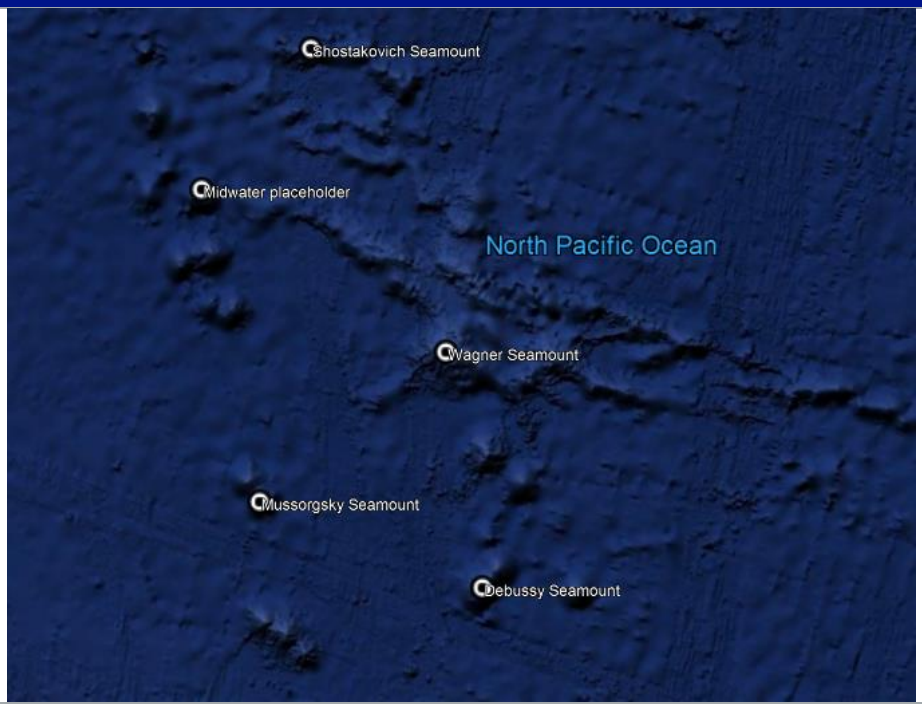
Ocean Exploration and Research

Okeanos Explorer ROV Dive Summary

Dive Information	
General Location	
General Area Descriptor	Musicians Seamounts
Site Name	Mussorgsky 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	DIVE12
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	DO sensor had an error, readings might be off.		
ROV Dive Summary (from processed ROV data)	Dive Summary: EX1708_DIVE12 ^^		
	In Water:	2017-09-18T18:24:59.548000 30°, 26.471' N ; 164°, 00.912' W	
	Out Water:	2017-09-19T02:30:02.395000 N/A ; N/A	
	Off Bottom:	2017-09-19T01:21:39.374000 30°, 26.159' N ; 164°, 00.769' W	
	On Bottom:	2017-09-18T19:41:26.503000 30°, 26.418' N ; 164°, 00.818' W	
	Dive duration:	8:5:2	
	Bottom Time:	5:40:12	
	Max. depth:	2058.6 m	
Special Notes			
Scientists Involved (please provide name, location, affiliation, email)	**Name**	**Email**	**Affiliation**
	Asako Matsumoto	amatsu@gorgonian.jp	Planetary Exploration Research Center, Chiba Institute of Technology
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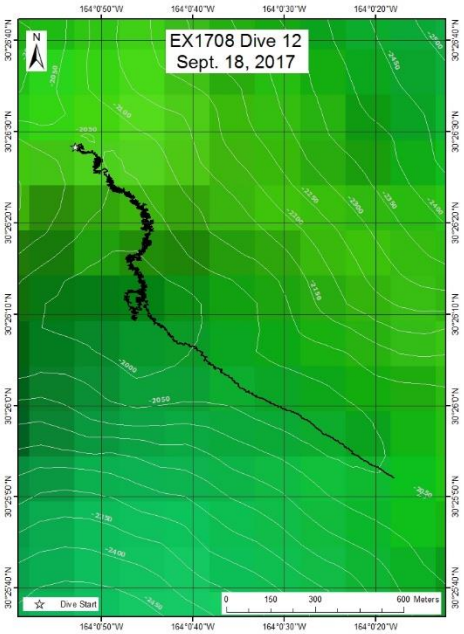
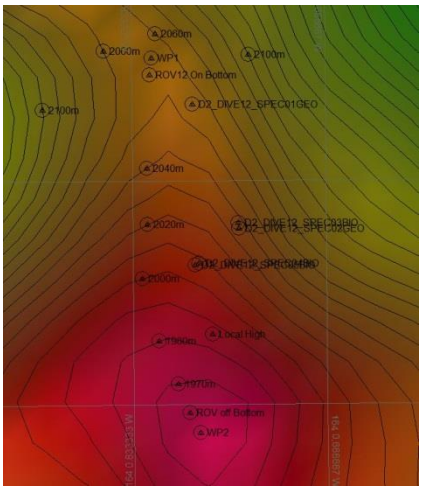
Purpose of the Dive	The purpose of this dive was to carry out the second of two dives to investigate the similarities and differences in community composition between two isolated seamounts (Mussorgsky and Debussy) that occupy the gap between the two main groups of the Musicians Seamounts. The primary objective for this dive was to characterize the distribution and abundance of benthic fauna, in particular corals, to examine the diversity, biogeography, and connectivity of corals living here compared to the lesser isolation of Debussy Seamount. Data from this dive will be used to compare benthic fauna distribution to Debussy Seamount and to the rest of the sites visited during this expedition. 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 will help describe the biogeography and connectivity of communities in the Pacific. The dive satisfies the CAPSTONE science theme to "Identify and map vulnerable marine habitats – particularly high-density deep-sea coral and sponge communities."		
