*Okeanos Explorer* ROV Dive Summary

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Dive Information | | | | | |
| Dive Map | |  | | | |
| Site Name | | unnamed seamount “Te Kaitira” | | | |
| Expedition Coordinator(s) | | Brian RC Kennedy, Nick Pawlenko | | | |
| ROV Lead(s) | | Karl McLetchie | | | |
| Science Team Lead(s) | | Amanda Demopoulos and Steven Auscavitch | | | |
| General Area Descriptor | | Phoenix Islands Protected Area (PIPA) | | | |
| ROV Dive Name | | | | | |
| Cruise | | EX-17-03 | | | |
| Leg | | 0 | | | |
| Dive Number | | 19 | | | |
| Equipment Deployed | | | | | |
| ROV | | Deep Discoverer (D2) | | | |
| 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: EX1703\_DIVE19  ^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^  In Water: 2017-03-26T18:28:56.573000  08°, 12.054' S ; 172°, 52.128' W  Out Water: 2017-03-27T02:26:42.300000  08°, 11.698' S ; 172°, 52.087' W  Off Bottom: 2017-03-27T01:57:31.757000  08°, 11.816' S ; 172°, 52.063' W  On Bottom: 2017-03-26T19:24:29.168000  08°, 12.100' S ; 172°, 51.995' W  Dive duration: 7:57:45  Bottom Time: 6:33:2  Max. depth: 998.7 m | | | |
| Special Notes | |  | | | |
| Scientists Involved  (please provide name, location, affiliation, email) | | |  |  |  | | --- | --- | --- | | Brian Kennedy | NOAA OER | Brian.Kennedy@noaa.gov | | Adrienne Copeland | NOAA | adrienne.copeland@noaa.gov | | Amanda Demopoulos | USGS | ademopoulos@usgs.gov | | Andrea Quattrini | Harvey Mudd College | aquattrini@g.hmc.edu | | Asako Matsumoto | Chiba Institute of Technology (Chitech), | amatsu@gorgonian.jp | | Deborah Glickson | National Academies of Sciences, Engineering, and Medicine | dglickson@nas.edu | | Dhugal Lindsay | JAMSTEC | dhugal@jamstec.go.jp | | Erik Cordes | Temple University | ecordes@temple.edu | | Katharine Weathers | NOAA | katharine.weathers@noaa.gov | | Kevin Kocot | The University of Alabama | kmkocot@ua.edu | | Les Watling | University of Hawaii at Manoa | watling@hawaii.edu | | Nicole Morgan | Florida State University | nmorgan@fsu.edu | | Peter Auster | Mystic Aquarium & UConn | peter.auster@uconn.edu | | Randi Rotjan | Boston University | rrotjan@bu.edu | | Santiago Herrera | Lehigh University | sherrera@alum.mit.edu | | Scott France | University of Louisiana at Lafayette | france@louisiana.edu | | Steve Auscavitch | Temple University | steven.auscavitch@temple.edu | | Taylor Heyl | WHOI | theyl@whoi.edu | | Timothy Shank | Woods Hole Oceanographic Institution | tshank@whoi.edu | | Brendan Roak | Texas A&M University | broark@geos.tamu.edu | | | | |
| Purpose of the Dive | | The general goal of this dive is to acquire baseline information on deep sea habitats, seafloor geology, and biological communities on Ufiata Seamount in the Tokelau region. The geologic age of this feature is around 57-58Ma. The structure of this seamount might make it suitable for the deposition of cobalt-rich ferromanganese crust. It falls within an area identified by SPC as a zone of crust potential, based on sampling by a joint Japan-SOPAC deep-sea minerals program  in the 1990s. | | | |
| Description of the Dive | | The last dive for EX1703 was at Ufiata Seamount within the Tokelau seamount chain. The dive started at ~990m, at the base of a steep slope. The seafloor was composed of large and small boulders, interspersed with fine sandy sediments. When a MnFe-coated rock was collected, the manipulator scratched a mark on one of the faces, revealing a lighter color, possibly consistent with carbonate composition. The piles of boulders indicated that these might be landslide debris deposits.  