

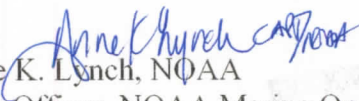


UNITED STATES DEPARTMENT OF COMMERCE

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

APR 23, 2015

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-15-03 Legs 1 & 2
Tropical Exploration (Mapping)

Attached is the final Project Instruction for EX-15-03 Legs 1 & 2, Tropical Exploration (Mapping), which is scheduled aboard NOAA Ship *Okeanos Explorer* during the period of May 5 - June 9, 2015. Of the 33 DAS scheduled for this project, 27 DAS are Line Office allocation and 6 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: April 20, 2015

Platform: NOAA Ship *Okeanos Explorer*

Project Number: EX-15-03 Legs I & II

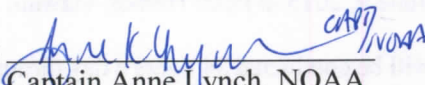
Project Title: Tropical Exploration (Mapping)

Project Dates: May 5, 2015 to June 9, 2015

Prepared by: Lindsay McKenna, NOAA Expedition Coordinator
Dated: 4/17/2015

Approved by: McDonough
John McDonough
Deputy Director
Office of Ocean Exploration & Research
Dated: _____

Digitally signed by John McDonough
DN: cn=John McDonough, o=Ocean
Exploration, ou=NOAA/OAR, email=john.
mcdonough@noaa.gov, c=US
Date: 2015.04.22 10:07:44 -0400

Approved by:  ^{CAPT} _{NOAA} Dated: 4/23/2015
Captain Anne 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 collecting continuous ocean exploration data over a fracture zone feature during a long transit across the Caribbean Sea and eastern Pacific.

A portion of the Clipperton Fracture Zone will be mapped with one beam-width wide swath of the EM302 multibeam during the transit from Panama to Hawaii. The Clipperton Fracture Zone feature was identified as a priority feature to map during the 2014 Ocean Exploration Trust Eastern Pacific Planning Workshop. The Clipperton Fracture extends across the eastern Pacific Rise for 1000's of kilometers. This prominent bathymetric feature has never been mapped with a high resolution multibeam system. By opportunistically mapping this feature during transit, there is a greater potential to discover new seafloor features, such as gaseous seeps or potential manganese-nodule deposits. Furthermore, new bathymetric data of the feature may also provide new insight into the complex history of the Pacific Plate.

The transit through the Caribbean and eastern Pacific present unique opportunities to discover unknown features on the seafloor. The Pacific Ocean contains a majority of the world's seamounts, but large portions of this ocean remain largely unexplored by multibeam sonar. In addition to transit mapping, several survey of opportunities will be conducted during the expedition. These projects, outlined in section V, will provide valuable oceanographic data to the scientific community.

This document contains project instructions for EX-15-03 Legs I & II. EX-15-03 Leg 1 operations are expected to commence on May 5, 2015 at San Juan, Puerto Rico and conclude on May 10, 2015 at Panama City, Panama. EX-15-03 Leg II operations are expected to commence on May 14, 2015 in Panama City and are expected to commence on June 9, 2015 at Pearl Harbor, Hawaii.

Multibeam and singlebeam mapping operations will be conducted 24 hours a day throughout the cruise, except in foreign waters where clearance has not been granted. Sub-bottom profile mapping will be conducted 24 hours a day at the discretion of the CO, except in foreign waters where clearance has not been granted.

B. Days at Sea (DAS)

Of the 33 DAS scheduled for this project, 0 DAS are funded by an OMAO allocation, 27 DAS are funded by a Line Office Allocation and 6 are program funded by NOAA PMEL. This project is estimated to exhibit a Medium Operational Tempo.

C. Operating Area

The transit area is through the Caribbean Sea through the Panama Canal and then through the eastern Pacific Ocean. The ship will transit through the following foreign waters: Dominican Republic,

Colombia, Panama, Costa Rica, France, and Kiribati. Consent to conduct Marine Scientific Research has been authorized by Costa Rica. Requests to the Dominican Republic, Panama, France, and Kiribati are pending.

The entire expedition is a transit, with planned stops at 2N/155W and 5N/155W to recover two moorings. The transit through the Caribbean will be the straightest route from San Juan to the Panama Canal, maximizing time in waters with foreign clearance to collect data. The transit through the eastern Pacific will be from Panama City to the Clipperton Islands, and then along the Clipperton Fracture Zone, between approximately 10N/112W to 2N/155W. This route is only 15 nm longer than following the great circle between Panama and the moorings. If we do not have permission to collect scientific data in foreign waters, the ship can still transit through, but no data will be collected or recorded.

