



**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-14-03  
Exploration, East Coast Mapping

Attached is the final Project Instruction for EX-14-03, Exploration, East Coast Mapping, which is scheduled aboard NOAA Ship *Okeanos Explorer* during the period of 7 May – 22 May 2014. Of the 16 DAS scheduled for this project, 16 DAS are base funded by OMAO allocation. This project is estimated to exhibit a Medium Operational Tempo. Acknowledge receipt of these instructions via e-mail to [OpsMgr.MOA@noaa.gov](mailto:OpsMgr.MOA@noaa.gov) at Marine Operations Center-Atlantic.

Attachment

cc:  
MOA1





## Project Instructions

**Date Submitted:** April 25, 2014


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


**Project Number:** EX-14-03

**Project Title:** Exploration, East Coast (Mapping)

**Project Dates:** May 7 – May 22, 2014

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

Approved by:  Dated: 4/28/14  
Craig W. Russell  
Program Manager  
Office of Ocean Exploration & Research

Approved by:  Dated: 4/28/2014  
Captain Anne K. Lynch, NOAA  
Commanding Officer  
Marine Operations Center - Atlantic

## I. OVERVIEW

### A. Brief Summary and Project Period

This document contains project instructions for EX-14-03, which is an exploration mapping cruise. Operations are expected to commence on May 7, 2014 in Tampa, Florida and conclude on May 22, 2014 in North Kingston, Rhode Island. Multibeam, singlebeam, and subbottom acoustic mapping operations will be conducted 24 hours a day throughout the cruise. The final decision to operate and collect sub-bottom profiler data will be at the discretion of the Commanding Officer. Exploratory mapping operations will focus on areas off the U.S. East Coast, especially in Marine Protected Areas in the South Atlantic off the east coast of Florida and Georgia. The expedition will also collect CTD data, water samples, and plankton samples from the Blake Plateau region in support of the Northeast Fisheries Science Center's (NEFSC) effort to examine the possibility of bluefin tuna spawning activity in the area. The CTD casts are also designed to fulfill the research objectives of the NOAA Ocean Acidification Program (OAP). The water samples and data collected during these casts will provide information on carbon, physical, and biogeochemical parameters as they relate to ocean acidification (OA). Limited exploratory mapping effort will also be completed in the vicinity of the Monitor National Marine Sanctuary to search for an underwater cultural heritage site.

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

During cruise planning, transits are optimized to allow mapping of unexplored or unmapped regions. We review input received from ocean science and management communities to identify unexplored regions for possible inclusion. We also consult those scientists and managers to verify that potential targets remain a high priority and were not recently explored. Requests for information on priority exploration areas for 2014 mapping and ROV exploration in the Gulf of Mexico also resulted in significant input on priority mapping areas off the U.S. East Coast off the coast of Florida and Georgia. Based on this input, a large contiguous region in the western portion of the Blake Plateau, generally referred to as Stetson Mesa, was selected as the primary focus area for mapping operations during this expedition. This region mostly lacks high resolution maps of the seafloor and is entirely within an area designated by NOAA as a Habitat Area of Particular Concern due to the presence of deep-sea corals and other important fisheries habitat.

The final stage of the expedition will involve mapping along the edge of the continental shelf of the U.S. eastern seaboard. This edge is where the relatively shallow coastal shelf seafloor dramatically slopes down to the deep sea, forming complex and rugged ocean canyons. The majority of these canyons were mapped during 2012 and 2013 *Okeanos Explorer* cruises as part

of a major exploration initiative referred to as the Atlantic Canyons Undersea Mapping Expeditions or ACUMEN. The transit to Rhode Island will traverse the heads of these canyons and map along the edge of the continental shelf to add to existing high resolution multibeam sonar mapping coverage of this region, fill gaps in multibeam coverage from previous cruises, re-visit known seep locations, and search for new gaseous seeps emanating from the seafloor.

## **B. Days at Sea (DAS)**

Of the 16 DAS scheduled for this project, 16 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 Medium Operational Tempo.

## **C. Operating Area**

The operating area encompasses an exploration transit path from port in Tampa, FL around the Florida Keys, and northward along the U.S. East Coast to the ship's home port of North Kingston, RI. The Stetson Mesa region in the western portion of the Blake Plateau in the Atlantic Ocean will be the location of focused mapping efforts. The ship will then transit eastward and northward over the Blake Plateau to collect CTD data, water samples, and plankton tows as part of a survey of opportunity with NEFSC. The *Okeanos Explorer* will then proceed northward along the edge of the Atlantic continental shelf back to Rhode Island. All operations will be conducted within the U.S. EEZ. Refer to Figure 1. for the Operating Area summary map, and Table 1 for key operating area coordinates. Figure 2. shows the area identified as the top priority region for focused mapping operations during this expedition, and the area where NEFSC sampling will occur. Ship track lines and specific exploration targets will be refined based on additional consultation with partner scientists and input from vessel crew on field conditions.

