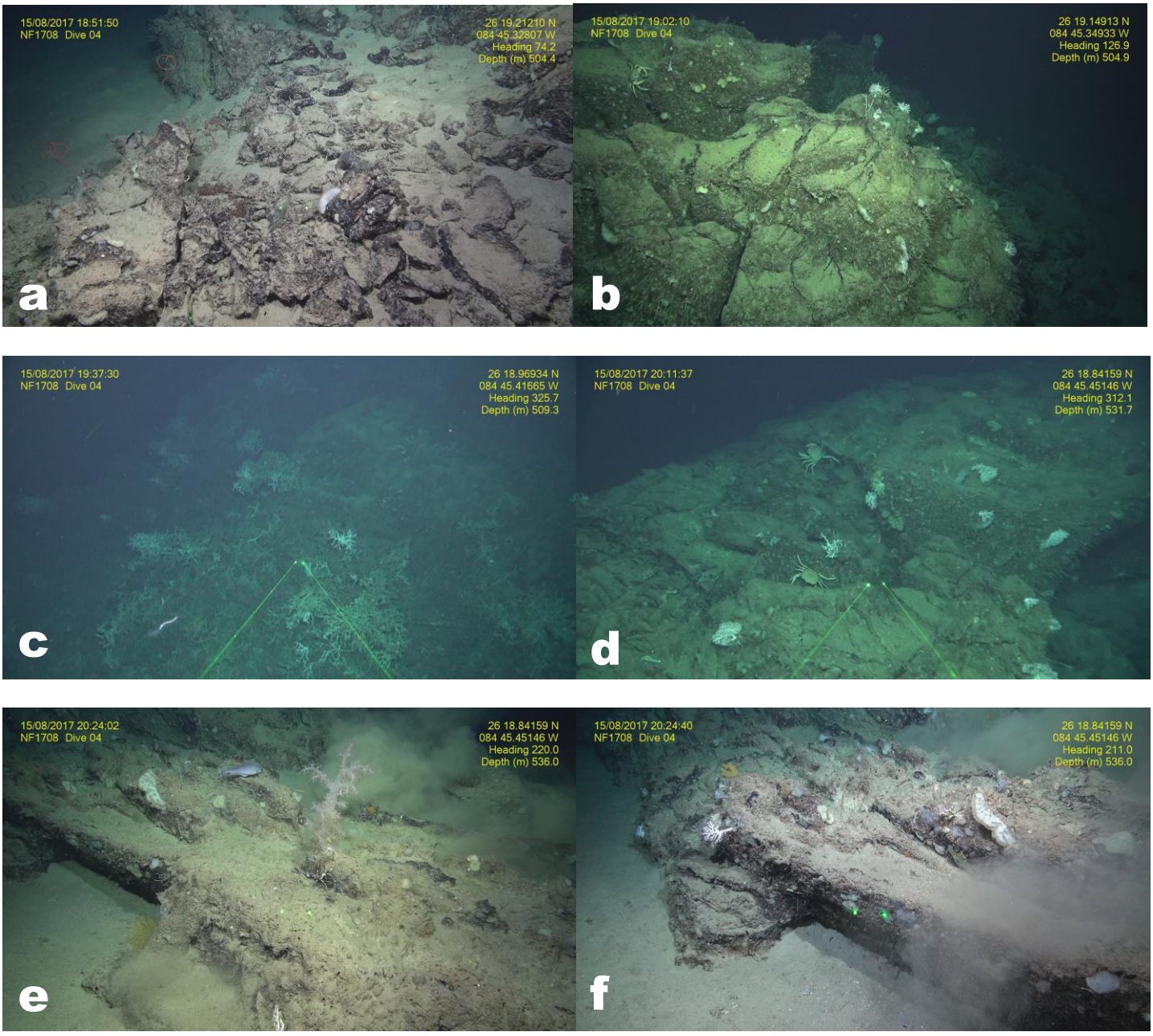
Depth profiles of **a.** UTC time, **b.** temperature, **c.** salinity, and **d.** dissolved oxygen measured by the CTD sensors that were attached to the ROV on DIVE03 at North Reed site. Note that depth profiles for temperature, salinity and dissolved oxygen (**b-d**) only include data collected during the downcast portion of the dive.

Dive number: NF1708-DIVE04
Date: 8/15/2017
Locality: North Reed
On bottom latitude & longitude: 26.3205, -84.7540
Off bottom latitude & longitude: 26.3140, -84.7575

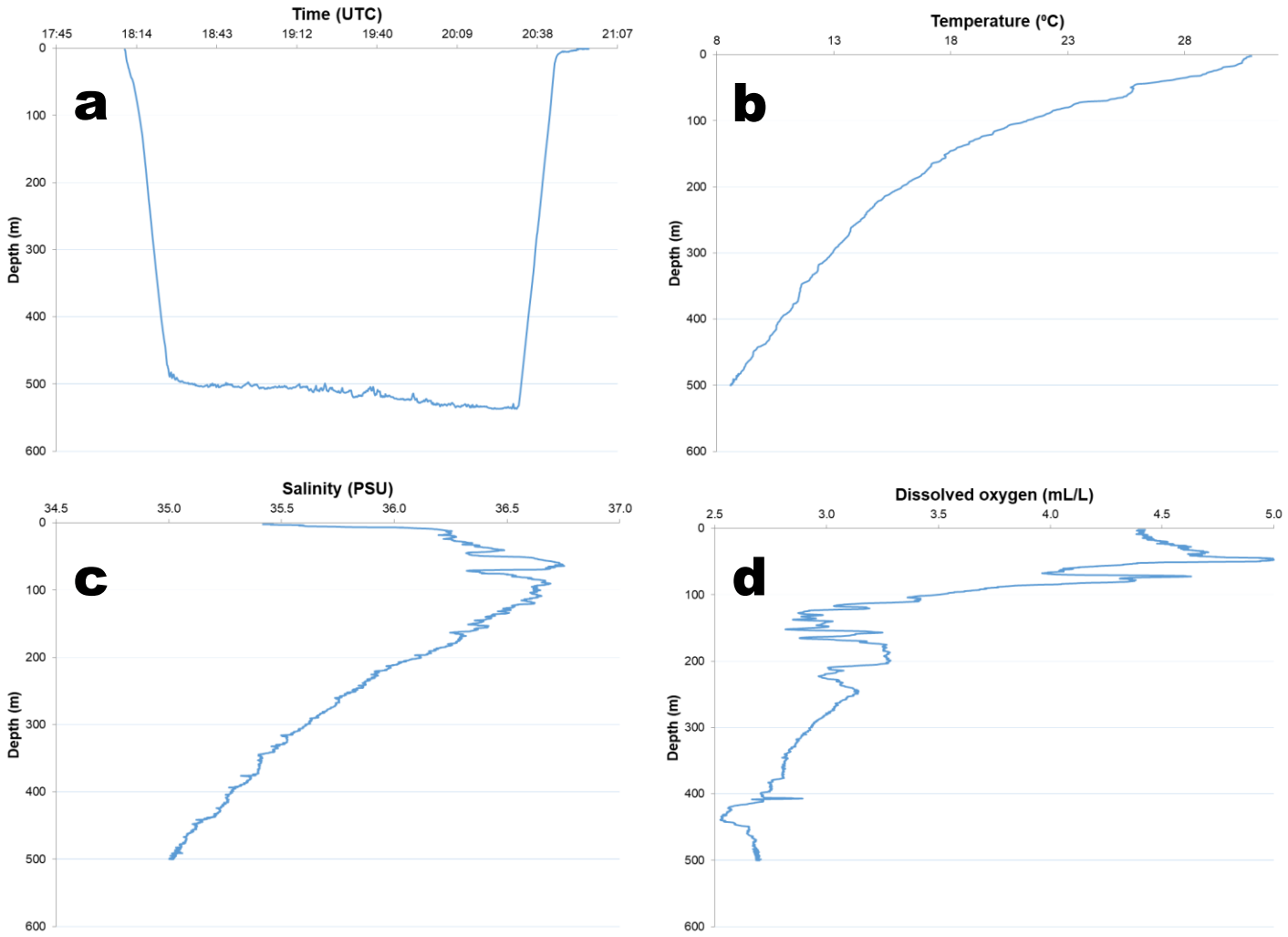
Summary:
The dive landed at 18:27 UTC at a depth of 480 m near Waypoint 2, in the south-central region of the proposed North Reed HAPC area, and then proceeded to seek out presumed mound features evident in backscatter data collected by NOAA Ship *Nancy Foster* in 2008. The ROV encountered several rocky outcrops over a short distance (~300-500 m), each of which was overgrown with corals and sponges. Most mounds were small, and aggregations were sparse. Mounds had a few golden crabs, *Stylaster* sp., *Stichopathes* sp., and small *Lophelia pertusa* colonies. *Euplectella* sp. sponges were present on most rock features. One mound had a moderate aggregation (1-2 m) of dead *L. pertusa*. Another had a large aggregation (> 10 m) of live and dead *L. pertusa*. A thick rope was observed wrapped around dead *L. pertusa*. Fish observed on the dive included roughy, lanternbelly, rattail, *Laemonema* sp. and scorpionfish. The ROV quickly outpaced the ship over the course of the dive and then struggled to regain control. Rocky outcrops were observed continuously along the transit, every 20-30 m or so, but were not evident in bottom topography data. The dive added new corals and sponge records in the central region of the North Reed proposed HAPC, where none were present before. Additionally, it showed that currently available seafloor multibeam data underrepresents the extent of hard bottom features. Backscatter data was more representative, but at 10 m cell size, neither topography nor backscatter data had sufficient resolution to be fully representative.



Map showing the dive track of DIVE04 at the North Reed site. Dive tracks were created using data from the ROV's Trackpoint navigation system.



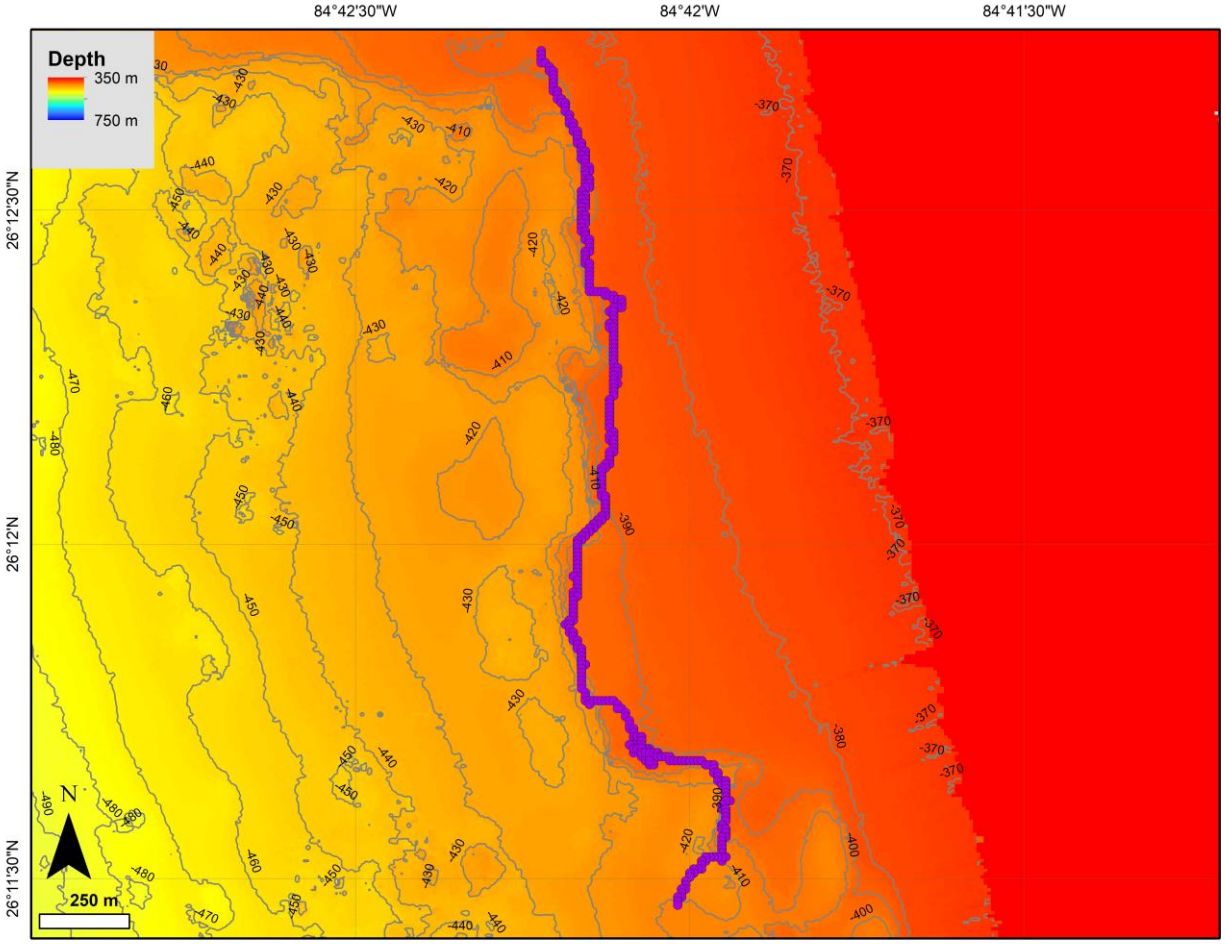
Highlight images collected during DIVE04 at North Reed site. **a.** Three *Stichopathes* sp. wire corals next to *Muriceides* sp., *Anthomastus* sp. and a sea cucumber; **b.** diverse assemblage including sponges and Stylasteridae next to a golden crab (*Chaceon fenneri*); **c.** dense aggregation of *Lophelia pertusa*; **d.** small patches of *L. pertusa*, Stylasteridae and sponges next to two golden crabs (*Chaceon fenneri*); **e.** *Laemonema goodebeanorum* fish next to large colony of Aquaumbridae soft coral, various sponges, and *Paramuricea* sp.; and **f.** diverse assemblage consisting of sponges, *Paramuricea* sp., and Stylasteridae.



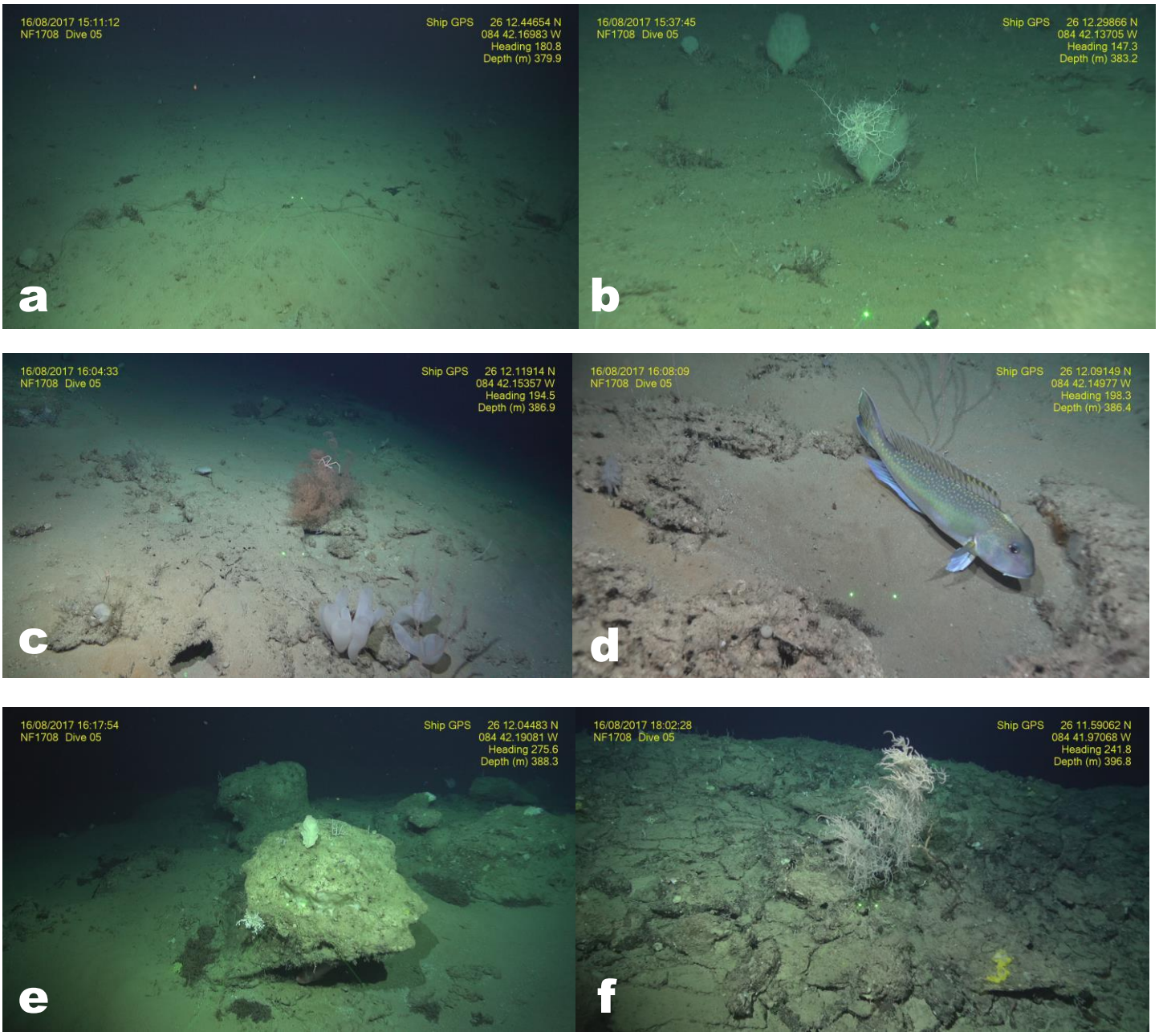
Depth profiles of **a.** UTC time, **b.** temperature, **c.** salinity, and **d.** dissolved oxygen measured by the CTD sensors that were attached to the ROV on DIVE04 at North Reed site. Note that depth profiles for temperature, salinity and dissolved oxygen (**b-d**) only include data collected during the downcast portion of the dive.

Dive number: NF1708-DIVE05
Date: 8/16/17
Locality: Many Mounds
On bottom latitude & longitude: 26.2090, -84.7030
Off bottom latitude & longitude: 26.1928, -84.6996

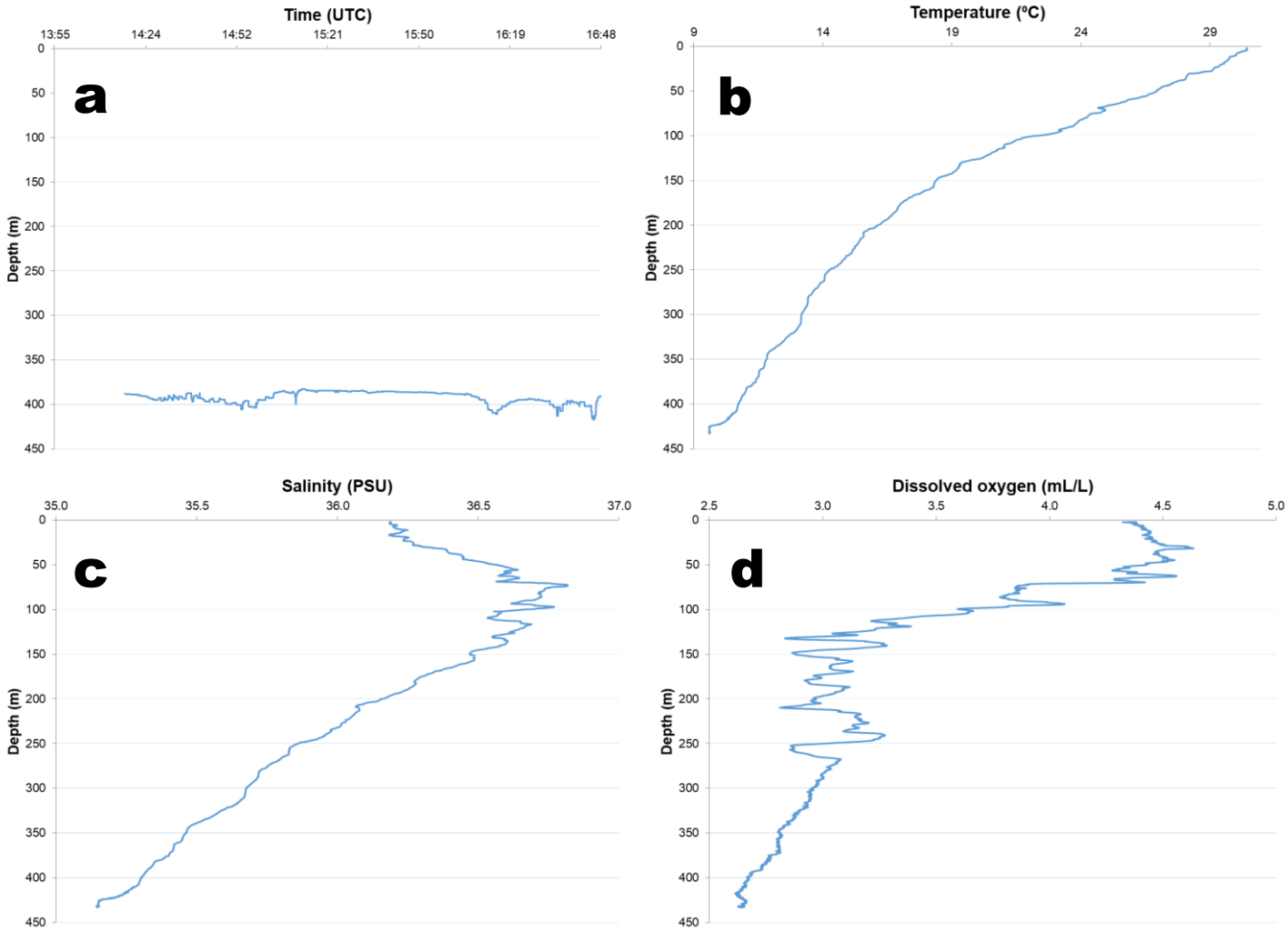
Summary:
The first part of the DIVE05 landed in Many Mounds site at 14:19 UTC at 385 m depth near Waypoint 2, in an unexplored eastern central region of the proposed HAPC area. The dive then proceeded to seek the presumed ridge feature at 385 m. The dive followed this contour. No transponders were operational, so the ROV flew by compass using dead reckoning, fathometers, and the topography of the steep ridge feature. The flat landing northwest of Waypoint 2 had several *Leiopathes glaberrima* colonies on scattered rock, which was notable because they occurred over flat sandy bottom. The dive transited far beyond Waypoint 5 until the wall feature grew less distinct. The ROV left bottom for tow to the west at 18:21 from its southernmost ridge position (26.1928N, l-84.6996W). Over the course of the ridge segment, the ROV imaged many colonies of *Leiopathes glaberrima, Stylaster* sp., and bamboo corals. A few colonies of *Callogorgia* sp., *Paramuricea* sp., and *Lophelia pertusa* were also observed. Fishes were relatively abundant, including blackbelly rosefish, swallowtail bass, Darwin slimeheads, *Synagrops* sp., *Benthocometes* sp. (on black corals), *Laemonema* sp., lanternbelly, rattail, shortnose greeneye, and tilefish. Mobile invertebrates included sea cucumbers, pencil urchins, golden crabs, and squat lobsters.



Map showing the dive track of DIVE05 on a ridge at Many Mounds. ROV position was approximated using the position and heading of the ship, ROV tether length, ROV depth, as well as noteworthy features (e.g., ridges, mounds) seen during the dive that were cross-referenced with contours in existing multibeam data of the area.



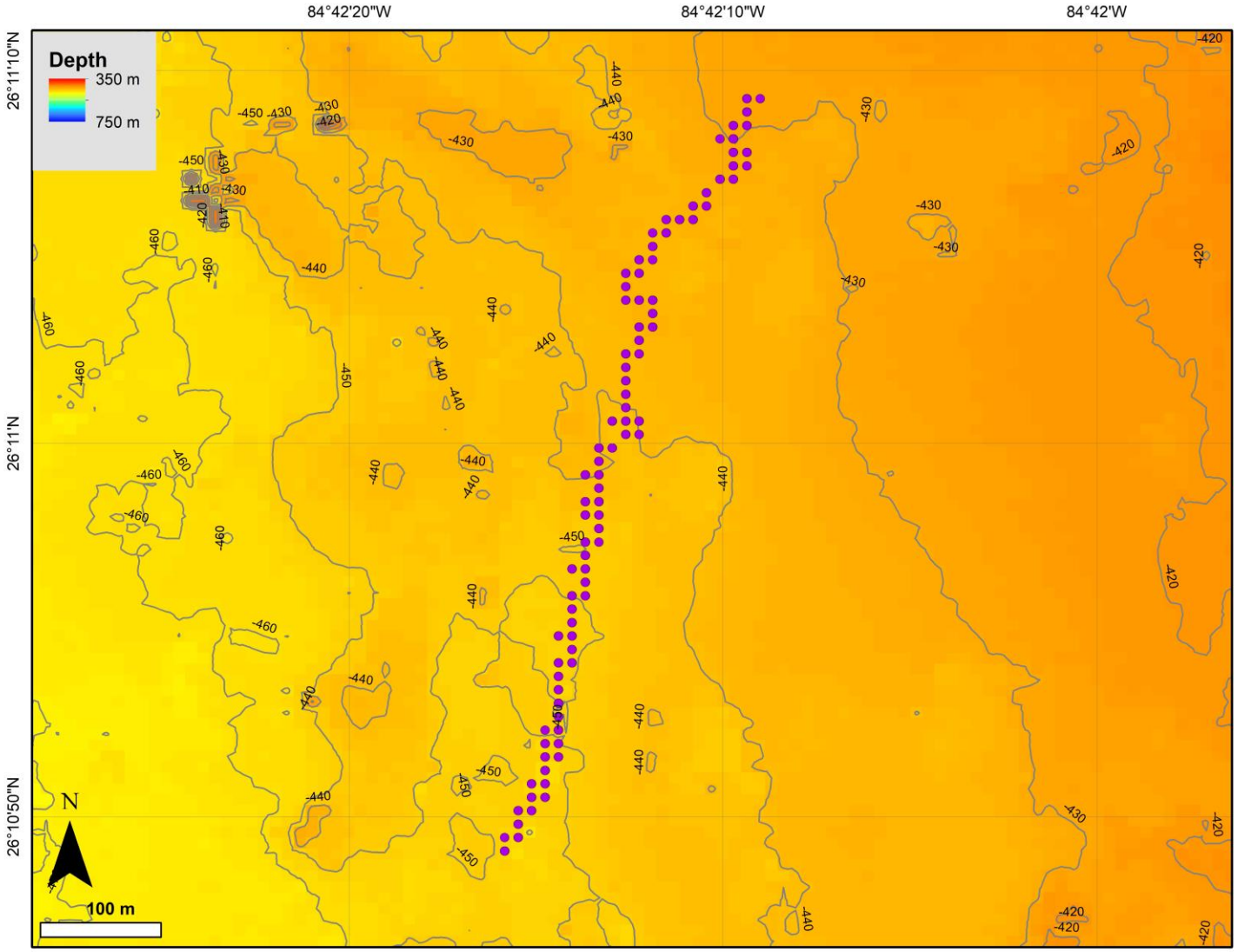
Highlight images collected during DIVE05 on a ridge at Many Mounds. **a.** fishing line wrapped around a sponge and bamboo coral (Isididae); **b.** various sponges including one with a commensal basket star next to bamboo corals (Isididae) and *Muriceides* sp.; **c.** *Laemonema barbatulum* fish next to sponges, *Leiopathes glaberrima* with commensal squat lobster, and a bamboo coral (Isididae); **d.** tilefish *Lopholatilus chamaelonticeps* next to a sponge and bamboo coral (Isididae); **e.** Darwin's slimehead (*Gephyroberyx darwini)* under rock that is overgrown with *Lophelia pertusa*, sponges, and *Muriceides* sp.; and **f.** two *L. glaberrima*. colonies next to rocks with various encrusting sponges.



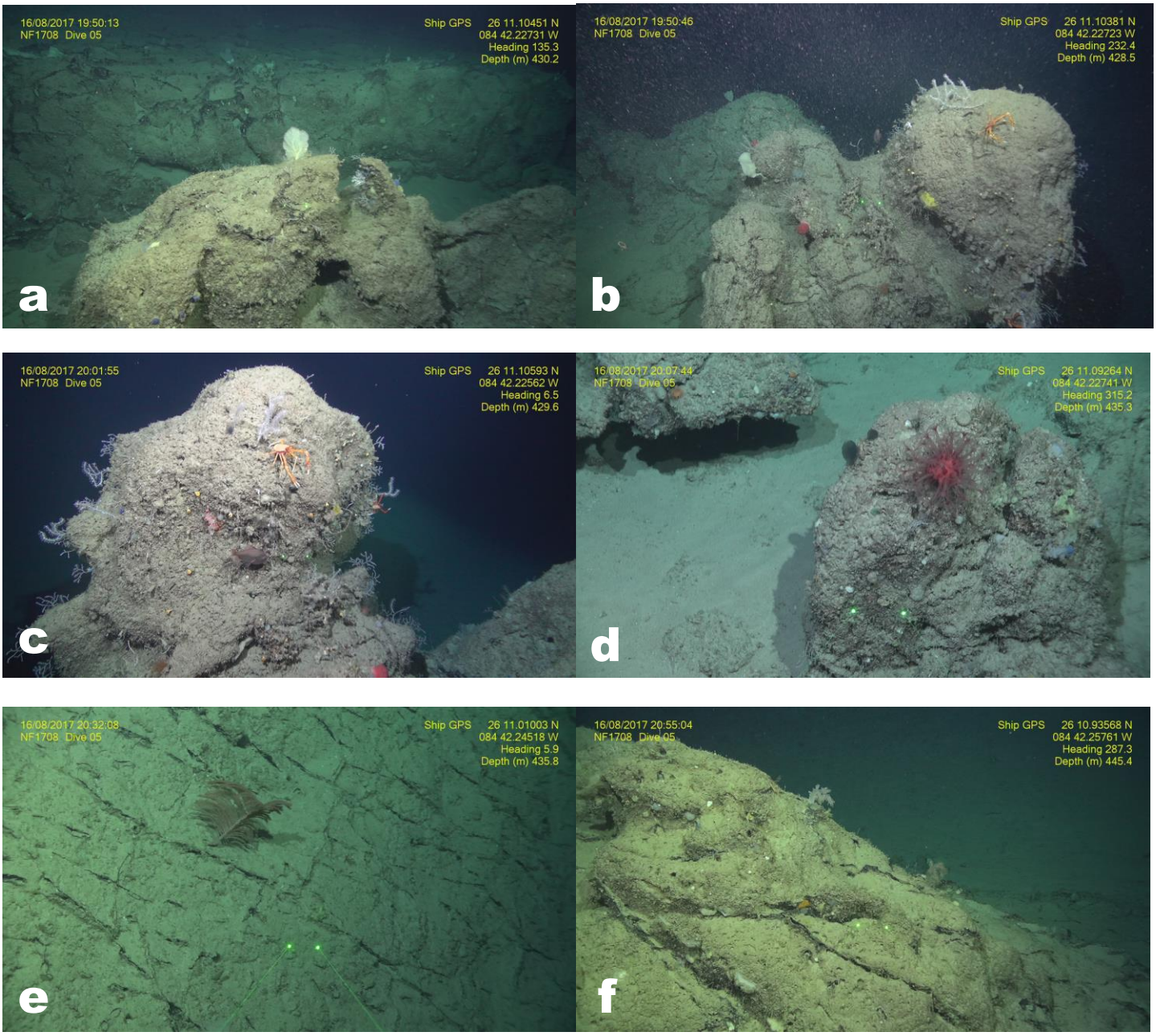
Depth profiles of **a.** UTC time measured during the on bottom portion of DIVE05 at Many Mounds using the ROV Trackpoint navigation system. Depth profiles of **b.** temperature, **c.** salinity, and **d.** dissolved oxygen measured during a CTD cast conducted approximately 1 km west of the site surveyed during DIVE05. Note that the ROV-mounted CTD was not operational during DIVE05, and therefore depth profiles for temperature, salinity and dissolved oxygen (**b-d**) show data collected with the ship's CTD-carousel sensors during a CTD cast (CTD09) conducted near the ROV dive site.

Dive number: NF1708-DIVE05A
Date: 8/16/17
Locality: Many Mounds (deep)
On bottom latitude & longitude: 26.1861, -84.7030
Off bottom latitude & longitude: 26.1764, -84.7048

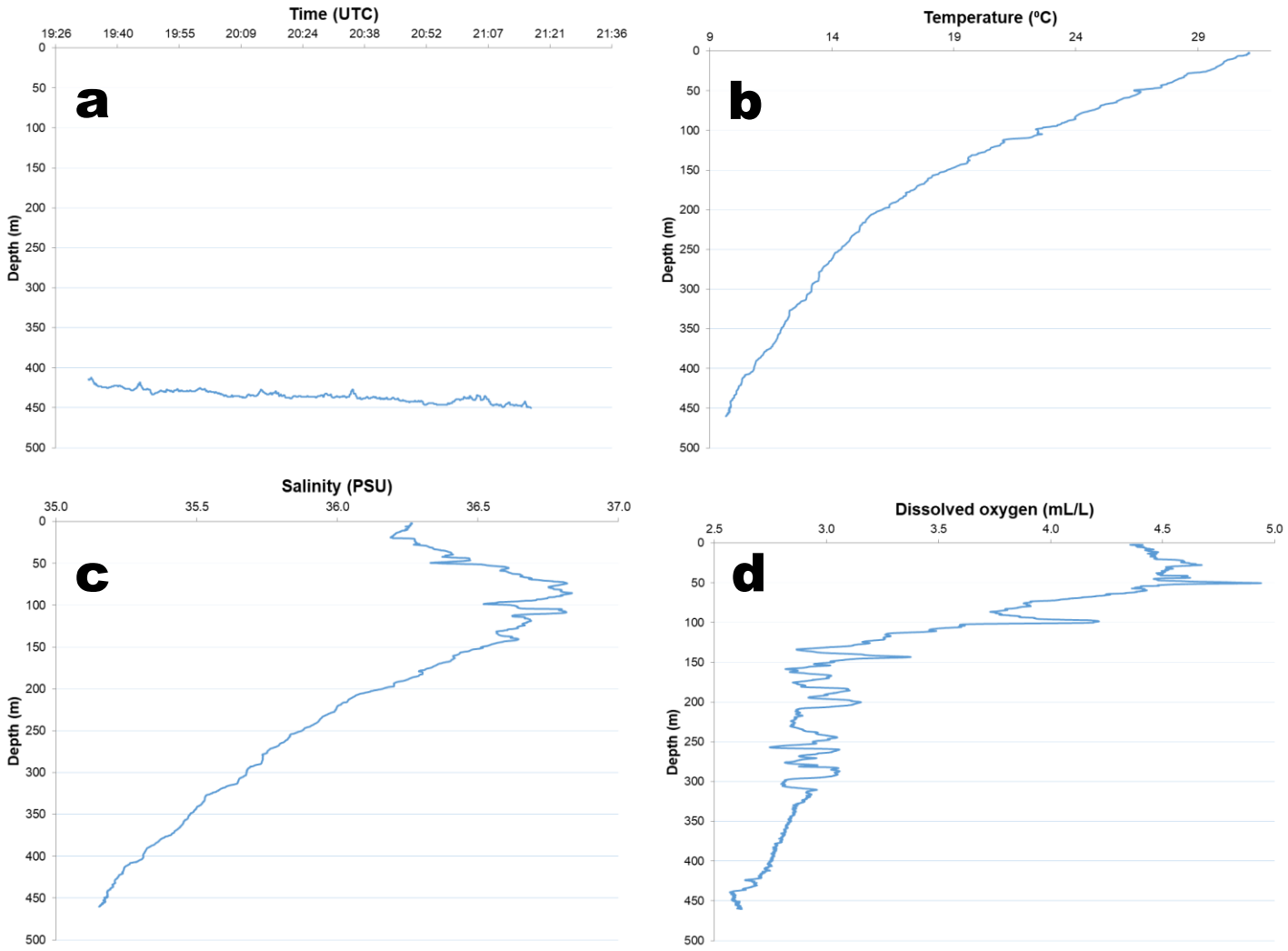
Summary:
The second part of the dive was labeled DIVE05A, whereas the first part was labeled DIVE05. The dive landed at 19:34 UTC, at a position nearby of DIVE05, and transited into deeper areas west of the ridge feature, using backscatter and sonar. The hard targets encountered by the ROV had the appearance of dried, cracked mud, but carbonate pits were evident on the sides. Epifauna was sparse on these features, but colonies of *Stylaster* sp., *Muriceides* sp., Aquaumbridae, *Phakellia* sp., and other 'bracket' sponges were most common. *Lophelia pertusa* was observed 2-3 times and *Leiopathes glaberrima* was observed once. The most conspicuous mobile invertebrate fauna were squat lobsters.



