



NOAA OFFICE OF OCEAN EXPLORATION AND RESEARCH

Project Instructions

Date Submitted: May 11, 2012

Platform: NOAA Ship *Okeanos Explorer*

Cruise Number: EX-12-04

Project Title: Northeastern Canyons and Continental Margins Exploration

Cruise Dates: May 29 - June 13, 2012 (Norfolk, VA – Davisville, RI)

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NOAA Office of Ocean Exploration & Research

Approved by:  Dated: 5/14/2012
Craig W. Russell, NOAA
Program Manager
Office of Ocean Exploration & Research

Approved by: _____ Dated: _____
CAPT David Score, NOAA
Commanding Officer
Marine Operations Center – Atlantic

I. OVERVIEW

A. Cruise Period

This document contains project instructions for EX-12-04 of NOAA Ship *Okeanos Explorer's* (EX) exploration of the North Eastern canyons and continental margins using the ship's Kongsberg EM 302 multibeam sonar, EK 60 and Knudsen sub-bottom profiler. EX-12-04 operations are expected to commence on May 29, 2012 at Norfolk, VA and conclude on June 13, 2012 at Davisville, RI. Multibeam mapping operations, including regular XBT casts, will be conducted 24 hours a day for the duration of the cruise.

B. Operating Area

The operating area is the North Eastern region of US East Coast from Virginia to Rhode Island focusing on several mapping priority areas in the vicinity of several canyons. The proposed transit from Norfolk, VA to the working grounds lies entirely within the 200nm exclusive economic zone (EEZ) maritime boundary of the United States of America (Figure 1).

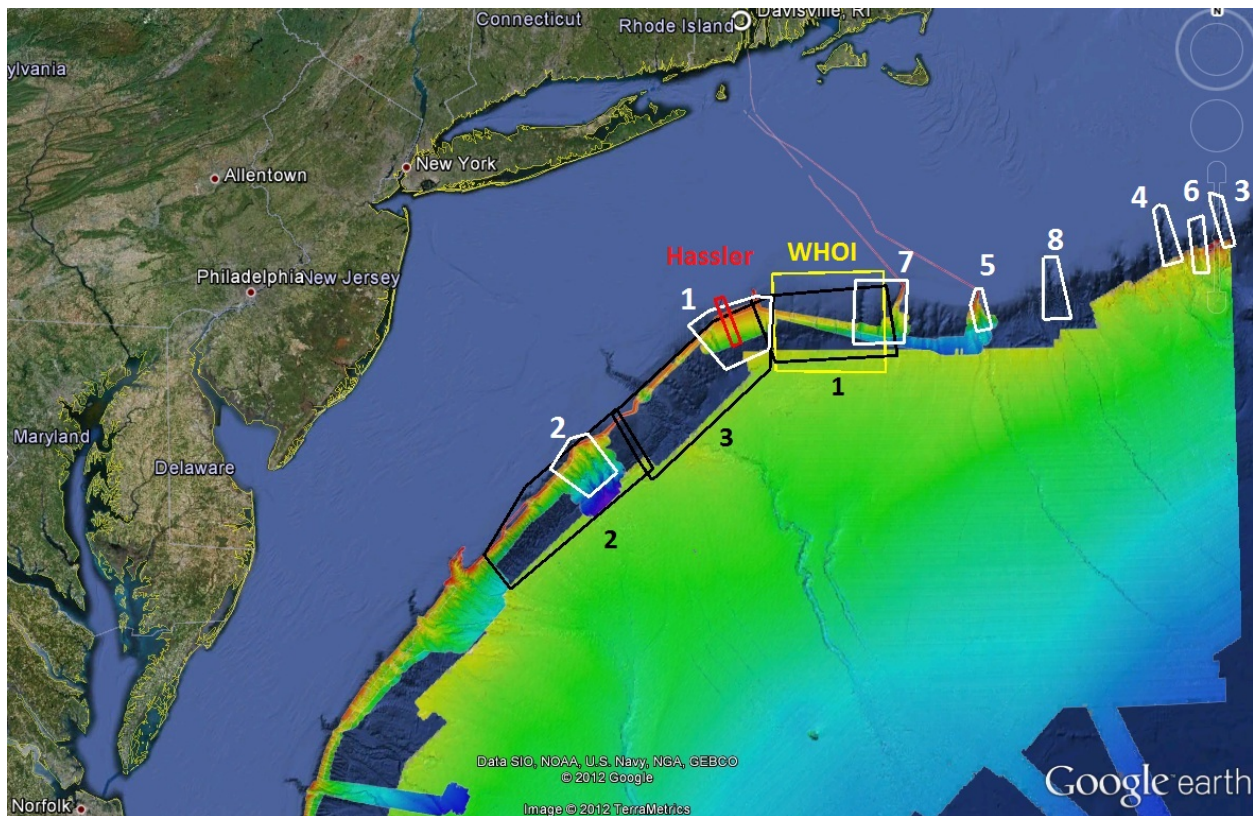


Figure 1: Operating area for EX-12-04 NE canyon exploration areas. The actual cruise track is subject to change due to weather and survey conditions. Earlier multibeam coverage during

EX1106 (2011) and EX1201 (2012) is shown. Law of the Sea continental slope data also shown. White polygons show the North East Fisheries Science Center priority areas, numbered according to priority. Black polygons summarize MARCO priority areas, numbered according to priority. Yellow polygon shows WHOI- Pioneer Array priority. Red polygon shows Hassler/Okeanos Explorer sonar data comparison area. Image created with Google Earth.

Coordinates of the broad exploration areas (Figure 1) are listed in the following table.

Exploration area coordinates			
Area	Longitude	Latitude	Remarks
NEFSC Priority 1	-71.219160	39.683912	<i>Okeanos Explorer</i> maps offshore portion only, inshore portion to be mapped by <i>Hassler</i>
	-71.200152	39.991954	
	-71.324316	39.993326	
	-71.675970	39.908575	
	-71.828712	39.822382	
	-71.544221	39.568108	
	-71.219160	39.683912	
NEFSC Priority 2	-72.350930	38.966004	Middle Toms Canyon Complex; Remaining inshore portion to be mapped by <i>Hassler</i>
	-72.576901	39.187069	
	-72.710777	39.156332	
	-72.851199	38.979219	
	-72.561004	38.820116	
	-72.350930	38.966004	
NEFSC Priority 3	-67.574224	40.258592	Lydonia Canyon
	-67.657865	40.548262	
	-67.762705	40.575913	
	-67.756268	40.514212	
	-67.667836	40.246148	
	-67.574224	40.258592	
NEFSC Priority 4	-67.998881	40.175304	Oceanographer Canyon
	-68.121984	40.500540	
	-68.173818	40.508841	
	-68.216876	40.479637	
	-68.153490	40.147617	
	-67.998881	40.175304	
NEFSC Priority 5	-69.513532	39.802094	Veatch Canyon
	-69.584461	40.036550	
	-69.635110	40.033149	
	-69.675996	39.938238	

