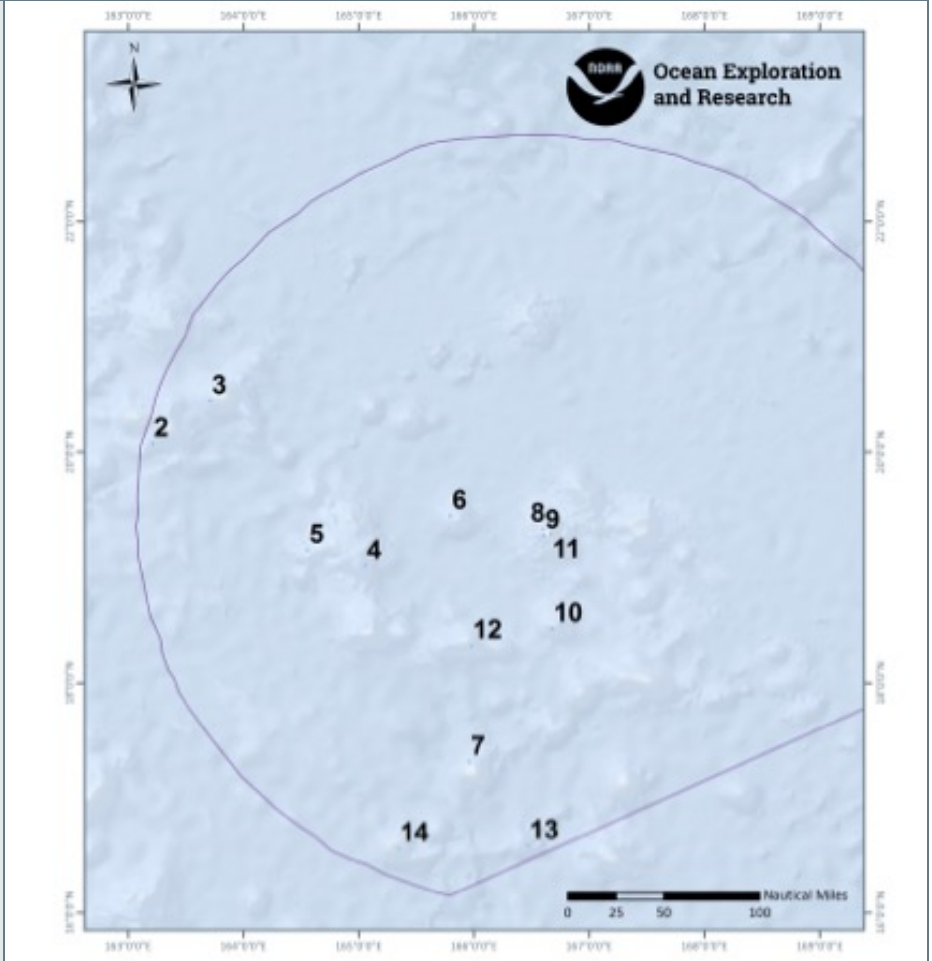
Ocean Exploration and Research

Okeanos Explorer ROV Dive Summary

Dive Information	
Dive Map	
Site Name	E Wake Island
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	11

