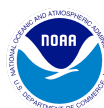




Okeanos Explorer ROV Dive Summary

| Dive Information | |
|-------------------------|--|
| General Location Map | |
| General Area Descriptor | U.S. Caribbean Sea |
| Site Name | Mona South Ridge |
| Science Team Leads | Stacey Williams (ISER) Steven Auscavitch (Temple) |
| Expedition Coordinator | Daniel Wagner (NOAA-OER) |
| ROV Dive Supervisor | Chris Ritter (GFOE) |
| Mapping Lead | Derek Sowers (NOAA-OER) |
| ROV Dive Name | |
| Cruise | EX1811 |
| Dive Number | DIVE17 |
| Equipment Deployed | |
| ROV | <i>Deep Discoverer</i> |
| Camera Platform | <i>Seirios</i> |

| 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 | During the dive one of the ship's generators overheated and went down. The ROVs were pulled off the bottom and held at 900 m until the ship generators came back online. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ROV Dive Summary Data (from processed ROV data) | In Water: | 2018-11-17T12:21:47.677710 17°, 56.903' N ; 67°, 53.447' W | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | On Bottom: | 2018-11-17T13:05:51.902217 17°, 56.865' N ; 67°, 53.387' W | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Off Bottom: | 2018-11-17T17:14:29.559180 17°, 56.717' N ; 67°, 53.192' W | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Out Water: | 2018-11-17T22:44:35.106375 17°, 56.466' N ; 67°, 52.623' W | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Dive duration: | 10:22:47 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Bottom Time: | 4:8:37 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Max. depth: | 1212.0 m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Special Notes | N/A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Scientists Involved (provide name, affiliation, email) | <table border="1"> <thead> <tr> <th>Name</th> <th>Affiliation</th> <th>Email</th> </tr> </thead> <tbody> <tr> <td>Andrew Shuler</td> <td>NOAA/CSS</td> <td>andrew.shuler@noaa.gov</td> </tr> <tr> <td>Asako Matsumoto</td> <td>Chiba Institute of Technology</td> <td>amatsu@gorgonian.jp</td> </tr> <tr> <td>Daniel Wagner</td> <td>NOAA/OER</td> <td>daniel.wagner@noaa.gov</td> </tr> <tr> <td>Debi Blaney</td> <td>NOAA/OER</td> <td>debi.blaney@noaa.gov</td> </tr> <tr> <td>Dhugal Lindsay</td> <td>JAMSTEC</td> <td>dhugal@jamstec.go.jp</td> </tr> <tr> <td>Donal Kobayashi</td> <td>NOAA/PIFSC</td> <td>donald.kobayashi@noaa.gov</td> </tr> <tr> <td>Graciela Garcia-Moliner</td> <td>Caribbean Fishery Management Council</td> <td>graciela_cfm@yahoo.com</td> </tr> <tr> <td>Mashkoor Malik</td> <td>NOAA/OER</td> <td>mashkoor.malik@noaa.gov</td> </tr> <tr> <td>Megan Cromwell</td> <td>NOAA/NCEI</td> <td>megan.cromwell@noaa.gov</td> </tr> <tr> <td>Megan McCuller</td> <td>North Carolina Museum of Natural Sciences</td> <td>megan.mcculler@naturalsciences.org</td> </tr> <tr> <td>Michelle Schärer</td> <td>HJR Reefscaping</td> <td>michelle.scharer@upr.edu</td> </tr> <tr> <td>Mike Ford</td> <td>NOAA/NMFS</td> <td>michael.ford@noaa.gov</td> </tr> <tr> <td>Ricardo Lugo</td> <td>Boqueron Fishermen Association</td> <td>ricardo.juan.lugo@gmail.com</td> </tr> <tr> <td>Scott France</td> <td>University of Louisiana at Lafayette</td> <td>france@louisiana.edu</td> </tr> <tr> <td>Stacey Williams</td> <td>Institute for Socio-Ecological Research</td> <td>stcmwilliams@gmail.com</td> </tr> <tr> <td>Steven Auscavitch</td> <td>Temple University</td> <td>steven.auscavitch@temple.edu</td> </tr> <tr> <td>Tom Hourigan</td> <td>NOAA/NMFS</td> <td>tom.hourigan@noaa.gov</td> </tr> <tr> <td>Tracey Sutton</td> <td>Nova Southeastern University</td> <td>tsutton1@nova.edu</td> </tr> </tbody> </table> | | | Name | Affiliation | Email | Andrew Shuler | NOAA/CSS | andrew.shuler@noaa.gov | Asako Matsumoto | Chiba Institute of Technology | amatsu@gorgonian.jp | Daniel Wagner | NOAA/OER | daniel.wagner@noaa.gov | Debi Blaney | NOAA/OER | debi.blaney@noaa.gov | Dhugal Lindsay | JAMSTEC | dhugal@jamstec.go.jp | Donal Kobayashi | NOAA/PIFSC | donald.kobayashi@noaa.gov | Graciela Garcia-Moliner | Caribbean Fishery Management Council | graciela_cfm@yahoo.com | Mashkoor Malik | NOAA/OER | mashkoor.malik@noaa.gov | Megan Cromwell | NOAA/NCEI | megan.cromwell@noaa.gov | Megan McCuller | North Carolina Museum of Natural Sciences | megan.mcculler@naturalsciences.org | Michelle Schärer | HJR Reefscaping | michelle.scharer@upr.edu | Mike Ford | NOAA/NMFS | michael.ford@noaa.gov | Ricardo Lugo | Boqueron Fishermen Association | ricardo.juan.lugo@gmail.com | Scott France | University of Louisiana at Lafayette | france@louisiana.edu | Stacey Williams | Institute for Socio-Ecological Research | stcmwilliams@gmail.com | Steven Auscavitch | Temple University | steven.auscavitch@temple.edu | Tom Hourigan | NOAA/NMFS | tom.hourigan@noaa.gov | Tracey Sutton | Nova Southeastern University | tsutton1@nova.edu |
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| Dive Purpose | This was a two-part dive, with the first part targeting seafloor habitats at 1,000-1,200 m depths south of Mona Island, and the second part including midwater transects at 300-900 m depths. The purpose of the first portion of the dive was exploratory with objectives to characterize seafloor communities, both hard and soft bottom. Hardbottom faunal communities, including coral and sponges, were expected on steeper-sloped terrain and on top of the ridge feature. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |



| | |
|------------------|---|
| Dive Description | <p>Arriving on bottom, we encountered a primarily sediment-dominated seafloor with a low-profile outcrop of FeMn-coated rock running approximately north to south. Attached organisms were commonly observed on rocky outcrops, including corals, sponges and echinoderms. The main substrate was soft, but we did arrive at a steep section of hard ground that was void of FeMn coating. Three species of fish were observed at this site. We saw two halosaurs, a grenadier (<i>Coryphaenoides</i> sp.) and <i>Bathytyphlops</i> sp. tripod fish. They were all located on soft sediment area.</p> <p>Deep-sea corals were very well represented at this site. We observed three species of black corals (<i>Trissopathes</i> sp., <i>Stichopathes</i> sp., <i>Parantipathes</i>-like sp., and an unknown, possible <i>Trissopathes</i> sp.). Among the Octocorallia we observed representatives from the Primnoidae, Plexauridae, Chrysogorgiidae, Isididae, and Coralliidae. Primnoids included <i>Candidella imbricata</i> and <i>Candidella gigantea</i>. One plexaurid (<i>Paramuricea</i> sp.) was observed. A single bottlebrush morphology of <i>Chrysogorgia</i> sp. was observed with multiple crustacean associates. At least one, possibly two, <i>Corallium</i> species were observed on this dive, but colonies tended to be smaller than 10 cm. Of these, one colony was white (likely <i>Corallium niobe</i>), while the other had a pink wash or tone at the central portion of the axis. One stylasterid, <i>Crypthelia</i> sp., was observed to create numerous small colonies (<5 cm) on available hard substrate. The majority of the Antipatharia and Octocorallia were exclusively found on hard substrate. One bamboo coral, <i>Acanella</i> sp., was found to occur in exclusively soft sediment. Two occurrences of predation by goniasterid stars (?<i>Circeaster</i> sp.) were found on this species of bamboo coral.</p> <p>Scleractinians, while not diverse, were some of the most abundant corals observed on this dive. The two represented species were <i>Madrepora oculata</i> and <i>Javania</i> sp. cup corals. <i>M. oculata</i> was often sparsely branched and found to occur more in soft sediment than on hard bottom. Older exposed skeletal material was at times covered with FeMn crust and indicated additional rubble below the surface of the sediment. Hard surfaces produced by older <i>Madrepora</i> skeletal material was observed to be a significant source of hard substrate for attachment of larger coral colonies in the predominantly soft-bottom habitat.</p> <p>There were a few stalked glass sponges (Hyalonematidae) on soft sediment slopes. Some of these stalked individuals had zoanthids covering the base. Euplectellids were the second most common sponges observed. One Euplectellid had about 6 shrimps inside the sponge. Farreid sponges were also found in this area, but took a yellow coloration that was not previously observed. There were also small sponges, possibly demosponges encrusting the FeMn-coated rocks. We observed a red cidarid urchin (<i>Histocidaris purpurata</i>) eating a carnivorous sponge (<i>Chondrocladia</i> sp.), which has not been previously observed on this expedition.</p> <p>Sea cucumbers were commonly observed on soft sediments. There were at least two species of sea cucumbers observed on bottom. <i>Eynpniastes eximia</i> was also seen hovering above the seafloor, and none were observed on the seafloor. We also saw small recruits of possible sea stars and sea urchins.</p> <p>At 16:05 UTC vehicles were required to come off bottom to troubleshoot a generator issue. A call was made to hold at 900 m depth in the midwater until the issue could be resolved. At 16:56 UTC the issue was resolved and we proceeded to the midwater portion of the dive, which consisted of horizontal transects at 900, 700, 500, and 300 m. Midwater assemblages at this location were much more diverse than at the last midwater dive done at Mona Canyon (Dive 10). We observed a number of organisms, including ctenophores, radiolarians, shrimp, medusae, siphonophores, and fish. There were at least 200 annotations in SeaTube v2 during the midwater portion of the dive. A time table of each transect in UTC time is shown below.</p> |
|------------------|---|