Map showing the dive track of DIVE05A at Many Mounds. ROV position was approximated using the position and heading of the ship, ROV tether length, ROV depth, as well as noteworthy features (e.g., ridges, mounds) seen during the dive that were cross-referenced with contours in existing multibeam data of the area.



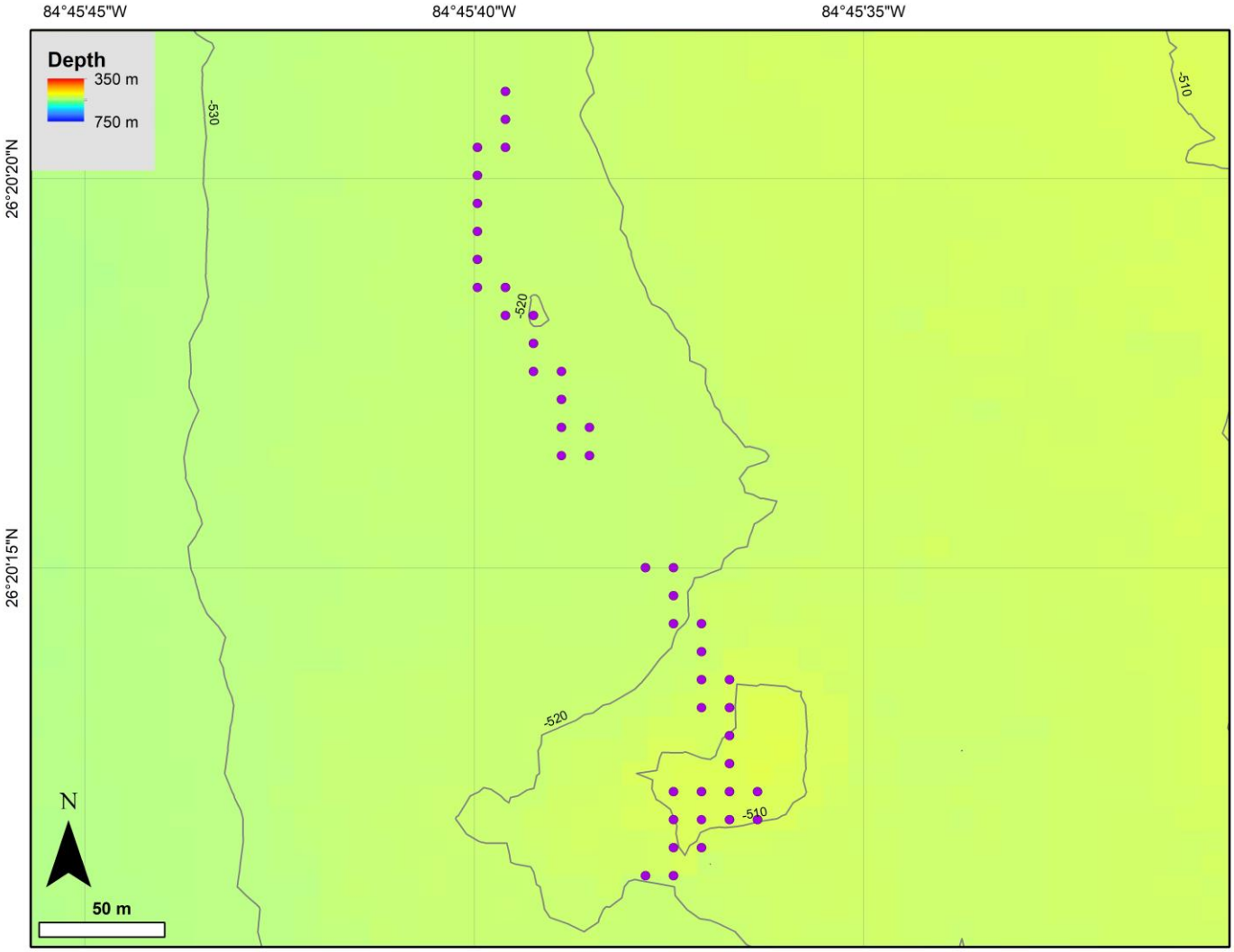
Highlight images collected during DIVE05A at Many Mounds. **a.** *Phakellia* sp. sponge, next to Stylasteridae and unidentified octocorals; **b.** *Eumunida picta* squat lobster next to sponges, unidentified octocorals, and roughy; **c.** *Hoplostethus occidentalis* fish next to *Eumunida picta* squat lobster, *Muriceides* sp., unidentified octocorals, cup corals, and a shrimp; **d.** the mushroom coral *Anthomastus* sp. on a rock that is also overgrown by encrusting sponges; **e.** *Bathypathes* sp. colony; and **f.** tow colonies of the Aquaumbridae soft coral next to various sponges.



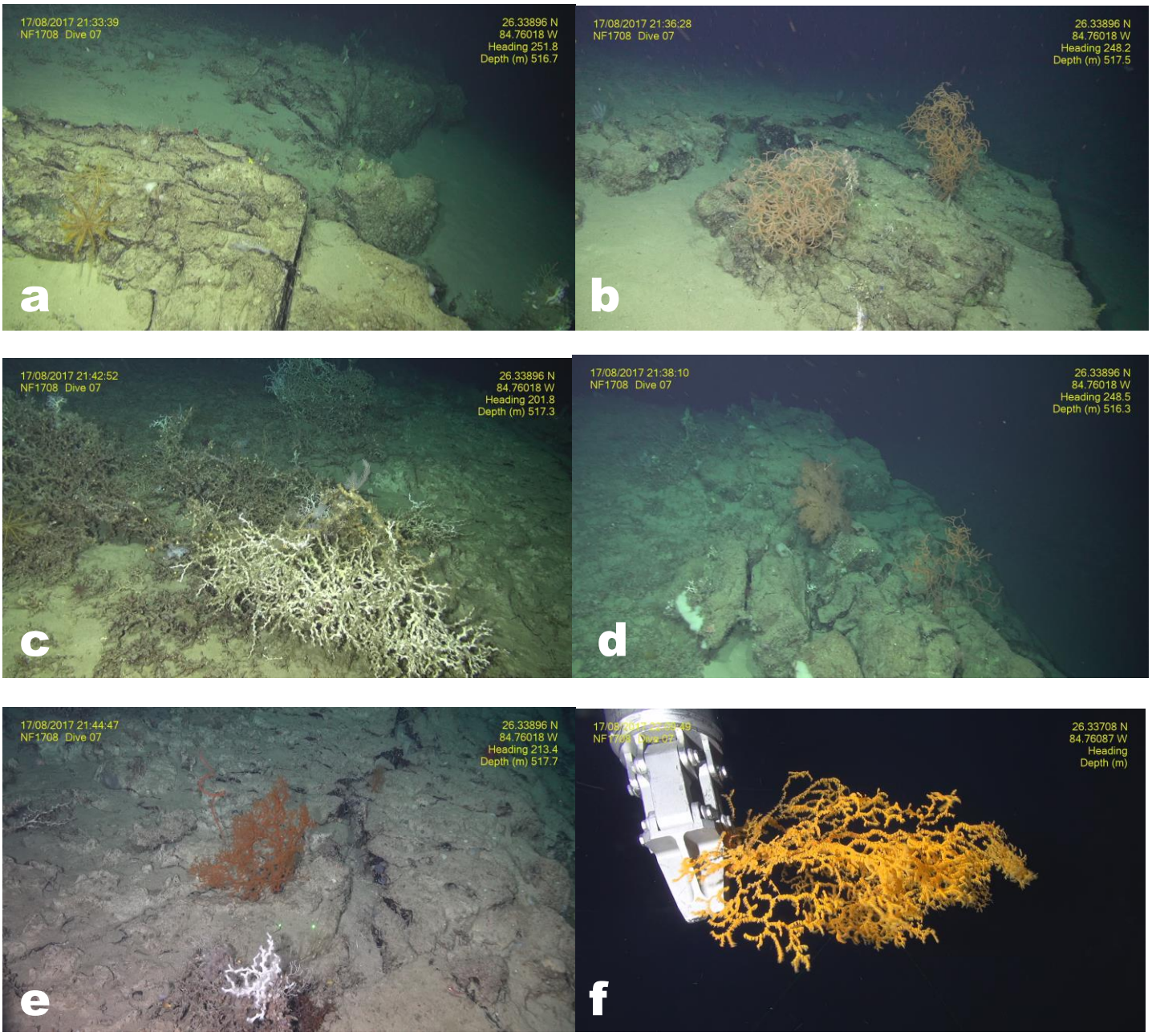
Depth profiles of **a.** UTC time measured during the on bottom portion of DIVE05A at Many Mounds using the ROV Trackpoint navigation system. Depth profiles of **b.** temperature, **c.** salinity, and **d.** dissolved oxygen measured during a CTD cast conducted approximately 1 km west of the site surveyed during DIVE05A. Note that the ROV-mounted CTD was not operational during DIVE05A, and therefore depth profiles for temperature, salinity and dissolved oxygen (**b-d**) show data collected with the ship's CTD-carousel sensors during a CTD cast (CTD10) conducted near the ROV dive site.

Dive number: NF1708-DIVE07
Date: 8/17/2017
Locality: North Reed
On bottom latitude & longitude: 26.3390, -84.7602
Off bottom latitude & longitude: 26.3369, -84.7602

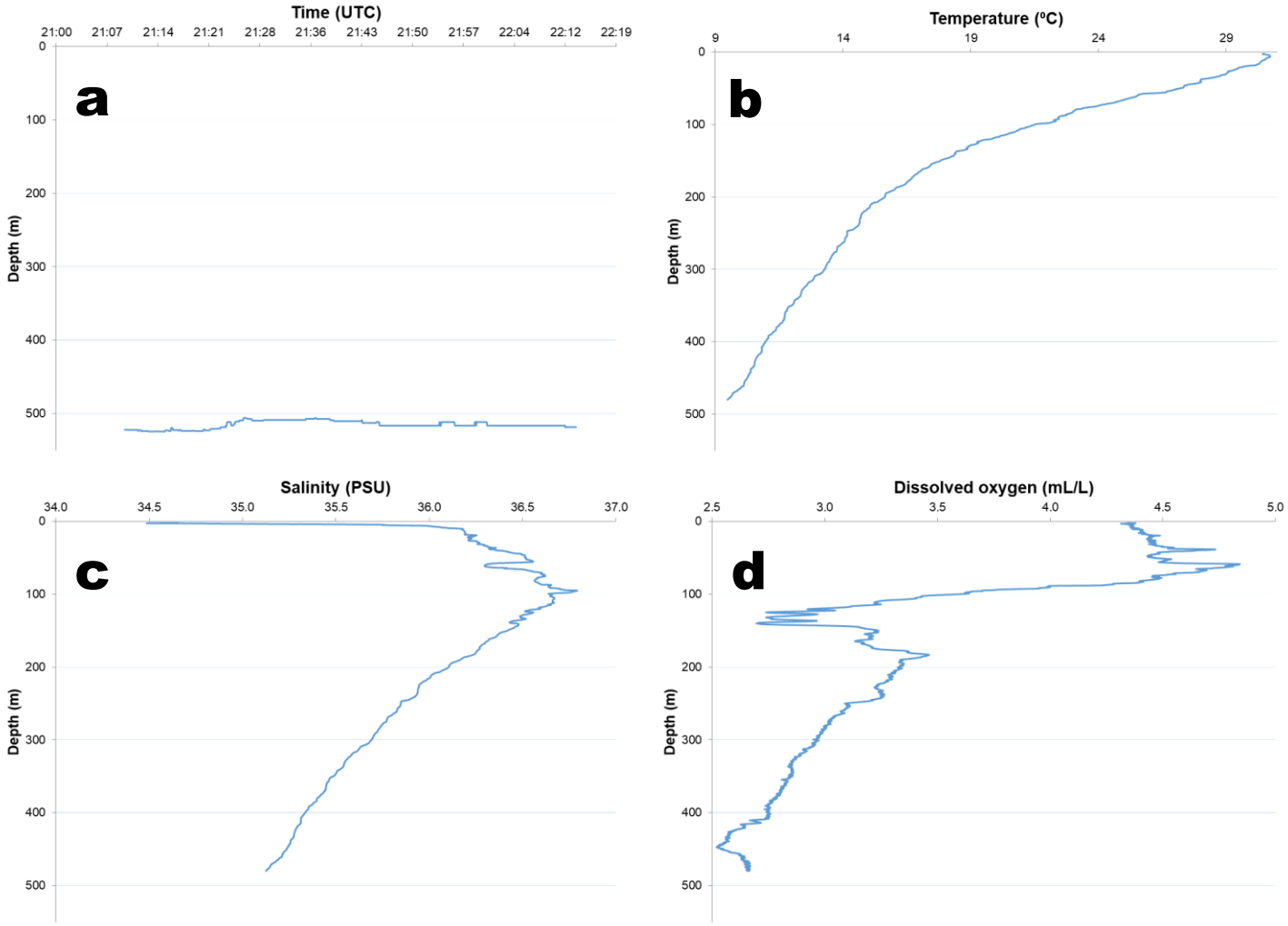
Summary:
The ROV dive deployed near 21:00 UTC and landed in soft sediment in the North Reed proposed HAPC near 500 m depth. The dive then proceeded to search for sampling targets at a previously explored site reported in Ross et al. (2017). Hard ground was encountered after ~20 minutes. The first rock was bare, the next had several medium-sized colonies of *Leiopathes glaberrima*, whereas the last had *Lophelia pertusa* and *L. glaberrima*. The manipulator arm seemed to work well, but tracking was again malfunctioning, even with new transponders. Time was limited. The ROV attempted to collect *L. pertusa* with a tool but the tool broke. Parallel jaws were also used to attempt to collect *L. pertusa*, but these attempts were also unsuccessful. One whole colony of *L. glaberrima* colony was eventually collected using the parallel jaws. Fish species observed during the dive included blackbelly rosefish, roughy, *Laemonema* sp., rattail, and lanternbelly. The ROV came off the bottom at 22:05.



Map showing the dive track of DIVE07 at North Reed site. ROV position was approximated using the position and heading of the ship, ROV tether length, ROV depth, as well as noteworthy features (e.g., ridges, mounds) seen during the dive that were cross-referenced with contours in existing multibeam data of the area.



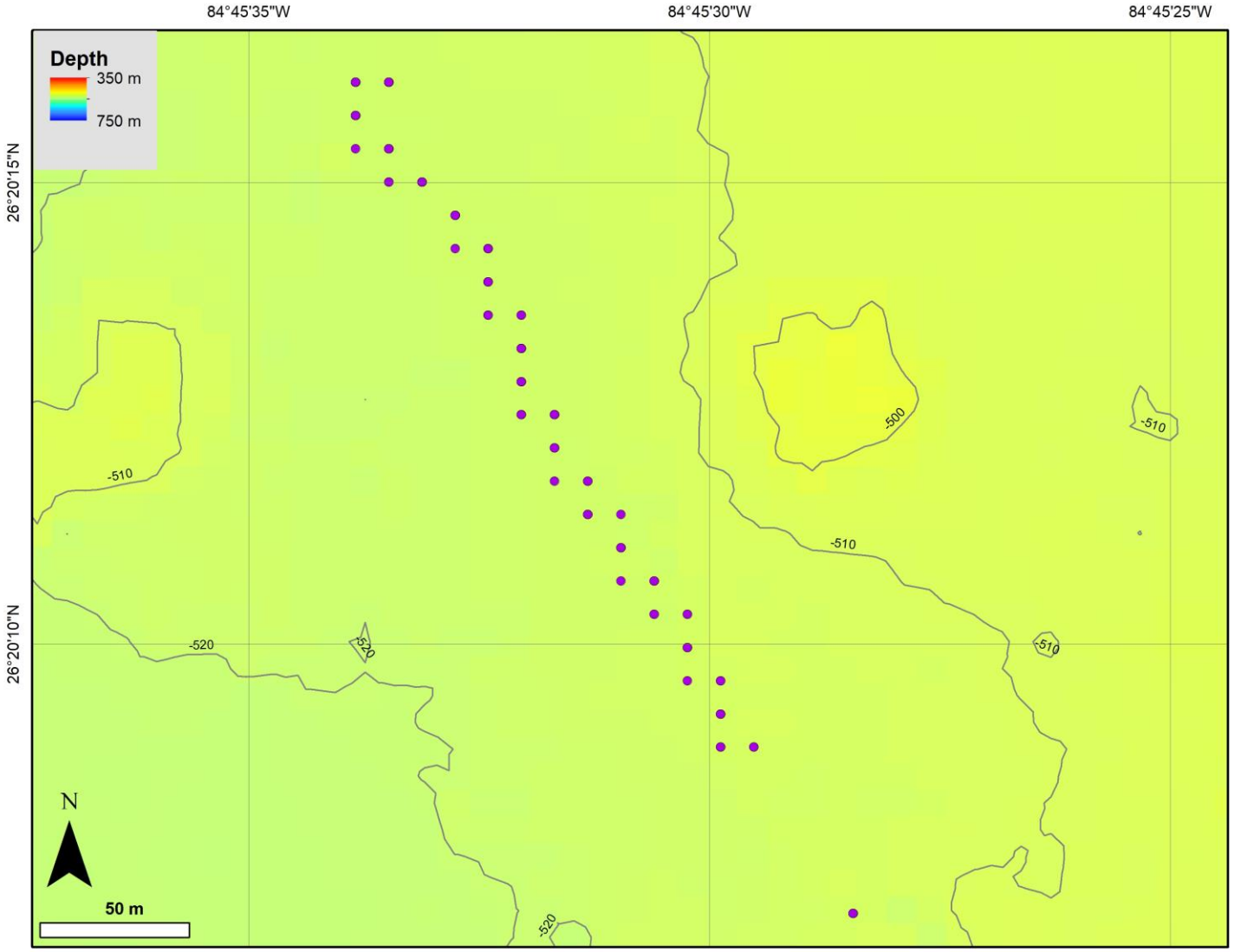
Highlight images collected during DIVE07 at North Reed site. **a.** two crinoids, next to sponges and Stylasteridae; **b.** two large *Leiopathes glaberrima* colonies next sponge and *Muriceides* sp.; **c.** diverse assemblage including live and dead *Lophelia pertusa* colonies, *Plumarella* sp., Stylasteridae, and various sponges; **d.** two *L. glaberrima* colonies next to various sponges **e.** *L. pertusa* next to the black corals *L. glaberrima* and *Stichopathes* sp.; and **f.** *L. glaberrima* specimen collected with the parallel jaws.



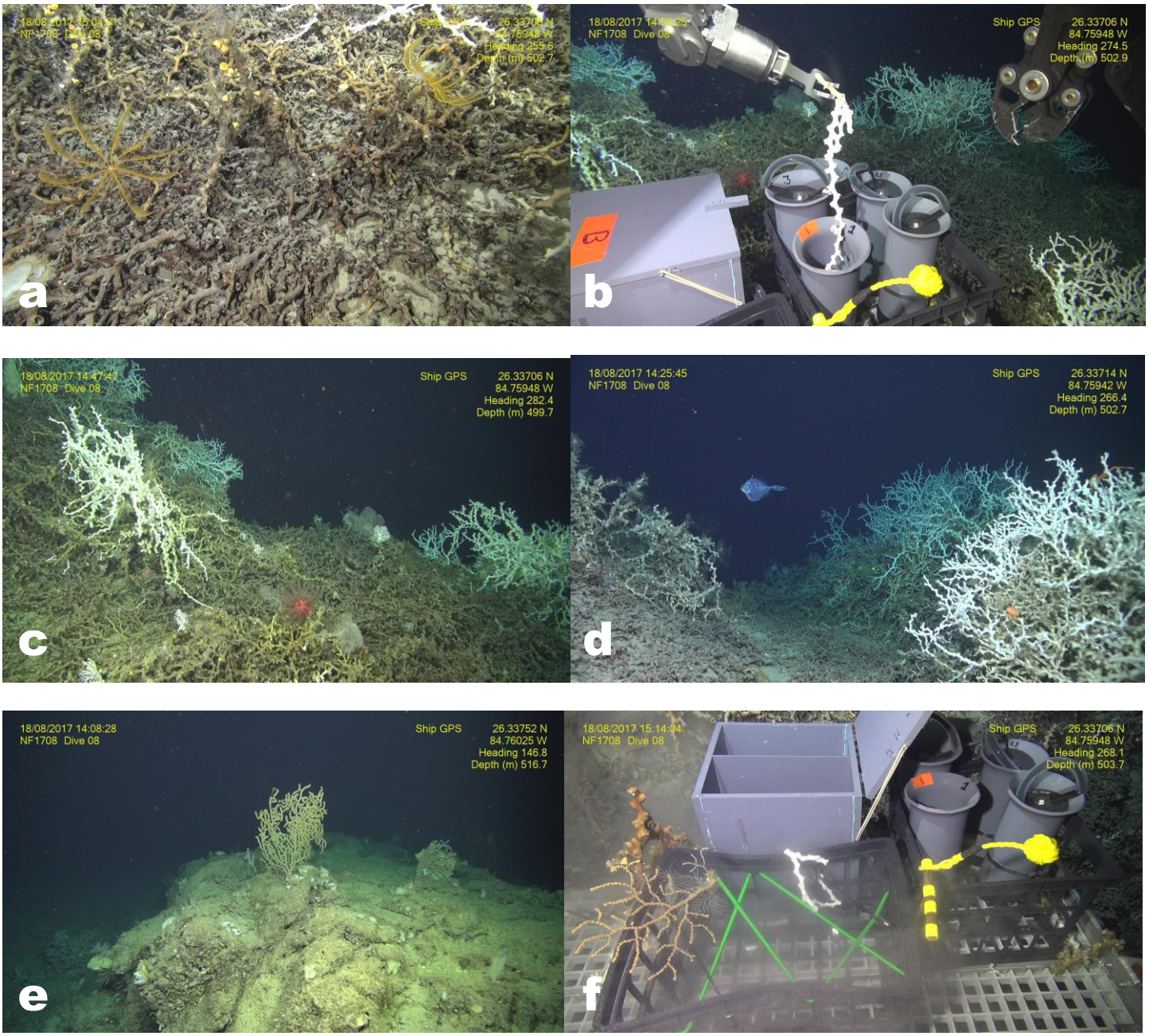
Depth profiles of **a.** UTC time measured during the on bottom portion of DIVE07 at North Reed using the ROV Trackpoint navigation system. Depth profiles of **b.** temperature, **c.** salinity, and **d.** dissolved oxygen measured during a CTD cast conducted approximately 2 km south of the site surveyed during DIVE07. Note that the ROV-mounted CTD was not operational during DIVE07, and therefore depth profiles for temperature, salinity and dissolved oxygen (**b-d**) show data collected with the ship's CTD-carousel sensors during a CTD cast (CTD06) conducted near the ROV dive site.

Dive number: NF1708-DIVE08
Date: 8/18/2017
Locality: North Reed
On bottom latitude & longitude: 26.3300, -84.7600
Off bottom latitude & longitude: 26.3370, -84.7590

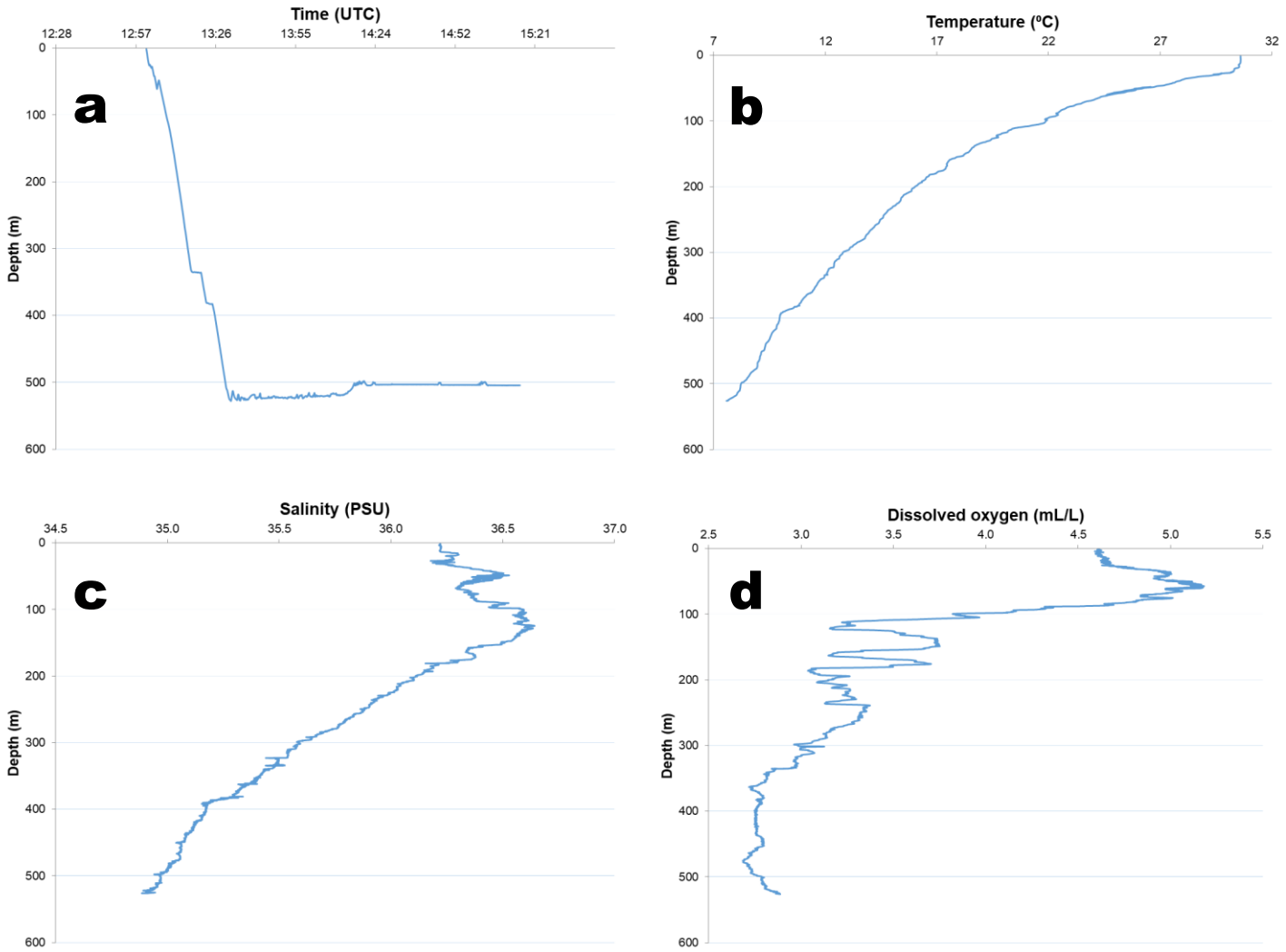
Summary:
The dive landed at 13:31 (UTC) at 525 m depth near Waypoint 2, in the north region of the proposed North Reed HAPC. The dive then proceeded to seek mound features reported in Ross et al. (2017). Several *Leiopathes glaberrima* colonies were present, as well as large mounds of *Lophelia pertusa*. The dive was dedicated to *L. pertusa* sampling, and mostly stationary. The team collected seven large specimens of *L. pertusa* for husbandry, genetics, and microbes, and one specimen of *Paramuricea* sp. that was overgrown with small *Plumarella* sp., *Muriceides* sp. and unknown octocoral at the base. Fish species observed included catsharks, tinselfish, blackbelly rosefish, *Merluccius* hake, *Laemonema* sp. and roughy. The dive left the bottom at 15:41.



Map showing the dive track of DIVE08 at North Reed Site. ROV position was approximated using the position and heading of the ship, ROV tether length, ROV depth, as well as noteworthy features (e.g., ridges, mounds) seen during the dive that were cross-referenced with contours in existing multibeam data of the area.



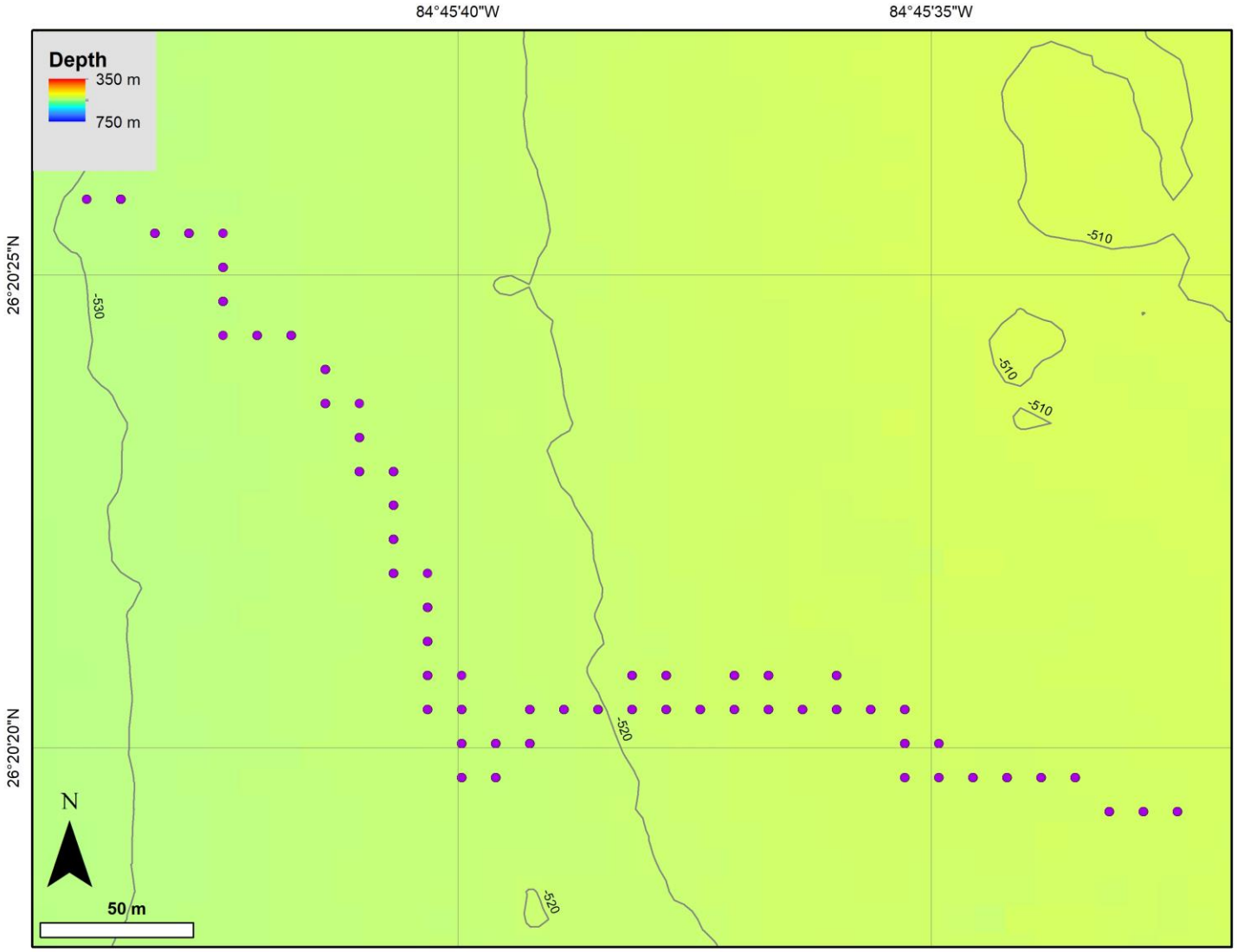
Highlight images collected during DIVE08 at North Reed Site. **a.** Two crinoids on *Lophelia pertusa* matrix; **b.** *L. pertusa* specimen collected using the manipulator arm; **c.** dense aggregation of *L. pertusa*, with some interspersed colonies of *Anthomastus* sp., Stylasteridae, *Plumarella* sp., and *Phakellia* sp.; **d.** *Grammicolepis brachiusculus* swimming over a dense aggregation of *L. pertusa*, that includes a *Eumunida picta* squat lobster; **e.** large *Paramuricea* sp. colony next to Isididae and sponges; and **f.** sampling tray of ROV with collected specimens of *Lophelia pertusa* and *Paramuricea* sp., the latter of which has small colonies of *Plumarella* sp., *Muriceides* sp., and an unknown octocoral growing at its base.



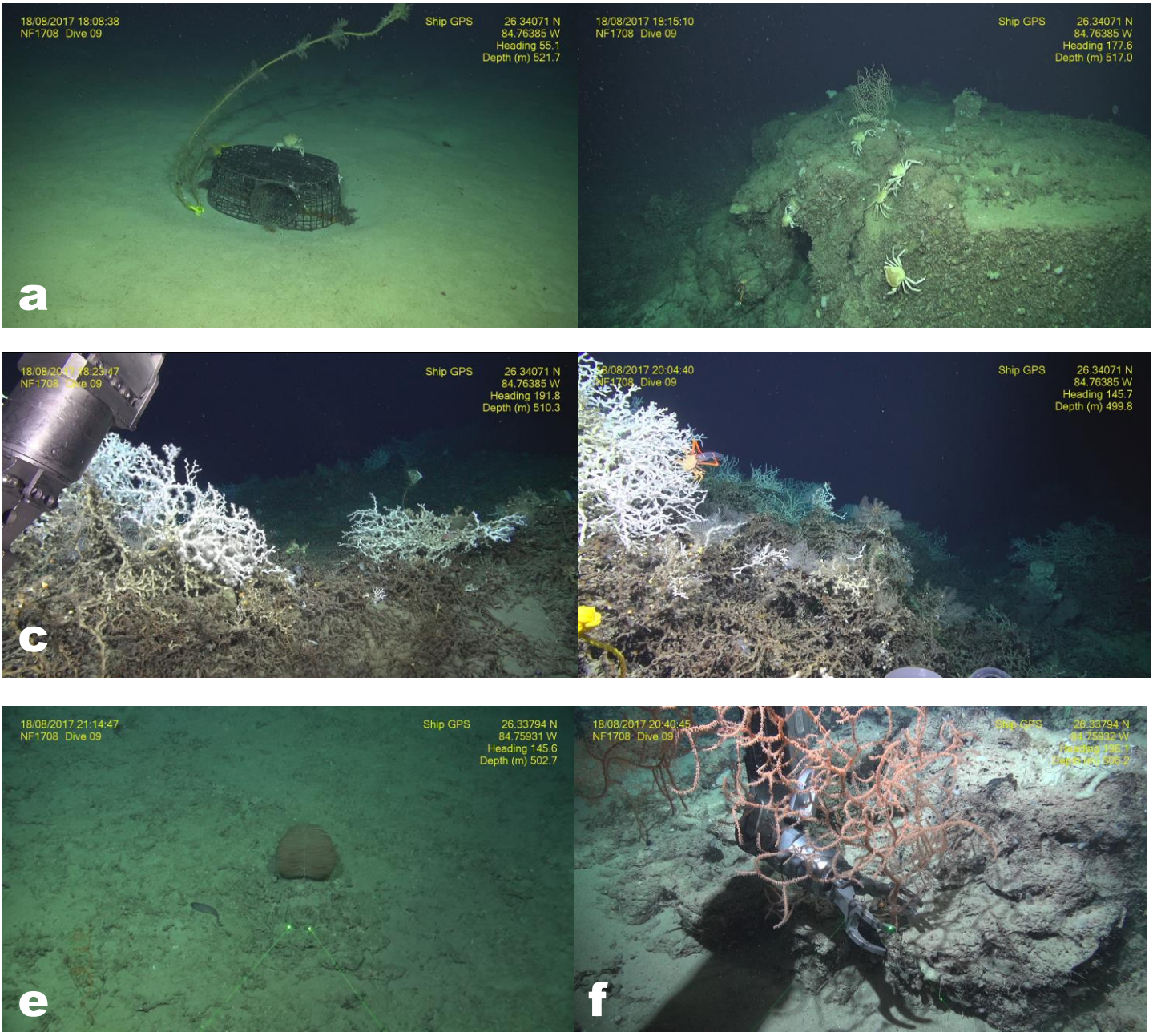
Depth profiles of **a.** UTC time, **b.** temperature, **c.** salinity, and **d.** dissolved oxygen measured by the CTD sensors that were attached to the ROV on DIVE08 at North Reed Site. Note that depth profiles for temperature, salinity and dissolved oxygen (**b-d**) only include data collected during the downcast portion of the dive, and that the CTD sensors stopped logging at 15:16 UTC, approximately 30 min before the end of the dive (**a**).

