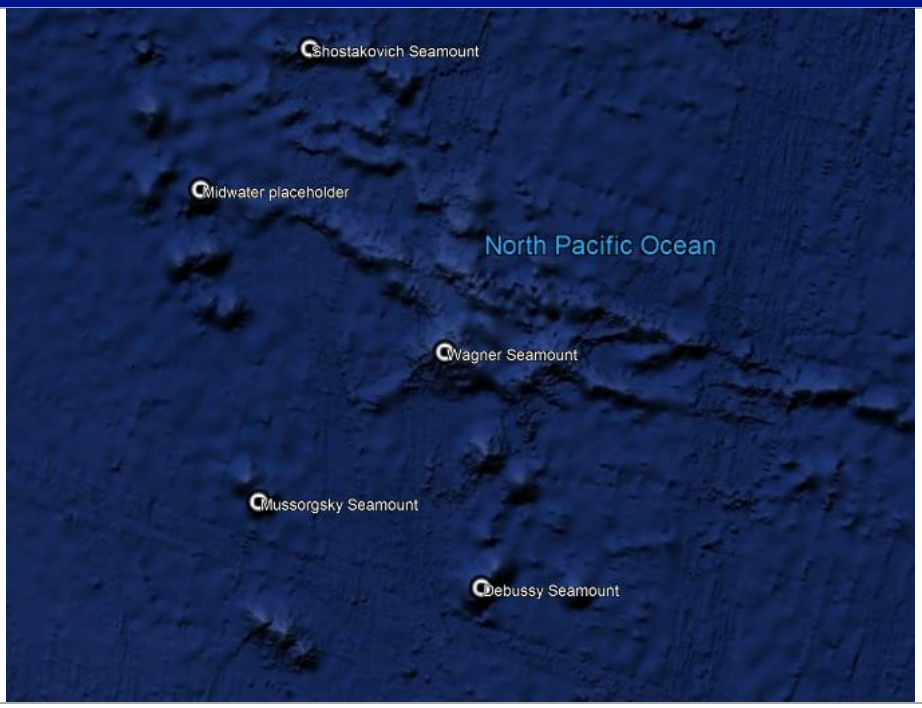
Ocean Exploration and Research

Okeanos Explorer ROV Dive Summary

Dive Information	
General Location	
General Area Descriptor	Musicians Seamounts
Site Name	Verdi 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	DIVE09
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	Deployment delayed due to issues with the winch that shortened the overall dive time.		
ROV Dive Summary (from processed ROV data)	Dive Summary: EX1708_DIVE09 ^^ In Water: 2017-09-15T20:30:15.895000 32°, 12.211' N ; 163°, 37.111' W Out Water: 2017-09-16T02:34:03.495000 32°, 12.768' N ; 163°, 36.443' W Off Bottom: 2017-09-16T00:52:57 32°, 12.341' N ; 163°, 36.962' W On Bottom: 2017-09-15T22:16:16.178000 32°, 12.266' N ; 163°, 36.926' W Dive duration: 6:3:47 Bottom Time: 2:36:40 Max. depth: 3098.3 m		
Special Notes	Shortened dive because of problems with umbilical winch prior to dive.		
Scientists Involved (please provide name, location, affiliation, email)			

