



UNITED STATES DEPARTMENT OF COMMERCE

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

MEMORANDUM FOR: Commander Ricardo Ramos, NOAA
Commanding Officer, NOAA Ship *Okeanos Explorer*

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

SUBJECT: Project Instruction for EX-14-02 Leg 3
Gulf of Mexico (ROV/Mapping)

Attached is the final Project Instruction for EX-14-02 Leg 3, Gulf of Mexico (ROV/Mapping), which is scheduled aboard NOAA Ship *Okeanos Explorer* during the period of 10 April to 1 May, 2014. Of the 22 DAS scheduled for this project, 22 days are funded by OMAO Allocation. This project is estimated to exhibit a High Operational Tempo. Acknowledge receipt of these instructions via e-mail to OpsMgr.MOA@noaa.gov at Marine Operations Center-Atlantic.

Attachment

cc:
MOA1





Project Instructions

Date Submitted: March 27, 2014

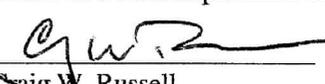
Platform: NOAA Ship *Okeanos Explorer*

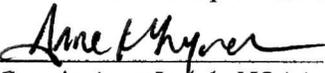
Project Number: EX-14-02 LEG III

Project Title: Exploration, Gulf of Mexico (ROV/Mapping)

Project Dates: April 10 – May 1, 2014

Prepared by: Kelley Elliot, NOAA
Expedition Manager
Office of Ocean Exploration & Research

Approved by:  Dated: 3/29/14
Craig W. Russell
Program Manager
Office of Ocean Exploration & Research

Approved by:  Dated: 4/7/14
Captain Anne Lyhch, NOAA
Commanding Officer
Marine Operations Center - Atlantic

I. OVERVIEW

1. Brief Summary and Project Period

This document contains project instructions for EX-14-02 LEG 3. EX-14-02 LEG 3 operations are expected to commence on April 10, 2014 at Pascagoula, MS and conclude on May 1, 2014 at St. Petersburg, FL. Daily daytime ROV dives are expected with full shore-based science participation; evening/night mapping and CTD operations. Focused operations will be conducted in deep water areas south and southeast of the Flower Garden Banks National Marine Sanctuary (FGBNMS), and limited operations on the west Florida shelf and adjacent Escarpment.

2. Days at Sea (DAS)

Of the 22 DAS scheduled for this project, 22 DAS are funded by an OMAO allocation, 0 DAS are funded by a Line Office Allocation, 0 DAS are Program Funded, and 0 DAS are Other Agency funded. This project is estimated to exhibit a High Operational Tempo.

C. Operating Area

There are two general operating areas planned for leg 3, both in the Gulf of Mexico. Operations will focus primarily on: 1) The area to the south and southeast of Flower Garden Banks National Marine Sanctuary (FGNMS), including Keathley Canyon and adjacent parts of the Sigsbee Escarpment (Fig. 2), and 2) areas in on the West Florida Escarpment southwest of Tampa (Fig. 3). ROV and most mapping operations will focus in depths >500 m. Most of the operations, including the transit, will be conducted within the 200nm exclusive economic zone (EEZ) maritime boundary of the United States of America, however several dives may be conducted in international waters south of FGBNMS.

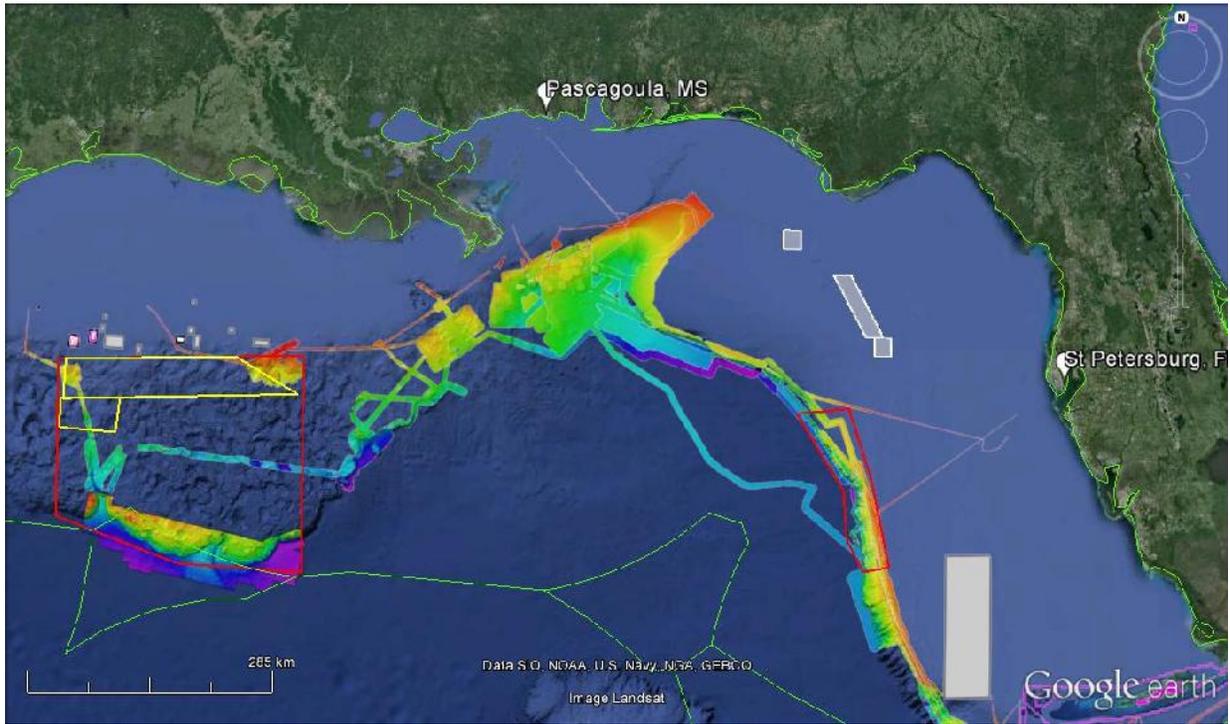


Figure 1: Overview map showing priority exploration areas for leg 3 of the 2014 Gulf of Mexico Expedition. Red boxes are general operating areas for ROV, CTD and mapping operations. Yellow boxes are areas planned to be mapped during EX1402 Leg 2. White boxes are marine protected areas, and the green line is the U.S./Mexico Exclusive Economic Zone. Bathymetry shown is from 2011-2012 *Okeanos* cruises, and Extended Continental Shelf data (courtesy UNH CCOM).

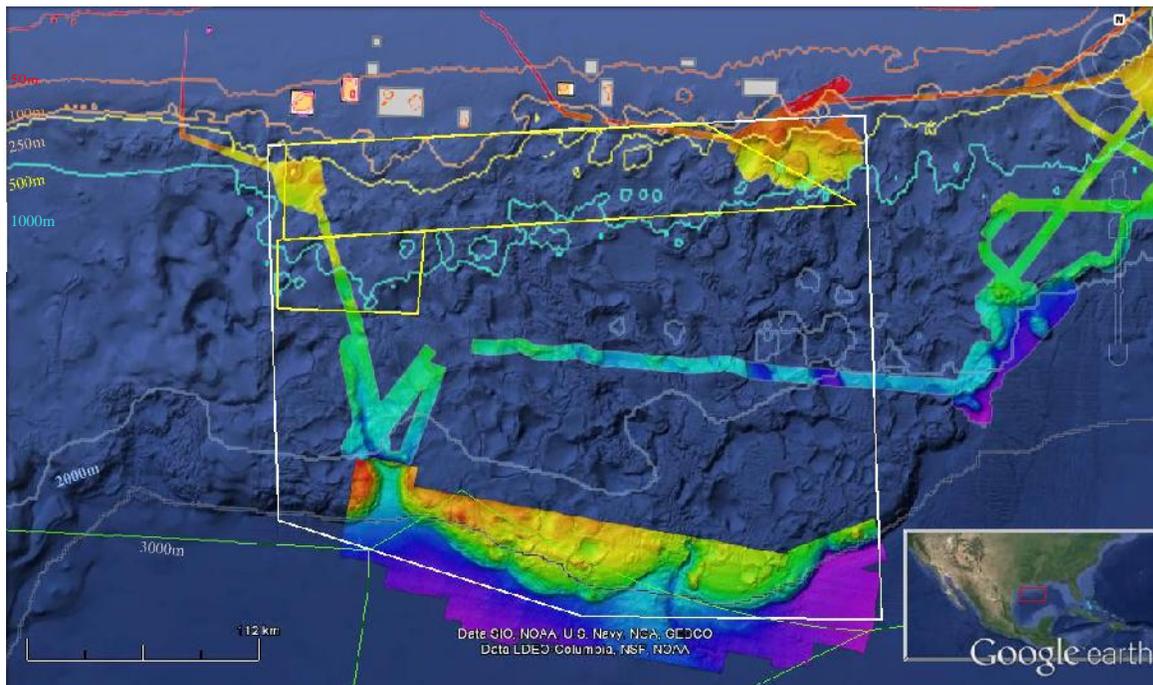


Figure 2: Close-up map showing the general operating area outlined in white for focused exploration activities during leg 3 of the 2014 Gulf of Mexico Expedition. Yellow boxes are areas planned to be mapped during EX1402 Leg 2. White-filled boxes are marine protected areas, and the green line is the U.S./Mexico Exclusive Economic Zone. Bathymetry show is from 2011-2012 *Okeanos* cruises, and Extended Continental Shelf data (courtesy UNH CCOM).