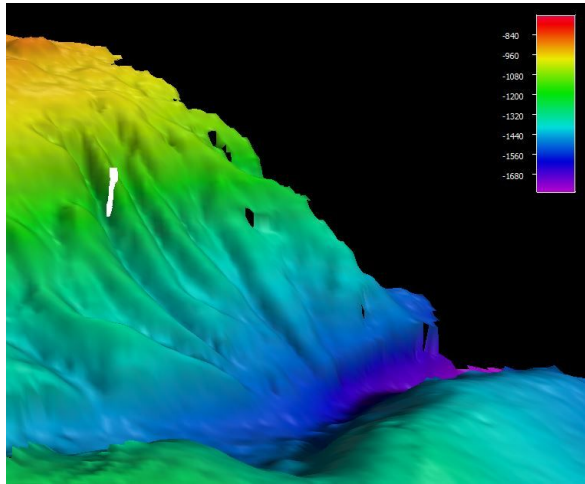


| Depth (m) | Start time (UTC) | End time (UTC) | Length (h:min) |
|-----------|------------------|----------------|----------------|
| 900 | 17:47 | 18:40 | 0:53 |
| 700 | 19:03 | 19:50 | 0:47 |
| 500 | 20:15 | 20:58 | 0:43 |
| 300 | 21:21 | 22:06 | 0:45 |

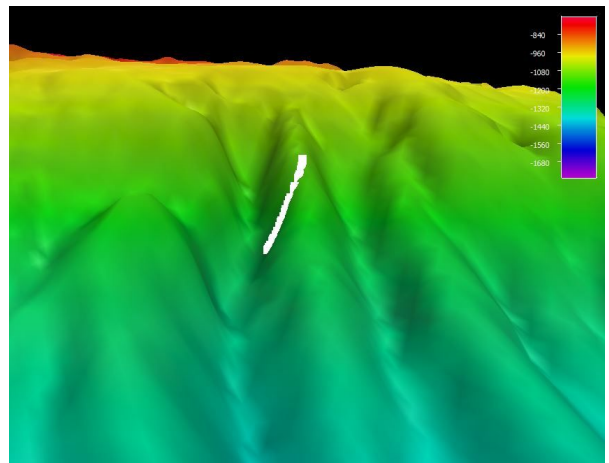
Notable Observations Large black coral fans on rocky outcrops, echinoderm predation on sponges and corals. Excellent imagery of midwater plankton (particularly the radiolarians).

| | |
|---|---|
| Community Presence/Absence <i>(community is defined as more than two species)</i> | <input checked="" type="checkbox"/> Corals and Sponges |
| | <input type="checkbox"/> Chemosynthetic Community |
| | <input checked="" type="checkbox"/> High biodiversity Community |
| | <input type="checkbox"/> Active Seep or Vent |
| | <input type="checkbox"/> Extinct Seep or Vent |
| | <input type="checkbox"/> Hydrates |