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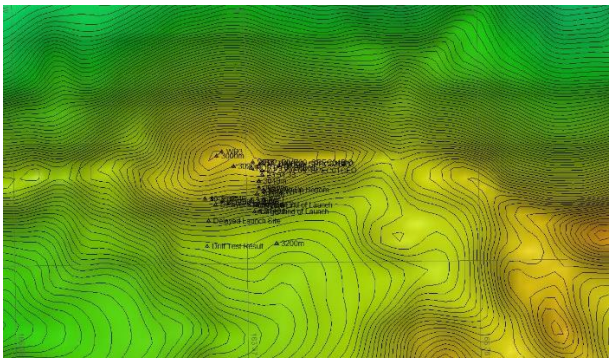
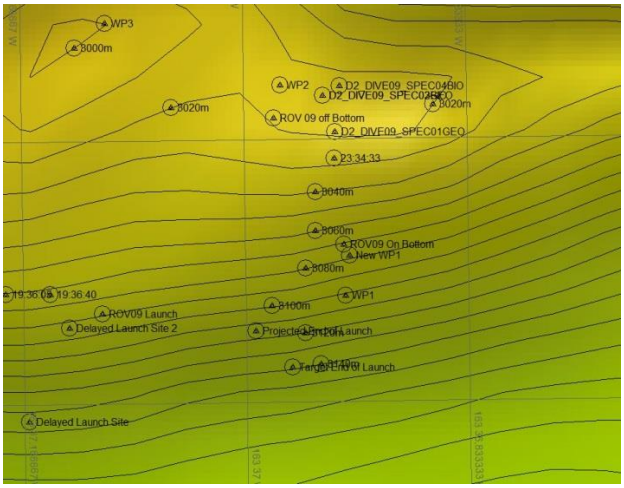
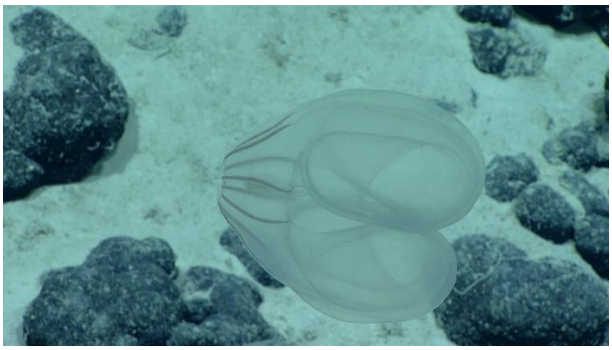
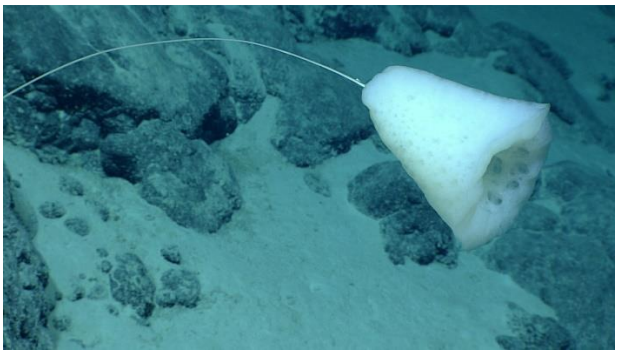
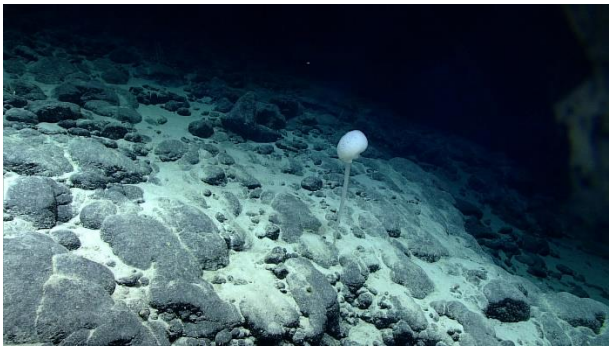
Purpose of the Dive	This dive had two main purposes. One was to explore a deep volcanic elongate ridge feature and collect rock samples to provide clues as to the origin of the lineament and the surrounding seamounts, informing a better understanding of the geologic history of the region. Thus, it satisfies the CAPSTONE theme to "investigate the geologic history of Pacific seamounts." The second purpose of the dive was to inform biogeographic patterns of benthic fauna throughout the Musicians Seamounts. A comparison of the diversity and distribution of biological communities (namely, corals and sponges) across the seamounts and to the Hawaiian Ridge and the broader North Pacific will help describe the biogeography and connectivity of communities in the Pacific. This 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	The ROV Deep Discoverer (D2) touched down on a steep slope of 45° to 55° at 3090 m, part of the way up the flank of the volcanic ridge. Fortuitously, we arrived at the contact between a moderately sedimented talus field and low relief lava outcrops including pillowed flows and lobate lava forms. Soon after a contact with the broken up edge of a < 1 m thick lava flow unit was observed at 3091 m. The slope steepened to ~60° at 3076 m, with the substrate consisting of talus, pillow flows, and sediment pockets in between. Here, a lizard fish, *Bathysaurus mollis*, was observed at time stamp 22:45. Alternating patches of intact pillow flows and sedimented talus areas were observed as D2 moved up and across the flank from 3068 to 3038 m where more pronounced intact and broken pillows/talus dominated. At 3033 m, the slope magnitude decreased as D2 approached the summit. The first rock collection failed, the sample being crushed by the manipulator claw. This rock had the same look as one attempted on Dive 01 of this cruise – a jumbled yellowish matrix with fine black inclusions, presumed to be basalt. A massive lava rock outcrop with a pillowed look was observed at 3020 m, with more flow fronts of like morphology seen in the distance upslope. The first rock sample, a piece of angular talus, was collected at 3016 m from the base of an outcrop, although it was not obviously in place. There was an especially abrupt slope change to a flat top terrace covered by sediment, talus, and small rubble		