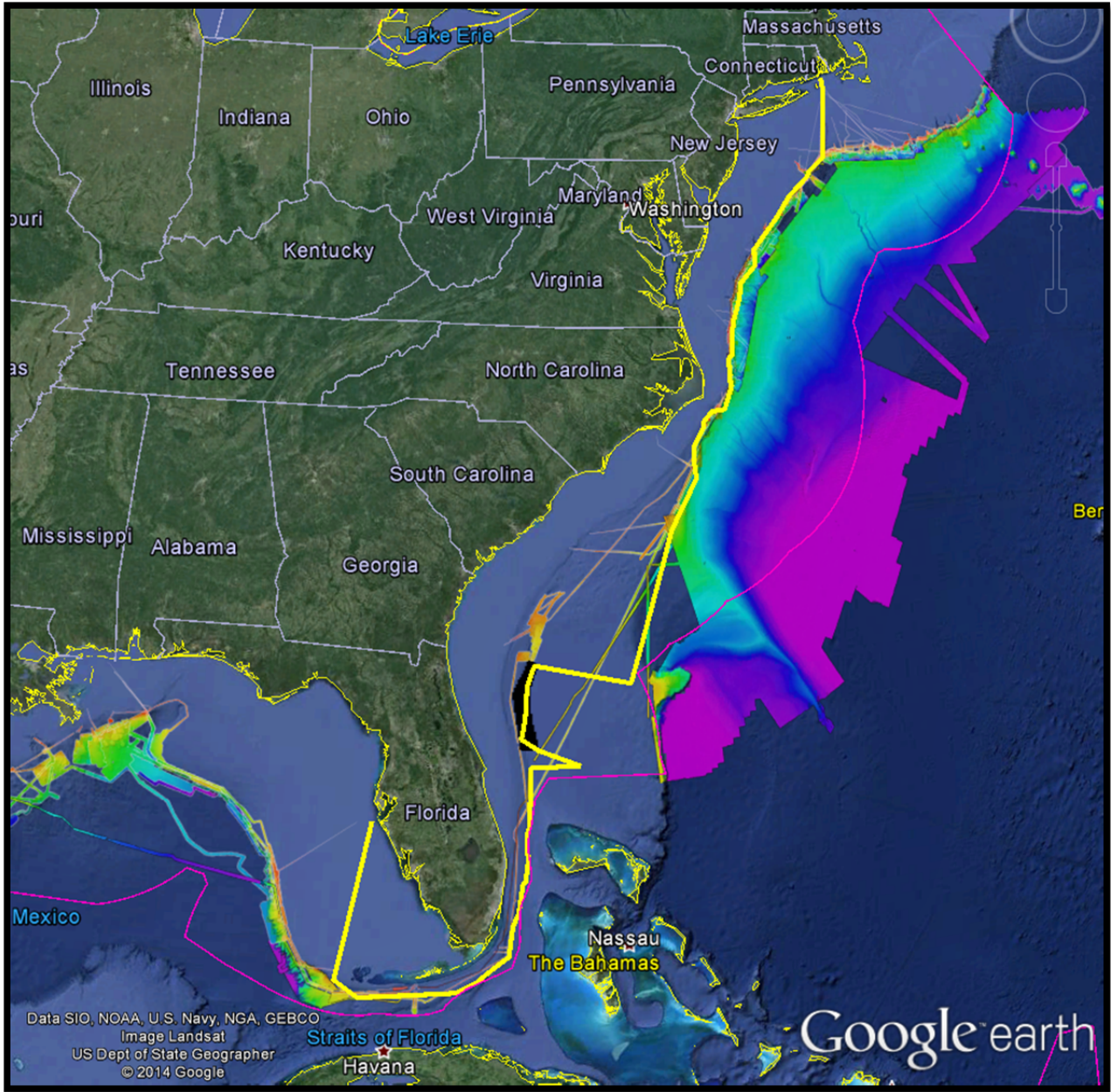


Figure 1: Approximate operating area of *Okeanos Explorer* for EX-14-03. The planned ship track line is shown in yellow. Focused mapping effort is planned for the black polygon off the northeast coast of Florida. International maritime boundaries shown in pink. Color-coded bathymetry previously collected by *Okeanos Explorer* and by the University of New Hampshire’s Center for Coastal and Ocean Mapping UNCLOS expeditions, shown in the background of the operating area for context. Figure produced in Google Earth Pro.

Table 1: Approximate waypoints for the EX-14-03 transit in degrees decimal minutes. The actual cruise track will vary due to prevailing conditions, exploration opportunities, and the discretion of the Commanding Officer. Additional waypoints for survey lines in priority mapping areas will

be provided by the mapping Team Lead during the cruise. Waypoints are ordered from start of trip to end of cruise.

Latitude	Longitude	Comments
27 30 N	82 53 W	Leave vicinity of Tampa Bay
24 30 N	83 30 W	Transit through Straits of Florida
24 10 N	83 0 W	Transit through Straits of Florida
24 15 N	81 0 W	Transit through Straits of Florida
24 30 N	80 30 W	Transit through Straits of Florida
24 18.486 N	80 50.95 W	Transit through Straits of Florida
24 27.848 N	80 31.92 W	Transit through Straits of Florida
24 45 N	80 10 W	Transit through Straits of Florida
24 55.359 N	79 54.411 W	Transit through Straits of Florida
25 30.713 N	79 51.080 W	Transit through Straits of Florida
25 45.621 N	79 44.402 W	Transit through Florida Channel
26 20 N	79 40 W	Transit through Florida Channel
26 20.633 N	79 36.896 W	Transit through Florida Channel
26 46.292 N	79 34.62 W	Transit through Florida Channel
27 0.192 N	79 36.969 W	Transit through Florida Channel
27 14.248 N	79 37.148 W	Transit through Florida Channel
27 22.762 N	79 34.666 W	Transit through Florida Channel
28 29.198 N	79 34.572 W	Transit through Florida Channel
28 30.104 N	78 29.989 W	Transit to start of Bluefin Tuna survey area
28 48.408 N	79 25.294 W	Bluefin Tuna survey area
29 00 N	79 47 W	Bluefin Tuna survey area
29 23 N	79 43 W	Stetson Mesa priority mapping area
30 00 N	79 40 W	Stetson Mesa priority mapping area
30 20 N	79 30 W	Stetson Mesa priority mapping area
30 0.210 N	77 23.966 W	Stetson Mesa priority mapping area
32 47.849 N	76 24.602 W	Bluefin Tuna survey area
33 44.058 N	75 46.552 W	Bluefin Tuna survey area
34 4.140 N	75 49.160 W	Northward transit, fill holidays, seep mapping
34 20.52 N	75 47.348 W	Northward transit, fill holidays, seep mapping
34 40.871 N	75 32.889 W	Northward transit, fill holidays, seep mapping
34 47.614 N	75 31.360 W	Northward transit, fill holidays, seep mapping
34 58.075 N	75 18.657 W	Northward transit, fill holidays, seep mapping
35 00 N	75 0 W	Northward transit, fill holidays, seep mapping
35 26.439 N	74 47.473 W	Northward transit, fill holidays, seep mapping
35 29.620 N	74 49.047 W	Northward transit, fill holidays, seep mapping
35 35.315 N	74 49.012 W	Northward transit, fill holidays, seep mapping
35 38.506 N	74 48.353 W	Northward transit, fill holidays, seep mapping
35 41.889 N	74 48.383 W	Northward transit, fill holidays, seep mapping



35 43.471 N	74 49.301 W	Northward transit, fill holidays, seep mapping
35 56.844 N	74 48.800 W	Northward transit, fill holidays, seep mapping
36 1.118 N	74 43.366 W	Northward transit, fill holidays, seep mapping
36 23.213 N	74 41.335 W	Northward transit, fill holidays, seep mapping
36 37.588 N	74 37.982 W	Northward transit, fill holidays, seep mapping
37 05 N	74 25 W	Northward transit, fill holidays, seep mapping
37 22.110 N	74 20.855 W	Northward transit, fill holidays, seep mapping
37 41 N	73 57 W	Northward transit, fill holidays, seep mapping
38 00 N	73 55 W	Northward transit, fill holidays, seep mapping
38 34.893 N	73 14.99 W	Northward transit, fill holidays, seep mapping
39 0.909 N	72 48.868 W	Northward transit, fill holidays, seep mapping
39 24.055 N	72 14.058 W	Northward transit, fill holidays, seep mapping
39 30 N	72 10 W	Northward transit, fill holidays, seep mapping
39 45 N	71 45 W	Northward transit, fill holidays, seep mapping
41 06 N	71 25 W	Northward transit, fill holidays, seep mapping
41 21.064 N	71 25.421 W	Entrance to Narragansett Bay

