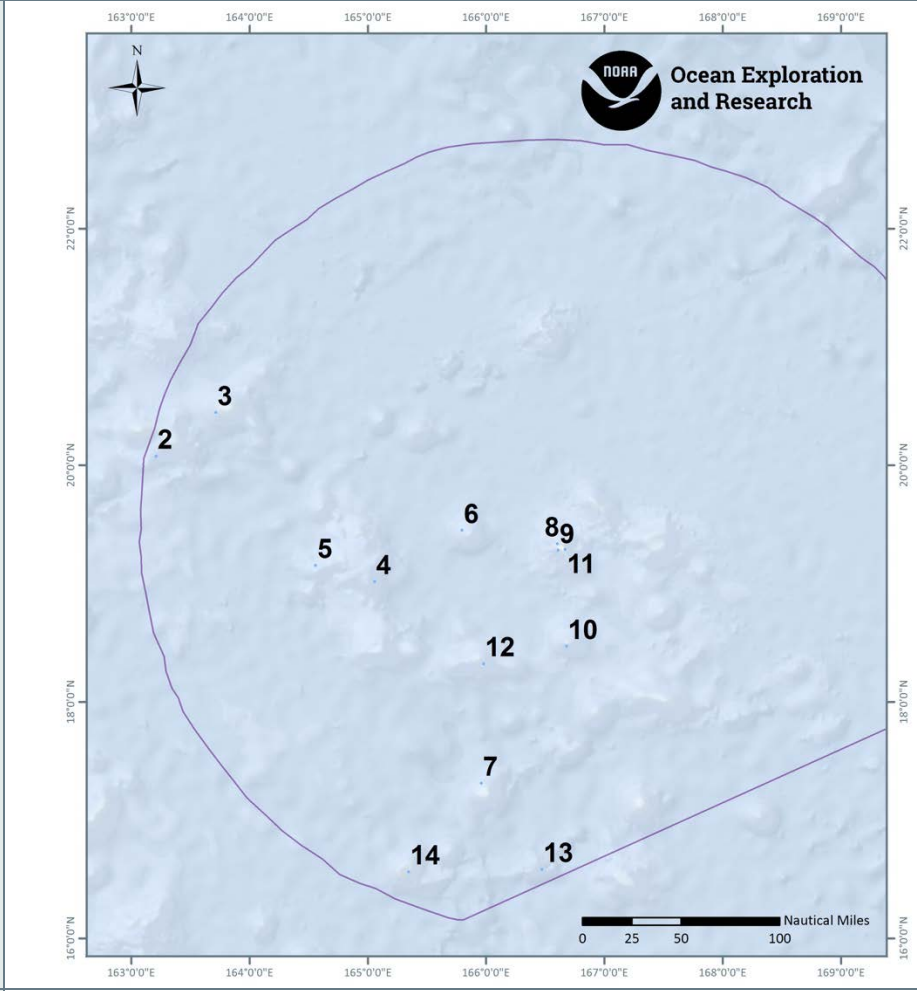
Ocean Exploration and Research

Okeanos Explorer ROV Dive Summary

Dive Information	
Dive Map	
Site Name	McDonnell Guyot West
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

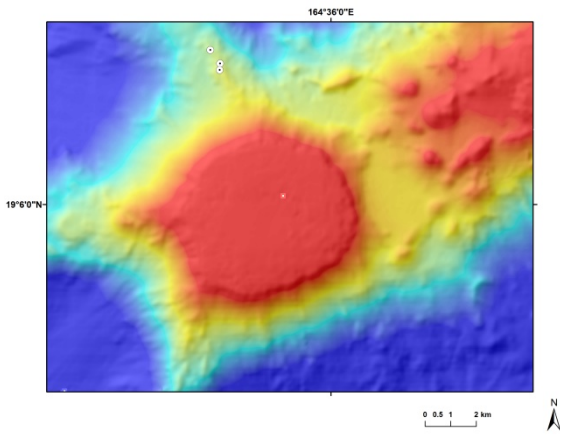
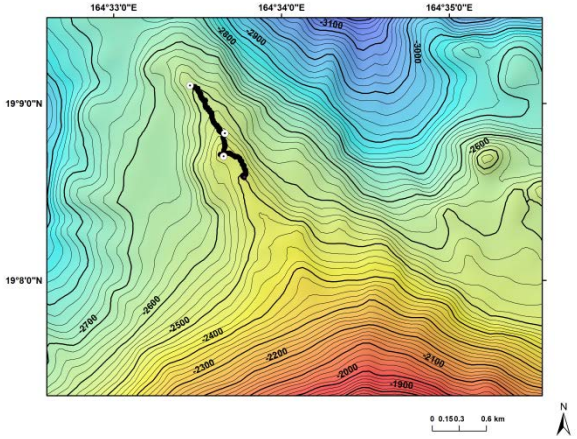
Dive Number	05		
Equipment Deployed			
ROV	Deep Discoverer (D2)		
Camera Platform	Seirios		
ROV Measurements	☒ CTD	☒ Depth	☒ Altitude
	☒ Scanning Sonar	☒ USBL Position	☒ Heading
	☒ Pitch	☒ Roll	☒ HD Camera 1
	☒ HD Camera 2	☒ Low Res Cam 1	☒ Low Res Cam 2
	☒ Low Res Cam 3	☒ Low Res Cam 4	☒ Low Res Cam 5
Equipment Malfunctions	none		
ROV Dive Summary (from processed ROV data)	Dive Summary: EX1606_DIVE05 ^^ In Water: 2016-08-04T19:55:56.940000 N/A ; N/A Out Water: 2016-08-05T06:33:06.017000 19°, 08.647' N ; 164°, 34.378' E Off Bottom: 2016-08-05T05:07:31.496000 19°, 08.584' N ; 164°, 33.779' E On Bottom: 2016-08-04T22:02:38.073000 19°, 09.091' N ; 164°, 33.481' E Dive duration: 10:37:9 Bottom Time: 7:4:53 Max. depth: 2582.4 m		
Special Notes			
Scientists Involved (please provide name, location, affiliation, email)	see table below		

