

Project Instructions

Date Submitted October 3, 2024

Platform NOAA Ship *Okeanos Explorer*

Project Number EX-25-01

Project Title Beyond the Blue: Papahānaumokuākea Mapping 3

Project Dates October 19, 2024 to November 12, 2024

Prepared by _____ Dated _____
Patricia Albano
Expedition Coordinator
NOAA Ocean Exploration

Approved by _____ Dated _____
Kasey Cantwell
Operations Chief, Expeditions and Exploration Division
NOAA Ocean Exploration

Approved by _____ Dated _____
Rachel Medley
Chief, Expeditions and Exploration Division
NOAA Ocean Exploration

Approved by _____ Dated _____
CAPT Colin D. Little, NOAA
Commanding Officer
Marine Operations Center – Pacific

1. Overview

1.1 Project Purpose

This expedition will commence on October 19, 2024 in Honolulu, Hawai'i, and conclude on November 12, 2024 in Honolulu, Hawai'i. Operations will be conducted 24 hours a day, and consist of mapping operations in U.S. waters off of Hawai'i, primarily in deep water (> 200 m), conductivity, temperature, and depth (CTD) deployments, plankton net tows, and full shore-based participation via telepresence. Operations will be focused in and around Papahānaumokuākea Marine National Monument.

Operations will include the use of the ship's deepwater mapping systems (Kongsberg EM 304 multibeam, EK60/EK80 split-beam sonars, Knudsen 3260 Chirp sub-bottom profiler, and Teledyne acoustic Doppler current profilers), expendable bathythermograph (XBTs) in support of multibeam sonar mapping operations CTD casts, plankton nets, and a high-bandwidth satellite connection for continuous ship-to-shore communications.

Mission objectives for EX2501 include focused acoustic operations, plankton sampling, transit mapping, and potential CTD casts. See Section 5.1 for the expedition data management plan. Objectives specific to EX2501 include:

A. Acoustic Mapping Objectives

- a. Strategic Transits
 - i. Collect transit data that addresses bathymetric gaps or prioritizes areas with poor bathymetric or seabed backscatter data quality. Depending on operational needs and data quality, the requested transit speeds may be the fastest possible.
 - ii. Conduct XBT casts to support surveys. The frequency will depend on operational conditions and resulting data quality.
- b. Focused Acoustic Mapping
 - i. Collect focused acoustic data in areas with no or poor multibeam data in and around the Papahānaumokuākea Marine National Monument as shown in Figure 1. General survey speeds will be requested by the Expedition Coordinator, Chief Survey Technician, or the Mapping Watch Lead. Speeds may differ per area.
 - ii. Conduct XBT casts to support surveys. The frequency will depend on operational conditions and resulting data quality.
 - iii. Maintain CTD capabilities as a backup sound velocity profiling method for mapping data requirements.
- c. Miscellaneous
 - i. Update all mapping-related standard operating procedures.

B. Science Objectives

- a. Identify, map, and explore the diversity and distribution of benthic habitats, including potential deep-sea coral and sponge communities, fish habitats, and chemosynthetic communities.
- b. Map geologic features to better understand the geological context of the region and improve knowledge of past and potential geohazards.
- c. Acquire acoustic and oceanographic data as a foundation to better understand the characteristics of the water column and the pelagic fauna that inhabit it.
- d. Engage a broad audience, including the scientific, management, and indigenous communities, as well as the public, in telepresence-based exploration.
- e. 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.
- f. Conduct stationary CTD casts as required to support high-priority requests from the scientific community.
- g. Collect water samples using the CTD-mounted Niskin bottles and filter samples in the onboard laboratory to obtain environmental DNA (eDNA) samples for shoreside processing.
- h. Collect sun photometer measurements to support surveys of opportunity in partnership with NASA.
- i. Collect acoustic observations of bats offshore in partnership with USGS.
- j. Conduct an Exploration Project of Opportunity to study larval tuna by plankton net tows.

C. Video Engineering Objectives

- a. Provide onboard support for 24-hour exploration operations.
- b. Verify Global Foundation for Ocean Exploration (GFOE) managed telepresence systems perform as expected.

D. Network/Onboard Data Objectives

- a. Ensure integrity of all data processing pipelines and automated transfer to shore for all raw sonar data and daily bathymetry and bottom backscatter mosaic products.
- b. Ensure Global Foundation for Ocean Exploration (GFOE) managed VSAT, network, and computing infrastructure operate as required to meet mission objectives.
- c. Ensure shipboard instruments/teams are producing expected data products at the expected rates according to established conventions.
- d. Ensure data management processes organize, backup, and transmit data to shore as expected.
- e. Support shore-based personnel with remote access to shipboard resources to better meet mission objectives.
- f. Cross-train network, system administration, and data management personnel.
- g. Improve system documentation.

E. Ship Objectives

- a. Hold a monthly safety day, for the ship's force to conduct required training and drills.
- b. Deploy and recover the ship's two small boats for monthly testing and training proficiency.
- c. Conduct all United States Coast Guard and NOAA policy required drills at the policies' prescribed frequency
- d. Conduct drills and maintenance as required for ship safety and readiness

1.2 Project Impact

Data collected during this EX2501 will provide valuable baseline information for scientists and managers in the region, and may help inform further future exploration and management decision-making in the Papahānaumokuākea Marine National Monument.

1.3 Project Performance Metrics

Project performance metrics include number of square kilometers of seafloor mapped, number of CTD casts completed, number of plankton samples collected, and number of water samples collected for eDNA processing.

1.4 Days at Sea (DAS)

25 DAS

Of the 25 DAS scheduled for this expedition, 24 DAS are base funded days and 1 DAS is funded by OMAO and is allocated for underway fleet inspection.

While mapping operations are planned 24 hours a day, this expedition will require daily support from the ship's survey, deck and engineering department.

1.5 Participating Institutions

- A. National Oceanic and Atmospheric Administration (NOAA), Office of Ocean Exploration and Research — 1315 East-West Highway, Silver Spring, MD 20910 USA
- B. NOAA, National Centers for Environmental Information (NCEI) — Stennis Space Center, MS 39529 USA
- C. University Corporation for Atmospheric Research (UCAR) Programs for Advancement of Earth System Science — P.O. Box 3000, Boulder, CO 80307 USA
- D. Global Foundation for Ocean Exploration (GFOE) — P.O. Box 417, Mystic, CT 06355 USA
- E. University of Hawai'i at Manoa — 2500 Campus Rd, Honolulu, HI 96822 USA
- F. Boston University — Commonwealth Ave, Boston, MA 02215 USA

Additional potential participating institutions for this expedition are the NOAA Pacific Islands Fisheries Science Center, University of Hawai'i, NOAA Pacific Islands Regional Office, NOAA Deep Sea Coral Research and Technology Program, NOAA Office of National Marine Sanctuaries, the United States Geological Survey, and the Bureau of Ocean Energy Management.

1.6 Licenses and Permits

This project will be conducted under NOAA Ocean Exploration Best Management Practices (BMPs), Essential Fish Habitat (EFH) consultation dated April 1, 2024, Endangered Species Act (ESA) Programmatic Letter of Concurrence dated March 14, 2022 and subsequent revision dated May 4, 2023, National Environmental Protection Act (NEPA) Categorical Exclusion (CE) dated April 18, 2024, and Papahānaumokuākea Marine National Monument permit PMNM-2024-001 dated January 1-December 31, 2024. Copies of permits are attached in appendix E and will be attached to the Expedition Report. According to permit conditions, a copy of Permit PMNM-2024-001 will be carried on the vessel at all times during EX2501.