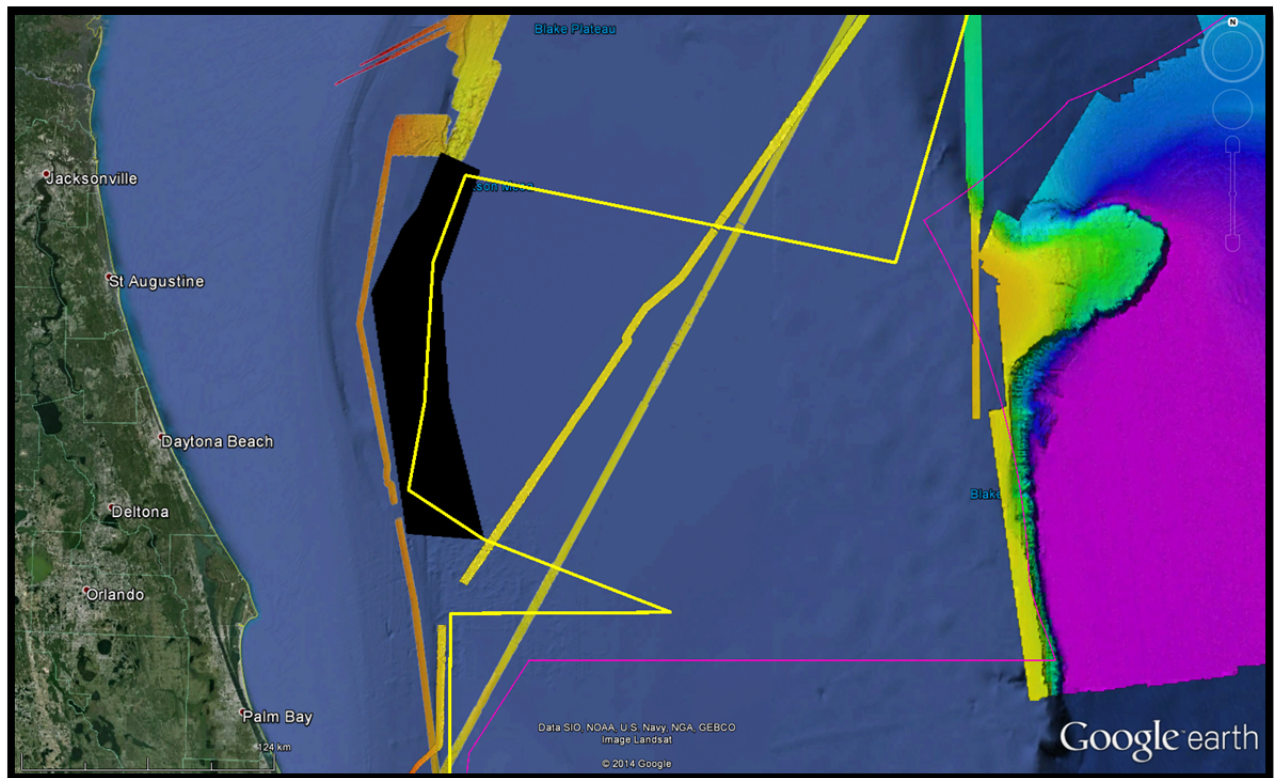


Figure 2: Map of highest priority area for focused mapping survey work in the Stetson Mesa region of the western Blake Plateau, shown as a black polygon. The approximate ship track line is shown in yellow. Bluefin tuna plankton tows will occur along east-west transit lines. International maritime boundaries shown in pink. Color-coded bathymetry previously collected by *Okeanos Explorer* and UNH/CCOM shown in the background of the operating area for

context. Figure produced in Google Earth Pro.

#### **D. Summary of Objectives**

EX-14-03 is an exploratory mapping expedition. Multibeam, single beam, and subbottom sonar data will be collected 24 hours a day and XBT casts will be conducted at an interval defined by prevailing oceanographic conditions, but not to exceed 3-4 hours. The final decision to operate and collect sub-bottom profiler data will be at the discretion of the Commanding Officer. All multibeam data will be fully processed according to standard onboard procedures and will be archived with the National Geophysical Data Center (NGDC). Subbottom sonar data will be also be archived with NGDC. Split-beam EK60 data will be archived at the National Oceanographic Data Center.

The following are cruise objectives for EX-14-03:

1. Collect deep water multibeam sonar data (MBES)
  - a. Conduct 24-hr mapping operations for the duration of the cruise
  - b. Collect bathymetric, seafloor backscatter, and water column backscatter data.
2. Collect ancillary sonar data
  - a. EK60 single beam sonar (24 hours/day)
  - b. Knudson sub-bottom profiler (up to 24 hours/day, at a minimum from 1000-2200). The final decision to operate and collect sub-bottom profiler data will be at the discretion of the Commanding Officer.
3. Perform baseline characterization mapping of the Stetson mesa region in the western portion of the Blake Plateau. The area to be mapped ranges between 500 and 800 meters in depth. This priority mapping area is shown as a black polygon in Figures 1 and 2.
4. During transit northward along the Atlantic continental slope, fill gaps in previous EX multibeam data and map previously unmapped areas along the shallower edges of existing multibeam coverage areas.
5. XBT and CTD operations
  - a. XBT casts will be collected at regular intervals of no more than 3-4 hours to ensure accurate sound velocity profiles for operating the MBES. These casts will be conducted by the mapping watches.
  - b. The CTD will be deployed at select sampling locations over the Blake Plateau region to characterize oceanographic conditions in the vicinity of the bluefin tuna plankton tows. CTD casts will gather water column profile data including auxiliary fluorometer and DO sensor measurements. Niskin bottle samplers will also be utilized to gather water samples at pre-determined depths for subsequent laboratory analyses. Auxiliary sensor equipment and water sample processing will be managed by the visiting scientist from NEFSC.
  - c. The CTD casts are designed to fulfill the research objectives of the NOAA Ocean Acidification Program (OAP). The water samples and data collected during these



casts will provide information on carbon, physical, and biogeochemical parameters as they relate to ocean acidification (OA). The specific offshore areas targeted for these operations have rarely been sampled. Additional details are provided in Appendix E of this document.

6. As a survey of opportunity partnership with NOAA's Northeast Fisheries Science Center, conduct shallow (20 meters from sea surface or less) plankton tows to help assess if bluefin tuna are spawning over the Blake Plateau region. The discovery of a new bluefin tuna spawning grounds in this region would be a major ecological discovery for a high profile fisheries species of international importance. Approximately 20 plankton tows are planned over the Blake Plateau to the east of the Gulf Stream. Additional details are provided in Appendix E of this document.
7. As a survey of opportunity, map a portion of the remaining search area for an underwater cultural heritage resource in the vicinity of the continental slope near Cape Hatteras. Data collected for this purpose will comply with the *Okeanos Explorer's* "Draft Standard Operating Procedures for Mapping Operations Involving Underwater Cultural Resources" document. This effort is a partnership with the Monitor National Marine Sanctuary, and the Sanctuary's Archaeologist has determined that data collected on this cruise will be made publicly available.
8. Conduct training of new mapping interns in all mapping data collection, including sonars and sound velocity profiling sensors and processing procedures (continuous throughout cruise).
9. Collect standard full suite of SCS data. All SCS data will be sent to NCDDC and will be used in real-time by NCDDC throughout the cruise.
10. Data Management Objectives: continue acquisition and shoreside push of mapping and water column data products.

