




UNITED STATES DEPARTMENT OF COMMERCE

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

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

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

SUBJECT: Project Instruction for EX-16-04
CAPSTONE Wake Island PRIMNM

Attached is the final Project Instruction for EX-16-04, CAPSTONE Wake Island PRIMNM, which is scheduled aboard NOAA Ship *Okeanos Explorer* during the period of March 23 – April 13, 2016. Of the 22 DAS scheduled for this project, 22 days are funded by a Line Office Allocation. This project is estimated to exhibit a High Operational Tempo. Acknowledge receipt of these instructions via e-mail to ChiefOps.MOA@noaa.gov at Marine Operations Center-Atlantic.





FINAL Project Instructions

Date Submitted: March 3, 2016

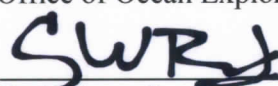
Platform: NOAA Ship *Okeanos Explorer*

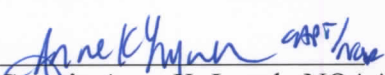
Project Number: EX-16-04

Project Title: CAPSTONE Wake Island PRIMNM (Preliminary Mapping)

Project Dates: March 23, 2016 – April 13, 2016

Prepared by: Derek Sowers
Derek Sowers, NOAA
Expedition Coordinator
Office of Ocean Exploration & Research

Approved by:  Dated: 4 Mar 2016
Craig Russell
Program Manager
Office of Ocean Exploration & Research

Approved by:  CAPT/Commanding Officer Dated: 3/14/2016
Captain Anne K. Lynch, NOAA
Commanding Officer
Marine Operations Center - Atlantic

I. Overview

A. Brief Summary and Project Period

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

This document contains project instructions for EX-16-04, with operations expected to commence on March 23, 2016 in Kwajalein Atoll in the Marshall Islands and conclude on April 13, 2016 in Guam. EX-16-04 is an exploratory mapping expedition, and is part of the multi-year Campaign to Address Pacific monument Science, Technology, and Ocean NEeds (CAPSTONE). NOAA priorities for the CAPSTONE campaign include a combination of science, education, outreach, and open data objectives that will support management decisions at multiple levels.

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

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

Originally created by Presidential Proclamation 8336 of January 6, 2009, Pacific Remote Islands Marine National Monument (PRIMNM) boundaries were expanded by Presidential Proclamation 9173, dated September 29, 2014. The expansion includes waters adjacent to Jarvis and Wake Islands, and Johnston Atoll. EX-16-04 focuses on ocean mapping of the Wake Island unit of PRIMNM for exploratory baseline characterization. Wake Island is the northernmost atoll in the Marshall Islands geological ridge, and according to the US Fish & Wildlife Service, is perhaps the oldest living atoll in the world. The Wake Island Unit of PRIMNM contains 406,307 km² of ocean area within the US Exclusive Economic Zone. Very little multibeam data exists in this region, and this cruise will therefore be the most

ambitious effort to date to explore this very large US marine protected area.

Multibeam and singlebeam mapping operations will be conducted 24 hours a day throughout the cruise. Sub-bottom profile mapping will be conducted 24 hours a day at the discretion of the CO. XBT and/or UnderwayCTD (UCTD) sound velocity casts in support of multibeam sonar mapping operations will be conducted at an interval defined by prevailing oceanographic conditions, but not to exceed 6 hours. All multibeam data will be fully processed according to standard onboard procedures and will be archived with the National Center for Environmental Information (NCEI). Split-beam EK60 data will be archived at the National Oceanographic Data Center.

The total transit between Kwajalein and Guam is estimated to be approximately 1,740 nm long, not including survey lines conducted in mapping focus areas within Wake PRIMNM. Average transit speeds of 8.5-9.5 knots are required to collect good quality multibeam data during the expedition.

B. Days at Sea (DAS)

Of the 22 DAS scheduled for this project, 22 DAS are funded by a Line Office Allocation. This project is estimated to exhibit a Medium Operational Tempo.

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

The operating area encompasses a large region of the Pacific Ocean between Kwajalein in the Marshall Islands and Guam (Figure 1). The focus of the expedition will be survey mapping in the Wake Island Unit of PRIMNM, with transit mapping between the departure and arrival ports designed to opportunistically map over numerous seamounts. The white boxes shown indicate the highest priority regions within the Wake Atoll Unit of PRIMNM to conduct survey mapping operations. The exact survey areas and survey ship track lines will be determined during the expedition based on weather conditions and additional input from scientists and agency managers.

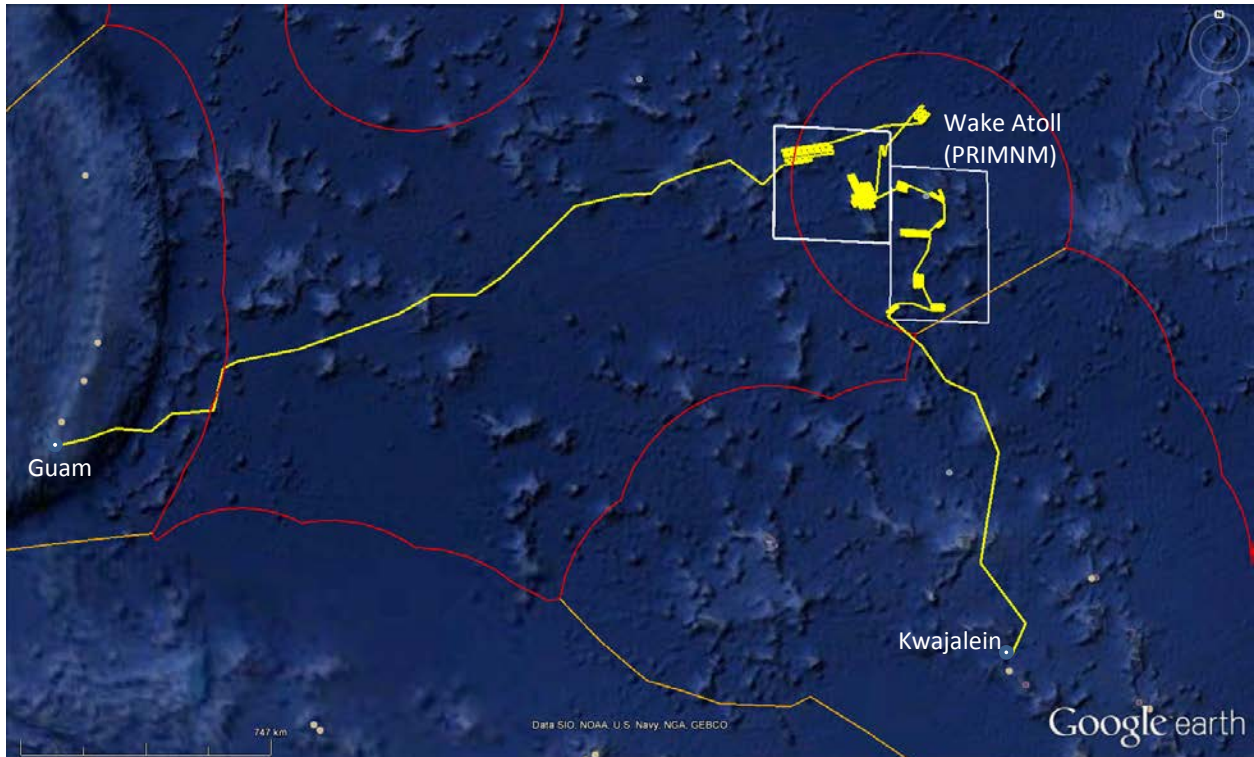


Figure 1: EX-16-04 operating area. The yellow line indicates the approximate ship trackline for the expedition, including the transits to and from the main working grounds near Wake Atoll. White boxes indicate the highest priority regions within the Wake Atoll Unit of PRIMNM to conduct survey mapping operations. The red lines show the approximate location of the US EEZ boundaries. Map made with Google Earth Pro.

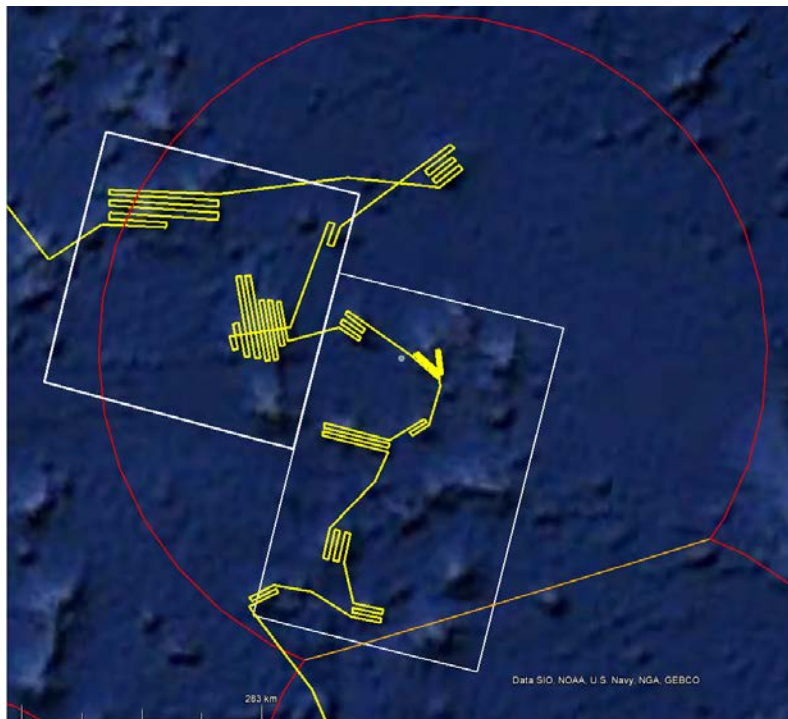


Figure 2. Draft survey mapping strategy to cover high priority seamount features and the area just south of Wake Atoll. This expedition will focus on seamounts in the western half of Wake Atoll PRIMNM. Exact survey lines to be determined in the field.

Table 1: Approximate transit waypoints (degrees decimal minutes) for transit from Kwajalein to Wake Island Unit of PRIMNM.

Waypoint #	Latitude (North)	Longitude (East)	Description
1	8 42.18	167 49.83	Start transit from Kwajalein
2	9 22.77	168 10.60	Transit, seamount mapping
3	10 49.25	167 7.36	Transit, seamount mapping
4	13 17.26	167 41.39	Transit, seamount mapping
5	14 37.49	167 12.59	Transit, seamount mapping
6	14 58.07	166 29.22	Transit, seamount mapping
7	15 45.34	165 58.15	Transit, seamount mapping
8	16 27.87	165 11.05	Arrive to Wake Unit, PRIMNM

Table 2: Approximate transit waypoints (degrees decimal minutes) for transit from Wake Atoll Unit of PRIMNM to Guam.

Waypoint #	Latitude (North)	Longitude (East)	Description
1	19 59.16	162 53.40	Start transit from Wake PRIMNM
2	19 32.23	162 22.75	Transit, seamount mapping
3	20 6.68	161 38.19	Transit, seamount mapping
4	19 52.14	160 38.36	Transit, seamount mapping
5	19 36.70	159 57.56	Transit, seamount mapping
6	19 22.33	159 42.26	Transit, seamount mapping
7	19 21.45	158 56.91	Transit, seamount mapping
8	19 7.35	157 53.67	Transit, seamount mapping
9	17 32.60	156 11.21	Transit, seamount mapping
10	17 7.30	155 32.65	Transit, seamount mapping
11	17 9.53	154 33.40	Transit, seamount mapping
12	16 43.35	153 44.19	Transit, seamount mapping
13	15 55.42	151 19.52	Transit, seamount mapping
14	15 38.36	149 48.68	Transit, seamount mapping
15	15 27.44	149 24.07	Transit, seamount mapping
16	14 29.80	149 15.77	Transit, seamount mapping
17	14 23.67	148 8.45	Transit, seamount mapping
18	13 59.12	147 37.53	Transit, seamount mapping
19	14 1.50	146 41.70	Transit, seamount mapping
20	13 44.60	145 53.47	Transit, seamount mapping
21	13 31.69	144 57.96	Arrive to Guam

As part of this expedition a High-frequency Acoustic Recording Package (HARP) buoy will be recovered, and a new HARP buoy deployed approximately four nautical miles southeast of Wake Island. HARPs are passive acoustic recorders that are moored to the ocean floor in 600-1000m of water. The Pacific Islands Fisheries Science Center's (PIFSC) Cetacean Research Program

(CRP) uses them as part of the long term monitoring to track cetacean occurrence in US waters throughout the tropical Pacific. The monitoring site at Wake Atoll has been occupied since 2010. The existing mooring will be recovered and brought on board the ship for delivery back to Honolulu at the end of the field season. A new HARP mooring will be deployed in approximately the same location as the existing instrument package. Coordinates for the HARP mooring: 19° 13.330'N, 160° 41.673'E. Additional details about this survey of opportunity can be found within Appendix 3.



