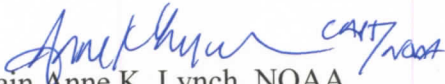


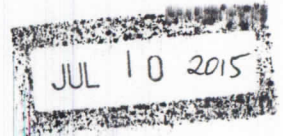


UNITED STATES DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration
NOAA Marine and Aviation Operations
Marine Operations Center
439 W. York Street
Norfolk, VA 23510-1114

MEMORANDUM FOR: Commander Mark Wetzler, NOAA
Commanding Officer, NOAA Ship *Okeanos Explorer*

FROM:  Captain Anne K. Lynch, NOAA
Commanding Officer, NOAA Marine Operations Center-Atlantic



SUBJECT: Project Instruction for EX-15-04 Leg 1
CAPSTONE NWHI & Johnston Exploration Mapping

Attached is the final Project Instruction for EX-15-04 Leg 1, CAPSTONE NWHI & Johnston Exploration Mapping, which is scheduled aboard NOAA Ship *Okeanos Explorer* during the period of July 10 - 24, 2015. Of the 15 DAS scheduled for this project, 5 DAS are Line Office allocation and 10 DAS are program funded by OAR/PMEL. This project is estimated to exhibit a Medium Operational Tempo. Acknowledge receipt of these instructions via e-mail to OpsMgr.MOA@noaa.gov at Marine Operations Center-Atlantic.

cc:
Deputy Director, Office of Ocean Exploration & Research
Expedition Coordinator, Office of Ocean Exploration & Research





Project Instructions

Date Submitted: June 26, 2015

Platform: NOAA Ship *Okeanos Explorer*

Project Number: EX-15-04 Leg I

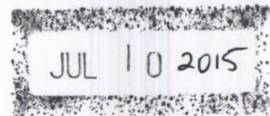
Project Title: CAPSTONE NWHI & Johnston Exploration Mapping

Project Dates: July 10 - 24, 2015

Prepared by: *Derek Sowers* Dated: 6/26/2015
Derek Sowers
Expedition Coordinator
Office of Ocean Exploration & Research

Approved by: ^{for} *J. McDonough* Dated: 6/29/2015
John McDonough
Deputy Director
Office of Ocean Exploration & Research

Approved by: *Anne K. Lynch* ^{CMDR NOAA} Dated: 7/10/2015
Captain Anne K. Lynch, NOAA
Commanding Officer
Marine Operations Center - Atlantic



I. Overview

A. Brief Summary and Project Period

The ocean is 95 percent unexplored, unknown, and unseen by human eyes. Resource managers cannot manage what they do not know. To understand, manage, and protect the ocean and its resources, NOAA believes it is critical to support a systematic program of ocean exploration, using the best of ocean technology to explore, discover, inform, educate, and motivate. Exploration of our largely unknown ocean supports key NOAA, national, and international goals related to a better understanding of the ocean that will benefit current and future generations. NOAA Ship *Okeanos Explorer* is helping us to better understand the unknown ocean by targeted exploratory mapping.

EX-15-04 Leg I is an exploratory mapping expedition, and is the first cruise of a two year major effort (2015-2016) in the Pacific by the Office of Ocean Exploration and Research, entitled CAPSTONE (Campaign to Address Pacific monument Science, Technology, and Ocean NEeds). NOAA priorities for the 2015 CAPSTONE Expedition include a combination of science, education, outreach, and open data objectives that will support management decisions at multiple levels.

Understanding biogeographic patterns between and among the Pacific Monuments and Sanctuaries is a coordinating theme for CAPSTONE science priorities. Themes and objectives for the 2015 Expedition include:

- Acquire data to support priority Monument and Sanctuaries science and management needs, including habitat surveys in recently expanded boundary areas;
- Identification and characterization of vulnerable marine habitats - particularly high density deep sea coral and sponge communities;
- Characterization of seamounts within the Prime Crust Zone (PCZ). The PCZ is the area of the Pacific with the highest expected concentration of deep sea minerals, including rare metals and rare earth elements;
- Collect information on the geologic history of Central Pacific Seamounts, including those that are or may be relevant to our understanding of plate tectonics and subduction zone biology and geology; and
- Provide a foundation of publicly accessible data and information products to spur further exploration, research, and management activities.

Originally created by Presidential Proclamation 8336 of January 6, 2009, Pacific Remote Islands Marine National Monument (PRIMNM) boundaries were expanded by Presidential Proclamation 9173, dated September 29, 2014. The expansion includes waters adjacent to Jarvis and Wake Islands, and Johnson Atoll.

This document contains project instructions for EX-15-04 Leg I, with operations expected to commence on July 10, 2015 at Honolulu, HI, and conclude on July 24, 2015 at Honolulu, HI. Multibeam and singlebeam mapping operations will be conducted 24 hours a day throughout the cruise. Sub-bottom profile mapping will be conducted 24 hours a day at the discretion of the CO. Most of the mapping areas to be pursued during this cruise have never been mapped with modern sonar before. Mapping activities will focus on the following priorities:

- 1) conducting a patch test calibration of the EM302 multibeam sonar at the beginning of the expedition;
- 2) mapping along fracture zones during the transits to/from Pearl Harbor to the Johnston Atoll region; and
- 3) mapping the tops and higher flanks of seamount and ridge features located within the Johnston Atoll region of the Pacific Remote Islands Marine National Monument (PRIMNM).

If unfavorable sea states prohibit mapping operations in the Johnston Atoll region, mapping work in the vicinity of Necker Island area within the Papahānaumokuākea Marine National Monument (PMNM) will be a contingency option.

B. Days at Sea (DAS)

Of the 15 DAS scheduled for this project, 0 DAS are funded by an OMAO allocation, 5 DAS are funded by a Line Office Allocation, 10 DAS are Program Funded, and 0 DAS are Other Agency funded. This project is estimated to exhibit a Medium Operational Tempo.

C. Operating Area (include optional map/figure showing op area)

Leg 1 is a mapping exploration cruise that will conduct 24 hour mapping operations, including during transit. The expedition will focus on mapping along fracture zones during the transits to/from Pearl Harbor to the Johnston Atoll region (three day transits each way), then spend the remaining survey time in the vicinity of Johnston Atoll within the PRIMNM. Mapping will take place along Horizon Guyot, the Karin Seamount chain, and the Johnston Seamount chain. All survey areas are in US and international waters.

If sea state and weather conditions prohibit mapping operations near Johnston Atoll, the ship will transit from Pearl Harbor, Oahu to PMNM and do "patch mapping" around existing multibeam coverage near Necker Island as a contingency plan.

