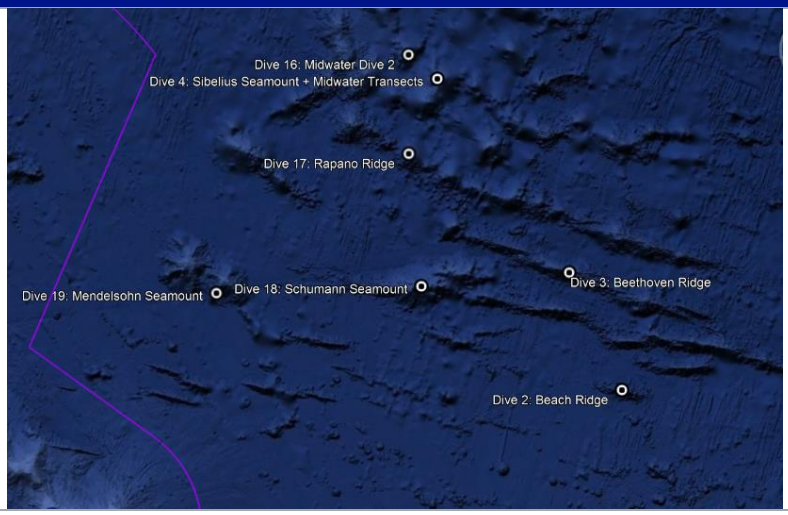
Ocean Exploration and Research

Okeanos Explorer ROV Dive Summary

Dive Information			
General Location			
General Area Descriptor	Musicians Seamounts		
Site Name	Sibelius Seamount		
Science Team Leads	John R. Smith/Meagan Putts		
Expedition Coordinator	Kasey Cantwell		
ROV Dive Supervisor	Karl McLetchie		
Mapping Lead	Mike White		
ROV Dive Name			
Cruise	EX1708		
Leg	-		
Dive Number	DIVE04		
Equipment Deployed			
ROV	Deep Discoverer		
Camera Platform	Seirios		
ROV Measurements	☒ CTD	☒ Depth	☒ Altitude
	☒ Scanning Sonar	☒ USBL Position	☒ Heading
	☒ Pitch	☒ Roll	☒ HD Camera 1

	☒ HD Camera 2	☒ Low Res Cam 1	☒ Low Res Cam 2
	☒ Low Res Cam 3	☒ Low Res Cam 4	☒ Low Res Cam 5
Equipment Malfunctions	There was a ground fault in the upper swingarm light circuit just after leaving the seafloor. The upper swingarms lights were turned off for the midwater surveys which reduced the lighting slightly.		
ROV Dive Summary (from processed ROV data)	Dive Summary: EX1708_DIVE04 ^^ In Water: 2017-09-10T18:19:32.388000 27°, 14.841' N ; 160°, 38.195' W Out Water: 2017-09-11T04:36:15.613000 27°, 14.856' N ; 160°, 37.998' W Off Bottom: 2017-09-11T01:15:50.112000 27°, 14.862' N ; 160°, 38.014' W On Bottom: 2017-09-10T19:51:50.522000 27°, 14.674' N ; 160°, 37.960' W Dive duration: 10:16:43 Bottom Time: 5:23:59 Max. depth: 2655.1 m		
Special Notes	This was an extended dive to accommodate a series of midwater transects that were carried out following completion of the on bottom portion of the dive. The transect at 500 meters was 13 minutes instead of 10 minutes to accommodate additional time in the deep scattering layer.		

Scientists Involved (please provide name, location, affiliation, email)

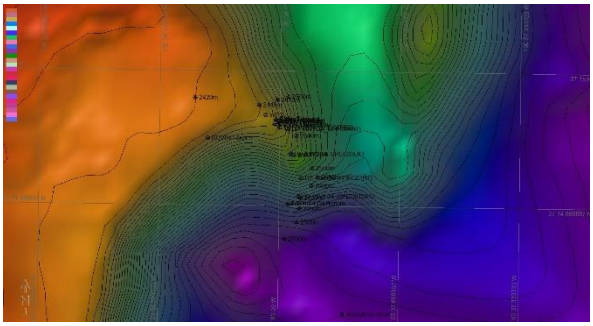
Name	Email	Affiliation
Amanda Netburn	amanda.netburn@noaa.gov	NOAA OER
Asako Matsumoto	amatsu@gorgonian.jp	Planetary Exploration Research Center, Chiba Institute of Technology
Christopher Kelley	ckelley@hawaii.edu	University of Hawaii
Christopher Mah	brisinga@gmail.com	Dept. Invertebrate Zoology, NMNH Smithsonian Institution
George Matsumoto	mage@mbari.org	MBARI
John Smith	jrsmith@hawaii.edu	University of Hawaii
Les Watling	watling@hawaii.edu	University of Hawaii at Manoa
Meagan Putts	Meagan.putts@noaa.gov	University of Hawaii
Megan	mccullermi@gmail.com	Williams-Mystic Maritime Studies Program

