



# Project Instructions: EX-19-07, 2019 Southeastern U.S. Deep-sea Exploration (ROV & Mapping)

**Date Submitted:** September 2019

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

**Project Number:** EX-19-07

**Project Title:** 2019 Southeastern U.S. Deep-Sea Exploration ROV/Mapping

**Project Dates:** October 31 to November 21, 2019

**Prepared by:** \_\_\_\_\_

**Dated:** \_\_\_\_\_

Michael White  
Expedition Coordinator  
Office of Ocean Exploration & Research

**Approved by:** \_\_\_\_\_

**Dated:** \_\_\_\_\_ 10/21/2019

  
Craig Russell  
Program Manager  
Office of Ocean Exploration & Research

**Approved by:** \_\_\_\_\_

**Dated:** \_\_\_\_\_

Captain David Zezula, NOAA  
Commanding Officer  
Marine Operations Center - Atlantic

# I. Overview

“America’s future depends on understanding the ocean. We explore the ocean because its health and resilience are vital to our economy and to our lives. We depend on the ocean to regulate weather and climate; sustain a diversity of life; for maritime shipping and national defense; and for food, energy, medicine, and other essential services to humankind.”

- NOAA Office of Ocean Exploration and Research Strategic Plan

## A. Brief Summary and Project Period

This document contains project instructions for EX-19-07. Operations for this cruise will be conducted 24 hours/day and consist of daily remotely operated vehicle (ROV) dives, CTD operations, overnight mapping, and full shore-based participation via telepresence. The expedition will commence on October 31, 2019 in Miami, Florida and conclude on November 21, 2019 in Key West, Florida. Operations will include the use of the ship’s deepwater mapping systems (Kongsberg EM302 multibeam sonar, EK 60/80 split-beam fisheries sonars, Knudsen 3260 chirp sub-bottom profiler sonar, and Teledyne Acoustic Doppler Current Profilers), XBTs in support of multibeam sonar mapping operations, CTD casts, the two-body ROV *Deep Discoverer* and *Seirios*, and the ship’s high-bandwidth satellite connection for continuous real-time ship-to-shore communications. Operations are planned throughout the Southeast U.S. Continental Margin, offshore Florida, Georgia, South Carolina and North Carolina.

The NOAA Office of Ocean Exploration and Research (OER) is the only federal program dedicated to exploring our deep ocean, closing the prominent gap in our understanding of U.S. deep waters to provide the valuable information needed to strengthen the economy, health, and security of our nation.

Using the latest tools and technology, OER explores previously unknown areas of our deep ocean, making discoveries of scientific, economic, and cultural value. Through live video streams, online coverage, training opportunities, and real-time events, OER allows scientists, resource managers, students, members of the general public, and others to actively experience ocean exploration, expanding available expertise, cultivating the next generation of ocean explorers, and engaging the public in exploration activities. From this exploration, OER makes the collected data needed to understand our ocean publicly available, so we can maintain the health of our ocean, sustainably manage our marine resources, accelerate our national economy, and build a better appreciation of the value and importance of the ocean in our everyday lives.

NOAA Ship *Okeanos Explorer* is the only U.S. federal vessel dedicated to exploring our largely unknown ocean for the purpose of discovery and the advancement of knowledge.



America's future depends on understanding the ocean. We explore the ocean to make valuable scientific, economic, and cultural discoveries; we explore because ocean health and resilience are vital to our economy and to our lives. Exploration supports NOAA mission priorities and national objectives by providing high-quality scientific information about the deep ocean to anyone who needs it.

In close collaboration with government agencies, academic institutions, and other partners, NOAA's Office of Ocean Exploration and Research (OER) conducts deep-ocean expeditions using advanced technologies on the NOAA Ship *Okeanos Explorer*. From mapping and characterizing previously unseen seafloor to collecting and disseminating information about ocean depths, this work helps to establish a foundation of information and to fill data gaps. Data collected on the ship follow federal open-access data standards and are publicly available shortly after an expedition ends. This ensures the delivery of reliable scientific data needed to identify, understand, and manage key elements of the ocean environment.

NOAA will work with the scientific and management community to characterize unknown and poorly-known areas of the Southeast U.S. Continental Margin through telepresence based exploration. Though this region is home to millions of Americans and is experiencing some of the highest population growth rates in the U.S. (Conley et al., 2017.), the offshore habitats are some of the least explored areas of the U.S. East Coast. Baseline information collected during this cruise will support and catalyze further exploration, research, and management activities.

This expedition will contribute to NOAA's Atlantic Seafloor Partnership for Integrated Research and Exploration (ASPIRE), a major multi-year, multi-national collaborative field program focused on raising collective knowledge and understanding of the North Atlantic. This campaign provides timely, actionable information to support decision making based on reliable and authoritative science. It also serves as an opportunity for the nation to highlight the uniqueness and importance of these deepwater environments. ASPIRE builds on the momentum of past U.S. campaigns and international initiatives to support ecosystem-based management of marine resources.

Aside from ASPIRE this cruise will also contribute to the ongoing NOAA collaboration with the Office of National Marine Sanctuaries Maritime Heritage Program, the Bureau of Ocean Energy Management (BOEM), DEEP SEARCH and U.S. Geological Survey (USGS) as well as the National Marine Fisheries Deep-sea Coral Research and Technology Program's Southeast Deep-sea Coral Initiative (SEDCI).

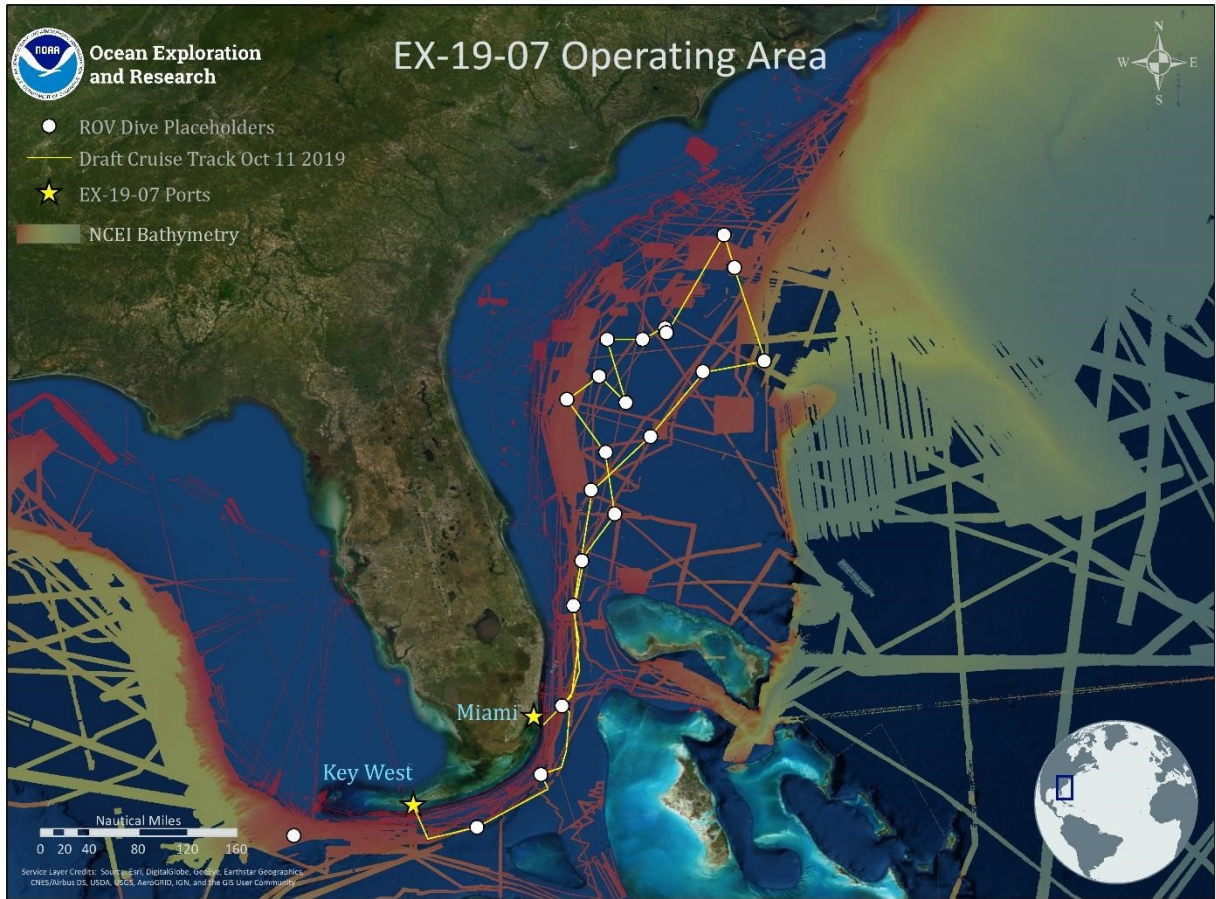
## B. Days at Sea (DAS)

Of the 22 DAS scheduled for this project, 22 DAS are funded by the Oceanic and Atmospheric Research (OAR) allocation. This project is estimated to exhibit a High Operational Tempo due to 24 hour operations consisting of daily ROV dives, CTD rosette casts, overnight mapping operations, and continuous shore-side participation via telepresence.