	at 3008 m. The slope increased again to ~30° at a contact with intact pillowed flows at 3010 m. A second rock sample, also angular talus, was collected from a summit depression at 3017 m, and not taken in place. Two requested biological specimens were also collected from the same area and depth, a black coral and a bamboo coral with associates. In the few remaining minutes of the dive D2 crossed another contact from a gently sloping sedimented talus field to a fully sedimented bottom with no debris or biological organisms. As D2 left bottom from 3021 m, observation was made of another transition from this sedimented plain back to a low slope sedimented talus field. Presumably, the ROVs had last been investigating the saddle between the western and eastern bathymetric highs. In summary, two rocks were collected that should help us better understand the hot spot/mid-ocean ridge interactions. Regarding the biology observed along the dive track, we saw a moderate number of primnoid coral and black coral as well as some *Hyalostyus* sp. glass sponges. Despite the low abundance of corals and sponges, we saw numerous small invertebrates including polychaetes, mysid shrimps, amphipods, and isopods. In terms of fun fishes, we saw *Bathysaurus mollis, Coryphaenoides* sp. and a Ophidioform fish. Perhaps most importantly, a ctenophore that may be new to science was observed.

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

Representative Photos of the Dive

	
Ctenophore that may be new to science	*Hyalostylus* sp. stalked glass sponge



Caulophacus sp. glass sponge on moderately sedimented talus slope

Curious *Coryphaenoides* sp. Grenadier fish with parasitic copepod on fin checking out D2

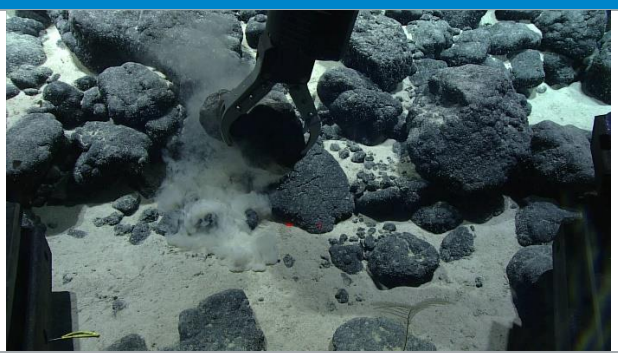
Samples Collected

Sample

Sample ID	EX1708_D2_DIVE09_SPEC01GEO
Date (UTC)	9/15/2017
Time (UTC)	23:51
Depth (m)	3016.8
Temperature (˚C)	1.5
Field ID(s)	Manganese crusted basalt
Commensal ID and Field Identification	
Comments	

Sample

Sample ID	EX1708_D2_DIVE09_SPEC02GEO
Date (UTC)	9/16/2017
Time (UTC)	00:23
Depth (m)	3017.3
Temperature (˚C)	1.6
Field ID(s)	Manganese crusted basalt
Commensal ID and Field Identification	
Comments	



Sample

Sample ID	EX1708_D2_DIVE09_SPEC03BIO	
Date (UTC)	9/16/2017	
Time (UTC)	00:27	
Depth (m)	3017.8	
Temperature (˚C)	1.6	
Field ID(s)	*Bathypathes* cf. *patula*	
Commensal ID and Field Identification		
Comments		
Sample		
Sample ID	EX1708_D2_DIVE09_SPEC04BIO	
Date (UTC)	9/16/2017	
Time (UTC)	00:43	
Depth (m)	3016.8	
Temperature (˚C)	1.6	
Field ID(s)	Keratoisidinae “unbranched”	
Commensal ID and Field Identification	EX1708_D2_DIVE09_SPEC04BIO_A01 Actinarian “red” EX1708_D2_DIVE09_SPEC04BIO_A02 Crinoid “yellow”	
Comments		

Please direct inquiries to:

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