Bounding Coordinates of Western Operating Area Box		
Point	Latitude (N)	Longitude (W)
NE Corner	27.87678207546225	-91.14842354677745
NW Corner	27.68221781298841	-93.99147347962929
SE Corner	25.74965690005428	-91.03593464341377
SW Corner	26.10661697888872	-93.8731182458903
South-Mid Point	25.74469495383532	-92.44108762842502

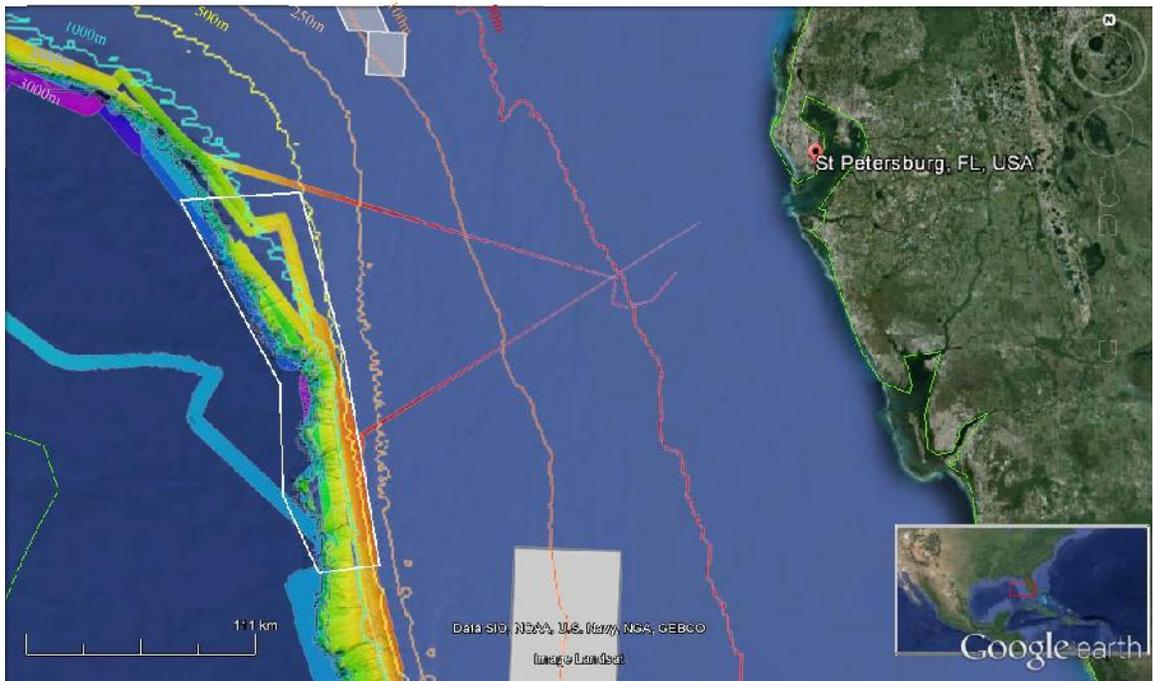


Figure 3: Close-up map showing the general operating area outlined in white for limited exploration activities during leg 3 of the 2014 Gulf of Mexico Expedition, as the ship makes her way into port in St. Petersburg, FL. White-filled boxes are marine protected areas, and the green line is the U.S./Mexico Exclusive Economic Zone. Bathymetry show is from 2011-2012 *Okeanos Explorer* cruises.

Bounding Coordinates of Eastern Operating Area Box		
Point	Latitude (N)	Longitude (W)
Mid-East Point	26.85235491641343	-84.83690797446732
NE Corner	27.53707096698763	-85.08953355797442
NW Corner	27.48159561439514	-85.6639786958786
Mid-West Point	26.72714171704449	-85.14143301159665
Mid-SW Point	26.25047425677312	-85.09817694592935
SW Corner	25.93407033469275	-84.91607554966636
SE Corner	25.9792000185841	-84.62997633666979

D. Summary of Objectives

EX-14-02 Leg 3 operations will focus within the two Gulf of Mexico polygons shown in figures 1 to 3 above. The overall goal of this cruise is to collect data to aid the development of a baseline characterization of the operating areas. Daytime operations will focus on ROV dives, while evening and night operations will be focused on CTD and Mapping operations.

Mission objectives for EX-14-02 Leg 3 include a combination of operational, science, education, outreach, surveys of opportunity, and data management objectives. They are:

1. Science
 - a. Identify and explore the diversity and distribution of benthic habitats and features in the region (e.g., seeps, deep corals and related benthic ecosystems, canyons).
 - b. Conduct ROV dives along the Sigsbee Escarpment and in adjacent deep-water canyons.
 - c. Locate and characterize underwater cultural heritage e.g., shipwrecks (data will be used to assess their eligibility for the National Register of Historic Places).
 - d. Ground-truth acoustic seep data and characterize associated habitat.
 - e. Deploy Argo Floats (See appendix F for more instructions.).

2. ROV
 - a. Re-integrate the ROV into the ship's systems.
 - b. Test and use the ROV for telepresence-enabled exploration.
 - c. Daytime ROV dives on exploration targets; and
 - d. Ongoing training of pilots; and
 - e. Ongoing system familiarization, documentation and training.
 - f. Train pilots to take high quality images and navigate the new ROV.
 - g. Continue to apply, develop and/or refine system checklists, SOPs, spares lists, etc.
 - h. Continue training in ROV launch and recovery operations.
 - i. Continue to train bridge crew on ROV operations and use of dynamic positioning system (DP).

3. Telepresence (VSAT 20 mb/sec ship-to-shore; T1 shore-to-ship)
 - a. Test terrestrial and high-speed satellite links; and
 - b. Test and refine ship-to-shore communications and operations procedures that engage multiple ECCs during the course of each cruise; and
 - c. Engage new ECC located at Harbor Branch Oceanographic Institution, and ECCs new to *Okeanos Explorer* telepresence operations (TAMU Galveston, Meadows Center at Texas State University); and
 - d. Test and refine operating procedures and products; and
 - e. Engage a broad spectrum of the scientific community and public in telepresence-based exploration; and
 - f. Integrate ROV Trac system into ship's network and establish backup procedure
 - g. Work with NOAA NOC to harden the video network path.
 - h. Test new pathways for the Internet 1 accessible video stream.
 - i. Continue to use the real-time RSS feed to generate public engagement.
 - j. Support live interaction between ship and shore for education and media events.

4. ECCs
 - a. Support distributed participation from science community at multiple shore-side locations through telepresence; and
 - b. Train scientists on how to use online collaboration tools and technologies to conduct remote science; and
 - c. Refine/update SOPs; and
 - d. Ongoing system familiarization and training.
 - e. Test new online collaboration tools SOPs.

5. Mapping Operations
 - A. Support night time mapping operations and holiday filling.
 - B. Support ROV dive planning by producing mapping products.
 - C. Acquire water-column data with EK 60 and EM 302;
 - D. Acquire sub-bottom data; and
 - E. Conduct mapping operations during transit, with possible further development of exploration targets; and
 - F. Conduct training of new mapping watchstanders.
 - G. Create daily standard mapping products.

6. CTD operations
 - A. Conduct CTD/rosette casts as needed; and

7. XBT operations
 - a. During mapping operations, XBT casts will be collected at regular intervals of 2-4 hours or more often as data quality requires.

8. Data Management
 - a. Provide a foundation of publicly accessible data and information products to spur further exploration, research, and management activities,
 - b. Provide daily cumulative multibeam products to shore for operational decision making purposes, as detailed in the 2013 field products list; and
 - c. Record 2 channels of streamed video footage of a ROV dive onboard the ship.
 - d. Begin configuration and installation of new shipboard Data Warehouse
 - e. Evaluate and if necessary revise video data consolidation scripts generated on EX1402L1. Integrate into video post processing SOP
 - f. Confirm integration and data quality of ROV environmental sensors
 - g. Update ROV camera codes and VIMS documentation with overwinter modifications

- h. Integrate automated frame export for captured video feeds (preliminary data product).

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

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

University of Rhode Island, Graduate School of Oceanography, Inner Space Center, Narragansett, Rhode Island, 02882

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

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

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

NOAA Pacific Marine Environmental Lab 7600 Sand Point Way NE, Seattle, WA 98115

U.S. Geological Survey, Woods Hole Science Center, 384 Woods Hole Road, Quissett Campus, Woods Hole, MA 02543-1598

The University of Texas at Austin, John A. and Katherine G. Jackson School of Geosciences, Institute for Geophysics, J.J. Pickle Research Campus, Building 196 (ROC), 10100 Burnet Road (R2200), Austin, TX 78758-0999

Cooperative Institute for Ocean Exploration, Research and Technology, Harbor Branch Oceanographic Institute at Florida Atlantic University, 5600 US 1 North, Fort Pierce, FL 34946

F. Personnel (Science Party)

A full mission complement is necessary for this cruise.