Figure 3: Location of the HARP mooring relative to Wake Island within the Wake Atoll Unit of PRIMNM. Map made with Google Earth Pro.

D. Summary of Objectives

MARCH 23 – APRIL 13, 2016 (Kwajalein - Guam)

During EX-16-04 multibeam data will be collected 24 hours a day, almost entirely over previously unexplored regions. This mapping expedition will provide essential baseline mapping and reconnaissance of the region prior to EX-16-06, enabling ROV dive locations to be planned partially in advance.

The following are cruise objectives for EX-16-04:

1. Collect 24-hr/day deep water multibeam (EM 302), split-beam (EK60), and sub-bottom

- sonar data (Knudsen 3260).
- a. Conduct 24-hour mapping operations for the duration of the cruise
 - b. Collect bathymetric, seafloor backscatter, and water column backscatter data.
 - c. Sub-bottom sonar 24-hr data collection will be at the discretion of the CO.
2. Conduct emergency drills. Drills may include some or all of the following as determined by CO:
 - a. Fire/Damage Control
 - b. Abandon Ship
 - c. Man-Over-Board
 - d. Steering Casualty
 - e. Oil Spill/ Hazmat spill
 3. Data management objectives:
 - a. Ensure expected data products are transferred from the ship to the Inner Space Center at URI.
 - b. Work with Mapping Team to improve data management process documentation and SOPs as they relate to mapping products
 4. Conduct water column sound velocity profile measurements via UCTD or XBT.
 - a. Test the UCTD and refine SOP. UCTD will be the preferred method to collect sound velocity casts once the SOP is refined and personnel have been adequately trained in its use. XBT casts will be conducted as needed.
 - b. Water column sound velocity casts will be collected at regular intervals of no more than 6 hours in support of multibeam sonar operations
 - c. CTD rosette operations may be requested to obtain sound velocity profiles as a back-up for XBT and UCTD operations, and thus the CTD should be mission-ready prior to the start of the expedition. Additional sensors typically mounted on the rosette including dissolved oxygen, light scattering sensor (LSS), and altimeter should be operationally tested and ready to perform exploration activities as the need arises should water column anomalies be discovered during the cruise.
 5. Train personnel in data collection and processing procedures as needed (continuous throughout cruise).
 - a) Train Explorers-in-Training
 - b) Train EPP mapping intern
 - c) Train augmenting Survey Tech or newly hired Survey Tech
 6. Map a large section of area within the Wake Island Unit of PRIMNM. Survey mapping will focus on mapping the large seamount features within the unit. This mapping work will form a foundational basis of information on which top priority ROV dive operations can be planned for subsequent exploration expeditions.
 7. Telepresence (VSAT 4.7 mbps ship to shore; 1.54 mbps shore to ship)
 - a) Maintain single live stream video from ship to shore with a focus on the multibeam mapping display

8. The longstanding NASA marine aerosols network survey of opportunity will continue for the cruise.
9. As a partnership survey of opportunity, recover an existing High-frequency Acoustic Recording Package (HARP) mooring, and deploy new HARP mooring near Wake Island.
10. Search for Underwater Cultural Heritage (UCH) sites associated with WWII battles in the region. Specific search targets are to be determined. NOAA OER's UCH policies will be followed to guide the management of data associated with sites found intentionally or unintentionally.
11. Test new QPS Qimera software for importing, cleaning, and making products from multibeam sonar data.

E. Participating Institutions

Mississippi State University, 75 B. S. Road, MS 39762

NOAA Educational Partnership Program with Minority Serving Institutions, 1315 East-West Highway Room 10600, Silver Spring, MD 20910-6233

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

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

NOAA, National Centers for Environmental Information (NCEI), 1021 Balch Blvd, Suite 1003 Stennis Space Center, MS. 39529

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

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

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

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

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

List of Science Party personnel

Name (Last, First)	Title	Date Aboard	Date Depart	M/F	Affiliation	Nationality
Sowers, Derek	Expedition Coordinator, Mapping Lead	3/21/16	4/14/16	M	NOAA OER (ERT, Inc)	US Citizen
Freitas, Dan	Mapping Watch Leader	3/21/16	4/14/16	M	UCAR Contractor	US Citizen
Bittinger, Amanda	Mapping Watch Leader	3/21/16	4/14/16	F	UCAR Contractor	US Citizen
Caitlin Ruby	Mapping Watchstander	3/21/16	4/14/16	F	Mississippi State University	US Citizen
Calder Atta	Mapping Watchstander	3/21/16	4/14/16	M	UCAR Explorer-in- Training	US Citizen
Melissa Price	Mapping Watchstander	3/21/16	4/14/16	F	UCAR Explorer-in- Training	US Citizen
Briana Grenier	Mapping Watchstander	3/21/16	4/14/16	F	UCAR Explorer-in- Training	US Citizen
Stephanie Martinez- Rivera	Mapping Watchstander	3/21/16	4/14/16	F	Educational Partnership Program	US Citizen

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

G. Administrative

1. Points of Contacts:

Ship Operations

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

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

Mission Operations

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

CDR Mark Wetzler, NOAA
Commanding Officer
NOAA Ship *Okeanos Explorer*
Phone: (401) 378-8284
Email: CO.Explorer@noaa.gov

ENS Bryan Pestone, NOAA
Acting Operations Officer
NOAA Ship *Okeanos Explorer*
Phone: Iridium - (808) 659-9179
E-mail: Ops.Explorer@noaa.gov

Other Mission Contacts

Craig Russell
EX Program Manager
NOAA Ocean Exploration and Research
Seattle, WA 98115
Phone: [\(206\) 526-4803](tel:(206)526-4803)
Mobile:[\(206\) 518-1068](tel:(206)518-1068)
E-mail : Craig.Russell@noaa.gov

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

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

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

2. Diplomatic Clearances

Most of the expedition takes place in US and International waters. The start of the expedition is in the Republic of the Marshall Islands (RMI), and diplomatic clearance requests have been approved. The diplomatic clearance letter is attached in Appendix 4.

3. Licenses and Permits

None Required. See Appendix 2 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*):

Saturday, March 19

- Mission personnel arrive to Kwajalein, stay in military accommodations

Sunday, March 20

- Mission personnel stay in military accommodations

Monday, March 21

- Mission personnel move onto ship and get settled in state rooms after EX-16-03 mission team departs

Tuesday, March 22

- Mission orientation and safety talk
- Pre-project meeting with Expedition Coordinator, CO, OPS

Wednesday, March 23

- Depart Kwajalein pier site early morning, start expedition
- Begin transit to Wake Atoll Unit of PRIMNM

Thursday, March 24

- Transit to Wake mapping seamounts along the way

Friday, March 25

- Transit to Wake mapping seamounts along the way, arrive to Wake Atoll Unit of PRIMNM and begin focused survey operations

Saturday, March 26 – Thursday, April 7 (13 days)

- Surveying in Wake Atoll Unit of PRIMNM
- Recover HARP mooring and deploy new HARP mooring near Wake Island
- Search for underwater cultural heritage sites while mapping

Friday, April 8 – Tuesday, April 12

- Transit from Wake to Guam
- Map seamounts along the way

Wednesday, April 13

- Arrive in port, complete mission

Thursday, April 14

- Mission personnel depart ship

Telepresence Events

There are currently no telepresence events scheduled.

In-Port Events

There are currently no in-port events scheduled.

B. Staging and Destaging:

Shipments

Send an email to *Okeanos Explorer's* Operations Officer at OPS.Explorer@noaa.gov indicating the size and number of items being shipped. All items should arrive no later than **COB March 18, 2016**.

Vessel shipping address:

Kwajalein Range Services, LLC
Shipping and Receiving
ATTN: NOAA Ship *Okeanos Explorer*/Operations Officer
993 Lagoon Rd
Kwajalein, MH 96555
(805) 355-2163

C. Operations to be conducted:

Sonar Operations

Multibeam and split-beam mapping operations will be conducted 24 hours a day throughout the cruise. Sub-bottom profile mapping will be conducted 24 hours a day at the discretion of the CO. XBT and/or UnderwayCTD sound velocity casts in support of multibeam sonar mapping operations will be conducted at an interval defined by prevailing oceanographic conditions, but not to exceed 6 hours.

ADCP sonars may be run if they do not interfere with the multibeam, or if information on currents on select features is required.

CTD Operations

CTD and UnderwayCTD casts may be requested during any day of the project. However, CTD operations are not currently anticipated to be a significant component of this expedition.

Mooring Recovery and Deployment

A HARP mooring will be recovered, and a new one deployed, approximately 4 nm southeast of Wake Island.

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, UnderwayCTD casts, and CTDs will not be conducted in very rough sea states or when there is significant risk of lightning. (2) If rough sea state is resulting in very poor data quality, sonar data may not be collected for that period of time.

III. Equipment

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

- Kongsberg Simrad EM302 Multibeam Echosounder (MBES)
- Kongsberg Simrad EK60 Deepwater Echosounders and GPTs (18, 38, 70, 120, 200 kHz)
- Knudsen Chirp 3260 Sub-bottom profiler (SBP)
- Teledyne RDI Workhorse Mariner (300 kHz) ADCP
- Teledyne RDI Ocean Surveyor (38 kHz) ADCP
- Teledyne UnderwayCTD
- LHM Sippican XBT (Deep Blue probes)
- Seabird SBE 911Plus CTD
- Seabird SBE 32 Carousel and 24 2.5 L Niskin Bottles
- Light Scattering Sensor (LSS)
- Oxidation – Reduction Potential (ORP)
- Dissolved Oxygen (DO) sensor
- Altimeter Sensor and battery pack
- CNAV GPS
- POS/MV
- Seabird SBE-45 (Micro TSG)
- Kongsberg Dynamic Positioning-1 System
- NetApps mapping storage system
- CARIS HIPS Software
- IVS Fledermaus Software
- SIS Software
- Hypack Software
- Scientific Computing System (SCS)
- ECDIS
- Met/Wx Sensor Package
- Telepresence System

- VSAT High-Speed link (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 –Sun photometer and handheld GPS required for NASA Marine Aerosols Network supplementary project.
- The HARP mooring has been loaded onboard at the start of EX-16-03.

IV. Hazardous Materials

A. Policy and Compliance

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

V. Additional Projects

A. Supplementary (“Piggyback”) Projects

During the cruise the marine aerosol layer observations will be collected for the NASA Maritime Aerosol Network (MAN). Observations will be made by mission personnel (mapping interns) with a sun photometer instrument provided by the NASA MAN program. Resulting data will be delivered to the NASA MAN primary investigator Alexander Smirnov by the expedition coordinator. All collected data will be archived and publically available at:

http://aeronet.gsfc.nasa.gov/new_web/maritime_aerosol_network.html. Equipment is stewarded by OER physical scientists. See Appendix 3 for full Survey of Opportunity Form.

As part of this expedition a High-frequency Acoustic Recording Package (HARP) buoy will be recovered, and a new HARP buoy deployed approximately four nautical miles southeast of Wake Island. Additional details about this project can be found in Section C and Appendix 3.

B. NOAA Fleet Ancillary Projects

No NOAA Fleet Ancillary Projects are planned.

VI. Disposition of Data and Reports

Disposition of data gathered aboard NOAA ships will conform to NAO 216-101 *Ocean Data Acquisitions* and NAO 212-15 *Management of Environmental Data and Information*. To guide the implementation of these NAOs, NOAA’s Environmental Data Management Committee (EDMC) provides the *NOAA Data Documentation Procedural Directive* (data documentation) and *NOAA Data Management Planning Procedural Directive* (preparation of Data Management Plans). OMAO is developing procedures

and allocating resources to manage OMAO data and Programs are encouraged to do the same for their Project data.

A. Data Classifications: *Under Development*

a. OMAO Data

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

b. Program Data

- At sea
 - Daily plans of the Day (POD)
 - Daily situation reports (SITREPS)
 - Daily summary bathymetry data files
- Post cruise
 - Refined SOPs for all pertinent operational activities
 - Assessments of all activities
- Science
 - Multibeam and XBT raw and processed data (see appendix 1 for the formal cruise data management plan)
 - EK 60 raw data
 - Knudsen 3260 sub-bottom profiler raw data
 - Mapping data report

B. Responsibilities: *Under Development*

VII. Meetings, Vessel Familiarization, and Project Evaluations

A. Pre-Project Meeting: The Expedition Coordinator and Commanding Officer will conduct a meeting of pertinent members of the scientific party and ship's crew to discuss required equipment, planned operations, concerns, and establish mitigation strategies for all concerns. This meeting shall be conducted before the beginning of the project with sufficient time to allow for preparation of the ship and project personnel. The ship's Operations Officer usually is delegated to assist the Expedition Coordinator in arranging this meeting.

