

**DRAFT Project Instructions**

**Date Submitted:** TBD

**Platform:** NOAA Ship *Okeanos Explorer*

**Project Number:** EX-16-05 Leg 1

**Project Title:** CAPSTONE CNMI & Mariana Trench MNM (ROV & Mapping)

**Project Dates:** April 20 – May 11, 2016

Prepared by:

Approved by: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Dated: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Craig Russell

Program Manager

Office of Ocean Exploration & Research

Approved by: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Dated: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Captain Anne K. Lynch, NOAA

Commanding Officer

Marine Operations Center - Atlantic

1. **OVERVIEW**

**A. Brief Summary and Project Period**

From April to July 2016, NOAA and partners will conduct three telepresence-enabled ocean exploration cruises on [NOAA Ship *Okeanos Explorer*](http://oceanexplorer.noaa.gov/okeanos/about.html) to collect critical baseline information in and around the Commonwealth of the Northern Marianas Islands (CNMI) and the Marianas Trench Marine National Monument (MTMNM). NOAA will work with the scientific and management community to characterize unknown and poorly-known areas through telepresence-based exploration. This expedition is part of a three year Campaign ([CAPSTONE](http://oceanexplorer.noaa.gov/okeanos/explorations/capstone/welcome.html)) focused on systematically collecting baseline information to support science and management needs within and around the Monuments and other protected places in the Pacific, and serves as an opportunity for NOAA and the Nation to highlight the uniqueness and importance of these national symbols of ocean conservation.

This document contains project instructions for EX-16-05 Leg 1. Operations for this cruise will include ROV, mapping, telepresence-based remote participation, and CTD rosette operations. The expedition will be commence in Santa Rita, Guam with operations beginning on April 20th and conclude in Saipan, CNMI on May 11th. Operations will use the ship’s deep water mapping systems (Kongsberg EM302 multibeam sonar, EK60 split-beam fisheries sonars, ADCPs, and Knudsen 3260 chirp sub-bottom profiler sonar), NOAA’s two-body 6000 m remotely operated vehicle (ROVs *Deep Discoverer* and *Seirios*), CTD rosette, and the ship’s high-bandwidth satellite connection for real-time ship to shore communications. Daytime ROV dives are planned every day from April 21 –May 10. ROV dives will include high-resolution visual surveys and limited rock and biologic specimen sampling. Mapping operations will be conducted overnight and when the ROV is on deck. CTD casts have been requested during the cruise to collect more environmental information at sites of interest. Exploration operations for this cruise will focus on deep-water areas around CNMI and MTMNM. This expedition will help establish a baseline of information in the region to catalyze further exploration, research and management activities.

NOAA Ship *Okeanos Explorer* systematically explores the ocean every day of every cruise to maximize public benefit from the ship’s unique capabilities. With 95% of the ocean unexplored, we pursue every opportunity to map, sample, explore, and survey at planned destinations as well as during transits; “Always Exploring” is a guiding principle. An integral element of *Okeanos Explorer*’s “Always Exploring” model is the ship’s seafloor and water column mapping capabilities. A subset or all of the sonars (EM 302, EK 60, Knudsen sub-bottom, ADCPs) on board will be operated on all transits during this expedition for 24-hour seabed, water column, and/or sub-bottom data collection and selected processing.

As a telepresence-enabled ROV cruise, EX-16-05 Leg 1 is anticipated to have a robust complement of shore-based science experts participating from their home institutions and Exploration Command Centers around the country. This shore-based science team will actively engage with the at-sea team in real-time using *Okeanos Explorer*’s state-of-the art telepresence technology, including during ROV dives and daily ship-to-shore science planning meetings. In general, operations will focus in the areas highlighted in Figure 1.

**B. Days at Sea (DAS)**

Of the 22 DAS scheduled for this project, 0 DAS are funded by an OMAO allocation, 0 DAS are funded by an OAR Line Office Allocation, and 22 DAS are funded by a NMFS Line Office Allocation, 0 DAS are Program Funded, and 0 DAS are other agency funded. This project is estimated to exhibit a High Operational Tempo due to daily ROV operations, nighttime mapping, and possible evening CTD work.

**C. Operating Area**

EX-16-05 Leg 1 of the CAPSTONE Expeditions is a telepresence-enabled ROV cruise that will focus on sites within CNMI and MTMNM. The overarching themes of CAPSTONE include collecting data to addressing Monument and Sanctuary science and management needs; vulnerable marine habitats; seamounts within the Prime Crust Zone; and collecting information about the geologic history of the Pacific Seamounts. Additional themes for the expedition include deep sea coral and bottom fish habitats; hydrothermal vents; mud volcanoes; trench and subduction zone areas. Operations for this cruise are located in the southern portion of the CNMI and South of Guam.

The ship will conduct 24 hour operations consisting of daytime ROV dives and evening/nighttime mapping operations including during transit. During this cruise we will conduct primarily 8 hour ROV dives with occasional 10 or 12 hour dives on particularly interesting or deep water dive sites, as staffing allows. ROV operations will focus in depths between 250 and 6,000 meters and will include high-resolution visual surveys and limited sample collection. Mapping operations will be conducted in 250m of water and deeper, and include transit and overnight multibeam, water column backscatter, and sub-bottom data collection. CTD rosette operations are requested at several sites to inform ROV dives, and may be requested opportunistically at selected sites where collecting the data is considered important to understanding the physical or chemical properties of the overlying water column.

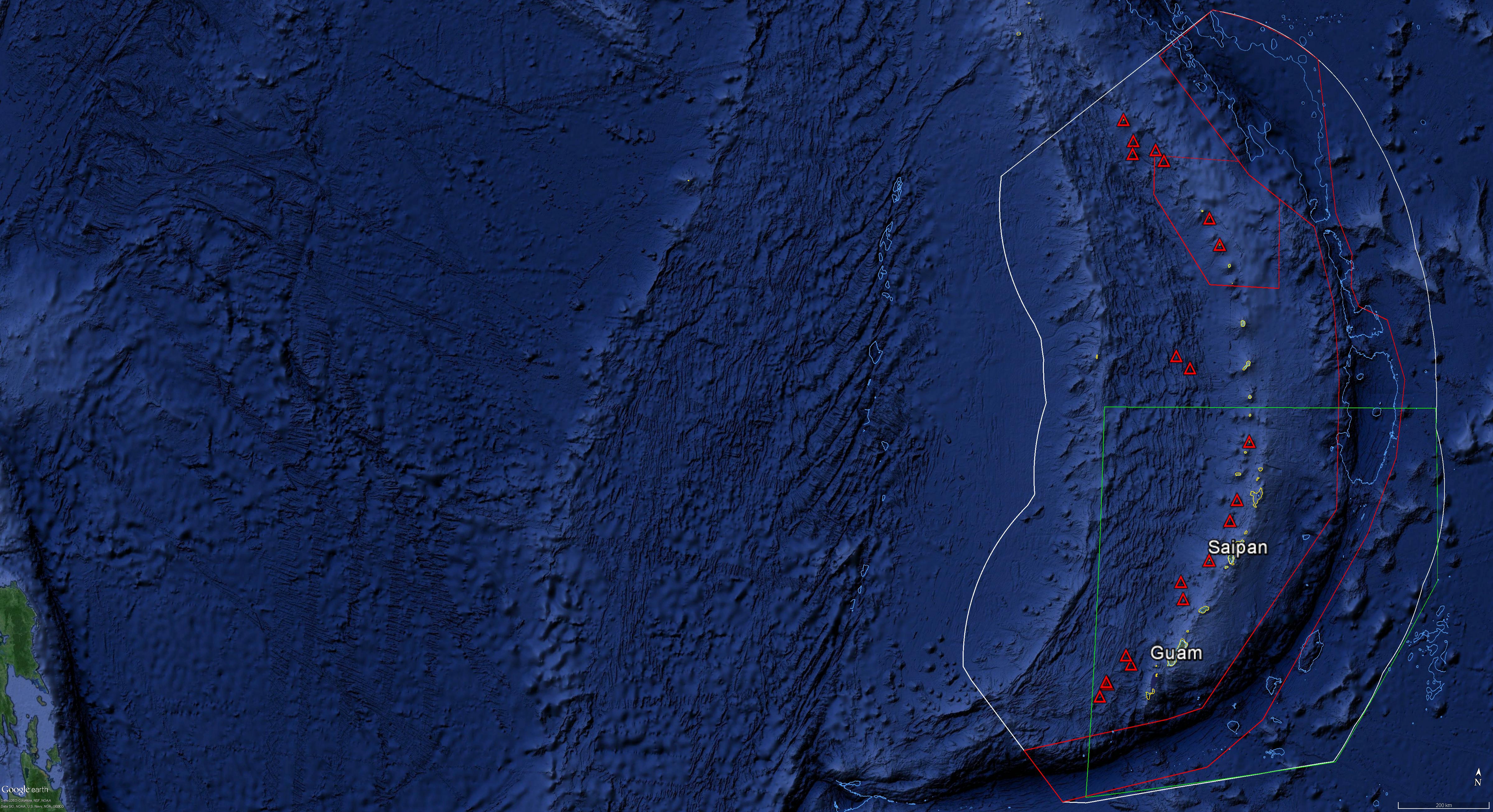


Figure 1: This figure shows the operating area (green box) of the *Okeanos Explorer* for EX-16-05 Leg 1. The white line shows the U.S. EEZ, the red lines and triangles are the boundaries of the Trench and Islands Unit of the MTMNM, and the red triangles are the Vents Unit of MTMNM. The yellow contour lines are the 250m contours surrounding Guam and the CNMI, and light blue are 6000m contours.

