


OKEANOS EXPLORER ROV DIVE SUMMARY

Site Name	East of Necker			
ROV Lead/Expedition Coordinator	Karl Mcletchie/ Brian RC Kennedy			
Science Team Leads	Daniel Wagner and Jonathan Tree			
General Area Descriptor	Papahānaumokuākea Marine National Monument			
ROV Dive Name	Cruise Season	Leg	Dive Number	
	EX1603	1	DIVE01	
Equipment Deployed	ROV:	Deep Discoverer		
	Camera Platform:	Seirios		
ROV Measurements	<input checked="" type="checkbox"/> D2 CTD	<input checked="" type="checkbox"/> Depth	<input checked="" type="checkbox"/> Altitude	
	<input checked="" type="checkbox"/> Scanning Sonar	<input checked="" type="checkbox"/> USBL Position	<input checked="" type="checkbox"/> Heading	
	<input checked="" type="checkbox"/> Pitch	<input checked="" type="checkbox"/> Roll	<input checked="" type="checkbox"/> HD Camera 1	
	<input checked="" type="checkbox"/> HD Camera 2	<input checked="" type="checkbox"/> ROV HD 2	<input checked="" type="checkbox"/> Seirios CTD	
	Temperature Probe	<input checked="" type="checkbox"/> D2 DO Sensor	<input checked="" type="checkbox"/> Seirios DO sensor	
Equipment Malfunctions	The Kraft manipulator arm malfunctioned on the pre-dive. After an hour of troubleshooting failed to resolve the issue we proceeded with the dive.			
ROV Dive Summary (From processed ROV data)	Dive Summary: EX1603_DIVE01			
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	In Water:	2016-02-27T19:40:59.542000 23°, 34.305' N ; 164°, 01.568' W		
	Out Water:	2016-02-28T02:47:11.227000 23°, 35.172' N ; 164°, 02.549' W		
	Off Bottom:	2016-02-28T00:17:45.380000 23°, 34.486' N ; 164°, 01.839' W		
	On Bottom:	2016-02-27T21:57:22.670000 23°, 34.409' N ; 164°, 01.644' W		
	Dive duration:	7:6:11		
	Bottom Time:	2:20:22		
Max. depth:	4292.7 m			
<b>Special Notes</b>				
<b>Scientists Involved (please provide name / location / affiliation / email)</b>	Name	Affiliation	Email Address	
	Steve Auscavitch	Temple University	steven.auscavitch@temple.edu	
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	Nicole Morgan	Florida State University	nmorgan@fsu.edu
	Jonathan Parshall	Nauticos	jonp@combinedfleet.com
	Brendan Roark	Texas A&M University	broark@geos.tamu.edu
	Jonathan Tree	University of Hawaii Geology and Geophysics Department	jtree@hawaii.edu
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	Katharine Woodard	NOAA/NCEI	katharine.woodard@noaa.gov

#### **Purpose of the Dive**

This dive, located on the northeast side of Necker Island (Mokumanamana), was carried out at the request of the Extended Continental Shelf (ECS) Program in order to obtain information that might be able to show a connection between Necker Island and Necker Ridge, a narrow feature that extends over 400 miles and protrudes past the current exclusive economic zone (EEZ) of the United States. The primary objective was to collect two geological samples on the ridge in order to determine whether these have the same composition as specimens that have previously been collected near Necker Island. Additionally, the ROV would survey biological communities in the area as time permits. The target start point of the dive was a flat surface located at a depth of 4302 m, which transitioned into a steep slope towards the northwest. The plan of the dive was for the ROV to survey up the steep slope moving northwest to a target depth of approximately 3900 m, collecting two geological samples along the way, as well as opportunistically documenting the biological community in the area.

