



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-14-04 Legs 2 & 3
Northeast Seamounts (Mapping)

Attached is the final Project Instruction for EX-14-04 Legs 2 & 3, Northeast Seamounts (Mapping), which are scheduled aboard NOAA Ship *Okeanos Explorer* during the periods of September 4-10, 2014 and September 16-October 7, 2014. Of the 7 DAS scheduled for Leg 2, 7 DAS are base funded by OMAO allocation. Of the 22 DAS scheduled for Leg 3, 15 DAS are funded by an OMAO allocation for FY14 and 7 DAS are funded by an OMAO allocation for FY15. 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:

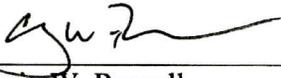
Platform: NOAA Ship *Okeanos Explorer*

Project Number: EX-14-04 Leg II and III

Project Title: Our Deepwater Backyard: Exploring the Atlantic Canyons and Seamounts

Project Dates: **Leg II** (ROV and VIPs) September 4-10, 2014
Leg III (ROV, Mapping, CTD) September 16 – October 7, 2014

Prepared by: Brian Kennedy, NOAA
Expedition Coordinator
Office of Ocean Exploration & Research

Approved by:  Dated: 8/26/14
Craig W. Russell
Program Manager
Office of Ocean Exploration & Research

Approved by:  Dated: 8/29/2014
Captain Anne K. Lynch, NOAA
Commanding Officer
Marine Operations Center - Atlantic

I. OVERVIEW

A. Brief Summary and Project Period

NOAA's *Okeanos Explorer* systematically explores the ocean every day of every cruise to maximize public benefit from the ship's unique capabilities. With 95% of the ocean unexplored, we pursue every opportunity to map, sample, explore, and survey at planned destinations as well as during transits; "Always Exploring" is a guiding principle. An integral element of *Okeanos Explorer*'s "Always Exploring" model is the ship's seafloor and water column mapping capabilities. All three mapping sonars (EM 302, EK 60, Knudsen sub-bottom) are operational on all transit cruises for 24-hour seabed, water column, and sub-bottom data collection and selected processing.

This document contains project instructions for EX-14-04 Leg II and Leg III, which are telepresence-enabled ROV and mapping exploration cruises. Operations for Leg II are expected to commence on September 4, 2014 in North Kingstown, Rhode Island, and conclude on September 10, 2014 in Baltimore, Maryland. Leg III operations are expected to commence on September 16, 2014 and conclude on October 7, 2014 in North Kingstown, Rhode Island. ROV dives will mostly be conducted during the day, while CTD casts, and multibeam, singlebeam, and sub-bottom acoustic mapping will occur when the ROV is on deck. Exploration operations will focus on the New England Seamount Chain and the shelf break canyons between North Carolina and Lydonia Canyon.

Requests for information on priority exploration areas for 2014 mapping and ROV exploration resulted in general interest for exploration of the New England Seamount Chain. At the time of writing of this draft (August 20, 2014), identification of discrete ROV exploration targets was still in development; however, preliminary plans indicate that the majority of the ROV dives will occur between Bear and Gregg Seamounts and between Norfolk and Lydonia Canyons.

Leg II will be a short seven-day cruise with 4 canyon or inter-canyon ROV dives planned. The ROV dives will focus on little or unknown areas of the continental slope between Rhode Island and Chesapeake Bay, with exact locations to be determined soon. The major driving objective during these dives will be conducting engineering trials of the ROV and focused outreach events. The first dive will be in the area of Lindenkohl canyons and will be devoted to ROV engineering trials. The second dive is currently planned for Washington Canyon and will be an exploration dive if there are no engineering objectives remaining from dive 1. Dive 3 will be in the head of Norfolk Canyon and will be an outreach dive with several VIPs onboard the ship observing the operations. Dive 4 will likely be at the mid-Atlantic gas seep site and will also be a VIP outreach dive. Both dives 3 and 4 will likely be evening dives, with the ROV being deployed in the afternoon and recovered at night. All telepresence systems will be functioning for shore-based science participation.

Leg III will depart Baltimore, Maryland and conduct several ROV dives along the continental slope submarine canyons, en route to and returning from the North Atlantic Seamount Chain. ROV operations on the seamounts will be conducted on seamounts both inside and outside the U.S. EEZ. Operations will focus on areas of high potential for discovery and of interest to the management community. The individual seamount that will be targeted is still TBD, but for each seamount visited during the cruise we plan on conducting between 1 and 3 ROV dives. Full shore-based distributed science participation is expected. This cruise will operate very similarly to previous *Okeanos Explorer*

expeditions.

B. Days at Sea (DAS)

Leg II:

Of the 7 DAS scheduled for this project, 7 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 due to daily ROV operations, small boat transfers, and nighttime mapping.

Leg III:

Of the 22 DAS scheduled for this project, 15 DAS are funded by an OMAO allocation for FY14 and 7 DAS are funded by an OMAO allocation for FY15, 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 due to daily ROV operations, nighttime mapping, and evening CTD work.

C. Operating Area

The 2014 “Our Deepwater Backyard” Expedition will focus primarily on U.S. Northeast Atlantic seamounts and canyons. Leg II will focus on the western portion of the canyons operating area, and Leg III will focus on the New England Seamount Chain (Fig. 1). The daily schedule for both cruises will usually be split between daytime ROV operations and evening/nighttime CTD and mapping operations. The majority of CTD casts will be conducted during Leg III; currently only one or two CTD casts are expected during Leg II. ROV operations will focus in depths >500m and will include high-resolution visual surveys. Mapping operations will include overnight sub-bottom data collection over key features, multibeam data collection over canyon heads requiring coverage development, and re-mapping of recently discovered gaseous seeps.