Name	Organization	Email Address
Jasper Konter	University of Hawaii	jkonter@hawaii.edu
Kelley Chris	University of Hawaii	ckelley@hawaii.edu

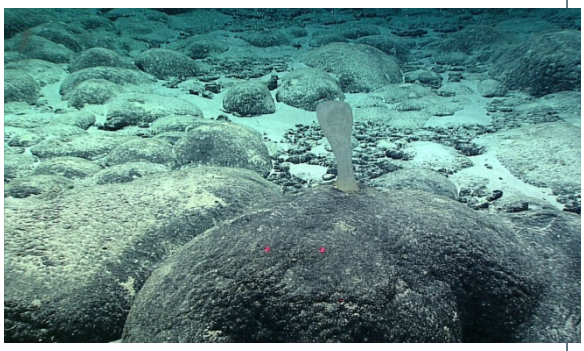
	Allison Miller	University of Guam	a33miller@gmail.com
	Amy Baco-Taylor	Florida State university	abacotaylor@fsu.edu
	Asako Matsumoto	Planetary Exploration Research Center (PERC), Chiba Institute of Technology	amatsu@gorgonian.jp
	Bruce Mundy	NOAA NMFS PIFSC	bruce.mundy@noaa.gov
	Charles Wahle	NOAA MPA Center	charles.wahle@noaa.gov
	Diva Amon	University of Hawaii	divaamon@gmail.com
	Kenneth Sulak	USGS	ksulak@usgs.gov
	Michael Vecchione	NOAA/NMFS/NSL	vecchiom@si.edu
	Nicole Morgan	Florida State University	nmorgan@fsu.edu
	Scott France	University of Louisiana at Lafayette	france@louisiana.edu
	Tina Molodtsova	P.P.Shirshov Institute of Oceanology RAS	tina@ocean.ru
Purpose of the Dive	The objective of the dive is to conduct a survey of the deepwater coral and sponge community on a ridge extending north from McDonnell guyot unofficially named McDonnell (Smoot, 1991). in the Wake Monument at depths just below the optimal range for Mn crust formation. The densest communities of deepwater corals and sponges have been discovered above 2500m and on this type of topography. Due to its approximate age, judged from similarities to seamounts further north that were age-dated, the ridge was therefore expected to be Mn crusted and documenting the environmental limits for animals found at the site should increase our knowledge of the species that are potentially at risk from deep sea mining activities in the future. Documenting Mn crust communities is a major CAPSTONE priority and determining the lower depth limit of these communities is important. A second objective of this dive was to provide data and samples for use in determining the geologic		

	history of this seamount. This geology of the seamounts in this area of the Pacific is poorly understood. The dive start and end points were at 2603 m and 2507 m.
Description of the Dive	The ROV (D2) reached the bottom at about 22:02 UTC, at a depth of 2608 m. The depth of the top of this seamount is similar to the adjacent seamounts, and fits with the expectation that this is an approximately 100 Ma old (Cretaceous) seamount. Dive 5 was on a smaller structure that is connected to a larger guyot (the main McDonnell seamount), but both have similarly deep flat tops, suggesting similar age, and likely a magmatic relationship. The seafloor during this dive was characterized with some steeper and more level sections. On the steeper sections we observed many cobble and some boulder sized rocks that appeared to be mainly pillow and tube lavas, coated in Mn crust. The steeper sections came to a maximum at an approximately 25m wall (part of a pillow mound) that was located roughly halfway through the dive. It turned out that the small, smooth peaks in the multibeam topography were relatively steep pillow mounds. Surrounding these high areas were much more level areas that were covered in a more significant amount of sand than the previous dives. In accordance with the strong current from the southwest, the sand featured clear current ripples that seemed to cover the beds of Mn nodules located in the sand (approx. 1 inch across). Past the original last way-point of the dive, the next low area showed significant sand, and on the other side of the valley Mn pavement, cracking and breaking loose in plate-like structures. No volcanic shapes or rocks were visible in this area. We collected a volcanic rock, coated in Mn crust near the starting point, and not quite half-way into the dive, a nice clear lava tube fragment was collected. The latter featured a clear radial cracking pattern, which is quite distinctive for submarine eruptions. With respect to biology, this site had low density but moderate to high diversity. Higher densities of animals occurred on the hard surfaces, particularly the larger pillow mounds and toward the later part of the dive when we reached shallower depths. With the exception of mollusks, representatives of all other phyla were observed. Cnidarians included antipatharians (Stauropathes sp, Heteropathes sp and a possible H. cf. americana), octocorals