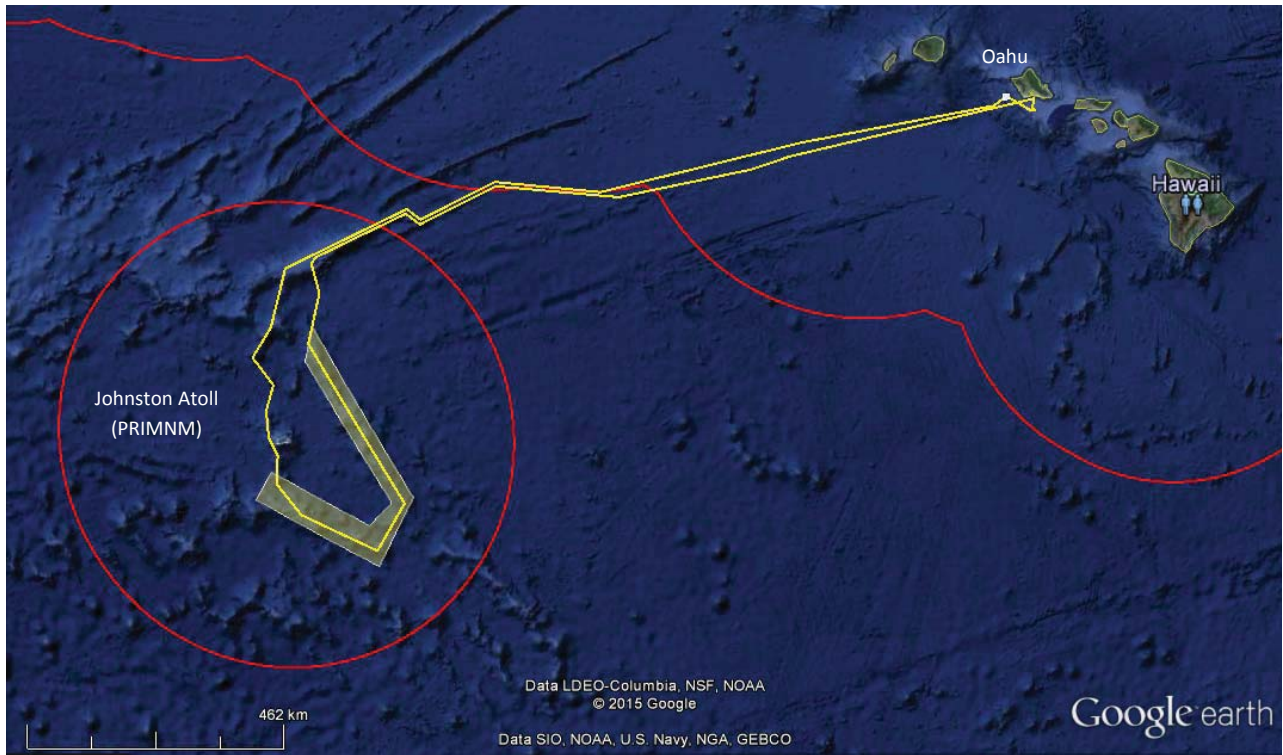


Figure 1: EX-15-04 Leg 1 Proposed transit lines and primary survey focus areas. The yellow lines show the draft cruise tracks. The yellow polygon represents the priority mapping focus areas within Johnston Atoll PRIMNM. The small white box near Oahu is the area where the multibeam patch test will be conducted. The red lines show the approximate location of the U.S. EEZ boundaries. Map made with Google Earth Pro.

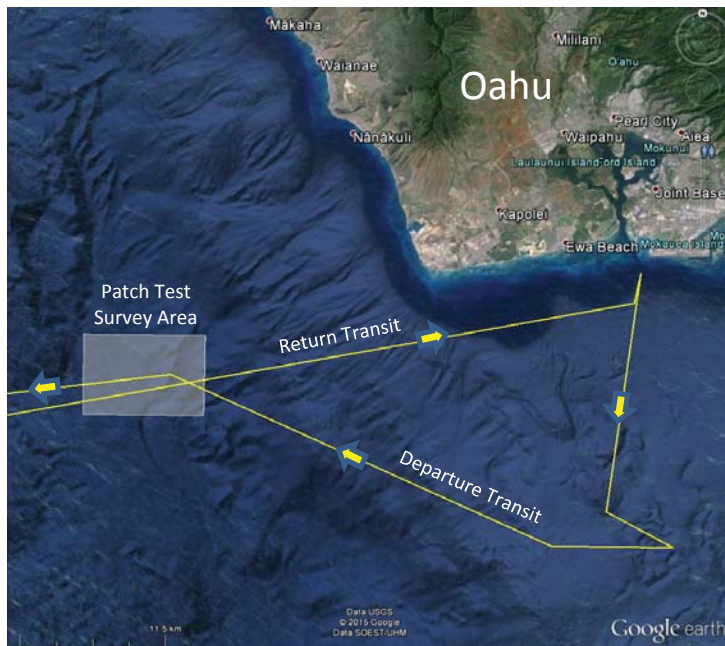


Figure 2: Map of patch test survey area. Ship transit lines shown in yellow and multibeam patch test area is shown as white box. Detailed line plan for the patch test will be provided during the expedition. Map made with Google Earth Pro.

Okeanos Explorer EX1504L1: CAPSTONE (Mapping)

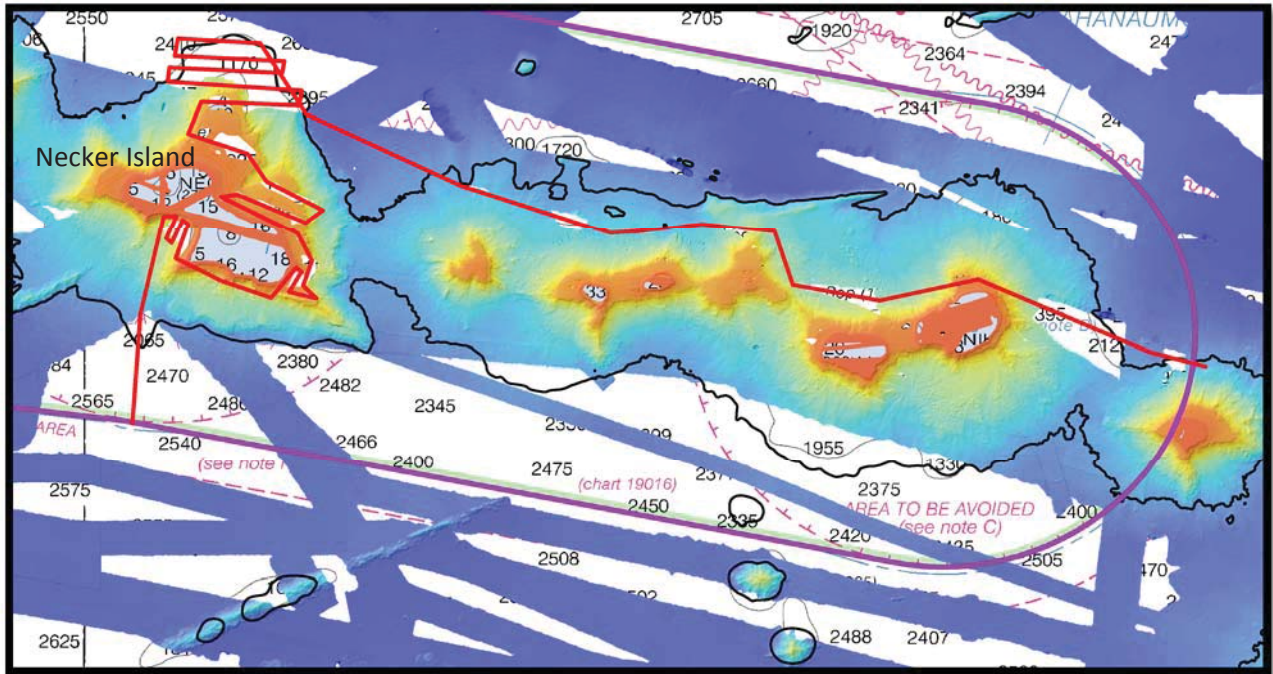


Figure 3. Contingency plan mapping area for EX-15-04 Leg 1. This area would only be surveyed if sea state conditions prohibited work implementation of the ship track shown in Figure 1. Approximate survey line of ship to fill gaps in multibeam coverage in the vicinity of Necker Island within the Papahānaumokuākea Marine National Monument (PMNM) shown with the red line. The pink line represents the approximate boundary of the PMNM. Color coded background bathymetry shows select multibeam coverage from various research expeditions, compiled by John Smith.

