Ocean Exploration and Research

Okeanos Explorer ROV Dive Summary

Dive Information			
General Location			
General Area Descriptor	Jarvis Unit of the Pacific Remote Islands Marine National Monument		
Site Name	Kahalewai seamount (proposed name)		
Science Team Leads	Scott France/ Del Bohnenstiehl		
Expedition Coordinator	Kasey Cantwell		
ROV Dive Supervisor	Bobby Mohr		
Mapping Lead	Mike White		
ROV Dive Name			
Cruise	EX1705		
Leg	-		
Dive Number	DIVE 04		
Equipment Deployed			
ROV	Deep Discoverer		
Camera Platform	Seirios		
ROV	☒ CTD	☒ Depth	☒ Altitude

Measurements	☒ 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	Only D2's LSS sensor was operational.		
ROV Dive Summary (from processed ROV data)	Dive Summary: EX1705_DIVE04 ^^ In Water: 2017-05-04T19:26:14.136000 01°, 30.791' S ; 159°, 27.499' W Out Water: 2017-05-05T03:34:54.311000 01°, 30.406' S ; 159°, 26.934' W Off Bottom: 2017-05-05T02:39:56.466000 01°, 30.479' S ; 159°, 27.265' W On Bottom: 2017-05-04T20:39:19.011000 01°, 30.699' S ; 159°, 27.417' W Dive duration: 8:8:40 Bottom Time: 6:0:37 Max. depth: 1700.0 m		
Special Notes			

Scientists Involved (please provide name, location, affiliation, email)