### C. Operating Area

EX-19-07 is a combined ROV and mapping cruise that will focus operations in deepwater habitats of the Southeastern U.S. Continental Margin. Mapping, ROV, and CTD rosette operations will focus in depths generally between 250 and 3,500 meters.

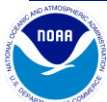


**Figure 1:** Map showing the general expedition operating area (green polygon) and current publicly available multibeam bathymetry. ROV dive sites locations are not finalized until the day before the dive, after the community planning call. Overnight mapping will target unmapped areas within the US EEZ deeper than 200 meters.

Generalized operating area coordinates		
ID	Latitude	Longitude
North	34.847 N	-75.293 W
South	23.966 N	-81.262 W
East	33.547 N	-71.989
West	24.165	-83.464

**Table 1:** Bounding coordinates of the EX-19-07 operating area. All ROV dive operations are planned within U.S. waters.

Draft ROV Dive Locations**		
ID	Latitude	Longitude
Dive 01	28° 29.521'N	79° 4.053'W
Dive 02	29° 20.139'N	79° 11.599'W
Dive 03	30° 3.119'N	79° 43.105'W
Dive 04	30° 22.116'N	79° 16.824'W
Dive 05	30° 0.450'N	78° 55.121'W
Dive 06	30° 52.233'N	79° 10.399'W
Dive 07	30° 52.123'N	78° 41.517'W
Dive 08	31° 1.316'N	78° 23.132'W
Dive 09	30° 57.469'N	78° 21.973'W
Dive 10	32° 17.403'N	77° 34.962'W
Dive 11	31° 50.613'N	77° 26.354'W
Dive 12	30° 34.567'N	77° 1.928'W
Dive 13	30° 25.655'N	77° 52.124'W
Dive 14	29° 32.801'N	78° 34.950'W
Dive 15	28° 49.198'N	79° 23.373'W
Dive 16	27° 51.358'N	79° 31.183'W
Dive 17	27° 14.930'N	79° 37.727'W
Dive 18	25° 53.013'N	79° 47.327'W
Dive 19	24° 56.828'N	80° 4.448'W



<b>Dive 20</b>	24° 13.874'N	80° 56.680'W
<b>Alternate Dive 20</b>	24° 7.172'N	83° 26.065'W

**Table 2:** Draft ROV dive locations. \*\*ROV dive locations are not finalized until the day before each dive after the community planning call.

## D. Summary of Objectives

### October 31 - November 21, 2019 (Miami, FL - Key West, FL) Telepresence-enabled ROV, CTD rosette, and mapping Operations.

EX-19-07 operations will occur in the waters offshore the U.S. Southeast Coast. This cruise will collect baseline data and information to support priority NOAA science and management needs including in multiple marine protected areas in the region.

Mission objectives for EX-19-07 include a combination of mapping/operational, science, education, outreach, and data management objectives:

1. Science
  - a. Acquire data to support priority science and management needs in support of the Southeast Deep-sea Coral Initiative (SEDCI).
  - b. Identify and map vulnerable marine habitats – particularly high-density deep-sea coral and sponge communities, and chemosynthetic communities.
  - c. Explore areas relevant to resource managers such as Essential Fish Habitats (EFH), Habitat Areas of Particular Concern (HAPC), National Marine Sanctuaries and their potential expansion areas.
  - d. Explore the diversity and distribution of benthic habitats – including fish habitats, deep-sea coral and sponge communities, chemosynthetic communities, and biological communities that colonized or aggregate around shipwrecks;
    - i. Collect data on: habitat size and extent, animal diversity and density;
    - ii. Focus close-up imaging operations on potential new, rare and poorly documented animals, as well as dominant members of the communities;
    - iii. Collect and preserve biological samples of potential new species, new records, dominant community members if not easily recognized, and other animals to aid in site characterization;
    - iv. Investigate biogeographic patterns of deep-sea ecosystems and connectivity across the Atlantic Basin;
    - v. Document substrate types as it relates to characterizing habitat suitability;
    - vi. Support transatlantic connectivity studies.
  - e. Investigate the geology of the South Atlantic Bight;
    - i. Collect and preserve geologic specimens that can be used to age a feature, provide additional insight into the geological context of the region, or improve knowledge of potential future or past geohazards.



- f. Explore U.S. maritime heritage by investigating sonar anomalies and characterizing shipwrecks.
  - g. Acquire a foundation of ROV, sonar, and oceanographic data to better understand the characteristics of the water column and fauna that live there.
  - h. Collect high-resolution bathymetry in areas with no (or low quality) sonar data.
  - i. Continue to refine specimen processing procedures, including integration and subsequent testing of new genetic subsampling protocols of the Biorepository at the National Museum of Natural History, Smithsonian Institution.
  - j. Ground-truth acoustic data using video imagery and characterize associated habitat.
  - k. Engage a broad spectrum of the scientific community and public in telepresence-based exploration.
  - l. Successfully conduct operations in conjunction with shore-based Exploration Command Centers (ECCs) and remote science team participants.
  - m. Create and provide input into standard science products to provide a foundation of publicly accessible data and information products to spur further exploration, research, and management activities.
  - n. Follow UCH SOPs as identified in Appendix H.
2. Remote Science/Exploration Command Centers (ECCs)
- a. Provide operational support and training to scientists and managers to enable remote participation in at-sea operations.
  - b. Continue to test best practices for hosting internet-1 based live interactions.
  - c. Facilitate outreach and engagement activities and events at the ECCs and other facilities that host interactions.
  - d. Test and refine ship-to-shore communications procedures that engage multiple ECCs and other remote participants.
  - e. Test and refine operating procedures and products.
  - f. Continue testing of the new version of SeaTube.
  - g. Test and troubleshoot new methods of distributing video to shore.
3. ROV Engineering
- a. Daytime ROV dives on exploration targets.
  - b. Complete engineering objectives during ROV dives.
  - c. Ongoing training of engineers and pilots.
  - d. Ongoing system maintenance, documentation, and training.
  - e. Test and refine new ROV mid-water exploration procedures
  - f. Follow UCH SOPs as identified in Appendix H.
  - g. Continue to develop and test ROV mosaic procedures for UCH and other sites.
4. Video Engineering (VSAT ~15 mb/sec ship-to-shore; 5 mb/sec shore-to-ship)
- a. Test terrestrial and high-speed satellite links.



- b. Support telepresence-enabled ROV operations.
- c. Collect/create all standard video products.
- d. Facilitate live outreach events between ship and shore.
- e. Follow UCH SOPs as identified in Appendix H.

## 5. Mapping

- a. Collect high-resolution mapping data from sonars in priority areas as dictated by operational needs, as well as science and management community input.
- b. Collect mapping data in support of Seabed 2030, SEDCI, NOAA's Southeast Regional Coordination Team (SECART), Monitor National Marine Sanctuary, and ongoing collaborations between NOAA, the Bureau of Ocean Energy Management, and the U.S. Geological Survey.
- c. Support ROV operations with mapping products and expertise.
- d. Conduct mapping operations during transit, with possible further development of exploration targets.
- e. Collect XBT casts as data quality requires during mapping operations.
- f. Create daily standard mapping products.
- g. Follow UCH SOPs as identified in Appendix H.
- h. Collect sun photometer measurements as part of surveys of opportunity (Section V, Appendix F).