Permit PMNM-2024-001 requires all personnel entering Papahānaumokuākea Marine National Monument to attend a cultural briefing prior to entering the Monument. A list of personnel entering the Monument and the approximate time of entry must be provided to the Monument Permit Coordinator at least 72 hours in advance of entry. Notification

shall include position when making report; vessel name and International Maritime Organization identification number; name, address, and telephone number of owner and operator; United States Coast Guard (USCG) documentation, State license, or registration number; home port; intended and actual route through the monument; general categories of any hazardous cargo on board; and length of vessel and propulsion type (e.g., motor or sail). Notification of departure from Papahānaumokuākea Marine National Monument must be provided within 12 hours of leaving.

Permit PMNM-2024-001 requires that all vessels, engines, and anchorlines shall be inspected and free of introduced species prior to entry into the Monument within 48 hours prior to departure. At least 24 hours prior to entry into the Monument, a report must be provided to the Monument Permit Coordinator prepared by the inspecting individual that: a) sets forth when and where the inspection occurred; b) identifies any introduced species observed, including where found; c) summarizes efforts to remove any species observed; and d) certifies the vessel as free of all introduced species. Inspections shall be completed by a qualified organization specializing in the prevention and eradication of rodent species according to industry standards. Documentation shall be provided for every rodent inspection, hull inspection, and VMS check for each entrance into the Monument if docking took place or goods were transported to the ship while it was at sea.

1.7 Foreign Research Clearances

None required.

1.8 Personnel/Science Party

(A) Principal Investigators/Expedition Coordinators

Name & Title: Patricia Albano, Expedition Coordinator
Laboratory/Office: NOAA Ocean Exploration
Phone Number: (202) 924-0658
Email Address: trish.albano@noaa.gov

(B) Additional Contacts

Name & Title: Kasey Cantwell, Operations Chief
Laboratory/Office: NOAA Ocean Exploration
Phone Number: (301) 717-7776
Email Address: kasey.cantwell@noaa.gov

Name (Last, First)	Title	Date Aboard	Date Disembark	Gender	Affiliation	Nationality	Survival Suit Size
Albano, Patricia	Expedition Coordinator	10/17	11/13	F	NOAA Ocean Exploration	USA	R

Aragon, Fernando	Data Manager	10/17	11/13	M	GFOE	USA	R
Brian, Roland	Video Engineer	10/17	11/13	M	GFOE	USA	R
Durbin, Mark	Network Engineer	10/17	11/13	M	GFOE	USA	R
Freitas, Dan	Mapping Watchstander	10/17	11/13	M	UCAR	USA	R
Hanley, Margaret	Mapping Watchstander	10/17	11/13	F	UCAR	USA	R
Hutchinson, Sarah	Explorer-in-Training	10/17	11/13	F	UCAR	USA	R
Kuniyoshi, Kelsie Pikake	Cultural Liaison	10/17	11/13	F	UCAR/ University of Hawai'i	USA	R
Prajna Jandial	Explorer-in-Training	10/17	11/13	F	UCAR	USA	R
Robins, Kalau'ihilani	Cultural Liaison	10/17	11/13	F	UCAR/ University of Hawai'i	USA	R
Wright, Chris	Data Manager	10/17	11/13	M	GFOE	USA	R
Zapata, Astrid	Explorer-in-Training	10/17	11/13	F	UCAR	USA	R

1.9 Project Classification

(A) Supplementary ("Piggyback") Projects

None

(B) NOAA Fleet Ancillary Projects

None

2. Operations

2.1 Project Area

EX2501 will focus on operations in Papahānaumokuākea Marine National Monument. Mapping and CTD operations will be conducted at depths between 200-6000 m.

As this expedition is operating in remote locations and/or far from a suitable port to treat medical emergencies, a medical officer is requested to be aboard for the entirety of the expedition.

- (A) Desired Operational Waters
Ocean, deep waters (> 200m) around the Hawaiian Islands and within Papahānaumokuākea Marine National Monument.

- (B) Way Point/Station List

Shapefiles have been shared with the ship via email.

Priority Region A	
Latitude	Longitude
28.29679622°N	177.8665226°E
28.75460434°N	177.8579738°E
29.13602462°N	177.9017695°E
29.53879477°N	178.0120081°E
30.02567191°N	178.2593461°E
30.55883863°N	178.645689°E
30.94693448°N	179.0429307°E
31.25212705°N	179.5015099°E
31.46874449°N	179.9985555°E
27.59732028°N	179.9929038°E
27.95902999°N	178.8286506°E
28.29679622°N	177.8665226°E

Priority Region B	
Latitude	Longitude
27.58739678°N	177.5857151°W
27.58814977°N	177.5839522°W

27.58351856°N	177.579321°W
27.58739678°N	177.5857151°W
27.58739678°N	177.5857151°W
26.61096334°N	179.8717725°W
26.64801306°N	179.9968154°W
29.0759277°N	179.9777116°W
27.58739678°N	177.5857151°W

Priority Region C	
Latitude	Longitude
29.45112476°N	179.988863°W
31.4614392°N	179.9761898°W
31.55739077°N	179.7779904°W
31.65146233°N	179.503012°W
31.73106135°N	179.184616°W
31.78171526°N	178.9024013°W
31.81789663°N	178.4537523°W
31.80342409°N	178.0702298°W
31.76000644°N	177.679471°W
31.70211625°N	177.3610749°W
31.61528096°N	177.0354426°W
28.99574979°N	177.9616857°W
28.99574979°N	178.3379719°W
29.0753488°N	179.054363°W
29.17665664°N	179.4813032°W
29.45112476°N	179.988863°W

Priority Region D	
Latitude	Longitude
23.69879724°N	172.47659°W
24.907255°N	172.3825184°W
24.66122168°N	172.1292489°W
23.77115998°N	167.8236658°W
23.7928688°N	166.9914943°W
23.73497861°N	166.8540051°W
22.94622475°N	167.4763247°W
22.5988836°N	167.1072747°W
22.27325127°N	167.7078855°W
23.69879724°N	172.47659°W

Priority Region E	
Latitude	Longitude
27.43000101°N	175.1969768°W
28.85464244°N	173.2409214°W
28.413682°N	172.517294°W
28.26669518°N	172.4607607°W
28.27800186°N	172.2007071°W
28.11970837°N	172.1554803°W
28.11970837°N	171.3527062°W
27.82573474°N	171.3640129°W

27.62221453°N	171.0021992°W
27.37346762°N	170.8099857°W
27.18125409°N	170.3351052°W
26.48024005°N	170.5951588°W
27.31693423°N	174.9369232°W
27.43000101°N	175.1969768°W

(C) Project Area Shapefile(s)