B. Vessel Familiarization Meeting: The Commanding Officer is responsible for ensuring scientific personnel are familiarized with applicable sections of the standing orders and vessel protocols, e.g., meals, watches, etiquette, drills, etc. A

vessel familiarization meeting shall be conducted in the first 24 hours of the project's start and is normally presented by the ship's Operations Officer.

- C. Post-Project Meeting: The Commanding Officer is responsible for conducted a meeting no earlier than 24 hrs before or 7 days after the completion of a project to discuss the overall success and short comings of the project. Concerns regarding safety, efficiency, and suggestions for future improvements shall be discussed and mitigations for future projects will be documented for future use. This meeting shall be attended by the ship's officers, applicable crew, the Expedition Coordinator, and members of the scientific party and is normally arranged by the Operations Officer and Expedition Coordinator.
- D. Project Evaluation Report: Within seven days of the completion of the project, a Customer Satisfaction Survey is to be completed by the Expedition Coordinator. The form is available at <http://www.oma.noaa.gov/fleeteval.html> and provides a "Submit" button at the end of the form. Submitted form data is deposited into a spreadsheet used by OMAO management to analyze the information. Though the complete form is not shared with the ships', specific concerns and praises are followed up on while not divulging the identity of the evaluator.

VIII. Miscellaneous

A. Meals and Berthing

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

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

and the storage areas utilized by the scientific party, both during the project and at its conclusion prior to departing the ship.

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

All persons boarding NOAA vessels give implied consent to comply with all safety and security policies and regulations which are administered by the Commanding Officer. All spaces and equipment on the vessel are subject to inspection or search at any time. All personnel must comply with OMAO's Drug and Alcohol Policy dated May 17, 2000 which forbids the possession and/or use of illegal drugs and alcohol aboard NOAA Vessels.

B. Medical Forms and Emergency Contacts

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

All NHSQs submitted after March 1, 2014, must be accompanied by [NOAA Form \(NF\) 57-10-02](#)- Tuberculosis Screening Document in compliance with [OMAO Policy 1008](#) (Tuberculosis Protection Program).

The completed forms should be sent to the Regional Director of Health Services at the applicable Marine Operations Center. The NHSQ and Tuberculosis Screening Document should reach the Health Services Office no later than 4 weeks prior to the start of the project to allow time for the participant to obtain and submit additional information should health services require it, before clearance to sail can be granted. Please contact MOC Health Services with any questions regarding eligibility or completion of either form. Ensure to fully complete each form and indicate the ship or ships the participant will be sailing on. The participant will receive an email notice when medically cleared to sail if a legible email address is provided on the NHSQ.

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

The only secure email process approved by NOAA is [Accellion Secure File Transfer](#) which requires the sender to setup an account. [Accellion's Web Users Guide](#) is a valuable aid in using this service, however to reduce cost the DOC contract doesn't provide for automatically issuing full functioning accounts. To receive access to a "Send Tab", after your Accellion account has been established send an email from the associated email account to accellionAlerts@doc.gov requesting access to the "Send Tab" function. They will notify you via email usually within 1 business day of your approval. The "Send Tab" function will be accessible for 30 days.

Contact information:

Regional Director of Health Services
Marine Operations Center – Atlantic
439 W. York Street
Norfolk, VA 23510
Telephone 757-441-6320
Fax 757-441-3760
Email: MOA.Health.Services@noaa.gov

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

https://docs.google.com/a/noaa.gov/forms/d/1pcoSgPluUVxaY64CM1hJ7511iYirTk48G-lv37Am_k/viewform

C. Shipboard Safety

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

Wearing open-toed footwear or shoes that do not completely enclose the foot (such as sandals or clogs) outside of private berthing areas is not permitted. At the discretion of the ship CO, safety shoes (i.e. steel or composite toe protection) may be required to participate in any work dealing with suspended loads, including CTD deployment and recovery. The ship does not provide safety-toed shoes/boots. The ship's Operations Officer should be consulted by the Expedition Coordinator to ensure members of the scientific party report aboard with the proper attire.

D. Communications

A progress report on operations prepared by the Expedition Coordinator may be relayed to the program office. Sometimes it is necessary for the Expedition Coordinator to

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

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

Important Telephone and Facsimile Numbers and E-mail Addresses

Ocean Exploration and Research (OER):

Phone: (301) 734-1010

Fax: (301) 713-4252

University of New Hampshire, Center for Coastal and Ocean Mapping

Phone: (603) 862-3438

Fax: (603) 862-0839

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

Okeanos Explorer Cellular: (401) 713-4114

Okeanos Explorer Iridium: (808) 659-9179

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

EX INMARSAT B

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

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

Voice Over IP (VoIP) Phone:

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

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

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

E. IT Security

Any computer that will be hooked into the ship's network must comply with the *OMAO Fleet IT Security Policy* 1.1 (November 4, 2005) prior to establishing a direct connection to the NOAA WAN. Requirements include, but are not limited to:

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

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

Non-NOAA personnel using the ship's computers or connecting their own computers to the ship's network must complete NOAA's IT Security Awareness Course within 3 days of embarking.

F. Foreign National Guests Access to OMAO Facilities and Platforms

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

Full compliance with NAO 207-12 is required.

Responsibilities of the Expedition Coordinator:

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

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

Responsibilities of the Commanding Officer:

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

Responsibilities of the Foreign National Sponsor:

1. Export Control - The foreign national's sponsor is responsible for obtaining any required export licenses and complying with any conditions of those licenses prior to the foreign national being provided access to the controlled technology onboard regardless of the technology's ownership.
2. The DSN of the foreign national shall assign an on-board Program individual, who will be responsible for the foreign national while on board. The identified individual must be a U.S. citizen and a NOAA or DOC employee. According to DOC/OSY, this requirement cannot be altered.
3. Ensure completion and submission of Appendix C (Certification of Conditions and Responsibilities for a Foreign National

VIII. Appendices

Appendix 1. Data Management Plan

Data Management Plan

Okeanos Explorer (EX1604): CAPSTONE Wake Island
PRIMNM (Preliminary Mapping)



OER Data Management Objectives

There will be no onboard data manager for this mission. This mission will rely on the onboard data managers for EX1603 to prepare the data environment for the this mission prior to disembarking. The data management stewardship team will rely on automated routines and standard operating procedures to ensure that data from this mission will be successfully received for post-processing.

03-Mar-16

Page 1

1. General Description of Data to be Managed

1.1 Name and Purpose of the Data Collection Project

Okeanos Explorer (EX1604): CAPSTONE Wake Island PRIMNM (Preliminary Mapping)

1.2 Summary description of the data to be collected.

Multibeam and singlebeam mapping operations will be conducted 24 hours a day throughout the cruise. Sub-bottom profile mapping will be conducted 24 hours a day at the discretion of the CO. XBT and/or UnderwayCTD (UCTD) sound velocity casts in support of multibeam sonar mapping operations will be conducted at an interval defined by prevailing oceanographic conditions, but not to exceed 6 hours. All data will be fully processed according to standard onboard procedures and will be archived with the NOAA National Centers for Environmental Information.

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

transformational research, undersea, underwater, Wake Atoll, Wake Island, water column backscatter, CAPSTONE, Central Pacific Seamounts, Davisville, deep sea corals, deep sea minerals, expedition, exploration, explorer, Guam, Kwajalein, mapping survey, marine education, marine sanctuary, multibeam, multibeam backscatter, multibeam sonar, multi-beam sonar, noaa, noaa fleet, ocean, ocean discovery, ocean education, ocean exploration, ocean exploration and research, ocean literacy, ocean research, oceans, OER, okeanos, okeanos explorer, PCZ, plate tectonics, Prime Crust Zone, PRIMNM, R337, rare earth elements, rare metals, Rhode Island, science, scientific computing system, scientific mission, scientific research, SCS, sea, seamounts, single beam sonar, singlebeam sonar, single-beam sonar, sponge community, stewardship, sub-bottom profile, subduction zone, systematic exploration, technology

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

Okeanos Mapping Cruises

1.5 Planned or actual temporal coverage of the data.

Dates: 3/23/2016 to 4/13/2016

1.6 Planned or actual geographic coverage of the data.

Latitude Boundaries: 8.7 to 20.12

Longitude Boundaries: 144.97 to 167.8

Okeanos Explorer (EX1604): CAPSTONE Wake Island PRIMNM (Preliminary Mapping)

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

Bottom Backscatter, Cruise Plan, Cruise Summary, CTD (processed), CTD (raw), Data Management Plan, EK60 [Singlebeam](#) Data, Highlight Images, Mapping Summary, Multibeam (image), Multibeam (processed), Multibeam (product), Multibeam (raw), [NetCDF](#), Quick Look Report, SCS Output (native), Sub-Bottom Profile data, Temperature data, Water Column Backscatter, XBT (raw)

1.8 What platforms will be employed during this mission?

NOAA Ship Okeanos Explorer

2. Point of Contact for this Data Producing Project

Overall POC: Derek Sowers, Physical Scientist, NOAA Office of Ocean Exploration and Research, Derek.Sowers@noaa.gov
 Title: Mapping Lead
 Affiliation/Dept: NOAA/OAR/OER
 E-Mail: derek.sowers@noaa.gov
 Phone: 6038620369

3. Point of Contact for Managing the Data

Data POC Name: Susan Gottfried (data stewardship), Andrew O'Brien ([shoreside](#) data manager)
 Title: OER EX Data Management
 E-Mail: susan.gottfried@noaa.gov, andrew.parson.obrien@gmail.com

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 NetCDF3 format to NCEI-MD; multibeam data and metadata will be compressed and delivered in a [bagit](#) format to NCEI-CO

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

Okeanos Explorer (EX1604): CAPSTONE Wake Island PRIMNM (Preliminary Mapping)

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 and published in an OER catalog and Web Accessible Folder (WAF) hosted at NCEI-MS for public discovery and access. The record will be harvested by data.gov.

URL: <https://www.ncddc.noaa.gov/oer-waf/ISO/Resolved/2016/>

Meta Std: ISO 19115-2 Geographic Information with Extensions for Imagery and Gridded Data will be the metadata standard employed; a NetCDF3 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 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.

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

Org: National Centers for Environmental Information

URL: www.ncei.noaa.gov

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

Hold Time: Data are made publicly accessible as soon as possible after the 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 Centers for Environmental Information. Refer to the Okeanos Explorer FY16 Data Management Plan at NOAA's EDMC DMP Repository (EX_FY16_DMP_Final.pdf) for detailed descriptions of the processes, procedures, and partners involved in this collaborative effort.

8.2 If no archive planned, why?

Okeanos Explorer (EX1604): CAPSTONE Wake Island PRIMNM (Preliminary Mapping)

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

30-60 days from cruise end

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

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

8.5 Prepare a Data Use Statement

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

Appendix 2. Categorical Exclusion



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

March 4, 2016

MEMORANDUM FOR: The Record

MCDONOUGHJ
OHN.J.III.136583
6678

digitally signed by
MCDONOUGHJ.III.136583
DN: cn=John J. McDonough, ou=OER,
ou=NOAA, ou=DOT, o=NOAA,
c=US
Date: 2016.03.04 15:26:11 -0500

FROM: John J. McDonough, Deputy Director
Office of Ocean Exploration & Research (OER)

SUBJECT: NEPA Categorical Exclusion for NOAA Ship *Okeanos Explorer*
Cruise EX-16-04

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 NOAA Ship *Okeanos Explorer's* scientific sensors possible effect on the human environment.

Description of the Project

This project is part of the NOAA Office of Ocean Exploration and Research's "Science Program" and entails ocean mapping activities and water column profiling using CTD, XBT, and Underway CTD casts designed to increase knowledge of the marine environment. This Categorical Exclusion addresses NOAA Ship *Okeanos Explorer* cruise EX-16-04 "CAPSTONE Wake Island PRIMNM (Preliminary Mapping)" led by Derek Sowers, Expedition Coordinator for NOAA OER.

This cruise will be conducted from March 23, 2016 to April 13, 2016. This is an exploratory mapping expedition departing from Kwajalein Atoll in the Marshall Islands, conducting focused ocean mapping operations within the Wake Island Unit of the Pacific Remote Islands Marine National Monument (PRIMNM), and returning to port in Guam. This expedition is part of the multi-year Campaign to Address Pacific monument Science, Technology, and Ocean Needs (CAPSTONE). NOAA priorities for the CAPSTONE campaign include a combination of science, education, outreach, and open data objectives that will support management decisions at multiple levels. Originally created by Presidential Proclamation 8336 of January 6, 2009, PRIMNM boundaries were expanded by Presidential Proclamation 9173, dated September 29, 2014. EX-16-04 focuses on ocean mapping of the Wake Island unit of PRIMNM for exploratory baseline characterization. The Wake Island Unit of PRIMNM contains 406,307 km² of ocean area within the US Exclusive Economic Zone. Very little multibeam sonar data exists in this region, and this cruise will therefore be the most ambitious effort to date to explore this very large US marine protected area.