## **E. Participating Institutions**

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

National Oceanic and Atmospheric Administration (NOAA) – Office of Coast Survey – Atlantic and Pacific Hydrographic Branches

National Oceanic and Atmospheric Administration National Marine Fisheries Service - Northeast Fisheries Science Center, Narragansett Laboratory -28 Tarzwell Drive Narragansett, RI 02882

Offshore Analysis and Research Solutions (OARS) - 8705 Shoal Creek Blvd, Suite 109 Austin, TX 78757 USA

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

**F. 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.

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

<b>Name (Last, First)</b>	<b>Title</b>	<b>Date Aboard</b>	<b>Date Disembark</b>	<b>Gender</b>	<b>Affiliation</b>	<b>Nationality</b>
Grabb, Kalina	Mapping Watchstander/Intern	5/5	5/23	F	UCAR	US Citizen
Lifavi, Danielle	Mapping Watchstander/Intern	5/5	5/23	F	UCAR	US Citizen
Self-Miller, Vanessa	Watch Leader	5/5	5/23	F	NOAA AHB	US Citizen
Sowers, Derek	Expedition Coordinator / Mapping Team Lead	5/5	5/23	M	NOAA OER (ERT Inc)	US Citizen
Stubbs, Chris	Watch Leader	5/5	5/23	M	OARS	US Citizen
Grosenick, Samuel	Mapping Watchstander/Intern	5/5	5/23	M	UCAR	US Citizen
Taylor, Chris	Scientist	5/5	5/23	M	NOAA Fisheries	US Citizen
Murk, David	Teacher at Sea	5/5	5/23	M	NOAA TAS	US Citizen

**G. Administrative**

1. Points of Contact:

*Ship Operations*

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

Chief, Operations Division, Atlantic (MOA)  
LT Laura Gibson, NOAA  
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E-mail: [Laura.Gibson@noaa.gov](mailto:Laura.Gibson@noaa.gov)

### *Mission Operations*

Derek Sowers, Expedition Coordinator/  
Mapping Team Lead  
NOAA Office of Ocean Exploration  
and Research (ERT, Inc)  
Phone : (714) 321-6084 / (603) 862-0369  
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Commanding Officer  
NOAA Ship *Okeanos Explorer*  
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LT Emily Rose, NOAA  
Operations Officer  
NOAA Ship *Okeanos Explorer*  
Phone: (808) 659-9197 (Ship's Iridium)  
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### *Other Mission Contacts*

Craig Russell, EX Program Manager  
NOAA Ocean Exploration & Research  
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John McDonough, Deputy Director  
NOAA Ocean Exploration & Research  
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Jared Drewniak, Telepresence Lead  
NOAA Office of Ocean Exploration & Research  
(Acentia)  
Phone: (401) 874-6250 (o) / (401) 330-9662 (c)  
Email: [jared.drewniak@noaa.gov](mailto:jared.drewniak@noaa.gov)

Vessel shipping address:

#### *Shipments:*

Send an email to the *Okeanos Explorer* Operations Officer at [OPS.Explorer@noaa.gov](mailto:OPS.Explorer@noaa.gov) indicating the size and number of items being shipped. All items should arrive at the below address prior to **COB May 5, 2014**.

John Harrison  
ATTN: Okeanos Explorer (name of contact)  
7917 Hangar Loop Dr, Hangar 5  
MacDill AFB, FL, 33621-5401

## 2. Diplomatic Clearances

None Required.

### 3. Licenses and Permits

See Appendix C for categorical exclusion documentation.

## II. OPERATIONS

The Chief Scientist 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)*

*Monday, May 5*

- Mission personnel arrive to ship, particularly air travelers

*Tuesday, May 6*

- Remaining mission personnel arrive to ship, orientation, operations meeting, and preparation for departure

*Wednesday, May 7 – Friday, May 9*

- Departure day; leave port in Tampa, FL and commence transit survey mapping operations (24 hours/day). Transit from Tampa to start of Stetson Mesa mapping priority area on western portion of the Blake Plateau.

*Saturday, May 10*

- Conduct CTD casts and plankton tows over the southern sampling transect over the Blake Plateau east of the Gulf Stream in support of Northeast Fisheries Science Center objectives for oceanographic characterization and search for a bluefin tuna spawning area.

*Sunday, May 11 - Friday, May 16*

- Conduct focused mapping operations within an approximately 2000 square mile area in the southwestern region of the Blake Plateau encompassing the Stetson Mesa area.

*Saturday, May 17 – Sunday, May 18*

- Conduct CTD casts and plankton tows over the northern Blake Plateau east of the Gulf Stream in support of Northeast Fisheries Science Center objectives for oceanographic characterization and search for a bluefin tuna spawning area.

*Monday, May 19 – Thursday, May 22*

- Transit from Blake Plateau region through vicinity of Monitor National Marine Sanctuary, and along the shallow edge of the continental shelf (heads of Atlantic Canyons) back to home port in RI.

*Thursday, May 22*

- Arrive in port at North Kingston, RI

*Thursday, May 22/ Friday May 23*

- Mission personnel depart ship

## **B. Telepresence Events**

Telepresence personnel will not be sailing on this cruise. However, a live connection between the *Okeanos Explorer* and shore may be possible on May 16, 2014 as part of the NOAA Open House event at Sand Point in Seattle. Craig Russell or Nicola VerPlanck will be present shoreside to talk about the feeds. The feasibility of this telepresence event, and the exact time remain to be determined.

## **C. In-Port Events**

There are currently no port events scheduled.

## **D. Staging and De-staging**

Deployment of the CTD and the plankton net as part of the NEFSC work on 5/16-5/18 will require staging and de-staging of the CTD unit and plankton nets at numerous sampling stations. Ship support for these operations is needed from Survey, ET, and Deck Departments as coordinated through the Operations Officer.

The Deep Discoverer ROV and both associated containers will need to be unloaded on 5/22 and 5/23. Deck and Engineering Department support will be needed from the ship.

## **E. Dive Plan**

All dives are to be conducted in accordance with the requirements and regulations of the NOAA Diving Program (<http://www.ndc.noaa.gov/dr.html>) and require the approval of the ship's Commanding Officer. No dives are currently planned for this cruise.

## **F. Sonar Operations**

Continuous EM 302, EK 60, and subbottom profiler data acquisition is planned for this cruise. All data acquisition will be conducted in accordance with established standard operating procedures under the direction of the mapping team lead. The final decision to operate and collect sub-bottom profiler data will be at the discretion of the Commanding Officer.