Table 1: Approximate transit waypoints (decimal minutes) for expedition. These points describe the proposed ship track from Pearl Harbor to the primary survey area in Johnston Atoll PRIMNM, then return transit to Pearl Harbor. Detailed survey line plans will be developed onboard for the focused survey area within Johnston Atoll PRIMNM.

| Latitude (north) | Longitude (West) | Remarks |
|------------------|------------------|---|
| 21 17.55 | 157 57.28 | Depart Pearl Harbor |
| 21 7.98 | 157 58.87 | Transit |
| 21 6.5 | 157 55.96 | Transit |
| 21 6.63 | 158 1.29 | Transit |
| 21 13.8 | 158 17.46 | Patch Test Area |
| 20 55.6 | 160 58.2 | Transit, fracture zone mapping |
| 20 49.11 | 161 34.88 | Transit, fracture zone mapping |
| 20 13.4 | 164 36.18 | Transit, fracture zone mapping |
| 20 24.02 | 166 10.89 | Transit, fracture zone mapping |
| 19 53.0 | 167 18.58 | Transit, fracture zone mapping |
| 20 2.4 | 167 30.58 | Horizon Tablemount start |
| 19 11.63 | 169 22.94 | Horizon Tablemount end |
| 18 21.28 | 169 36.6 | Transit |
| 17 55.2 | 169 54.25 | Transit |
| 17 31.6 | 169 34.9 | Transit |
| 17 9.74 | 169 42.04 | Transit |
| 16 46.01 | 169 40.09 | Northwest of Johnson Atoll island |
| 16 30.83 | 169 32.11 | Southwest of Johnson Atoll island |
| 16 5.5 | 169 33.7 | Start of focused survey area |
| 15 8.9 | 168 3.1 | Southernmost end of focused survey area |
| 15 50.9 | 167 37.5 | Transit |
| 18 7.6 | 169 1.9 | End of Focused survey area |
| 18 51.04 | 168 50.65 | Transit |
| 19 16.25 | 168 58.64 | Transit |
| 19 21.58 | 168 53.63 | Transit, Horizon Tablemount mapping |
| 19 58.15 | 167 31.71 | Transit, Horizon Tablemount mapping |
| 19 48.78 | 167 18.84 | Transit |
| 20 20.1 | 166 10.0 | Transit |
| 20 8.65 | 164 19.96 | Transit, fracture zone mapping |
| 20 27.92 | 162 20.84 | Transit, fracture zone mapping |
| 20 37.54 | 161 46.1 | Transit, fracture zone mapping |
| 21 16.33 | 157 57.62 | Transit |
| 21 17.55 | 157 57.28 | Entrance to Pearl Harbor |

Table 2: Contingency mapping plans – only to be used if Table 1 expedition plans not feasible. Approximate transit waypoints to survey area within Papahānaumokuākea Marine National Monument (decimal minutes)

| Latitude | Longitude | Remarks |
|------------|-------------|---|
| 21 16.8 N | 157 57.0 W | Departing Pearl Harbor |
| 21 15.6 N | 158 6.6 W | Near SW corner of Oahu |
| 21 19.75 N | 158 22.67 W | S28 Wreck Site area |
| 22 1.69 N | 160 0.98 | Just NE of Ni'ihau |
| 22 57.2 N | 161 1.9 W | Gap filling during transit |
| 22 57.19 N | 161 1.54 W | Gap filling during transit |
| 23 1.68 N | 161 15.71 W | Gap filling during transit |
| 23 10.10 N | 161 35.87 W | Gap filling during transit |
| 23 15.27 N | 161 48.42 W | Gap filling during transit |
| 23 14.0 N | 161 52.9 W | Gap filling during transit |
| 23 10.74 N | 162 9.0 W | Gap filling during transit |
| 23 13.85 N | 162 28.84 W | Gap filling during transit |
| 23 25.34 N | 162 30.42 W | Gap filling during transit |
| 23 27.4 N | 162 50.33 W | Gap filling during transit |
| 23 26.93N | 163 11.86 W | Gap filling during transit |
| 23 29.9 N | 163 21.9 W | Gap filling during transit |
| 23 33.78N | 163 32.54 W | Gap filling during transit |
| 23 35.54 N | 163 38.93 W | Gap filling during transit |
| 23 50.6 N | 164 12.37 W | Arrival at survey area near Necker Island |

D. Summary of Objectives

JULY 10 – 24, 2015 (Honolulu HI - Honolulu HI)

During EX-15-04 Leg I multibeam data will be collected 24 hours a day, largely over previously unexplored regions. Data will be used to better understand the seafloor and water column characteristics of the minor fracture zones between Oahu and Johnston Atoll and within the recently-expanded Johnston Atoll portion of the PRIMNM. This mapping expedition will provide essential baseline mapping and reconnaissance of the region prior to Leg IV of CAPSTONE, enabling ROV dive locations to be planned partially in advance.

XBT casts will be conducted at an interval defined by prevailing oceanographic conditions, but not to exceed 6 hours. XBT data will be used to correct the sound velocity of the multibeam data. Additionally, EK 60 (single beam) and sub-bottom profile data will be collected 24 hours per day, with permission from the CO.

All multibeam data will be fully processed according to standard onboard procedures and will be archived with the National Geophysical Data Center. Split-beam EK60 data will be archived at the National Oceanographic Data Center.