Dive number: NF1708-DIVE09
Date: 8/18/2017
Locality: North Reed
On bottom latitude & longitude: 26.3407, -84.7639
Off bottom latitude & longitude: 26.3380, -84.7593

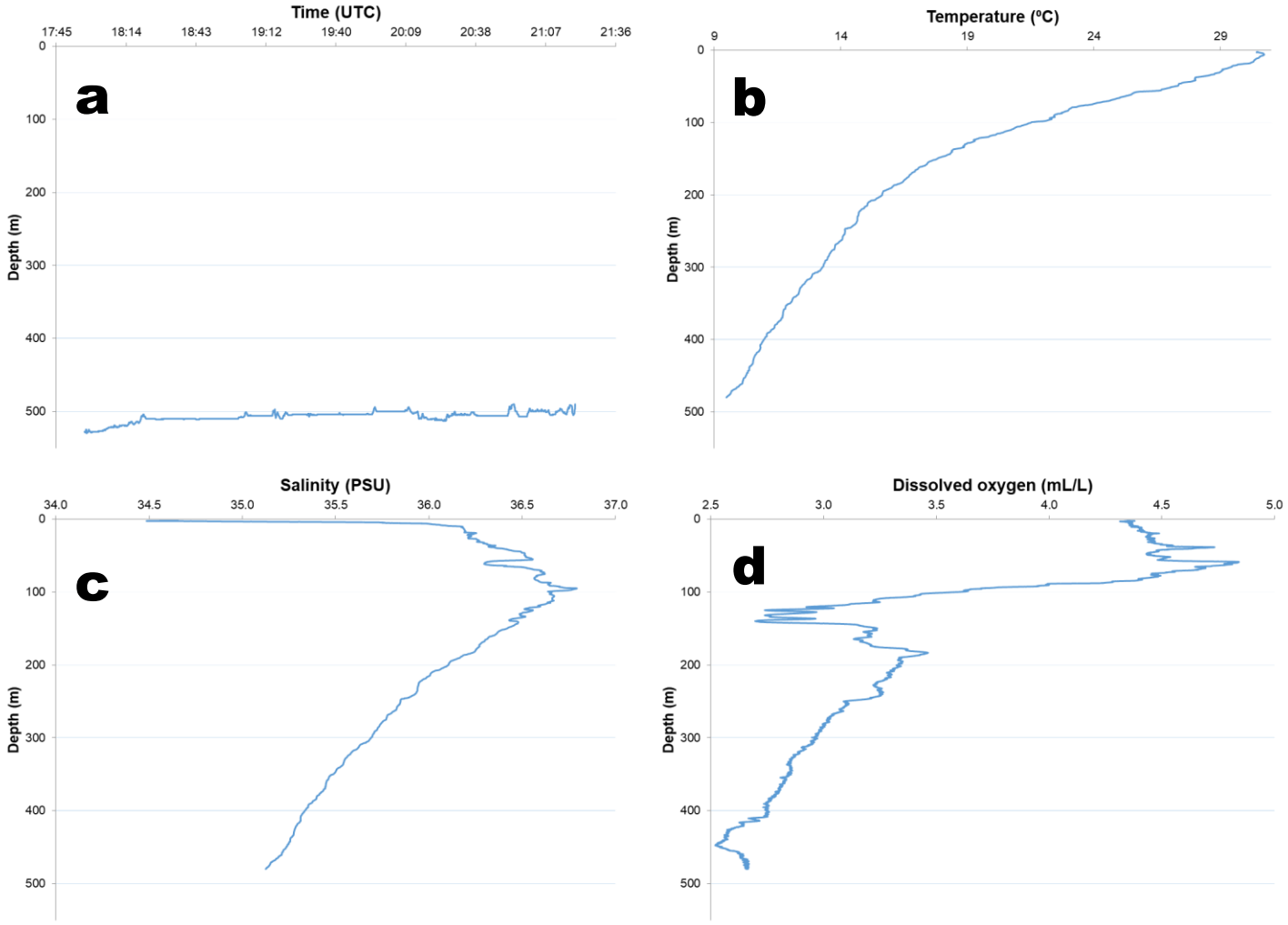
Summary:
The dive landed at 17:55 (UTC) at 525 m depth near Waypoint 2, in the north region of the proposed North Reed HAPC. The dive then proceeded to seek out mound features described in Ross et al. (2017). One lobster trap was seen. The first rock had many golden crabs and a large *Paramuricea* sp. colony. The dive was dedicated to *Lophelia pertusa* sampling, and mostly stationary. The team collected six large specimens of *L. pertusa* for husbandry, genetics, and microbes, and one specimen of *Leioopathes glabberima*; however, the basal portion of the black coral was lost on recovery. Fish species observed during the dive included blackbelly rosefish, rosy dory, tinselfish, cutthroat eel, shortnose greeneye, *Laemonema* sp., skate, and roughy.



Map showing the dive track of DIVE09 at North Reed Site. ROV position was approximated using the position and heading of the ship, ROV tether length, ROV depth, as well as noteworthy features (e.g., ridges, mounds) seen during the dive that were cross-referenced with contours in existing multibeam data of the area.



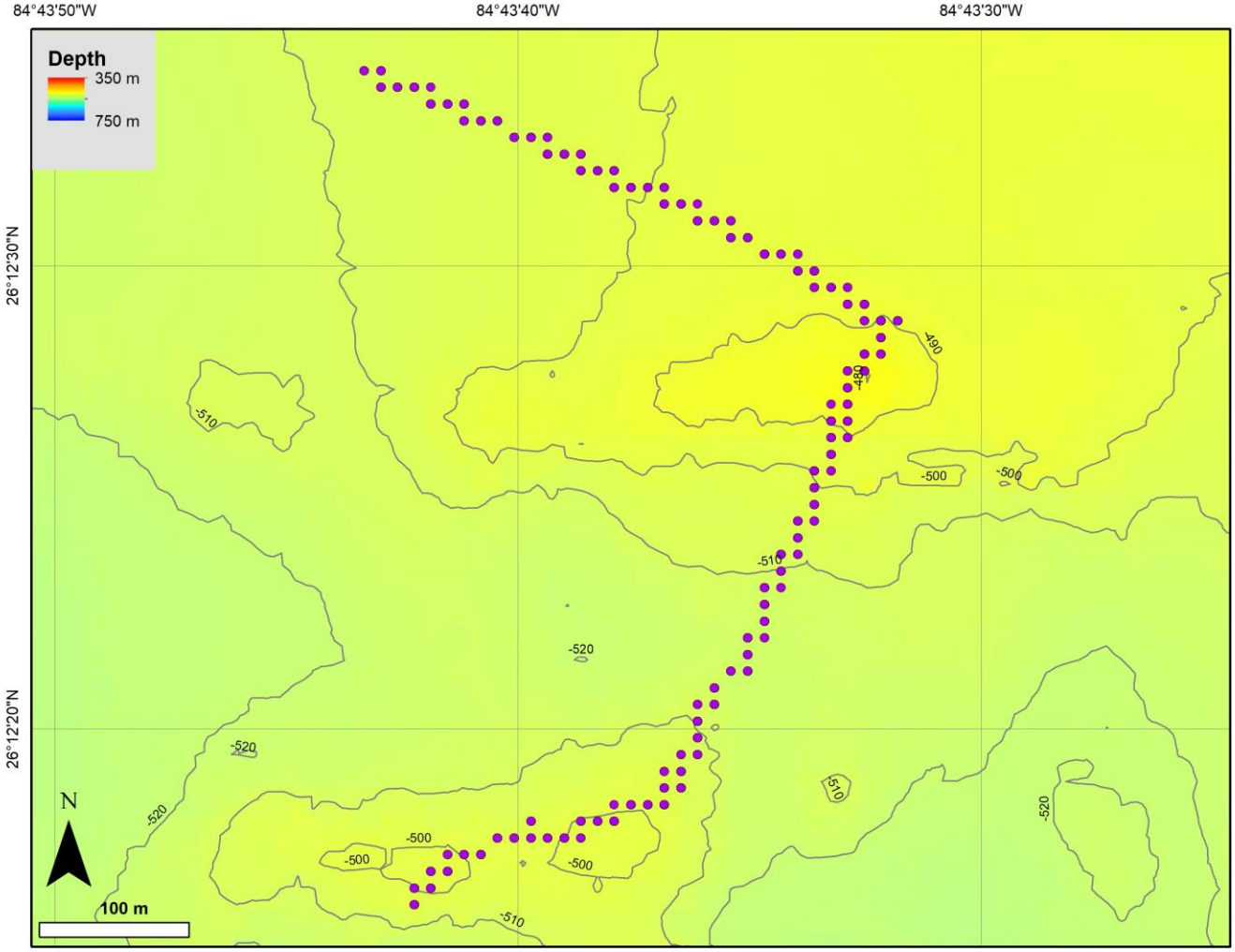
Highlight images collected during DIVE09 at North Reed Site. **a.** Golden crab (*Chaceon fenneri*) on top of a lobster/crab trap; **b.** five *C. fenneri* golden crabs and a squat lobster (*Eumunida picta*) next to large *Paramuricea* sp. colony; **c.** dense aggregation of *Lophelia pertusa* with some interspersed colonies of *Plumarella* sp. and Stylasteridae; **d.** Squat lobster *Eumunida picta* with a *Pyrosoma* sp. in its claws sitting on *L. pertusa*; **e.** fish next to the black corals *Bathypathes* sp. and *Stichopathes* sp.; **f.** *Leiopathes glaberrima* colony collected by the ROV.



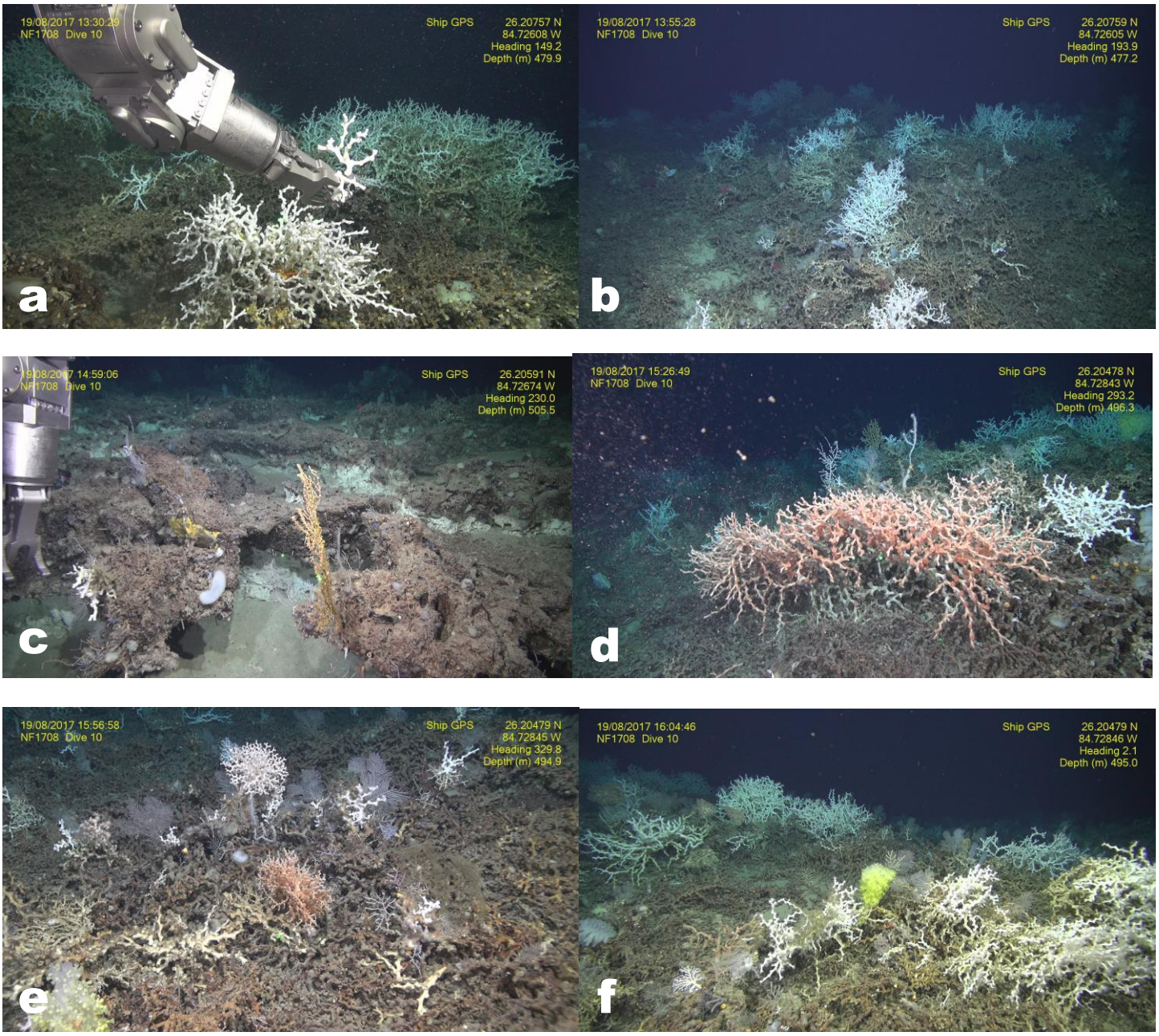
Depth profiles of **a.** UTC time measured during the on bottom portion of DIVE09 at North Reed using the ROV Trackpoint navigation system. Depth profiles of **b.** temperature, **c.** salinity, and **d.** dissolved oxygen measured during a CTD cast conducted approximately 2.4 km southwest of the site surveyed during DIVE09. Note that the ROV-mounted CTD was not operational during DIVE09, and therefore depth profiles for temperature, salinity and dissolved oxygen (**b-d**) show data collected with the ship's CTD-carousel sensors during a CTD cast (CTD06) conducted near the ROV dive site.

Dive number: NF1708-DIVE10
Date: 08/19/2017
Locality: Many Mounds
On bottom latitude & longitude: 26.2095, -84.7285
Off bottom latitude & longitude: 26.2048, -84.7285

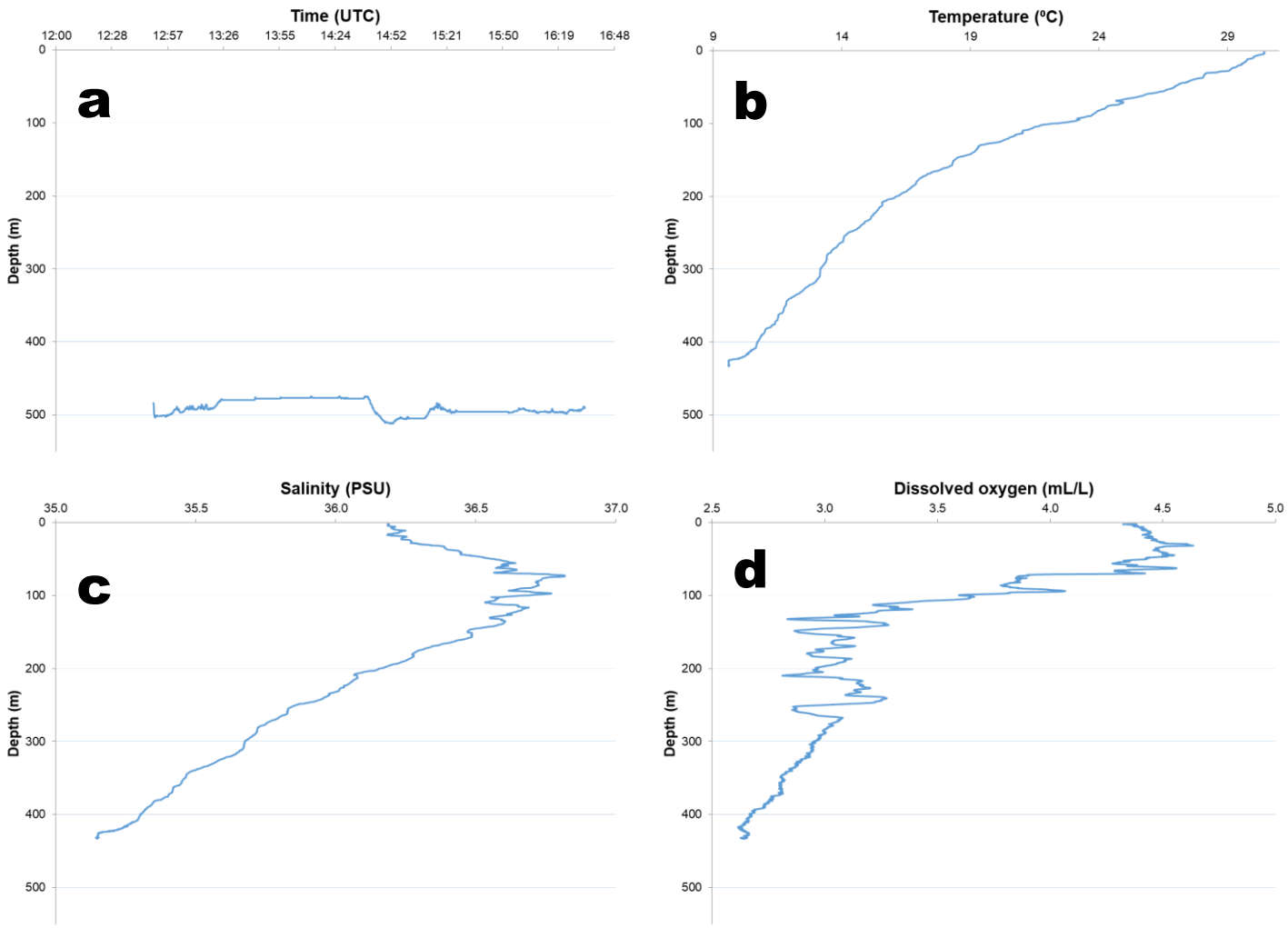
Summary:
The dive landed at 12:54 (UTC) at 500 m depth between Waypoints 1 and 2, in the north region of the proposed Many Mounds HAPC. The dive then proceeded to sample *Lophelia pertusa* aggregations described in Ross et al. (2017). The dive collected seven specimens of *L. pertusa*, and a *Paramuricea* sp. whole colony. Coral cover was very high for most of the dive. Surface currents were very strong at 2.8 knots, however, bottom currents were low. The morning CTD cast showed some evidence of freshwater intrusion on the surface. The loop current may be transporting low salinity waters to the region. Corals observed during the dive included *Stylaster* sp., *L. pertusa, Madrepora occulata, Javania* sp., *Bathypathes* sp., *Paramuricea* sp., *Acanthogorgia* sp., and *Anthomastus* sp.. and *Leiopathes glaberrima.* Goblet sponges were also present, and were overgrown by yellow zoanthids. Mobile invertebrates observed included golden crabs, galatheoid crabs, pelagic tunicates, shrimp, and octopus. Fish observed included shortnose greeneye, skate, lanternbelly, blackbelly rosefish, rattail, roughy, dogfish, *Benthocometes* sp., cutthroat eel, *Laemonema* sp., and thorny tinselfish.



Map showing the dive track of DIVE10 at Many Mounds. ROV position was approximated using the position and heading of the ship, ROV tether length, ROV depth, as well as noteworthy features (e.g., ridges, mounds) seen during the dive that were cross-referenced with contours in existing multibeam data of the area.



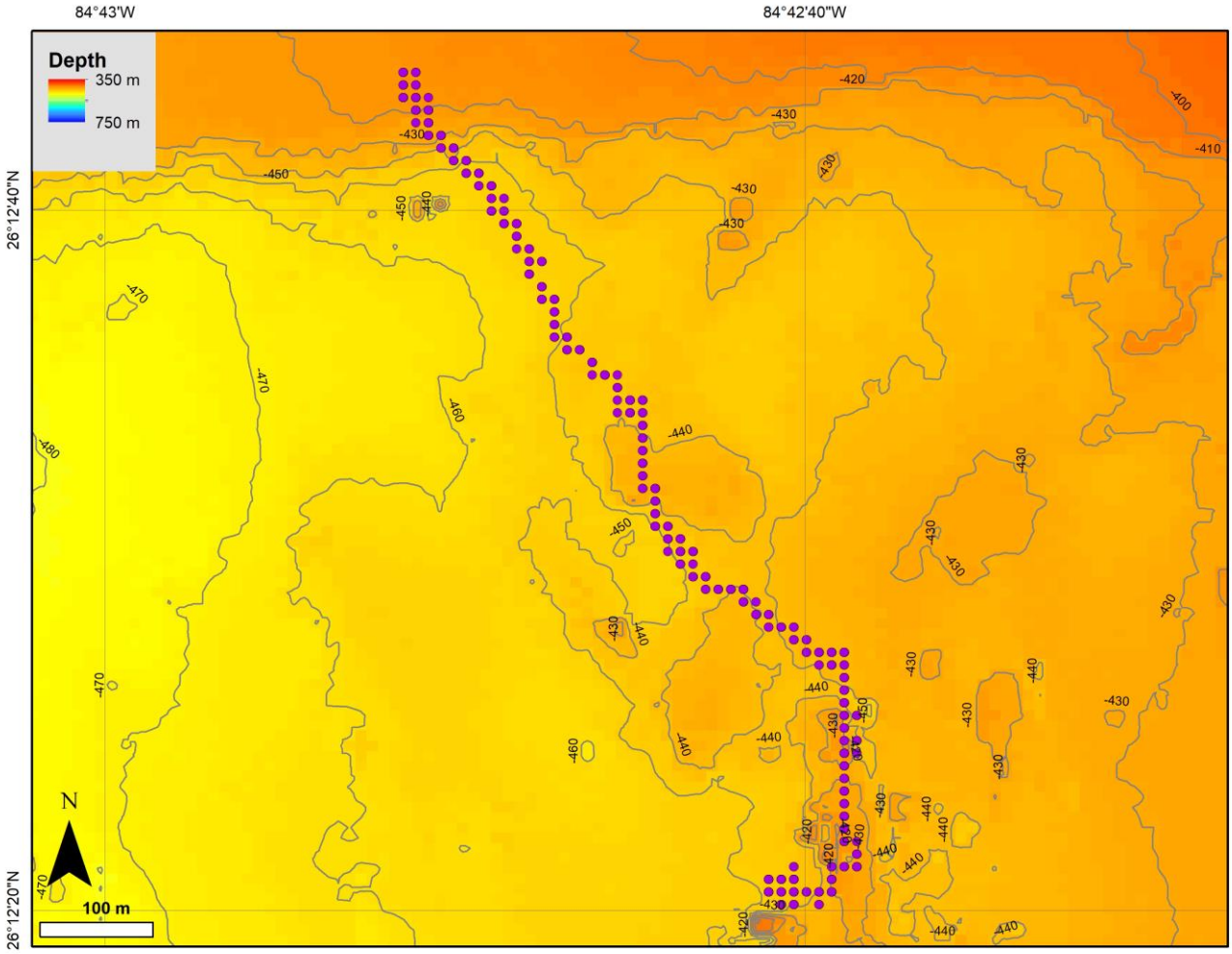
Highlight images collected during DIVE10 at Many Mounds. **a.** ROV collecting specimen in a dense aggregation of *Lophelia pertusa*; **b.** dense aggregation of *L. pertusa* with interspersed colonies of sponges, and mushroom corals (*Anthomastus* sp.); **c.** *Paramuricea* sp. colony next to *L. pertusa*, *Plumarella* sp., *Muriceides* sp., sponges, and a sea cucumber; **d.** rare pink color morphotype of *L. pertusa* next to white color morphotype; **e-f.** a diverse assemblage including live and dead *Lophelia pertusa*, *Plumarella* sp., *Paramuricea* sp., *Muriceides* sp., and sponges, some of which are overgrown by a yellow zoanthid.



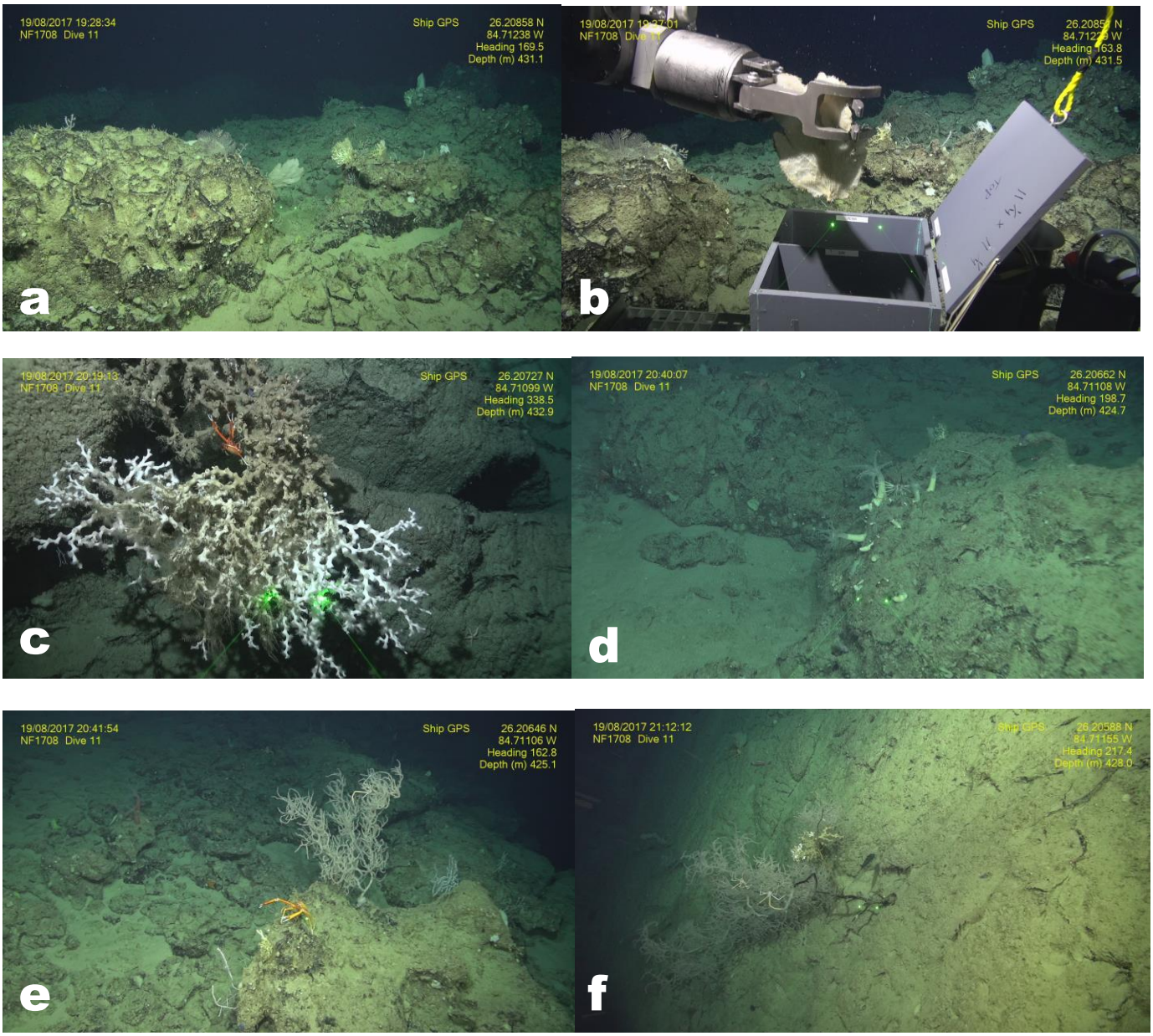
Depth profiles of **a.** UTC time measured during the on bottom portion of DIVE10 at Many Mounds using the ROV Trackpoint navigation system. Depth profiles of **b.** temperature, **c.** salinity, and **d.** dissolved oxygen measured during a CTD cast conducted approximately 1.6 km east of the site surveyed during DIVE10. Note that the ROV-mounted CTD was not operational during DIVE10, and therefore depth profiles for temperature, salinity and dissolved oxygen (**b-d**) show data collected with the ship's CTD-carousel sensors during a CTD cast (CTD09) conducted near the ROV dive site.

Dive number: NF1708-DIVE11
Date: 8/18/2017
Locality: Many Mounds
On bottom latitude & longitude: 26.2120, -84.7145
Off bottom latitude & longitude: 26.2059, -84.7116

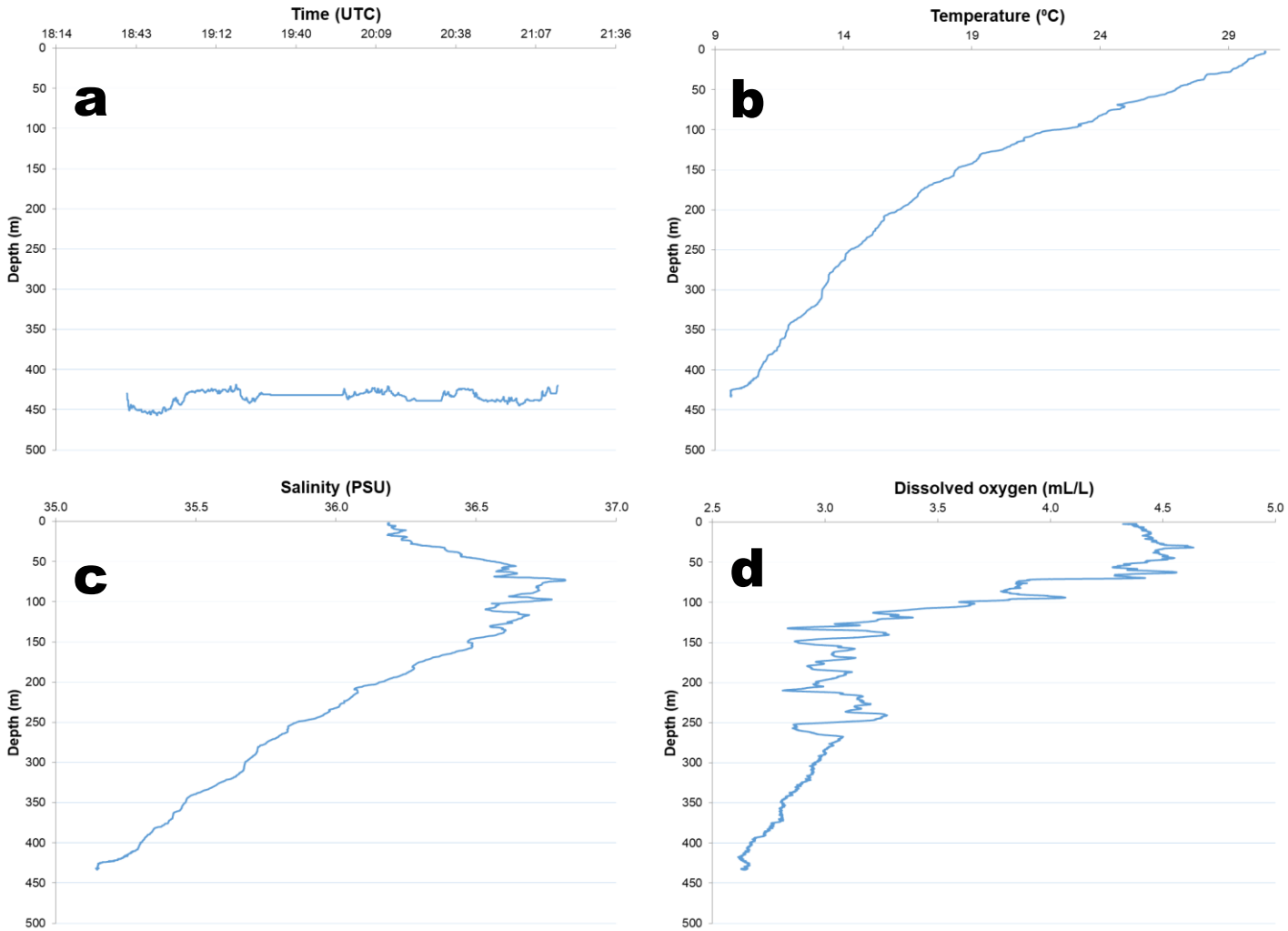
Summary:
The dive landed at 18:40 (UTC) at 428 m depth near Waypoint 1, in the northern portion of the proposed Many Mounds HAPC, just south of a steep wall feature that runs west to east. Surface currents were 2.8 knots from the northeast. The dive trajectory was to the south. The seafloor habitat was soft bottom sediment with occasional large pinnacle rocks of 15-20 m relief. The rocks had very low abundances of corals and sponges. Animals observed included many *Stylaster* sp., some sponges (*Euplectinella* sp. and *Phakellia* sp.), a few Isididae, *Plumarella* sp., *Paramuricea* sp., *Lophelia pertusa*, and *Leiopathes glaberrima*. Fish observed included rattail, lizardfish, dogfish, rosy dory, *Synagrops* sp., armored searobin, roughy, *Laemonema* sp., redeye gaper, shortnose greeneye, and *Benthocometes* sp. (within *L. glaberrima*). Mobile invertebrates were also rare, but included golden crab, cookie seastar, squat lobsters, and sea cucumbers. Five biological specimens (*Phakellia* sp., *Plumarella* sp., Stylasteridae, *L. pertusa*, and *L. glaberrima*) and one rock were collected during the dive.



Map showing the dive track of DIVE11 at Many Mounds. ROV position was approximated using the position and heading of the ship, ROV tether length, ROV depth, as well as noteworthy features (e.g., ridges, mounds) seen during the dive that were cross-referenced with contours in existing multibeam data of the area.



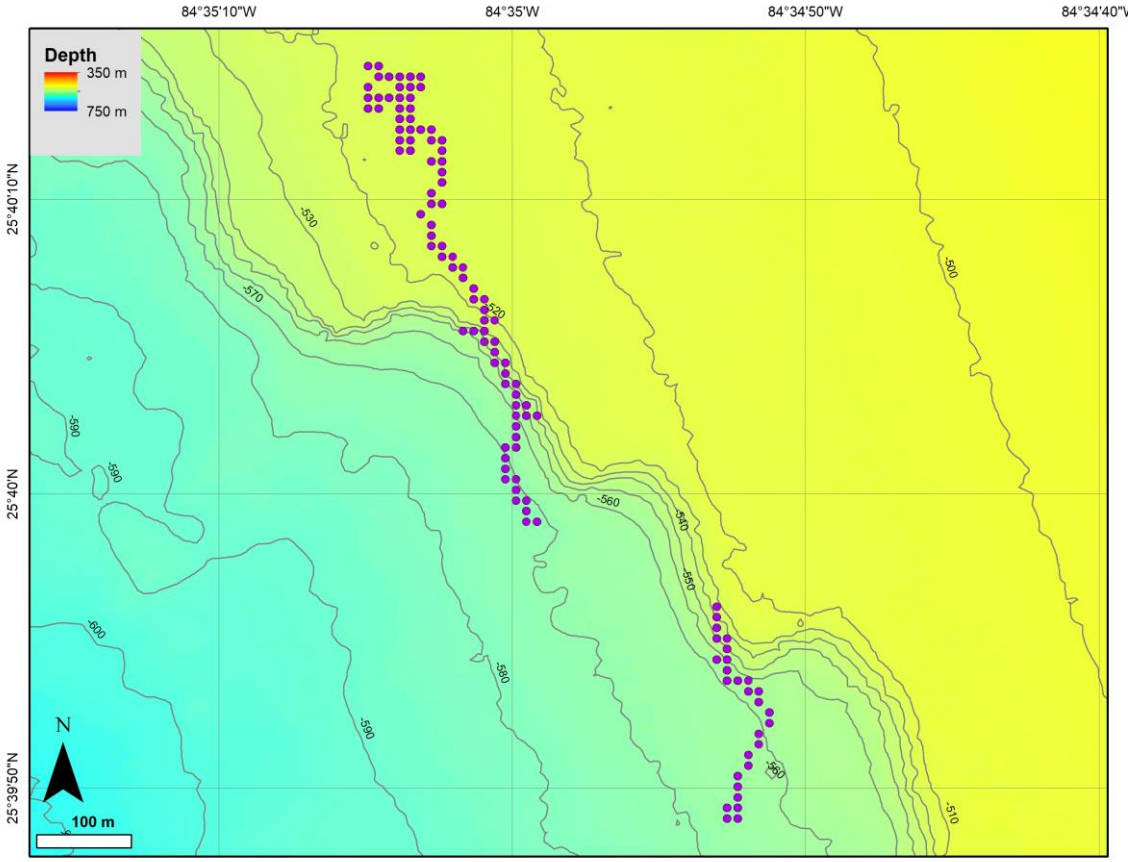
Highlight images collected during DIVE11 at Many Mounds. **a.** A diverse assemblage including *Plumarella* sp., Stylasteridae, *Muriceides* sp., *Phakellia* sp., and unidentified sponges; **b.** ROV collecting the sponge *Phakellia* sp.; **c.** *Eumunida picta* squat lobster on a colony of *L. pertusa*; **d.** aggregation of *Bathyalcyon* sp. soft corals next to pencil urchin; **e.** large *Leiopathes glaberrima* colony with commensal squat lobster (Chirostyloidae), next to *Muriceides* sp., and *Eumunida picta*; and **f.** large *L. glaberrima* colony with commensal squat lobsters (Chirostyloidae) and *L. pertusa* growing on it.