## 6. Data Management

- a. Provide a foundation of publicly accessible data and information products to spur further exploration, research, and management activities.
- b. Provide daily products to shore for operational decision making purposes.
- c. Train new data management personnel.
- d. Formalize Data Management SOPs.
- e. Follow UCH SOPs as identified in Appendix H.
- f. Continue to work on the GFOE network integration and develop SOPs.
- g. Complete sensor reports for each dive.
- h. Verify that GFOE data systems operate as expected
- i. Continue to implement abbreviated sample naming convention for physical samples collected by the ROV (i.e., biological and geological) into sample labels, dive summary forms, and cruise report: - Primary samples:
  - Biological: EX\*\*\*\*\_D\*\*\_\*\*B (e.g. EX1903L2\_D01\_01B)
  - Geological: EX\*\*\*\*\_D\*\*\_\*\*G (e.g. EX1903L2\_D01\_01G) -
 Associated samples:
  - EX\*\*\*\*\_D\*\*\_\*\*B\_A\*\* (e.g. EX1903L2\_D01\_01B\_A01) -
 Sub-samples:
  - EX\*\*\*\*\_D\*\*\_\*\*B\_S\*\* (e.g. EX1903L2\_D01\_01B\_S01)





## 7. Outreach

- a. Engage the general public in ocean exploration through live video and timely content (daily updates, topical essays and web logs, highlight videos, video clips, still imagery and mapping products) posted on the Ocean Explorer website.
- b. Host live events and interactions with shore, including live interactions
- c. Host a VIP and partner tour while in port in Miami for NOAA (final list of attendees TBD, we anticipate that this will not need ship support).

## 8. Ship

- a. Continue training new deck department personnel in ROV launch and recovery.
- b. Develop and maintain proficiency with small boat operations for new and long term crew.
- c. Conduct CTD operations as requested and able.
- d. Aft Conn Training.
- e. Follow UCH SOPs as identified in Appendix H.
- f. Review ROV Emergency Procedures.
- g. Allocated time for MOB drills/Maneuvering drills (weather permitting).
- h. Dive operations (weather permitting).
- i. Additional safety training.

## E. Participating Institutions

- National Oceanic and Atmospheric Administration (NOAA), Office of Ocean Exploration and Research (OER)–1315 East-West Hwy, Silver Spring, MD 20910 USA
- National Oceanic and Atmospheric Administration (NOAA), Deep Sea Coral Research and Technology Program–1315 East-West Hwy, Silver Spring, MD 20910 USA
- National Oceanic and Atmospheric Administration (NOAA), National Center for Coastal and Ocean Science–1305 East-West Hwy, Silver Spring, MD 20910 USA
- NOAA, National Oceanographic Data Center, National Coastal Data Development Center, Stennis Space Center MS, 39529 USA
- NOAA Office of National Marine Sanctuaries,1305 East-West Highway, Silver Spring, MD 20910
- University Corporation for Atmospheric Research Programs for Advancement of Earth System Science (CPAESS) , PO Box 3000 Boulder, CO 80307 USA
- University of New Hampshire (UNH) Center for Coastal and Ocean Mapping (CCOM) Jere A. Chase Ocean Engineering Lab, 24 Colovos Rd, Durham, NH 03824 USA
- Global Foundation for Ocean Exploration, P.O. Box 417, Mystic, CT 06355
- University of Rhode Island Inner Space Center, 215 South Ferry Road Narragansett, RI 02882
- University of Miami, Rosenstiel School of Marine and Atmospheric Science, 4600 Rickenbacker Causeway, Miami, FL 33149



- Florida Atlantic University, Harbor Branch Oceanographic Institute, 777 Glades Road, Boca Raton, FL 33431

## F. Personnel (Mission Party)

**Table 3:** Full list of seagoing mission party members and their affiliations. OER is currently working with the ship to potentially adjust the travel schedules of a few individuals. Schedules below are tentative until final travel is booked. Any deviations from the schedule below will be coordinated through the OPS Officer.

#	Name (First, Last)	Title	Date Aboard	Date Disembark	Gender	Affiliation	Nationality
1	Michael P. White	Expedition Coordinator	10/29	11/23	M	OER/ CNSP	USA
2	Stephanie Farrington	Science Lead	10/29	11/22	F	FAU_HBOI/UCAR	USA
3	Kimberly Galvez	Science Lead	10/29	11/22	F	UM-RSMAS/UCAR	USA
4	Shannon Hoy	Mapping Lead	10/29	11/22	F	OER/CNSP	USA
5	Colleen Peters	Mapping Watch lead	10/29	11/22	F	UCAR	USA
6	Madalyn Newman	Sample Data Manager	10/29	11/22	F	NCEI	USA
7	Chris Ritter	GFOE Operations Manager	10/29	11/22	M	GFOE	USA
8	Mark Durbin	Engineering team	10/29	11/22	M	GFOE	USA
9	<b>Fernando Aragon</b>	Engineering team	Sailing on EX1906	11/22	M	GFOE	USA
10	Jeffery Laning	Engineering team	10/29	11/22	M	GFOE	USA
11	<b>Brian Doros</b>	Engineering team	Sailing on EX1906	11/22	M	GFOE	USA
12	Levi Unema	Engineering team	10/29	11/22	M	GFOE	USA
13	Sean Kennison	Engineering team, Trainee GFOE OPS Manager	10/29	11/22	M	GFOE	USA
14	James (Jim) Meyers	Engineering team	10/29	11/22	M	GFOE	USA
15	<b>Chris Wright</b>	Engineering Team	Sailing on EX1906	11/22	M	GFOE	USA



16	Caitlin Bailey	Engineering team	10/29	11/22	F	GFOE	USA
17	Lars Murphy	Engineering team	10/29	11/22	M	GFOE	USA
18	Tara Smithee	Engineering team	10/29	11/22	F	GFOE	USA
19	Annie White	Engineering team	10/29	11/22	F	GFOE	USA
20	Art Howard	Engineering team	10/29	11/22	M	GFOE	USA
21	Mike Durbin	Engineering team	10/29	11/22	M	GFOE	USA
22	OER Partner/New Hire	TBD	10/29	11/22	M	OER	USA

## G. Administrative

### 1. Points of Contact:

#### Ship Operations

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

Chief, Operations Division, Atlantic (MOA)  
LCDR Fiona Matheson, NOAA  
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#### Mission Operations

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## Other Mission Contacts

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Alan Leonardi, Director  
NOAA Ocean Exploration & Research  
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## Vessel Shipping Address

### 1. Shipments

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

NOAA NMFS SEFSC  
C/O: LT Justin Boeck  
ATT: NOAA Ship *Okeanos Explorer* Operations Officer  
75 Virginia Beach Drive  
Key Biscayne, FL 33149

### Vessel Berthing Address:

US Coast Guard Base Miami Beach  
100 MacArthur Causeway Miami  
Beach, FL 33139

### 2. Diplomatic Clearances

OER has obtained a MSR to work in Bahamian waters. Expedition Coordinator and Operations Officer will provide necessary material to Bahama POC for clearance.

### 3. Licenses and Permit

Pursuant to the National Environmental Policy Act (NEPA), NOAA OER is required to include in its planning and decision-making processes appropriate and careful



consideration of the potential environmental consequences of actions it proposes to fund, authorize and/or conduct. NOAA's Administrative Order (NAO) 216-6A Companion Manual describes the agency's specific procedures for NEPA compliance. Among these is the need to review all proposed NOAA-supported field projects for their environmental effects. An Environmental Review Memorandum has been completed for this survey, in accordance with Section 4 of the Companion Manual (Appendix C).

Informal consultation was initiated under Section 7 of the Endangered Species Act (ESA), requesting NOAA Fisheries' Protected Resources Division concurrence with our biological evaluation determining that *Okeanos Explorer* operations conducted as part of ASPIRE, may affect, but are not likely to adversely affect, ESA-listed marine species. The informal consultation was completed on August 8, 2018 when NOAA OER received a signed letter from the Regional Administrator of South East Regional Office, stating that NMFS concurs with OER's determination that conducting proposed ASPIRE cruises are not likely to adversely affect ESA-listed marine species (Appendix D).