Description of the Dive	ROV Deep Discoverer (D2) arrived on bottom at 2059 m in a geological setting that included intact pillow flows, some cobbles, and little sediment cover. Large sponges and a codling fish were present near arrival. Numerous coral colonies soon came into view, with some lined up along a pillow ridge presumably facing into the long term prevailing current. A large primnoid coral colony with a host of associates presented at time 20:24, depth 2040 m. Small, rare brittlestars, *Asterophiura* sp., that mimic sea stars came into view at time 20:35 (2040 m), with additional sightings the dive progressed. The first rock sampled was a pillow toe collected at 2036 m from an isolated area at the base of the slope of ~30°. Intact low relief lumpy pillow flows were evident moving upslope, alternating with talus chutes. Larger talus blocks and higher relief pillow lobes appeared at 2019 m along with a couple lava flow fronts <1 m in thickness. The actual ridge crest was finally determined using the vehicles' scanning sonars and D2 began moving south along it. Large pillow lobes, many corals, and some sponges were observed. A strong east to west current of 0.5 to 1 knot was reported by the pilots. The corals in this area were aligned perpendicular to the current (21:43, 2007 m). At this time, contact to extensive smoother, low relief flows was observed along with more sediment cover. Larger outcrops and blocks appeared at 2004 m and continued upslope, along with talus, flow edges, many corals and some sponges. Combination lobate and sheets flows were seen at 1991 m where the second rock, a large rectangular slab, was collected nearly in place. The first biological specimen, a *Hemicorallium* sp. pink coral, was also collected here. A piece of trawl net was tangled in the coral. Large broken slabs alternated with sheet/lobate flows and sediment-filled fractures were observed in some of the flows. The same or higher density and abundance of corals persisted, although few sponges were observed by 1984 m. Low relief lava flows, some with obvious edges, and moderate sediment cover were observed at 1980 m. Here, primnoid and bamboo corals abounded. An *Acanthogorgia* sp. coral was collected at 1982 m near a lava flow edge. A third coral, *Narella* sp., was also		

