

## *Okeanos Explorer* ROV Dive Summary

Dive Information	
General Location	<p>The image is a bathymetric map of the Northern Manihiki Plateau. It shows a complex network of ridges and valleys. A specific area is highlighted in purple and labeled 'Jarvis Island Unit (US EEZ)'. A green dot marks the location of 'Te Kawhiti o Maui Potiki'.</p>
General Area Descriptor	Northern Manihiki Plateau
Site Name	Te Kawhiti a Maui Potiki (Te Kawhiti)
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	DIVE03



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Purpose of the Dive	This dive will investigate the distribution and abundance of benthic and water column fauna, map substrate composition in order to evaluate the relationship between faunal communities and substrate type, collect rock and crust samples to determine their geological and geochemical properties.		
Description of the Dive	<p>This dive investigated a narrow ridge structure that connects to the Manihiki Plateau to the southwest. It is one of a series of similar curvilinear ridges that extend from the northern margin of the plateau. Sea-surface altimetry data indicated that the peak of the ridge was likely at a depth ~3,300 m; however, subsequent mapping overnight showed that the crest of the ridge as closer to 2200 m.</p> <p>The ROV began on the south side of the ridge and worked upslope, covering a distance of 100 m. The ROV then followed the crest of the ridge for several hundred meters and summited atop a local high point on the ridge crest. The geology showed mostly in-place outcrops of rock. These rocks were dark in color and covered with Fe-Mn crust. Along some sections of the ROV path, pillow-like structures were evident, despite the presence of the Fe-Mn crusts on the surface. Light colored biogenic sediments filled in the low topography between the outcropping rocks.</p> <p>As the ROV reached the crest of the ridge, it passed a small saddle where more sediment was present. Ripples in these sediments indicated potentially strong bottom currents; however, the ROV pilot's indicated little-to-no bottom currents during this dive.</p> <p>Two rock samples were collected. D2_DIVE03_SPEC01GEO and D2_DIVE03_SPEC04GEO, 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 7-8 mm and had a mass of approximately 10 kg. These rocks appear to be slightly altered beneath the crust (brown in</p>		



color), but are likely to contain material suitable for dating and geochemical analysis.

Immediately upon acquiring the bottom we saw a bamboo coral colony, and quickly there were several more, and for the duration of the transect (to the shallowest part of the feature) we were in a dense bamboo coral (Isididae) forest, with at least many 100s, if not 1000s, of colonies. The dominant species in the forest (possible S1 clade/*Cladarisis*) had the form of an open irregularly branched bush. Many of the colonies were of immense size, taller than the ROV. A sample of the dominant isidid was collected, and it was discovered the colonies were extremely fragile, which supports the tentative ID of *Cladarisis* ("From kladaros, Gr. = easily broken, frail, referring to the brittleness of the axis, causing it to break with the slightest amount of handling"). Many broken branches and dead colonies were seen scattered in areas of live colonies. Most live colonies had crinoids perched on branches (possibly 3 different species), and on several occasions we encountered upright colonies stripped of tissue and completely covered in crinoids. Other associates of the "*Cladarisis*" included overgrowing zoanthids (at least 2 species), brittle stars (Ophiacanthidae), and gooseneck barnacles.

Other corals observed included: Octocorals: *Anthomastus*, Rock pen (Pennatulacea, ?*Calibelemnon* sp.), *Chrysogorgia* spp. (at least 2 species) with chirostylid squat lobsters (*Uroptychus* sp.), Paragorgiidae, at least 3 additional species of bamboo corals (*Jasonisis* sp., whip, Isididae), Corallidae (sampled), and *Iridogorgia*; Black corals: *Heteropathes* sp., *Bathypathes* sp., *Trissopathes* sp., Antipathidae,

Sponge observations included a possible new species of glass sponge (*Walteria*), a specimen of which was collected, carnivorous Cladorhizidae, and glass sponges (Hexactinellida) *Corbitella*, *Saccocalyx*, *Regadrella* ?n.sp., *Walteria*, *Dictyaulus*, and Bolosominae (Euplectellidae).