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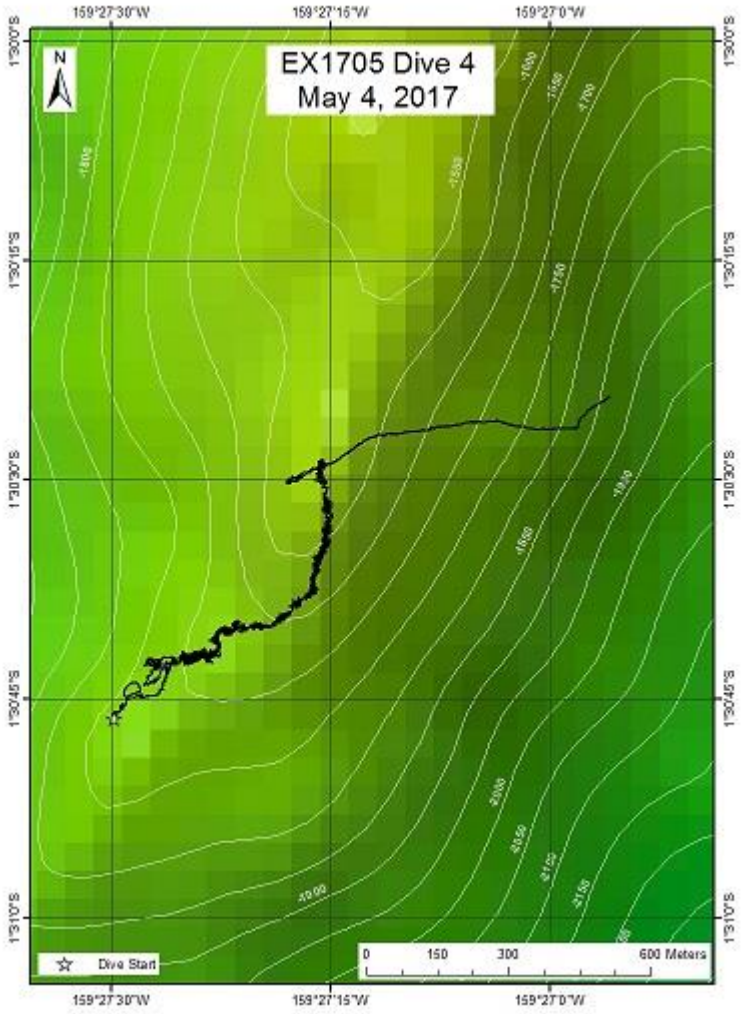
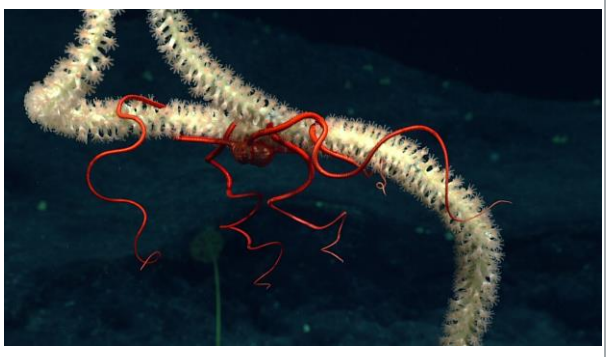
Purpose of the Dive	This dive investigated the distribution and abundance of benthic and water column fauna, mapped substrate composition in order to evaluate the relationship between faunal communities and substrate type, collected rock and crust samples to determine their geological and geochemical properties.		
Dive Summary	Kahalewai seamount is a symmetric volcanic edifice with a summit depth of ~950 m. The seamount has four prominent volcanic ridges extending from its otherwise symmetrical cone. Two are oriented west-northwest (the approximate orientation of the en echelon ridges found in the main Line-Island chain to the east) and two have a north-northwest trend. The dive targeted the prominent southern ridge at depths between 1700 and 1500 m depth. A thick Fe-Mn crust, covering largely in place rocks, was evident throughout the dive. Light colored, biogenic sediments, were deposited in crevasses and topographic lows. In some of the larger areas of sediment cover, ripples where observed, indicating a dominant flow direction from north to south (this is consistent with the bottom current conditions reported by the ROV pilots). These larger areas of sediment cover provided habitat for Sea Pen corals. Despite the Fe-Mn crust covering the rock, the ROV imaged collapsed lava tubes and primary volcanic flow (lobate to pillow) structures in some places. One sediment sample was collected (D2_DIVE04_SPEC02GEO) using the scoop tool on the ROV. It consisted of light colored grains of uniform size made up of foraminifera. Two rock samples were collected. D2_DIVE04_SPEC04GEO and D2_DIVE04_SPEC05GEO, one near the beginning and one near the middle of the dive, respectively. Inspection on the ship indicated that each contained a Fe-MN crust with a thickness of ~10 mm and had a mass of ~6 and 32 kg, respectively. These rocks appear to be slightly altered just beneath the crust (brown in color), but are likely to contain material suitable for dating and geochemical analysis. With respect to biology, the dive began as though we were continuing from the previous dive: in a field of large bamboo coral (Isididae) colonies; species included "*Jasonisis"/* J-clade fans, sparse bush/S1 clade as seen on Dive 3, and large, yellow, open bushes (likely clade S1), including a magnificently large colony from which a branch clipping was sampled. However, the densities never approached the "forest" scale seen on dive 3, and for much of the dive abundant corals were not observed, effectively replaced by crinoids		