The following are cruise objectives for EX-15-04 Leg I:

1. Collect 24-hr/day deep water multibeam (EM 302), split beam (EK 60), and subbottom sonar data (MBES)
 - a. Conduct 24-hour mapping operations for the duration of the cruise
 - b. Collect bathymetric, seafloor backscatter, and water column backscatter data.
 - c. Complement previously-gathered Extended Continental Shelf (ECS) surveying efforts around Johnston Atoll by mapping a key gap that may connect two ridge features
 - d. Map a substantial portion of the Johnston Seamount, Hutchinson Seamount, and Karin Ridge features within the Johnston Atoll PRIMNM, with a focus on the summits and shallower flanks.
 - e. Sub-bottom sonar 24-hr data collection will be at discretion of CO.
2. Conduct a patch test calibration for the EM 302 multibeam sonar. The patch test is needed after the recent dry dock to ensure system offsets are calibrated for optimum data quality. The patch test will be completed during the first day of the expedition prior to the long transit to Johnston Atoll, and should be accompanied by a CTD cast.
3. XBT operations
 - a. XBT casts will be collected at regular intervals of no more than 6 hours
4. Train new personnel in all data collection and processing procedures (continuous throughout cruise)
 - a. Training of new personnel in the Survey Department
 - b. Train UCAR Explorers-in-Training
 - c. Train UCAR mapping contractor new to the ship
 - d. Train EPP mapping intern and interested visiting scientists
5. Continue testing new or modified mission hardware, software, and the mission UPS system.
 - a. Mission computers recently upgraded to Windows 7
 - b. Continue testing upgrades to Caris, Fledermaus, Hypack, and ArcGIS
 - c. Assess performance of mission UPS following installation of new batteries
6. Telepresence (VSAT 5 mbps ship to shore; T1 shore to ship)
 - a. Maintain single live stream video from ship to shore with a focus on the multibeam mapping display.
7. CTD operations
 - a. A CTD cast at the start of the patch test survey is planned.
 - b. CTD rosette operations may be requested to obtain sound velocity profiles as a back-up for XBT operations, and thus the CTD should be mission-ready prior to the start of the expedition.
 - c. Additional sensors typically mounted on the rosette including dissolved oxygen, light scattering sensor (LSS), and altimeter should be operationally tested and ready to perform exploration activities as the need arises should water column anomalies be discovered during the cruise.

8. The longstanding NASA marine aerosols network survey of opportunity will continue for the cruise.

9. Marine mammal observations

Richard Hall, Fishery Policy Analyst for NOAA's NMFS Pacific Islands Region, will be onboard to lead marine mammal observations during the expedition. Data on observed marine mammal behavioral responses to the presence of the ship will be documented using the same methodology employed during the 2014 R/V *Falkor* expeditions within PMNM. For more information on this objective refer to Appendix 4.

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

NOAA Fisheries, Pacific Islands Regional Office, NOAA Inouye Regional Center (IRC), 1845 Wasp Blvd., Building 176, Honolulu, HI 96818

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

NOAA, National Ocean Service (NOS) - 1305 East-West Hwy, Silver Spring, MD 20910 USA

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

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

University of Hawai'i at Manoa, 1000 Pope Road, Marine Sciences Building, Honolulu, HI 96822 USA

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

University of Rhode Island, Graduate School of Oceanography's Inner Space Center, 215 South Ferry Rd. Narragansett, RI 02882 USA

F. Personnel/Science Party: name, title, gender, affiliation, and nationality

A full mapping complement is necessary for this cruise. Required mission personnel include a Mapping Lead/Expedition Coordinator as well as a minimum of two qualified watchstanders for each of the three eight hour watches. The Mapping Lead is responsible for facilitating overall mapping operations, including participating in operational meetings, providing guidance for mapping/survey troubleshooting, and communicating status of mapping sensors to personnel on shore.

Okeanos Explorer EX1504L1: CAPSTONE (Mapping)

Table 3. List of Science Party personnel

| Name (Last, First) | Title | Date Aboard | Date Depart | Gender | Affiliation | Nationality |
|-------------------------------|---|------------------------|------------------------|---------------|---------------------------------|--------------------|
| Sowers, Derek | Expedition Coordinator/ Mapping Team Lead | 7/8/15 | 7/25/15 | M | OER/ERT Inc. | US Citizen |
| Meyer, Jason | Watch Lead | 7/8/15 | 7/24/15 | M | UCAR Contractor | US Citizen |
| Bittinger, Amanda | Watch Lead | 7/8/15 | 7/24/15 | F | UCAR Contractor | US Citizen |
| Miller, Joyce | Watchstander | 7/9/15 | 7/24/15 | F | HI Mapping Research Group | US Citizen |
| Heywood, Luan | Watchstander, Explorer-in-Training | 7/8/15 | 7/24/15 | F | UCAR | US Citizen |
| Tauriello, Dan | Watchstander, Explorer-in-Training | 7/8/15 | 7/24/15 | M | UCAR | US Citizen |
| Veazey, Lindsay | Watchstander, Explorer-in-Training | 7/8/15 | 7/24/15 | F | UCAR | US Citizen |
| Baechler, Neah | Watchstander, Explorer-in-Training | 7/8/15 | 7/24/15 | F | UCAR | US Citizen |
| Cooksey, Maria | Watchstander | 7/8/15 | 7/24/15 | F | EPP | US Citizen |
| Hall, Richard | Mammal Observer | 7/9/15 | 7/24/15 | M | NMFS/PIRO | US Citizen |

G. Administrative

1. Points of Contacts:

Ship Operations

Chief, Operations Division, Atlantic (MOA)
LCDR Donald Beaucage
Telephone: (757) 441-6842
E-mail: chiefops.moa@noaa.gov

Marine Operations Center, Atlantic (MOA)
439 West York Street
Norfolk, VA 23510-1145
Telephone: (757) 441-6776
Fax: (757) 441-6495

Mission Operations

Derek Sowers
Expedition Coordinator/Mapping Team Lead
NOAA Office of Ocean Exploration
and Research (ERT, Inc)
Phone : (603) 862-0369
Mobile: (714) 321-6084
E-mail :Derek.Sowers@noaa.gov

CDR Mark Wetzler, NOAA
Commanding Officer
NOAA Ship *Okeanos Explorer*
Phone: Iridium - (808) 659 9179
Email: CO.Explorer@noaa.gov

LT Emily Rose, NOAA
Operations Officer
NOAA Ship *Okeanos Explorer*
Phone: (808) 659-9179
E-mail: Ops.Explorer@noaa.gov

Other Mission Contacts

Kelley Elliott
Acting EX Program Manager
NOAA Office of Ocean Exploration
and Research
Phone : (301) 734-1024
Mobile: (703) 927-5449
E-mail :Kelley.Elliott@noaa.gov

John McDonough
Deputy Director
NOAA Ocean Exploration & Research
Phone: (301) 734-1023 / (240) 676-5206
E-mail: John.McDonough@noaa.gov

Alan Leonardi, Director
NOAA Ocean Exploration & Research
Phone: 301-734-1016/ Mobile: 202-631-1790
E-mail: alan.leonardi@noaa.gov

Jeremy Potter
Expeditions Director
NOAA Office of Ocean Exploration and Research
Phone: (301) 734-1145 / (240) 215-7101
E-mail: jeremy.potter@noaa.gov

2. Diplomatic Clearances

None Required. All operations in US and International waters.

3. Licenses and Permits

Papahānaumokuākea Marine National Monument (PMNM) Research Permit: Though conducting mapping work in Papahanoumokuakea Marine National Monument (PMNM) is no longer planned for Leg 1 due to a loss of sea days, OER has still submitted a request to conduct work in PMNM. Final approval and receipt of the permit is contingent upon completion of the ESA Section 7 consultation, required ship inspections, and briefings to the crew and mission team. Plans have been made to complete all of these items and have a PMNM Representative provide a permit briefing to the Leg 1 science party and crew on the afternoon of July 9th in order to finalize and sign the permit prior to the start of Leg 1. If the main survey target within Johnston Atoll becomes subject to hazardous seas during Leg 1, then a contingency option could include work in PMNM. The *Okeanos Explorer* is making the logistical preparations necessary to complete all vessel inspections required to operate in PMNM prior to the start of EX1504L1. The hull Inspection portion has been accomplished with the pressure washing done in the Bellingham dry dock as part of the emergency bow/stern thruster repair work. Rodent Free Inspection is being scheduled to be finalized prior to Leg 1.

