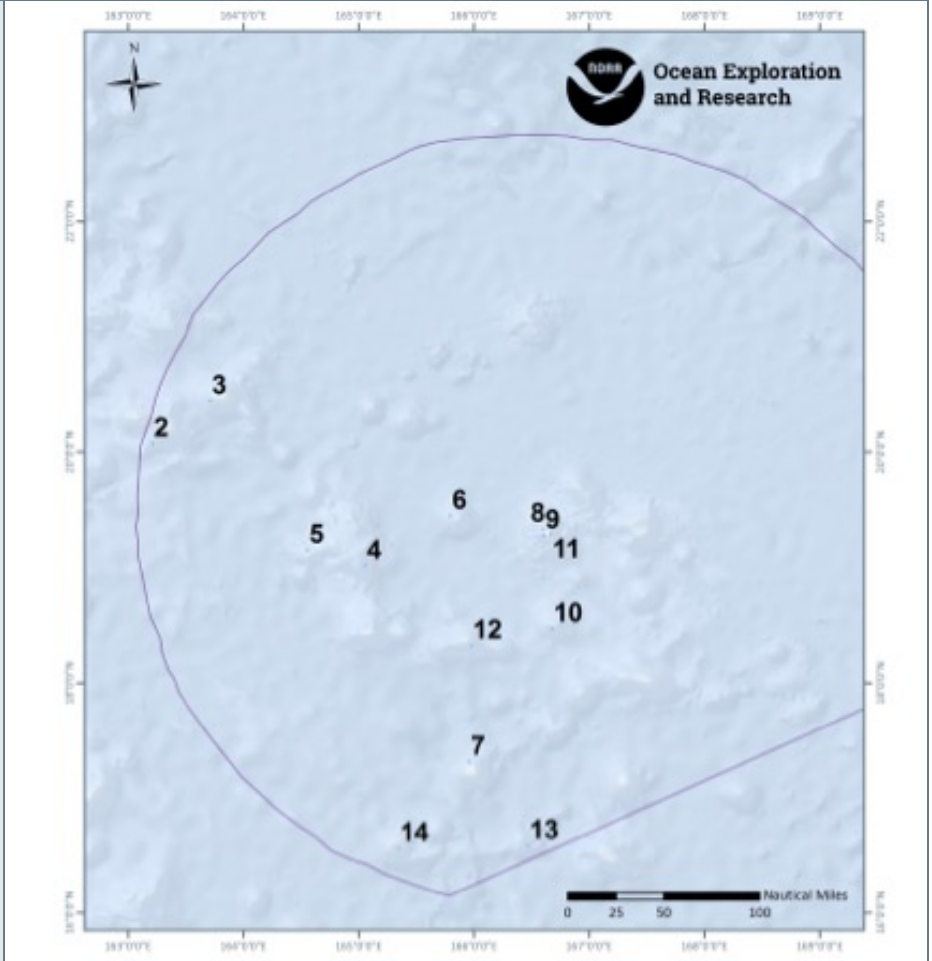
Ocean Exploration and Research

Okeanos Explorer ROV Dive Summary

Dive Information	
Dive Map	
Site Name	Lafayette Guyot (unofficial name)
Expedition Coordinator(s)	Brian RC Kennedy
ROV Lead(s)	Dan Rogers
Science Team Lead(s)	Chris Kelley and Jasper Konter
General Area Descriptor	Wake Atoll unit of PRIMNM
ROV Dive Name	
Cruise	EX-16-06
Leg	0

Dive Number	07
Equipment Deployed	
ROV	Deep Discoverer (D2)
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	none
ROV Dive Summary (from processed ROV data)	Dive Summary: EX1606_DIVE07 ^^^ In Water: 2016-08-08T20:39:15.732000 17°, 18.631' N ; 165°, 57.876' E Out Water: 2016-08-09T04:59:03.845000 17°, 18.156' N ; 165°, 58.150' E Off Bottom: 2016-08-09T03:31:20.915000 17°, 18.442' N ; 165°, 57.717' E On Bottom: 2016-08-08T22:00:23.493000 17°, 18.584' N ; 165°, 57.611' E Dive duration: 8:19:48 Bottom Time: 5:30:57 Max. depth: 2089.9 m
Special Notes	
Scientists Involved (please provide name, location, affiliation, email)	see table below