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| **Operating Area Bounding Coordinates** | | |
| **ID** | **Latitude (N)** | **Longitude (E )** |
| SE Corner | 11.6364 | 147.7862 |
| Mid-East Node | 14.6465 | 149.4795 |
| NE Corner | 17.5088 | 149.3278 |
| NW Corner | 17.3300 | 143.2906 |
| SW Corner | 11.0410 | 143.4362 |

Table: Bounding coordinates of the operating area box show in Figure 1.

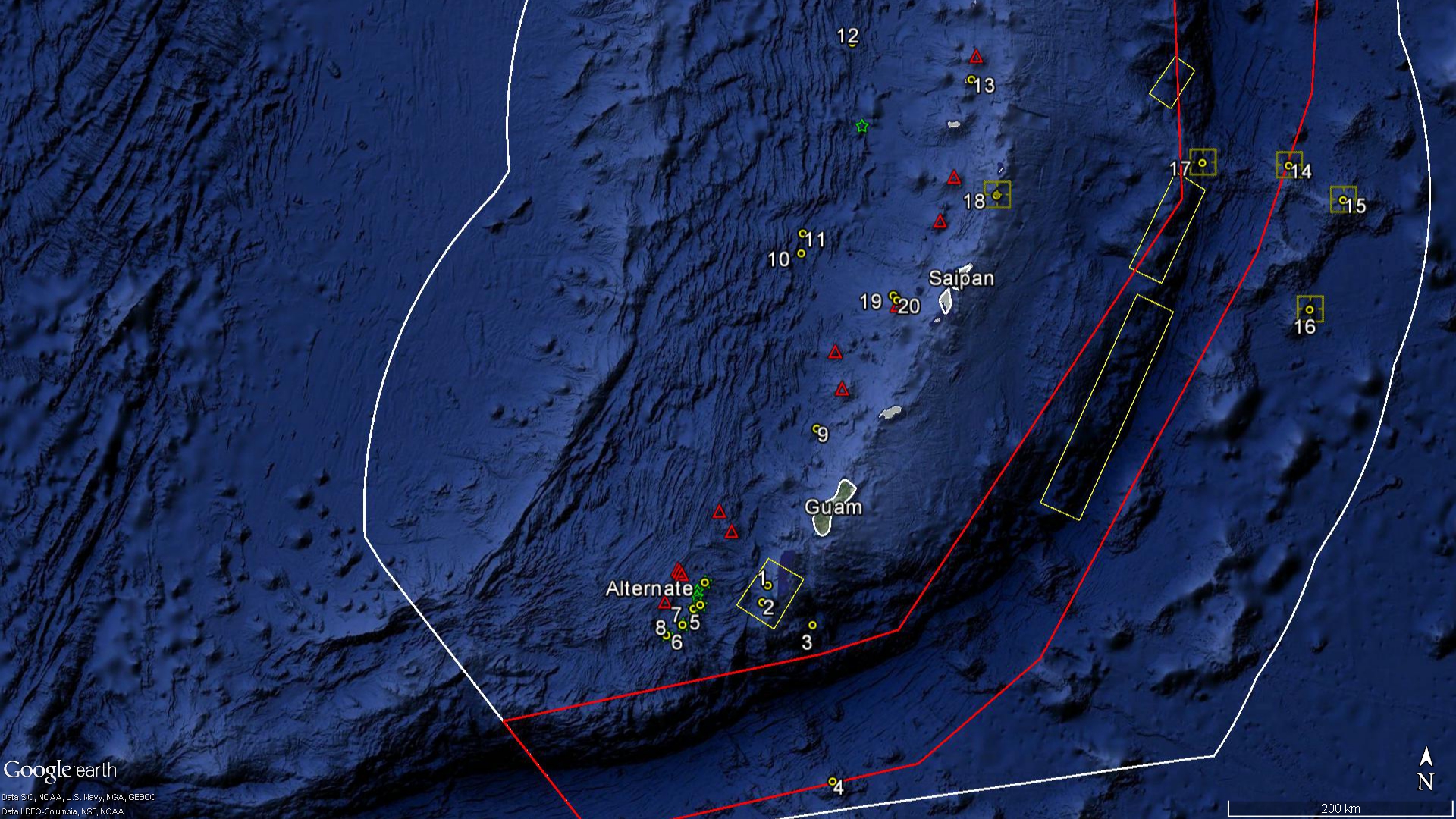


Figure 2: This figure shows the location of planned ROV dives (yellow dots with numbers), mapping area boxes (yellow boxes) and requested CTD rosette operations (green stars). The white boundaries are the U.S. EEZ, the red polygon is the boundary of the Trench Unit of MTMNM, and the red triangles compose the Vents Unit of the MTMNM. See the detailed itinerary in table 4 on page 19 for details on the ROV dive sites and an anticipated schedule of operations.

**D. Summary of Objectives**

**April 20 – May 11 (Santa Rita, Guam to Saipan, CNMI) Telepresence-enabled ROV cruise with mapping and CTD operations**

EX-16-05 Leg 1 operations will cover a wide area of the US EEZ in and around the Commonwealth of the Northern Marianas Islands, Guam, and the Marianas Trench Marine National Monument. The primary goal for this cruise is to collect baseline data and information to support priority NOAA science and management needs.

Mission objectives for EX-16-05 Leg 1 include a combination of operational, science, education, outreach, and data management objectives:

1. Science
   1. Acquire data to support priority Monument and Sanctuaries science and management needs;
   2. Explore the diversity and distribution of benthic habitats – including bottom fish habitats, deep sea and precious coral communities, hydrothermal vent communities, mud volcanoes, trench and subduction zone habitats;
      1. Collect data on: habitat size and extent, animal diversity and density;
      2. Focus close-up imaging operations on potential new, rare and poorly documented animals as well as dominant members of the communities;
      3. Collect and preserve biological samples of potential new species, new records, dominant community members if not easily recognized, and other animals to aid in site characterization
   3. Collect biological and geological data and samples on seamounts within the Prime Crust Zone east of the trench, particularly focusing on ridge tops and summit margins;
   4. Collect biological and geological data at sites to aid the understanding of the geologic history of the Pacific seamounts.
   5. Continue to refine specimen collection protocols and processing procedures;
   6. Ground-truth acoustic data using video imagery and characterize associated habitat;
   7. Engage a broad spectrum of the scientific community and public in telepresence-based exploration;
   8. Successfully conduct operations in conjunction with shore-based Exploration Command Centers and remote science team participants;
   9. Create and provide input into standard science products to provide a foundation of publicly accessible data and information products to spur further exploration, research, and management activities.
2. Remote Science/Exploration Command Centers
   1. Provide operational support and training to scientists and managers to enable remote participation in at-sea operations;
   2. Provide support and testing to bring new ECC or viewing center online at the University of Guam;
   3. Provide support and testing to bring internet-1 based ECC or viewing center online at Northern Marianas College;
   4. Develop and test best practices for hosting internet-1 based live interactions;
   5. Facilitate outreach and engagement activities and events at the ECCs;
   6. Test and refine ship-to-shore communications procedures that engage multiple ECCs and other remote participants;
   7. Test and refine operating procedures and products.
3. ROV Engineering
   1. Daytime ROV dives on exploration targets;
   2. Ongoing training of pilots;
   3. Ongoing system familiarization, documentation, and training;
   4. Test and refine new ROV systems and pilot sampling protocol.
4. Video Engineering (VSAT ~15 mb/sec ship-to-shore; 2.5 mb/sec shore-to-ship)
   1. Test terrestrial and high-speed satellite links (Test high speed at 18 mbps if bandwidth can be procured, to see if this is successful. Will need coordination from OER and KnightSky to do this)
   2. Support telepresence-enabled ROV operations;
   3. Collect/create all standard video products;
   4. Continue to refine new highlight video SOPs;
   5. Facilitate live outreach events between ship and shore;
   6. Continue to refine protocols for using YouTube live to host live video;
   7. Test and refine new video compression and editing hardware;
   8. Formalize / Finalize parallel processing of imagery and video compression routines;
   9. Work develop protocols and procedure for using the Telestream video recording suite.
5. Mapping
   1. Collect high resolution mapping data from sonars in priority areas as dictated by operational needs as well as science and management community needs;
   2. Support ROV operations with mapping products and expertise;
   3. Conduct mapping operations during transit, with possible further development of exploration targets;
   4. Collect XBT/ UnderwayCTD casts at regular intervals no longer than 6 hours, as data quality requires, during mapping operations;
   5. Create daily standard mapping products;
   6. Collection of sun photometer measurements as part of survey of opportunity;
   7. Continue to test the integration of the new EK60 frequencies and the ADCPs. Overnight mapping operations will focus on refining protocols for the new sonars.
6. Data Management
   1. Provide a foundation of publicly accessible data and information products to spur further exploration, research, and management activities;
   2. Provide daily products to shore for operational decision making purposes;
   3. Test SOP for providing sample data management support from shore;
   4. Continue to test the ability to record high definition video footage of a full dive onboard the ship;
   5. Develop and test protocols and procedures for handling the data from the Telestream video recording system;
   6. Develop and test protocols and procedures for handling data from pilot sampling efforts
   7. Cross train existing ROV dedicated personnel;
   8. Formalize Data Management SOPs;
   9. Continue development on real time data visualization of ROV geospatial and environmental parameters;
   10. Ensure Marine Archology data protection protocols are followed, if relevant.
7. Outreach
   1. Engage the general public in ocean exploration through live video and timely content (daily updates, topical essays and web logs, highlight videos, video clips, still imagery and mapping products) posted on the Ocean Explorer website;
   2. Provide support and testing to enable live-streaming and context for the Marians “mock command center” public exhibit at UnderWater World Guam.
   3. Conduct live interactions and UnderWater World Guam;
   4. Conduct live interactions with schools on Saipan;
   5. Host live events with VIPs;
   6. More TBD.
8. Ship
   1. Continue to refine SOPs for the New VSAT;
   2. Provide high a high quality stable internet connection with the new VSAT;
   3. Continue training new deck department personnel in ROV launch and recovery.

