RESTORE OP17 Full-Depth Cruise. Ship: MSV Ocean Project**. ROV:** Comanche 25

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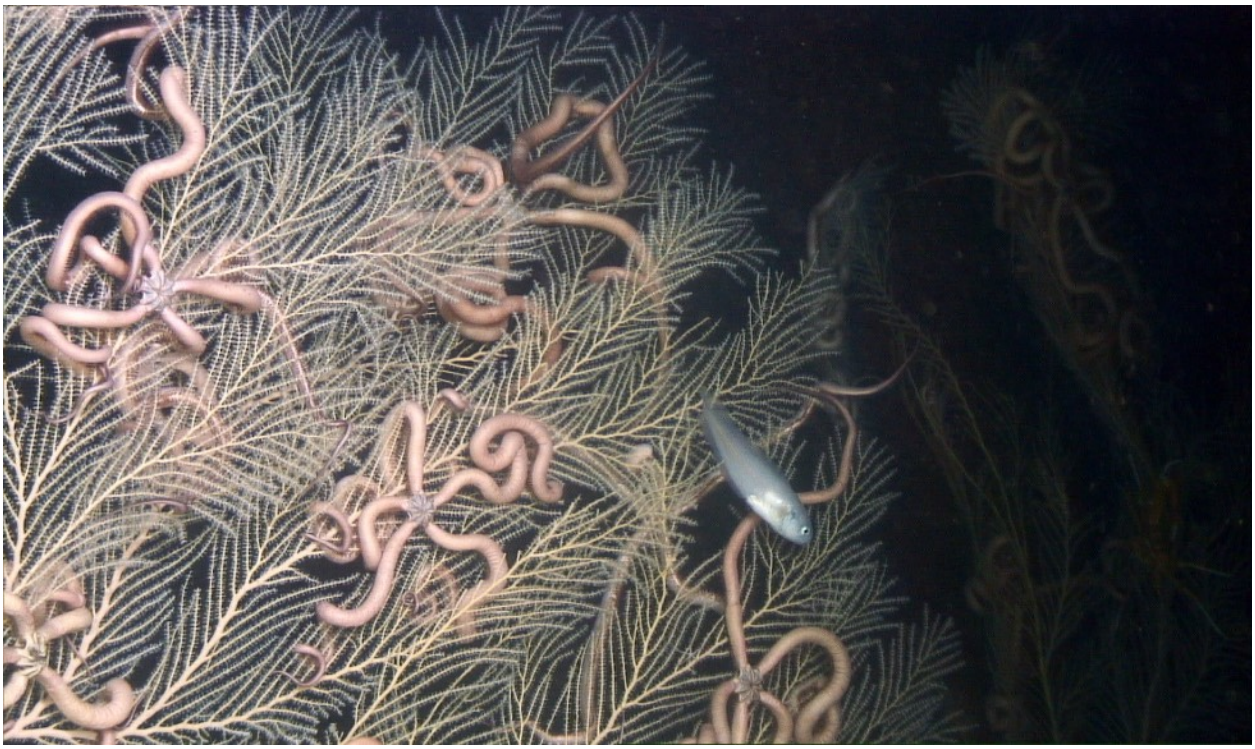

RESTORE OP17

Full-Depth Cruise

Ship: MSV Ocean Project
ROV: Comanche 25
Chief Scientist: Santiago Herrera, PhD[1]
Dates: July 18 - August 9, 2017

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INTRODUCTION

The Gulf of Mexico (GoM) has experienced numerous environmental catastrophes (oil spills, anoxic events) in recent history. With continued anthropogenic threats coupled with the pervasive threat of global ocean change, there is an urgent need to make decisions that will lead to the effective management and conservation of vulnerable marine ecosystems in the GoM. Deepwater corals (living deeper than 50 m) play a foundational role in such ecosystems by generating three-dimensional structures that provide habitats for diverse and abundant invertebrate and fish communities, including refuge and prey for commercially valuable fisheries. As such, the GoM Fishery Management Council (GMFMC) is currently considering designating a number of deepwater coral areas in the northern GoM as Habitat Areas of Particular Concern. Furthermore, the Flower Garden Banks National Marine Sanctuary (FGBNMS) has proposed to expand the boundaries of current protected areas to encompass additional mesophotic and deepwater coral sites. The establishment of Marine Protected Areas is one of the key restoration strategies for deep benthic communities impacted by human disturbances (PDARP, 2016).

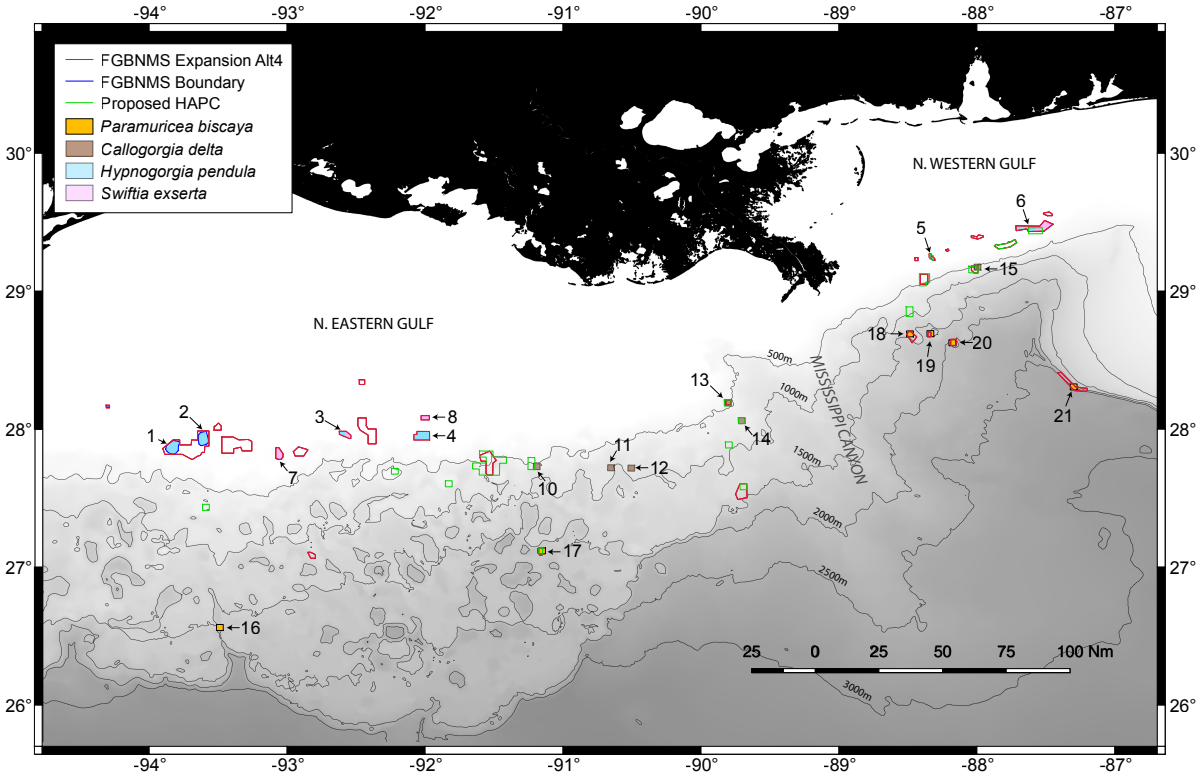

Figure 1. Map showing current and proposed expansion boundaries for the FGBNMS (Alternative 4), priority areas under consideration for protection as HAPCs by the GoM Fishery Management Council, and locations of significant populations of target coral species. Data for HAPCs under evaluation as of 2016 provided M. Kilgour, Fishery Biologist, GoM FMC. Data for expansion boundaries for the FGBMNS as of 2016 provided by E. Hickerson. 1. West Flower Garden Bank, 2. East Flower Garden Bank, 3. Geyer Bank, 4. Parker Bank, 5. Alabama Alps, 6. Roughtongue Reef, 7. McGrail Bank, 8. Alderdice Bank, 9. Diaphus Bank, 10. GC235, 11. GC246, 12. GC249, 13. MC751, 14. MC885, 15. VK826, 16. KC405, 17. GC852, 18. MC294, 19. MC297, 20. MC344, 21 DC673.

To help guide management decisions, this project '**Research Priority: Population Connectivity of Deepwater Corals in the Northern Gulf of Mexico**', funded by the NOAA RESTORE Science Program, aims to address crucial gaps in the understanding of the processes that shape population connectivity patterns in habitat-forming deepwater and mesophotic corals in the GoM, including species directly impacted by the Deepwater Horizon oil spill. This project addresses the fundamental question: To what degree are populations of deepwater corals connected in the northern GoM? Target coral species occur at three depth ranges: mesophotic (50-150 m), upper continental slope (400-1100 m), and lower continental slope (1300-2400 m). Specifically, this project aims to: 1) Define spatial scales of coral population genetic structure and differentiation; 2) Infer directionality and relative rate of genetic exchange among coral populations to establish source/sink relationships. This project integrates field sampling, state-of-the-art population genomic analyses and physical oceanographic modeling approaches to achieve these aims. This collaborative effort explicitly links basic research that will enhance the understanding of GoM ecosystems with concrete restoration and conservation initiatives to ensure recovery of degraded deepwater coral communities.

This research expedition, RESTORE OP17, was the fist expedition of the project. Deepwater corals were collected between July 18 - August 9, 2017, using the MSV Ocean Project and the ROV Comanche, both owned and operated by Oceaneering International, Inc. Operations were conducted 24h/day.

PRIMARY OBJECTIVES

The objectives of this expedition were to locate and sample biological specimens from deepwater coral habitats in the northern Gulf of Mexico between 50 (150 ft) and 2,500 meters (7,500 ft). Four octocoral species are targeted in this project: *Hypnogorgia pendula* and *Swiftia exserta* from mesophotic areas; *Callogorgia delta* from the upper continental slope; and *Paramuricea biscaya* from the lower continental slope. Populations of all of these species, except for *C. delta*, were directly impacted by the DWH oil spill (Etnoyer et al., 2016; Silva et al., 2016; White et al., 2012). *C. delta* is one of the most abundant corals on the upper continental slope of the GoM (Quattrini et al., 2013) and thus constitutes an ideal model to further our understanding of connectivity of deepwater corals at this depth range. Samples were preserved onboard for population genetic studies. The area of operations encompassed sites as far east as DeSoto Canyon, as far south and west as Keathley Canyon, and as far north as Roughtongue Reef (Figure 1). Specifically, the primary objectives of this expedition were to:

(1) locate known populations for each deepwater coral species, focusing on areas considered for protection by the FGBNMS and GMFMC;
(2) collect deepwater coral specimens for population genetic analyses and DNA barcoding;

SECONDARY OBJECTIVES

This expedition provided the opportunity to support additional ongoing projects that aim to increase our understanding of the biology and ecology of deepwater coral species and associated fauna in the Gulf of Mexico. The secondary objectives of this expedition were to:

(3) collect video and image data of deepwater coral benthic communities;
(4) collect samples of the coral *Lophelia pertusa* for experimental work;
(5) provide sub-samples of collected coral specimens for stable isotopes and microbiome analyses;
(6) provide sub-samples of coral-associated fauna, opportunistically sampled while performing coral collections, for stable isotope and gut-content analyses;
(7) collect sediment samples to characterize infaunal communities and organic content.

Lophelia experiments (Alexis Weinning, PhD Student - Erik Cordes lab, Temple University)

Lophelia pertusa colonies were collected for live coral experiments at Temple University. These colonies are an essential component to understanding the effects of multiple stressors on cold-water corals. The two categories of stressors being addressed are climate change related (increasing temperature and decreasing pH) and hydrocarbon influence (oil and chemical dispersants). While there are numerous studies highlighting the variable effects of climate change and oil and chemical dispersant exposure on marine organisms independently, there are very few studies focusing on the cumulative effects of both climate change and oil/dispersant pollution together. A series of experiments will be conducted exposing *Lophelia pertusa* (a prominent reef-building cold-water coral) to sublethal chemical exposures of oil and dispersant under two different pH (7.6 & 7.9) and temperature (8°C & 14°C) treatments (IPCC 2013, Lunden et al. 2014). The three chemical exposures will include surrogate oil WAF, the WAF of oil plus Corexit dispersant, and Corexit dispersant alone, plus a no-chemical control. Specimens will first be maintained under the experimental conditions (pH: 7.6 & temp: 8°C, pH: 7.9 & temp: 8°C, pH: 7.6 & temp: 14°C, pH: 7.9 & temp: 14°C) for 2 weeks, then subjected to the chemical exposure (oil, oil & disp, disp, control) for 24 hours before being returned to the experimental conditions. Health ratings will be recorded and genetic samples for RNAseq will be collected prior to, immediately following, and 24 hours after chemical exposure. The RNAseq data will assist in identifying genes that are actively over or under expressed in the response to environmental stressors. These genes will allow for the development of a suite of biomarkers that reflects cold-water coral health and provides an effective method for monitoring the state of cold-water coral reefs exposed to both changing climate change conditions and oil spills, even when there is no visual impact.

Octocoral microbiome (Samuel Vohsen, PhD Student - Chuck Fisher and Iliana Baums labs, Pennsylvania State University)

Two research objectives of the of GoMRI-funded 'Ecosystem Impacts of Oil and Gas Inputs to the Gulf' (ECOGIG) project are: 1) to study the microbial communities associated with corals in the Gulf of Mexico, and 2) the effect of seeps on deepwater corals. Thus for the four target octocoral species, the microbial community will barcoded using 16S sequencing. Microbial associations will be visualized using fluorescence in situ hybridization microscopy and electron microscopy of select samples. In addition, the stable carbon and nitrogen isotopic compositions of the tissue of *Callogorgia delta* samples will be analyzed

to determine access to seep derived organics to select samples for metagenomic and metatranscriptomic sequencing.

Partnerships of octocoral and associated ophiuroids (Katherine Stamler, Masters Student - Les Watling lab, University of Hawaii)

The research goal of Kate's thesis is to understand how ophiuroid brittle star diets are effected by 1) life strategy (coral association vs free living) and 2) type of coral host. Doing so will contribute to our understanding of these symbiotic relationships, and may help explain the evolutionary advantage of these ophiuroid-coral associations. During the cruise, sub-samples of opportunistically sampled coral-associated ophiuroids were taken. A combination of gut content barcoding, to identify ophiuroid stomach contents, and compound specific stable isotope analysis, to determine relative trophic position of the ophiuroid, will be performed in 2018 at the University of Hawaii (in conjunction with the Drazen lab for isotopes and the Donachie lab for gut barcoding).

Infaunal communities associated with coral habitats (Jill Bourque, Biologist - Amanda Demopoulos lab, Wetland and Aquatic Research Center, USGS)

Deep-sea corals create complex three-dimensional habitats that support distinct communities in adjacent sediments. While these systems may harbor significant levels of biodiversity and enhanced densities, details of their community structure and function are just starting to emerge as more locations with corals are documented and sampled. In addition to deep-sea coral habitats, the Gulf of Mexico contains extensive mesophotic coral habitats occur, yet little is known about the sediment communities associated with these shallow corals. Paired sediment push cores were collected adjacent to deep-sea coral and mesophotic coral habitats using push-cores with the ROV manipulator. Sediments will be analyzed for macrofaunal (>300μm) communities and environmental parameters including grain size, organic content (percent carbon and percent nitrogen), and stable isotope composition (^{13}C and ^{15}N). Samples collected will be contribute to a regional perspective of coral habitats in the Gulf of Mexico and provide valuable new information on the lesser studied mesophotic areas. In addition, sediment cores collected will support research into the microbiome of corals (Penn State) and trophic relationships between ophiuroids and their octocoral hosts (U. of Hawaii).

EXPEDITION MAP

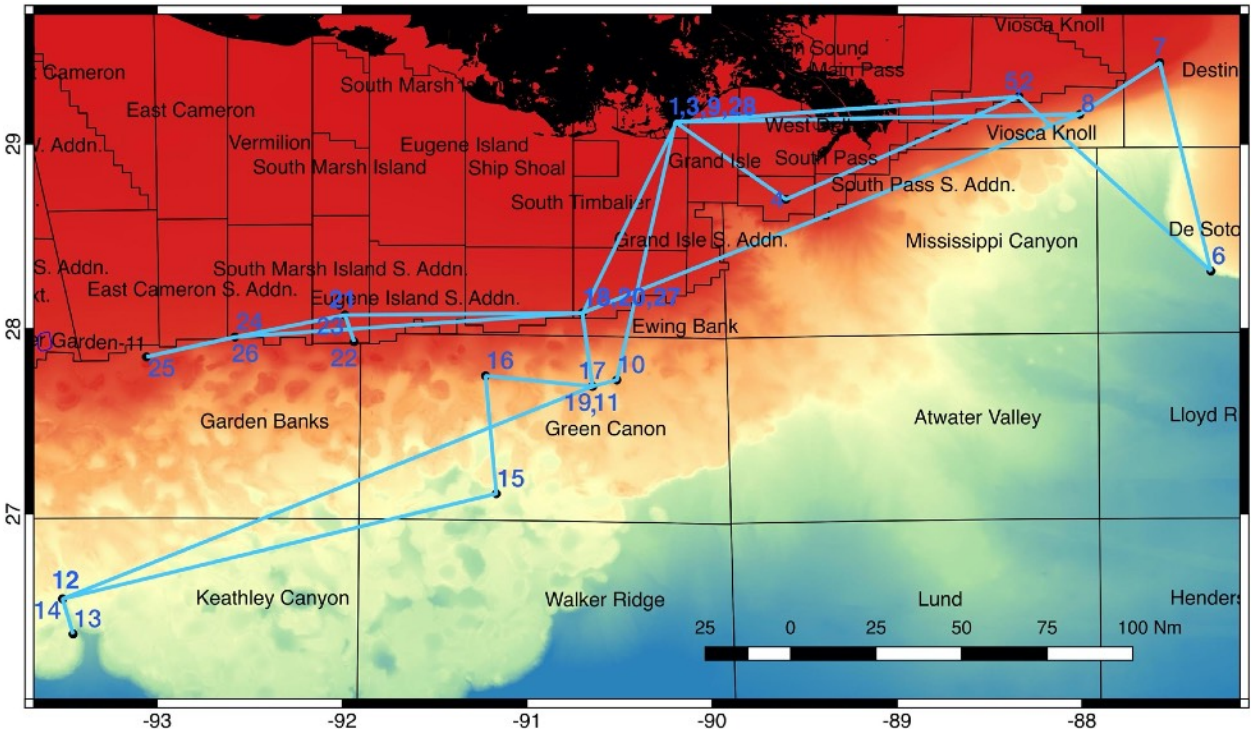

Figure 2. Map showing the operational area of the expedition aboard the MSV Ocean Project (RESTORE OP17: July 18 - August 9, 2017) that sampled deepwater coral ecosystems in the northern Gulf of Mexico using ROVs. Blue lines indicate the cruise track. Numbers indicate the order of the sites visited during the expedition: 1,3,9,28 Port Fourchon; 2,5 Alabama Alps Reef; 4 WD137; 6 DC673; 7 Roughtongue Reef; 8 VK826; 10 GC249; 11,17,19 GC290; 12,14 KC405; 13 KC626; 15 GC852; 16 GC234; 18,20,27 Diaphus Bank; 21,23 Alderdice Bank; 22 Parker Bank; 24 McGrail Bank; 25 Geyer Bank; 26 McGrail Bank.

METHODOLOGY

ROV sample collections

The primary purpose of ROV operations was to make non-lethal collections of tissue samples from coral colonies belonging to the four different species: *Hypnogorgia pendula* (50 – 150 m), *Swiftia exserta* (50-150 m), *Callogorgia delta* (400-1100 m), *Paramuricea biscaya* (1300-2400 m).Tissue samples from approximately thirty (30) individuals from one or two of the four primary target species were collected at each visited site. Additional samples were collected with the ROV to support the secondary objectives describe above.

Imagery and documentation of species associations was also conducted on the ROV dives using a High-Definition video camera mounted on the front of the ROV. The ROV utilized in this operations was the ROV Comanche (manufactured by Sub-Atlantic, owned and operated by Oceaneering Inc.). The ROVs was launched at each dive site from the ship and lowered on a cable using a power winch.

Figure 3. Images showing the ship and ROV equipment utilized during the expedition (RESTORE OP17: July 18 - August 9, 2017) that sampled deepwater corals in the northern Gulf of Mexico. a) Front of ROV Comanche showing the main instruments and tools; b) Port view of ROV Comanche, showing additional instruments; c) Deck view of MSV Ocean Project; d) Starboard view of MSV Ocean Project; e) Port view of ROV Comanche during a deployment.

During ROV deployment, an acoustic telemetry system was used to track the ROV underwater. The acoustic tracking system was an ultra-short baseline (USBL) telemetry system. The tracking system consists of a transponder unit mounted on the ROV (Sonardyne Ranger Pro 2 Transponder – operational frequencies 19-34 kHz, beam shape omni-directional, source level 187 - 193dB) and receiving beacon mounted on the

ship (HiPAP 350 standard features – Receive frequency band: 21 – 31 kHz, Telemetry frequency band: 21 – 31 kHz, Transmit frequency band: 21 – 24.5 kHz, 160/120 degree cone of sound, 206 dB re 1µPa@1m; HPT 5000 transceiver – frequency band 19-34 kHz, Up to 90 degree angle, source level 206dB.). The receiving beacon responds by sending an acoustic signal back to the hydrophone (transponder), which is used to determine the location of the ROV. The hydrophone (transponder) sends out a signal every two seconds to track the ROV's location. The transponder system transmits an omni-directional signal in the mid-frequency range (8-34 kHz) with short pulses (ranging from 1-15 milliseconds (ms) per pulse) and a sound pressure level of 190 decibels (dB re 1µPa at 1m) at about one meter from the source. The receiving beacon also transmits signals in the mid-frequency range (21.5 to 43.2 kHz) with a sound pressure level of 183 dB at the source. The ROV also had a high-frequency imaging sonar (Kongsberg MS900 Sonar – 675Khz) and an altimeter (Kongsberg-Simrad 1007 D Altimeter – Operation frequency 200kHz, 10 degree conical angle, 10 m range, source level 209 dB re 1µPa@1m). Real-time annotations of observations were collected during each dive.

The ROV was equipped with two arm manipulators: a 7-function starboard manipulator equipped with a coral cutter blade in the claw, and a 5-function port manipulator. In addition, the ROV was outfitted with 2 hydraulically retractable trays located under the ROV's frame. Each tray had room for 14 quiver containers (or push cores) where samples were stored during collections.

Dive sites were selected based on known high-density locations of populations for each of the four primary target octocoral species identified by project PIs and collaborators (Hickerson et al. 2008, Cordes et al. 2008, Quattrini et al 2013, Fisher et al 2014, Doughty et al 2014, Etnoyer et al 2016). ROV deployments were conducted using the A-frame on the port side of the MSV Ocean Project. The ROV Comanche was a cage-ROV system. The ROV was deployed in the cage and lowered to an altitude ~50m above the seafloor. At that point the ROV was driven out of the cage and lowered to the seafloor.

Once on the bottom, the ROV was driven in a search pattern at ~0.5 knots, approximately 0.5-1 m above the seafloor. When a high-density coral community was located, a physical marker was deployed (in addition to a virtual navigation marker) for spatial reference. The construction of the marker consists of a two pound dive weight attached to synthetic rope and a labeled syntactic foam marker. This design has been successfully used for many years by multiple groups in the Gulf of Mexico. Once the marker was deployed, the ROV was set down on the bottom near a set of coral colonies for collections. A new virtual marker was deployed on the navigation system every time the ROV sat down on the seafloor to perform a collection. Before each collection, a coral quiver mounted on the ROV was opened and a video screen grab of the coral colony was captured. Sample collections were made using coral cutters in the ROV claw mounted on the 7-function starboard manipulator. Approximately 3-4 inches were cut from distal branches of each coral colony to avoid mortality. Each sample was placed in the open coral quiver, which was partially or totally closed using a rubber stopper after collection. A medium rubber stopper was placed after the first sample was placed in a quiver, and a second sample was placed in the same quiver before sealing the quiver with a large stopper. A video screen grab of the coral colony was taken after sampling. For each collected specimen, the date, time, latitude, longitude, depth, salinity, and temperature were recorded at the time of collection. In most dives three to four sediment push-cores were collected near high-density coral communities in the

majority of the dives. When the quivers were full, the ROV was directed into the cage, brought back to the surface and recovered.

After ROV recovery, the quivers were transferred to the shipboard lab space. Quivers were immediately opened and samples were placed in pre-labelled containers filled with chilled seawater. Samples were quickly processed for preservation. All specimens were examined for commensal organisms, labeled, photographed and inventoried into a database containing all relevant metadata. Associated organisms found on the specimens were separated from the sample and processed separately. Each coral and associate sample was preserved in liquid nitrogen and chilled 95% ethanol. Sediment samples were processed and stored following standard procedures developed by the Demopoulos lab.

CTD data

A SeaBird SBE19 CTD was mounted on the cage frame of the ROV. The CTD was turned on during each dive. Continuous salinity, temperature, and depth data were collected throughout the entire duration of the dive.

PERMITS

Prior to the expedition, the chief scientist, Santiago Herrera, also completed a consultation with the NOAA National Marine Fisheries Service under section 7 of the Endangered Species Act (ESA) that addressed potential impacts of cruise activities on ESA-listed species and critical habitat. NMFS issued a letter of acknowledgement (LOA) on July 19, 2017 stating that the activities of the expedition would not adversely affect ESA-listed species, and would have insignificant effects on critical habitat. Erik Cordes obtained a similar LOA from NMFS, issued on February 10, 2015, that covers the *Lophelia pertusa* collections. The National Centers for Coastal Ocean Science - National Ocean Service also issued a memorandum on May 8, 2017 stating that the activities of the project qualified to be categorically excluded from further National Environmental Policy Act review.

FUNDING

The expedition was funded by the NOAA RESTORE Science Program, grant number NA17NOS4510096.

EXPEDITION EVENT LOG

Table 1. Timeline of events during expedition RESTORE OP17 that sampled deep-sea coral ecosystems in the Northern Gulf of Mexico on July 18 - August 9, 2017.