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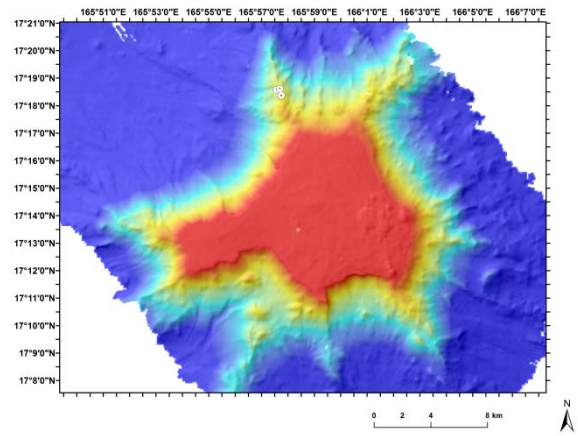
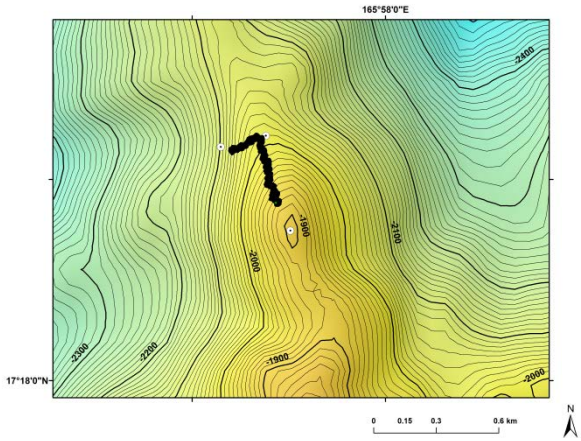
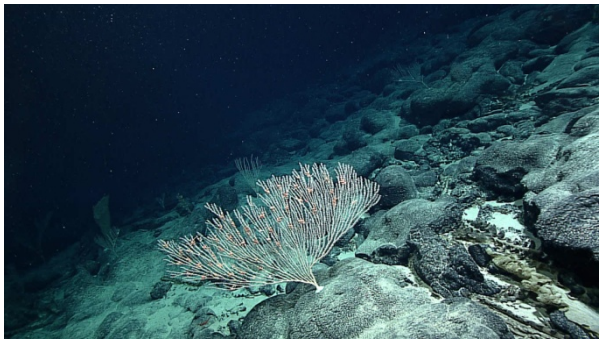
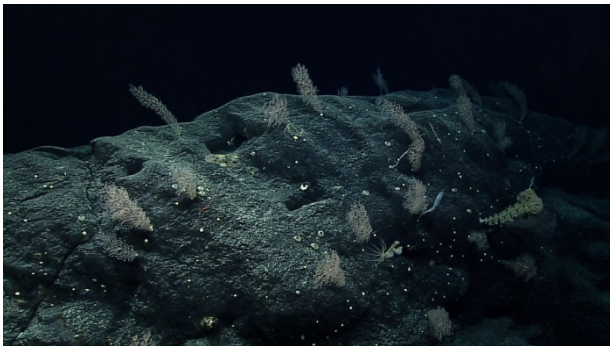
Purpose of the Dive	This dive is one of two proposed to explore a ridge extending from the northwest side of an unnamed seamount that we unofficially dubbed Lafayette guyot. The dive explored a depth range that typically hosts diverse coral and sponge communities. The goal of the dive was to carefully image the fauna, including multiple representatives of the same species, to provide insights into their natural history (including evidence for recent recruitment, reproductive status, aberrant growth), associates and predators. During the 2015 field season dives, many examples of coral predation and several examples of unusual colony growth (particularly among bamboo corals) were observed, but these types of observations were uncommon during this year's dives in the Marianas. What pattern will be seen in this intermediate geographic area? This proposed dive track began at 2090 m, below the crest of the ridge; the dive track then climbed the western-facing slope to the crest where it turned south following the crest line toward a local topographic high point at ≈1898 m. The proposers were more interested in detailed observations of the fauna along this track rather than reaching the topographic high. The dive was in the Pacific Remote Islands Marine National Monument and the results will provide information valuable to the NOAA Marine National Monuments Program and NOAA's Deep Sea Coral and Technology Program (DSCTP).		

