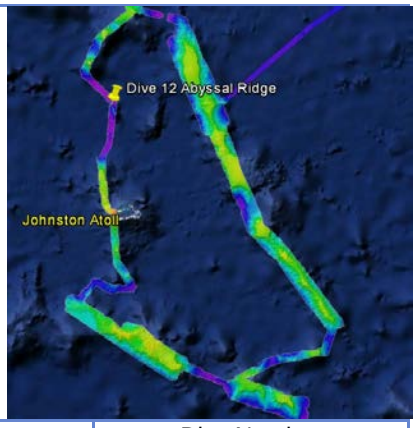
OKEANOS EXPLORER ROV DIVE SUMMARY

Site Name	Abyssal Ridge	
ROV Lead/Expedition Coordinator	Karl Mcletchie/ Brian RC Kennedy	
Science Team Leads	Scott France and Mackenzie Gerringer	
General Area Descriptor	Johnston Atoll Pacific Remote Islands Marine National Monument	

ROV Dive Name	Cruise Season	Leg	Dive Number
	EX1504	4	DIVE12
Equipment Deployed	ROV:	Deep Discoverer	
	Camera Platform:	Seirios	
ROV Measurements	☒ D2 CTD	☒ Depth	☒ Altitude
	☒ Scanning Sonar	☒ USBL Position	☒ Heading
	☒ Pitch	☒ Roll	☒ HD Camera 1
	☒ HD Camera 2	☒ ROV HD 2	☒ Seirios CTD
	Temperature Probe	☒ D2 DO Sensor	☐ Seirios DO sensor
Equipment Malfunctions	VSAT continues to underperform		

ROV Dive Summary (From processed ROV data)

Dive Summary: EX1504L4_DIVE12

In Water:	2015-09-25T18:14:16.500000 17°, 36.925' N ; 169°, 39.059' W
Out Water:	2015-09-26T04:04:27.671000 17°, 36.504' N ; 169°, 37.652' W
Off Bottom:	2015-09-26T01:42:42.234000 17°, 36.570' N ; 169°, 38.414' W
On Bottom:	2015-09-25T20:28:40.390000 17°, 36.883' N ; 169°, 38.691' W
Dive duration:	9:50:11
Bottom Time:	5:14:1
Max. depth:	4243.4 m

Special Notes

Scientists Involved *(please provide name / location / affiliation / email)*

Name	Institution	Email Address
Amy Baco-Taylor	FSU	abacotaylor@fsu.edu

Andrea Quattrini	USGS	aquattrini@usgs.gov
Asako Matsumoto	University of Tokyo	amatsu@gorgonian.jp
Bruce Mundy	NOAA NMFS Pacific Islands Fisheries Science Center	bruce.mundy@noaa.gov
Chris Kelley	University of Hawaii	ckelley@hawaii.edu
Diva Amon	University of Hawaii	divaamon@hawaii.edu
Jasper Konter	University of Hawaii	jkonter@hawaii.edu
Jeff Drazen	University of Hawaii	jdrazen@hawaii.edu
John Smith	University of Hawaii	jrsmith@hawaii.edu
Les Watling	University of Hawaii	watling@hawaii.edu
Mackenzie Garringer	University of Hawaii	mgerring@hawaii.edu
John Reed	Harbor Branch Oceanographic Institute- Florida Atantic University	jreed12@fau.edui
Scott France	University of Louisiana at Lafayette	france@louisiana.edu
Steve Haddock	MBARI	haddock@mbari.org
Steve Auscavitch	Temple	steven.auscavitch@temple.edu
Tina Molodtsova	P.P.Shirshov Institute of Oceanology	tina.molodtsova@gmail.com tina@ocean.ru
Rachael Bassett	NOAA	rachel.bassett@noaa.gov
Jim Masterson	FAU Harbor Branch Oceanographic	jmaster7@fau.edu
Kimberly Galvez	University of Miami - RSMAS CSL-Center for Carbonate Research	kgalvez@rsmas.miami.edu
Bill Clancey	IHMC	wclancey@ihmc.us
Josh Voss	HBOI	Jvoss2@fau.edu

Purpose of the Dive

To explore the abyssal community of a hard bottom in the Pacific Remote Islands Marine National Monument - Johnston Atoll.