## **G. Applicable Restrictions**

*NOT APPLICABLE TO THIS CRUISE*

## **III. EQUIPMENT**

### **A. Equipment and capabilities provided by the ship**

- Kongsberg Simrad EM302 Multibeam Echosounder (MBES)
- Kongsberg Simrad EK60 Deepwater Echosounder
- Knudsen Chirp 3260 Sub-bottom profiler (SBP)
- LHM Sippican XBT (Deep Blue probes)
- Seabird SBE 911 Plus CTD
- Seabird SBE 32 Carousel and 24 2.5 L Niskin Bottles
- Light Scattering Sensor (LSS)
- Oxidation – Reduction Potential (ORP)
- Dissolved Oxygen (DO) sensor
- Altimeter Sensor and battery pack
- CNAV GPS
- POS/MV
- Seabird SBE-45 (Micro TSG)
- Kongsberg Dynamic Positioning-1 System
- NetApps mapping storage system
- CARIS HIPS Software
- IVS Fledermaus Software
- SIS Software
- Hypack Software
- Scientific Computing System (SCS)
- ECDIS
- Met/Wx Sensor Package
- Telepresence System
- VSAT High-Speed link (Comtech 5Mbps ship to shore; 1.54 Mbps shore to ship)
- Cruise Information Management System (CIMS)

### **B. Equipment and capabilities provided by the scientists**

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

Equipment for NEFSC oceanographic characterization and bluefin tuna search:

- 1x2 meter neuston frame
- mechanical flow meter



- DO sensor and Wet Labs ECO-FL fluorometer with connector cables for CTD casts
- 2 five-gallon carboys of 95% ETOH (ethanol)
- 333 micron net
- a bucket, some rope, 2 squeeze bottles, and funnel
- 3 boxes of pint jars with lids (36), 2 boxes of quart jars with lids (24)
- 333 micron sieve

#### IV. HAZARDOUS MATERIALS

##### A. Policy and Compliance

For the bluefin tuna survey, NEFSC will be preserving samples in quart jars using 95% Ethanol. For this purpose, two 5-gallon carboys of 95% ethanol have been delivered to the *Okeanos Explorer*. MSDS sheets for 95% ethanol (ETOH) have been delivered to the ship and are provided in Appendix G. of this document.

##### B. Inventory

Common Name of Material	Qty	Notes	Trained Individual	Spill control
Ethyl Alcohol (95%)	2 x 5 gal	Flammable	Nikolai Pawlenko	F

##### C. Chemical safety and spill response procedures.

**Respiratory Protection (Specify Type):** None needed under normal conditions of use with adequate ventilation. A NIOSH/MSHA chemical cartridge respirator should be worn if PEL or TLV is exceeded.

Ventilation:

Local Exhaust: **Yes**

Mechanical (General):

**Yes** Special: **No**

**Other:** No

**Protective Gloves:** Natural rubber, Neoprene, PVC or equivalent.

**Eye Protection:** Splash proof chemical safety goggles should be worn.

**Other Protective Clothing or Equipment:** Lab coat, apron, eye wash, safety shower.

**Steps to Take in Case Material Is Released or Spilled:** Ventilate area of spill. Eliminate all sources of ignition. Remove all non-essential personnel from area. Clean-up personnel should wear proper protective equipment and clothing. Absorb material with suitable absorbent and containerize for disposal.

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

#### *Ship Responsibilities*

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

#### *NOAA OER Responsibilities*

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

#### *Deliverables*

- a. At sea
  - Daily plans of the Day (POD)
  - Daily situation reports (SITREPS)

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

*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 PLONE site (<http://tethys.gso.uri.edu/OkeanosExplorerPortal>).

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

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

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

Scientist, and members of the scientific party and is normally arranged by the Operations Officer and Chief Scientist.

## **B. Project Evaluation Report:**

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

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

## **VIII. MISCELLANEOUS**

### **A. Meals and Berthing**

Meals and berthing are required for 8 scientists. Meals will be served 3 times daily beginning one hour before scheduled departure, extending throughout the cruise, and ending two hours after the termination of the cruise. Since the watch schedule is split between day and night, the night watch may often miss daytime meals and will require adequate food and beverages (for example a variety of sandwich items, cheeses, fruit, milk, juices) during what are not typically meal hours. Special dietary requirements for scientific participants will be made available to the ship's command at least twenty-one days prior to the survey (e.g., Expedition Coordinator is allergic to fin fish). Berthing requirements, including number and gender of the scientific party, will be provided to the ship by the Expedition Coordinator. The Expedition Coordinator and Operations Officer will work together on a detailed berthing plan to accommodate the gender mix of the scientific party taking into consideration the current make-up of the ship's complement. The Expedition Coordinator is responsible for ensuring the scientific berthing spaces are left in the condition in which they were received; for stripping bedding and linen return; and for the return of any room keys which were issued. The Expedition Coordinator is also responsible for the cleanliness of the laboratory spaces and the storage areas utilized by the scientific party, both during the cruise and at its conclusion prior to departing the ship.

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

All persons boarding NOAA vessels give implied consent to comply with all safety and security policies and regulations which are administered by the Commanding Officer. All spaces and

equipment on the vessel are subject to inspection or search at any time. All personnel must comply with OMAO's Drug and Alcohol Policy dated May 7, 1999 which forbids the possession and/or use of illegal drugs and alcohol aboard NOAA Vessels.

## **B. Medical Forms and Emergency Contacts**

The NOAA Health Services Questionnaire (NHSQ, Revised: 02 JAN 2012) must be completed in advance by each participating scientist. The NHSQ can be obtained from the Chief Scientist or the NOAA website <http://www.corporateservices.noaa.gov/~noaaforms/eforms/nf57-10-01.pdf>. The completed form should be sent to the Regional Director of Health Services at Marine Operations Center. The participant can mail, fax, or scan and send via secure e-mail the form using the contact information below; participants should take precautions to protect their Personally Identifiable Information (PII) and medical information. The NHSQ should reach the Health Services Office no later than 4 weeks prior to the project to allow time for the participant to obtain and submit additional information that health services might require before clearance to sail can be granted. Please contact MOC Health Services with any questions regarding eligibility or completion of the NHSQ. Be sure to include proof of tuberculosis (TB) testing, sign and date the form, and indicate the ship or ships the participant will be sailing on. The participant will receive an email notice when medically cleared to sail if a legible email address is provided on the NHSQ. Contact information:

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

Please make sure the [medicalexplorer@noaa.gov](mailto:medicalexplorer@noaa.gov) email address is cc'd on all medical correspondence.

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

Emergency contact form is included as Appendix A.

## **C. Shipboard Safety**

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

Wearing open-toed footwear or shoes that do not completely enclose the foot (such as sandals or clogs) outside of private berthing areas is not permitted. Steel-toed shoes are required to

participate in any work dealing with suspended loads, including CTD deployments and recovery. The ship does not provide steel-toed boots. Hard hats are also required when working with suspended loads. Work vests are required when working near open railings and during small boat launch and recovery operations. Hard hats and work vests will be provided by the ship when required.

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

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

#### **D. Communications**

A daily situation report (SITREP) on operations prepared by the Expedition Coordinator will be relayed to the program office. Sometimes it is necessary for the Expedition Coordinator to communicate with another vessel, aircraft, or shore facility. Through various modes of communication, the ship is able to maintain contact with the Marine Operations Center on an as needed basis. These methods will be made available to the Expedition Coordinator upon request, in order to conduct official business. The ship's primary means of communication with the Marine Operations Center is via e-mail and the Very Small Aperture Terminal (VSAT) link. Standard VSAT bandwidth at 5Mbps is shared by all vessels staff and the science team at no charge. Increased bandwidth in 30 day increments is available on the VSAT systems at increased cost to the scientific party. If increased bandwidth is being considered, program accounting is required it must be arranged at least 30 days in advance.