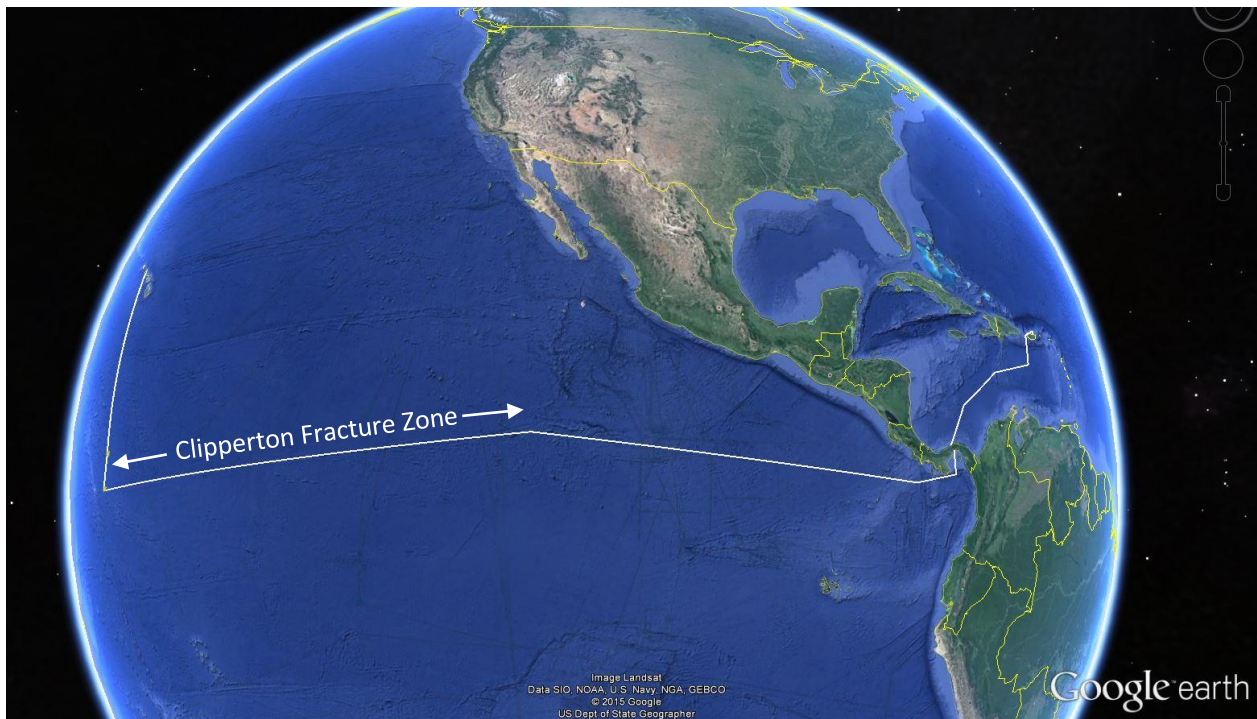


Figure 1: EX-15-03 transit lines. Leg I is in the Caribbean Sea between San Juan, PR and Panama City, Panama. Leg II is in the eastern Pacific Ocean between Panama City, Panama and Pearl Harbor, Hawaii, along the Clipperton Fracture Zone.

| EX-15-03 Leg I Transit Waypoints (approximate) | | Remarks |
|--|--------------|------------------|
| 18° 18.85' N | 67° 30.68' W | Depart San Juan |
| 15° 44.25' N | 68 17.18' W | Depart US waters |
| 15° 04.83' N | 73° 29.92' W | |
| 12° 28.68' N | 77° 57.82' W | |

| | | |
|-------------|--------------|---------------|
| 9° 25.07' N | 79° 51.25' W | Arrive Panama |
|-------------|--------------|---------------|

Table 1: Approximate waypoints for the EX-15-02 Leg I transit and survey area. The actual cruise track will vary due to prevailing conditions and the discretion of the Commanding Officer. Sonars will be turned off in any EEZ where scientific data collection permits have not been granted.

| EX-15-03 Leg II Transit Waypoints (approximate) | | Remarks |
|---|---------------|-----------------------------|
| 8° 49.05' N | 79° 33.10' W | Depart Panama |
| 7° 10.23' N | 79 28.92' W | |
| 6° 41.83' N | 83° 26.72' W | |
| 9° 57.73' N | 112° 54.77' W | Start mapping fracture zone |
| 2° 0' N | 155° 0' W | First mooring recovery |
| 5° 0' N | 155° 0' W | Second mooring recovery |
| 21° 01.72' N | 157° 59.15' W | Arrive Honolulu |

Table 2: Approximate waypoints of the transit lines. The actual cruise track will vary due to prevailing conditions and the discretion of the Commanding Officer. Sonars will be turned off in any EEZ where scientific data collection permits have not been granted.

D. Summary of Objectives

MAY 05 – JUN 9 (San Juan, Puerto Rico to Pearl Harbor, Hawaii)

During EX-15-03 Legs I & II, multibeam data will be collected 24 hours a day and XBT casts will be conducted at an interval defined by prevailing oceanographic conditions, but not to exceed 6 hours. Additionally, EK 60 (single beam) and sub-bottom profile data will be collected 24 hours per day. Data will only be collected in foreign waters where clearance has been granted. If no permit was obtained, all data collection systems will be shut down in those foreign waters. All multibeam data will be fully processed according to standard onboard procedures and will be archived with the National Geophysical Data Center. Ancillary sonar datasets will be archived at the National Oceanographic Data Center.

One survey of opportunity will be conducted on both Legs I and II, a NASA aerosols study.

Three additional projects will be conducted by NOAA's Pacific Marine Environmental Lab (PMEL) on Leg II, they include recovering two PICO-Prawler moorings, deploying ARGO floats, and towing a seasnake salinity instrument.

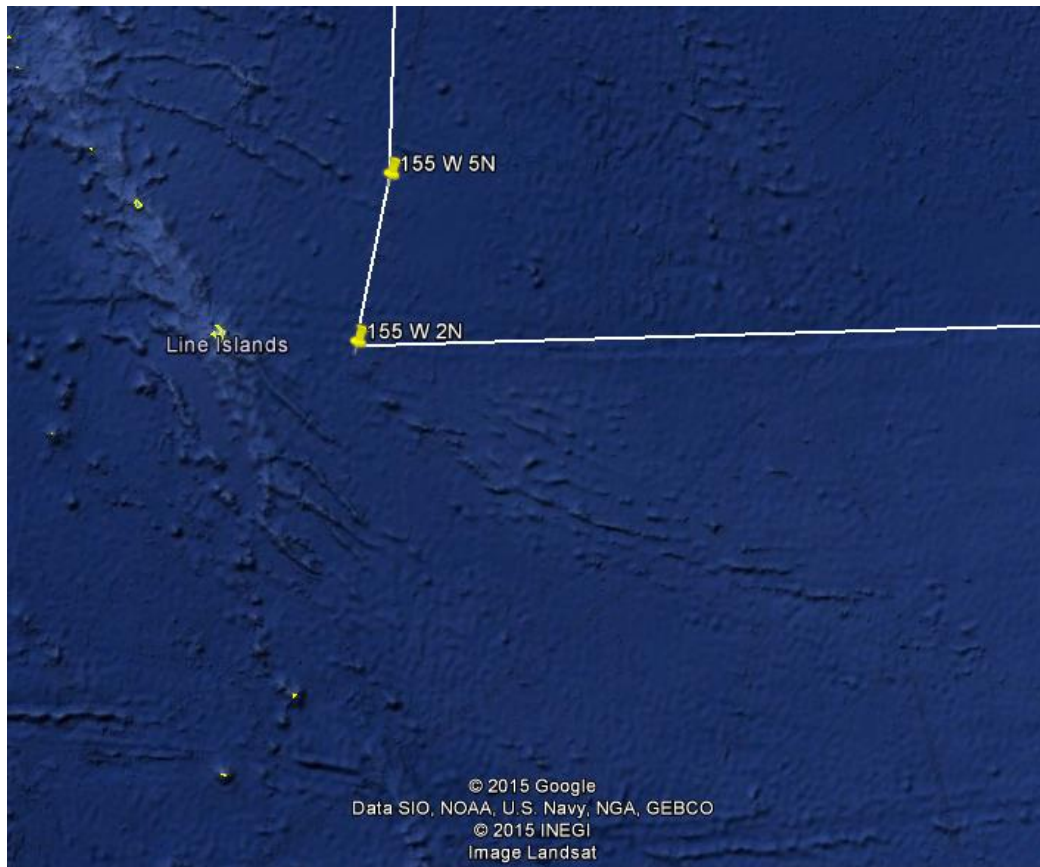


Figure 2. Approximate locations of the two mooring recovery locations. Figure from Google Earth.