**E. Participating Institutions**

National Oceanic and Atmospheric Administration (NOAA), Office of Ocean Exploration and Research (OER)–1315 East-West Hwy, Silver Spring, MD 20910 USA

Global Foundation for Ocean Exploration, 75 Greenmanville Ave., Mystic, CT 06355 USA

NOAA, National Oceanographic Data Center, National Coastal Data Development Center, Stennis Space Center MS, 39529 USA

NOAA, Office of Coast Survey, Hydrographic Surveys Division, Atlantic Hydrographic Branch, 439 W. York St., Bldg 2, Norfolk, VA 23510 USA

University Corporation for Atmospheric Research Joint Office for Science Support (JOSS), PO Box 3000 Boulder, CO 80307 USA

University of Hawai’i at Manoa- 2500 Campus Rd, Honolulu, HI 96822

University of New Hampshire (UNH) Center for Coastal and Ocean Mapping (CCOM) Jere A. Chase Ocean Engineering Lab, 24 Colovos Rd, Durham, NH 03824 USA

NOAA National Marine Fisheries Service, Pacific Islands Regional Office, 1845 Wasp Blvd, Honolulu, HI 96818

NOAA National Marine Fisheries Service, Marine National Monuments Program, 1845 Wasp Blvd, Honolulu, HI 96818

NOAA National Marine Fisheries Service, Pacific Islands Fisheries Science Center, 1845 Wasp Blvd, Honolulu, HI 96818

University of Guam, University Dr., Mangilao, Guam 96923

UnderWater World Guam, 1245 Pale San Vitores Rd, Tamuning, Guam 96911

Northern Marianas College, P.O. Box 501250, Saipan, MP 96950

**F. Personnel (Mission Party)**

**Table 2: Leg I – Full list of sea going mission party members and their affiliations**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Name**  **(First, Last)** | **Title** | **Date Aboard** | **Date Disembark** | **Gender** | **Affiliation** | **Nationality** |
| Kelley Elliott | Expedition Coordinator | 4/16 | 5/14 | F | NOAA OER | USA |
| Lindsay McKenna | Mapping Team Lead | TBD | TBD | F | NOAA OER | USA |
| Deborah Glickson | Scientist 2 | TBD | TBD | F | UCAR/FAU | USA |
| Diva Amon | Scientist 1 | TBD | TBD | F | UCAR/UH | United Kingdom, Trinidad and Tobago |
| Kevin Jerram | Mapping Watch Lead | TBD | TBD | M | UCAR | USA |
| Andy O'Brien | Data Management | TBD | TBD | M | UCAR/GFOE | USA |
| Karl McLetchie | Engineering Group Lead 1 | TBD | TBD | M | UCAR/GFOE | USA |
| Bobby Mohr | Engineering Group 2 | TBD | TBD | M | UCAR/GFOE | USA |
| Jeff Laning | Engineering Group 3 | TBD | TBD | M | UCAR/GFOE | USA |
| Levi Unema | Engineering Group 4 | TBD | TBD | M | UCAR/GFOE | USA |
| Joshua Carlson | Engineering Group 5 | TBD | TBD | M | UCAR/GFOE | USA |
| Andy Lister | Engineering Group 6 | TBD | TBD | M | UCAR/GFOE | USA |
| Sean Kennison | Engineering Group 7 | TBD | TBD | M | UCAR/GFOE | USA |
| Jim Newman | Engineering Group 8 | TBD | TBD | M | UCAR/GFOE | USA |
| Dan Rogers | Engineering Group 9 | TBD | TBD | M | UCAR/GFOE | USA |
| Tara Smithee | Engineering Group 10 | TBD | TBD | F | UCAR/GFOE | USA |
| Brian Kennedy | Engineering Group 11 | TBD | TBD | M | UCAR/GFOE | USA |
| Ed McNichol | Engineering Group 12 | TBD | TBD | M | UCAR/GFOE | USA |
| Roland Brian | Engineering Group 13 | TBD | TBD | M | UCAR/GFOE | USA |
| TBD | Engineering Group 14 | TBD | TBD | TBD | UCAR/GFOE | USA |