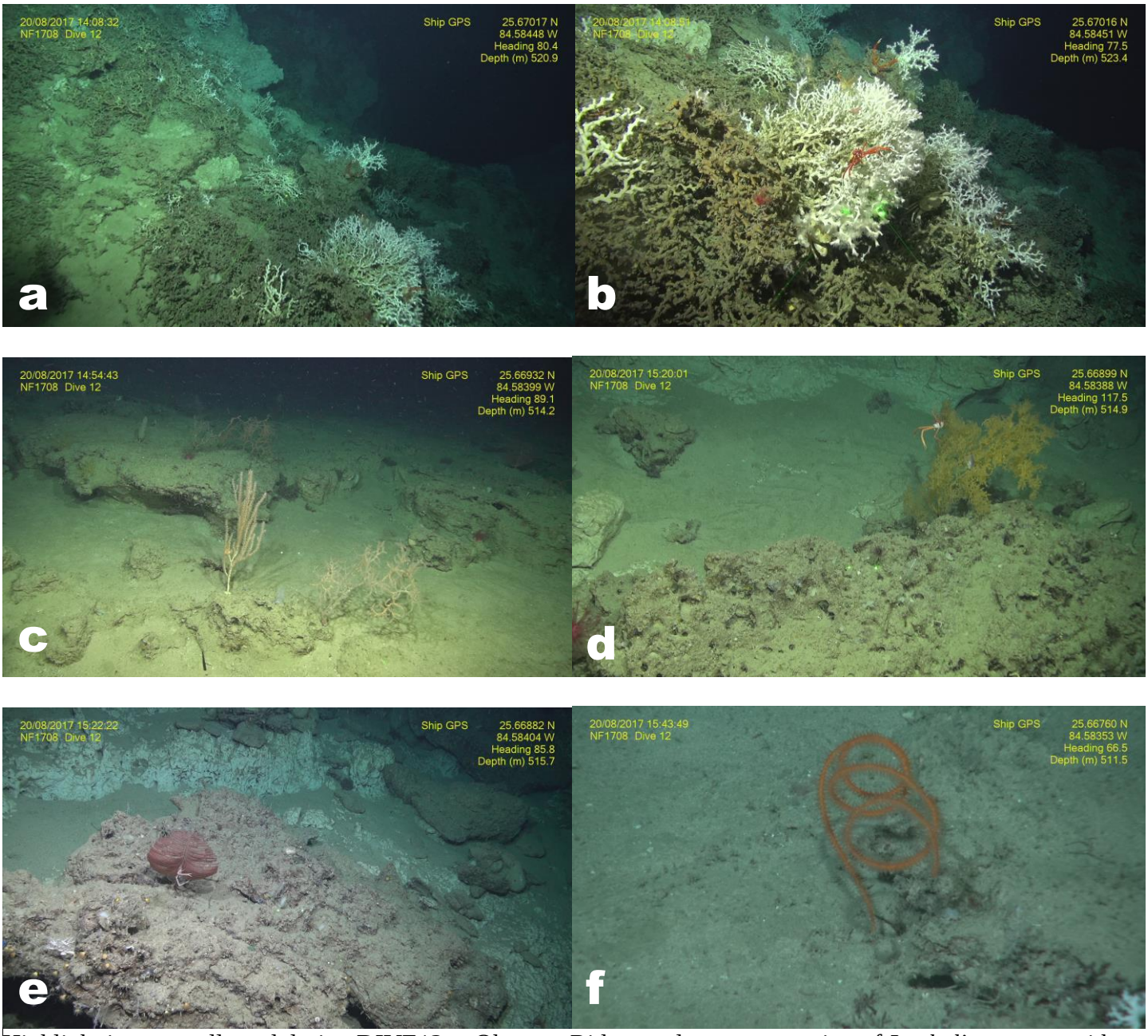
Depth profiles of **a.** UTC time measured during the on bottom portion of DIVE11 at Many Mounds using the ROV Trackpoint navigation system. Depth profiles of **b.** temperature, **c.** salinity, and **d.** dissolved oxygen measured during a CTD cast conducted approximately 0.6 km east of the site surveyed during DIVE11. Note that the ROV-mounted CTD was not operational during DIVE11, and therefore depth profiles for temperature, salinity and dissolved oxygen (**b-d**) show data collected with the ship's CTD-carousel sensors during a CTD cast (CTD09) conducted near the ROV dive site.

Dive number: NF1708-DIVE12
Date: 8/20/2017
Locality: Okeanos Ridge
On bottom latitude & longitude: 25.6719, -84.5913
Off bottom latitude & longitude: 25.6600, -84.5830

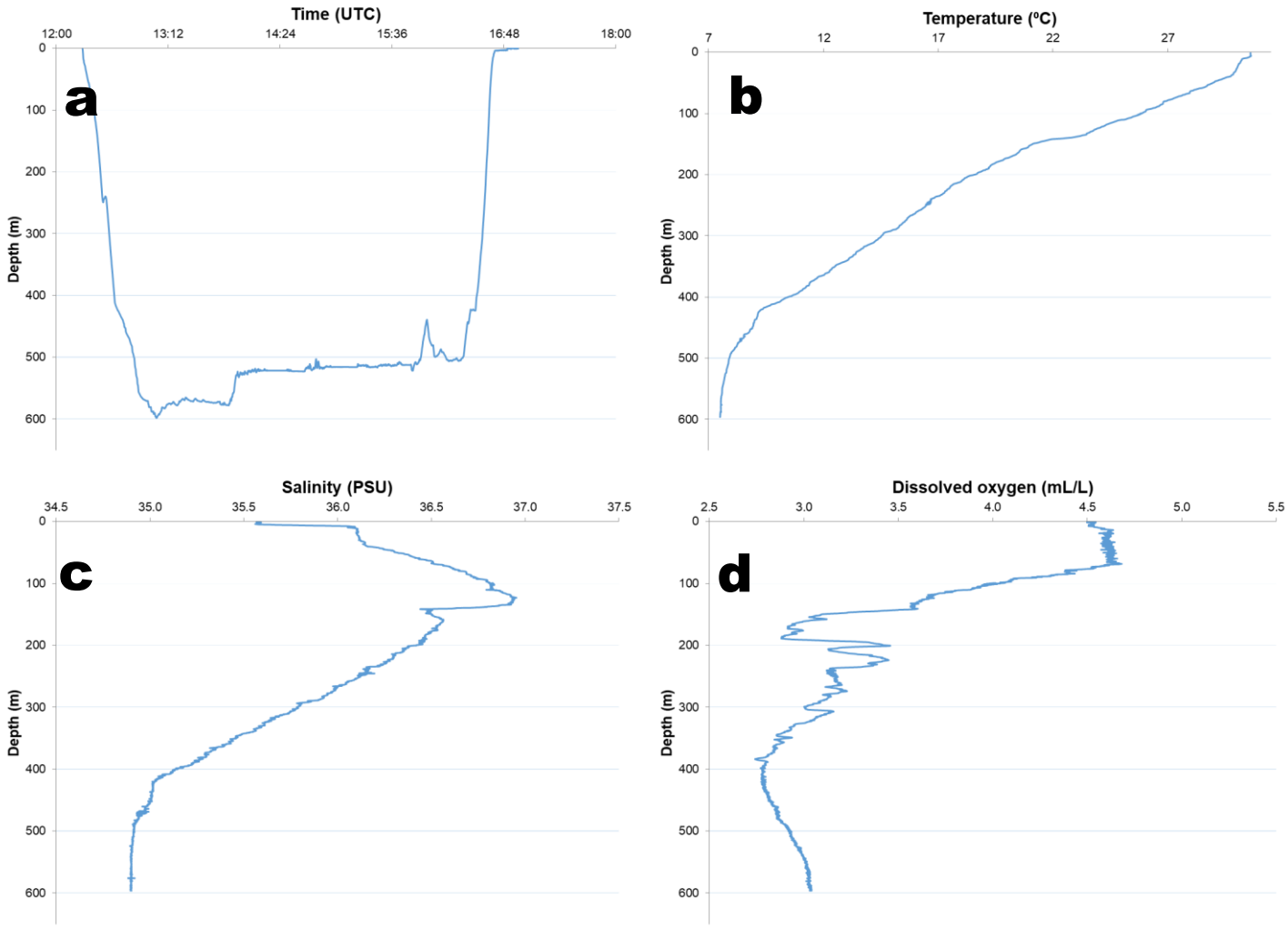
Summary:
The dive landed in Okeanos Ridge Site at 13:04 (UTC) at 592 m depth northwest of Waypoint 1. The ship towed the vehicle east for 35 minutes until a rocky wall feature was approached at 13:46 (25.67ºN, 84.545ºW) at a depth of 576 m. The vehicle started climbing the gently sloping wall feature and immediately encountered a circular fishing trap hanging by two rope lines at 539 m depth. A few minutes later, the ROV came upon a large aggregation of *Lophelia pertusa* colonies at 525 m depth. A *L. pertusa* sample was taken into a PVC quiver using the T-handle rake with parallel jaws. The ROV climbed the wall to 512 m depth, and transited south towards Waypoints 2. Observed corals included *Leiopathes glaberrima*, *Bathypathes* sp., *Stichopathes* sp., *Isidella* sp., *Anthomastus* sp., and *Paramuricea* sp. *Phakellia* sp. were the most conspicuous sponges observed. One whole *Isidella* sp. bamboo coral colony was collected for taxonomy, age, and growth. Observed fish included *Laemonema* sp., thornyback scorpionfish, thorny tinselfish, blackbelly rosefish, catshark, *Benthocometes* sp., and roughy. The wall started trending to the east after Waypoint 3, and the ship subsequently lost its position and started to drift south. The last moment on bottom was 19:54 at 492 m depth. Total bottom time for the dive was 2:50. The ROV was inadvertently towed into deep water and could not regain control. The dive was subsequently aborted due to strong southerly currents. Two samples were collected during the dive (*L. pertusa* and *Isidella* sp.).



Map showing the dive track of DIVE12 at Okeanos Ridge. ROV position was approximated using the position and heading of the ship, ROV tether length, ROV depth, as well as noteworthy features (e.g., ridges, mounds) seen during the dive that were cross-referenced with contours in existing multibeam data of the area.



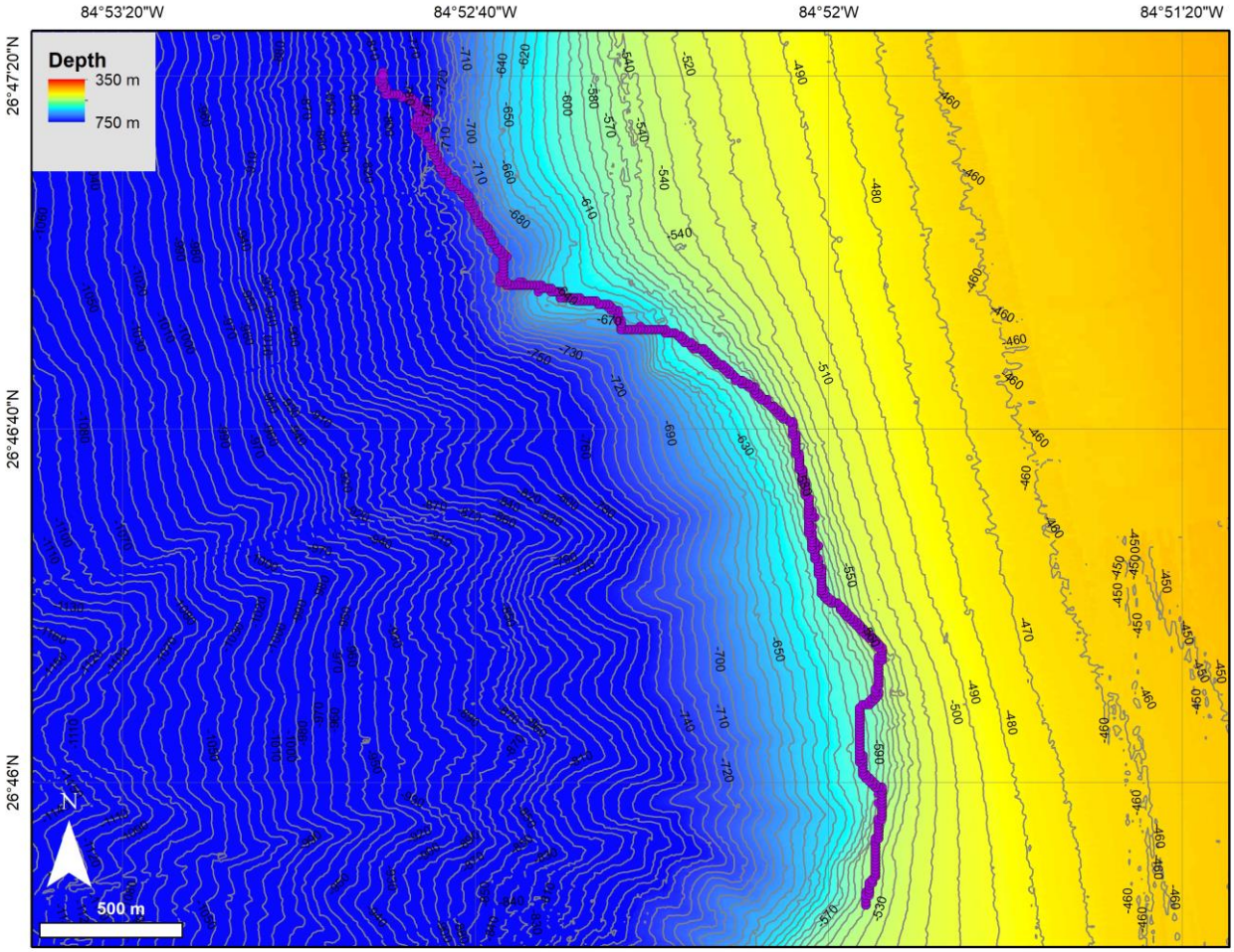
Highlight images collected during DIVE12 at Okeanos Ridge. **a.** dense aggregation of *Lophelia pertusa* with two commensal squat lobsters (*Eumunida picta*); **b.** *E. picta* squat lobsters and *Chaceon fenneri* golden crab on *L. pertusa* colonies; **c.** a bamboo coral (Isididae) and black coral (*L. glaberrima*); **d.** a large *L. glaberrima* colony with a commensal *Eumunida picta* squat lobster and a *Benthocometes* sp. fish; **e.** *Bathypathes* sp. with commensal squat lobster (Chirostyloidae); and **f.** *Stichopathes* sp. wire coral.



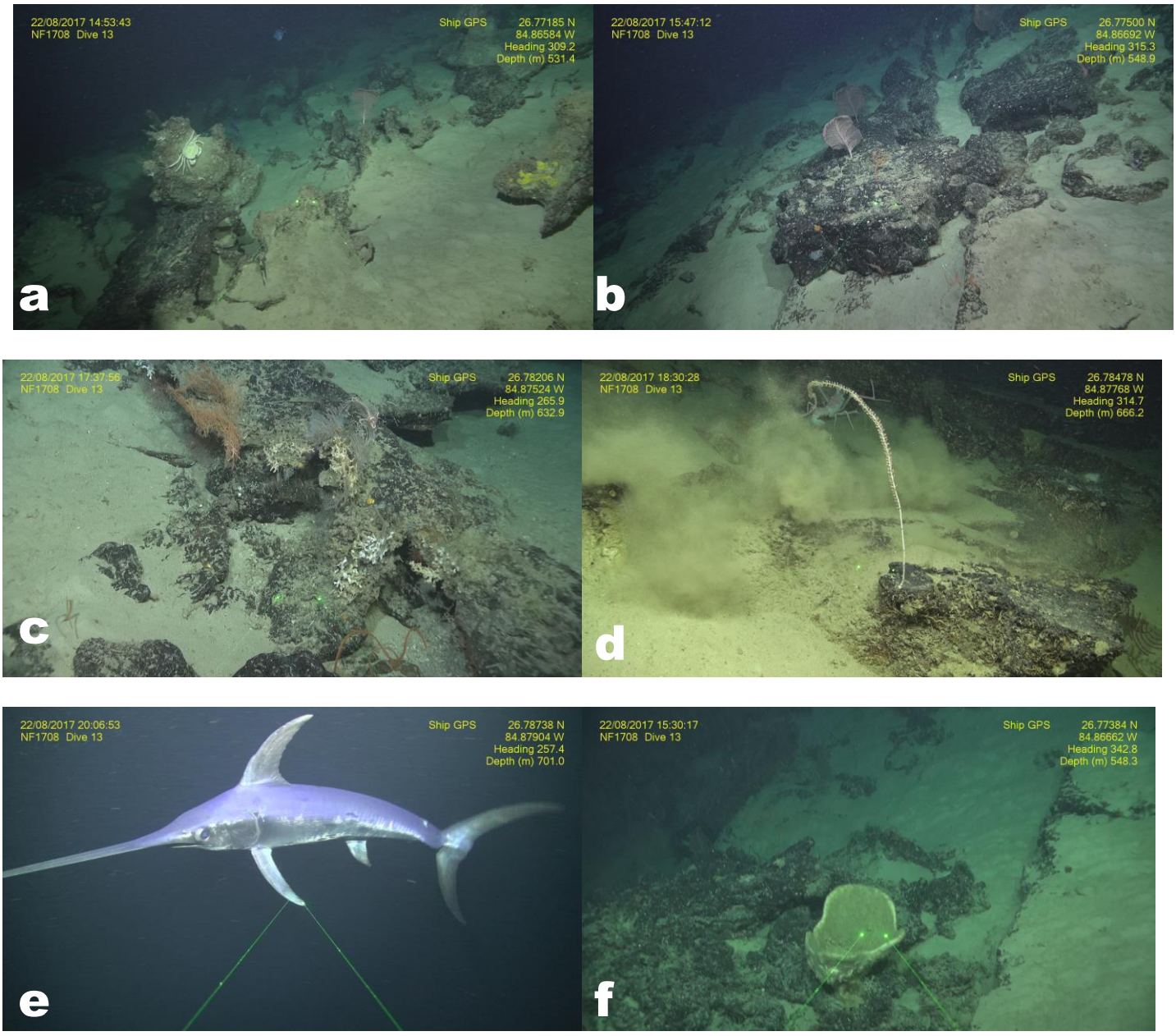
Depth profiles of **a.** UTC time, **b.** temperature, **c.** salinity, and **d.** dissolved oxygen measured by the CTD sensors that were attached to the ROV on DIVE12 at Okeanos Ridge. Note that depth profiles for temperature, salinity and dissolved oxygen (**b-d**) only include data collected during the downcast portion of the dive.

Dive number: NF1708-DIVE13
Date: 8/22/2017
Locality: North Wall
On bottom latitude & longitude: 26.7629, -84.8650
Off bottom latitude & longitude: 26.7890, -84.8804

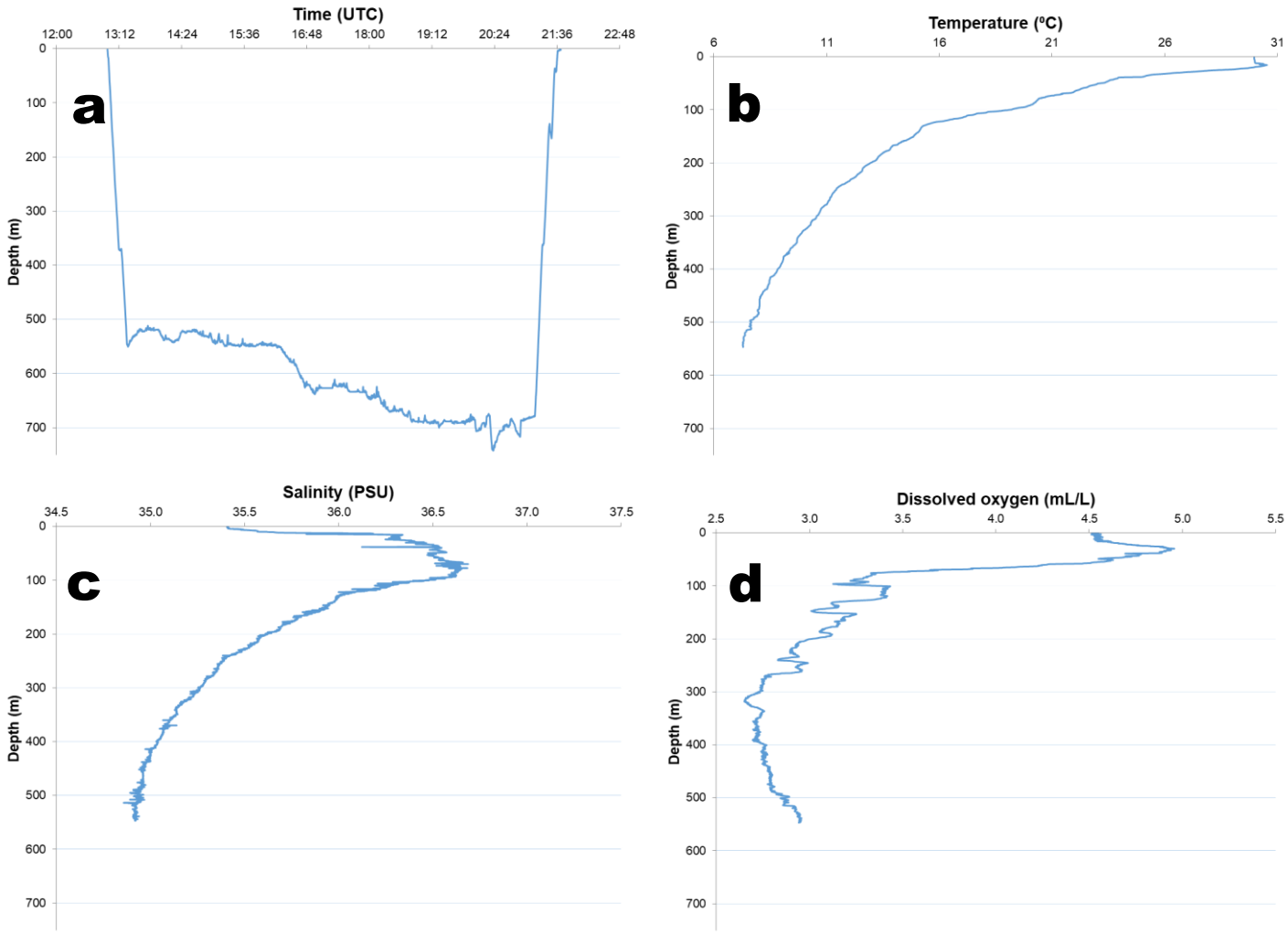
Summary:
The dive landed at 13:22 (UTC) at 539 m depth south of Waypoint 7, working from south to north under low (0.4 knots) but highly variable currents that shifted from south to north. The habitat consisted of low relief rocky habitat with surrounding sand flats. The dive transited 1 km distance along the 520 m isobath in roughly one hour, and another 2 km in the next couple hours before running out of sloping rocks and then dropping to 680 m in search of more steep rock. The most commonly observed corals were *Stichopathes* sp., *Bathypathes* sp., and *Chrysogorgia* sp.. *Lophelia pertusa*, *Chelidonisis aurantiaca*, *Paramuricea* sp., *Lepidisis* sp. and the black coral *Tenacetipathes* sp. were also present in low abundance. Squid eggs were seen on some *B. alternate* colonies. Mobile invertebrates included golden crabs, red crabs, galatheoids, Axiidae stromatopods, and occasional sea stars. The most abundant fish were tinselfish, *Laemonema* sp., blackbelly rosefish, searobins, redeyed gapers, and roughy. A swordfish appeared in the midwater near the end of the dive at 20:06. Some debris was present on the seafloor and included beer cans, a Folgers can, and a metallic bag. Strong surface currents prevented a westward ship move. Samples of *Paramuricea* sp., *Bathypathes* sp., and a glass sponge were attempted, but only *Stichopathes* sp. was collected due to strong currents and ship pulls on the ROV.



Map showing the dive track of DIVE13 at North Wall. ROV position was approximated using the position and heading of the ship, ROV tether length, ROV depth, as well as noteworthy features (e.g., ridges, mounds) seen during the dive that were cross-referenced with contours in existing multibeam data of the area.



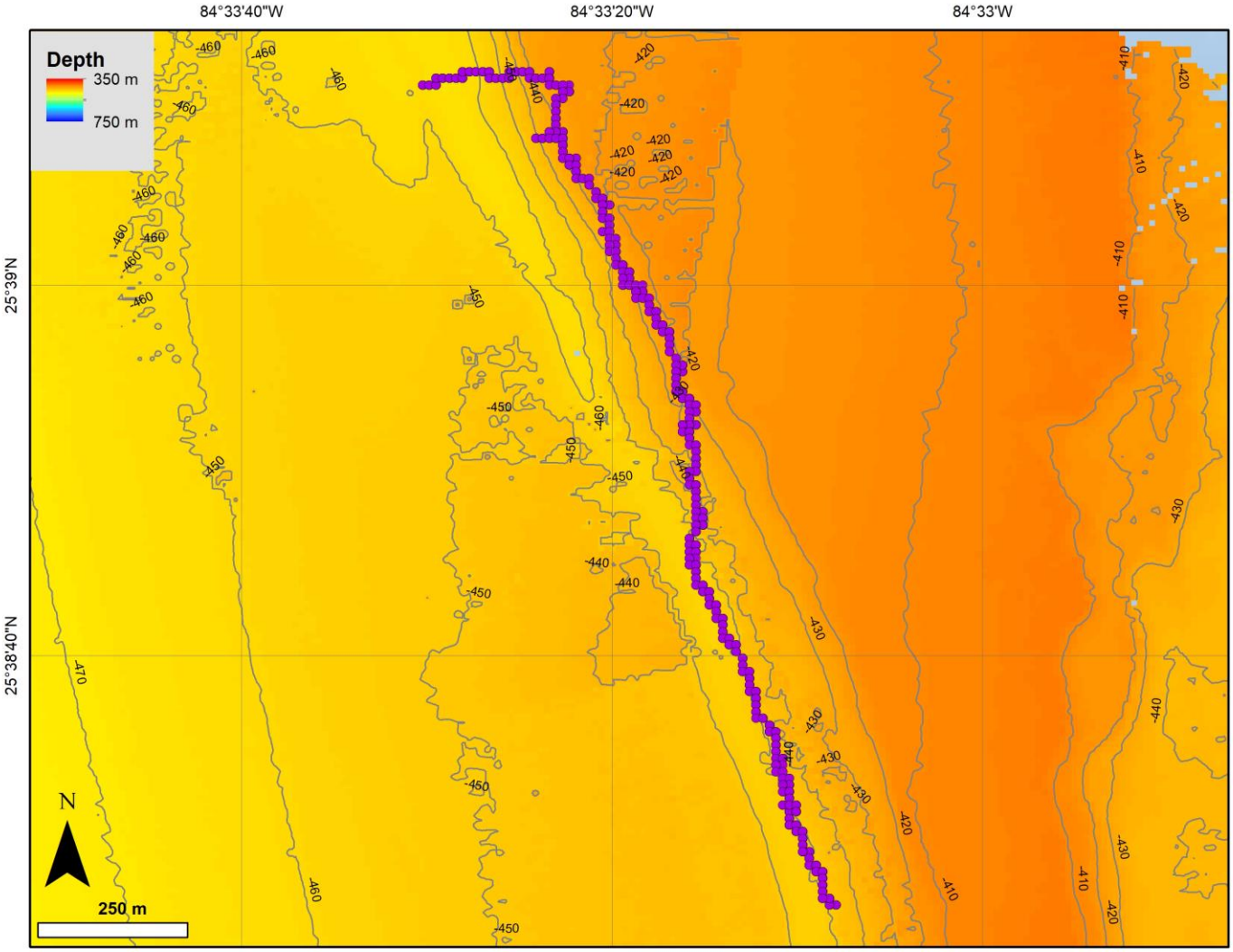
Highlight images collected during DIVE13 at North Wall. **a.** *Chaceon fenneri* golden crab next to sponge and the black coral *Bathypathes* sp.; **b.** two colonies of *Bathypathes* sp. and two colonies of *Stichopathes* sp; **c.** a diverse assemblage including sponges, cup coral, brittle star, *L. pertusa, Cheliodonisis aurantiaca, Stichopathes* sp., Stylasteridae, *Plumarella* sp., and a squat lobster (Chirostyloidae)**; d.** unbranched bamboo coral (Isididae); **e.** swordfish; and **f.** unidentified sponge.



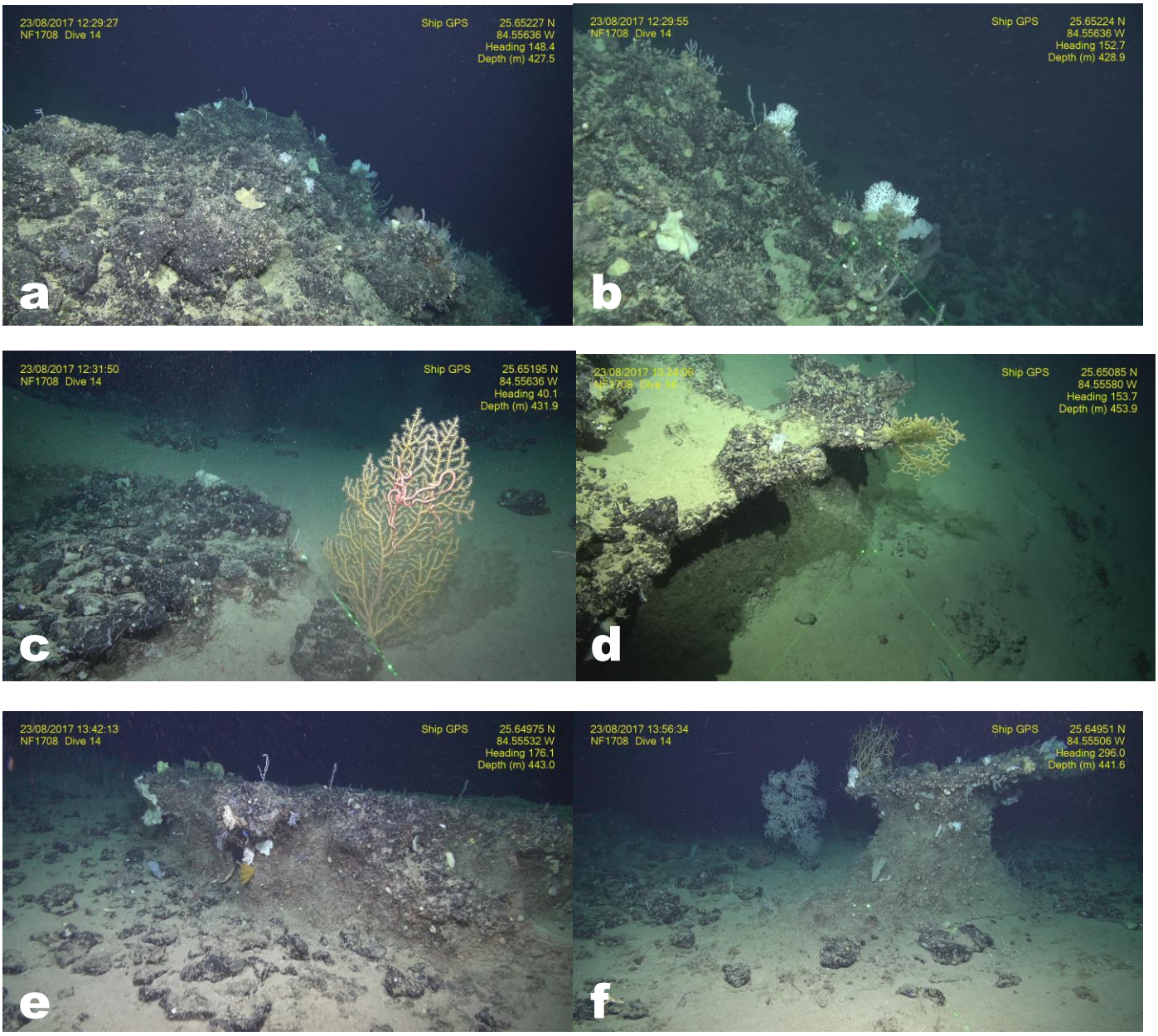
Depth profiles of **a.** UTC time, **b.** temperature, **c.** salinity, and **d.** dissolved oxygen measured by the CTD sensors that were attached to the ROV on DIVE13 at North Wall. Note that depth profiles for temperature, salinity and dissolved oxygen (**b-d**) only include data collected during the downcast portion of the dive.

Dive number: NF1708-DIVE14
Date: 8/23/2017
Locality: Okeanos Ridge
On bottom latitude & longitude: 25.6520, -84.5582
Off bottom latitude & longitude: 25.6404, -84.5523

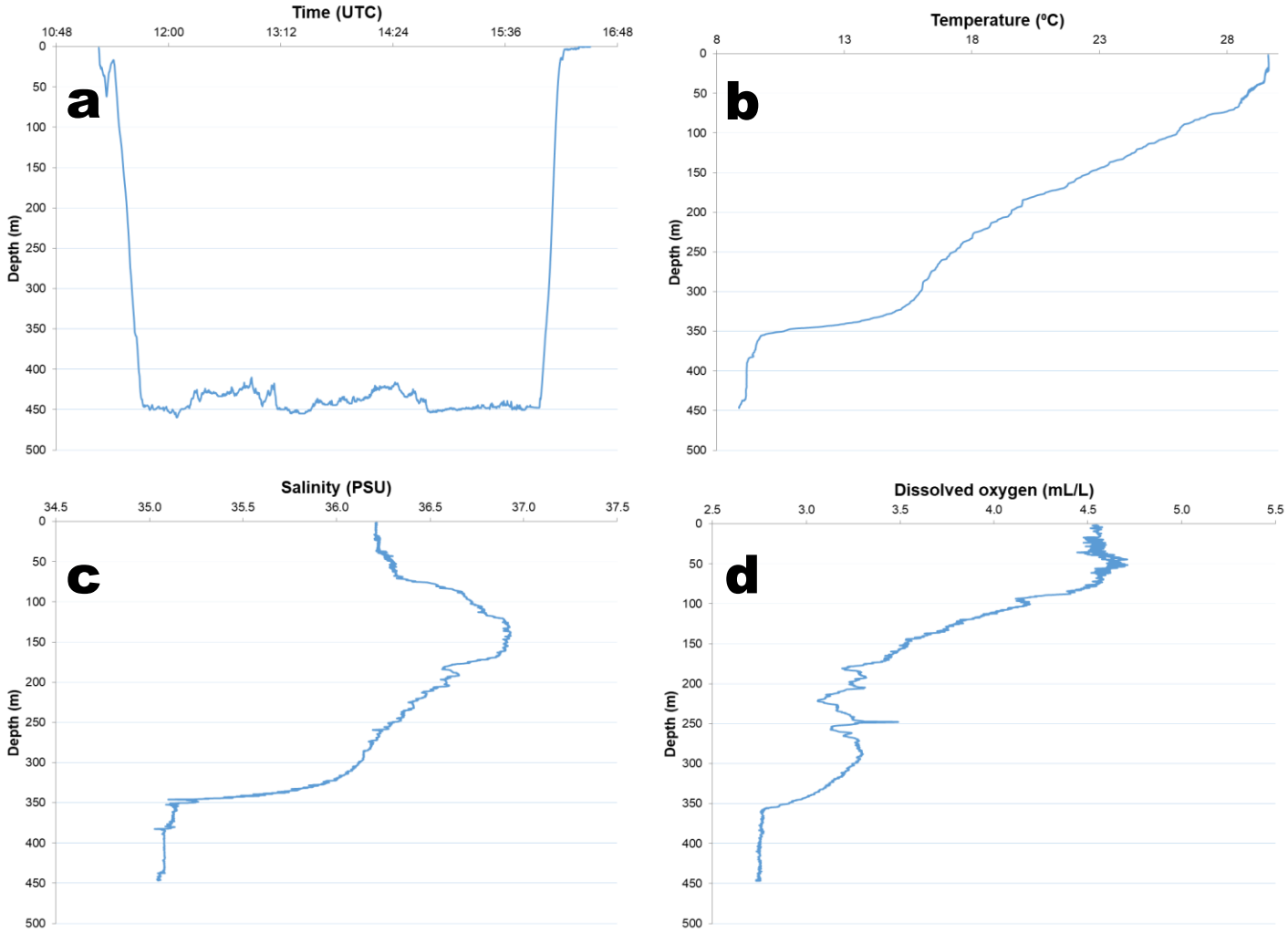
Summary:
The dive landed at 11:50 (UTC) at 450 m depth near Waypoint 2, after a 1:30 descent under difficult conditions. The ROV was working from north to south under strong surface currents (2.8 knots) from the north, which were compounded by 10 knot winds also from the north. *Leiopathes glaberrima* black coral was immediately identified on the bottom, along with numerous *Stylaster* sp. colonies, *Plumarella* sp., and a few *Lophelia pertusa*. There were also many large lobed sponges. A sample of a large *Paramuricea* sp. colony was attempted, but failed, as was an attempt to collect *Bathypathes* sp. A colony of *Paramuricea* sp. was later collected, as were a small colony of *Chelidoisis aurnatiaca* and medium-sized colony of *Leiopathes glaberrima*. Fish observed included blackbelly rosefish, bearfish, swallowtail bass, shortnose greeneye, rosy dory, thornyback scorpionfish, armored searobin, and *Laemonema* sp.. Golden crabs and numerous squid were also seen during the 4 h dive.



Map showing the dive track of DIVE14 at Okeanos Ridge. ROV position was approximated using the position and heading of the ship, ROV tether length, ROV depth, as well as noteworthy features (e.g., ridges, mounds) seen during the dive that were cross-referenced with contours in existing multibeam data of the area.