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

Ocean Exploration and Research (OER):

OER Program Administration:

Phone: (301) 734-1010

Fax: (301) 713-4252

E-mail: [Firstname.Lastname@noaa.gov](mailto:Firstname.Lastname@noaa.gov)

University of New Hampshire, Center for Coastal and Ocean Mapping

Phone: (603) 862-3438

Fax: (603) 862-0839



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

*Okeanos Explorer* Cellular: (401) 713-4114

*Okeanos Explorer* Iridium:(808) 659-9179

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

EX INMARSAT B

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

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

Voice Over IP (VoIP) Phone:

301-713-7785

301-713-7791

301-713-7792

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

[expeditioncoordinator.explorer@noaa.gov](mailto: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**

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/1pcoSgPluUVxaY64CM1hJ7511iIYirTk48G-lv37Am\\_k/viewform](https://docs.google.com/a/noaa.gov/forms/d/1pcoSgPluUVxaY64CM1hJ7511iIYirTk48G-lv37Am_k/viewform) with their emergency contact information

## **Appendix B: Data Management Plan**

Okeanos Explorer (EX1403): East Coast Mapping and Exploration



### *Data Management Objectives*

*Data management objectives for EX1403 are to ensure that data from this mission are gathered, documented, quality controlled, archived, and made available through online data access tools within 45-60 days post-cruise. Any archaeologically sensitive data that may be identified during this mission will be protected according to the National Historic Preservation Act.*

14-Mar-14

Page

## **1. General Description of Data to be Managed**

### **1.1 Name of the Dataset of Data Collection Project**

Okeanos Explorer (EX1403): East Coast Mapping and Exploration

EX1403 is an exploratory mapping expedition. Using deep water multibeam, single beam and sub-bottom profile data, EX will perform baseline characterization of highest priority areas based on feedback from other NOAA Offices, Programs, Labs and regional management councils. Top priority areas are focused on Marine Protected Areas in the South Atlantic off the east coast of the U.S. EX will also fill data gaps along the Atlantic continental slope. As surveys of opportunity, EX also plans to test an advanced oxygen/argon sensor, conduct shallow plankton tows to help assess if bluefin tuna are spawning over the Blake Plateau region, and search for an underwater cultural heritage resource in the vicinity of the continental slope near Cape Hatteras.

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

Okeanos Explorer

### **1.2 Keywords that could be used to characterize the data.**

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, oceans, Northeast Fisheries Science Center, Marine Protected Areas, archaeological, archaeology, conservation, conserve, crm, cultural resource management, historic, marine archaeology, maritime, maritime archaeology, nautical, nautical archaeology, preserve, protect, protection, submerged cultural heritage, submerged cultural resource, uch, underwater cultural heritage, Blake Plateau, bluefin tuna, Cape Hatteras

### **1.4 Summary description of the data to be generated.**

Multibeam, single beam, and subbottom sonar data will be collected 24 hours a day. XBT casts will be conducted regularly for multibeam calibration. The ship's Scientific Computing System (SCS) will monitor and collect oceanographic, navigation, and meteorological data throughout the cruise.

### **1.5 Anticipated temporal coverage of the data**

Cruise Dates: 5/7/2014 to 5/22/2014

### **1.6 Anticipated geographic coverage of the data.**

Latitude Boundaries: 41.4 to 24.15

Longitude Boundaries: -82.9 to -41.4

### **1.7 What platforms will be employed during this mission?**

NOAA Ship Okeanos Explorer

### **1.8 What data types will you be creating or capturing?**

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

### **1.8 What data types will you be submitting for archive?**

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

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

160 GB

## **2. Points of Contact**

### **2.1 Who is the overall point of contact for the data collection?**

Derek Sowers, Physical Scientist, NOAA Office of Ocean Exploration and Research, [Derek.Sowers@noaa.gov](mailto:Derek.Sowers@noaa.gov)

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

Derek Sowers, Physical Scientist, NOAA Office of Ocean Exploration and Research, [Derek.Sowers@noaa.gov](mailto:Derek.Sowers@noaa.gov)

### **2.3 Who is responsible for data documentation and metadata activities?**

Susan Gottfried, Data Management Coordinator, NOAA National Coastal Data Development Center,

susan.gottfried@noaa.gov

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

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

### **3. Data Stewardship**

#### **3.1 What quality control procedures will be employed?**

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

### **4. Data Documentation**

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

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

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

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

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

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

## **5. Data Sharing**

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

All 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.

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

Not Applicable

### **7.3 What transformations or procedures will be necessary to prepare data for preservation or sharing?**

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


## Appendix C: Categorical Exclusion



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

March 8, 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 EX-14-03

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 effect on the human environment.

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 "EX-14-03 Exploration, East Coast (Mapping)" and will be led by Derek Sowers, Physical Scientist for the *Okeanos Explorer* program within OER. NOAA Ship *Okeanos Explorer* will depart St. Petersburg, Florida on May 7, 2014, and arrive in port in North Kingston, Rhode Island on May 22, 2014, and will conduct sonar mapping operations at all times during the cruise. Focused mapping and sonar testing operations will occur along a transit path around the Florida Keys, then northward along the edge of the Atlantic continental shelf within top priority exploration target areas in U.S. federal waters. Acoustic instruments that will be operational during the project are a 30 kHz multibeam echosounder (Kongsberg 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 at regular intervals in association with multibeam data collection.

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



This 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.

**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 &amp; Affiliation)</i>	<i>Supporting Team Members ashore</i>
<b>POC: Dr. Alexander Smirnov</b>	<i>Supporting Team Members aboard (if required)</i>

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

<p><b>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.</b></p>
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## **Appendix E. Description of Bluefin Tuna Spawning Area Search and Ocean Acidification Survey of Opportunity.**

*Lead POC or Principle Investigator (PI & Affiliation)*

**David Richardson and Jon Hare**

National Marine Fisheries Service  
Northeast Fisheries Science Center  
Narragansett Laboratory

Lead Scientist Onboard EX-14-03: Chris Taylor, NOAA Fisheries

### Project Objectives:

The primary objective of this project is to evaluate whether bluefin tuna (*Thunnus thynnus*) are spawning in the waters over the Blake Plateau and to the north and east of the Bahamas. The discovery of spawning in this region would overturn the current paradigm that the Gulf of Mexico is the only western Atlantic spawning grounds for this species. The significance of such a discovery would be substantial given bluefin tuna's high profile in national and international fisheries, their critically low population levels, and the significant amount of resources that have been invested in resolving their life history and migration patterns.

