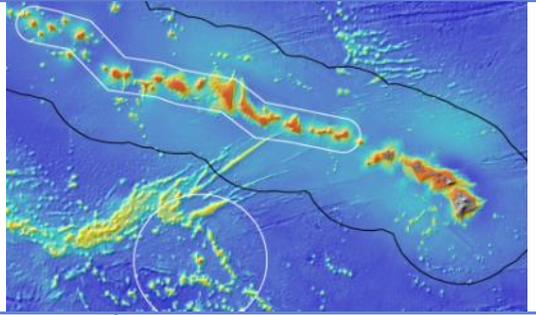


OKEANOS EXPLORER ROV DIVE SUMMARY

<b>Site Name</b>	Bank 9 South		
<b>ROV Lead/Expedition Coordinator</b>	Karl McLetchie Kelley Elliott		
<b>Science Team Leads</b>	Chris Kelley (Biology) Daniel Wagner (Biology)		
<b>General Area Descriptor</b>	Northwestern Hawaiian Islands		
<b>ROV Dive Name</b>	Cruise Season	Leg	Dive Number
	EX1504	2	DIVE08
<b>Equipment Deployed</b>	ROV:	Deep Discoverer	
	Camera Platform:	Seirios	
<b>ROV Measurements</b>	<input checked="" type="checkbox"/> 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"/> Low Res Cam 1	<input checked="" type="checkbox"/> Low Res Cam 2
	<input checked="" type="checkbox"/> Low Res Cam 3	<input checked="" type="checkbox"/> Low Res Cam 4	<input checked="" type="checkbox"/> Low Res Cam 2
<b>Equipment Malfunctions</b>	There were communications issues between the shore-based and shipboard science team; however, these were fewer than on previous days. Other than that, all other equipment worked properly.		
<b>ROV Dive Summary (From processed ROV data)</b>	Dive Summary: EX1504L2_DIVE08 ~~~~~		
	In Water at:	2015-08-09T19:54:14.375000 26°, 49.275' N ; 175°, 36.502' W	
	Out Water at:	2015-08-10T04:14:16.359000 26°, 49.858' N ; 175°, 36.289' W	
	Off Bottom at:	2015-08-10T03:35:45.781000 26°, 49.828' N ; 175°, 36.446' W	
	On Bottom at:	2015-08-09T20:44:43.656000 26°, 49.317' N ; 175°, 36.396' W	
	Dive duration:	8:20:1	
	Bottom Time:	6:51:2	
	Max. depth:	1381.6 m	
<b>Special Notes</b>			
<b>Scientists Involved (please provide name / location / affiliation / email)</b>	Allen Andrews, Honolulu, HI, PIFSC, Allen.Andrews@noaa.gov Amanda Ziegler, UH, UH, aziegler802@gmail.com Amy Baco-Taylor, HBOI ECC, FSU, abacotaylor@fsu.edu Brendan Roark, TAMUCC, TAMU, broark@geos.tamu.edu Bruce Mundy, Honolulu, HI, NMFS, bruce.mundy@noaa.gov Chris Kelley, EX, UH, ckelley@hawaii.edu Chris Mah, SI, SI NMNH, mahch@si.edu Daniel Wagner, EX, PMNM, daniel.wagner@noaa.gov Dave Clague, MBARI, MBARI, clague@mbari.org Diva Amon, UH, UH, divaamon@hawaii.edu Jonathan Tree, UH, UH, jtree@hawaii.edu Les Watling, UH, UH, watling@hawaii.edu Mackenzie Garringer, UH, UH, mgerring@hawaii.edu Michael Garcia, UH, UH, mogarcia@hawaii.edu Michael Parke, Honolulu, HI, PIFSC, Michael.Parke@noaa.gov Nicole Morgan, HBOI ECC, FSU, nbmorgan11@gmail.com Scott France, ULL, ULL, france@louisiana.edu Steve Auscavitch, Temple, Temple, steven.auscavitch@temple.edu Tina Molodtsova, SI (DC), PPSIO, tina@ocean.ru		
<b>Purpose of the Dive</b>			

This dive was located on the south side of Bank 9, which is believed to be a Cretaceous guyot or flat-topped seamount. Previous high-resolution mapping data of Bank 9 suggests that it is a composite feature that includes both a Cretaceous guyot to the south as well as a younger Hawaiian guyot to the north. The objectives of the dive were to explore for high-density communities of deep-sea corals and sponges on the southern older part, starting just below the break in slope of the main terrace, then move up to the terrace top, transect over to the base of what appears to be a volcanic cone, and finally up the slope of the cone. We hoped to encounter a coral and sponge community either on the terrace edge or the cone, and that the dive would provide insights into how this peculiar composite seamount might have formed. We also planned to survey for the presence of fossil rudist bivalves, which if found would conclusively indicate a Cretaceous age for this part of Bank 9. The target start point of the dive was on the terrace flank at a depth of 1396 m, while the endpoint of the dive was at the summit of the cone at 1127m.