#### **Description of the Dive:**

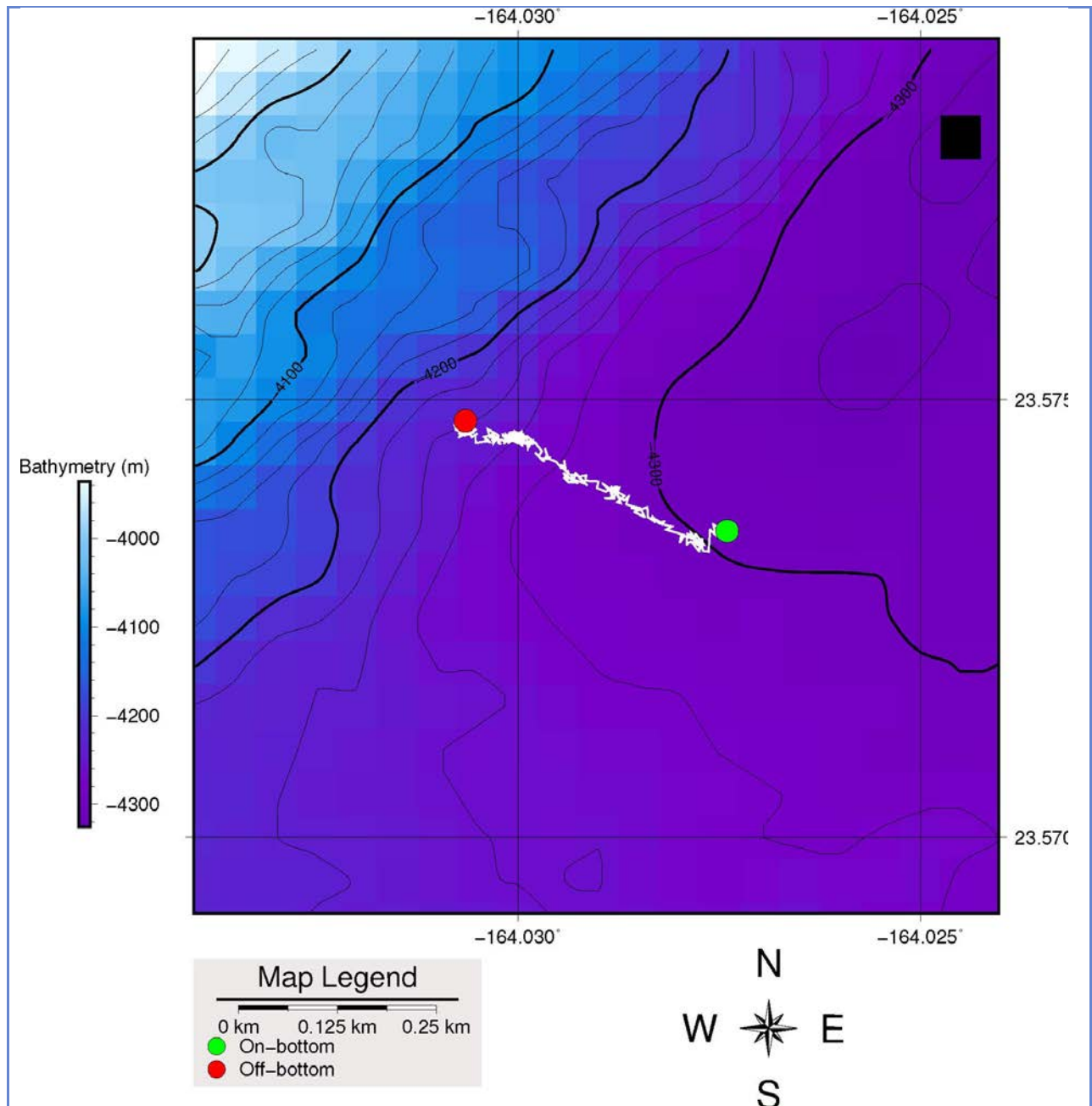
The ROV landed on flat, heavily-sedimented surface at 4291 m with weak or no current. The bottom had coalescent sediment cover with scattered Mn-encrusted boulders and pebbles. As the ROV moved northwestward towards the slope of the ridge, a few animals were observed including shrimps, sponges, sea anemones, sea cucumbers and two fish. At ~4280 m, the heavily-sedimented surface gave way to a more sloped surface with hardpan and isolated pillow lavas. Upon traversing up the slope near a depth of 4250 m, lobes of intact flows of pillow lavas were observed. A loose manganese-crusted volcanic rock was collected at 4245 m near the base of this flow. As the ROV moved up the slope, a couple of bamboo corals and anemones were observed. Sediment cover continued to decrease upslope to a surface composed of more Mn-encrusted pillow lavas with pockets of sediment. The Mn crusts appeared to be thin relative to the thicker crusts present on older (Cretaceous age) flows. This observation suggests that these flows are younger in age and were emplaced during