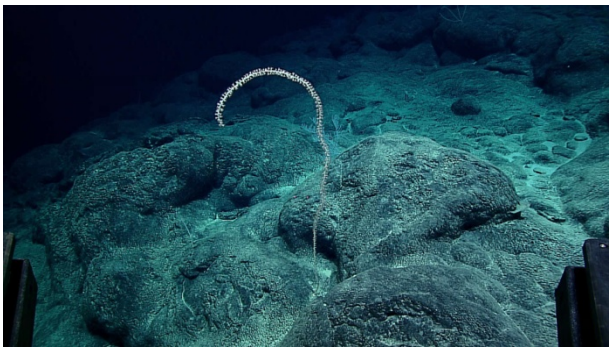
	(Pleurogorgia sp, Chrysogorgia sp, Chrysogorgia cf stellata, Iridogorgia bella, several species of isidids, a single polyp scleractinian, Narella sp, N. bifurcating, Narella unbranched, N. cf macrocalyx, and an unidentified pennatulacean). Sponges included Poliopogon sp, Caulophacus sp, Caulophacus (Caulodiscus) sp, Bolosoma sp, Semperella sp, Tretopleura sp, Stelodoryx sp?). Arthropods observed included shrimp (Lebbeus sp, Nematocarcinus sp, and an aristeid), squat lobsters, balanoid barnacles, a munnid isopod,) and echinoderms observed included young and adult commatulids, Pentacrinus sp, antedonid, Orphnurgus sp?, Calliaster sp, Hymenaster sp, Pedicellariidae, ophiuroids. A few fish were also observed and included Bassozetus sp, Bassogigas sp, and a macrourid (Kumba sp). Finally, the kebab sponge/tunicate was also seen at this site.

Overall Map of the ROV Dive Area	**Close-up Map of Main Dive Site**
	
Western part of McDonnell Guyot	NW rift zone ridge showing the actual dive track.

Representative Photos of the Dive



A sponge (Semperella sp) found on a mixed substrate of boulders, cobbles, and sediment.



Isidid octocoral encountered toward the latter part of the dive.

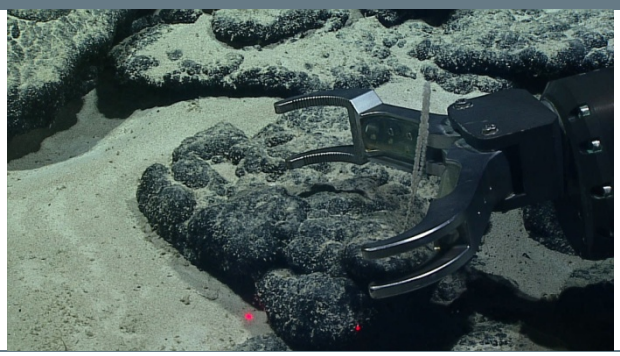
Samples Collected

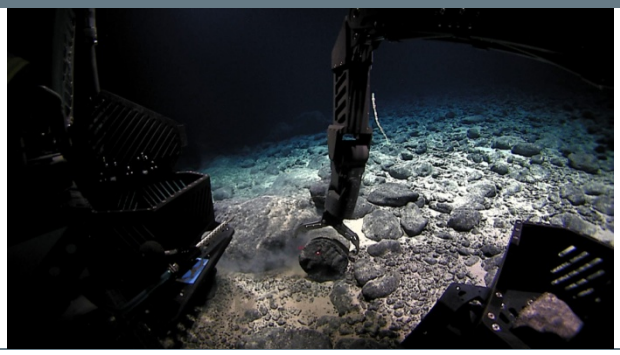
Sample

Sample ID	D2_DIVE05_SPEC01GEO
Date (UTC)	20160804
Time (UTC)	22:32:57
Depth (m)	2580.5131
Temperature (°C)	1.59061
Field ID(s)	Mn encrusted rock
Comments	

Sample

Sample ID	D2_DIVE05_SPEC02BIO
Date (UTC)	20160804
Time (UTC)	23:24:19
Depth (m)	2575.3933
Temperature (°C)	1.55947
Field ID(s)	Bifurcating Narella sp?
Comments	



Sample		
Sample ID	D2_DIVE05_SPEC03GEO	
Date (UTC)	20160805	
Time (UTC)	1:22:26	
Depth (m)	2545.3429	
Temperature (°C)	1.62185	
Field ID(s)	Mn encrusted tube lava	
Comments		

Sample		
Sample ID	D2_DIVE05_SPEC04BIO	
Date (UTC)	20160805	
Time (UTC)	5:06:21	
Depth (m)	2467.9898	
Temperature (°C)	1.63898	
Field ID(s)	Pleurogorgia sp	
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