All supplemental project equipment will be loaded on the ship in San Juan, PR prior to departure. See section V and Appendix C for more detailed supplemental project information.

All multibeam data will be fully processed according to standard onboard procedures and will be archived with the National Geophysical Data Center. Splitbeam EK60 data will be archived at the National Oceanographic Data Center. The following are cruise objectives for EX-15-03:

1. Collect deep water multibeam bathymetry sonar data (MBES) of the Clipperton Fracture Zone and during transit
 - a. Conduct 24-hour mapping operations for the duration of the cruise (where permissible)
 - b. Collect bathymetric, seafloor backscatter, and water column backscatter data (where permissible)
2. Collect ancillary sonar data
 - a. EK60 single beam sonar (24 hours/day, where permissible)
 - b. Knudsen sub-bottom profiler (24 hours/day, where permissible)

3. XBT operations
 - a. XBT casts will be collected at regular intervals of no more than 6 hours
4. Deploy ARGO floats
5. Recover PICO-Prawler moorings
4. Run Seasnake instrument for supplementary project data collection
5. Train new personnel in all data collection and processing procedures, continuous throughout cruise)
 - a. Training of mapping watch leads new to ship
 - b. Train mapping interns (UCAR)
6. Test new or modified mission hardware and software
7. Telepresence (VSAT 5 mbps ship to shore; T1 shore to ship)
 - a. Maintain single live stream video from ship to shore
 - b. transition to pacific satellites and earth station
 - c. Test multicast video traffic through new teleport and DS3 link connection to the NOAA NOC
8. Participate in robust summary web treatment for leg 2
9. Swing compass in San Juan, PR on May 5 before getting underway

E. Participating Institutions

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

National Oceanic and Atmospheric Administration (NOAA) – National Ocean Service (NOS) - 1305 East-West Hwy, Silver Spring, MD 20910

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

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

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

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

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

NOAA, Pacific Marine Environmental Laboratory (PMEL) 7600 Sand Point Way NE
Seattle, WA 98115

Earth and Space Research 2101 Fourth Ave, Suite 1310 Seattle, WA 98121

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

A partial mapping complement is necessary for Leg I. Required mission personnel include a Mapping Lead/Expedition Coordinator, and a mapping intern. Additional personnel sailing on Leg I will support mapping operations on an as-needed basis. A full mapping complement is necessary for Leg II. Required mission personnel include a Mapping Lead/Expedition Coordinator as well as 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.

EX-15-03 Leg I

| Name | Title | Date Aboard | Date Disembark | Affiliation | Gender | Nationality |
|------------------|---|--------------------|-----------------------|----------------------|---------------|--------------------|
| McKenna, Lindsay | Expedition Coordinator/ Mapping Team Lead | 5/3/2015 | 5/12/2015 | NOAA OER (ERT Inc) | F | US Citizen |
| Barber, Michael | Mapping Intern | 5/3/2015 | 5/12/2015 | UCAR | M | US Citizen |
| Josh Humberston | Mapping Intern | 5/3/2015 | 5/11/2015 | UCAR | M | US Citizen |
| Leonardi, Alan | VIP | 5/3/2015 | 5/11/2015 | NOAA OER | M | US Citizen |
| Kelley, Chris | VIP | 5/3/2015 | 5/11/2015 | University of Hawaii | M | US Citizen |
| Susan Haynes | Educator | 5/3/2015 | 5/11/2015 | NOAA OER (2020 Co.) | F | US Citizen |

EX-15-03 Leg II

| Name | Title | Date Aboard | Date Disembark | Gender | Affiliation | Nationality |
|-------------|--------------|--------------------|-----------------------|---------------|--------------------|--------------------|
|-------------|--------------|--------------------|-----------------------|---------------|--------------------|--------------------|

| | | | | | | |
|------------------------------|--|-----------|-----------|---|------------------------------|-------------------|
| McKenna, Lindsay | Expedition Coordinator/ Mapping Team Lead | 5/12/2015 | 6/10/2015 | F | NOAA OER (ERT Inc) | US Citizen |
| Miller, James J. | Mapping Watch Lead | 5/12/2015 | 6/10/2015 | M | NOAA ABH | US Citizen |
| Flinders, Ashton | Mapping Watch Lead | 5/12/2015 | 6/10/2015 | M | UCAR | US Citizen |
| Barber, Michael | Mapping Intern | 5/12/2015 | 6/10/2015 | M | UCAR | US Citizen |
| von Krusenstiern, Kate | Mapping Intern | 5/12/2015 | 6/10/2015 | F | UCAR | US Citizen |
| Casavant, Abigail | Mapping Intern | 5/12/2015 | 6/10/2015 | F | UCAR | US Citizen |
| Cotugno, Jonathan | Mapping Intern | 5/12/2015 | 6/10/2015 | M | UCAR | US Citizen |
| Michael, Kevin | Support Scientist | 5/12/2015 | 6/10/2015 | M | NOAA Corps (PMEL) | US Citizen |
| Rivera, Dave | Support Scientist | 5/12/2015 | 6/10/2015 | M | NOAA PMEL | US Citizen |
| Schanze, Julian | Research Associate | 5/12/2015 | 6/10/2015 | M | Earth & Space Research | German Citizen |
| Cantwell, Kasey | Web Coordinator | 5/12/2015 | 6/10/2015 | F | NOAA OER (2020 Co.) | US Citizen |

Table 2: Full list of the science party members and their affiliation.

G. Administrative

1. Points of Contacts:

Ship Operations

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

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

Mission Operations

Lindsay McKenna, Expedition
Coordinator/Mapping Team Lead
NOAA Office of Ocean Exploration
and Research (ERT, Inc)
Phone : (603) 862-5246
E-mail : lindsay.mckenna@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

2. Diplomatic Clearances

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

LT Brian Kennedy
Acting Deputy EX Program Manager
NOAA Office of Ocean Exploration
and Research
Phone : (401) 874-6150/ (401) 603-6017
E-mail : Brian.Kennedy@noaa.gov

CDR Thomas Pelzer
Associate Director for Operations Pacific Marine
Environmental Lab (PMEL)
Phone : (206) 526-4485
E-mail : pmel.dir.ops@noaa.gov

Jared Drewniak, Telepresence Lead
NOAA Office of Ocean Exploration & Research
(ERT, Inc)
Phone: (401) 874-6250 (o) / (401) 330-9662 (c)
E-mail: jared.drewniak@noaa.gov

This project involves Marine Scientific Research in waters under the jurisdiction of Dominican Republic, Panama, Costa Rica, France, and Kiribati. Diplomatic clearance has been requested. Clearance will be included as an appendix once they are received.