Table 2: Full list of the mission personnel afloat and their affiliation

Name (Last, First)	Title	Date Aboard	Date Disembark	Gender	Affiliation	Nationality
Elliott, Kelley	Expedition Coordinator	April 8	May 3	F	NOAA OER (20/20)	US Citizen
Austin, James	Science Co-Lead	April 9	May 3	M	UT	US Citizen
Farrington, Stephanie	Science Co-Lead	April 8	May 3	F	HBOI	US Citizen
Drewniak, Jared	Telepresence Video Lead		May 3	M	NOAA OER (ERT)	US Citizen
Reser, Brendan	Telepresence Data Lead	April 9	May 3	M	NOAA NCDDC (GDIT)	US Citizen
Lobecker, Elizabeth "Meme"	Mapping Team Lead	April 8	May 3	F	NOAA OER (ERT)	US Citizen
Marshall, Jeffery	Mapping Watch Lead		May 3	M	NOAA AHB	US Citizen
Bingham, Brian	Dive Supervisor	April 5	May 3	M	UCAR	US Citizen
Wright, Dave	ROV Engineer	April 3	May 3	M	UCAR	US Citizen
Williams, Jeff	ROV Engineer	April 3	May 3	M	UCAR	US Citizen
Mohr, Bobby	ROV Engineer	April 3	May 3	M	UCAR	US Citizen
Lanning, Jeff	ROV Engineer	April 3	May 3	M	UCAR	US Citizen
McLetchie, Karl	ROV Engineer	April 3	May 3	M	UCAR	US Citizen
Gregory, Todd	ROV Engineer	April 3	May 3	M	UCAR	US Citizen
Carlson, Joshua	ROV Engineer	April 3	May 3	M	UCAR	US Citizen
Ritter, Chris	ROV Engineer	April 3	May 3	M	UCAR	US Citizen
Rogers, Dan	ROV Engineer	April 3	May 3	M	UCAR	US Citizen
Howard, Art	ROV Engineer	April 8	May 3		UCAR	
McNicol, Ed	Telepresence Engineer	April 8	May 3	M	UCAR	US Citizen
Brian, Roland	Telepresence Engineer	April 3	May 3	M	UCAR	US Citizen

Shore-side Participants (Location and duration of participation will vary)

REMOTE	NAME	INSTITUTION	ROLE	INTEREST	PARTICIPATION LEVEL
URI	LTJG Brian Kennedy	NOAA OER	Operations Support	N/A	Core
URI	Dwight Coleman	URI/ISC	Marine Geologist/ Technical support	Marine Geology	Core
Remote	John Snedden	UTIG	Science	Marine Geology	Core for Submitted Dives
Remote	Jed Damuth	UT/Arlington	Science	Marine Geology	Core for

					Submitted Dives
Remote/ Stennis	Bill Shedd	BOEM	Science	Geophysicist	Core for Submitted Dives
Charleston	Peter Etnoyer	NOAA NCCOS	Science	Deepwater Corals	Core
Silver Spring	Brian Kinlan	NOAA NCCOS	Science	Deepwater Corals/ Geospatial Modelling	Partial
HBOI	John Reed	HBOI CIOERT	Science	Marine Ecology	Core
Remote/ SS	Mike Vecchione	NOAA NMFS	Science	Cephalopods	Core
Remote	Cindy Van Dover	Duke	Science	Science Seep Ecology	Core for Seep Dives
TAMUG	William Keine	NOAA FGNMS	Science	Interdisciplinary	Core
Silver Spring	Frank Cantelas	NOAA OER	Science	Archaeology	Core for Archaeology
Silver Spring	Jim Delgado	NOAA NMS	Science	Archaeology	Core for Archaeology
Stennis	Jack Irion	BOEM	Science	Archaeology	Core for Archaeology
Stennis	Chris Horrell	BSEE	Science	Archaeology	Core for Archaeology
Meadows Center, TX	Fritz Handelmann	TSU	Science	Archaeology	Core for Monterey
LSU	Bob Carney	LSU	Science	Biology/Geology	Intermittent
Remote	Andrea Quattrini	Temple	Science	Deepwater Coral and fish	Intermittent
TAMU	Brendan Roak	UT	Science	Deepwater Corals	Intermittent
Remote	Carolyn Ruppel	USGS	Science	Methane Hydrates	Intermittent
Temple	Erik Cordes	Temple	Science	Deepwater Corals/Seeps	Intermittent
Tampa	Morgan Kilgour	UCONN	Science	Deepwater Ecosystems	Intermittent
UL, Lafayette	Scott France	U. Louisiana, Lafayette	Science	Deepwater Corals	Intermittent
UNH	Larry Mayer	UNH CCOM	Science	Marine Geology	Intermittent
Remote/ SS	Martha Nzinski	NMFS/SI	Science	Marine Biology	Intermittent
Remote	Amanda Demopoulos	USGS	Science	Benthic Ecology	Intermittent
Remote	Thomas Ritter	Montana State University	Science	Ichthyology	Intermittent

G. Administrative

1. Points of Contact:

Ship Operations

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

Chief, Operations Division, Atlantic (MOA)
LT Laura Gibson, NOAA
Telephone: (757) 441-6842
E-mail: Laura.Gibson@noaa.gov

Mission Operations

Kelley Elliott
Expedition Manager
NOAA Office of Ocean Exploration
Phone: (301) 734-1024/ (703) 927-5449
Email: Kelley.Elliott@noaa.gov

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

Meme Lobecker, Mapping Lead
NOAA Ocean Exploration & Research (ERT, Inc.)
Phone: 603-862-1475/ 401-662-9297
E-mail: elizabeth.lobecker@noaa.gov

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

Other Mission Contacts

Craig Russell, EX Program Manager
NOAA Ocean Exploration & Research
Phone: 206-526-4803 / 206-518-1068
E-mail: Craig.Russell@noaa.gov

LCDR Nicola VerPlanck, NOAA
NOAA Ocean Exploration & Research
Phone: 206-526-4801
E-mail: Nicola.Verplanck@noaa.gov

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

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

LTJG Brian Kennedy, ECC Coordinator
NOAA Ocean Exploration & Research
Phone: 401-874-6150 / 706-540-2664
E-mail: Brian.Kennedy@noaa.gov

Brendan Reser, Telepresence Data Lead
NOAA NCDDC
Phone: 228-688-3516 (o) / 503-886-9705
E-mail: Brendan.Reser@noaa.gov

Shipments:

Send an email to the *Okeanos Explorer* Operations Officer at OPS.Explorer@noaa.gov indicating the size and number of items being shipped. All items should arrive at Pascagoula prior to **COB Tuesday, April 8, 2014.**

Vessel shipping address at the Gulf Marine Support Facility:

NOAA Gulf Marine Support Facility
ATTN: LT Emily Rose, NOAA
NOAA Ship *Okeanos Explorer*
151 Watts Ave
Pascagoula, MS 39567-4102

The Gulf Marine Support Facility's telephone numbers are:

- 228-769-0307 (Voice)
- 228-769-9529 (Fax)

2. Diplomatic Clearances

None Required.

3. Licenses and Permits

See Appendix C for categorical exclusion documentation.

II. OPERATIONS

A. Project Itinerary *(All times and dates are subject to prevailing conditions and the discretion of the Commanding Officer)*

April 3: ROV team arrives in Pascagoula

April 4: ROV team arrives on ship. As many members of the ROV team as can be accommodated will stay onboard the ship starting April 4.

April 4: Truck arrives with container; Crane arrives at dock. ROV, camera sled, equipment and container all to be loaded on ship. Argo floats to be loaded onto ship (stored in container). Mobilization and interfacing of equipment. During this time the ROV team will require access to support from the engineering, ET and Deck departments.

April 5 – 9: Continued mobilization and interfacing of equipment. During this time the ROV team will require access to support from the engineering, ET and Deck

departments. Weekend staffing/support from the ship will be required.

**April 6: Official crew rest day. Reduced staffing will be available.*

April 8: Other mission personnel arrive

April 10: Underway from Pascagoula

April 12-24: Daily daytime ROV Dives in the western operating area.

April 24-26: Depart western operating area and transit to eastern operating area.

April 26-30: Daily daytime ROV dives in eastern operating area.

April 30: Depart eastern operating area.

April ??: Live interview with NPR

May 1: Arrive St Petersburg, FL

B. Telepresence Events

Smithsonian Natural History Museum- TBD

NPR Cape Cod- TBD

C. In-Port Events

NOT APPLICABLE TO THIS CRUISE

D. Staging and De-staging

Staging:

A truck with OER's 20' container and a crane paid for by OER will arrive at the dock on April 4. The ROV, Camera Sled, additional equipment and the 20' container will be loaded onto the ship on April 4. Argo floats will be loaded onto ship during this time (and stored in the second 20' container).

Mobilization and interfacing of equipment will commence on April 4 and continue through the in port period to April 9. During this time the ROV team will require

access to and support from the engineering, ET and Deck departments. OER will work with the ship on a daily basis to determine support needed each day. Weekend staffing/support from the ship will be required.

Dates	ROV Operations	Remarks
4/4/14	ROV team arrives in Pascagoula, MS	Team will stay onboard the ship starting April 4 through departure and require berthing and meals.
4/4/14	Load ROV and camera sled	Crane support required
4/4/14	Loading 20ft container	Crane support required
4/4/14	Rigging block/winch wire	- Winch wire to be threaded through A-Frame block by ship crew and ROV team
4/4 - 4/9	Begin set up control room and ROV workshop	- ROV team will require ET support and the ability to conduct hot work
4/4 - 4/9	ROV integration and termination of vehicle.	- High Voltage testing - Test ROV support systems - Support ROV integration and testing - Shifting to ships power will be required
4/4	Load ARGO floats	Crane support requested. The Argo floats will be stored in the 20 ft container until they are deployed.
April 9	Ship Fueling	NO crane activities.

*Table 1: Draft table of activities for ROV Staging and Integration.
All dates are approximate and can still change*

De-staging

No de-staging required in St. Petersburg. The ROV D2, camera sled *Seirios* and second 20' container will remain onboard until the ship pulls into port in North Kingstown, RI.

De-staging in RI will commence the day the ship returns, May 22, will continue May 23 and will recommence on May 27.

E. Dive Plan

All dives are to be conducted in accordance with the requirements and regulations of the NOAA Diving Program (<http://www.ndc.noaa.gov/dr.html>) and require the approval of the ship's Commanding Officer.

No dives are scheduled for this cruise at this time.

F. Sonar Operations

Continuous nighttime EM 302, EK 60, and subbottom 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. The final decision to operate and collect sub-bottom profiler data will be at the discretion of the Commanding Officer.

