

## Okeanos Explorer ROV Dive Summary

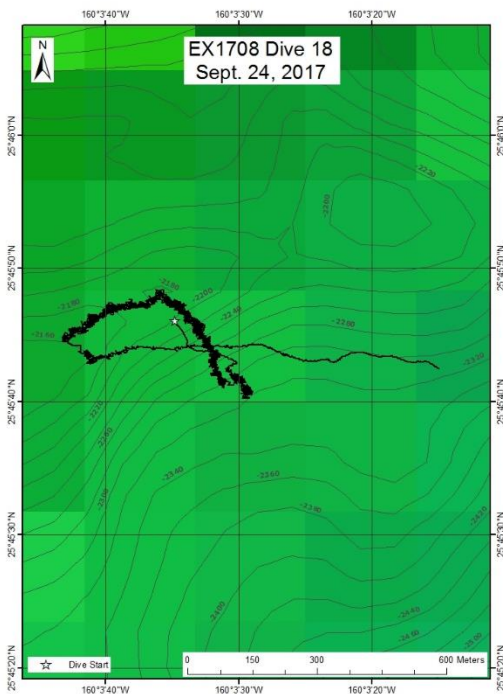
| Dive Information        |  |   |   |
|-------------------------|--|---|---|
| General Location        |  |   |   |
| General Area Descriptor | Musicians Seamounts                                |   |   |
| Site Name               | Schumann Seamount                                  |   |   |
| Science Team Leads      | John R. Smith/Meagan Putts                         |   |   |
| Expedition Coordinator  | Kasey Cantwell                                     |   |   |
| ROV Dive Supervisor     | Karl McLetchie                                     |   |   |
| Mapping Lead            | Mike White   |   |   |
| ROV Dive Name           |  |   |   |
| Cruise                  | EX1708   |   |   |
| Leg                     | -  |   |   |
| Dive Number             | DIVE18   |   |   |
| Equipment Deployed      |  |   |   |
| ROV                     | Deep Discoverer                                    |   |   |
| Camera Platform         | Seirios  |   |   |
| ROV Measurements        | <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 |