Okeanos Explorer EX1504L1: CAPSTONE (Mapping)

Endangered Species Act Section 7 Consultation: OER has submitted the request to initiate informal consultation under Section 7 of the Endangered Species Act for CAPSTONE EX1504 Legs 1-4 to NOAA PIRO's Protected Resources Division. This consultation is currently in progress.

Hawaii Board of Land and Natural Resources (BLNR): Permission to conduct CTD Rosette Operations in state waters has been received from the Hawaii BLNR. A hearing to review plans and receive permission to conduct ship operations in Hawaii state waters was held June 12, 2015. The permit from BLNR to conduct work in state waters has been approved.

Categorical Exclusion: See Appendix for Categorical Exclusion documentation.

II. Operations

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

A. Project Itinerary (*All times and dates are subject to prevailing conditions and the discretion of the commanding officer*):

Wednesday, July 8

- Most mission personnel arrive to ship throughout the day, mostly in the evening.

Thursday, July 9

- Remaining mission personnel arrive to ship (Hall and Miller), mission orientation and safety talk
- Afternoon meeting at IRC for science party and crew to get briefing on conditions of PMNM permit.
- Potential marine mammal observation training.

Friday, July 10

- Depart Pearl Harbor in the early morning and transit to multibeam patch test calibration site. Conduct multibeam patch test, then begin transit to Johnston Atoll.

Saturday, July 11

- Transit mapping en route to Johnston.

Sunday, July 12

- Continue transit towards Johnston mapping minor seafloor fracture zones along the way.

Monday, July 13

- Transit mapping over Horizon Tablemount

Tuesday, July 14

- Transit surveying from Horizon Tablemount, past Johnston Atoll, to start of focused survey area in vicinity of Johnston Seamounts, and Karin Ridge (within yellow survey box identified in Figure 1).

Wednesday, July 15-Tuesday, July 21

- Focused survey mapping of Johnston Seamounts, Hutchinson Seamount, Karin Ridge and other priority areas within Johnston Atoll PRIMNM.
- Begin transit back to port early morning hours of July 21

Tuesday, July 21-Friday, July 24

- Transit from focused survey area back to Honolulu, mapping fracture zones along the way.

Friday, July 24

- Arrive Pearl Harbor sea buoy in the morning
- Arrive in port
- Most mission personnel depart

Saturday, July 25

- Remaining mission personnel depart ship.

Telepresence Events

There are currently no telepresence events scheduled.

In-Port Events

There are currently no in-port events scheduled.

B. Staging and Destaging:

Shipments

Send an email to *Okeanos Explorer's* Operations Officer at OPS.Explorer@noaa.gov indicating the size and number of items being shipped. All items should arrive to Honolulu, HI no later than **COB July 7, 2015**.

Vessel shipping address:

Okeanos Explorer
1897 Ranger Loop, Bldg 184
Honolulu, HI 96818
VOIP Ship: (301)-713-7772

C. Operations to be Conducted:

Sonar Operations

The Kongsberg EM302 sonar will be calibrated on the first day of the expedition by conducting a patch test in the general area noted in the white box of Figure 2. A CTD cast is planned for *Okeanos Explorer* EX1504L1: CAPSTONE (Mapping)

the start of the patch test survey in order to obtain a high quality sound speed profile for the water column.

Multibeam, EK 60, and Knudsen sub-bottom profiler data acquisition is planned for this cruise. The mapping team will ensure that all the standard protocols, as laid out by the Commanding Officer and mapping lead directives will be followed for efficient and safe mapping operations. The final decision to operate and collect sub-bottom profiler data will be at the discretion of the Commanding Officer. XBTs will be deployed no less than every 6 hours to ensure high quality multibeam sonar data collection.

CTD Operations

A CTD cast is planned on the first day of the cruise for the start of the patch test survey in order to obtain a high quality sound speed profile for the water column. Additional CTD operations are not expected, but CTD operations may be conducted on as-needed basis for sound velocity profile data collection, and possibly if water column anomalies are discovered during the cruise.

D. 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.

Dives are not planned for this project.

E. Applicable Restrictions

Conditions which preclude normal operations: (1) XBTs will not be conducted in very rough sea states or when there is significant risk of lightning. (2) If rough sea state is resulting in very poor data quality, sonar data may not be collected for that period of time.

III. Equipment

A. Equipment and Capabilities provided by the ship (itemized)

- Kongsberg Simrad EM302 MultibeamEchosounder (MBES)
- Kongsberg Simrad EK60DeepwaterEchosounder
- Knudsen Chirp 3260 Sub-bottom profiler (SBP)
- 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

Oceanos Explorer EX1504L1: CAPSTONE (Mapping)

- 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 (Comtech5Mbps ship to shore; 1.54 Mbps shore to ship)
- Cruise Information Management System (CIMS)

B. Equipment and Capabilities provided by the scientists (itemized)

- Microtops II Ozone Monitor -Sunphotometer and handheld GPS required for NASA Marine Aerosols Network supplementary project.

IV. Hazardous Materials

A. Policy and Compliance

No Hazardous Materials are being brought aboard the ship for this project.

V. Additional Projects

A. Supplementary (“Piggyback”) Projects

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 (mapping interns) 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 is stewarded by OER physical scientists. See Appendix C for full Survey of Opportunity Form.

B. NOAA Fleet Ancillary Projects

No NOAA Fleet Ancillary Projects are planned.

VI. Disposition of Data and Reports

Disposition of data gathered aboard NOAA ships will conform to NAO 216-101 *Ocean Data Acquisitions* and NAO 212-15 *Management of Environmental Data and Information*. To guide the implementation of these NAOs, NOAA's Environmental Data Management Committee (EDMC) provides the *NOAA Data Documentation Procedural Directive* (data documentation) and *NOAA Data Management Planning Procedural Directive* (preparation of Data Management Plans). OMAO is developing procedures and allocating resources to manage OMAO data and Programs are encouraged to do the same for their Project data.

A. Data Classifications: *Under Development*

a. OMAO Data

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.

b. Program Data

- At sea
 - Daily plans of the Day (POD)
 - Daily situation reports (SITREPS)
 - Daily summary bathymetry data files
- Post cruise
 - Refined SOPs for all pertinent operational activities
 - Assessments of all activities
- 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
 - Mapping data report

B. Responsibilities: *Under Development*

VII. Meetings, Vessel Familiarization, and Project Evaluations

- A. 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.

- B. 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.
- C. Post-Project Meeting: The Commanding Officer is responsible for conducted a meeting no earlier than 24 hrs before or 7 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.
- D. 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.oma.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.

VIII. Miscellaneous

A. 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 seven days prior to the project.

Berthing requirements, including number and gender of the scientific party, will be provided to the ship by the Expedition Coordinator. The Expedition Coordinator and Commanding 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 project 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 17, 2000 which forbids the possession and/or use of illegal drugs and alcohol aboard NOAA Vessels.