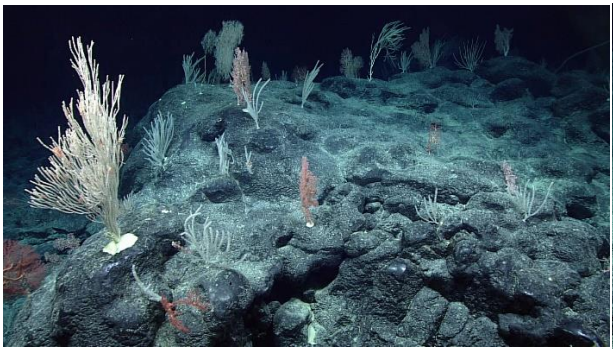
	collected from the same site. Low relief flows continued up the ~30° slope with little talus and occasional flow fronts/edges exposed. A series of lava morphology contacts were observed as follows: pillow flow edge (1974 m), lobate flow front (1965 m), slope change to 40-45° and smoother flows at 1966 m. At this point (1957 m), D2 was running along the narrow ridge crest and could pan to both sides and see the slopes of each without moving the vehicle laterally. The summit was nearly flat (1957 m) and was composed of a mix of low relief pillows, talus, and sediment. Many corals but no sponges were present here. No black coral or mushroom corals were observed on this dive. A blaze-orange Nemertean ribbon worm swam up from the seafloor into D2's main camera view at time 01:11 (1952 m). The final WP2 on the summit was reached and D2 left bottom at time 01:20 from 1954 m. The pilots reported that the current was low and approximately from the south near the end of the dive.

Overall Map of the ROV Dive Area	Close-up Map of Main Dive Site
	

Representative Photos of the Dive

Antimora mircolepis codling fish on pillow lavas and talus

Large Corbitellinae sponge, *Paragorgia* sp. coral and Primnoidae coral on intact low relief lava

	flows
	
Numerous octocorals positioned on the leading edge of a massive lava flow outcrop	Large *Paracalyptrophora* sp. primnoid coral fan on intact lava flow

Samples Collected

Sample

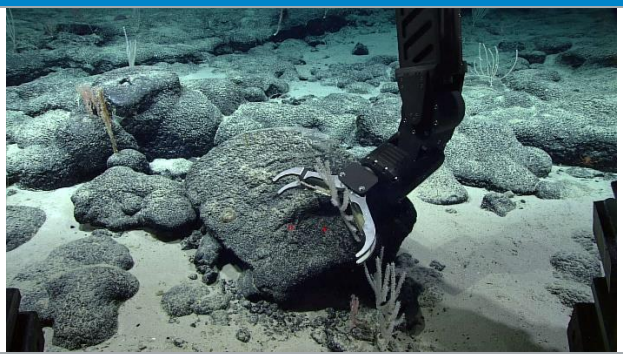
Sample ID	EX1708_D2_DIVE12_SPEC01GEO
Date (UTC)	9/18/2017
Time (UTC)	20:52
Depth (m)	2036.2
Temperature (°C)	1.9
Field ID(s)	Mn-crusted basalt pillow toe talus from base of outcrop
Commensal ID and Field Identification	
Comments	

Sample

Sample ID	EX1708_D2_DIVE12_SPEC02GEO
Date (UTC)	9/18/2017
Time (UTC)	22:55
Depth (m)	1991.2
Temperature (°C)	1.8
Field ID(s)	Mn-crusted in place rectangular basalt slab
Commensal ID and Field Identification	
Comments	

Sample		
Sample ID	EX1708_D2_DIVE12_SPEC03BIO	
Date (UTC)	9/18/2017	
Time (UTC)	23:07	
Depth (m)	1991.2	
Temperature (°C)	1.8	
Field ID(s)	*Hemicorallium* sp.	
Commensal ID and Field Identification	EX1708_D2_DIVE12_SPEC03BIO_A01 *Asteroschema* sp. EX1708_D2_DIVE12_SPEC03BIO_A02 Zoantharia	
Comments		

Sample		
Sample ID	EX1708_D2_DIVE12_SPEC04BIO	
Date (UTC)	9/18/2017	
Time (UTC)	23:58	
Depth (m)	1982.7	
Temperature (°C)	1.9	
Field ID(s)	*Acanthogorgia* sp.?	
Commensal ID and Field Identification		
Comments		

Sample		
Sample ID	EX1708_D2_DIVE12_SPEC05BIO	
Date (UTC)	9/19/2017	
Time (UTC)	00:05	
Depth (m)	1982.6	
Temperature (°C)	1.9	
Field ID(s)	*Narella* sp.	
Commensal ID and Field Identification	EX1708_D2_DIVE12_SPEC05BIO_A01 Crinoid yellow	
Comments		

Please direct inquiries to:

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