	McCuller		
	Michael Vecchione	vecchiom@si.edu	NMFS National Systematics Lab.
	Mike Ford	michael.ford@noaa.gov	NOAA NMFS
	Mike White	michael.white@noaa.gov	OER
	Nolan Barrett	barrettnh@g.cofc.edu	FAU Harbor Branch Oceanographic Institute
	Scott France	france@louisiana.edu	University of Louisiana at Lafayette
	Steve Auscavitch	tug19971@temple.edu	Temple University
	Tina Molodtsova	tina@ocean.ru; tina.molodtsova@gmail.com	P.P.Shirshov Institute of Oceanology RAS

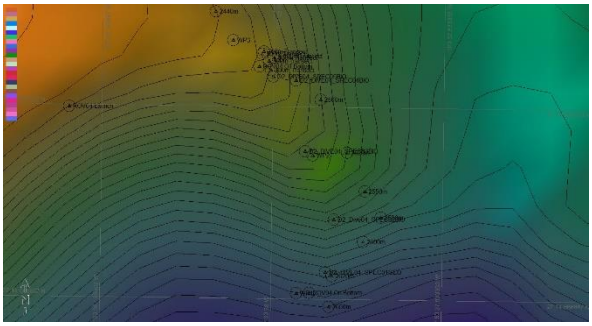
Purpose of the Dive	The primary objective for this dive was to characterize the distribution and abundance of benthic fauna along a scarp on the eastern side and upper flank of a large indentation, or cut-out, in the seamount, proposed to be the headwall section of a landslide. A comparison of the diversity and distribution of coral and sponge communities across the seamounts to the north and to the Hawaiian Ridge and the broader North Pacific is of particular importance to understanding biogeography and connectivity of communities in the Pacific. The first priority was to complete a photographic survey along the transect, covering as much of the feature as possible. Secondarily, sample collections occurred for unusual sightings, or rare/novel species. A representative rock sample was also taken for further petrologic, geochemical, and/or dating analyses.
Description of the Dive	ROV *Deep Discoverer* (D2) arrived on bottom at 2651 m water depth on Mn-crust coated intact lava flows close to a geologic contact, or transition, to a talus slope. Biologics were sparse at the landing site. Once underway, we soon arrived at another contact, this time the base of a massive wall of mostly intact pillow lavas at 2633 m. Soon after, another transition to a talus field was observed at 2620 m, whereupon the first and only rock sample for the dive was taken. We began seeing huge boulders and outcrops at ~2560 m with many large coral colonies attached, in contrast to the few corals in the surrounding talus fields. This observation continued upslope throughout the remainder of the dive. The often difficult to collect stoloniferan octocoral were acquired intact, thanks to their residence upon a dead Chrysogorgid stalk. Attempts and final successes were made to collect small sea stars that may represent new species and possibly a new family. A variety of large and small sponges joined the mix of corals and increased in density and diversity as we continued upslope. D2 left bottom at 2437 m, approximately 60 m short (laterally) of the final waypoint. Following the on bottom portion of the dive, a series of midwater transects were carried out at 800, 700, 600, 500, 400, and 300 m water depth. Transects contained a diversity of midwater animals including a snipe eel, *Halicreas* sp. jelly fish, siphonophores, hatchet fish, *Cyclothone* sp., and even a translucent squid with s fish inside! <u>Midwater summary</u> Depths of transects: 800, 700, 600, 500, 400, 300 All transect times 10 mins, except 13 mins at 500 m