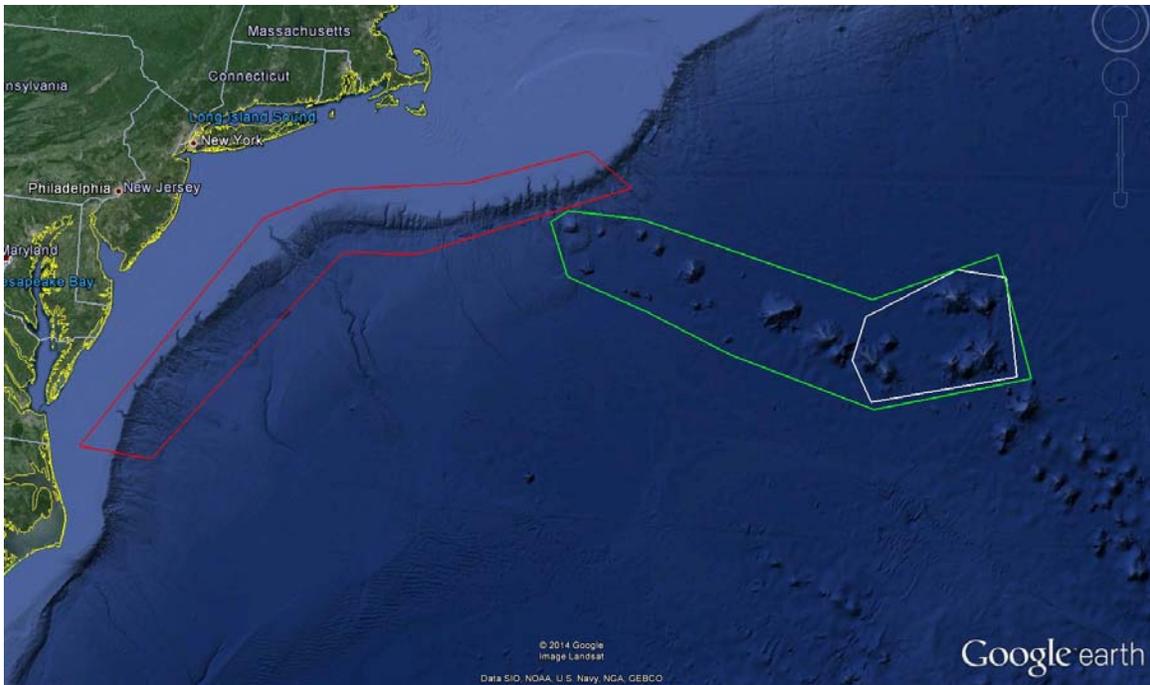


Figure 1: Approximate operating area of *Okeanos Explorer* for EX-14-04-Leg II and III. The red polygon is the operations area for Leg II and the transit dives during Leg III. The green polygon denotes the primary operating area for Leg III. The white polygon is the area in which seamount mapping operations focused during Leg I. Figure produced in Google Earth Pro.

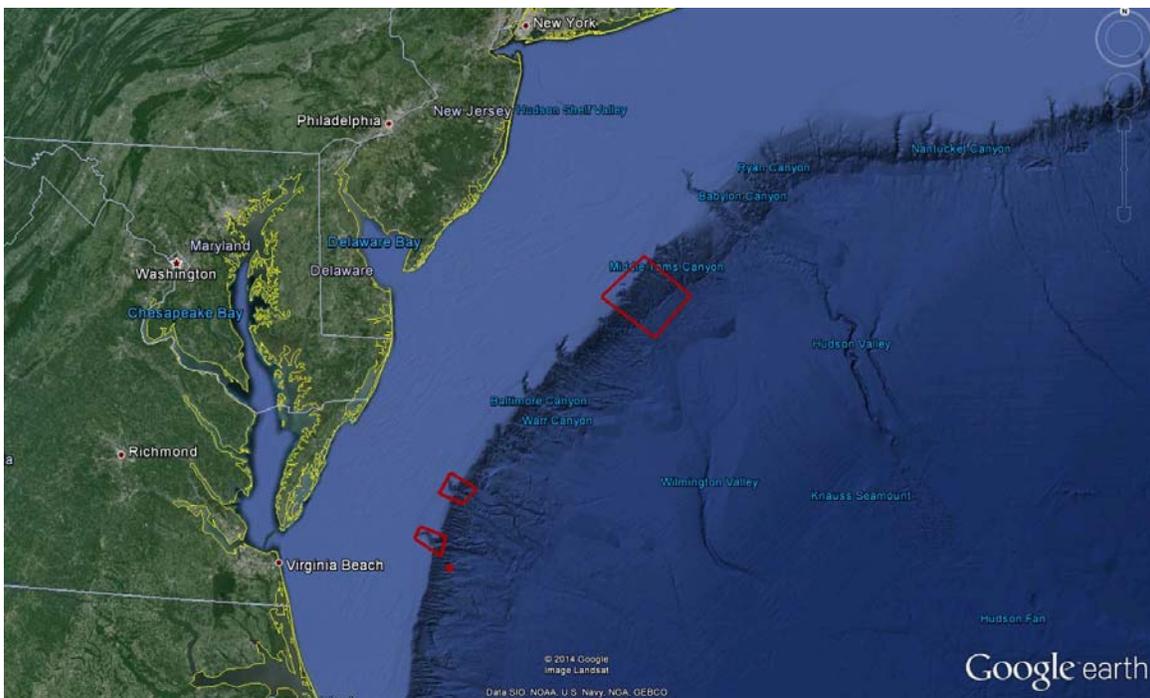


Figure 2: The red boxes denote the area for the expected dives during Leg II. The boxes will be visited from north to south. Figure produced in Google Earth Pro.