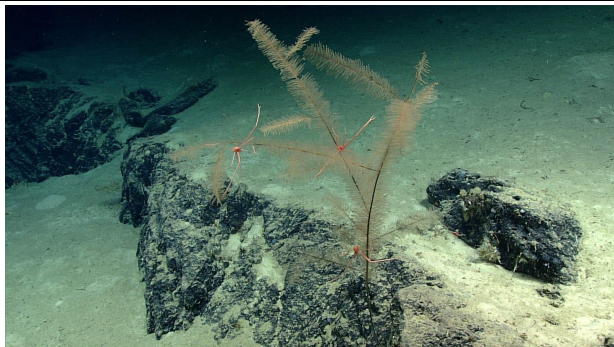
Overall Map of the ROV Dive Area



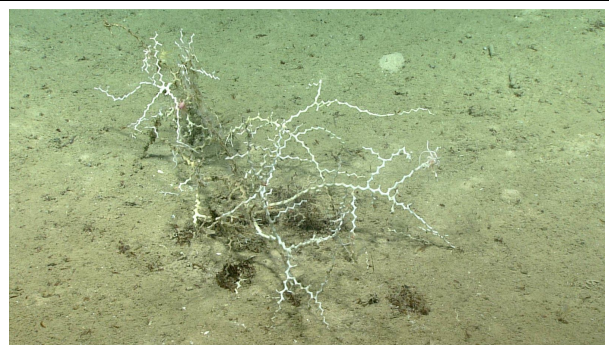
Close-up Map of Main Dive Site



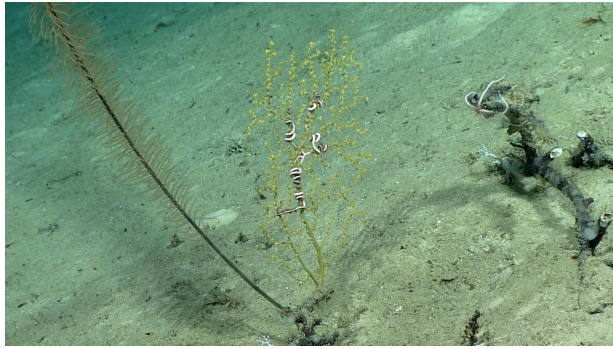
Representative Photos of the Dive



Black corals (possibly *Trissopathes* sp.) were among the largest observed attached to hard substrates.



Colonies of *Madrepora oculata* were commonly observed on soft sediment.



Using *Madrepora* skeleton as a hard attachment point, small octocoral and black coral colonies found habitable space that was often dominated by soft sediments.

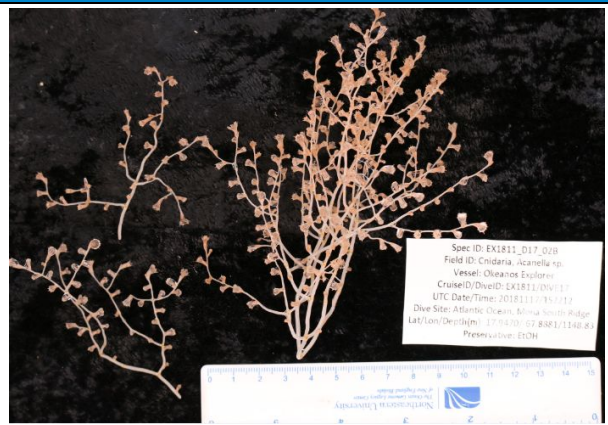
Goniasterid sea stars were seen grazing on at least two bamboo coral colonies, both seen with extensive coral tissue loss.

Samples Collected

| | |
|-------------|----------------|
| Sample ID | EX1811_D17_01B |
| Date (UTC) | 20181117 |
| Time (UTC) | 140037 |
| Depth (m) | 1192.558 |
| Temp. (°C) | 4.896 |
| Field ID(s) | Black Coral |
| Commensals | No commensals |
| Comments | |



| | |
|-------------|---------------------|
| Sample ID | EX1811D17_02B |
| Date (UTC) | 20181117 |
| Time (UTC) | 152212 |
| Depth (m) | 1148.829 |
| Temp. (°C) | 5.011 |
| Field ID(s) | <i>Acanella</i> sp. |



| | | | |
|------------|---------------------|----------------------|-------|
| Commensals | Commensal Sample ID | Field Identification | Count |
| | EX1811_D17_02B_A01 | Polychaeta | 1 |
| Comments | | | |

Please direct inquiries to:

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(301) 734-1014