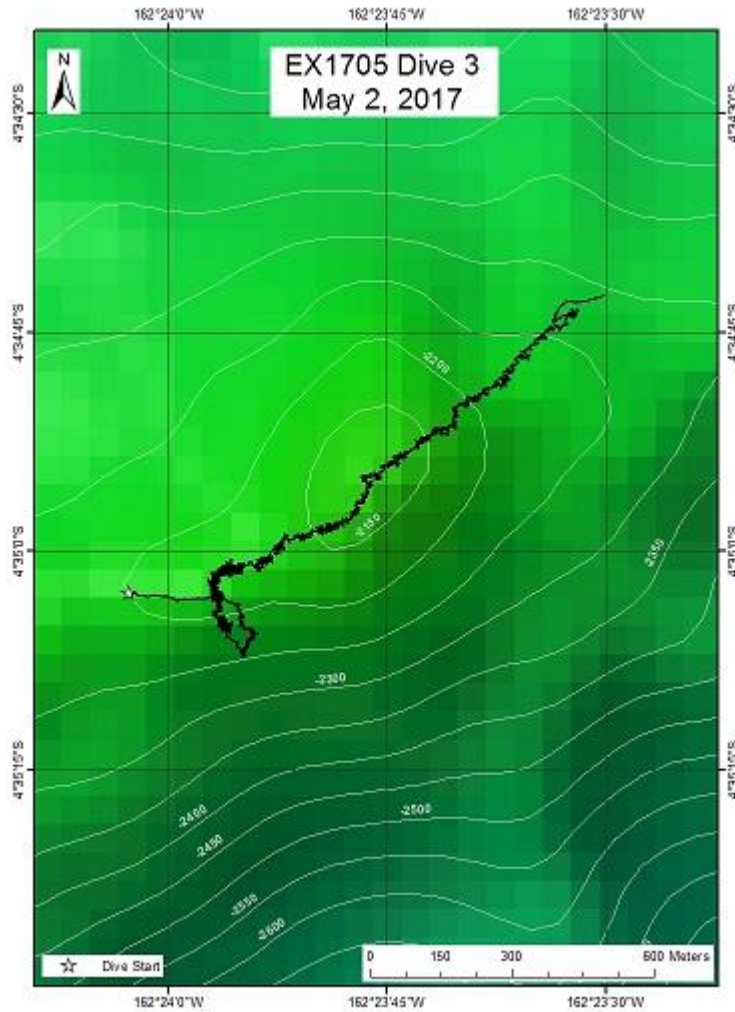
Fish were uncommon, but observations included *Antimora* (Moridae), rattail (Macrouridae), cusk eel (*Diplacanthopoma*, Bythitidae).

Other biological observations: 2 species of anemone (Actiniaria); munidopsid crabs (Galatheoidea, *Munida*), King Crabs (*Paralomis* sp, Lithodidae), shrimp (*Nematocarcinus*, Acanthephyridae, another with with bopyrid isopod parasite), hermit crabs with Epizoanthid (Paguroidea), gooseneck barnacles ; 2 species of seastars (brisingids, corallivorous *Hippasteria* [Goniasteridae] and a *Hymenaster*); sea urchin (Echinothuriidae), and a fourth species or crinoid (on the rock substrate) with 10 arms and tips lacking cirri. Many of the crinoids imaged showed predatory snails (Eulimidae) attached to the arms; two of these snails were preserved when collected with crinoids perched on the sampled *Walteria* sponge.

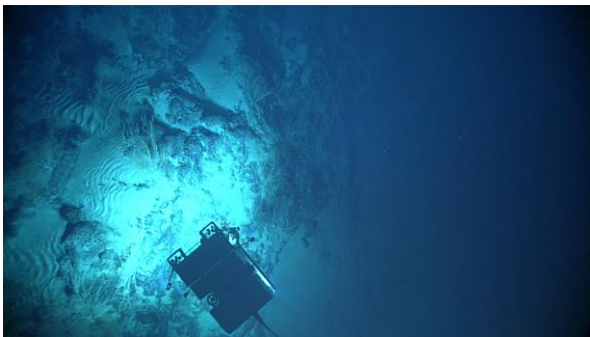
Following the seafloor work, we made a series of midwater transects. We spent 10 minutes at 8 different depths from 1800 to 300 m. Diversity was high, and we saw numerous siphonophores, chaetognaths, larvaceans, ctenophores, and jellyfish throughout much of the water column. Some other interesting fauna that we observed included a pelagothurian (a pelagic sea cucumber) at 1200m, a dolioid (pelagic tunicate) at 710 m, and a tomopterid polychaete worm at 900 m. We saw a surprising number of fishes, including a snipe eel (Nemichthyidae), a bristlemouth (*Cyclothone* sp.), and a hammerjaw (*Omosudis lowei*). The first time midwater ROV surveys have been conducted in this region, it was a very exciting series of transects.

Map of the ROV Dive Site

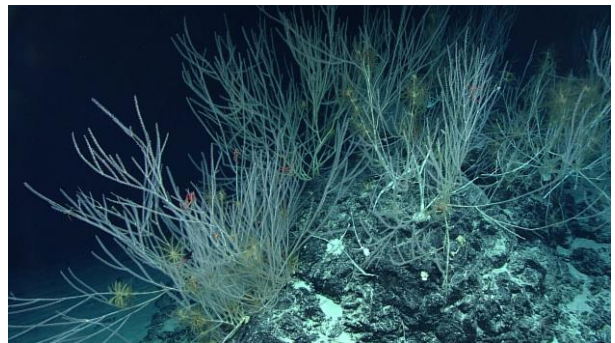




Representative Photos of the Dive



The geology of this dive was characterized by consolidated manganese encrusted rock. Some small ripples could be seen in the soft sediment around rocks from ROV Seirios.