D. Summary of Objectives

Leg II: SEPT 4–SEPT 10 (North Kingstown, RI to Baltimore, MD) Telepresence-enabled ROV cruise with VIP participation

EX-14-04 Leg II operations will focus on the western portion of the operating area shown in Figure 1. Refined target areas for ROV dives are shown in Figure 2. The primary goals for this cruise will be to conduct ROV shakedown activities, explore poorly known areas of the continental slope, and increase awareness of ocean exploration and OER through VIP interactions.

Leg III: SEPT. 16–OCT 7 (Baltimore, MD to North Kingstown, RI) Telepresence-enabled ROV cruise with mapping and CTD operations

EX-14-04 Leg III operations will focus on the New England Seamount Chain shown in Figure 1. The primary goals for this cruise include collecting baseline-characterization data of poorly known areas along the New England Seamount Chain and U.S. northeast continental shelf canyons.

Mission objectives for EX-14-04 Legs II and III include a combination of operational, science, education, outreach, and data management objectives:

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, and seamounts)
 - b. Ground-truth acoustic data using video imagery and characterize associated habitat
 - c. Collect baseline data for the areas visited
 - d. Create and provide input into standard science products
2. Remote Science/Exploration Command Centers
 - a. Test and refine ship-to-shore communications and operations procedures that engage multiple ECCs and other remote participants
 - b. Test and refine operating procedures and products
 - c. Engage a broad spectrum of the scientific community and public in telepresence-based exploration
3. ROV
 - a. Integrate ROV into ship systems
 - i. Load ROVs
 - ii. Load ROV stores
 - iii. Connect .68 cable to ROVs
 - iv. Test all ROV systems while alongside
 - v. Possibly conduct alongside ROV dive
 - vi. Conduct ROV launch and recovery training for new crew members
 - vii. Test USBL alongside
 - b. Daytime ROV dives on exploration targets
 - c. Ongoing training of pilots
 - d. Ongoing system familiarization, documentation, and training.

- e. Test new ROV sub systems
4. Telepresence (VSAT 20 mb/sec ship-to-shore; T1 shore-to-ship)
 - a. Turn on and test terrestrial and high-speed satellite links
 - b. Support telepresence-enabled ROV expedition
 - c. Collect/create all standard video products
 - d. Evaluate newly purchased video encoders
 - e. Test/implement new protocols for accessing the ship's wireless internet
 - f. Work with NOAA NOC to harden the video network path
 - g. Work with MTN to harden the VSAT system
 - h. Facilitate live outreach events between ship and shore
 - i. Test new YouTube Live streaming encoder
 - j. Take new B-roll shots of the ship from a small boat
 5. Mapping
 - a. Collect high resolution mapping data from all three sonars
 - b. Support ROV operations with mapping products and expertise
 - c. Conduct mapping operations during transit, with possible further development of exploration targets
 - d. Collect XBT cast at regular intervals no longer than 3-4 hours, as data quality requires, during mapping operations
 - e. Create daily standard mapping products
 - f. Collection sun photometer measurement as part survey for opportunity
 - g. Conduct heading patch test
 - h. Continue backscatter ground truthing work
 6. CTD operations
 - a. Conduct CTD cast for comparison to ROV CTDs
 - b. Conduct CTDs with water sample collection as requested after ROV dives
 7. Data Management
 - a. Troubleshoot ROV CTD data
 - b. Train new data engineer
 - c. Provide a foundation of publicly accessible data and information products to spur further exploration, research, and management activities, as detailed in the 2013 post-cruise product list
 - d. Provide daily products to shore for operational decision making purposes, as detailed in the 2013 field products list
 - e. Test the ability to record high definition video footage of a dive onboard the ship
 8. Outreach
 - a. Engage the general public in ocean exploration through live video and timely content posted on the Ocean Explorer website
 - b. Conduct two 24-hour VIP trips
 - c. Host live events with information science centers
 - d. Host live events with VIPs

- e. Participate in Google Hangout hosted by the National Aquarium
Participate in Star-Spangled Spectacular (S3) and other NOAA-organized outreach events

E. Participating Institutions

Oregon State University, College of Earth, Ocean, and Atmospheric Sciences, 104 CEOAS Administration Building, Corvallis, OR 97331-5503

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

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

Rockefeller University, Program for the Human Environment, 1230 York Ave, New York, NY 10021

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

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

University of Louisiana at Lafayette Biology Department, 300 E St. Mary Blvd., Lafayette, LA 70503 USA

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 USA

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

F. Personnel (Mission Party)

Partial mapping teams are necessary for Leg II. Leg III will have a normal ROV cruise mapping staff. Required mission personnel for Leg II include a mapping lead and full ROV team. Required mission personnel for Leg III include a mapping lead and one qualified watchstander and full ROV team.

Table 1: Leg II (first four days)—Full list of the mission party members and their affiliation

Name (Last, First)	Title	Date Aboard	Date Disembark	Gender	Affiliation	Nationality
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Kennedy, Brian	Expedition Coordinator	9/4/14	10/7/14	M	NOAA OER	USA
Drewniak, Jared	Video Lead	9/4/14	10/7/14	M	NOAA OER (ERT)	USA
Lobecker, Elizabeth “Meme”	Mapping Lead	9/4/14	9/11/14	F	NOAA OER (ERT)	USA
Reser, Brendan	Data Lead	9/2/14	9/7/14	M	NOAA NCDDC (DGIT)	USA
Austin, Jamie	Science Co-Lead	9/3/14	9/14/14	M	UTIG	USA
Ausubel, Jesse	Scientist	9/3/14	9/10/14	M	Rockefeller University	USA
Lovalvo, David	ROV team Lead	9/4/14	9/11/14	M	NOAA OER (ERT)	USA
Wright, Dave	ROV Engineer	9/2/14	10/8/14	M	UCAR	USA
Williams, Jeff	ROV Engineer	9/2/14	9/7/14	M	UCAR	USA
Mohr, Bobby	ROV Engineer	9/2/14	10/8/14	M	UCAR	USA
Lanning, Jeff	ROV Engineer	9/2/14	10/8/14	M	UCAR	USA
McLetchie, Karl	ROV Engineer	9/2/14	10/8/14	M	UCAR	USA
Gregory, Todd	ROV Engineer	9/2/14	10/8/14	M	UCAR	USA
Carlson, Joshua	ROV Engineer	9/2/14	10/8/14	M	UCAR	USA
Kennison, Sean	ROV Engineer	9/2/14	9/7/14	M	UCAR	USA
Bingham, Brian	ROV Engineer	9/2/14	9/11/14	M	UCAR	USA
Brian, Roland	Video Engineer	9/2/14	10/8/14	M	UCAR	USA
Howard, Art	Video Editor	9/2/14	9/7/14	M	UCAR	USA
TBD						
TBD						