NOAA Ship *Okeanos Explorer* will conduct sonar mapping operations at all times during the cruise. The Kongsberg EM 302 multibeam sonar (30 kHz), Kongsberg EK 60 singlebeam sonars (18, 38, 70, 120, 200 kHz), Knudsen 3260 Sub-Bottom Profiler sonar (3.5 kHz), and Teledyne RDI Workhorse Mariner (300 kHz) and an Ocean Surveyor (38 kHz) Acoustic Doppler Current Profilers (ADCPs) will be operated during the project. Additionally, expendable

bathymographs (XBTs), UnderwayCTD casts, and CTD rosette casts will be conducted in conjunction with multibeam data collection. Mapping operations will be conducted nearly continuously throughout the cruise, weather permitting.

Mapping Methods

The acquisition of high-resolution seafloor mapping data is an essential precursor to making significant biological, geological, archaeological and oceanographic discoveries. The *Okeanos Explorer* cruise will collect seafloor mapping data to supplement previous multibeam mapping in the region. NOAA Ship *Okeanos Explorer* can run several scientific sonars simultaneously without interference: the 30 kHz EM 302 multibeam, EK60 split-beam sonars (18, 70, 120, 200 kHz frequencies), and the 3.5 kHz sub-bottom profiler (Knudsen Chirp 3260). Sonar operations with all of these systems running simultaneously are planned to occur continuously throughout the day and night during the cruise except right when leaving and entering ports. Expendable bathymographs (XBTs) will be deployed at regular intervals in association with multibeam data collection. All of these systems are routinely used by this exploration vessel.

Bridge Officers and Watch Standers will be on watch during all hours and will look for marine mammals and other observable species potentially sensitive to the sound of the sonars. If cetaceans are sighted, knowledgeable personnel will follow established best management practices to minimize disturbance. If cetacean species are present within 400 m of the ship, the vessel will stop until the animals depart the area.

Multibeam

Multibeam sonar data will produce high-resolution bathymetry and acoustic backscatter maps. These maps will provide critical baseline information about the seafloor and water column within the poorly mapped Wake Island Unit of PRIMNM as well as transit areas that have never been previously mapped with multibeam sonar. The data collected will help scientists better understand the marine geology and habitat characteristics of this region of the ocean, allowing for improved prioritization of future exploration and research. Mapping work completed on this expedition will be used to identify top priority ROV dive locations planned for EX-16-06 later in 2016.

Expendable bathymographs (XBT):

XBTs are deployed to obtain sound velocity profiles. The profiles are required to calibrate the multibeam system and ensure accurate bathymetric mapping. Water column sound velocity profiles are required every 4-6 hours and will be conducted using either XBTs or the UnderwayCTD. The very fine wire connecting the XBT probe to the ship is extremely easy to break by hand once the probe reaches maximum depth. The low tensile strength of the wire should represent a minimal entanglement risk for marine animals. The expended materials are unlikely to result either in any significant environmental impacts to the sea floor or in a significant degradation of marine water quality. Over a period of years, these materials would degrade, corrode, and become incorporated into the sediments.

UnderwayCTD

The UnderwayCTD is a piece of equipment used to gather conductivity/temperature/depth (CTD) measurements or sound velocity measurements while the ship is moving. The ship currently obtains sound velocity profiles using expendable probes (XBTs). OER is installing the

UnderwayCTD in order to minimize the use of XBTs while still gathering essential sound velocity profile data needed in order to accurately collect high quality multibeam sonar data. The UnderwayCTD was installed on the ship in February 2016 and will be further tested and utilized on this cruise. When working correctly, UnderwayCTD casts will be used instead of XBTs to obtain water column profile data.

Split Beam Sonars:

Kongsberg EK 60 split-beam sonars are used to collect information about the water column, such as at gas plume or seep sites, and to obtain information about biomass. The EK60 split-beam sonar is used as a quantitative scientific echosounder to identify water column acoustic reflectors - typically biological scattering layers, fish, or gas bubbles - providing additional information about water column characteristics and anomalies. Fishery scientists have developed methods to analyze EK60 data to support fish stock assessment (e.g. Atlantic herring, pollock, capelin) and to predict hot spots of large fish in coral reefs. Split-beam sonars are also being used to help develop "acoustic signatures" of different marine species, which will greatly enhance existing efforts to assess abundance, distribution, and behavior using remote sensing methods. Additionally, split beam sonars are being used to estimate gaseous seep flux rates and improve assessments of their contribution to ocean and atmospheric chemistry. The *Okeanos Explorer* has five operational EK60 transducers at the following frequencies: 18 kHz, 38 kHz, 70 kHz, 120 kHz, and 200 kHz. One or more of these sonars will be operated during the majority of the cruise.

Sub Bottom Profiler:

The primary purpose of the Knudsen Chirp 3260 (3.5 kHz) sonar is to provide echogram images of surficial geological sediment layers underneath the seafloor to a maximum depth of about 80 meters below the seafloor. The Sub Bottom Profiler is normally operated to provide information about the sedimentary features and the bottom topography that is simultaneously being mapped by the multibeam sonar. The data generated by this sonar is fundamental in helping geologists interpret the shallow geology of the seafloor.

CTD Operations

The CTD instrument package does not emit an acoustic signal and is used to obtain conductivity, temperature, depth and other oceanographic data (dissolved oxygen, light scattering, oxygen reduction potential). CTD casts are not currently planned as part of this cruise, but may be collected if requested by shore-side scientists. The CTD would not touch the seafloor and would have limited time and presence in the marine environment.

Effects of the Project

The methods used to map the ocean during this cruise are used routinely by NOAA and UNOLS research vessels and are non-destructive in nature. 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 expedition will provide data and information on poorly understood deep water features contained within both the U.S. Exclusive Economic Zone (EEZ) and in international waters. This work will provide essential information for further research, exploration, conservation and

management of marine habitats. Providing the United States with scientifically credible and quality-controlled oceanographic data is a key benefit that will result from the cruise.

A small portion of the cruise (1-2 days) will occur within a geographic area with unique characteristics, since we will be mapping close to Wake Island where historically important WWII battles between the US and Japan occurred. If underwater cultural heritage sites are identified, it will only be via the use of acoustic remote sensing with no physical disturbance of the sites. Understanding the location and potential condition of historically significant wrecks in this area would enable NOAA and USFWS to make informed and appropriate management decisions regarding these resources. The potential initial discovery and characterization undertaken by this project will not pose the possibility of significant impact and, hence, do not warrant preparation of an EA or EIS as prescribed in NAO 216.6 Section 5.05c.

A High-frequency Acoustic Recording Package (HARP) buoy will be recovered, and a new HARP buoy deployed approximately four nautical miles southeast of Wake Island. HARPs are passive acoustic recorders that are moored to the ocean floor in 600-1000m of water. The Pacific Islands Fisheries Science Center's (PIFSC) Cetacean Research Program (CRP) uses them as part of the long term monitoring to track cetacean occurrence in US waters throughout the tropical Pacific. The monitoring site at Wake Atoll has been occupied since 2010. A weight at the end of the buoy is the only part of the mooring that touches the seafloor and it has a small footprint. This instrument package is essential in order to help NOAA better understand cetacean populations within this important US marine protected area. This is a passive listening device and does not emit acoustic signals.

Categorical Exclusion

This project, given its limited size, scope, magnitude and focus on mapping, is in alignment with the list of activities described in NOAA Administrative Order Series 216-6, May 20, 1999 (NAO) Section 6.03c.3(a)&(d). These listed activities do not normally have the potential for significant impact on the environment and, therefore, are excluded from preparation of an environmental assessment or environmental impact statement:

6.03c.3(a) Research Programs. Programs or projects, of limited size and magnitude or with only short-term effects on the environment and for which any cumulative effects, are negligible. Examples include natural resource inventories and environmental monitoring programs conducted with a variety of gear (satellite and ground-based sensors, fish nets, etc.) in water, air, or land environs. Such projects may be conducted in a wide geographic area without need for an environmental document provided related environmental consequences are limited or short-term.

6.03c.3(d) Administrative or Routine Program Functions. These include program planning and budgeting; strategic planning and operational planning; mapping, charting, and surveying services; ship support; ship and aircraft operations; fishery financial support services; grants for fishery data collection activities; basic and applied research and research grants, except as provided in Section 6.03b of this Order; enforcement operations; basic environmental services and monitoring; environmental satellite services; environmental data and information services; executive direction; and administrative services.

The project also does not trigger most of the extraordinary circumstances listed in Section 5.05c of the NAO and described below:

- The activity is the subject of controversy based on potential environmental consequences.
- The activity poses uncertain environmental impacts or unique or unknown risks.
- The activity establishes a precedent or decision in principle about future proposals.
- The activity may result in cumulatively significant impacts.
- The activity may have adverse effects upon endangered or threatened species and/or their habitats.

Although a segment of the proposed survey (1-2 days) will occur within a geographic area with unique characteristics, since we will be mapping close to Wake Island where historically important WWII battles between the US and Japan occurred. If underwater cultural heritage sites are identified, it will only be via the use of acoustic remote sensing with no physical disturbance of the sites. Understanding the location and potential condition of historically significant wrecks in this area would enable NOAA and USFWS to make informed and appropriate management decisions regarding these resources. The potential initial discovery and characterization undertaken by this project will not pose the possibility of significant impact and, hence, do not warrant preparation of an EA or EIS as prescribed in NAO 216.6 Section 5.05c.

As such, this project is categorically excluded from the need to prepare a full-scale NEPA environmental assessment. In sum, this project will not result in any lasting changes to the environment. It will have, at most, short-term environmental effects for which any direct or cumulative consequences are negligible and requires no further evaluation pursuant to NEPA.

In fact, the potential gains or beneficial effects of this project are likely to outweigh any potential adverse effects. The high-resolution seafloor maps to be produced will provide a valuable guide for planning future exploration and research expeditions. They will undoubtedly embellish the archive of understanding that we have about the Central Pacific. All collected data will be available in NOAA's public data archives within 30 days of the conclusion of the cruise and will be accessible via the NOAA Office of Ocean Exploration (OER) and Research's Digital Atlas and NOAA's National Geophysical Data Center.

Appendix 3. Surveys of Opportunity

NASA Maritime Aerosols Network Survey of Opportunity

Survey or Project Name

Maritime Aerosol Network

Points of Contact (POC): Dr. Alexander Smirnov

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

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

High-frequency Acoustic Recording Package (HARP) Survey of Opportunity

Survey or Project Name

High-frequency Acoustic Recording Package (HARP)

Points of Contact (POC)

Erik Norris: erik.norris@noaa.gov
Erin Oleson: erin.oleson@noaa.gov

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

HARPs are passive acoustic recorders that are moored to the ocean floor in 600-1000m of water. The Pacific Islands Fisheries Science Center's (PIFSC) Cetacean Research Program (CRP) uses them as part of the long term monitoring to track cetacean occurrence in US waters throughout the tropical Pacific. The monitoring site at Wake Atoll has been occupied since 2010. It is CRP's goal to recover the HARP at Wake Atoll and deploy another HARP to continue monitoring and data collection. If it this action is not performed with the EX it will likely not happen until 2017 when the Hi'ialakai passes Wake enroute to Guam and CNMI.

List of Participating Organizations

NOAA
NMFS
PIFSC
PSD (Protected Species Division)
CRP

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

It will likely require 4 hours for the HARP recovery and subsequent deployment. It is possible for recovery and deployment of HARPs to be performed by the ship or from small boats. Small boats have been launched from other NOAA vessels to handle HARP evolutions, so the ship can continue with its project with minimal interruption.

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

HARP location:
19-13.330 N, 166-41.673 E

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

HARPs do not have strobes or trackers on them, therefore recovery must be done during daylight hours.

Procedures (e.g. deployment & recovery of instrument, required ship speed, instrument max depth, etc.)

Recovery

The recovery vessel will need to be stationary or all stop. Lower the EdgeTech transducer into the water and use codes (to be provided later) to enable and send the release command to the acoustic release. When the acoustic release replies, indicating that it has released the anchor, use the range function to monitor the HARP's progress to the surface. It takes 20-30 minutes for the HARP to reach the surface. Once at the surface, look for yellow hardhat floats, approach the HARP and it is typical for the ship to use a crane to haul it aboard.

