Ocean Exploration and Research

Okeanos Explorer ROV Dive Summary

Dive Information			
General Location			
General Area Descriptor	Musicians Seamounts		
Site Name	Water Column 2		
Science Team Leads	John Smith/Meagan Putts		
Expedition Coordinator	Kasey Cantwell		
ROV Dive Supervisor	Karl McLetchie		
Mapping Lead	Mike White		
ROV Dive Name			
Cruise	EX1708		
Leg	-		
Dive Number	DIVE16		
Equipment Deployed			
ROV	Deep Discoverer		
Camera Platform	Seirios		
ROV Measurements	☒ CTD	☒ Depth	☒ Altitude
	☒ 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			
ROV Dive Summary (from processed ROV data)	Dive Summary: EX1708_DIVE16 ^^ In Water: 2017-09-22T18:26:33.560000 27°, 19.016' N ; 161°, 04.528' W Out Water: 2017-09-23T02:27:48.952000 27°, 18.954' N ; 161°, 04.117' W Dive duration: 8:1:15 Bottom Time: N/A Max. depth: 1001.3 m		
Special Notes			

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

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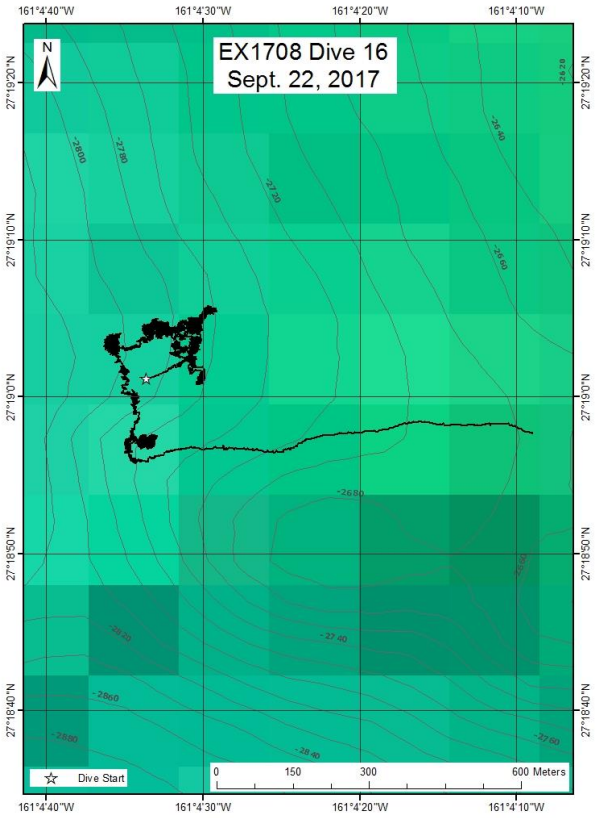
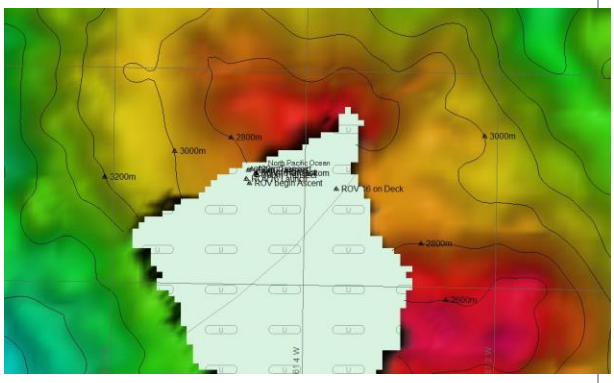
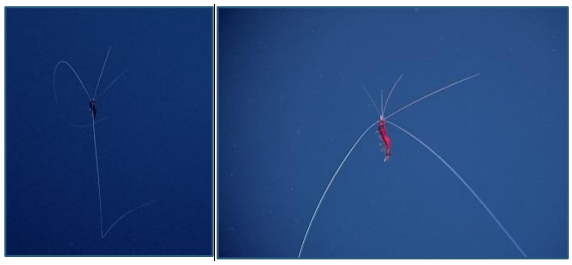
Purpose of the Dive	The water column is one of the most underexplored environments on the planet. Basic information is lacking on the distributions and abundances of midwater organisms in most parts of the globe, and the vicinity of the Musicians Seamounts remains poorly explored. ROV visual surveys provide crucial data on the distributions, abundances, and behaviors of a variety of midwater animals. ROV surveys are especially well-suited to observe the understudied gelatinous fauna, which commonly fall apart using traditional net sampling methods. Collecting acoustic backscatter data (Simrad EK60) throughout the cruise - including during ROV transects – will complement the ROV surveys by providing critical information on the depth and extent of deep scattering layers, diel vertical migrations, and ROV avoidance behavior.
Description of the Dive	Two vertical transects of the water column were made during the dive. The first was a steady oblique descent with optimal lighting conditions met from around 300m depth and punctuated by a series of horizontal transects of 25 minutes duration each at depths of 300, 500, 700 and 900m depth. The ROV was then brought back to 300m depth before again beginning a steady oblique descent