	-69.632914 -69.513532	39.784828 39.802094	
NEFSC Priority 6	-67.942000 -67.825000 -67.791000 -67.922000	40.412000 40.439000 40.094000 40.095000	Gilbert Canyon
NEFSC Priority 7	-70.555000 -70.153000 -70.180000 -70.579000	40.087000 40.081000 39.713000 39.708000	Alvin Canyon, Atlantis Canyon
NEFSC Priority 8	-69.097000 -68.993000 -68.889000 -69.117000	40.214000 40.219000 39.840000 39.839000	Hydrographer Canyon
NEFSC Priority 2: Hassler priority sub-area (Green Polygon, Fig 2)	-72.793031 -72.663526 -72.537154 -72.574405 -72.711851 -72.851048 -72.793031	38.946257 39.108035 39.146413 39.189100 39.155329 38.978805 38.946257	
NEFSC Priority 1: Hassler priority sub-area (Green Polygon, Fig 4)	-71.755822 -71.629103 -71.306775 -71.203628 -71.200888 -71.317295 -71.678218 -71.827662 -71.755822	39.756636 39.839794 39.934411 39.921870 39.991405 39.993501 39.908790 39.822337 39.756636	
MARCO Priority 1	-71.364137 -71.168293 -70.241192 -70.320168	39.989062 39.611854 39.648958 40.056046	
MARCO Priority 2	-73.035997 -73.331631 -73.128840 -72.083275 -72.364744	38.872228 38.469682 38.274572 39.334103 38.990322	
MARCO Priority 3	-72.090861 -71.210248	38.921809 39.570401	

	-71.182529 -71.644258 -72.394560 -72.195198	40.005032 39.846074 39.300366 39.038219	
Hassler Comparison	-71.604300 -71.478292 -71.434716 -71.558375 -71.604300	39.980798 39.717180 39.728856 39.993656 39.980798	<i>Hassler, Okeanos Explorer</i>
WHOI Pioneer Array Priority	-71.1658162 -70.33360638 -70.34134104 -71.19377715	39.560683 39.551688 40.140973 40.126001	

Table 1: Coordinates of EX-12-04 exploration mapping areas.

The shelf break of the US North Eastern region consists of a diverse habitat including more than 70 canyons which range from depths of ~ 100 m to ~ 3500 m. The shape of these canyons make them hard to fish and therefore provide refuge to several fauna including rare species of corals, fish and other animals. Some of the canyons have been previously studied extensively (for example refer to Hecker et. al, 2007)*. Some of the canyons have only partially been studied and constitute high priority for exploration and research of several federal and state agencies. NOAA's Office of Ocean Exploration and Research's (NOAA OER) previous work on NE canyons includes "Deep Water Mid-Atlantic Canyon Exploration" in 2011 which focused on Norfolk, Washington, Accomac and Baltimore canyons. Other NOAA programs [e.g., NMFS Northeast Fisheries Science Center (NEFSC) and NMFS Deep Sea Coral Research and Technology Program(DSCRTP)] also have interest in understanding the geomorphology and habitat complexity of these canyons. During planning of this expedition, NOAA OER engaged NMFS representatives to help identify priority canyons mapping targets. OER also consulted with representatives from the Mid Atlantic Regional Council on the Ocean (MARCO) which includes the states of New York, New Jersey, Delaware, Maryland and Virginia. MARCO seeks to understand and conserve coastal ocean resources. Scientific priorities were identified as building the base layers of the bathymetry, geomorphology and establishing accurate extent of these canyons.

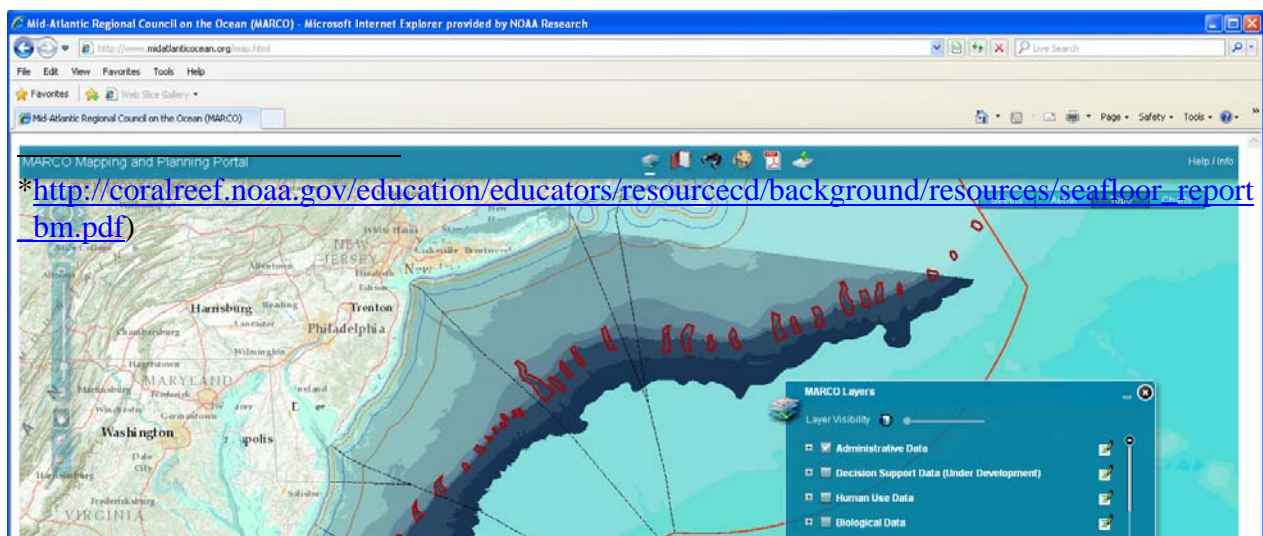


Figure 2: Screen grab of MARCO mapping and planning portal that shows several of the North East canyons along with different data layers that MARCO has started to accumulate. Bathymetry collected by Okeanos Explorer will add to topographic coverage of the canyons.