Event	Start Time (CST)	Duration	Locality	Summary
Mobilization	2017-07-18 15:00	1d 7h	Port Fourchon	
Transit	2017-07-19 22:00	14h 45m	Transit	ROV preparation continued. Transit to Alabama Alps Reef
ROV preparation	2017-07-20 12:45	2h 51m	Alabama Alps	ROV preparation continued
Dive CM01	2017-07-20 15:36	19m	Alabama Alps	Dive aborted. Problems with power and winch. Ground fault.
ROV repairs	2017-07-20 15:55	5h 16m	Alabama Alps	ROV repairs
Dive CM02	2017-07-20 21:11	31m	Alabama Alps	Dive aborted. ROV tether was not unspooling from cage.
ROV repairs	2017-07-20 21:42	14h 48m	Alabama Alps	Repairing tether winch motor.
Dive CM03	2017-07-21 12:30	37m	Alabama Alps	Dive aborted. ROV had no apparent electrical issues, but was negatively buoyant
ROV repairs	2017-07-21 13:07	28m	Alabama Alps	Removed ballast
Dive CM04	2017-07-21 13:35	1h 7m	Alabama Alps	Dive aborted. Reached bottom, sampled 1 *Hypnogorgia* and deployed marker S48, but then all power to the ROV was lost. Very strong currents and poor visibility.
ROV repairs	2017-07-21 14:42	9h 3m	Alabama Alps	Repairing blown fuses and burnt boards. Not enough spares, needed to head to port.
ROV repairs	2017-07-21 23:45	14h 45m	Transit	ROV repairs while in transit
ROV repairs	2017-07-22 14:30	21h 30m	Port Fourchon	ROV repairs with new parts. Restocked fruits and vegetables
ROV repairs	2017-07-23 12:00	5h 21m	Transit	ROV repairs while in transit
Dive CM05	2017-07-23 17:21	1h 4m	WD137	Test dive successful
ROV repairs	2017-07-23 18:25	12h 14m	Transit	ROV repairs while in transit back to Alabama Alps Reef
Dive CM06	2017-07-24 6:39	3h 42m	Alabama Alps	Dive aborted. Collected 2 *Hypnogorgia* and 6 *Swiftia*.
ROV repairs	2017-07-24 10:21	4h 18m	Alabama Alps	ROV repairs
Dive CM07	2017-07-24 14:39	20h 32m	Alabama Alps	Dive successful. Collected 11 *Hypnogorgia* and 19 *Swiftia*.
ROV preparation	2017-07-25 11:11	2h 24m	Alabama Alps	ROV preparation for next dive
Dive CM08	2017-07-25 13:35	1h 16m	Alabama Alps	Dive aborted. Collected 1 *Hypnogorgia* and 1 *Swiftia*, but HD camera blacked out
ROV repairs	2017-07-25 14:51	1h 34m	Alabama Alps	ROV repairs
Dive CM09	2017-07-25 16:25	1h 57m	Alabama Alps	Dive successful. Collected 9 *Hypnogorgia* samples.
ROV preparation	2017-07-25 18:22	38m	Alabama Alps	ROV preparation for steaming

Event	Start Time (CST)	Duration	Locality	Summary
Transit	2017-07-25 19:00	8h	Transit	ROV preparation continued. Transit to DeSoto Canyon DC673
ROV preparation	2017-07-26 3:00	1h 39m	DC673	ROV preparation for next dive
Dive CM10	2017-07-26 4:39	1h 57m	DC673	Test dive successful. Collected CTD data, ROV behaved well and biobox held temperature.
ROV preparation	2017-07-26 6:36	1h 3m	DC673	ROV preparation for next dive
Dive CM11	2017-07-26 7:39	59m	DC673	Dive aborted. Internal condensation on the HD camera lens. Recovered to replace.
ROV preparation	2017-07-26 8:38	19m	DC673	ROV camera swap
Dive CM12	2017-07-26 8:57	7h 39m	DC673	Dive successful. Collected 24 *Paramuricea* samples.
ROV preparation	2017-07-26 16:36	24m	DC673	ROV preparation for steaming
Transit	2017-07-26 17:00	7h	Transit	ROV preparation for next dive continued. Transit to Roughtongue Reef
ROV preparation	2017-07-27 0:00	46m	Roughtongue	ROV preparation for next dive
Dive CM13	2017-07-27 0:46	7h 33m	Roughtongue	Dive aborted. Collected 11 *Hypnogorgia* and 12 *Swiftia*.
ROV preparation	2017-07-27 8:19	1h 27m	Roughtongue	ROV preparation for next dive
Dive CM14	2017-07-27 9:46	8h 13m	Roughtongue	Dive aborted. Collected 11 *Hypnogorgia* and 17 *Swiftia*.
ROV preparation	2017-07-27 17:59	1h 1m	Roughtongue	
Transit	2017-07-27 19:00	4h	Transit	ROV preparation for next dive continued. Transit to VK826
ROV preparation	2017-07-27 23:00	42m	VK826	ROV preparation for next dive
Dive CM15	2017-07-27 23:42	1h 10m	VK826	Dive aborted. Full power loss of the ROV immediately after reaching bottom
ROV repairs	2017-07-28 0:52	3h 14m	VK826	ROV repairs
Dive CM16	2017-07-28 4:06	4h 4m	VK826	Dive successful. Collected *Lophelia* and push cores.
ROV preparation	2017-07-28 8:10	50m	VK826	ROV preparation for steaming
Transit	2017-07-28 9:00	9h	Transit	ROV preparation for next dive continued. Transit to GC249
Emergency	2017-07-28 18:00	6h	Transit	Transit to Pt. Fourchon for vessel crew changeout.
Extra mobilization	2017-07-29 0:00	12h	Port Fourchon	Restocking groceries, equipment and supplies.
Emergency	2017-07-29 12:00	1h 35m	Transit	Transit to GC249
Transit	2017-07-29 13:35	7h	Transit	ROV preparation for next dive continued. Transit to GC249

Event	Start Time (CST)	Duration	Locality	Summary
ROV preparation	2017-07-29 20:35	46m	GC249	ROV preparation for next dive
Dive CM17	2017-07-29 21:21	4h 46m	GC249	Dive successful. Collected 10 *Callogorgia* samples and push cores.
ROV preparation	2017-07-30 2:07	8m	GC249	ROV preparation for steaming
Transit	2017-07-30 2:15	45m	Transit	ROV preparation for next dive continued. Transit to GC290
ROV repairs	2017-07-30 3:00	1h	GC290	Operations delayed due to a problem with the tether winch chain.
Conditions	2017-07-30 4:00	3h 15m	GC290	Surface current too strong to put ROV in water (1.8 knots). Stood by until 07:00 to monitor conditions.
Transit	2017-07-30 7:15	4h 45m	Transit	Conditions did not improve at GC290. Decided to head to GC852
Conditions	2017-07-30 12:00	1h	GC290	Surface current too strong to put ROV in water (2 knots). Standing by
Transit	2017-07-30 13:00	13h 30m	Transit	Conditions did not improve at GC852 Decided to head to KC405
Conditions	2017-07-31 2:30	6h 30m	KC405	Surface current too strong to put ROV in water (1.8 knots). Stood by until 09:00 to monitor conditions.
ROV preparation	2017-07-31 9:00	45m	KC405	ROV preparation for next dive
Dive CM18	2017-07-31 9:45	1h 40m	KC405	Dive aborted. Full power loss of the ROV at 1000m. Problems with the which during recovery. Tether was not tracking correctly and required manual guidance.
ROV repairs	2017-07-31 11:25	11h 5m	KC405	ROV repairs. Opening previously faulty transformer.
ROV preparation	2017-07-31 22:30	15m	KC405	ROV preparation for next dive. Drift tests indicated that current was too strong to put ROV in water (2.0 knots). Generated an alternative dive plan for KC626.
Transit	2017-07-31 22:45	1h 15m	Transit	ROV preparation for next dive continued. Transit to KC626
ROV preparation	2017-08-01 0:00	40m	KC626	Drift tests indicated that current was optimal to put ROV in water (<1 knots)!
Dive CM19	2017-08-01 0:40	3h 30m	KC626	Dive occurred. Seafloor was unexpectedly all sand/ sediment bottom. Observed only one small octocoral.
ROV preparation	2017-08-01 4:10	20m	KC626	ROV preparation for steaming and next dive.
Transit	2017-08-01 4:30	1h 20m	Transit	Transit to KC405
ROV repairs	2017-08-01 5:50	3h	KC405	ROV repairs. Replacing board and flushing seawater from box. Drift tests indicated that current was optimal to put ROV in water (1 knot)
Dive CM20	2017-08-01 8:50	11h 40m	KC405	Dive successful. Collected 32 *Paramuricea* samples, 6 push cores and 1 *Swiftia.*
ROV preparation	2017-08-01 20:30	30m	KC405	ROV preparation for steaming. Transit to GC852
Transit	2017-08-01 21:00	14h	Transit	ROV preparation for next dive continued. Transit to GC852

Event	Start Time (CST)	Duration	Locality	Summary
ROV preparation	2017-08-02 11:00	1h 5m	GC852	Drift tests indicated that current was OK to put ROV in water (1.3 knots)
Dive CM21	2017-08-02 12:05	10h 20m	GC852	Dive successful. Collected 20 *Paramuricea* samples, 6 push cores and 1 *Swiftia.*
ROV preparation	2017-08-02 22:25	15m	GC852	ROV preparation for steaming and next dive.
Transit	2017-08-02 22:40	4h 10m	Transit	ROV preparation for next dive continued. Transit to GC234
ROV preparation	2017-08-03 2:50	40m	GC234	Drift tests indicated that current was OK to put ROV in water (0.8 knots)
Dive CM22	2017-08-03 3:30	6h	GC234	Dive successful. Collected 20 *Callogorgia* samples in a seepy area, and 6 push cores.
ROV preparation	2017-08-03 9:30	15m	GC234	ROV preparation for steaming and next dive.
Transit	2017-08-03 9:45	3h 35m	Transit	ROV preparation for next dive continued. Transit to GC290
Conditions	2017-08-03 13:20	2h 40m	GC290	Drift tests indicated that current was too strong to put ROV in water (1.8 knots). Standing by.
Transit	2017-08-03 16:00	3h 10m	Transit	Conditions did not improve at GC290. Decided to head to Diaphus Bank
ROV preparation	2017-08-03 19:10	1h	Diaphus	Drift tests indicated that current was 1.1 knots, but with the passing thunderstorm the seas are confused. Attempted to hold ship in position to asses feasibility of dive, but due to the shallow depth of this dive it wasn't feasible to perform the dive safely in these conditions
Transit	2017-08-03 20:10	2h 35m	Transit	Conditions did not improve at Diaphus. Decided to head back to GC290
ROV preparation	2017-08-03 22:45	45m	GC290	Drift tests indicated that current was OK to put ROV in water
Dive CM23	2017-08-03 23:30	4h 47m	GC290	Dive successful. Collected 17 *Callogorgia* samples.
ROV preparation	2017-08-04 4:17	58m	GC290	Drift tests indicated that current was OK to put ROV in water, second dive in GC290
Dive CM24	2017-08-04 5:15	3h 58m	GC290	Dive successful. Collected 17 *Callogorgia* samples.
ROV preparation	2017-08-04 9:13	15m	GC290	ROV preparation for steaming and next dive at Diaphus bank.
Transit	2017-08-04 9:28	2h 32m	Transit	ROV arm repairs for next dive continued. Transit to Diaphus Bank
ROV preparation	2017-08-04 12:00	15m	Diaphus	Drift tests indicated that current was not apt to put ROV in water (1.8 knots). Standing by for current. Trying to perform at-sea crew change at this point.
Conditions/ Transfer	2017-08-04 12:15	1h 45m	Diaphus	Performed periodic tests Drift tests indicated that current was too strong to put ROV in water (2.1 knots) or to perform personnel transfer due to sea state.

Event	Start Time (CST)	Duration	Locality	Summary
Conditions/ Transfer	2017-08-04 14:00	2h 10m	Transit	Decided to wait for conditions to improve. Decided to steam 1h north hoping sea state would be better in shallower waters for the transfer. Unfortunately this was not the case. Decided to head back to Diaphus to re-assess diving feasibility, however conditions had not improved there, but rather worsened (current 2.1 knots). Decided to cancel at-sea crew personnel transfer, but got ROV parts transferred. Given a favorable weather forecast for the next day, decided to head west towards Alderdice Bank.
Transit	2017-08-04 16:10	7h 20m	Transit	Transit to Alderdice Bank
ROV preparation	2017-08-04 23:30	2h	Alderdice	Drift tests indicated that current was borderline to put ROV in water (1.4 knots). Tried going in but vehicle went sideways immediately. Dive not conducted. Going to Parker Bank to assess currents there.
Transit	2017-08-05 1:30	1h 20m	Transit	Transit to Parker Bank
ROV preparation	2017-08-05 2:50	40m	Parker	Drift tests indicated that current was manageable to put ROV in water (0.9 knots).
Dive CM25	2017-08-05 3:30	3h 15m	Parker	Dive aborted. Loss of pitch function of 7-function arm (starboard). Collected 15 samples of *Hypnogorgia*.
ROV repairs	2017-08-05 6:45	5h	Parker	ROV repairs. Arm problem found and fixed
Transfer	2017-08-05 11:45	1h 45m	Parker	At-sea crew personnel transfer
Conditions	2017-08-05 13:30	1h	Parker	Drift tests indicated that current was too strong to put ROV in water (2.0 knots). Standing by.
ROV preparation	2017-08-05 14:30	25m	Parker	Drift tests indicated that current was manageable to put ROV in water (0.9 knots).
Dive CM26	2017-08-05 14:55	3h 15m	Parker	Dive successful. Collected 17 samples of *Hypnogorgia*.
ROV preparation	2017-08-05 18:10	20m	Parker	ROV preparation for steaming and next dive at Alderdice bank.
Transit	2017-08-05 18:30	1h 20m	Transit	Transit to Alderdice Bank
ROV preparation	2017-08-05 19:50	48m	Alderdice	Drift tests indicated that current was acceptable to put ROV in water (0.8 knots).
Dive CM27	2017-08-05 20:38	23m	Alderdice	Dive aborted. Multiple power losses of the ROV immediately after reaching bottom
ROV repairs	2017-08-05 21:01	5h 39m	Alderdice	ROV repairs. Found problem with vertical thruster that may have been drawing too much power and overheating electronics, thus causing power loses.
Dive CM28	2017-08-06 2:40	7h 30m	Alderdice	Dive successful. Collected 31 samples of *Swiftia*.
ROV preparation	2017-08-06 10:10	1h 40m	Alderdice	ROV preparation for steaming and next dive at McGrail bank.
Transit	2017-08-06 11:50	3h 35m	Transit	Transit to McGrail Bank

Event	Start Time (CST)	Duration	Locality	Summary
Conditions	2017-08-06 15:25	27m	McGrail	Drift tests indicated that current was too strong to put ROV in water (2.0 knots, 050 deg)
Transit	2017-08-06 15:52	3h 38m	Transit	Transit to Geyer Bank
ROV preparation	2017-08-06 19:30	1h 30m	Geyer	Drift tests indicated that current was acceptable to put ROV in water (0.8 knots).
Dive CM29	2017-08-06 21:00	5h 10m	Geyer	Dive successful. Repairs were successful. Collected 32 samples of *Swiftia*.
ROV preparation	2017-08-07 2:10	40m	Geyer	ROV preparation for steaming and next dive at McGrail bank.
Transit	2017-08-07 2:50	3h 10m	Transit	Transit to McGrail Bank
Conditions	2017-08-07 6:00	2h 52m	McGrail	Drift tests indicated that current was too strong to put ROV in water (1.8 knots)
Dive CM30	2017-08-07 8:52	7h 3m	McGrail	Dive successful. Collected 34 samples of *Hypnogorgia*.
ROV preparation	2017-08-07 15:55	50m	McGrail	ROV preparation for steaming and next dive at Diaphus bank.
Transit	2017-08-07 16:45	10h 45m	Transit	Transit to Diaphus Bank
ROV preparation	2017-08-08 3:30	1h 15m	Diaphus	Drift tests indicated that current was acceptable to put ROV in water (1.2 knots).
Dive CM31	2017-08-08 4:45	5h 50m	Diaphus	Dive successful. No problems with the ROV! Collected 34 samples of *Hypnogorgia*.
ROV repairs	2017-08-08 10:35	7h	Diaphus	Informed that the hydraulic pump manifold on the ROV is broken, no spares on board. Would have to go to port to get parts or end the cruise
ROV repairs	2017-08-08 17:35	9h 25m	Transit	Transit to Port Fourchon for ROV repairs. Decided to end cruise.
Demobilization	2017-08-09 3:00	12h	Port Fourchon	Left the ship and stayed at the Sleep Inn for the night before heading home

PARTICIPANTS

Scientific Party

The scientific party consisted of 13 participants, including Principal Investigators, Postdoctoral Researchers, technicians, and PhD, masters and undergraduate students from 7 different universities and research laboratories.

Crew and ROV personnel

There were 11 crew, 6 ROV operators, and 3 survey technicians, all employees or contractors of Oceaneering Inc.

Table 2. List of participants of expedition RESTORE OP17 that sampled deepwater coral ecosystems in the northern Gulf of Mexico on July 18 - August 9, 2017.

Name	Role	Affiliation	Email
Santiago Herrera	Chief Scientist	Lehigh University	sah516@lehigh.edu
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Name	Role	Affiliation	Email
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Sean Stokes	Capitain	Oceaneering	
Scott Lancios	1st Officer	Oceaneering	
Steven Miller	ROV Suppervisor	Oceaneering	
Vernon Luthi	ROV Suppervisor	Oceaneering	
Harry Leach	ROV Pilot	Oceaneering	
Joseph Girard	ROV Pilot	Oceaneering	
Doug McLean	ROV Technician	Oceaneering	
John Sullivan	ROV Technician	Oceaneering	
Quentin Hoffpauir	Chief Engineer	Oceaneering	
Marty Fielder	Assistant Engineer	Oceaneering	
Brandon Bissell	Survey	Oceaneering	
Louis Sanchez	Survey	Oceaneering	
Daniel Havens	Survey	Oceaneering	
Greg Herrera	Oiler	Oceaneering	
Benjamin Black	Oiler	Oceaneering	
Frederick Chambers	AB	Oceaneering	
Timothy Sutherlin	AB	Oceaneering	
Madeline Holloway	Cook	Oceaneering	
Henry Pippin	Cook	Oceaneering	
Ashley George	Galley Hand	Oceaneering	

SUMMARY STATISTICS

ROV dives

A total of 31 ROV dives were conducted during the expedition, yielding a total bottom time of 113h 43min. 15 different sites were visited: DeSoto Canyon (DC673), Viosca Knoll East (VK826), Green Canyon (GC234, GC249, GC290, and GC852), Keathley Canyon (KC405 and KC626), Alabama Alps Reef, Roughtongue Reef, Diaphus Bank, Alderdice Bank, Parker Bank, McGrail Bank, and Geyer Bank. Depth ranges during the ROV dives ranged from 64 to 2,209 m.

Sample collections

A total of 617 samples were collected during the expedition, including 396 specimens from the four primary target octocoral species, 2 samples of *Lophelia pertusa,* 76 sediment cores, and 143 specimens that were incidentally collected as associate organisms.

Table 3. Numbers of samples of primary target octocoral species collected during the RESTORE OP17 expedition in the northern Gulf of Mexico on July 18 - August 9, 2017.

Site	
	Callogorgia delta (400-1100 m)
Penchant Basin Rim/Green Canyon GC234	20
Green Canyon GC290	34
Green Canyon GC249	10
	Paramuricea biscaya (1300-2400 m)
Keathley Canyon KC405	32
St. Tammany Basin Rim/Green Canyon GC852	20
DeSoto Canyon/WFE (DC673)	24
	Swiftia exserta (50-150 m)
Geyer Bank	32
Alderdice Bank	31
Alabama Alps Reef	23
Roughtongue Reef	29
	Hypnogorgia pendula (50-150 m)
Diaphus Bank	34
McGrail Bank	34

Site	
Parker Bank	34
Alabama Alps Reef	24
Roughtongue Reef	12

DIVE SUMMARY TABLE

Table 4. Summary information for the dives of the ROV Comanche conducted during expedition RESTORE OP17 to the Northern Gulf of Mexico between July 18 - August 9, 2017.

Dive #	Locality	Start Date (CST)	Start Time (CST)	On bottom lat/lon (deg)	On bottom depth (m)	Off bottom lat/lon (deg)	Off bottom depth (m)	Bottom time (h:mm)	# Specimens collected
CM01	Alabama Alps	7/20/17	15:36	NA	NA	NA	NA	NA	0
CM02	Alabama Alps	7/20/17	21:11	NA	NA	NA	NA	NA	0
CM03	Alabama Alps	7/21/17	12:30	29.2503 -88.3362	75	29.2503 -88.3366	81	0h 5m	0
CM04	Alabama Alps	7/21/17	13:35	29.2503 -88.3362	65	NA	65	0h 42m	1
CM05	WD137	7/23/17	17:21	NA	NA	NA	NA	NA	0
CM06	Alabama Alps	7/24/17	6:39	29.2500 -88.3385	71	29.2505 -88.3384	72	2h 50m	6
CM07	Alabama Alps	7/24/17	14:39	29.2503 -88.3384	71	29.2538 -88.3391	79	19h 58m	31
CM08	Alabama Alps	7/25/17	13:35	29.2529 -88.3390	72	29.2528 -88.3391	72	0h 45m	2
CM09	Alabama Alps	7/25/17	16:25	29.2528 -88.3398	65	29.2526 -88.3391	70	1h 25m	9
CM10	DC673	7/26/17	4:39	28.3126 -87.3014	2209	28.3126 -87.3014	2209	0h 3m	0
CM11	DC673	7/26/17	7:39	NA	NA	NA	NA	NA	0
CM12	DC673	7/26/17	8:57	28.3129 -87.3016	2206	28.3126 -87.3011	2184	5h 33m	39
CM13	Roughtongue Reef	7/27/17	0:45	29.4391 -87.5768	64	29.4391 -87.5754	66	7h 5m	27

Dive #	Locality	Start Date (CST)	Start Time (CST)	On bottom lat/lon (deg)	On bottom depth (m)	Off bottom lat/lon (deg)	Off bottom depth (m)	Bottom time (h:mm)	# Specimens collected
CM14	Roughtongue Reef	7/27/17	9:46	29.4391 -87.5754	67	29.4389 -87.5769	68	7h 47m	29
CM15	VK826	7/27/17	23:42	29.1583 -88.0106	481	29.1588 -88.0104	480	0h 15m	0
CM16	VK826	7/28/17	4:06	29.1582 -88.0106	484	29.1586 -88.0105	479	2h 8m	18
CM17	GC249	7/29/17	21:12	27.7240 -90.5143	793	29.7241 -90.5140	791	3h 54m	39
CM18	KC405	7/30/17	9:50	NA	NA	NA	NA	NA	0
CM19	KC626	8/1/17	0:39	26.2512 -93.4545	1975	26.3456 -93.4503	1970	1h 22m	0
CM20	KC405	8/1/17	8:51	26.5706 -93.4834	1704	26.5720 -93.4825	1666	9h 15m	54
CM21	GC852	8/2/17	12:08	27.1103 -91.1660	1410	27.1101 -91.1663	1407	8h 41m	33
CM22	GC234	8/3/17	3:30	27.7464 -91.2244	515	27.7467 -91.2245	515	5h 27m	39
CM23	GC290	8/3/17	23:33	27.6891 -90.6460	852	27.6891 -90.6460	852	4h 2m	21
CM24	GC290	8/4/17	5:20	27.6893 -90.6457	847	27.6892 -90.6461	852	3h 0m	25
CM25	Parker Bank	8/5/17	3:26	27.8307 -92.0650	97	27.9308 -92.0651	96	3h 13m	22
CM26	Parker Bank	8/5/17	14:55	27.9037 -92.0650	95	27.9310 -92.0640	96	2h 55m	32
CM27	Alderdice Bank	8/5/17	20:36	28.0749 -91.9839	82	28.0750 -91.9842	82	0h 14m	42
CM28	Alderdice Bank	8/5/17	2:42	28.0746 -91.9804	82	28.0787 -91.9823	80	6h 42m	41
CM29	Geyer Bank	8/5/17	21:00	27.8497 -93.0578	97	27.8492 -93.0579	95	4h 47m	33
CM30	McGrail Bank	8/5/17	8:51	27.9563 -92.5795	91	27.9572 -92.5812	86	6h 36m	34
CM31	Diaphus Bank	8/8/17	5:14	28.0858 -90.6998	101	28.0862 -90.6997	97	4h 57m	39

CTD SUMMARY TABLE

Table 5. Inventory of ROV-mounted CTD casts conducted during expedition RESTORE OP17 to the Northern Gulf of Mexico.

CTD #	Locality	Date (CST)	Time (CST)	lat/lon (deg)	Maximum depth (m)
CM01_CTD	Alderdice Bank	7/20/17	15:36	NA	NA
CM02_CTD	Alderdice Bank	7/20/17	21:11	NA	NA
CM03_CTD	Alderdice Bank	7/21/17	12:30	29.2503 -88.3362	75
CM04_CTD	Alderdice Bank	7/21/17	13:35	28.7003 -89.8616	65
CM05_CTD	WD137	7/23/17	17:21	NA	NA
CM06_CTD	Alderdice Bank	7/24/17	6:39	29.2500 -88.3385	71
CM07_CTD	Alderdice Bank	7/24/17	14:39	29.2503 -88.3384	71
CM08_CTD	Alderdice Bank	7/25/17	13:35	29.2529 -88.3390	72
CM09_CTD	Alderdice Bank	7/25/17	16:25	29.2528 -88.3398	65
CM10_CTD	DC673	7/26/17	4:39	28.3126 -87.3014	2209
CM11_CTD	DC673	7/26/17	7:39	NA	NA
CM12_CTD	DC673	7/26/17	8:57	28.3129 -87.3016	2206
CM13_CTD	Roughtongue Reef	7/27/17	0:45	29.4391 -87.5768	64
CM14_CTD	Roughtongue Reef	7/27/17	9:46	29.4391 -87.5754	67
CM15_CTD	VK826	7/27/17	23:42	29.1583 -88.0106	481
CM16_CTD	VK826	7/28/17	4:06	29.1582 -88.0106	484
CM17_CTD	GC249	7/29/17	21:12	29.7240 -90.5143	793
CM18_CTD	KC405	7/30/17	9:50	NA	NA
CM19_CTD	KC626	8/1/17	0:39	26.2512 -93.4545	1975
CM20_CTD	KC405	8/1/17	8:51	26.5706 -93.4834	1704
CM21_CTD	GC852	8/2/17	12:08	27.1103 -91.1660	1410
CM22_CTD	GC234	8/3/17	3:30	27.7464 -91.2244	515
CM23_CTD	GC290	8/3/17	23:33	27.6891 -90.6460	852
CM24_CTD	GC290	8/4/17	5:20	27.6893 -90.6457	847
CM25_CTD	Parker Bank	8/5/17	3:26	27.8307 -92.0650	97

CTD #	Locality	Date (CST)	Time (CST)	lat/lon (deg)	Maximum depth (m)
CM26_CTD	Parker Bank	8/5/17	14:55	27.9037 -92.0650	95
CM27_CTD	Alderdice Bank	8/5/17	20:36	28.0749 -91.9839	82
CM28_CTD	Alderdice Bank	8/5/17	2:42	28.0746 -91.9804	82
CM29_CTD	Geyer Bank	8/5/17	21:00	27.8497 -93.0578	97
CM30_CTD	McGrail Bank	8/5/17	8:51	27.9563 -92.5795	91
CM31_CTD	Diaphus Bank	8/8/17	5:14	20.0858 -90.6998	101

OUTREACH/EDUCATION

The activities conducted during this cruise were shared through social media accounts:

- https://www.facebook.com/RESTOREdeepcorals/
- https://twitter.com/RESTOREdcorals
- https://www.instagram.com/restoredeepcorals/

The work from this project has been featured in the following news articles:

- ttps://www.eurekalert.org/pub_releases/2017-07/lu-utm071217.php
- https://phys.org/news/2017-07-mysteries-deepwater-corals-gulf-mexico.html

Live video feeds of the ROV dives were continuously streamed via YouTube

- https://www.youtube.com/channel/UC-lb30l-7e5QWcFbxVClE4Q/videos

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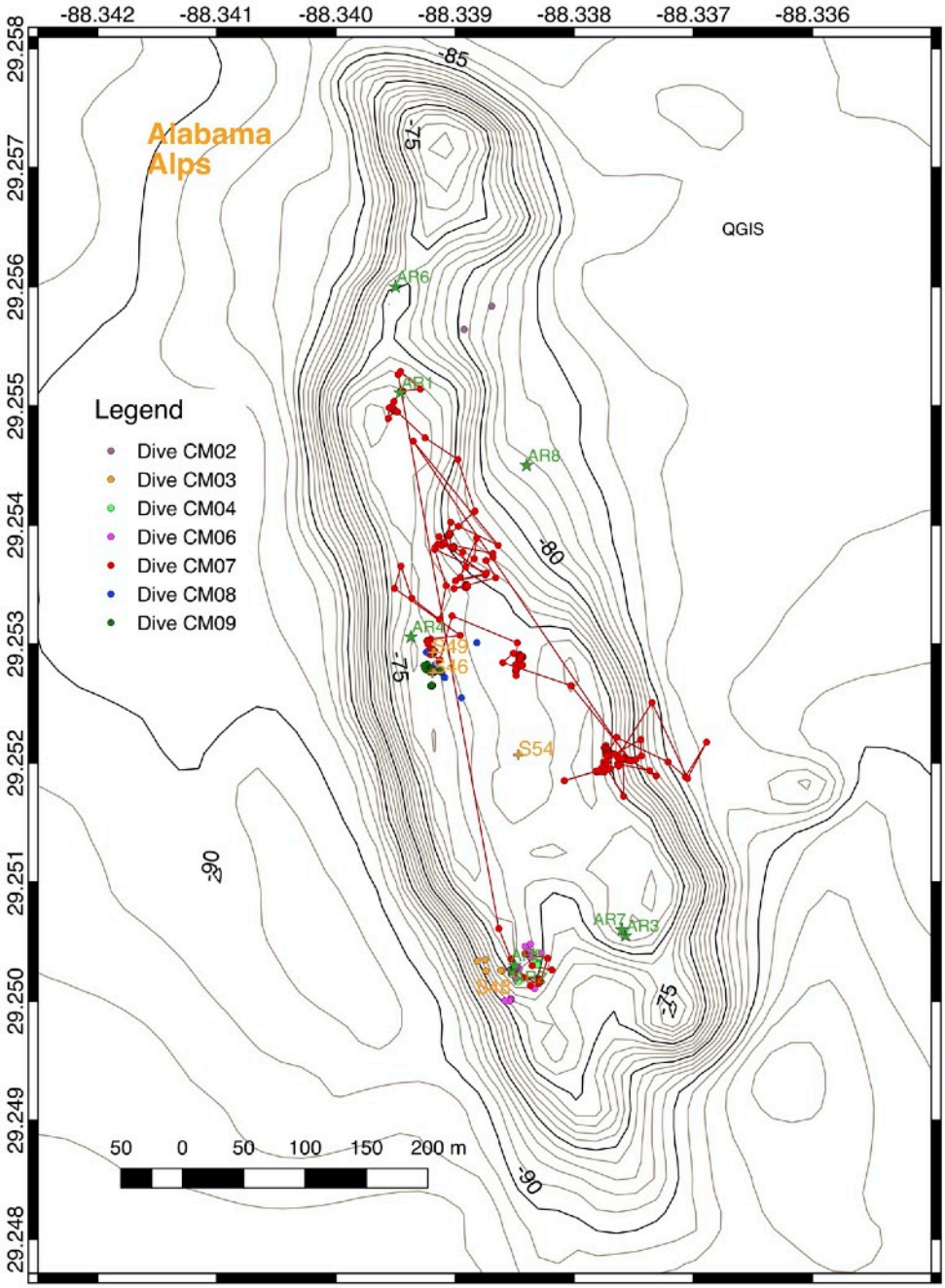
APPENDIX 1: DIVE SUMMARIES

Dive summaries are grouped by locality. Include maps showing the ROV tracks at each site visited during the expedition RESTORE OP17 (July 18 - August 9, 2017), CTD data, narrative description of the dive, and representative images from the locality. CTD data plots show depth profiles of salinity and temperature (top left corner), density and buoyancy (top right corner), T-S diagrams (bottom left corner), and map indicating the location of the ROV Dive/CTD cast.

Alabama Alps Reef



OP17_CM01

Start time: 2017-07-20 15:36
End Time: 2017-07-20 15:55
Description: Dive aborted. Problems with power and winch. Ground fault.

OP17_CM02

Start time: 2017-07-20 21:11
End Time: 2017-07-20 21:42
Description: Dive aborted. ROV tether was not unspooling from cage.

OP17_CM03

Start time: 2017-07-21 12:30
End Time: 2017-07-21 13:07
Description: Dive aborted. ROV had no evident electrical issues, but was negatively buoyant.

OP17_CM04

Start time: 2017-07-21 13:35
End Time: 2017-07-21 14:42
Description: Dive aborted. Reached bottom, sampled 1 *Hypnogorgia* and deployed marker S48, then all power to the ROV was lost. Very strong currents and poor visibility.

OP17_CM06

Start time: 2017-07-24 6:39
End Time: 2017-07-24 10:21
Description: Dive aborted. Relocated marker S48, collected 2 *Hypnogorgia* and 6 *Swiftia*, but dive was aborted due a full power loss of the ROV. Did not move far from marker S48. Very strong currents and poor visibility.

OP17_CM07

Start time: 2017-07-24 14:39
End Time: 2017-07-25 11:11
Description: Dive successful. Collected 11 *Hypnogorgia* and 19 *Swiftia*. Very strong currents and poor visibility. ROV tether got tangled up multiple times around rocky outcrops. Extremely challenging dive in less than optimal conditions.