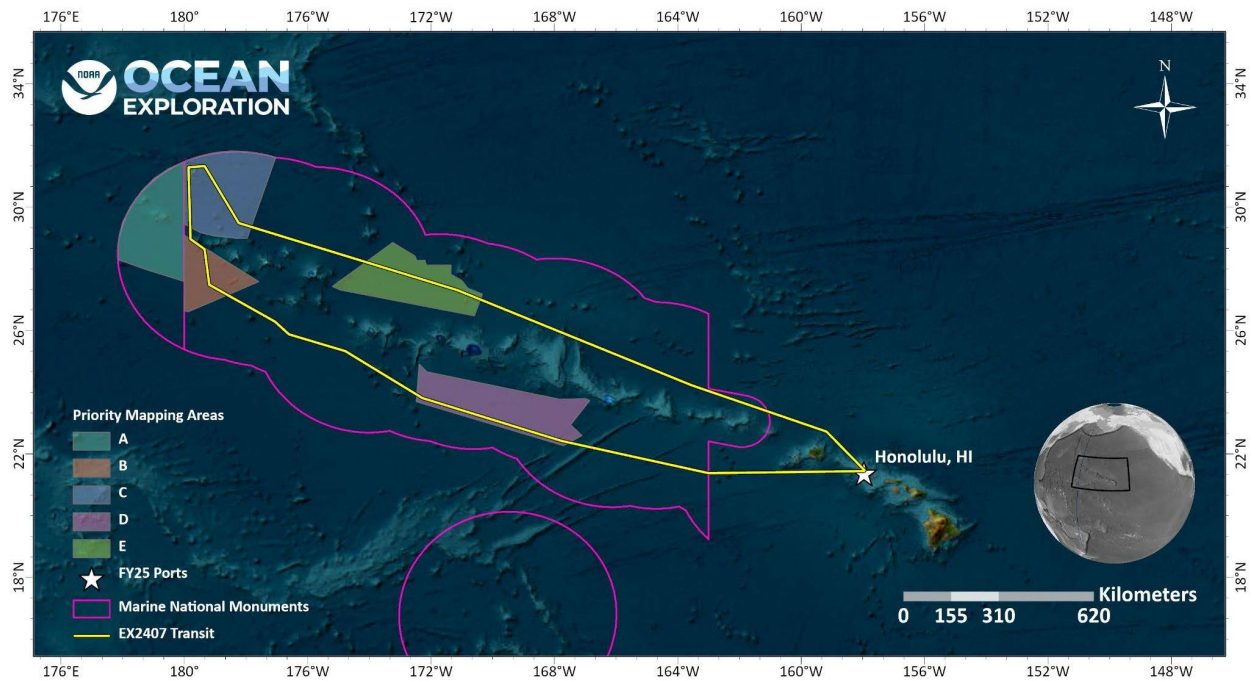


Figure 1. Map showing the general operating area for EX2501. The expedition track is subject to change based on survey results, field conditions, and the discretion of the Commanding Officer.

2.2 Project Itinerary

- (A) Starting Port: Honolulu, HI
- (B) Number (#) of Staging Days: 2
- (C) Itinerary Information: None
- (D) Intermediate Port Call(s): N/A
- (E) Foreign Port Call(s): N/A
- (F) Ending Port: Honolulu, HI
- (G) Number (#) of Destaging Days: 2

2.3 Staging and Destaging

Minimal staging and destaging are anticipated for this mapping expedition. For all SONAR related activities in Pearl Harbor, a written request will be sent to the Operations Officer and Chief Survey Technician's email accounts, at least 4 business days before the request to allow time to request approval from the US Navy. SONAR Operations are only allowed in Pearl Harbor weekly on Wednesdays from 1800-2359 local time.

2.4 Operations To Be Conducted

- A. Focused acoustic mapping operations over priority areas, and during all transits.
- B. CTD casts in priority areas as determined by the scientific community.
- C. Extended Operations: there are no planned extended operations for this expedition at this time.
- D. Telepresence/Outreach Events: three live video feeds will be used throughout the expedition to provide situational awareness for onshore personnel. Live interactions are being planned for this expedition, with a schedule to be determined and coordinated across the mission team.
- E. In-Port Events: Ship tours for Deep Sea Coral Program partners based at the Inouye Regional Center in Honolulu are planned for after the expedition on 11/14 after the completion of the Fleet inspection.
- F. Special/Unusual Operations or Requests: Cultural liaisons sailing in partnership with Papahānaumokuākea Marine National Monument and Office of National Marine Sanctuaries may request changes in course or speed at specific times to accommodate Native Hawaiian cultural protocol when working in and around Papahānaumokuākea. Requests will be discussed and confirmed at the pre-cruise meeting with all departments and all requests for course or speed changes for cultural practices will be communicated 24 hours in advance.

2.5 Dive Operations

All dives must be conducted per the requirements and regulations of the NOAA Diving Program and require ship CO approval.

Dives are not planned for this project.

2.6 Small Boat Operations

All small boat operations must be conducted per the requirements and regulations of the NOAA Small Boat Program (<https://sites.google.com/a/noaa.gov/noaa-small-boat-program/home>) and require ship CO approval.

Small boat operations are not planned for this project.

2.7 Uncrewed Systems Operations

Uncrewed systems operations are not planned for this project.

2.8 Applicable Restrictions

(A) Conditions That Preclude Normal Operations

Conditions that may affect operations may include poor weather conditions, equipment failure, and Navy operations within the region. Multiple focused mapping sites have been identified if the preferred sites are inaccessible for any of the aforementioned scenarios.

3. Equipment

3.1 Platform Capabilities

- (A) Vessel Core Systems: Functioning/seaworthy Safety of Life at Sea (SOLAS) approved fast rescue boat, functioning/seaworthy work boat to support personnel transfers, Electronic Chart Display and Information System (ECDIS), Kongsberg dynamic positioning system, meteorological and weather sensor package, three voice over internet protocol (VOIP) telephone lines.
- (B) Labs/Interior Spaces: Wet Lab for the staging of equipment, Dry Lab and Mission Control Room for mission team workspaces, Server Room for mission network.
- (C) Exterior Spaces: CTD deck, fantail, boat deck.
- (D) Handling And Over-The-Side Deployment/Retrieval: J-Frame for deployment/recovery of CTDs, hand-deployment of CastAway CTD, hand-deployment of EK calibration gear (if needed).
- (E) Acoustic Suite: Kongsberg EM 304 MKII multibeam echosounder, Kongsberg Simrad EK60/80 split-beam sonars: general purpose transceivers (18, 120, 200 kHz) and wide band transducers (38 and 70 kHz), Knudsen Chirp 3260 sub-bottom profiler, Teledyne RDI Workhorse Mariner ADCP (300 kHz), Teledyne RDI Ocean Surveyor ADCP (38 kHz).
- (F) Other: Lockheed Martin Sippican XBT Mark21 system, Atlantic Oceanographic and Meteorological automated XBT launcher, Sea-Bird SBE 9-11Plus CTD and deck box, Sea-Bird SBE 32 carousel and 12 10 L Niskin Bottles, Sea-Bird SBE 43 Dissolved Oxygen sensor, Sea-Bird SBE 45 MicroTSG Thermosalinograph, Sea-Bird SBE 38 Temperature Probe, ECO-FLNTU-RTD Fluorescence/Turbidity sensor, PMEL Oxidation-Reduction Potential (ORP) sensor, PMEL Altimeter

sensor, Scientific Computing System (SCS), Scientific Seawater System, HYPACK software license.