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_DIVE11 ^^ In Water: 2016-08-12T20:26:30.160000 19°, 17.111' N ; 166°, 40.148' E Out Water: 2016-08-13T04:35:18.643000 19°, 17.350' N ; 166°, 40.075' E Off Bottom: 2016-08-13T04:14:31.018000 19°, 17.440' N ; 166°, 39.900' E On Bottom: 2016-08-12T21:24:38.506000 19°, 17.144' N ; 166°, 40.150' E Dive duration: 8:8:48 Bottom Time: 6:49:52 Max. depth: 639.4 m		
Special Notes			
Scientists Involved (please provide name, location, affiliation, email)	**Name**	**Affliation**	**Email**
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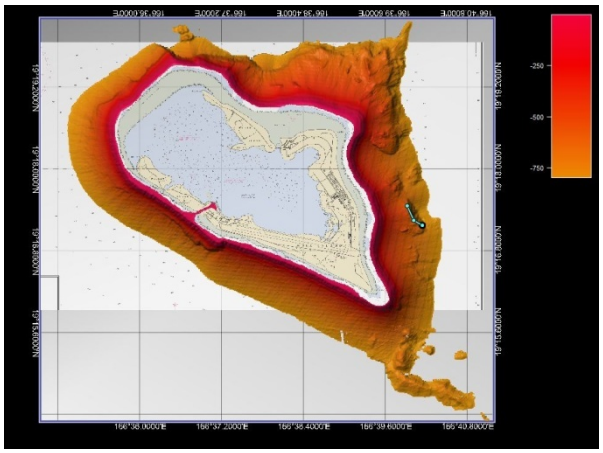
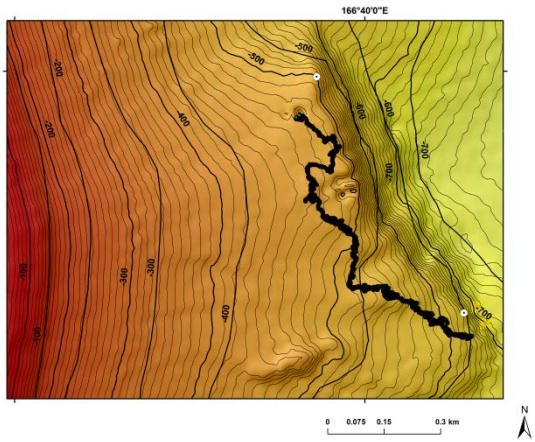
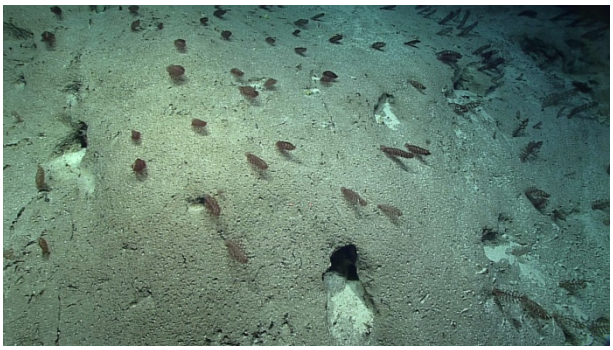
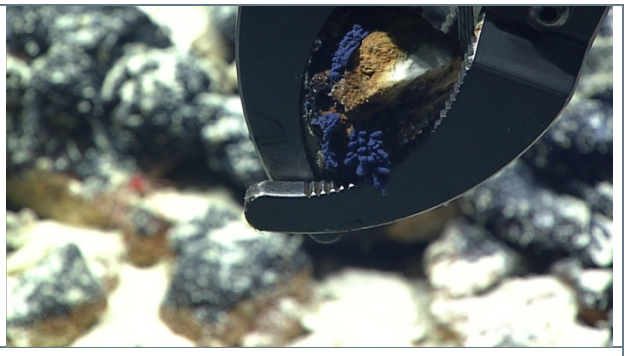
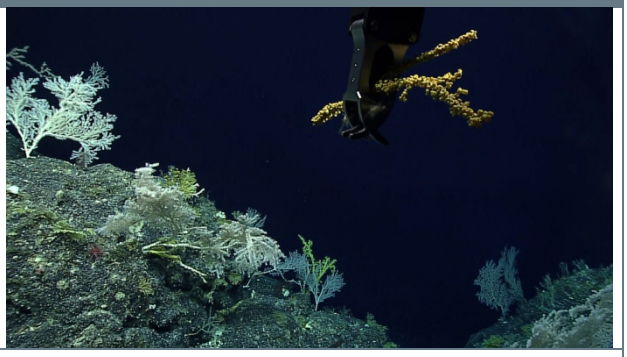
Purpose of the Dive	This was the second of two shallower dives targeting the precious coral resources around Wake Island. Since nothing was known about the presence of commercially valuable species of coralliids, isidids, antipatharians, and parazoanthids, the shallow water dives were planned to target the habitats of these animals. While no species in any of these families are known to have been harvested off Wake Island, precious corals are a fishery across the Pacific under the responsibility of NOAA Fisheries and therefore additional information on their distribution and abundance in any of the US EEZs is valuable for improving their management. These data are also important to the Deep Sea Coral Research and Technology Program. The objective of this dive was therefore to survey for corals, particularly precious corals, off Wake Island. In addition, the shallow(er) water dives were also aimed at characterizing the fish population in the monument.		
Description of the Dive	The ROVs reached the bottom around 21:11UTC at a depth of 640m. The dive ran along the top edge of what appeared to be a large slump or broken terrace wall on the slope of the island. This feature turned out to be a significant carbonate rock formation that had clearly undergone weathering and dissolution, at or above sea level. Subsequently, the present-day atoll near the surface generated and draped the ancient carbonate reef in a layer of coral sand. The location of this feature was just over a half mile from the eastern shore of Wake Atoll, and one of the shallowest areas at that distance from the atoll. Consequently, this location helped to characterize precious corals and mid-water fish in the monument. The terrain during this dive was dominated by carbonate deposits, sourced from the coral reef built on top of this atoll. At the landing site, the seafloor was steep (nearly 45 degrees) and consisted of light colored, solid carbonate (limestone consisting of reef fragments) with a light dusting of		