**Table 3: Leg I—Shore-based Operations Team**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Last Name** | **First Name** | **Organization** | **Area of interest or expertise.** | **What is your level of intended/desired participation?** | **Where are you planning on participating from?** |
| Kelley | Chris | UH Manoa | Deep Sea Taxonomy, sponges | Core | UH Manoa |
| Liwag | Jonathan | Northern Marianas College |  | Occasional | Saipan, Northern Marianas College |
| Gerringer | Mackenzie | University of Hawaii | Deep-sea Fishes, Hadal Trenches | Core | UH ECC |
| Quattrini | Andrea | Harvey Mudd College | benthic bio | Occasional | HMC |
| Parrish | Frank | PIFSC |  | Occasional | IRC |
| Watling | Les | University of Hawaii at Manoa | benthic biology, octocorals | Core | Hawaii, Maine |
| Levin | Lisa | Scripps Institution of Oceanography | benthic biology | Occasional | Scripps Institution of Oceanography |
| Parke | Michael | PIFSC | Benthic eccology | Core | IRC and UH |
| Zykov | Victor | Schmidt Ocean Institute |  | Occasional | SF Bay Area |
| Johnson | Hoku | NOAA/NMFS/PIFSC |  | Occasional | NOAA - Inouye Regional Center |
| Fraser | John | APASEEM | GIS, Chemistry | Core | Saipan, CNMI |
| Hirsh | Heidi | NOAA NMFS Monuments Program | geomorphology, benthic, biology, hydrothermal vents, geology, submarine volcanoes, ocean literacy, education and outreach | Core | NOAA Inouye Regional Center and Residence in Honolulu |
| Borja | James | Fisherman/Fishermen's Co-Op |  | Occasional | Guam |
| Baechler | Neah | College of Charelston | geomorphology, hydrothermal venting | Occasional | Portland, OR |
| Tibbatts | Brent | Guam DAWR | fisheries, fish taxonomy | Core | Guam DAWR |
| Oram | Risa | NMFS |  | Occasional | Honolulu, PIFSC, NMFS |
| Malay | Maria Celia (Machel) | University of Guam Marine Laboratory | benthic biology, crustaceans, invertebrates in general, biogeography | Occasional | Guam - University of Guam Marine Laboratory |
| Brooke | Samantha | NOAA |  | Core | IRC |
| Greene | Robbie | Pacific Coastal Research & Planning | bathymetry & seafloor mapping, geomorphology | Occasional | CNMI Dept. of Lands & Natural Resources, Saipan, Northern Mariana Islands |
| Simeon | Anna | Bureau of Statistics and Plans | reef biology and ecology | Occasional | Guam, BSP or Underwater world |
| Burdick | David | University of Guam Marine Laboratory | mesophotic benthic communities, focus on corals | Occasional | University of Guam Marine Laboratory |
| Schils | Tom | University of Guam Marine Laboratory | Benthic Ecology; Phycology; Water Quality Monitoring | Core | University of Guam, Guam, Mariana Islands |
| Heywood | Luan | Western Washington University | Igneous petrology/Volcanology | Occasional | Bellingham, WA, USA; Western Washington University |
| Kelley | Katherine | University of Rhode Island | igneous petrology | Occasional | University of Rhode Island |
| Molodtsova | Tina | P.P.Shirshov Institute of Oceanology RAS | deep-sea corals, benthic biology | Core | Moscow, P.P. Shirshov Institute of Oceanology |
| Coykendall | Katharine | USGS | benthic biology | Occasional | USGS Leetown Science Center |
| Reed | John | Harbor Branch Oceanographic Institute | geomorphology, benthic biology | Occasional | HBOI-FAU ECC |
| Carney | Robert | Louisiana State Univ | benthic biology | Occasional | LSU |
| Morgan | Nicole | Florida State University | benthic biology | Occasional | Florida State Uni, Tallahassee, FL |
| Austin | James | University of Texas/Austin | marine geology | Doctor-on-call | my office |
| Wicksten | Mary | TexasA&M University | invertebrate zoology | Occasional | Texas A&M University, College Station, TX |
| Perfit | Michael | University of Florida | Geology, Petrology, Geochemistry | Occasional | Harbor Branch, Florida Atlantic Univ |
| Vecchione | Michael | NMFS National Systematics Lab | cephalopods and pelagic biology | Core | Smithsonina, VIMS, and home |
| Catsambis | Alexis | Naval History & Heritage Command | Archaeology | Occasional | Washington DC |
| McKinnon | Jennifer | East Carolina University | archaeology | Occasional | East Carolina University |
| Gruber | David | Baruch College, City University of New York/National Geographic/AMNH | coral reefs, deep reef biology, biofluorescence, bioluminescence | Occasional | Baruch College, City University of New York/New York City |
| Herrera | Santiago | U Toronto, WHOI | benthic biology | Occasional | U Toronto |
| Dreyer | Brian | UCSC | petrology | Occasional | UCSC |
| Chadwick | Bill | NOAA/PMEL | Geology, volcanology | Occasional | Hatfield Marine Science Center, Newport, Oregon |
| Huber | Julie | Marine Biological Laboratory | microbiology | Core | Woods Hole, Marine Biological laboratory |
| Ross | Steve | UNC-W | fishes, deep-sea ecology, deep sea corals | Occasional | office |
| Stephanie | Farrington | Harbor Branch Oceanographic inst. at fau | Biology | Occasional | HBOI ECC |
| Miller | Allison | National Park Service | invertebrate biology and molecular phylogenetics | Core | Guam |
| Herter | Jeffrey | NY Department of State, Office of Planning & Development | Offshore Planning, Submarine canyons | Occasional | NY Department of State, Office of Planning & Development, Albany, NY |
| Moore | James | Bureau of Ocean Energy Management (BOEM) | Archaeology, shipwrecks, geomorphology | Core | NOAA Headquarters in Silver Spring, MD or BOEM Headquarters in Sterling, VA |
| Baco-Taylor | Amy | Florida State university | Benthic ecology, deep-sea corals and sponges | Core | FSU |
| Beauregard | Laura | USFWS | Marine National Monument | Occasional | USFWS Honolulu/Guam |
| Amesbury | Judith | Micronesian Archaeological Research Services | archaeology | Occasional | MARS office, Guam |
| Jourdan | David | Nauticos | Sonar mapping | Occasional | Nauticos, Cape Porpoise, Maine |
| Matsumoto | Asako | Chiba Institute of Technology | deep sea biology, deep water coral | Core | Japan |
| Carrier | Brandi | Bureau of Ocean Energy Management | archaeology, magnetometry | Core | Bureau of Ocean Energy Management, Sterling, Virginia |
| Jordan | Brian | BOEM | archaeology | Doctor-on-call | Sterling, VA BOEM HQ |
| Glickson | Deborah | FAU-Harbor Branch Oceanographic Institute | marine geology, hydrothermal vents | Core | HBOI |
| Embley | Robert | NOAA/PMEL | geology | Core | Newport, OR |
| Glazer | Brian | University of Hawaii | hydrothermal | Occasional | University of Hawaii Manoa |
| Mundy | Bruce | NOAA NMFS PIFSC | ichthyology (fish identification and biogeography) | Occasional | IRC ECC |
| Beaulieu | Stace | Woods Hole Oceanographic Institution | benthic biology | Occasional | Woods Hole Oceanographic Institution |
| GALLARDO | VICTOR | National Taiwan Ocean University | Benthic communities | Occasional | Taiwan |
| Amon | Diva | University of Hawaii | benthic biology | Core | Okeanos Explorer (leg 1), University of Hawaii (leg 3) |
| Drazen | Jeffrey | University of Hawaii | deep sea fishes | Occasional | UH campus |
| Phil | Alderslade | CSIRO O&A | octocorals | Occasional | CSIRO Hobart Tasmania Australia |
| Dieter | Bryan | PIFSC | exploration | Occasional | IRC |
| Baechler | Britta | CNMI Division of Fish & Wildlife | MPAs, fisheries, corals | Occasional | Saipan |
| Gawel | Mike | US DOI NPS | Octocorals, hard corals, invertebrates, fishes | Doctor-on-call | Guam |
| Matsumoto | Asako | Chiba Institute of Technology (Chitech) | deep sea biology, deep water coral | Core | Japan |
| Demopoulos | Amanda | USGS |  | Occasional | USGS office-Gainesville |
| Auyong | Marie | University of Guam | Community outreach | Occasional | Guam, University of Guam |
| Ford | Mike | NOAA Fisheries | jellyfish | Occasional | Silver Spring ECC |
| Hetti | Diluni | University of Texas at Dallas | Everything about hydrothermal vents | Occasional | Dallas TX, University of Texas at Dallas |
| Wicksten | Mary | Texas A&M University | invertebrate zoology | Occasional | Texas A&M University |
| Raineault | Nicole | OET | geomorph, exploration, seafloor mapping | Occasional | OET, GSO-URI |
| Wagner | Daniel | NOAA | Deep-sea corals | Occasional | IRC ECC and Office |
| Berntson | Ewann | NOAA Fisheries | deep sea corals | Occasional | NWFSC Manchester Research Station |
| Mittelstaedt | Eric | University of Idaho | geology and geophysics | Occasional | University of Idaho - my office |
| Shank | Timothy | WHOI | benthic biology | Core | WHOI command center |
| Rowley | Sonia | University of Hawai'i at Manoa | biogeography & taxonomy of Octorallia, benthic biology | Occasional | Hawai'i, University of Hawai'i at Manoa |
| Coykendall | Katharine | USGS | benthic biology | Occasional | USGS-Leetown Science Center |
| Frable | Ben | Scripps Institution of Oceanography | ichthyology | Occasional | Scripps Institution of Oceanography, La Jolla, CA |
| Andrews | Allen | NOAA Fisheries | Fishes and corals | Occasional | IRC |
| Collins | Allen | NOAA National Systematics Lab | Medusozoan Cnidarians, Hexactinellid sponges | Occasional | Washington DC NOAA |
| Johnston | Lyza | CNMI Bureau of Environmental and Coastal Quality | coral reef ecology | Occasional | BECQ Saipan |
| Putts | Meagan | Hawaii Pacific University | Benthic biology, deep-water coral | Occasional | Hawaii Pacific University/ University of Hawaii |
| Harmer Luke | Tara | Stockton University | deep sea biology | Core | Stockton University, Galloway, NJ |
| ROSE | PAUL | NATIONAL GEOGRAPHIC - PRISTINE SEAS |  | Occasional | UK and Geneva |
| France | Scott | University of Louisiana at Lafayette | Benthic biology, deep-sea coral | Core | University of Louisiana at Lafayette |
| Stern | Bob | U TX Dallas | Marianas | Occasional | UTD and Taos NM |
| Van Tilburg | Hans | NOAA ONMS | maritime heritage | Occasional | DKIRC |
| Mooi | Rich | California Academy of Sciences | echinoid systematics | Doctor-on-call | Calif. Acad. of Sciences, San Francisco |
| Smith | Sallie | Howard B. Owens Science Center |  |  | Howard B Owens Science Center |
| Mah | Christopher | National Museum of Natural History (Smithsonian) | Starfish,echinoderms, deep-sea biology, etc. | Occasional | Washington, D.C. |
| Nunnally | Clifton | University of Hawaii at Manoa | benthic ecology and biogeochemistry of marine sediments, Hadal ecology and energetics | Core | ECC of Univesity of Hawaii campus |
| Leitner | Astrid | University of Hawaii Manoa | deep sea fish ecology and biology | Occasional | University of Hawaii Manoa |
| Miller | Joyce | University of Hawaii | Geology | Occasional | Hawaii -- home |
| Trusdell | Frank | USGS | Volcanology |  | Hawaii, HVO, USA |
| Fryer | Patricia | Univ. Hawaiʻi at Mānoa (UHM) | geology/petrology | Core | Okeanos Explorer |