G. Applicable Restrictions

NOT APPLICABLE TO THIS CRUISE

III. EQUIPMENT

A. Equipment and capabilities provided by the ship

- Kongsberg Simrad EM302 Multibeam Echosounder (MBES)
- Kongsberg Simrad EK60 Deepwater Echosounder
- Knudsen Chirp 3260 Sub-bottom profiler (SBP)
- LHM Sippican XBT (Deep Blue probes)
- Seabird SBE 911 Plus CTD
- Seabird SBE 32 Carousel and 24 2.5 L Niskin Bottles
- Light Scattering Sensor (LSS)
- Oxidation – Reduction Potential (ORP)
- Dissolved Oxygen (DO) sensor
- Altimeter Sensor and battery pack
- CNAV GPS
- POS/MV
- Seabird SBE-45 (Micro TSG)

- Kongsberg Dynamic Positioning-1 System
- NetApps mapping storage system
- CARIS HIPS Software
- IVS Fledermaus Software
- SIS Software
- Hypack Software
- Scientific Computing System (SCS)
- ECDIS
- Met/Wx Sensor Package
- Telepresence System
- VSAT High-Speed link (Comtech 20Mbps ship to shore; 1.54 Mbps shore to ship)
- Cruise Information Management System (CIMS)

B. Equipment and capabilities provided by the scientists

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

IV. HAZARDOUS MATERIALS

A. Policy and Compliance

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

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

- List of chemicals by name with anticipated quantity
- List of spill response materials, including neutralizing agents, buffers, and absorbents
- Chemical safety and spill response procedures, such as excerpts of the program's Chemical Hygiene Plan or SOPs relevant for shipboard laboratories

- For bulk quantities of chemicals in excess of 50 gallons total or in containers larger than 10 gallons each, notify ship's Operations Officer regarding quantity, packaging and chemical to verify safe stowage is available as soon as chemical quantities are known.

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

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

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

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

B. Inventory

Common Name of Material	Qty	Notes	Trained Individual	Spill control
Ethyl Alcohol (70%)	1 x 1 gal	Flammable	Nikolai Pawlenko & Stephanie Farrington	F

C. Spill Response

A. Alcohol-

Small Spill:

Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

Large Spill:

Flammable liquid. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not

touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS

See Appendix F for 70% Ethyl Alcohol Material Safety Data Sheet.

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 (mapping interns) with a sun photometer instrument provided by the NASA MAN program. Resulting data will be delivered to the NASA MAN primary investigator Alexander Smirnov by the expedition coordinator. All collected data will be archived and publically available at: http://aeronet.gsfc.nasa.gov/new_web/maritime_aerosol_network.html

Equipment resides on the ship and is stewarded by ENS Pawlenko.

See Appendix E for full Survey of Opportunity Form.

B. NOAA Fleet Ancillary Projects

NOT APPLICABLE TO THIS CRUISE

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 [http://www.corporateservices.noaa.gov/ames/administrative_orders/chapter_212/212-15.html].

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.

Deliverables

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

Archive

- The Program 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

Daily Operations Briefing meetings will be held at 1430 in the forward lounge 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. A safety brief and overview of POD will occur on the Bridge each morning

at 0800. Daily Situation Reports (SITREPS) will be posted as well and shared daily through e-mail and the EX operations folder on Google Drive.

Pre-Project Meeting: The Chief Scientist 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 Chief Scientist in arranging this meeting.

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.

Post-Project Meeting: The Commanding Officer is responsible for conducted a meeting no earlier than 24 hrs before or 7 days after the completion of a project to discuss the overall success and short comings of the project. Concerns regarding safety, efficiency, and suggestions for future improvements shall be discussed and mitigations for future projects will be documented for future use. This meeting shall be attended by the ship's officers, applicable crew, the Chief Scientist, and members of the scientific party and is normally arranged by the Operations Officer and Chief Scientist.

B. Project Evaluation Report:

Within seven days of the completion of the project, a Customer Satisfaction Survey is to be completed by the Chief Scientist. The form is available at <http://www.oma.noaa.gov/fleeteval.html> and provides a "Submit" button at the end.

The Customer Satisfaction Survey is one of the primary methods OMAO and Marine Operations (MO) utilize to improve ship customer service. Information submitted through the form is automatically input into a spreadsheet accessible to OMAO and MO management for use in preparing quarterly briefings. Marine Operations Centers (MOC) address concerns and praise with the applicable ship. Following the quarterly briefings the data are briefed to the Deputy Director of OMAO.

VIII. MISCELLANEOUS

A. Meals and Berthing

Meals and berthing are required for 20 scientists. Meals will be served 3 times daily beginning one hour before scheduled departure, extending throughout the cruise, and ending two hours after the termination of the cruise. 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 make-up of the ship's complement. The Expedition Coordinator is responsible for ensuring the scientific berthing spaces are left in the condition in which they were received; for stripping bedding and linen return; and for the return of any room keys which were issued. The Expedition Coordinator is also responsible for the cleanliness of the laboratory spaces and the storage areas utilized by the scientific party, both during the 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, Revised: 02 JAN 2012) must be completed in advance by each participating scientist. The NHSQ can be obtained from the Chief Scientist or the NOAA website <http://www.corporateservices.noaa.gov/~noaaforms/eforms/nf57-10-01.pdf>. The completed form should be sent to the Regional Director of Health Services at Marine Operations Center. The participant can mail, fax, or scan and send via secure e-mail the form using the contact information below; participants should take precautions to protect their Personally Identifiable Information (PII) and medical information. The NHSQ should reach the Health Services Office no later than 4 weeks prior to the project to allow time for the participant to obtain and submit additional information that health services might require before clearance to

sail can be granted. Please contact MOC Health Services with any questions regarding eligibility or completion of the NHSQ. Be sure to include proof of tuberculosis (TB) testing, sign and date the 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. Contact information:

Regional Director of Health Services
Marine Operations Center – Atlantic
439 W. York Street
Norfolk, VA 23510
Telephone 757.441.6320
Fax 757.441.3760
E-mail: MOA.Health.Services@noaa.gov

Please make sure the medicalexplorer@noaa.gov email address is cc'd on all medical correspondence.

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

Emergency contact form is included as Appendix A.

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 on board *Okeanos Explorer*.
- All personnel on board are in the position of calling a halt to operations/activities in the event of a safety concern.

D. Communications

A daily 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 Very Small Aperture Terminal (VSAT) link. Standard VSAT bandwidth at 5Mbps is shared by all vessels staff and the science team at no charge. Increased bandwidth in 30 day increments is available on the VSAT systems at increased cost to the scientific party. If increased bandwidth is being considered, program accounting is required it must be arranged at least 30 days in advance.

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

University of New Hampshire, Center for Coastal and Ocean Mapping

Phone: (603) 862-3438

Fax: (603) 862-0839

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

Okeanos Explorer Cellular: (401) 713-4114

Okeanos Explorer Iridium: (808) 659-9179

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

EX INMARSAT B

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

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

Voice Over IP (VoIP) Phone:

301-713-7785 (expect a delay once picked up by directory)

301-713-7791

301-713-7792

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

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

E. IT Security

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

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

Completion of 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 3 days of embarking.

F. Foreign National Guests Access to OMAO Facilities and Platforms

NOT APPLICABLE FOR THIS PROJECT

All foreign national access to the vessel shall be in accordance with [NAO 207-12](#) and [RADM De Bow's March 16, 2006 memo](#).

The following are basic requirements. Full compliance with [NAO 207-12](#) is required.

Responsibilities of the Expedition Coordinator:

1. Provide the Commanding Officer with the e-mail generated by the FRNS granting approval for the foreign national guest's visit. This e-mail will identify the guest's DSN and will serve as evidence that the requirements of [NAO 207-12](#) have been complied with.
2. Escorts – The Expedition Coordinator is responsible to provide escorts to comply with [NAO 207-12](#) Section 5.10, or as required by the vessel's DOC/OSY Regional Security Officer. Ensure all non-foreign national members of the scientific party receive the briefing on Espionage Indicators ([NAO 207-12](#)) at least annually or as required by the servicing Regional Security Officer.
3. Export Control - The NEFSC currently neither possesses nor utilizes technologies that are subject to Export Administration Regulations (EAR).

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

Responsibilities of the Commanding Officer:

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

7. Ensure all OMAO personnel onboard receive the briefing on Espionage Indicators [NAO 207-12](#)) at least annually or as required by the servicing Regional Security Officer.

Responsibilities of the Foreign National Sponsor:

1. Export Control - The foreign national's sponsor is responsible for obtaining any required export licenses and complying with any conditions of those licenses prior to the foreign national being provided access to the controlled technology onboard regardless of the technology's ownership.
2. The DSN of the foreign national shall assign an on-board Program individual, who will be responsible for the foreign national while on board. The identified individual must be a U.S. citizen, NOAA (or DOC) employee. According to DOC/OSY, this requirement cannot be altered.
3. Ensure completion and submission of the Certification of Conditions and Responsibilities for a Foreign National Guest as required by [NAO 207-12](#) Section 5.03.h.

Appendix A. Emergency Data Sheet

EMERGENCY DATA SHEET

NOAA OKEANOS EXPLORER

Scientists sailing aboard the *Okeanos Explorer* should fill out the form found at the following link location:

https://docs.google.com/a/noaa.gov/forms/d/1pcoSgPluUVxaY64CM1hJ7511iIYirTk48G-lv37Am_k/viewform with their emergency contact information

Appendix B. DMP

Data Management Plan

Okeanos Explorer (EX1402L3): Gulf of Mexico Mapping and ROV Exploration



Data Management Objectives

Data management objectives: to provide a foundation of publicly accessible data and information products to spur further exploration, research, and management activities; to provide daily cumulative multibeam products to shore for operational decision making purposes; to record 2 channels of streamed video footage of ROV dives onboard the ship; to prepare for data warehouse upgrades; to evaluate a new video annotation tool brought aboard by the lead biologist; and to test production of a post-mission data product capturing environmental variables along a dive track corresponding to highlight images.