Table 2: Leg II (first VIP trip) —Full list of the mission party members and their affiliations

Name (Last, First)	Title	Date Aboard	Date Disembark	Gender	Affiliation	Nationality
Kennedy, Brian	Expedition Coordinator	9/4/14	10/7/14	M	NOAA OER	USA
Drewniak, Jared	Video Lead	9/4/14	10/7/14	M	NOAA OER (ERT)	USA

Lobecker, Elizabeth “Meme”	Mapping Lead	9/4/14	9/11/14	F	NOAA OER (ERT)	USA
Austin, Jamie	Science Co-Lead	9/3/14	9/14/14	M	UTIG	USA
Ausubel, Jesse	Science Co-Lead	9/3/14	9/10/14	M	Rockefeller University	USA
Lovalvo, Dave	ROV Team Lead	9/2/14	9/11/14	M	UCAR	USA
Wright, Dave	ROV Engineer	9/2/14	10/8/14	M	UCAR	USA
Bingham, Brian	ROV Engineer	9/2/14	9/11/14	M	UCAR	USA
Mohr, Bobby	ROV Engineer	9/2/14	10/8/14	M	UCAR	USA
Lanning, Jeff	ROV Engineer	9/2/14	10/8/14	M	UCAR	USA
McLetchie, Karl	ROV Engineer	9/2/14	10/8/14	M	UCAR	USA
Gregory, Todd	ROV Engineer	9/2/14	10/8/14	M	UCAR	USA
Carlson, Joshua	ROV Engineer	9/2/14	10/8/14	M	UCAR	USA
Brian, Roland	Video Engineer	9/2/14	10/8/14	M	UCAR	USA
VIP	Guest	9/7/14	9/8/14			USA
VIP	Guest	9/7/14	9/8/14			USA
VIP	Guest	9/7/14	9/8/14			USA
VIP	Guest	9/7/14	9/8/14			USA
VIP	Guest	9/7/14	9/8/14			USA
VIP	Guest	9/7/14	9/8/14			USA

Table 3: Leg II (second VIP trip)—Full list of the mission party members and their affiliations

Name (Last, First)	Title	Date Aboard	Date Disembark	Gender	Affiliation	Nationality
Kennedy, Brian	Expedition Coordinator	9/4/14	10/7/14	M	NOAA OER	USA
Drewniak, Jared	Video Lead	9/4/14	10/7/14	M	NOAA OER (ERT)	USA
Lobecker, Elizabeth “Meme”	Mapping Lead	9/4/14	9/11/14	F	NOAA OER (ERT)	USA
Austin, Jamie	Science Co-Lead	9/3/14	9/10/14	M	UTIG	USA
Ausubel, Jesse	Science Co-Lead	9/3/14	9/10/14	M	Rockefeller University	USA
Lovalvo, Dave	ROV Team Lead	9/2/14	9/11/14	M	NOAA OER (ERT)	USA
Wright, Dave	ROV Engineer	9/2/14	10/8/14	M	UCAR	USA

Bingham, Brian	ROV Engineer	9/2/14	9/11/14	M	UCAR	USA
Mohr, Bobby	ROV Engineer	9/2/14	10/8/14	M	UCAR	USA
Lanning, Jeff	ROV Engineer	9/2/14	10/8/14	M	UCAR	USA
McLetchie, Karl	ROV Engineer	9/2/14	10/8/14	M	UCAR	USA
Gregory, Todd	ROV Engineer	9/2/14	10/8/14	M	UCAR	USA
Carlson, Joshua	ROV Engineer	9/2/14	10/8/14	M	UCAR	USA
Brian, Roland	Video Engineer	9/2/14	10/8/14	M	UCAR	USA
Clark, Mike	Guest	9/8/14	9/9/14	M	OMB	USA
Miller, Kim	Guest	9/8/14	9/9/14	F	OMB	USA
Phelps, Michael	Guest	9/8/14	9/9/14	M	DOC	USA
Garneski, John	Guest	9/8/14	9/9/14	M	DOC	USA
Cruickshank, Walter	Guest	9/8/14	9/9/14	M	BOEM	USA
McDonough, John	Guest	9/8/14	9/9/14	M	NOAA OER	USA

Table 4: Leg III—Full list of the mission party members and their affiliations

Name (Last, First)	Title	Date Aboard	Date Disembark	Gender	Affiliation	Nationality
Kennedy, Brian	Expedition Coordinator	9/4/14	10/7/14	M	NOAA OER	USA
McKenna, Lindsay	Mapping Team Lead	9/13/14	10/7/14	F	NOAA OER (ERT Inc)	USA
Reser, Brendan	Data Lead	9/14/14	10/8/14	M	NOAA NCDDC (DGIT)	USA
Drewniak, Jared	Video Lead	9/4/14	10/7/14	M	NOAA OER (ERT Inc)	USA
France, Scott	Science Lead	9/14/14	10/8/14	M	University of Louisiana at Lafayette	US permanent resident (Canadian)
Schnur, Susan	Geologist	9/14/14	10/8/14	F	Oregon State University (UCAR)	USA
Gregory, Todd	ROV Team Lead	9/2/14	10/8/14	M	UCAR	USA