Hawaiian volcanic growth ~10 Myrs ago. A second manganese-crust volcanic rock was collected at the base of another pillow lava flow very close to the end of the dive at 4222 m. Based on observation of the Mn crust thickness, both of the geological samples collected are hypothesized to be Hawaiian in origin and age. This suggests that the Necker Ridge continuation was not observed on the NE flank of the Necker complex. However, further analysis will be needed to reveal the absolute age and composition of these samples to confirm this notion. The ROV left the bottom after a total bottom time of 2:18h.

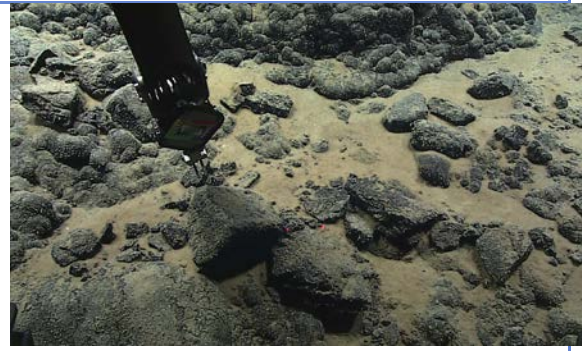
### Animals observed during dive

Phylum	Group	Species
Anellida	Polychaetes	Polychaete? (on sponge)
Arthropods	Shrimp	Unidentified red shrimp
Arthropods	Shrimp	Aristopenaeus? sp.
Cnidarians	Actinarians	Unidentified anemone
Cnidarians	Gorgonians	Bathygorgia? sp.
Cnidarians	Gorgonians	Chrysogorgia sp. planar
Cnidarians	Gorgonians	Isidella? sp.
Echinoderms	Holothurians	Psychropotes? sp.
Echinoderms	Holothurians	Elpidiidae
Fishes	Argentiniformes	Alepocephalidae?
Fishes	Aulopiformes	Bathysaurus mollis?
Mollusks	Cephalopod	Pink Octopus
Sponges	Hexactinellids	Hyalonema (Corynonema) sp.

Map of ROV Dive Area



Representative Photos of the Dive



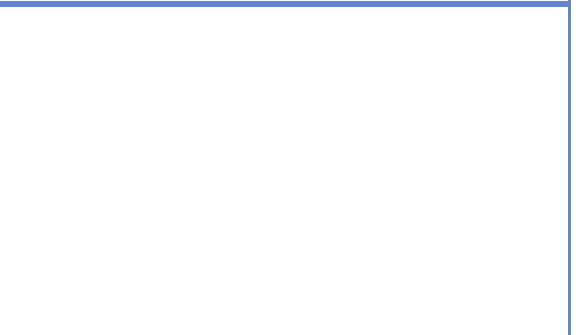
**Samples Collected**


<b>Sample ID</b>	EX1603_20160227T233000_D2_DIVE01_SPE C01GEO
<b>Date (UTC)</b>	20160227
<b>Time (UTC)</b>	23:30:15
<b>Depth (m)</b>	4245
<b>Temperature (°F)</b>	1.47
<b>Field ID(s)</b>	Mn-encrusted volcanic



**Comments**

<b>Sample ID</b>	EX1603_20160228T001300_D2_DIVE01_SPE C02GEO
<b>Date (UTC)</b>	20160228
<b>Time (UTC)</b>	00:13:45
<b>Depth (m)</b>	4223
<b>Temperature (°F)</b>	1.47
<b>Field ID(s)</b>	Mn-encrusted volcanic



		
<b>Comments</b>	subangular	
<b>Please direct inquiries to:</b>		NOAA Office of Ocean Exploration & Research 1315 East-West Highway (SSMC3 10 th Floor) Silver Spring, MD 20910 (301) 734-1014