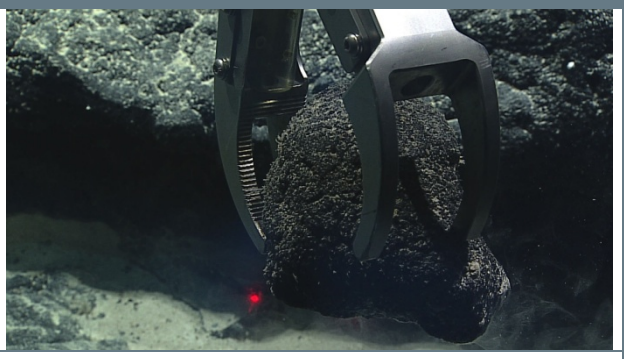
Description of the Dive	The ROV reached the seafloor at 21:55 (UTC), at a depth of 2108 m. This particular dive was designed to move up the side of a rift zone crest, before changing heading directly up the ridge-crest. The rift zone chosen for this approach was again on the northwest side of the seamount (i.e. guyot; 130 miles south of Wake Island), first ascending nearly due east, followed by a turn up the ridge crest toward the south-southwest. The depth range was optimized for observations on deep water corals and sponges, ranging from about 2100-1900m. The first view of the ocean floor showed a relatively steep wall of pillow lavas coated in thick Mn crust. The pillows were still visible as 10-50cm sized "bumps" under the thick, smooth Mn crust. The Mn crust was present as a pavement-type layer that appeared to show an almost flow-like structure, while showing a light sediment dusting. The steep-sided wall itself did not host many animals, but a small knob sticking out did host a few loose rocks, characterized by their more-black appearance. One of these was sampled as the first geologic sample, although it may not contain a volcanic rock fragment inside. This color contrast with the surrounding wall was likely the result of the individual darker rocks having rolled down the slope (losing their sediment). As we ascended to the ridge crest, it became fairly clear that the entire wall section was a large structure built from mainly pillow lavas (and some tube lavas). Only infrequent loose rocks were observed (likely displaced). Near the ridge crest and on top of it, the sediment load increased somewhat, particularly in the less steep sections along the crest. The ridge crest continued up hill in an uneven fashion with a more level section about halfway up, which had deep enough sand pockets to develop current ripples. After this section the slope became steeper and rockier again. Another loose rock on top of the Mn encrusted surface was collected in this last section. The ROV left the bottom around 3:30, within 100 or more meters of the endpoint of the dive, and a depth near 1900m. As we ascended the wall, the initial density of animals was moderate, mainly finding them on small knobs and boulders that were providing some distance from the main seafloor. As we entered the ridge crest, the density increased, particularly on the harder surfaces, though still on the higher boulders and knobs. On the first section, up the wall, we observed a number of corals, including primnoids (Calyptrophora, Narella, and Candidella sp.) and Chrysogorgia sp colonies, shrimp (Nematocarcinus sp) and several eels (Synaphobranchus sp). Further up the wall, the primnoids continued and were joined by black corals (Heteropathes sp), an anemone (Exocoelactis sp?), and a sea cucumber (Hansenothuria sp?). Sponges, including Caulophacus sp, a possible Crateromorpha sp, and Tretopleura sp) became more prominent near the ridge crest, and seemed to be slightly less restricted to the hard, high substrate. Besides several types of sponges seen in the previous dives, an unknown small, wide-stick-type sponge was observed several times, however its identity could not be deduced even to class. On the ridge crest, bottle-brush Chrysogorgia sp were the most dominant animal. We also found other chrysogorgiids including Iridogorgia magnaspiralis, and bamboo corals (cf Jasonisis sp.). The ridge crest also had other sponges (Poliopogon sp., Farrea sp., crinoids (Hyocrinidae, Sarametra sp) more sea cucumbers (Hansenothuria sp), , tunicates, sea stars (Calliaster and/or Evoplosoma sp. and fishes (Synaphobranchus sp and an unidentified ophidiid. Of particular interest was the observation of a black coral living on a sponge (Leiopathes or Antipathes) and sea spiders (Pycnogonida) predating the Jasonisis

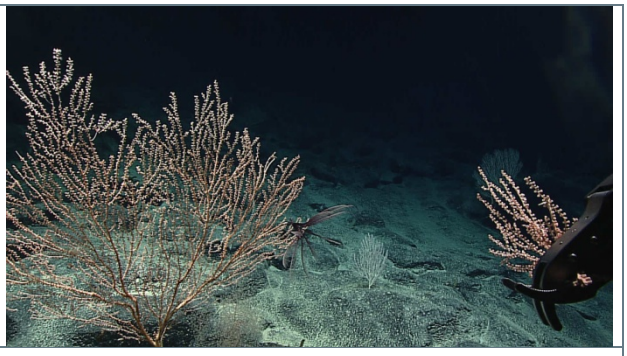
	colonies. One of the Jasonisis sp colonies was collected with with a brittle star and barnacles, and one of the bottle brush Chrysogorgia sp was collected with a squat lobster (Uroptychus sp).

Overall Map of the ROV Dive Area	**Close-up Map of Main Dive Site**
	
Overview map of Lafayette Guyot	Map showing the plan points and the actual track.

Representative Photos of the Dive	
	
Large bamboo coral (cf Jasonisis sp).	High point on the ridge with

	Chrysogorgia.

Samples Collected		
Sample		
Sample ID	D2_DIVE07_SPEC01GEO	
Date (UTC)	20160808	
Time (UTC)	22:46:33	
Depth (m)	2074.2509	
Temperature (°C)	2.20481	
Field ID(s)	Mn coated pillow fragment	
Comments		
Sample		
Sample ID	D2_DIVE07_SPEC02BIO	
Date (UTC)	20160809	
Time (UTC)	1:59:49	
Depth (m)	1950.973	
Temperature (°C)	2.17029	
Field ID(s)	Chrysogorgia sp	
Comments	Commensal squat lobster	
Sample		
Sample ID	D2_DIVE07_SPEC03GEO	
Date (UTC)	20160809	
Time (UTC)	2:19:46	
Depth (m)	1949.427	
Temperature (°C)	2.21001	
Field ID(s)	2.9912	
Comments		
Sample		
Sample ID	D2_DIVE07_SPEC04BIO	
Date (UTC)	20160809	

Time (UTC)	3:06:22	
Depth (m)	1928.419	
Temperature (°C)	2.21584	
Field ID(s)	Jasonisis? with OPH and BAR	
Comments	Commensal ophiuroid and barnacle	

Please direct inquiries to:

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