Deployment

Double check location, depth, and bathymetry. A location will be provided, roughly in the same location as the previous one. The HARP shall be deployed in less than 1000m of water. Additionally, make sure that the desired location and depth will not put the HARP on a steep slope or near a ledge. It is possible for the HARP to slide down a slope or miss a ledge and end up at a greater depth that may result in the destruction or loss of equipment. Once it is determined that location is appropriate, it is typical for the vessel to string out the upper portion of the HARP while holding onto the anchor. Then when ready the anchor is released.

It is recognized that each vessel is different. Therefore, it is best that exact procedures for recovery and deployment be discussed amongst the crew involved ahead of time. Detailed instructions on use of the acoustic release transponder and recommended order of operation for deployment will be provided.

Sample Daily Operations Schedule (e.g. deployments per day, time per deployment, data recorded, etc.)

This is not a daily operation.

Equipment/Systems Needed

<input type="checkbox"/> Dynamic Positioning <input type="checkbox"/> A-Frame <input type="checkbox"/> J-Frame <input type="checkbox"/> Multibeam (EM302) <input type="checkbox"/> EK60 (ES18) <input type="checkbox"/> Sub-Bottom Profiler (Chirp 3260) <input type="checkbox"/> Seawater flow-through system <input type="checkbox"/> CTD Rosette <input type="checkbox"/> XBT launcher <input type="checkbox"/> SCS Outputs	<input type="checkbox"/> Telepresence <input type="checkbox"/> ROV <input type="checkbox"/> Sled <input type="checkbox"/> Hazardous Storage Describe: <input checked="" type="checkbox"/> Other ship's equipment(s): Ship's crane
---	--

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

An EdgeTech transducer will be provided in order to ping acoustic releases.

Lead Time and Long Lead Time Items (*e.g., permits, foreign nationals participation, etc*)

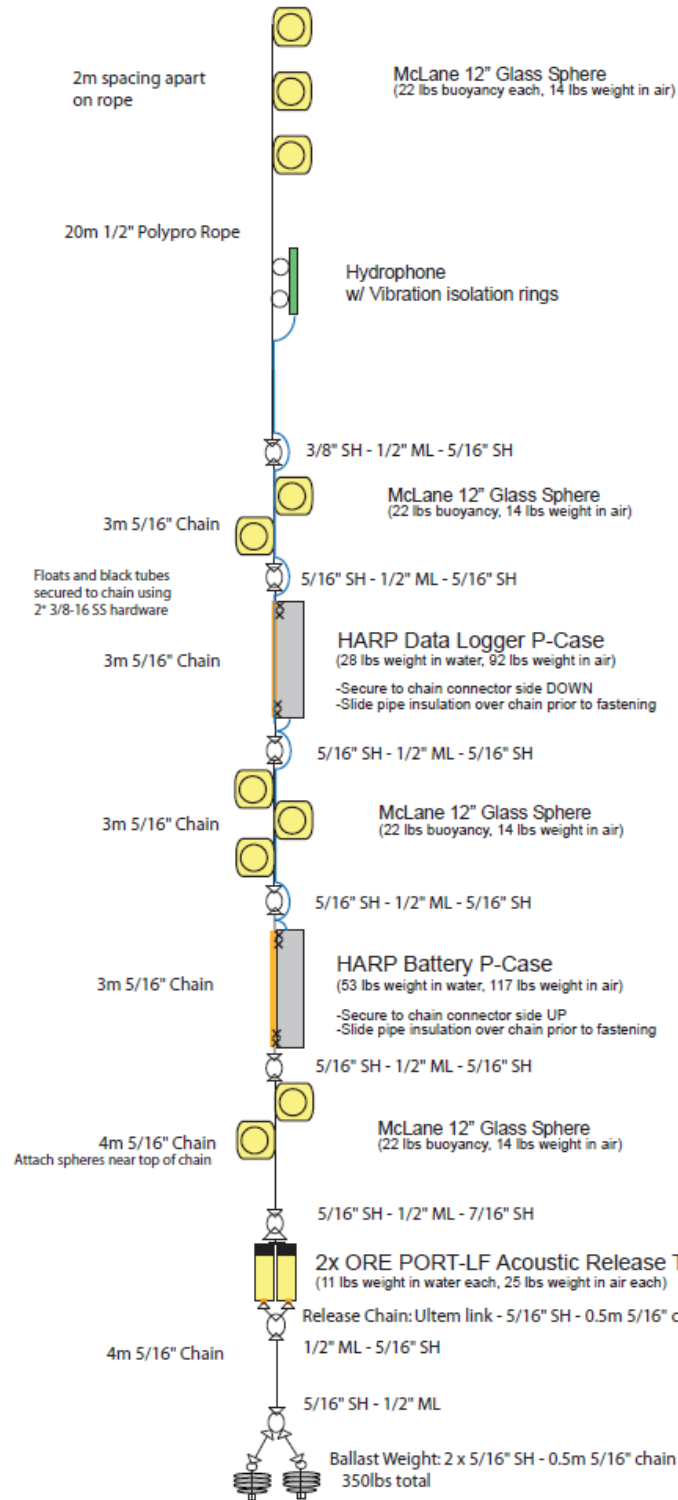
N/A

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

N/A

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

We request that the ship provide the coordinates when the new HARP is deployed.



HARP Small Mooring Configuration
 Drawing not to scale
 100107cjj

Mooring length: ~40 m, ~130 ft

Buoyancy above anchor:
 10x 12" floats (22lbs buoyancy each) = +220 lbs
 Chain (1.03 lbs/ft * ~53 ft) = ~55 lbs
 Shackles and Masterlinks = ~10 lbs
 HARP DL p-case = -28 lbs
 HARP Batt p-case = -53 lbs
 Tandem PORT releases = -22 lbs
 Total = ~+52 lbs upward

Weight of anchor (below release):
 Chain and hardware = ~20 lbs
 Ballast weight = 350 lbs
 Total weight = 370 lbs

Mooring Hardware (w/ McMaster-Carr part#):

22m	5/16" Chain - 34245T5
20m	1/2" Polypro Rope - 3837T37
21x	5/16" Shackle - 3555T47
1x	7/16" Shackle - 3555T49
1x	3/8" Shackle - 3555T48
9x	1/2" Master Link - 31195T31
22x	3/32" Dia 316SS Cotter pin, 3/4"L - 98355A070
2x	1/8" Dia 316SS Cotter pin, 1"L - 98355A140
22x	2" 3/8-16 Hex Cap Screw - 92186A632
22x	3/8-16 Nylon Insert hex locknut - 90715A145
44x	3/8" 1.25 OD Flat washer - 91525A141
6ft	Pipe Insulation - 4530K132

Ballast Weight:

14x	25lbs CAP Barbell standard plate
2x	10" 1/2-13 Eyebolt - 3016T47
6x	50lbs CAP Barbell standard plate
2x	25lbs CAP Barbell standard plate
2x	8" 1/2-13 Eyebolt - 3016T46
2x	1/2" 3.0 OD Flat washer - 91117A229
4x	1/2-13 galvanized nut - 90371A045

[8" 1/2-13 Eyebolt + 3 x 50lbs + 1 x 25lbs]
 or
 [10" 1/2-13 Eyebolt + 7 x 25lbs]

Appendix 4: Diplomatic Clearance Authorization



REPUBLIC OF THE MARSHALL ISLANDS
MINISTRY OF FOREIGN AFFAIRS
P.O. BOX 1349
MAJURO, MARSHALL ISLANDS 96960

US/98-15

The Ministry of Foreign Affairs of the Republic of the Marshall Islands presents its compliments to the Embassy of the United States of America and has the honor to make reference to U.S. **Diplomatic Note No.15-105** regarding request for an authorization for NOAA Chief of Scientist Jeremy Potter to conduct marine scientific research in area requiring the consent from the RMI Government. It is in this regard that the Ministry has the further honor to inform the Embassy that in compliance with the requirements of the MIMRA Act 1997, NOAA Research Vessel, "Okeanos Explorer", has been granted permission, on the condition that a copy of report of all data and other information from the research vessel in RMI WATERS be forwarded to the Ministry of Foreign Affairs and the Marshall Islands Resource Authority.

The Ministry has the further honor to advise that authorization is granted pursuant with the understanding that the said vessel, captain and crew will comply with all RMI laws and regulations, and in particular the Marine Water Quality (1992) regulations, Solid Waste (1989) regulations, and Toilet Facilities and Sewage Disposal (1990) regulations, copies of which are available for download at the RMI-EPA website <http://rmiepa.org>.

Furthermore, the Ministry wishes to forward herein, RMI's nominees from Marshall Islands Marine Resources Authority to participate in afore-named research.

Ms. Candice M. Guavis
Deputy Chief, Coastal Fisheries Monitoring and Compliance Unit
MIMRA
cmguavis@gmail.com

Mr. Benedict Yamamura
Coastal Fisheries Information Officer
MIMRA
Byamamura86@gmail.com

Ms. Lyla Lemari
Coastal Fisheries Research Officer
MIMRA
lylalemari@gmail.com

Phone: (692) 625-2699/2763/3012/3181 Fax: (692) 625-4979 RMI Website: <http://www.rmiembassyus.org/>

The Ministry of Foreign Affairs of the Republic of the Marshall Islands avails itself of this opportunity to renew to the Embassy of the United States of America the assurance of its highest consideration.



**Embassy of the United States of America
Majuro, REPUBLIC OF THE MARSHALL ISLANDS**

Appendix 5. ESA Section 7 Concurrence Letter



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Pacific Islands Regional Office
1845 Wasp Blvd., Bldg 176
Honolulu, Hawaii 96818
(808) 725-5000 • Fax: (808) 725-5215

Mr. John McDonough
Deputy Director
NOAA Office of Ocean Exploration and Research

Dear Mr. McDonough:

This letter responds to your January 14, 2016 Request for Consultation by the Office of Exploration and Research (OER) regarding efforts aboard the NOAA vessel *Okeanos Explorer* with the proposed action consisting of activities to explore and improve understanding of the distribution and diversity of deep water habitats in the Pacific, and in particular in the Marine National Monuments. You have requested our concurrence under Section 7 of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. §1531 et seq.), with your determination that the proposed action may affect but is not likely to adversely affect green, hawksbill, leatherback, olive ridley, and north Pacific loggerhead sea turtles; Main Hawaiian Islands false killer whale distinct population segment, humpback whales, blue whales, fin whales, sei whales, sperm whales, north Pacific right whales, the Indo-West Pacific and Central Pacific distinct population segment of the scalloped hammerhead shark, Hawaiian monk seals; and the coral species *Acropora globiceps*, *A. jacquelineae*, *A. retusa*, *A. speciosa*, *Euphyllia paradivisa*, *Isopora crateriformis*, and *Seriatopora aculeata*.

Proposed Action/Action Area: The proposed activity is more fully described in your request for consultation and the associated biological evaluation (CAPSTONE 2016). The proposed action (*Okeanos Explorer* cruises) includes the use of various ship and submersible-deployed electronic systems to collect data on the distribution and diversity of deep water habitats in the Marine National Monuments. The activity would occur during two years with up to 20 research cruises scheduled between February 2016 and December 2017. The expedition teams (26 crew and up to 20 rotating scientists and/or technicians on each cruise leg) would be authorized to conduct mapping and Remotely Operated Vehicle (ROV) surveys using the *Okeanos Explorer*'s multibeam, split beam, subbottom profiler and acoustic Doppler current profiler (ADCP) sonar systems, utilizing the ship's conductivity-temperature-depth (CTD) sampling rosette for various water measurements and deploying an ROV. No activities are scheduled to occur on land.

The suite of sonars aboard the vessel includes a Kongsberg EM302 30 kHz multibeam system, which collect bathymetry and backscatter data; several Simrad EK 60 split-beam sonars that



range from 18 to 333 kHz which are designed to gather measurements of biological and gaseous targets in the water column; and a Knudsen 3.5 kHz chirp sub-bottom profiler. The 300 kHz and 38 kHz ADCPs provide information about current velocity and direction at various depths. Sonar mapping activities will be conducted throughout the proposed action area and during transits to and from sites where operations will be conducted in an effort to fill in gaps in data knowledge and to build on data already collected. The maps generated from these activities will improve understanding of the geology and important biological habitats in the project area.

Conductivity, temperature and depth data will be collected by both an Underway CTD and a CTD rosette instrument. The CTD rosette, which is deployed while the ship is stopped and holding dynamic position, is lowered by a winch and wire to a maximum depth of 6800 m to collect water samples through 24 2.5 L niskin bottles. The CTD rosette will be deployed at select sites where ROV operations are conducted to allow for an improved understanding of the environmental conditions at that particular site. The deployment and retrieval of the CTD rosette takes up to several hours (depending on depth), while the Underway CTD can be deployed while the ship is moving, saving hours of time and fuel. The instrument is mounted on the stern railing and outfitted with a re-usable probe that is deployed and retrieved through the use of motorized spool. The Underway CTD will be used to collect water column profiles to a maximum depth of 700 m.