#### Description of the Dive:

The ROV landed on a sloped surface that consisted of pavement mixed with rubble at 1380 m. The substrate was heavily crusted with manganese and there was a slight current from the east towards the west. Only few animals were present close to the landing site, including one bamboo coral and a chrysogorgid coral. As the ROV moved up the slope towards the terrace of the seamount, the density of animals remained very low and included corals, sponges, asteroids, crinoids, sea pens, urchins, shrimps, fishes and sea cucumbers. One aluminum can was observed on the slope. A sample of a farreid sponge, which had a black coral growing over it, was collected at 1230 m. This association a sponge and black coral was seen on numerous occasions throughout the dive and the collection was made for the black coral, which has not been identified to even family at this point. On the terrace of the seamount, the substrate changed to Mn-coated cobbles and the density of animals continued to remain low. A Mn-crust rock sample was collected on the terrace at 1165 m. As the ROV reached and moved up the slope of the cone, several colonies of scleractinian corals (*Enallopsammia rostrata*), bubble gum corals and sponges (*Atlantisella* sp1) appeared; however, the density of animals remained low. A second Mn-crust rock sample was collected on the slope of the cone at 1169m. On the summit there were several pillow lavas in parallel rows and very few animals. After the reaching the summit, the ROV moved back down the cone and collected a comatulid crinoid at 1104. The ROV left the bottom at a depth of 1096m after a total bottom time of 6:52h, having covered a linear distance of over 1km. No fossil rudist bivalves were observed during the dive and both diversity and abundance of animals of any kind remained very low throughout the dive. Three possible explanations for the low density of the community were discussed by the science group and included low oxygen levels at this depth, the very thick mn crusts, and inappropriate topography coupled with low current flow.

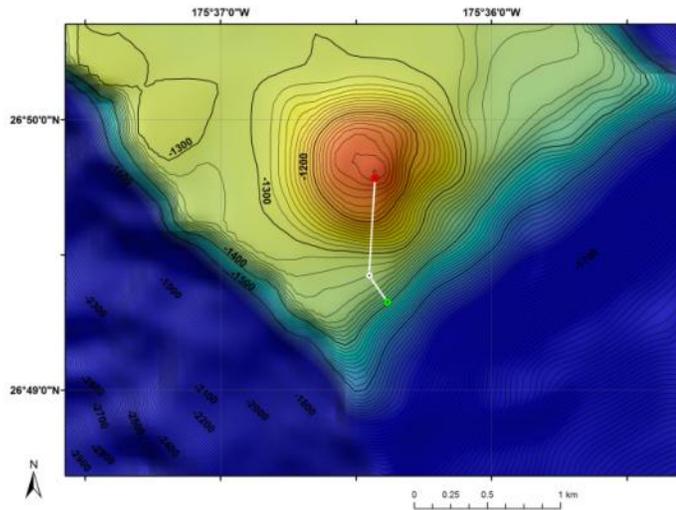
#### Animals observed during the dive are listed below:

Phylum	Group	Species
Annelida	Polychaetes	Polychaete
Annelida	Polychaetes	Polynoid
Arthropod	Copepod	Copepod
Arthropod	Crab	Crab with symbiotic anemone
Arthropods	Shrimp	Heterocarpus laevigatus
Arthropods	Shrimp	Nematocarcinus tenuistrotris
Arthropods	Squat lobsters	Munidae
Cnidarians	Actinarians	Anthomastus sp.
Cnidarians	Alcyonaceans	Anthomastus steenstrupi?
Cnidarians	Antipatharians	Antipatharian on Farrea nr. occa erecta
Cnidarians	Antipatharians	Bathypathes alternata (white)
Cnidarians	Gorgonians	Calyptrophora wyvillei
Cnidarians	Gorgonians	Candidella sp.
Cnidarians	Gorgonians	Chrysogorgia sp.
Cnidarians	Gorgonians	Corallium sp.
Cnidarians	Gorgonians	Iridogorgia magnispiralis
Cnidarians	Gorgonians	Keratoisis sp.
Cnidarians	Gorgonians	Narella? sp.
Cnidarians	Gorgonians	Paragorgia sp.
Cnidarians	Gorgonians	Unbranched isidids
Cnidarians	Gorgonians	Unidentified branched isidids
Cnidarians	Hydrozoans	Hydromedusae
Cnidarians	Hydrozoans	Narcomedusae
Cnidarians	Hydrozoans	Ptychogatria? sp. (Hydromedusae)
Cnidarians	Hydrozoans	Siphonophore