OER has completed consultation with NOAA's Habitat Conservation Division on potential ASPIRE impacts of our operations to Essential Fish Habitat (EFH). They concurred that our operations would not adversely affect EFH provided adherence to our proposed procedures and their guidance stated in the letter (Appendix E).

Additionally, OER received a Letter of Acknowledgement (LOA) from NMFS for operations in the Southeast Deepwater MPAs and areas deemed as a Habitat Areas of Particular Concern (HAPCs). The LOA is attached in Appendix G.

## II. Operations

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

### A. Project Itinerary

All times and dates are subject to prevailing conditions and the discretion of the Commanding Officer. Locations are approximate. Final dive sites will be delivered to the bridge at night for the next day's dive.

Additional items to be added to the schedule below as cruise plans evolve as we are closer to sailing: requested dedicated time for drills and training, CTD operations, OPS briefing, numbers and schedules of partner tours while in port, finalized arrival dates, final dive locations, and opportunities for water column exploration.



Extended dives will be requested as dive locations are developed.

Currently, we have tentative Underwater Cultural Heritage (UCH) ROV dive For the UCH sites, a go/no go decision will be made about the target ideally by 11:00 the preceding day, but at the latest by 18:00 the preceding day. For example- a target for 16th will be identified as a UCH site at the latest by 18:00 on July 15, which will allow time for the ship and mission teams to prepare to follow UCH protocols. We anticipate following all UCH protocols established in Appendix H for data pertaining to these sites.

Date	Activities
10/29	Mobilization. Normal ROV/Mapping Mobilization including: pinging of sonars, high voltage operations, crane operations, possible dunk test. Staging of sampling equipment.
10/30	Mobilization. Normal ROV/Mapping Mobilization including: pinging of sonars, high voltage operations, crane operations, possible dunk test. Staging of sampling equipment. All mission personnel aboard on 10/30 for vessel familiarization
10/31	Depart Miami
11/01	Dive 01/ Overnight Mapping
11/02	Dive02/Overnight Mapping
11/03	Dive 03/Overnight Mapping
11/04	Dive04/Overnight Mapping
11/05	Dive 05/Overnight Mapping
11/06	Dive 06/Overnight Mapping
11/07	Dive 07/Overnight Mapping
11/08	Dive 08/Overnight Mapping
11/09	Dive 09/Overnight Mapping
11/10	Dive 10/Overnight Mapping
11/11	Dive 11/Overnight Mapping
11/12	Dive 12/Overnight Mapping



<b>11/13</b>	Dive 13/Overnight Mapping
<b>11/14</b>	Dive 14/Overnight Mapping
<b>11/15</b>	Dive 15/Overnight Mapping
<b>11/16</b>	Dive 16/Overnight Mapping
<b>11/17</b>	Dive 17/Overnight Mapping
<b>11/18</b>	Dive 18/Overnight Mapping
<b>11/19</b>	Dive 19/Overnight Mapping
<b>11/20</b>	Dive 20/Overnight Mapping
<b>11/21</b>	Arrive at Key West, Florida, Demobilization
<b>11/22</b>	Demobilization continues. Update: September 13th, GFOE is still determining if they will unload the ROVs in Key West or Pascagoula

**Table 4: Cruise Itinerary.** This is an approximate itinerary and is subject to change based on community input, survey results, field conditions, and discretion of the CO. Please note- position information for each dive is tentative until the dive planning call approximately one day before the scheduled dive.

## B. Staging and De-staging

Minimal staging is expected as all mission equipment will be onboard already. Standard preparation for ROV expeditions is anticipated from 10/29-10/31, which includes hydraulic use, the ability to ping the USBL while in port, ability to initialize and conduct ping tests of the mapping sonar systems, and high voltage operations. There may also be the need to conduct ROV dunk tests between 10/29 and 10/30 for which ship support would be required. Kasey Cantwell (OER) may also be onsite assisting with preparation for sampling. No assistance is needed from the ship to load sampling supplies.

## C. Operations to be conducted

### 1. Telepresence / Outreach Events

- a. Three live video feeds will be used throughout the cruise to provide situational awareness for onshore personnel.
- b. Additional live events are likely but TBD.



## 2. In-Port Events

- a. No major in port events are currently planned for this cruise. However, with the change of departure port to Miami and considering the NOAA partners has in the region such as the SE Fisheries Science Center and the Atlantic Oceanographic and Meteorological Laboratory. Public and/or VIP tours may be scheduled if they are deemed an engagement priority.

## D. SCUBA Dive Plan

All dives are to be conducted in accordance with the requirements and regulations of the [NOAA Diving Program](#) and require the approval of the ship's Commanding Officer. No science dives are planned during EX-19-07, but the ship may plan training, safety drill, or maintenance dives.

## E. Applicable Restrictions

### Sonar Operations

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

# III. Equipment

## A. Equipment and capabilities provided by the ship

- Kongsberg Simrad EM302 Multibeam Echosounder (MBES)
- Kongsberg Simrad EK60 Deepwater Echosounders and GPTs (18, 70 [WBT], 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 Underway CTD
- LHM Sippican XBT Mark21 System(Deep Blue probes)
- AOML Automated XBT Launcher (Deep Blue probes)
- Seabird SBE 911Plus CTD
- Seabird SBE 32 Carousel and 12 10L Niskin Bottles
- Seapoint Turbidity / Light Scattering Sensor (LSS)





- PMEL Oxidation Reduction Potential (ORP)
- Seabird SBE-43 (DO) sensor
- Altimeter Sensor and battery pack
- POS/MV
- Seabird SBE-45 (Micro TSG)
- Kongsberg Dynamic Positioning-1 System
- Scientific Computing System (SCS)
- ECDIS
- Met/Wx Sensor Package
- 1 functioning and seaworthy SOLAS approved fast rescue boat
- 1 functioning and seaworthy work boat to support ROV operations and personnel transfers

## B. Equipment and capabilities provided by OER and Partners

- Microtops II Ozone Monitor Sun photometer and handheld GPS required for NASA Marine Aerosols Network supplementary project.
- NOAA OER 6000 m *Deep Discoverer* ROV NOAA *Seirios* Camera Platform
- IVS Fledermaus Software suite
- SIS Software and Kongsberg acquisition computer
- EK 60 acquisition computer
- Sub bottom profiler acquisition computer
- CTD acquisition computer
- Hypack Software
- GFOE provided VSAT High-Speed link (15 Mbps ship to shore; 5 Mbps shore to ship)
- Backscatter Mosaic computer
- GFOE exploration operations networking infrastructure
- Scientific Computing System (SCS)
- Telepresence System
- NCEI Cruise Information Management System (CIMS)
- GFOE VOIP system
- GFOE provided data storage
- MarineStar GPS with corrections

# IV. Hazardous Materials

## A. Policy and Compliance

The Expedition Coordinator is responsible for complying with FEC 07 Hazardous Materials and Hazardous Waste Management Requirements for Visiting Scientific Parties (or the