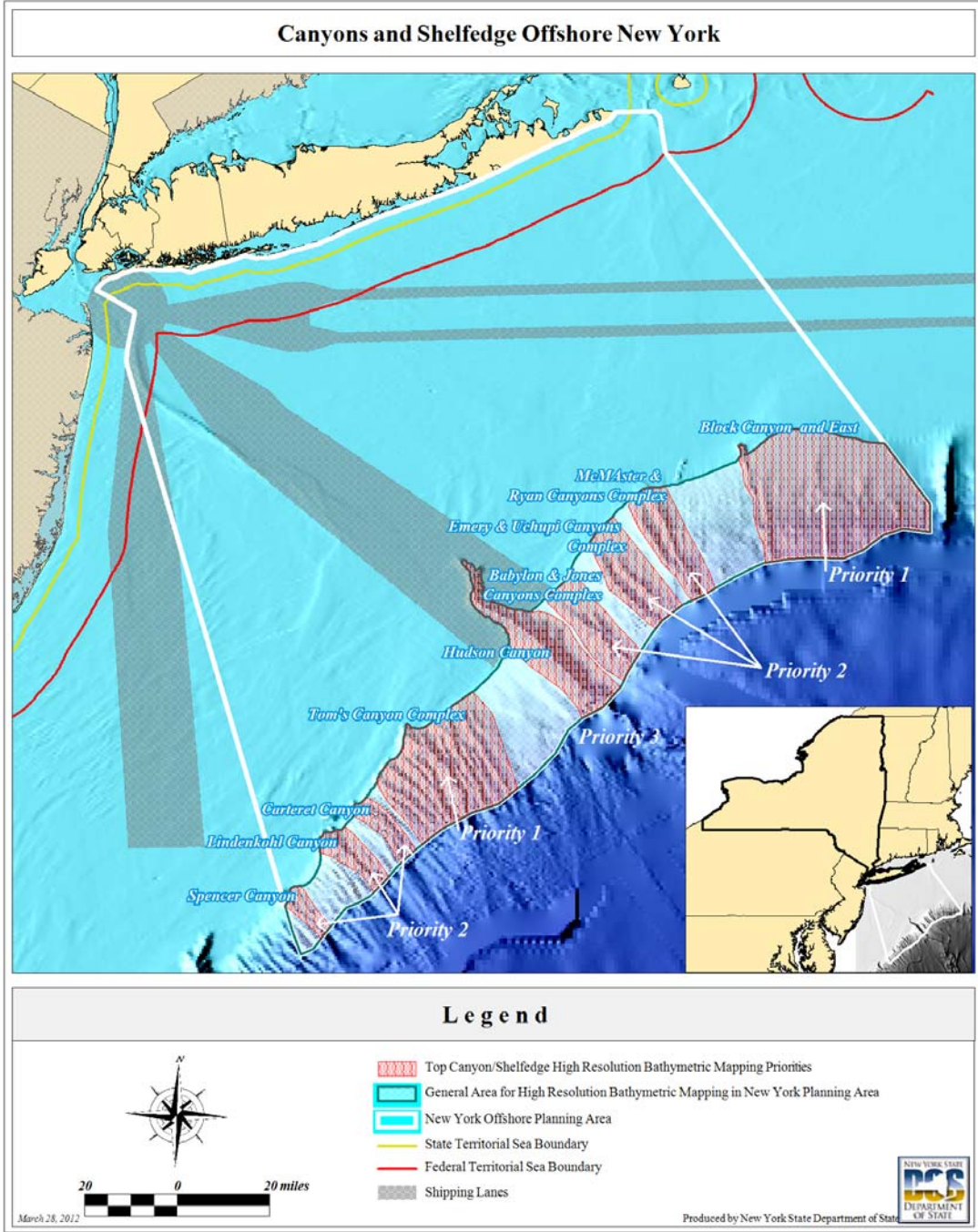


Figure 3. Map provided by NY Department of State highlights key canyon priority mapping areas.

NOAA Ship *Ferdinand R. Hassler* and NOAA Ship *Henry B. Bigelow* are expected to be working in vicinity of EX-12-04 operating areas later in the year. Ongoing discussions with these ships resulted in an interest in comparing the sensors onboard the three ships. *Hassler* is expected to be commissioned in June 2012 and is expected to test her deep water multibeam sonar (maximum depth ~ 700 m) in the vicinity of McMaster canyon. *Bigelow* is equipped with a fisheries multibeam sonar and is expected to be working in the vicinity of McMaster Canyon in July 2012. The comparison of these three multibeam sonars will enable a comprehensive test of *Hassler's* deep water multibeam system making both bottom and water column backscatter data available for comparison. *Bigelow* is expected to provide calibrated bottom and water column backscatter which will help provide details about calibration offsets of *Hassler* and *Okeanos Explorer* multibeam systems.

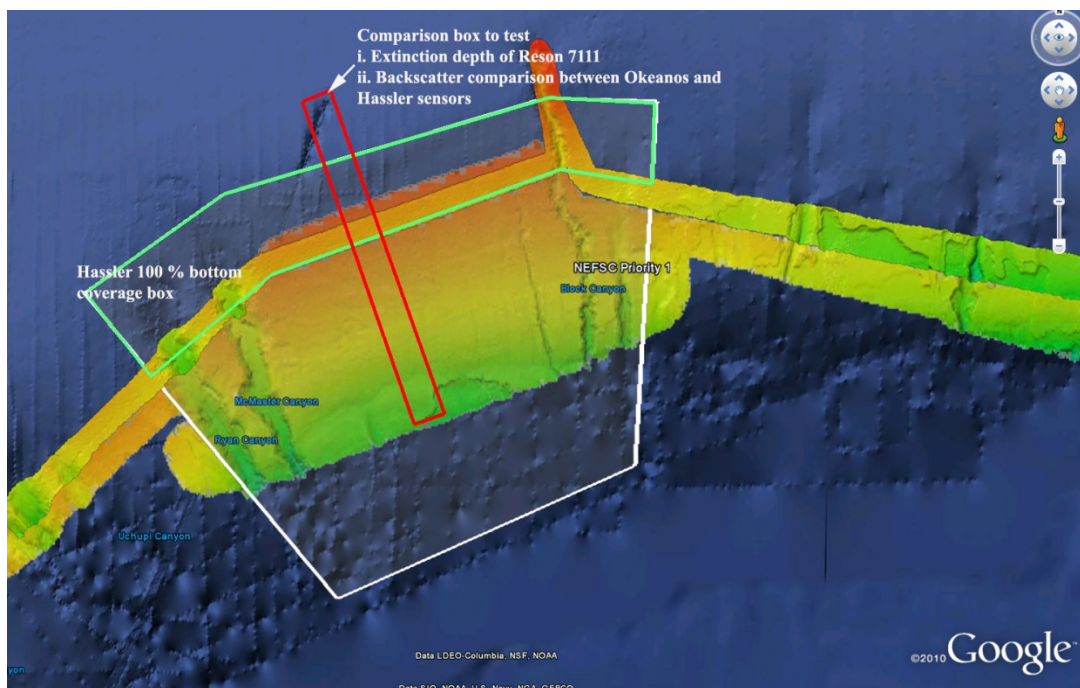


Figure 4. Close up of NEFSC Priority Area 1 showing multibeam backscatter testing area for NOAA Ship *Hassler* and NOAA Ship *Okeanos Explorer* data comparison. Previous EX data shown in background. Green polygon will be mapped by *Hassler*. Screenshot taken in Google Earth.

C. Summary of Objectives

The following are mission objectives for EX-12-04:

1. Collect deep water multibeam sonar data (MBES)
 - A. Conduct 24-hr mapping operations during transit, with possible further development of exploration targets and collect bottom and water column data.

- B. Collection of data over a sloped but featureless area in vicinity of McMaster canyon running north/ south line direction for the purposes of comparison with *Hassler* and *Bigelow*
2. Conduct training of new personnel in all data collection and processing procedures (continuous throughout cruise).
 - a. Cross training of E/V *Nautilus* personnel
 - b. Possible training of new ST if hired
 - c. Training of contractor new to the ship
 - d. Training of intern(s)
 3. Collect data from ancillary sonar systems as permitted by staffing / operational paradigm
 - A. EK60 single beam
 - B. Knudsen sub-bottom profiler
 - C. Test updated triggering and syncing for multi-sonar operation
 4. CTD operations
 - A. It is likely that CTD profiles will be collected at different locations around the axis of the canyons. Collection of additional water samples are being considered pending appropriate staff is available.
 5. Telepresence (VSAT 5 mb/sec ship to shore; T1 shore to ship)
 - a. Test and refine ship-to-shore communications and operations procedures
 - b. Test and refine operating procedures and products
 6. XBT operations
 - A. XBT casts will be collected at regular interval of -4 hours

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

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

North East Fisheries Science center (NEFSC), 166 Water Street Woods Hole, MA 02543

Virginia Sea Grant, Virginia Institute of Marine Science (VIMS), College of William & Mary P.O. Box 1346 Rt. 1208 Greate Road Gloucester Point, VA 23062

Mid Atlantic Regional Council on the Ocean (MARCO), www.midatlanticocean.org, Regional Council including states of New York, New Jersey, Delaware, Maryland and Virginia.