	The midwater portion of this dive was very successful. We encountered a high abundance and diversity of animals overall. In particular, we saw a notably high abundance of fish, including numerous Cyclothone sp. (bristlemouth), but also a snipe eel (800 m), a hatchetfish, and a several other unidentified fish. The 800 m transect was dominated by larvaceans and fish. While transitting to the next transect depth, we encountered a very neat squid that inked at the camera. At 700 m, we saw numerous chaetognaths, a calycophoran siphonophore, ctenophores, sergestid shrimp, the peaked jellyfish Halicreas. 600 m was dominated by sergestid shrimp and siphonophores. Throughout the water column we saw several of the flattened transparent jellyfish Solmissus. 500 m observations included pelagic foraminifera, Cyclothone, shrimps, ctenophores, and siphonophores. We were able to obtain some close up imagery of the hatchetfish Argyropelecus affinis. At 400 m, we saw a Thalassocalyce ctenophore and arrowworms. 300 m, we saw several pteropods Diacria trispinosa, jellyfish, and larvaceans. The high abundance of animals that we saw at these depths is in agreement with a thick layer of organisms that could be seen from ~350-900 m in the EK60 sonar data. The peak scattering was around 500 m. Much of the observed backscatter likely came from the numerous fish, shrimps, and physonect siphonophores seen throughout the dive.

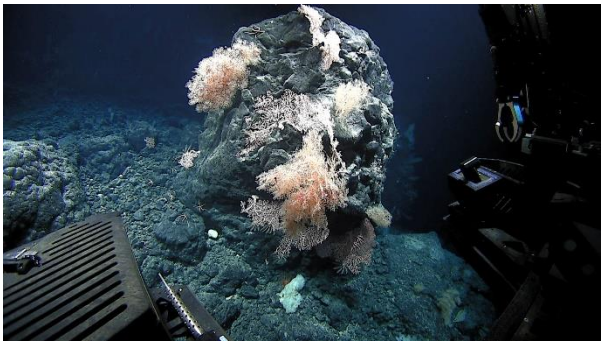
Overall Map of the ROV Dive Area

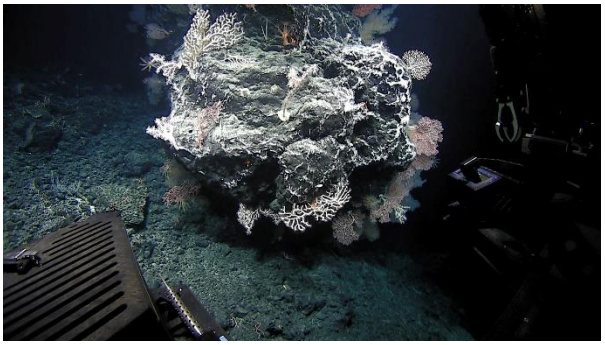


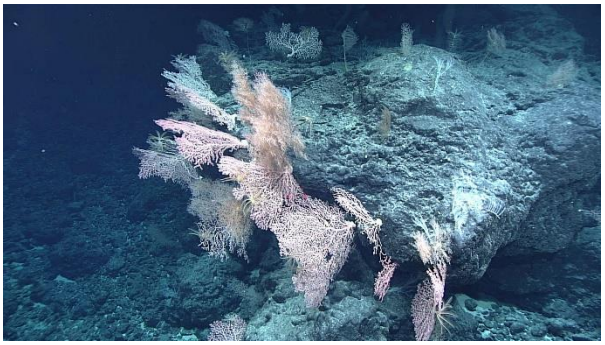
Close-up Map of Main Dive Site



Representative Photos of the Dive



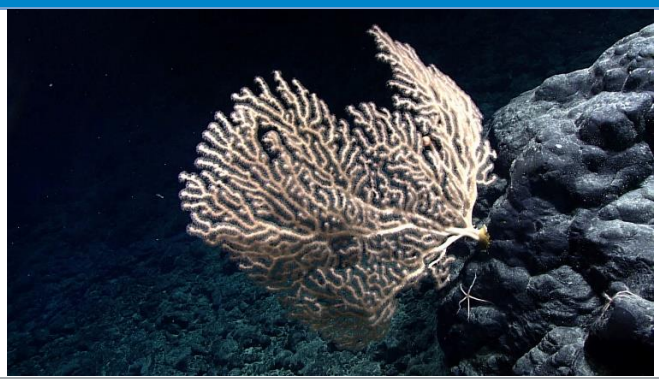


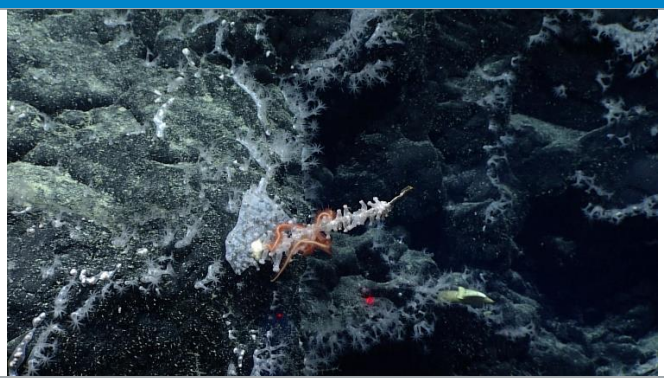
Highly dense coral colonies on isolated volcanic rock outcrop or boulder	High density coral colonies on isolated volcanic rock outcrop or boulder
	