3.2 Scientific Capabilities

- (A) Computers: Kongsberg acquisition computer, EK60/80 acquisition computer, Knudsen 3260 acquisition computer, UHDAS computer and CTD acquisition computer,
 - (B) Software: Kongsberg Seafloor Information System, QPS software suite (program provided), NOAA's National Centers for Environmental Information's (NCEI) Cruise Information Management System (CIMS)
 - (C) Equipment: Microtops II ozone monitor sun photometer and handheld GPS required for NASA Marine Aerosols Network supplementary project, Sontek CastAway-CTD, Kongsberg synchronization unit (K-Sync), EK80 wideband transceivers (38 and 70 kHz), MarineStar GPS with satellite corrections serial data feeds provided for the GFOE network. All programs provided.
 - (D) Data management/Network/Telepresence: GFOE provided VSAT high-speed link (15 Mbps ship-to-shore; 5 Mbps shore-to- ship), Exploration operations networking infrastructure, telepresence system, GFOE VoIP system, GFOE-provided data storage.
-

4. Hazardous Materials

4.1 Policy and Compliance

OER keeps hazardous materials onboard the ship between projects. An annual inventory is supplied to the ship's ECO officer and any additional hazardous materials brought on, OER supplies the SDS to the ship. For this project no additional hazardous materials will be brought onboard.

4.2 Spill Kit Inventory

A spill kit is located in the wet lab, between the fume hood and scientific refrigerator. It contains the following materials:

Manufacturer	Product Name	Quantity
ENPAC LLC	ENSORB Super Absorbent	0.3 gal
	Rubber gloves (pair)	1
	Goggles	1
	Small broom	1
	Absorbent pads	1

4.3 Safety and Spill Response

In the event of a spill, the proper protocols outlined in the associated safety data sheets (SDS) will be followed. The associated SDS for the hazardous materials currently onboard can be found in Appendix F attached to this document.

4.4 Radioactive Materials and X-ray Generating Devices

No Radioactive Isotopes or X-ray Generating Devices are planned for this project.

4.5 Lithium Batteries

Laptops brought on board will contain Lithium-Ion batteries. These batteries are enclosed within each unit and do not present any risks or disposal hazards.

5. Disposition of Data and Reports

Disposition of data gathered aboard NOAA ships must conform to all Federal, Agency, Expedition Coordinator's LO, and OMAO data governance directives, policies and stewardship (Appendix A and B). Systems that produce data continually, periodically, and during specific operations described in Section 2.4, and equipment listed in Sections 3.1 and 3.2, will have accompanying entries in the Project Data Management plan. The data will be classified as either OMAO data or Program Data and roles and responsibilities for acquisition, stewardship, and submission to archive will be determined during pre-project communications and meetings. OMAO expects the Expedition Coordinator, Program, and Lab Directors to abide by their LO Data Management Plan and procedural directive. By completing this section all parties agree to OMAO Policy 1102-38 Shipboard Data Acquisition and Stewardship.

5.1 Data Acquisitions Plan

The Data Management Plan (DMP) is completed following a program specific template.

Appendix A Operational Standards

1. Meetings, Vessel Familiarization, and Project Evaluations

1.1 Pre-Project Meeting

The Expedition Coordinator and Commanding Officer (CO) will meet with 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 must 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.

1.2 Vessel Familiarization Meeting

The CO is responsible for ensuring scientific personnel are familiarized with applicable sections of the standing orders and ship protocols (e.g., meals, watches, etiquette, drills, etc.). A ship familiarization meeting must be conducted in the first 24 hours of the project's start and is normally presented by the ship's Operations Officer. See OMAO Procedure 1102-20 - General Rules and Minimum Requirements for Embarked Personnel and OMAO Procedure 1201-080 - NOAA Ship Familiarization.

1.3 Meals and Berthing

- (A) 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. Send special dietary requirements for scientific participants to the ship's command at least 7 days before the project.
- (B) Berthing requirements, including number and gender of the scientific party, will be provided to the ship by the Expedition Coordinator. The Expedition Coordinator and CO will work together on a detailed berthing plan to accommodate the gender mix of the scientific party taking into consideration the current makeup of the ship's complement per OMAO Procedure 1102-03 - Vessel Quarters. 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 that were issued. Unless prior arrangements are made, the science party may move aboard the night before scheduled departure and must move off the ship the day after scheduled arrival (at the end of project). The Expedition Coordinator/Principal Investigator 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 before departing the ship.
- (C) 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 or Principal Investigator 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.

1.4 Shipboard Safety

- (A) All embarked personnel are required to fully support and comply with NAO 202-1106: NOAA Sexual Assault and Sexual Harassment Prevention and Response Policy. The at-

sea working/living environment is particularly sensitive and it is incumbent upon all personnel to uphold a positive and professional workplace dynamic in order to successfully accomplish cruise objectives.

- (B) All persons boarding NOAA vessels give implied consent to comply with all safety and security policies and regulations administered by the CO. All spaces and equipment on the vessel are subject to inspection or search at any time. All personnel must comply with OMAO Procedure 1102-20 General Rules and Minimum Requirements for Embarked Personnel, which forbids the possession and/or use of illegal drugs and alcohol aboard NOAA Vessels.
- (C) Surge protectors, power strips, and Uninterrupted Power Sources (UPS) must be approved for marine/shipboard use, removed from service if hot to the touch, regularly inspected for damage or wear, limited to one surge protector per duplex receptacle (i.e., "outlet"), and never daisy chained. The equipment must meet Military Performance Specification MIL-PRF-32167A (Transient Voltage Surge Suppressors), which incorporates American Society for Testing and Materials ASTM F1507 (Standard Specifications for Surge Suppressors for Shipboard Use) and Underwriters Laboratories UL 1449 (Safety Standards for Surge Protective Devices).
- (D) 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.
- (E) Wearing open-toed footwear or shoes that do not completely enclose the foot (such as sandals, clogs, or crocs) 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. See OMAO Procedure 1102-20 or SSI equivalent.

1.5 Post-Project Meeting

The CO is responsible for conducting a meeting no earlier than 24 hrs before or 7 days after the completion of a project to discuss the overall success and shortcomings of the project. Concerns regarding safety, efficiency, and suggestions for future improvements are discussed and mitigations for future projects will be documented for future use. This meeting includes the ship's officers, applicable crew, the Expedition Coordinator, and members of the scientific party and is normally arranged by the ship's Operations Officer and Expedition Coordinator.

1.6 Project Evaluation Report

Within 7 days of the completion of the project, the Expedition Coordinator or Principal Investigator completes a Customer Satisfaction Survey, as appropriate. The form is available at <https://sites.google.com/a/noaa.gov/omao-intranet-dev/operations/marine/customer-satisfaction-survey> and provides a "Submit" button at the end of the form. It is also located at [Marine Operations Customer Satisfaction Survey](#). 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.

2. Shoreside Support

2.1 Medical Forms and Emergency Contacts

- (A) Before departure, the Expedition Coordinator must provide an electronic listing of emergency contacts to the Executive Officer for all members of the scientific party, with the following information:

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 or Principal Investigator 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. NOAA Form (NF) 57-10-01 - Health Services Questionnaire (NHSQ) must be completed in advance by each participating scientist.