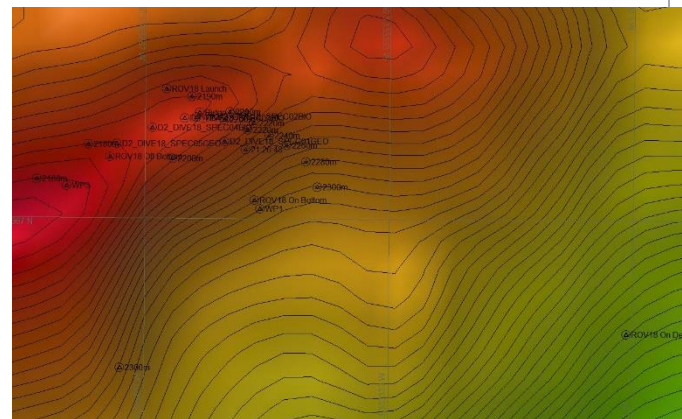
|                         |  |  |
|-------------------------|--|--|
|                         | Tina Molodtsova<br>tina@ocean.ru;<br>tina.molodtsova@gmail.com   | P.P.Shirshov Institute of Oceanology RAS |
| Purpose of the Dive     | <p>The primary objective for this dive was to characterize the distribution and abundance of benthic fauna. A comparison of the diversity and distribution of coral and sponge communities across the seamounts to the north and to the Hawaiian Ridge and the broader North Pacific is of particular importance to understanding biogeography and connectivity of communities in the Pacific. Sharp elongate ridge features have been shown to harbor large-scale, high-density coral communities on the NW Hawaiian Ridge. As such, the elongate ridges in these areas have a high potential to host similar communities. The dive satisfies the CAPSTONE science theme to "Identify and map vulnerable marine habitats – particularly high-density deep-sea coral and sponge communities."</p>  |  |
| Description of the Dive | <p>ROV <i>Deep Discoverer</i> (D2) arrived on bottom at time 19:42 and at 2311 m water depth on a flat sedimented plain with a gravelly surface dotted with isolated boulders harboring corals. Some other first biological sightings were <i>Eknomisis</i> sp. bamboo coral with "volcano polyps" and <i>Heteropathes</i> sp. black coral at 2317 m, a sea star eating a bamboo coral at 2310 m, and a Bolosominae glass sponge amidst the field of talus and boulders. Some small lava outcrops entered the scene along with a benthic jelly, <i>Aeginona</i> sp., predating a coral tree at 2304 m. An oasis of life appeared in the form of dense coral fans hosted by a big isolated boulder at 2296 m. Contact was made with a large volcanic outcrop of slope 20-30° at 2294 m that served as the stable substrate for numerous corals. Low relief pillow and lobate flows were observed at 2291 m along with many corals and some sponges. A pair of unusual urchins with soft spines on top, present on previous dives, were seen at time 20:37 (2290 m). Transition to a talus slope mostly consisting of small gravelly material occurred at 2284 m. A number of biological observations followed, including a large dead sponge toppled over, presumably after outgrowing its rock base, and parazoanthids overgrowing a pink coral. A slow transition to more and larger boulders with intermingled talus was observed at 2267 m. A coral covered boulder that included a Primnoid, <i>Narella</i> sp.2, was found to have a piece of marine debris caught in its branches at time 21:24 (2256 m) followed by a free-swimming <i>Chaunacops</i> sp. at time 21:35 (2250 m). D2 came across a massive outcrop at 2245 m and a rock sample was taken at time 21:50 (2242 m), a wedge-shaped piece of talus from the base of this outcrop. The first biological collection, a <i>Parantipathes</i> sp. black coral, was taken from a vertical wall with many large fans at time 22:26 (2186 m). A reduced slope of ~45° with a gravelling surface and random boulders was observed at 2181 m. Yellow staining exposed through a black gravelly surface was first observed at time 22:42 (2178 m). The ROV skid was dragged through it, revealing thick layers of soft material such as mud or clay as seen on other seamounts this trip. This is an important transition to understanding the geological history of the seamount as these deposits may represent lagoonal sediments or marine conglomerates. This particular outcrop was extensive and persisted until 2170 m. D2 arrived atop a broad ridge at 2170 m where the current greatly increased and more sponges became apparent. The ridge top was nearly flat with many corals, although smaller in size. Dead sponges littered the landscape. Additional yellow staining in a high relief outcrop was observed at 2168 m. More and larger corals and sponges were seen on a local high at 2154 m. Moving off the local high, the corals again became smaller at 2170 m as D2 approached the waypoint #2 dogleg at the base of the summit ridge. The second biologic, a "leafy" glass sponge, was collected at time 23:17 (2169 m). The a number of clustered Bolosominae sponges were imaged at time 23:21 (2168 m). A long, intact pillow</p> |  |

tube was followed by big outcrops, the tops festooned with many large bamboo corals at time 23:30. Light-colored, rippled sediment patches with clean surfaces were observed here. The next major change in geomorphology were large stepped outcrops that hosted many corals and sponges, including an old Bolosominae sponge at 2156 m. Shear rock faces were also observed here, with a darker and smoother complexion of Mn-crust. A rock collection attempt was aborted because of the fear of yellow mush. Soon after, D2 came across a giant ribbon-like, “folded blanket” like sponge, as known as the “minivan” sponge, nearly 4 meters in length at time 23:52 (2155 m). This sponge, Lanuginellidae “ruffles”, this sponge has been seen twice before in the Northwestern Hawaiian Islands. Collection of a piece of this mega sponge was made at time 00:08 (2153 m) as a paratype to help in the description of this new species. Seeing this rare sponge here, in the Musicians Seamounts, may be an indication of connectivity between the two seamount chains. Massive outcrops with flat sheared surfaces were again observed at time 00:15 (2153 m) while the uphill march of large corals and sponges continued. Another rock collection attempt was aborted because of the manipulator revealed a yellow inner core, leading to the speculation that the entire summit may be composed of this yellow mush or mud. At time 00:44 (2148 m), a large outcrop with numerous large, old bamboo corals lining its spine and facing the same direction was observed, suggesting a constant long term current direction. A second rock collection was finally made, a rounded piece of talus from the summit ridge at 2140 m. Later examination in the lab where the manipulator claw grasped the rock revealed the same ubiquitous yellow material beneath a thin layer of Mn-crust. A final push to the summit was made in the remaining minutes of the dive. Large outcrops with scattered talus and sediment cover and corals continued to 2130 m. D2 left bottom at 01:16 from 2128 m water depth.