for a second series of horizontal transects of 25 minutes duration each at depths of 400, 600, 800 and 1000m depth. The lights were again turned off and the camera gain levels cranked up at the end of the first descent but no effect was noted on the fauna observed immediately after the lights were turned back on in comparison with before they were turned off. During the course of the transects, several noteworthy observations were made. A medusa that looked like a cubomedusa was sighted at 300m depth. Two *Pterotrachea* heteropod molluscs were seen locked together, perhaps mating, at 400m depth. Good video of the constellationfish *Valenciennellus tripunctulatus* was obtained at 500m depth and of an ?*Acanthephyra* shrimp at 700m depth. A large (15cm?) spherical object, possibly an egg mass, was recorded at 700m and further work will need to be done to determine its identity. What appeared to be the eggsac larva of a fish was filmed at 800m depth, while scyphomedusae (*Periphyllopsis braueri*: 850m, *Poralia rufescens*: 900m [2 individuals], *Atolla ?wyvillei*: 900m) were observed slightly deeper. At 900m depth a large bathylagid fish (*Dolicholagaus longirostris* or *Melanolagus bericoides*?), which was floating with its head down, and a large, dark purple *Lampocteis cruentiventer* were filmed. In contrast to the usual situation, *Kiyohimea usagi* was observed at 700m depth with *Eurhamphaea vexilligera* occurring deeper at 800m depth. The physonect siphonophore *Marrus orthocanna* also occurred at 800m depth. At 1000m depth the hippopodid calycophoran siphonophore *Vogtia serrata* was observed with a very large larval nectophore still attached. An undescribed black cydippid ctenophore, a *Gnathophausia* mysid oppossum shrimp and the halicreatid medusa *Botrynema brucei* were also observed at 1000m depth. The organisms that stood out as particularly abundant during this dive were the Agalmatid physonect siphonophore *Agalma okenii*, which was observed in large numbers in the 650-700m depth layer, and the ctenophore *Thalassocalyce inconstans* (395-500m). Many prayine calycophoran siphonophores, including *Desmophyes annectens* (400m), occurred throughout the water column. Positive IDs for other siphonophores included *Nanomia bijuga* (330-500m), several *Lensia* spp. at 400-415m