Large Actinostolidae anemone on intact lava flow outcrop	Highly dense coral colonies on intact volcanic rock outcrop

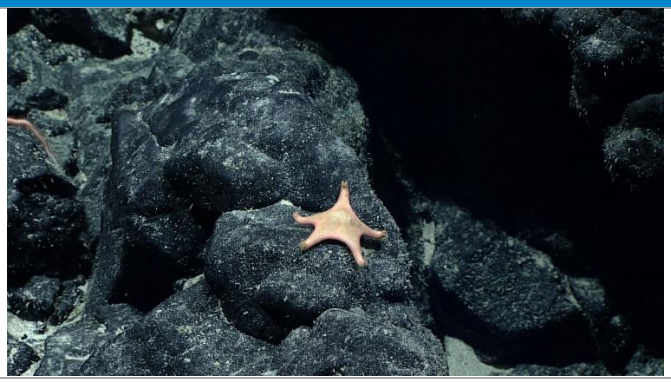
Samples Collected

Sample

Sample ID	EX1708_D2_DIVE04_SPEC01GEO
Date (UTC)	9/10/2017
Time (UTC)	20:30
Depth (m)	2624.1
Temperature (°C)	1.7
Field ID(s)	Manganese crusted basalt
Commensal ID and Field Identification	
Comments	

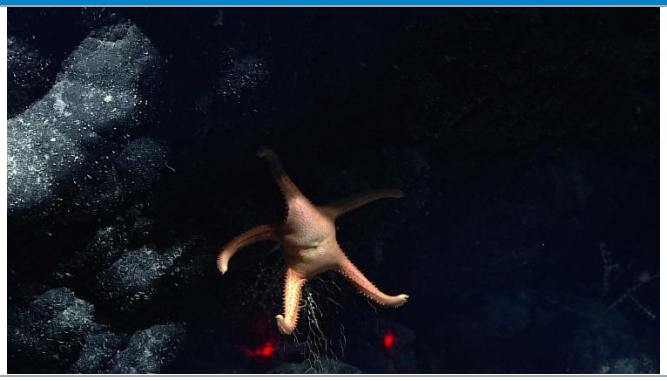
Sample		
Sample ID	EX1708_D2_DIVE04_SPEC02BIO	
Date (UTC)	9/10/2017	
Time (UTC)	21:42	
Depth (m)	2581.1	
Temperature (°C)	1.7	
Field ID(s)	Paragorgiidae	
Commensal ID and Field Identification	EX1708_D2_DIVE04_SPEC02BIO_A01 Hormathiidae	
Comments		

Sample		
Sample ID	EX1708_D2_DIVE04_SPEC03BIO	
Date (UTC)	9/10/2017	
Time (UTC)	23:15	
Depth (m)	2492.3	
Temperature (°C)	1.7	
Field ID(s)	Stolonifera	
Commensal ID and Field Identification		
Comments	On Chrysogorgid stalk	

Sample		
Sample ID	EX1708_D2_DIVE04_SPEC05BIO	
Date (UTC)	9/11/2017	
Time (UTC)	00:48	
Depth (m)	2440.0	
Temperature (°C)	1.7	
Field ID(s)	Goniasteridae	
Commensal ID and Field Identification		

Comments	
Sample	
Sample ID	EX1708_D2_DIVE04_SPEC04BIO
Date (UTC)	9/10/2017
Time (UTC)	23:49
Depth (m)	2480.9
Temperature (°C)	1.7
Field ID(s)	*Hemicorallium* sp.

Commensal ID and Field Identification	
Comments	
Sample	
Sample ID	EX1708_D2_DIVE04_SPEC06BIO
Date (UTC)	9/11/2017
Time (UTC)	01:04
Depth (m)	2437.7
Temperature (°C)	1.7
Field ID(s)	*Cerciaster* sp.



Commensal ID and Field Identification	
Comments	

Please direct inquiries to:

NOAA Office of Ocean Exploration & Research
1315 East-West Highway (SSMC3 10th Floor)
Silver Spring, MD 20910
(301) 734-1014