Overall Map of the ROV Dive Area



Close-up Map of Main Dive Site



Representative Photos of the Dive



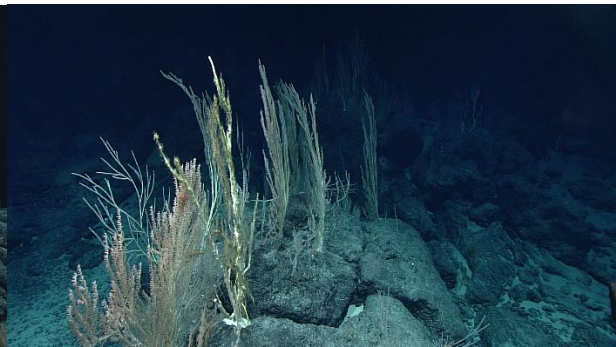
Two unusual sea urchins on the move in the small coral oasis on a large boulder



Numerous *Chrysogorgia* sp. coral colonies on a massive outcrop on the summit ridge



The minivan sponge, new genus of glass sponge in the family Lanuginellidae, draped over a rock outcrop on the summit ridge



Dense aggregation of bamboo coral fans lining a rock ridge and oriented in the same direction near the summit

### Samples Collected


#### Sample

|                           |  |
|---------------------------|--|
| Sample ID                 | EX1708_D2_DIVE18_SPEC01G<br>EO   |
| Date (UTC)                | 9/24/2017  |
| Time (UTC)                | 21:50  |
| Depth (m)                 | 2242.6   |
| Temperature (°C)          | 1.9  |
| Field ID(s)               | Mn-crusts wedge shaped<br>basalt talus from base of<br>massive outcrop |
| Commensal ID<br>and Field |  |




|                |  |
|----------------|--|
| Identification |  |
| Comments       |  |



**Sample**

|                                       |                                |  |
|---------------------------------------|--------------------------------|--|
| Sample ID                             | EX1708_D2_DIVE18_SPEC02B<br>IO |  |
| Date (UTC)                            | 9/24/2017                      |  |
| Time (UTC)                            | 22:27                          |  |
| Depth (m)                             | 2186.3                         |  |
| Temperature (°C)                      | 1.9                            |  |
| Field ID(s)                           | <i>Parantipathes</i> sp.?      |  |
| Commensal ID and Field Identification |                                |  |
| Comments                              |                                |  |

**Sample**

|                                       |   |   |
|---------------------------------------|---|---|
| Sample ID                             | EX1708_D2_DIVE18_SPEC03B<br>IO          |  |
| Date (UTC)                            | 9/24/2017                               |   |
| Time (UTC)                            | 23:17                                   |   |
| Depth (m)                             | 2169.0                                  |   |
| Temperature (°C)                      | 2.0                                     |   |
| Field ID(s)                           | Euretidae                               |   |
| Commensal ID and Field Identification | EX1708_D2_DIVE18_SPEC03BIO_A01 Amphipod |   |
| Comments                              |   |   |



| Sample                                |  |   |
|---------------------------------------|--|---|
| Sample ID                             | EX1708_D2_DIVE18_SPEC04BIO   |   |
| Date (UTC)                            | 9/25/2017  |   |
| Time (UTC)                            | 00:09  |   |
| Depth (m)                             | 2153.9   |   |
| Temperature ( °C)                     | 2.0  |   |
| Field ID(s)                           | "Lanuginellidae" "ruffles"   |   |
| Commensal ID and Field Identification | EX1708_D2_DIVE18_SPEC04BIO_A01 Aplacophoran  |   |
| Comments                              |  |   |
| Sample                                |  |   |
| Sample ID                             | EX1708_D2_DIVE18_SPEC05GE<br>O   |  |
| Date (UTC)                            | 9/25/2017  |   |
| Time (UTC)                            | 01:05  |   |
| Depth (m)                             | 2140.5   |   |
| Temperature ( °C)                     | 2.0  |   |
| Field ID(s)                           | Mn-crusts rounded talus from summit ridge. Later in lab noted that is soft and tan-colored inside. Possibly consolidated sediment or mudstone/claystone. Does not have heft (density) of basalt. |   |
| Commensal ID and Field Identification |  |   |
| Comments                              |  |   |

**Please direct inquiries to:**

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