ROV operations will be designed to provide interdisciplinary site characterization at priority targets in and around monuments, sanctuaries and protected areas, through visual observation of priority targets while acquiring environmental data with onboard sensors. Sampling will be focused on corals and sponges, but will target specimens believed to be new species or new records for an area. No ESA-listed corals would be sampled. As many as 200 deployments of the ROV may occur during the 2016 – 17 field season resulting in 1600 hours of total dive time. The dives will better enable scientists and managers to understand the diversity and distribution of deep water habitats.

The action area covered by the accompanying biological evaluation encompasses the marine environments of Papahānaumokuākea Marine National Monument (PMNM); Oahu and the big island of Hawai'i; the area south and west of Molokai, Lana'i, and Kaho'olawe, the Geologists Seamounts located about 100 nm south of Honolulu; the Musicians Seamounts located about 150 nm NNE of Nihoa Island; all of the Pacific Remote Island Areas composing the Pacific Remote Islands Marine National Monument (PRIMNM); the Commonwealth of the Northern Marianas Islands (CNMI) and the Marianas Trench Marine National Monument (MTMNM); the vicinity of American Samoa and the National Marine Sanctuary of American Samoa (NMSAS); the Rose Atoll Marine National Monument (RAMNM); and the vessel transit areas between Honolulu, Hawai'i, Guam, Saipan, Kwajalein, Pago Pago where ESA-listed marine species or their habitats may be impacted by the proposed activities.

Species That May Be Affected: OER determined that the proposed action may affect but is not likely to adversely affect green sea turtles (*Chelonia mydas*), hawksbill sea turtles (*Eretmochelys imbricata*), North Pacific distinct population segment of loggerhead sea turtles (*Caretta caretta*),

olive ridley sea turtles (*Lepidochelys olivacea*), leatherback sea turtles (*Dermochelys coriacea*), Main Hawaiian Islands false killer whale distinct population segment (*Pseudorca crassidens*), humpback whales (*Megaptera novaeangliae*), sperm whales (*Physeter macrocephalus*), fin whales (*Balaenoptera physalus*), blue whales (*Balaenoptera musculus*), sei whales (*Balaenoptera borealis*), north pacific right whales (*Eubalaena japonica*), the Indo-West Pacific and Central Pacific distinct population segments of the scalloped hammerhead shark (*Sphyrna lewini*), Hawaiian monk seals (*Neomonachus schauinslandi*), Hawaiian monk seal critical habitat and the coral species *Acropora globiceps*, *A. jacquelineae*, *A. retusa*, *A. speciosa*, *Euphyllia paradivisa*, *Isopora crateriformis*, and *Seriatopora aculeata*. Detailed information about the biology, habitat, and conservation status of sea turtles can be found in their recovery plans and other sources at <http://www.nmfs.noaa.gov/pr/species/turtles/>. The same can be found for Hawaiian monk seals and cetaceans at <http://www.nmfs.noaa.gov/pr/species/mammals/>; and more information on listed corals can be found at http://www.fpir.noaa.gov/PRD/prd_coral.html.

Critical Habitat: The proposed action would take place within designated monk seal critical habitat. Critical habitat was designated under the ESA for the Hawaiian monk seal on April 30, 1986 and revised on May 26, 1988 (53 FR 18988) and again on August 21, 2015 (80 FR 50926). Designated critical habitat includes all beach areas, lagoon waters, and ocean waters out to a depth of 200 m around Kure Atoll; Midway Islands (except Sand Island), Pearl and Hermes Reef, Lisianski Island, Laysan Island, Gardner Pinnacles, French Frigate Shoals, Necker Island, Maro Reef, and Nihoa Island, and includes the seafloor and all subsurface waters and habitat within 10 meters of the seafloor. Around the Main Hawaiian Islands, critical habitat extends in designated areas from the beach out to the 200 meter depth contour, and includes the seafloor and subsurface waters within 10 meters of the seafloor.

Analysis of Effects: In order to determine that a proposed action is not likely to adversely affect listed species, NMFS must find that the effects of the proposed action are expected to be insignificant, discountable, or beneficial as defined in the joint USFWS-NMFS Endangered Species Consultation Handbook: (1) insignificant effects relate to the size of the impact and should never reach the scale where take occurs; (2) discountable effects are those that are extremely unlikely to occur; and (3) beneficial effects are positive effects without any adverse effects (USFWS & NMFS 1998). This standard, as well as consideration of the probable duration, frequency, and severity of potential interactions, was applied during the analysis of effects of the proposed action on ESA-listed marine species, as is described in detail in the OER consultation request. The OER determined that the risk of collisions with vessels and the risk of entanglement would be discountable; and that the risk from exposure to elevated noise level, disturbance from human activity, as well as exposure to wastes and discharges would result in insignificant effects on ESA-listed sea turtles, marine mammals, sharks and corals; and that the potential effects of the proposed action to designated or proposed critical habitat would also be insignificant.

Considering the information and assessments presented in the OER consultation request, and in the best scientific information available about the biology and expected behaviors of the ESA-listed marine species considered in this consultation; NMFS agrees that: 1) the list of ESA-listed species and critical habitats potentially exposed to the effects of the action is correct, 2) the suite

of identified stressors is comprehensive, and 3) the assessment of exposure risk and significance of exposure to those stressors is accurate. Therefore, NMFS agrees that:

- the risk of collisions with vessels for marine mammals, turtles, sharks and the listed coral species in the action area is discountable;
- the risk of entanglement with marine mammals, sea turtles and sharks is discountable; and,
- ESA-listed species in the action area are unlikely to respond to anticipated elevated noise levels, disturbance from human activity, and exposure to wastes and discharges. Further, if any response were to occur, it would be temporary in nature and never reach the scale where it would affect the individual's health, and as such, have insignificant effects.

Conclusion: NMFS concurs with your determination that conducting the proposed Okeanos Explorer cruises are not likely to adversely affect ESA-listed marine species. This concludes your consultation responsibilities under the ESA for species under NMFS's jurisdiction. However, this consultation focused solely on compliance with the ESA. Additional compliance review that may be required of NMFS for this action (such as assessing impacts on Essential Fish Habitat) would be completed by NMFS Habitat Conservation Division in separate communication, if applicable.

ESA Consultation must be reinitiated if: 1) a take occurs; 2) new information reveals effects of the action that may affect listed species or designated critical habitat in a manner or to an extent not previously considered; 3) the identified action is subsequently modified in a manner causing effects to listed species or designated critical habitat not previously considered; or 4) a new species is listed or critical habitat designated that may be affected by the identified action.

If you have further questions please contact Richard Hall on my staff at (808) 725-5018. Thank you for working with NMFS to protect our nation's living marine resources.

Sincerely,



Michael D. Tosatto
Regional Administrator

Appendix 6. NOAA OER Underwater Cultural Heritage Standard Operating Procedure

NOAA Office of Ocean Exploration
Operational Policy and Procedures for Underwater Cultural Heritage
Missions Conducted onboard the NOAA Ship *Okeanos Explorer*

IV. Purpose

The purpose of this document is to provide guidance for OER mission activities conducted aboard the NOAA Ship Okeanos Explorer, when such mission activities involve either unexpected discovery or targeted exploration of potential Underwater Cultural Heritage sites.

II. Background

Since the inception of NOAA's ocean exploration program in 2000, OER data management practices have been guided by the 2000 President's Panel Report recommendations, which prioritized rapid and unrestricted data sharing as one of five critical exploration program components. More recently Public law 111-11 [Section XII Subtitle A Part 1 Exploration] reinforced and expanded OER data management objectives, continuing to stress the importance of sharing unique exploration data and information to improve public understanding of the oceans, and for research and management purposes.

OER missions conducted aboard the NOAA Ship Okeanos Explorer offer a 'best-case' scenario for meeting Program mission objectives related to data sharing:

- Dedicated shipboard and shore-side teams work in tandem to ensure near-real time data product generation from shipboard and ROV sensors;
- Telepresence is used to share data products and information in real-time with shore-side participants and the public;
- Mission information is publically communicated in real time via Internet access to streamed video and related resources; and
- Data are managed throughout the lifecycle in accordance with all applicable policy directives and community best practices.

The nature of exploration defines the possibility of discovery, including unexpectedly exposing the location of underwater cultural resources; on some occasions, exploration targets are specifically focused on the exploration of suspected underwater cultural heritage (UCH) sites.

The need to protect the location of suspected UCH sites until they are fully understood, whether purposefully explored or fortuitously discovered, is an important statutory

responsibility. In the case of OER expeditions aboard the Okeanos Explorer, a range of operational procedures must be modified to ensure this protection occurs to the fullest extent possible. The following sections of this document define the methods for ensuring protection of these sensitive data throughout the data lifecycle.

III. Authority

- a. **Marine Archaeology:** This document is informed by: the Federal archaeology program; U.S. legislation on the treatment of cultural remains; and the UNESCO Convention for the Protection of the Underwater Cultural Heritage.

The NOAA Office of Ocean Exploration and Research (OER) supports the standards for conducting marine archaeological activities enumerated in the Annex Rules of the UNESCO Convention on the Protection of the Underwater Cultural Heritage. Preservation and protection of prehistoric and historic cultural resources is the policy of the Federal government and OER has a responsibility to consider the effects of its activities on these resources. If data is found to be sensitive because it reveals the location of a historically significant cultural resource, Section 304 of the National Historic Preservation Act provides that the head of a Federal agency or other public official shall withhold from public disclosure information about the location, character, or ownership of a historic property when disclosure may: cause a significant invasion of privacy; risk harm to the historic property; or impede the use of a traditional religious site by practitioners. This document will use the term Underwater Cultural Heritage, or UCH, to refer to historic and prehistoric traces of human existence that are totally or partially underwater.

- b. **Data Management:** Geospatial data are considered a national capital asset. National policy and international standards guide data management best practices to ensure timely and broad public accessibility to these data. Within NOAA, data management practices are informed by NOAA Administrative Order (NAO) 212-15 Management of Environmental Data and Information, which states in part:

Environmental data will be visible, accessible and independently understandable to users, except where limited by law, regulation, policy (such as those applicable to personally identifiable information or protected critical infrastructure information or proprietary trade information) or by security requirements.

Sensitive UCH data collections require special handling while determinations are made as to whether each location will be nominated and will qualify for protection under the NHPA Section 304. OER considers these data to fall within the scope of the NAO 212-15 exceptions during this period.

IV. Roles and Responsibilities

Particular to the NOAA Ship *Okeanos Explorer*, there are many methods employed to ensure rapid and broad data access. When the goal is to restrict access to precise positional information, several operational scenarios must be considered. Alternate operating procedures are then developed for:

- Real time operations:
 - Routine data transmissions and events that broadcast the ship position
 - Seafloor mapping operations and data production
 - Telepresence-enabled ROV operations
 - Video annotations and production
 - Pubic broadcast operations via website and maps
- Post-cruise data management

This table summarizes the roles and responsibilities of each Team Lead in implementing the policy through the management approaches described herein and the SOPs as defined in the Appendices.

MISSION PERSONNEL (Coordinated by: Expedition Coordinator)	
Responsible Team	Accountable for these (primary) actions
Expedition Coordinator	Notification of NDA to Mission Personnel ID , communicate and enforce UCH buffer zone Coordinate with Team leads and key personnel / ensure SOP compliance
Seafloor Mapping Team	Segregate raw and processed data into marked files so that restricted data are held separately and are clearly marked
Telepresence Team	Ensure broadcast data is free of any positional information
Video Team	Ensure UCH Dives and dive products are annotated as such; ensure all raw data and products are not geo-referenced
Data Management Team	Ensure all UCH data are appropriately segregated and documented. Follow post cruise and archive procedures as specified.
Communications Team	Ensure all communications are controlled through one primary POC; ensure communications are not geo-referenced.
<i>Okeanos Explorer</i> Operations (Coordinated by: CO or Designee)	
OMAO Operations	Notification to crew of NDA responsibilities Stop SCS events (email notifications) upon entering buffer zone; Start SCS events (email notifications) upon exiting buffer zone

V. Appendices: Standard Operating Procedures

Appendix A: MAPPING OPERATIONS

The following outlines the process for pre-cruise planning, mapping field operations, post-cruise follow up, and data archival procedures for the following scenarios:

- When UCH is unexpectedly discovered on a standard, non-UCH targeted mapping cruise
- When a cruise is specifically targeted at UCH.
- When an Isolated UCH survey is conducted as part of a broader cruise
- Large survey over UCH area with potential to contain multiple instances of UCH

A. Pre-Cruise Planning

1. Standard Mapping Pre-Cruise Planning

- a.** This section does not affect normal pre-cruise or data management processes for standard mapping cruises that are not conducting targeted UCH mapping. During pre-cruise planning the EX Cruise Coordinator is advised to consult with the OER Marine Archaeologist to discuss possible UCH targets in the mission area. The mapping team may be requested to optimize line planning as necessary to detect UCH and to process data, when possible, to a smaller non-standard grid size to create higher resolution mapping products to provide better images of potential UCH. If so, follow guidance in the UCH Mapping Pre-Cruise Planning section below.