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| **Last Name** | **First Name** | **Organization** | **Area of interest or expertise.** | **Location** |
| Netburn | Amanda | NOAA | Shore-side Ops and Web Coordinator | Hawaii/ TBD |
| Cantwell | Kasey | NOAA OER (Collabralink) | Shore-side Ops | Silver Spring/ TBD |
| Kelley | Chris | UH Manoa | CAPSTONE Science Advisor, Shore-side Ops | UH Manoa |
| Martinez | Catalina | NOAA | Shore-side Ops | Rhode Island |
| Crum | Emily | NOAA OER | Communications Coordinator | Key West, FL |
| Wagner | Katie | NOAA OER (Collabralink) | Media specialist | Silver Spring, MD |
| Russell | Craig | NOAA OER | Program Manager, Operations | Seattle, WA |
|  |  |  |  |  |

**G. Administrative**

## Points of Contact:

*Ship Operations*

|  |  |
| --- | --- |
| Marine Operations Center, Atlantic (MOA)  439 West York Street  Norfolk, VA 23510-1145 Telephone: (757) 441-6776  Fax: (757) 441-6495 | Chief, Operations Division, Atlantic (MOA)  LCDR Don Beaucage, NOAA  Telephone: (757) 441-6842  E-mail: Chiefops.MOA@noaa.gov |
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### *Mission Operations*

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| Kelley Elliott  Expedition Manager  NOAA Office of Ocean Exploration  and Research  O: 301-734-1024  C: 202-689-4587  E-mail : [Kelley.Elliott@noaa.gov](mailto:Kelley.Elliott@noaa.gov)  Lindsay McKenna  Mapping Lead  NOAA Office of Ocean Exploration  and Research (ERT)  O: (603) 862-5246  E-mail : [Lindsay.Mckenna@noaa.gov](mailto:Lindsay.Mckenna@noaa.gov)  Karl McLechie  ROV Dive Supervisor  The Global Foundation for Ocean Exploration  C :(617)201-5637  E-mail : [Karl@seaknowledge.com](mailto:Karl@seaknowledge.com) | CDR Mark Wetzler, NOAA  Commanding Officer  NOAA Ship *Okeanos Explorer*  Phone: (401) 378-8284  Email: [CO.Explorer@noaa.gov](mailto:CO.Explorer@noaa.gov)  LTJG Aaron Colohan, NOAA  Operations Officer (Acting)  NOAA Ship *Okeanos Explorer*  Phone: (808) 659-9197 (Ship’s Iridium)  E-mail: [Ops.Explorer@noaa.gov](mailto:Ops.Explorer@noaa.gov) |

***Other Mission Contacts***

|  |  |
| --- | --- |
| John McDonough, Deputy Director  NOAA Ocean Exploration & Research  Phone: (301) 734-1023 / (240) 676-5206  E-mail: John.McDonough@noaa.gov  Dave Lovalvo  Engineering Group Lead  The Global Foundation for Ocean Exploration  Phone : (203)2465-5531  E-mail :[david.lovalvo@tgfoe.org](mailto:david.lovalvo@tgfoe.org) | Craig Russell  Program Manager  NOAA Ocean Exploration & Research  Phone: (206) 526-4803 / (206) 518-1068  E-mail: [Craig.Russell@noaa.gov](mailto:Craig.Russell@noaa.gov)  Kasey Cantwell  Leg 3 Expedition Coordinator  NOAA Ocean Exploration & Research  Phone: 301-734-1050  E-mail: [Kasey.cantwell@noaa.gov](mailto:Kasey.cantwell@noaa.gov) |
|  |  |

**Vessel shipping address:**

*Shipments:*

Send an email to the *Okeanos Explorer* Operations Officer at [OPS.Explorer@noaa.gov](mailto:OPS.Explorer@noaa.gov) indicating the size and number of items being shipped.

Items sent to Guam should arrive at the below address prior to COB April 13, 2016.

Naval Base Guam

Port Operations

Building 3169

Sumay Dr.

Santa Rita, Guam

96915

Attn: NOAA Ship *Okeanos Explorer*

1. Diplomatic Clearances  
     
   N/A
2. Licenses and Permits

A Scientific Research License application to conduct work on the submerged lands extending 3nm surrounding the Northern Marianas Island has been submitted to the Director’s Office of CNMI DLNR’s Division of Fish and Wildlife. The license is pending approval. Once the license is received, the DFW Fishing, Harvesting and Hunting permit for sample collections can be obtained.

The expedition is being planned and conducted by NOAA as an agency of the U.S. Federal government, in partnership with NOAA NMFS Pacific Islands Regional Office Marine National Monument Program. We do not require a permit to work in the MTMNM.

In order to support or conduct Marine Scientific Research within the U.S. EEZ, work funded, authorized and/or conducted by the NOAA must be compliant with the National Environmental Policy Act (NEPA). NOAA Administrative Order (NAO) 216-6 describes NOAA’s specific obligations with regard to NEPA compliance. Among these is the need to review all NOAA-supported projects with respect to their environmental consequences. In compliance with NAO 216-6 and NEPA, a memorandum describing the project’s scientific sensors’ possible effects on the environment has been submitted for the project. As expected with ocean research with limited time or presence in the marine environment, the project has been determined to not have the potential to result in any lasting changes to the environment. As defined in Sections 5.05 and 6.03.c.3 (a) of NAO 216-6, this is a research project of limited size or magnitude or with only short-term effects on the environment and for which any cumulative effects are negligible, and as such, the project is categorically excluded from the need to prepare a full-scale NEPA environmental assessment. The categorical exclusion met the requirements of NOA 216-6 and NEPA, and authorizes the Marine Scientific Research conducted for the project.

Additionally, informal consultation was initiated under Section 7 of the Endangered Species Act (ESA), requesting NOAA Fisheries’ Protected Resources Division concurrence with our biological evaluation determining that 2016 Marianas Expedition and all other planned *Okeanos* Explorer operations during the 2016-17 field season, may affect, but are not likely to adversely affect, ESA-listed marine species. The informal consultation was completed on February 3, 2016 when NOAA OER received a signed letter from the Regional Administrator of NMFS Pacific Islands Regional Office, stating that NMFS concurs with OER’s determination that conducting proposed *Okeanos Explorer* cruises are not likely to adversely affect ESA-listed marine species.

1. **OPERATIONS**

The Expedition Coordinator is responsible for ensuring the scientific staff are trained in planned operations and are knowledgeable of project objectives, priorities and environmental compliance procedures. The Commanding Officer is responsible for ensuring all operations conform to the ship’s accepted practices and procedures.

1. **Project Itinerary** *(All times and dates are subject to prevailing conditions and the discretion of the Commanding Officer)*

We will conduct primarily 8 hour ROV dives with a few longer dives and staffing allows. CTD casts are planned, subject to staffing availability.