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

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

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

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

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

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

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

## B. Inventory - Updated September 13th, 2019.

Item	Use	Approx. locations
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Deionized water (20 L)	Sample preservation	Cooler in wetlab
Sodium phosphate (1 kg)	Sample preservation	Wetlab, under the chemical hood
95% Denatured Ethanol (29 gallons)	Sample preservation	Paint Locker
37% Formaldehyde (2.5 gallons)	Sample preservation	Wetlab, under the chemical hood
Aqua Shield (7 bottles, 8 oz each)	Underwater Lubricant	ROV Workshop Fire Cabinet, Pit
Dow Corning 4 (10 bottles, 5.3 oz each)	Electrical insulating compound	ROV Workshop Fire Cabinet, Pit
Fluid Film Spray (2 bottles, 11.75 oz each)	Silicone Lubricant	ROV Workshop Fire Cabinet
Isopropanol Alcohol (2 gallons)	Solvent	ROV Workshop Fire cabinet
Scotchkote (7 bottles, 4 oz each)	Electrical insulating compound	ROV Workshop Fire cabinet
3M Silicone Spray (5 bottles, 13.74 oz each)	Silicone Lubricant	ROV Workshop Fire cabinet
Synthetic AW Hydraulic Oil, ISO-22 (35 gallons)	Amsoil (AWG-05)	Hanger, Pit, Vehicles
Tap Magic Cutting Fluid (1 bottle, 16 oz each)	Cutting/Machining Lubricant	ROV Workshop Fire cabinet
Tap Magic Heavyweight Cutting Fluid (2 bottles, 16 oz each)	Cutting/Machining Lubricant	ROV Workshop Fire cabinet
Tuff Coat M (20 gal)	Marine Lubricant	Winch room
Dow Corning Molykote 111 (7 bottles, 5.3 oz each)	Valve Lubricant and Sealant	ROV Workshop Fire cabinet, Pit
WD40 (3 bottles, 12 oz each)	Lubricant	ROV Workshop Fire cabinet
Loctite (2 bottles, 1.69 oz each)	Bolt adhesive	ROV Workshop Fire cabinet
Shell Diala S2 (55gallons)	Vitrea	Hanger, Vehicles
Por-15 (1 bottle, 8 oz each)	Paint Kit	ROV Workshop Fire cabinet
Aeroshell 41 (80 gal)	Hydraulic Fluid	Hanger, ROV D2
Ultratane (2 bottles, 5.13 oz each)	Butane fuel	ROV Workshop fire cabinet
Rust-oleum (2 bottles, 15 oz each)	Protective Enamel	ROV Workshop fire cabinet
Flux-Off (1 bottle, 12 oz each)	Soldering Flux remover	ROV Workshop fire cabinet
Propane (2 bottles, 14.1 oz each)	Torch Fuel	ROV Workshop fire cabinet
Adhesive Pliobond 25 (0 bottles, 3 oz each)	General adhesive	Tool room



AP 120 Metal Prep (1 bottle, 20 oz each)	Degreaser/cleaner for metal surfaces	Pit
PVC cement (1 bottle, 8 oz each)	Adhesive for PFV plastic piping	Tool Room
Phosphoric Acid (1 bottle, 6 oz each)	Ferrous metal rust removal	Tool room
Pipetite Paste (1 bottle, 8 oz each)	Plumbing sealant	Tool room/pit
Spindle Oil 10, ROS PT (14 bottles, 12 oz each)	Lubricant/compensation oil	Tool room
DC557 (1 bottle, 11 oz each)	Silicon grease	Tool room/pit
Tether Potting Catalyst (8 bottles, 5.2 g each)	Two part epoxy catalyst	Pit
Tether Potting Compound (8 bottles, 490 g each)	Two part epoxy ingredient	Pit
ThermaPlex Bearing Grease (1 bottle, 14.1 oz each)	Lubricant	Pit
Tritech Seaking (1 bottle, 32 oz each)	Compensator oil for sonar head	Pit

On EX1907, 30 gallons of ethanol will be stored in the Paint Locker.

### C. Chemical safety and spill response procedures

All safety and spill response procedures will be handled according to OMAO guidelines and following the manufacturer's MSDS which has been provided to the ship's ECO.

### D. Radioactive Materials

NOT APPLICABLE TO THIS CRUISE

## V. Additional Projects

### A. Supplementary Projects

#### NASA Maritime Aerosol Network

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

Equipment resides on the ship and is stewarded by the Expedition Coordinator. See Appendix G for full Survey of Opportunity Form.



## B. NOAA Fleet Ancillary Projects

No NOAA Fleet Ancillary Projects are planned.

# VI. Disposition of Data and Reports

## A. Data Responsibilities

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

### Ship Responsibilities

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

### NOAA OER Responsibilities

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

### Deliverables

1. At sea
  - a. Daily plans of the Day (POD)
  - b. Daily situation reports (SITREPS)
  - c. Summary forms for each ROV dive
  - d. Database containing records for each sample collection
  - e. Summary forms for each CTD rosette cast
  - f. Daily summary bathymetry data files
  - g. Raw sonar files (EM 302, EK 60, Subbottom, ADCP)
2. Post cruise
  - a. Refined SOPs for all pertinent operational activities
  - b. Assessments of all activities
3. Science
  - a. Multibeam raw and processed data (see appendix B for the formal cruise data management plan)
  - b. XBT raw and processed data
  - c. EK 60 raw data
  - d. Knudsen 3260 sub-bottom profiler raw data
  - e. ADCP raw data
  - f. Mapping data report
  - g. Cruise report



## Archive

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

# VII. Meetings, Vessel Familiarization, and Project Evaluations

## A. Shipboard Meetings

A safety brief and overview of POD will occur on the Bridge each morning. Daily Operations Briefing meetings will be held at a time and location determined by Operations Officer based on watch schedule, to review the current day, and define operations, associated requirements, and staffing needs for the following day. A Plan of the Day (POD) will be posted each evening for the next day in specified locations throughout the ship. OER Daily Situation Reports (SITREPS) will be produced by onboard Expedition Coordinator (EC). OMAO related information in SITREPS will be discussed during either safety or operations meetings. Additionally, EC and OPS will meet as needed to discuss OMAO related information in SITREPS. The OPS Officer will be cc'd on SITREPS sent to shore to provide additional clarification as needed.

### 1. Pre-Project Meeting:

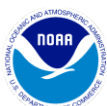
The Expedition Coordinator and Commanding Officer will conduct a meeting of pertinent members of the scientific party and ship's crew to discuss required equipment, planned operations, concerns, and establish mitigation strategies for all concerns. This meeting shall be conducted before the beginning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

### 2. Vessel Familiarization Meeting:

The Commanding Officer is responsible for ensuring scientific personnel are familiarized with applicable sections of the standing orders and vessel protocols, e.g., meals, watches, etiquette, drills, etc. A vessel familiarization meeting shall be conducted in the first 24 hours of the project's start and is normally presented by the ship's Operations Officer.

### 3. Post-Project Meeting:

The Commanding Officer is responsible for conducting a meeting no earlier than 24 hours before or seven days after the completion of a project to discuss the overall success, challenges, and shortcomings of the project. Concerns regarding safety, efficiency, and



suggestions for future improvements shall be discussed and mitigations for future projects will be documented for future use. This meeting shall be attended by the applicable ship's officers, applicable crew, the Expedition Coordinator, and members of the scientific party and is normally arranged by the Operations Officer and Expedition Coordinator.

#### **4. Project Evaluation Report:**

Within seven days of the completion of the project, a Customer Satisfaction Survey is to be completed by the Expedition Coordinator. The form is available at [https://docs.google.com/a/noaa.gov/forms/d/1a5hCCkgIwaSII4DmrHPudAehQ9HqhRqY3J\\_FXqbjp9g/viewform](https://docs.google.com/a/noaa.gov/forms/d/1a5hCCkgIwaSII4DmrHPudAehQ9HqhRqY3J_FXqbjp9g/viewform) 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 ship, 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 twenty-one days prior to the survey (e.g., Expedition Coordinator is allergic to fin fish).

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

All NOAA scientists will have proper travel orders when assigned to any NOAA ship. The Expedition Coordinator will ensure that all non-NOAA or non-Federal scientists aboard



also have proper orders. It is the responsibility of the Expedition Coordinator to ensure that the entire scientific party has a mechanism in place to provide lodging and food and to be reimbursed for these costs in the event that the ship becomes uninhabitable and/or the galley is closed during any part of the scheduled project.

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

## B. Medical Forms and Emergency Contacts

The NOAA Health Services Questionnaire (NHSQ, NF 57-10-01 (3-14)) must be completed in advance by each participating scientist. The NHSQ can be obtained from the Expedition Coordinator or the NOAA website

<http://www.corporateservices.noaa.gov/noaforms/eforms/nf57-10-01.pdf>.

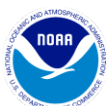
NHSQs must be submitted every 2 years for individuals under the age of 50 and every 1 year for ages 50 and above. NHSQs must be accompanied by [NOAA Form \(NF\) 57-10-02](#) - Tuberculosis Screening Document in compliance with [OMAO Policy 1008](#) (Tuberculosis Protection Program, which requires a yearly PPD or TB exam).

The completed forms should be sent to Marine 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](http://ocio.os.doc.gov/ITPolicyandPrograms/IT_Privacy/PROD01_008240)).

The only secure submission process approved by NOAA is [kiteworks](#) by Accellion Secure File Transfer, which requires the sender to set up an account using a valid NOAA email address and password. User accounts may expire after 30 days of inactivity. Simply re-register to send and receive files.