2. UCH Mapping Pre-Cruise Planning

- a.** Background information - The EX mapping team should be supplied with information about targets in the survey area that will help in their detection and identification. This information will be supplied by OER's marine archaeologist and collaborating archaeologists.
- b.** Data processing and data products - Archaeologists involved with the survey will consult with the mapping team to discuss data processing and data products that will increase the potential to discover UCH. The cruise coordinator and mapping team lead will work with OER's marine archaeologist to coordinate this activity.
- c.** Consultation and data sensitivities - Cruise planning must also include a discussion on data sensitivity and data management/archiving. It is the appropriate time to collaborate with other Federal and state agencies that may have a legal or management

interest in potential UCH in the survey area. The risks to the resources should be weighed to inform a post-cruise decision on whether or not UCH with potential historical or cultural significance should have information about their location restricted from public release. This should be a collaborative discussion that includes OER's marine archaeologist, cruise coordinator and cruise data manager along with cultural resource managers and archaeologists from other agencies with an interest in the UCH. Agencies that may have an interest include the Office of National Marine Sanctuaries (ONMS) Maritime Heritage Program, Bureau of Ocean Energy Management, Bureau of Safety and Environmental Enforcement, U.S. Navy History and Heritage Command, National Park Service, State Historic Preservation Officers, and others. While planning expeditions in any foreign country the host government should be made aware of the potential to discover UCH.

- d.** In survey areas where an agency has responsibility for UCH, the data management team should carry out a consultation process with the agency to identify any special protocols that should be put in place to conform with the policies of the agency and these should be incorporated into the data management plan. The expedition coordinator is responsible for the overall execution of the data management plan.
- e.** On mapping missions within the National Marine Sanctuary System, pre-cruise discussions between the EX Cruise Coordinator and ONMS should include the ONMS Director of the Maritime Heritage Program (MHP) and the maritime heritage coordinator at the sanctuary site. They will help determine the sensitivity of data and data products.

B. Mapping Field Operations

1. Standard Mapping Field Operations

- a.** While standard mapping field operations are not affected by the marine archaeology SOP, any features which appear to be of cultural or historical significance, and appear anthropogenic in origin, do require special consideration. Cultural features include wrecks of ships or aircraft, the recognizable debris from wrecks, evidence of previous human settlements, or other items which may appear anthropogenic in origin and have some associated cultural or historical significance.
- b.** The EX Cruise Coordinator will consult with OER's marine archaeologist immediately on the discovery of UCH in the field. The Cruise Coordinator should provide an image and location information by email. The OER marine archaeologist may request special data products that have higher resolutions than standard data products to aid in characterizing UCH.
- c.** If UCH is determined not to be historically or culturally significant or it is determined that no harm will result by disclosing position information, no change to standard mapping field procedures is required.

- d.** If UCH is historically significant or potential to be historically significant, data and data products should be held from public release until reviewed for sensitivity as applicable under the National Historic Preservation Act and other pertinent legislation and regulations, prior to releasing data to a public archive.
- e.** The expedition coordinator is responsible for the overall execution of the data management plan.
- f.** When appropriate, OER's marine archaeologist will contact relevant entities to notify them of the discovery and consult with them regarding the significance of the UCH.

2. UCH Targeted Mapping Field Operations

- a.** No informal information about UCH should be released to the general public by the ship or personnel. This includes posting information and images on social networking sites like Facebook, Twitter or personal blogs. Mapping data will be released to the public following the normal process and announcement of discoveries will be made through the appropriate offices and public affairs officials.
- b.** A five-mile buffer zone shall be created around the UCH isolated survey box. The following steps will be taken just prior to entering the buffer zone in order to stop broadcasting the ship's location while the survey is conducted:
 - i. NOAA Shiptracker: Disable the SCS feed from the ship going to Shiptracker
 - ii. Automated Information System (AIS): NOAA requires that the AIS feed which broadcasts information about the ship, including position, course and speed, must remain on at all times for collision avoidance and other safety reasons. Although the [International Maritime Organization's](#) (IMO) Maritime Safety Committee condemns the Internet publication of AIS data, it is easily available for viewing. During the cruise planning phase the Expedition Coordinator will provide the AIS broadcast range on the EX to the chief scientist and science team. The Chief scientist, the science team, or other parties involved in a UCH mapping cruise should be made aware of this and decide whether the value of the operation merits acceptance of the potential issues/outcomes imposed.
 - iii. Telepresence Video Feeds: Do not stream any feeds that include a visible ship location, for example the multi-beam acquisition screen does not high enough resolution over the video feed to see ship position. Streams include but not limited to the SCS data screen, or any active mapping data acquisition screens, or video feeds. It is acceptable to stream video feeds that do not include the ship's location.
 - iv. The Cruise Coordinator will ensure the survey department takes steps to distinguish and separate UCH mapping data from non-UCH mapping data as

- appropriate.
- v. Raw Multibeam Data Acquisition: Raw data will be logged in the standard folder structure on the multibeam acquisition computer. Raw data will be copied into a "Restricted" folder in the RAW data network folder structure. Data acquisition and processing logs will clearly state which files are restricted.
 - vi. Multibeam Data Field Processing: Restricted files will be processed and gridded separately from other non-restricted data and will be clearly labeled as such in projects and filenames. The products will be created according to normal field quality-control procedures, but will not be sent to shore with the daily products, in order to not become publicly available via normal channels (FTP / Digital Atlas).
 - vii. Raw EK 60 and Subbottom Data Acquisition: Raw data will be logged in the standard folder structure on the acquisition computers. Raw data will be copied into a 'Restricted' folder on the RAW and CRUISE DATA data network folder structure. Data acquisition and processing logs will clearly state which files are restricted.
 - viii. Cruise Data Transfer (EX to UNH) Package: In the Cruise Data Package carried from the ship by the Mapping Team Lead, a "Restricted" top-level directory will be added in the cruise data folder. Within the "Restricted" folder the same directory structure as the unrestricted folder will be repeated (i.e. SCS, CTD, Multibeam, Imagery, etc).
 - ix. CTD and XBT operations conducted within the buffer zone do not need to be isolated from non-UCH data, or repressed from the Okeanos Atlas. CTD and XBT files should follow the normal unrestricted processing procedures and archiving.
 - x. Daily updates are normally linked to the location of the ship at the time the update is posted. If daily updates are made during UCH surveys, no position shall be provided. If a position is required, the position should be posted as it makes sense, 5 miles outside of the extent of the survey area.
- c.** Normal transmissions from the ship shall resume after the EX finishes UCH survey operations and exits the 5-mile buffer zone. **Exiting the buffer zone should occur at approximately the same location as entry to prevent obvious data location gaps pointing to UCH location.**

C. Post-Cruise Follow Up

1. Information Release

- a.** No informal information about UCH should be released to the general public by the ship or personnel. This includes posting information and images on social networking sites like Facebook or personal blogs. Mapping data will be released

to the public following the normal process and announcement of discoveries will be made through the appropriate offices and public affairs officials.

2. *Standard Mapping Cruise follow-up where UCH is discovered*

- a.** The mapping team will provide a brief summary of the survey and target that includes a description of the survey, water depth, site location, site dimensions, bottom type, and images of the target at the best available resolution.
- b.** The EX Cruise Coordinator and the OER Marine Archaeologist have an initial consultation to discuss the nature of the UCH and its potential significance. This consultation may include other agencies or entities.
- c.** If UCH is determined not to be historically significant no change to standard data management procedures is required.
- d.** If UCH has the potential for historical significance but it is determined that no harm will result by disclosing position information, such as UCH in deep water, no change to standard data management procedures is required.
- e.** If UCH has potential historical significance and disclosing information about the site poses a threat, further discussions will be held on how to minimize potential harmful impacts, including data management decisions outlined in Data Archiving section of this document. The EX cruise Coordinator, a representative from the data management team, OER's marine archaeologist, a representative from the ONMS Maritime Heritage Program, and any parties with jurisdiction, management or other legal ties to the resource shall meet to determine what measures are needed to protect the UCH while minimizing impacts on the distribution of data and data products.

3. *UCH Targeted Mapping Cruise Follow-Up*

- a.** The mapping team will create a survey report that provides technical details on the survey, data processing and data products. It should contain a list of targets that includes site location, water depth, site dimensions, bottom type/topography, and images of the target at the best available resolution. Other helpful products include SD and kmz files.
- b.** The EX cruise coordinator, OER's marine archaeologist, a representative from the ONMS Maritime Heritage Program, archaeologists involved in the survey, and any parties with jurisdiction, management or other legal ties to the resource shall meet to discuss the potential historical significance of the UCH and the sensitivities of releasing data to the public that can be protected under Section 304 of the National Historic Preservation Act.
- c.** The outcome of this meeting will determine if it is necessary to protect site location information from public release.

- d.** When data can be released
 - i.** If the findings determine that releasing information and data on UCH is not a threat, development of products and data management should follow the guidelines for a standard mapping cruise.
- e.** When data should be protected
 - i.** If it is determined that a site is or has potential to be historically significant and eligible for nomination to the National Register of Historic Places, the location and data containing the location should not be released to the public.
 - ii.** Data products that contain position information will be forwarded to the EX data management team where data and products will be stored in an archive with restricted access.
 - iii.** Cruise plans, cruise reports, situation reports, mapping summary reports and other documents that are publically available outside NOAA or freely accessible within NOAA shall not provide location information for UCH or survey areas. In certain circumstances the lead archaeologist for the cruise may request that certain UCH sites are not mentioned in the public reports.

4. UCH mapping follow-up for National Marine Sanctuaries

- a.** When the EX conducts UCH work inside a National Marine Sanctuary the EX Cruise Coordinator shall inform the OER Marine Archaeologist, ONMS Maritime Heritage Program Director, Sanctuary Superintendent and Sanctuary Maritime Heritage Coordinator on the availability of data products and initial results of the survey. ONMS shall determine the sensitivity of the data and whether or not it can be disclosed to the public. Published metadata shall indicate the point of contact to access UCH data within the NMS system is the Director of the Office of National Marine Sanctuaries.

D. Data Archiving – See Appendix C

Appendix B: TELEPRESENCE-ENABLED ROV OPERATIONS

The following outlines the process for pre-cruise planning, field operations, post-cruise follow up, and data archival procedures for the following scenarios:

- When a cruise conducts ROV operations specifically targeted at UCH.
- When UCH is unexpectedly discovered on non-archaeological operation

A. Unexpected UCH Discovery

- During the Cruise: If UCH is unexpectedly discovered during an ROV dive, the onboard Expedition Coordinator should immediately contact OER's Lead Maritime Archaeologist, and the Archaeology Doctors-on-Call identified for that expedition. Those archaeologists should be engaged in the site investigation as soon as possible to provide information to help assess the site discovered. No changes to the data, video or onboard data acquisition processes should be made. A post-dive and post-cruise discussion will be held with the OER archaeologist to determine whether any datasets should be withheld from archive. (Section 2.D.II).
- **Follow-up when UCH is unexpectedly discovered**
 - a.** The EX Cruise Coordinator and the OER Marine Archaeologist will have an initial consultation to discuss the nature of the UCH and its potential significance. This consultation may include other agencies or entities.
 - b.** If UCH is determined not to be historically significant no change to standard data management procedures is required.
 - c.** If UCH has the potential for historical significance but it is determined that no harm will result by disclosing position information, such as UCH in deep water, no change to standard data management procedures is required.
 - d.** If UCH is or has potential historical significance and disclosing location information about the site poses a threat, further discussions will be held on how to minimize potential harmful impacts, including data management decisions outlined in the Data Archiving section of this document. The EX cruise Coordinator, a representative from the data management team, OER's marine archaeologist, a representative from the ONMS Maritime Heritage Program, and any parties with jurisdiction, management or other legal ties to the resource shall meet to determine what measures are needed to protect the UCH while minimizing impacts on the distribution of data and data products.

B. Cruises conducted with ROV operations specifically targeted at UCH.

1. Pre-Cruise Planning: ROV Exploration

a. Notifying the Team of their Responsibility to Protect Sensitive UCH Resources

Expedition members and OER personnel to have a legal responsibility to protect sensitive archaeological information (primarily location information) from untimely release.