NHSQs must be submitted every 2 years for individuals under the age of 50 and every 1 year for ages 50 and above. NHSQs 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 Marine Health Services at the applicable Marine Operations Center. Before clearance to sail can be granted, all participating scientists must submit the NHSQ and Tuberculosis Screening Document to Marine Medical Branch no later than 4 weeks before the start of the project to allow time for the participant to obtain and submit additional information should health services require it. Please contact Marine Medical Branch with any questions regarding eligibility or completion of either form. 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. https://www.osec.doc.gov/opog/privacy/pii_bii.html.

(B) Contact information:

Marine Health Services
Marine Operations Center – Pacific
2002 SE Marine Science Dr.
Newport, OR 97365
Telephone 541-867-8822
Fax 541-867-8856
Email MOP.Health-Services@noaa.gov

- (C) Before departure, the Expedition Coordinator must provide an electronic listing of emergency contacts to the Executive Officer for all members of the scientific party, with the following information: Contact name, Address, Relationship to member, and Telephone number.

3. Communications and Information Technology (IT)

3.1 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. If increased bandwidth is being considered, program accounting is required and it must be arranged through the CO at least 30 days in advance.

3.2 IT Security

(A) IT Security Awareness Training:

- (1) Guest scientists must complete NOAA's IT Security Awareness Course before using or accessing any NOAA ship science computer or network resources. It is recommended that guests complete the course 3 days before embarking. Guest scientists must review and sign the Rules of Behaviour (ROB)
 - (2) For Foreign Nationals see section 7.6
- (B) Any computer that will be hooked into the ship's network must meet the following requirements, at a minimum:

- (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.
- (4) No Kaspersky products are allowed
- (5) Adhere to all licenses, copyright laws, contracts, and other restricted or proprietary information.
- (6) Utilize all security measures that are in place to protect the confidentiality, integrity, and availability of information and systems.
- (7) Refrain from using NOAA OMAO Public Network information resources for inappropriate activities.
- (8) Do not visit inappropriate sites while using NOAA OMAO Public Network. Inappropriate sites can be but are not limited to:
 - (a) Sexually Explicit Content (including nudity, pornography, and other obscene materials)
 - (b) Websites With Extreme Political Views
 - (c) Hate Websites
 - (d) Websites That Promote Drug Use or Terrorist Activities
 - (e) Online Gambling (including ads with adult-only content)
 - (f) Web Sharing Websites (Downloading illegal content, BitTorrent, Webtorrent, uTorrent)
- (C) Computer Operating Systems that the support vendor has identified as reaching “End of Life” for support will not be allowed on the shipboard network.
- (D) At any time, NOAA/OMAO may monitor and/or audit user activity and/or network traffic. In addition, NOAA/OMAO may access your system and disclose information obtained through audits to third parties, including law enforcement authorities.

3.3 Disposition of Data and Reports

Data Classifications:

(A) OMAO Data

- (1) Since OMAO has limited tools and bandwidth for moving large datasets, OMAO commits to acquisition and archive responsibility for:
 - (a) Scientific Computer System (SCS) data and metadata
 - (b) Conductivity Temperature Depth (CTD profile) data
 - (c) Acoustic Doppler Current Profile (ADCP) data
 - (d) Ship Daily Activity Tracker (SDAT) Cruise level metadata
- (2) On a project by project basis, if special submission capabilities are made available, the CO may commit to stewardship of other datasets.

(B) Program Data

- (1) Systems attached to and maintained by the ship but will be run by the science party or Survey department such as bathymetric multibeam sonar, water column single, split beam, multibeam sonar, video and other digital imagery.
- (2) Systems the Scientific Party brings aboard
- (3) SCS, CTD, and ADCP will remain part of the Expedition Coordinator’s project data

package as well as being submitted to the archive in near real time by ship's personnel.

(C) Communication and Documentation

- (1) Data Management Plans are reviewed at the Pre-Project Meeting (Section 7).
- (2) Instrument, system, geographic, and operational interference are discussed and prioritized during pre-cruise communications and the Pre-Project Meeting. This ensures that every data acquisition system can operate to satisfy commitments to initiatives such as Seabed 2030 and OMAO's general guidance to acquire the most and best data possible, while not interfering with the project's primary objectives.

(D) Data Transmittal and Storage Media

- (1) Before departure, bandwidth, storage capacity, and MACC (Marine and Aviation Cyber Center) media policies will guide strategies for stewardship of data collected during the project and the manner that the Expedition Coordinator's data package and other large data files will be transmitted to shore or carried from the ship at the end of the project.
- (2) The ship CO completes data transmittal or other chain of custody documentation and a copy of each is retained on the ship and will accompany the data media.

(E) Acknowledgment and Acceptance

- (1) Cover page signatures acknowledge each parties acceptance of the data submission responsibilities outlined in this section.

3.4 Responsibilities

(A) OMAO Data

- (1) OMAO owned shipboard systems will be maintained, calibrated at prescribed intervals, in good working order, and tested before departure. Sounders and systems that require patch test or sphere calibration may require project time if the ship does not have the means to conduct calibrations before the beginning of the project
- (2) System (SCS) data, Conductivity Temperature Depth (CTD profile) data, Acoustic Doppler Current Profile (ADCP) data will be submitted in near real time or at end-of-project through existing and developing utilities.
- (3) Metadata for each data type will be complete, up-to-date, and accurate.
- (4) SDAT ship and cruise level metadata will be accurate and updated every 2 to 3 days.
- (5) On a project by project basis, if special submission capabilities are made available, the ship's CO may commit to stewardship of other datasets.

(B) Program Data

- (1) All non-OMAO data collected is stewarded and delivered to the lab's data managers for prompt packaging and submission to National Centers for Environmental Information according to their LO's directives.
- (2) Holds, or embargoes may be placed on sensitive data for up to 1 year.

(C) Communication and Documentation

- (1) Data Management Plans are reviewed at the Pre-Project Meeting.

- (2) Instrument, system, geographic, and operational interference are discussed and prioritized during pre-cruise communications and the Pre-Project Meeting. This ensures that every data acquisition system can operate to satisfy commitments to initiatives such as Seabed 2030 and OMAO's general guidance (including OMAO Environmental Data Management Directive and ship specific instructions) to acquire the most and best data possible, while not interfering with the project's primary objectives.

(D) Data Transmittal and Storage Media

- (1) Before departure, bandwidth, storage capacity, and MACC (Marine and Aviation Cyber Center) media policies will guide strategies for stewardship of data collected during the project and the manner that the Expedition Coordinator's data package and other large data files will be transmitted to shore or carried from the ship at the end of the project.
- (2) The ship CO completes data transmittal or other chain of custody documentation and a copy of each is retained on the ship and will accompany the data media.

(A) Acknowledgment and Acceptance

- (1) Signatures on this document acknowledge each parties acceptance of the data submission responsibilities outlined in this section.