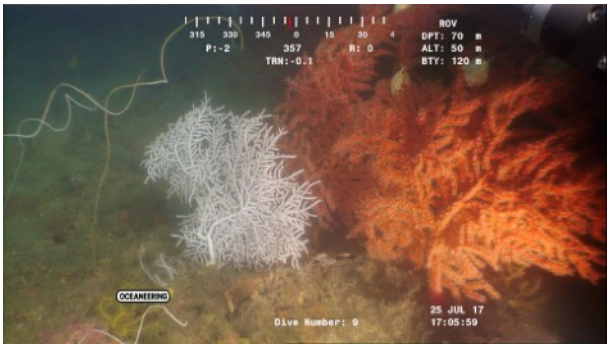
OP17_CM08

Start time: 2017-07-25 13:35
End Time: 2017-07-25 14:51
Description: Dive aborted. Collected 1 *Hypnogorgia* and 1 *Swiftia*, but HD camera blacked out. Observed several Lionfish.

OP17_CM09

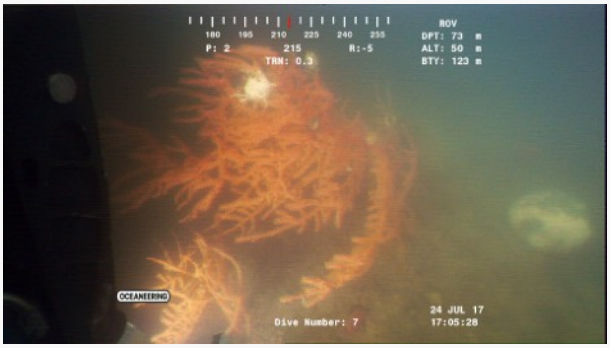
Start time: 2017-07-25 16:25
End Time: 2017-07-25 18:22
Description: Dive successful. Collected 9 *Hypnogorgia* samples. Gave a window of 2 hours to sample as many specimens of *Hypnogorgia* as possible, before leaving for next site. Found several large colonies that helped the speed of collections.

a.

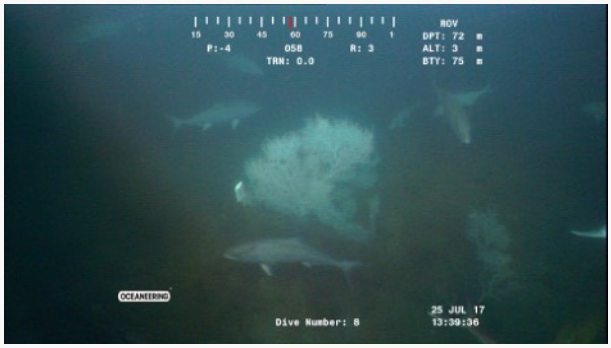


b.

c.

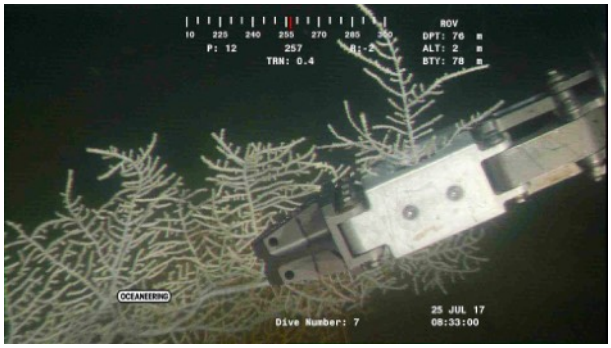


d.



e.

f.



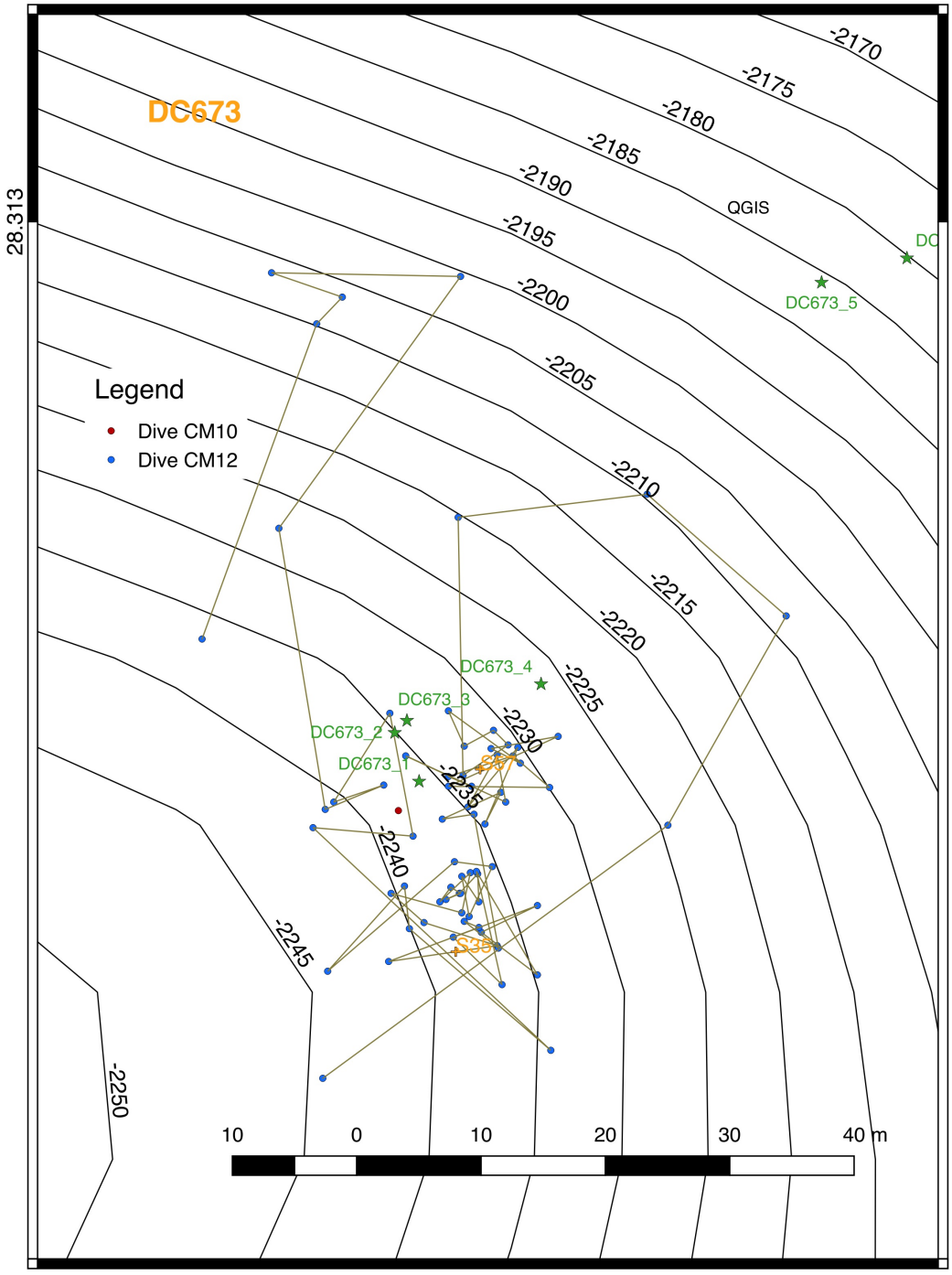
Representative Images of Alabama Alps Reef. a. *Hypnogorgia pendula* (white) and *Swiftia exserta* (red) colonies competing for space; b. Large *H. pendula* colonies with basketstar associates, next to Marker S49; c. Large *S. exserta* colonies with basketstar associates; d. Large *H. pendula* colony amid fish aggregation; e. Collection of *S. exserta* sample; and f. Collection of *H. pendula* sample.

WD137

OP17_CM05

Start time: 2017-07-23 17:21
End Time: 2017-07-23 18:25
Description: Test dive after ROV repairs. Successful.

De Soto Canyon DC673



OP17_CM10

Start time: 2017-07-26 4:39
End Time: 2017-07-26 6:36
Description: Test dive successful. Collected CTD data, ROV behaved well and biobox held temperature.

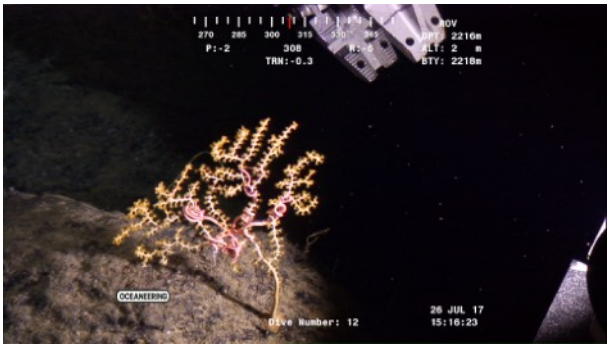
OP17_CM11

Start time: 2017-07-26 7:39
End Time: 2017-07-26 8:38
Description: Dive aborted. Internal condensation on the HD camera lens. Recovered to replace.

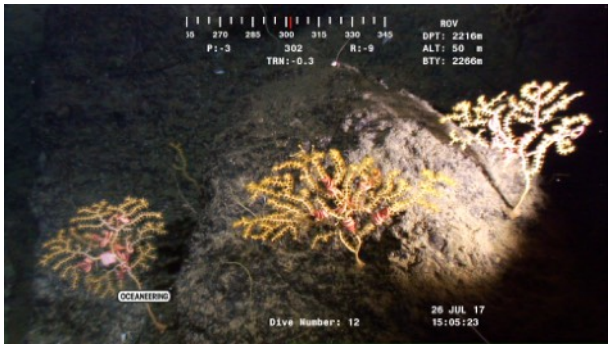
OP17_CM12

Start time: 2017-07-26 8:57
End Time: 2017-07-26 16:36
Description: Dive successful. Collected 24 *Paramuricea* samples. Extremely steep terrain. Slopes exceeding 20-30 degrees. Found all corals in a relatively small area. Ended the dive with a short exploration of a vertical wall with abundant bamboo corals and Chrysogorgiids, many highlight images here of the corals and terrain.

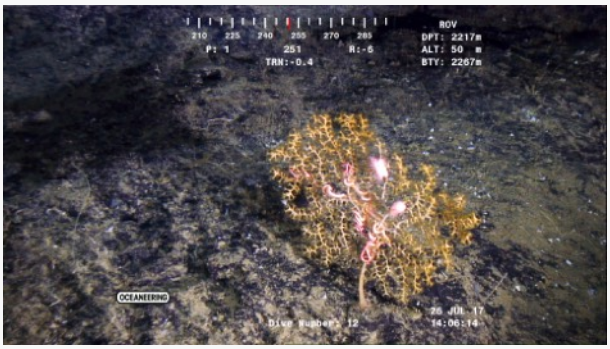
a.



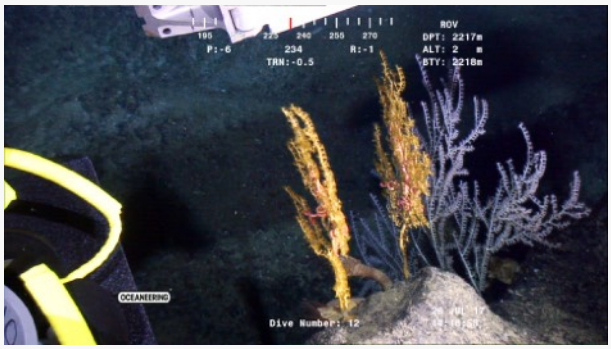
b.



c.

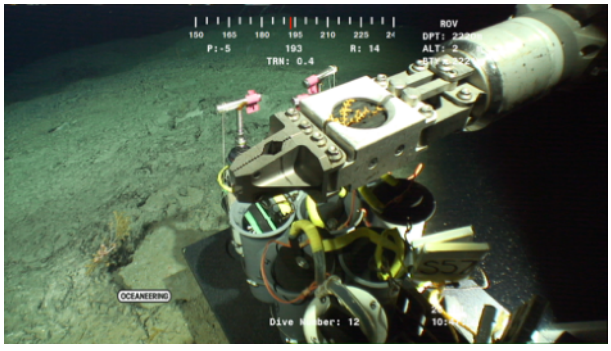


d.



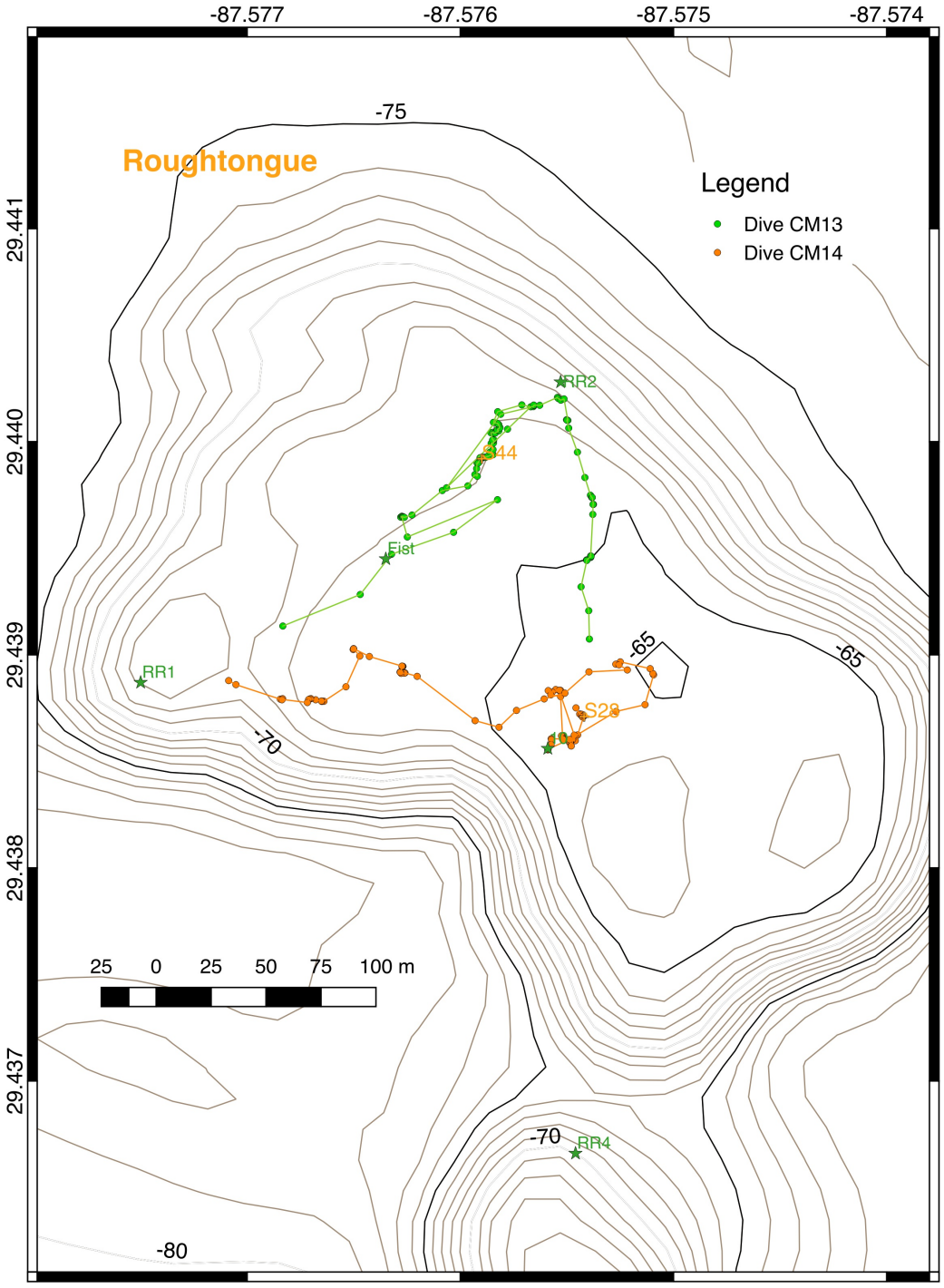
e.

f.



Representative Images of DC673. a. *Paramuricea biscaya* with ophiuroid associate; b. Multiple *P. biscaya* colonies with associates; c. *P. biscaya* with ophiuroid and anemone associates; d. Large *P. biscaya* and bamboo coral colonies; e. Marker deployment next to *Iridogorgia* colony; and f. Collection of *P. biscaya* sample.

Roughtongue Reef



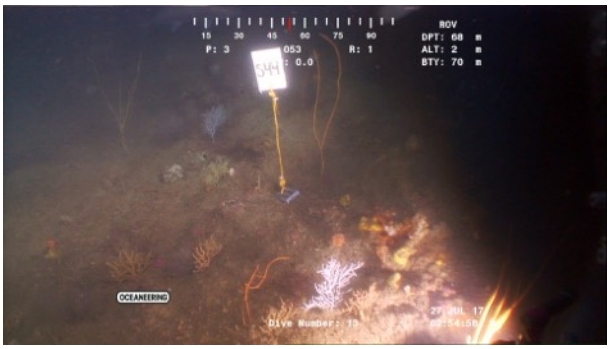
OP17_CM13

Start time: 2017-07-27 0:46
End Time: 2017-07-27 8:19
Description: Dive aborted. Collected 11 *Hypnogorgia* and 12 *Swiftia*, full power loss of the ROV. Very good visibility during this dive. Many highlights of fish and corals.

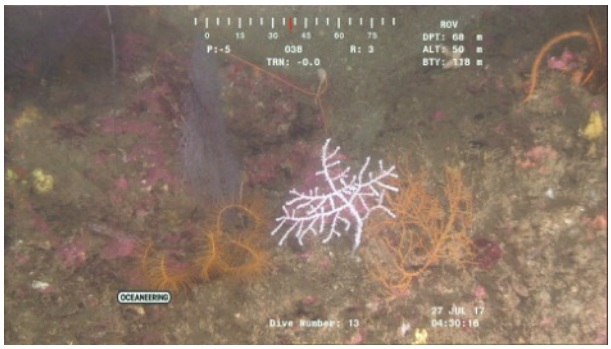
OP17_CM14

Start time: 2017-07-27 9:46
End Time: 2017-07-27 17:59
Description: Dive aborted. Collected 11 *Hypnogorgia* and 17 *Swiftia*, full power loss of the ROV. Poor visibility during second half of dive. Extremely difficult to collect and identify *Hypnogorgia* unambiguously due to small sizes of corals in general.

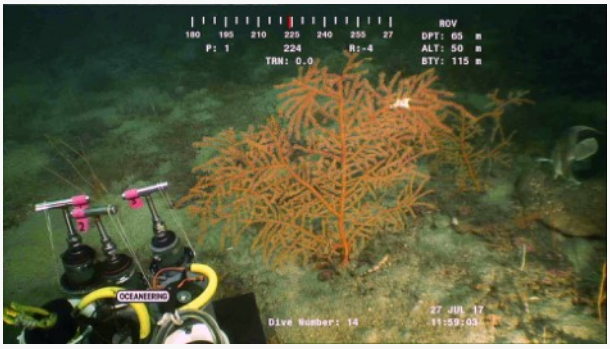
a.



b.



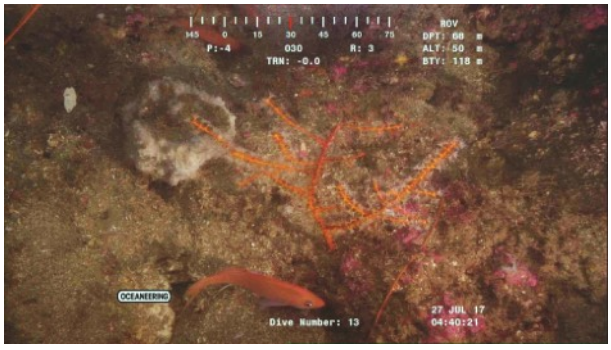
c.



d.

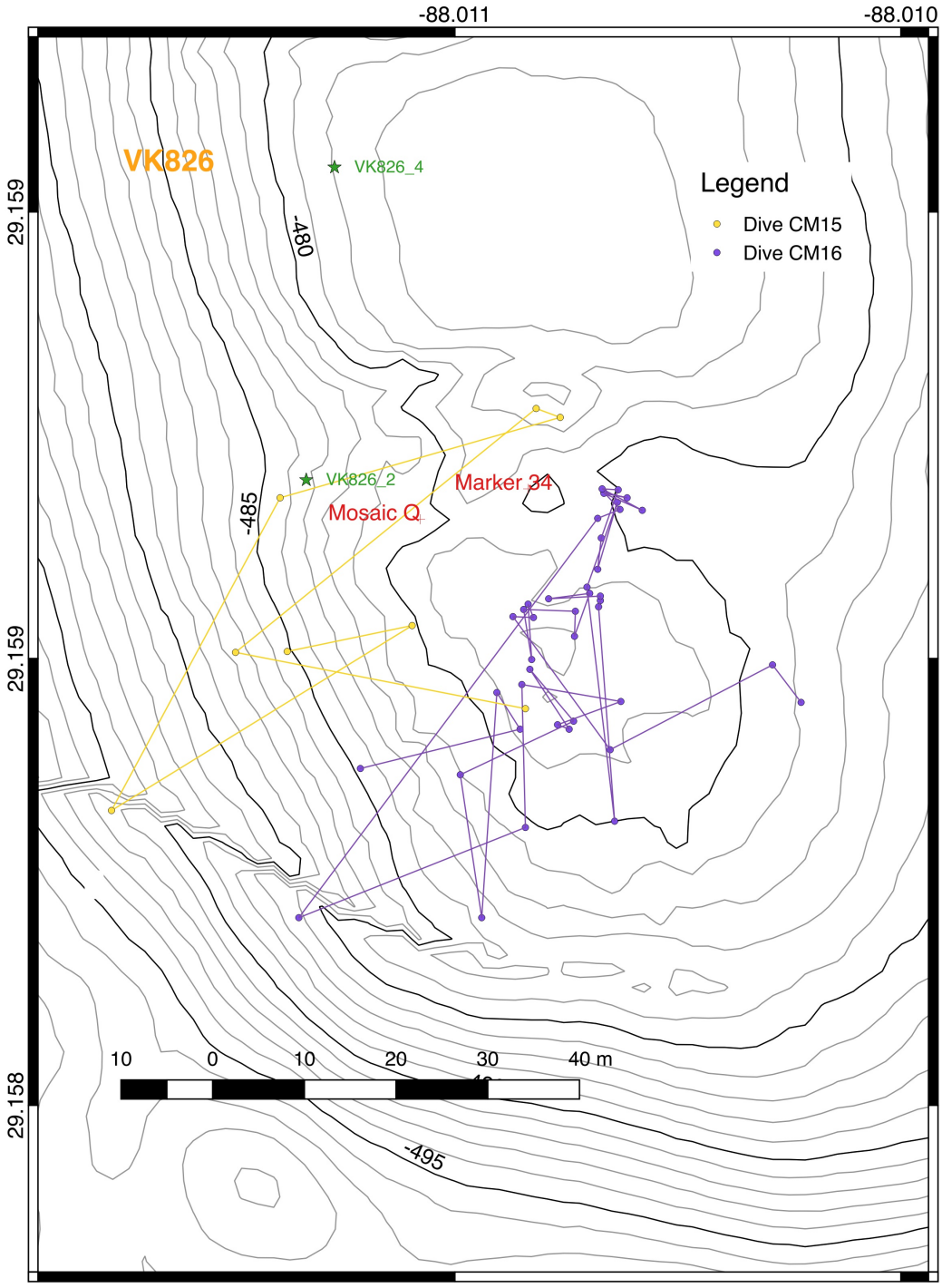
e.

f.



Representative Images of Roughtongue Reef. a. Small gorgonian colonies in the vicinity of Marker S44; b. Small *Hypnogorgia pendula colony*; c. Multiple *Swiftia exserta* colonies with associates; d. Large *S. exserta* colony; e. Fishes found in the vicinity of coral communities; and f. Small *S. exserta* colony.

Viosca Knoll East VK826



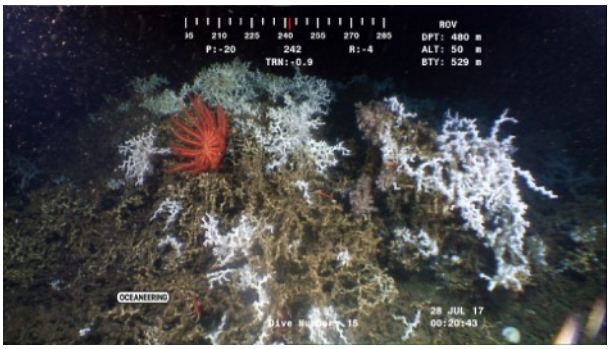
OP17_CM15

Start time: 2017-07-27 23:42
End Time: 2017-07-28 0:52
Description: Dive aborted. Full power loss of the ROV immediately after reaching bottom.

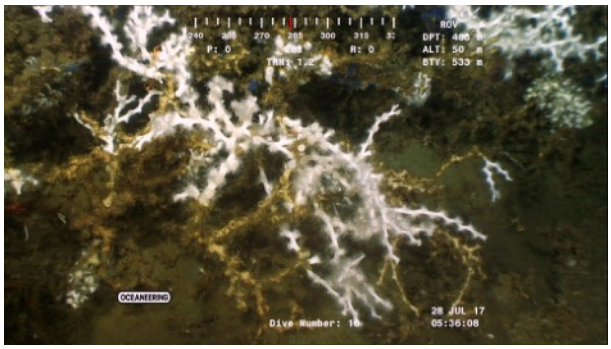
OP17_CM16

Start time: 2017-07-28 4:06
End Time: 2017-07-28 8:10
Description: Dive successful. Collected *Lophelia* and push cores. Landed right on the coral mound, found two good spots for collection of living branches, moved slightly to collect push cores. Highlight images of *Lophelia* with brisigngid stars and squat lobsters.

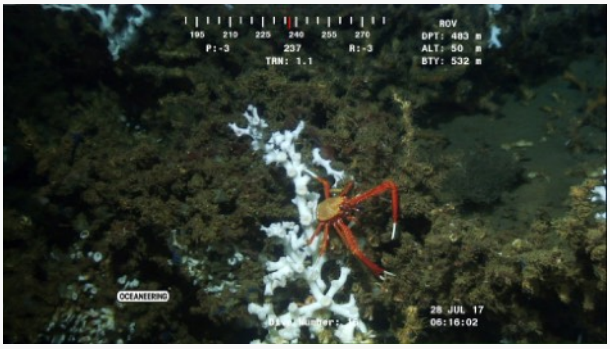
a.



b.



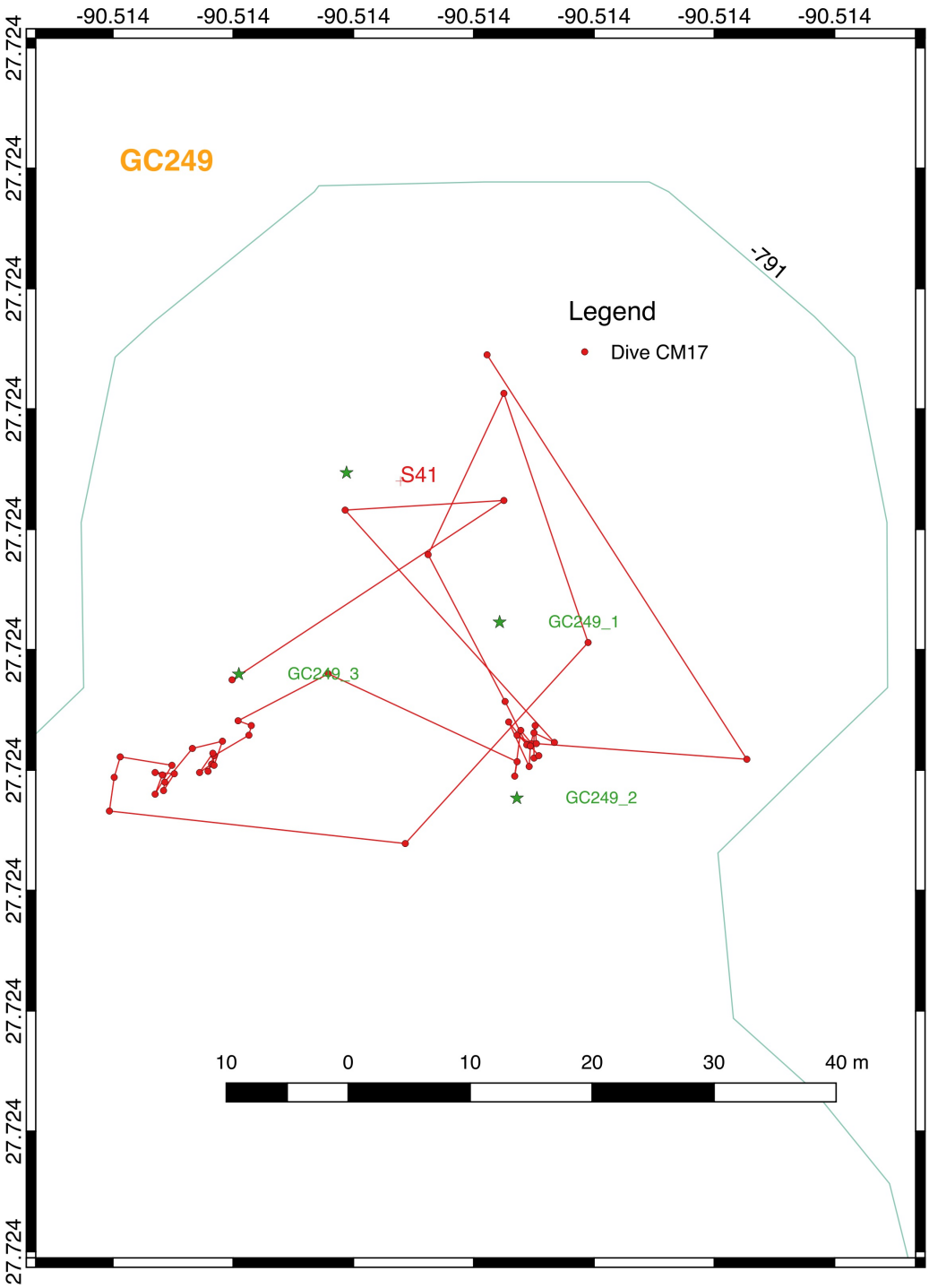
c.



d.