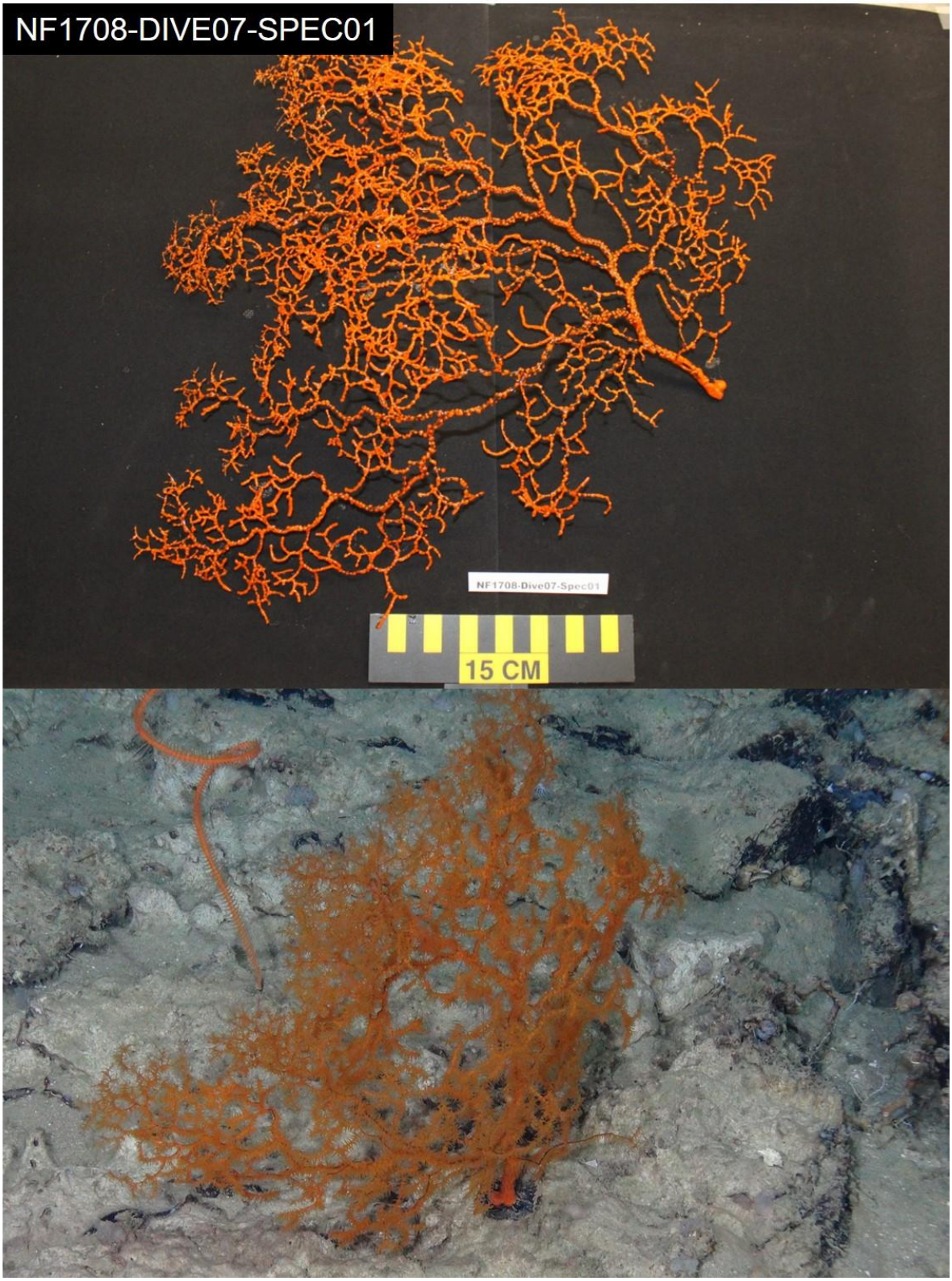


Highlight images collected during DIVE14 at Okeanos Ridge. **a-b.** Diverse assemblage consisting of sponges, Stylasteridae, *Plumarella* sp., and *Muriceides* sp.; **c.** large *Paramuricea* sp. with commensal brittle star (*Asteroschema* sp.); **d.** *Paramuricea* sp. colony next to *Muriceide*s sp. and sponges; **e.** various sponges, Stylasteridae, Isididae, and *Muriceides* sp.; and **f.** large *Leiopathes glaberrima* colony next to rocky outcrop overgrown with *Paramuricea* sp., *Phakellia* sp., *Muriceides* sp., and Stylasteridae.

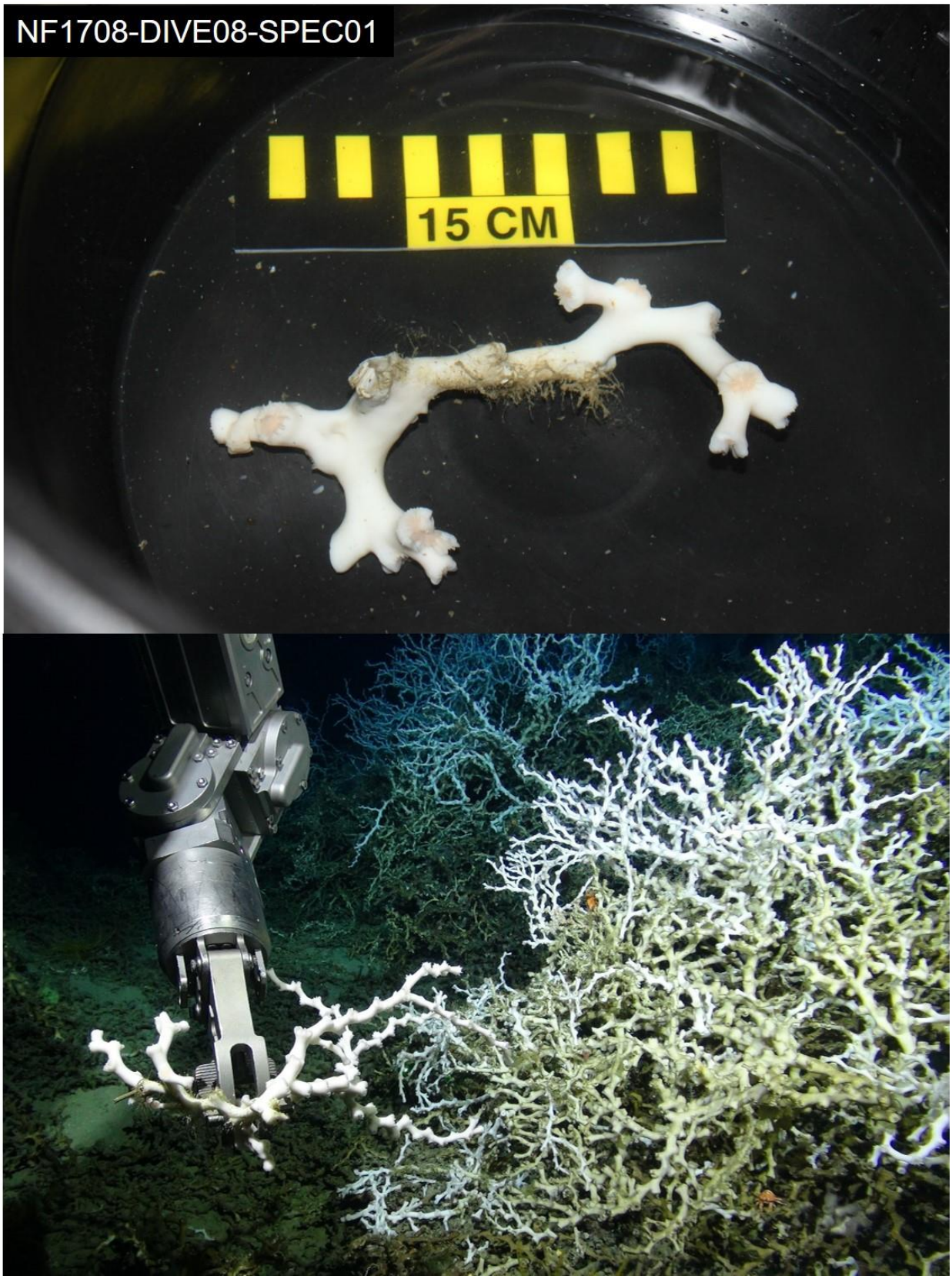


Depth profiles of **a.** UTC time, **b.** temperature, **c.** salinity, and **d.** dissolved oxygen measured by the CTD sensors that were attached to the ROV on DIVE14 at Okeanos Ridge. Note that depth profiles for temperature, salinity and dissolved oxygen (**b-d**) only include data collected during the downcast portion of the dive.

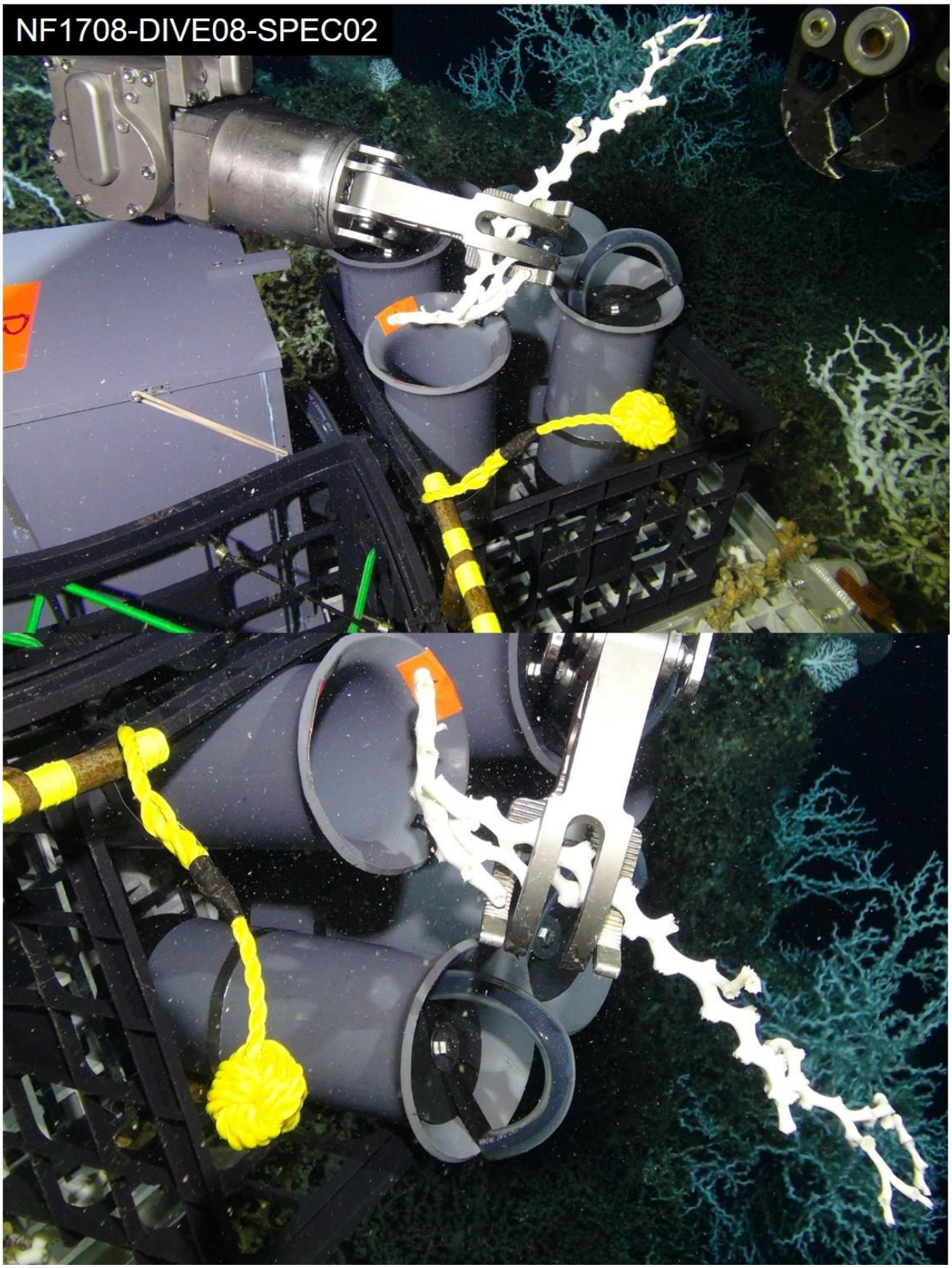
Appendix 2: Specimen photographs



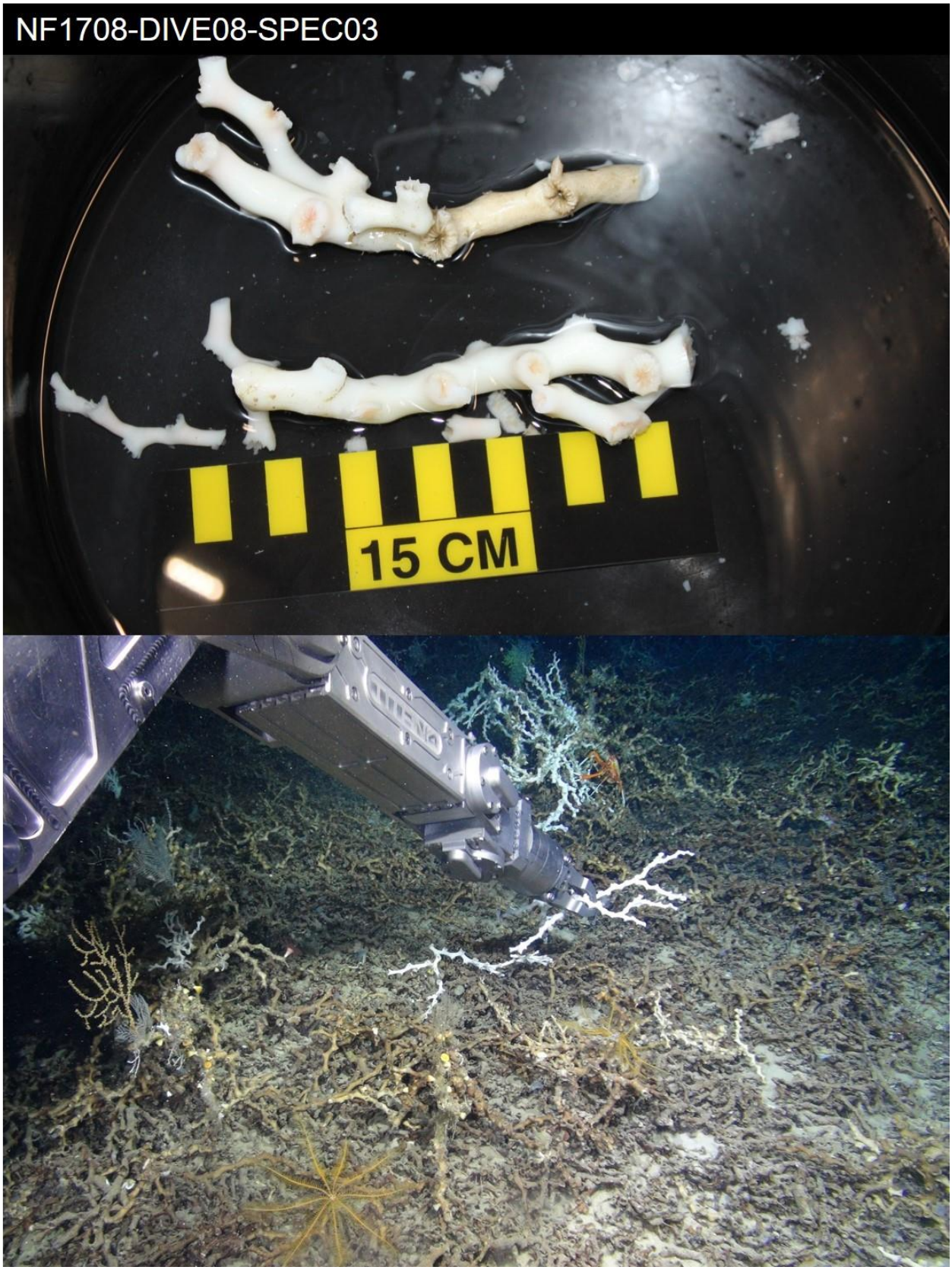
Photograph of *Leiopathes glaberrima* specimen (NF1708-DIVE07-SPEC01) collected at 517 m (top) in the laboratory, and (bottom) *in situ*.



Photograph of *Lophelia pertusa* specimen (NF1708-DIVE08-SPEC01) collected at 503 m (top) in the laboratory, and (bottom) *in situ*.



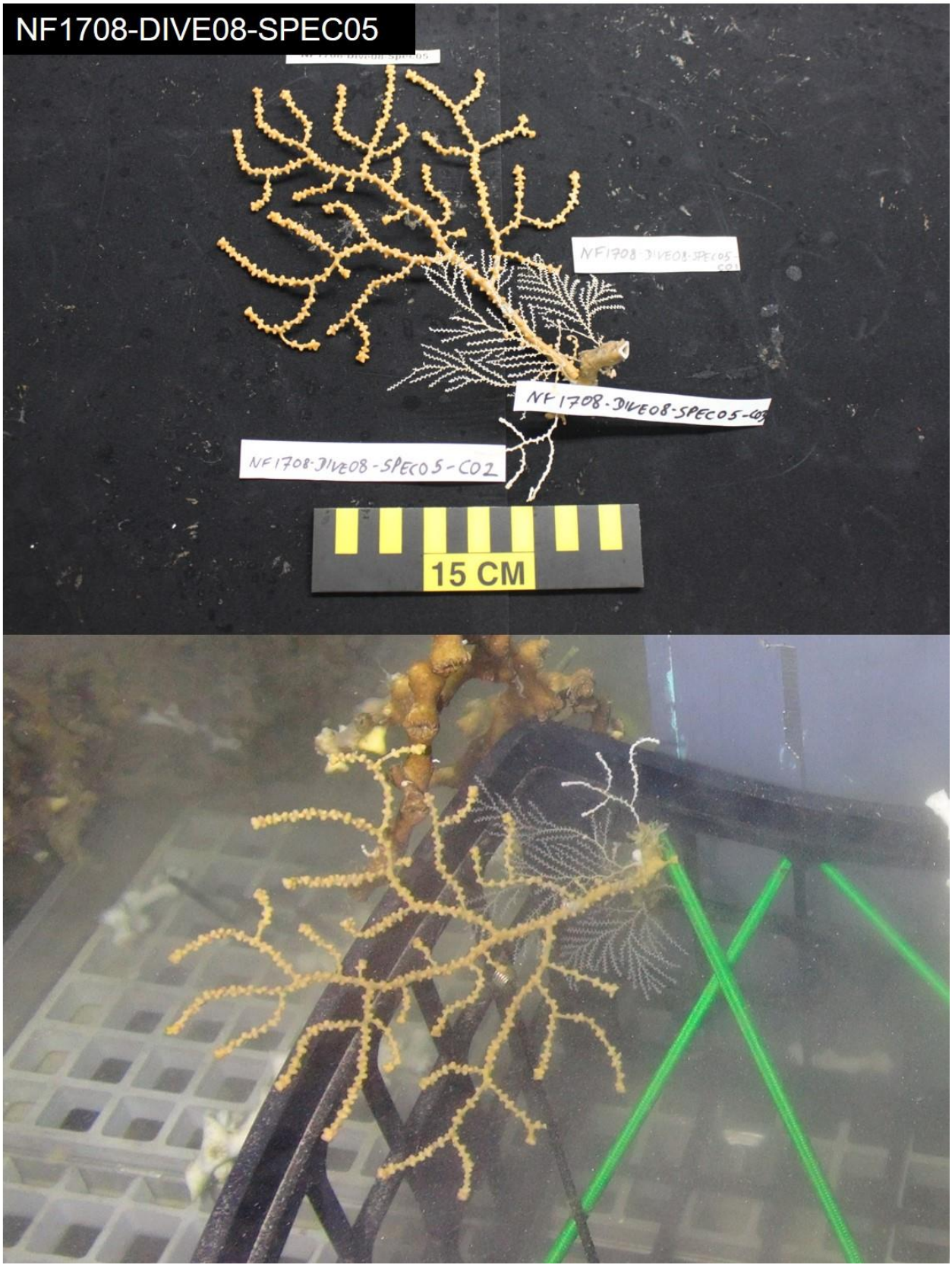
In situ photographs of *Lophelia pertusa* specimen (NF1708-DIVE08-SPEC02) collected at 503 m.



Photograph of *Lophelia pertusa* specimen (NF1708-DIVE08-SPEC03) collected at 503 m (top) in the laboratory, and (bottom) *in situ*.

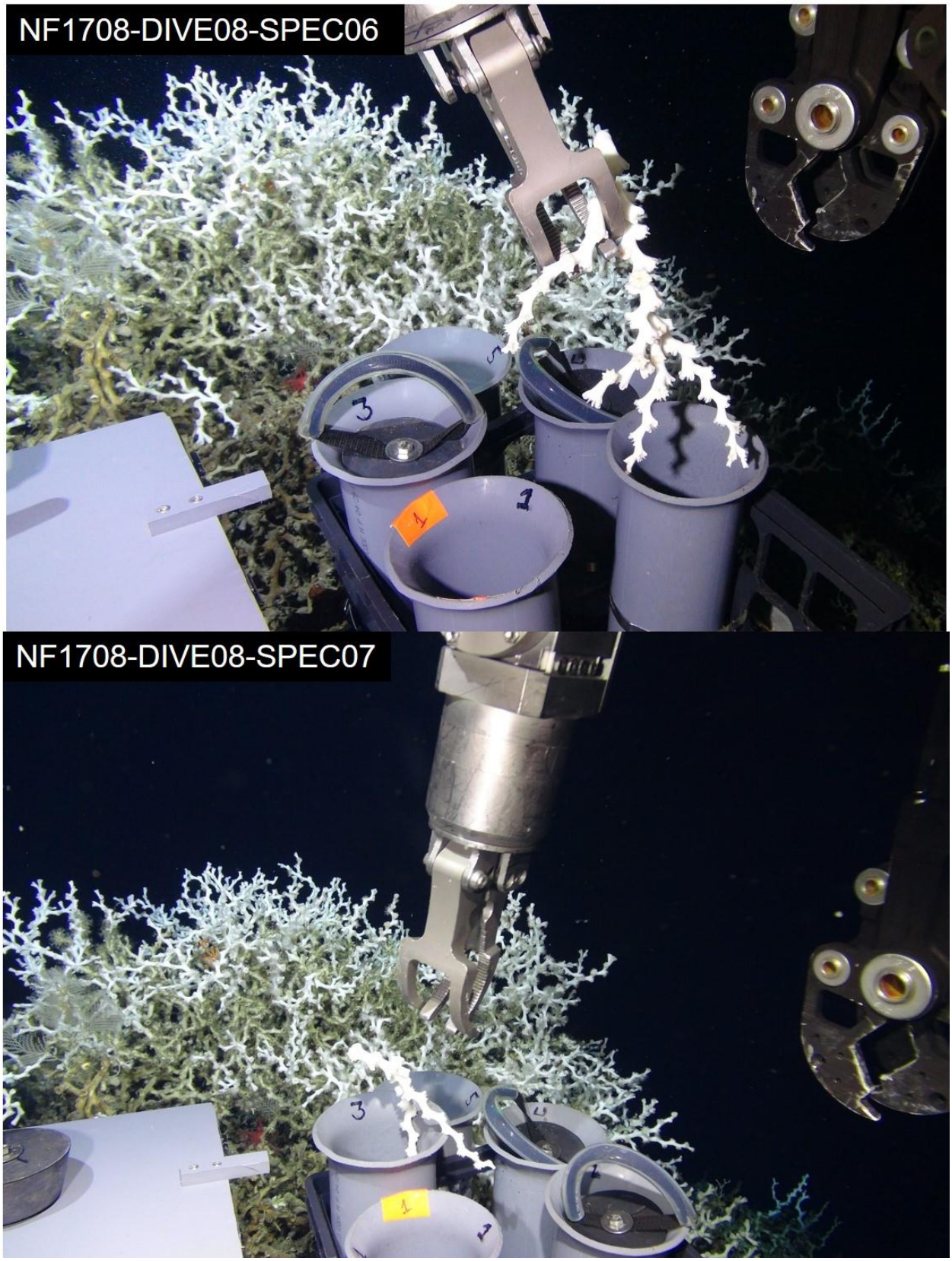
Photograph of *Lophelia pertusa* specimen (NF1708-DIVE08-SPEC04) collected at 503 m (top) in the laboratory, and (bottom) *in situ*.

Laboratory photographs of *Coralliophila aberrans* (NF1708-DIVE08-SPEC04-C01) collected at 503 m as commensal on *Lophelia pertusa*.

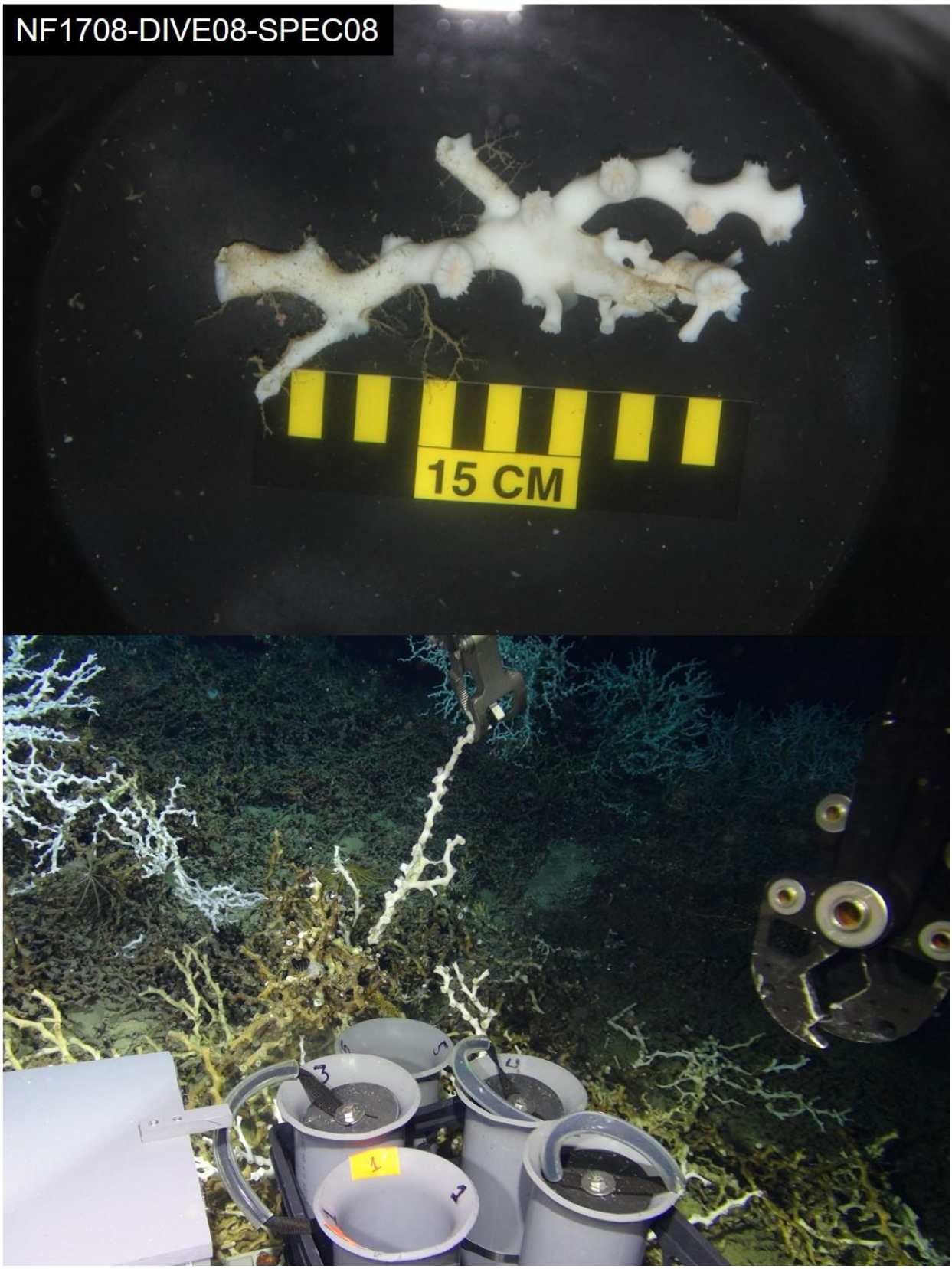


Photograph of *Paramuricea* sp. specimen (NF1708-DIVE08-SPEC05) collected at 503 m (top) in the laboratory, and (bottom) in the collection tray of the ROV.

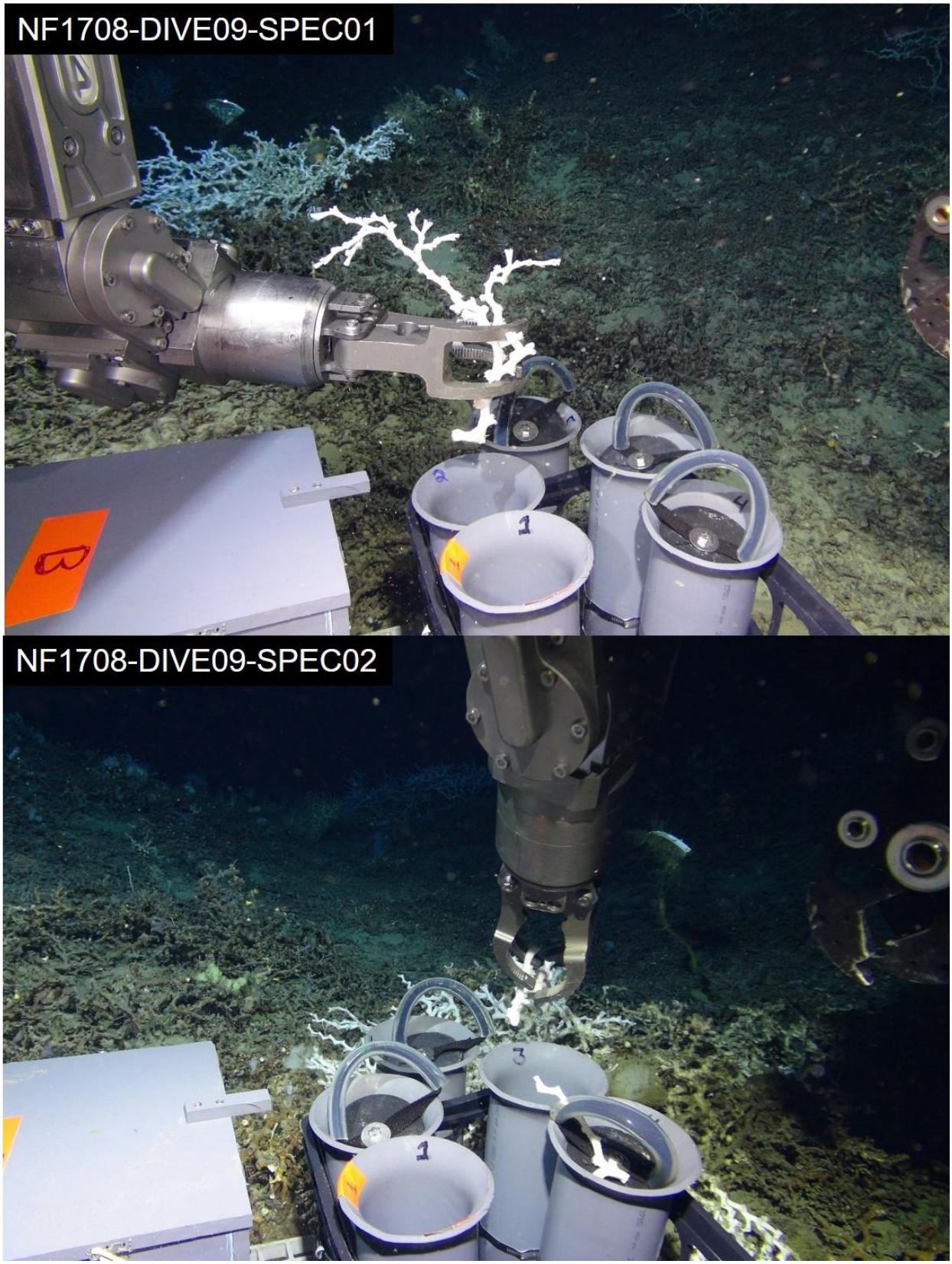
Photograph of commensals collected on *Paramuricea* sp. specimen, including (top) *Plumarella* sp. specimen (NF1708-DIVE08-SPEC04-C01) and (bottom) *Muriceides* sp. (NF1708-DIVE08-SPEC04-C02).



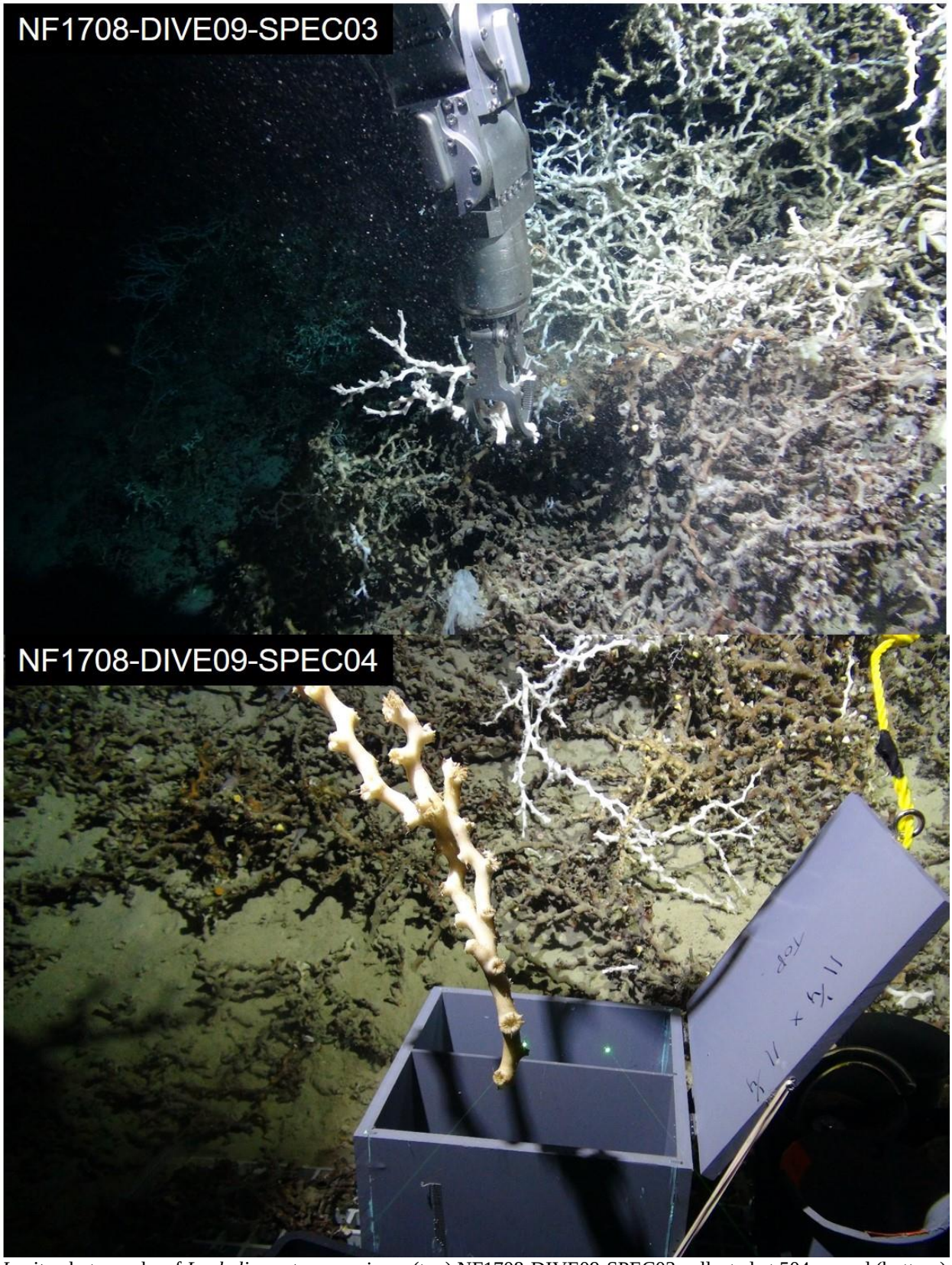
In situ photographs of *Lophelia pertusa* specimen (top) NF1708-DIVE08-SPEC06 collected at 503 m, and (bottom) NF1708-DIVE08-SPEC07 collected at 503 m.