**Table 4: EX1605 Leg 1 Detailed Itinerary**

*This is an approximate itinerary and is subject to change*

|  |  |  |  |
| --- | --- | --- | --- |
| **Date** | **Dive** | **Activities** | **Site details** |
| 4/17-19 |  | Mobilization. Mission personnel arrive. VIP tours expected. | VIP tours expected |
| 4/20/2016 |  | Depart Guam. CTD operations at Fina Nagu if time allows, overnight mapping at Santa Rosa. |  |
| 4/21/2016 | Dive 1 | Dive Santa Rosa 2 - Overnight mapping at Santa Rosa | - Santa Rosa Site 2  - 12° 51.453 N, 144° 18.386 E, 500m  - Bottom fish fishery, high density corals, precious corals |
| 4/22/2016 | Dive 2 | Dive Santa Rosa 3 - Overnight mapping at Santa Rosa - Transit to Sirena Canyon | - Santa Rosa Site 3  - 12° 43.96 N,144° 16.166 E, 500m  - Bottom fish fishery, high density corals, precious corals |
| 4/23/2016 | Dive 3 | Dive Sirena Canyon  - Transit to New Plate Seamount | - Sirena Canyon  - 12° 34.50’ N, 144° 39.25’ E, 6000m  - Trench habitat |
| 4/24/2016 | Dive 4 | Dive New Plate Seamount | - New Plate Seamount  - 11°25'34.35"N, 144°50'8.88"E, 4,300m  - Trench habitat, seamount, geologic history of Pacific Seamounts |
| 4/25/2016 | Dive 5 | Dive Fina Nagu D? - Evening CTD operations  - Overnight mapping operations | - Fina Nagu Caldera D  - 12.67° N, 143.75°E, 3,000m  - Hydrothermal vent habitat |
| 4/26/2016 | Dive 6 | Dive Fina Nagu E? - Evening CTD operations  - Overnight mapping operations | - Fina Nagu Caldera E  - 12.7° N, 145.8°E, 2,970m  - Hydrothermal vent habitat |
| 4/27/2016 | Dive 7 | Dive Fina Nagu F? - Evening CTD operations  - Overnight mapping operations | - Fina Nagu Caldera F  - 12.55° N, 143.67°E, 3,270m  - Hydrothermal vent habitat |
| 4/28/2016 | Dive 8 | Dive Fina Nagu D or E  - Transit to NW Guam Seamount | - Fina Nagu Caldera G  - 12.47° N, 143.55°E, 2,830m  - Hydrothermal vent habitat |
| 4/29/2016 | Dive 9 | NW Guam Seamount | - NW Guam Seamount  - 14° 1.5' N, 144° 39' E, 1,560m  - Extinct hydrothermal vent, fisheries and deep-sea coral habitat? |
| 4/30/2016 | Dive 10 | Lava Flows | - Lava Flows  - 4100-4400m  - Hydrothermal vent habitat |
| 5/1/2016 | Dive 11 | New Hydrothermal Vent Field | - New Hydrothermal Vent Field  - 3840m  - Hydrothermal vent habitat |
| 5/2/2016 | Dive 12 | Newly Discovered Hydrothermal Vent Field | - New Hydrothermal Vent Field 2  - 3280m  - Hydrothermal vent habitat |
| 5/3/2016 | Dive 13 | Zealandia (long transit, 14-15 hours?) | - Zealandia  - 16° 42.095,145° 49.083, 400m  - Bottom fish fishery, high density corals, precious corals |
| 5/4/2016 | Dive 14 | Del Cano Guyot (may start a little late?) - Subbottom after - Map Subducting Seamount overnight - Transit to Pigafetta Guyot | - Del Cano Guyot  - 16° 6.375, 148° 22.426, 1930m  - High density coral communities, Mn-crusted communities |
| 5/5/2016 | Dive 15 | Pigafetta Guyot - Subbottom after | - Pigafetta Guyot  - 15° 50.965/148° 48.877, 1164m  - High density coral communities, Mn-crusted communities |
| 5/6/2016 | Dive 16 | Enrique Guyot - Subbottom after | - Enrique Guyot  - 14° 59.985/148° 31.022, 2200m  - High density coral communities, Mn-crusted communities |
| 5/7/2016 | Dive 17 | Subducting Seamount  - Collect mapping data in seep area en route | - Subducting seamount  - 16° 06.5’ N, 147° 40’ E, 6,000m  - Trench/subduction zone habitat, seamounts |
| 5/8/2016 | Dive 18 | Dive FDM - Map 400 and 500m contours around FDM - Transit to Esmerelda (map crater en route if there is time) | - FDM  - 15° 48.844 N,146° 1.187 E, 450m  - Bottom fish fishery, high density corals, precious corals |
| 5/9/2016 | Dive 19 | Dive Esmerelda - Map Esmerelda Bank Crater | - Esmerelda  - 15° 2.049 N, 145° 13.203 E, 500m  - Bottom fish fishery, high density corals, precious corals |
| 5/10/2016 | Dive 20 | Dive Esmerelda Bank Crater | - Esmeralda Bank Crater  - 15°N, 145.25°E, 3-500m  - Hydrothermal vent site |
| 5/11/2016 |  | Map data gaps around Saipan Pull into port |  |
| 5/12/2016 |  | Cruise demobilization | Ship tours expected in afternoon |
| 5/13/2016 |  | Mission personnel depart | Possible additional VIP tours that do not require ship support. |

1. **Staging and Destaging**
   1. Minimal mobilization will be required because the most of the ROV personnel and equipment will already be onboard from the previous cruise.
   2. Minimal demobilization will be required because nearly all equipment and samples will remain on board.
2. **Operations to be Conducted**

**Telepresence Events**

* 1. Dates TBD – Live events are expected during the cruise with schools in Saipan, UnderWater World Guam, and VIP events with the ECCs at the University of Guam, Northern Marianas College, and others still being identified. There will be additional live events that come up as the cruise progresses. These events will have little to no effect on the ship’s operations and will be raised during daily operations briefings.

**In-Port Events**

1. Planning is still underway, but limited ship tours for VIP and media are anticipated in Guam on April 18th or 19th prior to cruise departure. These should not require ship personnel.
2. Ship tours for VIPs, teachers, public officials and possibly some members of the public are planned during the Saipan inport for either the afternoon of May 12th or the morning of May 13th and will require ship support. This is still being planned and discussed with the ship.
3. **SCUBA Dive Plan**

All dives are to be conducted in accordance with the requirements and regulations of the NOAA Diving Program (<http://www.ndc.noaa.gov/dr.html>) and require the approval of the ship’s Commanding Officer. No SCUBA dives are currently planned for this cruise.

1. **Applicable Restrictions**

**Sonar Operations**

EM 302, EK 60, ADCP, and sub-bottom profiler data acquisition is planned for this cruise. All data acquisition will be conducted in accordance with established standard operating procedures under the direction of the mapping team lead. These operating procedures will include protection measures when operating in the vicinity of marine mammals, sea turtles or Endangered Species Act-listed species as described in appendices D and E. The final decision to operate and collect 24-hour sub-bottom profiler data will be at the discretion of the Commanding Officer.

1. **EQUIPMENT**
2. **Equipment and capabilities provided by the ship**

* Kongsberg Simrad EM302 MultibeamEchosounder (MBES)
* Kongsberg Simrad EK60DeepwaterEchosounders and GPTs (18, 70, 120, 200 kHz)
* Knudsen Chirp 3260 Sub-bottom profiler (SBP)
* Teledyne RDI Workhorse Mariner (300 kHz) ADCP
* Teledyne RDI Ocean Surveyor (38 kHz) ADCP
* Teledyne UnderwayCTD
* LHM Sippican XBT (Deep Blue probes)
* Seabird SBE 911Plus CTD
* Seabird SBE 32 Carousel and 24 2.5 L Niskin Bottles
* Light Scattering Sensor (LSS)
* Oxidation – Reduction Potential (ORP)
* Dissolved Oxygen (DO) sensor
* Altimeter Sensor and battery pack
* CNAV GPS
* POS/MV
* Seabird SBE-45 (Micro TSG)
* Kongsberg Dynamic Positioning-1 System
* NetApps mapping storage system
* CARIS HIPS Software
* IVS Fledermaus Software
* SIS Software
* Hypack Software
* Scientific Computing System (SCS)
* ECDIS
* Met/Wx Sensor Package
* Telepresence System
* VSAT High-Speed link (Comtech 20 Mbps ship to shore; 2 Mbps shore to ship)
* Cruise Information Management System (CIMS)
* Three VoIP telephone lines
* NOAA OER 6000 m *Deep Discoverer* ROV
* NOAA *Seirios* Camera Platform

1. **Equipment and capabilities provided by the scientists**

* Microtops II Ozone Monitor Sunphotometer and handheld GPS required for NASA Marine Aerosols Network supplementary project.
* Equipment associated with new sampling protocol

1. **HAZARDOUS MATERIALS**
2. Policy and Compliance

The Expedition Coordinator is responsible for complying with FEC 07 Hazardous Materials and Hazardous Waste Management Requirements for Visiting Scientific Parties (or the OMAO procedure that supersedes it). The Expedition Coordinator and Science Team Lead will be responsible for transporting all samples and HAZMAT on and off the ship. By Federal regulations and NOAA Marine and Aviation Operations policy, the ship may not sail without a complete inventory of all hazardous materials by name and quantity, MSDS, appropriate spill cleanup materials (neutralizing agents, buffers, or absorbents) in amounts adequate to address spills of a size equal to the amount of chemical brought aboard, and chemical safety and spill response procedures. Documentation regarding those requirements will be provided by the Chief of Operations, Marine Operations Center, upon request.

Per OMAO procedure, the scientific party will include with their project instructions and provide to the CO of the respective ship 30 days before departure:

* + - List of chemicals by name with anticipated quantity
    - List of spill response materials, including neutralizing agents, buffers, and absorbents
    - Chemical safety and spill response procedures, such as excerpts of the program’s Chemical Hygiene Plan or SOPs relevant for shipboard laboratories
    - For bulk quantities of chemicals in excess of 50 gallons total or in containers larger than 10 gallons each, notify ship’s Operations Officer regarding quantity, packaging and chemical to verify safe stowage is available as soon as chemical quantities are known.

Upon embarkation and prior to loading hazardous materials aboard the vessel, the scientific party will provide to the CO or their designee:

* An inventory list showing actual amount of hazardous material brought aboard
* An MSDS for each material
* Confirmation that neutralizing agents and spill equipment were brought aboard sufficient to contain and cleanup all of the hazardous material brought aboard by the program
* Confirmation that chemical safety and spill response procedures were brought aboard

Upon departure from the ship, scientific parties will provide the CO or their designee an inventory showing that all chemicals were removed from the vessel. The CO’s designee will maintain a log to track scientific party hazardous materials. MSDS will be made available to the ship’s complement, in compliance with Hazard Communication Laws.

Scientific parties are expected to manage and respond to spills of scientific hazardous materials. Overboard discharge of hazardous materials is not permitted aboard NOAA ships.