24-Mar-14

Page 1

1. General Description of Data to be Managed

1.1 Name of the Dataset of Data Collection Project

Okeanos Explorer (EX1402L3): Gulf of Mexico Mapping and ROV Exploration

The overall goal of this cruise is to collect data to aid in the development of a baseline characterization of the targeted operating areas. Science objectives are to identify and explore the diversity and distribution of benthic habitats and features in the region; to conduct ROV dives along the Sigsbee Escarpment and in adjacent deep-water canyons; to locate and characterize underwater cultural heritage sites; to groundtruth acoustic seep data and characterize associated habitat; to recover long deployment experiments from the seafloor; and to deploy Argo floats.

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

Okeanos Explorer

1.2 Keywords that could be used to characterize the data.

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, archaeological, archaeology, conservation, conserve, crm, cultural resource management, historic, marine archaeology, maritime, maritime archaeology, nautical, nautical archaeology, preserve, protect, protection, submerged cultural heritage, submerged cultural resource, uch, underwater cultural heritage, oceans, St. Petersburg, Pascagoula, Flower Garden Banks, FGBNMS, Sigsbee Escarpment, benthic habitat, benthic ecosystems, shipwreck, Argo float, expedition

1.4 Summary description of the data to be generated.

Multibeam mapping, single beam, water column sonar, sub-bottom profile, water column profile, ship sensor, ROV sensor, video and image data will all be collected during this mission.

1.5 Anticipated temporal coverage of the data.

Cruise Dates: 4/10/2014 to 5/1/2014

1.6 Anticipated geographic coverage of the data.

Latitude Boundaries:	30 to	24
Longitude Boundaries:	-95 to	-83

1.7 What platforms will be employed during this mission?

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

1.8 What data types will you be creating or capturing?

Cruise Summary, Data Management Plan, Highlight Images, Quick Look Report, CTD (raw), CTD (processed), CTD (product), Dive Summaries, Highlight Video, Mapping Summary, Multibeam (processed), Multibeam (product), Multibeam (raw), Sub-Bottom Profile data, Water Column Backscatter, XBT (raw), Bottom Backscatter, EK60 Singlebeam Data, SCS Output (compressed), SCS Output (native), Cruise Plan

1.8 What data types will you be submitting for archive?

Cruise Summary, Data Management Plan, Highlight Images, Quick Look Report, CTD (raw), CTD (processed), CTD (product), Dive Summaries, Highlight Video, Mapping Summary, Multibeam (processed), Multibeam (product), Multibeam (raw), Sub-Bottom Profile data, Water Column Backscatter, XBT (raw), Bottom Backscatter, EK60 Singlebeam Data, SCS Output (compressed), SCS Output (native), Cruise Plan

1.9 What volume of data is anticipated to be collected in the Project Time Frame?

7-10 TB

2. Points of Contact**2.1 Who is the overall point of contact for the data collection?**

Kelley Elliott, Contractor (Acentia/2020 LLC), NOAA Office of Ocean Exploration and Research, kelley.elliott@noaa.gov

2.2 Who is responsible for verifying the quality of the data?

Elizabeth Lobecker, Multibeam Mapping Expert, Contractor (ERT, Inc.), NOAA Office of Ocean Exploration and Research, elizabeth.lobecker@noaa.gov

2.3 Who is responsible for data documentation and metadata activities?

Susan Gottfried, Data Management Coordinator, NOAA National Coastal Data Development Center, susan.gottfried@noaa.gov

2.4 Who is responsible for data storage and data disaster recovery activities?

NOAA National Data Centers (National Geophysical Data Center, National Oceanographic Data Center, NOAA Central Library)

3. Data Stewardship**3.1 What quality control procedures will be employed?**

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

4. Data Documentation

4.1 Which metadata repository will be used to document this data collection?

An ISO format collection-level metadata record will be generated during pre-cruise planning and published in an OER catalog and Web Accessible Folder (WAF) hosted at NCDDC for public discovery and access. The record will be harvested by data.gov.

4.2 What additional metadata or other documentation is necessary to fully describe the data and ensure its long-term usefulness?

Additional metadata includes: Multibeam metadata to file level; Scientific Computing System (SCS) metadata; MACHine Readable Catalog (MARC) metadata for Library items.

4.3 What standards will be used to represent data and metadata elements in this data collection?

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

5. Data Sharing

5.1 What date will the data be made available to the public?

All non-sensitive data from this mission is expected to be documented, archived and accessible within 60-90 days post-mission through the NOAA National Data Centers and public access GIS map applications. Meteorological and Oceanographic (METOC) sensor data from the SCS, and CTD data are converted in a post-mission model into archive ready compressed NetCDF-4 format and stored within the NCDDC THREDDS open-access server. Any data considered sensitive due to protection of potential underwater cultural resources will be protected from public access under the Historic Preservation Act.

5.2 If the data are not to be made publicly available, under what authority are the data restricted?

Not Applicable

5.2a Access Constraints Statement?

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

5.2b Use Constraints Statement?

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

6. Initial Data Storage and Protection

6.1 Where and how will the data be stored initially (prior to archive submission)?

Data are recorded and stored on NOAA shipboard systems compliant with NOAA IT procedures. Data are moved from ship to shore using a variety of standard, documented data custody transfer procedures. Data are transferred to NOAA Data Centers using digital and physical data transfer models depending upon the data volume.

6.2 Discuss data back-up, disaster recovery, contingency planning and off-site storage relevant to this data collection.

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

6.3 Describe how the data will be protected from unauthorized access, how permissions will be managed and what process will be followed in the event of 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. Long-Term Archiving and Preservation

7.1 In what NOAA Data Center(s) will the data be archived and preserved?

Data from this mission will be preserved and stewarded through the NOAA National Data Centers. Refer to the Okeanos Explorer FY14 Data Management Plan at NOAA's EDMC DMP Repository (EX_FY14_DMP_Final.pdf) for detailed descriptions of the processes, procedures, and partners involved in this collaborative effort.

7.1 a If you do not plan to archive in the NOAA Data Centers, what is your long-term strategy for maintaining, curating, and archiving the data?

Not Applicable

7.2 What transformations or procedures will be necessary to prepare data for preservation or sharing?

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

Appendix C. Categorical Exclusion



March 24, 2013

MEMORANDUM FOR: The Record

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

SUBJECT: Categorical Exclusion for NOAA Ship *Okeanos Explorer* cruise
EX1402, Leg 3

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

Description of Projects

This project is part of the Office of Ocean Exploration and Research's "Science Program." It will conduct remotely operated vehicle (ROV) operations and ocean mapping activities designed to increase knowledge of the marine environment. This project is entitled "EX1402 Gulf of Mexico Exploration" and will be led by Kelley Elliott, an Expedition Manager for NOAA OER. The work will be conducted in April and May at various locations in the Gulf of Mexico: an area to the south and southeast of Flower Garden Banks National Marine Sanctuary, including Keathley Canyon and adjacent parts of the Sigsbee Escarpment; and areas in on the West Florida Escarpment southwest of Tampa. A tandem 6,000 meter ROV system will be deployed and CTD rosette casts may be conducted during the expedition. The Kongsberg EM 302 multibeam (30 kHz), Kongsberg EK 60 singlebeam (18 kHz), and Knudsen 3260 Sub-Bottom Profiler (3.5 kHz) will be operated during the project. Additionally, expendable bathythermographs (XBTs) will be conducted in conjunction with multibeam data collection. Multibeam mapping operations will be conducted at all times during the transit.

Effect of Projects

As expected with ocean research with limited time or presence in the marine environment, this project will not have the potential for significant impacts. Knowledgeable experts who are aware of the sensitivities of the marine environment will conduct the at-sea portions of this project.

Categorical Exclusion

This project would not result in any changes to the human environment. As defined in Sections 5.05 and 6.03.c.3 (a) of NAO 216-6, this is a research project of limited size or magnitude or with only short-term effects on the environment and for which any cumulative effects are negligible. As such, this project is categorically excluded from the need to prepare an environmental assessment.

Signed: _____ Date: _____
John McDonough, Acting Director

Appendix D. Maritime Archeology SOP

NOAA Office of Ocean Exploration
Operational Policy and Procedures for Underwater Cultural Heritage
Missions conducted onboard the NOAA Ship *Okeanos Explorer*
Version 2.1

I. 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.

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

II. 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 offset buffer zone shall be created around the UCH isolated survey box. The buffer zone shall be placed at random around the UCH such that the center of the zone does not indicate the location of the UCH. The following steps will be taken just prior to entering the buffer zone in order to stop broadcasting the ship's location while the survey is conducted:
- i. NOAA Shiptracker: Disable the SCS feed from the ship going to Shiptracker
 - ii. Automated Information System (AIS): NOAA requires that the AIS feed which broadcasts information about the ship, including position, course and speed, must remain on at all times for collision avoidance and other safety reasons. Although the [International Maritime Organization](#)'s (IMO) Maritime Safety Committee condemns the Internet publication of AIS data, it is easily available for viewing. During the cruise planning phase the Expedition Coordinator will provide the AIS broadcast range on the EX to the chief scientist and science team. The Chief scientist, the science team, or other parties involved in a UCH mapping cruise should be made aware of this and decide whether the value of the operation merits acceptance of the potential issues/outcomes imposed.
 - iii. Telepresence Video Feeds: Do not stream any feeds that include a visible ship location, for example the multi-beam acquisition screen does not high enough resolution over the video feed to see ship position. Streams include but not limited to the SCS data screen, or any active mapping data acquisition screens, or video feeds. It is acceptable to stream video feeds that do not include the ship's location.
 - iv. The Cruise Coordinator will ensure the survey department takes steps to distinguish and separate UCH mapping data from non-UCH mapping data as appropriate.
 - v. Raw Multibeam Data Acquisition: Raw data will be logged in the standard folder structure on the multibeam acquisition computer. Raw data will be copied into a "Restricted" folder in the RAW data network folder structure. Data acquisition and processing logs will clearly state which files are restricted.
 - vi. Multibeam Data Field Processing: Restricted files will be processed and gridded separately from other non-restricted data and will be clearly labeled as such in projects and filenames. The products will be created according to normal field quality-control procedures, but will not be sent to shore with the daily products, in order to not become publicly available via normal channels (FTP / Digital Atlas).
 - vii. Raw EK 60 and Subbottom Data Acquisition: Raw data will be logged in the standard folder structure on the acquisition computers. Raw data will be copied into a 'Restricted' folder on the RAW and CRUISE DATA data network folder structure. Data acquisition and processing logs will clearly state which files are restricted.
 - viii. Cruise Data Transfer (EX to UNH) Package: In the Cruise Data Package carried from the ship by the Mapping Team Lead, a "Restricted" top-level directory will be added in the cruise data folder. Within the "Restricted" folder the

same directory structure as the unrestricted folder will be repeated (i.e. SCS, CTD, Multibeam, Imagery, etc).