B. 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 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 4 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 1 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
Email MOA.Health.Services@noaa.gov

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 using the Google Form at

<https://docs.google.com/a/noaa.gov/forms/d/1pcoSgPluUVxaY64CM1hJ75l1iiYirTk48G-lv37Amk/viewform>

C. 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. At the discretion of the ship CO, safety shoes (i.e. steel or composite toe protection) may be required to participate in any work dealing with suspended loads, including CTD deployment and recovery. The ship does not provide safety-toed shoes/boots. The ship's Operations Officer should be consulted by the Expedition Coordinator to ensure members of the scientific party report aboard with the proper attire.

Okeanos Explorer EX1504L1: CAPSTONE (Mapping)

D. Communications

A progress report on operations prepared by the Expedition Coordinator may 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 means of communications, the ship can usually accommodate the Expedition Coordinator. Special radio voice communications requirements should be listed in the project instructions. The ship's primary means of communication with the Marine Operations Center is via email and the Very Small Aperture Terminal (VSAT) link. Standard VSAT bandwidth at 128kbs is shared by all vessels staff and the science team at no charge. Increased bandwidth in 30 day increments is available on the VSAT systems at increased cost to the scientific party. If increased bandwidth is being considered, program accounting is required and it must be arranged through the ship's Commanding Officer at least 30 days in advance.

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>[http://www.moc.noaa.gov/MOC/phone.html - EX](http://www.moc.noaa.gov/MOC/phone.html#EX)

Important Telephone and Facsimile Numbers and E-mail Addresses

Ocean Exploration and Research (OER):

Phone: (301) 734-1010

Fax: (301) 713-4252

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:

301-713-7772 (expect a delay once picked up by directory)

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

Okeanos Explorer EX1504L1: CAPSTONE (Mapping)

expeditioncoordinator.explorer@noaa.gov - For dissemination of all hands emails by Expedition Coordinator while on board. See ET for password.

E. IT Security

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:

- (1) Installation of the latest virus definition (.DAT) file on all systems and performance of a virus scan on each system.
- (2) Installation of the latest critical operating system security patches.
- (3) No external public Internet Service Provider (ISP) connections.

Completion of the above 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 3 days of embarking.

F. Foreign National Guests Access to OMAO Facilities and Platforms

All foreign national access to the vessel shall be in accordance with NAO 207-12 and RADM De Bow's March 16, 2006 memo (<http://deemedexports.noaa.gov>). National Marine Fisheries Service personnel will use the Foreign National Registration System (FNRS) to submit requests for access to NOAA facilities and ships. The Departmental Sponsor/NOAA (DSN) is responsible for obtaining clearances and export licenses and for providing escorts required by the NAO. DSNs should consult with their designated Line Office Deemed Export point of contact to assist with the process.

Full compliance with NAO 207-12 is required.

Responsibilities of the Expedition Coordinator:

1. Provide the Commanding Officer with the email generated by the Servicing Security Office granting approval for the foreign national guest's visit. (For NMFS-sponsored guests, this email will be transmitted by FNRS.) This email will identify the guest's DSN and will serve as evidence that the requirements of NAO 207-12 have been complied with.
2. Escorts – The Expedition Coordinator is responsible to provide escorts to comply with NAO 207-12 Section 5.10, or as required by the vessel's DOC/OSY Regional Security Officer.
3. Ensure all non-foreign national members of the scientific party receive the briefing on Espionage Indicators (NAO 207-12 Appendix A) at least annually or as required by the Servicing Security Office.
Okeanos Explorer EX1504L1: CAPSTONE (Mapping)

4. Export Control - Ensure that approved controls are in place for any technologies that are subject to Export Administration Regulations (EAR).

The Commanding Officer and the Expedition Coordinator will work together to implement any access controls necessary to ensure no unlicensed export occurs of any controlled technology onboard regardless of ownership.

Responsibilities of the Commanding Officer:

1. Ensure only those foreign nationals with DOC/OSY clearance are granted access.
2. Deny access to OMAO platforms and facilities by foreign nationals from countries controlled for anti-terrorism (AT) reasons and individuals from Cuba or Iran without written approval from the Director of the Office of Marine and Aviation Operations and compliance with export and sanction regulations.
3. Ensure foreign national access is permitted only if unlicensed deemed export is not likely to occur.
4. Ensure receipt from the Expedition Coordinator or the DSN of the FNRS or Servicing Security Office email granting approval for the foreign national guest's visit.
5. Ensure Foreign Port Officials, e.g., Pilots, immigration officials, receive escorted access in accordance with maritime custom to facilitate the vessel's visit to foreign ports.
6. Export Control - 8 weeks in advance of the project, provide the Expedition Coordinator with a current inventory of OMAO controlled technology onboard the vessel and a copy of the vessel Technology Access Control Plan (TACP). Also notify the Expedition Coordinator of any OMAO-sponsored foreign nationals that will be onboard while program equipment is aboard so that the Expedition Coordinator can take steps to prevent unlicensed export of Program controlled technology. The Commanding Officer and the Expedition Coordinator will work together to implement any access controls necessary to ensure no unlicensed export occurs of any controlled technology onboard regardless of ownership.
7. Ensure all OMAO personnel onboard receive the briefing on Espionage Indicators (NAO 207-12 Appendix A) at least annually or as required by the Servicing Security Office.

Responsibilities of the Foreign National Sponsor:

1. Export Control - The foreign national's sponsor is responsible for obtaining any required export licenses and complying with any conditions of those licenses prior to the foreign national being provided access to the controlled technology onboard regardless of the technology's ownership.
2. The DSN of the foreign national shall assign an on-board Program individual, who will be responsible for the foreign national while on board. The identified

individual must be a U.S. citizen and a NOAA or DOC employee. According to DOC/OSY, this requirement cannot be altered.

3. Ensure completion and submission of Appendix C (Certification of Conditions and Responsibilities for a Foreign National)

VIII. Appendices

Appendix 1. Data Management Plan

Data Management Plan

Okeanos Explorer (EX1504L1): CAPSTONE NWHI
Exploration Mapping



OER Data Management Objectives

Normal data management objectives for mapping and underway data. Surveys of Opportunity include NASA Aerosol Network and National Marine Fisheries Service Pacific Islands Region marine mammal observations of behavioral responses to the presence of the ship. A small area will be mapped for potential UCH targets. These data will be restricted from public access until it can be reviewed. If no UCH is discovered, the data will be released at a later date.

26-Jun-15

Page 1

1. General Description of Data to be Managed

1.1 Name and Purpose of the Data Collection Project

Okeanos Explorer (EX1504L1): CAPSTONE NWHI Exploration Mapping

1.2 Summary description of the data to be collected.

Multibeam and singlebeam mapping operations will be conducted 24 hours a day throughout the cruise. Sub-bottom profile mapping will be conducted 24 hours a day at the discretion of the CO. Most of the mapping areas to be pursued during this cruise have never been mapped with modern sonar before. Mapping activities will focus on three primary areas, (1) some potential underwater cultural heritage sites south of Oahu, (2) the Necker Island area within the Papahānaumokuākea Marine National Monument (PMNM), and (2) the Karin Seamount Chain near Johnson Atoll within the recently expanded Pacific Remote Islands Marine National Monument (PRIMNM).