Three sources of information lead us to think that bluefin tuna spawn in this region. First, electronic tagging studies indicate that many spawning size bluefin tuna do not enter the Gulf of Mexico during the spawning season, but do migrate to our target study area. Second, limited plankton sampling over the Blake Plateau in 1985 revealed the presence of bluefin tuna larvae. At the time these larvae were thought to be transported to this region from known spawning locations in the Gulf of Mexico. Our reanalysis of this data, using more recent information on regional circulation, suggests that such a transport route is impossible given the age of the larvae. Third, recent sampling of longline catches in the region identified two female bluefin in near-spawning condition. These fish were collected north of the Bahamas and estimated to be within 24 hours of spawning.

In the event that bluefin tuna are not discovered through this effort, we still feel that the results of this sampling will be noteworthy. Other high-profile pelagic species, including marlin, may be spawning in this region and would be collected by our nets. The spawning grounds of some of these species, such as roundscale spearfish, to this day have not been determined, while for others we have only an incomplete picture.

The CTD casts are designed to fulfill the research objectives of the NOAA Ocean Acidification Program (OAP). The water samples and data collected during these casts will provide information on carbon, physical, and biogeochemical parameters as they relate to ocean acidification (OA). The specific offshore areas targeted for these operations have rarely been sampled.

### **Sampling Methods**

We will evaluate whether spawning is occurring in this region by conducting short (15-20 minute) tows to 20 meters depth with a small (1x2 meter) plankton net able to collect bluefin tuna eggs and larvae. Bluefin tuna eggs hatch <24 hours after spawning, while sampled larvae are generally <10 days old. Early life stage collections combined with the analysis of oceanographic data can be used to definitively identify a spawning area. Our plankton net has been previously deployed from a variety of platforms including both research and small recreational vessels. The J-frame on the *Okeanos Explorer* would be a suitable means to deploy and recover the sampling net, seeking to avoid dragging the net through the ship's propwash. Typical towing speeds are 1-2 knots through the water. Tows can be conducted at any time of day or night, and close coordination with the Chief Bosun will be required to ensure adequate support from the ship's Deck Department. Some experimentation with weighting the net may be needed to reach the target sampling depth of 20 meters below the surface. The net is equipped with a flow meter. A total of 20-25 tow samples are expected for this cruise. Sampling gear can be deployed in marginal sea conditions, during both day and night. Exact sampling locations may change as onshore support should be able to provide satellite images

of possible frontal locations along our cruise track that would be particularly promising locations to sample. Once the net is recovered, the plankton sample will be retrieved by Chris Taylor and processed in the wet lab using sieves and preserving the samples in jars with 95% ethanol. Safe storage space is needed where the samples can be protected from breakage. Samples do not need refrigeration.

Approximately 6 CTD casts are planned in support of the bluefin tuna plankton sampling effort and to provide useful data to NOAA's Ocean Acidification Program (OAP). CTD casts will be conducted to encompass almost the full depth of the water column, not to exceed 1,000 meters. 5-6 water samples will be captured in Niskin bottles of the CTD rosette on the up-cast of the profile. NOAA Fisheries is providing their own DO sensor and fluorometer instruments to attach to the CTD. Fisheries will be responsible for pre and post sampling calibrations of these sensors.

### Area of Survey and Cruise Track Descriptions

This survey of opportunity will be conducted over the Blake Plateau region of the U.S. continental shelf offshore of northeast Florida and Georgia. CTD casts and plankton tows will be completed along the east-to-west trending transect lines in Figure 1, and along the northward transit line leaving the Blake Plateau area (areas shown within red circles). A more detailed plan of sampling stations and coordinates will be provided to the ship during the cruise.

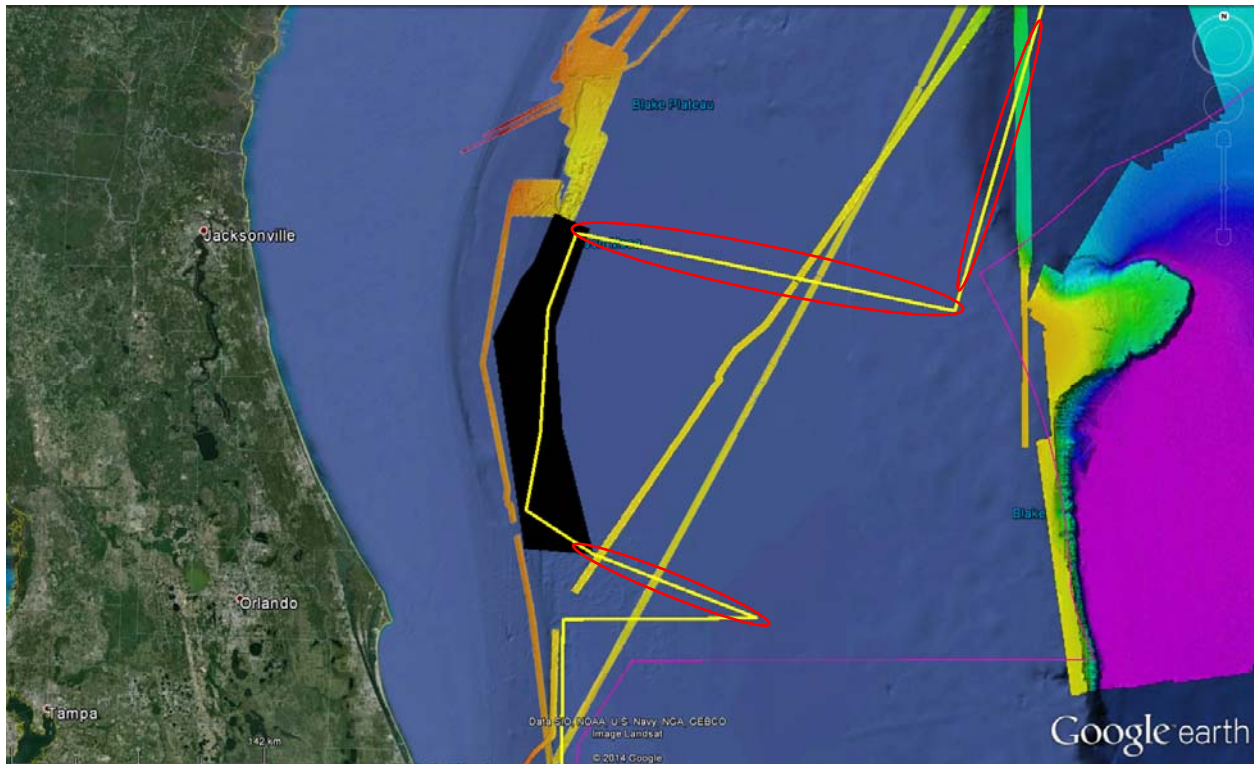


Figure 1: Area of plankton tows and CTD operations. Yellow line is the ship's planned transit route. Red circles are sampling transects. Black polygon is high priority mapping area for EX-14-03.