- ix. CTD and XBT operations conducted within the buffer zone do not need to be isolated from non-UCH data, or repressed from the Okeanos Atlas. CTD and XBT files should follow the normal unrestricted processing procedures and archiving.
 - x. Daily updates are normally linked to the location of the ship at the time the update is posted. If daily updates are made during UCH surveys, no position shall be provided. If a position is required, the position should be posted as it makes sense, 5 miles outside of the extent of the survey area.
- C.** Normal transmissions from the ship shall resume after the EX finishes UCH survey operations and exits the 5-mile buffer zone. Exiting the buffer zone should occur at approximately the same location as entry to prevent obvious data location gaps pointing to UCH location.

C. Post-Cruise Follow Up

1. Information Release

- a.** No informal information about UCH should be released to the general public by the ship or personnel. This includes posting information and images on social networking sites like Facebook or personal blogs. Mapping data will be released to the public following the normal process and announcement of discoveries will be made through the appropriate offices and public affairs officials.

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

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

and data products.

3. UCH Targeted Mapping Cruise Follow-Up

- a.** The mapping team will create a survey report that provides technical details on the survey, data processing and data products. It should contain a list of targets that includes site location, water depth, site dimensions, bottom type/topography, and images of the target at the best available resolution. Other helpful products include SD and kmz files.
- b.** The EX cruise coordinator, OER's marine archaeologist, a representative from the ONMS Maritime Heritage Program, archaeologists involved in the survey, and any parties with jurisdiction, management or other legal ties to the resource shall meet to discuss the potential historical significance of the UCH and the sensitivities of releasing data to the public that can be protected under Section 304 of the National Historic Preservation Act.
- c.** The outcome of this meeting will determine if it is necessary to protect site location information from public release.
- d.** When data can be released
 - i.** If the findings determine that releasing information and data on UCH is not a threat, development of products and data management should follow the guidelines for a standard mapping cruise.
- e.** When data should be protected
 - i.** If it is determined that a site is or has potential to be historically significant and eligible for nomination to the National Register of Historic Places, the location and data containing the location should not be released to the public.
 - ii.** Data products that contain position information will be forwarded to the EX data management team where data and products will be stored in an archive with restricted access.
 - iii.** Cruise plans, cruise reports, situation reports, mapping summary reports and other documents that are publically available outside NOAA or freely accessible within NOAA shall not provide location information for UCH or survey areas. In certain circumstances the lead archaeologist for the cruise may request that certain UCH sites are not mentioned in the public reports.

4. UCH mapping follow-up for National Marine Sanctuaries

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

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 buffer zone shall be placed at random around the UCH such that the center

of the zone does not indicate the location of the UCH. The time at which the ship enters, and departs the three-mile buffer zone needs to be recorded and provided to the Data Team Lead for post-processing use. Following work at the site, the ship will return to the site where it first entered the three-mile buffer zone to continue operations.

- c.** The following steps will be taken just prior to entering the three-mile buffer zone in order to stop broadcasting the ship's location while the survey is conducted:
 - I.** NOAA email events will be stopped (OMAO/ET)
 - NOAA Shiptracker: Disable/stop the e-mail updates from the ship going to OMAO / Shiptracker
 - Okeanos Atlas*: Disable/stop the e-mail updates to NCDDC
 - SAMOS: Disable/stop the e-mail update to FSU containing METOC and flow-through data, etc.
 - II.** Telepresence Video Feeds (OER Telepresence team lead): Do not stream any feeds that include the ship or ROVs location, including but not limited to the SCS data screen, ROV navigation screens, 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, highly valuable items, etc.) are going to be investigated or are unexpectedly encountered during the course of our seafloor investigation, the lead archaeologist, Science Team Lead, ROV Team Leader, Expedition Coordinator or Commanding Officer has authority to switch the live feed from the ROV and Seirios camera sled to another camera on the ship.
- d.** Daily updates on the *Okeanos Atlas* are normally linked to the location of the ship at the time the update is posted. If daily updates are made during UCH surveys, no position shall be provided. If a position is required, the position should be posted as it makes sense, 3 miles outside of the extent of the site or survey area.
- e.** Normal transmissions from the ship shall resume after the EX finishes UCH survey operations and exits the 3-mile buffer zone. The point of exit should be as near to the point of entry as is feasible to minimize location data gaps pointing to the location of the UCH.
- f.** No informal information about UCH should be released to the general public by the ship or personnel. This includes posting information and images on social networking sites like Facebook, Twitter or personal blogs. Images, video and information on UCH will be released to the public following the normal process and announcement of discoveries will be made through the appropriate offices and public affairs officials.
- g.** In addition to the items listed, the ship sends out automated weather (autoIMET) observations every hour and manual weather observations every 6 hours with positions as a voluntary ship observer. These observations are pulled onto public sites by several different websites and Google Map apps. One example is sailwx.info. This is only accurate to the nearest decimal degree (6 nm). This level of accuracy is not of concern.

Summary Table: Actions to be taken to protect UCH location information prior to and during operations in the 3-mile buffer zone surrounding a UCH target:

Action	Responsible Party
Pre/During Operations in Buffer Zone	Communicated by EC
The time at which the ship enters, and departs the three-mile buffer zone needs to be recorded and provided to the Data Team Lead for post-processing use.	OER/Expedition Coordinator
Stop NOAA E-mail events: NOAA Shiptracker: Disable/stop the e-mail updates from the ship going to OMAO / Shiptracker <i>Okeanos Atlas</i> : Disable/stop the e-mail updates to NCDDC SAMOS: Disable/stop the e-mail update to FSU containing METOC and flow-through data, etc.	OMAO/Electronics Technician
Do not stream any feeds that include the ship or ROVs locations.	OER/Telepresence Lead
Redirect Live Feeds as Needed	OMAO/OER: ROV Team Leader, Expedition Coordinator, Commanding Officer, Onboard Science Team Leads, Lead Archaeologist
Notify personnel no informal information about UCH should be released to the general public by the ship or personnel.	OMAO/OER: Commanding Officer (crew), Expedition Coordinator (Mission Personnel)
Return to same or very near point of entry into buffer zone to continue operations and sharing of location information.	OMAO: Commanding Officer gives authority
Following Completion of Operations in Buffer Zone:	
Resume NOAA E-mail events: NOAA Shiptracker: Disable/stop the e-mail updates from the ship going to OMAO / Shiptracker <i>Okeanos Atlas</i> : Disable/stop the e-mail updates to NCDDC SAMOS: Disable/stop the e-mail update to FSU containing METOC and flow-through data, etc.	OMAO/Electronics Technician
Review and if needed, discuss <i>Okeanos Atlas</i> update location	OER/Expedition Coordinator

with data team. Provide location to data team that is offset from UCH operating area.	
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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

If data are found to be sensitive because they reveal 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 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 Types in Consideration for Archive:

Data sets and associated products are housed in the appropriate NOAA archive:

- Geophysical Data (Multibeam Sonar, Singlebeam Sonar, Sub-Bottom) at the National Geophysical Data Center (NGDC)
- Oceanographic Data (Oceanographic, Navigational, Meteorological, Environmental, Biological) at the National Oceanographic Data Center (NODC), including such files from the vessel and from any submersible vehicles.
- Multimedia Data (Video, Imagery, Documentation) at the NODC NOAA Central Library (NCL)
- Geospatially-enabled data and REST Services at the National Coastal Data Development Center (NCDDC)

NGDC

Geophysical data generated by the *Okeanos Explorer* Program is archived under a data management agreement with the NGDC. Data that has potential to reveal the nature and location of UCH shall be restricted from public access. The EX Mapping team shall deliver these data to NCDDC for documentation and archive already segregated into restricted (sensitive) and unrestricted folders. In accordance with the data management agreement, sensitive data from the EX will have restricted access at NGDC.

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. If NGDC can not publish metadata for information use only, NCDDC shall publish these metadata on behalf of the program.

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.

NODC and the NOAA Central Library

Data targeted for the NODC and NOAA Central Library that are labeled for restricted access are required to include a period of time for the access restriction. Once that period of time is over, the NODC will request a re-evaluation of the data sensitivity and the data shall either be put on an extended hold or released based on the direction of the data provider, OER.

Metadata for restricted data targeted for NODC/NCL shall be maintained in the NCDDC OER Web Accessible Folder (WAF) for discoverability and shall provide information about the sensitivity of the data and the points of contact for data requests. If and when the data become publicly accessible, the data and metadata shall be delivered to the NODC/NCL using normal procedures for archiving.

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.