	carbonate sand (derived from shells and corals). During the first half of the dive, the bottom became increasingly sandy, from occasional sandy pockets, to wider and deeper sand deposits with ripples. After about an hour, we finally reached the top of the solid carbonate, and changed terrain to sand-dominated bottom with occasional pebble to boulder-sized reef fragments (including complete fossil coral heads). As we continued on the dive, the boulders made way for small islands of rocky outcrops. The larger, steeper ones showed carbonate color and texture near the sediment base, but a thin black coating higher up (presumably Mn crust, although we are unsure if this effectively precipitates at such shallow depths). We surveyed these types of rocky, steep formations for most of the remainder of the dive (since it hosted the most varied life forms), however, near the end we descended slightly from the heights defined by the Mn coated carbonate and transected a large sandy area. This area defined a slope down to the top-edge of a large drop off (presumably the wall identified in the multibeam data). Clearly sand and reef fragments are periodically transported down the slope and over the edge. We completed a slightly modified dive track, having moved the final way-point slightly up hill, leaving bottom around 466m. The fauna on the carbonate varied depending on the nature of the substrate. Animals observed on sediment included fishes (Polymixia sp, Chlorophthalmus sp, Chrionema chryseres, Glossanodon sp, Gadella sp, Lophiodes sp), sea pens (Pennatula inflata, Kophobelemnon stelliferum?), seastars (goniasterids, and an echiuran spoon worm (Bonellia sp?), though the latter was in a carbonate hole. Animals found on the scattered boulders on the sediment included anemones (hormathiids, Actinoscyphia sp, Liponema sp), antipatharians (Stauropathes sp, Leiopathes sp), octocorals (plexaurids, isidids, stoloniferans, Rhodaniridogorgia sp) scleractinians (Polymyces wellsi? and Enallopsammia rostrata), crustaceans (shrimp and crabs) and echinoderms. Black corals were dominant in the first part of the dive, where the substrate was mixed sediment, boulders, and ledges. When the ROV reached the dropoff, a large number of corals and other animals appeared, most notable of which were numerous precious gold coral colonies (Kulamanamana sp, the nodal isidids that they were overgrowing, and thousands of rock pens (Calibelemnon sp). A sample of the each of the corals was taken. The fish community at the drop off was dominated by alfonsinos (Beryx decadactylus) and tinsel fish (Grammacolepus brachiusculus). The ROV was also visited by a large six gill shark (Hexanchus griseus) at the ledge. In the water column, the pilot was able to get good images of snaggletooth fishes (Astronesthes sp. There were many other animals as well, too numerous to list in this summary however a couple of others is worth a mention. An unidentified blue encrusting animal was collected and one of the bottomfish species (Randallichthys filamentosus) also swam by quickly before the pilot could get a closeup. Finally, a beautiful purple octocoral with white branches was also observed but not collected (regretably). At the present time, this coral remains unidentified.

Overall Map of the ROV Dive Area	**Close-up Map of Main Dive Site**
	
Overview of the dive site showing relationship to Wake Island.	Map showing the actual dive track.
Representative Photos of the Dive	
	
Gold coral (Kulamanamana sp overgrowing an unidentified nodal isidid.	Some of the thousands of rock pens (Calibelemnon sp?) observed at the dive site.
Samples Collected	
Sample	

Sample ID	D2_DIVE11_SPEC01BIO	
Date (UTC)	20160813	
Time (UTC)	1:21:32	
Depth (m)	483.944	
Temperature (°C)	8.53818	
Field ID(s)	Blue bio material with pebble	
Comments	encrusting on rock	
Sample		
Sample ID	D2_DIVE11_SPEC02BIO	
Date (UTC)	20160813	
Time (UTC)	2:10:40	
Depth (m)	458.5413	
Temperature (°C)	9.85629	
Field ID(s)	Gold Coral with bamboo	
Comments	Specimen consists of 1 branch overgrown by gold coral and one branch not overgrown	
Sample		
Sample ID	D2_DIVE11_SPEC03GEO	
Date (UTC)	20160813	
Time (UTC)	3:17:58	
Depth (m)	461.1346	
Temperature (°C)	8.83498	
Field ID(s)	Carbonate rock	
Comments	Two commensals found on rock that included a cup coral and a bivalve.	

Please direct inquiries to:

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