Representative Images of VK826. a. Large *Lophelia pertusa* reef; b. Close up on *L. pertusa* polyps; c. Squat lobster associated with *L. pertusa*; d. Sediment sampling with push cores.

Green Canyon GC249

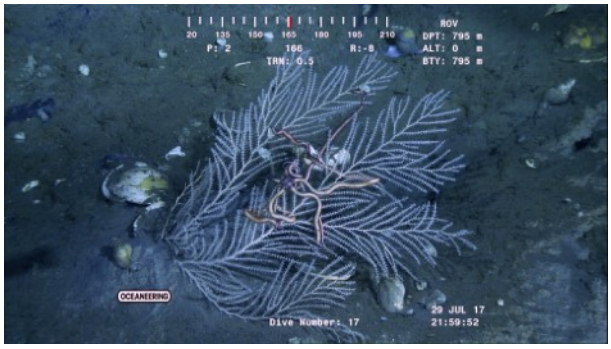


OP17_CM17

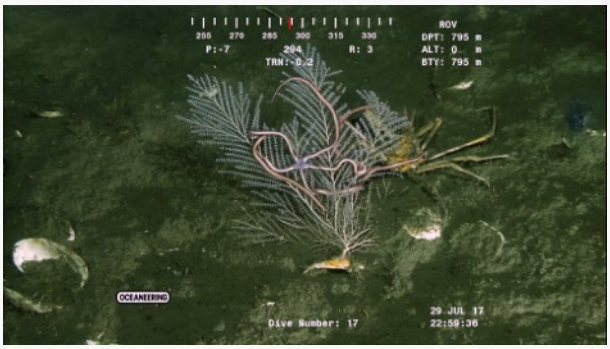
Start time: 2017-07-29 21:21
End Time: 2017-07-30 2:07
Description: Dive successful. Collected 10 *Callogorgia* samples and push cores. All *Callogorgia* were sampled on the opposite side of clam bed found during the ECOGIG OIII2017 cruise. All sampled specimens were medium in size and were growing on dead mussel shells. Explored the mussel bed for a few minutes at the end of the dive.

a.

b.



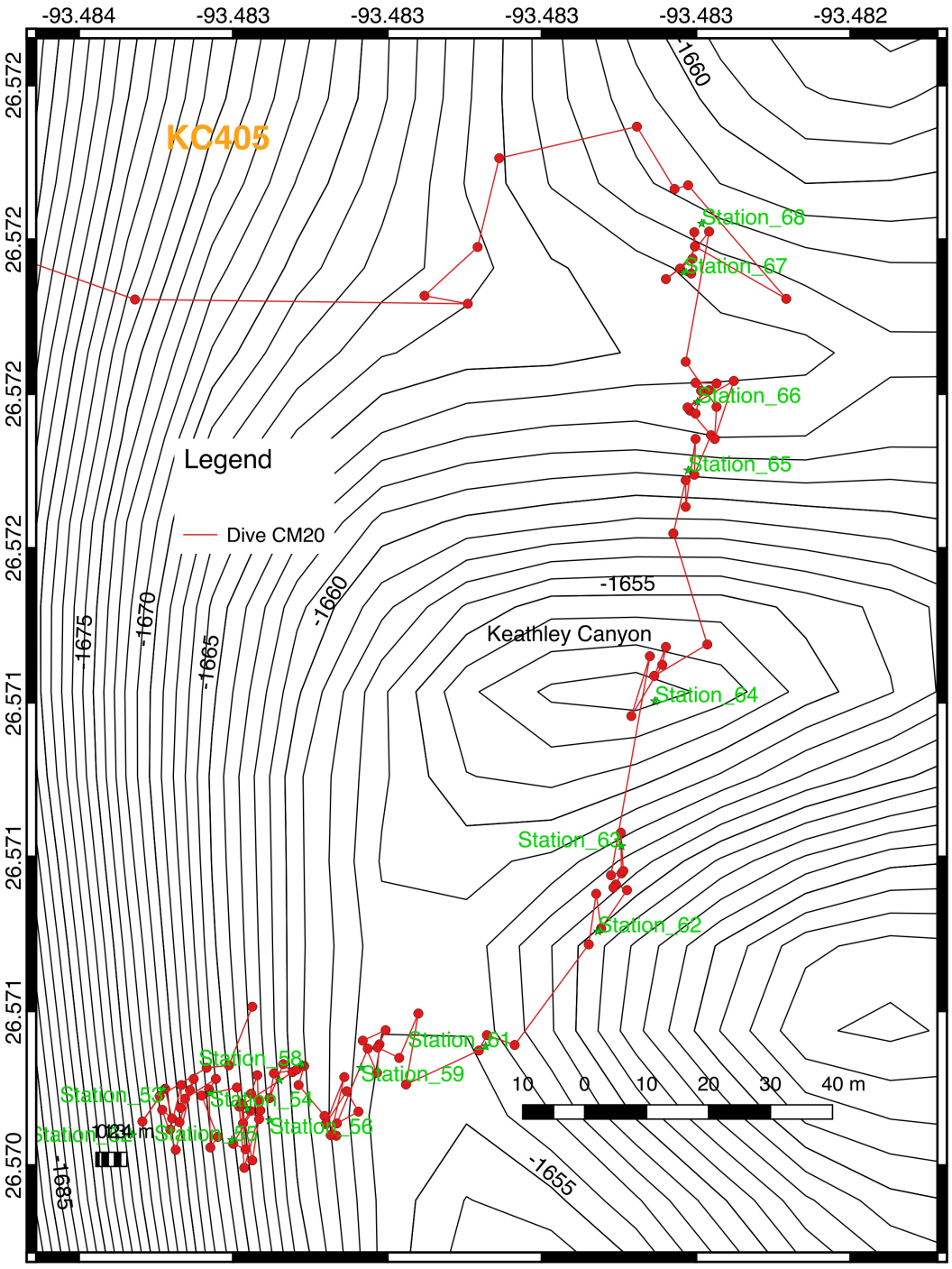
c.



d.

Representative Images of GC249. a. Field of *Callogorgia delta* growing in the vicinity of a hydrocarbon seep. Marker S41 in the background. Chimaera fish in the front; b. *C. delta* with associate ophiuroid growing on dead clam shells; c. *C. delta* with associate ophiuroid growing on dead clam shells; d. Collection of *C. delta* sample.

Keathley Canyon KC405



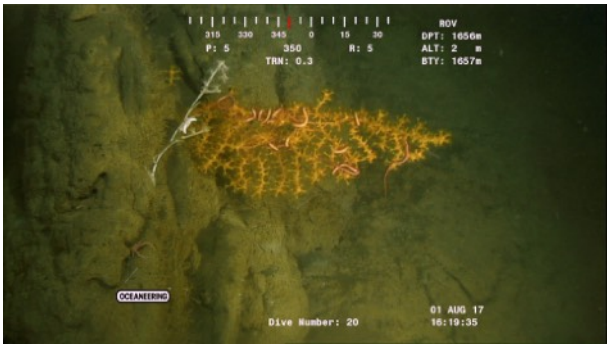
OP17_CM18

Start time: 2017-07-31 9:45
End Time: 2017-07-31 11:25
Description: Dive aborted. Full power loss of the ROV at 1000m. Problems with the which during recovery. Tether was not tracking correctly and required manual guidance.

OP17_CM20

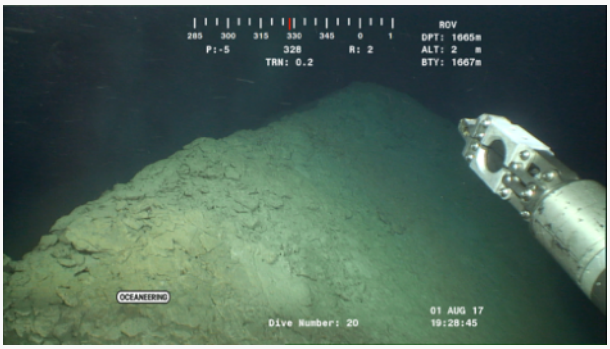
Start time: 2017-08-01 8:50
End Time: 2017-08-01 20:30
Description: Dive successful. Collected 32 *Paramuricea* samples, 6 push cores and 1 *Swiftia*. ROV blacked out 4 times but was successfully restarted every time. HD camera flickered a lot. Steep terrain, top of ridge has a razor-back shape with a width as narrow as ~10 cm. Seafloor made of clay, no hard substrate found. However, the clay was dense enough to allow the colonization of hundreds of small *Paramuricea*, some Paragorgiids and small bamboo corals. Dominant fauna were a species of commatulid crinoids. Many highlight images of topography and Crinoids, as well as of a bubblegum coral.

a.

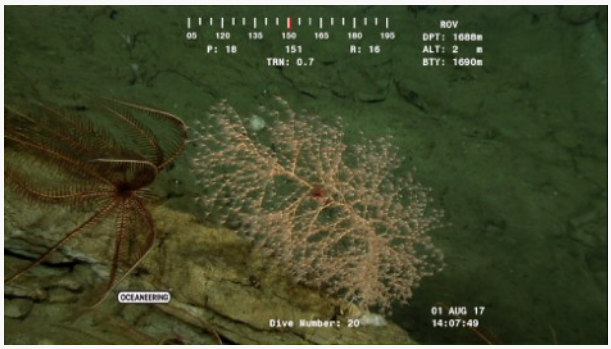


b.

c.

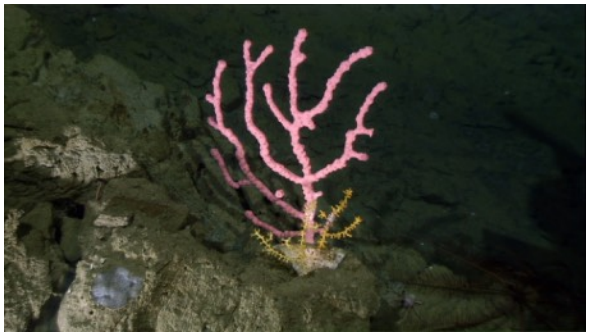


d.



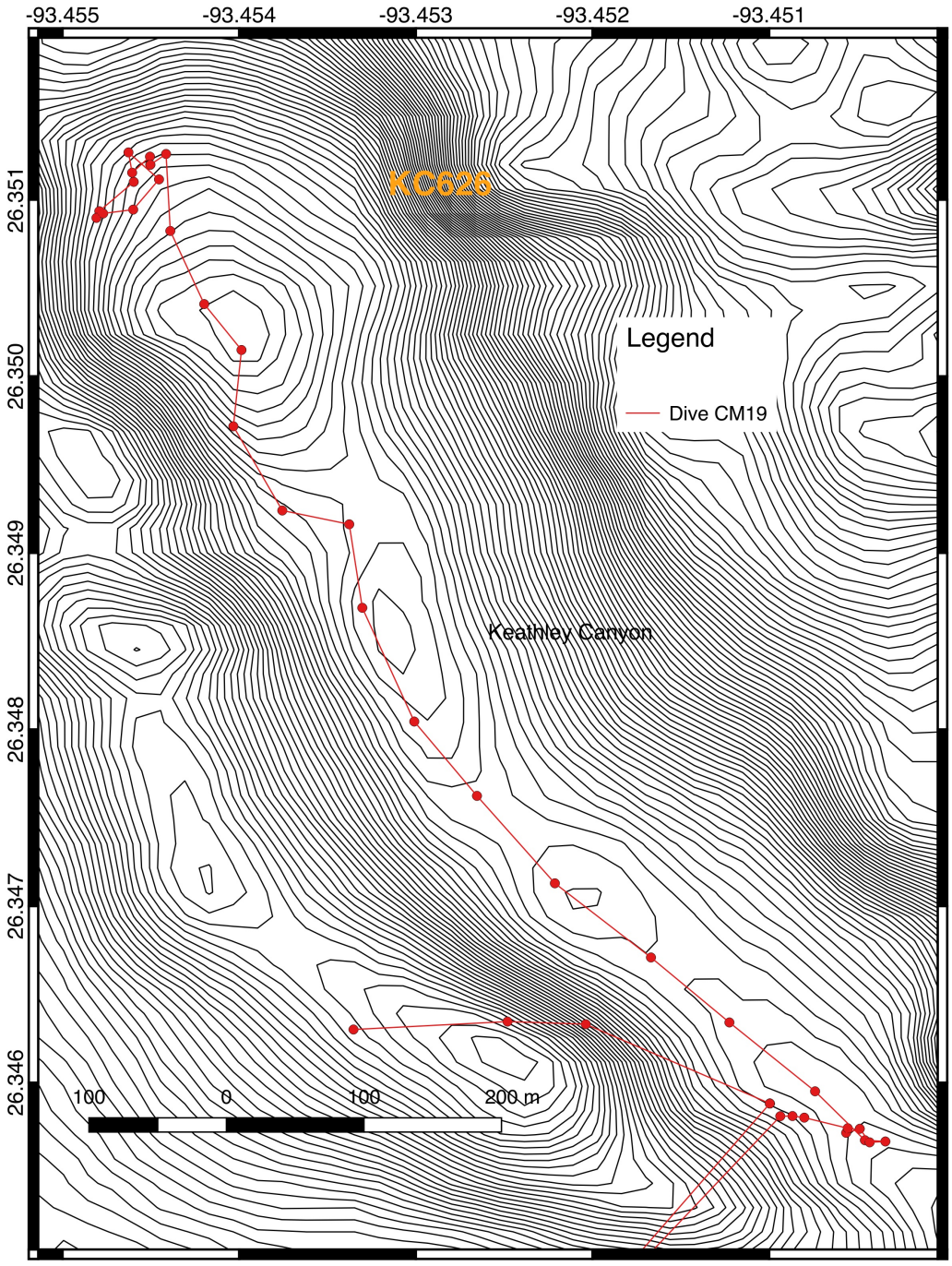
e.

f.



Representative Images of KC405 a. *Paramuricea biscaya* with ophiuroid; b. *P. biscaya* with ophiuroid; c. Clay ridge. Corals were found growing on the steep slopes of this soft-bottom feature; d. Commatulid crinoid and chrysogorgiid octocoral; e. *Swiftia* sp. colony; and f. Paragorgiid bubblegum coral, likely *Sibogagorgia cauliflora* (Herrera et al. 2010) with *P. biscaya* colonies growing on its base.

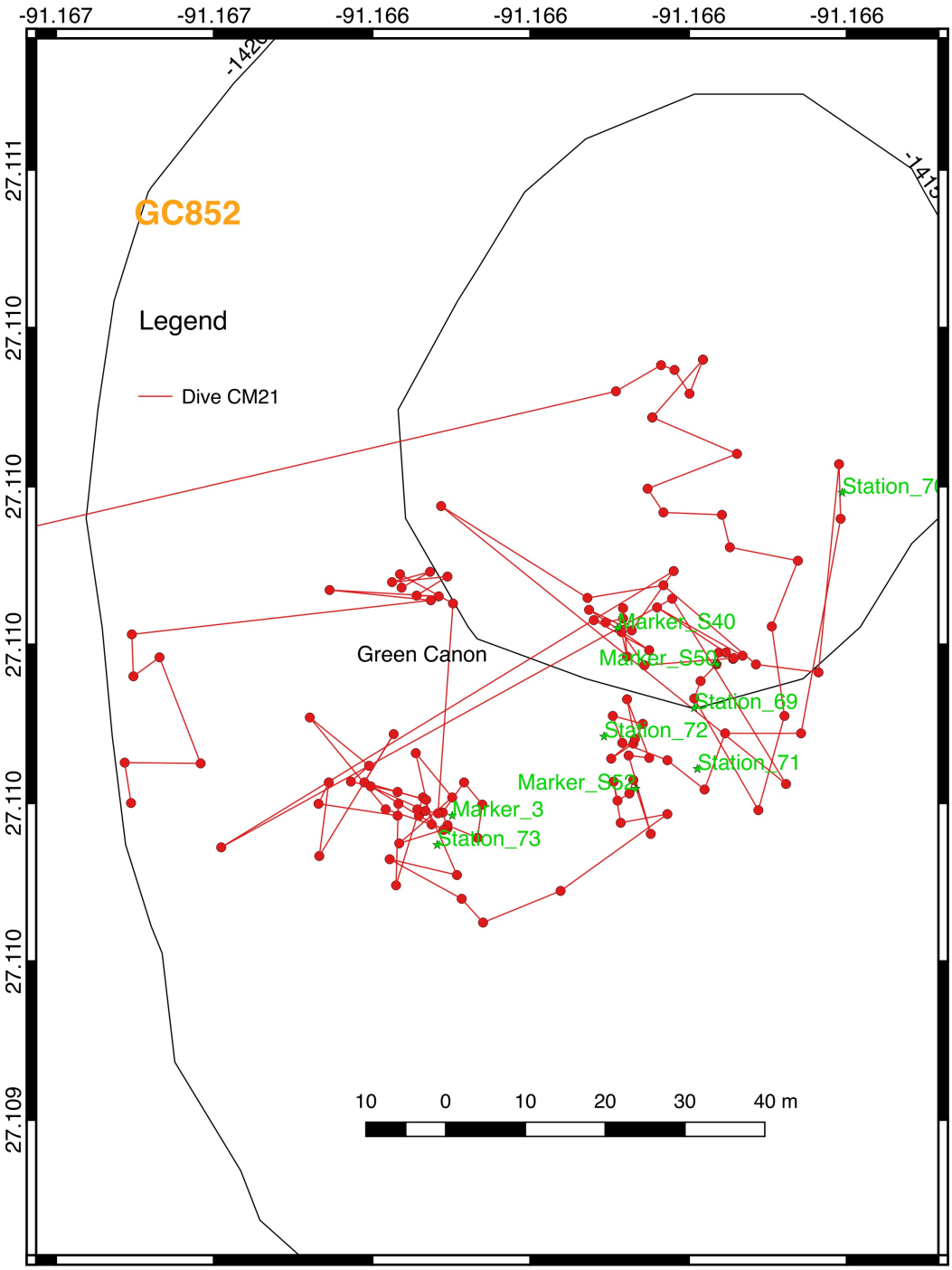
Keathley Canyon KC626



OP17_CM19

Start time: 2017-08-01 0:40
End Time: 2017-08-01 4:10
Description: Dive occurred. Seafloor was unexpectedly all soft clay bottom. Observed only one small octocoral. Dominant fauna were holothurians. Ridge was a giant sandbar, no hard substrate found. Incredible. Decided to end dive at 02:40 after exploring most of the ridge, head to KC405. Problems with the which during recovery.

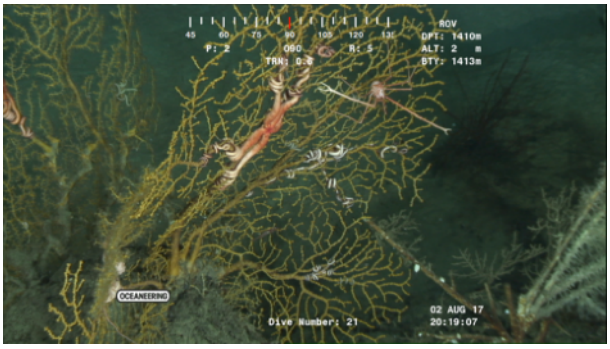
St. Tammany Basin Rim GC852



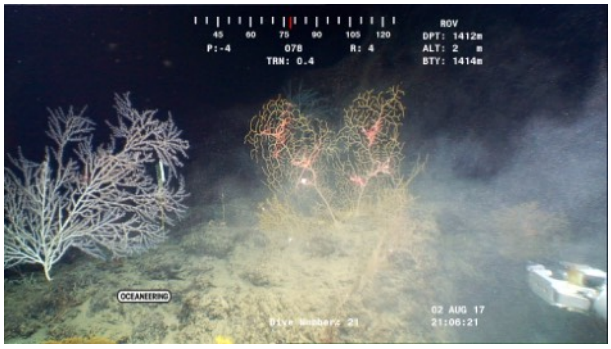
OP17_CM21

Start time: 2017-08-02 12:05
End Time: 2017-08-02 22:25
Description: Dive successful. Collected 20 *Paramuricea* samples, 6 push cores and 1 *Swiftia*. ROV blacked out 1 or 2 times but was successfully restarted every time. HD camera flickered less. Abundant large corals (bamboo, *Paramuricea*, *Iridogoriga*) on large boulder outcrops Also found a seep area that seemed to be in its late stages. Many highlight images, except for the first 2 hours of the dive where the HD camera was foggy with water vapor condensation that made visibility difficult. Camera cleared out afterwards.

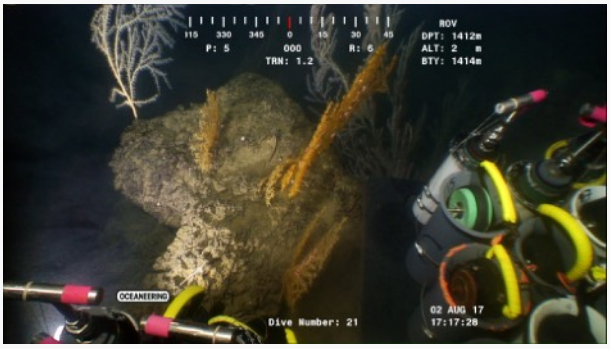
a.



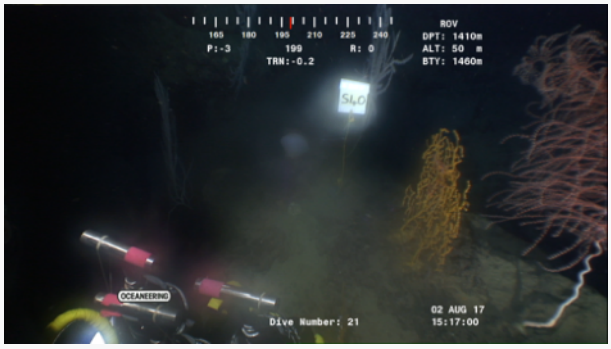
b.



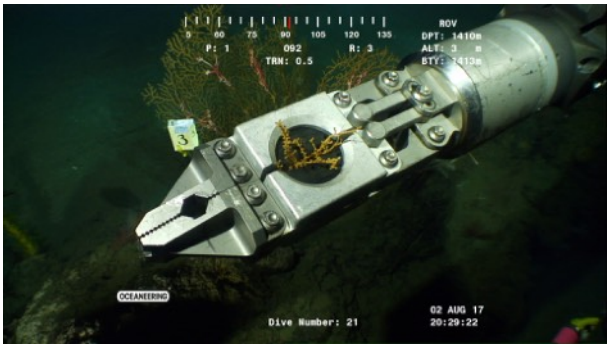
c.



d.



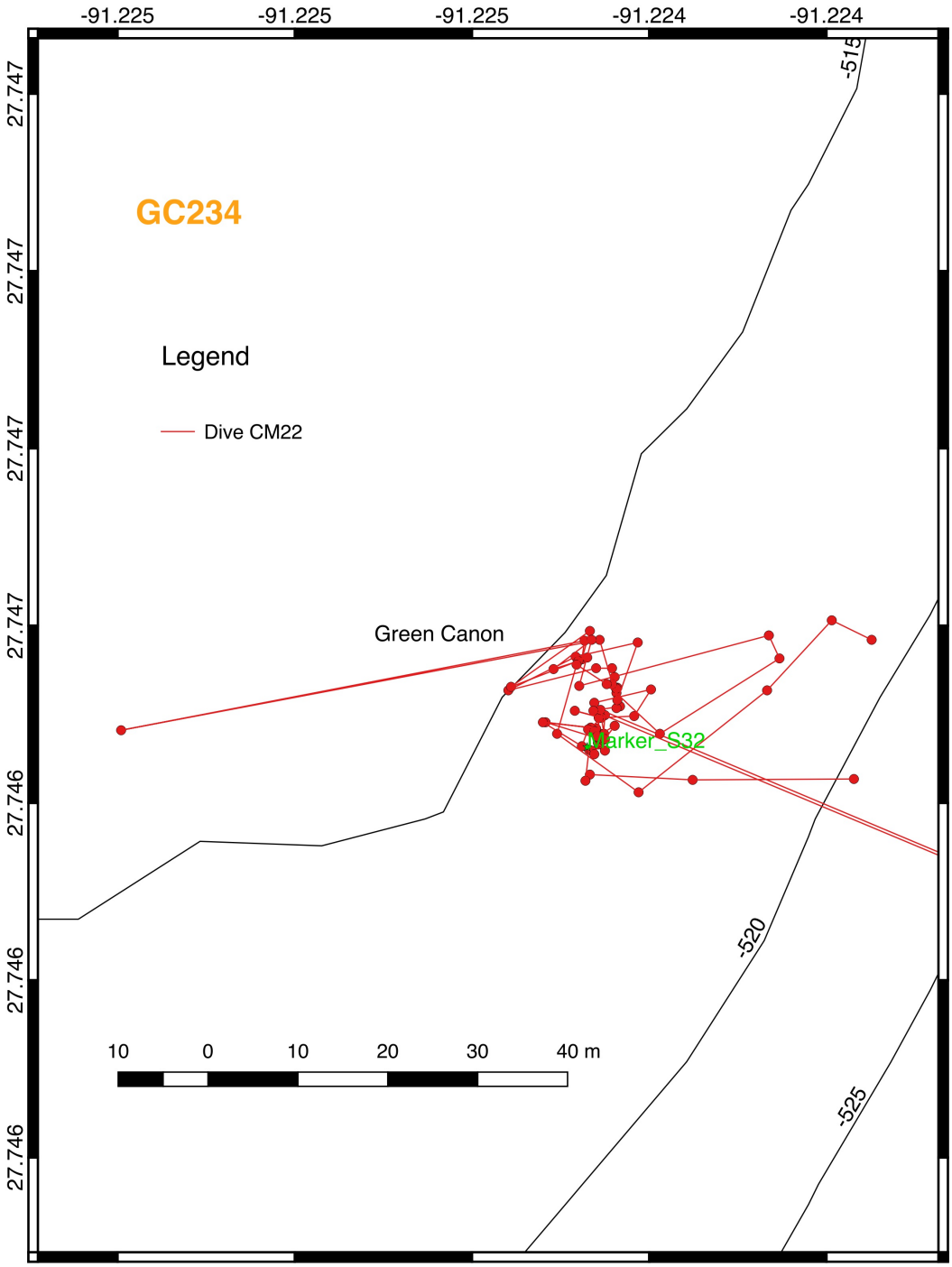
e.



f.

Representative Images of GC852. a. *Paramuricea biscaya* colonies with ophiuroid associates; b. Large *P. biscaya* and isidid bamboo coral colonies; c. Large *P. biscaya* and isidid bamboo coral colonies; d. Large *P. biscaya, Iridogorgia*, and isidid bamboo coral colonies next to Marker S40; e. Collection of *P. biscaya* sample next to Marker 3; and f. Sediment sampling with push cores.

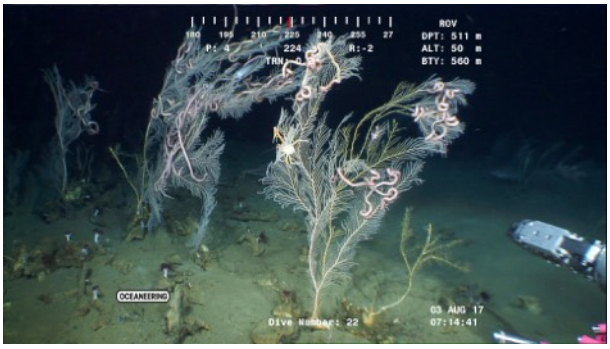
Penchant Basin Rim GC234



OP17_CM22

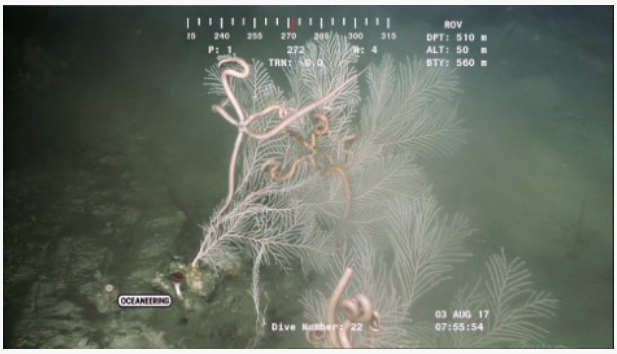
Start time: 2017-08-03 3:30
End Time: 2017-08-03 9:30
Description: Dive successful. Collected 20 *Callogorgia* samples in a seepy area, and 6 push cores. Did not move significantly from start site (5-10 meters maximum). ROV blacked out 1 or 2 times but was successfully restarted every time. HD camera flickered less. Very large colonies found at this site, with many associate ophiuroids, squat lobsters. Highlight imagery of a fish sheltering among the branches of a *Callogorgia* colony. Many highlight images, except for the first 1 hour of the dive where the HD camera was foggy with water vapor condensation that made visibility difficult. Camera cleared out afterwards.

a.



b.