## Appendix F: 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.



## Appendix G. MSDS for 95% Ethanol (ETOH)

### Material Safety Data Sheet



## Ethanol, Denatured, 95%

Revised: 02/20/2012  
Replaces: 02/14/2012  
Printed: 08/31/2012

### Carolina Biological Supply Company

2700 York Rd | Burlington, NC 27215 • to order: 800.334.5551 • for support: 800.227.1150

**CAROLINA**  
www.carolina.com

#### Section 1 - Product Description

**Product Name:** Ethanol, 95%  
**Product Code(s):** 15-4708A, 15-4708CA, 15-4724A, 89-2301, 892305, 19-1184, 19-1176, 15-4725, 19-1177, 76-6200, 86-1281, 86-1283, 86-1285, 84-1135, 10-1026, 10-1036, 84-0887, 84-0528, C70188, C71535  
**Size:** 1 oz, 75 mL, 350 mL, 500 mL, 4 L, 20 L, various  
**Chemical Name:** Ethanol, 95%  
**CAS Number:** See Section 3  
**Formula:** See Section 3  
**Synonyms:** Alcohol, Ethyl alcohol  
**Distributor:** Carolina Biological Supply Company, 2700 York Road, Burlington, NC 27215  
**Chemical Information:** 800-227-1150 (8am-5pm (ET) M-F) Chemtrec 800-424-9300 (Transportation Spill Response 24 hours)

#### Section 2 - Hazard Identification

**Emergency Overview:** WARNING - Highly flammable. Harmful by inhalation and if swallowed.  
**Potential Health Effects:**  
**Eyes:** May cause irritation. **Skin:** May cause irritation to skin.  
**Ingestion:** May cause gastrointestinal discomfort. **Inhalation:** May cause irritation to respiratory tract.

#### Section 3 - Composition / Information on Ingredients

**Principal Hazardous Components:** Ethyl Alcohol (CAS # 64-17-5) 85.5%; Denaturant: Isopropyl Alcohol (CAS # 67-63-0) 5.0%; Denaturant: Methyl Alcohol (CAS # ) 4.5%  
**TLV units:** Ethyl alcohol: ACGIH-TLV 1000 ppm (TWA)  
**PEL units:** Ethyl alcohol: OSHA-PEL 1000 ppm (TWA)

#### Section 4 - First Aid Measures

**Emergency and First Aid Procedures:**  
**Eyes** - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.  
**Skin** - After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water.  
**Ingestion** - If swallowed, do not induce vomiting; seek medical advice immediately and show this container or label.  
**Inhalation** - In case of accident by inhalation: remove casualty to fresh air and keep at rest.

#### Section 5 - Firefighting Procedures



Flash Point (Method Used): 12.8 °C (CC) (Ethanol)

NFPA Rating:

Health: 2

Fire: 3

Reactivity: 0

Extinguisher Media: Use dry chemical, CO<sub>2</sub> or appropriate foam.

Flammable Limits in Air % by Volume: (Ethanol) LEL: 3.3% UEL: 19%

Autoignition Temperature: (Ethanol) 363 °C

Special Firefighting Procedures: Firefighters should wear full protective equipment and NIOSH approved self-contained breathing apparatus.

Unusual Fire and Explosion Hazards: Vapours may travel back to ignition source. Closed Containers exposed to heat may explode.

Extremely flammable.

## Section 6 - Spill or Leak Procedures

Steps to Take in Case Material Is Released or Spilled: Ventilate area of spill. Eliminate all sources of ignition. Remove all non-essential personnel from area. Clean-up personnel should wear proper protective equipment and clothing. Absorb material with suitable absorbent and containerize for disposal.

## Section 7 - Special Precautions

Precautions to Take in Handling or Storing: Keep container tightly closed in a cool, well-ventilated place. Keep away from oxidizing materials and strong acids.

## Section 8 - Protection Information

Respiratory Protection (Specify Type): None needed under normal conditions of use with adequate ventilation. A NIOSH/MSHA chemical cartridge respirator should be worn if PEL or TLV is exceeded.

Ventilation:

Local Exhaust: Yes

Mechanical(General): Yes

Special: No

Other: No

Protective Gloves: Natural rubber, Neoprene, PVC or equivalent.

Eye Protection: Splash proof chemical safety goggles should be worn.

Other Protective Clothing or Equipment: Lab coat, apron, eye wash, safety shower.

## Section 9 - Physical Data

Molecular Weight: (Ethanol) 46.07

Boiling Point: (Ethanol) 78.5 °C

Vapor Density(Air=1): (Ethanol) 1.59

Percent Volatile by Volume: 100%

Solubility in Water: Soluble

Melting Point: (Ethanol) -114.1 °C

Vapor Pressure: (Ethanol) 59.3 mmHg at 25°C

Specific Gravity (H<sub>2</sub>O=1): (Ethanol) 0.789 at 20 °C

Evaporation Rate (BuAc=1): 3.3

Appearance and Odor: Clear, colorless liquid, Alcohol odor.

## Section 10 - Reactivity Data

Stability: Stable

Conditions to Avoid: Heat and sources of ignition.

Incompatibility (Materials to Avoid): Oxidizers,

Hazardous Decomposition Products: CO<sub>x</sub>,

Hazardous Polymerization: Will not occur

## Section 11 - Toxicity Data

Toxicity Data: (Ethanol) ori-rat LD50 7060 mg/kg; ihl-rat LC50 20000 ppm/10H

**Effects of Overexposure:**

**Acute:** See Section 2

**Chronic:** Not listed as a carcinogen by IARC, NTP or OSHA. Mutation data cited. Reproductive data cited. Tumorigenic data cited.

**Conditions Aggravated by Overexposure:** Skin disorders, Eye disorders, Respiratory disorders, Liver disorders,

**Target Organs:** Eyes, Liver, Kidneys, Central Nervous System,

**Primary Route(s) of Entry:** Inhalation and ingestion.

## Section 12 - Ecological Data

EPA Waste Numbers: Ethanol (D001)

## Section 13 - Disposal Information

**Waste Disposal Methods:** Dispose in accordance with all applicable Federal, State and Local regulations. Always contact a permitted waste disposer (TSD) to assure compliance.

## Section 14 - Transport Information

DOT Proper Shipping Name: UN1170, Ethanol, 3, II

## Section 15 - Regulatory Information

EPA TSCA Status: On TSCA Inventory

Hazard Category for SARA Section 311/312 Reporting: Acute Fire

**Name List:**  
Ethanol - No

**Chemical Category:**  
Ethanol - No

CERCLA Section 103 RQ(lb.): Ethanol - No

RCRA Section 261.33: Ethanol - No

## Section 16 - Additional Information

The information provided in this Material Safety Data Sheet represents a compilation of data drawn directly from various sources available to us. Carolina Biological Supply makes no representation or guarantee as to the suitability of this information to a particular application of the substance covered in the Material Safety Data Sheet. Any employer must carefully assess the applicability of any information contained herein in regards to the particular use to which the employer puts the material.

**Glossary**

ACGIH	American Conference of Governmental Industrial Hygienists
CAS Number	Chemical Services Abstract Number
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DOT	U.S. Department of Transportation
IARC	International Agency of Research on Cancer
N/A	Not Available
NTP	National Toxicology Program
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
ppm	Parts per million
RCRA	Resource Conservation and Recovery Act
SARA	Superfund Amendments and Reauthorization Act
TLV	Threshold Limit Value
TSCA	Toxic Substances Control Act