3.5 Shipboard Data Acquisition and Stewardship Procedures

- (A) Expedition Coordinator/Principal Investigator – Draft Project Instructions, Collect Data, Define Metadata, and Submit Processed Data**

The CS/PI shall:

- (1) Include a section entitled "Disposition of Data and Reports" in the Project Instructions.
 - (a) This Section shall state that the CS/PI is responsible for the collection, management, and archiving of all project-specific data in accordance with NOAA's Administrative Order (NAO) 212-15 - Management of Environmental Data and Information.
- (2) Clearly identify in the "Disposition of Data and Reports" the data sets generated during the project and classifications of data as either OMAO Data or Program Data. OMAO is required to archive OMAO data and the Program is required to archive Program Data. Programs will archive their data following their own internal procedures.
- (3) Clearly identify in the "Disposition of Data and Reports" Section 5 of the Project Instructions all data that NOAA will publicly release and all data that NOAA will not publicly release along with responsible parties for each data set.
- (4) Assign an indefinite date for public release by the proper authorities for data having homeland/national security, cultural heritage, or protected resources.
- (5) Document in the Project Instructions the specific justification for non-release of data, as well as the authority responsible for the non-release decision.

- (6) The CS/PI shall work with shipboard personnel to collect data of the highest possible quality and to create project metadata. Unless otherwise excepted, the project data and metadata shall include a date for public release of data not to exceed 1 year after collection.
 - (7) As soon as practical and not to exceed 15 days following the completion of the project, the CS/PI shall obtain a copy of raw data collected with OMAO-owned instruments.
 - (8) The CS/PI shall provide all project-specific processed data with corresponding project metadata to a data archive within 1 year of collection. In addition, the CS/PI shall submit, when available, data event logs, Project Instructions, survey reports, and other high-utility documentation to this archive.
 - (9) Upon receiving evidence (preferably an accession number or a digital object identifier) that the project-specific processed data has been properly archived following NOAA guidelines with metadata, the CS/PI's responsibility for archival is complete.
 - (10) The CS/PI shall be responsible for all data generated from instruments not owned by OMAO. Future opportunities to participate in data collection activities, as a CS/PI aboard a NOAA ship, may require verification from a data archive that project-specific processed data with project metadata were delivered within 1 year of collection.
- (B) Commanding Officer/Master - Submit Raw Data to NCEI and Data Disposition
- (1) Depending on connectivity, and preferably not to exceed 60 days following the completion of each cruise/project, the CO shall ensure all OMAO-collected data, corresponding project metadata, and Project Instructions are submitted to NCEI.
 - (a) These data include all raw data collected with OMAO-owned and scientific party-provided instruments that OMAO is responsible for per the Project Instructions, as well as any processed data available at the time of submission.
 - (2) The CO or the CO's designee shall notify NCEI electronically when the data are ready for transfer. This procedure does not relieve the CS/PI from their responsibility to provide all project-specific data and project metadata to a data archive within 1 year of data collection.
 - (3) The CO's responsibility for archiving the data is complete upon receiving confirmation from NCEI that raw data and project metadata are archived (preferably an accession number or a digital object identifier).
 - (4) Policy for implementing Appendix Section 3.5 is outlined in OMAO Policy 1102-38 Shipboard Data Acquisition and Stewardship.
 - (5) For each project, the CO shall ensure that all OMAO-owned instruments are acquiring high-quality data. OMAO instruments should be acquiring data at all times

unless it interferes with the specific project, violates rules/laws/policy, or is due to another reason specified in the SDAL Ship Operations Log for that sea day.

(C) OMAO Environmental Data Acquisition Manager

- (1) The EDAM plans, directs, and implements policies and procedures to standardize the acquisition, safeguarding, and submission of high quality environmental, water column, and bathymetric data by NOAA Ships.
- (2) The EDAM will validate and monitor publication of the appropriate metadata in the NOAA archive, ensure the data is publicly available by the agreed date of public release, and assess current digital inventories of all published OMAO owned data sets.
- (3) The EDAM will ensure proper data stewardship and implementation of the terms of the submission agreements, address policy requirements, and adopt procedural directives throughout the data lifecycle.

(D) NCEI Data Manager - Archive and Publish Data at NCEI

(1) After confirming that raw data and project metadata received from the CO or the CO's designee are valid, a DM will archive them at NCEI and then return confirmation (preferably an accession number or a digital object identifier) to the CO and/or the CO's designee and the OMAO Data Manager.

(2) A DM will validate and publish metadata, archive appropriate data in accordance with data archival best practices, make the data publicly available by the agreed date of public release, safeguard non-public, restricted data (i.e., data with homeland/national security, cultural heritage, or protected resources value), and maintain current digital inventories of all public data.

(3) NCEI will make publicly available all unrestricted raw and processed data (i.e., all data with no homeland/national security, cultural heritage, or protected resources value) no sooner than the agreed date of public release and not later than 1 year after collection. Ships should account for NCEI's time to receive and process the data (~90 days) in this 1 year.

(4) OMAO and NCEI will describe the technical details of implementing Section 5 in their Submission Agreements and appendices to this document. The DM will ensure to implement the terms of the submission agreements.

4. Foreign Nationals

4.1 Foreign National Guests Access to OMAO Facilities and Platforms

All foreign national access to the vessel shall be in accordance with [NAO 207-12: Technology Controls and Foreign National Access](#). All LO personnel will use the Foreign National Registration System (FNRS) to submit requests for access to NOAA facilities and ships. FNRS does not route through OMAO for access to OMAO facilities and platforms or for access to OMAO Information Technology systems. Therefore OMAO also requires the form [Request for Foreign National Access to OMAO Facilities and Platforms](#). 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 LO Controlled Technology Coordinators to assist with the process.

Foreign National access must be sought not only for access to the ship involved in the project but also for any Federal Facility access (NOAA Marine Operations Centers, NOAA port offices, USCG Bases, Navy Bases, commercial ports) that foreign nationals might have to traverse to gain access to and from the ship. The following are basic requirements.

Full compliance with NAO 207-12 is required.

(A) Responsibilities of the Expedition Coordinator

- (1) Provide the CO with the email generated by the Servicing Security Office granting approval for the foreign national guest's visit. This email will identify the guest's DSN and Designated Escorts (if any) 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) at least annually or as required by the Servicing Security Office.
- (4) Export Control - Ensure that approved controls are in place for any technologies subject to [Export Administration Regulations \(EAR\)](#) that will be brought aboard the ship.
- (5) The CO and the Expedition Coordinator will keep each other informed of controlled technologies belonging to the ship and to the scientific party and will work together to implement any access controls necessary to ensure no unlicensed export occurs.

(B) 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 Servicing Security Office email granting approval for the foreign national guest's visit. OMAO CTC will email the CO when access to the platform and IT assets has been approved.
- (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) Ensure all OMAO personnel onboard receive the briefing on Espionage Indicators (NAO 207-12) at least annually or as required by the Servicing Security Office.

(C) Responsibilities of the Departmental Sponsor

- (1) Export Control - The DSN 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, if not sailing for the project, 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 NAO 207-12 (Certification of Conditions and Responsibilities for a Foreign National) within 3 days of the FN's arrival onboard the ship.

5. Hazardous Materials

5.1 Policy and Compliance

The Expedition Coordinator is responsible for complying with OMAO Procedure 0701-22 Visiting Scientists' Chemicals and Related Hazardous Materials (Mission HAZMAT). 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, Safety Data Sheets (SDS), appropriate spill cleanup materials (i.e., 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.