Persons without a NOAA email account must fax or mail their forms.





Contact information: Include only the Pacific OR Atlantic Office as applicable.

Marine 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](mailto:MOA.Health.Services@noaa.gov)

Prior to departure, the Chief Scientist must provide an electronic listing of emergency contacts to the Executive Officer for all members of the scientific party, with the following information: contact name, address, relationship to member, and telephone number.

### C. Shipboard Safety

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

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

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



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

#### D. Communications

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

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

#### Important Telephone and Facsimile Numbers and E-mail Addresses Ocean Exploration and Research (OER):

OER Program Administration  
 Phone: (301) 734-1010  
 Fax: (301) 713-4252  
 E-mail: [Firstname.Lastname@noaa.gov](mailto:Firstname.Lastname@noaa.gov)

University of New Hampshire, Center for Coastal and Ocean Mapping  
 Phone: (603) 862-3438  
 Fax: (603) 862-0839

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

*Okeanos Explorer* Cellular: (401) 713-4114  
*Okeanos Explorer* Iridium:(808) 659-9179  
 OER Mission Iridium (dry lab): (808) 851-3827  
 EX INMARSAT B  
 Line 1: 011-870-764-852-328 Line  
 2: 011-870-764-852-329 Voice  
 Over IP (VoIP) Phone:  
 (541) 867-8932  
 (541) 867-8933  
 (541) 867-8934

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

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



## E. IT Security

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

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

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

## F. Foreign National Guests Access to OMAO Facilities and Platforms

There are currently no planned Foreign National Guests.

# IX. References

Conley, M.F., M.G. Anderson, N. Steinberg, and A. Barnett, eds. 2017. The South Atlantic Bight Marine Assessment: Species, Habitats and Ecosystems. The Nature Conservancy, Eastern Conservation Science.



# Appendix A

## EMERGENCY CONTACT DATA SHEET–NOAA SHIP *OKEANOS EXPLORER*

Scientists sailing aboard *Okeanos Explorer* shall fill out the form found at the following link location: [https://docs.google.com/forms/d/1xbmRNHbLhyc68QiY\\_R-km9f7ynRSCpUPsFdk9dnc1W4/viewform?edit\\_requested=true#start=invite](https://docs.google.com/forms/d/1xbmRNHbLhyc68QiY_R-km9f7ynRSCpUPsFdk9dnc1W4/viewform?edit_requested=true#start=invite) with their emergency contact information



# Appendix B: Data Management Plan

Okeanos Explorer Mission EX1907 Data Management Plan

Report Date: 2019-09-24

## 1. General Description of Data to be Managed

### 1.1 Name and Purpose of the Data Collection Project:

Okeanos Explorer (EX1907): Mid and Southeast US (ROV & Mapping)

This expedition will contribute to NOAA's Atlantic Seafloor Partnership for Integrated Research and Exploration (ASPIRE), a major multi-year, multi-national collaborative field program focused on raising collective knowledge and understanding of the North Atlantic. This campaign provides timely, actionable information to support decision making based on reliable and authoritative science. It also serves as an opportunity for the nation to highlight the uniqueness and importance of these deepwater environments. ASPIRE builds on the momentum of past U.S. campaigns and international initiatives to support ecosystem-based management of marine resources.

### 1.2 Summary Description of the data to be collected:

Operations will include the use of the ship's deep-water mapping systems (Kongsberg EM302 multibeam sonar, EK 60/80 split-beam fisheries sonars, Knudsen 3260 chirp sub-bottom profiler sonar, and Teledyne Acoustic Doppler Current Profilers), XBTs in support of multibeam sonar mapping operations, CTD casts, the two-body ROV Deep Discoverer and Seirios, and the ship's high-bandwidth satellite connection for continuous real-time ship-to-shore communications.

**1.3 Keywords or phrases that could be used to discover the data:** expedition, exploration, explorer, marine education, noaa, ocean, ocean discovery, ocean education, ocean exploration, ocean exploration and research, ocean literacy, ocean research, OER, science, scientific mission, scientific research, sea, stewardship, systematic exploration, technology, transformational research, undersea, underwater, Davisville, mapping survey, multibeam, multibeam backscatter, multibeam sonar, multi-beam sonar, noaa fleet, okeanos, okeanos explorer, R337, Rhode Island, scientific computing system, SCS, single beam sonar, singlebeam sonar, single-beam sonar, sub-bottom profile, water column backscatter, Seabed 2030, SEDCI, SECART, sonar anomalies, South Atlantic Bight, oceans, biogeographic patterns, deep-sea ecosystems, habitat characterization, dominant community members, potential new species, site characterization, Essential Fish Habitats, Habitat Areas of Particular Concern, National Marine Sanctuaries, Southeast Deep-sea Coral Initiative, Southeastern US Continental Margin, ASPIRE

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

Okeanos ROV Cruises

### 1.5 Planned or Actual Temporal Coverage of the data:

Start Date: 10/31/2019 and End Date: 11/21/2019

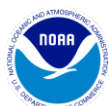
### 1.6 Actual or Planned Geographic Coverage of the data:

Northernmost Boundary: 34.85 and Southernmost Boundary: 23.96

Westernmost Boundary: -83.47 and Easternmost Boundary: -71.98

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

Bottom Backscatter, Cruise Plan, Cruise Summary, CTD (processed), CTD (product), CTD



(raw), Data Management Plan, Dive Summaries, EK60 Split Beam Data, Highlight Images, Multibeam (image), Multibeam (processed), Multibeam (product), Multibeam (raw), Quick Look Report, Raw Video (digital), Sample Analysis Reports, SCS Output (compressed), SCS Output (native), Sound Velocity Profile, Sub-Bottom Profile data, Temperature data, Water Column Backscatter, XBT (raw)

### **1.8 What platforms will be employed?**

NOAA Ship Okeanos Explorer, Deep Discoverer ROV, SEIRIOS Camera Sled

### **2 Points of Contact for this Data Producing Project**

Overall POC: Michael White

Title: Expedition Coordinator

Affiliation: NOAA Office of Ocean Exploration and Research

Phone: 301-938-8460

### **3 Points of Contact for Managing the Data**

Data POC: Fernando Aragon, Megan Cromwell

Data POC Title: Shoreside/Onboard Data Manager, Sample Data Manager and Stewardship Data Manager

Data POC Email: fernando.aragon@tgfoe.org, megan.cromwell@noaa.gov

### **4 Resources**

#### **4.1 Have resources for management of these data been identified?**

Yes

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

Unknown

### **5 Data Lineage and Quality**

#### **5.1 What is the processing workflow from collection to public release?**

SCS data shall be delivered in its native format as well as an archive-ready, documented, and compressed NetCDF3 format to NCEI-MD; Acoustic data and metadata will be compressed and delivered in a bagit format to NCEI-CO; Video data shall be delivered via hard-drive to NCEIMD, where they will be post-processed, documented, and archived then made discoverable and accessible through the OER Video Portal.

#### **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. CTDs are post-processed by the data management team as a quality control measure and customized CTD profiles are generated for display on the Okeanos Atlas.

### **6 Data Documentation**

#### **6.1 Does the metadata comply with the Data Documentation Directive?**

Yes

##### **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 precruise planning and published in the NOAA OneStop catalog and an OER Web Accessible Folder (WAF) hosted at NCEI-MS for public discovery and access.

URL: [https://data.noaa.gov/waf/NOAA/NESDIS/ncei/oer/iso\\_u/xml/](https://data.noaa.gov/waf/NOAA/NESDIS/ncei/oer/iso_u/xml/)

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

## 6.3 Process for producing and maintaining metadata:

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

## 7 Data Access

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

Yes

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

Not Applicable

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

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

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

Organization: NOAA National Centers for Environmental Information (NCEI)

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

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

time: Data are considered immediately publicly accessible as soon as possible after the mission, unless there are documented restrictions.

Hold 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 Data Management Plan at NOAA's EDMC DMP Repository for detailed descriptions of the processes, procedures, and partners involved in this collaborative effort.