Woods Hole Oceanographic Institute (WHOI), Woods Hole Oceanographic Institution fax: (508) 457-2163, Woods Hole, MA 02543-1541

E. Personnel (Science Party)

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

Name	Affiliation	Position	M/F	Status
Elizabeth “Meme” Lobecker	OER (ERT Inc)	Expedition Coordinator / Mapping Lead	F	US Citizen
Gina Brewer	UCAR	Mapping Watch Lead	F	US Citizen
Ashley Harris	UCAR	Mapping Watch Lead	M	US Citizen
Nicole Raineault	Ocean Exploration Trust	Mapping Watchstander	F	US Citizen
Roderick McLeod	Ocean Exploration Trust	Mapping Watchstander	M	Non-US Citizen
Meredith Meyers	UCAR	Mapping Watchstander	F	US Citizen
William Boll	UCAR	Mapping Data Processor	M	US Citizen
David Packer	NOAA Northeast Fisheries Science Center	Scientist, Federal Escort for R. McLeod	M	US Citizen

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

NOAA Ship *Ferdinand R. Hassler* Cruise Point-of-Contact:
 LT Samuel Greenaway, NOAA
 Operations Officer, *Ferdinand R. Hassler*
 Marine Operations Center, Atlantic
 439 West York Street
 Norfolk, VA 23510
[206-427-9554](tel:206-427-9554)
samuel.greenaway@noaa.gov

NOAA Ship *Henry B. Bigelow* Cruise Point-of-Contact:
Dr. Martha Nizinski, NOAA
NEFSC - National Systematics Laboratory
202-633-0671
nizinski@si.edu or Martha.nizinski@noaa.gov

F. Administrative

Key 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
(Ship will be docked in this location/address)

Chief Operations Division, Atlantic (MOA)
LCDR Jennifer Pralgo
Telephone: (757) 441-6716
E-mail: ChiefOps.MOA@noaa.gov

Mission Operations

Elizabeth “Meme” Lobecker, Expedition Coordinator,
Mapping Lead (Onboard)
NOAA Office of Ocean Exploration
and Research (ERT, Inc.)
Phone: (401) 662-9297/ (603)377-6319
E-mail: elizabeth.lobecker@noaa.gov

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

LT Megan Nadeau, NOAA
Operations Officer
NOAA Ship *Okeanos Explorer*
Phone: (207) 240-0957 (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
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LCDR Nicola VerPlanck,
NOAA Ocean Exploration & Research
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John McDonough, Deputy Director
NOAA Ocean Exploration & Research
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Catalina Martinez, Regional Manager
NOAA Office of Ocean Exploration & Research
Phone: (401) 874-6250 (o) / (401) 330-9662 (c)
Email: Catalina.Martinez@noaa.gov

Martha S. Nizinski, Ph.D.
NOAA/NMFS Systematics Laboratory
Smithsonian Institution
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NHB, WC-57, MRC-153
Washington, DC 20013-7012
Phone: [202-633-0671](tel:202-633-0671)
email: nizinski@si.edu

Mashkoor Malik
Mapping Lead
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E-mail : Mashkoor.Malik@noaa.gov

Jeremy Potter, Expedition Manager
NOAA Office of Ocean Exploration
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Webb Pinner, Telepresence Lead
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Email: Webb.Pinner@noaa.gov

Troy W. Hartley, Ph.D.
Virginia Sea Grant Director,
Virginia Institute of Marine Science (VIMS)
Research Associate Professor
College of William & Mary
P.O. Box 1346
Rt. 1208 Greate Road
Gloucester Point, VA 23062
Ph. [804.684.7248](tel:804.684.7248)
Email. thartley@vims.edu

Adam Skarke, Mapping Lead
NOAA Ocean Exploration & Research (ERT, Inc.)
Phone: 603-862-0369/ 302-981-9908
E-mail: Adam.Skarke@noaa.gov

Shipments

No shipments are necessary for this cruise

G. Diplomatic Clearances

NOT APPLICABLE TO THIS CRUISE

H. Licenses and Permits

See Appendix C for categorical exclusion documentation

II. OPERATIONS

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

Details about salient operations 29 May – 13 June, 2012 are summarized as below

Date	Operations	Remarks
5/27/12	Mission party arrives to ship	
5/29/12-5/30/12	Ship transits from Norfolk, VA to working grounds	
5/31/12-6/11/12	Mapping the NE canyons.	Canyons will be mapped moving south to north. It is expected that all areas described in Table 1 will be mapped, however if inclement weather or other unforeseen circumstances make prioritizing necessary, higher priority areas will be concentrated on.
6/13/12	Arrive Davisville, RI	
6/14/12	Mission party departs ship	

B. Telepresence Events

There are no Telepresence events anticipated during this leg.

C. In-Port Events

May 24: An inport event in Norfolk, VA is planned with regional scientists and representatives from MARCO and VA Sea Grant. The port event is expected to involve ship tours. Further details forthcoming.

There are no port events in Davisville, RI are anticipated at this time.

D. Staging and Destaging

Destaging of the ROV is expected to occur on 14 and 15 June 2012. Destaging the 20 ft container will likely require the movement of the ship to another pier with a higher weight limit (such as Davisville Pier 2). Alternatively, a barge crane may be considered for offloading. The destaging of the 20 ft container will be coordinated with the loading of the *Sentry* container.

E. Sonar Operations

Mapping Operations

Round the clock EM 302 and EK 60 data acquisition is being planned for this cruise. Mapping team will ensure that all the standard protocols, as laid out in the Commanding Officer and mapping lead directives, will be followed for efficient and safe mapping operations around the clock.

Knudsen sub-bottom profiler has been synchronized with EM 302 but 24 hour operations are not anticipated due to excessive noise within the living quarters. As a compromise, it is anticipated that Knudsen sub-bottom profiler will be operated during day time hours (0800-2000) to minimize impact of excessive noise on the crew. The final decision to operate and collect sub-bottom profiler data will be at the discretion of Commanding Officer.

F. Dive Plan

NOT APPLICABLE TO THIS CRUISE

G. Applicable Restrictions

NOT APPLICABLE TO THIS CRUISE

III. EQUIPMENT

A. Equipment and capabilities provided by the ship

- Kongsberg Simrad EM 302 Multibeam Echosounder (MBES)
- Kongsberg Simrad EK 60 Singlebeam Echosounder
- Knudsen Chirp 3260 Sub-bottom profiler (SBP)
- LHM Sippican XBT (various probes)
- Seabird SBE 911Plus CTD
- Light Scattering Sensors (LSS)
- Oxidation – Reduction Potential (ORP)
- Dissolved Oxygen (DO) sensor
- Altimeter Sensor and battery pack
- Seabird SBE 32 Carousel and 24 2.5 L Niskin Bottles
- 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
- Cruise Information Management System (CIMS)
- High Speed VSAT (5 mbps ship-to-shore; T1 shore-to-ship)

B. Equipment and capabilities provided by the scientists

None.

IV. HAZARDOUS MATERIALS

A. Policy and Compliance

The Expedition Coordinator is responsible for complying with MOCDOC 15, Fleet Environmental Compliance #07, Hazardous Material and Hazardous Waste Management Requirements for Visiting Scientists, released July 2002. Documentation regarding those requirements will be provided by the Chief of Operations, Marine Operations Center, upon request.