- (A) Per OMAO Procedure 0701-22, the scientific party will include with their Project Instructions and provide the CO of the respective ship 30 days before departure:
 - (1) List of chemicals by name with anticipated quantity;
 - (2) List of spill response materials, including neutralizing agents, buffers, and absorbents;
 - (3) Chemical safety and spill response procedures, such as excerpts of the program's Chemical Hygiene Plan or SOPs relevant for shipboard laboratories; and
 - (4) For bulk quantities of chemicals in excess of 50 gallons total or in containers larger than 10 gallons each, notify the ship's Operations Officer regarding quantity, packaging, and chemical to verify safe stowage is available.
- (B) During embarkation and before loading hazardous materials aboard the vessel, the scientific party will provide the CO or their designee:
 - (1) An inventory list (NF 57-07-11 or similar) showing actual amount of hazardous material to be brought aboard;
 - (2) An SDS for each material;
 - (3) 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; and
 - (4) Confirmation that chemical safety and spill response procedures were brought aboard.
- (C) During loading, the scientific parties will work with the ship's Operations Officer and the ECO to track mission hazmat brought aboard, using NOAA Form 57-07-11 or similar. SDS

will be made available to the ship's complement, in compliance with Hazard Communication Laws.

- (D) Underway, the 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.
- (E) Upon departure from the ship, the removal of mission hazmat and related products must be verified and the Expedition Coordinator and Operations Officer or designee must initial the Mission HAZMAT Log (NF 57-07-11). A closed out copy of the Mission Hazmat Log will be provided to the scientific party upon request.

5.2 Chemical safety and spill response procedures

(A) ACID [A]

- (1) Wear appropriate protective equipment and clothing during clean-up. Keep upwind. Keep out of low areas.
- (2) Ventilate closed spaces before entering them.
- (3) Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible.
- (4) Large Spills: Dike far ahead of spill for later disposal. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal.
- (5) Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.
- (6) Never return spills in original containers for re-use.
- (7) Neutralize spill area and washings with soda ash or lime. Collect in a non-combustible container for prompt disposal.
- (8) J. T. Baker NEUTRASORB® acid neutralizers are recommended for spills of this product.

(B) Mercury [M]

- (1) Spills: Pick up and place in a suitable container for reclamation or disposal in a method that does not generate dust. Sprinkle area with sulfur or calcium polysulfide to suppress mercury. Use Mercury Spill Kit if need be.

(C) Formalin/Formaldehyde [F]

- (1) Ventilate area of leak or spill. Remove all sources of ignition.
- (2) Wear appropriate personal protective equipment.
- (3) Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible.
- (4) Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e.g., vermiculite, dry sand, earth), and place in a chemical waste container.
- (5) Do not use combustible materials, such as sawdust.

5.3 Radioactive Materials and X-ray Generating Devices

The Expedition Coordinator is responsible for complying with OMAO Procedure 0701-10 Radioactive Material and X-ray Generating Device Use Aboard NOAA Ships. Documentation regarding those requirements is provided by the Chief of Operations, Marine Operations, upon request. Use of radioactive isotopes in areas under the jurisdiction of other countries may require additional permits from the host countries. Port calls in other countries, while the ship is carrying radioactive isotopes, may also require special notification, compliance with host country regulations, and consent from the host.

(A) Radioactive Materials (RAM)

The Expedition Coordinator submits, at least three months in advance of a domestic project and eight months in advance of a foreign project start date, required documentation to MOC-CO, including:

- (1) NF 57-07-02 Request to use Radioactive Material Aboard a NOAA Ship.
- (2) Draft Project Instructions (only one copy required per project).
- (3) Licenses: Nuclear Regulatory Commission (NRC) Materials License (NRC Form 374) or State license with Report of Proposed Activities in Non-Agreement States, Areas of Exclusive Federal Jurisdiction, or Offshore Waters (NRC Form 241).
- (4) Experiment and usage protocols, including spill clean-up and accidental exposure procedures.
- (5) If applicable, copies of any applications submitted and/or consent obtained from other countries.

(B) X-ray Generating Devices (XGD)

The Expedition Coordinator submits, at least three months in advance of a domestic or foreign project start date, required documentation to MOC-CO, including:

- (1) NF 57-07-19 Request to use X-ray Generating Device (XGD) Aboard a NOAA Ship.
- (2) Draft Project Instructions (only one copy required per project).
- (3) Experiment or usage protocol, including all proposed use parameters.
- (4) A current (within 1 year of the day the vessel is to leave port) performance test report for each device
- (5) Manufacturer specification sheet.
- (6) If applicable, copies of any applications submitted and/or consent obtained from other countries.

Scientific parties will follow responsibilities and requirements for storage and use, routine wipe tests, signage, and material disposal as outlined in OMAO Procedure 0701-10.

5.4 Lithium Batteries

Lithium batteries include:

- Lithium batteries,
- Lithium cells,
- Lithium battery-powered, or associated, systems or equipment, and
- Batteries that utilize lithium metal, alloys, or compounds.

Per OMAO Procedure 1102-04 Lithium Battery Safety Procedures, the Expedition Coordinator is responsible for:

(A) Providing a risk management plan to mitigate lithium battery concerns, including:

- (1) Packaging. How will the system/battery be packaged?
- (2) Storage facilities. How will the system/battery be stored from delivery to disposal?
- (3) Transportation methods
- (4) Operational use scenario (Include a complete description of how the system/batteries will be handled and used; what platform(s) will carry or deploy the system; location of recharging operations; recovery operations; number of units anticipated to be used; and, where appropriate, the sequence of events before system use/activation/deployment, etc.).
- (5) Disposal information

(B) Provide scientific party and Ship's Command with relevant SOPs related to equipment containing lithium batteries.

(C) Include Safety Data Sheets and/or Technical Data Sheets in the hazardous materials inventory that is transmitted to the ship.

(D) Notify the ship's Command/ECO when equipment arrives on-scene.

Appendix B References

Federal Regulations and Standards

- ASTM F1507 American Society for Testing and Materials - Standard Specifications for Surge Suppressors for Shipboard Use
- Export Administration Regulations (EAR)
- MIL-PRF-32167A Military Performance Specification - Transient Voltage Surge Suppressors
- UL 1449 Underwriters Laboratories - Safety Standards for Surge Protective Devices

NOAA Administrative Orders

- NAO 121-15-B Management of NOAA's Data and Information
- NAO 202-1106 NOAA Sexual Assault and Sexual Harassment Prevention and Response Policy
- NAO 207-12 Technology Controls and Foreign National Access
- NAO 212-15 Management of Environmental Data and Information
 - NOAA Data Documentation Procedural Directive
 - NOAA Data Management Planning Procedural Directive (preparation of DMPs)
- NAO 216-101 Ocean Data Acquisitions

OMAO Policies and Procedures

- OMAO Policy 1008 Tuberculosis Protection Program
- OMAO Policy 1102-38 Shipboard Data Acquisition and Stewardship
- COVIDM01 - Marine Operations COVID-19 Protocols
- OMAO Procedure 0701-10 Radioactive Material and X-ray Generating Device Use aboard NOAA Ships
- OMAO Procedure 0701-22 Visiting Scientists' Chemicals and Related Hazardous Materials (Mission HAZMAT)
- OMAO Procedure 1102-03 Vessel Quarters
- OMAO Procedure 1102-04 Lithium Battery Safety Procedures
- OMAO Procedure 1102-20 General Rules and Minimum Requirements for Embarked Personnel
- OMAO Procedure 1201-080 NOAA Ship Familiarization