Wright, Dave	ROV Engineer	9/2/14	10/8/14	M	UCAR	USA
Williams, Jeff	ROV Engineer	9/11/14	10/8/14	M	UCAR	USA
Mohr, Bobby	ROV Engineer	9/2/14	10/8/14	M	UCAR	USA
Lanning, Jeff	ROV Engineer	9/2/14	10/8/14	M	UCAR	USA
McLetchie, Karl	ROV Engineer	9/2/14	10/8/14	M	UCAR	USA
TBD	ROV Engineer	9/2/14	10/8/14	M	UCAR	USA
Ritter, Chris	ROV Engineer	9/14/14	10/8/14	M	UCAR	USA
Carlson, Joshua	ROV Engineer	9/2/14	10/8/14	M	UCAR	USA
Rogers, Dan	ROV Engineer	9/14/14	10/8/14	M	UCAR	USA
Howard, Art	Video Editor	9/2/14	10/8/14	M	UCAR	USA
Brian, Roland	Video Engineer	9/2/14	10/8/14	M	UCAR	USA
TBD	Video Engineer	9/14/14	10/8/14	M	UCAR	USA
Miller, James	Mapping Watch lead	9/15/14	10/8/14	M	NOAA AHB	USA

Table 5: Leg II and III—Shore-based participants

Last Name	First Name	Organization	Area of interest or expertise.	Location
Martinez	Catalina	NOAA OER	Shore-side Ops	ISC
Elliott	Kelley	NOAA OER (20/20)	Shore-side Ops	SS ECC
Cantwell	Kasey	NOAA OER (20/20)	Web Coordinator	SS ECC
Graddy	Sarah	NOAA OER (20/20)	Web Coordinator	SS ECC
Heyl	Taylor	WHOI	Benthic biology	Redfield Building, WHOI
Shank	Timothy	WHOI	Benthic biology	Redfield Building, WHOI
Brooke	Sandra	FSUCML	Coral and seep ecology	FSUCML
White	Scott	University of South Carolina	Geomorphology, volcanology, structure/tectonics	University of South Carolina, Columbia, SC
Ford	Mike	NOAA Fisheries	Gelatinous zooplankton - oceanography	United States

Carney	Robert	Louisiana State Univ	Benthic biology	United States
Cantwell	Kasey	NOAA OER		United States
Cordes	Erik	Temple University	Benthic biology	Temple University, Philadelphia PA
Jann	Wendt	University of Kiel	Geomorphology	University of Kiel
Herrera	Santiago	WHOI	Biology	WHOI
Stevens	Brad	Univ of MD Eastern Shore	Epibenthos, crustaceans	United States
James	Moore	BOEM	Archaeology	BOEM Headquarters, Herndon, VA
Mayer	Larry	UNH CCOM	Geomorphology - mapping	UNH when there
Baco-Taylor	Amy	Florida State University	Benthic ecology and genetics	Florida State University
Carney	Robert	LSU	Benthic biology	Baton Rouge La, LSU
Clostio	Rachel	University of Louisiana at Lafayette	Deep-sea corals	University of Louisiana at Lafayette
Nizinski	Martha	NOAA/NMFS	Deep-sea corals, crustaceans	Smithsonian Institution/Silver Spring Command Center
Ball	Bernie	Duke University Marine Lab	Chemosynthetic ecology and biology	Duke University Marine Lab, Beaufort NC
Ruppel	Carolyn	USGS	Methane hydrate, methane, seeps, other geoscience	wherever I am on that day (home, MIT, USGS), but may got to URI ISC for any non-VIP seep dives
Pomponi	Shirley	Harbor Branch - FAU - CIOERT	Benthic biology, sponges	HBOI ECC

Auster	Peter	UConn and SRF	Benthic biology, deep sea fish, habitat	URI or SRF/MMA
Vecchione	Michael	NMFS Systematics Lab	Cephalopods, nekton, pelagic diversity	Silver Spring for pelagic obs, office or home otherwise; Can do public I2 presentation at National Museum of Natural History
Jordan	Brian	BOEM	Archaeology	BOEM Herndon, VA or from home
Ritter	Thomas	Montana State University	Ichthyology	MSU - Bozeman
Quattrini	Andrea	USGS		home
Ohleth	Kris	Mid-Atlantic Regional Council on the Ocean (MARCO)		MARCO Office, New Jersey
Odell	Jay	The Nature Conservancy	Benthic ecology, invertebrate zoology, conservation biology, regional ocean planning	TNC in Richmond or ?
Ticco	Paul	NOAA/ONMS	Marine Protected Area management	Newport News, VA
Bohan	Margot	NOAA	Geology, benthic biology	United States
Morgan	Nicole	Florida State university	Benthic biology, octocorals	FSU, Tallahassee FL
Morrison	Cheryl	USGS	Benthic biology, corals and galatheid crabs	USGS Leetown WV

Shea	Liz	Delaware Museum of Natural History	Cephalopods	Delaware Museum of Natural History, Wilmington, DE USA
Ross	Steve	Univ. of NC at Wilmington	Fishes, deep corals, seeps, water column and benthic ecology	my office at UNCW
Skarke	Adam	Mississippi State University	Marine geology, geophysics, gas seeps, mapping	Stennis Space Center ECC
Hemphill	Arlo	MARCO - Mid-Atlantic Regional Council on the Ocean	Communications, ichthyology	Ocean City, Maryland; MARCO
Roark	Brendan	Texas A&M University	Deep sea coral and biogeochemistry	Office at Texas A&M
Gilbert	Lisa	Williams College	Volcanology, geophysics, seafloor mapping	Williams-Mystic, Mystic, CT
Austin	James	University of Texas/Austin, Jackson School of Geosciences	Marine geology	Institute for Geophysics, Austin, TX
Herter	Jeffrey	NYS Department of State, Office of Planning & Development	Offshore planning	United States

G. Administrative

1. Points of Contact:

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

Jeremy Potter, Expeditions Director
NOAA Ocean Exploration and Research
Phone: (301) 734-1145 / (240) 215-7101
Jeremy.Potter@noaa.gov

Vessel shipping address:

Shipments:

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

Leg II items should arrive at the below address prior to **COB September 2, 2014**.