3. Licenses and Permits

See Appendix B 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*):

Monday, May 4

- Mission personnel arrive to ship, prepare for expedition

Tuesday, May 5

- Morning departure from Panama from San Juan

Saturday, May 9

- Arrive Panama Canal, begin overnight transit through canal

Sunday, May 10

- Arrive in Panama City

Tuesday, May 14

- Depart Panama City for Hawaii

Tuesday, June 2

- Arrive at first PICO-Prawler mooring at 155W, 2N; recover mooring

Thursday, June 4

- Arrive at second PICO-Prawler mooring at 155W, 5N; recover mooring; continue to Pearl Harbor

Tuesday, June 9

- Arrive Pearl Harbor

Wednesday, June 10

- Personnel depart ship

Telepresence Events

Tentatively, there is a 30 minute telepresence event scheduled with a high school in Delaware on May 7 or 8.

In-Port Events

There are currently no in-port events scheduled.

B. Staging and Destaging:

The supplementary project equipment will all be loaded on the ship while it is dockside in San Juan, PR. All equipment should be properly secured for a possibly rough transit to the Caribbean and Pacific.

Shipments

Send an email to the *Okeanos Explorer* Operations Officer at OPS.Explorer@noaa.gov indicating the size and number of items being shipped. All items should arrive at San Juan, Puerto Rico prior to COB May 1, 2015.

Vessel shipping address:

ATTN: LT Emily Rose, NOAA

NOAA Ship Okeanos Explorer
c/o Coast Guard Sector San Juan
5 Calle La Puntilla
San Juan, PR 00901

C. Operations to be Conducted:

Sonar Operations

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.

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 poor weather. (2) If rough sea state is resulting in 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 EM302 Multibeam Echosounder (MBES)
 - Kongsberg Simrad EK60 Deepwater Echosounder
 - Knudsen Chirp 3260 Sub-bottom profiler (SBP)
 - LHM Sippican XBT (Deep Blue probes)
 - Seabird SBE 911 Plus CTD
 - Seabird SBE 32 Carousel and 24 2.5 L Niskin Bottles
 - Light Scattering Sensor (LSS)
 - Oxidation – Reduction Potential (ORP)
 - Dissolved Oxygen (DO) sensor
 - Altimeter Sensor and battery pack
 - CNAV GPS
 - POS/MV
 - Seabird SBE-45 (Micro TSG)
 - Kongsberg Dynamic Positioning-1 System
 - NetApps mapping storage system

- CARIS HIPS Software
 - IVS Fledermaus Software
 - SIS Software
 - Hypack Software
 - Scientific Computing System (SCS)
 - ECDIS
 - Met/Wx Sensor Package
 - Telepresence System
 - VSAT High-Speed link (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.
 - ARGO floats
 - PICO-Prowler mooring recovery equipment (toolboxes, electronic cases, reel stands)
 - PMEL capstan- 3 phase 480VDC (50 amp preferred, 30 amp minimum)
 - Sea-snake system consisting of a collapsible 30ft outrigger with standing rigging, a suction hose and a high-powered peristaltic pump feeding water to a Seabird SBE-45 thermosalinograph.

IV. Hazardous Materials

A. Policy and Compliance

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

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

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

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

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

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

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

B. Inventory

| Common Name of Material | Qty | Notes | Trained Individual | Spill control |
|---|-----------------------------|--------------|---------------------------|----------------------|
| 2 DD Lithium batteries in each ARGO float (122.4g of Lithium/float) | 1 for each float, 12 floats | | Dave Rivera | N/A |

C. Chemical safety and spill response procedures

The lithium ion batteries are located within the floats, so there is no risk of a hazardous material spill.

D. Radioactive Materials

No Radioactive Isotopes are planned for this project.

V. Additional Projects

A. Supplementary (“Piggyback”) Projects

The first supplementary project is deploying ARGO floats along the transit from Panama City to Pearl Harbor.

The second supplementary project is recovering two PICO-Prawler moorings.

The third supplementary project, which was initially submitted as a survey of opportunity, is towing a sea-snake instrument along-side the ship to collect continuous salinity measurements in the top 5cm.

See Appendix C for more detailed information on the supplementary projects.

The survey of opportunity is the NASA Maritime Aerosol Network. During the cruise the marine aerosol layer observations will be collected for the NASA Maritime Aerosol Network (MAN). Observations will be made by mission personnel (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 D 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

b. Program Data

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 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 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/noaforms/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 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.

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.

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.

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.
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 A. Data Management Plan

Appendix B. Categorical Exclusion

Appendix C. Supplemental Project Information

Appendix D. NASA Maritime Aerosols Network Survey of Opportunity

Appendix A. Data Management Plans

Data Management Plan

Okeanos Explorer (EX1503L1): Tropical Exploration (Mapping I)



OER Data Management Objectives

Normal data management objectives for mapping and underway data.

13-Apr-15

Page 1

1. General Description of Data to be Managed

13.1 Name and Purpose of the Data Collection Project

Okeanos Explorer (EX1503L1): Tropical Exploration (Mapping I)

13.2 Summary description of the data to be collected.

Multibeam data will be collected 24 hours a day and XBT casts will be conducted at an interval defined by prevailing oceanographic conditions, but not to exceed 6 hours. Additionally, EK60 single beam and sub-bottom profile data will be collected 24 hours per day. Data will only be collected in foreign waters where clearance has been granted. If no permit was obtained, all data collection systems will be shut down in those foreign waters. All multibeam data will be fully processed according to standard onboard procedures.

13.3 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, Panama City, Panama, Panama Canal, Puerto Rico, San Juan

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

Okeanos Mapping Cruises

13.5 Planned or actual temporal coverage of the data.

Dates: 5/5/2015 to 5/10/2015

13.6 Planned or actual geographic coverage of the data.

Latitude Boundaries: 18.5 to 9

Longitude Boundaries: -80 to -67.5

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, Bottom Backscatter, XBT (raw), EK60 Singlebeam Data, Multibeam (image), Multibeam (processed), Multibeam (product), Multibeam (raw), Mapping Summary, GSF, HDCS, SCS Output (compressed), SCS Output (native), Sub-Bottom Profile data, Water Column Backscatter, Expedition Cruise Report

1.8 What platforms will be employed during this mission?

Okeanos Explorer (EX1503L1): Tropical Exploration (Mapping I)

NOAA Ship Okeanos Explorer

2. Point of Contact for this Data Producing Project

Overall POC: Lindsay McKenna, Physical Scientist, NOAA Office of Ocean Exploration and Research, Lindsay.McKenna@noaa.gov

Title: Mission Expedition Coordinator, Mapping Lead, Principal Investigator

Affiliation/Dept: UNH CCOM/JHC

E-Mail: lindsay.mckenna@noaa.gov

Phone: (603) 862-5246

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? True
- 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-3 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/>
discovery and access. The record will be harvested by data.gov.