Appendix C Forms

- NOAA Form 57-07-02 Request to Use Radioactive Material Aboard a NOAA Ship
- NOAA Form 57-07-19 Request to Use X-ray Generating Devices (XGD) Aboard a NOAA Ship
- NOAA Form 57-10-02 Tuberculosis Screening Document
- NOAA Form 57-10-01 Health Services Questionnaire (NHSQ)
- NRC Form 374 Nuclear Regulatory Commission Materials License
- NRC Form 241 Report of Proposed Activities in Non-Agreement States, Areas of Exclusive Federal Jurisdiction, or Offshore Waters
- Request for Foreign National Access to OMAO Facilities and Platform

Appendix D Data Management Plan

Okeanos Explorer Mission EX2501 Data Management Plan

Report Date: 2024-08-30

1. General Description of Data to be Managed

1.1. Name and Purpose of the Data Collection Project:

EX-24-07, Beyond the Blue: Papahānaumokuākea Mapping 3

This expedition will commence on October 19, 2024, in Honolulu, HI and conclude on November 12, 2024, in Honolulu, HI. Operations will be conducted 24 hours a day and may consist of mapping operations, conductivity, temperature, and depth (CTD) deployments, plankton net tows, and full shore-based participation via telepresence.

1.2. Summary Description of the data to be collected:

Operations will include the use of the ship's deepwater mapping systems (Kongsberg EM 304 multibeam, EK60/EK80 split-beam sonars, Knudsen 3260 Chirp sub-bottom profiler, and Teledyne acoustic Doppler current profilers), expendable bathythermograph (XBTs) in support of multibeam sonar mapping operations, conductivity, temperature, depth profiler (CTD) casts, plankton nets, and a high-bandwidth satellite connection for continuous ship-to-shore communications.

1.3. Keywords or phrases that could be used to discover the data:

Theme Keywords:

Acoustic doppler current profiler, ADCP, Acoustic sound velocity profile, ASVP, Bathymetry gaps, Beyond the Blue, Conductivity temperature depth, CTD, Coral communities, Deep sea, Deepsea, Deep-sea, Dissolved oxygen, Expendable bathythermograph, XBT, Fish habitats, Geohazards, Habitat areas of particular concern, HAPC, Habitat characterization, High-bandwidth satellite connection for continuous ship-to-shore communications, Mapping survey, Marine education, Multibeam, Multibeam backscatter, Multibeam sonar, MB, Multi-beam, National Marine Sanctuaries, National Marine Monument, NOAA, NOAA fleet, Ocean, Ocean education, Ocean exploration, Ocean exploration and research, Ocean literacy, Ocean research, Oceans, OER, Okeanos, Okeanos explorer, plankton, R337, Science, Scientific computing system, SCS, Scientific mission, Scientific research, Sea, Seabed 2030, Single beam sonar, Singlebeam sonar, Single-beam sonar, Site characterization, Sonar anomalies, Sponge communities, Split beam sonar, Stewardship, Sub-bottom profile, Submarine geohazards, Sun photometer, Systematic exploration, Water column backscatter

Place Keywords:

Beyond the Blue, Hawai'i, HI, Honolulu, HI, Pacific Ocean, Northern Pacific Ocean, Papahānaumokuākea National Marine Monument, Papahānaumokuākea National Marine Sanctuary

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

Okeanos Mapping Expedition

1.5. Planned or Actual Temporal Coverage of the data:

Start Date: 2024-07-18 and End Date: 2024-08-12

1.6. Actual or Planned Geographic Coverage of the data:

Northernmost Boundary: 33.4 and Southernmost Boundary: 18.2
Westernmost Boundary: 176.3 and Easternmost Boundary: -156.0

1.7. What data types will be created or captured and submitted for archive?

Project Instructions, Expedition Report, Seafloor Imagery, Multibeam Data (raw, processed, derived products), Bottom Backscatter, Water Column Backscatter, EK60/EK80 Split Beam Data, Ship Navigation Data (raw), Meteorological Data (raw), Sub-Bottom Profile Data, Acoustic Sound Velocity Profile Data, ASVP, Sea Surface Temperature Data, Sun Photometer Data, CTD Data (raw, processed), temperature, depth, dissolved oxygen, eXpendable BathyThermograph, XBT, Acoustic Doppler Current Profiler, ADCP, Scientific Computing System (SCS raw), eDNA, Water Samples

1.8. What platforms will be employed?

NOAA Ship Okeanos Explorer

2. Points of Contact for this Data Producing Project

Overall POC: NOAA Ocean Exploration

Title: Expedition Coordinator Team

Email: EX.ExpeditionCoordinator@noaa.gov

3. Points of Contact for Managing the Data

Data POC: NOAA National Centers for Environmental Information (NCEI)

Data POC Title: Stewardship Data Management Team

Data POC Email: OER.info.mgmt@noaa.gov

4. Resources

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

Yes

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?

Navigational, meteorological, and oceanographic data shall be delivered in its native format to NCEI for preservation in the Oceanographic Archive. Mapping (multibeam, water column, sub bottom) data are sent to the University of New Hampshire (UNH) for post-processing. Raw and processed mapping data are then delivered to NCEI for preservation in the Geophysical Archives.

5.2. What quality control procedures will be employed?

Quality control procedures for the data from the Kongsberg EM304 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). Navigational, meteorological, and oceanographic 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.

6. Data Documentation

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

Yes, Metadata Standard: ISO 19115-2 Geographic Information with Extensions for Imagery and Gridded Data will be the metadata standard employed.

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 published in the NOAA OneStop catalog and an NOAA Ocean Exploration Web Accessible Folder (WAF) hosted for public discovery and access at:

URL: <https://data.noaa.gov/waf/NOAA/NESDIS/ncei/oer/iso/>

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?

Yes

7.1.1. If the data will not be available to the public, or with limitations, provide a valid reason.

Not Applicable

7.1.2. If there are limitations, describe how data are protected from unauthorized access.

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. Data POC: OER.info.mgmt@noaa.gov

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

Organization: NOAA National Centers for Environmental Information (NCEI)

URL: <https://www.ncei.noaa.gov>

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

Hold time: Data are considered immediately publicly accessible as soon as possible after the mission, unless there are documented restrictions (i.e., Underwater Cultural Heritage Sites).

Hold authority: not applicable

7.4. Prepare a Data Access Statement

No data access constraints, unless data are protected under Section 304 of the National Historic Preservation Act of 1966. Data collected and derivative data products produced by the *Okeanos Explorer* will be archived in a location where it can be withheld from public disclosure.

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 (NCEI). Refer to the corresponding Annual *Okeanos Explorer* Data Management Plan at NOAA Central Library Institutional Repository 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.

The EM304 output data is a new format not currently read by NCEI archive systems. The new file format is being added to the system capability. There will be an unknown delay for the archive of these .kml files. All ADCP data are not currently archived with NCEI. Contact the Expedition Coordinators

(EX.ExpeditionCoordinator@noaa.gov) or NCEI Data Management team (OER.info.mgmt@noaa.gov) for ADCP data access. All other data will be archived at NCEI.

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 Ocean Exploration.

Appendix E Environmental Compliance Documents

All environmental compliance documents, permits, and regulations can be found in this folder:
https://drive.google.com/drive/folders/1L-tzxYphilQNBmYigo-Ild17bfZUiSYe?usp=drive_link