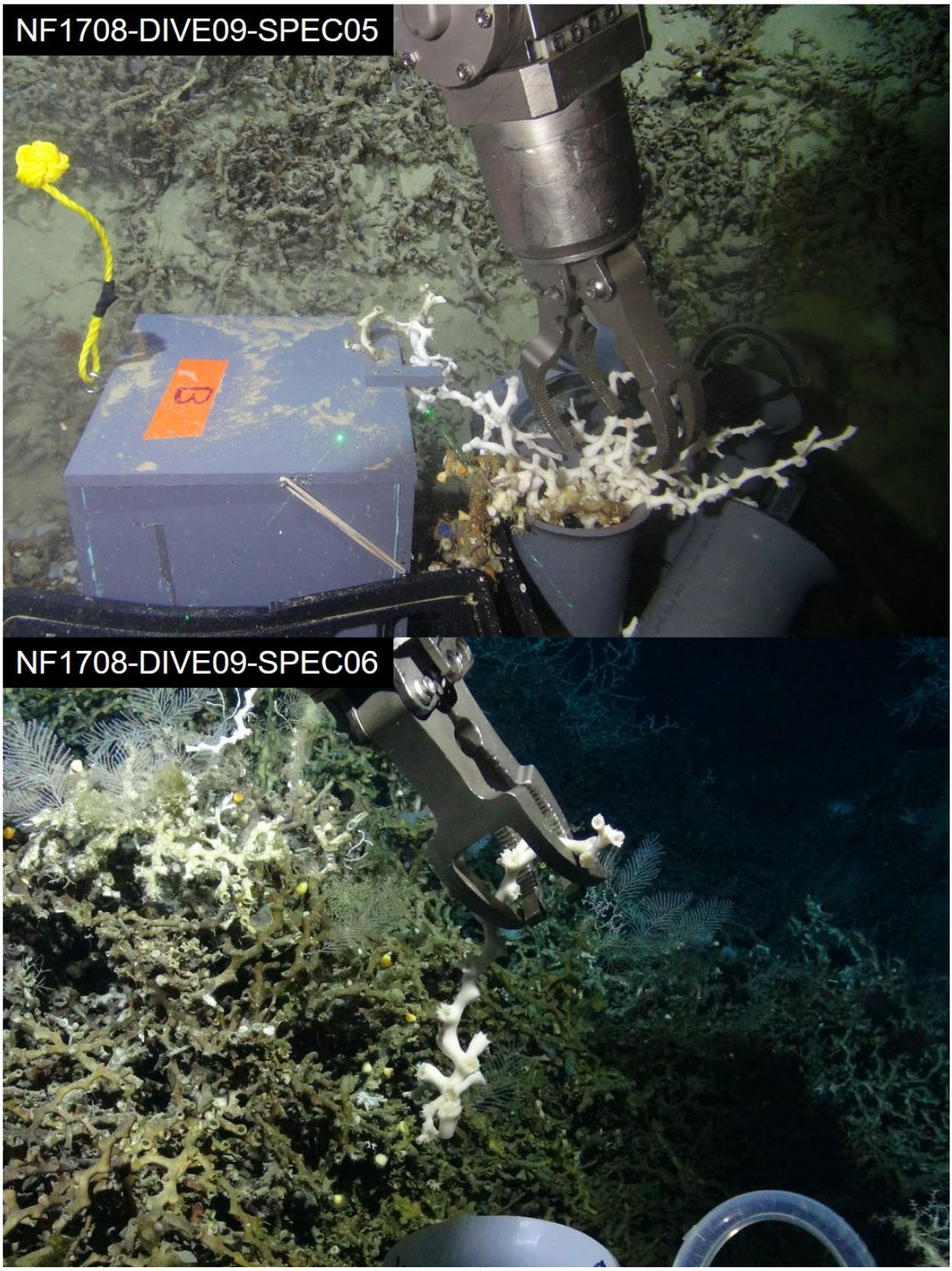
Photograph of *Lophelia pertusa* specimen (NF1708-DIVE08-SPEC08) collected at 503 m (top) in the laboratory, and (bottom) *in situ*.



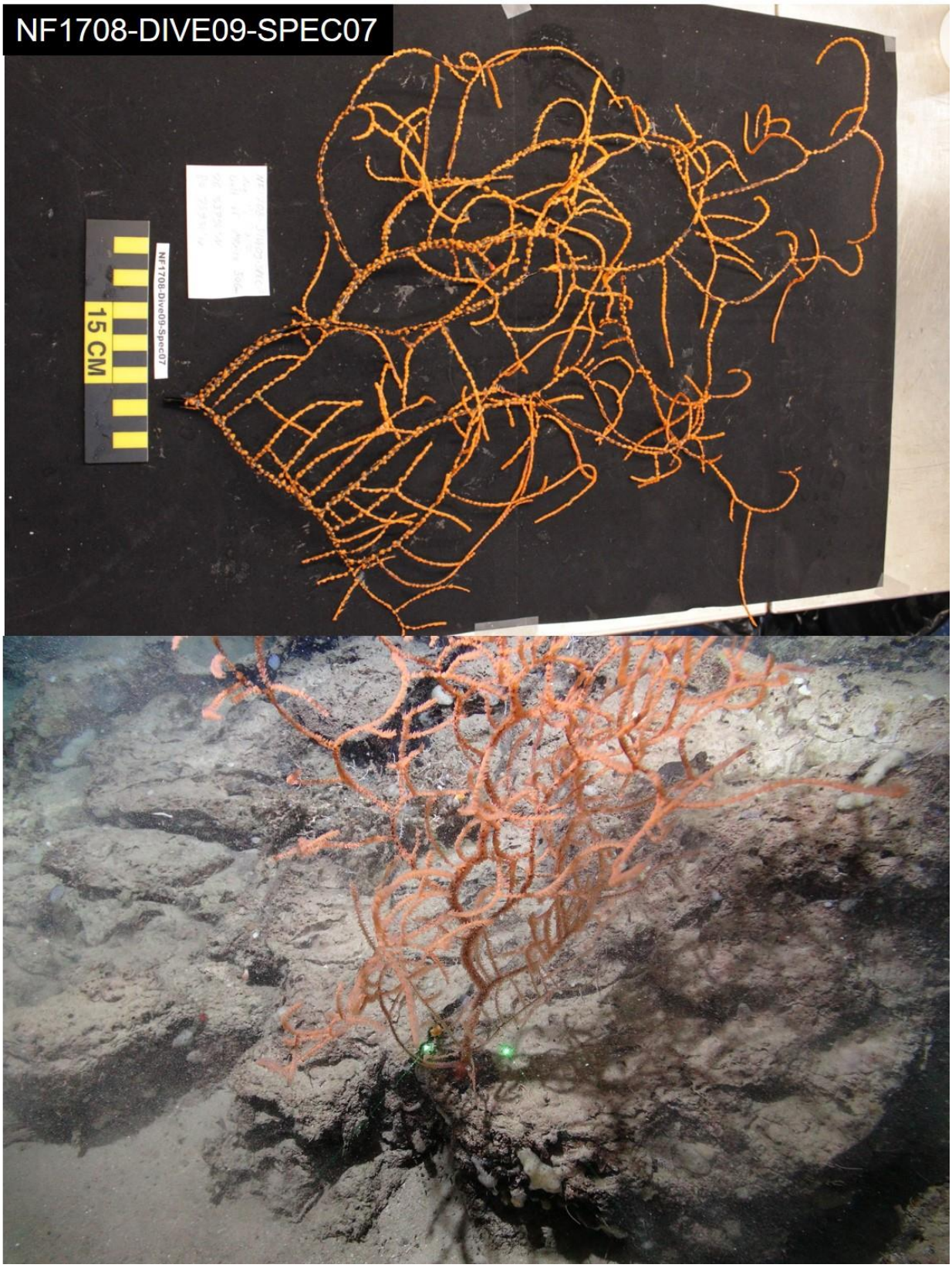
In situ photographs of *Lophelia pertusa* specimen (top) NF1708-DIVE09-SPEC01 collected at 510 m, and (bottom) NF1708-DIVE09-SPEC02 collected at 510 m.



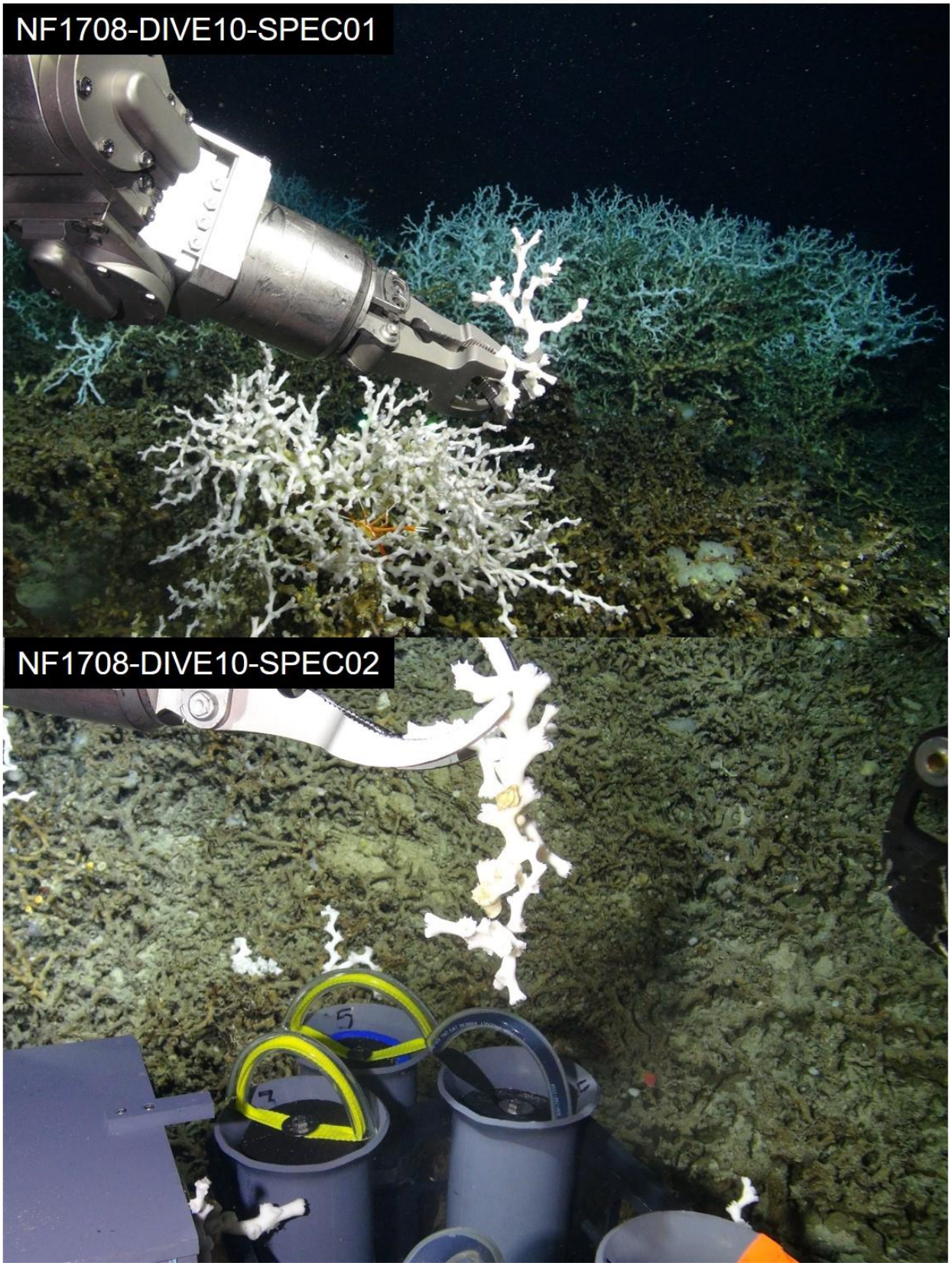
In situ photographs of *Lophelia pertusa* specimen (top) NF1708-DIVE09-SPEC03 collected at 504 m, and (bottom) NF1708-DIVE09-SPEC04 collected at 504 m.



In situ photographs of *Lophelia pertusa* specimen (top) NF1708-DIVE09-SPEC05 collected at 504 m, and (bottom) NF1708-DIVE09-SPEC06 collected at 500 m.



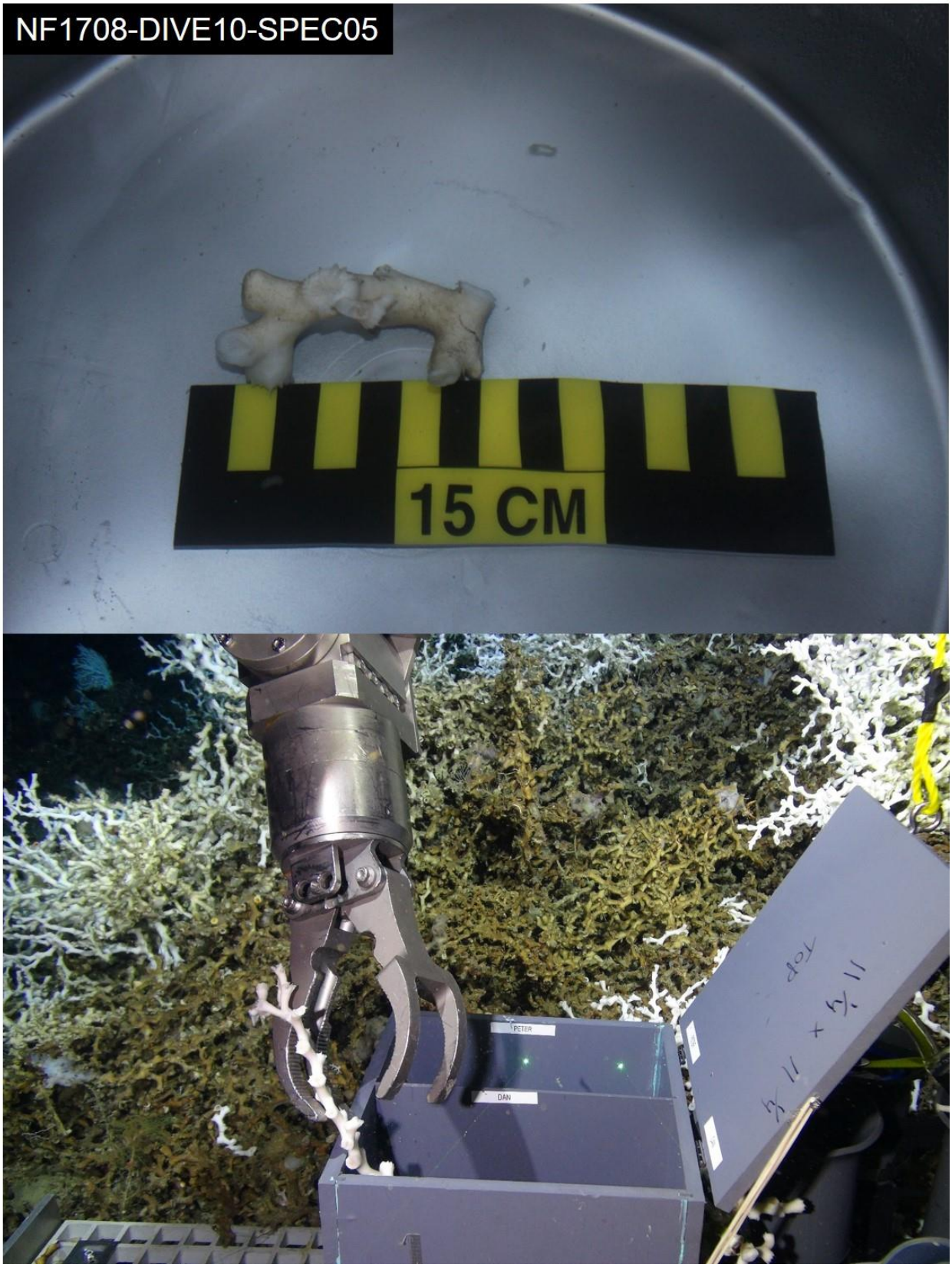
Photograph of *Leiopathes glaberrima* specimen (NF1708-DIVE09-SPEC07) collected at 506 m (top) in the laboratory, and (bottom) *in situ*.



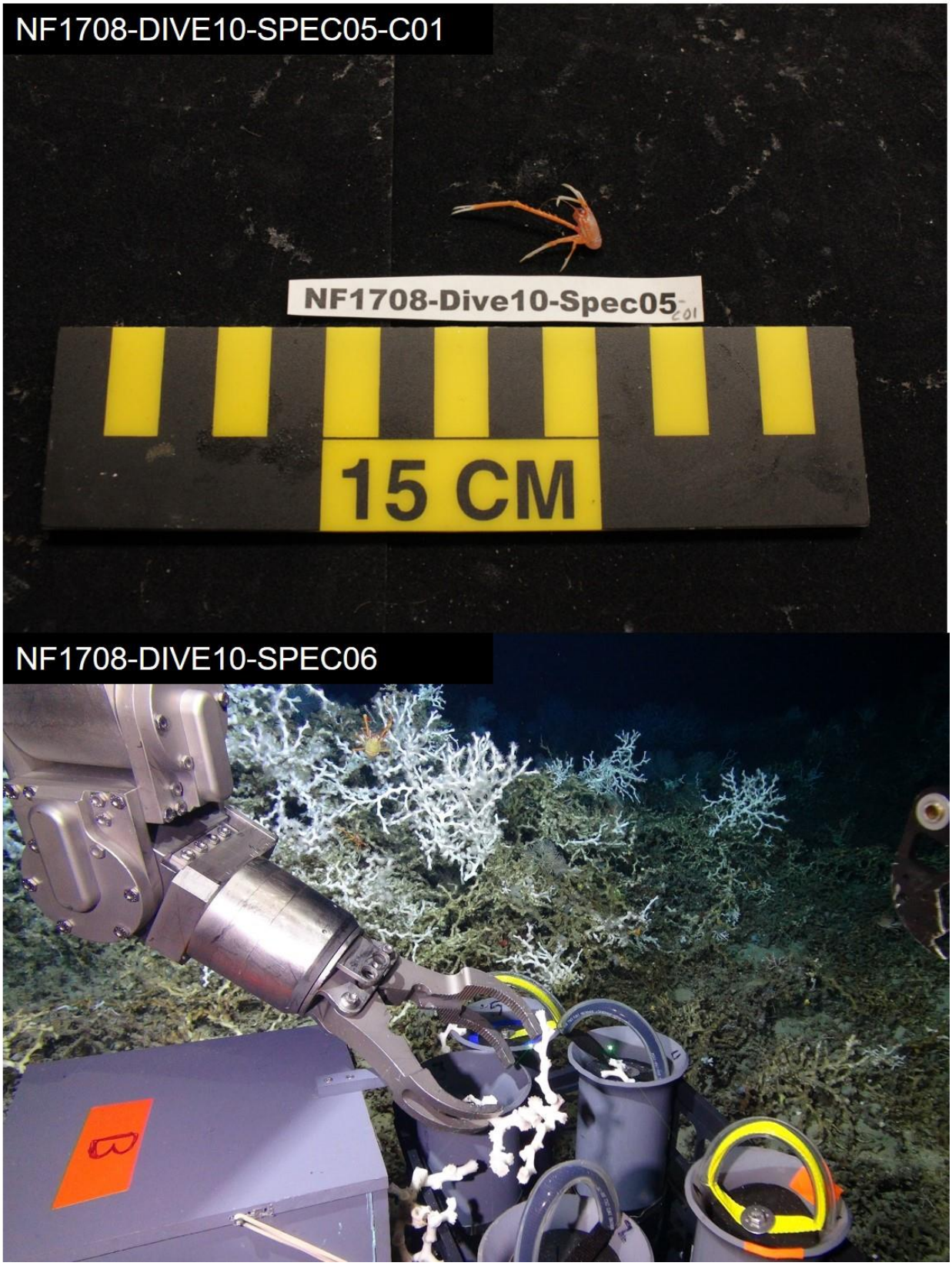
In situ photographs of *Lophelia pertusa* specimen (top) NF1708-DIVE10-SPEC01 collected at 480 m, and (bottom) NF1708-DIVE10-SPEC02 collected at 478 m.

In situ photographs of *Lophelia pertusa* specimen (NF1708-DIVE10-SPEC07) collected at 479 m.

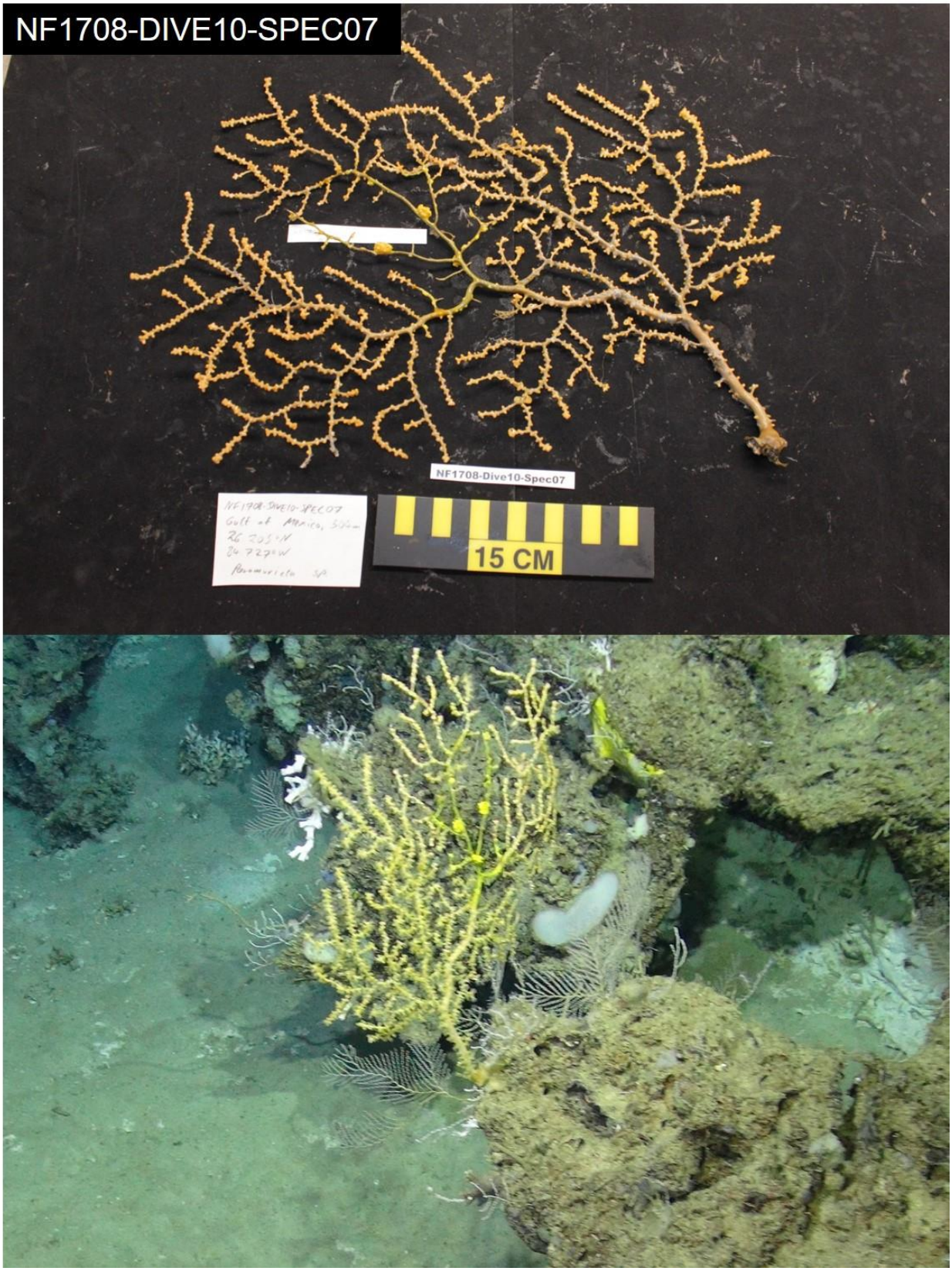
Photograph of *Lophelia pertusa*specimen (NF1708-DIVE10-SPEC04) collected at 476 m (top) in the laboratory, and (bottom) *in situ*.



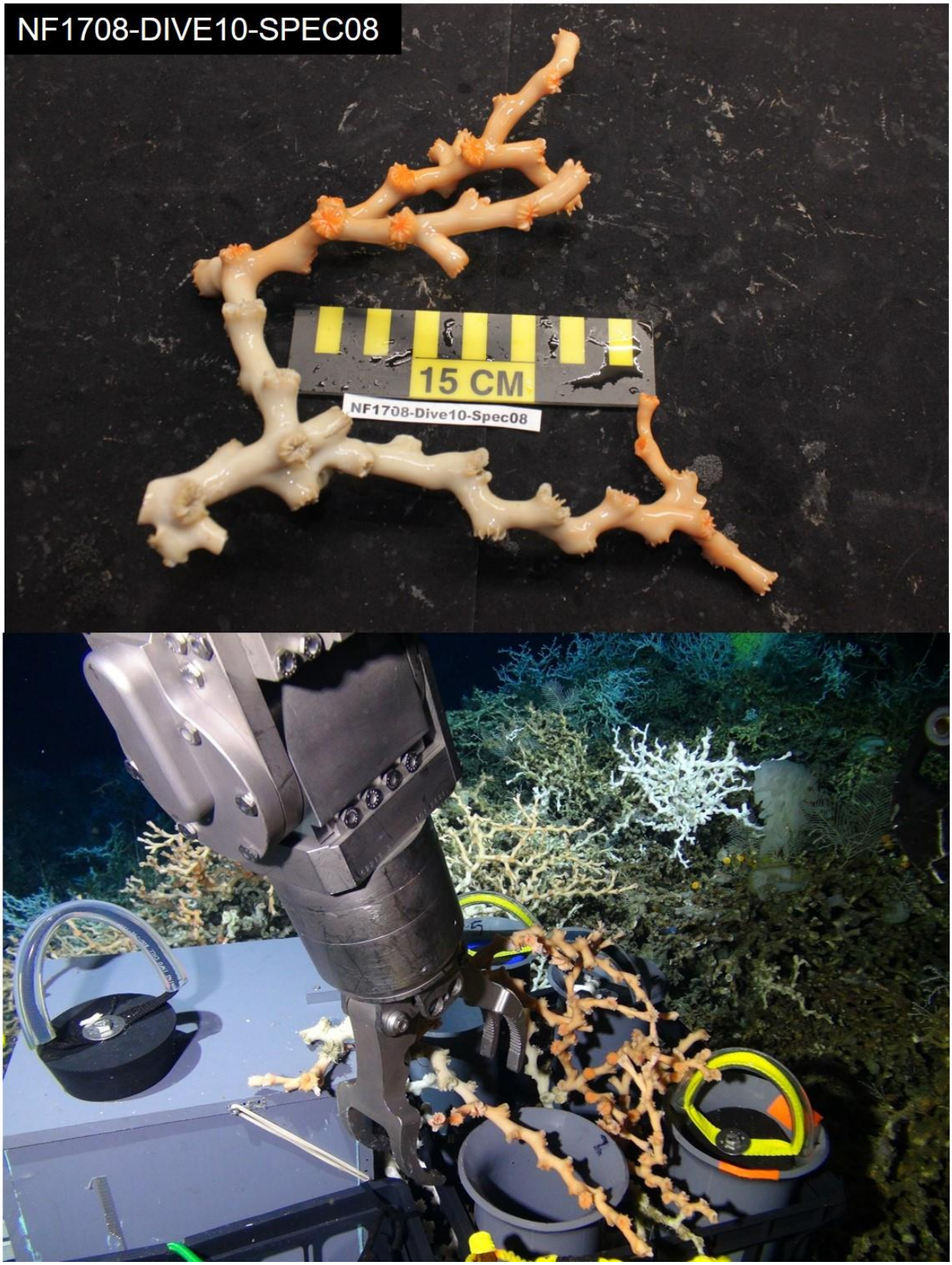
Photograph of *Lophelia pertusa* specimen (NF1708-DIVE10-SPEC05) collected at 476 m (top) in the laboratory, and (bottom) *in situ*.



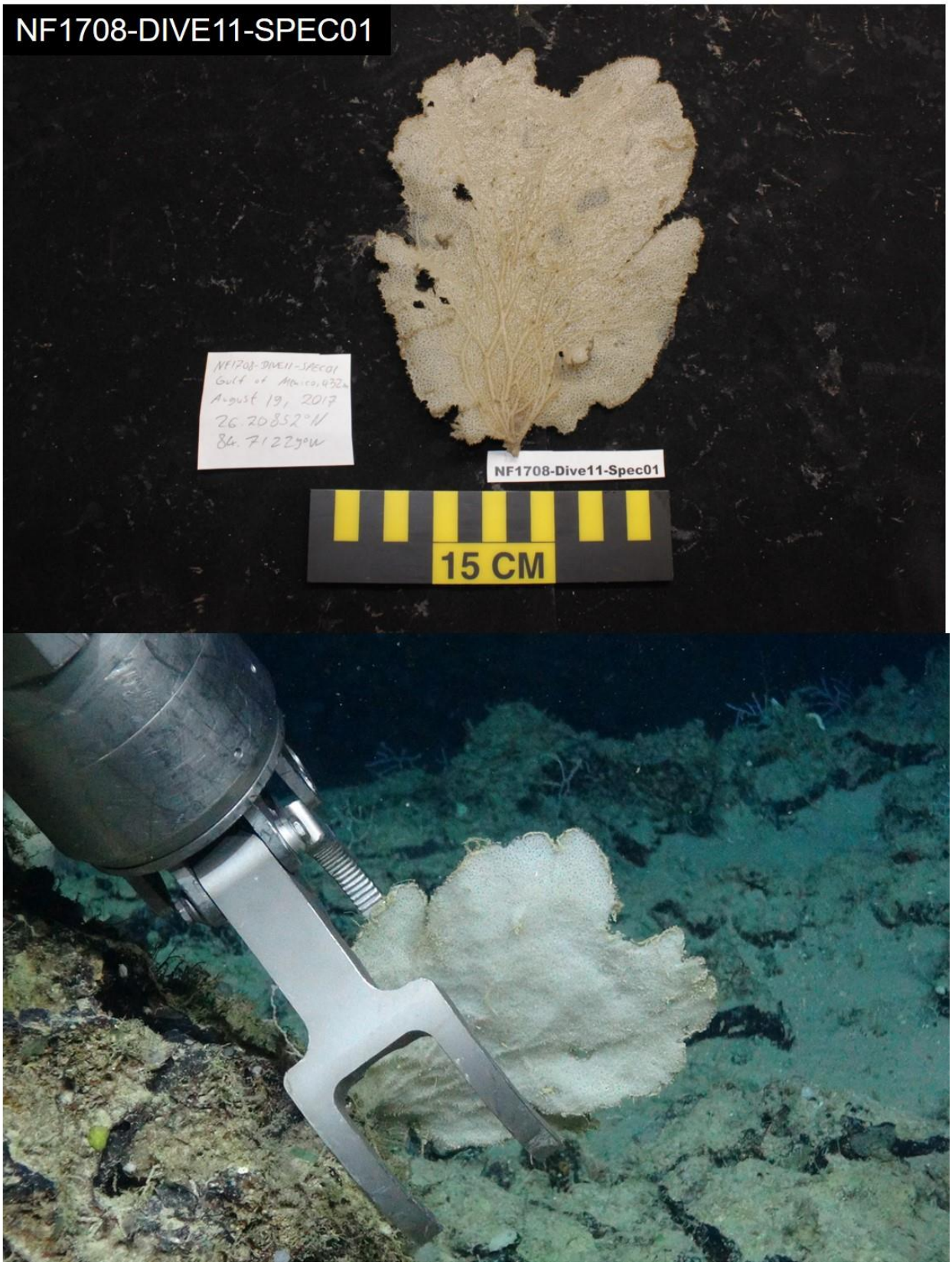
Photograph of (top) commensal Chirostyloidea specimen (NF1708-DIVE10-SPEC05-C01) collected on *Lophelia pertusa* at 476 m, and (bottom) *Lophelia pertusa* specimen (NF1708-DIVE10-SPEC06) collected at 478 m.



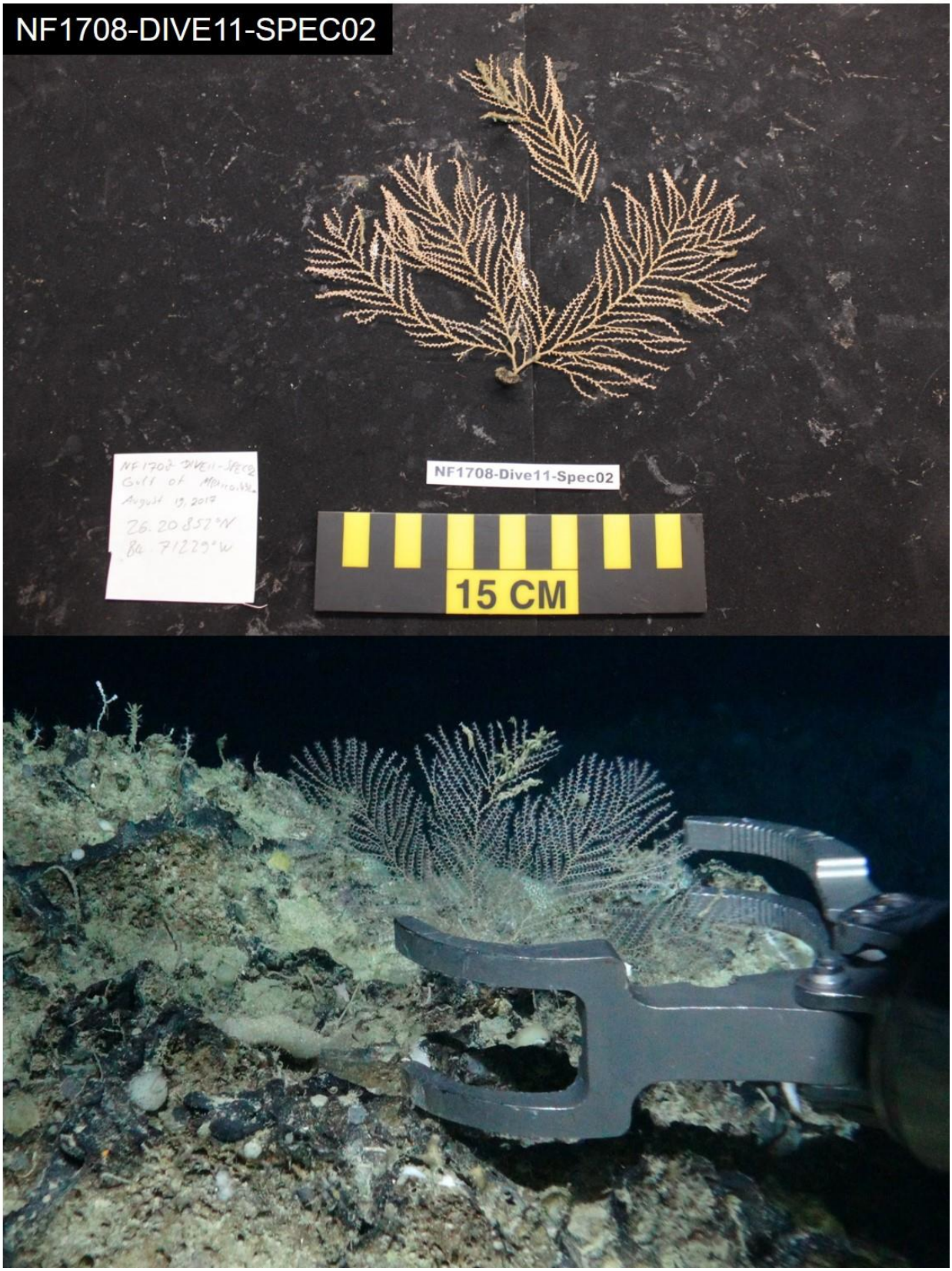
Photograph of *Paramuricea* sp. specimen (NF1708-DIVE10-SPEC07) collected at 506 m (top) in the laboratory, and (bottom) *in situ*.



Photograph of pink and white *Lophelia pertusa* specimen (NF1708-DIVE10-SPEC08) collected at 496 m (top) in the laboratory, and (bottom) *in situ*.