NCDDC

Digital Atlas: NCDDC will develop appropriate metadata records to post on the OER Digital Atlas that indicate data sensitivities that exist. These metadata records shall be maintained throughout the lifecycle of these data. Only links to publicly releasable data sets will be provided through the Digital Atlas. Users can contact the data point of contact for inquiries about access to restricted data.

Okeanos Atlas: The *Okeanos Atlas* will not display the ship track, dive tracks or other geospatially enabled data sets that reveal the location of UCH or potential UCH sites. 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. Any geospatial data that concern restricted data yet are approved for display in the *Okeanos Atlas* will be generalized to a point that will not reveal the location.

Follow Up:

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
- All ROV dive products (including associated sensor data)
- CTD rosette and *in situ* sensor datasets collected in relation to the UCH, and within the 3 mile buffer zone
- All imagery needs to be reviewed and geospatial imagery removed before being made public
- Ship Track

Appendix D: NDA References

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

If they are federally-employed scientists, they agreed not to disclose sensitive information and to adhere to federal laws as part of the terms of their employment with the federal government.

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

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

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

MISSION PERSONNEL (Notified by: Expedition Coordinator)		
Employee	Accountability Mechanism for With-holding Sensitive Data	Action
NOAA Federal Employees	NOAA and Federal Contract	Reminder of contract, and provide archaeology background document.
Mission Contractors (UCAR, ERT Inc., 2020 Company LLC)	Non-Disclosure Agreement	Confirm all contractors signed NDA. Send reminder of contract and provide archaeology background document.
NOAA/Federal Scientists	NOAA and Federal Contract	Reminder of Contract, and provide Archaeology background document
Other Federal Scientists (BOEM, Navy, NPS, etc.)	Federal Contract	Reminder of Contract, and provide Archaeology background document
Other Mission Personnel and Scientists	Non-Disclosure Agreement	Get NDA Signed
<i>Okeanos Explorer</i> Crew (Notified by: CO or Designee)		
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

Appendix E. NASA Maritime Aerosols Network Survey of Opportunity

Survey or Project Name

Maritime Aerosol Network

Points of Contact (POC)

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

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

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

Appendix F Argo Float Deployment

Below is a proposal for Argo float deployments. The deployment locations will be modified to fit the ship’s cruise track.

SURVEYS OF OPPORTUNITY - INITIAL REQUEST FORM

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

Given the ship’s unique technology and capabilities, NOAA’s Office of Ocean Exploration and Research

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

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

Survey or Project Name

U.S. Argo

Points of Contact (POC)

<i>Lead POC or Principle Investigator (PI & Affiliation)</i> Molly Baringer – NOAA/AOML molly.baringer@noaa.gov Tel: 305-361-4345	<i>Supporting Team Members ashore</i> Zach Barton – NOAA/AOML - zach.barton@noaa.gov – Tel: 305-361-4548 Pelle Robbins – WHOI - probbins@whoi.edu Tel: 508 289 4917
	<i>Supporting Team Members aboard (if required)</i>

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

The objective of this activity is to deploy a number of Argo profiling floats into previously unreachable areas of the gulf of Mexico. To complete this objective, a representative from either the scientific group on board or from the vessel will need to deploy the float from the back of the vessel using a rope and a davit to lower the float into the water while the ship is underway. The goal will be to place floats in areas outside of the loop current so that the floats are able to stay in the waters of the Gulf and not be quickly advected into the Florida Current.

List of Participating Organizations

NOAA/AOML
WHOI

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

Duration will be roughly 30 minutes per float, counting for mass startup time in the beginning and for deployment.

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

Area of survey would be approximately 26°N, 85°W and 26°N, 90°W.

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

Required water depths are at 2000m or greater. Also required would be storage for the floats which are 1x1x5 feet each, weighing approximately 50 Lbs each.

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

Starting up of the floats will require a clear view of the sky, and for the floats to be put almost upright. (Can be leaned against the rail of a ship, for instance) a magnet swipe in the appropriate, labeled area will start the float. The starter will need to check the ballast bladders to ensure inflation and deflation. The floats will send messages to WHOI confirming proper startup. The starter will need to have access to e-mail or phone to be notified by WHOI or NOAA personnel as to status of float startup to ensure that no floats that may have malfunctioned will be deployed.

Deployment would be from rear of vessel, lowered into the water by rope until a starch disk releases and the deployment tethers are free of the box. Only one person is required for this, though more can make the deployment easier. Ship speed can be anything less than 20knots.

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

No specific daily operations are necessary. Deployments are based on location of vessel, so there may be more than one deployment per day based on ship speed and course.

Equipment/Systems Needed

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

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

Gear required to deploy floats (rope, releases, etc) will be supplied with shipment of floats or will be already attached to floats awaiting deployment.

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

The deployments are planned for US and international waters only. No foreign clearances are required. However, if another group were requesting foreign clearance for other purposes, we would consider modifying our deployment positions and the clearance request.

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

n/a

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

Only necessary data is time and position at deployment.

QUALITATIVE PARAMETERS

Why is this project considered “exploration”?

This project is considered exploration because historically, few deployments in this area of the gulf have occurred. This is due partly to ships not crossing the areas of depth required regularly. It is also due to the past floats not being able to handle areas of much less than 2000m. The newer floats are able to handle distance to bottom better.

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

The data for this survey is sent by the float to AOML where it is processed and then sent to the WMO Global Telecommunication System (GTS) which can be accessed by a number of institutions.

What is the public outreach potential for this project?

There are many avenues for public outreach, such as adopting a float where a school group can pick, or adopt, a specific float by its identifying numbers and track it over the course of their class. There are educational classroom materials available at http://www.argo.ucsd.edu/Educational_use.html via groups that participate in Argo around the world. There are also Google Earth overlays that can be used to track and view specific floats as well as the entire float array.

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

The data will be sent to the GTS as noted before and also to the National Oceanographic Data Center (NODC) and to Coriolis, the official Argo data global data assembly center. The NODC will also archive the data. The data will be used by investigators worldwide, resulting in more than 100 publications each year.

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

None.

If this project is maritime archeologically focused, what is the site’s archaeological or

historical importance?

N/A

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

N/A

Appendix F. 70% Alcohol Material Safety Data Sheet

Material Safety Data Sheet

Ethyl Alcohol, 70%

ACC# 91791

Section 1 - Chemical Product and Company Identification

MSDS Name: Ethyl Alcohol, 70%

Catalog Numbers: S75119, S75120, S556CA4

Synonyms: Ethyl Alcohol; Ethyl Hydrate; Ethyl Hydroxide; Fermentation Alcohol; Grain Alcohol; Methylcarbinol; Molasses Alcohol; Spirits of Wine.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
64-17-5	Ethyl alcohol	70	200-578-6
7732-18-5	Water	30	231-791-2

Hazard Symbols: F

Risk Phrases: 11

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless clear liquid. Flash Point: 16.6 deg C. **Flammable liquid and vapor.** May cause central nervous system depression. Causes severe eye irritation. Causes respiratory tract irritation. Causes moderate skin irritation. This substance has caused adverse reproductive and fetal effects in humans. **Warning!** May cause liver, kidney and heart damage.

Target Organs: Kidneys, heart, central nervous system, liver.

Potential Health Effects

Eye: Causes severe eye irritation. May cause painful sensitization to light. May cause chemical conjunctivitis and corneal damage.

Skin: Causes moderate skin irritation. May cause cyanosis of the extremities.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May cause systemic toxicity with acidosis. May cause central nervous system depression, characterized by excitement, followed by headache, dizziness, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness, coma and possible death due to respiratory failure.

Inhalation: Inhalation of high concentrations may cause central nervous system effects characterized by nausea, headache, dizziness, unconsciousness and coma. Causes respiratory tract irritation. May cause narcotic effects in high concentration. Vapors may cause dizziness or suffocation.

Chronic: May cause reproductive and fetal effects. Laboratory experiments have resulted in mutagenic effects. Animal studies have reported the development of tumors. Prolonged exposure may cause liver, kidney, and heart damage.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid. Gently lift eyelids and flush continuously with water.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Flush skin with plenty of soap and water.

Ingestion: Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid. Do NOT use mouth-to-mouth respiration.

breathing is difficult, give oxygen. Get medical aid. Do NOT use mouth-to-mouth resuscitation.

Notes to Physician: Treat symptomatically and supportively. Persons with skin or eye disorders or liver, kidney, chronic respiratory diseases, or central and peripheral nervous system diseases may be at increased risk from exposure to this substance.

Antidote: Replace fluid and electrolytes.

Section 5 - Fire Fighting Measures

General Information: Containers can build up pressure if exposed to heat and/or fire. As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Vapors may form an explosive mixture with air. Vapors can travel to a source of ignition and flash back. Will burn if involved in a fire. Flammable Liquid. Can release vapors that form explosive mixtures at temperatures above the flashpoint. Use water spray to keep fire-exposed containers cool. Containers may explode in the heat of a fire.

Extinguishing Media: For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam. For large fires, use water spray, fog, or alcohol-resistant foam. Use water spray to cool fire-exposed containers. Water may be ineffective. Do NOT use straight streams of water.

Flash Point: 16.6 deg C (61.88 deg F)

Autoignition Temperature: 363 deg C (685.40 deg F)

Explosion Limits, Lower: 3.3 vol %

Upper: 19.0 vol %

NFPA Rating: (estimated) Health: 2; Flammability: 3; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Remove all sources of ignition. Use a spark-proof tool. Provide ventilation. A vapor suppressing foam may be used to reduce vapors.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use only in a well-ventilated area. Ground and bond containers when transferring material. Use spark-proof tools and explosion proof equipment. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Avoid contact with heat, sparks and flame. Avoid ingestion and inhalation. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

Storage: Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a tightly closed container. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Flammables-area. Do not store near perchlorates, peroxides, chromic acid or nitric acid.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use explosion-proof ventilation equipment. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Ethyl alcohol	1000 ppm TWA	1000 ppm TWA; 1900 mg/m ³ TWA 3300 ppm IDLH	1000 ppm TWA; 1900 mg/m ³ TWA
Water	none listed	none listed	none listed

OSHA Vacated PELs: Ethyl alcohol: 1000 ppm TWA; 1900 mg/m³ TWA Water: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

Section 9 - Physical and Chemical Properties

Section 9 - Physical and Chemical Properties

Physical State: Clear liquid

Appearance: colorless

Odor: Mild, rather pleasant, like wine or whis

pH: Not available.