This dive was characterized by an extensive spread of large bamboo corals as shown here. The bamboo coral forest extended for the length of the dive. Also seen here are several crinoids which were frequent

associates on these corals.




## Samples Collected

### Sample

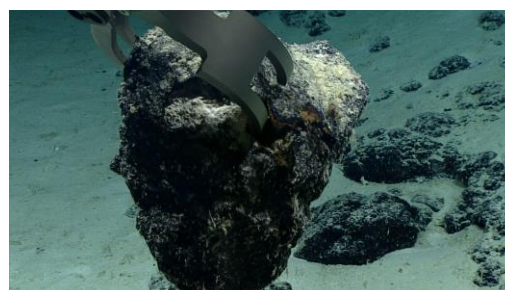
Sample ID	EX1705_20170502T214305_D2_DIVE03_SP EC01GEO	
Date (UTC)	20170502	
Time (UTC)	214305	
Depth (m)	2216.28	
Temperature (°C)	2.07	
Field ID(s)	Mn crusted angular rock	
Commensal ID and Field Identification		
Comments	crust ~7-8 mm	



### Sample

Sample ID	EX1705_20170502T220629_D2_DIVE03_SP EC02BIO	
Date (UTC)	20170502	
Time (UTC)	220629	
Depth (m)	2207.88	
Temperature (°C)	2.07	
Field ID(s)	Bamboo coral with anemone	
Commensal ID and Field Identification	EX1705_20170502T220629_D2_DIVE03_SPEC02BIO_A01: Anemone	
Comments	This sample (soft tissue) fell apart when we retrieved it - took images of polyps	



Sample	
Sample ID	EX1705_20170502T231241_D2_DIVE03_SP EC03BIO
Date (UTC)	20170502
Time (UTC)	231241
Depth (m)	2172.14
Temperature (°C)	2.11
Field ID(s)	Walteria sponge with associates
Commensal ID and Field Identification	EX1705_20170502T231241_D2_DIVE03_SPEC03BIO_A01 - Crinoid EX1705_20170502T231241_D2_DIVE03_SPEC03BIO_A02 - Crinoid EX1705_20170502T231241_D2_DIVE03_SPEC03BIO_A03 - Eulimidae snail on Crinoid A01 EX1705_20170502T231241_D2_DIVE03_SPEC03BIO_A04 - Eulimidae snail on Crinoid A02 EX1705_20170502T231241_D2_DIVE03_SPEC03BIO_A05 - Isopod EX1705_20170502T231241_D2_DIVE03_SPEC03BIO_A06 - Amphipod A EX1705_20170502T231241_D2_DIVE03_SPEC03BIO_A07 - Amphipod B EX1705_20170502T231241_D2_DIVE03_SPEC03BIO_A08 - Amphipod C (3 indivs) EX1705_20170502T231241_D2_DIVE03_SPEC03BIO_A09 - Amphipod D (3 indivs)
Comments	
Sample	
Sample ID	EX1705_20170502T233724_D2_DIVE03_SP EC04GEO
Date (UTC)	20170502
Time (UTC)	233724
Depth (m)	2167.61
Temperature (°C)	2.1
Field ID(s)	Angular Mn Crusted rock
Commensal ID and Field Identification	EX1705_20170502T233724_D2_DIVE03_SPEC04GEO_A01 - sponge?
Comments	crust ~7-8 mm



Sample	
Sample ID	EX1705_20170503T001148_D2_DIVE03_SP EC05BIO
Date (UTC)	20170503
Time (UTC)	001148
Depth (m)	2150.53
Temperature (°C)	2.06
Field ID(s)	Corallid with ophiuroids
Commensal ID and Field Identification	EX1705_20170503T001148_D2_DIVE03_SPEC05BIO_A01 - Ophiuroidea EX1705_20170503T001148_D2_DIVE03_SPEC05BIO_A02 - Ophiuroidea
Comments	
	
Sample	
Sample ID	EX1705__D2_DIVE03_SPEC06BIO
Date (UTC)	20170503
Time (UTC)	220600
Depth (m)	2207.88
Temperature (°C)	2.07
Field ID(s)	Zoanthid
Commensal ID and Field Identification	
Comments	This was a "volunteer" into the starboard forward rock box, collected at same site as bamboo coral
	

**Please direct inquiries to:**

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