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 the anticipated quantity brought aboard, MSDS and appropriate neutralizing agents, buffers, and/or absorbents in amounts adequate to address spills of a size equal to the amount of chemical brought aboard. The amount of hazardous material arriving and leaving the vessel shall be accounted for by the Expedition Coordinator.

B. Radioactive Isotopes

NOT APPLICABLE TO THIS CRUISE

C. Inventory

NOT APPLICABLE TO THIS CRUISE

V. ADDITIONAL PROJECTS

A. Supplementary Projects

NOT APPLICABLE TO THIS CRUISE

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/NAOs/Chap_212/naos_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 the EX 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)
 - Mapping data 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.

B. Pre and Post Cruise Meeting

Pre-Cruise Meeting

Prior to departure, the Operation's Officer will conduct a meeting of the scientific party to inform them of cruise objectives and vessel protocols, e.g., meals, watches, etiquette, etc.

Post-Cruise Meeting

Upon completion of the cruise, a meeting will be held by the Operation's Officer and attended by the ship's Survey Technicians, the Expedition Coordinator and members of the scientific party to review the cruise. Concerns regarding safety, efficiency, and suggestions for improvements for future cruises should be discussed.

Shipboard Meetings

Daily Operations Briefing meetings will be held at 1500 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 PLONE site (<http://tethys.gso.uri.edu/OkeanosExplorerPortal>).

C. Ship Operation Evaluation Report

Within seven days of the completion of the cruise, a Ship Operation Evaluation form is to be completed by the Expedition Coordinator and lead scientist. The preferred method of transmittal of this form is via email to OMAO.Customer.Satisfaction@noaa.gov . If email is not an option, a hard copy may be forwarded to:

Director, NOAA Marine and Aviation Operations
NOAA Office of Marine and Aviation Operations
8403 Colesville Road, Suite 500
Silver Spring, MD 20910

VII. MISCELLANEOUS

A. Meals and Berthing

Meals and berthing are required for up to 19 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: 12/11) must be completed in advance by each participating scientist. The NHSQ can be obtained from the Expedition Coordinator or the NOAA website at [NOAA HEALTH SERVICES QUESTIONNAIRE](http://www.corporateservices.noaa.gov/~noaaforms/eforms/nf57-10-01.pdf) found at <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 the form into an email using the contact information below. The NHSQ should reach the Health Services Office no later than 4 weeks prior to the cruise 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. Clearances are valid for 2 years for personnel under age 50 and 1 year for age 50 and over. All PPD's expire after one year from the date of administration. 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 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

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 the EX.
- 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 128kbs is shared by all vessels staff and the science team at no charge. Increased bandwidth in 30 day increments is available on the VSAT systems at increased cost to the scientific party. If increased bandwidth is being considered, program accounting is required it must be arranged at least 30 days in advance.

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

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:

EX Cellular: (401) 932-4114
 EX Iridium: (808) 659-9179
 OER Mission Iridium (wet lab): (808) 851-3827

EX INMARSAT B
 Line 1: 011-872-764-852-328
 Line 2: 011-872-764-852-329

Voice Over IP (VoIP) Phone:

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

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

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

E. IT Security

Any computer that will be hooked into the ship's network must comply with the 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

Roderick McLeod (United Kingdom citizen) will be escorted by David Packer, a Federal employee of the NOAA Northeast Fisheries Science Center.

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
NOAA OKEANOS EXPLORER**

PRINT CLEARLY

NAME: _____
(Last, First, Middle)

Mailing Address _____

(Other than the ship address)

Phone (Home) _____
(Cell) _____

Date of Birth _____

Email Address: _____

Emergency Contact (E.C.): _____
(Name and Relationship)

E.C.Address: _____

E.C.Phone (Home) _____

E.C.(Work) _____

E.C.(Cell) _____

E.C.Email: _____

Signature _____ Date _____

Appendix B: EX-12-04 Data Management Plan

Document Purpose

This document is an addendum to the overarching Okeanos Explorer FY12 Data Management Plan (EX_FY12_DMP.pdf) and is specific to the EX-12-04 mission entitled “Northeast Canyons and Continental Margins Exploration” For more detailed information on the data management effort for the Okeanos Explorer in FY12, please refer to that document.

General Description of the Data to be Managed

Kongsberg EM302 multibeam sonar, Simrad EK60, and Knudsen sub-bottom profiler data collected during the transit from Norfolk, VA to Davisville, RI and at targeted canyons along the northeastern U.S. coastline within the Exclusive Economic Zone (EEZ). CTD casts may be conducted around different locations around the axis of the canyons depending upon staff availability. XBT casts will be conducted every 2-4 hours for system calibration checks. Multibeam data collected in a sloped but featureless area in the vicinity of McMaster canyon will be used in comparison with data in this same area recorded by the NOAA Ship *Hassler* and the NOAA Ship *Bigelow*.

- Name of Dataset
 - : “EX1204: Northeast Canyons and Continental Margins Exploration”
- Mission Specific Keywords:
 - Place
 - Norfolk
 - US East Coast
 - U.S. East Coast
 - Virginia
 - Rhode Island
 - Atlantic Basin
 - Norfolk Canyon
 - Washington Canyon
 - Accomac Canyon
 - Baltimore Canyon
 - Hudson Canyon
 - Lydonia Canyon
 - Gilbert Canyon
 - Oceanographer Canyon
 - Hydrographer Canyon
 - Veatch Canyon
 - Atlantis Canyon
 - Alvin Canyon
 - Uchupi Canyon
 - Babylon Canyon
 - Jones Canyon
 - Hudson Canyon

- Carteret Canyon
 - Davisville
 - Theme
 - Multibeam
 - Multibeam sonar
 - Sub-bottom profile
 - Mapping survey
 - Exclusive economic zone
 - EEZ
 - Atlantic canyon
 - Northeast Fisheries Science Center
 - Woods Hole Oceanographic Institute
 - WHOI
 - Virginia Sea Grant
 - Mid Atlantic Regional Council on the Ocean
 - MARCO
 - Ocean Exploration Advisory Working Group
 - National Marine Fisheries Service
 - OEAWG
 - Shelf break
 - Coral preservation
 - Coral habitat
 - Deep sea corals
 - Deep water corals
 - Fisheries management
 - Canyon complex
 - NOAA Ship Hassler
 - NOAA Ship Bigelow
 - Multibeam backscatter
 - Water column backscatter
 - Offshore management
- Summary description:
 - During the *Okeanos Explorer (EX)* mission EX1204, the vessel will sail from Norfolk, VA, along the continental shelf break of the U.S. East Coast, to the ship's home port of Davisville, RI. The goal of the mission is to explore northeastern canyons and continental margins using the ship's Kongsberg EM302 multibeam sonar, Simrad EK60, and Knudsen sub-bottom profiler. CTD casts may be conducted around different locations around the axis of the canyons depending upon staff availability. XBT casts will be fired every 2-4 hours for system calibration checks. Multibeam data collected in a sloped but featureless area in the vicinity of McMaster canyon will be used in comparison with data in this same area recorded by the NOAA Ship Hassler and the NOAA Ship Bigelow.