Okeanos Explorer (EX1503L1): Tropical Exploration (Mapping I)

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.

Not Applicable

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: <http://explore.noaa.gov/digitalatlas>

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

Hold Time: Okeanos Explorer data is made publicly accessible as soon as possible

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.

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 Data Centers. Refer to the Okeanos Explorer FY15 Data Management Plan at NOAA's EDMC DMP Repository (EX_FY14_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.

30-90 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.

Data Management Plan

Okeanos Explorer (EX1503L2): Tropical Exploration (Mapping II)



OER Data Management Objectives

Normal data management objectives for mapping and underway data. Surveys of Opportunity include NASA Aerosol Network and recovering PMEL-Prawler moorings, deploying ARGO floats, and towing a seasnake salinity instrument.

13-Apr-15

Page 1

1. General Description of Data to be Managed

13.1 Name and Purpose of the Data Collection Project

Okeanos Explorer (EX1503L2): Tropical Exploration (Mapping II)

13.2 Summary description of the data to be collected.

During EX-15-03L2, multibeam data will be collected 24 hours a day and XBT casts will be conducted at an interval defined by prevailing oceanographic conditions, but not to exceed 6 hours. Additionally, EK 60 (single beam) and sub-bottom profile data will be collected 24 hours per day. Data will only be collected in foreign waters where clearance has been granted. If no permit was obtained, all data collection systems will be shut down in those foreign waters. All multibeam data will be fully processed according to standard onboard procedures and will be archived with the National Geophysical Data Center. Ancillary sonar datasets will be archived at the National Oceanographic Data Center.

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

Hawaii, moorings, PICO-Prawler Mooring, ARGO float, seasnake salinity instrument, 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, Clipperton Fracture Zone, Panama City, Clipperton Islands, Eastern Pacific Ocean, Pearl Harbor

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

Okeanos Mapping Cruises

13.5 Planned or actual temporal coverage of the data.

Dates: 5/14/2015 to 6/9/2015

13.6 Planned or actual geographic coverage of the data.

Latitude Boundaries: 21.2 to 2

Longitude Boundaries: -158 to -79

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

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

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: Lindsay McKenna, Physical Scientist, NOAA Office of Ocean Exploration and Research, Lindsay.McKenna@noaa.gov
 Title: Expedition Coordinator, Mapping Lead, Principal Investigator
 Affiliation/Dept: UNH CCOM/JHC
 E-Mail: Lindsay.McKenna@noaa.gov
 Phone: 603-862-5246

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? True
- 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-3 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:

Okeanos Explorer (EX1503L2): Tropical Exploration (Mapping II)

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/>
 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.

Not Applicable

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: <http://explore.noaa.gov/digitalatlas>

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

Hold Time: data are made publicly accessible as soon as possible after cruise end

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.

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 Data Centers. Refer to the Okeanos Explorer FY15 Data Management Plan at NOAA's EDMC DMP Repository (EX_FY14_DMP_Final.pdf) for detailed descriptions of the processes, procedures, and partners involved in this collaborative effort.

8.2 If no archive planned, why?

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

30-90 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 B. 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

April 9, 2015

MEMORANDUM FOR: The Record

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

SUBJECT: Categorical Exclusion for NOAA Ship *Okeanos Explorer*
Cruise EX-15-03 Leg 1 and Leg 2

NAO 216-6, Environmental Review Procedures, requires all proposed projects to be reviewed with respect to environmental consequences on the human environment. This memorandum addresses the NOAA Ship *Okeanos Explorer's* scientific sensors possible effect on the human environment.

This project is part of the NOAA Office of Ocean Exploration and Research's "Science Program" and entails multi-disciplinary ocean mapping and exploration activities designed to increase knowledge of the marine environment. This project is entitled "EX-15-03 Legs 1 and 2 Exploration, Tropical (Mapping)" and will be led by Lindsay McKenna, Physical Scientist for the *Okeanos Explorer* program within OER. NOAA Ship *Okeanos Explorer* will depart San Juan, Puerto Rico for Leg 1 on May 5, 2015, and arrive in port in Panama City, Panama on May 10, 2015. Leg 2 will depart Panama City, Panama on May 14, 2015 and arrive in port in Pearl Harbor, Hawaii on June 9, 2015. NOAA Ship *Okeanos Explorer* will conduct sonar mapping operations at all times during the cruise. Focused mapping and sonar testing operations will occur along (1) a transit path from San Juan to Panama City, and (2) a transit path along the Clipperton Fracture Zone feature from Panama to Pearl Harbor. Acoustic instruments that will be operational during the project are a 30 kHz multibeam echosounder (Kongsberg EM 302), an 18 kHz singlebeam echosounder (Kongsberg EK 60), 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. Two moored instruments that belong to NOAA PMEL will be recovered in Kiribati waters, and a dozen Argo floats will be deployed during the Leg 2 transit.



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.

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 an environmental assessment.

Appendix C. Supplementary Project Information

SURVEYS OF OPPORTUNITY - INITIAL REQUEST FORM

A surveys of opportunity is a small, exploratory expedition that takes advantage of the elastic schedules of ocean-going, research vessels, - in this case, the Okeanos Explorer - by maximizing transit times between ports or projects, or by filling small gaps in the ship's calendar.

Given the ship's unique technology and capabilities, NOAA's Office of Ocean Exploration and Research (OER) invites regional researchers to help acquire additional data within the vessel's operating areas to assess specific but poorly known sites, adding to an inventory of submerged resources. In circumstances where individuals cannot serve on a "survey of opportunity", then OER ensures that acquired data and any other pertinent information are transferred to the appropriate researchers after the expedition. Previously successful surveys of opportunity have included mapping geological features, locating and characterizing shipwrecks, and defining marine protected areas. Some surveys are completed in only a few hours, while others last a couple days.

Although exploration potential and scientific merit play a role in which opportunistic surveys are conducted, they are not chosen through a peer-reviewed process. Rather, their selection is based more on the vessel operating in the right place with the right equipment at the right time, and the ship's calendar and on-board resources allow for the added work. All requests for a survey of opportunity are archived with OER and the ship, and expire only when the survey work is completed. There is no guarantee that any request for a survey will be accomplished, nor is there any system of prioritization or ranking. Keep in mind that this proposal may be available to the public upon request except for privileged information and material that is personal, proprietary or otherwise exempt from disclosure under law.