Vapor Pressure: 59.3 mm Hg @ 20 deg C

Vapor Density: 1.59

Evaporation Rate: Not available.

Viscosity: 1.200 cP @ 20 deg C

Boiling Point: 78 deg C

Freezing/Melting Point: -114.1 deg C

Decomposition Temperature: Not available.

Solubility: Miscible.

Specific Gravity/Density: 0.790 @ 20°C

Molecular Formula: C₂H₅OH

Molecular Weight: 46.0414

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, ignition sources, excess heat, oxidizers.

Incompatibilities with Other Materials: Strong oxidizing agents, acids, alkali metals, ammonia, hydrazine, peroxides, sodium, acid anhydrides, calcium hypochlorite, chromyl chloride, nitrosyl perchlorate, bromine pentafluoride, perchloric acid, silver nitrate, mercuric nitrate, potassium-tert-butoxide, magnesium perchlorate, acid chlorides, platinum, uranium hexafluoride, silver oxide, iodine heptafluoride, acetyl bromide, disulfuryl difluoride, tetrachlorosilane + water, acetyl chloride, permanganic acid, ruthenium (VIII) oxide, uranyl perchlorate, potassium dioxide.

Hazardous Decomposition Products: Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 64-17-5: KQ6300000

CAS# 7732-18-5: ZC0110000

LD50/LC50:

CAS# 64-17-5:

Draize test, rabbit, eye: 500 mg Severe;

Draize test, rabbit, eye: 500 mg/24H Mild;

Draize test, rabbit, skin: 20 mg/24H Moderate;

Inhalation, mouse: LC50 = 39 gm/m³/4H;

Inhalation, rat: LC50 = 20000 ppm/10H;

Oral, mouse: LD50 = 3450 mg/kg;

Oral, rabbit: LD50 = 6300 mg/kg;

Oral, rat: LD50 = 9000 mg/kg;

Oral, rat: LD50 = 7060 mg/kg;

CAS# 7732-18-5:

Oral, rat: LD50 = >90 mL/kg;

Carcinogenicity:

CAS# 64-17-5:

ACGIH: A4 - Not Classifiable as a Human Carcinogen CAS# 7732-18-5: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

Epidemiology: Ethanol has been shown to produce fetotoxicity in the embryo or fetus of laboratory animals. Prenatal exposure to ethanol is associated with a distinct pattern of congenital malformations that have collectively been termed the "fetal alcohol syndrome".

Teratogenicity: Oral, Human - woman: TDLo = 41 gm/kg (female 41 week(s) after conception) Effects on Newborn - Apgar score (human only) and Effects on Newborn - other neonatal measures or effects and Effects on Newborn - drug dependence.

Reproductive Effects: Intrauterine, Human - woman: TDLo = 200 mg/kg (female 5 day(s) pre-mating) Fertility - female fertility index (e.g. # females pregnant per # sperm positive females; # females pregnant per # females mated).

Neurotoxicity: No information available.

Mutagenicity: DNA Inhibition: Human, Lymphocyte = 220 mmol/L.; Cytogenetic Analysis: Human, Lymphocyte = 1160

gm/L.; Cytogenetic Analysis: Human, Fibroblast = 12000 ppm.; Cytogenetic Analysis: Human, Leukocyte = 1 pph/72H (Continuous).; Sister Chromatid Exchange: Human, Lymphocyte = 500 ppm/72H (Continuous).

Other Studies: Standard Draize Test(Skin, rabbit) = 20 mg/24H (Moderate) S tandard Draize Test: Administration into the eye (rabbit) = 500 mg (Severe).

Section 12 - Ecological Information

Ecotoxicity: Fish: Rainbow trout: LC50 = 12900-15300 mg/L; 96 Hr; Flow-through @ 24-24.3°C Rainbow trout: LC50 = 11200 mg/L; 24 Hr; Fingerling (Unspecified) ria: Phytobacterium phosphoreum: EC50 = 34900 mg/L; 5-30 min; Microtox test When spilled on land it is apt to volatilize, biodegrade, and leach into the ground water, but no data on the rates of these processes could be found. Its fate in ground water is unknown. When released into water it will volatilize and probably biodegrade. It would not be expected to adsorb to sediment or bioconcentrate in fish.

Environmental: When released to the atmosphere it will photodegrade in hours (polluted urban atmosphere) to an estimated range of 4 to 6 days in less polluted areas. Rainout should be significant.

Physical: No information available.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	ETHANOL				No information available.
Hazard Class:	3				
UN Number:	UN1170				
Packing Group:	II				

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 64-17-5 is listed on the TSCA inventory.

CAS# 7732-18-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 64-17-5: acute, chronic, flammable.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 64-17-5 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

CAS# 7732-18-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

WARNING: This product contains Ethyl alcohol, a chemical known to the state of California to cause birth defects or other reproductive harm. California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

F

Risk Phrases:

R 11 Highly flammable.

Safety Phrases:

S 16 Keep away from sources of ignition - No smoking.

S 33 Take precautionary measures against static discharges.

S 7 Keep container tightly closed.

S 9 Keep container in a well-ventilated place.

WGK (Water Danger/Protection)

CAS# 64-17-5: 0

CAS# 7732-18-5: No information available.

Canada - DSL/NDSL

CAS# 64-17-5 is listed on Canada's DSL List.

CAS# 7732-18-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B2, D2A, D2B.

Canadian Ingredient Disclosure List

CAS# 64-17-5 is listed on the Canadian Ingredient Disclosure List.

Exposure Limits

CAS# 64-17-5: OEL-AUSTRALIA:TWA 1000 ppm (1900 mg/m3) OEL-BELGIUM:TWA 1000 ppm (1880 mg/m3) OEL-CZECHOSLOVAKIA:TWA 1000 mg/m3;STEL 5000 mg/m3 OEL-DENMARK:TWA 1000 ppm (1900 mg/m3) OEL-FINLAND:TWA 1000 ppm (1900 mg/m3);STEL 1250 ppm (2400 mg/m3) OEL-FRANCE:TWA 1000 ppm (1900 mg/m3);STEL 5000 pp OEL-GERMANY:TWA 1000 ppm (1900 mg/m3) OEL-HUNGARY:TWA 1000 mg/m3;STEL 3000 mg/m3 OEL-THE NETHERLANDS:TWA 1000 ppm (1900 mg/m3) OEL-THE PHILIPPINES:TWA 1000 ppm (1900 mg/m3) OEL-POLAND:TWA 1000 mg/m3 OEL-RUSSIA:STEL 1000 mg/m3 OEL-SWEDEN:TWA 1000 ppm (1900 mg/m3) OEL-SWITZERLAND:TWA 1000 ppm (1900 mg/m3) OEL-THAILAND:TWA 1000 ppm (1900 mg/m3) OEL-TURKEY:TWA 1000 ppm (1900 mg/m3) OEL-UNITED KINGDOM:TWA 1000 ppm (1900 mg/m3) JAN9 OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

Section 16 - Additional Information

MSDS Creation Date:4/17/2001

Revision #1 Date: 4/17/2001

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

Appendix G. Marine Mammal Sonar Policy



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Office of Oceanic and Atmospheric Research
Office of Ocean Exploration and Research
1315 East-West Hwy, SSMC3
Silver Spring, MD 20910 USA

March 7, 2014

MEMORANDUM FOR: The Record
NOAA Office of Ocean Exploration and Research

FROM: Craig W. Russell, Program Manager
NOAA/OAR/OER

SUBJECT: Revised Guidance and Standard Operating Procedure for
OER Sonar operations on NOAA Ship *Okeanos Explorer* in
the vicinity of marine mammals and sea turtles

This memorandum document and sets forth revised guidance for OER sonar operations on the NOAA Ship *Okeanos Explorer* in the vicinity of marine mammals and sea turtles.

In 2011, NOAA's Southwest Fisheries Science Center provided guidance to the Office of Ocean Exploration and Research (OER) on multibeam, splitbeam, and subbottom sonar use on the NOAA Ship *Okeanos Explorer* specific to OER expeditions within and in the vicinity of National Marine Sanctuaries and endangered whales in California for March 16-April 1, 2011.

OER continued to use that guidance as basis for mapping Standard Operating Procedures since the guidance was not operationally prohibitive. Since mid-2011, OER has conducted *Okeanos Explorer* sonar operations in the Atlantic basin, including the Gulf of Mexico. Although OER sought but never received additional guidance from the National Marine Fisheries Northeast Regional Office, we consulted NOAA's existing acoustic threshold guidance and determined, based on the best information available, that the EX's sonar surveys and mapping activities are not likely to have significant impacts on marine mammals or sea turtles of a direct or cumulative nature. Currently, OER operates mission systems on the *Okeanos Explorer* under a signed Categorical Exclusion.

With consideration given to best management practices that ensure encounters and impacts with marine mammals and sea turtles are minimized, OER will implement its *Okeanos Explorer* sonar mapping standard operating procedure as follows: sonars will be secured if (1) encountered marine mammals or sea turtles appear disturbed or (2) it is operationally efficient, or legally required to do so by permit, guidance, policy, or law. This SOP will be revisited as new information, guidance, or policy is obtained or provided.