1.3 Keywords or phrases that could be used to enable users to find the data.

expedition, exploration, explorer, marine education, noaa, ocean, ocean discovery, ocean education, ocean exploration, ocean exploration and research, ocean literacy, ocean research, OER, science, scientific mission, scientific research, sea, stewardship, systematic exploration, technology, transformational research, undersea, underwater, Davisville, mapping survey, multibeam, multibeam backscatter, multibeam sonar, multi-beam sonar, noaa fleet, okeanos, okeanos explorer, R337, Rhode Island, scientific computing system, SCS, single beam sonar, singlebeam sonar, single-beam sonar, sub-bottom profile, water column backscatter, oceans, Papahanaumokuakea, Karin Seamount Chain, PMNM, PRIMNM, Pacific Remote Islands Marine National Monument, Marine National Monument, CAPSTONE, Karin Ridge, Johnston Atoll, NASA Marine Aerosols Network, NMFS Pacific Islands Region, marine mammal observations, marine mammal behavioral response, Necker Island, Pearl Harbor, Johnston seamount chain, habitat survey, deep sea corals, sponge communities, deep sea minerals, rare metals, rare earth elements, Prime Crust Zone, PCZ, Central Pacific Seamounts, plate tectonics, subduction zone biology, subduction zone geology, archaeological, archaeology, conservation, conserve, crm, cultural resource management, historic, marine archaeology, maritime, maritime archaeology, nautical, nautical archaeology, preserve, protect, protection, submerged cultural heritage, submerged cultural resource, uch, underwater cultural heritage

1.4 If this mission is part of a series of missions, what is the series name?

Okeanos Mapping Cruises

1.5 Planned or actual temporal coverage of the data.

Dates: 7/10/2015 to 7/24/2015

1.6 Planned or actual geographic coverage of the data.

Latitude Boundaries: 15.81 to 23.84

Longitude Boundaries: -167.35 to -157.95

1.7 What data types will you be creating or capturing and submitting for archive?

Cruise Plan, Cruise Summary, Data Management Plan, Highlight Images, Quick Look Report, CTD (processed), CTD (product), CTD (raw), EK60 Singlebeam Data, Multibeam (image), Multibeam (processed), Multibeam (product), Multibeam (raw), GSF, Expedition Cruise Report, Mapping Summary, NetCDF, Bottom Backscatter, Floating Point GeoTIF, Sub-Bottom Profile data, Water Column Backscatter, XBT (raw), SCS Output (compressed), SCS Output (native)

1.8 What platforms will be employed during this mission?

NOAA Ship Okeanos Explorer

2. Point of Contact for this Data Producing Project

Overall POC: Derek Sowers, Physical Scientist, NOAA Office of Ocean Exploration and Research, Derek.Sowers@noaa.gov
 Title: Physical Scientist, Principal Investigator, Mapping Lead
 Affiliation/Dept: NOAA Office of Ocean Exploration and Research
 E-Mail: Derek.Sowers@noaa.gov
 Phone: (603) 862-0369

3. Point of Contact for Managing the Data

Data POC Name: Susan Gottfried
 Title: OER Data Management Coordinator
 E-Mail: susan.gottfried@noaa.gov

4. Resources

4.1 Have resources for management of these data been identified? False

4.2 Approximate percentage of the budget devoted to data management. (specify % or "unknown")
 unknown

5. Data Lineage and Quality**5.1 What is the processing workflow from collection to public release?**

SCS data shall be delivered in its native format as well as an archive-ready, documented, and compressed NetCDF-4 format to NODC; multibeam data and metadata will be compressed and delivered in a bagit format to NGDC.

5.2 What quality control procedures will be employed?

Quality control procedures for the data from the Kongsberg EM302 is handled at UNH CCOM/JHC. Raw (level-0) bathymetry files are cleaned/edited into new data files (level-1) and converted to a variety of products (level-2). Data from sensors monitored through the SCS are archived in their native format and are not quality controlled. Data from CTD casts and XBT firings are archived in their native format and are not quality controlled. CTDs are processed into profiles for display only on the Okeanos Atlas.

6. Data Documentation

6.1 Does the metadata comply with the Data Documentation Directive? True

6.1.1 If metadata are non-existent or non-compliant, please explain:

not applicable

6.2 Where will the metadata be hosted?

Organization: An ISO format collection-level metadata record will be generated during pre-cruise planning

URL: <http://www.ncddc.noaa.gov/oer-waf/ISO/Resolved/2015/discovery> and access. The record will be harvested by data.gov.

Meta Std: ISO 19115-2 Geographic Information with Extensions for Imagery and Gridded Data will be the metadata standard employed; a NetCDF-4 standard for oceanographic data will be employed for the SCS data; the Library of Congress standard, MACHine Readable Catalog (MARC), will be employed for NOAA Central Library records.

6.3 Process for producing and maintaining metadata:

Metadata will be generated via xml editors or metadata generation tools.

7. Data Access

7.1 Do the data comply with the Data Access Directive? True

7.1.1 If the data are not to be made available to the public at all, or with limitations, provide a valid reason.

A small area south of Oahu with potential UCH targets will be mapped. These data will not be released if UCH targets are confirmed and fall under the protection of the Historical Preservation Act.

7.1.2 If there are limitations to public data access, describe how data are protected from unauthorized access or disclosure.

Account access to mission systems are maintained and controlled by the Program. Data access prior to public accessibility is documented through the use of Data Request forms and standard operating procedures.

7.2 Name and URL of organization or facility providing data access.

Org: National Centers for Environmental Information

URL: explore.noaa.gov/digitalatlas

7.3 Approximate delay between data collection and dissemination. By what authority?

Hold Time: no

Authority: not applicable

7.4 Prepare a Data Access Statement

No data access constraints, unless data are protected under the National Historic Preservation Act of 1966.

Okeanos Explorer (EX1504L1): CAPSTONE NWHI Exploration Mapping

8. Data Preservation and Protection

8.1 Actual or planned long-term data archive location:

Data from this mission will be preserved and stewarded through the NOAA National Centers for Environmental Information. Refer to the Okeanos Explorer FY15 Data Management Plan at NOAA's EDMC DMP Repository (EX_FY15_DMP_Final.pdf) for detailed descriptions of the processes, procedures, and partners involved in this collaborative effort.

8.2 If no archive planned, why?

not applicable

8.3 If any delay between data collection and submission to an archive facility, please explain.

30-60 days

8.4 How will data be protected from accidental or malicious modification or deletion?

Data management standard operating procedures minimizing accidental or malicious modification or deletion are in place aboard the Okeanos Explorer and will be enforced.

8.5 Prepare a Data Use Statement

Data use shall be credited to NOAA Office of Ocean Exploration and Research.

Appendix 2. Categorical Exclusion



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
OCEANIC AND ATMOSPHERIC RESEARCH
Office of Ocean Exploration and Research
Silver Spring, MD 20910

June 24, 2015

MEMORANDUM FOR: The Record

FROM:

John McDonough
Deputy Director, NOAA Office of Ocean Exploration
and Research (OER)

John McDonough

Digitally signed by John McDonough
DN: cn=John McDonough, o=Ocean
Exploration, ou=NOAA/OAR, email=John.
mcdonough@noaa.gov, c=US
Date: 2015.06.24 16:09:24 -0400

SUBJECT:

Categorical Exclusion for NOAA Ship *Okeanos Explorer*
Cruise EX-15-04 Leg 1

NAO 216-6, Environmental Review Procedures, requires all proposed projects to be reviewed with respect to environmental consequences on the human environment. This memorandum is assessing the possible effects of this NOAA Ship *Okeanos Explorer* ocean mapping survey on the human environment.