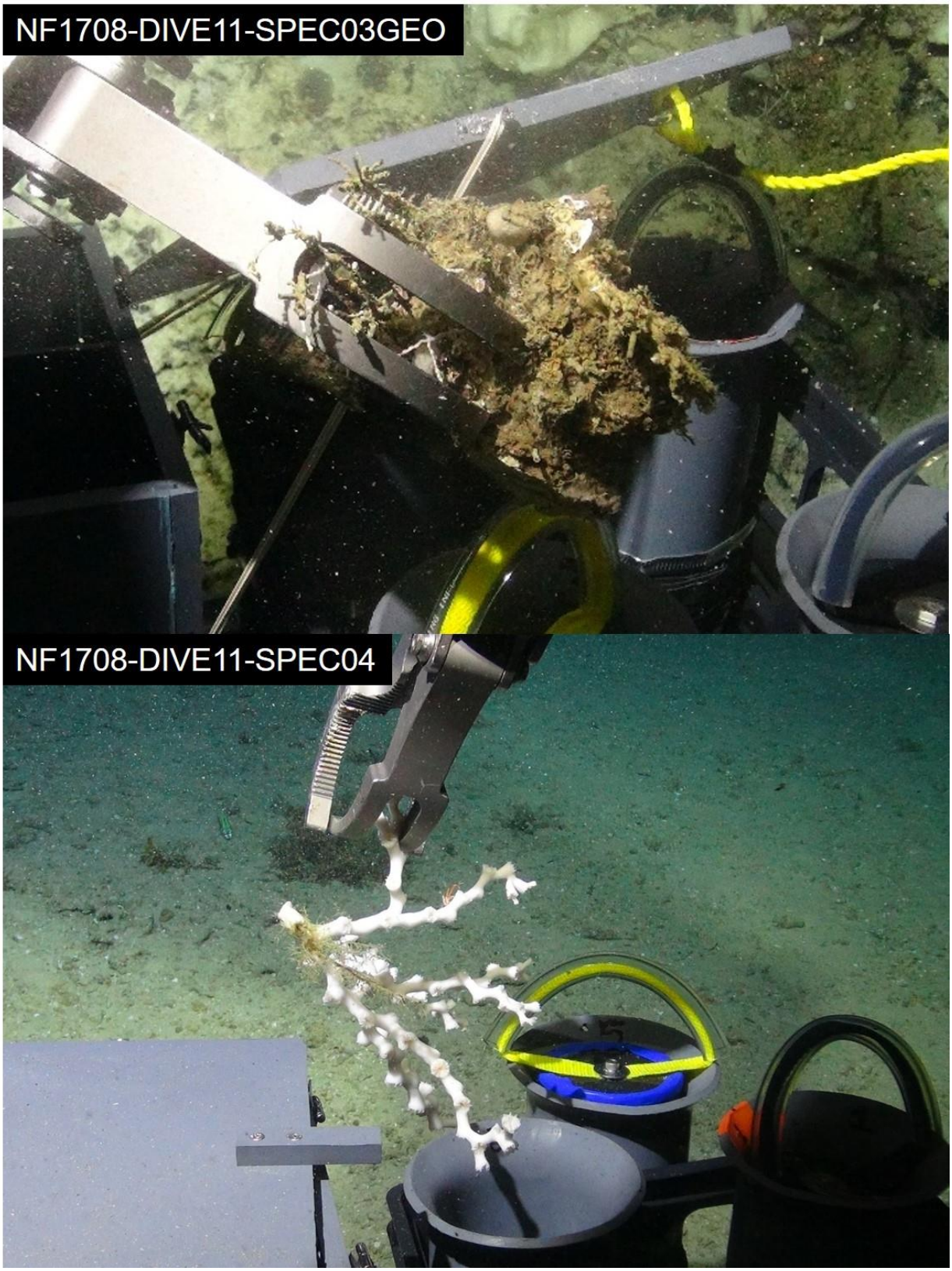


Photograph of *Phakellia* sp. specimen (NF1708-DIVE11-SPEC01) collected at 432 m (top) in the laboratory, and (bottom) *in situ*.



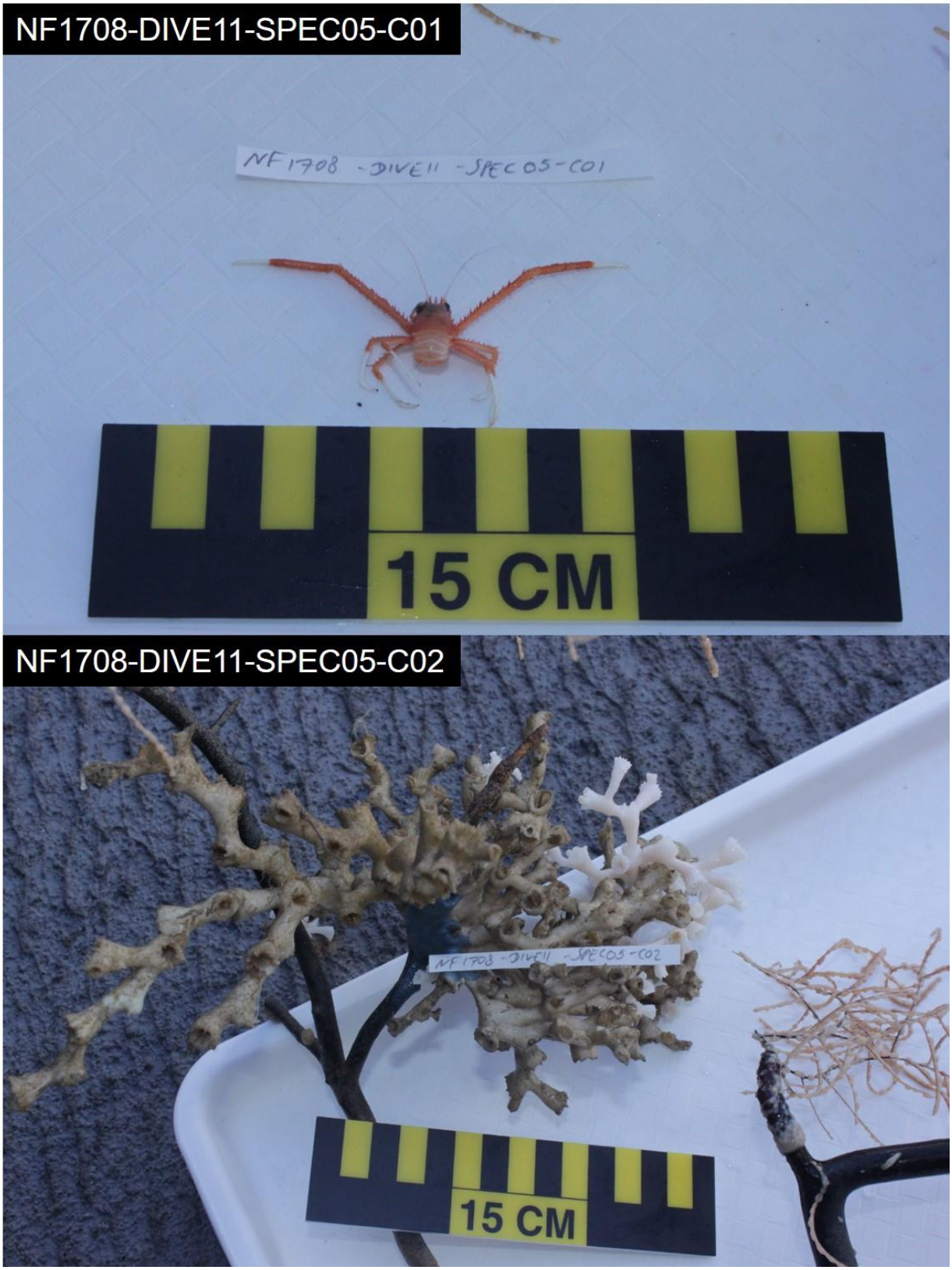
Photograph of *Plumarella* sp. specimen (NF1708-DIVE11-SPEC02) collected at 432 m (top) in the laboratory, and (bottom) *in situ*.

Photograph of Stylasteridae specimen (NF1708-DIVE11-SPEC03) collected at 432 m (top) in the laboratory, and (bottom) *in situ*.

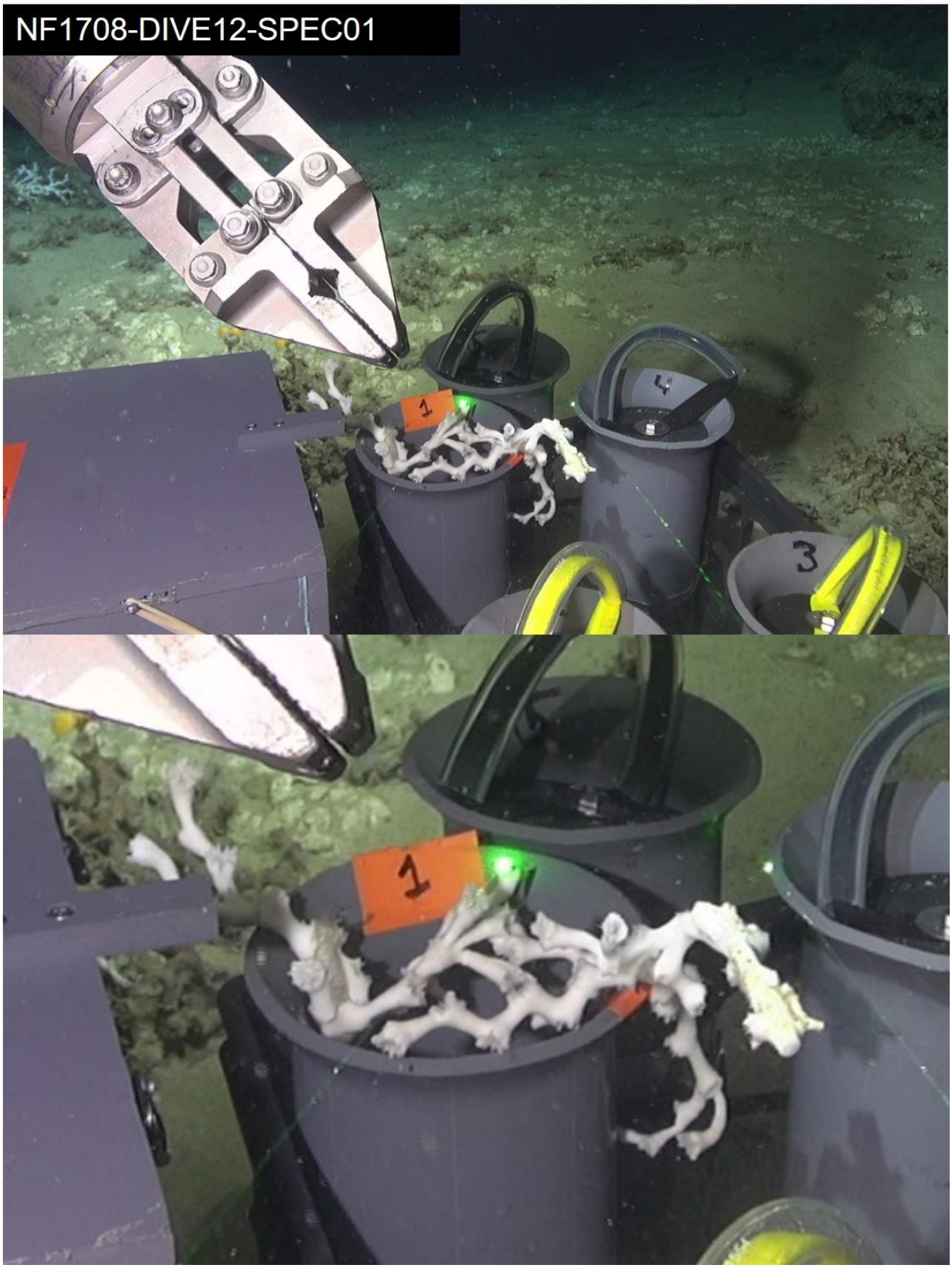


In situ photographs of (top) rock sample (NF1708-DIVE11-SPEC03GEO) collected with Stylasteridae specimen (NF1708-DIVE11-SPEC03) at 432 m, and (bottom) *Lophelia pertusa* specimen (NF1708-DIVE11-SPEC04) collected at 432 m.

Photograph of *Leiopathes glaberrima* specimen (NF1708-DIVE11-SPEC05) collected at 430 m (top) in the laboratory, and (bottom) *in situ*.

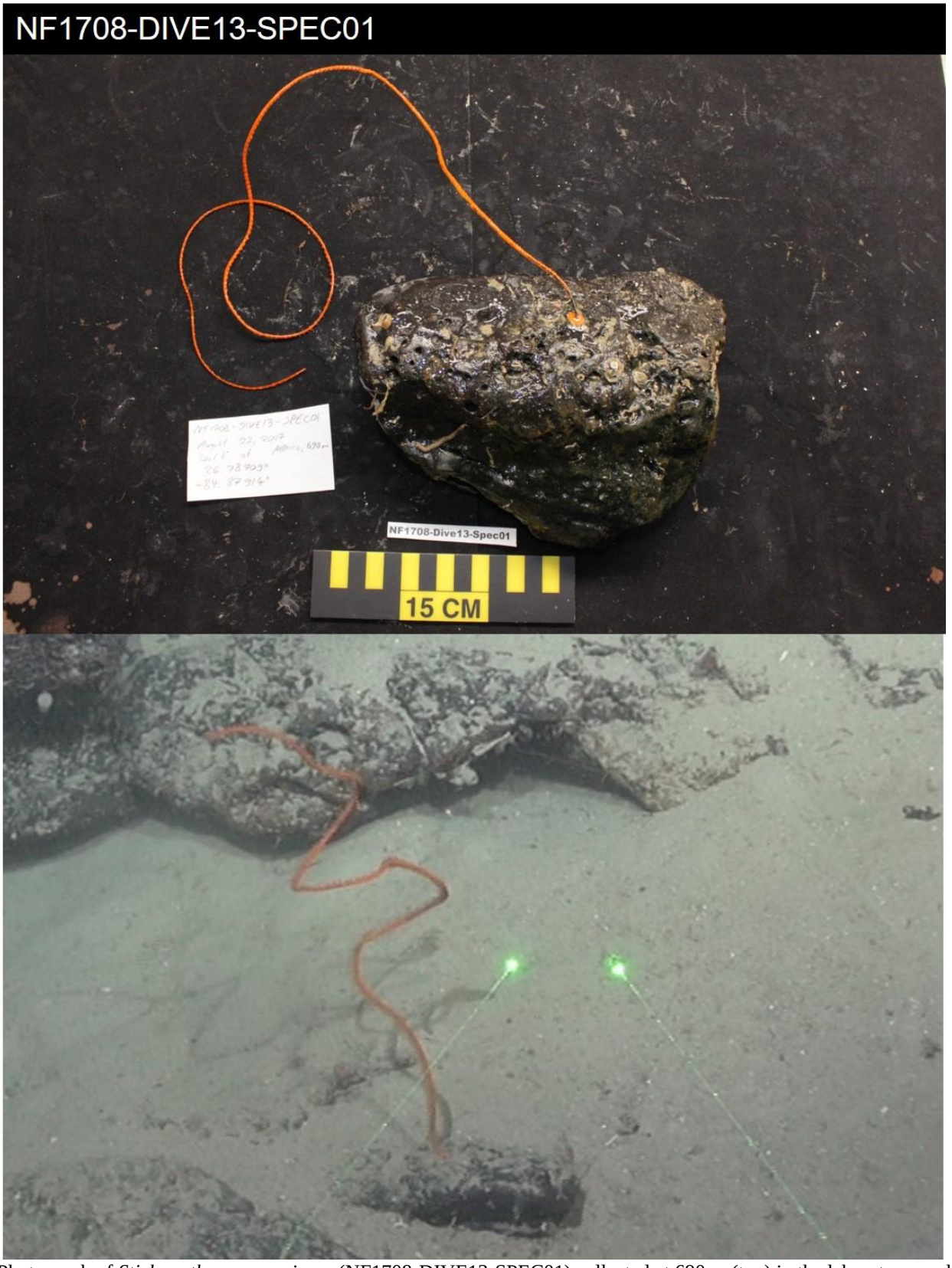


Photograph of commensal organisms collected on *Leiopathes glaberrima* specimen (NF1708-DIVE11-SPEC05) 430 m including (top) Chirostyloidea (NF1708-DIVE11-SPEC05-C01), and (bottom) *Lophelia pertusa* (NF1708-DIVE11-SPEC05-C02).

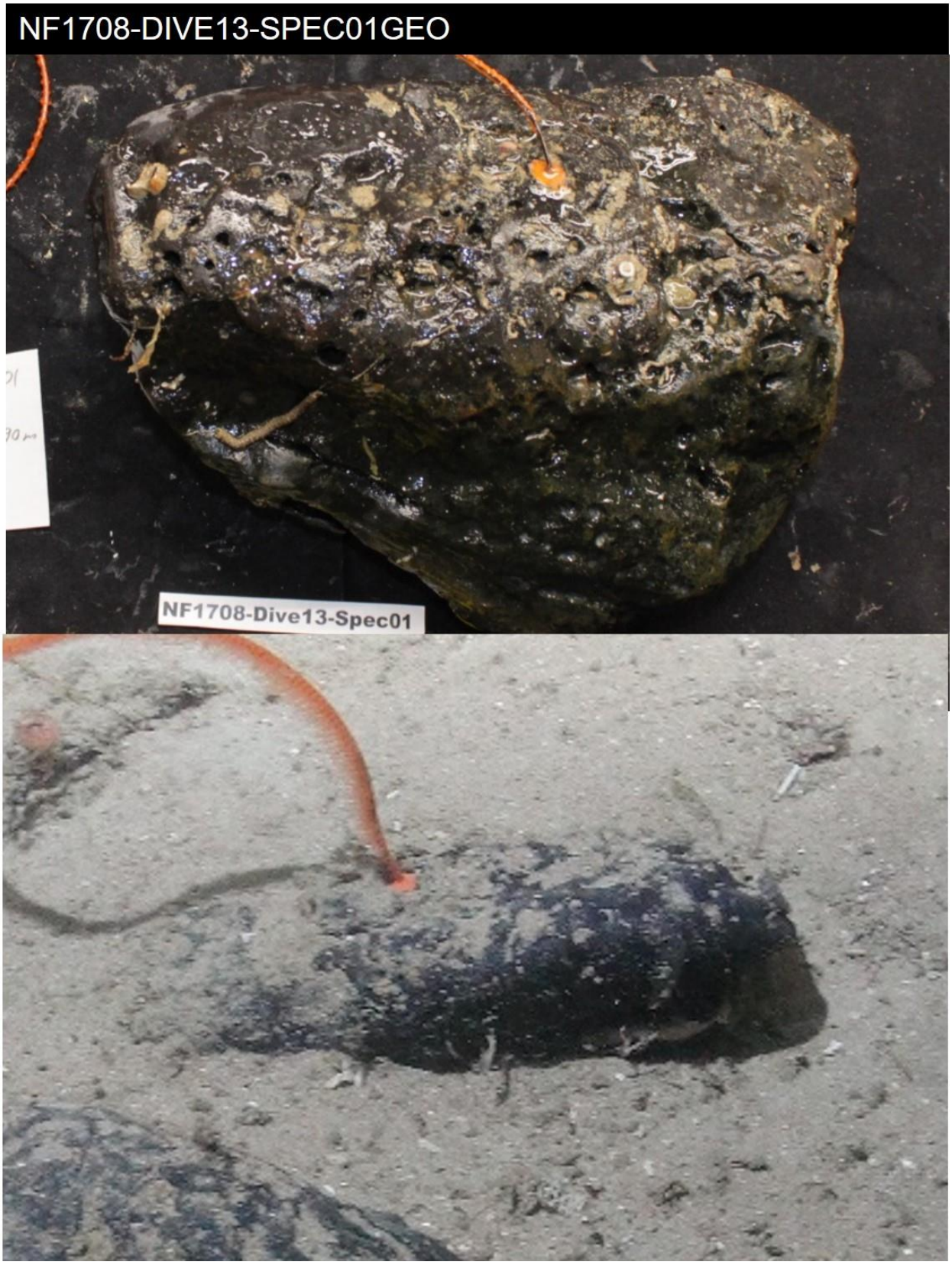


In situ photographs of *Lophelia pertusa* specimen (NF1708-DIVE12-SPEC01) collected at 521 m.

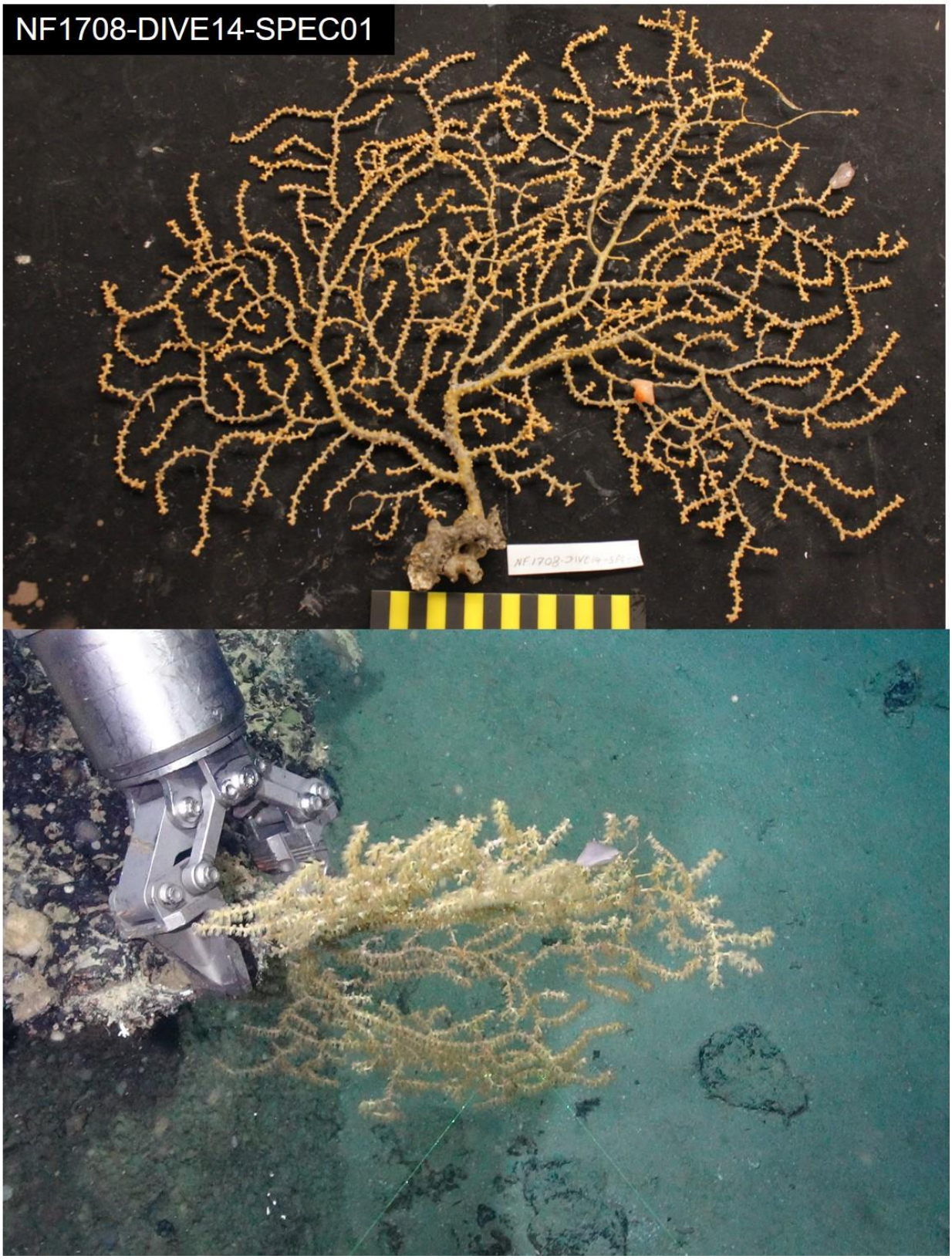
Photograph of Isididae specimen (NF1708-DIVE12-SPEC02) collected at 515 m (top) in the laboratory, and (bottom) *in situ*.



Photograph of *Stichopathes* sp. specimen (NF1708-DIVE13-SPEC01) collected at 690 m (top) in the laboratory, and (bottom) *in situ*.

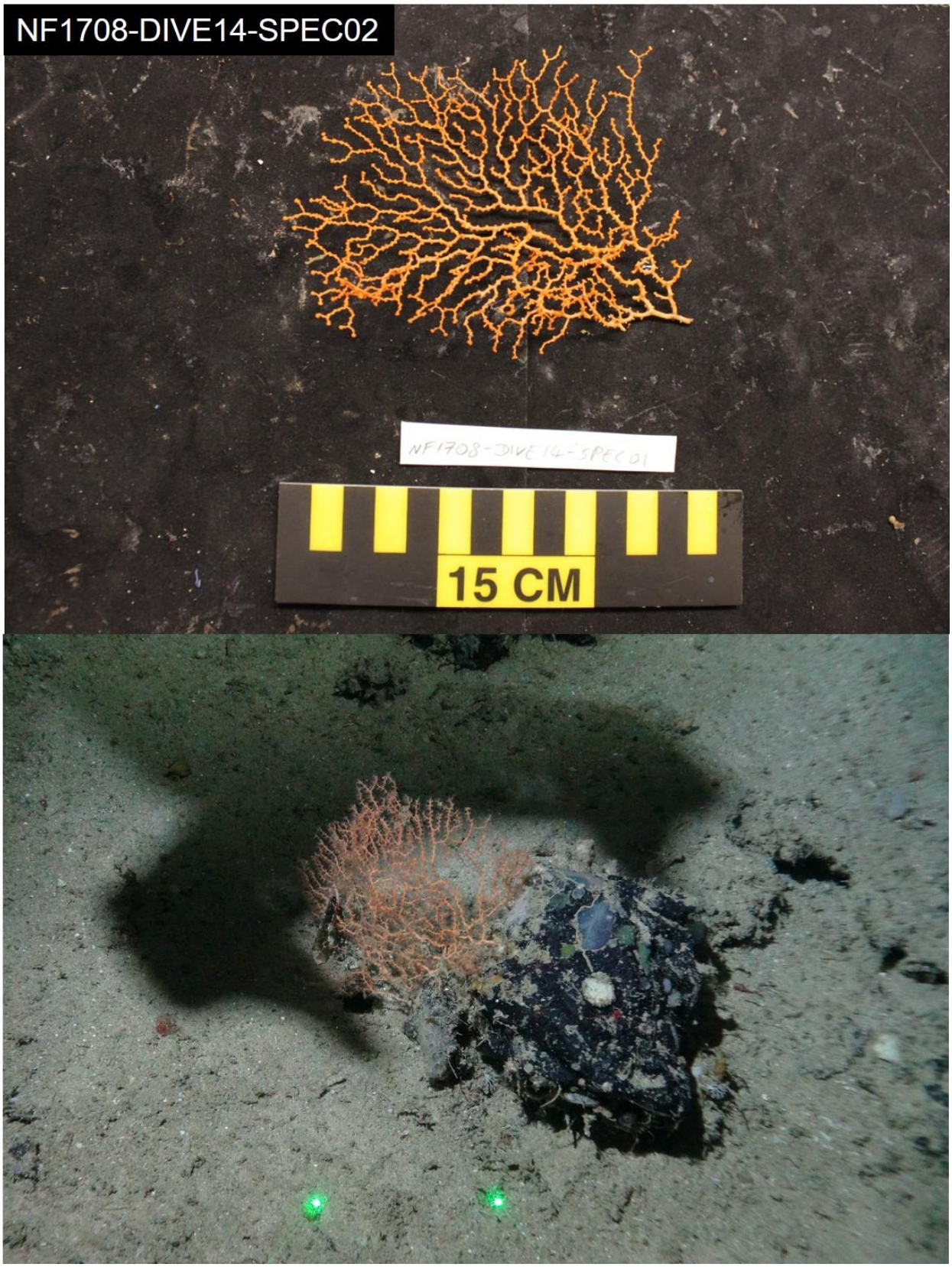


Photograph of rock sample (NF1708-DIVE13-SPEC01GEO) collected as part of collection of a black coral sample (NF1708-DIVE13-SPEC01) at 690 m (top) in the laboratory, and (bottom) *in situ*.

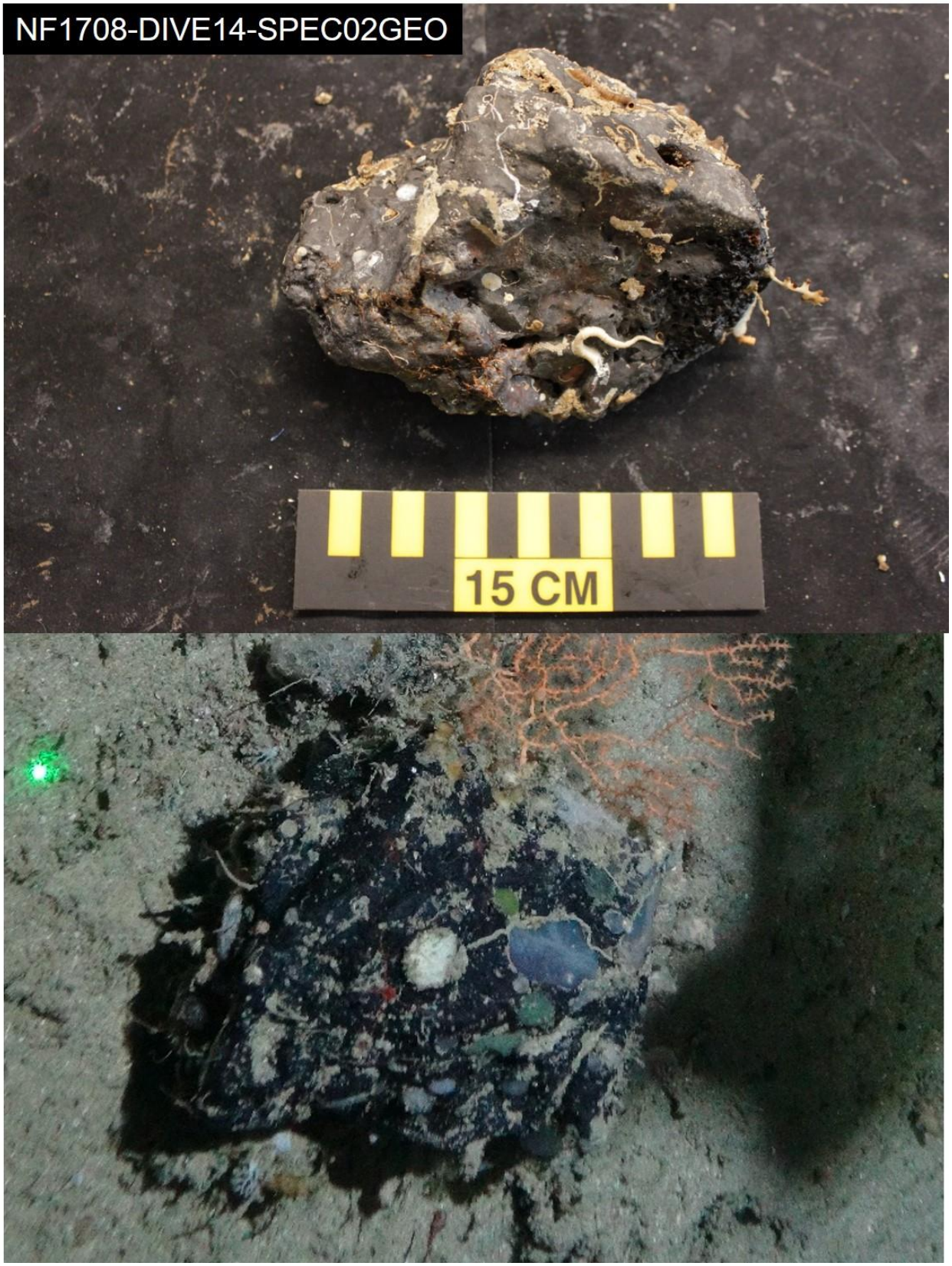


Photograph of *Paramuricea* sp. specimen (NF1708-DIVE14-SPEC01) collected at 454 m (top) in the laboratory, and (bottom) *in situ*.

Photographs of commensal anemones taken from *Paramuricea* sp. specimen (NF1708-DIVE14-SPEC01) collected at 454 m, including (top) specimen NF1708-DIVE14-SPEC01-C01, and (bottom) specimen NF1708-DIVE14-SPEC01-C02.



Photograph of *Chelodonisis* sp. specimen (NF1708-DIVE14-SPEC02) collected at 443 m (top) in the laboratory, and (bottom) *in situ*.



Photograph of rock sample (NF1708-DIVE14-SPEC02GEO) collected as part of *Chelodonisis* sp. specimen (NF1708-DIVE14-SPEC02) taken at 443 m. Rcok sample (top) in the laboratory, and (bottom) *in situ*.

Photograph of *Leiopathes glaberrima* specimen (NF1708-DIVE14-SPEC03) collected at 446 m (top) in the laboratory, and (bottom) *in situ*.

Appendix 3: Preliminary observations made during each ROV dive of NF-17-08.