NOAA Ship *Okeanos Explorer*
2578 Davisville Rd.
North Kingstown, RI 02852

Leg III items should arrive at the below address prior to **COB September 11, 2014**.

NOAA Ship *Okeanos Explorer*
2578 Davisville Rd.
North Kingstown, RI 02852

2. Diplomatic Clearances

None Required.

3. Licenses and Permits

See Appendix C for categorical exclusion documentation.

II. OPERATIONS

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

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

Table 3: Leg II Detailed Itinerary

Date	Activity	Notes and Requirements
8/30/2014	Load ROVs and ROV stores	Crane operators and line handles for 2-3 hours after the ship is alongside. OER will arrange for a truck to move the ROVs from the port office to the ship. Use of the ship's forklift and an operator would speed up the process.
8/31/2014	Unpack ROV stores and re integrate ROV into ship systems	No ships force work will be necessary. The ROV engineers will need to work 12 hours onboard. The ability to do small hot work such as soldering would speed up the operation.
9/1/2014	Unpack ROV stores and re integrate ROV into ship systems	No ships force work will be necessary. The ROV engineers will need to work 12 hours onboard. The ability to do small hot work such as soldering would speed up the operation.
9/2/14	ROV mission personnel move on the ship	Mission personnel check-in.
9/2/2014	Continue to re-integrate ROV	Crane operations and Hydraulics required assistance from the ETs to bring all additional ROV and Telepresence systems come online. Conduct over the ship USBL test.
9/3/2014	Practice ROV launch and recovery	Full deck department participation in launch and recovery walk through and alongside dive test dive.
9/3/2014	Rest of the mission personnel move on the ship	Additional mission personnel check-in.
9/4/2014	Depart Rhode Island 0900 hours	
9/5/2014	Engineering Shakedown Dive	ROV engineering dive. Following the ROV dive we will need to conduct a CTD to compare with the CTDs on the ROVs. The dive site will be a location of convenience in the area of Lindenkohl Canyon.
9/6/2014	Exploration Dive	Normal ROV dive day Washington Canyon. If there are engineering objectives remaining from dive 1 they will be completed during this dive.
9/7/2014	VIP dive 1	Pick up VIPs near shore ~0630 then steam to Norfolk Canyon. Deploy ROV dive approx. 1400 and Recover the ROV around 2200 then transit back to VIP pick location.
9/8/2014	VIP dive 2	Pick up VIPs near shore ~0630 then steam to the mid-Atlantic seep site location. Deploy ROV approx. 1500. Recover the ROV around 2200 then transit back to VIP drop off location.

9/9/2014	Transit Day	Drop off VIPs to small boat near shore ~0800. After the personnel transfer the ship will begin preparations for arrival into Baltimore. Commence transit in the Chesapeake at approximately 1700.
9/10/2014	Arrival Baltimore	Arrive Annapolis in the morning (~0800), pick up VIPs by small boat, then transit to Baltimore Inner Harbor.

Table 3: Leg III Detailed Itinerary

Date	Activity	Notes and Requirements
9/16/2014	Depart Baltimore	Departure will be 1115 with a possible VIP/media drop-off at Annapolis.
9/17/2014	Transit day	Transit day.
9/18/2014	Dive 1 Canyons	Normal ROV operations followed by transit mapping.
9/19/2014	Dive 2 Canyons	Normal ROV operations followed by transit mapping.
9/20/2014	Dive 3 Canyons	Normal ROV operations followed by transit mapping.
9/21/2014	Dive 4 Seamounts	Normal ROV operations followed by transit mapping.
9/22/2014	Dive 5 Seamounts	Normal ROV Operations followed by CTD and mapping operations.
9/23/2014	Dive 6 Seamounts	Normal ROV Operations followed by CTD and mapping operations.
9/24/2014	Dive 7 Seamounts	Normal ROV Operations followed by CTD and mapping operations.
9/25/2014	Dive 8 Seamounts	Normal ROV Operations followed by CTD and mapping operations.
9/26/2014	Dive 9 Seamounts	Normal ROV Operations followed by CTD and mapping operations.
9/27/2014	Dive 10 Seamounts	Normal ROV Operations followed by CTD and mapping operations.
9/28/2014	Dive 11 Seamounts	Normal ROV Operations followed by CTD and mapping operations.
9/29/2014	Dive 12 Seamounts	Normal ROV Operations followed by CTD and mapping operations.

9/30/2014	Dive 13 Seamounts	Normal ROV Operations followed by CTD and mapping operations.
10/1/2014	Dive 14 Seamounts	Normal ROV Operations followed by CTD and mapping operations.
10/2/2014	Dive 15 Seamounts	Normal ROV Operations followed by CTD and mapping operations.
10/3/2014	Dive 16 Seamounts	Normal ROV Operations followed by CTD and mapping operations.
10/4/2014	Dive 17 Seamounts	Normal ROV Operations followed by CTD and mapping operations.
10/5/2014	Dive 18 Canyons	Normal ROV operations followed by transit mapping.
10/6/2014	Dive 19 Canyons	Normal ROV operations followed by transit mapping.
10/7/2014	Arrival RI	Demob two containers and ROVs.