Description of the Dive:

This dive explored a very deep feature in the Pacific Remote Islands Marine National Monument. The ROV D2 climbed a ridge on a feature that is not much taller than an abyssal hill, but had steep walls to the east and west. This was the deepest bottom explored on Leg 4. The dive track began at 4241 m and ascended the ridge to a local high at 4062 m. The axis of the ridge was quite narrow (<75 m) and mostly sediment free. A brief drift test with the ROV estimated the current flow at ≈ 0.1 knots from a direction of 237 degrees. The exposed rock appeared heavily Mn-coated and smooth and eroded. There were many alternations between smooth pavement and collapsed rubble, with occasional dramatic changes in local topography in the forms of pillow mounds. Angular fractured features were particularly noteworthy around 4098 m. Rock samples were collected from 4238, 4096, and 4062 m.

The sparse biota was dominated by glass sponges (Hexactinellida), and no corals were observed. We estimated 8 different sponge morphotypes, some that could be tentatively identified to some taxonomic level (Pheronematidae, *Caulophacus*, *Hyalonema*, *Saccocalyx*, Corbitellinae, and Cladorhizidae [multiple with isopods – prey or temporary associates?]) and others that were completely unknown (eg. a purple prostrate morph). The most abundant sponge was an unidentified squat vase-like form, a sample of which was collected. A second unidentified hexactinellid sponge, possible Hyalonematidae, was collected from a depth of 4062 m. Early in the dive at 4238 m a giant solitary hydroid, likely in the genus *Candelabrum,* was observed in a strong current flow, and was collected along with the rock it was growing from.

Only a few fish were seen, including the cusk eel *Leucicorus* (*Ophidiidae*), which was also imaged on a leg 2 of this expedition. Four individuals of this species were seen during the dive. Knowledge of the genus comes only from a collection of about 20 specimens, thus the high quality video observations of these deep-sea fishes is extremely rare and valuable. Detailed video of a macrourid fish (*Coryphaenoides sp.*) were also collected.

Sea cucumbers (Holothuroidea) were commonly observed along the dive track, likely all elasipodoids; one of these was imaged swimming. Also commonly observed were squat lobsters (*Munodopsis*), one of which performed a classic caridoid escape response (swimming backward by flapping the abdomen) as the vehicle approached. Several swimming nemertean worms (both red- and white-colored) were seen. A swimming polychaete was imaged, possibly of the genus *Swima*, whose body appeared transparent.

Fauna observed

Echinoderms: Holothurian sea cucumbers – many synallactids; ophiuroids; crinoids; brisingid asteroids

Cnidarians: Solitary hydroid – *Candelabrum*; pelagic hydromedusa; Actiniaria sea anemones (small, white)

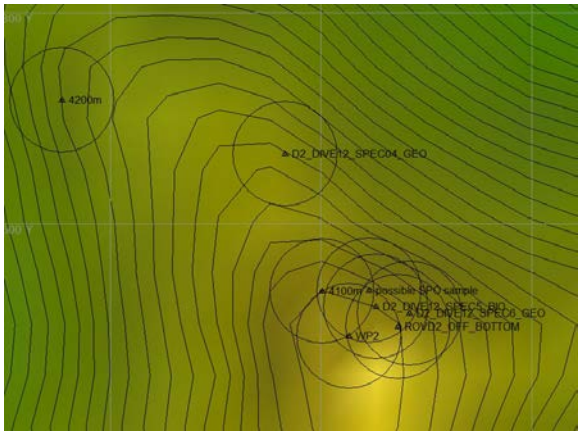
Crustaceans: shrimp *Nematocarcinus*; acorn barnacles – verrucomorphs; squat lobsters *Munidopsis*; Isopoda carrying embryos; mysid shrimp

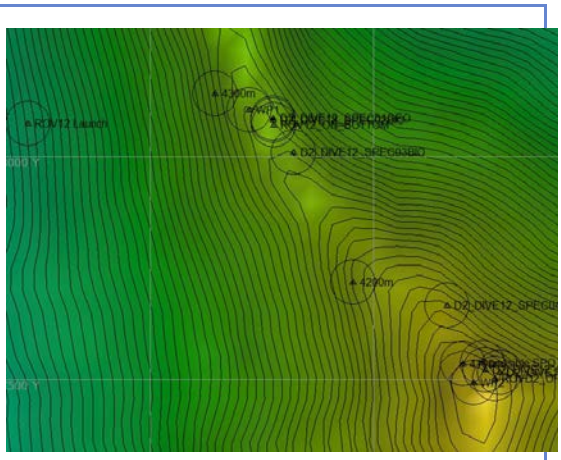
Sponges: Pheronematidae, *Caulophacus*, *Hyalonema*, Cladorhizidae, *Saccocalyx*, Corbitellinae, unknown vase-like and purple morphs