Time (UTC)	Observation
DIVE01 - August 13, 2017 - Long Mound	
15:04:00	fish and mud
17:04:00	bamboo coral
17:04:51	sponge
17:07:07	starting transit, bamboo coral ~5 colonies, sponge, *Stylaster*
17:10:45	algae
17:11:29	chain dogfish/catshark
17:14:00	hermit crab
17:08:06	sea robin
17:52:33	fishing line on bottom
18:26:00	blackbelly rosefish, golden crab, small rock structure
18:31:00	blackbelly rosefish, golden crab
18:33:00	line and beer can
18:42:00	sponge, crab, squat lobster in sediment
18:44:40	2 blackbelly rosefish
18:47:00	blackbelly rosefish, hard bottom, another fish, urchin?
18:49:30	mound/rock
18:51:00	end dive
DIVE02 - August 14, 2017 - Long Mound	
13:00:00	bottom
13:02:46	start transect 1
13:06:00	sea robin
13:10:00	hanging out in place for a while
13:13:00	end of transect 1
13:20:00	sea robin (2)
13:22:00	3 galatheoids
13:29:00	*Munida* sp.
13:19:00	start transect 2
13:27:00	end transect 2
13:36:00	blackbelly rosefish
13:37:00	squat lobster
13:38:00	squat lobster and blackbelly rosefish
13:39:00	*Munid*?, fish
13:41:00	dogfish
13:42:00	octocoral with fish
13:45:00	gorgonian
13:47:00	field of octocorals
13:49:00	octocoral wish fish *Leiopathes. Lophelia, Eumunida picta*, primnoid

Time (UTC)	Observation
DIVE02 - August 14, 2017 - Long Mound (continued)	
13:57:00	on wall
14:03:00	*E. picta, C. fenneri*
14:09:00	lantern belly
14:16:00	start transect 3
14:17:30	*Lophelia*
14:18:00	squat lobster, sea star
14:20:00	*E. picta*
14:23:00	sponges, pandalid shrimp, *Anthomastus*, many *E. picta*, cup coral (*Bathypsammia),* slimehead, dead *Lophelia*, *Leiopathes*, many fish
14:28:00	big *Leiopathes*, chirostyloids
14:31:30	end transect 3
14:33:00	*Leiopathes*, unknown coral
14:35:00	coral with fish, *Lophelia, E. picta*
14:37:00	roughy, sponge
14:39:00	start transect 4
14:40:00	black corals, *Lophelia, E. picta* (many)
14:42:00	sponge
14:42:00	beer can and trash
14:44:00	sponge, *Lophelia*, shrimp
14:46:00	catshark
14:50:00	end transect 4
14:51:00	*Leiopathes* with obligate associate fish (*Benthocometes*)
14:55:00	shrimp and sponge, *Leiopathes* and obligate fish
14:58:00	octocoral?
15:00:00	pencil urchin
15:01:00	sponge?
15:01:40	*E. picta, Lophelia*
15:02:00	*Leiopathes*
15:04:00	*Leiopathes* & fish
15:06:00	*Leiopathes, E. picta, Uroptychus nitidus*?
15:32:00	red eyed gaper
15:34:00	golden crab, goosefish
15:38:00	beardfish
15:49:00	sand, flat fish?
15:51:00	blackbelly rosefish
16:02:00	squat lobsters (2), many *E. picta*
16:09:40	start of transect 5, golden crab
16:11:00	*E. picta*
16:13:00	*Leiopathes*
16:14:00	beardfish and coral (2)

Time (UTC)	Observation
DIVE02 - August 14, 2017 - Long Mound (continued)	
16:15:30	end transect 5
16:16:00	*Paramuricea* with *Benthocometes* fish
16:17:00	*Paramuricea*, two *E. picta* and *Lophelia*
16:20:00	sponge (3 gorgonians)
16:22:00	dead *Lophelia*
16:22:40	*Anthomastus* and gorgonian
16:28:22	*Paramuricea* and *E. picta* (same as before?)
16:30:40	*Lophelia*
16:36:00	*Anthomastus*
16:36:45	transect 6 start, golden crab
16:39:00	end transect 6
16:40:00	Isididae, a couple of species?
16:41:30	Aquaumbridae
16:42:00	bamboo coral
17:09:20	scrapped
17:45:32	dragging ROV by ship to east to find wall
DIVE02A - August 14, 2017 - Long Mound	
18:51:00	back on bottom, DIVE02A, wall habitat
18:59:00	sparse golden crab
19:02:00	octopus, lantern belly, glass sponge, blackbelly rosefish
19:05:00	*Chaunax*
19:10:22	*Leiopathes*, blue sponge, squat lobster, scorpionfish
19:13:46	primnoids, squat lobster
19:17:38	conger eel?
19:18:36	black coral
19:19:11	thornyback fish
19:19:52	beardfish
19:20:40	black coral and *Benthocometes*
19:22:48	*Leiopathes* and 2 fish, 2 corals
19:25:00	slimehead
19:27:54	fishing line
0:00:00	*Leiopathes* and fish
19:30:35	gaper, thornyback, crab
19:32:00	*Leiopathes* and fish and more-medium density aggregation
19:33:35	lantern belly
19:38:30	skate
19:40:15	alfonsino fish
19:41:00	trash (bottle)
19:43:30	glass sponge

Time (UTC)	Observation
DIVE02A - August 14, 2017 - Long Mound (continued)	
19:44:25	scorpionfish
19:45:00	sponge
19:46:40	antheid and roughy
20:03:12	sponge
20:06:30	octopus and sponge
20:07:10	fishes
20:21:50	rock
20:23:00	dory
20:33:00	*E.picta*, roughy, *Stylaster*, glass sponge
20:34:00	glass sponges
20:36:00	wall, glass sponges, tinsel fish
20:37:50	*Leiopathes*, chirostyloid
20:39:50	fish, sponges
20:41:00	slimehead
20:42:00	*E. picta*
20:44:00	coral with fish, *Lophelia, E. picta*
20:46:40	gold crab, 2 fish
20:51:29	gaper, thornyback, crab
21:03:00	*Stylaster*
21:04:15	blackbelly rosefish, hermit crabs
21:05:00	cuttlefish and *Stylaster*
21:07:40	sea star, *Stylaster*
21:09:00	beardfish
21:11:20	beardfish and fish
21:13:20	sea cucumber
21:19:00	sea star
21:20:20	sea stars and hermit crab
21:21:20	sea robin, *Stylaster*
21:22:00	lantern belly
21:25:30	fish, primnoid
21:25:50	lantern belly, boarfish
21:27:40	*Stylaster*
21:28:11	sea robin
21:28:44	*Chanaux*, lantern belly
21:30:00	shrimp
21:32:00	end of dive

Time (UTC)	Observation
DIVE03 - August 15, 2017 - North Reed	
12:53:00	on bottom, wall, lots of golden crabs, squat lobster
13:03:00	sea cucumber
13:05:00	*E. picta*, corals, *Leiopathes*, Isididae
13:07:00	*Leiopathes*, seafans
13:08:00	*Leiopathes* X 3
13:09:00	antheid, crinoid, Isididae, alphonsino
13:10:00	blackbelly rosefish, golden crab (*C. fenneri*), *Leiopathes*
13:14:40	*Leiopathes*
13:16:00	*Leiopathes*, eel
13:23:00	*Leiopathes*, blackbelly rosefish
13:23:39	tinselfish, *E. picta*, 3 *Leiopathes* with chirostyloid
13:25:30	octopus, *E. picta*
13:31:10	antheid
13:38:10	trash
13:39:10	sponge, coral
13:40:00	sea cucumber/pyrosome, blackbelly rosefish
13:41:00	Aquaumbridae
13:42:30	pencil urchin
13:44:10	tinselfish with amphipod, lantern belly
13:44:00	*Leiopathes, Anthomastus*
13:45:50	primnoid, sponges, *Anthomastus*?, Isididae, sea star, sponge
13:49:50	*Anthomastus*
13:52:50	bamboo, *Stylaster*, crinoid
13:59:00	gaper (2)
14:00:00	black coral
14:01:00	antheid, sea cucumber, *E. picta, Leiopathes*
14:02:00	antheid (2), *Leiopathes, E. picta, Chaceon fenneri*
14:03:00	conger eel, *Anthomastus*, antheid
14:05:00	lantern belly, antheid, *Leiopathes*, brittle star
14:07:00	*Leiopathes*, sponge, gaper, pencil urchin
14:10:00	*Leiopathes*, slimehead, *C. fenneri*, Isididae
14:11:00	Aquaumbridae, sponge
14:12:00	sea cucumber
14:14:00	*Leiopathes, Paramuricea* with *Asteroschema*, Isididae
14:15:00	fish, pencil urchin
14:23:00	*C. fenneri*
14:24:00	mora cod, blackbelly rosefish
14:26:00	*Leiopathes* (orange and red)
14:32:00	*Leiopathes* with obligate fish, *E. picta*

Time (UTC)	Observation
DIVE03 - August 15, 2017 - North Reed (continued)	
14:37:00	field of *Stylaster* and sponges
14:45:00	roughy, chirostyloid, *Anthomastus*, *Leiopathes*
14:46:15	Leiopathes, blackbelly rosefish
14:48:30	*C. fenneri*, Isididae, *Leiopathes, Stylaster*
14:50:30	Isididdidae, *C. fenneri*
14:51:00	sea cucumber and brittle stars
14:54:00	bamboo corals and stylasterids
14:55:20	slimehead, blackbelly rosefish, tinselfish, *E. picta*, coral, sea star, sponge, lantern belly
14:59:00	crinoid, Isididae, yellow stick sponge,
15:00:00	rosy dory, Isididae
15:05:00	slimehead, sponge, *Leiopathes*
16:30:00	rope
16:31:00	fishing gear wrapped around *Stylaster*
16:38:00	end of dive
DIVE04 - August 15, 2017 - North Reed	
18:27:00	on bottom, sandy bottom
18:50:00	*Stichopathes* whip coral, *C. fenneri*, mushroom coral, *Stylaster* sponges
19:02:00	*Stylaster*, *C. fenneri*, sponges, *Anthomastus*
19:18:00	sea cucumber and lantern belly
19:30:00	at a bump, first hard bottom
19:32:00	line and beer bottle
19:33:00	rattail, sponge, *Stichopathes, Anthomastus*
19:34:00	line and dead *Lophelia*
19:36:00	*Lophelia*
20:18:00	*Stylaster*, sponges, crinoid
20:21:00	*Munida* sp.
20:22:00	skate, *Munida* sp.
20:25:00	Aquaumbridae, *Stichopathes, Paramuricea, Anthomastus*, sponges
20:26:00	issues with ROV navigation
20:29:00	*C. fenneri* (2), *Stylaster*
20:33:00	end of dive
DIVE05 - August 16, 2017 - Many Mounds	
13:40:00	launch
14:12:00	bottom in sight
14:19:00	start survey, soft sand habitat, abundant patches of *Sargassum*, small amounts of rocky rubble, fan sponge (*Phakellia*) 26º12.72, 86º 42.23, 385 m, on top of scarp: *Leiopathes*, Isididae, glass sponges? 5 swallowtail bass
14:25:00	*Leiopathes* on rock 26º 12.71, 84º 42.22, depth 387 m, another *Leiopathes*
14:30:00	large orange *Leiopathes*, still on ssw sparse, low relief rock outcrops. Another *Leiopathes* and small glass sponges (lollipop) depth 386 m, *Gephryoberyx darwinii*
14:34:00	large rocky mound. 26º 12.63, 84º 42.8 384 m

Time (UTC)	Observation
DIVE05 - August 16, 2017 - Many Mounds (continued)	
14:42:00	on top of scarp, lots of rough (Gd), 26º 12.59, 84º 42.18. Rocky eroded pavement/boulders. Swallowtail bass, gd, urchin (*Echirus* or *Lytechirus*?) blackbelly rosefish
14:48:00	golden tilefish 382 m, *Leiopathes*
14:55:00	primnoid octocoral (*Callogorgia*?), 26º 12.54, 84º 42.17, 382 m
14:58:00	tilefish, same kind of habitat, swallowtail bass (*Anthias woodsi*), blackbelly rosefish, urchin (Echinoidea)
15:01:00	on sand, ripples, 26 dep 12.52, 84º, 42.1, 378 m
15:09:00	Isididae, cidaroid urchin, glass sponge, 26º 12.46, 84º 42.17, 381 m, *Laemonema*. Mostly ss habitat
15:11:21	fishing line! Isididae, sponges, *Leiopathes*
15:17:00	Isididae, sponges, on rocks
15:17:38	over sand ripples, Isididae, *Stichopathes*, sandy/rubble-rock
15:20:00	line ss rocky outcrops
15:24:00	26º 12.35, 84º 42.14. rocks and ss. *Leiopathes*. Fan sponge, *Laemonema, Synograps*
15:34:00	26º 12.3?, 84º 42.14. 383 m back in ss. Rocky rubble habitat, sponges, Isididae, *Laemonema, Callogorgia* w. *Asteroschema*, cup coral, sponges, squid, several large Isididae
15:45:00	heading 264 looking for edge of scarp. Probably on top 384
15:46:00	*Leiopathes*? Unknown
15:47:00	heading 283 depth 385
15:47:55	scorpionfish
15:49:00	rubble, bamboo
15:50:00	bamboo and antipatharian, heading 127 rubble
15:51:00	close up of previous line *Leiopathes*
15:51:00	sea cucumber, heading 210, depth 286.7 m
15:52:00	large coral bush, 385.6 m
15:53:00	conger eel
15:53:45	toward edge of escarpment 274, coming around to large colony to get lasers at base
15:55:00	large colony front and center, pencil urchin in foreground
15:57:00	still maneuvering to get lasers on colony
15:58:00	several squat lobsters in colony
15:58:00	next to wall drop off
15:59:00	bamboo coral
15:59:44	sponge 387.7 m heading 148
16:00:00	coral with basket star, *Stylaster* 387.2
16:01:16	sandy bottom 385 m heading 215
16:02:47	sandy with occasional cobble h: 190, d:387
16:03:43	zooming in roughy in hole 387 m
16:04:46	sponge, coral, squat lobster 387 m
16:06:00	tube sponges heading 276

Time (UTC)	Observation
DIVE05 - August 16, 2017 - Many Mounds (continued)	
16:08:00	golden tilefish 26 12.08, 84 42.15 384 m
16:22:00	*Lophelia* 26 12.03, 84.42.19 tile fish
16:32:00	on sediment
16:44:00	squid
16:48:00	ship moving at 3 knots ROV off bottom
16:54:00	back on bottom, sand/rock cobble, *Leiopathes*
16:56:00	sea cucumber, bamboo, *Leiopathes*, short nose greeneye
16:58:00	small rock outcrop- Darwin slimehead, *Leiopathes*, swallowtail bass
17:01:00	*Laemonema*, swallowtail bass, golden crabs
17:04:00	*Lophelia* and *Leiopathes* pics
17:06:00	*Leiopathes* at edge of ledge
17:09:00	tilefish on small cobbles at edge of ledge
17:11:00	sea cucumber, pencil urchin, swallowtail bass
17:13:00	Darwin slimehead
17:16:00	*Leiopathes*
17:18:00	golden crab, swallowtail bass on rock outcrop
17:20:00	on sediment
17:31:00	back on bottom of rock wall, *Stylaster*
17:33:00	pencil urchin, yellow sponge
17:34:00	low relief outcrops, Darwin's slimehead, swallowtail bass, top of ledge 388 m
17:36:00	sea star, pencil urchin, blue sponge on rock outcrop 387 m
17:40:00	sponge and *Stylaster* 388 m, pencil urchin and *Leiopathes* and swallowtail bass
17:48:00	still on rock cobble at edge of wall 389m
17:53:00	several Darwin slimehead on rock outcrops 389 m
17:56:00	pulled off bottom- rock outcrops on wall
17:57:00	back on bottom
17:58:00	squat lobster, *Stylaster*, yellow sponge
18:02:00	*Leiopathes*
18:05:00	*Lophelia* at edge of wall 394 m
18:10:00	white sponge
18:16:00	several *Stylaster* colonies, Darwin slimehead, on edge of wall 390 m
18:18:00	*Leiopathes*, golden crab
18:21:00	coming off bottom, going to have ship tow us approx. 1 km to sw
19:35:00	back on bottom, sand, rattail
19:48:00	rock outcrops, *Stylaster*, sponge, squat lobster
19:50:00	*Lophelia* 428 m
19:53:00	getting pic of *Phakellia* sponge
19:56:00	Aquaumbridae
19:57:00	bamboo coral
20:01:00	*Stylaster*, squat lobster, *Muriceides*

Time (UTC)	Observation
DIVE05 - August 16, 2017 - Many Mounds (continued)	
20:04:00	transiting over sediment to next rock
20:05:00	small rock outcrop, *Stylaster*
21:10:00	*Lophelia* and black corals 425 m
21:20:00	off bottom
DIVE06 - August 17, 2017 - North Reed	
18:40:00	begin dive preparations
19:13:00	at surface, end of dive hydraulic fluid leak, never reached the bottom, dive cancelled
DIVE07 - August 17, 2017 - North Reed	
21:10:00	spider crab, *Rochinia crassa*
21:13:00	lizard fish
21:16:00	rock
21:21:15	rock with *Stylaster*, sponge, *E. picta*, *Lophelia*, Lat. and Long. Frozen in frame
21:29:05	rock, 2. *C. fenneri*, *Stylaster*, *Paramuricea*
21:31:00	Aquaumbridae, *Anthomastus*
21:32:41	blackbelly rosefish, *Stylaster*, sponge, aqua, rattail, Anthomastus
21:33:00	crinoid
21:34:00	*C. fenneri*, sponge, *Leiopathes*, mora cod
21:38:00	*Leiopathes*, chirostyloid, *Stichopathes*
21:40:00	blackbelly rosefish, lizard
21:41:00	*Lophelia*!
21:03:43	sampling location? 26.3364, 84.76055, *Lophelia*, squat lobster, *Leiopathes*, galatheoid, *Lophelia* and *Leiopathes*, only *Lophelia* collected
22:07:00	off bottom
DIVE08 - August 18, 2017 - North Reed	
0:00:00	no heading depth or lat/long
0:00:00	depth on
13:31:30	on bottom
13:39:00	lat and long added to video fram (ship coordinates)
13:41:16	shrimp
13:44:26	catshark
13:45:50	tinselfish
13:48:12	shrimp
13:49:10	shrimp
13:49:50	shrimp
13:51:45	2 shrimp
13:54:50	golden crab, sponges
14:01:00	*Lophelia* rubble, urchin
14:00:00	fish, rubble, *Stylaster*
14:04:40	hake
14:05:20	shrimp, sponges

Time (UTC)	Observation
DIVE08 - August 18, 2017 - North Reed (continued)	
14:07:03	urchin
14:08:20	rock, *C. fenneri*, *Paramuricea*
14:09:00	*Leiopathes* in distance, *Callogorgia*
14:10:50	golden crab
14:11:30	beer bottle
14:14:20	rusted out drum
14:15:20	rubble, bamboo
14:16:10	*Lophelia* mound (here for a while)
14:21:20	*Plumarella*
14:22:25	catshark
14:25:40	tinselfish
14:27:40	crinoids
14:31:30	collection (Lophelia) taken
14:36:30	*Munidopsis*, biobox forward compartment DIVE08-SPEC01, *Lophelia*
14:43:10	collected DIVE08-SPEC01 quiver 4
14:47:10	moving again
14:47:53	*Anthomastus*
14:53:14	collection, quiver 1 sample DIVE08-SPEC03
15:05:00	crinoid
15:11:43	DIVE08-SPEC04, biobox rear, piece fell into black crate
15:14:52	DIVE08-SPEC05 black crate
15:19:00	squat lobster amongst *Lophelia*
15:27:23	DIVE08-SPEC06 quiver 2
15:31:30	DIVE08-SPEC07 quiver 3
15:34:20	shrimp, *E. picta*, crinoids
15:37:50	DIVE08-SPEC08 quiver 5
15:41:00	end of dive
DIVE09 - August 18, 2017 - North Reed	
17:26:40	in water target is mound
17:58:00	on bottom, rocks, sponges, *Stylaster*
18:00:15	shrimp, sand
18:08:00	lobster trap with golden crab on top
18:12:00	low relief rock outcrops, blackbelly rosefish
18:14:00	skate on sand/rock cobble
18:15:00	several golden crab on rock outcrop *Paramuricea*, *Leiopathes*
18:16:00	rubble
18:17:00	sand
18:17:00	low relief outcrops, *Leiopathes*

Time (UTC)	Observation
DIVE09 - August 18, 2017 - North Reed (continued)	
18:19:00	rubble- blackbelly rosefish, rosy dory, *Laemonema*
18:19:00	*Lophelia* mound
18:20:00	waypoint 1, set up to sample
18:22:00	tinselfish (lasers!), marker @ 26.34071, 84.766385 510 m
18:31:00	sample, DIVE09-SPEC01, quiver 2, 510.4 m
18:39:00	marker looks like T05?
18:49:00	DIVE09-SPEC02, quiver 3, 510.1 m
19:00:00	more *Lophelia*
19:05:00	*Lophelia* mound again
19:00:00	javania?
19:17:31	shrimp, crinoid, *Lophelia*
19:19:21	moving over mound
19:20:00	*E. picta* (3), *C. fenneri* (3), *L. pertusa*, fish, sponge
19:25:31	DIVE09-SPEC03, front biobox, 504.3 m
19:29:30	*Anthomastus*
19:31:44	new spot on mound, *Lophelia*, cup coral
19:34:00	DIVE09-SPEC04, back biobox 504.3 m
19:42:00	move to new spot sponge, *Bathypsammia*
19:43:40	*L. pertusa*, *E. picta*
19:50:20	DIVE09-SPEC05, quiver 1??, lifted off bottom before sample completely in
19:53:00	set down again
19:56:10	tinselfish
19:57:00	*Plumarella*, *E. picta*, *Lophelia*
19:59:00	predation, *E. picta* on salp? (pyrosome)
20:01:20	DIVE09-SPEC06, quiver 5, 499.8 m
20:03:56	crinoid, bullseye! On *Plumarella*
20:09:00	transiting east towards *Leiopathes* colonies?
21:09:00	on bottom
20:22:25	skates (2)
20:24:00	sea star
20:28:00	off bottom again
20:32:00	rock
20:33:00	*Lophelia*
20:37:00	rock, *Leiopathes*, DIVE09-SPEC07, milk crate
20:48:00	*Stichopathes*
21:07:09	*Lophelia*, *C. fenneri*, sponge
21:14:50	*Bathypathes*
21:01:00	mound/rock

Time (UTC)	Observation
DIVE10 - August 19, 2017 - Many Mounds	
12:50:00	on bottom
12:58:20	golden crab
13:02:00	shrimp
13:04:00	gaper
13:16:00	blackbelly rosefish, rocky burrow?
13:12:00	blackbelly rosefish, Isididae
13:16:00	fish
13:21:00	*Bathypathes*, rubble
13:22:00	*C. fenneri*, *Leiopathes*, *Lophelia*, sponge
13:23:00	sponge, *Leiopathes, Paramuricea, Anthomastus*
13:24:50	*Lophelia*, *E. picta*, DIVE10-SPEC01, quiver 4, 479.9 m, *Lophelia*, *E. picta* (2), one piece sample 01 fell into milk crate, more fell in crate, target location is between WP1 and WP2, ship GPS 26.20758, 84.70605
13:35:00	lantern belly
13:43:00	new batch of *Lophelia,* rattail
13:49:21	DIVE10-SPEC02, quiver 01, 477 m piece fell in milk crate
13:55:00	*Anthomastus*
13:55:00	quiver 5, DIVE10-SPEC03, *Lophelia pertusa*
14:11:00	lots of *E. picta, Lophelia*
14:14:50	DIVE10-SPEC04, biobox forward, *L. pertusa*, 476.5 m
14:18:20	DIVE10-SPEC05 biobox aft, 476.5 m
14:26:00	more *Lophelia*
14:37:00	DIVE10-SPEC06, quiver 3
14:38:00	*Munidopsis, E. picta, Lophelia*, sponges
14:40:00	*C. fenneri*
14:41:00	*L. pertusa, E. picta*
14:42:00	*Bathypathes*
14:44:00	dogfish
14:46:00	*E. picta* (3)
14:49:00	Rocks, *Anthomastus*
14:52:00	*Stylaster, E. picta, Anthomastus*
14:53:00	sponge, scorpionfish
14:54:40	*Bathypathes*
14:55:20	*E. picta*, sponge, *Leiopathes, Anthomastus, Benthocomedes, Stylaster, Paramuricea* with zooanthid
14:57:00	DIVE10-SPEC07, *Paramuricea, Plumarella,*504 m, 26.205, 84.727
15:00:00	*Stylaster, Javania* in background, *Leiopathes, Stichopathes*
15:11:00	*Lophelia* bushel(s), bright yellow sponge
15:13:00	golden crab 492 m
15:19:00	*Lophelia* bushels, many

Time (UTC)	Observation
DIVE10 - August 19, 2017 - Many Mounds (continued)	
15:24:00	marker at 26.20495, 84.72821 (ship position)
15:34:00	DIVE10-SPEC08, quiver 2, orange *Lophelia* 496 m
15:53:00	purple *Acanthogorgia* 497 m
15:56:00	*Madrepora* 495 m
16:04:00	goblet sponge with zoanthid 491m
16:05:00	*Acanthogorgia* 495 m
16:17:00	sponge *Eurete*? sp. 496 m
16:18:00	octopus 496 m
16:22:00	*Acanthogorgia* purple 499 m
16:26:00	*Helicolenus dactlopterus* (fish) 493 m
16:29:00	*Garammicolapis brachiuseclus* (thorny tinselfish) 495 m
16:31:00	off bottom 495 m
DIVE11 - August 19, 2017 - Many Mounds	
18:40:00	on bottom
18:43:20	on rock
18:44:00	dogfish
18:46:15	*Stylaster*, sponge
18:53:42	rock
18:54:40	sponge, *Stylaster*, lizard fish
18:55:50	rock, sponges galore, *Stylaster* galore
18:57:00	*Stylaster*, sponge
18:59:00	fish, unknown rattail
19:03:00	Rosy dory (2), lantern belly 427.5 m
19:07:00	more boulders and rocks
19:08:20	S*tylaster, C. fenneri*
19:09:30	*E. picta*
19:11:15	sponges and *Stylaster*
19:12:41	*E. picta*, Isididae, *Lophelia*
19:13:20	*Leiopathes* with chirostyloid, golden crab, *Stylaster*
19:15:00	dogfish, sponge, *Stylaster*
19:17:00	gaper fish
19:24:20	wall sponges, *E. picta*
19:28:00	*Stylaster*, sponge, *Plumarella*
19:31:00	*Plumarella*, ophiuroids, sponges, squat lobster (*Munidopsis*?)
19:34:20	DIVE11-SPEC01, biobox aft , sponge, 431.5 m, DIVE11-SPEC02 biobox aft, *Plumarella* 26.20851, 84.712230
19:41:15	DIVE11-SPEC03, 431 m, *Stylaster* with zoanthids and sponge BROKE THE BIOBOX
19:59:00	soft bottom
20:12:20	pillar/pinnacle, sponges, *Stylaster, C. fenneri*, antheid
20:15:15	*Lophelia, E. picta,*DIVE11-SPEC04, quiver 2, 440 m?, 26.20723, 84.7110, seastar

Time (UTC)	Observation
DIVE11 - August 19, 2017 - Many Mounds (continued)	
20:30:00	dinner
20:45:00	drawing of a seastar
20:46:00	ratfish
21:00:00	sea robin
21:03:00	*Leiopathes, Benthocometes*, sea star, sponge
21:08:00	collection attempt
21:11:10	cucumber, *Paramuricea, C. fenneri, E. picta*, sponge
21:13:50	*Leiopathes*, 2 *Gastroptychus*, L.P., *E. picta*, DIVE11-SPEC05, arm
21:14:00	off bottom
DIVE12 - August 20, 2017 - Okeanos Ridge	
13:05:00	on bottom 590 + m
13:07:00	off bottom, about 30 m to move ship east of feature
13:16:00	back on bottom, sediment
13:51:00	small rock outcrops
13:52:00	whip coral- *Stichopathes*, golden crab
13:53:00	crab trap with line attached
13:55:00	rock ridge- *Lophelia*
13:56:00	numerous *Lophelia* colonies
13:59:00	squat lobster, *Stylaster, Leiopathes*
14:02:00	tinselfish, thornyback scorpionfish
14:06:00	numerous *Lophelia* colonies, golden crab, Anthomastus, blackbelly rosefish
14:12:00	sitting ROV down to sample
14:15:00	focusing on *Lophelia* clump, 520.7 m, 25.66998 N, 84.58441 W, quiver 1 stopper out at 14:07:06
14:28:59	aborting sampling attempt
14:29:00	moving to another patch of *Lophelia, C. fenneri, E. picta*, DIVE12-SPEC01, quiver 1, 521.5 m, *L. pertusa*, 25.66996, 84.58423
14:45:00	*Lophelia, C. fenneri*
14:46:00	water transit?
14:50:00	*Lophelia* wall/mound
14:51:00	*Lophelia, E. picta*
14:53:00	*Leiopathes, Bathypathes*
14:54:00	*Leiopathes*, Primnoidae, *Leiopathes*
15:00:00	*Leiopathes*
15:02:20	DIVE12-SPEC02, aft biobox, 514.7 m 25.66940, 84.5840, 15:03:05 in biobox, 10-spec-02, rubberband caught on edge
15:07:33	unstuck, stuck again, unstuck
15:11:50	*Leiopathes*, spotted 514.8 m, 25.6694 n, 84.58397 w, moving on
15:14:48	top of ridge, Lophelia 512 m
15:17:00	golden crab, roughy, blackbelly rosefish, thorny tinselfish

Time (UTC)	Observation
DIVE12 - August 20, 2017 - Okeanos Ridge (continued)	
15:18:40	urchin
15:20:00	squat lobster, *Benthocometes* in *Leiopathes*
15:21:00	*Anthomastus, Bathypathes*
15:23:00	squat lobster, cup coral
15:26:00	*Stichopathes*
15:27:00	roughy, golden crab, blackbelly rosefish
15:29:00	top of ridge
15:34:00	roughy, golden crab, *Stylaster, Leiopathes*
15:35:00	numerous squat lobsters on *Leiopathes*
15:45:00	*Stichopathes*
15:50:00	*Lophelia, Leiopathes*
15:51:00	*Leiopathe, L. pertusa, C. fenneri, Stylaster*
15:53:00	water moving to WP4
16:28:00	recovering vehicle
DIVE13 - August 22, 2017 - North Wall	
13:22:00	on bottom, sediment just south of waypoint 7
13:24:00	rock outcrops- roughy, golden crab, tinselfish
13:26:00	sand
13:29:00	zoom in on red crab
13:32:00	armored searobin
13:36:00	low-relief, rock outcrops
13:38:00	roughy, *Laemonema*, blackbelly rosefish
13:40:00	tinselfish, golden crab, red crab, several palm-like vegetation- mangrove?
13:44:00	sand
13:47:00	golden crab
13:50:00	low relief rock outcrops
13:52:00	Sand, tinselfish, armored searobin, *Laemonema*, lantern belly
13:55:00	Waypoint 6
13:59:00	low relief rock outcrops, *Laemonema*, roughy, tinselfish, golden crab
14:03:00	*Stichopathes, Bathypathes*, tinselfish
14:07:00	*Tenacetipathes*
14:08:00	redeye gaper
14:10:00	*Anthomastus*
14:12:00	several tinselfish
14:14:00	golden crab, scorpion fish
14:18:00	unbranched white gorgonian and *Bathypathes*
14:19:00	sand
14:21:00	moving shallower to try and find hardbottom, *Laemonema*, armored sea robin
14:23:00	blackbelly rosefish, golden crab, Laemonema, low relief outcrop
14:24:00	squat lobster on small piece of Lophelia

Time (UTC)	Observation
DIVE13 - August 22, 2017 - North Wall (continued)	
14:27:00	couple of *Bathypathes*, *Stichopathes*, blackbelly rosefish
14:31:00	redeye gaper
14:32:00	crinoid- Cerianthidae, cup corals, roughy
14:36:00	several tinselfish
14:37:00	sea star
14:38:00	golden crab, roughy, blackbelly rosefish, thorny tinselfish
14:39:00	waypoint 5, covered 1 km so far
14:47:00	golden crab
14:48:00	off bottom
14:49:00	rov back on bottom, *Bathypathes*, golden crab, tinself fish
14:50:00	squid eggs on *Bathypathes*, *Leiopathes*, small piece of *Lophelia*, *Stichopathes*
14:52:00	*Anthomastus*
14:53:00	human debris, yellow sponge, white sponge, *Laemonema*
14:56:00	rov off bottom
14:57:00	rov back on bottom
14:59:00	sparse rock outcrops, mostly sand
15:01:00	moving deeper to 540-560 m
15:16:00	tinselfish, golden crab
15:22:00	trash tin can?
15:22:00	*Stichopathes*, *Bathypathes* (many)
15:23:00	more *Bathypathes*
15:25:00	*Stichopathes*, *Bathypathes*
15:27:00	*Bathypathes*, *Stichopathes*, golden crab
15:30:00	*Bathypathes*, sponge
15:34:00	*Bathypathes*
15:38:00	*Stichopathes*, *Bathypathes*
15:40:00	*C. fenneri*
15:41:30	*Bathypathes*, *C. fenneri*, fish (4) blackbelly rosefish, *C. quinquedens*
15:45:50	*Bathypathes* (2)
15:46:00	trash, *Stichopathes* (multiple), *Bathypathes* (many)
15:48:00	beer can, *Bathypathes*, *Stichopathes*
15:48:30	goosefish (2), *Stichopathes* (many), slimehead (many)
15:49:00	*Bathypathes*, *Stichopathes*, crab
15:50:00	*Bathypathes*, *Stichopathes*
15:51:00	*Stichopathes*
15:52:00	golden crab, *Stichopathes*
15:53:00	*C. fenneri*
15:54:40	goosefish (2), *Stichopathes* (many), slimehead (many)
15:55:00	goosefish, gaper

Time (UTC)	Observation
	DIVE13 - August 22, 2017 - North Wall (continued)
15:56:00	fish
15:57:00	fish, golden crab
15:58:40	fish (many), and garbage
15:59:00	*Bathypathes*, slimehead
16:00:00	*Bathypathes*
16:01:00	*C. fenneri*
16:02:00	*C. fenneri, Stichopathes, Bathypathes*
16:04:00	*Stichopathes* (many), *Bathypathes*
16:06:00	fish (hake)
16:08:00	*C. fenneri*, *Bathypathes, Stichopathes*, chirostyloids
16:09:00	fish, blackbelly rosefish, *Bathypathes*, *Stichopathes*, roughy
16:10:00	*Stichopathes*
16:11:00	blackbelly rosefish
16:14:00	*Bathypathes, Anthomastus, Stichopathes,* ceriathid?
16:16:00	slimehead
16:17:00	*Stichopathes*
16:25:00	cerianthid
16:29:00	*C. quinquedens*
16:30:00	axiidae? Shrimp?
16:31:00	sea pen
16:42:30	axiidae
16:56:00	fish
16:57:00	fish
16:58:00	*Munidopsis*
17:00:00	*E. picta*
17:02:00	*Stichopathes*, slimehead
17:03:00	*Stichopathes*
17:05:00	*Stichopathes*for collection, specimen floated away
17:21:00	rattail
17:22:00	*Munidopsis*
17:23:50	octocoral *Chrysogorgia*?
17:28:00	axiidae or shrimp?
17:35:50	*Stichopathes*
17:38:00	*Leiopathes, Stichopathes, Plumarella* with ophiuroid with chrisotyloid, *Madrepora? Lepidisis? Bathopsammia*
18:06:00	*C. fenneri*
18:08:00	in water column
18:14:00	Axiidae? Shrimp?
18:30:00	*Lepidisis* and *Bathypathes*
18:32:30	*Lepidisis* and *Stichopathes, Chrysogorgia, Bathypathes*

Time (UTC)	Observation
DIVE13 - August 22, 2017 - North Wall (continued)	
18:38:00	*C. quiquedens, Stichopathes*
18:38:50	sponge with zoanthid
18:39:40	*Stichopathes, C. quinquedens*
18:40:00	*Stichopathes*
18:42:00	*Stichopathes*
18:42:00	gaper, *Stichopathes*
18:46:00	water column
18:48:00	something
18:49:00	hake, Axiidae
18:50:00	*Stichopathes*, sponges, and *Plumarella*
18:52:00	*Desmophyllum, Paramuricea, Lophelia,* 2 chirostyloid, collection attempt, 687.7 m 26.78649, 84. 87883- not collected
18:58:00	hake, *C. quinquedens*
18:58:11	*Paramuricea, Lophelia, Plumarella* collection attempt, 685m, 26.78704, 84.8792 failed
19:02:00	shrimp
19:04:00	*C. fenneri*
19:04:48	another attempt at crushing hopes and dreams
19:09:30	chirostyloid, *Lophelia*
19:23:00	sponge? Gorgonian? *Bathypathes* with *Chirostylus*
19:28:00	*Munidopsis*
19:30:00	elasopodid sea cucumber
19:32:00	broken dreams (failed collection), *Stichopathes*
19:40:00	*Stichopathes*
19:42:00	DIVE13-SPEC01 *Stichopathes* 690 m, 26.78704, 84.87914, milk crate
20:04:00	floating in the water
20:22:00	back on bottom
20:50:00	off bottom again
20:57:00	end dive 26.78873, 84.88024
DIVE14 - August 23, 2017 - Okeanos Ridge	
11:50:00	on bottom
12:01:50	blackbelly rosefish
12:12:50	*Leiopathes*, crab
12:15:00	*Stylaster*
12:16:30	big rock 430.8 m, sponges, bamboo
12:19:00	Stylaster, sponge, blackbelly rosefish
12:20:50	*Leiopathes*??
12:21:00	*Lophelia pertusa, E. picta*, sponge
12:22:00	*Bathypathes*
12:22:50	*Stylaster, Bathypsammia*, sponges

Time (UTC)	Observation
DIVE14 - August 23, 2017 - Okeanos Ridge (continued)	
12:24:00	*Stylaster, E. picta, Leiopathes*
12:27:00	*E. picta, Stylaster*, sponge, bamboo, antheid, *Plumarella*, urchin, *Paramuricea?*
12:28:40	*Paramuricea?, Plumarella*
12:29:00	sponges, bamboo, primnoid?, *Stylaster, E. picta, Plumarella*
12:30:00	sea star, *E. picta, Paramuricea* w/ ophiuroid (*Asteroschema*), dive 14 *Paramuricea* sp. with *Asteroschema*, 25.65190, 84.5563, 432,3 m (ship gps), dreams dashed
12:46:00	*Leiopathes* and bamboo, *Paramuricea*
12:50:00	floating in the ocean
13:15:00	red seafan (*Muricea*?)
13:16:00	sponge
13:17:00	urchin, *Stylaster*
13:19:00	*Stylaster*
13:23:00	*Paramuricea?, Plumarella*
13:28:19	DIVE14-SPEC01, crate, 454 m, 25.65078, 84.55568, *Paramuricea*?
13:39:00	starfish, *E. picta, Stylaster*
13:40:50	*Muricea*, sponge, DIVE14-SPEC02, crate, 25.64975, 84.55535, 443.0 m
13:45:00	*Leiopathes* with chirostyloids
13:50:17	*Stylaster, Leiopathes, Paramuricea*
13:52:00	*Stylaster*
13:53:00	*Paramuricea, Leiopathes, Stylaster*
13:59:00	yellow gorgonian with several brittlestars on it, *Paramuricea*
14:02:00	white sponge
14:04:00	rosy dory
14:09:00	shortnose greeneye, *Stylaster*, squid
14:10:00	golden crab
14:12:00	*Stylaster* and sponges
14:15:00	*Leiopathes*
14:21:00	bamboo coral, *Bathypathes*
14:25:00	attempted to collect *Bathypathes* but got pulled off bottom
14:31:00	back on bottom
14:32:00	sponge, *Leiopathes*
14:32:00	*Muricea*, beardfish
14:33:00	*Leiopathes*
14:35:00	sponges, sea stars, little bamboos, beardfish
14:37:00	water floating- it's a thing
14:46:00	on bottom, golden crab, beardfish, *Muricea?, Leiopathes*
14:47:00	dory
14:48:00	lantern fish, sea robin
14:51:00	dory
14:52:00	sea star munidopsid?, shortnose greeneye

Time (UTC)	Observation
DIVE14 - August 23, 2017 - Okeanos Ridge (continued)	
14:53:00	*Laemonema*, dory, sea fan
14:54:00	bamboo, sponge
14:55:00	thorny back scorpionfish, shortnose greeneye
14:56:00	soft bottom
14:58:00	rocky bottom
14:59:00	scorpionfish, sea urchin, sea star
15:00:00	beer can
15:21:00	golden crab
15:24:00	waiting for boat to catch up
15:27:00	making forward movement, soft bottom
15:28:00	*Stichopathes*, bamboo coral
15:30:00	beardfish, *Leiopathes*
15:32:00	rosy dory
15:35:00	pulled off bottom
15:42:00	back on bottom
15:46:00	attempted to collect *Leiopathes*, but coldn't get to it
15:47:00	blackbelly rosefish
15:49:00	couldn't hold position long enough to collect *Leiopathes*
15:51:00	*Benthocometes*
15:55:00	SPEC03 *Leiopathes*, 25.64036, 84.55229, holding in claw
15:58:00	leaving bottom

United States Department of Commerce

Wilbur Ross

Secretary of Commerce

National Oceanic and Atmospheric Administration

Benjamin Friedman

Deputy Under Secretary for Operations
and Acting Administrator

National Ocean Service

Russell Callender

Assistant Administrator