B. Telepresence Events

- A. Live interaction with Aquariums and possibly National Geographic
- B. Mid-Atlantic Regional Ocean Council live interaction
- C. USM Marine Science major interaction from Stennis ECC
- D. Google Hangout hosted by the National Aquarium in partnership with the Ocean Exploration Trust

C. In-Port Events

- A. The *Okeanos Explorer* will be participating in the Star-Spangled Spectacular festival in Baltimore, MD to commemorate the 200th anniversary of the National Anthem. This five-day in port will be heavy with VIP and public outreach events. Details are TBD

D. Staging and De-staging

The ROV and ROV stores will be loaded the day the ship returns to port from EX-14-04 Leg I. Please see the detailed schedule for more details. At the conclusion of Leg III, OER will remove the ROV and containers details and times are TBD.

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 SCUBA dives are currently planned for this cruise.

F. Sonar Operations

EM 302, EK 60, and sub-bottom profiler data acquisition is planned for this cruise. All data acquisition will be conducted in accordance with established standard operating procedures under the direction of the mapping team lead. The final decision to operate and collect 24-hour 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 MultibeamEchosounder (MBES)
- Kongsberg Simrad EK60DeepwaterEchosounder
- Knudsen Chirp 3260 Sub-bottom profiler (SBP)
- LHM Sippican XBT (Deep Blue probes)
- Seabird SBE 911Plus CTD
- Seabird SBE 32 Carousel and 24 2.5 L Niskin Bottles
- Light Scattering Sensor (LSS)
- Oxidation – Reduction Potential (ORP)
- Dissolved Oxygen (DO) sensor
- Altimeter Sensor and battery pack
- CNAV GPS
- POS/MV
- Seabird SBE-45 (Micro TSG)
- Kongsberg Dynamic Positioning-1 System
- NetApps mapping storage system
- CARIS HIPS Software
- IVS Fledermaus Software
- SIS Software
- Hypack Software
- Scientific Computing System (SCS)
- ECDIS
- Met/Wx Sensor Package
- Telepresence System
- VSAT High-Speed link (Comtech 20Mbps ship to shore; 1.54 Mbps shore to ship)
- Cruise Information Management System (CIMS)
- Two VoIP telephone lines

B. Equipment and capabilities provided by the scientists

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

IV. HAZARDOUS MATERIALS

- A. Policy and Compliance
- B. Inventory
- C. Chemical safety and spill response procedures
- 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 the Expedition Coordinator.

See Appendix D 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. See Appendix B for detailed data management plans.

Deliverables

- a. At sea
 - Daily plans of the Day (POD)
 - Daily situation reports (SITREPS)
 - Daily summary bathymetry data files
 - Summary forms for each ROV dive
 - Summary forms for each CTD rosette casts
- 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/or the EX FTP site.

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

and project personnel. The ship's Operations Officer usually is delegated to assist the Expedition Coordinator in arranging this meeting.

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

B. Project Evaluation Report:

Within seven days of the completion of the project, a Customer Satisfaction Survey is to be completed by the Expedition Coordinator. The form is available at <http://www.oma.noaa.gov/fleeteval.html> and provides a "Submit" button at the end of the form. Submitted form data is deposited into a spreadsheet used by OMAO management to analyze the information. Though the complete form is not shared with the ships, specific concerns and praises are followed up on while not divulging the identity of the evaluator.

VIII. MISCELLANEOUS

A. Meals and Berthing

Meals and berthing are required for twenty scientists. Meals will be served three 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, NF 57-10-01 (3-14)) must be completed in advance by each participating scientist. The NHSQ can be obtained from the Expedition Coordinator or the NOAA website <http://www.corporateservices.noaa.gov/noaaforms/eforms/nf57-10-01.pdf>.

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

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

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

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

Regional Director of Health Services
Marine Operations Center – Atlantic
439 W. York Street
Norfolk, VA 23510
Telephone (757) 441.6320

Fax (757) 441.3760

E-mail: MOA.Health.Services@noaa.gov

Please make sure the medical.explorer@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 onboard *Okeanos Explorer*.
- All personnel onboard are in the position of calling a halt to operations/activities in the event of a safety concern.

D. Communications

A daily 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

(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 onboard. 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 three days of embarking.

F. Foreign National Guests Access to OMAO Facilities and Platforms

1. Foreign National access to the NOAA ship or Federal Facilities is not required for this project.

Appendix A

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/1pcoSgPluUVxaY64CM1hJ7511iYirTk48G-lv37Am_k/viewform with their emergency contact information

Appendix B:
EX-14-04 Data Management Plans

Data Management Plan
Okeanos Explorer (EX1404L2): Shakedown &
Northeast Seamounts and Canyons



Data Management Objectives

1) provide data management support for engineering dives; 2) QA/QC Deep Discoverer and Seirios CTD sensor; 3) Verify relay of environmental and navigation data to SCS system; 4) Capture full-length video of engineering and exploration dives; 5) Maintain data management systems and routines; 6) Provide operational support to video team; 7) Continue transition of data warehouse services to MAC Minis; 8) provide tethys support to shipboard scientists

20-Aug-14

Page 1

2.1 Name

1. General Description of Data to be Managed

1.1 Name and Purpose of the Data Collection Project

Okeanos Explorer (EX1404L2): Shakedown & Northeast Seamounts and Canyons

Perform four ROV dives focusing on the shelf break canyon and inter canyon areas between Rhode Island and the entrance to the Chesapeake Bay. The ROV will focus on little known or unexplored areas. During this leg, the ROV team will be shaking down some new systems and equipment. Leg 2 will also have a significant outreach component in both live interaction off the ship and the potential for media and MPs sailing on the vessel including "day trips" for VIP participation.