Data management procedures are fully documented in the data management plan for the Okeanos Explorer for the FY12 field season (EX_FY12_DMP.pdf)

- Temporal Bounds:
 - May 29 – June 13, 2012
- Spatial Bounds:
 - Northern – 40.7
 - Southern – 36.4
 - Western – -74.9
 - Eastern – -67.4
- Data Type Collections for Preservation/Stewardship:
 - Multibeam Bathymetry – continuous collection during the entire duration of the expedition
 - Bottom Backscatter – continuous collection during the entire duration of the expedition.
 - Water Column Backscatter – continuous collection during the entire duration of the expedition
 - Scientific Computing System (SCS) output – continuous collection of navigational, meteorological, integrated oceanographic sensor data
 - XBT – continuous casts approx. 4 hours apart collecting water temperature at depth for sound velocity calculations
 - CTD – test casts with Rosette firings collecting conductivity, temperature, depth and water samples at targeted depths
 - Knudsen CHIRP 3260 –sub-bottom profiler data as deemed appropriate by the ship
 - EK60 – single beam sonar for water column features during the entire duration of the expedition
- Data Product/Product Collections for Preservation/Stewardship:
 - Gridded bathymetry (.txt)
 - Gridded bathymetric image (.tif)
 - Fledermaus gridded bathymetry imagery (.sd)
 - Fledermaus gridded backscatter imagery (.sd)
 - Google Earth gridded bathymetry (.kml)
 - SCS data output in NetCDF
 - CTD data output in NetCDF
 - Final Mapping Summary document
- Volume of Data Expected
 - Approximately 135 GB of data is expected to be collected on this mission.
- Personally Identifiable Information (PII) concerns
 - No PII will be included in these data.

Points of Contact

- Overall Point of Contact (POC) for the data:
 - Data Acquisition: Elizabeth “Meme” Lobecker (Elizabeth.Lobecker@noaa.gov)
 - Data Management: Susan Gottfried (Susan.Gottfried@noaa.gov)

- Responsible for Data Quality:
 - Seafloor mapping and water column data: Elizabeth Lobecker
 - SCS data: Office of Marine and Aviation Operations (OMAO): Lt. Megan Nadeau, Okeanos Explorer Operations Officer (Ops.Explorer@noaa.gov)
- Responsible for data documentation and metadata activities:
 - National Coastal Data Development Center (NCDDC); Susan Gottfried, OER Data Management Coordinator
- Responsible for the data storage and data disaster recovery activities:
 - NOAA National Data Centers; National Oceanographic Data Center (NODC), National Geophysical Data Center (NGDC), NOAA Central Library (NCL)
- Responsible for ensuring adherence to this data management plan, including resources are made available to implement the DMP:
 - Data Acquisition: Elizabeth Lobecker, Expedition Coordinator
 - Data Acquisition: Lt. Megan Nadeau, OMAO, Okeanos Explorer Operations Officer
 - Data Management: Susan Gottfried, OER Data Management Coordinator

Data Stewardship

- What quality control procedures will be employed?
 - Quality control procedures for the data from the Kongsberg EM302 is handled at UNH CCOM/JHC. Field processing of raw (level-0) bathymetry files reviewed and verified, and processed data are converted to a variety of products.
 - Data from sensors monitored through the SCS are archived in their native format and are not quality controlled.
- What is the overall lifecycle of the data from collection or acquisition to making it available to customer?
 - All data from this mission is expected to be archived and accessible within 60-90 days post-mission.
 - METOC data from the SCS are converted in a post-mission model into archive-ready compressed NetCDF3 format and stored within the NODC THREDDS open-access server.

Data Documentation

- An ISO format metadata record to document the mission will be generated during pre-cruise planning and published in an OER catalog for public discovery and access. Data collections and products will be documented with ISO or FGDC CSDGM metadata and published at the appropriate NOAA Data Center.
- ISO 19115-2 Geographic Information with Extensions for Imagery and Gridded Data will be the metadata standard employed.

Data Sharing

- All data recorded, observed, generated or otherwise produced on the Okeanos Explorer are considered non-proprietary and will be made available to the public as soon as

possible after a period of due diligence in performing quality assurance and data documentation procedures.

Initial Data Storage and Protection

- 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 data volume.

Long-Term Archiving and Preservation

- Data from this mission will be preserved and stewarded through the NOAA National Data Centers. Refer to the Okeanos Explorer FY12 Data Management Plan (EX_FY12_DMP.pdf) for detailed descriptions of the processes, procedures, and partners involved in this collaborative process. Appendix A has an excerpt from EX_FY12_DMP.pdf that illustrates the data and product pipelines that will be employed for this mission.

Data Management Objectives

The DMT's objectives for this mission are:

- Develop ISO metadata for collection-level and dataset-level records (multibeam, singlebeam sonar, sub-bottom profiler, XBT, CTD, EX METOC)
- Ensure compliance with EX12 Data Pipelines
- Ensure the near real-time update of the *Okeanos Atlas* with
 - Ship track and hourly observations received via email.
 - Daily logs pulled from URI through RSS feeds and links to related images on oceanexplorer.noaa.gov website.
 - CTD cast locations with thinned profiles to be compared to the World Ocean Atlas historical profiles for the general location and month.
 - Daily cumulative bathymetric image overlays received via URI SRS.
 - Execute multibeam and oceanographic data pipelines according to the FY12 DMP (EX_FY12_DMP.pdf).

Expedition Principals for Data Management

Webb Pinner, OER Telepresence, EX Data and Information Lead, Webb.Pinner@noaa.gov
Sharon Mesick, NCDDC, Federal Program Manager, IPT Chair, Sharon.Mesick@noaa.gov
Susan Gottfried, NCDDC, OER Data Management Coordinator, Susan.Gottfried@noaa.gov
Andy Navard, NCDDC, Okeanos Atlas Developer, Andrew.Navard@noaa.gov
Dan Price, NGDC, Geophysical Data Officer, Daniel.Price@noaa.gov
Tom Ryan, NODC, Oceanographic Data Officer, Thomas.Ryan@noaa.gov
Anna Fiolek, NCL, Multimedia Librarian, Anna.Fiolek@noaa.gov

Appendix A: Data and Product Pipelines (excerpt from EX_FY12_DMP.pdf)
Oceanographic/Meteorological/Navigational Data Archive Pipeline

Data from hull-mounted and off-board oceanographic and meteorological (METOC) sensors; integrated oceanographic sensors from the submersibles; and navigational instrumentation on both the vessel and its submersibles are monitored through the ship's Scientific Computer System (SCS). Some of these data will be used in a near real-time mode to update the *Okeanos Atlas*. All of these data will be archived at the National Oceanographic Data Center (NODC) Marine Data Stewardship Division (MDS) in Silver Spring, MD. A collection level metadata record describing the data inventory to be archived at the NODC/MDS will be included with the data submission.