	and barnacles as the dominant sessile fauna. The ROV landed by a ledge with overhang that was populated by an abundance of low-growing octocorals (purple stoloniferous [*Clavularia*?], *Anthomastus* recruits), encrusting sponge, and barnacles (both pedunculate and sessile). A synaphobranchid eel (*Ilyophis*) and small elongate macrourid (*Nezumia*) were seen in this area. No other fish species were identified. Octocorals observed included *Anthomastus*, *Metallogorgia* (with seemingly extra large polyps), *Iridogorgia*, the first primnoids of EX1705 (?*Callogorgia* with asteroschematid ophiuroid), whip bamboo corals (Keratoisidinae) including some colonies with a single branch, plexaurid fans (?Paramuriceid), *Chrysogorgia* spp., Coralliidae sp. (with asteroschematid ophiuroid), rock pen (Pennatulacea, ?*Anthoptilum* sp.), and Paragorgiidae (with a dumbo octopus egg [*Grimpoteuthis*]). *Halipteris* sea pens were abundant in rippled sediment channels set among the exposed rock. A possible *Heteropathes* sp. Was the only black coral observed. Sponge observations included several Bolosominae (Euplectellidae) and a Farreidae. For much of the dive, crinoids were the dominant fauna, both feather stars (comatulids and stalked sea lilies); a stalked Proisocrinidae was collected. Many of the stalked crinoids were home to numerous myzostome polychaetes, perhaps gall forming. Sea urchins were also common and abundant throughout the dive, mainly long, curved-spine Aspidodiadematidae (*Plesiodiadema* sp.) and robust-spine *Caenopedina* sp. (Pedinidae), but also 2 species of leather urchins (Echinothuriidae: *Sperosoma*. *Tromikosoma*). Ophiuroid brittle stars were characteristically common, but an observation of an *Asteronyx* on a bamboo coral was unusual. Other echinoderms included sea cucumbers (Holothuroidea, Synallactidae) and sea stars (Benthopectinidae and *Hymenaster*). Pagurid hermit crabs and chirostylid squat lobsters were common. Other crustaceans included a homolid crab carrying an anemone, a possible Lophogastridae (= Gnathophausiidae), gooseneck and acorn (sessile) barnacles, the latter which were very numerous on rock floor throughout the dive. Molluscs seen incuded a chiton (discovered responsible for leaving feeding traces on rock surfaces and an aplacophoran feeding on bamboo coral.
Map of the ROV Dive Site	



Representative Photos of the Dive

Sediment covered area with ripples and Halipteris sea pens.



Asteronyx ophiuroid on a bamboo coral, a relationship not previously seen by the science team.

	
MN-Crust volcanic terrain with possible collapsed lava tube.	Sessile barnacles on rock surface were very common throughout the dive.

Samples Collected

Sample

Sample ID	EX1705_20170504T213840_D2_DIVE04_SPEC01BIO
Date (UTC)	20170504
Time (UTC)	213840
Depth (m)	1687.15
Temperature (°C)	2.64
Field ID(s)	Yellow Isididae
Commensal ID and Field Identification	
Comments	

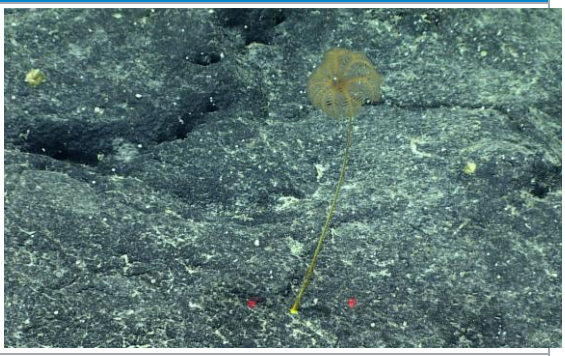
Sample

Sample ID	EX1705_20170504T223426_D2_DIVE04_SPEC02GEO
Date (UTC)	20170504
Time (UTC)	223426
Depth (m)	1684.15
Temperature (°C)	2.69
Field ID(s)	Light Colored Biogenic? Sediment
Commensal ID and Field Identification	
Comments	light colored, well sorted, fine-sand size sediments

Sample

Sample ID	EX1705_20170504T231010_D2_DIVE04_SPEC03GEO
Date (UTC)	20170504
Time (UTC)	231010
Depth (m)	1669.91
Temperature (°C)	2.71
Field ID(s)	Mn crusted rock
Commensal ID and Field Identification	There was an urchin when we collected, but it must have fallen off

Comments	
Sample	
Sample ID	EX1705_20170505T004859_D2_DIVE04_SPEC04BIO
Date (UTC)	20170505
Time (UTC)	004859
Depth (m)	1636.47
Temperature (˚C)	2.69
Field ID(s)	Yellow stalked crinoid Phrynoerinidae



Commensal ID and Field Identification	EX1705_20170505T004859_D2_DIVE04_SPEC04BIO_A01 Unknown commensal; this was very tiny- may not have been alive
Comments	
Sample	
Sample ID	20170505T012402
Date (UTC)	20170505
Time (UTC)	012402
Depth (m)	1606.94
Temperature (˚C)	2.7
Field ID(s)	Mn-crusted rock

Commensal ID and Field Identification	
Comments	Massive- Estimated weight of 32 kg

Please direct inquiries to:

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