1. Inventory

|  |  |  |
| --- | --- | --- |
| Item | Use | Approx. locations |
| 95% Denatured Ethanol (10 gallons) | Sample preservation | Wetlab, under the chemical hood |
| 10% Buffered Formalin (3 gallons) | Sample preservation | Wetlab, under the chemical hood |
| Chaos Buffer (0.5 gallons)  (4 M guanidine thiocyanate, 0.5% N-laurosyl sarcosine, 25 mM Tris pH 8.0, 0.1 M beta-mercaptoethanol) | Sample preservation (genetics) | Wetlab, under the chemical hood |
| Aqua Shield | Underwater Lubricant | ROV Workshop Fire Cabinet, Pit |
| Dow Corning 4 | Electrical insulating compound | ROV Workshop Fire Cabinet, Pit |
| Fluid Film Spray | Silicone Lubricant | ROV Workshop Fire Cabinet |
| Isopropanol Alcohol | Solvent | ROV Workshop Fire cabinet |
| Scotchkote | Electrical insulating compound | ROV Workshop Fire cabinet |
| 3M Silicone Spray | Silicone Lubricant | ROV Workshop Fire cabinet |
| Synthetic AW Hydraulic Oil, ISO-22 | Amsoil (AWG-05) | Hanger, Pit, Vehicles |
| Tap Magic Cutting Fluid | Cutting/Machining Lubricant | ROV Workshop Fire cabinet |
| Tap Magic Heavyweight Cutting Fluid | Cutting/Machining Lubricant | ROV Workshop Fire cabinet |
| Tuff Coat M | Marine Lubricant | ROV Workshop Fire cabinet |
| Dow Corning Molykote 111 | Valve Lubricant and Sealant | ROV Workshop Fire cabinet, Pit |
| WD40 | Lubricant | ROV Workshop Fire cabinet |
| Loktite | Bolt adhesive | ROV Workshop Fire cabinet |
| Mineral Oil | Vitrea | Hanger, Vehicles |
| Por-15 | Paint Kit | ROV Workshop Fire cabinet |
| Univis HVI 13 | Hydraulic Fluid | Hanger, ROV D2 |
| Ultratane | Butane fuel | ROV Workshop fire cabinet |
| Rust-oleum | Protective Enamel | ROV Workshop fire cabinet |
| Flux-Off | Soldering Flux remover | ROV Workshop fire cabinet |
| Propane | Torch Fuel | ROV Workshop fire cabinet |

1. Chemical safety and spill response procedures
   1. All safety and spill response procedures will be handled according to OMAO guidelines and following the manufacturers MSDS which has been provided to the ship’s ECO.
2. Radioactive Materials  
   *NOT APPLICABLE TO THIS CRUISE*
3. **ADDITIONAL PROJECTS**
4. **Supplementary Projects**

*NASA Maritime Aerosol Network*

During the cruise the marine aerosol layer observations will be collected for the NASA Maritime Aerosol Network (MAN). Observations will be made by mission personnel (as time allows) with a sun photometer instrument provided by the NASA MAN program. Resulting data will be delivered to the NASA MAN primary investigator Alexander Smirnov by the expedition coordinator. All collected data will be archived and publically available at: <http://aeronet.gsfc.nasa.gov/new_web/maritime_aerosol_network.html>

Equipment resides on the ship and is stewarded by the Expedition Coordinator.

See Appendix F for full Survey of Opportunity Form.

1. **NOAA Fleet Ancillary Projects**

No NOAA Fleet Ancillary Projects are planned.

1. **DISPOSITION OF DATA AND REPORTS**
2. **Data Responsibilities**

All data acquired on *Okeanos Explorer* will be provided to the public archives without proprietary rights. All data management activities shall be executed in accordance with NAO 212-15, Management of Environmental and Geospatial Data and Information

[<http://www.corporateservices.noaa.gov/ames/administrative_orders/chapter_212/212-15.html>].

##### Ship Responsibilities

The Commanding Officer is responsible for all data collected for missions until those data have been transferred to mission party designees. Data transfers will be documented on NOAA Form 61-29. Reporting and sending copies of project data to NESDIS (ROSCOP form) is the responsibility of OER.

##### NOAA OER Responsibilities

#### The Expedition Coordinator will work with the *Okeanos Explorer* Operations Officer to ensure data pipeline protocols are followed for final archive of all data acquired on *Okeanos Explorer*without proprietary rights. See Appendix B for detailed data management plans.

#### *Deliverables*

* 1. At sea
     + - Daily plans of the Day (POD)
       - Daily situation reports (SITREPS)
       - Daily summary bathymetry data files
       - Summary forms for each ROV dive
       - Summary files for each sample collection
       - Summary forms for each CTD rosette cast
  2. Post cruise
     + - Refined SOPs for all pertinent operational activities
       - Assessments of all activities
  3. Science
* Multibeam and XBT raw and processed data (see appendix B for the formal cruise data management plan)
* EK 60 raw data
* Knudsen 3260 sub-bottom profiler raw data
* Summary file with all sample data
* Mapping data report
* Cruise Report

#### *Archive*

* OER and ship will work together to ensure documentation and stewardship of acquired data sets in accordance with NAO 212-15. The Cruise Information Management System is the primary tool used to accomplish this activity.

1. **Meetings, Vessel Familiarization, and Project Evaluations**

Shipboard Meetings

A safety brief and overview of POD will occur on the Bridge each morning at 0800. Daily Operations Briefing meetings will be held at 1330 in the forward lounge to review the current day, and define operations, associated requirements, and staffing needs for the following day. A Plan of the Day (POD) will be posted each evening for the next day in specified locations throughout the ship. Daily Situation Reports (SITREPS) will be posted as well and shared daily through e-mail.

1. Pre-Project Meeting: The Expedition Coordinator and Commanding Officer will conduct a meeting of pertinent members of the scientific party and ship’s crew to discuss required equipment, planned operations, concerns, and establish mitigation strategies for all concerns. This meeting shall be conducted before the beginning of the project with sufficient time to allow for preparation of the ship and project personnel. The ship’s Operations Officer usually is delegated to assist the Expedition Coordinator in arranging this meeting.
2. Vessel Familiarization Meeting: The Commanding Officer is responsible for ensuring scientific personnel are familiarized with applicable sections of the standing orders and vessel protocols, e.g., meals, watches, etiquette, drills, etc. A vessel familiarization meeting shall be conducted in the first 24 hours of the project’s start and is normally presented by the ship’s Operations Officer.
3. Post-Project Meeting: The Commanding Officer is responsible for conducting a meeting no earlier than 24 hrs before or seven days after the completion of a project to discuss the overall success and short comings of the project. Concerns regarding safety, efficiency, and suggestions for future improvements shall be discussed and mitigations for future projects will be documented for future use. This meeting shall be attended by the ship’s officers, applicable crew, the Expedition Coordinator, and members of the scientific party and is normally arranged by the Operations Officer and Expedition Coordinator.
4. Project Evaluation Report:

Within seven days of the completion of the project, a Customer Satisfaction Survey is to be completed by the Expedition Coordinator. The form is available at <http://www.omao.noaa.gov/fleeteval.html> and provides a “Submit” button at the end of the form. Submitted form data is deposited into a spreadsheet used by OMAO management to analyze the information. Though the complete form is not shared with the ships, specific concerns and praises are followed up on while not divulging the identity of the evaluator.

1. **MISCELLANEOUS**
2. **Meals and Berthing**

The ship will provide meals for the scientists listed above. Meals will be served 3 times daily beginning one hour before scheduled departure, extending throughout the project, and ending two hours after the termination of the project. Since the watch schedule is split between day and night, the night watch may often miss daytime meals and will require adequate food and beverages (for example a variety of sandwich items, cheeses, fruit, milk, juices) during what are not typically meal hours. Special dietary requirements for scientific participants will be made available to the ship’s command at least twenty-one days prior to the survey (e.g., Expedition Coordinator is allergic to fin fish).

Berthing requirements, including number and gender of the scientific party, will be provided to the ship by the Expedition Coordinator. The Expedition Coordinator and Operations Officer will work together on a detailed berthing plan to accommodate the gender mix of the scientific party taking into consideration the current make-up of the ship’s complement. The Expedition Coordinator is responsible for ensuring the scientific berthing spaces are left in the condition in which they were received; for stripping bedding and linen return; and for the return of any room keys which were issued. The Expedition Coordinator is also responsible for the cleanliness of the laboratory spaces and the storage areas utilized by the scientific party, both during the cruise and at its conclusion prior to departing the ship.

All NOAA scientists will have proper travel orders when assigned to any NOAA ship. The Expedition Coordinator will ensure that all non-NOAA or non-Federal scientists aboard also have proper orders. It is the responsibility of the Expedition Coordinator to ensure that the entire scientific party has a mechanism in place to provide lodging and food and to be reimbursed for these costs in the event that the ship becomes uninhabitable and/or the galley is closed during any part of the scheduled project.