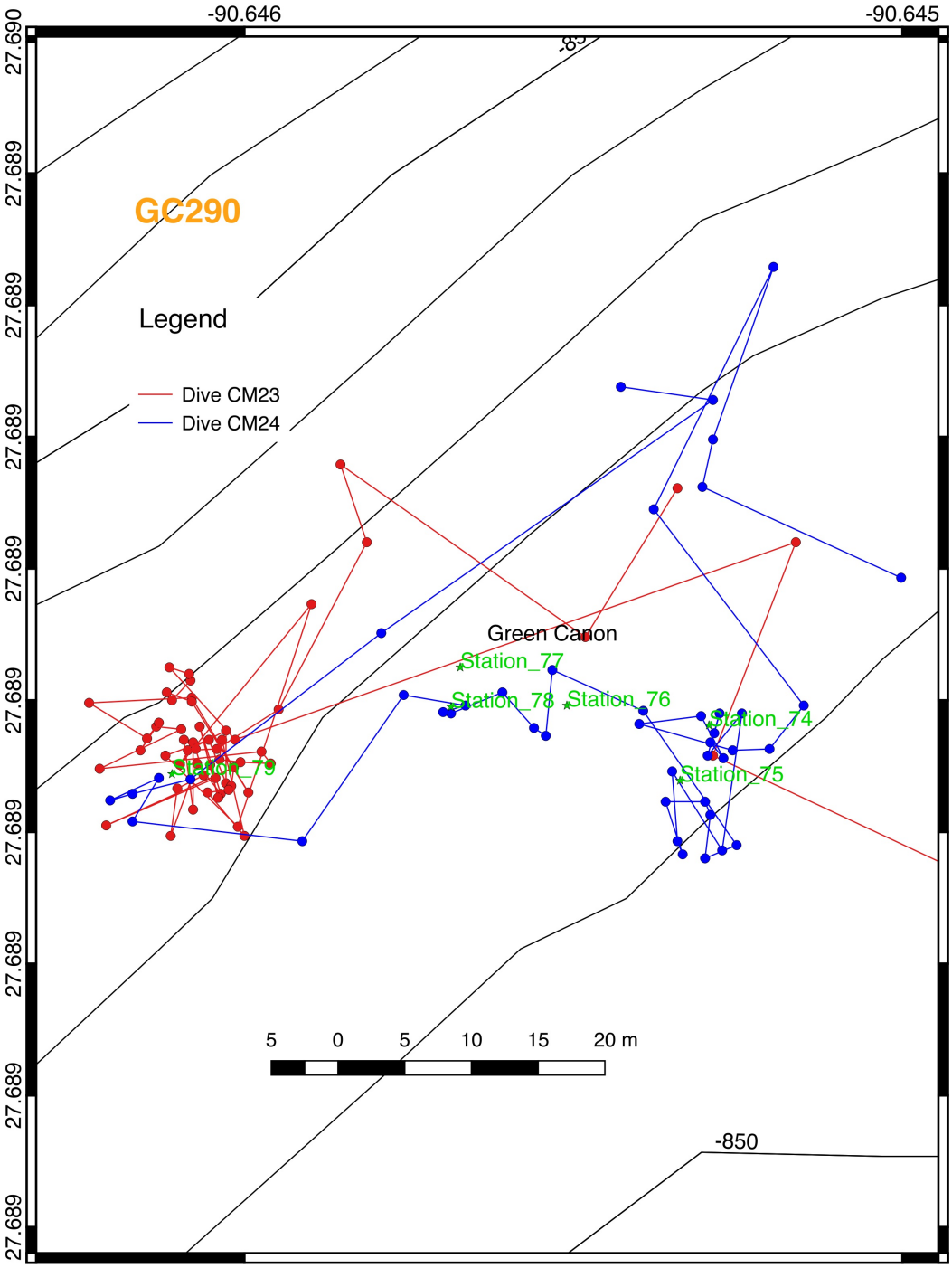
c.



d.

Representative Images of GC234. a. Field of *Callogorgia delta* growing in the vicinity of a hydrocarbon seep. Cup corals on the foreground. Multiple invertebrate and fishes associated with this community. ; b. *C. delta* colonies with associate ophiuroids; c. *C. delta* colonies with associate ophiuroids; d. C*C. delta* colonies with associate ophiuroids and fish.

Green Canyon GC290



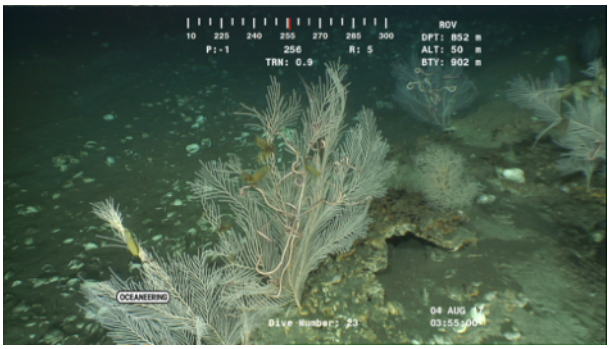
OP17_CM23

Start time: 2017-08-03 23:30
End Time: 2017-08-04 4:17
Description: Dive successful. Collected 17 *Callogorgia* samples in a seep area (single stoppers only). Many large colonies in a single spot, collected them all around marker 9 (deployed). Some colonies were growing on muscle shells, but most growing on authigenic carbonate. Virtually all colonies had ophiuroid associates, and many had catshark egg cases attached. Observed few small *Chrysogorgia* in the area. ROV HD camera foggy for the first 1h, ROV blacked out once but restarted. Had problems reaching things on the outward starboard side due to an unknown new issue with the arm. Repairs to follow during at-sea crew personnel transfer and transfer of ROV parts.

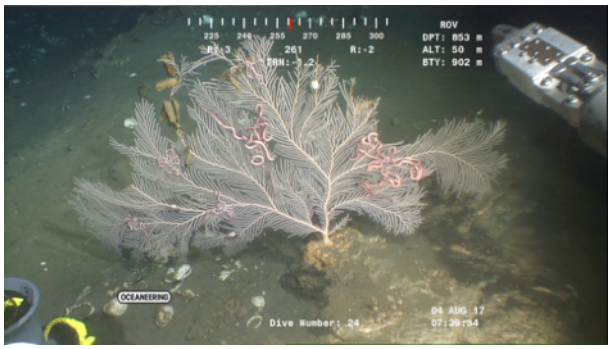
OP17_CM24

Start time: 2017-08-04 5:15
End Time: 2017-08-04 9:13
Description: Dive successful. Collected 17 *Callogorgia* samples in a seepy area (single stoppers only). Many large colonies in a small area. Some growing on muscle shells, but most growing on authigenic carbonate. Observed few small *Chrysogorgia* in the area. Virtually all colonies had ophiuroid associates, and many had catshark egg cases attached. ROV HD camera foggy for the first 1h, ROV blacked out once but restarted. Had problems reaching things on the outward starboard side due to an unknown new issue with the arm. Repairs to follow during at-sea crew personnel transfer/transfer of ROV parts /transit to Diaphus (transfer ship arrived at dive location during the dive).

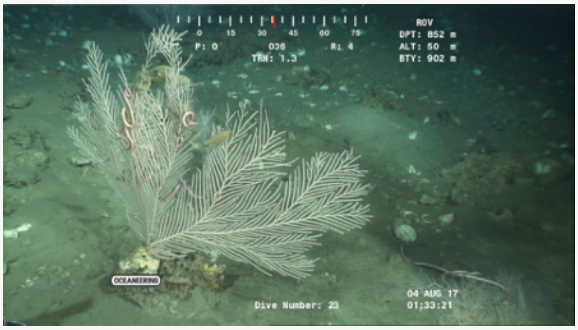
a.



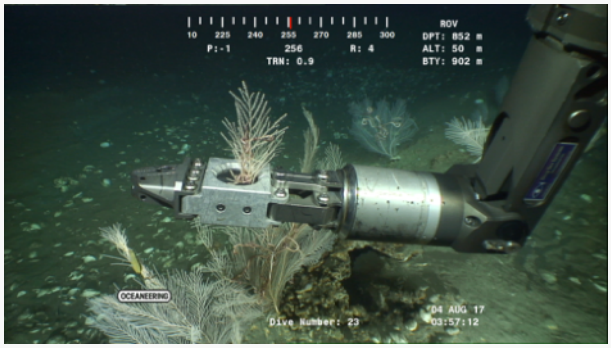
b.



e.

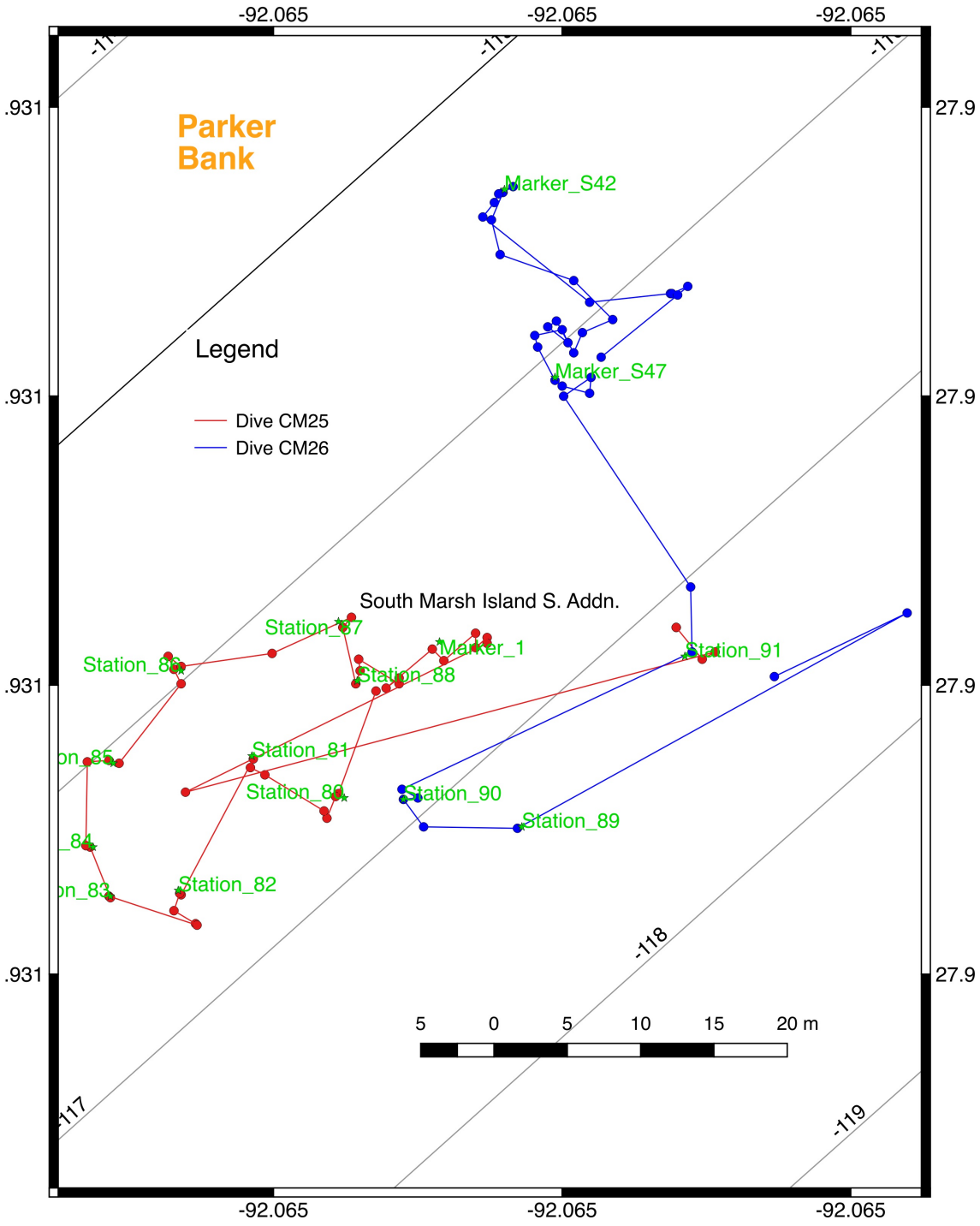


f.



Representative Images of GC290. *Callogorgia delta* colonies growing in the vicinity of a hydrocarbon seep. Species associated with these corals include ophiuroids, cat sharks (egg cases), and anemones.

Parker Bank



OP17_CM25

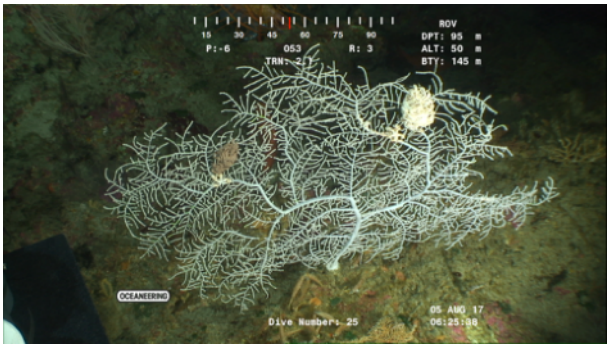
Start time: 2017-08-05 3:30
End Time: 2017-08-05 6:45
Description: Dive aborted. Loss of pitch function of 7-function arm (starboard). Until this point dive was going very well. Collected 15 samples of *Hypnogorgia*. Had good visibility, moderate current. Spectacular place with many large *Hypnogorgia* colonies, many fish, including a couple of lionfish. Gentle slope with mostly

even hard bottom. Also observed one *Swiftia*. Dive ended after deploying Marker 1 and collecting 3 samples in the vicinity of the marker. ROV lost power many times (at least 7) during the dive, but restarted every time. HD camera flickered a lot less after changes using new bottle parts.

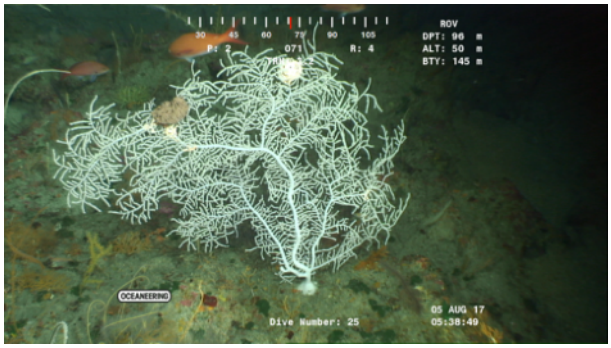
OP17_CM26

Start time: 2017-08-05 14:55
End Time: 2017-08-05 18:10
Description: Dive successful. 7-function arm (starboard) worked well after repairs. Collected 17 samples of *Hypnogorgia*. Had good visibility, moderate current. Spectacular place with many large *Hypnogorgia* colonies, many fish. Gentle slope with mostly even hard bottom. Also observed one *Swiftia*. Collected one *Callogorgia* resembling delta as outgroup. Deployed 2 markers. ROV lost power many times (at least 12) during the dive, but restarted every time.

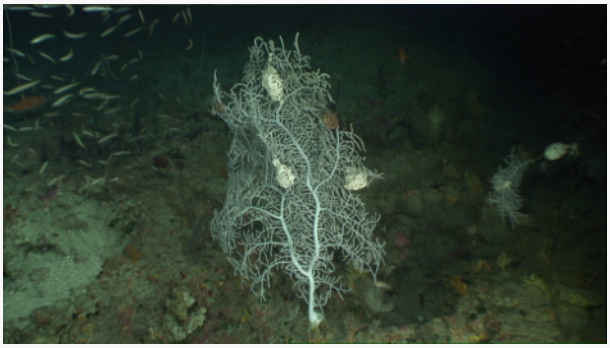
a.



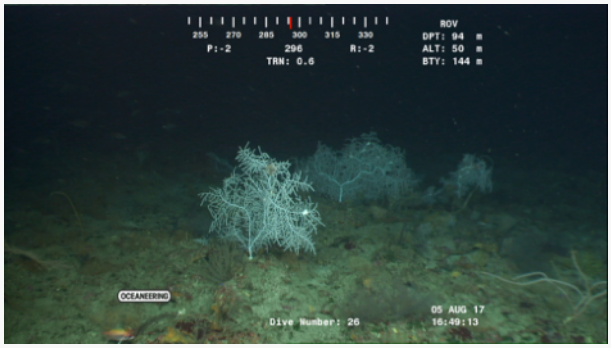
b.



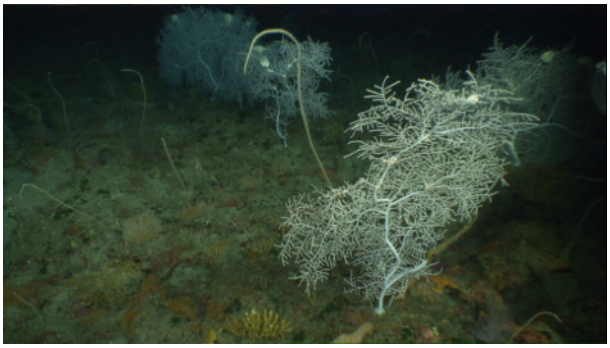
c.



d.



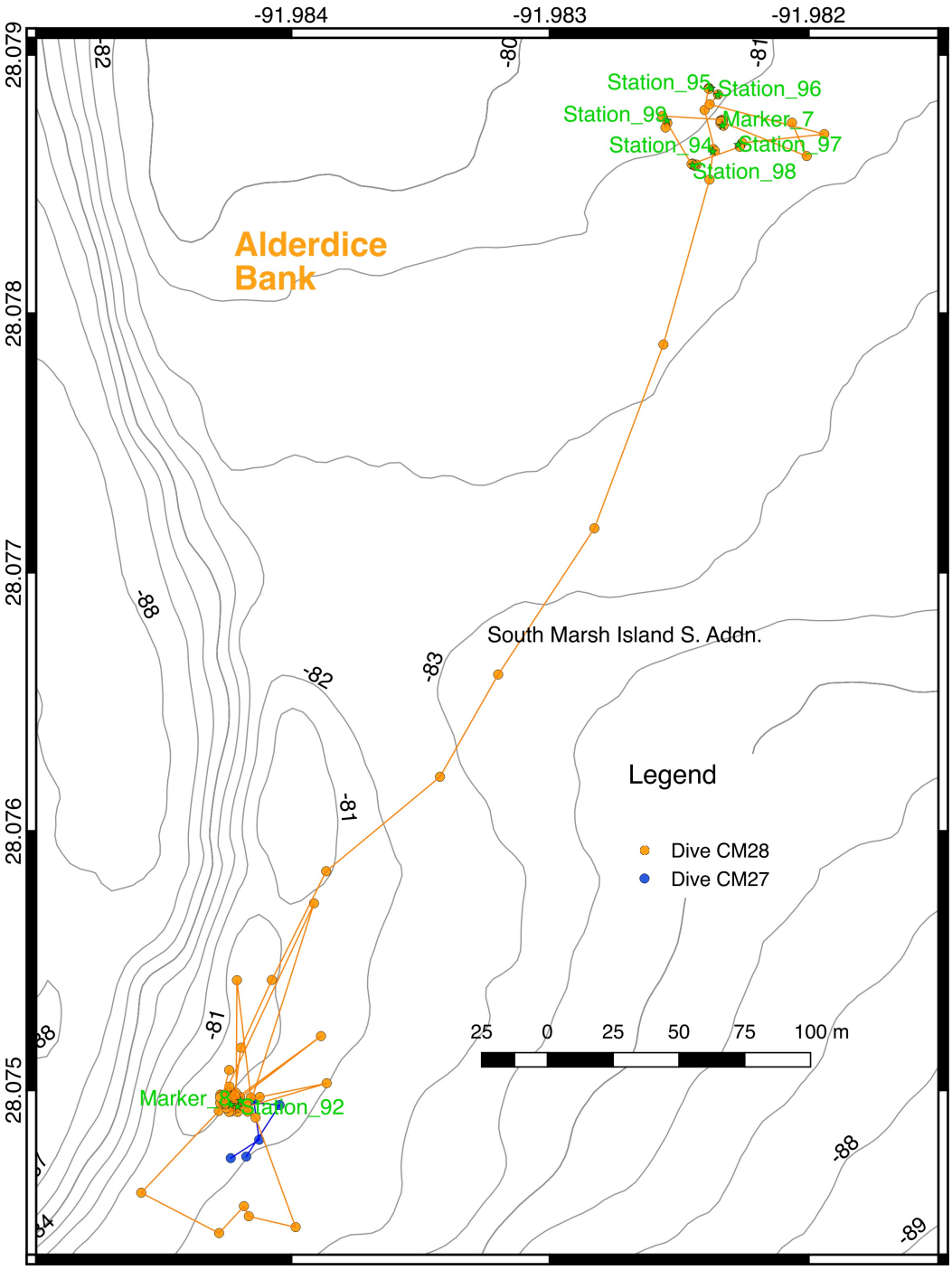
e.



f.

Representative Images of Parker Bank. a-e. Large *Hypnogorgia pendula* colonies with basketstar associates, amid fish aggregations; and f. *S. exserta* colony next to a lionfish and a snapper.

Alderdice Bank



OP17_CM27

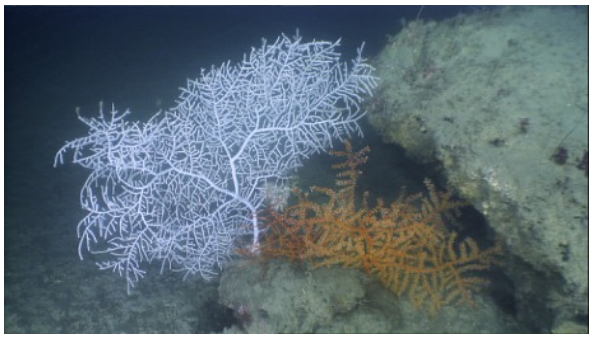
Start time: 2017-08-05 20:38
End Time: 2017-08-05 21:01
Description: Dive aborted. Multiple power losses of the ROV immediately after reaching bottom.

OP17_CM28

Start time: 2017-08-06 2:40
End Time: 2017-08-06 10:10
Description: Dive successful. Repairs were successful, no power loses during dive! Spent first 30 min of dive testing this repair by thrusting down 100% at ~60 meters. However, sonar was not functional. Collected 31 samples of *Swiftia*. Had low visibility, moderate current. Visited AB2 and found outcrop with 19 *Swiftia* colonies, sampled all of them and deployed physical marker. Observed abundant snapper, lionfish, and grouper at this location. Moved to AB4 observing mostly soft bottom along the way. Found several scattered *Swiftia* in the area of AB4. At the end of the dive found the outcrop that was likely the area described as waypoint with many *Swiftia*, it hosted about 8 colonies. Deployed Marker 7 here. Also observed scattered *Hypnogorgia* throughout the dive.

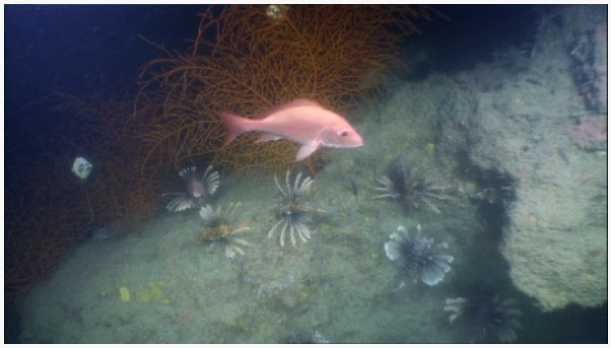
a.

b.

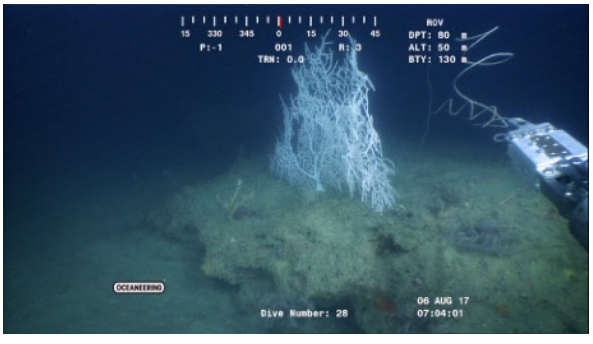


c.

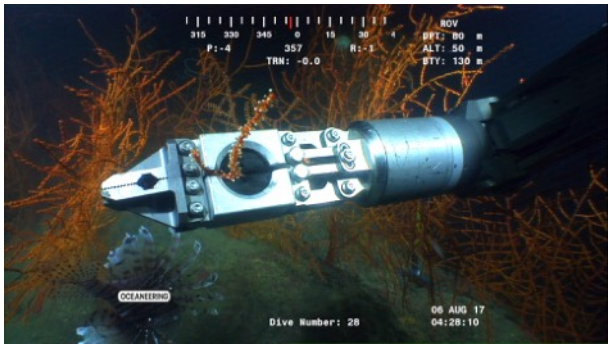
d.



e.

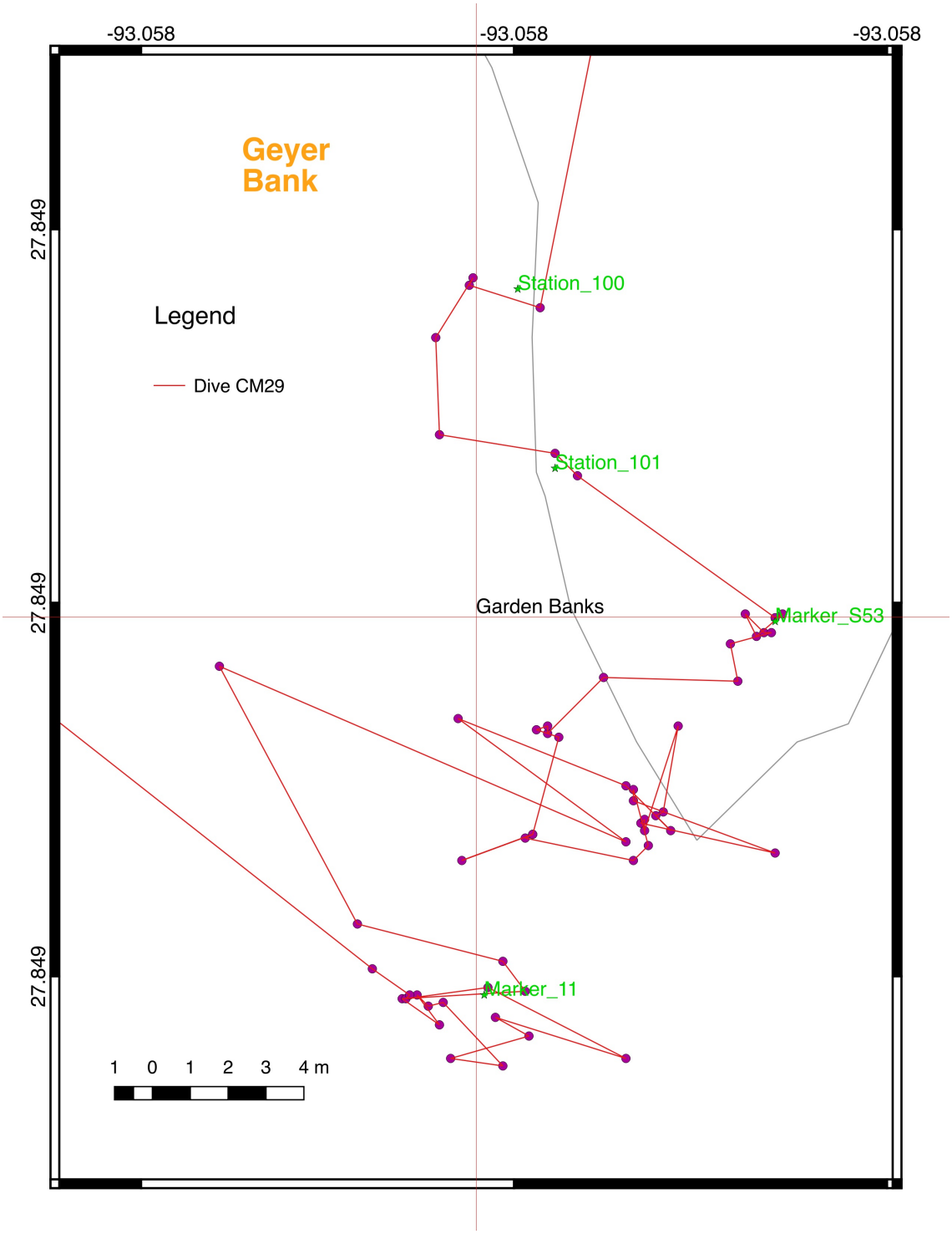


f.



Representative Images of Alderdice Bank. a-f. *Swiftia exserta* and *Hypnogorgia pendula* colonies with basketstar associates, amid fish aggregations, including lionfish and snappers.

Geyer Bank



OP17_CM29

Start time: 2017-08-06 21:00
End Time: 2017-08-07 2:10
Description: Dive successful. Repairs were successful, no power loses during dive and sonar was fixed! Collected 32 samples of *Swiftia*. Had very good visibility, moderate current. Visited GB1 and found abundant *Swiftia* colonies, didn't leave the area. Did not sample all of them. Deployed two physical markers (S53 and

Marker 11). Did not observe snapper or lionfish, and only a few grouper at this location. Also observed a few *Hypnogorgia*. There were abundant hard rocky substrates (even surfaced pancakes), and only small patches of sand.

a.

b.

c.

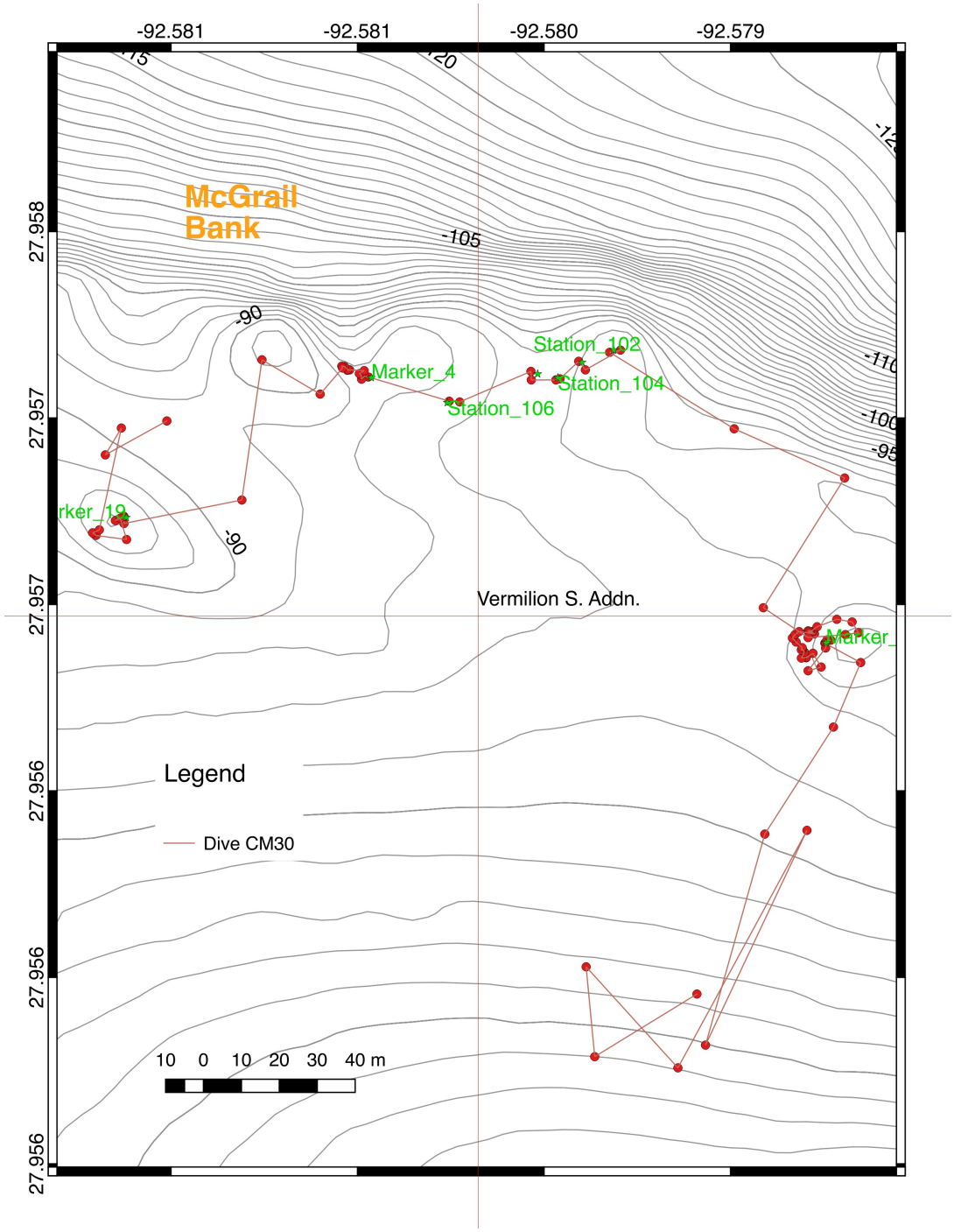
d.

e.

f.