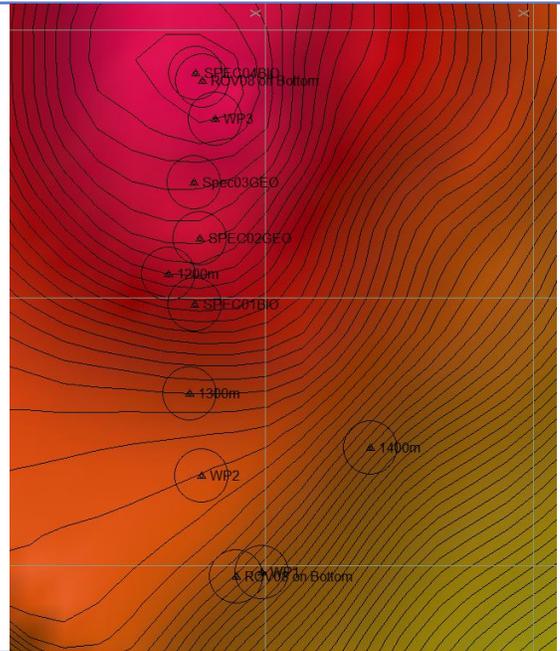
Cnidarians	Pennatulaceans	Anthoptilum sp.
Cnidarians	Pennatulaceans	Halipteris sp.
Cnidarians	Pennatulaceans	Pennatula inflata
Cnidarians	Scleractinians	Enallopsammia rostrata
Ctenophores	Ctenophores	Ctenophores
Echinoderms	Asteroids	Asthenactis sp.
Echinoderms	Asteroids	Goenostaridae
Echinoderms	Asteroids	Hymenaster pentagonalis
Echinoderms	Asteroids	Pteraster reticulatus
Echinoderms	Asteroids	Pteraster sp.
Echinoderms	Asteroids	Unidentified asteroid
Echinoderms	Crinoids	Glyptometra lateralis
Echinoderms	Crinoids	Unidentified comatulid (5arms)
Echinoderms	Crinoids	Unidentified comatulid (9arms)
Echinoderms	Holothuria	Deimatidae
Echinoderms	Holothuria	Peniagone sp.
Echinoderms	Ophiuroids	Unidentified ophiuroids
Echinoderms	Urchin	Aspidodiadema hawaiiensis
Echinoderms	Urchin	Caenopedina sp.
Echinoderms	Urchin	Sperosoma cf. obscurum
Fishes	Eel-like	Aldrovandia phalacra
Fishes	Eels	Synaphobranchus affinis?
Fishes	Eels	Synaphobranchus brevidorsalis
Fishes	Eels	Synaptobranchid
Fishes	Macrourids	Coryphaenoides sp.
Fishes	Macrourids	Ophidiid
Mollusks	Gastropods	Pleurobranchea sp.
Mollusks	Gastropods	Snail on bamboo coral
Sponges	Demosponges	Unidentified cladorhizid
Sponges	Hexactinellids	Atlantisella sp.1
Sponges	Hexactinellids	Bolosoma sp.
Sponges	Hexactinellids	Atlantisella sp1.
Sponges	Hexactinellids	Poliopogon sp.
Sponges	Hexactinellids	Saccocalyx cf. pedunculatus
Sponges	Hexactinellids	Tretopleura sp.2
Sponges	Hexactinellids	Walteria flemmingi
Sponges	Hexactinellids	Walteria sp.

**Overall Map of Dive Area**

**Actual track of ROV dive**



Bathymetry data for the dive site. Planned dive start and end points are shown as green and red dots, respectively.



Hypack screen grab showing waypoints dropped during actual ROV dive.

### Representative Photos of the Dive



Unidentified eel swimming over a heavily mn-crust substrate, supporting extreme old age for this seamount.



Closeup image of a feather star, *Pentametracrinus* sp., a new record for this genus in Hawaii.