This project is part of the NOAA Office of Ocean Exploration and Research's "Science Program" and entails ocean mapping activities designed to increase knowledge of the marine environment. This project is entitled "EX-15-04 CAPSTONE NWHI & Johnston Exploration" and will be led by Derek Sowers, Physical Scientist for the *Okeanos Explorer* program within OER. NOAA Ship *Okeanos Explorer* will depart Pearl Harbor, Hawaii on July 10, 2015 and arrive in port in Pearl Harbor, Hawaii on July 24, 2015.

The ship will transit three days from Pearl Harbor to the main exploration mapping area in the vicinity of Johnston Atoll, which is part of the Pacific Remote Islands Marine National Monument. Following eight days of focused surveying of ridge and seamount features near Johnston Atoll, the ship will transit three days back to port in Pearl Harbor. If hazardous weather conditions prohibit surveying in the vicinity of Johnston Atoll, mapping within the Papahānaumokuākea Marine National Monument (PMNM) will be a contingency plan.

As is standard procedure for mapping exploration cruises with this vessel, the ship will conduct sonar mapping operations at all times during the cruise. Acoustic instruments that will be operational during the project are a 30 kHz multibeam echosounder (Kongsberg EM 302), an 18 kHz singlebeam echosounder (Kongsberg EK60), and a 3.5 kHz sub-bottom profiler (Knudsen



Chirp 3260). Additionally, expendable bathythermographs (XBTs) will be deployed at regular intervals in association with multibeam data collection. All of these systems are routinely used by this exploration vessel and have provided invaluable scientific data for marine researchers and managers, including numerous National Marine Sanctuaries, the Bureau of Ocean Energy Management and the U.S. Geological Survey.

Marine mammal observers will be on watch during all daylight hours to look for marine mammals and other observable species potentially sensitive to the sound of the sonars. If cetacean species are present within 400 m of the ship, the vessel would stop until the animals depart the area. In addition to a dedicated observer monitoring for the presence of protected species during daylight hours, standard practice during all *Okeanos Explorer* cruises and operations include Officers or Watch Standers on the Bridge around-the-clock, monitoring the surrounding ocean for the presence of other ships, unanticipated hazards, and marine animals – especially cetaceans. If a cetacean is observed, the Mapping Watch Leader is notified, and if appropriate, the ship will slow down or stop until the animal has departed the area. When marine mammals are able to be identified by Bridge Officers or Watch Standers, these observations are noted in the NOAA fleet marine mammal observation log as part of standard practice.

The Pacific Remote Islands Marine National Monument does not have a permitting requirement pertaining to the proposed work in the vicinity of Johnston Atoll, and the exploration mapping work is being planned and shared with Monument researchers and managers. For the contingency plan of mapping operations within PMNM, OER is in the final stages of receiving a permit to conduct research within the Monument.

OER has also conducted a Biological Evaluation for all operations to be conducted as part of CAPSTONE expeditions EX1504 Legs 1-4. OER has submitted the request to initiate informal consultation under Section 7 of the Endangered Species Act for CAPSTONE EX1504 Legs 1-4 to NOAA PIRO's Protected Resources Division. This consultation is currently in progress.

Depth ranges surveyed will range from 50-5300 meters, with most of the survey being conducted in >2500 meters. Latitudinal boundaries of the survey range from 15.81 to 23.84, and longitudinal boundaries range from -167.35 to -157.95. As expected for ocean research with limited duration or presence in the marine environment, this project will not have the potential for significant impacts. Knowledgeable experts who are aware of the sensitivities of the marine environment will conduct the at-sea portions of this project. The potential gains or beneficial effects of the project seem to outweigh any potential adverse effects. This expedition will provide baseline characterization of poorly understood deep water habitats contained within marine protected areas inside the U.S. exclusive economic zone. This work will provide essential information for further research, exploration, and conservation of marine habitat within the Monument(s).

This project would not result in any changes to the human 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. As such, this project is categorically excluded from the need to prepare a NEPA environmental assessment.

Appendix 3. Survey of Opportunity

NASA Maritime Aerosols Network Survey of Opportunity Survey or Project Name

Maritime Aerosol Network

Points of Contact (POC): Dr. Alexander Smirnov

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.

Appendix 4: Marine Mammal Observations

Conducting marine mammal observations during daylight hours is a requirement for working in PMNM. While this can be carried by ship crew manning the bridge, the presence of interns on this cruise provides the opportunity to fulfill this requisite in an “enhanced” manner that will add to the scant body of knowledge on the effects of multibeam sonar on this group of animals. Richard Hall will lead the interns into manning 2 hour watch stands on either the port or starboard areas outside the bridge where mounted compasses are present. Interns wearing life jackets will be provided a water proof clipboard containing data sheets, as well as a watch, pencils, binoculars, and a handset to communicate with the bridge. When a mammal is spotted, the interns will record the time on the data sheets and use the compass to obtain estimates of their bearing and distance from the ship. They will also record other data including identification if possible, the number of individuals, their heading, and behavior. If the animals are close enough, the interns will also attempt to take a photo. If the animals are within 400 m of the ship or will shortly enter that distance from the ship, the interns will advise the bridge using the handset. Interns will continue to record behaviors, distances, and times from the ship until the animals can no longer be seen, at which point the observation will be considered complete. Each observation will be recorded on a separate data sheet. If the watch is calibrated to the ship’s clocks and shipboard data with timecodes can be easily accessed by the interns, then they will be asked to extract ship heading and speed data for each observation recorded that day. If that is not possible, then the interns will be asked to contact the bridge at each observation and request that information over the handset so it can be recorded on the datasheets.

Depending on the time constraints of their other responsibilities during the cruise, the interns may be asked to enter the observation data into an Access database. When no interns are available to conduct observations, the ship’s bridge crew will be responsible for watching out for mammals to avoid collisions and to maintain 400 m distance from any individuals spotted. Collection of observational data however will be left to their discretion since it is understood that the ship operation is their primary responsibility.

Standard practice during *Okeanos Explorer* operations include Officers or watch standers on the Bridge around-the-clock, monitoring the surrounding ocean for the presence of other ships, unanticipated hazards, and marine animals – especially marine mammals. These observations are noted in the NOAA fleet marine mammal observation log, when marine mammals are able to be identified, by Bridge Officers or watch standers as part of standard practice. If a marine mammal is observed, the Mapping Watch Lead or Science Lead is notified and if appropriate the team then proceeds with protocols to continue monitoring the animal, pause ship operations, or shut down mapping sonars until the animal has departed the area for an appropriate period of time. During the July to September CAPSTONE expedition these procedures will include monitoring for the presence of sea turtles and, when appropriate, taking protection measures.

Interns and interested ship’s crew will also be provided marine mammal training either prior to or early on during the cruise.