Representative Images of Geyer Bank. a-f. *Swiftia exserta* and *Hypnogorgia pendula* colonies.

McGrail Bank

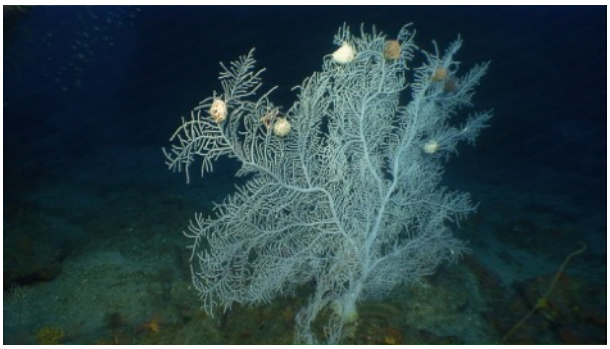


OP17_CM30

Start time: 2017-08-07 8:52
End Time: 2017-08-07 15:55
Description: Dive successful.Current dropped to 1.5 knots and decided to go in the water. No problems with the ROV! Collected 34 samples of *Hypnogorgia*. Had very good visibility, moderate current. Visited MB1 and could not find the Hypnogorgia field described in the FGBNMS database. This was an area of gentle slope, with even surface partially covered with a thing layer of coarse sand, observed many whip corals *Ellisella* and possibly *Stichopathes*. From there decided to move upslope to MB4 (a topographic high) and found a

garden of approximately 16 colonies on a rocky outcrop. Deployed marker 7, and sampled all of the large ones. From there continued moving over rocky terrain towards MB3 along a ridge and collected few more colonies scattered on vertical surfaces and tops of outcrops. Continued to MB2 and found the many (M) *Hypnogorgia* mentioned in the FGBNMS database. Deployed physical Marker 4, and sampled most colonies. Started to observe an increase abundance of fish, including large groupers and snappers. From there moved to the next local high MB6 and found another field of *Hypnogorgia*. Deployed physical Marker 19 and sampled a couple of colonies. This was a remarkable end of the dive with multiple *Hypnogorgia* and *Swiftia* colonies side by side and hundreds of large fish: groupers, snappers, small fish. Turned the ROV lights off and saw the ecosystem under ambient light. Excellent highlight images and video Only observed one lionfish during this dive. Also observed a few *Swifitia*. There were abundant hard rocky substrates and only small patches of sand. HD camera flickered only a few times.

a.

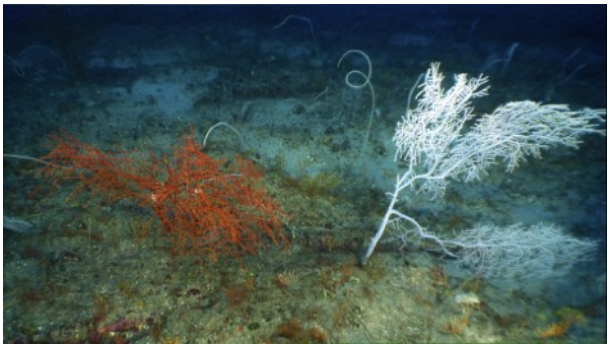


b.

c.

d.

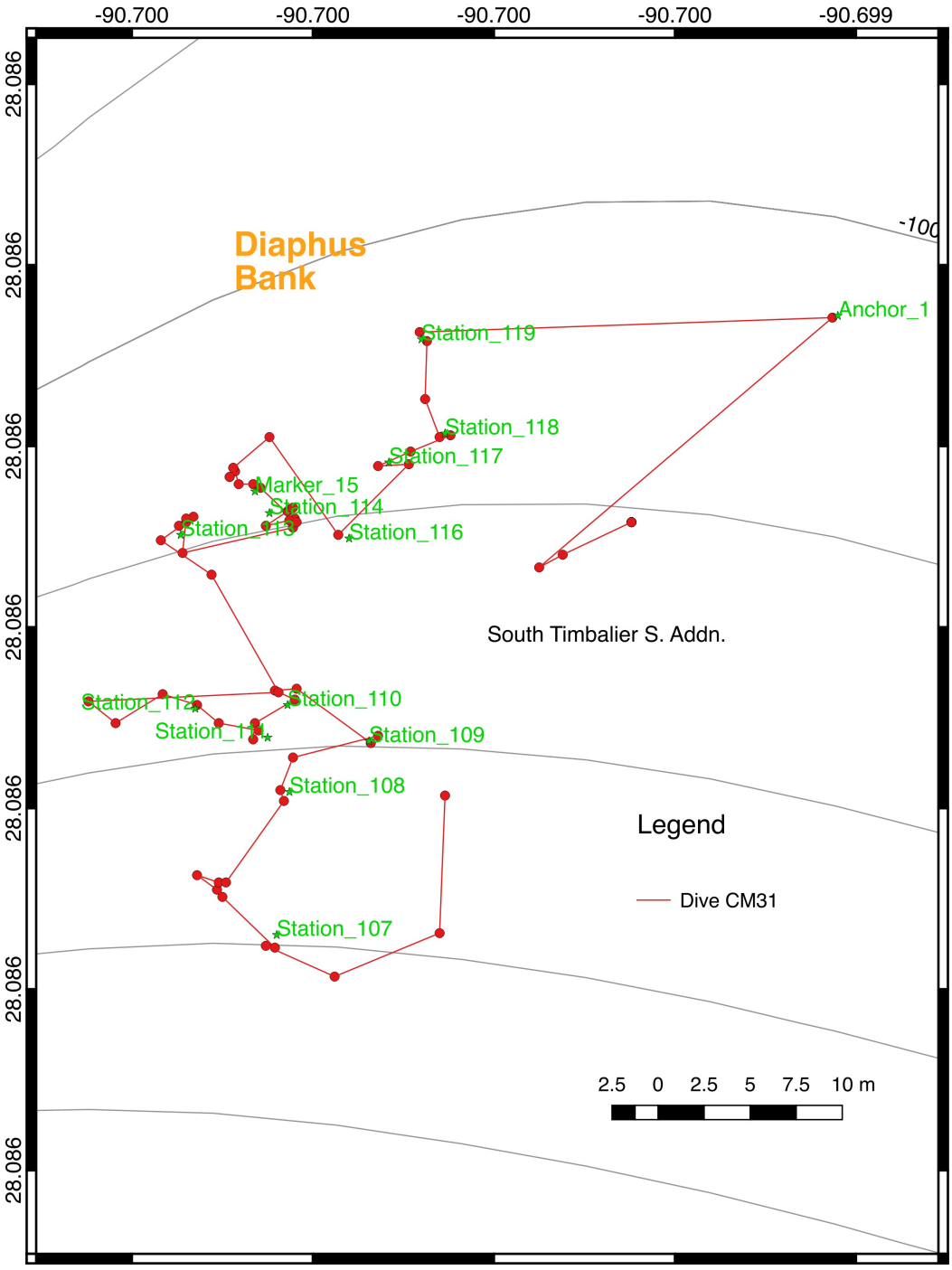
e.



f.

Representative Images of McGrail Bank. a-f. Large *Hypnogorgia pendula* and *Swiftia exserta* colonies with basketstar associates, amid fish aggregations, including groupers and snappers.

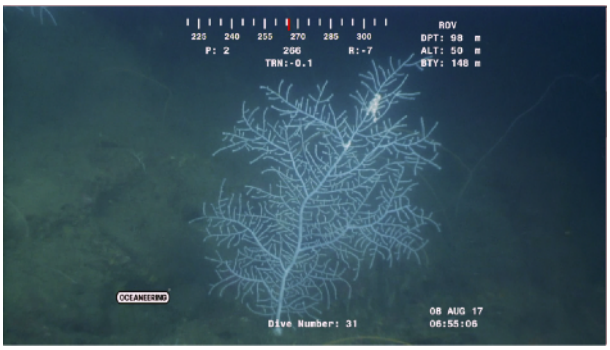
Diaphus Bank



OP17_CM31

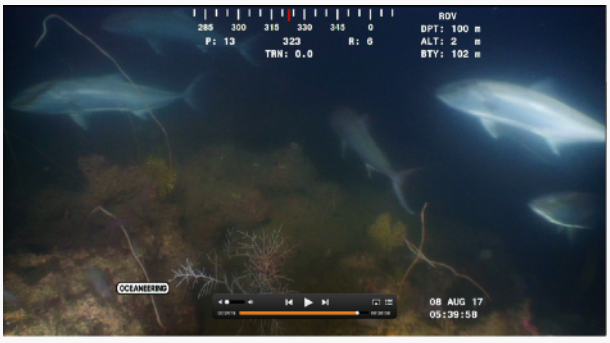
Start time: 2017-08-08 4:45
End Time: 2017-08-08 10:35
Description: Dive successful. No problems with the ROV! Collected 34 samples of *Hypnogorgia*. Had poor visibility, moderate current from 310 degrees. Visited DB1 and moved upslope only a few dozen meters. This was an area of very steep slope, with outcrops and walls, partially covered with a thing layer of coarse sand, observed many whip corals *Ellisella* and possibly *Stichopathes*. Observed many small to medium *Hypnogorgia* colonies and sampled them. Deployed marker 15 along base of wall. Did not observe any *Swiftia* colonies Only observed one or two lionfish during this dive. HD camera flickered only a few times

a.

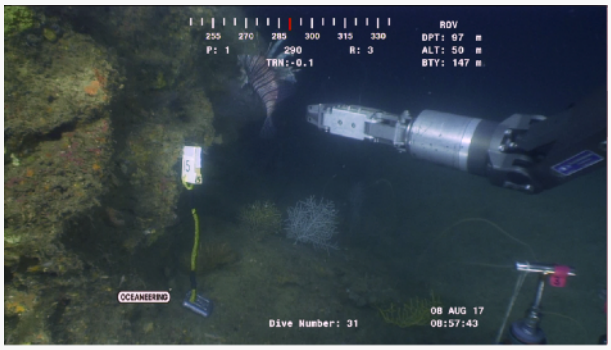


b.

c.



d.



Representative Images of Diaphus Bank. a-d. *Hypnogorgia pendula* colonies with basketstar associates, amid fish, including amberjacks and lionfish.

APPENDIX 2: SAMPLES

Inventory of specimens collected during expedition RESTORE OP17 to the Northern Gulf of Mexico, from July 18 - August 9, 2017 (Destination SH=Santiago Herrera, AD=Amanda Demopoulos, EC= Erik Cordes).

Sample ID	Scientific Name	Date (CST)	Time (CST)	Locality	Latitude	Depth (m)	Destination
OP17_001	*Hypnogorgia pendula*	7/21/17	14:17	Alabama Alps	29.25023 -88.33851	71	SH
OP17_002	*Swiftia exserta*	7/24/17	7:50	Alabama Alps	29.25020 -88.33840	72	SH
OP17_003	*Hypnogorgia pendula*	7/24/17	8:06	Alabama Alps	29.25020 -88.33840	71	SH
OP17_004	*Swiftia exserta*	7/24/17	8:35	Alabama Alps	29.25028 -88.33849	71	SH
OP17_005	*Swiftia exserta*	7/24/17	9:01	Alabama Alps	29.25028 -88.33849	71	SH
OP17_006	*Hypnogorgia pendula*	7/24/17	9:28	Alabama Alps	29.25041 -88.33839	72	SH
OP17_007	*Swiftia exserta*	7/24/17	9:41	Alabama Alps	29.25041 -88.33837	72	SH
OP17_008	*Swiftia exserta*	7/24/17	17:13	Alabama Alps	29.25495 -88.33951	73	SH
OP17_009	*Swiftia exserta*	7/24/17	17:40	Alabama Alps	29.25496 -88.33951	73	SH
OP17_010	*Swiftia exserta*	7/24/17	18:46	Alabama Alps	29.25391 -88.33904	79	SH
OP17_011	*Swiftia exserta*	7/24/17	19:28	Alabama Alps	29.25300 -88.33900	77	SH
OP17_012	*Swiftia exserta*	7/24/17	20:14	Alabama Alps	29.25300 -88.33900	78	SH
OP17_013	*Swiftia exserta*	7/24/17	20:54	Alabama Alps	29.25350 -88.33890	77	SH
OP17_014	*Swiftia exserta*	7/24/17	22:52	Alabama Alps	29.25303 -88.33922	75	SH
OP17_015	*Hypnogorgia pendula*	7/24/17	23:24	Alabama Alps	29.25290 -88.33920	75	SH
OP17_016	*Hypnogorgia pendula*	7/25/17	0:12	Alabama Alps	29.25200 -88.33900	75	SH

Sample ID	Scientific Name	Date (CST)	Time (CST)	Locality	Latitude	Depth (m)	Destination
OP17_017	*Hypnogorgia pendula*	7/25/17	0:45	Alabama Alps	29.25291 -88.33919	75	SH
OP17_018	*Swiftia exserta*	7/25/17	2:04	Alabama Alps	29.25288 -88.33845	78	SH
OP17_019	*Swiftia exserta*	7/25/17	2:18	Alabama Alps	29.25289 -88.33844	78	SH
OP17_020	*Swiftia exserta*	7/25/17	2:45	Alabama Alps	29.25289 -88.33841	78	SH
OP17_021	*Swiftia exserta*	7/25/17	2:52	Alabama Alps	29.25286 -88.33845	78	SH
OP17_022	*Hypnogorgia pendula*	7/25/17	3:20	Alabama Alps	29.25287 -88.33845	78	SH
OP17_023	*Hypnogorgia pendula*	7/25/17	3:38	Alabama Alps	29.25279 -88.33847	78	SH
OP17_024	*Swiftia exserta*	7/25/17	5:00	Alabama Alps	29.25213 -88.33774	75	SH
OP17_025	*Swiftia exserta*	7/25/17	5:25	Alabama Alps	29.25211 -88.33772	75	SH
OP17_026	*Swiftia exserta*	7/25/17	5:39	Alabama Alps	29.25211 -88.33772	75	SH
OP17_027	*Hypnogorgia pendula*	7/25/17	6:04	Alabama Alps	29.25208 -88.33771	76	SH
OP17_028A	*Hypnogorgia pendula*	7/25/17	6:27	Alabama Alps	29.25208 -88.33772	76	SH
OP17_028B	*Gorgonocephlus articus basket star*	7/25/17	6:27	Alabama Alps	29.25208 -88.33772	76	SH
OP17_029	*Swiftia exserta*	7/25/17	6:42	Alabama Alps	29.25207 -88.33771	76	SH
OP17_030	*Swiftia exserta*	7/25/17	7:08	Alabama Alps	29.25058 -88.33769	76	SH
OP17_031	*Swiftia exserta*	7/25/17	8:16	Alabama Alps	29.25198 -88.33770	76	SH
OP17_032	*Swiftia exserta*	7/25/17	8:22	Alabama Alps	29.25198 -88.33770	76	SH
OP17_033	*Hypnogorgia pendula*	7/25/17	8:35	Alabama Alps	29.25197 -88.33770	76	SH
OP17_034	*Hypnogorgia pendula*	7/25/17	8:50	Alabama Alps	29.25195 -88.33770	76	SH

Sample ID	Scientific Name	Date (CST)	Time (CST)	Locality	Latitude	Depth (m)	Destination
OP17_035	*Hypnogorgia pendula*	7/25/17	9:02	Alabama Alps	29.25194 -88.33774	75	SH
OP17_036	*Swiftia exserta*	7/25/17	9:29	Alabama Alps	29.25913 -88.33778	75	SH
OP17_037	*Hypnogorgia pendula*	7/25/17	9:39	Alabama Alps	29.25192 -88.33782	75	SH
OP17_038	*Hypnogorgia pendula*	7/25/17	14:07	Alabama Alps	29.23010 -88.33870	71	SH
OP17_039	*Swiftia exserta*	7/25/17	14:33	Alabama Alps	29.25000 -88.33930	72	SH
OP17_040	*Hypnogorgia pendula*	7/25/17	16:44	Alabama Alps	29.25279 -88.33921	71	SH
OP17_041	*Hypnogorgia pendula*	7/25/17	16:50	Alabama Alps	29.25279 -88.33921	71	SH
OP17_042	*Hypnogorgia pendula*	7/25/17	16:55	Alabama Alps	29.25279 -88.33922	71	SH
OP17_043	*Hypnogorgia pendula*	7/25/17	17:02	Alabama Alps	29.25279 -88.33922	71	SH
OP17_044	*Hypnogorgia pendula*	7/25/17	17:10	Alabama Alps	29.25277 -88.33922	71	SH
OP17_045	*Hypnogorgia pendula*	7/25/17	17:27	Alabama Alps	29.25277 -88.33912	71	SH
OP17_046	*Hypnogorgia pendula*	7/25/17	17:34	Alabama Alps	29.25278 -88.33916	71	SH
OP17_047	*Hypnogorgia pendula*	7/25/17	17:45	Alabama Alps	29.25278 -88.33912	73	SH
OP17_048	*Hypnogorgia pendula*	7/25/17	18:00	Alabama Alps	29.25264 -88.33920	71	SH
OP17_049	*Paramuricea biscaya*	7/26/17	10:23	DC673	28.31290 -87.30160	2206	SH
OP17_049B	*Euryalid*	7/26/17	10:23	DC673	28.31290 -87.30160	2206	SH
OP17_050	*Paramuricea biscaya*	7/26/17	10:49	DC673	28.31250 -87.30150	2220	SH
OP17_051	*Paramuricea biscaya*	7/26/17	11:05	DC673	28.31200 -87.30150	2222	SH
OP17_052	*Paramuricea biscaya*	7/26/17	11:16	DC673	28.31240 -87.30150	2223	SH

Sample ID	Scientific Name	Date (CST)	Time (CST)	Locality	Latitude	Depth (m)	Destination
OP17_053	*Paramuricea biscaya*	7/26/17	11:25	DC673	28.31240 -87.30150	2222	SH
OP17_054	*Paramuricea biscaya*	7/26/17	11:34	DC673	28.31240 -87.30150	2222	SH
OP17_054B	*Euryalid*	7/26/17	11:34	DC673	28.31240 -87.30150	2222	SH
OP17_055	*Paramuricea biscaya*	7/26/17	12:27	DC673	28.31200 -87.30100	2222	SH
OP17_056	*Paramuricea biscaya*	7/26/17	12:42	DC673	28.31200 -87.30100	2224	SH
OP17_056B	*Euryalid*	7/26/17	12:42	DC673	28.31200 -87.30100	2224	SH
OP17_057	*Paramuricea biscaya*	7/26/17	12:56	DC673	28.31200 -87.30100	2224	SH
OP17_058	*Paramuricea biscaya*	7/26/17	13:07	DC673	28.31200 -87.30100	2224	SH
OP17_059	*Paramuricea biscaya*	7/26/17	13:19	DC673	28.31200 -87.30100	2224	SH
OP17_059B	*Euryalid*	7/26/17	13:19	DC673	28.31200 -87.30100	2224	
OP17_060	*Paramuricea biscaya*	7/26/17	13:27	DC673	28.31200 -87.30100	2224	SH
OP17_060B	*Euryalid*	7/26/17	13:27	DC673	28.31200 -87.30100	2224	SH
OP17_061	*Paramuricea biscaya*	7/26/17	13:47	DC673	28.31200 -87.30100	2219	SH
OP17_061B	*Euryalid*	7/26/17	13:47	DC673	28.31200 -87.30100	2219	SH
OP17_060C	*Unknown Annelid*	7/26/17	13:27	DC673	28.31200 -87.30100	2224	
OP17_062	*Paramuricea biscaya*	7/26/17	13:51	DC673	28.31200 -87.30100	2219	SH
OP17_063	*Paramuricea biscaya*	7/26/17	14:05	DC673	28.31200 -87.30100	2217	SH
OP17_063B	*Euryalid*	7/26/17	14:05	DC673	28.31200 -87.30100	2217	SH
OP17_064	*Paramuricea biscaya*	7/26/17	14:10	DC673	28.31200 -87.30100	2217	SH

Sample ID	Scientific Name	Date (CST)	Time (CST)	Locality	Latitude	Depth (m)	Destination
OP17_065	*Paramuricea biscaya*	7/26/17	14:18	DC673	28.31200 -87.30100	2217	SH
OP17_065B	*Euryalid*	7/26/17	14:18	DC673	28.31200 -87.30100	2217	SH
OP17_066	*Paramuricea biscaya*	7/26/17	14:22	DC673	28.31200 -87.30100	2217	SH
OP17_066B	*Euryalid*	7/26/17	14:22	DC673	28.31200 -87.30100	2217	SH
OP17_067	*Paramuricea biscaya*	7/26/17	14:26	DC673	28.31200 -87.30100	2217	SH
OP17_068	*Paramuricea biscaya*	7/26/17	14:47	DC673	28.31200 -87.30100	2217	SH
OP17_069	*Paramuricea biscaya*	7/26/17	14:41	DC673	28.31200 -87.30100	2217	SH
OP17_069B	*Euryalid*	7/26/17	14:41	DC673	28.31200 -87.30100	2217	SH
OP17_070	*Paramuricea biscaya*	7/26/17	14:52	DC673	28.31200 -87.30100	2217	SH
OP17_071	*Paramuricea biscaya*	7/26/17	14:57	DC673	28.31200 -87.30100	2217	SH
OP17_072	*Paramuricea biscaya*	7/26/17	15:09	DC673	28.31200 -87.30100	2216	SH
OP17_072B	*Euryalid*	7/26/17	15:09	DC673	28.31200 -87.30100	2216	SH
OP17_073	*Paramuricea biscaya*	7/26/17	15:14	DC673	28.31200 -87.30100	2216	SH
OP17_074	*Paramuricea biscaya*	7/26/17	15:18	DC673	28.31200 -87.30100	2216	SH
OP17_074B	*Euryalid*	7/26/17	15:18	DC673	28.31200 -87.30100	2216	SH
OP17_075	*Swiftia exserta*	7/27/17	1:45	Roughtongue Reef	29.43965 -87.57628	68	SH
OP17_076	*Swiftia exserta*	7/27/17	2:00	Roughtongue Reef	29.43965 -87.57628	68	SH
OP17_077	*Hypnogorgia pendula*	7/27/17	2:25	Roughtongue Reef	29.43984 -87.57593	68	SH
OP17_078	*Hypnogorgia pendula*	7/27/17	2:38	Roughtongue Reef	29.43990 -87.57592	69	SH

Sample ID	Scientific Name	Date (CST)	Time (CST)	Locality	Latitude	Depth (m)	Destination
OP17_079	*Hypnogorgia pendula*	7/27/17	3:00	Roughtongue Reef	29.43992 -87.57590	68	SH
OP17_080	*Hypnogorgia pendula*	7/27/17	3:10	Roughtongue Reef	29.43993 -87.57587	68	SH
OP17_081	*Hypnogorgia pendula*	7/27/17	3:15	Roughtongue Reef	29.43993 -87.57587	68	SH
OP17_082	*Swiftia exserta*	7/27/17	3:26	Roughtongue Reef	29.43995 -87.57586	68	SH
OP17_083	*Swiftia exserta*	7/27/17	3:33	Roughtongue Reef	29.43996 -87.57583	68	SH
OP17_084	*Swiftia exserta*	7/27/17	3:44	Roughtongue Reef	29.43994 -87.57586	68	SH
OP17_085	*Hypnogorgia pendula*	7/27/17	3:49	Roughtongue Reef	29.44001 -87.57585	68	SH
OP17_086	*Swiftia exserta*	7/27/17	3:57	Roughtongue Reef	29.44001 -87.57585	68	SH
OP17_087	*Hypnogorgia pendula*	7/27/17	4:17	Roughtongue Reef	29.44004 -87.57586	68	SH
OP17_088	*Hypnogorgia pendula*	7/27/17	4:24	Roughtongue Reef	29.44004 -87.57584	68	SH
OP17_089	*Hypnogorgia pendula*	7/27/17	4:34	Roughtongue Reef	29.44005 -87.57583	68	SH
OP17_090	*Swiftia exserta*	7/27/17	4:44	Roughtongue Reef	29.44007 -87.57581	68	SH
OP17_091	*Swiftia exserta*	7/27/17	4:54	Roughtongue Reef	29.44008 -87.57582	68	SH
OP17_092	*Swiftia exserta*	7/27/17	5:42	Roughtongue Reef	29.44017 -87.57566	68	SH
OP17_093	*White Plexauridae*	7/27/17	5:58	Roughtongue Reef	29.44020 -87.57550	68	SH
OP17_094	*Swiftia exserta*	7/27/17	6:21	Roughtongue Reef	29.44010 -87.57550	68	SH
OP17_095	*Swiftia exserta*	7/27/17	6:59	Roughtongue Reef	29.43970 -87.57540	67	SH
OP17_096	*Swiftia exserta*	7/27/17	7:10	Roughtongue Reef	29.43971 -87.57538	67	SH
OP17_097	*Hypnogorgia pendula*	7/27/17	7:24	Roughtongue Reef	29.43946 -87.57538	68	SH

Sample ID	Scientific Name	Date (CST)	Time (CST)	Locality	Latitude	Depth (m)	Destination
OP17_098	*Hypnogorgia pendula*	7/27/17	7:47	Roughtongue Reef	29.43944 -87.57541	68	SH
OP17_087B	*Nudibranch*	7/27/17	4:17	Roughtongue Reef	29.44004 -87.57586	68	
OP17_093B	*Barnacle?*	7/27/17	5:58	Roughtongue Reef	29.44020 -87.57550	68	
OP17_094B	*Nudibranch*	7/27/17	6:21	Roughtongue Reef	29.44010 -87.57550	68	
OP17_099	*Swiftia exserta*	7/27/17	10:17	Roughtongue Reef	29.43872 -87.57544	66	SH
OP17_100	*Swiftia exserta*	7/27/17	10:24	Roughtongue Reef	29.43872 -87.57544	66	SH
OP17_101	*Swiftia exserta*	7/27/17	10:38	Roughtongue Reef	29.43871 -87.57542	65	SH
OP17_102	*Swiftia exserta*	7/27/17	10:46	Roughtongue Reef	29.43871 -87.57542	65	SH
OP17_103A	*Swiftia exserta*	7/27/17	11:05	Roughtongue Reef	29.43861 -87.57546	65	SH
OP17_103B	*Unknown Euryalid*	7/27/17	11:05	Roughtongue Reef	29.43861 -87.57546	65	
OP17_104	*Swiftia exserta*	7/27/17	11:16	Roughtongue Reef	29.43859 -87.57547	65	SH
OP17_105	*Swiftia exserta*	7/27/17	11:23	Roughtongue Reef	29.43860 -87.57547	65	SH
OP17_106	*Swiftia exserta*	7/27/17	11:40	Roughtongue Reef	29.43859 -87.57548	65	SH
OP17_107	*Swiftia exserta*	7/27/17	11:43	Roughtongue Reef	29.43859 -87.57548	65	SH
OP17_108	*Swiftia exserta*	7/27/17	11:49	Roughtongue Reef	29.43859 -87.57548	65	SH
OP17_109	*Swiftia exserta*	7/27/17	11:57	Roughtongue Reef	29.43857 -87.57548	65	SH
OP17_110	*Swiftia exserta*	7/27/17	12:02	Roughtongue Reef	29.43859 -87.57548	65	SH
OP17_111	*Swiftia exserta*	7/27/17	12:58	Roughtongue Reef	29.43891 -87.57552	65	SH
OP17_112	*Swiftia exserta*	7/27/17	13:09	Roughtongue Reef	29.43860 -87.57552	64	SH