All persons boarding NOAA vessels give implied consent to comply with all safety and security policies and regulations which are administered by the Commanding Officer. All spaces and equipment on the vessel are subject to inspection or search at any time. All personnel must comply with OMAO's Drug and Alcohol Policy dated May 7, 1999 which forbids the possession and/or use of illegal drugs and alcohol aboard NOAA Vessels.

1. **Medical Forms and Emergency Contacts**

The NOAA Health Services Questionnaire (NHSQ, NF 57-10-01 (3-14)) must be completed in advance by each participating scientist. The NHSQ can be obtained from the Expedition Coordinator or the NOAA website <http://www.corporateservices.noaa.gov/noaaforms/eforms/nf57-10-01.pdf>.

All NHSQs submitted after March 1, 2014 must be accompanied by [NOAA Form (NF) 57-10-02 - Tuberculosis Screening Document](http://www.moc.noaa.gov/all-ships/NOAA%20Form%2057-10-02%20(1-14)%20Tuberculosis%20Screening%20Document.pdf) in compliance with OMAO Policy 1008 (Tuberculosis Protection Program).

The completed forms should be sent to the Regional Director of Health Services at the applicable Marine Operations Center. The NHSQ and Tuberculosis Screening Document should reach the Health Services Office no later than four weeks prior to the start of the project to allow time for the participant to obtain and submit additional information should health services require it, before clearance to sail can be granted. Please contact MOC Health Services with any questions regarding eligibility or completion of either form. Ensure to fully complete each form and indicate the ship or ships the participant will be sailing on. The participant will receive an email notice when medically cleared to sail if a legible email address is provided on the NHSQ.

The participant can mail, fax, or email the forms to the contact information below. Participants should take precautions to protect their Personally Identifiable Information (PII) and medical information and ensure all correspondence adheres to DOC guidance (<http://ocio.os.doc.gov/ITPolicyandPrograms/IT_Privacy/PROD01_008240>).

The only secure email process approved by NOAA is Accellion Secure File Transfer which requires the sender to setup an account. Accellion’s Web Users Guide is a valuable aid in using this service, however to reduce cost the DOC contract doesn’t provide for automatically issuing full functioning accounts. To receive access to a “Send Tab,” after your Accellion account has been established send an email from the associated email account to accellionAlerts@doc.gov requesting access to the “Send Tab” function. They will notify you via email, usually within one business day of your approval. The “Send Tab” function will be accessible for 30 days.

Contact information:

Regional Director of Health Services  
Marine Operations Center – Atlantic  
439 W. York Street  
Norfolk, VA 23510  
Telephone (757) 441.6320  
Fax (757) 441.3760  
E-mail: [MOA.Health.Services@noaa.gov](mailto:MOA.Health.Services@noaa.gov)

Please make sure the [medical.explorer@noaa.gov](mailto:medical.explorer@noaa.gov) email address is cc’d on all medical correspondence.

Prior to departure, the Expedition Coordinator must provide a listing of emergency contacts to the Operations Officer for all members of the scientific party, with the following information: name, address, relationship to member, and telephone number.

Emergency contact form is included as Appendix A.

1. **Shipboard Safety**

Hard hats are required when working with suspended loads. Work vests are required when working near open railings and during small boat launch and recovery operations. Hard hats and work vests will be provided by the ship when required.

Wearing open-toed footwear or shoes that do not completely enclose the foot (such as sandals or clogs) outside of private berthing areas is not permitted. Steel-toed shoes are required to participate in any work dealing with suspended loads, including CTD deployments and recovery. The ship does not provide steel-toed boots. Hard hats are also required when working with suspended loads. Work vests are required when working near open railings and during small boat launch and recovery operations. Hard hats and work vests will be provided by the ship when required.

Operational Risk Management: For every operation to be conducted aboard the ship (NOAA-wide initiative), risk management procedures will be followed. For each operation, risks will be identified and assessed for probability and severity. Risk mitigation strategies/measures will be investigated and implemented where possible. After mitigation, the residual risk will have to be assessed to make Go-No Go decisions for the operations. Particularly with new operations, risk assessment will be ongoing and updated as necessary. This does not only apply to over-the-side operations, but to everyday tasks aboard the vessel that pose risk to personnel and property.

* CTD, ROV (and other pertinent) ORM documents will be followed by all personnel working onboard *Okeanos Explorer*.
* All personnel onboard are in the position of calling a halt to operations/activities in the event of a safety concern.

1. **Communications**

A daily situation report (SITREP) on operations prepared by the Expedition Coordinator will be relayed to the program office. Sometimes it is necessary for the Expedition Coordinator to communicate with another vessel, aircraft, or shore facility. Through various modes of communication, the ship is able to maintain contact with the Marine Operations Center on an as needed basis. These methods will be made available to the Expedition Coordinator upon request, in order to conduct official business. The ship’s primary means of communication with the Marine Operations Center is via e-mail and the Very Small Aperture Terminal (VSAT) link. VSAT bandwidth at 15Mbps will be paid by OER and provided by OMAO.

Specific information on how to contact NOAA Ship *Okeanos Explorer* and all other fleet vessels can be found at <http://www.moc.noaa.gov/MOC/phone.html#EX>

**Important Telephone and Facsimile Numbers and E-mail Addresses**

#### Ocean Exploration and Research (OER):

OER Program Administration:

Phone: (301) 734-1010

Fax: (301) 713-4252

E-mail: Firstname.Lastname@noaa.gov

#### University of New Hampshire, Center for Coastal and Ocean Mapping

Phone: (603) 862-3438

Fax: (603) 862-0839

#### NOAA Ship *Okeanos Explorer* - Telephone methods listed in order of increasing expense:

*Okeanos Explorer* Cellular: (401) 713-4114

*Okeanos Explorer* Iridium:(808) 659-9179

OER Mission Iridium (dry lab): (808) 851-3827

EX INMARSAT B

Line 1: 011-870-764-852-328

Line 2: 011-870-764-852-329

Voice Over IP (VoIP) Phone:

(541) 867-8932

(541) 867-8933

(541) 867-8934

E-Mail: [Ops.Explorer@noaa.gov](mailto:Ops.Explorer@noaa.gov) - (mention the person’s name in SUBJECT field)

[expeditioncoordinator.explorer@noaa.gov](mailto:expeditioncoordinator.explorer@noaa.gov) For dissemination of all hands emails by Expedition Coordinator while onboard. See ET for password.

1. **IT Security**
2. Any computer that will be hooked into the ship's network must comply with the *OMAO Fleet IT Security Policy* 1.1 (November 4, 2005) prior to establishing a direct connection to the NOAA WAN. Requirements include, but are not limited to: Installation of the latest virus definition (.DAT) file on all systems and performance of a virus scan on each system.
3. Installation of the latest critical operating system security patches.
4. No external public Internet Service Provider (ISP) connections.

Completion of these requirements prior to boarding the ship is required.

Non-NOAA personnel using the ship's computers or connecting their own computers to the ship's network must complete NOAA’s IT Security Awareness Course within three days of embarking.

1. **Foreign National Guests Access to OMAO Facilities and Platforms**

Foreign National Guest, Diva Amon, will sail on EX-16-05 Leg 1. Her FNG sponsor is Kelley Elliott. Notification of Diva’s participation in the cruise has been submitted to the NOAA Office of Security. Diva has been cleared against the denied persons list, and the signed CAO endorsement on Appendix B has been received. The CO has been notified of her plans to sail. Final clearance is pending.

**Appendix A**

**EMERGENCY CONTACT DATA SHEET**

#### NOAA OKEANOS EXPLORER

#### Scientists sailing aboard the *Okeanos Explorer* should fill out the form found at the following link location: <https://docs.google.com/a/noaa.gov/forms/d/1pcoSgPluUVxaY64CM1hJ75l1iIYirTk48G-lv37Am_k/viewform>with their emergency contact information

**Appendix B: Data Management Plan**

**Appendix C: Categorical Exclusion**

**Appendix D: Permit to conduct research activities in CNMI-managed waters**

**Appendix E: ESA Section 7 Initiation Letter, Biological Evaluation and Letter of Concurrence**

**Appendix F: NASA Maritime Aerosols Network Survey of Opportunity**

**Survey or Project Name**

|  |
| --- |
| **Maritime Aerosol Network** |

**Points of Contact (POC)**

|  |  |
| --- | --- |
| *Lead POC or Principle Investigator (PI & Affiliation)* | *Supporting Team Members ashore* |
| **POC: Dr. Alexander Smirnov** | *Supporting Team Members aboard (if required)* |

**Activities Description(s)***(Include goals, objectives and tasks)*

|  |
| --- |
| **The Maritime Aerosol Network (MAN) component of AERONET provides ship-borne aerosol optical depth measurements from the Microtops II sun photometers. These data provide an alternative to observations from islands as well as establish validation points for satellite and aerosol transport models. Since 2004, these instruments have been deployed periodically on ships of opportunity and research vessels to monitor aerosol properties over the World Oceans.** |