For a planned UCH cruise, the EC shall notify the CO and each shall have responsibility for ensuring personnel are aware of this responsibility. The EC shall provide an archaeology background document to familiarize personnel with the particular mission and requirements.

Appendix D details the range of existing accountability mechanisms already in place.

2. Pre-dive planning

- a.** Archaeologists will develop a dive plan based on the best available knowledge of the site that will maximize data recovery and minimize any potential impact to the site. The archaeology team will work closely with the cruise coordinator and deep submergence vehicle manager to develop and implement the plan. The plan should include:
 - I.** Objectives (cultural/interdisciplinary science)
 - II.** The types of sensors needed and data to be generated
- b.** As a rule ROV dives will not disturb or touch the shipwreck or cultural feature. Exceptions to this rule must discuss the rationale behind such a decision and incorporate it into the dive plan (collection of diagnostic artifacts or samples is sometimes conducted if the activity leads to better baseline characterization).
- c.** Prior to the cruise any permitting requirements should be identified and if required, permits must be procured.
- d.** Automated Information System (AIS): NOAA requires that the AIS feed which broadcasts information about the ship, including position, course and speed, must remain on at all times for collision avoidance and other safety reasons. Although the [International Maritime Organization](#)'s (IMO) Maritime Safety Committee condemns the Internet publication of AIS data, it is easily available for viewing. During the cruise planning phase the Expedition Coordinator will provide the AIS broadcast range on the EX to the chief scientist and science team. The science team, chief scientist, or other parties involved in a UCH mapping cruise should be made aware of this and decide whether the value of the operation merits acceptance of the potential issues/outcomes imposed. A Go/No-Go decision will be made based on this information.

C. Field Operations

- 1.** Exploration dives by ROV should be planned to collect optical and acoustic images without causing physical disturbance to the UCH. Representatives and leads from operational groups including the ROV, data/video, and telepresence teams, and ship operations should meet to discuss ROV operations and data collection.
 - a.** The guidelines for mapping operations should be followed to ensure site locations are not disclosed during field operations. SOPs with full operational details are

available on the ship.

- b.** A three-mile buffer zone shall be created around the UCH target or isolated survey box. The time at which the ship enters, and departs the three-mile buffer zone needs to be recorded and provided to the Data Team Lead for post-processing use. Following work at the site, the ship will return to the site where it first entered the three-mile buffer zone to continue operations.
- c.** The following steps will be taken just prior to entering the five-mile buffer zone in order to stop broadcasting the ship's location while the survey is conducted:
 - I.** NOAA email events will be stopped (OMAO/ET)
 - NOAA Shiptracker: Disable/stop the e-mail updates from the ship going to OMAO / Shiptracker
 - *Okeanos Atlas*: Disable/stop the e-mail updates to NCDDC
 - SAMOS: Disable/stop the e-mail update to FSU containing METOC and flow-through data, etc.
 - II.** Telepresence Video Feeds (OER Telepresence team lead): Do not stream any feeds that include the ship's location, including but not limited to the SCS data screen, or any active mapping data acquisition screens, or video feeds. It is acceptable to stream video feeds that do not include the ship's location.
 - III.** Redirect Live Feed as needed (OER EC or CO): If highly sensitive features (human remains, evidence of human remain such as shoes or other accoutrements, highly valuable items, etc.) are going to be investigated or are unexpectedly encountered during the course of our seafloor investigation, the lead archaeologist, ROV Team Leader, Expedition Coordinator or Commanding Officer has authority to immediately switch the live feed from the ROV and Seirios camera sled to another camera on the ship.
- d.** Daily updates on the *Okeanos Atlas* are normally linked to the location of the ship at the time the update is posted. If daily updates are made during UCH surveys, no position shall be provided. If a position is required, the position should be posted as it makes sense, 3 miles outside of the extent of the site or survey area.
- e.** Normal transmissions from the ship shall resume after the EX finishes UCH survey operations and exits the 3-mile buffer zone. The point of exit should be as near to the point of entry as is feasible to minimize location data gaps pointing to the location of the UCH.
- f.** No informal information about UCH should be released to the general public by the ship or personnel. This includes posting information and images on social networking sites like Facebook, Twitter or personal blogs. Images, video and information on UCH will be released to the public following the normal process and announcement of discoveries will be made through the appropriate offices and public affairs officials.

- g.** In addition to the items listed, the ship sends out automated weather (autoIMET) observations every hour and manual weather observations every 6 hours with positions as a voluntary ship observer. These observations are pulled onto public sites by several different websites and Google Map apps. One example is sailwx.info. This is only accurate to the nearest decimal degree (6 nm). This level of accuracy is not of concern.

D. Post-Cruise Data Management – Appendix C for detail

Following completion of the expedition, the Expedition Coordinator should have a follow-up call with the Data Management Team & OER lead archaeologist to review the datasets collected, confirm those that need to be withheld from public archive, and provide information to the data management team for associated metadata records.

E. Post-Cruise Follow-Up

1. Information Release

- a.** No informal information about UCH should be released to the general public by the ship or personnel. This includes posting information and images on social networking sites like Facebook or personal blogs. Images, video, and mapping data will be released to the public following the normal process and announcement of discoveries will be made through the appropriate offices and public affairs officials.
- b.** Determination of whether UCH is potentially eligible for nomination to the National Register of Historic Places, or eligible for protection under other legislation such as the Sunken Military Craft Act or National Marine Sanctuary Act, will take some time following completion of the cruise. Sensitive or potentially sensitive information about the UCH is to remain restricted until determination is complete. Following completion of the cruise, the lead Archaeologist will work with others to analyze the UCH data and conduct historical research to determine whether the UCH is eligible for nomination to the National Register of Historic Places.
 - I.** If the UCH is determined to be eligible, the lead Archaeologist will prepare the nomination for the NRHP process.
 - II.** If the UCH is determined to NOT be eligible, and protection of the site does not fall under other legislation, the Lead archaeologist will notify the data management team that site information can be made publicly available.

2. UCH Targeted Cruise Follow-Up

- a.** The EX cruise coordinator, OER's marine archaeologist, a representative from the ONMS Maritime Heritage Program, archaeologists involved in the survey, and any parties with jurisdiction, management or other legal ties to the resource shall meet to discuss the potential historical significance of the UCH and the sensitivities of releasing data to the public that can be protected under Section 304 of the National

Historic Preservation Act. The outcome of this meeting will determine if it is necessary to protect site location information from public release.

- I.** When location data can be released:
 - a.** If the findings determine that releasing information and data on UCH is not a threat, development of products and data management should follow the guidelines for a standard ROV cruise.
- II.** When location data should be protected:
 - a.** If it is determined that a site is or has potential to be historically significant and eligible for nomination to the National Register of Historic Places, the location and data containing the location should not be released to the public.
- III.** Data products that contain position information will be forwarded to the EX data management team where data and products will be stored in an archive with restricted access.
- IV.** Cruise plans, cruise reports, situation reports, mapping summary reports and other documents that are publically available outside NOAA or freely accessible within NOAA shall not provide location information for UCH or survey areas. In certain circumstances the lead archaeologist for the cruise may request that certain UCH sites are not mentioned in the public reports.

Appendix C: Post-Cruise Data Management

Data collected by OER that is considered sensitive will be protected from direct public release until such time as a final determination can be made as to permanent protection. Data in this state will be:

- Fully documented, so as to be independently understandable to users;
- Visible through publication of metadata records by OER;
- Accessible upon request to OER (controlled access by permission);
- Preserved in NOAA archives as ‘restricted’ (not available for direct public access).

These data will not be available for direct public access unless and until they are eliminated from consideration for nomination to the National Register of Historic Places (NHPA Section 304), or for protection under other legislation such as the Sunken Military Craft Act or National Marine Sanctuary Act.

If data are nominated and accepted for any official protection, then the exceptional status will be made permanent, and all documentation updated and finalized as such.

This section from Appendix A needs clean up

Data generated by the *Okeanos Explorer* Program is archived under a data management agreement with NGDC. Only data that has potential to reveal the nature and location of UCH shall be restricted from

public access. In accordance with the data management agreement, sensitive data from the EX will have restricted access at NCEI. To assist researchers in discovering sensitive data NGDC will publish a metadata record (but not the data) that identifies a point of contact for access. Requests to access the data will be made to the Director of OER who may delegate to the OER marine archaeologist. In lieu of the OER marine archaeologist, the OER Director may delegate to the Director of the ONMS Maritime Heritage Program.

If data is found to be sensitive because it reveals the location of a historically significant cultural resource, Section 304 of the National Historic Preservation Act provides that the head of a Federal agency or other public official shall withhold from public disclosure information about the location, character, or ownership of a historic property when disclosure may cause a significant invasion of privacy; risk harm to the historic property; or impede the use of a traditional religious site by practitioners. Data collected by the EX that is considered sensitive will be archived in a location where it can be withheld from public disclosure.

Data sets and associated products are housed in the appropriate NOAA archive; National Oceanographic Data Center, National Geophysical Data Center, National Coastal Data Development Center, National Climate Data Center, and the NOAA Central Library.

- Digital Atlas: **NCDDC** will develop appropriate metadata records to post on the digital atlas.
- CTD and XBT data collected during mapping operations conducted within the buffer zone will not be repressed from the *Okeanos Atlas* and will be held in a public archive.
- Cruise reports, cruise plans, mapping summary reports and other documents that are publically available outside NOAA or freely accessible within NOAA should not provide location information for UCH or survey areas.

This section from Appendix B needs cleanup

Start and end times for the 3-mile buffer zone surrounding a UCH site need to be provided to the data management team. Datasets containing sensitive location information will be restricted in their entirety, unless other parsing arrangements have been made. The following datasets may contain sensitive UCH location information and need to be reviewed, post-processed as appropriate, made restricted and pertinent metadata records created and made available.

- Multibeam, sub-bottom and single beam sonar data
- SCS Data Logs are to be restricted
- All ROV dive products (including associated sensor data) need to be restricted
- CTD rosette and *in situ* sensor datasets collected in relation to the UCH, and within the 3 nm buffer zone, need to be restricted.
- All imagery needs to be reviewed and geospatial imagery removed before being made public. Imagery with geospatial information should be restricted.
- **Ship track? Other datasets?**

Appendix D: NDA References

Expedition members and OER personnel to have a legal responsibility to protect sensitive archaeological information (primarily location information) from untimely release. The following summarizes the types of personnel who might be engaged in an *Okeanos Explorer* Expedition, where their responsibility to protect sensitive location information about UCH lies, and whether this responsibility has already been addressed or signature of a Non-Disclosure Agreement (NDA) is required to allow their participation in an expedition with planned UCH operations.

- If they are federally-employed scientists, they agreed not to disclose sensitive information and to adhere to federal laws as part of the terms of their employment with the federal government.
- The crew onboard the ship are under the CO's purview. On *Okeanos Explorer*, all crew are federal employees, and thus agreed not to disclose sensitive information and to adhere to federal laws as part of the terms of their employment with the federal government.
- All other members of the Mission team who are not federal employees and are engaged at-sea or ashore (including technicians, vehicle operators, students, etc.) are required to sign a non-disclosure agreement to protect sensitive cultural heritage information as part of their contract agreement.

- Other OER personnel who have access to data and information on the FTP site are either federal employees or contractors and need to be similarly reminded of their responsibilities. OER contractors signed an NDA as condition of employment with the federal government (this should be confirmed annually).

At the beginning of the expedition, all personnel need to be notified of their responsibilities:

MISSION PERSONNEL (Notified by: Expedition Coordinator)		
Employee	Accountability Mechanism for With-holding Sensitive Data	Action
NOAA Federal Employees	NOAA and Federal Contract	Reminder of contract, and provide archaeology background document.
Mission Contractors (UCAR, ERT Inc., 2020 Company LLC)	Non-Disclosure Agreement	Confirm all contractors signed NDA. Send reminder of contract and provide archaeology background document.
NOAA/Federal Scientists	NOAA and Federal Contract	Reminder of Contract, and provide Archaeology background document
Other Federal Scientists (BOEM, Navy, NPS, etc.)	Federal Contract	Reminder of Contract, and provide Archaeology background document
Other Mission Personnel and Scientists	Non-Disclosure Agreement	Get NDA Signed
Okeanos Explorer Crew (Notified by: CO or Desingnee)		
NOAA Federal Employees	Subject to NOAA and the ship's communications plans and protocols for sensitive data	CO sends out reminder of contract to ship via All Hands, and provides Archaeology background document
Other Federal Employees (e.g. Public Health Service)	Subject to NOAA and the ship's communications plans and protocols for sensitive data	CO sends out reminder of contract to ship via All Hands, and provides Archaeology background document
Wage Mariners	Subject to NOAA and the ship's communications plans and protocols for sensitive data	CO sends out reminder of contract to ship via All Hands, and provides Archaeology background document