Oceanographic/Meteorological/Navigational Data/Products Pipeline

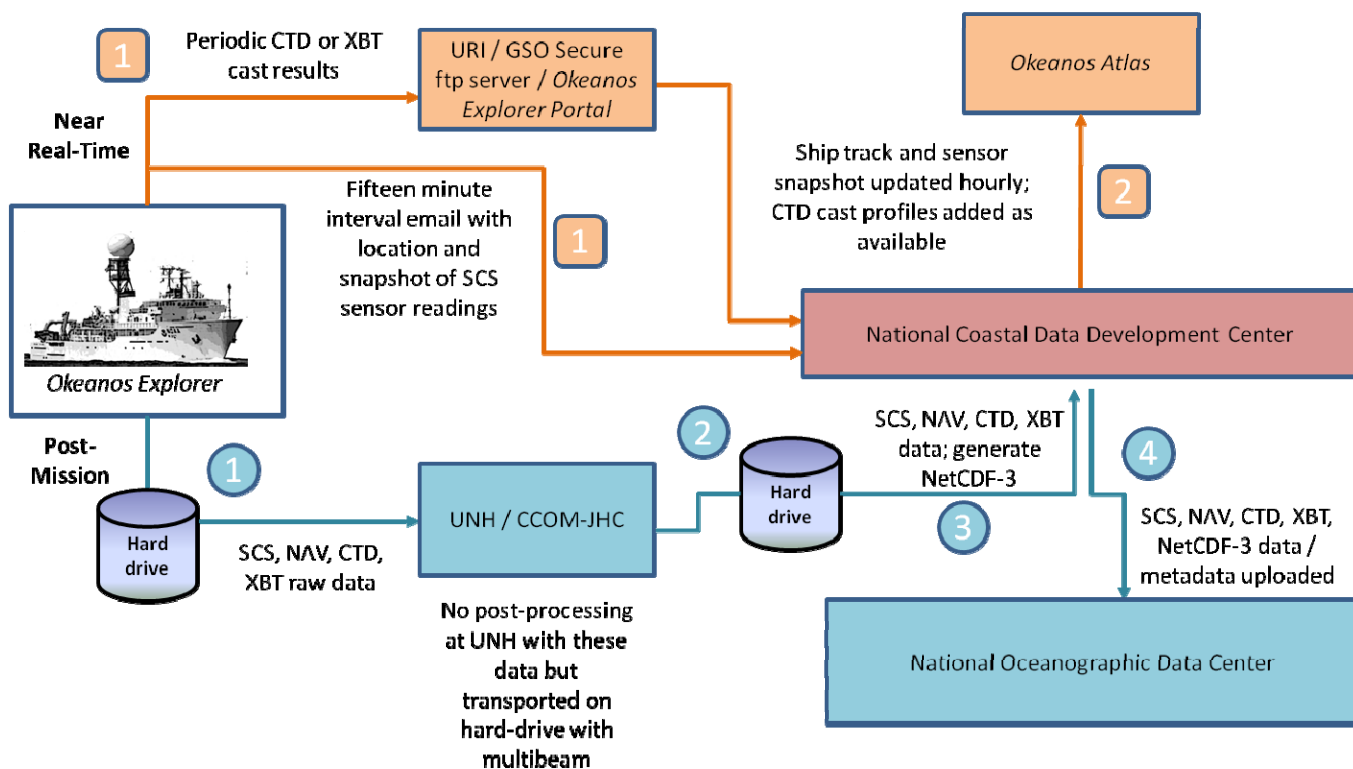


Fig 1: Oceanographic/Meteorological/Navigational Data Archive Pipeline

1

At periodic (currently twenty minutes) intervals, an email from the ship to NCDDC is delivered with the ship’s position and a snapshot of the SCS sensor suite.

As CTD or XBT casts are deployed, the results of the cast are included in the hourly synchronizations to the SRS.

2

The GIS team at NCDDC processes CTD cast data into thinned profiles for comparison to World Ocean Atlas historical profiles in the same region and month. The thinned profiles are geo-located on the Okeanos Atlas. Ship track and sensor snapshot readings are geo-located on the Okeanos Atlas.

1

All SCS data, including navigation and CTD/XBT cast data are saved to a hard-drive. This hard-drive is the same that will hold the multibeam survey raw data and products generated on-board. This hard-drive will be either brought back or shipped to the University of New Hampshire Center for Coastal and Ocean Mapping (UNH CCOM) for post-processing, after which it will be shipped to NCDDC.

2

The Data Management team will post-process the SCS, NAV, CTD, and XBT raw data files, adding ASCII headers to each file and generating NetCDF-3 formatted files for the entire cruise for both SCS/NAV data and CTD/XBT data. FGDC CSDGM metadata will be generated for the navigational data and for the METOC sensor data.

3

The ASCII files, and the metadata will be uploaded to the National Oceanographic Data Center (NODC), where they will be accessioned and archived.

4

The NetCDF3 files will be stored within an NCDDC hosted Thematic Real-time Environmental Distributed Data Services (THREDDS) server for user discoverability and access.

Data Class	Instrument	Data Type	Format	Metadata Granularity	Archive Center
OCN/ MET	All SCS monitored sensors	Meteorological and Oceanographic data sensors	ASCII	1 meta rec	NODC/MDSD
NAV	DGPS,	EX, ROV, and sled	ASCII	1 meta rec	NODC/MDSD

	CNAV	navigation			
ALL	All	Archive Ready	NetCDF-3	1 meta rec	NODC/MDSD

Table 4: Oceanographic/Meteorological/Navigational Metadata Granularity and Target Archive

Multibeam Survey Data Archive Pipeline

The multibeam survey data collected by bottom-looking and complementary sensors, data from the calibration instruments, and the products generated after the data is returned to and post-processed at UNH will be archived at the NGDC. These data will be accompanied with a collection level metadata record for the NGDC as well as individual metadata records for each raw (level-0) file, each edited (level-1) file and each data product (level-2) and report (level-3) generated as a result. In addition, the submission to NGDC will include the following:

- raw (level-0) mapping survey and water column data files,
- CTD and/or XBT profile data used for calibration in multibeam survey,
- post-processed, quality assured, and edited (level-1) data files,
- specific data products (level-2) including cumulative GeoTIF images, gridded bathymetric files, KML files, Fledermaus output files, and an ArcGrid format, and
- comprehensive mapping survey data summary (level-3) report.