We saw a few fish at the start of the dive, including an unknown cusk eel (cf., brotula, Bythitidae) and several midwater species (tentative identification: viperfish [*Chauliodus*], bristlemouths [*Cyclothone*], and unknown hatchetfish [Sternoptychidae]). Very few invertebrates were found in this area, including chrysogoriids, coralliids, stoloniferans (pale lavender), holothurians (Deimatidae), benthic siphonophore (Rhodaliidae), homolid crabs, and caridean shrimp. We saw a few additional fish before heading upslope, including cutthroat and congeriid eels (e.g., Synaphobranchidae and *Bathycongrus*, respectively), and an unknown fish with elongated body morphology and distinct caudal fin.  As the dive track transitioned to a steep wall, the seafloor changed to more platy morphology, with thick horizontal blocks, covered with manganese iron oxide coating. Along the rock wall, the fauna was very patchy, and included yellow demosponges and euplectellid sponges, homolid crabs holding plexaurids, anemones, and some were empty handed, a 2-tone cusk eel, and *Echinus*-like urchins. Corals included purple *Victorgorgia*, yellow cf. *Acanthogorgia*, yellow plexaurids, coralliids, primnoids, and a bamboo whip.  Once we arrived at the ridge and progressed up to the summit, yellow sponges and white *Narella* primnoids dominated the seafloor, although in low abundance. All attached fauna were found in MnFe coated cracks in the seafloor pavement. Fine sandy sediment was present within the cracks of the seafloor. Other fauna included a rattail (cf. *Nezumia*), squat lobsters (cf. *Eumunida*), scattered colonies of purple *Victorgorgia*, pink coralliids (collected), one bamboo whip, and scleractinians (e.g., unknown cup corals and colonial *Enallopsammia* and *Madrepora*). Homolid crabs and caridean shrimp (e.g., *Heterocarpus*) were the dominant megafaunal crustaceans observed throughout the dive. Some of the shrimp were > 10 cm long. Gelatinous invertebrates observed at or near the summit included a maroon colored scyphozoan jellyfish, a trachymedusa (cf. *Benthocodon*), and ctenophores. We saw one seastar (*Astroceramus*) on the pavement at the summit.  We observed the most impressive display of predatory behavior when we saw a caridean shrimp impaling and consuming a type of midwater dragonfish (cf. Stomiidae or [stareater, Astronesthinae: *Astronesthes* sp.]) while the fish was still alive. The shrimp removed several pieces of fish tissue and stomach contents, including a smaller fish and a worm. It was incredible to watch the feeding activity and we wondered how this shrimp was able to trap the fish in the first place. | | | |
| Overall Map of the ROV Dive Area | | | **Close-up Map of Main Dive Site** | | |
|  | | |  | | |
|  | | |  | | |
| Representative Photos of the Dive | | | | | |
| https://lh5.googleusercontent.com/N-sDByhspTT6bGoqizWlkaA9mbCPm6wZON7601PXK8rmJcF08MVRmhMBDaCR-9WDryMbCkuBDn_BjGRPWz5Lluk7ym17t-HwG1PwLK-c-6uet6nhGt2kQvvu_VEWTOI5Hwk779w4 | | | https://lh4.googleusercontent.com/2GL5diY_888NWUB_xXd8h1vXRVjX7NW7ekG0FCish8IdNP3Hr9ezeY4LQ6MJPyr0HTEWE2Bi9cPIbp_j8jK46xpXahTRmtiBXYjvm9KN9woXD0hcR3p-A9NpTy5wabAwoXx88KnF | | |
| A caridean shrimp, *Heterocarpus*, was observed feeding on a type of mid-water dragonfish, possible a stareater, at around 998 meters. | | | Two homolid crabs were observed holding claws at around 757 meters depth. It was unclear whether this was potentially aggressive or pre-mating behavior. | | |
| Samples Collected | | | | | |
| Sample | | | | | |
| Sample ID | EX1703\_20170326T204307\_D2\_DIVE19\_SPEC01GEO | |  | | |
| Date (UTC) | 20170326 | |  | | |
| Time (UTC) | 20:43:07 | |  | | |
| Depth (m) | 954.04 | |  | | |
| Temperature (°C) | 4.56 | |  | | |
| Field ID(s) | Fe-Mn crusted rock | |  | | |
| Comments |  | | | | |
| ****Sample**** | | | | | |
| Sample ID | EX1703\_20170327T014445\_D2\_DIVE19\_SPEC02BIO | |  | | |
| Date (UTC) | 20170327 | |  | | |
| Time (UTC) | 01:44:45 | |  | | |
| Depth (m) | 751.03 | |  | | |
| Temperature (°C) | 01:44:45 | |  | | |
| Field ID(s) | Coralliidae | |  | | |
| 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