Survey or Project Name

| |
|--|
| Measuring Very-Near Sea Surface Salinity in a High-Precipitation Region |
|--|

Points of Contact (POC)

| | |
|---|---|
| <i>Lead POC or Principle Investigator (PI & Affiliation)</i> Julian J Schanze, Ph.D., Earth & Space Research, Seattle, WA | <i>Supporting Team Members</i> Gary Lagerloef (PI NASA Aquarius Mission), Earth & Space Research, Seattle, WA |
|---|---|

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

| |
|---|
| <p>The primary objective of the deployment of the very-near surface salinity sampler ('sea snake') is to make salinity measurements at a depth of 1-5cm to understand near-surface salinity structure and its influence on the calibration and validation of the NASA Aquarius salinity mission. The measurements are taken using a 1-inch vacuum-rated hose with several intake holes that is towed from a boom that is mounted either on port or starboard of the vessel. The water is pumped into a double-stage de-bubbler and analyzed in a Seabird SBE-45 thermosalinograph. The data are compared to measurements taken with the available thermosalinograph which samples at a depth of approximately 5 m. Significant differences are expected in the presence of rainstorms and have been observed during previous deployments of the instrument in the North Atlantic aboard the R/V Endeavor. The main goals are to understand the effect of freshwater lenses on the calibration and validation efforts of the Aquarius satellite mission as well as understanding the effects of freshwater lensing on surface mixing.</p> |
|---|

| |
|---|
| <p>While the instrument has been deployed on two previous 30-day cruises in the North Atlantic, it has recently undergone a number of improvements, including a temperature/pressure transducer at the end of the hose, an enhanced de-bubbling system as well as an improved boom system which will ensure that the instrument is able to sample undisturbed water outside the bow wake of the vessel. This instrument will provide crucial observations during the upcoming multi-agency Salinity Processes in the Upper Ocean Regional Study (SPURS)-2 mission. During the SPURS-2 mission, NOAA PMEL will deploy Prowler moorings in the SPURS-2 region and the sea snake data will be used to enhance the surface measurements taken by these moorings.</p> |
|---|

List of Participating Organizations

| |
|--|
| Earth and Space Research, 2101 Fourth Ave, Suite 1310, Seattle, WA |
|--|

Duration (specific start and end dates, or expected length of survey)

Survey: May 14 -- June 10, 2015, 28 days

Loading of equipment in San Juan, PR: May 1-5, 2015.

Installation of all materials takes approximately 10 hours and will be accomplished in Panama City, Panama

Area of Survey and Cruise Track Descriptions (please attach appropriate charts and include chart reference numbers)

No modifications to existing cruise plans: Panama City, Panama to 5N,155W via Great Circle Route (approximately 8N, 125W) to Honolulu, HI, USA.

Conditions and Dependencies (e.g, water depths, special sea conditions, time constraints, etc)

The sea surface salinity sampler is able to operate at all vessel speeds up to a tested 13 knots and in most wind- and sea conditions. The hose can be removed on a pulley system if needed for ship operations. The boom is mounted on a mast hinge and can be raised or completely removed in extremely rough conditions. In all of the previous deployments on the R/V Endeavor, the system did not interfere with any vessel operations.

Equipment/Systems Needed

| | |
|---|---|
| <input type="checkbox"/> DP <input type="checkbox"/> A-Frame <input type="checkbox"/> Traction Winch <input type="checkbox"/> Hydro Winch <input type="checkbox"/> ROV Crane <input type="checkbox"/> General Purpose Crane <input type="checkbox"/> EM302 <input type="checkbox"/> Deep Water Echo Sounder <input type="checkbox"/> VSAT Pipe Mbps # days full pipe <input type="checkbox"/> Cameras <input type="checkbox"/> Telepresence <input type="checkbox"/> CCTV <input type="checkbox"/> ROV | <input type="checkbox"/> Sled <input type="checkbox"/> xBot <input type="checkbox"/> Seawater flow-through system <input type="checkbox"/> Fluorometer <input type="checkbox"/> CTD (deck unit) <input type="checkbox"/> CTD Rosette <input type="checkbox"/> SCS Outputs <input type="checkbox"/> Hazardous Storage Describe: <input checked="" type="checkbox"/> Other ship's equipment(s): Describe All: Ship's thermosalinograph, Weather data, |
|---|---|

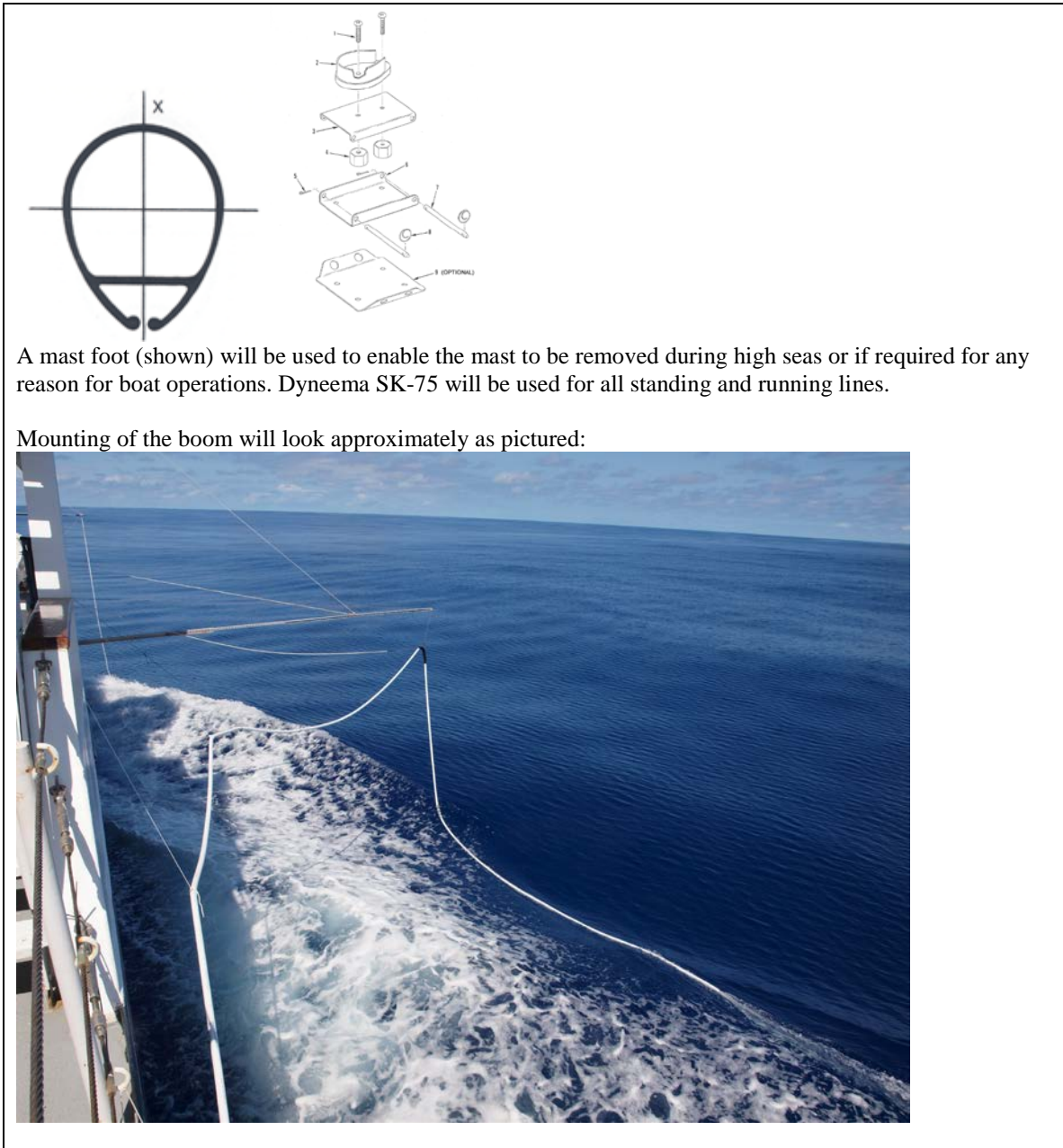
Special Equipment (identify any PI-supplied gear that the ship will be requested to deploy)