	depth, *Apolemia* sp. at 600m, two *Chuniphyes multidentata* at 600m depth, and *Physophora* sp. (600m). Good video taken of an as-yet-unidentifed physonect (Agalmatidae sensu lato) at 600m depth. Rhopalonematid trachymedusae that were observed included *Colobonema sericeum* (400-700m), *Pantachogon haeckeli* (800m) and *Arctapodema* spp. [two colour morphs] (600-1000m), while *Crossota rufobrunnea* was not observed. Members of the trachymedusae family Halicreatidae were found throughout the deeper parts of the water column (485-720m) with *Halicreas minimum* at 490m depth, and both *Halitrephes valdiviae* and a *Haliscera* sp. at 600m . The many-tentacled narcomedusa *Solmissus* (500-900m) occurred predominantly in the 600m transect, while an undescribed narcomedusa of the genus *Bathykorus* with 4 tentacles was observed between 600-1000m depth. The 8-tentacled *Aeginura grimaldii* was not observed during this dive. In contrast to the previous midwater dive, *Solmundella bitentaculata* and doliolid nurses only occurred in very small numbers. Other ctenophores that were observed included several species of the lobate ctenophore *Bathocyroe* (600-1000m), with three individuals of *Bathocyroe fosteri* being sighted at 600m depth. One of these was observed to flap its auricles in addition to its lobes when starting to swim. A lobate form with no auricles was observed at 600m depth. Protists were observed quite often with Coelodendrid phaeodarians (400-800m) being most abundant between 400-500m depth, a tuscarorid phaeodarian sighted at 500m depth, and radiolarians abundant between 400-600m depth. Fish highlights, in addition to those listed above, were a possible *Serrivomer* at 900m depth, a *Sternoptyx* species at 870m, a Melamphaidae at 720m depth and an eel (Nemichthyidae?) at 605m depth. Several good shots of the resident *Cyclothone* species (900m, 1000m) were also obtained. Cephalopods were few but a cranchid squid was filmed at 600m depth. A tomopterid polychaete was filmed at 800m depth, a nemertean at 900m depth and a *Phronima sedentaria* amphipod at 500m depth. Larvaceans were extremely abundant, more so than the last midwater dive, and good shots were taken of a Frittilarid as well as several other oikopleurid appendicularians. This dive successfully collected a wealth of information on the midwater fauna of this area that had never been surveyed by an ROV previously.
Overall Map of the ROV Dive Area	Close-up Map of Main Dive Site

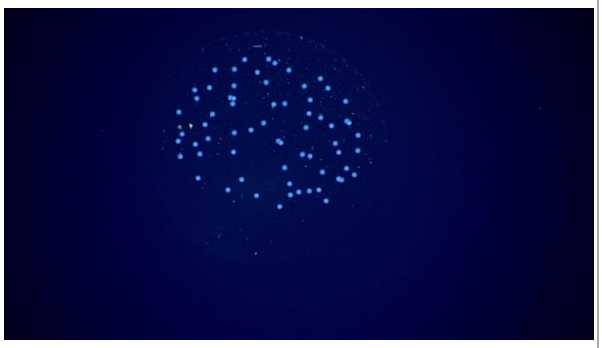




Representative Photos of the Dive

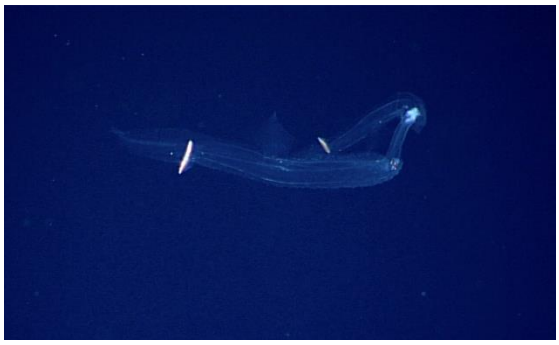


This shrimp, possibly an *Acanthephyra* or *Systellaspis*, according to expert Tammy Frank (NSU), has extremely elongate white tentacles that extend many body lengths behind the body of the animal. If could not be identified to species by the science team.



This unidentified spherical object, possibly an egg mass, was observed at 700 m.

The ctenophore, *Bathocyroe*, was common at depths of 600-1000 m.



Two heteropods locked together, possibly mating, were imaged at 400 m.

Samples Collected

No samples were collected during this dive

Please direct inquiries to:

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