### 8.2 If no archive planned, why?

Not Applicable

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

60-90 days

### 8.4 How will data be protected from accidental or malicious modification or deletion? Data management standard operating procedures minimizing accidental or malicious modification or deletion are in place aboard the Okeanos Explorer and will be enforced.



## 8.5 Prepare a Data Use Statement

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

# Appendix C: Categorical Exclusion

## Categorical Exclusion (CE) Evaluation Worksheet

**Project Identifier:** EX-19-07

**Date Review Completed:** 10/11/2019

**Completed by:** Caitlin Adams, OER Project Coordinator

**OAR Functional Area:** OER

**Worksheet File Name:** 2019-10-OER-E3-EX-19-07

### Step 1. CE applicability

1. **Is this federal financial assistance, including via grants, cooperative agreements, loans, loan guarantees, interest subsidies, insurance, food commodities, direct appropriations, and transfers of property in place of money?**

no

2. **What is the proposed federal action?**

The proposed action is for OER to collect baseline mapping data using NOAA Ship Okeanos Explorer's scientific sonar systems (Kongsberg EM302 multibeam, Simrad EK60 and EK80 split-beam, Knudsen 3260 chirp sub-bottom profiler, and Teledyne Acoustic Doppler Current Profiler), and to conduct baseline characterization of unexplored areas using NOAA's two-body remotely operated vehicle (ROV), XBT, CTD rosette system and telepresence. ROV operations will include collection of detailed high resolution imagery, limited biological and geological specimens, and digital environmental sensor data. The expedition will conduct operations in unexplored deep water (>200 m) throughout the Southeast U.S. Continental Margin offshore of Florida, Georgia, South Carolina, North Carolina, and Virginia. The expedition is currently scheduled to start in Miami, FL on October 31, 2019, and end in Key West, FL on November 21, 2019. All mission personnel are either on contract to OER or are funded through an OER grant. This action demonstrates independent utility and is not a connected action.

3. **Which class of CE in Appendix E of the NAO 216-6A Companion Manual is applicable to this action and why?**





- a. E3: Activities to collect aquatic, terrestrial, and atmospheric data in a non-destructive manner.
- b. The topical scope of this action is consistent with CE number E3 in Appendix E of the Companion Manual to NOAA Administrative Order (NAO) 216-6A: activities to collect aquatic, terrestrial, and atmospheric data in a non-destructive manner. The expedition will use remote sensing, video, imagery, and a limited number of physical samples to collect baseline information on unexplored deep-water (>200 m) areas throughout the Southeast U.S. Continental Margin offshore of Florida, Georgia, South Carolina, and North Carolina.

## Step 2. Extraordinary Circumstances Consideration

### 4. Would the action result in adverse effects on human health or safety that are not negligible?

This action will not result in adverse effects on human health or safety. NOAA Ship Okeanos Explorer will be operating in offshore, deep-sea (>200 m) areas of the Southeast U.S. Continental Margin during EX-19-07. All operation areas are underwater and therefore have no human presence. This action does not involve any procedures or outcomes known to result in impacts on human health and safety.

### 5. Would the action result in adverse effects on an area with unique environmental characteristics that are not negligible?

Data collection will primarily occur offshore and in deep water (greater than 200 meters), including the Stetson-Miami Terrace Deepwater Coral Habitat Area of Particular Concern. The effects will be negligible, as acoustic mapping and ROV operations are transient and will not cause any permanent impact on the seabed or water column.

The expedition is being planned and conducted in partnership with NOAA National Marine Fisheries Service (NMFS), NOAA Deep Sea Coral Research and Technology Program (DSCRTP), NOAA National Centers for Coastal Ocean Science (NCCOS), U.S. Geological Survey, U.S. Fish and Wildlife Service, and other Management agencies of the region. OER will use input from these management authorities that are familiar with these areas in order to ensure no more than negligible effects on any areas with potentially unique environmental characteristics.

### 6. Would the action result in adverse effects on species or habitats protected by the ESA, MMPA, MSA, NMSA, or MBTA that are not negligible?

OER has taken measures to ensure that any effects on species or habitats protected by the ESA, MMPA, MSA or NMSA meet the definition of negligible. In 2018, an informal consultation was initiated under Section 7 of the Endangered Species Act (ESA), requesting NOAA Fisheries'

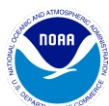
Protected Resources Division concurrence with our Biological Evaluation determining that NOAA Ship Okeanos Explorer operations conducted during the 2018-2019 field seasons are not likely to adversely affect ESA-listed marine species. The informal consultation was completed on August 8, 2018 when OER received a signed letter from the Chief ESA Interagency Cooperation Division in the NOAA Office of Protected Species, stating that NMFS concurs with OER's determination that operations conducted during NOAA Ship Okeanos Explorer 2018-2019 field seasons are not likely to adversely affect ESA-listed marine species. The ESA Section 7 Letter of Concurrence is provided as an appendix in the EX-19-07 project instructions. OER is currently in the process of requesting a re-initiation request to cover the 2020 field season, which will be operating in the same areas as were approved for 2018-2019 field seasons.

OER has taken measures to ensure that any effects on species or habitats protected by the ESA, MMPA, MSA or NMSA meet the definition of negligible. In 2018, an informal consultation was initiated under Section 7 of the Endangered Species Act (ESA), requesting NOAA Fisheries' Protected Resources Division concurrence with our Biological Evaluation determining that NOAA Ship Okeanos Explorer operations conducted during the 2018-2019 field seasons are not likely to adversely affect ESA-listed marine species. The informal consultation was completed on August 8, 2018 when OER received a signed letter from the Chief ESA Interagency Cooperation Division in the NOAA Office of Protected Species, stating that NMFS concurs with OER's determination that operations conducted during NOAA Ship Okeanos Explorer 2018-2019 field seasons are not likely to adversely affect ESA-listed marine species. The ESA Section 7 Letter of Concurrence is provided as an appendix in the EX-19-07 project instructions. OER is currently in the process of requesting a re-initiation request to cover the 2020 field season, which will be operating in the same areas as were approved for 2018-2019 field seasons.

Given the offshore focus of most of our proposed work, it is improbable that we will encounter marine mammals protected under the MMPA, or sea birds protected under the MBTA. If we did encounter any such protected animals, our impacts would be negligible because of the best management practices to which we adhere to avoid or minimize environmental impacts. These best management practices are all outlined in the appendices of the in the EX-19-07 project instructions.

OER also initiated a request for an abbreviated Essential Fish Habitat (EFH) consultation for expeditions by NOAA Ship Okeanos Explorer in 2018-2020 to the Greater Atlantic Region, including EX1906. On July 19, 2018, OER received a letter from the Assistant Regional Administrator for the NOAA Office of Habitat Conservation stating that these expeditions will not adversely impact EFH. This letter is provided in appendices of the EX-19-07 project instructions.

Additionally, OER received a Letter of Acknowledgement (LOA) from NMFS for operations in the Southeast Deepwater MPAs and areas deemed as a Habitat Areas of Particular Concern (HAPCs). The LOA is also included in the project instructions.



**7. Would the action result in the potential to generate, use, store, transport, or dispose of hazardous or toxic substances, in a manner that may have a significant effect on the environment?**

The operations of the expedition will be in compliance with FEC 07 Hazardous Materials and Hazardous Waste Management Requirements for Visiting Scientific Parties (or the OMAO procedure that supersedes it) to ensure generation, use, storage, transport, and disposal of such substances will not result in significant impacts.

**8. Would the action result in adverse effects on properties listed or eligible for listing on the National Register of Historic Places authorized by the National Historic Preservation Act of 1966, National Historic Landmarks designated by the Secretary of the Interior, or National Monuments designated through the Antiquities Act of 1906; Federally recognized Tribal and Native Alaskan lands, cultural or natural resources, or religious or cultural sites that cannot be resolved through applicable regulatory processes?**

During the expedition, we will be conducting ROV dives on sonar anomaly targets believed to be shipwrecks. If these anomalies are confirmed to be significant shipwrecks, they can potentially be eligible for listing on the National Register of Historic Places. OER conducts non-invasive surveys of archaeology targets and protects the location of sensitive cultural heritage sites (UCH). OER's standard operating procedures for UCH sites can be found in Appendix H of the project instructions. This expedition is being planned in conjunction with the NOAA Office of National Marine Sanctuaries' Maritime Heritage Program and the Bureau of Ocean Energy Management (BOEM). Staff from the Maritime Heritage Program and BOEM will participate in UCH operations to ensure that operations are non-invasive and compliant to all applicable regulations.