200 ft vac-shield hose (PI supplied), Shipboard system consisting of Pump, de-bubblers, thermosalinographs and data logging systems (PI supplied), Salinity sample bottles (PI supplied)

Rain gauge (PI supplied) to be mounted on unobstructed position on vessel, to be determined by boatswain.

Power requirements total: ~8A 110V AC, access to wet lab for seawater discharge, storage of salinity samples

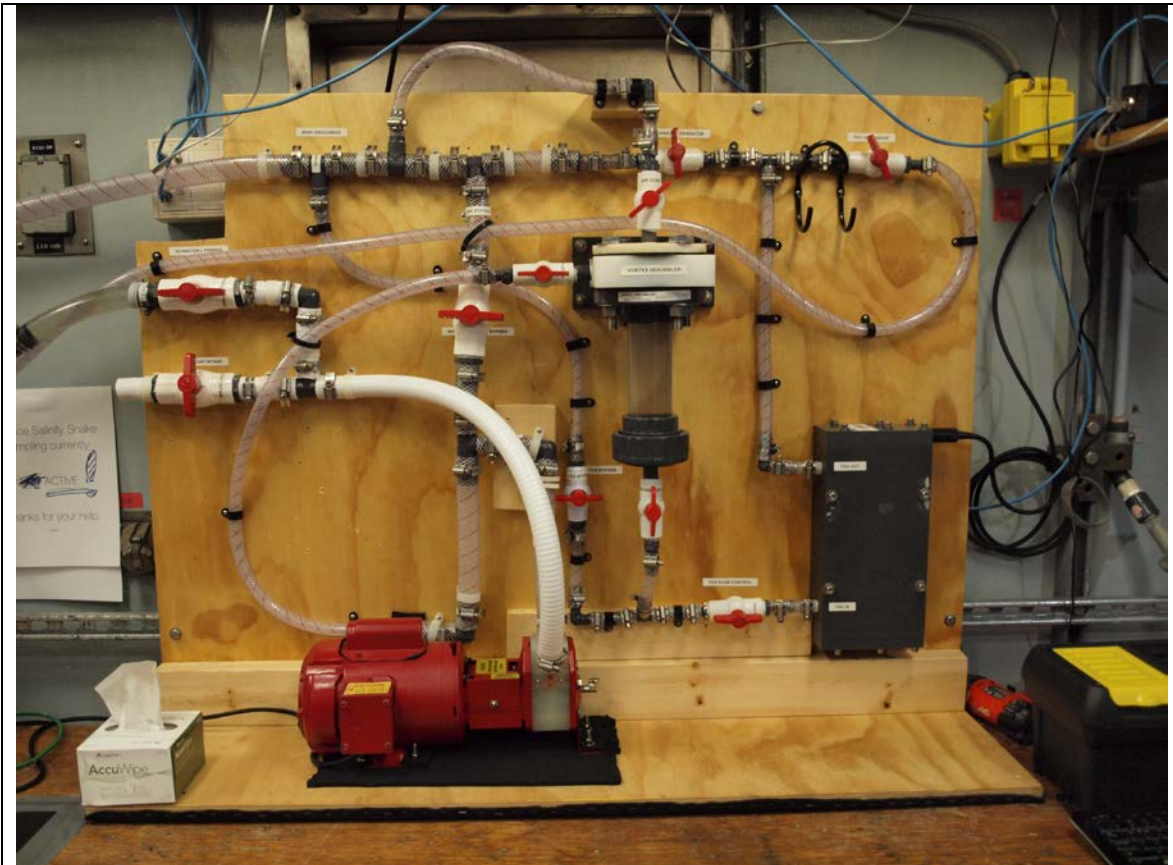
A boom and mast-foot to be mounted on the vessel will be supplied by the PI. The boom is 29 ft (Depending on vessel characteristics, this can be adjusted) and a commercially available maritime mast (Dwyer DM-5)



A mast foot (shown) will be used to enable the mast to be removed during high seas or if required for any reason for boat operations. Dyneema SK-75 will be used for all standing and running lines.

Mounting of the boom will look approximately as pictured:





Shipboard apparatus shown. Space Required is approximately 4x3x1 ft³. All instrumented are mounted on marine plywood and secured to Unistrut with 4 bolts

A presentation with further details and results from previous cruises may be accessed at <http://goo.gl/I5qI32>.

Lead Time and Long Lead Time Items (e.g., permits, etc)

Shipping of main Sea Snake apparatus and boom to San Juan, PR

Shore-side support (besides staffing, what other coordination is needed, e.g. telepresence center)

none

Data, Products and Outputs (requested shipboard data processing, archiving and product generation, such as sonar processing, GIS layer creation, mosaic, video archiving, etc)

All processing is done on the PI-supplied data logging systems. Access to shipboard thermosalinograph and weather sensors (air temperature, wind speed, wind direction, barometric pressure) required

QUALITATIVE PARAMETERS

Why is this project considered “exploration”?