Multibeam Data/Products Pipeline

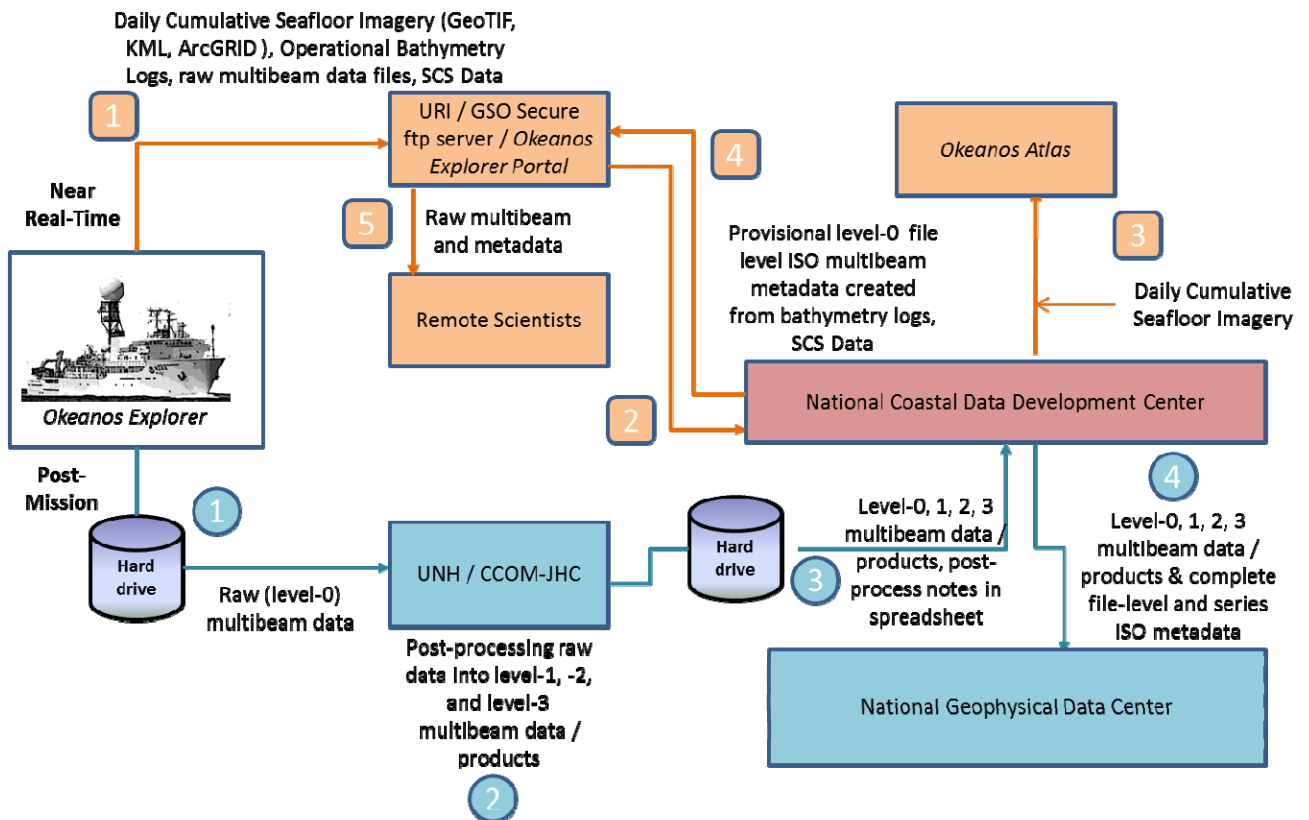


Figure 2: Multibeam Survey Data Archive Pipeline

Near Real-Time

1

The mapping survey team on the EX will include their operational processing spreadsheet in the folder that is targeted for synchronization to the SRS periodically throughout the day. As operational GeoTIFF images are created, these will also be saved to this folder.

2

The data management team at NCDDC pulls the GeoTIFF images, operational bathymetry processing spreadsheet and the SCS data streams for near real-time metadata generation and Okeanos Atlas update procedures.

3

Daily cumulative GeoTIFF images of the seafloor imagery are geo-located on the Okeanos Atlas by the GIS team at NCDDC.

4

Provisional metadata in an ISO format is generated for each raw (level-0) multibeam raw files using the SCS exported data, the operational processing spreadsheet and saved to the SRS.

5

Participating scientists wanting access to the raw multibeam in near real-time can pull the individual files with the metadata that provides operational and provisional processing steps and a disclaimer for non-QC status of the data.

Post-Mission

1

All bottom-looking sensor data and complementary data (water column and sound velocity) are saved to a hard-drive. This hard-drive will be either brought back or shipped to the University of New Hampshire Center for Coastal and Ocean Mapping (UNH CCOM) for post-processing.

2

A full complement of multibeam data from a 30-day EX cruise on which the Kongsberg EM302 multibeam system runs continuously will produce 200-300 Gigabytes of raw multibeam

(37.5% of total volume) and water column data (62.5% of total volume). At UNH, the mapping team will post-process the multibeam data through the following steps:

- The raw (level-0) data will be saved to the CCOM file servers, where they will be quality checked and post-processed.
- The edited level-0 data is saved as level-1 data files in a non-proprietary format – ASCII xyz files (cleaned not gridded).
- The post-processing steps used to produce the level-1 data will be documented.
- Level-2 products will be generated from the level-1 data files.
- The post-processing steps used to produce the level-2 data products will be documented.
- The level-1 data, level-2 products, post-processing steps, and working data processing spreadsheets will be copied to the hard drive in a new folder. A processing spreadsheet for FY12 will contain the temporal and spatial limits of each file and any supplemental information documenting problems or issues that affected the quality of the data in that file.

3 The hard-drive will be shipped to the NCDDC within approximately 3 weeks from cruise end date.

4 At NCDDC, all multibeam related files will be post-processed through metadata generation procedures. Metadata will be generated for each individual survey track file (level-0 and -1), for accompanying CTD/XBT profile data sets, for composite xyz files, KMLs, GeoTIFs, png images, and Fledermaus output (level-2), and a set of data products and reports (level-3). The metadata will be added to the hard-drive and the hard-drive will be shipped to NGDC.

Data Class	Instrument	Data Type	Format	Metadata Granularity	Archive Center
GEO	Kongsberg EM302 (30 kHz)	Multibeam Bathymetry, Bottom Backscatter, Water Column Backscatter (proprietary format read into MBSystem)	.all, .wcd (proprietary)	1 meta rec per .all file in Multibeam Data folder and subfolders	NGDC
GEO	Simrad EK60	Singlebeam (time,depth)	.txt, (ASCII), .raw (proprietary)	Included in the SCS feed	TBD
GEO	Knudsen CHIRP 3260 (3.5 kHz)	Sub-bottom profile	.sgy, .kea, .keb (proprietary)	1 meta rec = Subbottom Profile Data folder	NGDC
OCN	SeaBird SBE-911plus	CTD Cast	.hex, .con (Proprietary); .cnv, .hdr, .bl, .jpg (processed)	1 meta rec = CTD folder	NGDC
OCN	Sippican MK-21 eXpendable BathyThermograph (XBT)	XBT	.edf (ASCII), .rdf (proprietary)	1 meta rec = XBT folder	NGDC
OCN	RESON	Sound Velocity (m/s)	TBD	1 meta rec = RESON folder	NGDC
OCN	Calculated	Sound Velocity (m/s)	.asvp (ASCII)	1 meta rec = Profile_Data/SVP or Profile_Data/ASVP	NGDC

Table 5: Multibeam Survey Metadata Granularity and Target Archive

Appendix C:



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

March 28, 2012

MEMORANDUM FOR: The Record

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

SUBJECT: Categorical Exclusion for NOAA Ship *Okeanos Explorer*
cruise EX1204

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 Project


This project is part of the NOAA Office of Ocean Exploration and Research's "Science Program" and entails multi-disciplinary ocean mapping and exploration activities designed to increase knowledge of the marine environment. This project is entitled "EX1204 North East canyons exploration" and will be lead by Elizabeth 'Meme' Lobecker, a physical scientist for the *Okeanos Explorer* program within OER. The ship will depart Norfolk, VA on May 29, 2012, and arrive in Davisville, RI on June 13, 2012, and conduct sonar mapping operations at all times during the transit. Focused mapping and sonar testing operations will occur at various canyons spread along shelf break. Acoustic instruments that will be operational during the project are a 30 kHz multibeam echosounder (Kongsburg EM 302), an 18 kHz singlebeam echosounder (Kongsberg EK 60), and a 3.5 kHz sub-bottom profiler (Knudsen Chirp 3260). Additionally, expendable bathythermographs (XBTs) will be deployed regular intervals in association with multibeam data collection.

Effect of Projects

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

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: 
John McDonough, Deputy Director

Date: 3/28/2012