Fishes: Ophidiidae *Leucicorus*; *Coryphaenoides* sp

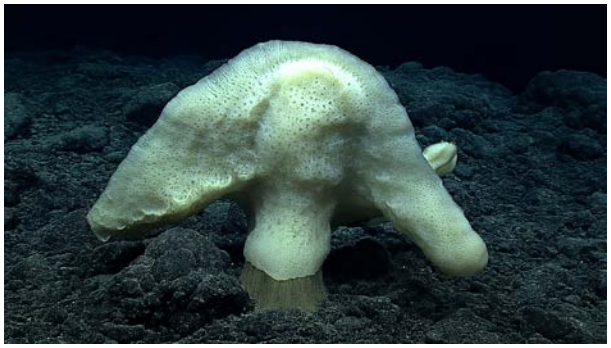
Other: Polychaetea *Swima*; pelagic Nemertea

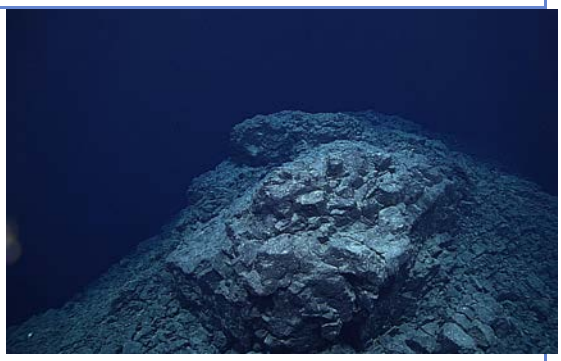
Overall Map of ROV Dive Area	**Close-up Map of Main Dive Site**





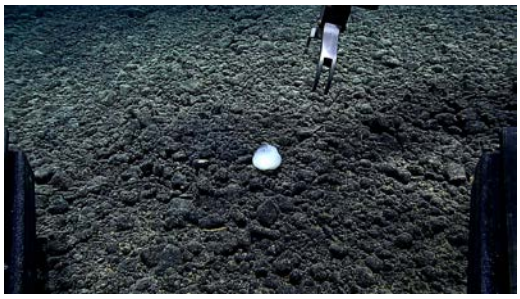
Representative Photos of the Dive





Samples Collected

Sample ID	EX1504L4_20150925T205256_D2_DIVE12_SPEC01GEO
Date (UTC)	20150925
Time (UTC)	205256
Depth (m)	4238.06

Temperature (°C)	1.46	
Field ID(s)	Mn-encrusted basalt	
Comments	Two rocks were collected with SPEC02BIO. The first rock (SPEC01GEO) and the second rock (SPEC02BIO_C01) that was connected to SPEC02BIO. In situ images and video are named SPEC02BIO.	
Sample ID	EX1504L4_20150925T205505_D2_DIVE12_SPEC02BIO	
Date (UTC)	20150925	
Time (UTC)	205505	
Depth (m)	4237.59	
Temperature (°C)	1.45	
Field ID(s)	Candelabrid hydroid	
Comments	Sampled w/ attached rock. Inflated and extended on collection.	
Sample ID	EX1504L4_20150925T213430_D2_DIVE12_SPEC03BIO	
Date (UTC)	20150925	
Time (UTC)	213430	
Depth (m)	4232.54	
Temperature (°C)	1.45	
Field ID(s)	Hexactinellid	
Comments	Spongy	
Sample ID	EX1504L4_20150925T235114_D2_DIVE12_SPEC04GEO	
Date (UTC)	20150925	
Time (UTC)	235114	
Depth (m)	4096.58	
Temperature (°C)	1.46	
Field ID(s)	Basalt	
Comments		

Sample ID	EX1504L4_20150926T011422_D2_DIVE12_SPEC05BIO	
Date (UTC)	20150926	
Time (UTC)	011422	
Depth (m)	4059.62	
Temperature (^{o}C)	1.45	
Field ID(s)	Hyalonematidae	
Comments		

Sample ID	EX1504L4_20150926T014011_D2_DIVE12_SPEC06GEO	
Date (UTC)	20150926	
Time (UTC)	014011	
Depth (m)	4062.33	
Temperature (^{o}C)	1.47	
Field ID(s)	Mn-encrusted basalt	
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