**9. Would the action result in a disproportionately high and adverse effect on the health or the environment of minority or low-income communities, compared to the impacts on other communities (EO 12898)?**

NOAA Ship Okeanos Explorer will be operating in remote and offshore areas of the Southeast US Continental Margin during the expedition. There are no communities within or near the geographic scope of the expedition, and the mission does not involve actions known or likely to result in adverse impacts on human health.

**10. Would the action contribute to the introduction, continued existence, or spread of noxious weeds or nonnative invasive species known to occur in the area or actions**



**that may promote the introduction, growth, or expansion of the range of the species?**

During EX-19-07, NOAA Ship Okeanos Explorer will not make landfall in areas other than commercial ports. The ship and OER mission team will comply with all applicable local and federal regulations regarding the preventing or spread of invasive species. At the completion of every CTD cast and ROV dive, the equipment will be thoroughly rinsed with freshwater and completely dried to prevent spreading organisms from one site to another. Also, the Engineering Department aboard the NOAA Ship Okeanos Explorer attends yearly Ballast Management Training in accordance with NOAA Form 57-07-13 NPDES VGP Annual Inspection and Report to prevent the introduction of invasive species.

**11. Would the action result in a potential violation of Federal, State, or local law or requirements imposed for protection of the environment?**

The proposed action will not result in any violations of Federal, State, or local law or requirements imposed for protection of the environment. OER engaged in the requisite consultations on ESA Section-7 and EFH for this expedition as outlined in questions 4-6 above.

**12. Would the action result in highly controversial environmental effects?**

The exploration activities will be localized and of short duration in any particular area at any given time. Given the project's scope and breath, no notable or lasting changes or highly controversial effects to the environment will result.

**13. Does the action have the potential to establish a precedent for future action or an action that represents a decision in principle about future actions with potentially significant environmental effects?**

While each cruise contributes to the overarching goal of exploring, mapping, and sampling the ocean, every cruise is independently useful and not connected to subsequent cruises.

**14. Would the action result in environmental effects that are uncertain, unique, or unknown?**

The techniques and equipment used are standard for this type of field study, and the effects are well known.

**15. Does the action have the potential for significant cumulative impacts when the proposed action is combined with other past, present and reasonably foreseeable future actions, even though the impacts of the proposed action may not be significant by themselves?**

By definition, actions that a federal agency classifies as a categorical exclusion have no potential, individually or cumulatively, to significantly affect the environment. This cruise is consistent with a class of CE established by NOAA and there are no extraordinary circumstances for this action that may otherwise result in potentially significant impacts.

**CE Determination**

I have determined that a Categorical Exclusion is the appropriate level of NEPA analysis for this action and that no extraordinary circumstances exist that would require preparation of an environmental assessment or environmental impact statement.

I have determined that an environmental assessment or environmental impact statement is required for this action.

Signature: **CANTELAS.FRAN** Digitally signed by  
CANTELAS.FRAN;KJ.13658550  
87  
Date: 2019.10.11 11:28:33  
-0400

Signed by: Frank Cantelas

Date Signed: 10/11/2019



# Appendix D: ESA Section Letter of Concurrence

An copy of OER's relevevant ESA Letter of Concurrence can be found here:

<https://drive.google.com/open?id=1rgb24b7yEOrA3tHdOZhqmZIOhceuesU5>



# Appendix E: EFH Consultation Letter

An Essential Fish Habitat letter issued for NOAA OER's Okeanos Explorer operations in the Atlantic Basin can be found here:

<https://drive.google.com/open?id=1Kt0cJBC3ndpE7k4njcPyjF1BQAMGxTta>



# Appendix F: NASA Maritime Aerosols Network Survey of Opportunity

Survey or Project Name Maritime Aerosol Network

Lead POC or Principle Investigator (PI & Affiliation)  
POC: Dr. Alexander Smirnov

Supporting Team Members Ashore

Supporting Team Members Aboard (if required)

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

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





# Appendix G: NMFS Letter of Acknowledgement (LOA) for operations in the Southeast United States



**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
**NATIONAL MARINE FISHERIES SERVICE**  
Southeast Regional Office  
263 13<sup>th</sup> Avenue South  
St. Petersburg, Florida 33701-5505  
<https://www.fisheries.noaa.gov/region/southeast>

06/06/2019

F/SER25:FH

Mr. Craig Russell  
NOAA Office of Ocean Exploration and Research (OER)  
7600 Sand Point Way, NE  
Seattle, WA 98115

Dear Mr. Russell:

This letter of acknowledgement (LOA) recognizes the activities outlined in your May 30, 2019, request as scientific research in accordance with the definitions and guidance at 50 CFR 600.10 and 600.745(a). As such, the proposed activities are not subject to fishing regulations at 50 CFR 622 developed in accordance with the Magnuson-Stevens Fishery Conservation and Management Act. This LOA is effective from date of issuance through December 31, 2019.

NOAA Fisheries understands primary operations aboard the NOAA Ship *Okeanos Explorer* will take place throughout federal waters of the South Atlantic and U.S. Caribbean in areas deeper than 250 m. OER anticipates supporting cruises that will be some combination of mapping and remote operating vehicle (ROV) operations. Specifically, these efforts will (1) survey deep-sea coral ecosystems using ROV, including using a suction sampler to take 4-6 biological samples per ROV dive, (2) map deep-water habitats using multi-beam echosounders, and (3) sample the physical and chemical properties of the water column. From June 20 through July 12, 2019, NOAA OER will conduct a seafloor and water column mapping cruise (EX-19-03-L2) to collect data to help improve fundamental understanding in this region. Operations will consist of daytime ROV dives and overnight mapping operations. ROV dive sites are expected to include deep-sea coral and sponge habitats, submarine canyons, potential methane seeps, maritime heritage sites and midwater exploration. Another cruise (EX-19-07) will be conducted from November 1-23, 2019, with similar ROV and mapping operations. The combined dives will enable scientists and managers to have a better understanding of the diversity and distribution of deep-water habitats in this region, and enable informed resource management decisions.

Project participants covered under this LOA include: Kasey Cantwell, Eric Johnson, Elizabeth Lobecker, Rosemary Abbitt, Craig Russell, and Alan Leonardi. Copies of this LOA and the scientific research plan for the project should be onboard the vessel during all sampling activities. This LOA is separate and distinct from any permit or consultation required by the Marine Mammal Protection Act, Endangered Species Act, or any other applicable law.



Please send a copy of any cruise report or other publications resulting from the scientific research activity to me and to the Director, Southeast Fisheries Science Center, 75 Virginia Beach Drive, Miami, Florida 33149-1003.

Sincerely,

STRELCHECK.AND Digitally signed by  
STRELCHECK.ANDREW.J.1365  
963152  
Date: 2019.06.06 08:29:50 -0400  
REW.J.1365863152

for Roy E. Crabtree, Ph.D.  
Regional Administrator

Enclosure

cc: F/SEFSC, F/EN3



# Appendix H: UCH Standard Operating Procedures

## NOAA Office of Ocean Exploration and Research 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.*

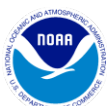
### II. Background

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 publicly 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
  - Public 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.

<b>MISSION PERSONNEL (Coordinated by: Expedition Coordinator)</b>	
<b>Responsible Team</b>	<b>Accountable for these (primary) actions</b>
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.
<b><i>Okeanos Explorer Operations (Coordinated by: CO or Designee)</i></b>	
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

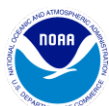
### A. Pre-Cruise Planning

#### 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" toplevel 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 postprocessing 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 flowthrough 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](http://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.

Data generated by the *Okeanos Explorer* is archived under a data management agreement with NCEI. 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: NCEI 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.

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 and other datasets within the buffer zone

## 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:

<b>MISSION PERSONNEL (Notified by: Expedition Coordinator)</b>		
<b>Employee</b>	<b>Accountability Mechanism for With-holding Sensitive Data</b>	<b>Action</b>
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
<b>Okeanos Explorer Crew (Notified by: CO or Desingnee)</b>		
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