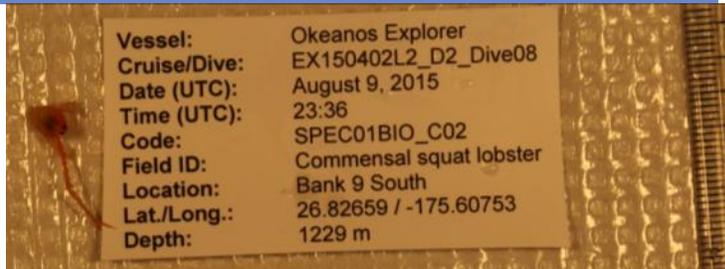
### Samples Collected

Sample ID	EX1504L2_20150809233658_D2_Dive08_SPECO1BIO
Date (UTC)	2015/08/09
Time (UTC)	23:36:58
Depth (m)	1129
Temperature (°C)	2.98077
Oxygen (mL/L)	1.27736
Field ID(s)	Antipatharian on <i>Farrea</i> near <i>occa erecta</i>



**Comments** Numerous sponge colonies with the antipatharian coral were observed during the dive. No sponge colonies without the antipatharian were seen during the dive. The collected sample had commensal shrimps, polychaetes and a squat lobsters on it that were also collected.

Sample ID	EX1504L2_20150809233658_D2_Dive08_SPECO1BIO_C01
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<b>Date (UTC)</b>	2015/08/09	
<b>Time (UTC)</b>	23:36:58	
<b>Depth (m)</b>	1129	
<b>Temperature (°C)</b>	2.98077	
<b>Oxygen (mL/L)</b>	1.27736	
<b>Field ID(s)</b>	Commensal shrimp	
<b>Comments</b>	The shrimps came up with the black coral/sponge sample.	
<b>Sample ID</b>	EX1504L2_20150809233658_D2_Dive08_SPEC01BIO_C02	
<b>Date (UTC)</b>	2015/08/09	
<b>Time (UTC)</b>	23:36:58	
<b>Depth (m)</b>	1129	
<b>Temperature (°C)</b>	2.98077	
<b>Oxygen (mL/L)</b>	1.27736	
<b>Field ID(s)</b>	Commensal squat lobster	
<b>Comments</b>	The squat lobster came up with the black coral/sponge sample.	
<b>Sample ID</b>	EX1504L2_20150809233658_D2_Dive08_SPEC01BIO_C03	
<b>Date (UTC)</b>	2015/08/09	
<b>Time (UTC)</b>	23:36:58	
<b>Depth (m)</b>	1129	
<b>Temperature (°C)</b>	2.98077	
<b>Oxygen (mL/L)</b>	1.27736	
<b>Field ID(s)</b>	Commensal polychaete	
<b>Comments</b>	The polychaetes came up with the black coral/sponge sample.	
<b>Sample ID</b>	EX1504L2_20150810002436_D2_Dive08_SPEC02GEO	
<b>Date (UTC)</b>	2015/08/10	
<b>Time (UTC)</b>	00:24:36	
<b>Depth (m)</b>	1165	
<b>Temperature (°C)</b>	3.09288	
<b>Oxygen (mL/L)</b>	1.21906	
<b>Field ID(s)</b>	Mn-crust rock	
<b>Comments</b>	Very thick manganese crust on rock.	
<b>Sample ID</b>	EX1504L2_20150810012920_D2_Dive08_SPEC03GEO	
<b>Date (UTC)</b>	2015/08/10	
<b>Time (UTC)</b>	01:29:20	
<b>Depth (m)</b>	1169	

<b>Temperature (°C)</b>	3.20205	
<b>Oxygen (mL/L)</b>	1.10915	
<b>Field ID(s)</b>	Mn-crusted rock	
<b>Comments</b>	Unidentified echinoderm was attached to the collected rock.	
<b>Sample ID</b>	EX1504L2_20150810012920_D2_Dive08_ SPEC03GEO_C01	
<b>Date (UTC)</b>	2015/08/10	
<b>Time (UTC)</b>	01:29:20	
<b>Depth (m)</b>	1169	
<b>Temperature (°C)</b>	3.20205	
<b>Oxygen (mL/L)</b>	1.10915	
<b>Field ID(s)</b>	Echinoderm on rock	
<b>Comments</b>	Unidentified echinoderm was attached to the collected rock.	
<b>Sample ID</b>	EX1504L2_20150810030812_D2_Dive08_ SPEC04BIO	
<b>Date (UTC)</b>	2015/08/10	
<b>Time (UTC)</b>	03:08:12	
<b>Depth (m)</b>	1104	
<b>Temperature (°C)</b>	3.32554	
<b>Oxygen (mL/L)</b>	1.03895	
<b>Field ID(s)</b>	Comatulid crinoid	
<b>Comments</b>	Crinoid lost some appendages during collection.	
<b>Please direct inquiries to:</b>	NOAA Office of Ocean Exploration & Research 1315 East-West Highway (SSMC3 10 <sup>th</sup> Floor) Silver Spring, MD 20910 (301) 734-1014	