Rain storms are unpredictable and have an important effect on the upper ocean (and mixed-layer) ocean dynamics. 86% of evaporation and 78% of precipitation occur over the ocean, yet the hydrological cycle of the ocean is poorly understood. The effect of freshwater lensing can only be understood by sampling very near the surface (significantly more shallow than regular thermosalinograph systems and Argo floats, which typically operate no shallower than 5m depth). It is only through exploration in a high-precipitation region that we can make qualitative measurements of these important processes.

How is this survey multidisciplinary? *(Will various types of data be acquired by different user groups during the survey? Will the data products will be used by different users after the survey?)*

This survey uses both atmospheric and oceanic data to calibrate and validate measurements taken from the NASA satellite Aquarius/SAC-D which measures surface salinity. The data will be made available both to the Aquarius and Surface Salinity Science Team (SSST). Furthermore, the data will be used in the planning and evaluation of data gathered during the Salinity in the Upper Ocean Regional Study-2 (SPURS-2), centered around 10N, 125W, which is a multi-agency (NASA, NOAA, NSF) effort to understand upper ocean salinity. By measuring the salinity at the very surface, it is possible to quantify the presence and dissipation of fresh lenses in the ocean, which is crucial to understanding the link between the hydrological cycle and the maintenance of upper ocean salinity.

What is the public outreach potential for this project?

Several efforts to measure very-near sea surface salinity have been used in outreach for the Aquarius/SAC-D missions. In the past, the 'sea snake', as it has been nicknamed has been featured twice on NASA blogs with good public feedback. It can be used to communicate the importance of the hydrological cycle in the ocean to the public.

The clear link between the terrestrial and oceanic water cycle and potential shifts in the water cycles have been highlighted in recent news, particularly with droughts and floods in Australia and California. This offers a unique opportunity to inform the public of the link between the ocean, atmosphere and land.

What will become of the data, imagery, information and samples after this survey?
(Who is responsible for data archiving? How will the information be archived? Are there any intended publications from this survey? Will this data be used as leverage for follow-up investigation?)

The PI will be responsible for data management and sharing. The information will be achieved with SPURS-2 observations and will be publically available as required by NASA guidelines.

The data may be used in the planning of the upcoming SPURS-2 mission as outlined above.

What restrictions of confidentiality are placed on this request? *(Can this request be shared with OER partners operating in the area who might be able to acquire these data? Is any part of this intended dataset sensitive and restricted? Are you willing to work with NOAA public affairs officials to report any discoveries made by this survey?)*

no restrictions

If this project is maritime archeologically-focused, what is the site's archaeological or historical importance?

N/A

If this project is maritime archeologically-focused, who has jurisdiction over the site, and have the appropriate agencies been contacted?

N/A

Pac Prawler Cruise 2015- Okeanos Explorer

PMEL Materials and Equipment

- 1 tool box/bag
- 1 large wooden box for recovered nylon
- 3 large wooden spools for line recovery
- 2 small spools for wire rope recovery
- 2 folding wire baskets
- 2 nylon cutters (one mooring will require this as it does not have an acoustic release)
- 2 prawler cases
- 1 empty acoustic release box
- 1 small wooden box for recovered hardware
- 1 safety equipment box (hard hats, pfd, etc.)
- 1 winch
- 1 acoustic release deck set
- 1 aluminum stand for the large HLB buoy
- 1 steel lifting bar for mounting the HLB buoy
- 2 blocks for mooring recovery
- 1 reel of DS Comp working line

Mooring Operations

As is clear from the mooring diagrams, both the PICO Prawler Mooring and the HLB Prawler Mooring have some unique differences in design. As a result both recovery operations will have some slight operational differences; however, both recoveries will require small boat operations.

The first planned recovery is for the HLB Prawler Mooring. This will be the more difficult of the two moorings as the HLB itself is quite large, and may require the removal of the wind sensor before bringing on deck. First and foremost it will be important to perform a current test so as to position the ship properly before starting the recover. After the deck and crew are prepped and the ship has conducted the drift study, the operations will commence by releasing the acoustic release with the PMEL transducer.

Once the mooring is released the small boat team will launch in the work boat to attach the ships working line to the buoy (provided by PMEL), and if need be, remove any sensors that may get damaged when passing through the A-Frame. Once attached, the ship will haul in the buoy, detach it from the mooring line, stop the mooring off on deck, stow the buoy, and then proceed to reel in the mooring using the PMEL winch. The Prawler will be attached to the wire rope (Nilspin), and will need to be removed before hauling in the remainder of the mooring.

The PICO Prawler Mooring has a few noticeable differences when viewing the diagram. There is no acoustic release on this mooring, so we will need to use a PMEL hydrostatic cutter.

Operations will commence much the same way as the previous mooring- with the ship conducting a drift study, and then small boating operations. Once the buoy, prawler, and wire rope are on deck, the mooring will need to be pulled taut which will require hauling in another 300 meters of nylon before

attaching the line cutter. After the line cutter is attached, it will sink to 3700 meters (approx. 30- 45 minutes), the hydrostatic pin will release, and the line will part from the anchor.

Total recovery time is estimated between 4 and 5 hours for each mooring.

Measuring Very-Near Sea Surface Salinity in a High-Precipitation Region

The primary objective of the deployment of the very-near surface salinity sampler ('sea snake') is to make salinity measurements at a depth of 1-5cm to understand near-surface salinity structure and its influence on the calibration and validation of the NASA Aquarius salinity mission. The measurements are taken using a 1-inch vacuum-rated hose with several intake holes that is towed from a boom that is mounted either on port or starboard of the vessel. The water is pumped into a double-stage de-bubbler and analyzed in a Seabird SBE-45 thermosalinograph. The data are compared to measurements taken with the available thermosalinograph which samples at a depth of approximately 5 m. Significant differences are expected in the presence of rainstorms and have been observed during previous deployments of the instrument in the North Atlantic aboard the R/V Endeavor. The main goals are to understand the effect of freshwater lenses on the calibration and validation efforts of the Aquarius satellite mission as well as understanding the effects of freshwater lensing on surface mixing.

While the instrument has been deployed on two previous 30-day cruises in the North Atlantic, it has recently undergone a number of improvements, including a temperature/pressure transducer at the end of the hose, an enhanced de-bubbling system as well as an improved boom system which will ensure that the instrument is able to sample undisturbed water outside the bow wake of the vessel. This instrument will provide crucial observations during the upcoming multi-agency Salinity Processes in the Upper Ocean Regional Study (SPURS)-2 mission. During the SPURS-2 mission, NOAA PMEL will deploy Prowler moorings in the SPURS-2 region and the sea snake data will be used to enhance the surface measurements taken by these moorings.

Appendix D. Survey of Opportunity

NASA Maritime Aerosols Network Survey of Opportunity

Survey or Project Name

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

Points of Contact (POC)

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

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

| |
|---|
| <p>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.</p> |
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