Sample ID	Scientific Name	Date (CST)	Time (CST)	Locality	Latitude	Depth (m)	Destination
OP17_113	*Swiftia exserta*	7/27/17	13:16	Roughtongue Reef	29.43860 -87.57552	64	SH
OP17_114	*Swiftia exserta*	7/27/17	13:26	Roughtongue Reef	29.43860 -87.57557	65	SH
OP17_115	*Swiftia exserta*	7/27/17	13:40	Roughtongue Reef	29.43855 -87.57559	65	SH
OP17_116	*Hypnogorgia pendula*	7/27/17	14:05	Roughtongue Reef	29.43890 -87.57509	66	SH
OP17_117	*Sediment Core*	7/27/17	15:31	Roughtongue Reef	29.43892 -87.57627	67	AD
OP17_118	*White Plexauridae*	7/27/17	16:18	Roughtongue Reef	29.43902 -87.57650	66	SH
OP17_119	*White Plexauridae*	7/27/17	16:20	Roughtongue Reef	29.43902 -87.57650	66	SH
OP17_120	*White Plexauridae*	7/27/17	16:44	Roughtongue Reef	29.43877 -87.57665	66	SH
OP17_121	*White Plexauridae*	7/27/17	16:50	Roughtongue Reef	29.43878 -87.57665	66	SH
OP17_122	*White Plexauridae*	7/27/17	17:04	Roughtongue Reef	29.43879 -87.57670	65	SH
OP17_123	*White Plexauridae*	7/27/17	17:08	Roughtongue Reef	29.43878 -87.57670	65	SH
OP17_124	*White Plexauridae*	7/27/17	17:13	Roughtongue Reef	29.43878 -87.57671	65	SH
OP17_125	*White Plexauridae*	7/27/17	17:24	Roughtongue Reef	29.43870 -87.57860	67	SH
OP17_126	*White Plexauridae*	7/27/17	17:35	Roughtongue Reef	29.43879 -87.57683	67	SH
OP17_127	*Sediment Core*	7/27/17	15:28	Roughtongue Reef	29.43892 -87.57627	67	AD
OP17_128	*Lophelia pertusa*	7/28/17	6:14	VK826	29.15867 -88.01030	483	EC
OP17_129A	*Sediment Core*	7/28/17	6:47	VK826	29.15856 -88.01034	482	AD
OP17_129B	*Sediment Core*	7/28/17	6:47	VK826	29.15856 -88.01034	482	AD
OP17_129C	*Sediment Core*	7/28/17	6:47	VK826	29.15856 -88.01034	482	AD

Sample ID	Scientific Name	Date (CST)	Time (CST)	Locality	Latitude	Depth (m)	Destination
OP17_130A	*Sediment Core*	7/28/17	6:49	VK826	29.15856 -88.01034	482	AD
OP17_130B	*Sediment Core*	7/28/17	6:49	VK826	29.15856 -88.01034	482	AD
OP17_130C	*Sediment Core*	7/28/17	6:49	VK826	29.15856 -88.01034	482	AD
OP17_131A	*Sediment Core*	7/28/17	6:51	VK826	29.15856 -88.01034	482	AD
OP17_131B	*Sediment Core*	7/28/17	6:51	VK826	29.15856 -88.01034	482	AD
OP17_131C	*Sediment Core*	7/28/17	6:51	VK826	29.15856 -88.01034	482	AD
OP17_132A	*Sediment Core*	7/28/17	6:53	VK826	29.15856 -88.01034	482	AD
OP17_132B	*Sediment Core*	7/28/17	6:53	VK826	29.15856 -88.01034	482	AD
OP17_132C	*Sediment Core*	7/28/17	6:53	VK826	29.15856 -88.01034	482	AD
OP17_133A	*Sediment Core*	7/28/17	7:00	VK826	29.15856 -88.01034	482	AD
OP17_133B	*Sediment Core*	7/28/17	7:00	VK826	29.15856 -88.01034	482	AD
OP17_133C	*Sediment Core*	7/28/17	7:00	VK826	29.15856 -88.01034	482	AD
OP17_134	*Lophelia pertusa*	7/28/17	7:15	VK826	29.15855 -88.01030	481	EC
OP17_134B	*Crinoid*	7/28/17	7:15	VK826	29.15855 -88.01030	481	SH
OP17_135	*Callogorgia delta*	7/29/17	22:12	GC249	27.72392 -90.51405	794	SH
OP17_135B	*Asteroschema*	7/29/17	22:12	GC249	27.72392 -90.51405	794	SH
OP17_136	*Callogorgia delta*	7/29/17	22:27	GC249	27.72391 -90.51405	794	SH
OP17_136B	*Asteroschema*	7/29/17	22:27	GC249	27.72391 -90.51405	794	SH
OP17_137	*Callogorgia delta*	7/29/17	22:41	GC249	27.72389 -90.51405	793	SH

Sample ID	Scientific Name	Date (CST)	Time (CST)	Locality	Latitude	Depth (m)	Destination
OP17_137B	*Asteroschema*	7/29/17	22:41	GC249	27.72389 -90.51405	793	SH
OP17_137C	*Snail*	7/29/17	22:41	GC249	27.72389 -90.51405	793	SH
OP17_138	*Callogorgia delta*	7/29/17	22:54	GC249	27.72394 -90.51429	795	SH
OP17_139	*Callogorgia delta*	7/29/17	23:04	GC249	27.72392 -90.51432	795	SH
OP17_139B	*Asteroschema*	7/29/17	23:04	GC249	27.72392 -90.51432	795	SH
OP17_140	*Callogorgia delta*	7/29/17	23:38	GC249	27.72393 -90.51431	795	SH
OP17_140B	*Asteroschema*	7/29/17	23:28	GC249	27.72393 -90.51431	795	SH
OP17_141	*Callogorgia delta*	7/29/17	23:41	GC249	27.72392 -90.51431	795	SH
OP17_141B	*Asteroschema*	7/29/17	23:41	GC249	27.72392 -90.51431	795	SH
OP17_142	*Callogorgia delta*	7/29/17	23:56	GC249	27.72385 -90.51436	795	SH
OP17_142B	*Asteroschema*	7/29/17	23:56	GC249	27.72385 -90.51436	795	SH
OP17_143	*Callogorgia delta*	7/30/17	0:10	GC249	27.72390 -90.51436	795	SH
OP17_143B	*Asteroschema*	7/30/17	0:10	GC249	27.72390 -90.51436	795	SH
OP17_144	*Callogorgia delta*	7/30/17	0:26	GC249	27.72391 -90.51439	795	SH
OP17_144B	*Asteroschema*	7/30/17	0:26	GC249	27.72391 -90.51439	795	SH
OP17_144C	*Ophiuroid*	7/30/17	0:26	GC249	27.72391 -90.51439	795	SH
OP17_145A	*Sediment Core*	7/30/17	1:05	GC249	27.72395 -90.51405	795	AD
OP17_145B	*Sediment Core*	7/30/17	1:05	GC249	27.72395 -90.51405	795	AD
OP17_145C	*Sediment Core*	7/30/17	1:05	GC249	27.72395 -90.51405	795	AD

Sample ID	Scientific Name	Date (CST)	Time (CST)	Locality	Latitude	Depth (m)	Destination
OP17_146A	*Sediment Core*	7/30/17	1:09	GC249	27.72395 -90.51405	795	AD
OP17_146B	*Sediment Core*	7/30/17	1:09	GC249	27.72395 -90.51405	795	AD
OP17_146C	*Sediment Core*	7/30/17	1:09	GC249	27.72395 -90.51405	795	AD
OP17_147A	*Sediment Core*	7/30/17	1:10	GC249	27.72395 -90.51405	795	AD
OP17_147B	*Sediment Core*	7/30/17	1:10	GC249	27.72395 -90.51405	795	AD
OP17_147C	*Sediment Core*	7/30/17	1:10	GC249	27.72395 -90.51405	795	AD
OP17_148A	*Sediment Core*	7/30/17	1:19	GC249	27.72395 -90.51405	795	AD
OP17_148B	*Sediment Core*	7/30/17	1:19	GC249	27.72395 -90.51405	795	AD
OP17_148C	*Sediment Core*	7/30/17	1:19	GC249	27.72395 -90.51405	795	AD
OP17_149A	*Sediment Core*	7/30/17	1:20	GC249	27.72395 -90.51405	795	AD
OP17_149B	*Sediment Core*	7/30/17	1:20	GC249	27.72395 -90.51405	795	AD
OP17_149C	*Sediment Core*	7/30/17	1:20	GC249	27.72395 -90.51405	795	AD
OP17_150A	*Sediment Core*	7/30/17	1:23	GC249	27.72395 -90.51405	795	AD
OP17_150B	*Sediment Core*	7/30/17	1:23	GC249	27.72395 -90.51405	795	AD
OP17_150C	*Sediment Core*	7/30/17	1:23	GC249	27.72395 -90.51405	795	AD
OP17_151	*Paramuricea biscaya*	8/1/17	10:30	KC405	26.57058 -93.48339	1705	SH
OP17_152	*Swiftia sp.*	8/1/17	10:48	KC405	26.57054 -93.48343	1703	SH
OP17_153	*Paramuricea biscaya*	8/1/17	11:00	KC405	26.57060 -93.48331	1703	SH
OP17_153B	*Ophiuroid*	8/1/17	11:00	KC405	26.57060 -93.48331	1703	SH

Sample ID	Scientific Name	Date (CST)	Time (CST)	Locality	Latitude	Depth (m)	Destination
OP17_154	*Paramuricea biscaya*	8/1/17	11:17	KC405	26.57061 -93.48330	1703	SH
OP17_155	*Paramuricea biscaya*	8/1/17	11:59	KC405	26.57063 -93.48329	1700	SH
OP17_155B	*Ophiuroid*	8/1/17	11:59	KC405	26.57063 -93.48329	1700	SH
OP17_156	*Paramuricea biscaya*	8/1/17	12:06	KC405	26.57056 -93.48328	1700	SH
OP17_157	*Paramuricea biscaya*	8/1/17	12:12	KC405	26.57050 -93.48320	1698	SH
OP17_157B	*Ophiuroid*	8/1/17	12:12	KC405	26.57050 -93.48320	1698	SH
OP17_158	*Paramuricea biscaya*	8/1/17	12:23	KC405	26.57050 -93.48320	1698	SH
OP17_158B	*Ophiuroid*	8/1/17	12:23	KC405	26.57050 -93.48320	1698	SH
OP17_159	*Paramuricea biscaya*	8/1/17	12:35	KC405	26.57050 -93.48320	1697	SH
OP17_159B	*Ophiuroid*	8/1/17	12:35	KC405	26.57050 -93.48320	1697	SH
OP17_160	*Paragorgia*	8/1/17	12:48	KC405	26.57050 -93.48320	1695	SH
OP17_161	*Paramuricea biscaya*	8/1/17	12:55	KC405	26.57050 -93.48320	1694	SH
OP17_162	*Paramuricea biscaya*	8/1/17	13:04	KC405	26.57060 -93.48320	1693	SH
OP17_163	*Paramuricea biscaya*	8/1/17	13:21	KC405	26.57050 -93.48320	1693	SH
OP17_164	*Paramuricea biscaya*	8/1/17	13:30	KC405	26.57060 -93.48310	1692	SH
OP17_164	*Ophiuroid*	8/1/17	13:30	KC405	26.57060 -93.48310	1692	SH
OP17_165	*Paramuricea biscaya*	8/1/17	13:36	KC405	26.57060 -93.48100	1691	SH
OP17_165B	*Ophiuroid*	8/1/17	13:36	KC405	26.57060 -93.48100	1691	SH
OP17_166	*Paramuricea biscaya*	8/1/17	13:43	KC405	26.57060 -93.48310	1691	SH

Sample ID	Scientific Name	Date (CST)	Time (CST)	Locality	Latitude	Depth (m)	Destination
OP17_166B	*Ophiuroid*	8/1/17	13:43	KC405	26.57060 -93.48310	1691	SH
OP17_167	*Paramuricea biscaya*	8/1/17	14:05	KC405	26.57060 -93.48310	1689	SH
OP17_167B	*Ophiuroid*	8/1/17	14:05	KC405	26.57060 -93.48310	1689	SH
OP17_168	*Paramuricea biscaya*	8/1/17	14:21	KC405	26.57060 -93.48310	1688	SH
OP17_168B	*Ophiuroid*	8/1/17	14:21	KC405	26.57060 -93.48310	1688	SH
OP17_169	*Paramuricea biscaya*	8/1/17	14:31	KC405	26.57050 -93.48310	1684	SH
OP17_169B	*Ophiuroid*	8/1/17	14:31	KC405	26.57050 -93.48310	1684	SH
OP17_170	*Paramuricea biscaya*	8/1/17	14:42	KC405	26.50660 -93.48304	1682	SH
OP17_171	*Paramuricea biscaya*	8/1/17	14:54	KC405	26.57070 -93.48300	1678	SH
OP17_171B	*Ophiuroid*	8/1/17	14:54	KC405	26.57070 -93.48300	1678	SH
OP17_172	*Paramuricea biscaya*	8/1/17	15:02	KC405	26.57070 -93.48300	1678	SH
OP17_173	*Paramuricea biscaya*	8/1/17	15:31	KC405	26.57070 -93.48290	1673	SH
OP17_174	*Paramuricea biscaya*	8/1/17	15:42	KC405	26.57070 -93.48280	1666	SH
OP17_175	*Paramuricea biscaya*	8/1/17	15:58	KC405	26.57080 -93.48260	1656	SH
OP17_175B	*Ophiuroid*	8/1/17	15:58	KC405	26.57080 -93.48260	1656	SH
OP17_176	*Paramuricea biscaya*	8/1/17	16:26	KC405	26.57095 -93.48260	1658	SH
OP17_176B	*Ophiuroid*	8/1/17	16:26	KC405	26.57095 -93.48260	1658	SH
OP17_177	*Paramuricea biscaya*	8/1/17	16:33	KC405	26.57105 -93.48260	1658	SH
OP17_177B	*Ophiuroid*	8/1/17	16:33	KC405	26.57105 -93.48260	1658	SH

Sample ID	Scientific Name	Date (CST)	Time (CST)	Locality	Latitude	Depth (m)	Destination
OP17_178	*Paramuricea biscaya*	8/1/17	16:48	KC405	26.57130 -93.48259	1657	SH
OP17_178B	*Ophiuroid*	8/1/17	16:48	KC405	26.57130 -93.48259	1657	SH
OP17_179	*Paramuricea biscaya*	8/1/17	16:53	KC405	26.57163 -93.48251	1660	SH
OP17_179B	*Ophiuroid*	8/1/17	16:53	KC405	26.57163 -93.48251	1660	SH
OP17_180	*Paramuricea biscaya*	8/1/17	17:25	KC405	26.57169 -93.48258	1661	SH
OP17_180B	*Ophiuroid*	8/1/17	17:25	KC405	26.57169 -93.48258	1661	SH
OP17_181	*Paramuricea biscaya*	8/1/17	17:37	KC405	26.57171 -93.48256	1662	SH
OP17_182	*Paramuricea biscaya*	8/1/17	17:54	KC405	26.57000 -93.48252	1663	SH
OP17_182B	*Ophiuroid*	8/1/17	17:54	KC405	26.57000 -93.48252	1663	SH
OP17_183	*Paramuricea biscaya*	8/1/17	18:22	KC405	26.57188 -93.48249	1664	SH
OP17_183B	*Ophiuroid*	8/1/17	18:22	KC405	26.57188 -93.48249	1664	SH
OP17_184	*Paramuricea biscaya*	8/1/17	18:54	KC405	26.57201 -93.48251	1666	SH
OP17_184B	*Ophiuroid*	8/1/17	18:54	KC405	26.57201 -93.48251	1666	SH
OP17_185	*Squat lobster*	8/1/17	19:18	KC405	26.57201 -93.48251	1666	SH
OP17_186	*Paramuricea biscaya*	8/1/17	16:48	KC405	26.57163 -93.48251	1660	SH
OP17_187	*Mystery bulk*	8/1/17	NA	KC405	NA NA	NA	SH
OP17_187B	*Ophiuroid*	8/1/17	NA	KC405	NA NA	NA	SH
OP17_188	*Sediment Core*	8/1/17	19:25	KC405	26.57202 -93.48251	1666	AD
OP17_189	*Paramuricea biscaya*	8/2/17	13:56	GC852	27.10992 -91.16616	1411	SH
OP17_190	*Paramuricea biscaya*	8/2/17	14:07	GC852	27.10999 -91.16597	1411	SH

Sample ID	Scientific Name	Date (CST)	Time (CST)	Locality	Latitude	Depth (m)	Destination
OP17_191	*Paramuricea biscaya*	8/2/17	14:27	GC852	27.10993 -91.16593	1411	SH
OP17_192	*Paramuricea biscaya*	8/2/17	14:54	GC852	27.10998 -91.16611	1411	SH
OP17_193	*Paramuricea biscaya*	8/2/17	15:04	GC852	27.11000 -91.16608	1410	SH
OP17_194	*Paramuricea biscaya*	8/2/17	15:08	GC852	27.11001 -91.16608	1410	SH
OP17_195	*Paramuricea biscaya*	8/2/17	15:30	GC852	27.10363 -91.15318	1410	SH
OP17_196	*Paramuricea biscaya*	8/2/17	15:41	GC852	27.10997 -91.16594	1411	SH
OP17_197	*Swiftia sp.*	8/2/17	15:46	GC852	27.10997 -91.16594	1411	SH
OP17_198	*Paramuricea biscaya*	8/2/17	16:31	GC852	27.10981 -91.16595	1412	SH
OP17_198B	*Ophiuroid*	8/2/17	16:31	GC852	27.10981 -91.16595	1412	SH
OP17_199	*Paramuricea biscaya*	8/2/17	16:46	GC852	27.09880 -91.16609	1413	SH
OP17_200	*Paramuricea biscaya*	8/2/17	17:09	GC852	27.10988 -91.16607	1412	SH
OP17_201	*Paramuricea biscaya*	8/2/17	17:25	GC852	27.10984 -91.16600	1412	SH
OP17_202	*Paramuricea biscaya*	8/2/17	17:28	GC852	27.10980 -91.16605	1412	SH
OP17_203	*Paramuricea biscaya*	8/2/17	17:35	GC852	27.10980 -91.16605	1412	SH
OP17_204	*Paramuricea biscaya*	8/2/17	18:55	GC852	27.10974 -91.16634	1412	SH
OP17_205	*Paramuricea biscaya*	8/2/17	19:47	GC852	27.10979 -91.16632	1412	SH
OP17_206	*Paramuricea biscaya*	8/2/17	19:54	GC852	27.10979 -91.16632	1412	SH
OP17_207	*Paramuricea biscaya*	8/2/17	20:14	GC852	27.10974 -91.16629	1410	SH
OP17_208	*Paramuricea biscaya*	8/2/17	20:22	GC852	27.10993 -91.16631	1410	SH

Sample ID	Scientific Name	Date (CST)	Time (CST)	Locality	Latitude	Depth (m)	Destination
OP17_209	*Paramuricea biscaya*	8/2/17	20:31	GC852	27.10976 -91.16631	1410	SH
OP17_210A	*Sediment Core*	8/2/17	20:52	GC852	27.10979 -91.16630	1412	AD
OP17_210B	*Sediment Core*	8/2/17	20:52	GC852	27.10979 -91.16630	1412	AD
OP17_210C	*Sediment Core*	8/2/17	20:52	GC852	27.10979 -91.16630	1412	AD
OP17_211	*Sediment Core*	8/2/17	20:54	GC852	27.10979 -91.16630	1412	AD
OP17_212	*Sediment Core*	8/2/17	20:55	GC852	27.10979 -91.16630	1412	AD
OP17_213	*Paramuricea B3*	8/2/17	21:17	GC852	27.11006 -91.16633	1411	SH
OP17_213B	*Ophiuroid*	8/2/17	21:17	GC852	27.11006 -91.16633	1411	SH
OP17_214	*Sediment Core*	8/2/17	21:34	GC852	27.11007 -91.16637	1413	AD
OP17_215	*Sediment Core*	8/2/17	21:36	GC852	27.11007 -91.16637	1413	AD
OP17_216	*Sediment Core*	8/2/17	21:37	GC852	27.11007 -91.16637	1413	AD
OP17_217	*Paramuricea B3*	8/2/17	21:44	GC852	27.11012 -91.16624	1411	SH
OP17_218	*Callogorgia delta*	8/3/17	3:55	GC234	27.74645 -91.12245	511	SH
OP17_218B	*Ophiuroid*	8/3/17	3:55	GC234	27.74645 -91.12245	511	SH
OP17_218C	*Ophiuroid*	8/3/17	3:55	GC234	27.74645 -91.12245	511	SH
OP17_218D	*Amphipod*	8/3/17	3:55	GC234	27.74645 -91.12245	511	SH
OP17_219	*Callogorgia delta*	8/3/17	4:37	GC234	27.74640 -91.22446	510	SH
OP17_219B	*Ophiuroid*	8/3/17	4:37	GC234	27.74640 -91.22446	510	SH
OP17_220	*Callogorgia delta*	8/3/17	4:55	GC234	27.74648 -91.22445	510	SH

Sample ID	Scientific Name	Date (CST)	Time (CST)	Locality	Latitude	Depth (m)	Destination
OP17_220B	*Ophiuroid*	8/3/17	4:55	GC234	27.74648 -91.22445	510	SH
OP17_221	*Callogorgia delta*	8/3/17	5:01	GC234	27.74648 -91.22445	510	SH
OP17_222	*Callogorgia delta*	8/3/17	5:14	GC234	27.74640 -91.22447	510	SH
OP17_222B	*Ophiuroid*	8/3/17	5:14	GC234	27.74640 -91.22447	510	SH
OP17_222C	*Amphipod*	8/3/17	5:14	GC234	27.74640 -91.22447	510	SH
OP17_223	*Callogorgia delta*	8/3/17	5:25	GC234	27.74640 -91.22447	510	SH
OP17_223B	*Ophiuroid*	8/3/17	5:25	GC234	27.74640 -91.22447	510	SH
OP17_224	*Callogorgia delta*	8/3/17	5:56	GC234	27.74643 -91.22445	510	SH
OP17_225	*Callogorgia delta*	8/3/17	6:05	GC234	27.74650 -91.22442	511	SH
OP17_226	*Callogorgia delta*	8/3/17	6:10	GC234	27.74650 -91.22442	511	SH
OP17_227	*Callogorgia delta*	8/3/17	6:24	GC234	27.74650 -91.22445	510	SH
OP17_227B	*Ophiuroid*	8/3/17	6:24	GC234	27.74650 -91.22445	510	SH
OP17_228	*Callogorgia delta*	8/3/17	6:31	GC234	27.74650 -91.22445	510	SH
OP17_228B	*Amphipod*	8/3/17	6:31	GC234	27.74650 -91.22445	510	SH
OP17_229	*Callogorgia delta*	8/3/17	6:37	GC234	27.74650 -91.22442	510	SH
OP17_229B	*Amphipod*	8/3/17	6:37	GC234	27.74650 -91.22442	510	SH
OP17_230	*Callogorgia delta*	8/3/17	6:50	GC234	27.74650 -91.22445	510	SH
OP17_231	*Callogorgia delta*	8/3/17	7:04	GC234	27.74654 -91.22445	510	SH
OP17_232	*Callogorgia delta*	8/3/17	7:08	GC234	27.74652 -91.22443	510	SH

Sample ID	Scientific Name	Date (CST)	Time (CST)	Locality	Latitude	Depth (m)	Destination
OP17_232B	*Amphipod*	8/3/17	7:08	GC234	27.74652 -91.22443	510	SH
OP17_233	*Callogorgia delta*	8/3/17	7:23	GC234	27.74655 -91.22445	510	SH
OP17_234	*Callogorgia delta*	8/3/17	7:44	GC234	27.74654 -91.22449	510	SH
OP17_235	*Callogorgia delta*	8/3/17	7:53	GC234	27.74654 -91.22448	510	SH
OP17_236	*Callogorgia delta*	8/3/17	8:00	GC234	27.74656 -91.22445	510	SH
OP17_236B	*Ophiuroid*	8/3/17	8:00	GC234	27.74656 -91.22445	510	SH
OP17_237	*Callogorgia delta*	8/3/17	8:27	GC234	27.46574 -91.22449	510	SH
OP17_238A	*Sediment Core*	8/3/17	8:57	GC234	27.75262 -91.22449	510	AD
OP17_238B	*Sediment Core*	8/3/17	8:57	GC234	27.75262 -91.22449	510	AD
OP17_238C	*Sediment Core*	8/3/17	8:57	GC234	27.75262 -91.22449	510	AD
OP17_239	*Sediment Core*	8/3/17	8:58	GC234	27.75262 -91.22449	510	AD
OP17_240A	*Sediment Core*	8/3/17	9:00	GC234	27.75262 -91.22449	510	AD
OP17_240B	*Sediment Core*	8/3/17	9:00	GC234	27.75262 -91.22449	510	AD
OP17_240C	*Sediment Core*	8/3/17	9:00	GC234	27.75262 -91.22449	510	AD
OP17_241A	*Sediment Core*	8/3/17	9:07	GC234	27.74674 -91.22451	510	AD
OP17_241B	*Sediment Core*	8/3/17	9:07	GC234	27.74674 -91.22451	510	AD
OP17_241C	*Sediment Core*	8/3/17	9:07	GC234	27.74674 -91.22451	510	AD
OP17_242A	*Sediment Core*	8/3/17	9:09	GC234	27.74674 -91.22451	510	AD
OP17_242B	*Sediment Core*	8/3/17	9:09	GC234	27.74674 -91.22451	510	AD

Sample ID	Scientific Name	Date (CST)	Time (CST)	Locality	Latitude	Depth (m)	Destination
OP17_242C	*Sediment Core*	8/3/17	9:09	GC234	27.74674 -91.22451	510	AD
OP17_243A	*Sediment Core*	8/3/17	9:11	GC234	27.74674 -91.22451	510	AD
OP17_243B	*Sediment Core*	8/3/17	9:11	GC234	27.74674 -91.22451	510	AD
OP17_243C	*Sediment Core*	8/3/17	9:11	GC234	27.74674 -91.22451	510	AD
OP17_244	*Callogorgia delta*	8/4/17	0:13	GC290	27.68906 -90.64630	852	SH
OP17_245	*Callogorgia delta*	8/4/17	0:21	GC290	27.68904 -90.64602	852	SH
OP17_245B	*Ophiuroid*	8/4/17	0:21	GC290	27.68904 -90.64602	852	SH
OP17_246	*Callogorgia delta*	8/4/17	0:29	GC290	27.68904 -90.64602	852	SH
OP17_247	*Callogorgia delta*	8/4/17	0:31	GC290	27.68904 -90.64602	852	SH
OP17_248	*Callogorgia delta*	8/4/17	0:45	GC290	27.68904 -90.64602	852	SH
OP17_248B	*Ophiuroid*	8/4/17	0:45	GC290	27.68904 -90.64602	852	SH
OP17_249	*Callogorgia delta*	8/4/17	1:01	GC290	27.68907 -90.64602	852	SH
OP17_250	*Callogorgia delta*	8/4/17	1:10	GC290	27.68902 -90.64597	852	SH
OP17_251	*Callogorgia delta*	8/4/17	1:17	GC290	27.68902 -90.64597	852	SH
OP17_252	*Callogorgia delta*	8/4/17	1:27	GC290	27.68903 -90.64604	852	SH
OP17_253	*Callogorgia delta*	8/4/17	2:08	GC290	27.68903 -90.64604	852	SH
OP17_253B	*Ophiuroid*	8/4/17	2:08	GC290	27.68903 -90.64604	852	SH
OP17_254	*Callogorgia delta*	8/4/17	2:29	GC290	27.68901 -90.64601	852	SH
OP17_255	*Callogorgia delta*	8/4/17	2:41	GC290	27.68902 -90.64596	852	SH

Sample ID	Scientific Name	Date (CST)	Time (CST)	Locality	Latitude	Depth (m)	Destination
OP17_256	*Callogorgia delta*	8/4/17	2:54	GC290	27.68913 -90.64607	852	SH
OP17_257	*Callogorgia delta*	8/4/17	3:13	GC290	27.69063 -90.64607	852	SH
OP17_258	*Callogorgia delta*	8/4/17	3:41	GC290	27.68910 -90.64602	852	SH
OP17_259	*Callogorgia delta*	8/4/17	3:52	GC290	27.68910 -90.64602	852	SH
OP17_260	*Callogorgia delta*	8/4/17	3:58	GC290	27.68910 -90.64602	852	SH
OP17_260B	*Ophiuroid*	8/4/17	3:58	GC290	27.68910 -90.64602	852	SH
OP17_261	*Callogorgia delta*	8/4/17	5:58	GC290	27.68905 -90.64562	852	SH
OP17_262	*Callogorgia delta*	8/4/17	6:03	GC290	27.68905 -90.64562	852	SH
OP17_263	*Callogorgia delta*	8/4/17	6:13	GC290	27.68905 -90.64562	852	SH
OP17_264	*Callogorgia delta*	8/4/17	6:20	GC290	27.68905 -90.64562	852	SH
OP17_264B	*Ophiuroid*	8/4/17	6:20	GC290	27.68905 -90.64562	852	SH
OP17_265	*Callogorgia delta*	8/4/17	6:26	GC290	27.68905 -90.64562	852	SH
OP17_265B	*Ophiuroid*	8/4/17	6:26	GC290	27.68905 -90.64562	852	SH
OP17_266	*Callogorgia delta*	8/4/17	6:37	GC290	27.68905 -90.64560	851	SH
OP17_267	*Callogorgia delta*	8/4/17	6:46	GC290	27.68901 -90.64568	853	SH
OP17_268	*Callogorgia delta*	8/4/17	6:57	GC290	27.68901 -90.64568	853	SH
OP17_268B	*Ophiuroid*	8/4/17	6:57	GC290	27.68901 -90.64568	853	SH
OP17_269	*Callogorgia delta*	8/4/17	7:18	GC290	27.68901 -90.64568	853	SH
OP17_270	*Callogorgia delta*	8/4/17	7:37	GC290	27.68911 -90.64565	853	SH

Sample ID	Scientific Name	Date (CST)	Time (CST)	Locality	Latitude	Depth (m)	Destination
OP17_270B	*Ophiuroid*	8/4/17	7:37	GC290	27.68911 -90.64565	853	SH
OP17_270C	*Catshark egg case*	8/4/17	7:37	GC290	27.68911 -90.64565	853	SH
OP17_271	*Callogorgia delta*	8/4/17	7:44	GC290	27.68911 -90.64565	853	SH
OP17_272	*Callogorgia delta*	8/4/17	7:52	GC290	27.68908 -90.64581	853	SH
OP17_273	*Callogorgia delta*	8/4/17	8:01	GC290	27.68908 -90.64581	853	SH
OP17_274	*Callogorgia delta*	8/4/17	8:11	GC290	27.68910 -90.64565	852	SH
OP17_275	*Callogorgia delta*	8/4/17	8:23	GC290	27.69890 -90.64560	852	SH
OP17_275B	*Ophiuroid*	8/4/17	8:23	GC290	27.69890 -90.64560	852	SH
OP17_276	*Callogorgia delta*	8/4/17	8:31	GC290	27.68902 -90.64631	852	SH
OP17_276B	*Ophiuroid*	8/4/17	8:31	GC290	27.68902 -90.64631	852	SH
OP17_277	*Callogorgia delta*	8/4/17	8:40	GC290	27.68920 -90.64607	852	SH
OP17_277B	*Ophiuroid*	8/4/17	8:40	GC290	27.68920 -90.64607	852	SH
OP17_278	*Hypnogorgia pendula*	8/4/17	3:44	GC290	27.83070 -92.06500	97	SH
OP17_278B	*Ophiuroid*	8/4/17	3:44	GC290	27.83070 -92.06500	97	SH
OP17_278C	*Ophiuroid*	8/4/17	3:44	GC290	27.83070 -92.06500	97	SH
OP17_279	*Hypnogorgia pendula*	8/4/17	3:54	GC290	27.93070 -92.06510	95	SH
OP17_279B	*Ophiuroid*	8/4/17	3:54	GC290	27.93070 -92.06510	95	SH
OP17_280	*Hypnogorgia pendula*	8/4/17	4:04	GC290	27.97030 -92.06520	96	SH
OP17_281	*Hypnogorgia pendula*	8/4/17	4:19	GC290	27.93065 -92.06520	96	SH