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

Okeanos ROV Cruises

1.3 Summary description of the data to be collected.

High resolution mapping data from vessel multibeam and submersible sonar systems; singlebeam and sub-bottom profile data; periodic CTD casts; submersible CTD data; underwater video from two-body submersible systems; underway oceanographic, meteorological, and flow-through sensors from vessel

1.4 Keywords that could be used to characterize the data.

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, benthic habitats, benthic ecosystems, New England Seamounts, Northeast U.S. Canyons, Bear Seamount, Sheldrake Seamount, Chesapeake Bay, continental slope, expedition, exploration, explorer, marine education, noaa, ocean, ocean discovery, ocean education, ocean exploration, ocean exploration and research, ocean literacy, ocean research, OER, science, scientific mission, scientific research, sea, stewardship, systematic exploration, technology

1.5 Anticipated temporal coverage of the data.

Cruise Dates: 9/4/2014 to 9/10/2014

1.6 Anticipated geographic coverage of the data.

Latitude Boundaries: 40.08 to 36.25

Longitude Boundaries: -75.75 to -66.25

Okeanos Explorer (EX1404L2): Shakedown & Northeast Seamounts and Canyons

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?

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

1.8 What data types will you be submitting for archive?

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

2. Point of Contact for this Data Management Plan

- 2.1 Name Brian Kennedy
 2.2 Title Commissioned Officer
 2.3 Affil NOAA Office of Ocean Exploration and Research
 2.4 email brian.kennedy@noaa.gov
 2.4 phone (401) 874-6150

3. Data Lineage and Quality**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.

3.2 What is the processing workflow from collection to public release?

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

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.

Okeanos Explorer (EX1404L2): Shakedown & Northeast Seamounts and Canyons

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 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.

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.

7.1a 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

Data Management Plan
Okeanos Explorer (EX1404L3): Northeast
Seamounts and Canyons



Data Management Objectives

1) verify that the data pathways for nav and sensors from ROV are established and stable 2) verify data consolidation is operational 3) verify and monitor push to shore is operational 4) provide video support 5) continue work on data warehouse functionality migration to warehouse replacement systems

20-Aug-14

Page 1

2.1 Name

1. General Description of Data to be Managed

1.1 Name and Purpose of the Data Collection Project

Okeanos Explorer (EX1404L3): Northeast Seamounts and Canyons

Leg III of EX1404 will concentrate on mapping and exploring the New England Seamount Chain using a combination of ROV operations during the day and CTD/Rosette operations in the evening and overnight. Mapping operations will include subbottom data collection over key features, multibeam data collection over canyon heads requiring coverage development, and holiday lines completing previous multibeam data coverages.

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

Okeanos ROV Cruises

1.3 Summary description of the data to be collected.

High resolution mapping data from vessel multibeam and submersible sonar systems; singlebeam and sub-bottom profile data; periodic CTD casts; submersible CTD data; underwater video from two-body submersible systems; underway oceanographic, meteorological, and flow-through sensors from vessel

1.4 Keywords that could be used to characterize the data.

expedition, exploration, explorer, marine education, noaa, ocean, ocean discovery, ocean education, ocean exploration, ocean exploration and research, ocean literacy, ocean research, OER, science, scientific mission, scientific research, sea, stewardship, systematic exploration, technology, transformational research, undersea, underwater, Davisville, mapping survey, multibeam, multibeam backscatter, multibeam sonar, multi-beam sonar, noaa fleet, okeanos, okeanos explorer, R337, Rhode Island, scientific computing system, SCS, single beam sonar, singlebeam sonar, single-beam sonar, sub-bottom profile, water column backscatter, New England Seamount Chain, Northeast U.S. Canyons, Bear Seamount, Sheldrake Seamount, benthic habitats, benthic ecosystems, Chesapeake Bay

1.5 Anticipated temporal coverage of the data.

Cruise Dates: 9/16/2014 to 10/7/2014

1.6 Anticipated geographic coverage of the data.

Latitude Boundaries: 40.25 to 37.33

Longitude Boundaries: -68 to -56.5

1.7 What platforms will be employed during this mission?

Okeanos Explorer (EX1404L3): Northeast Seamounts and Canyons

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

1.8 What data types will you be creating or capturing?

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

1.8 What data types will you be submitting for archive?

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

2. Point of Contact for this Data Management Plan

- 2.1 Name Brian Kennedy
 2.2 Title Commissioned Officer
 2.3 Affil NOAA Office of Ocean Exploration and Research
 2.4 email brian.kennedy@noaa.gov
 2.4 phone (401) 874-6150

3. Data Lineage and Quality

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.

3.2 What is the processing workflow from collection to public release?

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

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 NCDCC 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

Okeanos Explorer (EX1404L3): Northeast Seamounts and Canyons

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 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 NCCDC THREDDS open-access server.

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.

7.1a 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

Appendix C: Categorical Exclusion

August 5, 2014

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
EX1404, Legs 2 & 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 "EX1404 Our Deepwater Backyard: Exploring the Atlantic Canyons and Seamounts" and will be led by Brian Kennedy, an Expedition Manager for NOAA OER. The work will be conducted in September and October at various locations in the North Atlantic: an area from the North Carolina Virginia boarder north to the Canadian Maritime border and up to 650 nm offshore. 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.

 Digitally signed by John McDonough
DN: cn=John McDonough, o=Ocean
Exploration, ou=NOAA OAR,
email=john.mcdonough@noaa.gov,
c=US
Date: 2014.08.05 16:24:37 -0400

Signed: _____ Date: _____

John McDonough, Acting Director

Appendix D. 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 E: Memo for the Record on Sonars



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.