**Okeanos Explorer ROV Dive Summary**

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| **Site Name** | Young Lava Flows |  |
| **ROV Lead/****Expedition Coordinator** | Jim Newman / Kelley Elliott |  |
| **Science Team Leads** | Deborah Glickson & Diva Amon |  |
| **General Area Descriptor** | Southern Marianas |  |
| **ROV Dive Name** | Cruise Season | Leg | Dive Number |
|  | EX1605 | 1 | DIVE 09 |
| **Equipment Deployed** | ROV: | Deep Discoverer |
|  | Camera Platform: | Seirios |
| **ROV Measurements** | [x]  D2 CTD | [x]  Depth | [x]  Altitude |
|  | [x]  Scanning Sonar | [x]  USBL Position | [x]  Heading |
|  | [x]  Pitch | [x]  Roll | [x]  HD Camera 1 |
|  | [x]  HD Camera 2 | [x]  ROV HD 2 | [x]  Seirios CTD |
|  | Temperature Probe | [x]  D2 DO Sensor | [x]  Seirios DO sensor |
| **Equipment Malfunctions** |  |
| **ROV Dive Summary****(From processed ROV data)** |  Dive Summary: EX1605L1\_DIVE09^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^In Water: 2016-04-29T20:30:50.247000 15°, 26.156' N ; 144°, 30.033' EOut Water: 2016-04-30T06:31:45.418000 15°, 26.162' N ; 144°, 30.872' EOff Bottom: 2016-04-30T04:20:16.694000 15°, 25.931' N ; 144°, 30.285' EOn Bottom: 2016-04-29T22:54:47.854000 15°, 26.239' N ; 144°, 30.341' EDive duration: 10:0:55Bottom Time: 5:25:28Max. depth: 4068.5 m |
| **Special Notes** |  |
| **Scientists Involved*****(please provide name / location / affiliation / email)*** | Stace Beaulieu, WHOI; sbeaulieu@whoi.eduBill Chadwick, NOAA PMEL; william.w.chadwick@noaa.govScott France, UL Lafayette; france@louisiana.eduPatty Fryer, UH; pfryer@soest.hawaii.eduJulie Huber, MBL; jhuber@mbl.eduChris Kelley, UH; ckelley@hawaii.eduJohn Kellogg, U Victoria; jkellogg@uvic.caAsako Matsumoto, Chiba Institute of Technology; amatsu@gorgonian.jpTina Molodtsova, Shirshov Institute of Oceanology; tina@ocean.ruBruce Mundy, NOAA PIFSC; bruce.mundy@noaa.govShirley Pomponi, FAU/HBOI; spomponi@fau.eduTara Harmer Luke, Stockton University; Tara.Luke@stockton.eduTimothy Shank, WHOI; tshank@whoi.eduRobert Stern, UTDallas; rjstern@utdallas.eduMichael Perfit, UF; mperfit@ufl.edu |
| **Purpose of the Dive** This dive explored a series of recent (2013-2015) lava flows and searched for hydrothermal vents or diffuse flow on the young lavas. Biology inhabiting the area was noted. The dive began at a depth of 4066 m, and moved south from pillow mound to mound for ~700 m (if possible), ending at a depth of 4055 m. |
| **Description of the Dive:** |
| This dive began at the base of a fresh pillow flow at a depth of 4064 m. As expected, the pillow flows were very fresh, with glassy surfaces and very little sediment. Some areas had an iron precipitate that may have been microbially-mediated (although there was no current microbial activity). These took the forms of flocculant, staining, and “rusticles.” We collected a sample at this location – the northernmost pillow mound (D2\_DIVE09\_SPEC01GEO). Some of the pillows looked a bit older due to sediment cover, but all pillows were approximately the same age. As we moved off the pillow mound to the south, we encountered an area of what looked like ash deposits or volcaniclastics, followed soon after by a field of broken pillows with some white authigenic deposits (D2\_DIVE09\_SPEC02GEO). We guessed that this was due to an explosive event, but then came upon a very steep-walled pillow mound (60 m high) where the pillow toes had fallen off after being erupted. There was some hydrothermal staining here as well. We then jumped to the southernmost of the 3 pillow mounds, where pillows with very glassy textures and some strange morphology (sticking out at 90 degrees into the air) were seen. We collected a particularly glassy and curly pillow extrusion (D2\_DIVE09\_SPEC03GEO).The biology on this dive was extremely scarce. In total, there were about four morphotypes observed: a Synallactidae holothurian, a *Munidopsis* squat lobster and many swimming polychaetes. One surprise of the dive was finding an area of diffuse flow (7 degrees C), where approximately four vent-endemic *Chorocaris* shrimp were seen. |
| **Map of ROV Dive Area** |  |
|  | PublicData:cruises:EX1605L1:Dive Summaries:Hypack screengrabs:Dive09:EX1605L1_DIVE09_Hypack_zoom.JPG |
| Fledermaus map of planned dive EX1605L1-DIVE09 track. | Hypack screengrab of actual dive EX1605L1-DIVE09 track |
| **Representative Photos of the Dive** |
| **CruiseData:EX1605L1:Imagery:EX1605L1_DIVE09_20160429:EX1605L1_IMG_20160429T231459Z_D2_DIVE09_SPEC01GEO_04.jpg** | CruiseData:EX1605L1:Imagery:EX1605L1_DIVE09_20160429:EX1605L1_IMG_20160430T021041Z_ROVHD_HYX_SHI_HL.jpg |
| Glassy pillow extrusions being collected during DIVE 09. | A species of *Chorocaris* shrimp, a hydrothermal vent endemic, seen during DIVE 09. |
| **Samples Collected** |
| **Sample ID** | D2\_DIVE09\_SPEC01GEO | CruiseData:EX1605L1:UPLOAD:TOPSIDE SAMPLE IMAGES:EX1605L1_DIVE09_TOPSIDE_SAMPLE_IMAGES:IMG_1172.JPG |
| **Date (UTC)** | 20160429 |  |
| **Time (UTC)** | 23:17:05 |  |
| **Depth (m)** | 4056 |  |
| **Temperature (oC)** | 1.664 |  |
| **Field ID(s)** | Pillow extrusion  |  |
| **Comments** | No commensals. |
| **Sample ID** | D2\_DIVE09\_SPEC02GEO | :DIve09:IMG_1177.JPG |
| **Date (UTC)** | 20160430 |  |
| **Time (UTC)** | 01:15:59 |  |
| **Depth (m)** | 4047.9 |  |
| **Temperature (oC)** | 1.653 |  |
| **Field ID(s)** | Pillow lava |  |
| **Comments** | No commensals. |
| **Sample ID** | D2\_DIVE09\_SPEC03BIO | :DIve09:IMG_1184.JPG |
| **Date (UTC)** | 20160430 |  |
| **Time (UTC)** | 03:50:31 |  |
| **Depth (m)** | 4062.5 |  |
| **Temperature (oC)** | 1.652 |  |
| **Field ID(s)** | Pillow extrusion |  |
| **Comments** | No commensals.  |
| **Please direct inquiries to:** | NOAA Office of Ocean Exploration & Research1315 East-West Highway (SSMC3 10th Floor)Silver Spring, MD 20910(301) 734-1014 |