Sample ID	Scientific Name	Date (CST)	Time (CST)	Locality	Latitude	Depth (m)	Destination
OP17_282	*Hypnogorgia pendula*	8/4/17	4:29	GC290	29.30630 -92.06525	96	SH
OP17_282B	*Ophiuroid*	8/4/17	4:29	GC290	29.30630 -92.06525	96	SH
OP17_282C	*Ophiuroid*	8/4/17	4:29	GC290	29.30630 -92.06525	96	SH
OP17_283	*Hypnogorgia pendula*	8/4/17	4:38	GC290	27.93063 -92.06520	96	SH
OP17_283B	*Ophiuroid*	8/4/17	4:38	GC290	27.93063 -92.06520	96	SH
OP17_283C	*Ophiuroid*	8/4/17	4:38	GC290	27.93063 -92.06520	96	SH
OP17_284	*Hypnogorgia pendula*	8/4/17	4:52	GC290	27.93075 -92.06531	97	SH
OP17_285	*Hypnogorgia pendula*	8/4/17	5:05	GC290	27.93087 -92.06582	97	SH
OP17_286	*Hypnogorgia pendula*	8/4/17	5:25	GC290	27.93081 -92.06527	96	SH
OP17_287	*Hypnogorgia pendula*	8/4/17	5:40	GC290	27.93084 -92.06515	96	SH
OP17_288	*Hypnogorgia pendula*	8/4/17	5:55	GC290	27.93081 -92.06513	96	SH
OP17_289	*Hypnogorgia pendula*	8/4/17	6:05	GC290	27.93078 -92.06512	96	SH
OP17_289B	*Ophiuroid*	8/4/17	6:05	GC290	27.93078 -92.06512	96	SH
OP17_290	*Hypnogorgia pendula*	8/4/17	6:20	GC290	27.93083 -92.06510	96	SH
OP17_291	*Hypnogorgia pendula*	8/4/17	6:27	GC290	27.93083 -92.06506	96	SH
OP17_292	*Hypnogorgia pendula*	8/4/17	6:34	GC290	27.93083 -92.06506	96	SH
OP17_293	*Hypnogorgia pendula*	8/5/17	15:13	Parker Bank	27.90370 -92.06503	95	SH
OP17_293B	*Astrocyclus*	8/5/17	15:13	Parker Bank	27.90370 -92.06503	95	SH
OP17_293C	*Astrocyclus*	8/5/17	15:13	Parker Bank	27.90370 -92.06503	95	SH

Sample ID	Scientific Name	Date (CST)	Time (CST)	Locality	Latitude	Depth (m)	Destination
OP17_293D	*Euryalid*	8/5/17	15:13	Parker Bank	27.90370 -92.06503	95	SH
OP17_294	*Hypnogorgia pendula*	8/5/17	15:21	Parker Bank	27.93069 -92.06509	95	SH
OP17_294B	*Gorgoncephalus*	8/5/17	15:21	Parker Bank	27.93069 -92.06509	95	SH
OP17_294C	*Euryalid*	8/5/17	15:21	Parker Bank	27.93069 -92.06509	95	SH
OP17_294D	*Euryalid*	8/5/17	15:21	Parker Bank	27.93069 -92.06509	95	SH
OP17_295	*Hypnogorgia pendula*	8/5/17	15:29	Parker Bank	27.93072 -92.06509	95	SH
OP17_296	*Hypnogorgia pendula*	8/5/17	15:39	Parker Bank	27.93082 -92.06491	95	SH
OP17_296B	*Gorgoncephalus*	8/5/17	15:39	Parker Bank	27.93082 -92.06491	95	SH
OP17_296C	*Euryalid*	8/5/17	15:39	Parker Bank	27.93082 -92.06491	95	SH
OP17_296D	*Euryalid*	8/5/17	15:39	Parker Bank	27.93082 -92.06491	95	SH
OP17_297	*Hypnogorgia pendula*	8/5/17	15:42	Parker Bank	27.93100 -92.06499	94	SH
OP17_297B	*ophiuroid arm*	8/5/17	15:42	Parker Bank	27.93100 -92.06499	94	SH
OP17_298	*Hypnogorgia pendula*	8/5/17	15:54	Parker Bank	27.93100 -92.06498	95	SH
OP17_299	*Hypnogorgia pendula*	8/5/17	15:58	Parker Bank	27.93100 -92.06498	95	SH
OP17_300	*Hypnogorgia pendula*	8/5/17	16:06	Parker Bank	27.93101 -92.06499	95	SH
OP17_301	*Hypnogorgia pendula*	8/5/17	16:17	Parker Bank	27.93104 -92.06501	94	SH
OP17_302	*Hypnogorgia pendula*	8/5/17	16:34	Parker Bank	27.93104 -92.06500	94	SH
OP17_302B	*Euryalid*	8/5/17	16:34	Parker Bank	27.93104 -92.06500	94	SH
OP17_303	*Hypnogorgia pendula*	8/5/17	16:40	Parker Bank	27.93104 -92.06500	94	SH

Sample ID	Scientific Name	Date (CST)	Time (CST)	Locality	Latitude	Depth (m)	Destination
OP17_304	*Hypnogorgia pendula*	8/5/17	16:46	Parker Bank	27.93105 -92.06498	94	SH
OP17_305	*Hypnogorgia pendula*	8/5/17	16:54	Parker Bank	27.93105 -92.06497	94	SH
OP17_306	*Hypnogorgia pendula*	8/5/17	17:04	Parker Bank	27.93110 -92.06505	94	SH
OP17_307	*Hypnogorgia pendula*	8/5/17	17:10	Parker Bank	27.93113 -92.06504	94	SH
OP17_307B	*Astrocyclus*	8/5/17	17:10	Parker Bank	27.93113 -92.06504	94	SH
OP17_307C	*Euryalid1*	8/5/17	17:10	Parker Bank	27.93113 -92.06504	94	SH
OP17_307D	*crustacean*	8/5/17	17:10	Parker Bank	27.93113 -92.06504	94	SH
OP17_307E	*Euryalid2*	8/5/17	17:10	Parker Bank	27.93113 -92.06504	94	SH
OP17_307F	*Euryalid3*	8/5/17	17:10	Parker Bank	27.93113 -92.06504	94	SH
OP17_307G	*Euryalid4*	8/5/17	17:10	Parker Bank	27.93113 -92.06504	94	SH
OP17_307H	*Euryalid5*	8/5/17	17:10	Parker Bank	27.93113 -92.06504	94	SH
OP17_307I	*Euryalid6*	8/5/17	17:10	Parker Bank	27.93113 -92.06504	94	SH
OP17_308	*Hypnogorgia pendula*	8/5/17	17:19	Parker Bank	27.93115 -92.06503	94	SH
OP17_308B	*Gorgoncephalus*	8/5/17	17:19	Parker Bank	27.93115 -92.06503	94	SH
OP17_308C	*Euryalid*	8/5/17	17:19	Parker Bank	27.93115 -92.06503	94	SH
OP17_309	*Hypnogorgia pendula*	8/5/17	17:30	Parker Bank	27.93114 -92.06504	94	SH
OP17_309B	*Gorgoncephalus*	8/5/17	17:30	Parker Bank	27.93114 -92.06504	94	SH
OP17_310	*Hypnogorgia pendula*	8/5/17	17:35	Parker Bank	27.93113 -92.06506	94	SH
OP17_311	*Sediment Core*	8/5/17	17:40	Parker Bank	27.93104 -92.06490	97	AD

Sample ID	Scientific Name	Date (CST)	Time (CST)	Locality	Latitude	Depth (m)	Destination
OP17_312	*Sediment Core*	8/5/17	18:00	Parker Bank	27.93104 -92.06490	97	AD
OP17_313	*Swiftia exserta*	8/6/17	3:32	Alderdice Bank	28.07495 -91.98419	80	SH
OP17_313B	*Ophiuroid*	8/6/17	3:32	Alderdice Bank	28.07495 -91.98419	80	SH
OP17_314	*Swiftia exserta*	8/6/17	3:35	Alderdice Bank	28.07495 -91.98419	80	SH
OP17_315	*Swiftia exserta*	8/6/17	3:42	Alderdice Bank	28.07493 -91.98418	315	SH
OP17_316	*Swiftia exserta*	8/6/17	3:52	Alderdice Bank	28.07487 -91.98423	81	SH
OP17_317	*Swiftia exserta*	8/6/17	4:01	Alderdice Bank	28.07487 -91.98423	81	SH
OP17_318	*Swiftia exserta*	8/6/17	4:14	Alderdice Bank	28.07489 -81.98422	60	SH
OP17_319	*Swiftia exserta*	8/6/17	4:21	Alderdice Bank	28.07489 -81.98422	60	SH
OP17_320	*Swiftia exserta*	8/6/17	4:29	Alderdice Bank	28.07489 -81.98422	60	SH
OP17_321	*Swiftia exserta*	8/6/17	4:34	Alderdice Bank	28.07489 -81.98422	60	SH
OP17_322	*Swiftia exserta*	8/6/17	5:19	Alderdice Bank	20.07494 -91.98425	80	SH
OP17_323	*Swiftia exserta*	8/6/17	5:27	Alderdice Bank	20.07494 -91.98425	80	SH
OP17_324	*Swiftia exserta*	8/6/17	5:52	Alderdice Bank	20.07494 -91.98426	80	SH
OP17_325	*Swiftia exserta*	8/6/17	6:02	Alderdice Bank	20.07494 -91.98426	80	SH
OP17_326	*Swiftia exserta*	8/6/17	6:07	Alderdice Bank	20.07494 -91.98426	80	SH
OP17_327	*Swiftia exserta*	8/6/17	6:16	Alderdice Bank	20.07494 -91.98426	79	SH
OP17_328	*Swiftia exserta*	8/6/17	6:19	Alderdice Bank	20.07494 -91.98426	79	SH
OP17_329	*Swiftia exserta*	8/6/17	6:34	Alderdice Bank	20.07494 -91.98426	79	SH

Sample ID	Scientific Name	Date (CST)	Time (CST)	Locality	Latitude	Depth (m)	Destination
OP17_330	*Swiftia exserta*	8/6/17	6:40	Alderdice Bank	20.07494 -91.98426	79	SH
OP17_331	*Swiftia exserta*	8/6/17	6:47	Alderdice Bank	28.07520 -91.98420	80	SH
OP17_332	*Swiftia exserta*	8/6/17	7:43	Alderdice Bank	28.07864 -91.98238	80	SH
OP17_333	*Swiftia exserta*	8/6/17	7:59	Alderdice Bank	28.07887 -91.98230	80	SH
OP17_334	*Swiftia exserta*	8/6/17	8:02	Alderdice Bank	28.07887 -91.98230	80	SH
OP17_335	*Swiftia exserta*	8/6/17	8:07	Alderdice Bank	28.07887 -91.98230	80	SH
OP17_336	*Swiftia exserta*	8/6/17	8:14	Alderdice Bank	28.07884 -91.98235	80	SH
OP17_337	*Swiftia exserta*	8/6/17	8:34	Alderdice Bank	28.07864 -91.98226	81	SH
OP17_338	*Swiftia exserta*	8/6/17	8:37	Alderdice Bank	28.07864 -91.98226	81	SH
OP17_339	*Swiftia exserta*	8/6/17	8:50	Alderdice Bank	28.07859 -91.98254	80	SH
OP17_340	*Swiftia exserta*	8/6/17	8:56	Alderdice Bank	28.07859 -91.98254	80	SH
OP17_341	*Swiftia exserta*	8/6/17	9:19	Alderdice Bank	28.07872 -91.98255	80	SH
OP17_342	*Swiftia exserta*	8/6/17	9:35	Alderdice Bank	28.07873 -91.98233	80	SH
OP17_343	*Swiftia exserta*	8/6/17	9:39	Alderdice Bank	28.07873 -91.98233	80	SH
OP17_344A	*Sediment Core*	8/6/17	9:46	Alderdice Bank	28.07873 -91.98233	80	AD
OP17_344B	*Sediment Core*	8/6/17	9:46	Alderdice Bank	28.07873 -91.98233	80	AD
OP17_344C	*Sediment Core*	8/6/17	9:46	Alderdice Bank	28.07873 -91.98233	80	AD
OP17_345A	*Sediment Core*	8/6/17	9:54	Alderdice Bank	28.07873 -91.98233	80	AD
OP17_345B	*Sediment Core*	8/6/17	9:54	Alderdice Bank	28.07873 -91.98233	80	AD

Sample ID	Scientific Name	Date (CST)	Time (CST)	Locality	Latitude	Depth (m)	Destination
OP17_345C	*Sediment Core*	8/6/17	9:54	Alderdice Bank	28.07873 -91.98233	80	AD
OP17_346A	*Sediment Core*	8/6/17	9:59	Alderdice Bank	28.07873 -91.98233	80	AD
OP17_346B	*Sediment Core*	8/6/17	9:59	Alderdice Bank	28.07873 -91.98233	80	AD
OP17_346C	*Sediment Core*	8/6/17	9:59	Alderdice Bank	28.07873 -91.98233	80	AD
OP17_347	*Swiftia exserta*	8/6/17	21:18	Geyer Bank	27.84937 -93.05790	97	SH
OP17_348	*Swiftia exserta*	8/6/17	21:26	Geyer Bank	27.84938 -93.05790	97	SH
OP17_348B	*Crinoid*	8/6/17	21:26	Geyer Bank	27.84938 -93.05790	97	SH
OP17_349	*Swiftia exserta*	8/6/17	21:33	Geyer Bank	27.84937 -93.05792	96	SH
OP17_350	*Swiftia exserta*	8/6/17	21:42	Geyer Bank	27.84933 -93.05788	95	SH
OP17_351	*Swiftia exserta*	8/6/17	22:00	Geyer Bank	27.84928 -93.05783	95	SH
OP17_352	*Swiftia exserta*	8/6/17	22:04	Geyer Bank	27.84928 -93.05783	95	SH
OP17_353	*Swiftia exserta*	8/6/17	22:20	Geyer Bank	27.84928 -93.05783	95	SH
OP17_354	*Swiftia exserta*	8/6/17	22:25	Geyer Bank	27.84928 -93.05783	95	SH
OP17_355	*Swiftia exserta*	8/6/17	22:32	Geyer Bank	27.84928 -93.05787	95	SH
OP17_356	*Swiftia exserta*	8/6/17	22:38	Geyer Bank	27.84928 -93.05787	95	SH
OP17_357	*Swiftia exserta*	8/6/17	22:46	Geyer Bank	27.84928 -93.05787	95	SH
OP17_358	*Swiftia exserta*	8/6/17	22:49	Geyer Bank	27.84928 -93.05787	95	SH
OP17_359	*Swiftia exserta*	8/6/17	23:01	Geyer Bank	27.84923 -93.05789	96	SH
OP17_360	*Swiftia exserta*	8/6/17	23:10	Geyer Bank	27.84923 -93.05789	96	SH

Sample ID	Scientific Name	Date (CST)	Time (CST)	Locality	Latitude	Depth (m)	Destination
OP17_361	*Swiftia exserta*	8/6/17	23:20	Geyer Bank	27.84923 -93.05787	95	SH
OP17_362	*Swiftia exserta*	8/6/17	23:23	Geyer Bank	27.84923 -93.05787	95	SH
OP17_363	*Swiftia exserta*	8/6/17	23:33	Geyer Bank	27.84925 -93.05787	95	SH
OP17_364	*Swiftia exserta*	8/6/17	23:48	Geyer Bank	27.84925 -93.05787	95	SH
OP17_365	*Swiftia exserta*	8/6/17	23:58	Geyer Bank	27.84925 -93.05787	95	SH
OP17_366	*Swiftia exserta*	8/7/17	0:07	Geyer Bank	27.84925 -93.05788	95	SH
OP17_367	*Swiftia exserta*	8/7/17	0:11	Geyer Bank	27.84925 -93.05788	95	SH
OP17_368	*Swiftia exserta*	8/7/17	0:18	Geyer Bank	27.84925 -93.05788	95	SH
OP17_369	*Swiftia exserta*	8/7/17	0:24	Geyer Bank	27.84925 -93.05788	96	SH
OP17_370	*Swiftia exserta*	8/7/17	0:45	Geyer Bank	27.84925 -93.05790	96	SH
OP17_371	*Swiftia exserta*	8/7/17	0:51	Geyer Bank	27.84910 -93.05790	96	SH
OP17_372	*Swiftia exserta*	8/7/17	0:54	Geyer Bank	27.84910 -93.05790	96	SH
OP17_373	*Swiftia exserta*	8/7/17	0:59	Geyer Bank	27.84910 -93.05790	96	SH
OP17_374	*Swiftia exserta*	8/7/17	1:04	Geyer Bank	27.84910 -93.05790	96	SH
OP17_375	*Swiftia exserta*	8/7/17	1:13	Geyer Bank	27.84910 -93.05790	96	SH
OP17_376	*Swiftia exserta*	8/7/17	1:20	Geyer Bank	27.84910 -93.05790	95	SH
OP17_377	*Swiftia exserta*	8/7/17	1:30	Geyer Bank	27.84920 -93.05790	95	SH
OP17_378	*Swiftia exserta*	8/7/17	1:37	Geyer Bank	27.84920 -93.05790	95	SH
OP17_379	*Hypnogorgia pendula*	8/7/17	10:09	McGrail Bank	27.95690 -92.57926	90	SH

Sample ID	Scientific Name	Date (CST)	Time (CST)	Locality	Latitude	Depth (m)	Destination
OP17_380	*Hypnogorgia pendula*	8/7/17	10:15	McGrail Bank	27.95690 -92.57926	90	SH
OP17_381	*Hypnogorgia pendula*	8/7/17	10:24	McGrail Bank	27.95690 -92.57926	90	SH
OP17_382	*Hypnogorgia pendula*	8/7/17	10:34	McGrail Bank	27.95690 -92.57926	90	SH
OP17_382B	*Ophiuroid*	8/7/17	10:34	McGrail Bank	27.95690 -92.57926	90	SH
OP17_383	*Hypnogorgia pendula*	8/7/17	10:43	McGrail Bank	27.95690 -92.57926	90	SH
OP17_384	*Hypnogorgia pendula*	8/7/17	10:50	McGrail Bank	27.95690 -92.57926	90	SH
OP17_385	*Hypnogorgia pendula*	8/7/17	10:59	McGrail Bank	27.95690 -92.57926	90	SH
OP17_385B	*Ophiuroid*	8/7/17	10:59	McGrail Bank	27.95690 -92.57926	90	SH
OP17_386	*Hypnogorgia pendula*	8/7/17	11:03	McGrail Bank	27.95690 -92.57926	90	SH
OP17_387	*Hypnogorgia pendula*	8/7/17	11:12	McGrail Bank	27.95690 -92.57926	90	SH
OP17_388	*Hypnogorgia pendula*	8/7/17	11:18	McGrail Bank	27.95690 -92.57926	90	SH
OP17_389	*Hypnogorgia pendula*	8/7/17	11:25	McGrail Bank	27.95690 -92.57926	90	SH
OP17_389B	*Gastropod*	8/7/17	11:25	McGrail Bank	27.95690 -92.57926	90	SH
OP17_390	*Hypnogorgia pendula*	8/7/17	11:32	McGrail Bank	27.95690 -92.57926	90	SH
OP17_390B	*Gastropod*	8/7/17	11:32	McGrail Bank	27.95690 -92.57926	90	SH
OP17_391	*Hypnogorgia pendula*	8/7/17	12:18	McGrail Bank	27.95695 -92.57927	90	SH
OP17_392	*Hypnogorgia pendula*	8/7/17	12:22	McGrail Bank	27.95696 -92.57919	90	SH
OP17_393	*Hypnogorgia pendula*	8/7/17	12:37	McGrail Bank	27.95691 -92.57917	90	SH
OP17_394	*Hypnogorgia pendula*	8/7/17	13:04	McGrail Bank	27.95767 -92.57981	89	SH

Sample ID	Scientific Name	Date (CST)	Time (CST)	Locality	Latitude	Depth (m)	Destination
OP17_395	*Hypnogorgia pendula*	8/7/17	13:16	McGrail Bank	27.95762 -92.57989	92	SH
OP17_396	*Hypnogorgia pendula*	8/7/17	13:24	McGrail Bank	27.95761 -92.57996	92	SH
OP17_397	*Hypnogorgia pendula*	8/7/17	13:29	McGrail Bank	27.95762 -92.58001	93	SH
OP17_398	*Hypnogorgia pendula*	8/7/17	13:34	McGrail Bank	27.95762 -92.58002	93	SH
OP17_399	*Hypnogorgia pendula*	8/7/17	13:45	McGrail Bank	27.95754 -92.58024	92	SH
OP17_399B	*Basket star*	8/7/17	13:45	McGrail Bank	27.95754 -92.58024	92	SH
OP17_400	*Hypnogorgia pendula*	8/7/17	13:57	McGrail Bank	27.95761 -92.58046	92	SH
OP17_401	*Hypnogorgia pendula*	8/7/17	14:03	McGrail Bank	27.95761 -92.58048	90	SH
OP17_401B	*Basket star*	8/7/17	14:03	McGrail Bank	27.95761 -92.58048	90	SH
OP17_402	*Hypnogorgia pendula*	8/7/17	14:08	McGrail Bank	27.95761 -92.58048	90	SH
OP17_403	*Hypnogorgia pendula*	8/7/17	14:10	McGrail Bank	27.95761 -92.58049	90	SH
OP17_404	*Hypnogorgia pendula*	8/7/17	14:17	McGrail Bank	27.95763 -92.58046	92	SH
OP17_405	*Hypnogorgia pendula*	8/7/17	14:28	McGrail Bank	27.95763 -92.58052	92	SH
OP17_406	*Hypnogorgia pendula*	8/7/17	14:32	McGrail Bank	27.95763 -92.58052	93	SH
OP17_406B	*Basket star*	8/7/17	14:32	McGrail Bank	27.95763 -92.58052	93	SH
OP17_407	*Hypnogorgia pendula*	8/7/17	14:39	McGrail Bank	27.95763 -92.58053	92	SH
OP17_408	*Hypnogorgia pendula*	8/7/17	15:08	McGrail Bank	27.95721 -92.58113	86	SH
OP17_409	*Hypnogorgia pendula*	8/7/17	15:16	McGrail Bank	27.95720 -92.58110	86	SH
OP17_410	*Hypnogorgia pendula*	8/7/17	15:19	McGrail Bank	27.95720 -92.58110	86	SH

Sample ID	Scientific Name	Date (CST)	Time (CST)	Locality	Latitude	Depth (m)	Destination
OP17_410B	*Basket star*	8/7/17	15:19	McGrail Bank	27.95720 -92.58110	86	SH
OP17_411	*Hypnogorgia pendula*	8/7/17	15:25	McGrail Bank	27.95721 -92.58117	86	SH
OP17_412	*Hypnogorgia pendula*	8/7/17	15:33	McGrail Bank	27.95719 -92.58120	86	SH
OP17_413	*Hypnogorgia pendula*	8/8/17	5:36	Diaphus Bank	20.08582 -90.69982	100	SH
OP17_414	*Hypnogorgia pendula*	8/8/17	5:47	Diaphus Bank	28.08585 -90.69983	99	SH
OP17_415	*Hypnogorgia pendula*	8/8/17	5:53	Diaphus Bank	28.08585 -90.69983	99	SH
OP17_416	*Hypnogorgia pendula*	8/8/17	5:59	Diaphus Bank	28.08585 -90.69983	99	SH
OP17_417	*Ellisella*	8/8/17	6:05	Diaphus Bank	28.08585 -90.69983	99	SH
OP17_418	*Hypnogorgia pendula*	8/8/17	6:15	Diaphus Bank	28.08591 -90.69982	99	SH
OP17_419	*Hypnogorgia pendula*	8/8/17	6:19	Diaphus Bank	28.08592 -90.69981	99	SH
OP17_420	*Hypnogorgia pendula*	8/8/17	6:28	Diaphus Bank	28.08594 -90.69996	99	SH
OP17_421	*Hypnogorgia pendula*	8/8/17	6:32	Diaphus Bank	28.08594 -90.69979	99	SH
OP17_422	*Hypnogorgia pendula*	8/8/17	6:40	Diaphus Bank	28.08596 -90.69982	98	SH
OP17_423	*Hypnogorgia pendula*	8/8/17	6:45	Diaphus Bank	28.08594 -90.69983	98	SH
OP17_424	*Hypnogorgia pendula*	8/8/17	6:53	Diaphus Bank	28.08594 -90.69983	98	SH
OP17_425	*Hypnogorgia pendula*	8/8/17	6:56	Diaphus Bank	28.08594 -90.69983	98	SH
OP17_425	*Ophiuroid*	8/8/17	6:56	Diaphus Bank	28.08594 -90.69983	98	SH
OP17_426	*Hypnogorgia pendula*	8/8/17	7:01	Diaphus Bank	28.08594 -90.69983	98	SH
OP17_427	*Hypnogorgia pendula*	8/8/17	7:07	Diaphus Bank	28.08595 -90.69987	98	SH

Sample ID	Scientific Name	Date (CST)	Time (CST)	Locality	Latitude	Depth (m)	Destination
OP17_427B	*Ophiuroid*	8/8/17	7:07	Diaphus Bank	28.08595 -90.69987	98	SH
OP17_428	*Hypnogorgia pendula*	8/8/17	7:13	Diaphus Bank	28.08595 -90.69987	98	SH
OP17_429	*Hypnogorgia pendula*	8/8/17	7:17	Diaphus Bank	28.08595 -90.69990	98	SH
OP17_430	*Hypnogorgia pendula*	8/8/17	7:22	Diaphus Bank	20.08675 -90.69970	96	SH
OP17_431	*Hypnogorgia pendula*	8/8/17	7:42	Diaphus Bank	20.08675 -90.69970	96	SH
OP17_432	*Hypnogorgia pendula*	8/8/17	7:47	Diaphus Bank	20.08675 -90.69970	96	SH
OP17_433	*Hypnogorgia pendula*	8/8/17	7:50	Diaphus Bank	20.08675 -90.69970	96	SH
OP17_434	*Hypnogorgia pendula*	8/8/17	7:53	Diaphus Bank	20.08675 -90.69970	96	SH
OP17_435	*Hypnogorgia pendula*	8/8/17	8:14	Diaphus Bank	28.08605 -90.69810	97	SH
OP17_435B	*Ophiuroid*	8/8/17	8:14	Diaphus Bank	28.08605 -90.69810	97	SH
OP17_435B	*Ophiuroid*	8/8/17	8:14	Diaphus Bank	28.08605 -90.69810	97	SH
OP17_436	*Hypnogorgia pendula*	8/8/17	8:19	Diaphus Bank	28.08605 -90.69810	97	SH
OP17_437	*Hypnogorgia pendula*	8/8/17	8:27	Diaphus Bank	28.08605 -90.69825	97	SH
OP17_438	*Hypnogorgia pendula*	8/8/17	8:32	Diaphus Bank	28.08605 -90.69825	97	SH
OP17_439	*Hypnogorgia pendula*	8/8/17	8:37	Diaphus Bank	28.08605 -90.69825	97	SH
OP17_440	*Hypnogorgia pendula*	8/8/17	8:54	Diaphus Bank	28.08608 -90.69983	97	SH
OP17_441	*Hypnogorgia pendula*	8/8/17	9:02	Diaphus Bank	28.08607 -90.69982	97	SH
OP17_442	*Hypnogorgia pendula*	8/8/17	9:10	Diaphus Bank	28.08607 -90.69982	97	SH
OP17_443	*Sediment Core*	8/8/17	9:25	Diaphus Bank	28.08607 -90.69982	97	AD

Sample ID	Scientific Name	Date (CST)	Time (CST)	Locality	Latitude	Depth (m)	Destination
OP17_444	*Sediment Core*	8/8/17	9:27	Diaphus Bank	28.08607 -90.69982	97	AD
OP17_445A	*Sediment Core*	8/8/17	9:28	Diaphus Bank	28.08607 -90.69982	97	AD
OP17_445B	*Sediment Core*	8/8/17	9:28	Diaphus Bank	28.08607 -90.69982	97	AD
OP17_445C	*Sediment Core*	8/8/17	9:28	Diaphus Bank	28.08607 -90.69982	97	AD
OP17_446	*Hypnogorgia pendula*	8/8/17	9:37	Diaphus Bank	28.08651 -90.69977	98	SH
OP17_447	*Hypnogorgia pendula*	8/8/17	9:44	Diaphus Bank	28.08609 -90.69975	96	SH
OP17_448	*Hypnogorgia pendula*	8/8/17	9:53	Diaphus Bank	28.08609 -90.69975	97	SH
OP17_449	*Hypnogorgia pendula*	8/8/17	10:01	Diaphus Bank	28.08610 -90.69972	97	SH
OP17_450	*Hypnogorgia pendula*	8/8/17	10:15	Diaphus Bank	28.08615 -90.69974	97	SH
OP17_450	*ophiuroid*	8/8/17	10:15	Diaphus Bank	28.08615 -90.69974	97	SH
OP17_451	*Ellisella*	8/8/17	9:10	Diaphus Bank	28.08607 -90.69982	97	SH